# California-Oregon Advanced Transportation System:

## Strategic Deployment Plan


Caltrans

U.S. Department of Transportation
Federal Highway Administration

Oregon Department of Transportation

Western Transportation Institute
Montana State University-Bozeman

Montana State University
Bozeman

# CALIFORNIA – OREGON ADVANCED TRANSPORTATION SYSTEM:

## *STRATEGIC DEPLOYMENT PLAN*

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## ABBREVIATIONS

| | |
|---|---|
| APCD | Air Pollution Control District |
| APTS | Advanced Public Transportation Systems |
| AQMD | Air Quality Management District |
| ARTIC | Advanced Rural Technology Integration Center |
| ARTS | Advanced Rural Transportation Systems |
| ATIS | Advanced Traveler Information Systems |
| ATMS | Advanced Transportation Management Systems |
| AVI | Automatic Vehicle Identification |
| AVL | Automatic Vehicle Location |
| Caltrans | California Department of Transportation |
| CCTV | Closed-Circuit Television |
| CHIN | California Highway Information Network |
| CHP | California Highway Patrol |
| CIA | Central Intelligence Agency |
| CMAQ | Congestion Mitigation and Air Quality |
| CO | Carbon Monoxide |
| COATS | California/Oregon Advanced Transportation Systems |
| COG | Council of Government |
| CPA | Critical Program Area |
| CTC | California Transportation Commission |
| CVISN | Commercial Vehicle Information Systems and Networks |
| CVO | Commercial Vehicle Operations |
| DOT | Department of Transportation |
| DSRC | Dedicated Short-Range Communications |
| EMS | Emergency Medical Services |
| FAH | Federal-Aid Highway |
| FCR | Flexible Congestion Relief |
| FHWA | Federal Highway Administration |
| GIS | Geographic Information System |
| GPS | Global Positioning System |
| HAR | Highway Advisory Radio |
| HAZMAT | Hazardous Materials |
| HCL | High Crash Location |
| HOT | High Occupancy Toll |
| HTCRS | Highway Travel Conditions Reporting System |
| HTF | Highway Trust Fund |
| IOF | Immediate Opportunity Fund |
| ISP | Information Service Provider |
| ISTEA | Intermodal Surface Transportation Efficiency Act |
| ITS | Intelligent Transportation Systems |
| IVHS | Intelligent Vehicle Highway Systems |
| IVI | Intelligent Vehicle Initiative |
| LTC | Local Transportation Commission |
| MPO | Metropolitan Planning Organization |

| | |
|---|---|
| NHS | National Highway System |
| NTCIP | National Transportation Communications for ITS Protocol |
| NTR | New Technology and Research |
| O&M | Operations and Maintenance |
| ODOT | Oregon Department of Transportation |
| OSP | Oregon State Police |
| OTIB | Oregon Transportation Infrastructure Bank |
| PM-10 | Small Particulate Matter |
| PS&E | Plans, Specifications and Estimates |
| PVEA | Petroleum Violation Escrow Account |
| RTPA | Regional Transportation Planning Agency |
| RWIS | Road Weather Information System |
| SDP | Strategic Deployment Plan |
| SLTPP | State and Local Transportation Partnership Program |
| SOC | Satellite Operation Center |
| SOVA | Southern Oregon Visitors Association |
| SPR | State Planning and Research |
| STP | Surface Transportation Program |
| TC | Transportation Commission |
| TCIP | Transit Communications Interface Protocol |
| TEA-21 | Transportation Equity Act for the 21$^{st}$ Century |
| TMC | Transportation Management Center |
| TOC | Transportation Operation Center |
| TSM | Traffic System Management |
| VMS | Variable Message Sign |
| VMT | Vehicle-Miles of Travel |
| WIM | Weigh in Motion |
| WTI | Western Transportation Institute |

# TABLE OF CONTENTS

## LIST OF TABLES

## LIST OF FIGURES

# EXECUTIVE SUMMARY

The effectiveness of a rural region's transportation system has far-reaching impacts on the quality of life for the region's residents, businesses, and visitors. Traditional solutions to improving the capacity of the transportation system, especially in rural areas, are becoming increasingly difficult to implement, due to concerns about funding, cost-benefit effectiveness, and the environment. For this reason, there has been an emphasis in recent years on improving the operations of the transportation system. One major set of strategies used to this end are intelligent transportation systems (ITS), which are combinations of communications, computational and electronic technology that help to improve the safety and operation of the transportation system. If strategically implemented, ITS may provide solutions to many of the transportation challenges found in rural areas, such as non-recurrent congestion, weather, safety, tourism, mobility, and freight movement.


**Figure ES-1:** COATS Study Area Boundaries.

The value of ITS in saving lives, time and money has been well documented for urban areas, but not as much so for rural areas. For this reason, the California and Oregon Departments of Transportation (Caltrans and ODOT, respectively) partnered with the Western Transportation Institute at Montana State University-Bozeman to investigate the feasibility of ITS in rural areas. This partnership resulted in the creation of the California/Oregon Advanced Transportation Systems (COATS) project, which seeks to encourage regional, public and private sector cooperation between California and Oregon organizations to better facilitate the planning and implementation of ITS in a bi-state area extending between Eugene, Oregon and Redding, California (see Figure ES-1). The COATS study area includes parts of thirteen counties in northern California as well as the southern half of Oregon, covering over 80,000 square miles, which share many common transportation challenges. The intent of this project is to facilitate the use of ITS to enhance safety, improve the movement of people, goods, and services, and subsequently promote the economic development of the region.

This document, the COATS ITS Strategic Deployment Plan, represents a compilation of three years of research and outreach to address the issues and opportunities within the bi-state region. This document is a summary of comprehensive analysis and findings that describes a strategic approach for implementing rural ITS strategies on a larger scale. Emphasis is placed on integration and expansion of future ITS components within the study area based on evaluation results. Apart from its focus on this particular part of the country, the COATS project has a couple of unique features.

- The project has been approached primarily from a research perspective. Rather than relying solely on interviews and subjective data provided by stakeholders and travelers, the COATS Strategic Deployment Plan seeks to tie deployment locations to specific challenges as justified by various data collection efforts as well as stakeholder input. Many distinct outreach efforts were made to ensure that stakeholders throughout the study area had the chance to participate in the planning process, and that their ideas and concerns were considered in the development of strategies and deployment.

- It seeks to provide both *strategies* to guide future ITS investment, as well as specific *deployment* locations that can support this strategic direction. This combination allows the plan to reflect a broader long-term view that can supercede the short-term transportation programming processes, while at the same time giving concrete recommendations for projects that may help to keep this plan active.

The COATS project sought to build upon the best practices used from previous ITS planning efforts across the country. On that basis, critical project aspects include stakeholder identification and outreach, assessment of area challenges, development of a vision and strategic direction, and identification of specific projects to build on that vision.

## Stakeholder Identification and Outreach

Hundreds of stakeholders are involved in the transportation system in the study area, and it was important to engage them in this effort to ensure that this plan would represent a larger regional vision for ITS. Several formats, including stakeholder workshops, outreach through a project Steering Committee and Regional Teams, newsletters and a Web page, were used to conduct outreach. Stakeholder concerns were represented on an ongoing basis through the Steering Committee and Regional Teams, whose membership organizations are shown in Table ES-1.

## Area Challenges

Extensive efforts were undertaken in the COATS project limits to research the challenges being experienced. Quantitative data was collected on the conditions and performance of the surface transportation system as well as travelers' opinions. Quantitative data analyzed included over 24,000 crash records from a three-year period. Data analyzed for each incident included collision type, first harmful event, object hit, vehicle type, weather conditions, road surface conditions, contributing causes and driver violations. In order to be able to analyze crashes in a detailed manner without having to review each crash record, high crash locations were selected as those having a crash rate greater than two standard deviations above the mean. Additional quantitative data collected included traffic volumes, population, emergency notification and response time, road closures, visitation and tourism expenditures at recreation destinations, wireless geographic communication coverage, and hazardous material spills. This data was

**Table ES-1:** COATS Steering Committee and Regional Team Member Organizations.

| California | Oregon |
|---|---|
| Lassen Local Transportation Commission | Oregon State Police |
| Plumas Local Transportation Commission | City of Winston |
| Siskiyou Local Transportation Commission | The Driftwood Group |
| Trinity Local Transportation Commission | Rogue Valley Council of Governments |
| Modoc Local Transportation Commission | Rogue Valley Transportation District |
| Del Norte Local Transportation Commission | US Forest Service |
| Humboldt County Association of Govts. | City of Burns |
| Lake County/City Area Planning Council | Oregon Chapter of ITS America |
| Mendocino Council of Governments | FHWA |
| Shasta Local Transportation Commission | State Traffic Engineer |
| Shasta Cascade Wonderland Association | Southern Oregon Visitors' Assoc. |
| Tehama Local Transportation Commission | ODOT – Trans. Devel. Branch |
| California Trucking Association | ODOT – Region 2 |
| California Highway Patrol | ODOT – Region 3 |
| Redwood Empire Association | ODOT – Region 4 |
| FHWA, Oregon Division | ODOT – District 5 |
| FHWA, California Division | ODOT – District 11 |
| California Alliance for Advanced Technologies | ODOT – ITS Unit |
| California Association for Commuter Transportation | FHWA |
| Caltrans – New Technology & Research | National Park Service |
| Caltrans – District 1 | |
| Caltrans – District 2 | |
| Caltrans – Traffic Operations | |
| FHWA, ITS Joint Programming Office | |
| National Park Service | |

related to existing (legacy) systems and used as input to the potential locations of planned advanced technology improvements as illustrated in Figure ES-2.

A traveler needs survey sought to assess how information could help to address these challenges from a motorist perspective. The results of the survey determined *what* information the rural traveler needs and wants, the *medium* through which information would need to be presented to the traveler and where the traveler would want this information presented. Table ES-2 shows the technologies that emerged as favorites for improving traveler information.

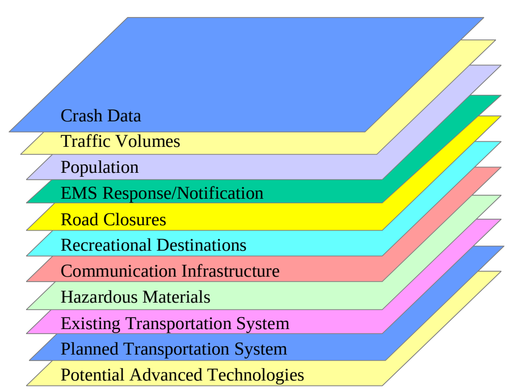



**Figure ES-2:** Layered Methodology for Analyzing Study Area Challenges.

## Vision and Strategic Direction

Having a shared vision is essential in

order to effectively demonstrate ITS projects. The vision can characterize a snapshot of the future as to what the likely benefits of the COATS project will be. The Steering Committee adopted the following vision for the COATS project (see also Figure ES-3):

> "The California/Oregon Advanced Transportation Systems (COATS) project is a cooperative bi-state, public-private sector project designed to develop a comprehensive ITS to address unique rural regional and local transportation challenges."

Some of the major goals identified for ITS in the region include:

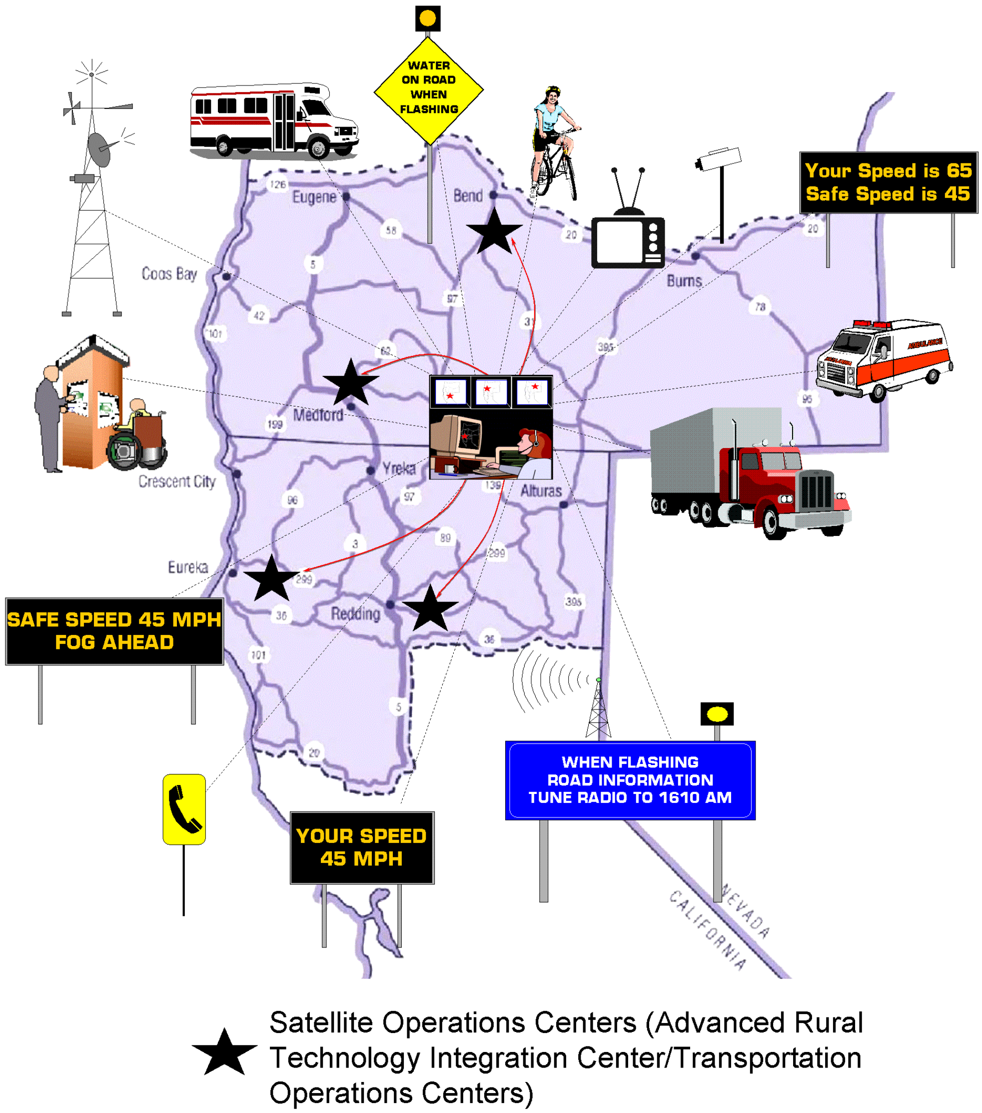
- Improve the safety and security of the region's rural transportation system
- Enhance personal mobility and accessibility to services and enhance convenience and comfort of motorists traveling in and through northern California and southern Oregon
- Increase operational efficiency and productivity focusing on system providers
- Enhance economic productivity of individuals, businesses and organizations
- Reduce energy consumption, environmental costs and negative impacts
- Develop and foster long-term partnerships that will result in the demonstration of ITS initiatives and traditional solutions that address rural needs of the region
- Ensure compatibility with statewide and national ITS initiatives
- Incorporate ITS into the State Transportation Improvement Program planning and programming efforts

**Table ES-2:** Ranking of Potential Technology Applications.

| **Technology Applications *(ranked in order of priority)*** |
|---|
| Warning signs for speed, curves and animal presence that change base conditions |
| A telephone number to report an incident or accident |
| A special radio channel for road conditions, accidents, etc. |
| Changeable message signs |
| A telephone number for road condition |
| A cellular phone |
| An in-vehicle device to enhance driving capabilities in low visibility situations |
| An in-vehicle device to help you avoid collisions or running off the roadway |
| A special radio channel for tourist information |
| Small computerized information centers – or kiosks – at convenient locations |
| A local TV channel with continuously updated tourist and traveler information |
| A small in-vehicle computer with traveler information |

These goals will be achieved through ITS projects that follow a deployment path that addresses traveler safety in the short-term, transportation management and public safety in the

**Figure ES-3:** COATS Vision.




medium-term, and an integrated traveler and transportation management system in the long-term. It is envisioned that the COATS project vision will be achieved by continuing the lower priority short-term improvements during the medium-term deployment phase and lower medium-term priorities during the longer-term phase until the integrated traveler and transportation management system long-term strategy is achieved, as shown in Figure ES-4.

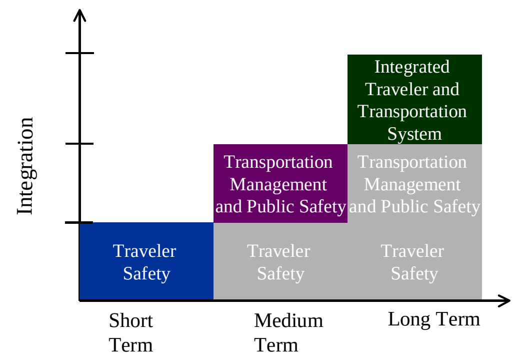
***Short Term (less than 4 years)***

<u>Focus: Traveler Safety</u>

***Operational efficiency and public safety***

In the short-term, the first strategy will be to address the operational efficiency and public safety through automated "smart" systems to maximize resources and reduce exposure to adverse conditions and obstacles that may impede traveler safety. This strategy will be accomplished through:

**Figure ES-4:** Timeline for Strategic Deployment of ITS.




- monitoring road-weather conditions with road weather information systems, wind monitoring stations, automated flood warning systems, automated visibility systems, automated anti-icing systems and advanced vehicle detection; and

- monitoring the roadway rights-of-way or the roadway for potential animal-vehicle conflicts or detecting landslides.


***Advise unfamiliar travelers of unsafe driving conditions***

This will be accomplished through advance warning systems that utilize variable message signs and highway advisory radio to warn travelers of the following:

- speed/travel conditions;
- intersection collision avoidance;
- wide loads on narrow lanes; or
- bike/pedestrian hazard locations.

***Regional and bi-state coordination***

The third strategy for the short-term will be to provide for the development of a center(s) to coordinate sub-regional and bi-state activity. This strategy will be accomplished through these methods.

- Monitoring traffic and roadway conditions through traffic sensors and closed circuit television cameras to verify conditions.

- Implementing or better utilizing Advanced Rural Technology Integration Centers in Redding and Eureka, California and Transportation Operations Centers in Bend and

Medford, Oregon to serve as coordination focal points for regional "real-time" en route/pre-trip traveler information through variable message signs, highway advisory radio, the Internet, and 1-800 travel advisory telephone systems. These centers would coordinate, communicate and cooperate with each other, nearby communities, local organizations, State agencies, and other regions (i.e. Central Coast, Portland, Nevada).


- Providing for the ability to control access to the roadway system through automated gate closure systems.

***Medium Term (4-8 years)***

<u>Focus: Transportation Management and Public Safety</u>

***Improved response to incidents***

This strategy will be accomplished through the development of a set of predefined actions, roles, and responsibilities established in regional incident management plans. To compliment these plans, common public fleet management system/dispatch systems (automatic vehicle location) would be purchased and installed. These would improve the ability to locate emergency situations via a rural coordination addressing system, detect delays through probe vehicles and assist in coordinating with local organizations and statewide centers. Motorist-aide call boxes, used in conjunction with vehicle-based mayday systems, may provide responders with quicker notification of roadway incidents. Improvement management of information regarding hazardous materials shipments may expedite response and clean-up to these incidents, lessening potential transportation and environmental impacts.

***Long Term (8-15 years)***

<u>Focus: Integrated Traveler and Transportation System</u>

***Economic productivity enhancements for individuals, businesses and organizations***


When visitors have access to timely and accurate information they are far more likely to visit the area and thus increase the economic vitality of an area. This information will be provided by such deployments as:

- kiosks in rest areas, businesses or other high volume patronage locations;
- a travel advisory telephone system that includes tourism services and transportation information;

- advisory television channels to promote tourism and provide safety information; and
- the implementation of a smart card system.

Also, the installation of commercial vehicle pre-clearance systems and weigh-in-motion systems will help to increase the efficient movement of goods and services.

***Personal mobility, accessibility and awareness for public transportation***

In counties where more traditional transit is warranted, personal mobility and accessibility will be increased through monitoring on-time performance and tracking vehicle fleets via transit vehicle routing/scheduling systems and software that will provide more accurate real-time information to managers and patrons through automatic passenger counters and transit traveler information systems.

To enhance personal mobility and accessibility in areas that warrant more innovative solutions, the solutions and strategies such as dynamic ridesharing and paratransit services, or implementing recreational vehicle park and ride lots with shuttle services for highly visited communities hosting major special events (e.g. Shakespeare Festival) are recommended. Also, as highlighted previously, a smart card system to track transit accounts and patron usage is proposed.

***Improved tourism industry, transportation and transit coordination***

This strategy can be accomplished by assisting in the development of long-term partnerships and information sharing and through deployment of Internet-based information systems, traveler information systems and forming partnerships with the private sector for in-vehicle systems.

## Realizing the Vision

This plan takes several initial steps toward realizing this ITS vision.

- A regional ITS architecture, which shows organizations need to exchange information with each other to support these ITS technologies, was developed through this effort.

- This plan recommends nearly 1,500 ITS projects for the COATS study area. Of these, there are approximately 330 separate short-term projects with an estimated capital cost of $25 million.

- This plan reviews Federal, state, regional, local and private-sector funding sources that may be utilized to support deployment or operations and maintenance costs.

**Table ES-3:** List of Actions and Responsible Organizations.

| Action | Responsible Agency | | | | | |
|---|---|---|---|---|---|---|
| | Caltrans New Tech & Research / ODOT ITS Unit | Caltrans District / ODOT Region | CA Highway Patrol / OR State Police | State and Local Tourism | County/ Local | FHWA/FTA |
| ***Project Continuance and Outreach*** | | | | | | |
| Continue Stakeholder Outreach | ✓ | ✓ | ✓ | ✓ | | |
| Develop Marketing Strategy | ✓ | | | | | |
| Provide Updates on National ITS Developments | ✓ | ✓ | | | | ✓ |
| Utilize or Eliminate Regional Teams | ✓ | | | | | |
| Demonstrate the Benefits to RTPAs, MPOs and COGs | ✓ | ✓ | ✓ | ✓ | | |
| Expand Architecture Development and Education | ✓ | ✓ | | | | ✓ |
| Maintain ITS Inventory | | ✓ | | | ✓ | |
| ***Strategy for Implementation*** | | | | | | |
| Increase Regional Support or Other Alternatives | ✓ | ✓ | | | | |
| Mainstream ITS into Program and Project Prioritization | | ✓ | | ✓ | ✓ | |
| Modify Project Organization | ✓ | | | | | |
| Emphasize Multi-modal and Tourism Opportunities | ✓ | ✓ | | | | |
| Secure Demonstration and non-Traditional Funding | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Public Private Partnership Task Force | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

- This plan provides recommendations on how operations and maintenance of the ITS infrastructure should be supported in the COATS region, and the questions that need to be addressed.

With these major steps underway, this plan provides an important foundation for the effective deployment of ITS in the COATS region. Additional steps will be required to ensure its long-term success are shown in Table ES-3.

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# 1 INTRODUCTION

The importance of transportation to the daily activities of life cannot be understated. In connecting people to employment, shipping goods to markets, providing access to medical and emergency services, broadening opportunities for recreational activities and many others, transportation's impact is enormous. As such, the nature of the transportation system can impact many aspects of the quality of life. As the quality of the transportation system is improved, it is anticipated that its benefits would be widespread.

In recent years, one major area of improvements to the transportation system is a group of solutions collectively known as intelligent transportation systems (ITS). These solutions are combinations of communications, computational and electronic technology that help to improve the safety and operation of the transportation system. The promise of ITS to save time, lives and money is significant, and has been documented in many studies across the country. Most of these benefits have been found in urban areas, where ITS deployment has been more accelerated in order to maximize the capacity of the transportation system under recurring traffic congestion conditions. However, it is likely that ITS may offer significant yet different benefits to the rural environment as well, as it addresses some of the non-recurrent congestion and safety issues that are more pronounced in rural areas.

In order to provide for the effective implementation of ITS, it is important to have an overarching strategic framework, that describes how ITS will work in conjunction with the rest of the transportation system in order to ultimately enhance its quality. Because ITS is still relatively unproven in rural areas, this need is critical in order to maximize the benefits of ITS investments for both operating agencies and the traveling public they serve.

The purpose of this document is to provide a strategic deployment plan for ITS in a rural, bi-state area including northern California and southern Oregon, as a major milestone in the Rural California/Oregon Advanced Transportation Systems (COATS) project. This plan is intended to provide a strategic framework to guide future ITS deployment decisions, as well as recommended technologies and locations for ITS deployment where ITS can address specific challenges in the study area.

The plan starts with a brief overview of intelligent transportation systems in Chapter 2, and how they may be useful in a rural environment. Chapter 3 provides a broad overview of the COATS project, describing the study area, highlighting project objectives, presenting the project management structure, identifying key stakeholder groups, and reviewing various methods of project outreach.

Chapters 4 through 7 provide a progressively more specific picture of how ITS may address the transportation needs of the COATS study area. Chapter 4 summarizes several efforts completed early in the life of the project to quantify and locate specific needs and challenges in the study area. Following this, Chapter 5 presents a vision for the COATS study area. This vision is stated in terms of goals and objectives for transportation in the region, but also in the perspective of different groups of stakeholders. This helps to show how the transportation vision for the study area extends beyond the state departments of transportation to include a variety of other stakeholders. One key element in bringing this vision to reality is to have a regional ITS architecture that can provide a framework for showing information exchange relationships between different organizations. Chapter 6 summarizes this architectural vision. In order to realize this vision, the vision is subdivided into strategies and specific technology applications and locations, as described in Chapter 7.

Realizing that many ITS plans fail to result in implementation of projects, this plan seeks to address several areas that have impeded success of other plans. Chapter 8 addresses the anticipated financial cost to implement operate and maintain the proposed ITS infrastructure. Chapter 9 builds on this by describing potential sources of public and private sector funding to support ITS initiatives. Chapter 10 addresses the non-financial operations and maintenance issues associated with ITS, a critical concern especially in this rural region. Finally, Chapter 11 presents the next steps that need to be pursued in order to realize the recommendations of this plan.

# 2 WHAT IS ITS?

The COATS Strategic Deployment Plan presents a blueprint to guide the deployment of intelligent transportation systems (ITS) in a rural bi-state area between southern Oregon and northern California. Before proceeding into the heart of the plan, it is important to have an understanding of the overall role of ITS in the transportation system. The purpose of this chapter is to provide a cursory overview of the context for ITS, what ITS is, what it is intended to accomplish, and how it may be beneficial to rural areas.

## 2.1 Context of ITS

As Chapter 1 indicated, transportation plays a significant role in everyday activities. The quality of the transportation system may contribute to the overall quality of life, by allowing people to get to destinations more quickly, more reliably, and in greater safety and comfort. As the transportation system fails under various pressures, including heavy demand, incidents and unusual weather events, it may contribute to lessening the quality of life.

Traditionally, the broad approach to addressing many transportation problems has been to build new roadway capacity and/or to enhance the design of existing roadways. This solution is generally falling out of favor for a couple of reasons. First, most states are finding it increasingly difficult to continue funding this approach, since roadways that were built thirty, forty and fifty years ago are now in need of significant rehabilitation or even reconstruction. Second, many of the problems experienced in the function of the transportation system occur only at certain times of day (e.g. peak commuting periods), certain seasons of the year (e.g. peak tourist season), and during certain largely unpredictable events (e.g. major festivals, incidents, weather events). It may be difficult to justify traditional solutions for many of these challenges on a cost-benefit basis.

As traditional solutions have fallen out of favor, a new package of solutions has emerged principally in the last ten years as an alternative to addressing some of these transportation challenges. This new set of solutions, called intelligent transportation systems (ITS), is intended to work in conjunction with the existing transportation system to improve its performance for both key operating agencies, such as departments of transportation and highway patrol, as well as for users, including commuters, transit users, tourists, freight concerns, and others.

Since ITS is designed to be integrated with the existing transportation system, it is important to understand that ITS may not represent a "magic bullet" that will solve every transportation problem that exists. In some locations for some problems, traditional solutions will be appropriate. In other cases, however, ITS may provide a more cost-effective and more reliable solution. ITS solutions need to be applied strategically and thoughtfully, to address specific challenges at specific locations in conjunction with the existing transportation system.

## 2.2 Definition of ITS

What is ITS? Broadly considered, ITS may be defined as the application of advanced communications, information processing, control and electronics technology to improve the transportation system in order to save lives, time and money. ITS is an open-ended term that is not restricted to a fixed group of technologies or solutions, but rather characterizes the method of approach to solving a problem.

ITS as a term has gained popularity in the last several years, primarily with the passage of Federal legislation entitled the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991. This legislation, which served as the major re-authorization of transportation funding at the Federal level, designated separate funding to support research and operational tests of intelligent vehicle highway systems (IVHS). The legislation defined IVHS as "the development or application of electronics, communications, or information processing (including advanced traffic management systems, commercial vehicle operations, advanced traveler information systems, commercial and advanced vehicle control systems, advanced public transportation systems, satellite vehicle tracking systems, and advanced vehicle communications systems) used singly or in combination to improve the efficiency and safety of surface transportation systems." (1) Shortly after, the concept of intelligent vehicle highway systems was re-designated as intelligent transportation systems, to show that the concept reflects broader applications of technology beyond automobiles and vehicle control. The Transportation Equity Act for the 21st Century (TEA-21), passed in 1998 to succeed ISTEA, provided continued funding for ITS research and deployment across the country.

While ITS has been strongly encouraged by Federal support, it is an initiative that was not created at the Federal level. From a technological standpoint, many agencies have been experimenting with ITS technologies for years, even decades, before passage of ISTEA. Some would say that traffic signals, which have been around since the 1920s, may represent one of the first ITS applications in their use of electronics to improve the operation of existing intersections. In subsequent years, there have been numerous other applications of technology to the transportation system, such as changeable message signs to warn of low visibility conditions, installed on Interstate 5 near Albany, Oregon in the 1960s and 1970s, and similar signage in California's Central Valley near Fresno and Stockton during the same time period. Highway advisory radio has been around for decades as a way to inform travelers in a localized area of pertinent travel information, including incidents, construction-related detours, and tourist-site access and parking information. Improvements in computational power and manufacturing have improved the capability, reliability and usefulness of these technologies. While ITS may sound visionary and far-removed from reality, there are numerous real examples of ITS systems, products and services at place throughout the country.

The passage of ISTEA and TEA-21 did, however, inaugurate a new awareness of the potential to apply advanced technologies to the transportation system. The increased Federal emphasis, supported by funding, has enabled many states to adopt ITS for a variety of applications, such as streamlining commercial vehicle clearance procedures, providing better management of traffic on congested roadways, and obtaining information about incidents and weather conditions from remote conditions on a real-time basis.

The Federal role in ITS funding is anticipated to lessen over time. It has been said that the long-term goal for ITS financing is that 80 percent of the infrastructure would eventually be supported by the private sector. To accomplish this, there will need to be significant mainstreaming of ITS into the traditional transportation planning process as a solution that can supplement traditional transportation solutions. Furthermore, there will need to be a conscious effort to partner with the private sector to find ways in which they can earn a reasonable rate of return on ITS investments that will also provide clear net benefit to the traveling public as well as public-sector agencies.

## 2.3 Rural Applications of ITS

ITS has traditionally been employed in the context of metropolitan areas. The economics of ITS are quite obvious in the urban context, where recurring congestion can likely never be fully addressed by adding capacity to the roadway system – assuming that fiscal, social and environmental constraints even permitted such capacity to be added. Consequently, many early deployments of ITS have been focused on more urbanized areas.

It is important to emphasize that ITS may have special applicability to the rural transportation system for several reasons. First, it will be highly difficult to make a successful case for adding transportation system capacity in a rural area to accommodate non-recurring congestion, resulting from incidents or weather events. Economically, the cost-benefit analysis for a rural area will be a lot more challenging than in an urbanized area, because congestion occurs less frequently in the rural environment. Furthermore, many rural areas are constrained by challenges due to topography as well as protected lands, such as National Parks or Forest Service Land. While land costs may be cheaper in a rural environment than the urban environment, the costs of environmental mitigation and preservation will often be significantly higher. Strategically located ITS technologies may help to solve the problems at a lesser cost with a lesser impact on the adjacent environment than conventional solutions.

In addition, the larger distances and lower traffic volumes found in rural areas present some unique challenges not present in the urbanized area. A vehicle that overturns on an urban interstate in the evening will likely have another vehicle see the problem within seconds and notify emergency personnel, who would be able to respond within a few minutes. In the rural environment, it may be minutes or sometimes even an hour before the same incident is identified. In addition, the location of emergency services may be a long distance away. Consequently, the potential for lasting harm to the survivor of the incident would therefore be significantly higher in the rural environment.

Long distances and low volumes are not only critical for emergency response, but also for tourist traffic. A tourist bound for a destination in an urbanized area, such as a theme park, would have numerous hotels, restaurants, gas stations, and other services in very close proximity, in case they were in need of route or vehicle assistance, lodging, or food. For tourists in the rural area, however, these services are typically dispersed due to lower population levels. Consequently, a rural tourist may spend longer finding the destination if they receive bad directions, may have to drive many more hours in order to find accommodations, and face many other similar challenges. The consequences of bad information in the rural environment may pose a greater time penalty than in the urban environment.

Another effect of the distance across rural areas is to increase travel time for agencies responsible for operating and maintaining the roadways. This means that the time cost involved in any activities that are far from the dispatch center will be higher. It means that road closures due to incidents may last longer, if there is a long distance between the appropriate dispatch center and the incident location. It means that inaccurate information about snow or ice locations may cause significantly more wasted time for snowplows, and potentially increase the frequency and severity of incidents. ITS may be used to reduce the effect of this travel time by, at a minimum, providing better information to these agencies. More than this, ITS could be used to automatically initiate corrective actions at key locations, to improve the safety and security of the traveling public.

Recognizing the potential applicability of ITS to the rural environment, while acknowledging that ITS solutions in metropolitan areas may not be fully transferable, a separate program was created in the national ITS program called advanced rural transportation systems (ARTS). ARTS is in a sense a subset of all other ITS programs. For example, Advanced Transportation Management Systems (ATMS) and Advanced Traveler Information Systems (ATIS) have clear applicability to the rural environment in response to non-recurring congestion. However, it also represents a distinct focal area. Recognizing this, the ARTS Strategic Plan (2) describes seven critical program areas that focus on the specific needs of rural transportation users and providers, as follows.

- Traveler Safety and Security addresses the need for improving driver ability to operate a vehicle in a safe and responsible way and for improving driver notification of potentially hazardous driving conditions (i.e., poor road conditions, reduced visibility, and so forth).

- Emergency Services focuses on providing improved response when an incident occurs, including reduced emergency notification time, as well as providing additional crash details to enable improved response and care.

- Tourism and Travel Information Services provides travel information and mobility services to travelers unfamiliar with the rural area and at tourist destinations.

- Public Traveler Services/Public Mobility Services improves accessibility and reduces isolation for travelers using or relying on public transportation.

- Infrastructure Operations and Maintenance addresses efficient and effective maintenance and operation of rural roadways and signals.

- Fleet Operations and Maintenance provides for efficient scheduling, routing, locating and maintaining of rural fleets.

- Commercial Vehicle Operations addresses regulation, management and logistics of commercial fleets and agricultural equipment to meet the needs of rural commercial vehicle operators.

The potential applications of ITS to the rural environment are limited by only a couple of factors: funding, provision of communications and power, and the creativity of transportation professionals.

## 2.4 Benefits of Rural ITS

ITS America, a non-profit organization which seeks to lead the public and private sectors in pursuing a national ITS agenda, cites the primary benefits of ITS as saving lives, time and money. This is true in both the urban and rural contexts. When effectively researched, developed, tested and demonstrated, ITS implementation can provide enhanced, safer, and more secure travel, while assisting rural transportation users and operators achieve improved levels of productivity. Some of the potential benefits of ITS applications in rural areas include the following.

- Increase Safety. National statistics document that approximately 60 percent of fatalities occur in rural areas and of those fatalities, 70 percent are due to run-off-the-road vehicles. Advanced technology applications may help to reduce accidents, reduce the impact of weather on driving conditions, reduce the impact of driver/ roadway operations characteristics, and reduce the impact of vehicle mix on safety.

- Improve Emergency Response. National statistics document that rural areas have approximately 2:1 greater response time to incidents and arrival at medical facilities. ITS may help to improve incident response time, emergency preparedness and hazardous cargo identification.

- Improve Commercial Vehicle Operations (CVO). Given that rural areas are dependent upon the efficiency of CVO, ITS can provide significant benefit to rural areas by streamlining CVO regulation and operation and improving CVO safety.

- Increase Travel Information and Trip Enhancement. ITS may help to provide strategies and technologies to improve traveler information systems, so that accurate, complete and timely information is provided on a real-time basis.

- Improve Interagency Communications. Communications, cooperation and coordination are essential to ITS effectiveness. Conversely, ITS may also help to create an environment where stakeholders might address institutional issues, determine methods and systems that assist in communication, and improve relationships with each other.

- Reduce Congestion. Many of the roadways in the study area have non-recurrent congestion (i.e., congestion caused by incidents) challenges, while recreational attractions such as national parks, national monuments, or ski areas, have recurring congestion challenges at gate entrances and visitor site-specific locations. ITS may help to improve traffic flow in these areas.

- Increase Economic Activity. As rural economies shift increasingly toward dependence upon tourism, ITS technologies may help to enhance the visitor experience, ultimately impacting economic activity.

## 2.5 Summary

ITS represents an initiative to use advanced technologies to improve the operation of the transportation system to save lives, time and money. It is a group of solutions that is intended to complement traditional solutions to transportation problems. Just as the transportation system impacts many aspects of life, so also there are many spillover benefits from ITS. While ITS has been deployed primarily in urban and metropolitan areas, it has unique areas of applicability in the rural environment as well, due to some of the unique challenges facing the rural transportation system. These rural applications should be pursued strategically on a regional and local basis, however, in order to address the deficiencies in the existing transportation system. This is most effectively done through an ITS strategic deployment planning process, such as the Rural California/Oregon Advanced Transportation Systems (COATS) project. This project will be introduced in the next chapter.

# 3 COATS PROJECT OVERVIEW

While intelligent transportation systems have clear applicability to the rural environment, it must be re-emphasized that ITS is not a magical solution that can solve every transportation problem. ITS in rural areas should not be viewed as “a solution in search of a problem.” This viewpoint can only be counteracted by strategic, regional consideration of the transportation system, and how ITS may address specific, real challenges.

In this context, this chapter provides an overall context for the Rural California/Oregon Advanced Transportation Systems (COATS) project, of which this strategic deployment plan is a primary product. This chapter will start with a brief description of the study area, followed by an overview of the project, a description of its management structure, a broad overview of the various stakeholders included in the plan, and a review of the various outreach methods that were used to engage stakeholders and the traveling public.

## 3.1 The COATS Study Area Background

The COATS study area boundaries were defined to address important characteristics common to each area. Figure ES-1 shows the boundaries of the COATS study area. As can be seen, it is a large, rural, bi-state area of northern California and southern Oregon, encompassing over 80,000 square miles. Within California and Oregon, the study area is not defined by county lines but rather by roadway segments. The northern boundary starts at Florence on the Oregon coast and follows Oregon Route 126 through Eugene to Sisters, where it then follows US Route 20 through Bend and Burns all the way to the Idaho border. The southern boundary for the study area is California Route 20 from the Pacific coast near Fort Bragg, through Willits and past Clear Lake, to Interstate 5. The southern boundary continues north on Interstate 5 to Red Bluff, where it continues on California Route 36 to its terminus in Lassen County, and concludes south of US Route 395 to the Nevada


**Figure 3-1:** COATS Study Area Boundaries.

**Table 3-1:** Area and Population of COATS Counties.

| State | County | Area (sq mi) | Population 1999 est. | 2020 est. | Growth |
|---|---|---|---|---|---|
| California | Colusa* | 1,151 | 18,844 | 41,398 | 120% |
| | Del Norte | 1,008 | 26,477 | 41,898 | 58% |
| | Glenn* | 1,315 | 26,328 | 49,113 | 87% |
| | Humboldt | 3,573 | 121,358 | 141,092 | 16% |
| | Lake* | 1,258 | 55,405 | 93,058 | 68% |
| | Lassen* | 4,558 | 33,028 | 49,322 | 49% |
| | Mendocino* | 3,509 | 84,085 | 118,804 | 41% |
| | Modoc | 3,944 | 9,210 | 12,396 | 35% |
| | Plumas* | 2,554 | 20,370 | 23,077 | 13% |
| | Shasta | 3,786 | 164,530 | 240,975 | 46% |
| | Siskiyou | 6,287 | 43,570 | 53,676 | 23% |
| | Tehama* | 2,951 | 54,012 | 83,996 | 56% |
| | Trinity | 3,179 | 12,927 | 15,594 | 21% |
| Oregon | Coos | 1,600 | 61,670 | 69,513 | 13% |
| | Curry | 1,627 | 21,170 | 32,465 | 53% |
| | Deschutes* | 3,018 | 110,810 | 181,448 | 64% |
| | Douglas | 5,037 | 101,805 | 120,671 | 19% |
| | Harney* | 10,135 | 7,295 | 7,744 | 6% |
| | Jackson | 2,785 | 175,822 | 221,665 | 26% |
| | Jefferson* | 1,781 | 16,861 | 30,824 | 83% |
| | Josephine | 1,640 | 74,919 | 93,669 | 25% |
| | Klamath | 5,945 | 63,435 | 78,369 | 24% |
| | Lake* | 8,136 | 7,173 | 8,530 | 19% |
| | Lane* | 4,554 | 314,901 | 419,842 | 33% |
| | Linn* | 2,291 | 105,337 | 127,158 | 21% |
| | Malheur* | 9,888 | 28,445 | 35,810 | 26% |
| **Total*** | | **97,510** | **1,759,787** | **2,392,107** | **36%** |

* - These counties are partially within the COATS study area; the actual area and population of the study area will be smaller.

Sources: 3, 4, 5, 6.

border.

Table 3-1 summarizes the area and population of counties which are included at least partly within the study area. By means of comparison, the smallest county within the study area – Del Norte – is almost the same size as Rhode Island, the smallest state in the United States. The study area is approximately the same size as the state of Kansas. While Kansas is typically considered as a rural state, it has approximately 1 million more residents than the COATS study area.

Despite consisting of parts of two states, the study area has several unifying characteristics.

- First, it is predominantly rural. Eugene, at the northern edge of the study area, has a population of approximately 128,000. Within the heart of the study area, Redding (78,000) and Medford (57,000) are the largest population centers. Bend, Eureka, Grants Pass, Roseburg, Klamath Falls, Ashland, Susanville, Arcata, Coos Bay and Red Bluff are the only other communities within the study area with populations greater than 10,000.

- Each state's portion of the study area has similar geographic and topographic features. Both have coastal regions subject to flooding, slides and low-visibility conditions. Both have mountainous areas that may be closed during severe winter weather. Both states also have sparsely populated areas, both forested and not.

- These portions of each state have more in common in terms of transportation challenges than with the remainder of their states. Interestingly, these common transportation challenges were a major impetus behind a movement in the early to middle part of the 20$^{th}$ century to found a new state called Jefferson that included much of the COATS study area. While talk of secession has largely subsided, it remains true that Medford's challenges have more in common with those of Redding than those of Portland, and Eureka's challenges have more in common with Coos Bay than with those of the San Francisco Bay area.

- Each state's portion of the study area has a similar economic base that is evolving in a similar direction. Historically, both sides of the border have been dependent upon industries like forestry, agriculture and fishing to sustain the economy. Increasingly, this part of the country is becoming known as a tourist destination, not only due to spectacular scenery and limitless outdoor recreation opportunities, but also due to local festivals, such as the Ashland Shakespeare Festival. The region sees its economic base increasingly tied to its ability to attract and sustain tourist traffic.

- The two states are joined by several north-south transportation arteries, including US Routes 97, 101, 199 and 395, and Interstate 5. These routes serve a variety of commercial and recreational traffic, and all may experience various weather-related challenges.

For these reasons and others, the COATS study area represented a logical geographical unit upon which to base an ITS strategic deployment plan. In California, this study area allows the COATS plan to integrate with other regional ITS strategic plans across the state, as shown in Figure 3-2.

## 3.2 Description of COATS Project

The study area includes portions of northern California and southern Oregon and has diverse transportation needs and challenges. Despite the relative sparseness of the resident population, travel to and through the area is extensive. Furthermore, travelers in the area are in need of information, perhaps more than those in urban areas due to the remoteness of the region.


**Figure 3-2:** ITS Planning Efforts in California.

The two-state area contains transportation links vital to the region's economy and commercial industry. Numerous primary and secondary routes serve commercial vehicles destined for urban centers throughout the West. Weather and geography add to the transportation challenges. Travelers throughout the corridor must contend with diverse and rapidly changing weather conditions including snow, high winds, fog and heavy rain. The combination of varied driving conditions and abundant off-road, commercial and recreational traffic produces an immediate and expanding need for increased traffic safety measures and information dissemination techniques.

In recognition of the common challenges in the study area, and in order to maximize resources and foster cooperation, the California Department of Transportation (Caltrans) and the Oregon Department of Transportation (ODOT) partnered to investigate the feasibility of ITS in the study area. They partnered with the dozens of state and local stakeholders, along with the Western Transportation Institute (WTI) at Montana State University-Bozeman, on this project, known as the rural California/Oregon Advanced Transportation Systems (COATS) project. The intent of this project is to facilitate the use of ITS to enhance safety, improve the movement of people, goods, and services, and subsequently promote the economic development of the bi-state region and to begin deployment of those solutions.

### *3.2.1 COATS Project Mission*

The following mission statement addresses the goals and objectives of the COATS project in the Northern California/Southern Oregon Region.

> "The Rural COATS project will serve to unify member agencies, focusing on a seamless, state-of-the art, multi-modal transportation network benefiting travelers, goods movement, economic activity, and transportation operators in Oregon and California. Through communication and cooperation, the COATS project and its partnership coalition will serve as an information clearinghouse to provide for 1) effective and efficient ITS development, demonstration, and delivery and 2) the promotion of safety, mobility, trip enhancement, and environmental quality." (7)

### *3.2.2 COATS Project Objectives*

The specific objectives of the COATS project include:

- identifying the transportation and information needs within the study area;
- determining ITS solutions that are beneficial, cost-effective, and implementable for deployment within the study area on the basis of the identified needs;
- identifying, designing and deploying initial, small-scale "early winner" projects with existing funds on a multi-year basis to test the feasibility of rural ITS;
- developing a Strategic Deployment Plan that describes a strategic approach for implementing rural ITS strategies on a larger scale, with an emphasis on integration and expansion of future ITS components within the study area based on evaluation results; and
- preparing and securing Federal funds to implement Rural Model Deployment Initiative projects.

Another way of describing the COATS project is that it is a combination of ITS planning, through the creation of the Strategic Deployment Plan, and ITS demonstration, through projects like the "early winners." The demonstration aspect of the COATS project continues after COATS project funding is exhausted, with the COATS Showcase program. This effort provides funding for demonstration and evaluation of technologies, consistent with COATS goals and objectives, in the COATS study area.

The attainment of COATS project objectives includes investigating technical, institutional, planning, maintenance, operations, phasing, cost, and deployment issues. The overall goal of rural ITS planning, demonstration, and deployment is to make "rural travel safe, dependable and convenient."

### *3.2.3 COATS Project Anticipated Benefits*

Broadly stated, deployments resulting from the COATS project are expected to have benefits to the traveling public, public sector agencies, and the private sector. To the motoring public, benefits include increased safety, and information, as well as reduced non-recurrent congestion. To the public sector, benefits include increased coordination, reduced operating costs through the automated traveler information system interfaces including variable message signs, highway advisory radio, kiosks, etc. Additional benefits are seen through the ability to more efficiently plan and manage their traffic operations. The private sector will benefit by having greater abilities to provide tourism information and the development of technology that is marketable throughout the world due to the wide range of tourists that visit the area.

This project positions northern California and southern Oregon, and subsequently other rural areas, to take advantage of the benefits of ITS. The project will result in more effective, coordinated and integrated ITS development and demonstration activities for both California and Oregon, ultimately benefiting the public and private sector, as well as the traveling public.

### *3.2.4 COATS Project Methodology*

The flowchart in Figure 3-3 provides an overview of the methodology used in developing this Strategic Deployment Plan. As shown, the Strategic Deployment Plan represents the culmination of many earlier project efforts. As such, many of the earlier efforts will be referred to only in passing in this document.

The methodology used for this Strategic Deployment Plan is unique from that used to develop other Strategic Deployment Plans in several ways, apart from the geographical challenges posed by conducting this type of planning effort in such a large, dispersed area. First, the project has been approached primarily from a research perspective. Rather than relying solely on interviews and subjective data provided by stakeholders and travelers, the COATS Strategic Deployment Plan seeks to tie deployment locations to specific challenges as justified by various data collection efforts. At the same time, this plan was not developed in a vacuum independent of the concerns of local stakeholders. Many distinct outreach efforts were made to ensure that stakeholders throughout the study area had the chance to participate in the planning process, and that their ideas and concerns were considered in the development of strategies and deployment.

Another unique feature of this plan is that it is a Strategic Deployment Plan, and seeks to provide both *strategies* to guide future ITS investment, as well as specific *deployment* locations that can support this strategic direction. The combination allows the plan to reflect a broader

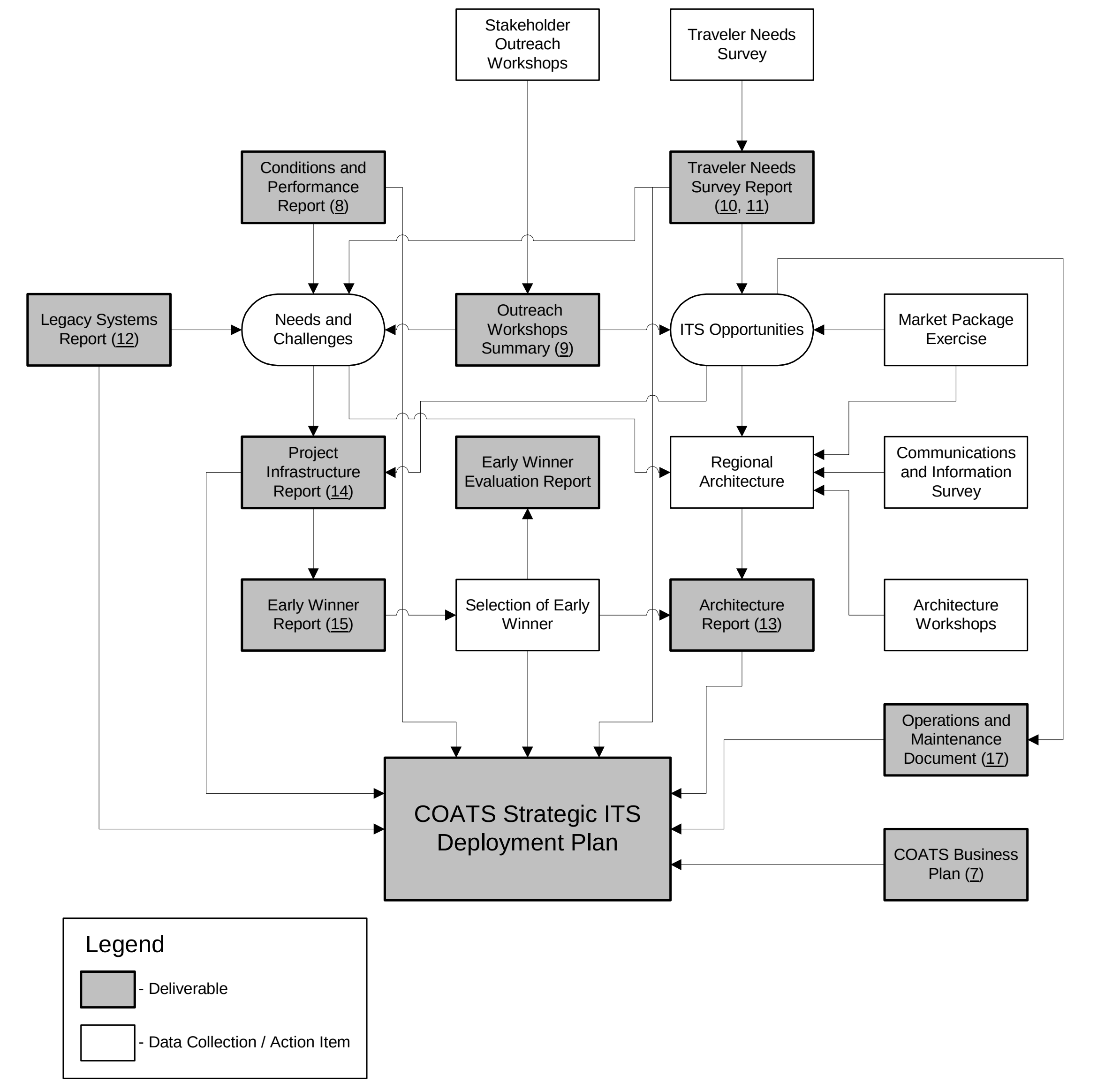



**Figure 3-3:** Flow Chart for COATS Strategic Plan.

long-term view that can supercede the short-term transportation programming processes, while at the same time giving concrete recommendations for projects that may help to keep this plan active.

Also unique to this plan is that while it considers currently existing ITS technologies, it does not constrain itself to these. The plan develops recommendations based on the functional capabilities that may be provided by technologies, though these technologies may be in various stages of research or preliminary design. This helps to provide a longer-term view as well to what ITS can do not only with existing technologies, but how it may help the transportation system into the future as well as technology continues to evolve and advance.

## 3.3 COATS Institutional Framework

There is a significant number and diversity of agencies and stakeholders that are directly or indirectly involved in transportation in the COATS study area. This necessitated the development of an institutional framework to ensure that the planning effort would be able to proceed. This was accomplished through a business plan (7), which describes a framework for policy, process and action among the public and private jurisdictions involved in the COATS project. Establishing a management structure helped to ensure that the interest and involvement of the COATS project coalition would continue, so that solutions may be deployed and evaluated.

### *3.3.1 COATS Project Management Structure*

The purpose of the management structure is to provide for an orderly decision-making process regarding the COATS project. It is important to articulate the roles of the various project participants and to document a structured decision making process to fully engage participation in the project from key stakeholders.

As shown in Figure 3-4, transportation stakeholders were organized into four primary groups: the Governing Board (an executive board), a Steering Committee, Regional Teams, and Technical Task Forces. These groups had varying responsibilities in terms of providing project direction or policy guidance. Together, these groups were arranged to emphasize the group's ability to meet its objectives and lessen administrative obstacles. This framework encourages an

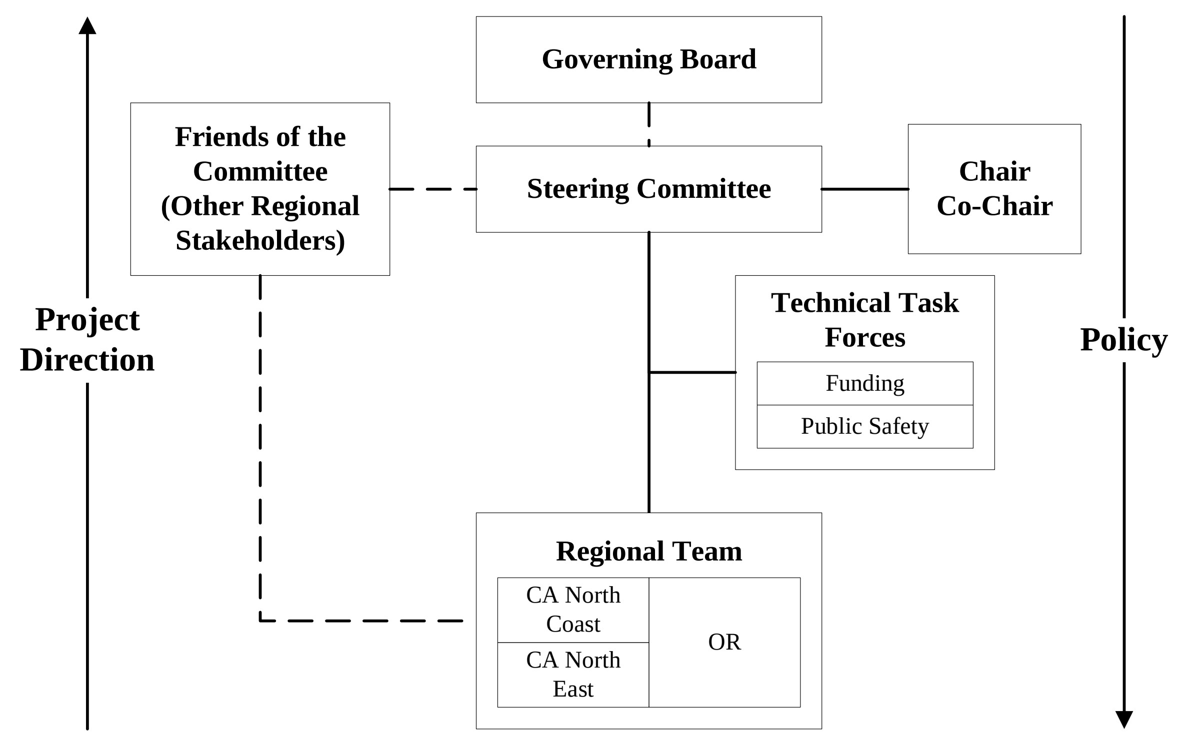



**Figure 3-4:** Organizational Structure and Relationships.

atmosphere that expands institutional linkages between stakeholders to reach consensus in developing ITS deployments in the study area.

There were several other important functions of these groups. The Governing Board provided long-term direction and resolved politically sensitive issues. The Steering Committee functioned to provide a method to decide program direction and focus, and to approve project deliverables. The Regional Teams' purpose was to provide an environment that would encourage ideas, outreach, and consensus to meet local needs and other Regional Team priorities. Allowance was made for task forces to be formed on an ad hoc basis, to investigate specific project-related issues as appropriate. A more detailed description of each function is described below.

### *3.3.2 Executive Director/Co-Executive Director*

It was important to have individuals, above all of the other project management structures, who were invested with responsibility for overall project oversight. The COATS project designated two individuals to fill this role: an Executive Director, and a Co-Executive Director.

The Executive Director in consultation with the Co-Executive Director, operated under advisement of the Steering Committee and is responsible for contract management of WTI. The Executive Director was responsible for project management, contract administration, authorizing payments and informing the Steering Committee of all project and contract progresses. For these reasons, the Executive Director was designated as a Caltrans employee, since California was the lead administrative state for the COATS project, and Caltrans was the agency that controlled expenditures from the funding source. At the project's inception, Coco Briseño of Caltrans' New Technology and Research (NTR) Program was designated to serve as Executive Director.

Due to the bi-state nature of this project, a Co-Executive Director position was also designated. This individual was selected from ODOT staff and was vested with similar administrative responsibilities. Robert Fynn of ODOT's Traffic Management Section was designated to serve as the Co-Executive Director.

The business plan encouraged ongoing communication between the Executive Director, Co-Executive Director and Steering Committee Co-Chairperson when issues arose or, at a minimum, prior to Governing Board and Steering Committee meetings.

### *3.3.3 Governing Board*

The role of the Governing Board was to provide policy guidance for those issues that are beyond the authority of the Steering Committee. Though the Steering Committee decided the majority of technical and institutional issues, some specific and critical issues required input above those involved at a Steering Committee level. Some of these issues related to long-term agency roles and responsibilities, funding sustainability, and politically sensitive matters. An executive-level board, consisting of the highest-level managers, was to undertake these issues, meeting as required. Table 3-2 lists the membership of the Governing Board by organization, at the inception of the project.

**Table 3-2:** Governing Board Members.

| *CALIFORNIA* | *OREGON* |
|---|---|
| Program Manager<br>Caltrans New Technology and Research Program | State Traffic Engineer<br>ODOT |
| Program Manager, Caltrans Traffic Operations | Transportation Development/Planning |
| District 1 Director | Region 3 Director |
| District 2 Director | District 11 Manager |
| President, California Alliance for Advanced Transportation Systems | President, ITS Oregon |
| Commander, CHP, Redding Division | Oregon State Police |
| Travel Management Coordinator, ITS Joint Programming Office, Federal Highway Administration | |

### *3.3.4 Steering Committee*

The role of the Steering Committee was to provide strategic direction and oversight for the project. Specific functions of the Committee included the following.

- Review project progress
- Review project deliverables, including technical memoranda and reports
- Participate in project workshops
- Provide input and guidance to WTI
- Ensure that available funds are programmed for short and long-term ITS demonstrations, operations, and maintenance
- Encourage community participation
- Review new technologies and concepts

The Steering Committee consisted of one voting representative for each active member agency, with three ex-officio representatives from the Federal Highway Administration (FHWA). The Committee was responsible for organizing itself, establishing rules and conducting business. Organizations represented in the Steering Committee are listed in Table 3-3. The Caltrans NTR Program, ODOT and WTI provided staff support to the Steering Committee.

### *3.3.5 Regional Teams*

The role of the Regional Teams was to build regional consensus among public and private stakeholders regarding ITS priorities. Each team acted as an advisory group to the Steering Committee to bring their regional stakeholders' recommendations to the Steering Committee for inclusion in the project. Each regional team selected a member from their team to formally represent their interests on the Steering Committee. Team members were to reach out to stakeholders or "Friends of the Committee" in their region that are not formal members of the

**Table 3-3:** Steering Committee Members.

| *CALIFORNIA* | *OREGON* |
|---|---|
| Caltrans New Technology and Research | ODOT Traffic Management Section ITS Unit |
| Caltrans District 1, Planning | Region 3 Traffic Manager, Roseburg |
| Caltrans District 1, Maintenance and Operations | Region 4 Traffic Manager, Bend |
| Caltrans District 2, Maintenance and Operations | District 5 Traffic Manager |
| North Coast Regional Team Representative | Regional Team Representative |
| Northeast Regional Team Representative | Regional Team Representative |
| California Highway Patrol | Oregon State Police |
| California Trucking Association | Rogue Valley COG |
| Shasta Cascade Association | Southern Oregon Visitors Association |
| CA Association of Coordinated Transportation | Rogue Valley Transit District |
| California Highway Patrol, Special Projects | National Parks Service |
| Caltrans, Traffic Operations, ITS | |
| Redwood Empire Association | FHWA, (ex-officio) |
| FHWA, Region 9 (ex-officio) | FHWA, Region 10 (ex-officio) |

project, such as transit providers, health and human services providers, and inter-city transportation providers.

Team representatives considered projects, ideas, concepts, and priorities for their region and were responsible for screening regional stakeholder input to bring it to the attention of the Steering Committee. Regional Teams could address issues relating to operations, partnerships, and policy, including traffic, safety, enforcement, emergency response and management, transit, fleet management, commercial vehicle operations, identification of early winner projects, and outreach to industry, institutions, and public sector representatives. Additionally, each team was asked to review project deliverables, including technical memoranda and reports, and participate in project workshops.

The teams provided a relatively informal network and structure and met as often as deemed necessary in each state/region. Staff from the Caltrans NTR Program, ODOT Traffic Management Section, and/or WTI often facilitated team meetings. Table 3-4 lists the membership to the Regional Teams.

### *3.3.6 Task Forces*

Task forces were to be designated on an as-needed basis to study areas of interest identified by the Steering Committee or Governing Board. Potential task force activities included problem definition, private sector participation, and future program planning. During the course of the project, two task forces were formed. The Funding Task Force sought to identify opportunities for new funding sources to contribute to the project and its initiatives. The Public

**Table 3-4:** Regional Team Members.

| *CALIFORNIA* | | *OREGON* | |
|---|---|---|---|
| North Coast Team | Northeast Team | Regional Team | |
| Del Norte LTC | Lassen LTC | City Manager, Burns | COG, Central Point |
| Humboldt COG | Modoc LTC | The Driftwood Group | ODOT Region 2 |
| Lake COG | Plumas LTC | ODOT Region 3 Traffic | ODOT District 1 |
| Mendocino COG | Shasta LTC | Oregon State Police | US Forest Service |
| | Siskiyou LTC | Rogue Valley COG | Mayor, Winston |
| | Tehama LTC | | |
| | Trinity LTC | | |

Safety Task Force formed to identify the role for ITS in improving public safety and transportation in the COATS region and identify appropriate projects to implement that role.

## 3.4 COATS Stakeholders

The management structure described in the previous section was necessitated by the number and diversity of stakeholders and systems that influence or are influenced by the region's transportation system. The purpose of this section is to summarize these stakeholders and systems.

### *3.4.1 State Departments of Transportation*

Caltrans and ODOT represent the two state departments of transportation for the study area. These organizations each have several divisions that are responsible for different aspects of the transportation system.

Two Caltrans districts are included in the study area. District 1 covers the northern coastal counties of the state, and includes Del Norte, Humboldt, Lake and Mendocino Counties. District 2 covers the northeastern part of the state, and includes Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, and Trinity Counties. ODOT is organized into regions, which are subdivided into maintenance districts. Four ODOT regions and seven ODOT districts are partially or wholly included in the study area. Oregon counties that are at least partially in the study area include Coos, Curry, Deschutes, Douglas, Harney, Jackson, Jefferson, Josephine, Klamath, Lake, Lane and Malheur.

For each state, many functions are performed at a district or regional level, including planning of transportation improvements, roadway maintenance, traffic operations, and outreach to local media. Each state has an office that provides traffic management functions on a regional basis. For Caltrans Districts 1 and 2, these functions are to be provided through advanced rural technology integration centers (ARTIC) based at Eureka and Redding. In Oregon, the transportation operations center (TOC) in Medford covers the southwestern part of the state, and a center in Bend provides coverage for the southeastern part of the state.

Both Caltrans and ODOT also have administrative divisions with statewide responsibility. Some of these divisions may coordinate with the districts on some statewide initiatives, while other divisions, such as those related to commercial vehicles, do not.

### *3.4.2 County and Local Departments of Transportation*

While Caltrans and ODOT are significant players in the study area, there are other agencies directly responsible for the transportation system as well. Counties and most cities have public works departments responsible for construction and maintenance activities on county and local roads. County and local roads are critical components of the regional transportation system, providing access to local services and attractions, and creating potential alternate routes when state routes are adversely affected by weather events, incidents or maintenance. Moreover, since travelers are typically unconcerned with the jurisdiction of particular road segments, it is important for counties and municipalities to make their transportation systems as seamless with the state system as possible. To do this, counties and municipalities may find benefit in using information gathered from ITS technologies deployed on the state highway system, as well as in installing ITS technologies in their own jurisdictions.

### *3.4.3 Emergency Response*

Emergency response agencies are a critical stakeholder in the COATS study area, as they help to ensure traveler safety and may help to manage incidents resulting from vehicle collisions or weather.

The principal state-level emergency response agencies included in the study area are the California Highway Patrol (CHP) and Oregon State Police (OSP). CHP and OSP work closely with their respective state department of transportation to keep state roadways open and safe. In many cases, their staff are collocated with department of transportation staff, in order to promote cooperative management of major roadway incidents. These agencies may coordinate with local law enforcement agencies as needed. Local law enforcement agencies include county sheriffs, city police, and tribal police.

Each state has a well-established system of emergency medical response through 911, provided by local entities. This system provides for coordination with local fire and medical response teams to respond to incidents as appropriate. There are also organized response teams to deal with hazardous materials spills on the roadway.

There are other state organizations that may be involved in emergency response, depending upon the nature of the incident. These organizations include the U.S. Coast Guard, the California Governor's Office of Emergency Services, California Department of Forestry, State Fish & Wildlife, National Parks, Bureau of Land Management, and others.

Another critical group of stakeholders for emergency response are the local towing companies. Dispatchers from the department of transportation or the state police will use tow companies on a rotating basis to move stalled or wrecked vehicles from the roadway.

### *3.4.4 Tourism*

Tourism is increasing in its importance to the local economies of the COATS study area; consequently, tourism-related stakeholders were also involved in the COATS project. Some of the most significant tourist attractions in the study area, based on visitation levels, include National Parks and other federally managed lands. These lands offer recreational opportunities, and include camping and/or other lodging options to encourage multiple-day visits. Some state parks also have significant visitation levels and attract visitors from outside of the study area.

Some cities and communities within the COATS region also attract significant tourism on their own. These towns may have a major festival or nearby attractions (such as lakes and ski areas) which draw significant numbers of people. Some of these cities and attractions have their own tourism promotional programs, which may include pre-trip traveler information and roadside signage. There are also organizations that promote tourism to larger sections of the COATS region, such as the Southern Oregon Visitors Association and the Shasta-Cascade Wonderland Association.

Together, all of these tourism-related stakeholders provide insight into the transportation needs of tourists.

### *3.4.5 Transit*

The various transit agencies in the COATS study area provide a vital role to those who cannot or choose not to use personal vehicles. Scheduled transit service coverage is primarily limited to the larger cities in the study area, with demand-responsive service available in other areas, especially to assist the elderly. These systems are affected by the same road closures and incidents that affect those who travel by personal vehicle. Moreover, transit may be used to manage spikes in demand associated with unanticipated road closures (such as due to a landslide) or to handle transportation demand associated with local festivals and events. Inter-city transit service, through bus and rail, is also provided throughout the study area.

Transit providers may benefit from ITS in several ways. First, transit agencies may implement ITS technologies on their fleets to improve the efficiency and reliability of operations. These vehicle-based ITS technologies may be useful to provide real-time information to state and local transportation agencies about current travel times. Transit providers may also use ITS infrastructure that has been deployed on the transportation system by state and local agencies to gain real-time, accurate information about roadway and weather conditions in their service areas. They may use this information to keep riders better informed of potential schedule delays or route changes.

While most person-trips in the COATS study area are currently served by private automobile, it is important that ITS technologies be used to provide better information about transportation alternatives, in order to create a transportation system that effectively services the needs of all travelers.

### *3.4.6 Planning Agencies*

Various federal, state, county and local organizations are involved in transportation planning. In addition to the state departments of transportation, all California counties and some Oregon counties have agencies responsible for transportation planning. In California, planning is done through the Regional Transportation Planning Agencies (RTPA), one of which is designated for each county in the COATS study area. RTPAs are responsible for developing regional transportation plans for their respective counties and for adopting regional transportation improvement programs to implement these plans. Accordingly, they will have an active role in ITS programming and implementation. In Oregon, ITS planning and funding is currently pursued at a statewide level with regional input.

In addition to programming and implementation activities, planning agencies may be able to use the new and improved quality of data available from ITS field devices to improve planning efforts in the long run. The ability to archive data collected from various ITS field elements could be useful for planning transportation improvements, quantifying air quality measures, and other studies.

### *3.4.7 Private-Sector*

There are private sector stakeholders not included in the previous groupings, such as trucking companies and local media. These stakeholders were welcomed into the planning process, although limited participation was realized. It is anticipated that private-sector participation would increase as the COATS project proceeded from the initial planning phase to a more deployment-oriented focus.

## 3.5 Outreach

Consensus building is key to effective transportation planning. As such, it is critical to involve many regional stakeholders to increase the likelihood of project success. One significant barrier to this in the COATS study area is that ITS was first deployed on a larger scale in urbanized areas, so most COATS stakeholders would be expected to have little familiarity with the potential applicability of ITS to the transportation needs of the region. Developing a formal approach and involving key people in decision making is the first step in this process.

This section summarizes the principal outreach activities associated with the COATS project, which include workshops, a project brochure, newsletters and a Web site. Also, Steering Committee and Governing Board meetings were considered as part of our outreach efforts. While not normally considered an outreach function, it was the intent of COATS project to move the meetings around the study area to increase awareness of our activities, as shown in Figure 3-5. At these meetings, stakeholder group representatives were invited to participate.

### *3.5.1 Workshops*

Four stakeholder outreach workshops – two in Oregon and two in California – were held to introduce the COATS project and to discuss the transportation challenges that currently exist in the study area. The workshops, led by WTI staff, included:

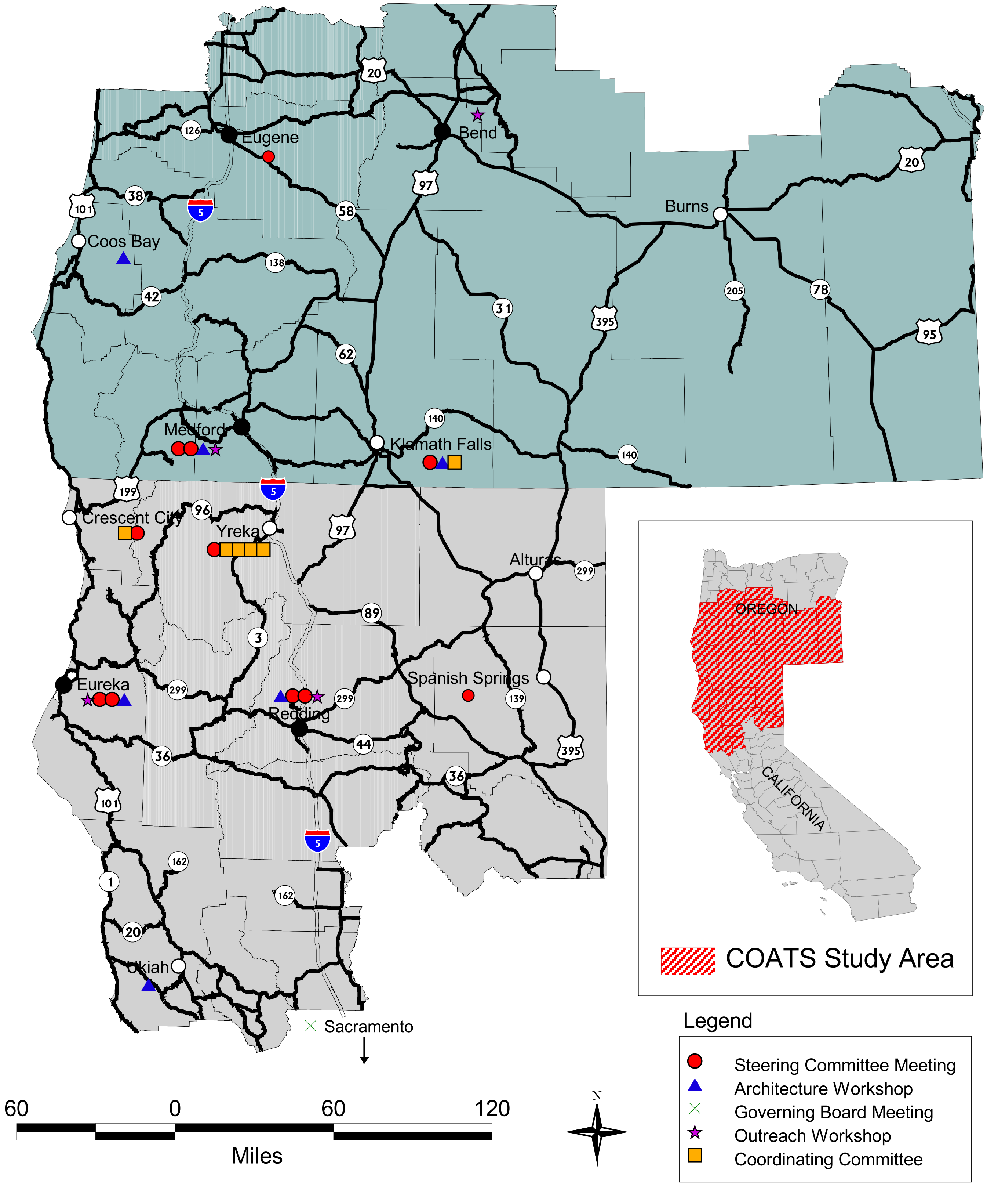



**Figure 3-5:** Location of COATS Outreach Activities.

- an overview of the COATS project,
- an introduction to advanced rural transportation systems (ARTS),
- an overview of transportation and safety challenges in the study area,
- an overview of the results of the Traveler Needs Survey (to be discussed in the next chapter), and
- small breakout group discussions (based on functional area, including traveler safety and emergency services, public transit and fleet operations, travel and tourism, infrastructure operations and maintenance, and commercial vehicle operations) to highlight rural needs and opportunities.

The dates and times of workshops are shown in Table 3-5.

**Table 3-5:** Stakeholder Outreach Workshop Locations.

| Location | Date |
|---|---|
| Medford, OR | December 10, 1998 |
| Redding, CA | February 4, 1999 |
| Eureka, CA | February 5, 1999 |
| Bend, OR | March 31, 1999 |

The information collected at the workshops was intended to complement and supplement the quantitative data already collected and analyzed in the Conditions and Performance Report (8), to be discussed next chapter. The challenges and opportunities identified at these workshops (9) are summarized in Tables 3-6 and 3-7, respectively. The rightmost column in each table indicates the number of workshops where an issue or opportunity was identified.

### *3.5.2 Brochure*

A project brochure was produced at the start of the project. The brochure describes the project objectives, study area, and expected benefits. In addition, the project partners are named and contact information is also provided.

### *3.5.3 Newsletter*

Caltrans periodically distributed a project newsletter at key milestones during the course of the project, to inform stakeholders of progress-to-date and identify opportunities for further involvement. The newsletter was distributed broadly to Governing Board, Steering Committee, and Regional Team members, as well as to friends and other interested parties.

### *3.5.4 Web Site*

To further facilitate the dissemination of information about the COATS project, a Web site at http://www.ruralits.org/projects/coats was set up. The Web site, maintained by Caltrans, included a description of the COATS project scope, an archive of minutes and agendas from Steering Committee meetings, as well as links to project documents.

**Table 3-6:** Workshop Results: Challenges.

| Category of Issues | Issues Identified | Workshop Location | | | | Number of Workshops at Which Issue Was Raised |
|---|---|---|---|---|---|---|
| | | Medford,OR | Redding,CA | Eureka,CA | Bend,OR | |
| Safety and Emergency Services | Locations of emergency services | ✓ | | | ✓ | ✓✓ |
| | Lack of alternative routes | ✓ | | ✓ | | ✓✓ |
| | Incident management | | | | ✓ | ✓ |
| | Interagency coordination and data sharing | ✓ | ✓ | | ✓ | ✓✓✓ |
| | Routing inefficiencies | ✓ | ✓ | ✓ | | ✓✓✓ |
| | Disaster management (Hazmat, natural) | ✓ | | | ✓ | ✓✓ |
| | Jurisdictional issues | ✓ | ✓ | | ✓ | ✓✓✓ |
| | Bikers & Pedestrians | | ✓ | ✓ | | ✓✓ |
| | Funding Money | | ✓ | ✓ | ✓ | ✓✓✓ |
| | Sub-standard geometric configuration | ✓ | ✓ | ✓ | | ✓✓✓ |
| | Driver Inattentiveness, Alertness | ✓ | | | ✓ | ✓✓ |
| | Visibility - Fog, Weather | ✓ | | ✓ | ✓ | ✓✓✓ |
| | Visibility - Signs, Obstructions | ✓ | | ✓ | ✓ | ✓✓✓ |
| | Hazard Identification - Fixed & Variable | ✓ | ✓ | ✓ | | ✓✓✓ |
| Travel and Tourism | Road closures and traffic delays | ✓ | | ✓ | ✓ | ✓✓✓ |
| | Parking - facility, attractions | ✓ | ✓ | ✓ | | ✓✓✓ |
| | Tourist traffic jams - pull-outs | | ✓ | ✓ | ✓ | ✓✓✓ |
| | Pass through travelers | | ✓ | | | ✓ |
| | Destination activity promotion | | ✓ | ✓ | | ✓✓ |
| | Signage - Agency issues | | ✓ | ✓ | ✓ | ✓✓✓ |
| | Lack of public education | | ✓ | | | ✓ |
| | Timeliness of Information | | ✓ | ✓ | ✓ | ✓✓✓ |
| | Weather and road condition information | ✓ | ✓ | ✓ | ✓ | ✓✓✓✓ |
| | Information relating locations of construction zones or other events and associated detours | ✓ | | ✓ | ✓ | ✓✓✓ |
| | Information targeted towards tourists within the area | ✓ | ✓ | ✓ | ✓ | ✓✓✓✓ |
| | Lack of communication services (cell & hard line) | ✓ | ✓ | ✓ | ✓ | ✓✓✓✓ |
| O & M | Pavement maintenance | ✓ | | ✓ | ✓ | ✓✓✓ |
| | Landslides, Flooding | ✓ | | ✓ | ✓ | ✓✓✓ |
| CVO & Transit | Inadequate HAR | | ✓ | ✓ | | ✓✓ |
| | Inadequate Pull-outs | | ✓ | ✓ | | ✓✓ |
| | Commercial vehicle management | ✓ | ✓ | ✓ | ✓ | ✓✓✓✓ |
| | Transponders not inter-operable | ✓ | ✓ | | ✓ | ✓✓✓ |
| | Lack of transit services | | | | ✓ | ✓ |
| | Icy bridges | | ✓ | ✓ | | ✓✓ |
| | Inclement weather - snow | ✓ | | ✓ | ✓ | ✓✓✓ |

**Table 3-7:** Workshop Results: Opportunities.

| Workshop Breakout Groups | Opportunity for ITS Application | Workshop Location | | | | Number of Workshops at Which Opportunity Was Raised |
|---|---|---|---|---|---|---|
| | | Medford, OR | Redding, CA | Eureka, CA | Bend, OR | |
| Safety and Emergency Services | Education | ✓ | ✓ | ✓ | ✓ | ✓✓✓✓ |
| | Pavement Riffles | ✓ | | | | ✓ |
| | Signing - Warning | | | ✓ | | ✓ |
| | Automated Bridge De-icing | | ✓ | | | ✓ |
| | Turnouts | | | ✓ | | ✓ |
| | Animal control - control vegetation, barriers | | | ✓ | | ✓ |
| | Reader Boards | ✓ | ✓ | | | ✓✓ |
| | Internet | ✓ | ✓ | ✓ | ✓ | ✓✓✓✓ |
| | Variable Message Signs | ✓ | ✓ | ✓ | ✓ | ✓✓✓✓ |
| | Automated Enforcement - Cameras | ✓ | ✓ | | ✓ | ✓✓✓ |
| | Railroad Technologies for Fleet Management | | ✓ | | | ✓ |
| | Better Use & Coverage of Highway Advisory Radio | ✓ | ✓ | ✓ | ✓ | ✓✓✓✓ |
| | Remote Weather Information Systems | | ✓ | | ✓ | ✓✓ |
| | Full Cellular Phone Coverage | | ✓ | ✓ | | ✓✓ |
| | Lower Speed Limits on Narrow Highways | | | ✓ | | ✓ |
| | Ice Detection System | | | ✓ | ✓ | ✓✓ |
| | Call Boxes - 1-800 Number | | ✓ | ✓ | ✓ | ✓✓✓ |
| | In-Vehicle Mayday Devices | | ✓ | ✓ | ✓ | ✓✓✓ |
| | Cross Jurisdictional Incident Response | ✓ | | | ✓ | ✓✓ |
| Travel and Tourism | Television, Newspaper | ✓ | ✓ | ✓ | | ✓✓✓ |
| | Data Collection, Traffic Information | ✓ | ✓ | | ✓ | ✓✓✓ |
| | Kiosks | ✓ | ✓ | ✓ | ✓ | ✓✓✓✓ |
| | Multi-Use Rest Areas - Information | ✓ | ✓ | ✓ | | ✓✓✓ |
| | Remote Advertising | | ✓ | | | ✓ |
| | Smart Card - Tracks Tourist Behavior | ✓ | ✓ | | ✓ | ✓✓✓ |
| | Regional Server for Multiple Agencies | | ✓ | | ✓ | ✓✓ |
| | Off-Peak Rewards | ✓ | | | | ✓ |
| | Bicycle Lanes Routing | ✓ | | ✓ | | ✓✓ |
| O & M | Automatic Maintenance | ✓ | | | | ✓ |
| | Cooperation in Transportation Planning | ✓ | | ✓ | ✓ | ✓✓✓ |
| CVO and Transit | Tecnology to Solve Tight Corners | ✓ | | | | ✓ |
| | Rock Slide Warnings | ✓ | | ✓ | | ✓✓ |
| | HAZMAT - On Board Mayday | ✓ | ✓ | ✓ | ✓ | ✓✓✓✓ |
| | Interoperable Transponders | ✓ | | | ✓ | ✓✓ |
| | In-Vehicle Control- "Smart Vehicles" | ✓ | ✓ | | ✓ | ✓✓✓ |
| | Merge Warnings | ✓ | ✓ | | | ✓✓ |
| | Dynamic Downhill Speed Signs | ✓ | ✓ | | | ✓✓ |
| | Road Closure Broadcasts | ✓ | | | | ✓ |
| | Real Time Weather Conditions | ✓ | ✓ | ✓ | ✓ | ✓✓✓✓ |
| | Centralized Dispatch for Information | | ✓ | | ✓ | ✓✓ |
| | Time Stamping of Information | | ✓ | | | ✓ |
| | CCTV on Web Site | | ✓ | ✓ | ✓ | ✓✓✓ |
| | Partnering | | | ✓ | ✓ | ✓✓ |
| | Making Transit Attractive | | | ✓ | ✓ | ✓✓ |
| | Data and Resource Management | | | ✓ | ✓ | ✓✓ |

## 3.6 Summary

This chapter has established a foundation for developing a COATS ITS Strategic Deployment Plan. It started with a summary of some of the key characteristics of the study area. The purpose and origin of the COATS project was reviewed, along with some of its key objectives, anticipated benefits, and methodology. Based on this methodology, it was necessary to include dozens of stakeholders across the study area. Consequently, this chapter also presented the project management structure that guided COATS over the life of the project, and identified some of the major stakeholder groups that were desired for inclusion in this project management structure. Finally, the chapter included a review of some of the principal means of outreach that were conducted throughout the project.

The next chapter will build on this foundation by reviewing some of the needs and challenges that were identified for the COATS study area.

# 4 NEEDS ASSESSMENT

Central to the COATS project was the systematic identification of corridor needs, and the mapping of these needs to specific ITS solutions, as shown in Figure 4-1. The COATS project may be unique among ITS strategic plans in terms of the number of different methods that were used to define needs and challenges for the study area. These multiple efforts helped to ensure that planned deployments are traceable to specific problems as identified through stakeholder input and quantitative data. They combined objective and subjective data, user and operator perspectives, views of historical conditions, and projections of future needs.

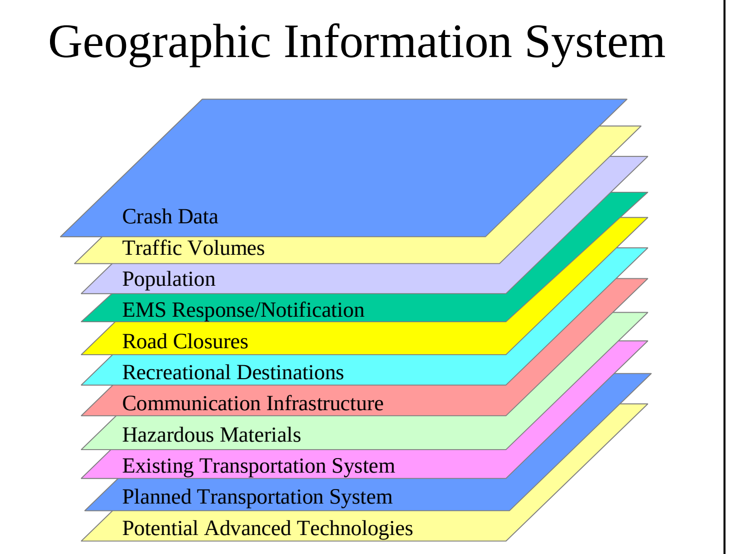



**Figure 4-1:** Layered Methodology for Analyzing Study Area Challenges.

This chapter summarizes the various efforts that were used to assess transportation needs within the study area, including the Traveler Needs Survey, the Legacy Systems Report, and the Conditions and Performance Report. This chapter concludes with a summary of the findings from each of these efforts.

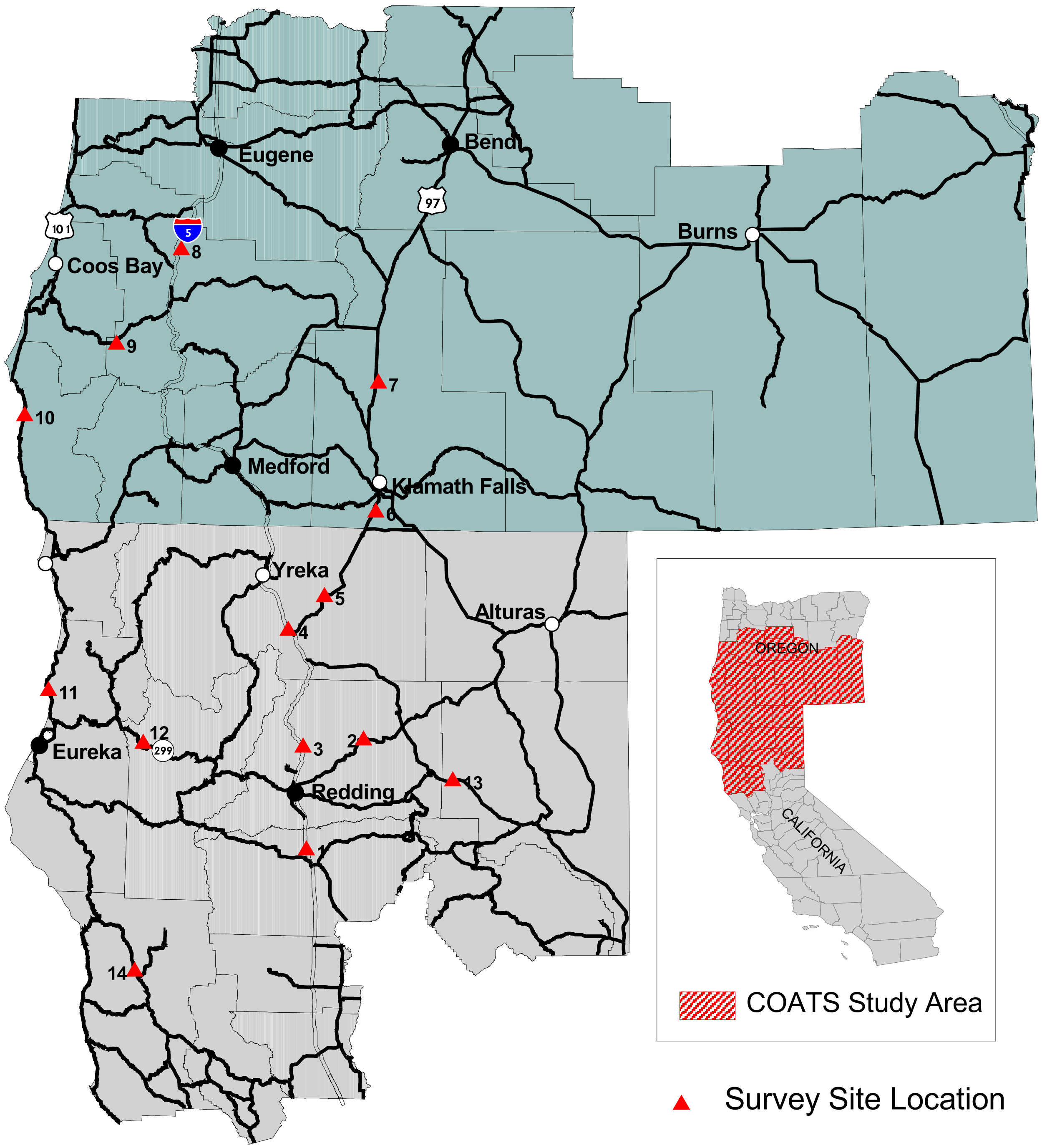
## 4.1 Traveler Needs Survey

In order to assess user perceptions regarding the performance of the regional transportation system and the applicability of advanced technologies to address perceived challenges, a survey was conducted of motorists in the COATS study area (10, 11). The purpose of the survey was to identify and investigate the transportation and information needs of travelers in Northern California and Southern Oregon[1]. The specific objectives of the traveler needs survey were to determine:

- what information the rural traveler needs and wants,
- how the information should be presented to the traveler, and
- where the traveler would want this information presented.

In addition, the survey investigated traveler acceptance of ITS applications and new user services throughout the study area.

[1] The Steering Committee made the decision to focus on motorists in the survey and not all types of travelers, such as those who use public transportation or modes such as passenger rail, due to a lack of funding that would be necessary to support a broader survey effort.




| ID# | Rest Area Name | ID# | Rest Area Name |
|---|---|---|---|
| 1 | Herbert S. Miles | 8 | Cabin Creek |
| 2 | Hillcrest | 9 | Camas Valley |
| 3 | O'Brien | 10 | Ophir |
| 4 | Weed Airport | 11 | Trinidad |
| 5 | Grass Lake | 12 | Salyer |
| 6 | Midland | 13 | Lake Almanor |
| 7 | Beaver Marsh | 14 | Moss Cove |


**Figure 4-2:** Traveler Needs Survey Locations.

### *4.1.1 Methodology*

The survey instrument was designed to be able to be understood and completed by respondents within six to eight minutes, by constraining the survey to a maximum of fifty questions. It addressed perceived corridor challenges, tourist and traveler information, information sources and advanced technology. Survey questions were tailored to address concerns and needs specified by the sponsoring agencies, including increased safety, improved emergency response, increased traveler information and trip enhancement, reduced congestion and increased economic activity. The survey also collected information about respondent demographics.

Survey administration was designed to involve all motorists, including both those who were familiar and those who were unfamiliar with the areas in question. The survey was administered at fourteen rest stops and recreational areas in Northern California and Southern Oregon, as shown in Figure 4-2. A total of 1,040 responses were collected, with approximately 45 percent of those asked agreeing to complete the survey.

### *4.1.2 Survey Results and Analysis*

This section will highlight some of the major findings from the survey. More detailed results from the traveler needs survey, including an analysis of correlations between demographics and survey responses, are provided in the Traveler Needs Survey Report (10, 11).

Table 4-1 lists to what extent respondents were concerned with specific transportation challenges in the COATS region, where 1 represents never concerned and 4 represents always concerned. It is important to emphasize that a survey question that uses a ranking system like this is valid to the extent of comparing the relative values of different responses; the absolute numbers have little significance by themselves.

**Table 4-1:** Top Transportation Challenges in COATS Study Area.

| **Challenge** | **Level of Concern (4 = high; 1 = low)** |
|---|---|
| Passing trucks and other heavy vehicles (clearance/visibility) | 2.48 |
| Road conditions like ice, snow, rain or fog | 2.40 |
| Driving through construction zones | 2.33 |
| Debris, objects or animals on the roadway | 2.18 |
| Driving on hills or curves | 2.14 |
| Encountering slow moving vehicles like snowplows, farm equipment or RVs | 2.13 |
| Lack of information from signs along the roadway | 2.03 |
| Running off the roadway | 1.83 |

The highest ranked challenge was related to passing trucks or larger vehicles, due to clearance and visibility problems. This challenge may be especially pronounced in the mountainous parts of the COATS region, which are characterized by sharp curves and narrow road widths. Ranked closely behind this were weather-related challenges, such as ice and snow, and driving through construction zones.

Respondents were asked to assess the importance of different types of tourist and traveler information before they started a trip in the COATS project region; the mean rankings are shown in Table 4-2 in decreasing order of importance. The highest ranked information type was related to weather conditions, which correlates with what motorists perceived to be a significant challenge in the study area. The second most important type of information travelers wished to receive was "the best route to destination." This would require information about short-term weather forecasts, integrating information about incidents and construction activities as well.

**Table 4-2:** Relative Importance of Different Types of Traveler Information.

| Type of Information | Relative Importance (4 = high, 1 = low) |
|---|---|
| Weather conditions | 3.08 |
| The best route to destination | 3.06 |
| Location of traveler services (rest stops) | 2.94 |
| Distance to destination | 2.83 |
| Location of traffic delays due to special events, road closures, construction zones and/or detours | 2.83 |
| Location of accidents or incidents | 2.81 |
| Tourist attractions (parks/recreation/historical) | 2.64 |
| Knowing trip-planning assistance is available from rest stops or other places along your route | 2.62 |

Respondents were asked to indicate when they preferred to receive tourist and traveler information. As shown in Table 4-3, a majority of respondents wanted information both before the trip and when they are on the road. A larger proportion of respondents wanted to receive information before their trip.

Motorists were asked how likely they would be to use various devices and services to obtain traveler information or aid in driving. A four-point scale was used, with higher values indicating greater likelihood. The results are shown in Table 4-4. Motorists were most likely to use signs providing dynamic warning of conditions requiring lower speeds, such as curves, animal presence, and weather conditions.

**Table 4-3:** When Travelers Want Information.

| | | During the trip? | | |
|---|---|---|---|---|
| | | Yes | No | Total |
| Before the trip? | Yes | 53.9% | 30.7% | 84.6% |
| | No | 9.3% | 6.1% | 15.4% |
| | Total | 63.2% | 36.8% | |

## 4.2 Legacy Systems Report

The COATS ITS Strategic Deployment Plan is intended to plan for the deployment and integration of technologies within the existing transportation system infrastructure in order to meet the regional transportation challenges. Accordingly, it was critical to understand the extent of the existing transportation system. The Legacy Systems Report (12) addressed this need.

**Table 4-4:** Relative Likelihood to Use Different Traveler Information Technologies.

| Challenge | Relative Likelihood (4 = very likely, 1 = not at all likely) |
|---|---|
| Warning signs for speed, curves and animal presence that change based on conditions | 3.33 |
| A telephone number to report an incident or accident | 3.12 |
| A special radio channel for road conditions, accidents, etc. | 2.97 |
| Changeable message signs | 2.95 |
| A telephone number for road conditions | 2.81 |
| A cellular phone | 2.79 |
| An in-vehicle device to enhance driving capabilities in low visibility situations | 2.78 |
| An in-vehicle device to help you avoid collisions or running off the roadway | 2.75 |
| A special radio channel for tourist information | 2.70 |
| Small computerized information centers - or kiosks - at convenient locations | 2.52 |
| A local TV channel with continuously updated tourist and traveler information | 2.26 |
| A small in-vehicle computer with traveler information | 2.13 |

### *4.2.1 Report Objectives*

The purpose of the Legacy Systems Report is to document existing and planned transportation improvements and ITS deployments in order to avoid any redundancy among various projects. WTI surveyed appropriate providers to identify and inventory legacy (existing and planned) systems that include safety and hazardous warning systems, traffic management systems, traveler information systems, emergency response resources, commercial vehicle facilities, public transportation facilities, fleet management systems, and communications infrastructure. The information assists in identifying gaps and potential linkages in existing systems, and helps to identify future ITS solutions that may add value to on-going efforts.

### *4.2.2 Data Collection and Review*

The methodology employed to inventory legacy systems (existing or planned programs), determine areas of study overlap, and identify gaps where improvements need further consideration, was a four-step process as shown in Figure 4-3.

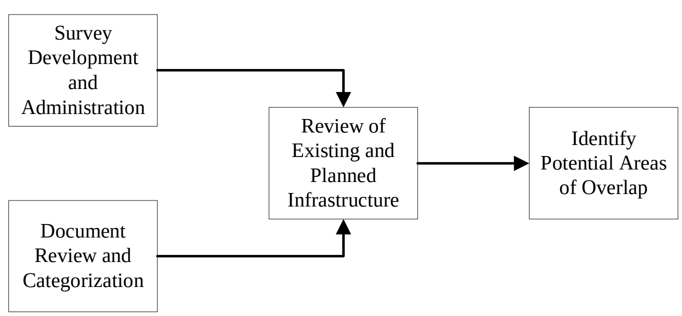



**Figure 4-3:** Legacy Report Methodology.

A survey was designed and distributed to project participants in order to collect transportation data and inventory existing, planned and needed transportation improvements, either advanced or traditional, that are located within the study area. In addition to this, documents provided by project partners were reviewed and categorized by focus area, including policy, planning/engineering studies, construction and ITS. This information was reviewed and summarized both geographically and by Advanced Rural Transportation System (ARTS) Critical Program Areas (CPA), which were introduced in Chapter 2. This helped existing and planned (legacy) systems align with the National ITS Architecture and USDOT's ARTS Strategic Plan (2).

In addition to reviewing and categorizing projects, there were projects that were outside that scope which were reviewed including communication infrastructure, intermodal systems, and state and national parks.

#### *4.2.3 Summary of Findings*

The Legacy Systems Report includes a lengthy appendix detailing specific infrastructure types and locations throughout the COATS study area; the reader is encouraged to examine this report for additional information.

In California, the report found that Caltrans and other agencies had familiarity with rural ITS. Current needs center on unifying efforts and practices in planning, programming and implementation of rural ITS systems between Districts 1 and 2 and efforts related to tourism services, fleet operations and communications. There could also be increased focus on solutions that pertain to or encompass more than one CPA, as the majority of previously conducted or on-going ITS-related studies have concentrated on traditional improvements, public transportation, traveler safety and security, and infrastructure operations and maintenance. In broadest terms, the potential areas of overlap between COATS and Caltrans efforts may include:

- traveler safety and security;
- emergency services;
- public traveler/mobility services; and
- infrastructure operations and maintenance.

The review of programs in Oregon revealed that there has been relatively more focus on initiatives relating to emergency services, traveler safety and security, tourism services, public transportation, and infrastructure operations and maintenance. Again, very little work has been done in the areas of fleet operations and maintenance, or communications infrastructure. There is little to suggest potential overlap between Oregon DOT's ITS-related programs and the COATS project. The State's Emergency Operations Plan and their Incident Response Procedures are both in place and, therefore, do not need to be addressed by the COATS study.

## 4.3 Conditions and Performance Report

The Conditions and Performance Report (8), together with the Legacy Systems Report, form Technical Memorandum One. This report provides an overview of the major transportation challenges and defines areas of geographical focus by going beyond subjective information collected through various outreach efforts and producing an objective analysis of challenges and needs.

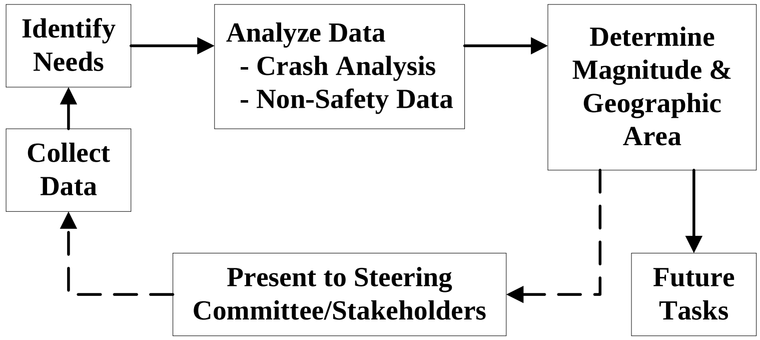



**Figure 4-4:** Methodology of Conditions and Performance Document.

### *4.3.1 Methodology*

As shown in Figure 4-4, the process for evaluating the existing conditions and performance of the transportation system was to collect data relating to the corridor, identify the challenges/needs, analyze the data to estimate the magnitude of challenges, and identify the geographic area of focus.

Challenges were identified from a number of sources. First, a review was conducted of documents including planning documents, transportation studies, needs assessments, and many others. Second, the results of the Traveler Needs Survey (10, 11) were reviewed. Lastly, additional challenges were identified when crash data was analyzed.

For each challenge identified, an attempt was made to collect related data in order to determine its magnitude and identify any geographic areas of focus. The data collected for each challenge identified is shown in Table 4-5[2]. In addition, crash records were analyzed for the entire corridor. This was done both to quantify safety issues already identified and identify any other prevalent safety concerns.

$$Rate = \frac{(\#Crashes) \times 1{,}000{,}000}{ADT \times 365 \times 3 \times 0.5}$$

**Figure 4-5:** High Crash Location Equation.

Crash data was collected for three years (January 1, 1994 through December 31, 1996), which included over 24,000 crashes. The data included information about each incident including collision type, first harmful event, object hit, vehicle type, weather conditions, road surface conditions, contributing causes and driver violations. In order to be able to analyze crashes in a detailed manner without having to review each crash record, high crash locations were identified based on the equation shown in Figure 4-5. Crash rates were determined for half-mile segments. The segments having a crash rate greater than two standard deviations above the mean were determined to be high crash locations (HCLs).

[2] Descriptions of the data are given in the discussion of findings in (**8**).

**Table 4-5:** Challenges Identified and Data Collected.

| Transportation Challenge | Data Collected |
|---|---|
| Safety | |
| Poor horizontal and vertical alignment | Literature |
| Railroad grade crossing | Vehicle crash data |
| Ice and snow | Vehicle crash data |
| Intersection safety | Vehicle crash data |
| Narrow shoulder/clear zone | Vehicle crash data |
| Animal collision | Vehicle crash data |
| Slow moving farm vehicles | Vehicle crash data |
| Speed related crashes | Vehicle crash data |
| Passing maneuvers | Vehicle crash data |
| Construction zone | Vehicle crash data |
| Alcohol | Vehicle crash data |
| Driver fell asleep | Vehicle crash data |
| Freight Movement | |
| Lack of intermodal facilities | Existing intermodal facilities |
| Truck inspection/high truck traffic | Truck traffic volumes & existing P.O.E. |

| Transportation Challenge | Data Collected |
|---|---|
| Incident Response | |
| Multi-jurisdictional incident | Locations of road closures |
| Long emergency notification and response times | Emergency notification response times |
| Mobility | |
| Bicycle and pedestrian traffic (safety) | Literature review and vehicle crash data |
| Transit availability | Mobility impaired populations |
| Tourism | |
| High recreation traffic | Recreational destinations |
| Economic sustainability | Tourist expenditures |
| Lack of information | Literature |
| Non-Recurring Congestion | Road Closures |
| Environmental Impacts | Hazmat incidents |
| Deteriorating Pavement | Literature review |

For each HCL, crash records were analyzed in order to determine a causal trend. A list of these trends was developed and added to the list of safety challenges already identified in the literature review. For each of these safety issues, a macro analysis of all crashes in the corridor was conducted in order to determine their magnitude.

### *4.3.2 Findings*

Figure 4-6 shows both the total number of crashes that relate to the particular crash trend and the percentage of these crashes that caused a fatality or severe injury. As a benchmark, six percent of the total crashes in the corridor resulted in a fatality or severe injury.

Maps and tables were prepared to summarize the transportation challenges by geographic area of focus. Many of these maps and tables are provided in Appendix A.

## 4.4 Needs Summary

The three efforts described in this chapter, combined with the outreach workshops discussed in Chapter 3, were used to assess the challenges in the COATS study area that may be addressed by ITS. This section will summarize some of the principal challenges by CPA, identifying "hot spot" locations and ITS applications that may potentially address these challenges.

### *4.4.1 Traveler Safety and Security*

As was stated earlier, the traveler safety and security CPA addresses the need for improving the driver's ability to operate a vehicle in a safe and responsible way and for improving driver notification of potentially hazardous driving conditions, such as slippery

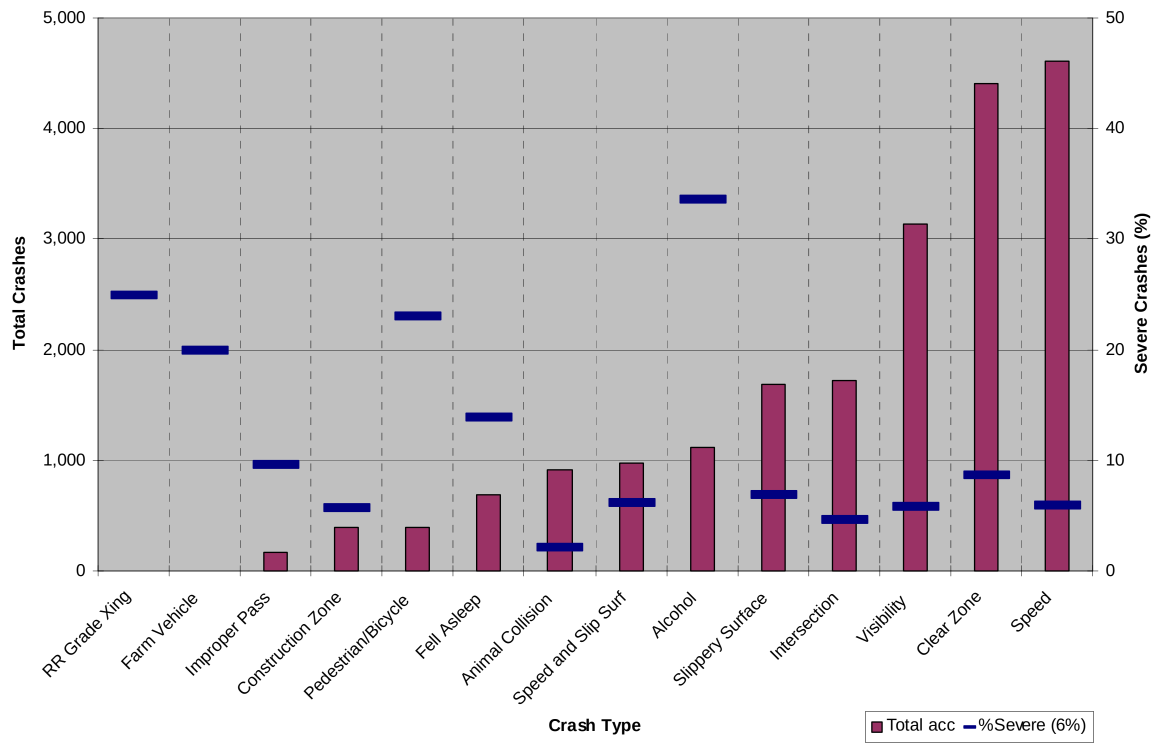



**Figure 4-6:** Number and Severity of Crashes by Crash Type.

surface or poor visibility. From outreach workshops and the Conditions and Performance report, it was evident that there were many challenges in the study area that fit under this category.

Winter weather conditions pose a significant challenge to mobility through the study area. Snowstorms with reduced visibility, iced over roadways, and similar conditions contribute to incidents, and may require action to remove incidents or even close the roadway. Generally, these challenges are focused on Interstate 5 and for roadways that cross the Cascade Range, such as Santiam Pass (US Route 20) and Willamette Pass (State Route 58) in Oregon, and Fredonyer Pass (State Route 36) in California.

As the mountain snows melt in the spring, new weather-related challenges confront the study area, in the form of landslides and mudslides. Slides may result in long-term highway closures, depending upon the amount of debris that falls into the roadway. These typically occur on roadways closer to the Pacific coast, where higher precipitation levels combine with melting snowpack off of sheer roadside cliffs to create potentially dangerous conditions. US Route 101, which runs north-south along the Pacific Coast, is prone to slide-related closures. East-west highways that cross the coastal range, such as US Route 199, Oregon Route 126, and California State Routes 3, 20 and 36, are also susceptible to slides. Flooding may occur in the same areas that are prone to slides, as well as at low-profile roadways crossing or parallel to rivers and streams.

Reduced visibility conditions, due to coastal or valley fog as well as snow, are also common in the study area. Substantially reduced visibility can increase the potential for collisions, especially for tourists and visitors who may be unfamiliar with the alignment and speed changes associated with the local roads. Several locations on US Route 101 experience visibility challenges due to the frequent coastal fog conditions in these areas. Other areas that are susceptible to fog include certain valley areas, such as Interstate 5 in Eugene and south of Roseburg at the Myrtle Creek Curves, as well as mountain passes, such as Siskiyou Pass on Interstate 5 and Willamette Pass.

High wind conditions may prove hazardous for high-profile vehicles, such as recreational vehicles and commercial vehicles. These conditions, like reduced visibility, tend to occur in certain areas with greater frequency; one such location is US Route 101 near Humbug Mountain in Curry County.

The rugged topography of the study area has resulted in many highway segments having winding road alignments and narrow lane widths or clear zones. These are not only problems by themselves, but may amplify the weather-related challenges described earlier. Parts of US Route 101, which winds through tall groves of redwoods and beside steep rock embankments, have narrow clear zone challenges. Other challenging routes include US Route 199 in Del Norte County, California Route 299 in Trinity County and California Route 36 east of Red Bluff. Navigating topography-constrained roadways creates challenges primarily for long and wide-load vehicles, as well as for smaller vehicles that are attempting to pass in the opposite direction.

The vast distance between towns can contribute to driver drowsiness. Some of the study area's roadways have relatively flat and straight alignments that may lull drivers to sleep. This is true for much of Interstate 5 through the study area, as well as parts of US Route 101, and California Routes 20 and 299. Another set of challenges occurs as drivers near the perimeter of towns, due to significant changes in speed limits as well as increased likelihood of cross-traffic. Towns including Burns, Brookings, Bend, Crescent City and White City are areas where intersection-related safety challenges tend to be focused.

Bicycle and pedestrian traffic, primarily focused along Route 101 and some of the small towns in the study area, is another transportation challenge in the study area, for bicyclists and pedestrians as well as motorists. There is often little space in the roadway to accommodate bicycle or pedestrian traffic, and drivers may be unaware of areas where bicyclists and pedestrians tend to cross due to trail alignments. Incidents in these circumstances may result in fatalities or debilitating injury to the bicyclist/pedestrian.

Another major challenge in the COATS study area is animal-vehicle collisions. These collisions may involve significant property damage to vehicles, as well as significant human injury. Deer, elk and other large animals have fairly well established migration patterns through the study area, of which motorists are typically made aware through static signing. However, animals tend to be more mobile during twilight hours, when lower visibility conditions reduce the driver's ability to react. While these collisions may occur throughout the study area, they are predominantly focused in the eastern part of the study area, such as US Route 20 in Harney and Malheur Counties, US Route 97 between Bend and Klamath Falls, US Route 395 in Modoc and Lassen Counties, and California Route 299 in Modoc County.

While not a cure-all, ITS technologies may be used to mitigate some of these challenges, through both improved pre-trip and en-route traveler information. Before a trip, for example, a traveler could learn of a road closure through an advisory cable television channel. During the trip, spot warning systems could provide dynamic information about where hazardous conditions exist (for example, “bridge icy when flashing”) as well as appropriate detours, through variable message signs and highway advisory radio. As these conditions do occur, motorist-aide call boxes can help drivers to obtain a quicker response from emergency personnel and/or towing services. Other systems, such as anti-icing systems for bridge decks, may help to provide maintenance personnel with advance warning about when hazardous conditions are present, so they may perform remedial action sooner.

### *4.4.2 Emergency Services*

One of the most important functions of any region’s transportation systems is to provide for quick emergency medical services to those who are in need. In the COATS study area as well as other rural areas, significant travel distances may increase notification and response time, increasing the risk of long-term disability or death resulting from an incident. Within the study area, the areas with the highest response time are in eastern Oregon around Burns, as well as in the eastern California counties, including Lassen, Modoc and Plumas. However, these problems may occur throughout the study area. The ability to rely on other vehicles providing earlier notification about incidents is reduced on the low-volume roadways in the study area.

ITS may be used to improve emergency service effectiveness on a county or regional basis by reducing both notification and response time. For emergency notification, in-vehicle mayday systems may provide emergency service providers with quick notification when a crash occurs. While these systems are included with the purchase of newer vehicles, their usability is affected significantly by the availability of local cellular coverage, which tends to be sporadic in the COATS study area due to reduced population density and topographic challenges.

The ability to coordinate responses with numerous state and local agencies is critical to minimizing response time. Incident management plans, which specify inter-agency relationships for responding to incidents on specific roadway corridors, may help. These plans typically include information about how agencies should provide pertinent information to related ITS elements, such as a Web site or a highway advisory radio.

Emergency response for off-roadway events (such as a heart attack in a person’s home) is hindered by poor or inconsistent addressing schemes in rural areas. By systematically cross-referencing locations with a geographic information system, response time can be further reduced.

### *4.4.3 Tourism and Traveler Information*

Tourism is becoming an increasingly significant portion of the regional economy for the COATS study area. Tourist traffic brings different challenges beyond safety and security, as travelers will typically need more detailed information about lodging, attractions, restaurants, shopping, and other services. Their unfamiliarity with the local transportation system, combined with the sparse provision of services, means that providing reliable, accurate and complete pre-trip and en-route information to travelers is vital.

Tourism-related travel has some predictable "hot spots" in the COATS study area, including National Parks (e.g. Crater Lake, Redwoods, and others), outdoor recreation (e.g. ski areas, Forest Service lands), and regional festivals (e.g. Ashland Shakespeare Festival). In addition to destinations like these, many of the communities attract tourists during the summer who are stopping over on the way to a destination elsewhere on the Pacific Coast.

Technological improvements, led primarily by the Internet, create the means to provide improved quality and timeliness of information to travelers. Web sites, toll-free telephone numbers and kiosks are some of the ways that information may be packaged and distributed to travelers. In the long-term, in-vehicle systems may provide motorists with information on directions to their destination, available campsites, local entertainment options, and gift shops.

### *4.4.4 Public Traveler / Mobility Services*

Most of the travel throughout the COATS study area occurs in private automobiles. However, public transit provides a significant role in the region's transportation system. Between cities, inter-city bus lines may provide tourists with an alternative to flying or driving. Within communities, public transit may be a valuable lifeline connecting people with key medical and shopping services that may not be available in their community. Age, mobility impairment and reduced income may all contribute to a person's need to rely on public transportation. Thirty percent of the study area's residents are affected by one or more of these factors. These demographic indications indicate that transit dependency would be highest in Josephine County in Oregon and in Lake County in California.

New transit service is typically prohibitively expensive to initiate in a rural environment. However, ITS can help to reduce that cost by providing ways for local ride-providers, such as social services organizations, to have centralized fleet and scheduling control, while distributing farebox revenues equitably to each organization. By monitoring vehicle locations through satellite technology, agencies can provide improved transit traveler information to prospective riders, potentially increasing transit ridership. Improvements in computer technology may also help to encourage ridesharing for commuting and recreational traffic, by providing for improved coordination of transportation services.

One special area of mobility-related challenges for the COATS study area is the management of parking and roadway demand at certain tourist destinations, especially for recreational vehicle traffic. Parking management systems may help to provide a better real-time picture of parking availability, to reduce the amount of time that traffic circles a lot while waiting for a parking space. Recreational vehicles, which may have difficulty navigating certain roadways, may be encouraged to use remote lots and shuttle service, once those lots are equipped with sophisticated real-time surveillance equipment.

### *4.4.5 Infrastructure Operations and Maintenance*

Throughout the study area, agencies are faced with a continual challenge to effectively and efficiently manage their transportation systems. Some challenges include the timely notification and clearance of incidents and the prompt dispatching of maintenance vehicles to clear roadways of snow or other debris. This challenge is exacerbated in the rural environment, where the distance between a dispatch office and the location may be multiple hours. The ability to rely on technology to handle field activities remotely is a clear benefit of ITS.

Several challenges related to infrastructure operations and maintenance may be directly addressed through ITS. Remote surveillance and vehicle detection technology can provide advance information of incidents. Road weather information systems can help maintenance crews to know when ice is forming, in order to dispatch plows and/or chemical trucks. In areas with frequent road closures, automated gate closure systems can reduce the amount of time a hazard is present for motorists, while saving man-hours as well. Highway advisory radio and variable message signs may also be used to provide quicker information to motorists as conditions warrant.

As may be expected, these technologies will be clustered around areas that tend to have higher frequencies of accidents, in the case of vehicle detection and closed-circuit television cameras. For others, such as road weather information systems (RWIS), it may be more important to have a broader geographic representation of the area to know how best to dispatch maintenance vehicles.

Another promising area where ITS can assist in infrastructure operations and maintenance is through improving the safety and efficiency of existing maintenance actions. Research in this area has yielded several potential applications, including snowplows with improved roadway navigation capabilities, remotely operated unmanned vehicles to remove landslide debris, and systems to improve work zone safety.

#### *4.4.6 Fleet Operations and Maintenance*

The efficient management and usage of vehicle fleets is essential in a rural environment, in order to avoid being unnecessarily harmed by the large distances that exist between towns. Fleet management may be significantly aided through the use of automatic vehicle location, which can assist in vehicle tracking and dispatching. Fleet vehicles may also collect valuable information about the roadway environment by serving as probes, recording local weather conditions in order to supplement information gathered through road weather information systems. As vehicle fleets exist on both sides of the border, these ITS applications may provide a broader regional benefit, rather than specific local benefits.

#### *4.4.7 Commercial Vehicle Operations*

Another important element in the regional transportation system is commercial vehicle traffic. Truck traffic typically represents a higher portion of overall roadway traffic in a rural environment than may be found in a more urbanized environment. The COATS study area produces many commercial commodities, such as agricultural and wood products, and has demand for many others. In these cases, it is important to local residents and businesses to provide for efficient and inexpensive freight transportation. In addition, many commercial vehicles pass through the study area for more remote destinations such as Seattle, Los Angeles, or even Canada or Mexico. Efficient movement of these vehicles through the study area may help to attract additional traffic, providing residual benefits to various service providers along major freight travel routes.

Interstate 5, US Route 97 and US Route 101 serve as the primary north-south arteries for freight movement in the study area. The number of east-west routes is constrained by topography; hence, many routes – including California Routes 20 and 299 and Oregon Routes 38, 58 and 126 – have significant amounts of truck traffic.

ITS can help to improve the efficiency of freight movement by pre-clearing vehicles in advance of weighing and inspection stations, reducing travel time for freight vehicles and reducing congestion on the adjacent roadway. ITS can also help emergency management personnel to deal more effectively with hazardous material cargo that may be spilled during a commercial vehicle accident, by providing quicker and more accurate instructions on proper handling procedures of the spill.

## 4.5 Conclusion

The research efforts described in this chapter were important foundational steps in discerning the transportation needs in the COATS study area that may be addressed with ITS technologies. They provide a foundation for the development of a vision and the implementation of ITS strategies, which will be described in the following chapter.

# 5 THE COATS VISION

The essential goal of the COATS project is to provide an integrated transportation system where transportation agencies, transit providers, emergency managers, tourism operators and other stakeholders will be able to provide the information and control needed to manage travel in this predominantly rural area. This is consistent with the overall goal of rural ITS planning, demonstration, and evaluation: to make "rural travel safe, dependable and convenient." It was important to be able to translate these ideas into an agenda that could direct future ITS activities in the COATS study area. This chapter describes the guiding agenda that was developed to cover both the COATS planning process, as well as ongoing ITS planning, demonstration and deployment in the bi-state area. It includes a vision, a mission statement, a series of goals and objectives, and then more specific strategies for the COATS study area.

## 5.1 Vision

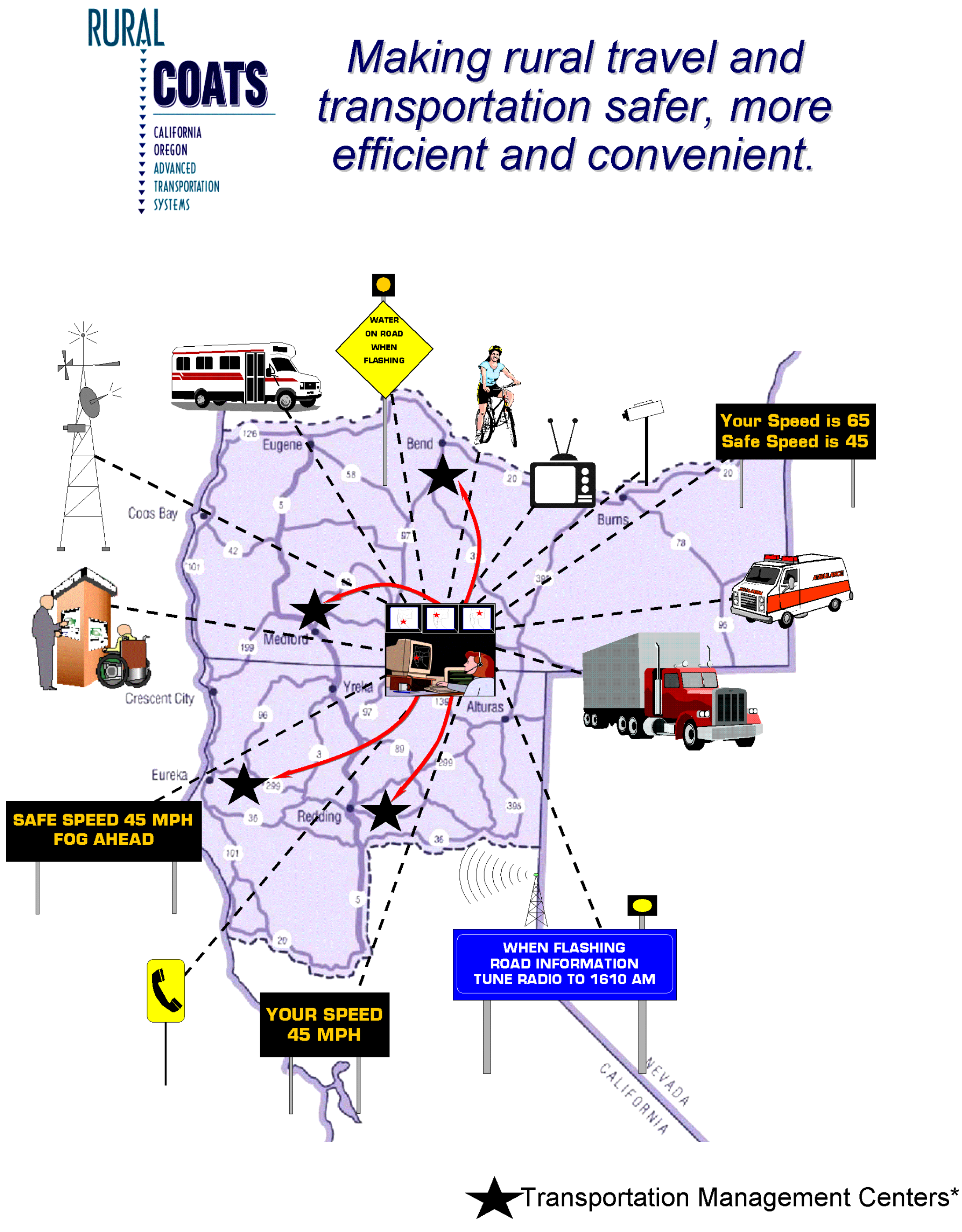
Having a shared vision is essential in order to effectively demonstrate ITS projects. The vision can characterize a snapshot of the future as to what the likely benefits of the COATS project will be. This vision can help to galvanize and coordinate efforts among diverse stakeholders, serving as a catalyst for agency leadership in ITS. It can help to encourage stakeholders to make local transportation decisions reflecting a regional perspective, giving the traveling public state-of-the-art mobility and real-time information.

The vision developed for the COATS project, as approved by the Steering Committee, is as follows:

> "The California/Oregon Advanced Transportation Systems (COATS) project is a cooperative bi-state, public-private sector project designed to develop a comprehensive ITS to address unique rural regional and local transportation challenges."

The vision is graphically depicted in Figure 5-1. ITS will improve the quality and timeliness of information exchange between stakeholders throughout the project area. It can provide real-time information to transportation operations personnel to help them make better, more informed decisions. It can provide real-time warnings and guidance to drivers to help them navigate challenging conditions. This information may also be incorporated into various pre-trip traveler information systems, such as kiosks, to discourage trips when weather conditions become hazardous. The system can improve communication between emergency response personnel and highway dispatchers in order to improve emergency notification and response times. In sum, this vision will ultimately provide benefits to all travelers in the region, including motorists, commercial vehicle operators, tourists, transit riders, and pedestrians and bicyclists.

It is important to translate the overall vision into terms accessible to individual stakeholders to answer the question, "What's in it for me?" Table 5-1 describes how the overall COATS vision of ITS may provide benefits for different groups of stakeholders in the COATS region. The level of realized benefits depends on the extent of deployment in a given part of the COATS region, and the overall level of integrated and coordinated information across the study




*Includes ODOT's Transportation Operation Centers (TOC) and Caltrans' Advanced Rural Technology Integration Centers (ARTIC)

**Figure 5-1:** The COATS Vision.

**Table 5-1:** Potential COATS Benefits by Stakeholder Group.

| Stakeholder Category | Potential Benefits from COATS |
|---|---|
| Departments of Transportation | • Improved coordination with other agencies<br>• More efficient planning and management of traffic operations<br>• Improved safety, effectiveness and efficiency in maintenance operations<br>• Improved timeliness and accuracy of road and weather information<br>• Enhanced efficiency of communicating key information to the traveling public |
| Emergency Response | • Improved coordination with other agencies<br>• Reduced frequency and severity of incidents<br>• Reduced notification, verification and response times<br>• Enhanced hazardous materials response |
| Public Lands and Other Tourist Attractions | • Improved coordination with other agencies<br>• Improved information dissemination to tourists |
| Tourism Promotion | • Improved coordination with transportation providers<br>• Improved information dissemination to tourists |
| Tourists | • Improved timeliness and accuracy of information, on road and weather conditions and tourist attractions<br>• Improved traveler safety<br>• Improved visitation experience |
| Transit Agencies | • Improved coordination with other agencies<br>• Improved operational efficiency and schedule adherence |
| Planning Agencies | • Improved coordination with other agencies<br>• More efficient planning and management of traffic operations<br>• Improved archiving of transportation system data |
| Trucking | • Reduced congestion at ports of entry and weigh scales<br>• Improved timeliness and accuracy of road and weather information<br>• Improved safety at critical locations |
| Media | • Improved timeliness and accuracy of road and weather information |
| Private Sector | • Enhanced market for traveler information services |
| Motorists | • Improved traveler safety<br>• Improved traveler information, including road and weather conditions<br>• Reduced delay |
| Transit-Dependent Travelers | • Improved schedule adherence<br>• Greater flexibility and responsiveness in demand-responsive service |

area. As ITS deployment increases across the region, it is anticipated that these benefits will increase.

## 5.2 Stakeholder Perspective

As noted earlier it is important to translate the overall vision into terms accessible to individual stakeholders to answer the question, “What’s in it for me?” The following descriptions provide a perspective of how technology may assist the organizations and their customers in making their day-to-day living to make it “safer, more convenient, and more accessible.” The stakeholders identified are only personal examples and not intended to be an exhaustive list.

### *5.2.1 Transportation Maintenance and Operations*

*One of the biggest headaches transportation maintenance and operation engineers have is trying to figure out just how bad the weather conditions are or will be, where snowplows and other resources are located and how the weather is impacting roadway operations. In this respect, Charlie from ODOT faced the same problems as many other engineers in rural areas: Medford had similar difficulties and challenges. However, Medford was different – it was an exciting place to practice the transportation maintenance and operations profession. The implementation of the COATS project had provided a new set of state-of–the-art tools for Charlie and his staff. The COATS project provided an initial roadmap for ITS deployment in the area, and many technologies were deployed to address weather-related challenges, including road weather information systems, closed circuit television cameras, variable message signs, traffic monitoring stations, global positioning systems for ODOT maintenance vehicles, and improved coordination with Caltrans, CHP, OSP, and the cities of Ashland and Hilt. The result of these technologies, deployed to improve management of Siskiyou Pass on Interstate 5, is that roadway, weather condition and fleet resources were now being managed with unparalleled effectiveness (see Figure 5-2).*

*What really excited Charlie, though, was the volume of high-quality data about current and forecasted traffic demand, roadway temperatures, and the location of snowplow fleets for ODOT, Caltrans and local agencies. In addition, Charlie now had the ability to inform the travelers real-time 30 to 60 miles upstream of the mountain pass. Receiving and transmitting accurate and reliable data in a timely manner had always been a problem from his perspective as well as those of other agencies. The improved quality and timeliness of data, resulting from the technologies described earlier, had proved invaluable to improve coordination between other agencies, and to provide travelers with greater confidence in the information they received about current conditions (see Figure 5-3).*

### *5.2.2 Police and Fire Emergency Response*

*Patricia was very concerned when she received the radio transmission that a tanker truck had overturned on US Route 199 and was blocking the roadway. She had been involved in such incidents before and remembered that it had brought the entire highway network to a complete standstill for over eight hours. She also recalled that she was required to work all night on that occasion, and that there were difficulties in initially detecting the incident, coordinating*

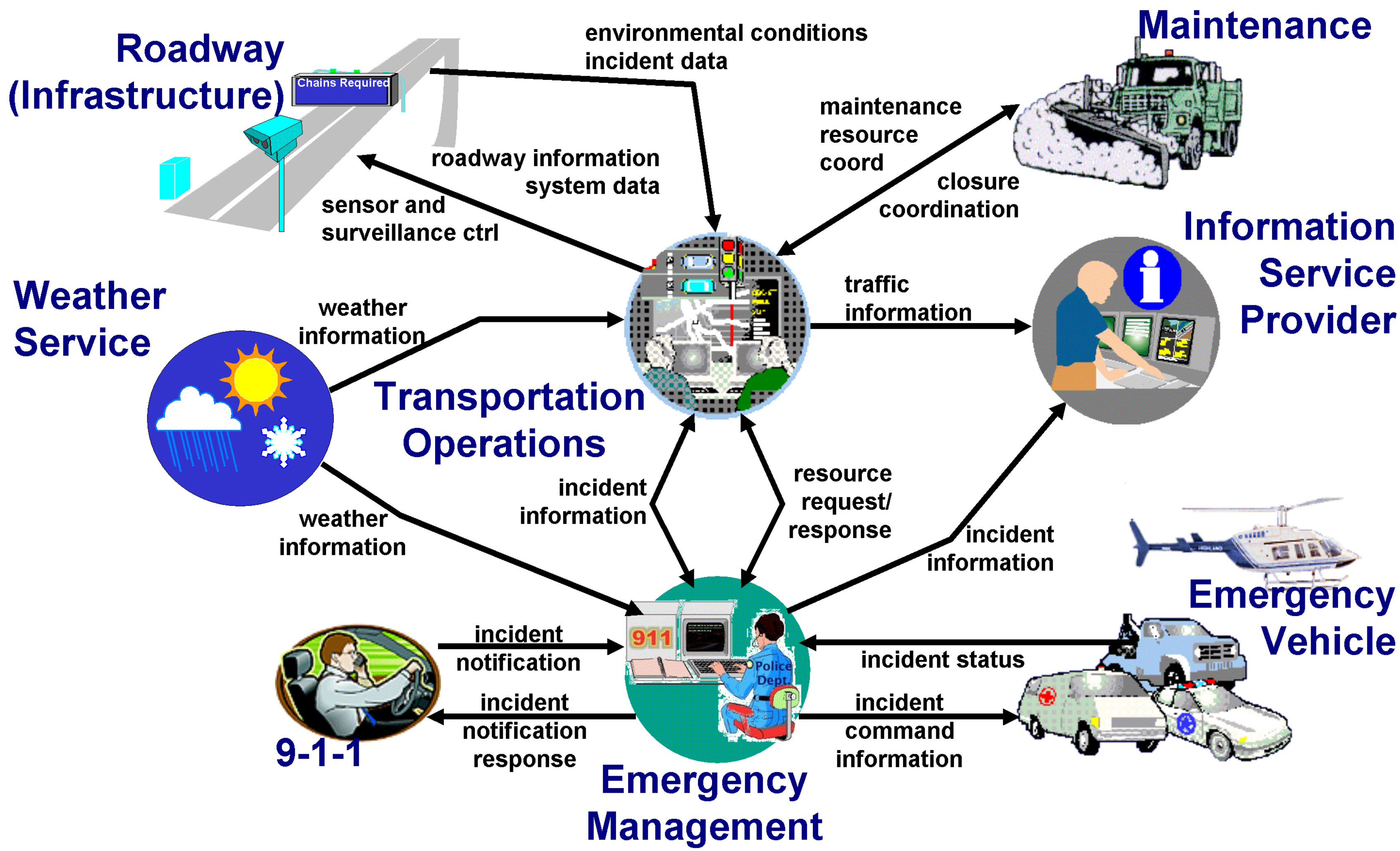



**Figure 5-2:** The COATS Vision – The Winter Scenario.

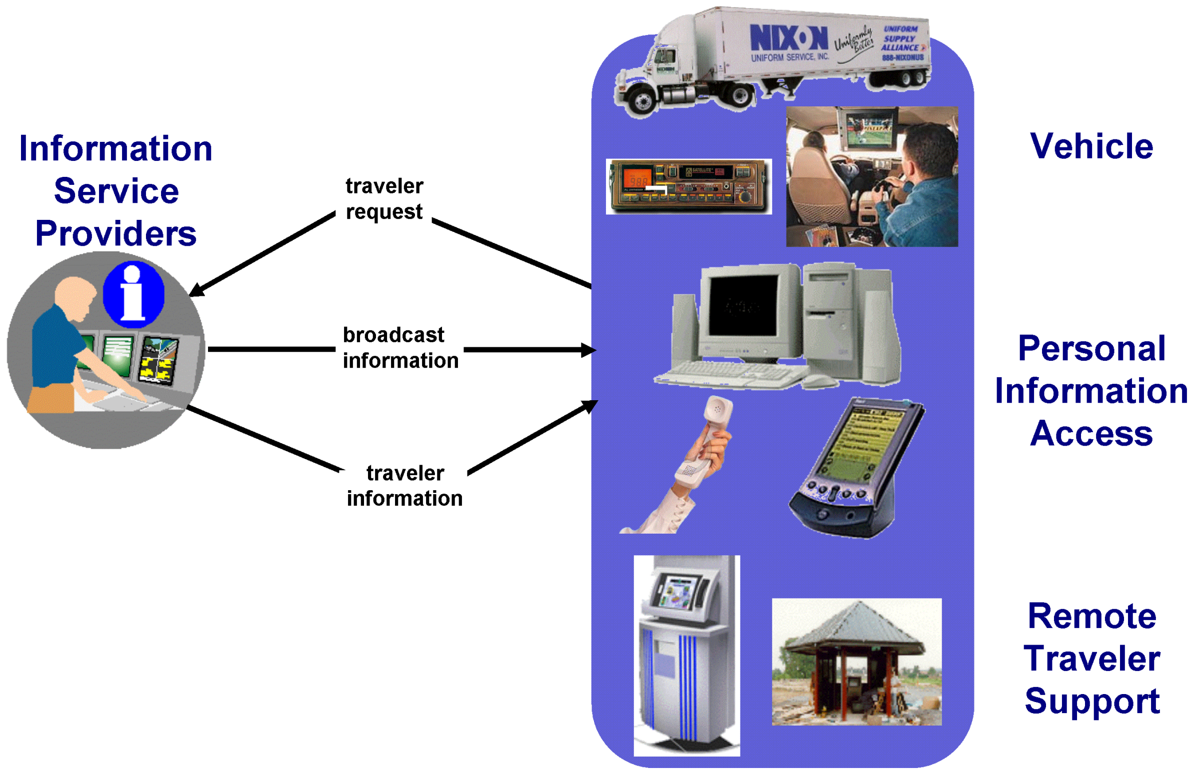



**Figure 5-3:** The COATS Vision – Keeping Travelers Informed.

*response units, verifying the use of available alternative routes, and providing travelers with accurate information about the duration of the road closure.*

*All this ran through her mind as she began to dispatch officers, fire trucks, ambulance and towing services to the scene. While dispatching, she remembered that now CHP, through the COATS project, had access to 1) a video display that showed closed circuit television camera images of the truck rollover, as well as other key highway interchanges, 2) an automatic vehicle location system for CHP, fire, and ambulance fleets that provided improved information about vehicle location, 3) common radio frequencies between local police and CHP, and finally 4) a regional incident management plan for the pre-planned alternative routes that could be used for diverting traffic around the scene.*

*At that moment, Patricia got a radio transmission for the towing service that the truck had been turned upright, and then from a CHP Sergeant that traffic upstream of the scene was light because traffic had been rerouted according to the previously agreed route by Caltrans, which was transmitted to motorists via the variable message signs and highway advisory radio. Patricia breathed a sigh of relief.*

### *5.2.3 Tourist*

*Chris and Jenny are traveling from San Francisco, where they are spending their five-year wedding anniversary. Chris had been planning this trip for some time and wanted to take Jenny* *to the California and Oregon coast, because of her love for the ocean and tourism village attractions. They had planned this trip meticulously, starting with a visit to their local travel agency and the San Francisco Chamber of Commerce, where they collected brochures on hotels, routes, and other information.*

*While at the Chamber of Commerce, Chris noticed a brochure for the COATS project that described a traveler information system for the area that they would be destined for. The brochure described how road, weather and tourism information would be available through a variety of sources, including a telephone hotline, a cable television channel, and kiosks at highway rest areas and businesses. The brochure had initially attracted his attention because it puzzled him that there should be a brochure on what looked like traffic control in a chamber of commerce. On further investigation, Chris noticed that it described much more than just traffic control, but how the systems could be useful to their trip, and where the services were available. It turned out the traveler information system provided much of the information they needed on routing and the range of services that would make their trip easier. Chris pointed this out to Jenny but she was engrossed in a magazine article about the Ashland Shakespeare Festival.*

*Chris and Jenny departed San Francisco out to explore the coastline. As they approached Eureka, Jenny noticed a variable message sign advising them of a major landslide between Eureka and Crescent City, and that they should listen to the Caltrans highway advisory radio channel for more information. Chris immediately tuned his car radio to the channel to find out that the road would be closed for eight to twelve hours. Immediately, they were disappointed, but decided to spend some time in Eureka seeing the sights. It was in Eureka that Chris remembered the COATS project brochure and the Traveler Information System. He immediately sought out the nearest COATS kiosk in Eureka to find out the status of slide. As Chris was walking back to Jenny with the bad news that the slide would close the highway for 12 to 24 hours now, he noticed that she was still reading the article about the Ashland Shakespeare Festival. Quickly thinking, Chris contacted the 1-800-tourism hotline that was listed in the COATS brochure and secured seats at the next days showing of "Taming of the Shrew." Chris was now ready to break the news to Jenny of the closure with a back-up plan. Upon hearing the news, she was overjoyed and they left Eureka with a new plan for their anniversary travels.*

### *5.2.4 County Transportation Planner*

*Maria was sitting in her office still thinking of last night's city council meeting. The discussion had focused on an upcoming festival that was going to attract 150,000 visitors to the nearby 20,000 resident community, and all the issues that were associated with it, such as transportation and facility impacts, coordination of services, and emergency preparedness. Maria felt like last year's event had just ended, when she was suddenly forced to answer the city council's difficult questions about how to manage this year's event.*

*As she began to think about the questions that needed to be addressed, Maria remembered that the COATS project coordinated the deployment of advanced technology systems that would collect much of the data needed to respond to the city council request. Moreover, a geographical information system had been developed with a database that contained archived data for maintenance, transit operations, traffic operations, and emergency management (see Figures 5-4 and 5-5).*

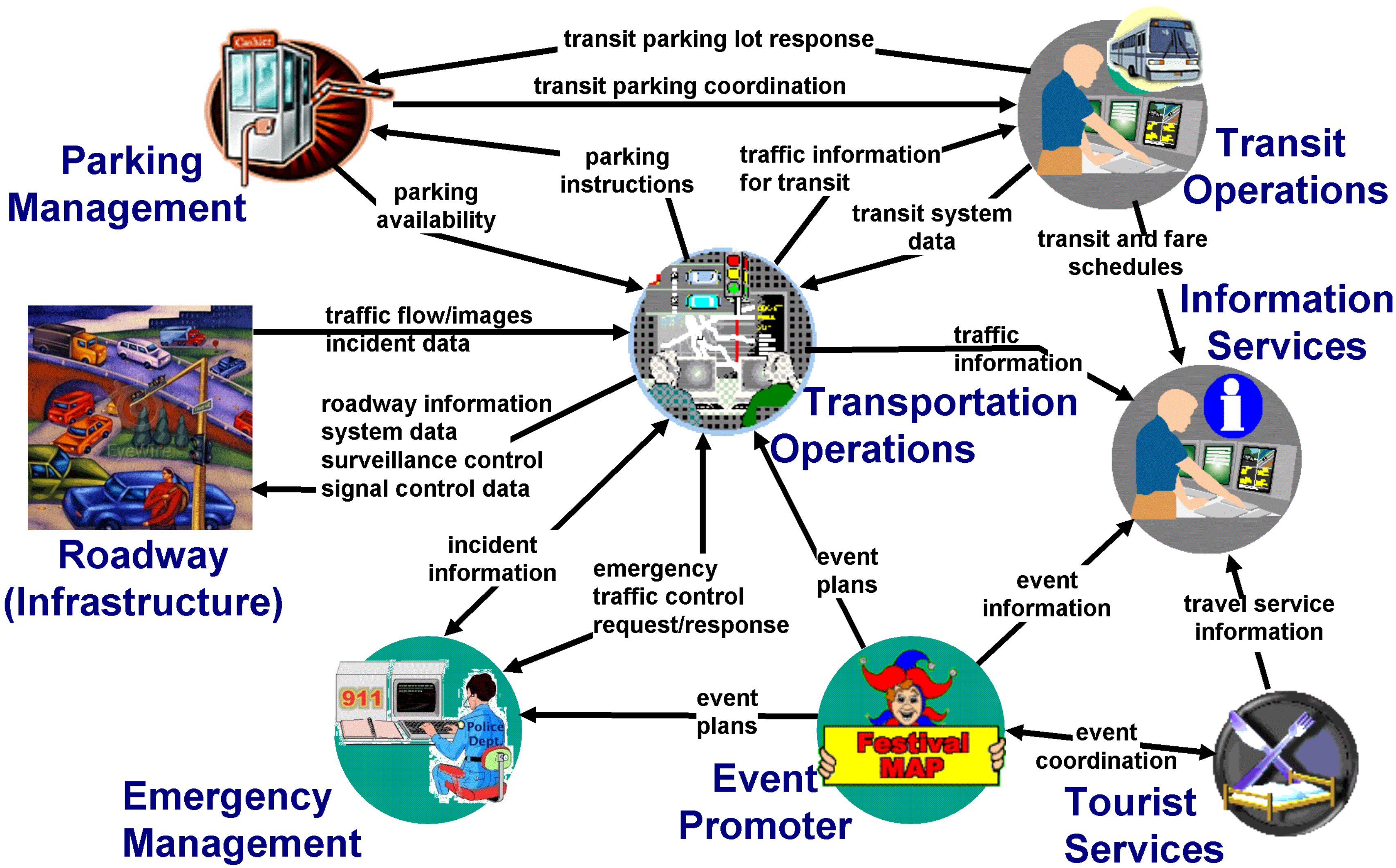



**Figure 5-4:** The COATS Vision – The Festival Scenario.

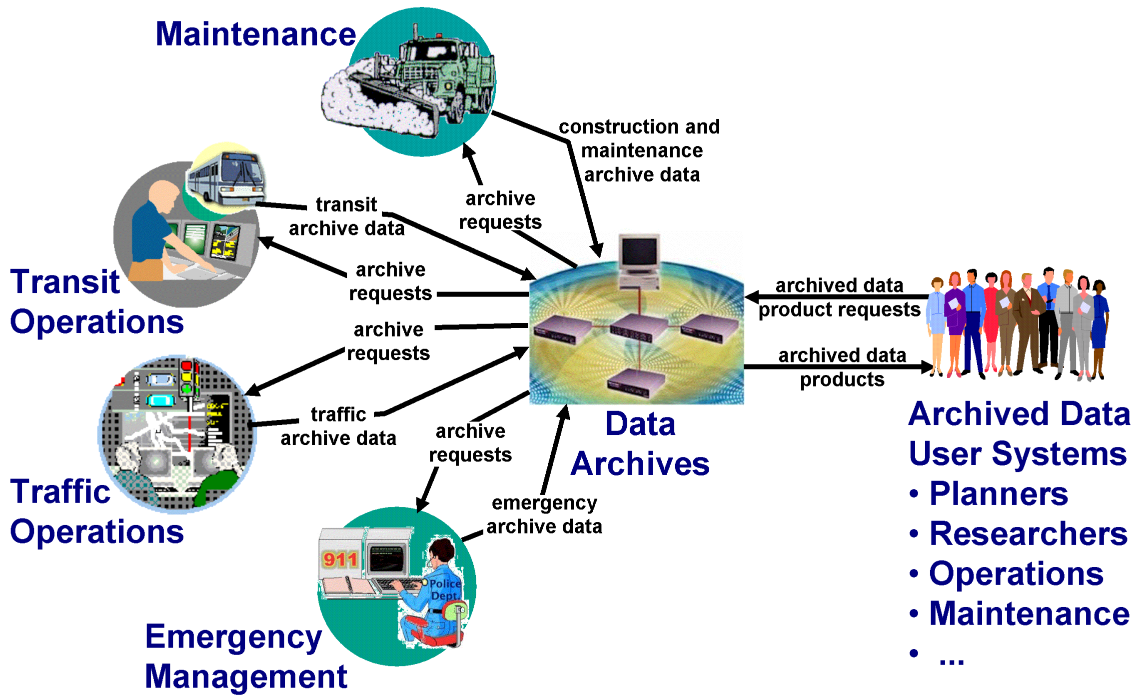



**Figure 5-5:** The COATS Vision – Collecting Operational Data.

*Maria called her Caltrans partner to access historic traffic volume data, which had been collected and archived by Caltrans on the routes it maintains. Through the COATS project and the partnerships developed through it, Maria was able to build a relationship of trust and work with her partner to compile the information needed to address city council issues.*

## 5.3 Mission

The purpose of a mission statement is to describe how stakeholders will achieve the COATS vision. The mission statement adopted by the Steering Committee is as follows:

> "The COATS Project serves to focus member agencies on a seamless, state-of-the art, multi-modal transportation network benefiting travelers, goods movement, economic activity, and transportation systems operators in California and Oregon. Collaboration between the COATS project and its partnership coalition provides information regarding the development of an effective ITS initiative that improves the rural transportation needs of the region. Information gained serves to promote increased safety, mobility, traveler comfort, environmental quality, and operational efficiency and productivity. Development of a fully functional and compatible ITS program supports long-term public/private partnerships, assists in the transfer of technology between public agencies and increases awareness of ITS technology among state and local officials, transportation professionals and transportation users."

**Table 5-2:** COATS Goals and Objectives.

**Goal #1. Improve the safety and security of the region's rural transportation system**

*Objectives:*

- *Provide sustainable traveler information systems that collect and disseminate credible, accurate "real-time" information.*
- *Provide systems that advise regional transportation system users of slow-moving vehicles, obstructions and road and weather conditions.*
- *Provide systems that advise unfamiliar motorists of alignment and speed conditions, tourist attractions, services, construction, weather, and the ability to request assistance.*
- *Coordinate public fleet responses to unsafe conditions (weather, incidents, detour routes) and provide for improved regional movement.*
- *Reduce the severity of vehicle accidents and their related fatality rates through improved notification and response times.*
- *Reduce exposure to unsafe driving situations through motorist aid devices.*
- *Provide improved methods for commercial vehicle monitoring, and hazardous material identification.*

**Goal # 2. Enhance personal mobility and accessibility to services and enhance convenience and comfort of motorists traveling in and through Northern California/Southern Oregon.**

*Objectives:*

- *Increase public awareness of public transportation alternatives to and within the states.*
- *Encourage and provide incentives for increased transit utilization.*
- *Expand information availability for tourist areas and services.*
- *Coordinate transit services to State or National Parks.*
- *Provide parking information to reduce internal State or National Park congestion.*

**Goal # 3. Increase operational efficiency and productivity focusing on system providers.**

*Objectives:*

- *Collect, process and share data between local, state, and federal agencies to increase efficiency and resources utilization.*
- *Provide automated notification of conditions that may impact operations and maintenance of regional roadways to improve resource management and allocation.*
- *Improve communication system capabilities to provide for increased coordination of services (i.e. radio, wire-line/wireless).*

**Goal # 4. Enhance economic productivity of individuals, businesses and organizations.**

*Objectives:*

- *Develop projects that address local needs and provide for national "showcase".*
- *Improve identification of goods, services, and opportunities in regional communities (e.g., en-route information, transportation service information, etc.)*
- *Provide mechanism by which tourism industry, transportation and transit services can work more closely together.*
- *Provide opportunity for commercial vehicles and goods to be moved more efficiently (i.e. pre-clearance systems).*

**Table 5-2:** COATS Goals and Objectives. (cont.)

**Goal # 5. Reduce energy consumption, environmental costs and negative impacts.**

*Objectives:*

- *Improve response time to hazardous material incidents.*
- *Promote and encourage the use of alternative fuels and the use of transit in the State and National Parks.*

**Goal # 6. Develop and foster long-term partnerships that will result in the demonstration of ITS initiatives and traditional solutions that address rural needs of the region.**

*Objectives:*

- *Establish formal and informal opportunities to inform public and private sector decision-makers on initiatives for the COATS project and gain support for ITS efforts from key stakeholders.*
- *Facilitate a technical and financial group for the promotion of partnership projects.*
- *Develop opportunities for public- private partnerships for operations and maintenance.*

**Goal # 7. Ensure compatibility with statewide and national ITS initiatives.**

*Objectives:*

- *Coordinate Northern California/Southern Oregon project with statewide efforts.*
- *Provide for technology transfer between state agencies.*

**Goal # 8. Incorporate ITS into the State Transportation Improvement Program planning and programming efforts.**

*Objectives:*

- *Provide for the incorporation of advanced technology applications to be considered in the Transportation Improvement Plan and Program processes.*

## 5.4 Goals and Objectives

Table 5-2 lists the goals and objectives that support the vision and mission for the COATS project. These were created subsequent to the completion of the various needs assessment efforts described earlier, and were adopted by the Steering Committee in April 1999.

## 5.5 Strategic Direction

This ITS Strategic Deployment Plan is a tool to guide agencies in programming and deploying ITS projects, and neither mandates nor limits what projects are programmed in an area or the overall deployment strategy of projects. The plan can help agencies to make the best use of transportation resources and technologies by providing a framework for the integrated application of ITS to meet the transportation challenges of the region. The ITS Strategic Deployment Plan seeks to improve the delivery of transportation services, and shows a connection between the transportation challenges at the local, and regional level. The plan seeks to reinforce the integration of ITS into the mainstream transportation planning process. The plan also recognizes that the basic communication infrastructure deployment is fundamental to the utility of any future ITS services. There are many challenges in the COATS region for deploying basic communication infrastructure, and new wireless systems may offer more cost-effective solutions in some cases.

The overall strategy for the COATS ITS Strategic Deployment Plan is embodied in the vision and related goals and objectives. The COATS ITS Strategic Deployment Plan sees technology as an enabler. ITS technologies must be applied in the correct locations at the correct time and in the correct way. The technology deployments must be targeted to specific identified needs and challenges. The overall strategies and technology applications for the COATS project are intended to accomplish the following:

- provide for operational efficiency and public safety through automated "smart" systems to maximize resources and reduce exposure;
- provide for systems to advise the unfamiliar traveler of unsafe driving conditions;
- provide for the development of a center(s) to coordinate sub-regional and bi-state activity;
- provide for improved response and regional coordination for events and services;
- enhance economic productivity of individuals, businesses and organizations;
- enhance personal mobility, accessibility, and increase public awareness of public transportation; and
- provide for a mechanism by which the tourism industry, transportation and transit services can work more closely together.

The overall strategic direction for the COATS project and the bi-state region includes strategies and a deployment path that addresses short-term (less than four years), medium-term (four to eight years) and long-term (eight to fifteen years) needs. Based on the issues identified through the course of the project, a deployment path that addresses traveler safety in the short-term, transportation management and public safety in the medium-term and an integrated traveler and transportation management system in the long-term appears most feasible to meet stakeholder, travelers, and institutional needs and opportunities. As shown in Figure 5-6, not all projects related to traveler safety will occur in the short-term, nor will all projects supporting transportation management and public safety occur in the medium-term. In each case, initial deployments will focus on those locations for which the potential benefit of ITS deployment is highest. Projects implemented during each time horizon will serve to improve the transportation system for the study region, resulting in enhanced quality of life and economic productivity.

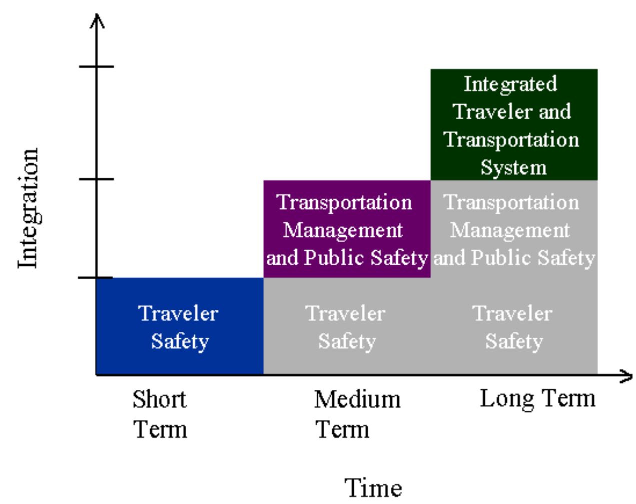



**Figure 5-6:** Implementation of ITS Priorities Over Time.

### *5.5.1 Short-Term – Traveler Safety*

Based on the Travelers Needs Survey (10), some of the primary challenges identified by travelers focused on safety, including narrow clearance, visibility, road/weather conditions and obstacles in the roadway. The survey also identified that travelers wanted the best route to destinations and the location of traveler services, and that travelers wanted more roadside information on such items as accidents or incidents, special events, road closures, construction zones and/or detours traffic delays. These challenges, along with the strategies or technology applications to address them, were also highly ranked by Steering Committee members and stakeholders at the outreach workshops. As such, the strategies to address traveler safety ("hot spots") and the management of those non-recurring events are the focus of short-term improvements. Once a foundation is in place to detect and monitor the transportation system and the safety of the traveling public, more robust strategies and systems may be implemented to improve the effectiveness of systems and the coordination of institutions and enhancements that impact economic productivity and personal mobility.

**Figure 5-7:** Example of Visibility Challenge on US Route 101.

**Figure 5-8:** Example of Animal Interactions on US Route 199.

In the short-term, the first strategy will be to address operational efficiency and public safety through automated "smart" systems to maximize resources and reduce exposure to adverse conditions and obstacles that may impede traveler safety. This strategy will be accomplished through

- monitoring road-weather conditions with road weather information systems, wind monitoring stations, automated flood warning systems, automated visibility systems, automated anti-icing systems and advanced vehicle detection; and
- monitoring the roadway rights-of-way or the roadway for potential animal-vehicle conflicts or detecting landslides.


**Figure 5-9:** Example of Highway Advisory Radio Signage.

The second short-term strategy will be to provide for systems to advise the unfamiliar traveler of unsafe driving conditions. This will be accomplished through advance warning systems that utilize variable message signs to warn travelers of speed/travel conditions; highway advisory radio; intersection warning systems; advanced warning systems for narrow lane widths; or bike/pedestrian hazard locations.

**Figure 5-10:** CCTV Camera.

The third strategy for the short-term will be to provide for the development of a center(s) to coordinate sub-regional and bi-state activity. This strategy will be accomplished through these methods.

- Monitoring traffic and roadway conditions through traffic sensors and closed-circuit television cameras to verify conditions.

- Implementing or better utilizing the centers in Redding and Eureka, California and in Bend and Medford, Oregon to serve as coordination focal points for regional "real-time" en route and pre-trip traveler information through variable message signs, highway advisory radio, Internet, and 1-800 travel advisory telephone systems. The Caltrans Advanced Rural Technology Integration Centers (ARTIC) and ODOT Transportation Operations Centers (TOC) would coordinate, communicate and cooperate with each other, nearby communities, local organizations, State agencies, and other regions (i.e. Central Coast, Portland, Nevada).


**Figure 5-11:** Example of Dynamic Warning Variable Message Signing on Interstate 5.

- Providing for the ability to control access to the roadway system through automated gate closures, which may enhance the safety and security for travelers and increase DOT and police resource effectiveness.

### *5.5.2 Medium-term – Transportation Management and Public Safety*

Once an ITS foundation is in place to strengthen and support highway operations, emergency management and traveler safety and security, more robust strategies and solutions may be implemented from which coordination, fleet management, public transportation, and tourism can be leveraged.

The medium-term strategy is to augment the short-term strategies with the technology applications from which to provide for improved response and regional coordination for events and services. This strategy will be accomplished through regional incident management plans, which include a set of predefined actions, roles, and responsibilities.  To compliment these plans, common public fleet management and dispatch systems (automatic vehicle location) would be purchased and installed. These would improve the ability to locate emergency situations via a rural coordination addressing system, detect delays through probe vehicles and assist to coordinate with local organization and statewide centers. Motorist-aide call boxes, used in conjunction with vehicle-based mayday systems, may provide responders with quicker notification of roadway incidents. Improved management of information regarding hazardous materials shipments may expedite response and clean-up to these incidents, lessening potential transportation and environmental impacts.

**Figure 5-12:** Example of Incident Challenges in COATS Study Area.

### *5.5.3 Long-term – Integrated Traveler and Transportation Management System*

Once strategies and deployment to improve traveler safety and to improve coordination and information exchange between organizations have been implemented, then ITS strategies and deployment may focus on further enhancing the economic productivity of individuals, businesses and organizations. This will be accomplished by increasing access to traveler and tourism information and services through such deployment as:

**Figure 5-13:** Example of Smart Card.

- kiosks in rest areas, businesses or other high volume patronage locations;
- a travel advisory telephone system that includes tourism services and transportation information;
- advisory television channels to promote tourism and provide safety information; and
- the selected implementation of a smart card system.


**Figure 5-14:** Example of Kiosks.

The smart card system would be an "open" system to allow a variety of services, as opposed to a "closed" system where one smart card is used by only one vendor. The smart card would be managed by a financial institution and supported by the tourism, transit, and transportation communities. The read-write capable smart card would be a frequent-use card targeted at a specific region or community and allow for negotiated discounts with participating merchants, and transit properties.

**Figure 5-15:** Example of Weigh-in-Motion.

A traveler profile and identification may be contained on the card. Users may be asked to voluntarily reveal travel patterns including origins and destinations in exchange for other benefits. The traveler profile and travel pattern data will be analyzed for use in improving traveler and tourism services, and also for developing economic indicators for use in development of economic growth-oriented development strategies. Inverted pricing strategies assist in encouraging desirable travel behavior, such as off-peak arrival and transit use. The idea behind such strategies is to reward travelers for desirable travel behavior instead of imposing restrictions and penalties for undesirable travel behavior.

Also, to increase the efficient movement of goods and services begin to expand the installation of commercial vehicle pre-clearance systems and weigh-in-motion systems to collect better information.

**Figure 5-16:** Example of Paratransit Vehicle.

In addition to these strategies, the ability to enhance personal mobility, accessibility, and increase public awareness of public transportation can now receive the attention it deserves in specific counties and the region. This strategy will be achieved through monitoring on-time performance and tracking vehicle fleets via transit vehicle routing/scheduling systems and software, providing more accurate real-time information to managers and patrons through automatic passenger counters and transit traveler information systems. Some of these systems may be used to improve coordination of transit and mobility across county or state lines, to allow travelers to better plan coordinated trips via transit.

Second, to enhance personal mobility and accessibility in areas that are characterized by long-distance commuting, high elderly populations or major special events, technologies will be deployed to improve transit alternatives, such as dynamic ridesharing and paratransit services, implementing recreational vehicle park and ride lots with shuttle services for highly visited communities hosting major special events (e.g. Shakespeare Festival). Also, as highlighted previously, smart card systems are recommended for implementation to track transit accounts and patron usage.

The final recommendation for strategies and deployment is to provide for a mechanism by which the tourism industry, transportation and transit services can work more closely together. This can be accomplished by assisting in the development of long-term partnerships and information sharing through deployment of Internet-based information systems, traveler information systems and forming partnerships with the private sector for in-vehicle systems.

In summary the COATS Strategic Deployment Plan evolutionary path can be summarized in Table 5-3.

**Table 5-3:** Strategic Deployment Path.

| Phase and Focus | Strategy | Deployment |
|---|---|---|
| **Short-term**<br><br>*Traveler Safety* | • Provide for operational efficiency and public safety through automated "smart" systems to maximize resource efficiency and reduce exposure<br>• Provide for systems to advise the unfamiliar traveler of unsafe driving conditions<br>• Provide for the development of a Center(s) to coordinate sub-regional and bi-state activity | Road weather information system, wind monitoring system, flood warning system, automated visibility, automated anti-icing, animal-vehicle collision avoidance, landslide detection/ notification<br><br>Variable message signs, highway advisory radio, intersection collision avoidance, advanced narrow lane width warning systems; bike/pedestrian warning systems<br><br>Traffic sensors, closed circuit television cameras, command and control centers, automated gate closure systems |
| **Medium-term**<br><br>*Transportation Management and Public Safety* | • Provide for improved response and regional coordination for events and services | Regional incident management plans, public fleet management and dispatch systems (AVL), rural coordinate addressing systems, probe vehicles, motorist-aide call boxes, mayday systems, hazardous materials management |
| **Long-term**<br><br>*Integrated Traveler Transportation Management System* | • Enhance economic productivity of individuals, businesses and organizations<br>• Enhance personal mobility, accessibility, and increase public awareness of public transportation<br>• Provide for a mechanism by which the tourism industry, transportation and transit services can work more closely together. | Kiosks, 800 telephone systems, advisory television channel, smart cards, weigh-in-motion, pre-clearance systems<br><br>Transit vehicle routing and scheduling software, automatic passenger counters, transit traveler information, dynamic ridesharing/ paratransit services, recreational vehicle park and ride lots with security systems, smart card<br><br>Internet, traveler information, in-vehicle systems |

# 6 SYSTEM ARCHITECTURE

At the core of the COATS vision is the idea that the transportation system across the bi-state region should be seamless from the perspective of the traveler, and integrated from the perspective of the system operator. In the planning process, it is important to have a framework or architecture in place that describes how deployed intelligent transportation systems will be integrated.

This chapter highlights the process and results of the architecture development process used in the COATS Strategic Deployment Plan. After reviewing the benefits of having an ITS architecture, several key elements of the COATS architecture will be highlighted. The reader is referred to the COATS Architecture Report for additional detail, especially additional background on the National ITS Architecture and the unique information flow diagrams prepared for the COATS project (13).

## 6.1 Background on National ITS Architecture

An ITS architecture provides a conceptual framework for the design and operation of intelligent transportation systems. It is neither a system design nor a design concept; rather, it defines the framework around which multiple design approaches can be developed, each one specifically tailored to meet the needs of individual stakeholders, while maintaining the benefits of a common architecture. The architecture defines:

- the functions, such as gathering traffic information, that must be performed to implement a given user service;
- the physical entities or subsystems where these functions reside, such as the roadside or the vehicle;
- the interfaces/information flows between the physical subsystems; and
- the communication requirements for the information flows (e.g., wireline or wireless).

In addition, the architecture identifies and specifies the requirements for the standards needed to support national and regional interoperability, as well as product standards needed to support economy of scale considerations in deployment.

The National ITS Architecture, a systems architecture developed by a combined Lockheed Martin and Rockwell International team (representing the public sector, private sector, and academia) for the U.S. Department of Transportation, is the standard for describing the interrelationship of organizations and systems under specific ITS projects. The architecture may be considered from three primary views:

- the logical architecture, which presents a functional view of ITS;
- the physical architecture, which partitions the functions reflected within the logical architecture into systems and subsystems where functions are actually performed; and
- communications, which connect the various systems.

The following sections will describe each of these components in more detail.

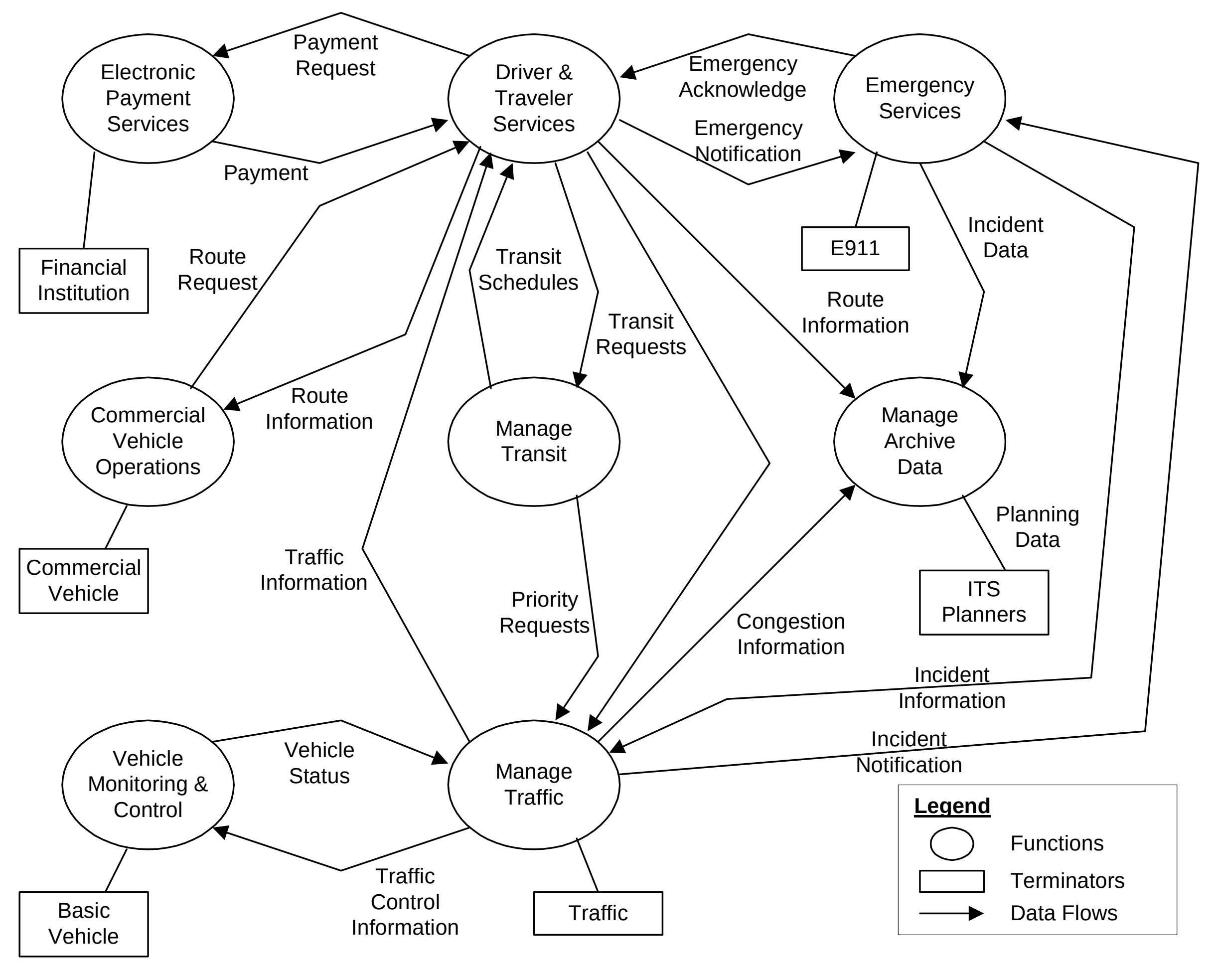



**Figure 6-1:** Top-Level Data Flow Diagram.

### *6.1.1 Model of ITS Functions (Logical Architecture)*

One critical element in the successful deployment of ITS is to explicitly consider what the ITS technologies are supposed to accomplish. In the architecture, this is primarily reflected in the logical architecture.

The logical architecture serves to present a functional view of the ITS user services, which in turn represent what ITS should accomplish from a user's perspective. The National ITS Architecture defines the logical architecture as being divorced from likely implementations and physical interface requirements. By doing this, the architecture is open and flexible enough to handle most legacy systems, and does not inordinately constrain the market into certain technologies. At a more detailed level, the logical architecture defines the functions or process specifications that are required to perform ITS user services, and the information or data flows that need to be exchanged between these functions.

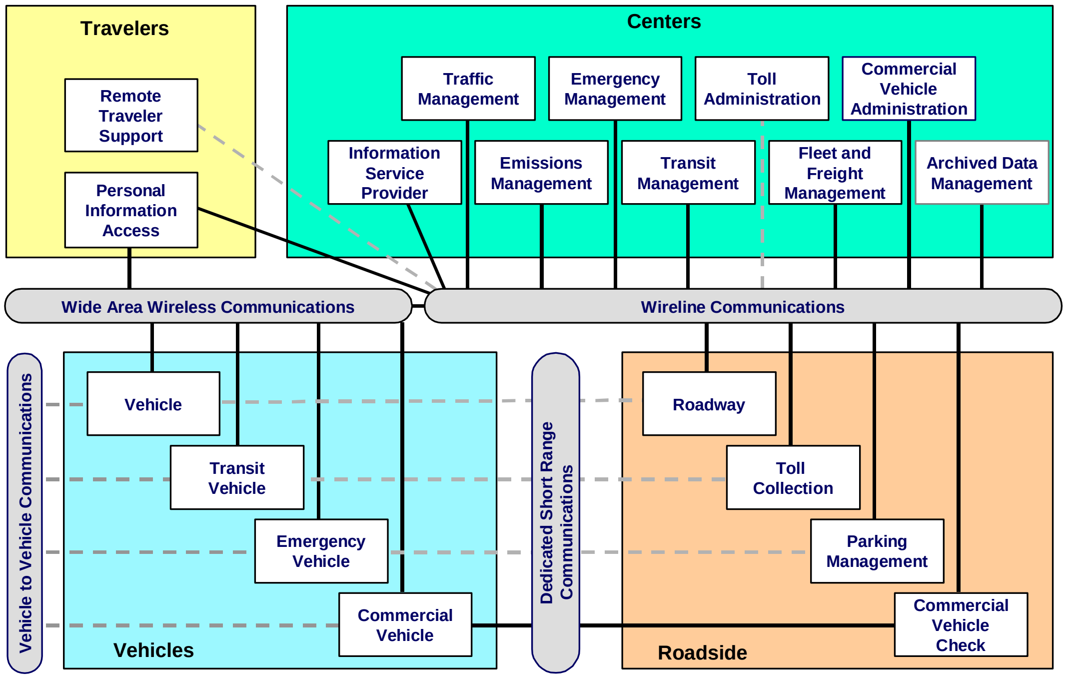



**Figure 6-2:** High-Level Diagram of Physical Architecture.

Figure 6-1 shows a simplified top-level data flow diagram. The circles represent functions, which may be decomposed into lower levels of detail, and rectangles represent terminators, which are defined in the following section. The lines between functions, and between functions and entities external to the architecture, represent data flows, with arrows indicating the direction of data flow. The data flows may also be decomposed. The lowest level of detail of functions and data flows may be used to define detailed functional requirements for new ITS deployments, which is critical to any ITS planning effort.

### *6.1.2 Model of ITS Physical Entities (Physical Architecture)*

The logical architecture is useful in developing functional specifications, but it does not provide any information about where functions are to be performed. Therefore, the National ITS Architecture defines a physical architecture, which distributes the functions defined by the logical architecture into systems and subsystems, based on the similarity of functions and the location where functions are to be performed.

A high-level diagram of the physical architecture, commonly referred to as a “sausage diagram,” is shown in Figure 6-2. The physical architecture defines four types of systems:

- *center* subsystems, which deal with those functions normally assigned to public/private administrative, management, or planning agencies;
- *roadside* subsystems, which involve the deployment of sensors, signals, programmable signs, or other interfaces with travelers and vehicles that must be positioned in a roadside location;

- *vehicle* subsystems, which are installed in a vehicle; and
- *traveler* subsystems, which provide interfaces to travelers.

These four types of systems are partitioned into nineteen subsystems. The specific choice of nineteen subsystems represents a lower level of partitioning of functions that is intended to capture all anticipated subsystem boundaries for the present, and twenty years into the future.

### *6.1.3 Communications*

The National ITS Architecture also provides the framework that ties the transportation and telecommunication worlds together to enable the development and effective implementation of the broad range of ITS user services. There are multiple communications options available to the system designer. The flexibility in choosing between various options allows each implementer the ability to select the specific technology that meets local, regional, or national needs. The architecture identifies and assesses the capabilities of candidate communications technologies, but it does not select or recommend "winning" systems and technologies.

## 6.2 Regional Architecture

The National ITS Architecture is designed to be implemented at a sub-national level – state, regional or local. The remainder of this chapter will describe how the National ITS Architecture was used in developing a regional architecture for the COATS study area. The benefits of a regional architecture that demonstrates conformance with the National ITS Architecture include the following.

- Section 5206(e) of the Transportation Equity Act for the 21st Century (TEA 21) requires that ITS projects using funds from the Highway Trust Fund conform to the National ITS Architecture and standards. Therefore, a regional architecture that can demonstrate conformance may have greater ability to leverage Federal funding for future ITS deployment. The Rural COATS Architecture helps fulfill the Federal Highway Administration's requirement and the Federal Transit Administration's rule effective April 8, 2001 that ITS projects funded through the Highway Trust Fund to conform to the National ITS Architecture and applicable standards.[3]

- A regional architecture facilitates regional integration. It helps agencies and other stakeholders to identify and plan for the many integration and information sharing opportunities which ITS offers.

[3] The COATS Regional Architecture Report was approved by the COATS Steering Committee in December 2000. This architecture met or exceeded the interim policy guidance for architecture conformance from US DOT that was in effect at that time. Since then, a final rule has been issued on architecture conformance, effective April 8, 2001. Based on this new rule, additional effort will be needed beyond this regional architecture to fully demonstrate conformance on individual future projects. Future efforts include an operational concept and agreements necessary to support operations, including interoperability and standards; system functional requirements; and the sequence of projects required for implementation. These will need to be in place by 2005.

- A regional architecture that conforms with the National ITS Architecture (including appropriate ITS standards) enables other ITS systems, that will be developed for use throughout the U.S., to operate with systems in the COATS region.

- Transportation improvements in the region are typically made incrementally as funding becomes available for various project components. A regional architecture provides guidance for how these projects should fit together, improving interoperability between the projects, making efficient use of scarce resources, and facilitating future ITS expansion in the region.

These benefits will only be realized if the regional architecture is used in planning projects for the region and adapted as requirements change in the future. Therefore, developing a regional architecture for the COATS study area is critical to the project's long-term success.

## 6.3 Architecture Methodology

The activities that contributed to the development of the COATS Regional Architecture are shown in Figure 6-3. The three main activities have included identification of the stakeholders and systems, definition of regional needs and challenges, and crafting a regional architecture.

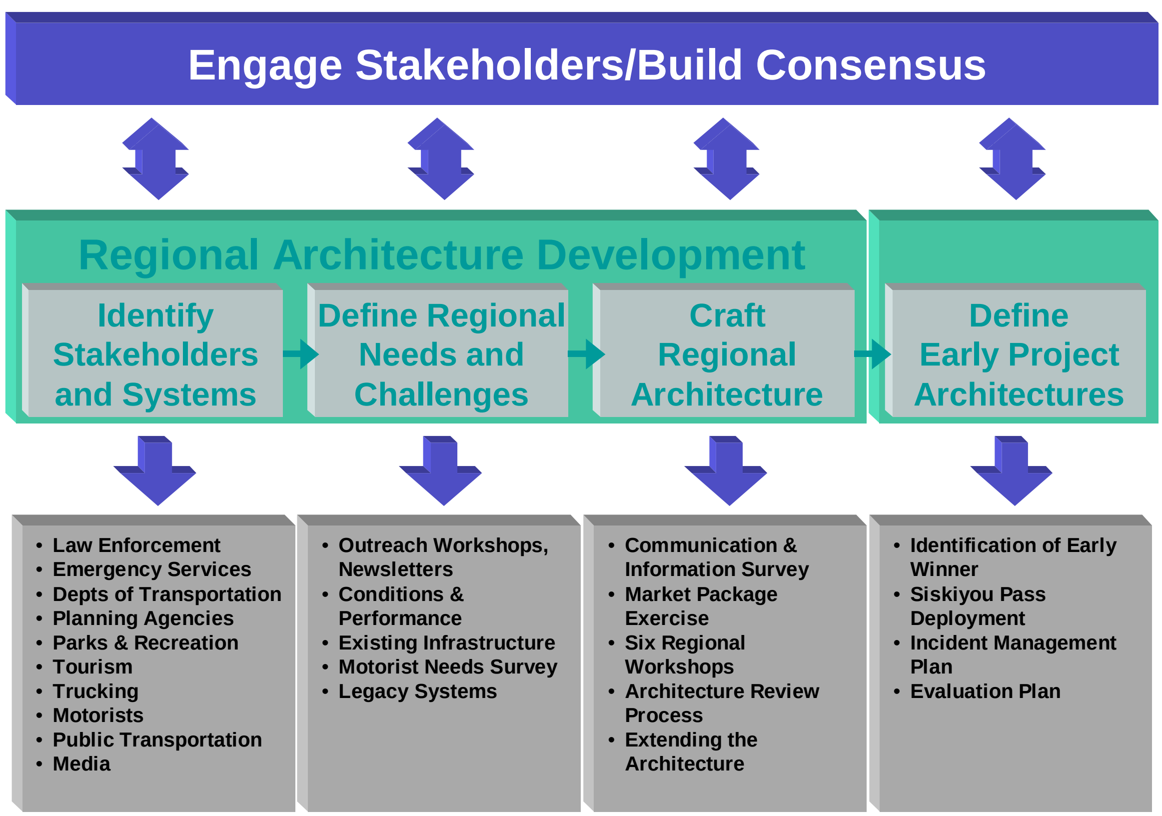



**Figure 6-3:** Methodology for Developing the COATS Regional Architecture.

### *6.3.1 Identification of Systems and Stakeholders in the COATS Region*

Since the regional architecture is so dependent on the inventory of what exists and what is planned for the region, the definition of a regional architecture begins with an inventory of the existing and future systems that will be deployed. These systems together provide the advanced transportation services that will be offered in the COATS region. These systems, and the stakeholders who are responsible for their operation and maintenance, are the heart of the regional architecture.

The stakeholder base in the COATS region is much broader than in many other ITS architectures, and this is a reflection of the character of the COATS project and region. Consequently, identification of stakeholders and systems has been an ongoing process throughout the COATS project. The first significant stakeholder outreach was a series of workshops held at the beginning of the COATS project, described in Chapter 3. The purpose of these workshops was to familiarize stakeholders with ITS and the COATS Project, as well as to validate needs and challenges in the COATS region. Subsequent outreach efforts, such as other Steering Committee meetings and architecture workshops, have sought to expand the circle of identified stakeholders and systems in the COATS region.

The existing and future systems in the region were identified along with the public agencies and private interests that are responsible for each system's operation and maintenance. These identified systems and stakeholders – 168 in total – were mapped to the National ITS Architecture, as indicated in Appendix B. In many cases, an inventory element serves as a placeholder representing numerous actual entities (such as local law enforcement agencies). This level of abstraction allows the regional architecture to be more easily maintained and understood. It also highlights the common interfaces and requirements that are shared by stakeholders in the region.

### *6.3.2 Define Regional Needs and Challenges*

The Legacy Systems Report, the Conditions and Performance Report, the Traveler Needs Survey, and the Project Infrastructure Report were used to gain an understanding about the transportation challenges in the COATS study area, as well as the outreach workshops. As the first four documents are discussed elsewhere in the report[4], this section will focus on the outreach workshops.

Through the outreach workshop sessions, stakeholders provided information for Caltrans, ODOT and WTI that was helpful in validating regional transportation needs. WTI analyzed this information in order to develop rural ITS early winner project candidates, which are described in more detail in Chapter 7. The stakeholders were divided into groups based on their area of interest. The groups that were formed focused on Safety and Emergency Services, Travel and Tourism, Operations and Maintenance, or Commercial Vehicle Operations. The groups were asked to list the challenges that they perceived existed in their area. Based upon these challenges, the stakeholders were asked to list the opportunities that they felt existed to remedy the various problems.

[4] The first three of these documents were summarized in Chapter 4; the Project Infrastructure report will be discussed in detail in Chapter 7.

### *6.3.3 Crafting the Architecture*

Crafting the regional architecture involved three major activities: the Market Package Exercise, the Communication and Information Survey, and the six regional architecture workshops. These activities were conducted after the identification of stakeholders and systems and the definition of regional needs and challenges.

COATS Market Packages. The National ITS Architecture defines 65 market packages that represent a range of potential ITS implementations that address specific transportation challenges. "Broadcast Traveler Information," "Road Weather Information Systems," and "Transit Vehicle Tracking" are examples of the market packages that have been defined. The market packages combine this service-oriented view of ITS with a detailed identification of the pieces of the National ITS Architecture that are required to implement these services. For instance, the "Broadcast Traveler Information" market package identifies the pieces of the architecture that collect traveler information and broadcast this information, and the devices used by the travelers to receive these broadcasts. This combination of service-oriented and architecture-oriented views makes the market packages a useful entry point to the National ITS Architecture definition. They provide an accessible, service-oriented view of the potential for ITS that can be used to build consensus on what needs to be done in a region. This service-oriented view is easily converted into a more technical architecture view because of the connectivity between market packages and architecture definition. The market packages are used in this chapter as a convenient way to define the transportation services that the COATS Regional Architecture will provide.

Members of the Steering Committee reviewed the market packages identified in the National ITS Architecture and selected a set of priority market packages that best address the COATS regional challenges. Table 6-1 lists all of the market packages, indicating which packages were prioritized by Steering Committee members. The data compiled in the table are from COATS Steering Committee members, where "O" refers to Oregon respondents, "C" refers to California respondents, and "O/C" refers to respondents from both Oregon and California. As can be seen, there was substantial agreement between the two states' respondents.

Responses to this Market Package Exercise were tabulated in order to develop a priority listing of the market packages, as shown in Table 6-2. Higher rankings indicate that a market package has greater applicability for the COATS region than other market packages. Steering Committee members from both Oregon and California were in agreement on the priority ranking of the market packages.

In order to ensure that ITS recommendations correlate with the transportation needs and challenges identified for the corridor, a comparison was made of priority needs based on the feedback given from various methods of data collection. The methods included the Traveler Needs Survey, the Market Package Exercise, the Project Infrastructure Report, as well as the stakeholder workshops.

The result of this comparison is summarized in Table 6-3. The table consists of the ITS opportunities that surfaced from the various exercises conducted. The opportunities were

**Table 6-1:** Market Package Responses.

| National ITS Architecture Designation | COATS Regional Stakeholder Groups<br><br>O = Oregon Stakeholder Respondents<br>C = California Stakeholder Respondents<br>O/C = Both Oregon and California Stakeholder Respondents | Law Enforcement and Emergency Services | Transportation Agencies | Planning Agencies | Tourism | Trucking | Public Transportation |
|---|---|---|---|---|---|---|---|
| APTS1 | Transit Vehicle Tracking | | O/C | | | | C |
| APTS2 | Transit Fixed-Route Operations | | C | | | | C |
| APTS3 | Demand Response Transit Operations | | O | | | | O/C |
| APTS4 | Transit Passenger and Fare Management | | C | | | | |
| APTS5 | Transit Security | | O | | | | C |
| APTS6 | Transit Maintenance | | O | | | | O/C |
| APTS7 | Multi-modal Coordination | | | | | | C |
| APTS8 | Transit Traveler Information | | C | | | | C |
| ATIS1 | Broadcast Traveler Information | C | O/C | O/C | O/C | C | O |
| ATIS2 | Interactive Traveler Information | C | O/C | | O/C | | O/C |
| ATIS3 | Autonomous Route Guidance | | C | | | | C |
| ATIS4 | Dynamic Route Guidance | O | | | | | |
| ATIS5 | ISP Based Route Guidance | | | | | | |
| ATIS6 | Integrated Transportation Management/Route Guidance | C | | | | | C |
| ATIS7 | Yellow Pages and Reservation | | C | | O/C | | |
| ATIS8 | Dynamic Ridesharing | O | O/C | | O/C | | O/C |
| ATIS9 | In Vehicle Signing | | O | | | | C |
| ATMS1 | Network Surveillance | | O/C | | | | C |
| ATMS2 | Probe Surveillance | | O/C | O/C | | C | |
| ATMS3 | Surface Street Control | | O | | | | |
| ATMS4 | Freeway Control | | O | | | | |
| ATMS5 | HOV Lane Management | | | | | | |
| ATMS6 | Traffic Information Dissemination | | O/C | O/C | O/C | C | C |
| ATMS7 | Regional Traffic Control | | O/C | O/C | | | |
| ATMS8 | Incident Management System | O | O/C | O/C | O/C | | |
| ATMS9 | Traffic Prediction and Demand Management | | | | | | |
| ATMS10 | Electronic Toll Collection | | | | | | |
| ATMS11 | Emissions Monitoring and Management | | | | | | |
| ATMS12 | Virtual TMC and Smart Probe Data | | O/C | | | | |
| ATMS13 | Standard Railroad Grade Crossing | | C | | | | |
| ATMS14 | Advanced Railroad Grade Crossing | | | | | | |
| ATMS15 | Railroad Operations Coordination | | | | | | |
| ATMS16 | Parking Facility Management | | C | | | | |
| ATMS17 | Reversible Lane Management | | | | | | |
| ATMS18 | Road Weather Information System | O/C | O/C | O | O | C | O/C |
| AVSS1 | Vehicle Safety Monitoring | O | | | | | |
| AVSS2 | Driver Safety Monitoring | O | | | | | |
| AVSS3 | Longitudinal Safety Warning | O | | | | | C |
| AVSS4 | Lateral Safety Warning | O | | | | | C |
| AVSS5 | Intersection Safety Warning | O/C | O | | | | |

**Table 6-1:** Market Package Responses (cont.).

| National ITS Architecture Designation | COATS Regional Stakeholder Groups<br><br>O = Oregon Stakeholder Respondents<br>C = California Stakeholder Respondents<br>O/C = Both Oregon and California Stakeholder Respondents | Law Enforcement and Emergency Services | Transportation Agencies | Planning Agencies | Tourism | Trucking | Public Transportation |
|---|---|---|---|---|---|---|---|
| AVSS6 | Pre-Crash Restraint Deployment | | | | | | |
| AVSS7 | Driver Visibility Improvement | O | | | | | C |
| AVSS8 | Advanced Vehicle Longitudinal Control | O | | | | | |
| AVSS9 | Advanced Vehicle Lateral Control | | | | | | |
| AVSS10 | Intersection Collision Avoidance | | O | | | | |
| AVSS11 | Automated Highway System | | | | | | |
| CVO1 | Fleet Administration | | C | | | | C |
| CVO2 | Freight Administration | | O/C | | | | |
| CVO3 | Electronic Clearance | O | O/C | O/C | | O/C | O |
| CVO4 | CV Administrative Processes | O | O/C | | | | |
| CVO5 | International Border Electronic Clearance | | | | | | |
| CVO6 | Weigh-In-Motion | O | O/C | O/C | | O/C | |
| CVO7 | Roadside CVO Safety | O | O/C | | | | |
| CVO8 | On-board CVO Safety | O | | | | | |
| CVO9 | CVO Fleet Maintenance | O | C | | | | C |
| CVO10 | HAZMAT Management | O | O/C | | | | |
| EM1 | Emergency Response | O/C | O/C | | | | C |
| EM2 | Emergency Routing | O | O/C | | | C | C |
| EM3 | Mayday Support | O/C | O/C | O/C | | | C |
| ITS1 | ITS Planning | | O/C | | | | |
| ARTS1 | Animal/Vehicle Collision Countermeasures | O/C | C | | | | |
| ARTS2 | Emergency Vehicle Maintenance | | | | | | |
| ARTS3 | Dynamic Warning Systems | O/C | O/C | | | | C |
| ARTS4 | Safe Speed Advisory | O | O/C | | O/C | | |
| ARTS5 | Mobile Traffic Management/Enforcement | O | O/C | | | | C |

**Table 6-2:** Priority Listing of COATS Market Packages.

| NSA Nos. | | NSA Market Package Title | Priority | NSA Nos. | | NSA Market Package Title | Priority |
|---|---|---|---|---|---|---|---|
| 35 | atms18 | Road Weather Information Systems | 16 | 61 | arts1 | Anim./Veh. Crash Countermeasures | 8 |
| 9 | atis1 | Broadcast Traveler Information | 15 | 63 | arts3 | Dynamic Warning Systems | 8 |
| 23 | atms06 | Traffic Information Dissemination | 13 | 18 | atms01 | Network Surveillance | 7 |
| 25 | atms08 | Incident Management System | 10 | 19 | atms02 | Probe Surveillance | 7 |
| 59 | em3 | Mayday Support | 10 | 1 | apts1 | Transit Vehicle Tracking | 7 |
| 64 | arts4 | Safe Speed Advisory | 10 | 65 | arts5 | Mobile Traffic Mgmt/Enforcement | 7 |
| 10 | atis2 | Interactive Traveler Information | 9 | 29 | atms12 | Virtual TMC and Smart Probe Data | 6 |
| 49 | cvo03 | Electronic Clearance | 9 | 56 | cvo10 | HAZMAT Management | 5 |
| 57 | em1 | Emergency Response | 9 | 58 | em2 | Emergency Routing | 5 |
| 52 | cvo06 | Weigh-In-Motion | 8 | 60 | its1 | ITS Planning | 5 |

Legend: NSA Nos. = National System Architecture Market Package Identification Numbers. Higher priority numbers indicate higher priority.

**Table 6-3:** Comparison of ITS Technology Rankings.

| | Traveler Needs Survey | Market Package Exercise | Stakeholder Outreach | Steering Committee |
|---|---|---|---|---|
| 1-800 Travel Advisory Telephone | 5 | | 2 | 10 |
| 1-800 Reporting Telephone | 2 | | 2 | |
| Call Boxes | | | 2 | 11 |
| Cellular Phone Coverage | 6 | | | |
| Variable Message Signs | 4 | | 1 | 9 |
| Automated Flood Warning | | | | 6 |
| Dynamic Warning VMS | 1 | 6 | | 7 |
| Automated Visibility Warning | | | | 12 |
| Safe Speed Advisory | | 4 | | |
| Animal Vehicle Collision Warning | | 6 | | |
| In-Vehicle Device for Low Visibility | 7 | | | |
| In-Vehicle Device for Accident Avoidance | 8 | | | |
| In-Vehicle Control | | | 2 | |
| In-Vehicle Mayday Device | | | 2 | |
| In-Vehicle Traveler information | 12 | | | |
| Incident Management System | | 5 | | 1 |
| Emergency Response | | 5 | | |
| HAZMAT On Board Mayday | | | 1 | |
| Mayday Support | | 4 | | |
| Road Weather Information System | | 1 | 1 | 2 |
| Broadcast Traveler Information | | 2 | | |
| Highway Advisory Radio | 3 | | 1 | 3 |
| Tourist Radio Channel | 9 | | | |
| Advisory Television | | | 2 | 8 |
| Closed Circuit Television | | | 2 | 4 |
| Traffic Information | | 3 | 2 | |
| Interactive Traveler Information | | 5 | | |
| Kiosks | 10 | | 1 | 5 |
| Locally Televised Traveler Information | 11 | | | |
| Smart Cards - Tourist Behavior | | | 2 | |
| Regional Internet Server / Web Site | | | 1 | |
| Education | | | 1 | |
| Electronic Clearance | | 6 | | |
| Automated Enforcement - Cameras | | | 2 | |
| Weigh-in-Motion | | 7 | | |
| Probe Surveillance | | 7 | | |
| Network Surveillance | | 7 | | |
| Mobile Traffic Management/Enforcement | | 7 | | |
| Regional Transportation Planning | | | 2 | |

numbers represent ranking of importance (low number = high importance) assigned a score of importance with respect to the other opportunities that were considered, with lower scores indicating a higher priority. The rankings varied according to the methods of the exercise. The Traveler Needs Survey results were easily quantified and ranked based on the averages of the survey responses. The Market Package Exercise also allowed for an absolute ranking based on the score that each market package received. The stakeholder outreach, however, was not scored so the ranking of the opportunities was not easily achievable. The items were assigned either a ranking of 2 or 1 depending on whether a particular opportunity was recognized by three or four of the four workshops, respectively.

Communication & Information Survey. In October 1999, a survey was distributed to key stakeholders in the COATS region to identify their existing and desired information exchange activities with other organizations. Stakeholders were selected based on previous outreach efforts, and included representatives from state and local transportation departments, highway patrol, transit, state and county planning, tourism, emergency management, trucking and tribal lands. The survey was intended to have responding organizations identify:

- how they currently receive and provide various types of transportation information, and
- how they would like to receive and provide these types of information in the future.

Respondents were asked to list organizations and/or technologies along with their associated communication methods for each of several types of transportation-related information. The survey was distributed to dozens of organizations in both California and Oregon, representing a broad mix of stakeholders.

In reviewing survey responses, it was evident that these would not be adequate by themselves to develop a regional architecture. One problem was that the response rate was lower than what would be appropriate for developing a comprehensive regional architecture: of 216 surveys mailed out, there were 72 responses, representing a 33 percent response rate. Moreover, among the surveys that were received, some were incomplete, and others were vague in defining technologies and/or organizations. Follow-up telephone calls to selected stakeholders identified by the Steering Committee and Regional Teams improved the quality of the data received, such that the responses yielded a helpful starting point for understanding the communications and information needs of stakeholders in the COATS region.

Regional Workshops. A series of six architecture workshops was held in order to build upon the results gathered in the communication and information survey. Workshop sites and dates are shown in Table 6-4. The purpose of these workshops was twofold:

- to confirm information flows and stakeholders identified in the survey, and
- to identify missing information flows and stakeholders.

**Table 6-4:** Architecture Workshop Locations.

| Location | Date |
|---|---|
| Coos Bay, Oregon | March 1, 2000 |
| Klamath Falls, Oregon | March 22, 2000 |
| Redding, California | April 10, 2000 |
| Eureka, California | April 11, 2000 |
| Ukiah, California | April 13, 2000 |
| Medford, Oregon | April 24, 2000 |

The workshops were intended to improve upon the results of the survey in two primary ways. First, the workshops would attract stakeholders who did not receive or respond to the survey. Second, by assembling participants from a broad cross-section of transportation, law enforcement, transit, emergency management and response, tourism and other organizations, the workshops could spawn discussion that would help to identify information needs not originally considered.

The workshop format consisted of an educational component as well as a discussion component. The educational and outreach segment was necessary in part because these workshops represented the first COATS meetings in two of the cities, Klamath Falls and Ukiah, and because many workshop participants had little or no familiarity with the COATS project or ITS before the workshop. To guide the discussion, two scenarios – a non-planned event (such as a weather-related traffic incident) and a planned event (such as a summer festival) – were presented. The purpose of the scenarios was to provide a real-world, tangible setting to assist stakeholders in assessing their communication and information needs. Subsequent to this, a list of stakeholders identified through previous outreach and research efforts was presented to workshop attendees for their review. This review helped to ensure that all pertinent parties were accounted for in the development of the regional architecture.

### *6.3.4 Architecture Review Process*

The initial draft architecture was based strictly on the National ITS Architecture and did not provide any customization based on regional needs. A draft architecture was completed in June 2000 and presented to the Steering Committee for review and comment. It was hoped that the review process would help to identify missing stakeholders and subsystems, and to add or delete information data flows as necessary.

ODOT conducted internal review of many subsystems with which it had some operational familiarity. WTI conducted two outreach workshops for Caltrans staff – one in Redding and one in Eureka – to assist in a similar review process. Additional feedback was received from one Steering Committee member.

### *6.3.5 Extending the Architecture*

As a result of the review process, it was determined that significant extensions to the National ITS Architecture would be required in order for it to most completely reflect actual information exchange relationships between various subsystems. In mapping existing and future systems to the National ITS Architecture, it was found that there were several systems for which no adequate architecture counterpart has yet been defined at a national level. This has occurred because the National ITS Architecture has been designed to function around traditionally urban ITS deployments. The National ITS Architecture therefore places less emphasis on roadway maintenance (including events and traffic incidents) and weather, which are among the primary concerns of COATS stakeholders. Table 6-5 lists the extensions to the National ITS Architecture that were deemed necessary to appropriately define the COATS regional architecture.

In addition to these additional subsystems, several extensions to the National ITS Architecture were required in order to define all required information data flows. These are

**Table 6-5:** COATS Entity Extensions to National ITS Architecture.

| **Name** | **Description** | **Class** | **Type** |
|---|---|---|---|
| Maintenance Dispatch Office | This is a center which serves to coordinate maintenance vehicles for planned and non-planned maintenance activities. The center will help to coordinate actions between different vehicles in order to effectively clear incidents, perform winter maintenance, and manage traffic control. | Center | System |
| Maintenance Vehicles | These are vehicles used by maintenance personnel in performing their work activities. They will include some sort of voice communications system to a central dispatch center, and will typically have means of communicating with other maintenance vehicles. Some maintenance vehicles may have the capability of communicating with emergency response personnel via CB radio. Maintenance vehicles may be equipped with automatic vehicle location technology for dispatching and tracking purposes. | Vehicle | System |
| Other Maintenance Dispatch Office | Representing another maintenance dispatch office, this subsystem is intended to provide a source and destination for ITS data flows between peer (e.g. inter-regional) maintenance dispatch functions. It enables maintenance activities to be coordinated across different jurisdictional areas. | Center | System |
| Other Maintenance Vehicles | These are vehicles used by maintenance personnel in performing their work activities that may not, on a particular action, communicate directly with the maintenance dispatch office. These vehicles will maintain the capability of communicating with the dispatch center, but this is not shown in order to preserve simplicity. | Vehicle | System |
| Permitting Office | This office provides various external parties with access to highway right-of-way through a permitting process. It is responsible for processing the paperwork associated with permit requests and disseminating this information to local districts. | Center | System |
| Public Information Office | This entity provides relevant travel information to local broadcast and print media through telephone, fax or e-mail. Information provided is typically near real-time, such as extended road closures, or planned, such as construction projects. | Center | System |

indicated in Table 6-6 (see page 74). In some cases, these information data flows are already included in the National ITS Architecture, but have different subsystems identified for the source and destination of the information flow. In other cases, completely new information data flows were identified, often with some of the subsystems with which the COATS regional architecture was extended.

## 6.4 Overview of COATS Regional Architecture

It was decided that the recently released Turbo Architecture 1.0 software package, prepared under contract for the U.S. Department of Transportation would be used to facilitate the development of a regional architecture. This software reflects the most recent version – version 3.0 – of the National ITS Architecture. It allows the user to develop an inventory of systems and stakeholders, identify applicable market packages, and customize data flows. Of particular value

**Table 6-6:** COATS Flow Extensions to National ITS Architecture.

| Flow Name | Description | From | To |
|---|---|---|---|
| construction activity status | Information about impending construction projects coordinated at a statewide level and distributed to districts. | Construction and Maintenance | Maintenance Dispatch Office** |
| incident data* | Data and imagery from the roadside supporting incident detection and verification. | Roadway Subsystem | Emergency Management |
| | | Roadway Subsystem | Maintenance Dispatch Office** |
| incident information* | Notification of existence of incident and expected severity, location, time and nature of incident. | Maintenance Dispatch Office** | Information Service Provider |
| | | Traffic Management | Information Service Provider |
| incident response vehicle coordination | Communication between vehicles involved in emergency or incident response activities. This communication is essential to reducing the impact of incidents, especially road closures, on travelers. It may require several different communication media, as this will typically span over many jurisdictional lines. | Emergency Vehicle Subsystem | Emergency Vehicle Subsystem |
| | | Emergency Vehicle Subsystem | Maintenance Vehicles** |
| | | Maintenance Vehicles** | Emergency Vehicle Subsystem |
| localized weather information | Select weather information (e.g. wind, precipitation, humidity, temperature, etc.) that may be used to active a local weather warning system. The information is transmitted between a field-based weather data station and a collocated traveler advisory system. | Weather Service | Roadway Subsystem |
| maintenance activity coordination | Information communicated from the maintenance dispatch center to maintenance vehicles to coordinate maintenance activities. This could include information about locations of activities, resource deployment status, and any actions which should be taken. | Maintenance Dispatch Office** | Maintenance Vehicles** |
| maintenance activity information | Information about non-planned and planned road conditions that may affect travel conditions, including construction-related lane closures and detours, and weather-related events. | Maintenance Dispatch Office** | Information Service Provider |

* - Existing flow in National ITS Architecture with different source and/or destination
** - Architecture extension

**Table 6-6:** COATS Flow Extensions to National ITS Architecture (cont.).

| Flow Name | Description | From | To |
|---|---|---|---|
| maintenance activity status | Any communication sent from maintenance vehicles back to the maintenance dispatch office. This would include information about the current status of the action, expected duration of an action, and the need for additional resources. | Maintenance Vehicles** | Maintenance Dispatch Office** |
| maintenance dispatch office coordination | Information communicated between different maintenance dispatch centers regarding locations of critical maintenance actions, like road closures, detours, winter road maintenance, etc. | Maintenance Dispatch Office** | Other Maintenance Dispatch Office** |
| | | Other Maintenance Dispatch Office** | Maintenance Dispatch Office** |
| maintenance vehicle coordination | Any type of vehicle to vehicle communication between maintenance vehicles. | Maintenance Vehicles** | Other Maintenance Vehicles** |
| | | Other Maintenance Vehicles** | Maintenance Vehicles** |
| maintenance vehicle location | Information transmitted from maintenance vehicles to the maintenance dispatch office, characterizing the vehicle's location. | Maintenance Vehicles** | Maintenance Dispatch Office** |
| media information request* | Request from the media for current transportation information. | Media | Public Information Office** |
| permit request | Information about the date, time and nature of activities permitted on the right-of-way. | Permitting Office** | Traffic Management |
| permit support request | Information provided to maintenance staff to assist in permits for right-of-way access granted by the permitting agency. This would include date, time and location of requests for infringement of highway right-of-way, along with details about any precautions that maintenance staff should undertake to protect the traveling public, maintenance staff, and those authorized onto the right-of-way, including traffic cones, VMS messages, flaggers, etc. | Permitting Office** | Maintenance Dispatch Office** |
| permit support request confirmation | Maintenance dispatch offices confirm that information regarding a specific permit request has been understood, and that any maintenance tasks required to protect the traveling public and permittees will be undertaken. | Maintenance Dispatch Office** | Permitting Office** |

* - Existing flow in National ITS Architecture with different source and/or destination
** - Architecture extension

**Table 6-6:** COATS Flow Extensions to National ITS Architecture (cont.).

| Flow Name | Description | From | To |
|---|---|---|---|
| road construction information for transit | Information regarding construction activities which may affect transit service, requiring long-term realignment of routes and/or delay to transit users. | Construction and Maintenance | Transit Management |
| | | Traffic Management | Transit Management |
| seismic conditions | Current seismic conditions as measured by remote sensors and communicated by supporting field equipment. | Roadway Subsystem | Traffic Management |
| traffic images* | High fidelity, real-time traffic images suitable for surveillance monitoring by the operator or for use in machine vision applications. | Roadway Subsystem | Emergency Management |
| | | Roadway Subsystem | Maintenance Dispatch Office** |
| traffic information for media* | Report of current traffic conditions, incidents, maintenance activities and other traffic-related information prepared for public dissemination through the media. | Public Information Office** | Media |
| weather information coordination | Information exchange between agencies who are collecting weather-related information, including generalized atmospheric and precipitation conditions, as well as local stream gauge readings. | Traffic Management | Construction and Maintenance |
| | | Traffic Management | Other TM |
| | | Traffic Management | Weather Service |
| | | Weather Service | Traffic Management |

* - Existing flow in National ITS Architecture with different source and/or destination
** - Architecture extension

to the COATS project, given the architecture extensions identified earlier, is the program's capacity to extend the national architecture, through adding subsystems and/or information data flows.

The Turbo Architecture database developed for the COATS project has the following characteristics:

- 169 subsystems;
- 17 market packages;
- over 700 architecture interconnects; and
- over 2,100 information data flows.

The COATS Regional Architecture does the following.

- <u>It focuses on the major system and institutional boundaries in the region</u>. This emphasis is because optimal system performance can only be achieved when the overall system works as well at the jurisdictional boundaries as it does everywhere else.

- <u>It addresses conformance with the National ITS Architecture</u>. This will yield result in the benefits described in section 6.2.

- <u>It provides a long-term view that can guide ITS planning and project development in the region</u>. Many systems and interfaces that are identified in the regional architecture have not yet been implemented.

- <u>It encourages better cooperation between agencies</u>. The COATS Regional Architecture highlights the ways that they can more effectively use and share data to meet the needs of travelers in the region.

- <u>It includes subsystems that may not be used by any of COATS' priority market packages, such as various CVO-related applications</u>. This recognizes that this architecture be eventually merged with other architectures where these market packages are considered to be more critical.

The COATS Regional Architecture does *not* do the following.

- <u>It does not define the internal design for individual systems in the region</u>. Internal design decisions are better left to the implementing agencies and their contractors.

- <u>It does not alter the existing institutional arrangements or the authority of participating agencies</u>. A fundamental requirement of the regional architecture is to operate within the existing institutional framework in the region.

- <u>It does not mandate specific technology choices in the region</u>. The regional stakeholders may consider technology agreements, but these extend beyond the fundamentally technology-neutral framework defined by the regional architecture.

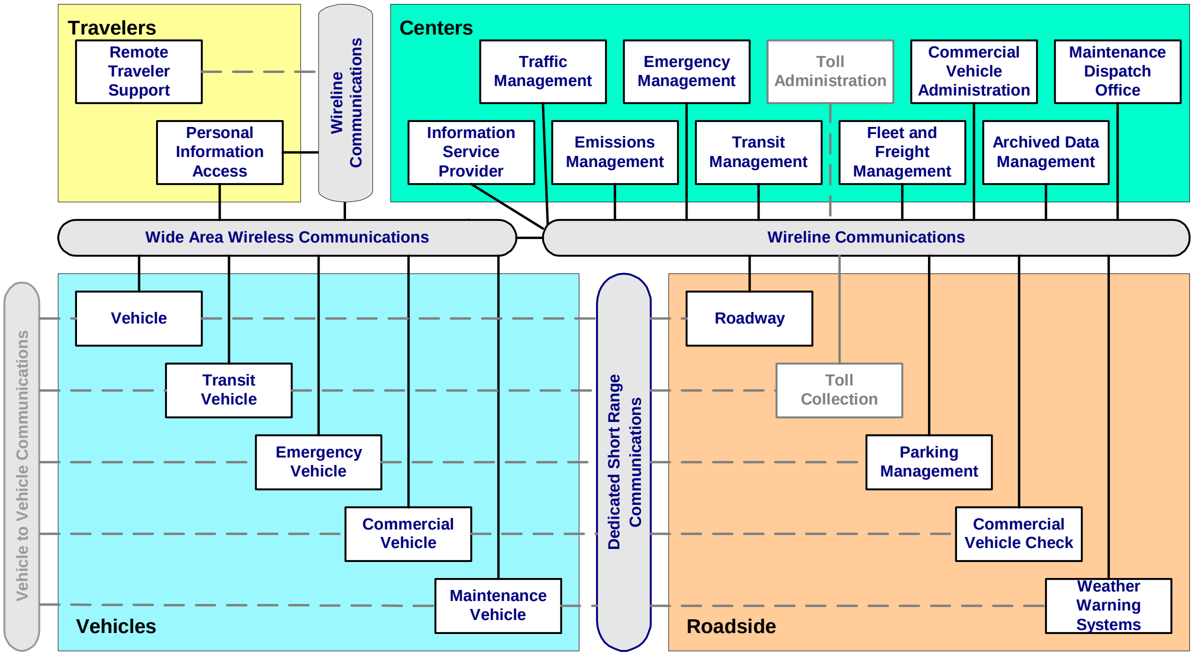



**Figure 6-4:** Subsystems and Interconnects Applicable to the COATS Region.

Several different depictions of the COATS architecture were developed in the course of this project. The architecture includes high-level "sausage diagram" renderings of the architecture to the architecture flow level presentation that defines hundreds of information flows. The different levels of presentation are each suited to different audiences and applications.

### *6.4.1 High-Level Physical Architecture*

As an initial introduction to the COATS Regional Architecture, the subsystems in the COATS study area can be recast into a "sausage diagram" based on the mapping between regional systems and the National ITS Architecture. The sausage diagram is a mainstay of National ITS Architecture presentations and has been widely adopted as a useful way to present major systems and communications interconnects at the highest level.

Figure 6-4 highlights the elements of the National ITS Architecture sausage diagram that are applicable to the COATS region. The figure shows that most of the subsystems and the majority of the communications interconnects defined in the National ITS Architecture have application in the COATS region. All of these subsystems are included in the current detailed regional architecture definition for the COATS region except for the Toll Administration and Toll Collection subsystems. By correlating the systems in the COATS study area with the National ITS Architecture sausage diagram, like systems are grouped together.

The standard National ITS Architecture sausage diagram has a couple of key limitations.

- The standard sausage diagram only shows the 19 subsystems. It does not include, by definition, any extensions to the architecture that are appropriate for a given region. For this reason, the sausage diagram was amended to include several additional subsystems identified through extending the architecture.

- The standard sausage diagram omits the National ITS Architecture terminators, some of which are very important to the COATS Regional Architecture. This limitation was preserved in order to preserve the simplicity of the sausage diagram.

- The sausage diagram also shows a deceptively simple, fully networked communications system that connects every subsystem with every other on a single region-wide backbone. The COATS Regional Architecture does not require such complete connectivity between systems; in fact, a partitioned network that limits access to various systems and assets is important from a practical standpoint.

To address these issues, the high-level regional interconnect diagram in Figure 6-5 can provide a more detailed view of how the systems in each region can be integrated. It shows how the general classes of systems that are implemented in every subregion within COATS are interconnected. It offers a more complete view than the sausage diagram of the types of systems in the region and the potential connectivity between these systems. The general connection strategy is a structure of several sub-networks that are interconnected through defined gateways to improve information sharing across the region without sacrificing the performance, reliability, and security of the most safety-critical portions of the network.

Figure 6-5 includes a number of interconnects that are more specific than the four basic interconnects (Wireline, Wide Area Wireless, Dedicated Short Range Communications [DSRC], and Vehicle to Vehicle) defined by the National ITS Architecture. For example, several different "wireline" interconnects are defined to segregate the different applications for fixed point to fixed point communications in the region. This separation is important because different wireline communications applications have different reliability, security, and performance constraints. Each of the interconnects in the graphic are described in more detail in Appendix C.

### *6.4.2 Subregional View*

The high-level physical architecture may have limited applicability to a local agency concerned with a specific city, county or tourist destination. Therefore, it was decided that the COATS study area should be broken up into subregions. These subregions, shown in Figure 6-6, include:

- southern Oregon,
- north central California, and
- northern California coast.

The COATS Regional Architecture spans and integrates these three subregional architectures. More than a simple aggregation, the COATS Regional Architecture also provides an overarching framework for the subregions. This unifying structure works on two levels. First,

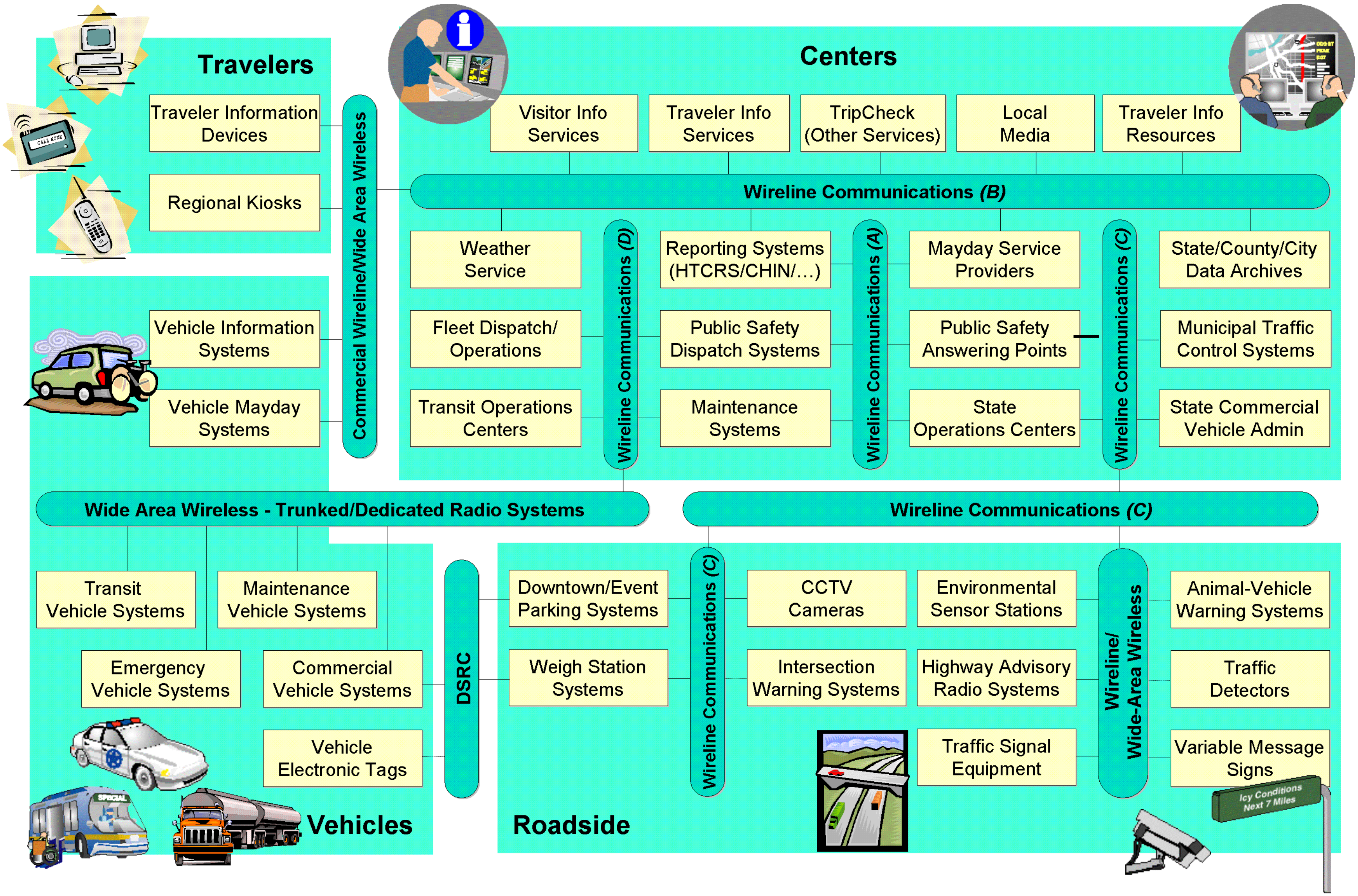



**Figure 6-5:** COATS Regional Architecture Systems and Interconnects.

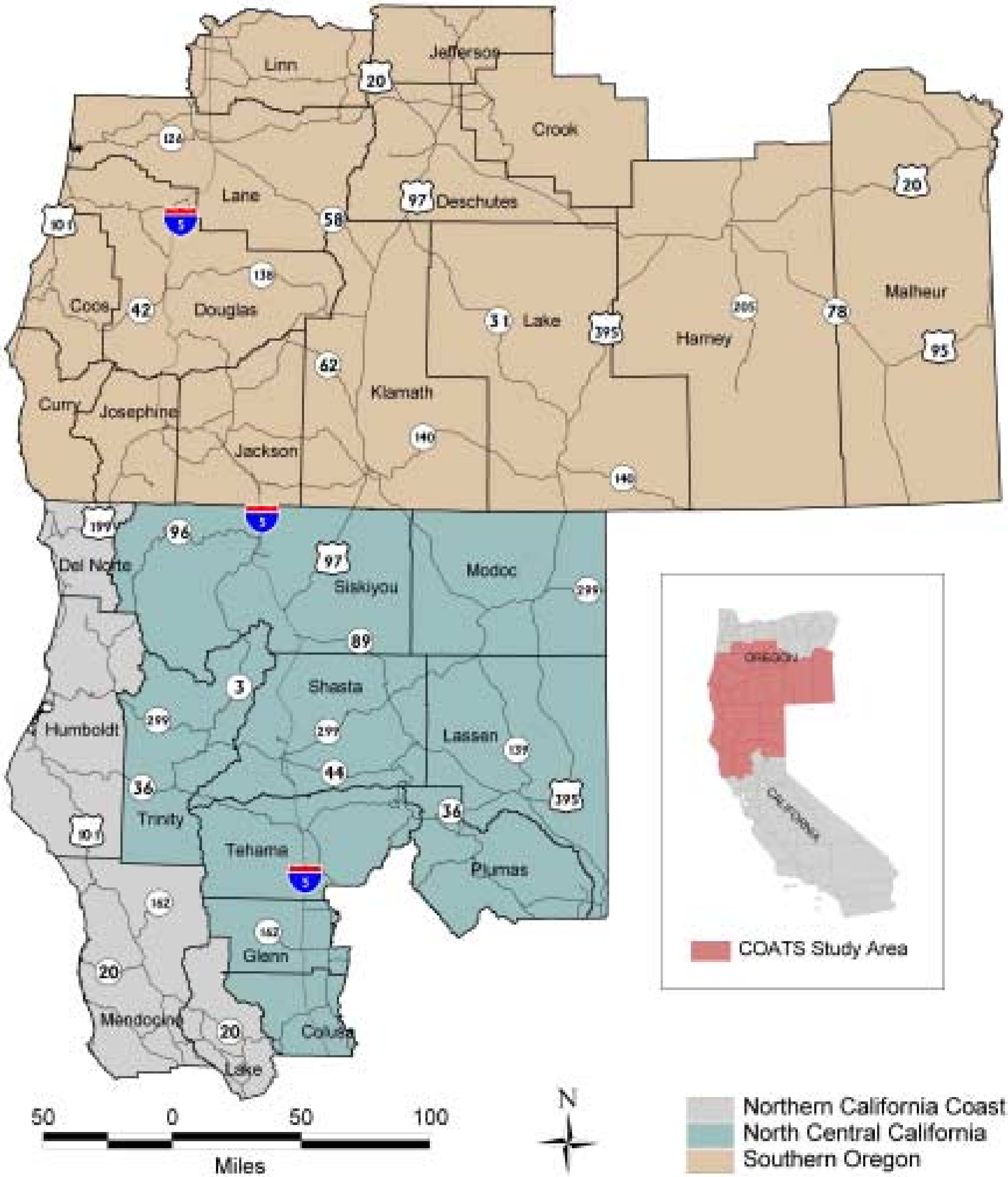



**Figure 6-6:** COATS Architecture Subregions.

it identifies common systems and interfaces that are implemented in all subregions; and second, it provides a plan for interconnecting the subregions where this makes sense.

There are two major factors that require an overarching layer of communications connectivity between the COATS subregions. First, several key routes, such as Interstate 5, US Routes 97, 101, and 199, and California Routes 36 and 299, cross subregional boundaries. If the

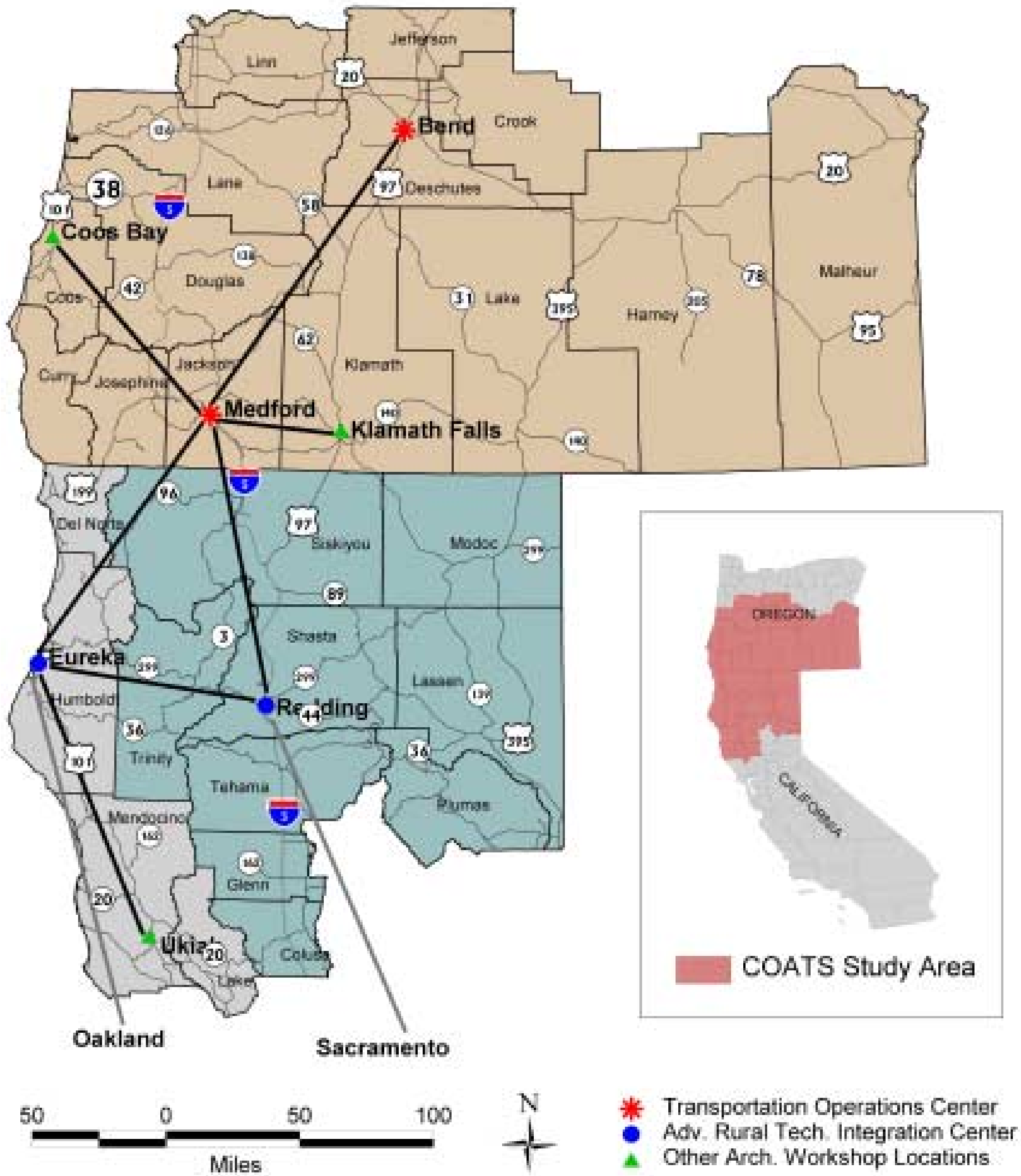



**Figure 6-7:** COATS Regional Interconnects.

COATS architecture is to work as well at these subregional boundaries as it does elsewhere, then it must allow for communications between agencies on each side of these boundaries. Second, there are important services – most notably incident management and traveler information – that require a broader, region-wide view of the transportation system.

Figure 6-7 shows the general connections between subregions that have been identified through the COATS project. As shown, the Medford Transportation Operations Center (TOC) and the Redding Advanced Rural Technology Integration Center (ARTIC) have been identified as the regional hubs for southern Oregon and northern California, respectively. These operations centers connect to satellite systems in their respective states. This state-level integration allows coordination across subregions within each state. The regional hubs also connect to each other to support communications between transportation agencies within southern Oregon and northern California for coordinating traveler information, large-scale incident management and CVO operations coordination. The specific centers that communicate are ODOT's Medford TOC (which is collocated with OSP) and Caltrans/California Highway Patrol (CHP) ARTICs in Eureka and Redding.

The subregional view of the architecture may be best explored through information data flow diagrams, which are provided in the Architecture Report (13). This level of detail allows the architecture to reflect not only the fact that two subsystems exchange information, but what type of information is exchanged, and what the direction of that exchange is.

To develop subregional architectures using Turbo Architecture, the COATS Architecture database includes one regional architecture encompassing all of the COATS regional inventory and interface definitions, and three subregional architectures, one for each identified COATS subregion. This allows the COATS architecture to be viewed from an overall regional perspective as well as a subregional perspective.

## 6.5 Next Steps

The architecture development described in this chapter is adequate for an ITS strategic deployment plan. It should be understood, however, that this initial ITS architecture development is only the first step in the sustained planning and integration effort. The development of an ITS architecture is, by its very nature, very dynamic, as shown in Figure 6-8. The architecture is a blueprint for project development and, consequently, will need regular review and updating to insure its validity. The validation process for this architecture, which started with review performed through the Steering Committee, was beyond the scope of this strategic deployment plan.

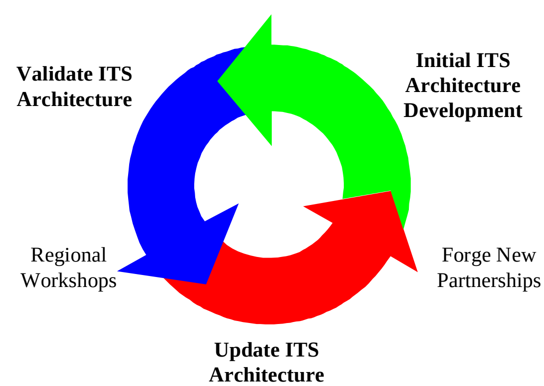



**Figure 6-8:** Development and Refinement of a Regional ITS Architecture.

The COATS regional architecture may provide significant benefits to stakeholders throughout the region. It may help to leverage resources for ITS projects in the COATS study area. It highlights new opportunities for partnership in order to utilize scarce resources more efficiently, promotes interoperability and integration, and provides guidance for defining new projects. However, just as the ongoing success of the COATS project hinges on the development and pursuit of working relationships with new stakeholders, so the success of this regional architecture depends upon the ongoing input from stakeholders to maximize its potential. Consequently, validation efforts should be undertaken by COATS stakeholders in order to help address the transportation challenges of the COATS region in a truly regional way.

# 7 IMPLEMENTATION PRIORITIES

One critical end result of an ITS strategic deployment plan is a schedule for deployment of ITS technologies. The schedule reflects the priorities of stakeholders in the study area and helps to determine the level of funding required to support ITS initiatives consistent with those priorities.

This chapter presents a summary of the ITS infrastructure proposed for deployment in the COATS study area. First, the methodology used in developing a prioritized list of ITS deployments for the COATS study area is reviewed. The early-winner project, which represents the highest priority project in the COATS study area as determined by the COATS Steering Committee, is described. Finally, a county-by-county review of proposed deployment is presented.

## 7.1 Methodology

The flow chart in Figure 7-1 shows how the various data collection and survey efforts were integrated to determine the types and locations of projects to be implemented. As was described

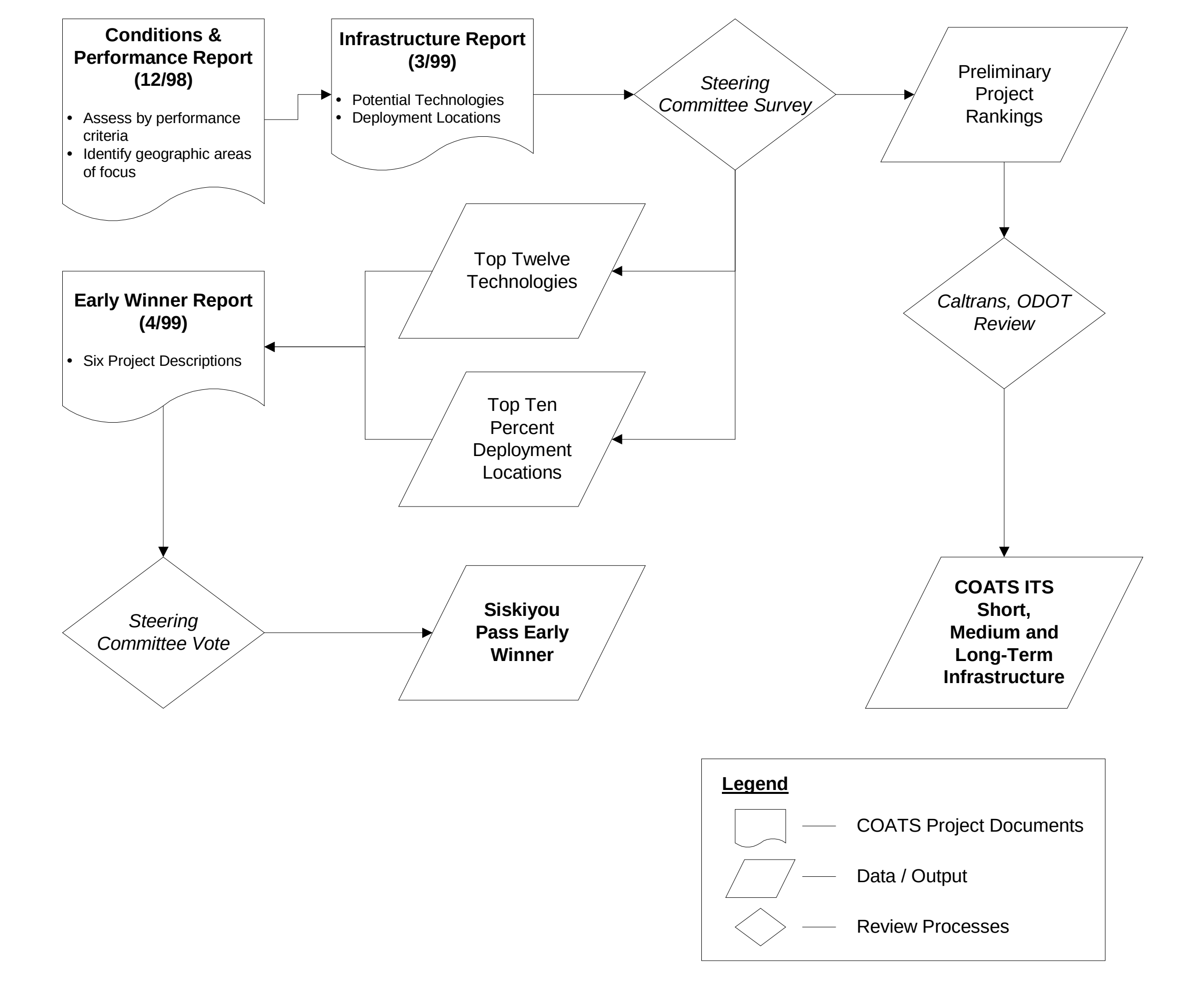



**Figure 7-1:** Development of COATS Infrastructure Recommendations.

**Table 7-1:** Performance Criteria.

| Challenge | Type | Performance Criteria | | Limiting Factors | | |
|---|---|---|---|---|---|---|
| *Emergency Services* | **Notification Times** | Time AND<br>Frequency for Major Segment | | >20 Minutes<br>>2 Incidents/Segment | | |
| | **Response Times** | Time AND<br>Frequency for Major Segment | | >40 Minutes<br>>2 Incidents/Segment | | |
| *Mobility* | **Transit Availability** | Percent of Potential Transportation Dependent Population | | >35% | | |
| *Tourism* | **High Recreation Traffic** | Annual Visitor Counts | | >200K Visitors | | |
| *Safety* | | | | **# of Accidents** | **½-Mile Segment Rate** | |
| | **- Speed & Slip Surf<br>- Clear Zone** | No. of Accidents in ½ Mile Segment AND > ½ Mile Segment Rates | | >4 | CA<br>OR | 4.98<br>2.88 |
| | **- Intersection<br>- Visibility** | No. of Accidents in ½ Mile Segment AND > ½ Mile Segment Rates | | >10 | CA I-5<br>OR I-5 | 1.18<br>0.62 |
| | | | | **# of Accidents** | **Major Segment Rate** | |
| | **- Drowsy Driver<br>- Animal Collision** | No. of Accidents in Major Segment AND >Major Segment Rates | | >10 | CA & OR | 0.1 |
| | **- Bicycle/Pedestrian** | No. of accidents in city limits | | >4 | | |
| | **- Alcohol<br>- Lack of Seat Belt** | Area Wide (not clustered) | | | | |
| | **- Construction<br>- Passing Maneuver<br>- Poor Alignment<br>- RR Grade Crossing** | Determined by Stakeholders | | | | |
| *Road Closures* | | **Weighted Closures**<br>{Per Major Segment Per Year} | **Weighted Duration**<br>{Days Per Major Segment Per Year} | | | |
| | **Slide** | 3 | 10 | | | |
| | **Flood** | 1 | 2 | | | |
| | **Weather** | 2 | 0.5 | | | |
| | **Object** | 2 | 0.5 | | | |
| | **Vehicle Crash** | 2 | 0.5 | | | |

earlier, the Conditions and Performance Report (8) was used to identify geographic areas of focus for ITS applications. These geographic areas were linked to specific challenges that the COATS study area faces, including:

- emergency medical service notification and response times;
- traveler mobility;
- tourism;

- safety, related to speed and slippery surfaces, narrow lane widths/clear zones, intersections, limited visibility, drowsy drivers, animal/vehicle collisions, bicycle/pedestrian conflicts, alcohol, lack of seat belt use, and construction zones; and
- road closures, due to slides, floods, weather, objects in the roadway, and vehicle accidents.

For each of these challenges, thresholds were established in order to identify "hot spots." These thresholds are shown in Table 7-1.

The Project Infrastructure Report (14) compiled a list of appropriate technologies to meet geographic challenges. For each technology, the report described how the technology would function, what its objectives would be, and for what types of locations it would be most appropriate. This information is provided in Appendix D. Technologies included in the infrastructure report were not extracted from a set of existing technologies. In some cases, preliminary functional specifications were identified that would need to have specific technologies designed and tested before deployment in the study area. The report indicated potential locations for each technology on maps, and these locations were also included in an appendix table.

Steering Committee members were asked to validate and prioritize the infrastructure locations identified in the Project Infrastructure Report. Priorities could be established as short-term, medium-term, or long-term as follows:

- short-term priorities should be deployed within four years;
- medium-term priorities have a targeted deployment time frame of four to eight years; and
- long-term priorities have a targeted time frame of eight to fifteen years[5].

Respondents also had the option to recommend deletion of locations and addition of new ones. Sixty percent of Steering Committee members completed the exercise. In many cases, respondents focused only on those elements in the part of the study area for which they have the most responsibility and/or experience.

To compile an overall Steering Committee ranking of each infrastructure element, a numeric value was assigned to each response (0 = delete, 1 = long-term, 2 = medium-term, and 3 = short-term), with the values of all responses for each location averaged. The result of this formulation is that locations having a higher score were ranked higher.

The results were summarized in two dimensions: one by looking at specific locations, and the other by examining each technology averaged over all locations. Average rankings for specific project locations were used as a base level of prioritization in order to develop the project infrastructure for the entire study area. Those technologies achieving higher average rankings were mapped in order to help highlight "hot spots," for the development of early-winner projects, as described in the following section.

[5] Priorities were set to reflect strategic goals, and may be constrained by the availability of funding, among other factors.

As Figure 7-1 indicates, the results of this Steering Committee survey fed into two different efforts related to the project infrastructure. The first was the development of early-winner projects, which are described in the next section. The second effort was the prioritization of all other infrastructure elements into short, medium and long-term time frames, which is described in section 7.3.

## 7.2 Early-Winner Project

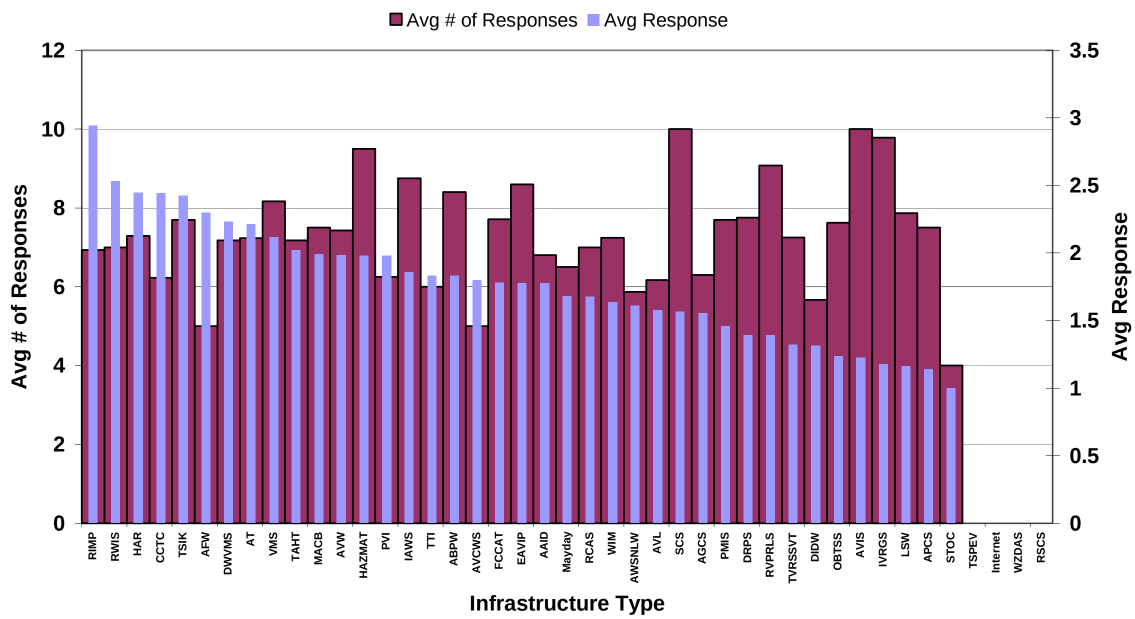
When ITS in a given region progresses between the planning to deployment stages, it is important to implement a small number of projects which are likely to yield significant benefits in the short-term. The benefit of this type of deployment, known as “early-winner” projects, is that it provides documented benefits that may justify further ITS deployments (as prescribed in a long-term plan) and enhances public acceptance of the new technologies. Therefore, a critical part of the COATS project has been the selection and implementation of an early winner project.

### *7.2.1 Project Selection*

The methodology for selection of the early-winner project was shown in Figure 7-1. A combination of the top ten percent of the ranked infrastructure locations and the top twelve technologies, as shown in Figure 7-2, were considered in determining potential early-winner projects.

Figure 7-2 shows both the average ranking for each technology type and the average number of project participants that ranked that technology. By showing both, the figure helps to indicate how robust or reliable the average ranking for a particular technology is. From this analysis, the top twelve infrastructure types were, in order of declining ranking:

- regional incident management plan,
- road weather information systems (RWIS),
- highway advisory radio (HAR),
- closed-circuit television cameras (CCTV),
- touch screen interactive kiosks,
- automated flood warning,
- dynamic warning variable message signs,
- advisory television,
- variable message signs (VMS),
- 1-800 travel advisory telephone hotline,
- motorist-aide call boxes, and
- automated visibility warning.




**Legend**

| | |
|---|---|
| **RIMP** | Regional Incident Management Plan |
| **RWIS** | Road Weather Information System |
| **HAR** | Highway Advisory Radio |
| **CCTC** | Closed-Circuit Television Camera |
| **TSIK** | Touch Screen Interactive Kiosks |
| **AFW** | Automated Flood Warning |
| **DWVMS** | Dynamic Warning Variable Message Signs |
| **AT** | Advisory Television |
| **VMS** | Variable Message Signs |
| **TAHT** | 1-800 Travel Advisory Hotline Telephone |
| **MACB** | Motorist-Aide Call Boxes |
| **AVW** | Automated Visibility Warning |
| **HAZMAT** | HAZMAT Management |
| **PVI** | Probe Vehicle Instrumentation |
| **IAWS** | Intersection Advanced Warning System |
| **TTI** | Transit Traveler Information |
| **ABPW** | Advanced Bicycle/Pedestrian Warning |
| **AVCWS** | Animal/Vehicle Collision Warning System |
| **FCCAT** | Freight/Cargo Content Administration & Tracking |
| **EAVIP** | Electronic AVI Preclearance |
| **AAID** | Automated Anti-Icing Dispenser |
| **Mayday** | Mayday Systems |
| **RCAS** | Rural Coordinate Addressing System |
| **WIM** | Weigh-in-Motion |
| **AWSNLW** | Advanced Warning System for Narrow Lane Widths |
| **AVL** | Automatic Vehicle Location |
| **SCS** | Smart Card System |
| **AGCS** | Automated Gate Closure System |
| **PMIS** | Parking Management and Information System |
| **DRPS** | Dynamic Ridesharing/Paratransit Service |
| **RVPRLS** | Recreational Vehicle Park & Ride Lots with Surveillance |
| **TVRSSVT** | Transit Vehicle Routing/Scheduling Software and Vehicle Tracking |
| **DIDW** | Driver Impairment Detection and Warning |
| **OBTSS** | On-Board Transit Safety Systems |
| **AVIS** | Automatic Vehicle Identification System |
| **IVRGS** | In-Vehicle Route Guidance Systems |
| **LSW** | Lateral Safety Warning |
| **APCS** | Automated Passenger Counting System |
| **STOC** | Satelite Transportation Operation Centers (includes Caltrans' ARTICs and ODOT's TOCs) |

The following technologies had no specific locations included in the study area:

| | |
|---|---|
| **TSPEV** | Traffic Signal Priority for Emergency Vehicles |
| **Internet** | Internet |
| **WZDAS** | Work Zone Delay Advisory System |
| **RSCS** | Regional Server/Coordination Software |

**Figure 7-2:** Technology Rankings.

To increase the likelihood that it will yield realizable benefits, the early winner needs to be deployed to address specific, identifiable, regional needs and challenges. For this reason, the first step in selecting the early winner project was to compile the needs and challenges identified through earlier stages of the project. A review of recommended market packages combined with a more detailed analysis of the performance criteria were used to develop a comprehensive list of proposed technologies with hot spot deployment locations. Based on a Steering Committee review of these locations, contained in the Infrastructure Report, six geographic focus areas were identified, as shown in Figure 7-3, where a package of ITS technologies could be deployed (15).

Members of the Steering Committee were asked to rank each of the six focus areas in the following six factors.

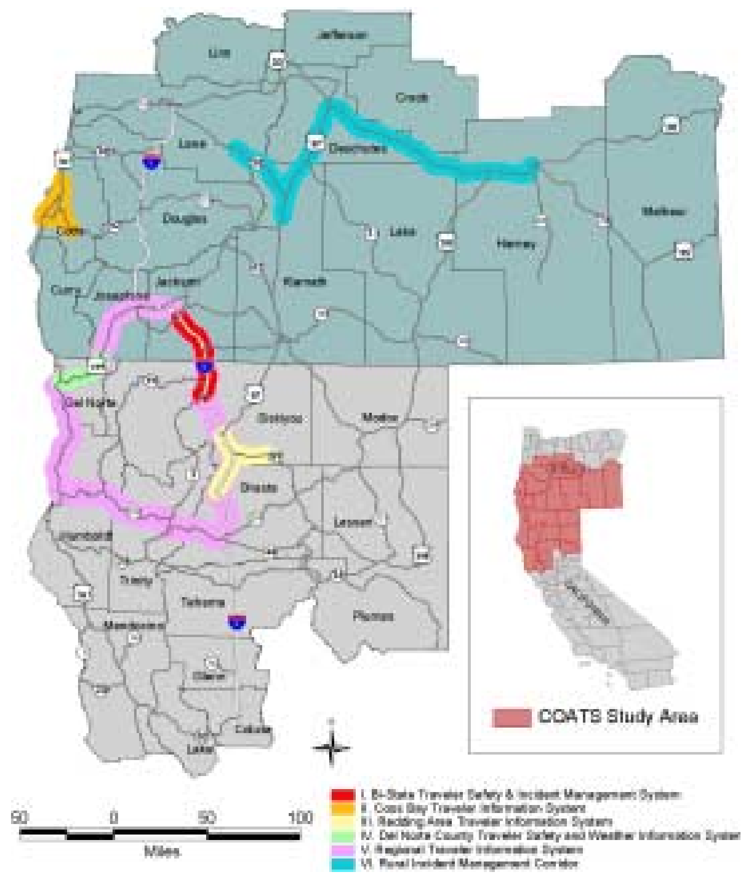



**Figure 7-3:** Map of Study Area Showing Six Candidate Early Winner Focus Areas.

- Timeliness & cost – could the project be deployed quickly and in a cost-effective manner?
- Regional coordination – does the project represent an opportunity to expand and improve regional coordination?
- Project recognition – does the project highlight solutions that may attract increased public or private sector funding from national sponsors?
- Sustainability – how difficult will it be to sustain the project in the long-term?
- Scalability – does the project represent a prototype that could be applied to similar geographic areas elsewhere in the COATS region?
- Evaluation feasibility – does the project lend itself well to a quantitative evaluation of its effectiveness?

Based on the results from the ranking exercise (shown in Table 7-3), the Bi-State Traveler Safety & Incident Management System was selected as the COATS early winner project.

### *7.2.2 Project Description*

The Bi-State Traveler Safety & Incident Management System, also referred to as the Siskiyou Pass Early Winner Project, is focused primarily on Interstate 5 between Yreka, California and Medford, Oregon, as shown in Figure 7-4. In this vicinity, Interstate 5 is a major connecting route between these cities having an average daily truck traffic between 4,000 and 6,000. It crosses Siskiyou Pass near the California/Oregon border, and frequently experiences inclement weather conditions.

The infrastructure associated with this project is shown in Table 7-2. Roadside infrastructure on the Oregon side of the border would be managed through the Medford Transportation Operations Center, while in California it would be managed by the Redding Advanced Rural Technology Integration Center (ARTIC). Figure 7-5 shows the relative location of legacy systems and COATS technologies for the Siskiyou Pass project.

### *7.2.3 Project Architecture*

Success of the COATS ITS Strategic Deployment Plan depends upon not only the investment in advanced technologies in rural locations as described in this chapter, but also on efforts to integrate these technologies to maximize their benefit. Following from last chapter's discussion of the regional architecture, a project architecture has been developed for the early-winner project. The regional architecture provides a foundation for project deployments by ensuring that smaller-scale deployments will coalesce with the larger regional ITS vision. Conversely, the development of a project architecture also enhances the development of a regional architecture by keeping the latter grounded in the reality of actual ITS deployment.

**Table 7-3:** Ranking of Early Winner Candidate Projects.

| Map Code | Title | Ranking |
|---|---|---|
| I | Bi-State Traveler Safety & Incident Management System | 8.8 |
| V | Regional Traveler Information System | 8.5 |
| IV | Del Norte County Traveler Safety & Weather Information System | 6.5 |
| III | Redding Area Traveler Information System | 6.1 |
| VI | Rural Incident Management Corridor | 5.7 |
| II | Coos Bay Traveler Information System | 5.3 |

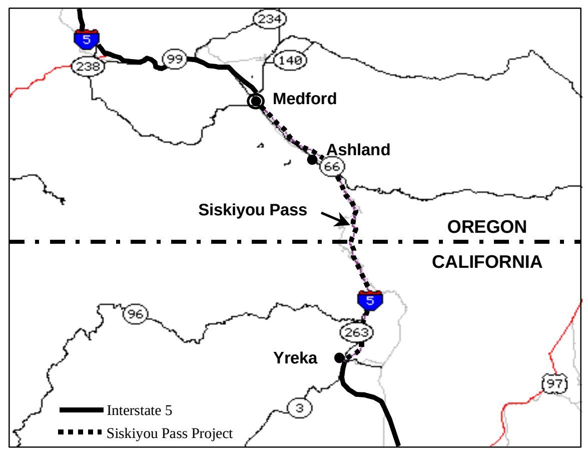



**Figure 7-4:** Siskiyou Pass Early Winner Project Limits.

**Table 7-2:** Proposed Infrastructure for Siskiyou Pass Early Winner Project.

| Rank | Infrastructure Element | Existing Location | Short-Term Location |
|---|---|---|---|
| 1 | Regional Incident Management Plan | | Between Yreka, CA and Medford, OR |
| 2 | RWIS | OR MP 4.3 - Siskiyou Summit | |
| | | OR MP 28.33 - Medford Viaduct | |
| 3 | Highway Advisory Radio | OR MP 28.33 - Medford Viaduct | CA-Sis-65.21 - Near Bailey Hill Road |
| 4 | Closed-Circuit Television | OR MP 4 - Siskiyou Summit | CA-Sis-56 |
| | | OR MP 5 - Siskiyou Summit | CA-Sis-58 |
| | | | CA-Sis-68.33 - At Hilt OC |
| | | | OR MP 28.33 - Medford |
| 5 | Kiosks | OR MP 19.1 - Ashland | |
| | | OR MP 28.33 - Medford (4) | |
| 7 | Dynamic Warning VMS | | At Milepost OR 4.6 |
| 8 | Advisory Television | | Ashland |
| | | | Medford |
| | | | Yreka |
| 9 | Variable Message Sign | OR MP 16.72 - Medford | CA-Sis-62 - Near Henley Way |
| | | OR MP 31.31 | OR MP 29 - Medford Viaduct |
| 11 | Motorist-Aide Call Box | OR MP 28.16 - Medford Viaduct | OR MP 3.8 - Siskiyou Summit |
| | | OR MP 29.16 - Medford Viaduct | OR MP 4.8 - Siskiyou Summit |

* - All locations are on Interstate 5; all California postmiles are located within Siskiyou County.

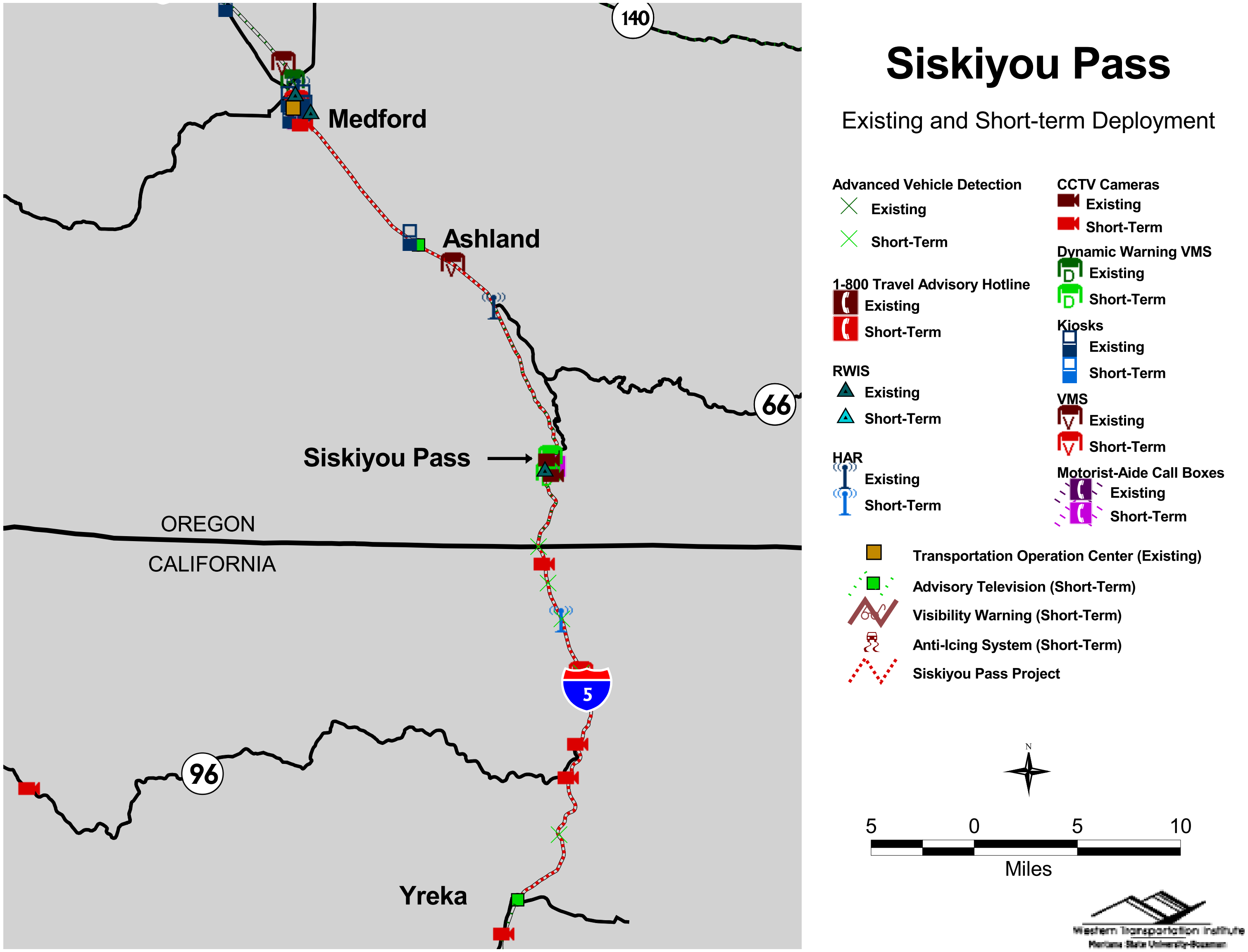



**Figure 7-5:** Existing and Planned Infrastructure for Siskiyou Pass Early Winner Project.

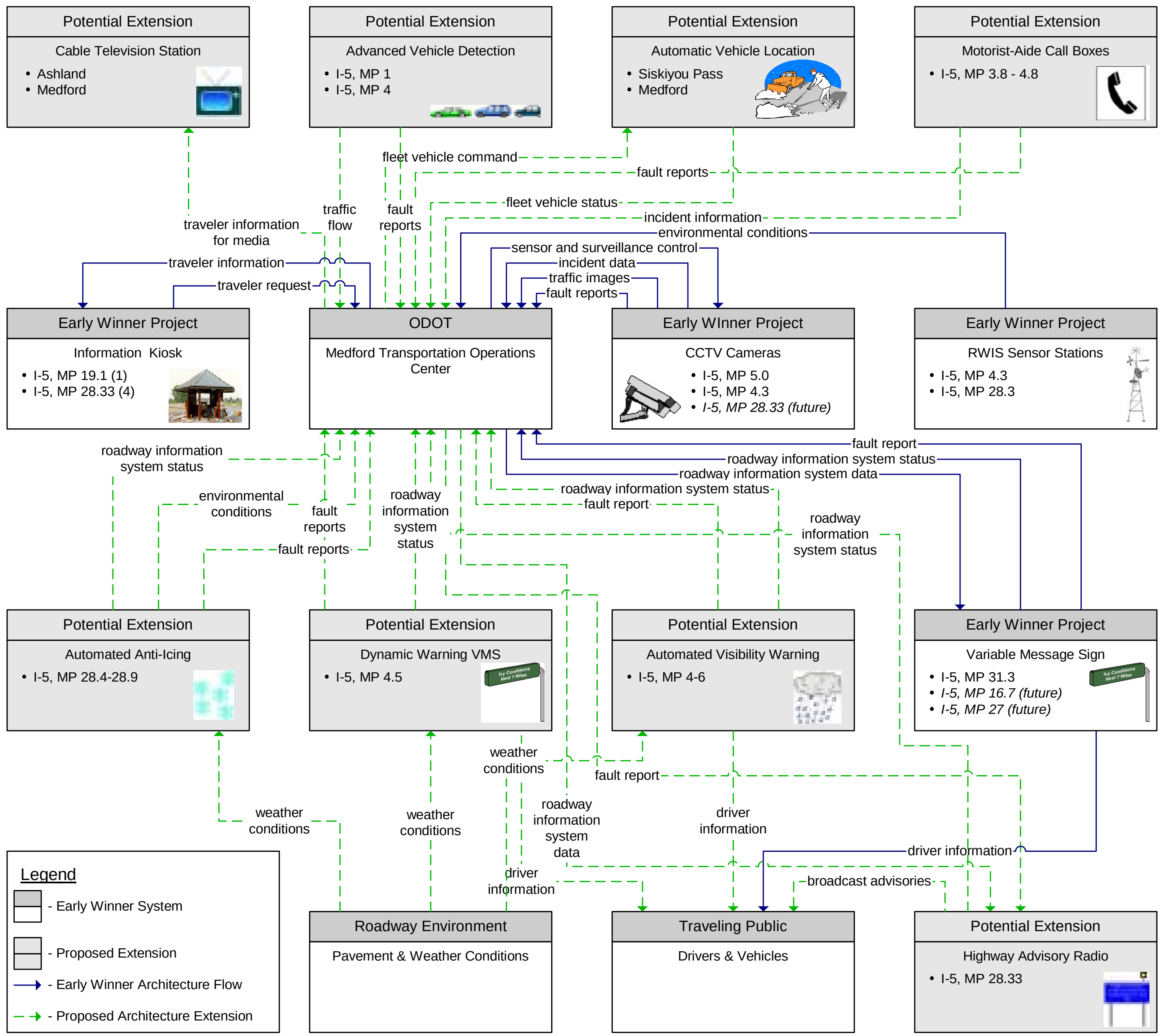



**Figure 7-6:** Early Winner Project Architecture (Oregon).

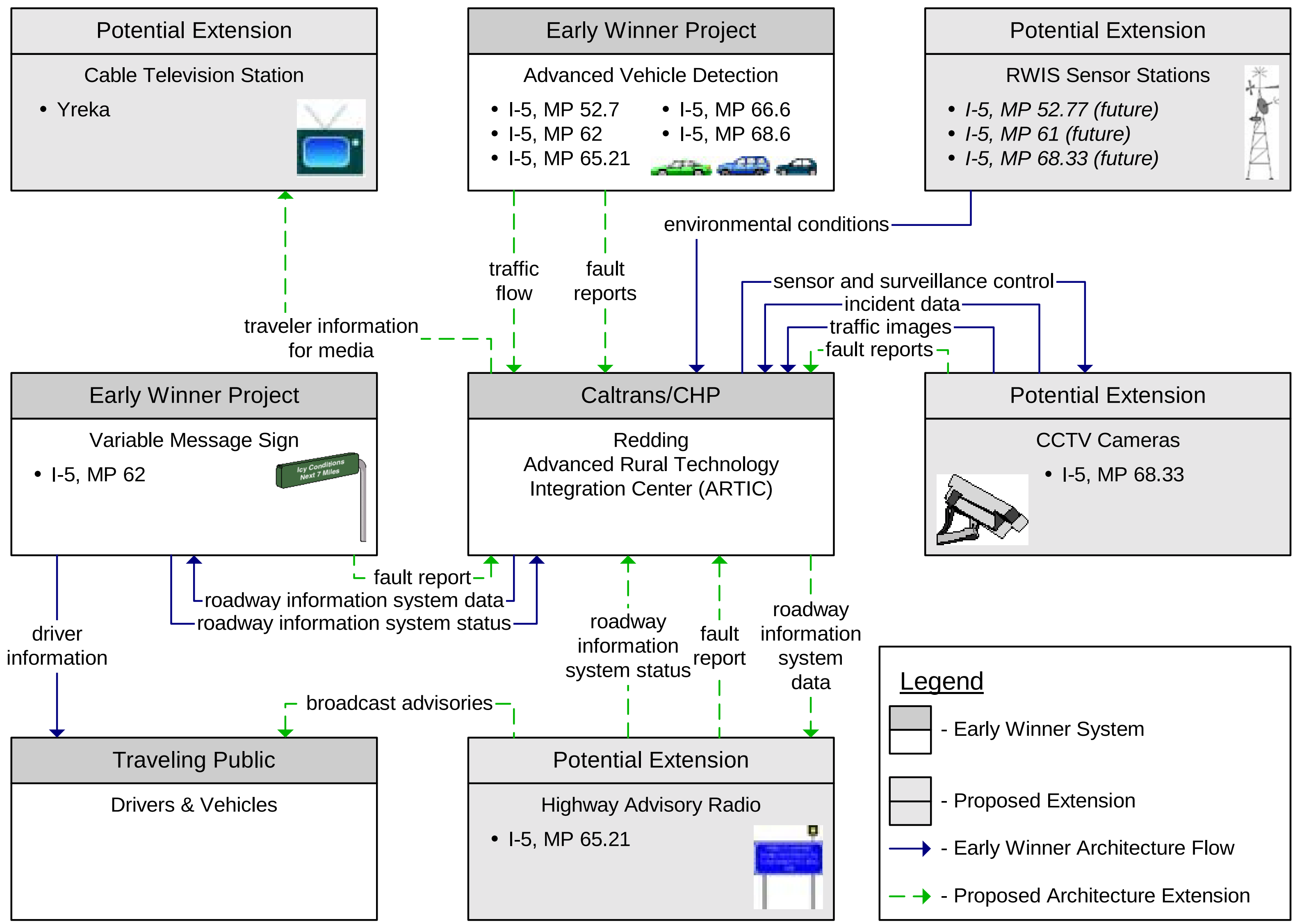



**Figure 7-7:** Early Winner Project Architecture (California).

The project architecture translates some of the broader element descriptions into specific technologies and locations. From this level, one can begin to utilize the more detailed portions of the National ITS Architecture, including performance specifications and standards, to develop functional and performance requirements for eventual procurement.

For simplicity, separate architecture diagrams were developed for each state's ITS deployment in the vicinity of Siskiyou Pass. Oregon's deployment is shown in Figure 7-6; California's is shown in Figure 7-7. These diagrams are simplified in that they represent the subset of equipment deployed on either side of the border without showing how the two states will relate to each other. The diagrams also do not include the current and future coordination of ODOT and Caltrans with law enforcement agencies on both sides of the border to manage incidents on the pass.

These figures are simplified in at least two areas. First, the figures do not include the communications involved with implementing the Siskiyou Pass Incident Management Plan, which coordinates emergency response and dispatch activities among several agencies on both sides of the state border. Moreover, the Southern Oregon Visitors Association would continue to be responsible for kiosks in southern Oregon.

The architecture flow diagrams show each of these technologies having real-time communications with the Medford TOC or Redding ARTIC. The specific media employed will depend upon the availability of nearby landline coverage and/or the coverage area for wireless communications. This will likely be determined on a case-by-case basis, although bandwidth requirements to support future deployments should be considered in developing functional requirements for shorter-term ITS elements.

As different vendors may be used to supply technologies, it is critical that a conscious effort be made to coordinate information flow between the Medford TOC and Redding ARTIC, as shown in Figure 7-8. As ITS infrastructure in the vicinity of the border increases, it is critical that information exchange across the state boundary be as seamless as possible.

## 7.3 Regional Deployment

Potential applications of ITS for the COATS study area have been identified through previous analyses of regional needs and stakeholder concerns. On this basis, this plan recommends numerous ITS deployments for the region, including and beyond the early-winner projects[6].

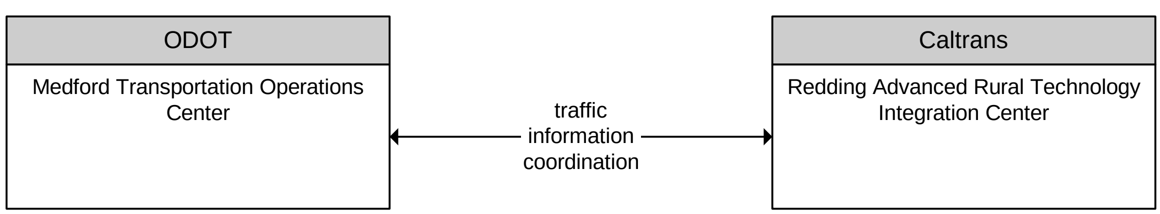



**Figure 7-8:** Potential Coordination Flow Between Medford TOC and Redding ARTIC.

A first assessment of prioritization for these deployments was based on the results of the Steering Committee survey described earlier. It was determined that the results of the survey alone were not adequate to develop a proper regional prioritization of the ITS infrastructure for a couple of reasons.

- Those parties who are responsible for funding the technologies will ultimately make decisions on how deployment is prioritized. The prioritization rankings developed through the survey combined the opinions of those who would be responsible for funding as well as those who would not be.

- The survey mechanism allowed individuals to suggest additions or deletions to the project infrastructure without the review of other Steering Committee members. Accordingly, the prioritization level assessed for these new locations would not be comparable with other locations of the same technology.

It was decided that the prioritization rankings could be improved by an additional iteration of review by project stakeholders. Time and resource constraints prohibited a widespread survey of all stakeholders. Consequently, validation and review efforts were restricted to Caltrans and ODOT. These two agencies were selected because it was anticipated that they would provide the majority of funding for early COATS initiatives, and because most projects identified in the infrastructure would be located within their jurisdiction or right-of-way.

The large number of devices and the geographic scale of the COATS study area makes it difficult to adequately summarize, either graphically or in tabular form, the nature of the infrastructure recommended for the study area. Therefore, the prioritized infrastructure for the COATS study area as a whole is provided in Appendix E.

## 7.4 California County-Level Deployment

This section reviews existing and planned deployment for each of the California counties that are within the COATS study area[7]. Tables and maps describing this deployment in greater detail may be found in Appendix F.

### *7.4.1 Colusa, Glenn and Lake Counties*

Colusa, Glenn and Lake Counties are in North Central California or the southernmost part of the COATS study area. While parts of Colusa and Glenn Counties were included in the study area boundaries, they were not considered in significant detail in this ITS planning effort, since they are slated for inclusion in a future ITS planning effort. Interstate 5 is the major north-south route and Highway 20 the primary east-west route for this area. Demographic statistics indicate that Lake County has a high percentage of transit-dependent residents. Other challenges for the area include crashes due to drowsy drivers on Interstate 5 and long response and notification times and road closures on Highway 20.

#### 7.4.1.1 Short-term Priorities

En-route traveler information is a critical short-term priority in this area. Five variable message signs (VMS), collocated with closed-circuit television (CCTV) cameras, are planned for major decision points in Lake County, such as the intersections of State Route 20 with State Routes 29 and 53 on either side of Clear Lake. On State Route 53, the VMS would be used to warn motorists approaching State Route 20 that cross traffic does not stop. The CCTV cameras would be used both for verification of messages on the variable message signs, as well as to provide for remote monitoring of critical intersections.

#### 7.4.1.2 Additional Deployment

A fully developed list of recommended deployments for Colusa, Glenn and Lake Counties is located in Table F-1. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. As Figure F-1 indicates, an automated flood warning system is recommended for long-term deployment on State Route 20 in Lake County. Figure F-2 shows that call boxes are currently a common ITS element in these counties. Enhancement of call box programs is recommended in the medium-term for the entire length of Interstate 5 in the COATS study area, as well as on State Route 20 in Colusa County. An intersection advance warning system is recommended as a long-term priority for the intersection of State Routes 20 and 53; this would provide more dynamic information to motorists about the presence of approaching traffic on State Route 20. Advisory television, to provide improved pre-trip traveler information, is recommended for medium-term deployment in Clearlake, and long-term deployment in Williams.

[7] In some cases, deployments are indicated that extend beyond the boundaries of the study area. The specific location and prioritization for these deployments was not verified.

As indicated in Figure F-3, further deployment of VMS is recommended, with one near the Interstate 5 junction with State Route 32 in Glenn County in the medium-term, and two others on Interstate 5 in the long-term. To supplement the VMS, three highway advisory radio locations are recommended: a medium-term location on Interstate 5 at the Maxwell Rest Area, and long-term locations at Orland and in central Lake County on State Route 20. There is also a long-term recommendation for dynamic warning VMS for both eastbound and westbound traffic on State Route 20 in Lake County near the Colusa County line. Other long-term recommendations for traveler safety and security may require the involvement of vehicle manufacturers, including lateral safety warning and driver-impairment detection systems through the entire length of the State Route 20 in Lake County.

Emergency Services. Based on the infrastructure prioritization process, there are no short-term recommendations pertaining to emergency services in Colusa, Glenn and Lake Counties, as shown in Figure F-4. Rural coordinate addressing systems are recommended for the Colusa County portion of State Route 20 in the medium-term, and for State Route 162 in Glenn County in the long-term. In both cases, these systems are expected to help reduce emergency notification times. In the long-term, a regional incident management plan is recommended for State Route 20 through both Colusa and Lake Counties. Mayday systems are suggested as a long-term ITS application for State Route 20 in Colusa County, although implementation of this will depend more upon vehicle manufacturers and wireless communications capabilities than public agencies or local businesses.

Tourism and Traveler Information Services. Three deployments are recommended to improve tourism and traveler information services in this three-county area, as shown in Figure F-5. A 1-800 travel advisory telephone hotline, which would provide both traveler and tourist information, is recommended for medium-term implementation to cover State Route 20 through Lake County. Kiosks are recommended in the long-term for two locations along State Route 20 in Lake County: at the junction with State Route 29, and the junction with State Route 53.

Public Traveler/Mobility Services. According to demographic characteristics, Lake County is one of the more transit-dependent counties in the COATS study area. Accordingly, there are several recommendations for ITS applications in the area of public traveler/mobility services. As shown in Figure F-6[8], only one of these applications – dynamic ridesharing and paratransit – is recommended for the medium-term, while other applications are all recommended for long-term deployment. Those technologies recommended for the long-term – automated passenger counting, an automatic vehicle identification system, on-board transit safety systems, smart cards, and software for transit vehicle routing and scheduling – should all help to improve the efficiency and effectiveness of the Lake Transit Authority and more localized transit providers in meeting the mobility needs of the county.

Infrastructure Operations and Maintenance. Aside from the short-term priority for CCTV, the primary deployment related to infrastructure operations and maintenance in Colusa, Glenn and Lake Counties is road weather information systems (RWIS). As shown in Figure F-7, RWIS is recommended for long-term deployment along State Route 20 to provide broad geographic

[8] In this map and others, countywide applications of technologies are not shown in order to preserve map simplicity.

coverage. Advanced vehicle detection is recommended along State Route 20 near postmile 24 to collect additional real-time information on roadway traffic patterns.

Fleet Operations and Maintenance and Commercial Vehicle Operations. ITS applications in the areas of fleet operations and maintenance and commercial vehicle operations highlight the prominent role of the Interstate 5 and State Route 20 corridors in Colusa, Glenn and Lake Counties. As shown in Figure F-8, using fleet vehicles as probes is recommended in the medium-term for State Route 20 through Lake County. Improved management of hazardous materials spills is recommended for Interstate 5 in Colusa and Glenn Counties in the medium-term, and for State Route 20 in Lake County for the long-term.

### *7.4.2 Del Norte County*

Del Norte County borders Oregon to the north and the Pacific Ocean to the west. A large number of tourists travel US Route 101, which runs north-south along the California coast. Challenges experienced in Del Norte County include poor visibility due to fog, road closures due to adverse weather, long notification and response times, and narrow shoulders/clear zone on US Routes 101 and 199. Additionally, there are pedestrian and bicycle and intersection safety challenges within Crescent City.

#### 7.4.2.1 Short-term Priorities

A variety of ITS applications are recommended for short-term deployment in Del Norte County. Most prominent are four variable message signs, three of which are located on US Route 101, and one of which is located on US Route 199 just south of the Oregon state line. At each of these locations, CCTV cameras are recommended for short-term deployment to verify variable message sign performance and to provide improved remote monitoring. An additional CCTV camera is recommended for the Collier Rest Area, collocated with RWIS and highway advisory radio (HAR). An additional HAR site is recommended for US Route 101 near Crescent City, to address visibility challenges, disseminate road closure information, and provide tourist information as appropriate. Traveler information may also be provided through kiosks, which are recommended for short-term deployment in Jedediah Smith Redwoods State Park and the Gasquet Ranger Station, both of which are located on US Route 199. A slide detection station, to be located near Patrick’s Creek on US Route 199, may help to further improve traveler safety and security. There are also short-term recommendations for regional incident management plans for US Route 101 from the Humboldt County line to the US Route 199 junction, and then continuing on US Route 199 to the Oregon state line.

#### 7.4.2.2 Additional Deployment

A fully developed list of recommended deployments for Del Norte County is located in Table F-2. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Figure F-9 indicates a couple of locations that are targeted for ITS technologies to address weather-related transportation challenges. Flood warning systems are recommended for a broad length of US Route 101 between US Route 199 and the Humboldt County line, with specific sections to be identified for long-term deployment through a more detailed engineering analysis. An automated visibility warning system is recommended for US Route 199 just east of US Route 101 in the medium-term, and in the long-term for two locations on US Route 101.

Many transportation safety challenges in Del Norte County are related to narrow clear zones caused by the local topography. As shown in Figure F-10, advanced warning systems for narrow lane widths are recommended for medium-term deployment at one location on US Route 101 and two locations on US Route 199. Narrow clear zones may be compounded by heavy bicycle and pedestrian traffic around tourist destinations. Consequently, there are recommendations for advanced bicycle/pedestrian warning systems in Crescent City (medium-term) and Cushing Creek on US Route 101 and for US Route 199 at the Collier Tunnel (both long-term). Because of the local change in travel speeds along US Route 101, intersection advance warning systems are recommended for Crescent City in the long-term. Advisory television is recommended for medium-term deployment in Crescent City, to provide travelers with pre-trip information about potential traveler safety concerns.

In the long-term, it is recommended that locations with narrow lane widths would be addressed better through lateral safety warning systems. As shown in Figure F-11, these are recommended for the same locations as the advance warning systems for narrow lane widths described earlier. No additional VMS are recommended for the county. An additional HAR site is recommended for Klamath, near the US Route 101 junction with State Route 169, as a long-term deployment.

Emergency Services. The short-term vision for Del Norte County for emergency services is to focus on regional incident management plans, as described earlier. As shown in Figure F-12, it is recommended that the short-term incident management plan for US Route 101 be extended from Crescent City to the Oregon state line in the medium-term. In the medium-term, the focus would be on encouraging the usage of mayday systems on US Route 101 from Humboldt County to the US Route 199 interchange, continuing on US Route 199 to the Oregon state line. Rural coordinate addressing would be recommended for this same corridor in the long-term.

Tourism and Traveler Information Services. Kiosks and 1-800 travel advisory telephone hotlines are the key ITS applications recommended in this critical program area, as shown in Figure F-13. The telephone system would be used primarily to advise motorists of road closures due to slides and floods along US Route 101 between Crescent City and the Humboldt County line, and on all of US Route 199 in Del Norte County, with an additional emphasis on tourism information at Jedediah Smith Redwoods State Park. Each of these telephone systems are recommended for medium-term deployment. In addition to the short-term recommendations described earlier, kiosks are recommended for long-term deployment in Crescent City and at the Collier Rest Area. In the long-term, it is envisioned that in-vehicle route guidance systems may be able to provide travelers with improved traveler and tourist information. It is recommended that these systems would focus initially on US Route 101 from Humboldt County to US Route 199, then continuing on US Route 199 to Oregon.

Public Traveler/Mobility Services. The primary focus for public traveler/mobility services is on the tourist traffic that visits Del Norte County. In the medium-term, it is recommended that improved transit information be provided for travelers destined to Jedediah Smith Redwoods State Park. In the long-term, this information would be supplemented with improved parking management systems and recreational vehicle park and ride lots with surveillance, connected to the park by shuttle service. Other long-term recommendations – automated passenger counting, on-board transit safety systems, and transit vehicle routing/scheduling software – are provided to help local transit providers increase the efficiency of their operations. These recommendations are shown in Figure F-14.

Infrastructure Operations and Maintenance. CCTV cameras are the primary short-term emphasis in this critical program area for Del Norte County, as shown in Figure F-15. In the medium-term, advanced vehicle detection is recommended for US Route 101 at postmile 21.15, and at two locations on US Route 199 (postmiles 1.25 and 27.05) in conjunction with narrow clear zone challenges. Long-term recommendations for advanced vehicle detection include several areas along US Route 101 to better foresee flood conditions, a CCTV camera at the US Route 101/Route 169 junction near Klamath, and an additional RWIS on US Route 101 due to local low-visibility challenges.

Fleet Operations and Maintenance and Commercial Vehicle Operations. No ITS applications are recommended in the area of fleet operations and maintenance for Del Norte County. As shown in Figure F-16, there are recommendations for improved management of hazardous materials shipments in the county. In the medium-term, the focal area is US Route 101 between Humboldt County and the Oregon state line; in the long-term, this would be recommended for US Route 199 between US Route 101 and the Oregon state line.

### *7.4.3 Humboldt County*

Humboldt County also borders the Pacific Ocean and experiences a large volume of tourist traffic traveling on US Route 101. Humboldt County also experiences poor visibility and road closures due to adverse weather on US Route 101 and State Route 299, and narrow shoulders/clear zones along Highway 101. Pedestrian and bicycle challenges are present in the urban areas of the county, as well.

#### 7.4.3.1 Short-term Priorities

The greatest concentration of short-term ITS activity is along US Route 101 in Eureka. Fourteen CCTV cameras are recommended for deployment over a nine-mile corridor through Eureka. This corridor also includes seven advanced vehicle detection systems, to record real-time traffic volumes and speeds. Six other cameras are recommended for Humboldt County along US Route 101: two at the north end of the county, two at the State Route 299 junction, and two at the junction with State Route 36. These last four CCTV locations are all collocated with variable message signs, which also are recommended for short-term deployment. Four locations are recommended for short-term deployment of RWIS in Humboldt County: three along US Route 101 (near the Mendocino County line, at postmile 30, and a few miles north of the Boyce Creek viaduct), and one along State Route 299 at Berry Summit. These would be integrated with an Advanced Rural Technology Integration Center (ARTIC), which may be transitioned into a Satellite Operation Center that would be connected to the Regional Transportation Management Center in Oakland. This ARTIC, located in Eureka, would serve to coordinate transportation and emergency management functions for Caltrans District 1, and would be run by both Caltrans and CHP.

Automated gate closure systems on the Eureka Channel Bridge (State Route 255) are also recommended for short-term deployment. Regional incident management plans are recommended for short-term implementation on US Route 101 from Eureka to Del Norte County, and on State Route 299. Other short-term recommendations include animal-vehicle collision warning systems in northern Humboldt County on US Route 101 and highway advisory radio for Eureka.

#### 7.4.3.2 Additional Deployment

A fully developed list of recommended deployments for Humboldt County is located in Table F-3. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Figure F-17 shows several systems that are recommended for deployment in Humboldt County to address weather-related challenges. Flooding of roadways is a significant problem in Humboldt County that may be better identified through automated flood warning systems. These systems are recommended for medium-term deployment on three locations on State Route 96, and for long-term deployment along US Route 101 north of Eureka toward Del Norte County, and spot locations on US Route 101 and State Routes 36 and 211. Automated visibility warning systems are recommended for the long-term at three sites: at Berry Summit on State Route 299, at the southern end of US Route 101 in Humboldt County, and on the Eureka Channel Bridge. Anti-icing systems, which can provide for localized weather treatment without the need to immediately dispatch maintenance crews, are recommended in the medium-term for US Route 101 near postmile 133 and on State Route 299 at Berry Summit.

Other traveler safety and security technologies recommended for Humboldt County are shown in Figures F-18 and F-19. Bicycle and pedestrian traffic is a significant safety concern in Humboldt County. To address this, advanced bicycle/pedestrian warning systems are recommended for Arcata and Eureka (both medium-term), as well as for the Mad River Bridge on US Route 101 (long-term). In addition to the location mentioned under short-term deployment, animal-vehicle collision warning systems are recommended in the medium-term along US Route 101 at two locations. Intersection advance warning systems are recommended in the long-term for US Route 101 south of Eureka and the junction of US Route 101 with State Route 36. Three locations are identified for the medium-term deployment of advanced warning systems for narrow lane widths: US Route 101 between postmiles 1.2 and 2.9, US Route 101 between postmiles 121.8 and 122.7, and State Route 299 between postmiles 29.9 and 32.8. In the long-term, it is recommended that lateral safety warning systems be considered for each of these locations. Advisory television, to provide improved pre-trip traveler information about local transportation challenges, is recommended for Eureka (medium-term), Fortuna and McKinleyville (both long-term).

As indicated in Figure F-19, increased deployment of HAR and VMS is recommended as medium and long-term priorities. In the medium-term, HAR is recommended for Garberville, for US Route 101 at postmile 35.1, and for State Route 299 at postmile 19. Variable message signs are recommended in the medium-term for eastbound State Route 299 at the Trinity County line, and at the junction of State Routes 96 and 299. Long-term recommendations for HAR are intended to address a variety of challenges: road closure and tourist information at the US Route 101/State Route 36 junction, local information at Orick on US Route 101, and information on visibility challenges on State Route 299 in eastern Humboldt County. Dynamic warning VMS are recommended to assist motorists in handling visibility challenges at two locations: Berry Summit in the medium-term, and US Route 101 in the long-term.

Emergency Services. There are many recommendations for ITS applications related to emergency services for Humboldt County, as shown in Figure F-20. Additional regional incident management plans are recommended for US Route 101 between postmiles 0 and 57 in the medium-term, and in the long-term for State Routes 36 and 96 across the county. Mayday systems are recommended for medium-term deployment on the primary east-west routes across the county – state routes 36, 99 and 299 – along with US Route 101 from Arcata to Del Norte County. Rural coordinate addressing systems are recommended for State Routes 96 and 299 in the medium-term, and for State Route 36 and US Route 101 north of Arcata in the long-term.

Tourism and Traveler Information Services. There is a less immediate emphasis on tourism and traveler information in Humboldt County compared to traveler safety and security, as shown in Figure F-21. The primary ITS application recommended for traveler information in Humboldt County is 1-800 travel advisory telephone hotlines. Systems are recommended in conjunction with several tourist locations as well as locations subject to slide and flood-related road closures. All of these are medium-term recommendations. In the long-term, kiosks are recommended to be placed at several sites throughout the county, including State and National Parks, rest areas and welcome centers. In-vehicle route guidance systems are recommended in the long-term to help with road closures along much of US Route 101, and along State Routes 36 and 96.

Public Traveler/Mobility Services. Humboldt County is well-served by several transit systems; accordingly, there are many ITS applications recommended to improve public transit and mobility. The medium-term emphasis in this area is on improving transit traveler information, as shown in Figure F-22. There are two corridor focus areas – one on US Route 101 between postmiles 70 and 110, and the other along State Route 299 between Eureka and postmile 20. Localized transit traveler information is recommended to assist travelers destined to Redwood National Park or Humboldt Redwoods State Park. Parking management and shuttle-serviced recreational vehicle park and ride lots are recommended in the long-term in conjunction with these tourist destinations. Dynamic ridesharing and paratransit is recommended in the long-term to improve mobility along State Route 299 and on US Route 101 between Eureka and the Del Norte County line. Other systems to improve the efficiency and operations of existing fixed-route systems – automated passenger counting, on-board transit safety systems, and transit vehicle routing/scheduling software – are recommended for long-term deployment.

Infrastructure Operations and Maintenance. As can be seen in Figure F-23, this critical program area is a primary short-term focus for ITS applications in Humboldt County. Further deployment is recommended, especially in the area of advanced vehicle detection, where seventeen additional locations are recommended. These locations are primarily in connection with areas susceptible to floods and slides, as well as areas with narrow shoulder and clear zone challenges. CCTV cameras are recommended for joint medium-term deployment with variable message signs described earlier, on State Route 299 eastbound entering Trinity County and at the junction of State Routes 96 and 299. Long-term deployments include an additional automated gate closure system at the western terminus of State Route 36 at US Route 101, and an RWIS site on State Route 96 at postmile 15.

Fleet Operations and Maintenance and Commercial Vehicle Operations. Figure F-24 shows recommendations for ITS applications in the areas of fleet operations and maintenance and commercial vehicle operations. Weigh-in-motion technology with preclearance for commercial vehicles is recommended in the medium-term for deployment near existing weigh stations on US Route 101 at postmiles 34 and 97. Improved management of hazardous materials incidents is recommended for the length of US Route 101 (medium-term) and State Route 299 (long-term) through the county. Probe vehicle instrumentation is recommended in the medium-term for fleet vehicles traveling east-west along either State Route 36 or State Route 299. Finally, automatic vehicle location is recommended in the medium-term for fleet vehicles based in Eureka.

### *7.4.4 Lassen and Plumas Counties*

Lassen and Plumas Counties[9] are located along the California-Nevada border. Within the portion of these counties that is within the study area, visitors and residents use US Route 395, and State Routes 36, 44, 139 and 299 when traveling in or through these counties. Some of the major issues in these counties include long notification and response times when an incident occurs.

#### 7.4.4.1 Short-term Priorities

The primary location of ITS activity in these counties in the short-term is Fredonyer Summit, located between postmiles 11 and 13 on State Route 36 in Lassen County. In response to hazardous conditions created by a combination of winter weather and sharp curves, several ITS applications are being recommended for short-term deployment. Two RWIS sites would be integrated with extinguishable message signs, which are used only to indicate one fixed message whenever conditions warrant, to provide motorists warnings about icy conditions. One CCTV camera near the summit would provide additional information on conditions for maintenance crews about the presence of wintry driving conditions.

Fredonyer Summit is not the only location in this part of the COATS study area to have recommendations for short-term deployment. Within the study area, there are six other recommendations for deployment of CCTV cameras in the short-term: two at junctions of State Route 36 (State Route 44 and US Route 395), two in Susanville, one at Big Valley Mountain Summit on State Route 299 and one at Sage Hen Summit on US Route 395. RWIS would be collocated with the cameras at Big Valley Mountain and Sage Hen Summits.

[9] Only the portion of Plumas County north of and including State Route 36 is included in the COATS study area.

#### 7.4.4.2 Additional Deployment

A fully developed list of recommended deployments for Lassen and Plumas Counties is located in Table F-4. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Most of the recommended locations for ITS deployment in the area of traveler safety and security are long-term, as shown in Figures F-25, F-26 and F-27. These include five VMS, primarily near major junctions, and four HAR locations, primarily on State Route 36. Medium-term recommendations for Lassen and Plumas Counties include advisory television (to provide improved pre-trip traveler information) for Susanville, motorist-aide call boxes along US Route 395 between Susanville and the Modoc County line, and an automated visibility warning system along State Route 44 in Lassen County to help during white-out conditions. Other long-term recommendations for ITS applications related to traveler safety and security include advanced bicycle/pedestrian warning systems in Susanville, animal-vehicle collision warning systems and driver impairment detection for much of US Route 395, and automated anti-icing systems at Fredonyer Summit.

Emergency Services. Regional incident management and mayday systems are the areas of primary focus for ITS applications related to emergency services, as shown in Figure F-28. In the medium-term, regional incident management plans are recommended for State Route 36 across Lassen and Plumas Counties. Mayday systems along US Route 395, where emergency notification and response times are higher, are recommended for medium-term deployment, as is rural coordinate addressing on State Route 299. Rural coordinate addressing is considered to be a long-term priority for US Route 395 and State Route 36 in Lassen County.

Tourism and Traveler Information Services. As shown in Figure F-29, the primary emphasis in this program area in these counties will be the long-term support of in-vehicle route guidance systems along State Route 36, to provide improved real-time information about road closures.

Public Traveler/Mobility Services. Long-term recommendations for ITS applications in public traveler/mobility services are intended to help local transit agencies provide more efficient transit service to these low-population density counties. Specific technology applications include automated passenger counting, on-board transit safety systems, and transit vehicle routing/scheduling software, as shown in Figure F-30. The software could be of particular benefit in helping to coordinate transit service across these counties.

Infrastructure Operations and Maintenance. The primary focus of deployment in infrastructure operations and maintenance in Lassen and Plumas Counties is an extensive network of CCTV cameras and RWIS sites, as shown in Figure F-31. Seven additional cameras and four additional RWIS are recommended for long-term deployment, beyond those included among short-term deployments. Several of these are collocated in order to share power and communications. There is also a long-term recommendation for a satellite traffic operations center at Susanville beyond the existing center in Redding in Shasta County, which may be able to manage transportation in the eastern part of the state more effectively.

Fleet Operations and Maintenance and Commercial Vehicle Operations. Probe vehicle instrumentation is considered to be a vital, long-term tool in this area, as shown in Figure F-32. Recommended deployment segments include State Routes 36, 44 and 299. Automatic vehicle location is recommended for Susanville, to assist in the management of fleets over the area.

### *7.4.5 Mendocino County*

Mendocino County borders the Pacific Ocean and is located in the southern portion of the COATS Study Area. Residents of this county experience high tourist traffic along Highways 101 and 1. Challenges in this area include long notification and response times and a large number of road closures on Highways 101, 1, 20 and 162.

#### 7.4.5.1 Short-term Priorities

Seven variable message signs, each accompanied by a CCTV camera, are recommended for deployment in Mendocino County. Recommended locations include two near the US Route 101 / State Route 20 junction near Redwood Valley, one near the US Route 101 / State Route 20 junction near Willits, one north of Willits on US Route 101, one near Fort Bragg on State Route 20, and two near the junction of US Route 101 with State Route 1. The VMS address a variety of safety and information related criteria; the CCTV will be used for verification of VMS messages and surveillance of traffic conditions at these key locations.

Also recommended for short-term deployment is a regional incident management plan along State Route 1, from Fort Bragg to the US Route 101 junction, due to this area’s isolation from major population centers. Advanced vehicle detection would be used to assist in detecting traffic volume and speed changes that may indicate flooding on US Route 101 north of Willits. RWIS locations on US Route 101 at postmiles 41.17 and 82.20 would be used to identify visibility challenges and the potential need to close roads due to bad weather, respectively.

#### 7.4.5.2 Additional Deployment

A fully developed list of recommended deployments for Mendocino County is located in Table F-5. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Weather challenges in Mendocino County include occasional ice formation on roadways, low visibility, and flooding. ITS applications to address these challenges are shown in Figure F-33. A visibility warning system is also recommended for US Route 101 between postmiles 90 and 92. Automated flood warning systems are recommended for deployment on US Route 101 between postmiles 46 and 59. An automated anti-icing system is recommended for US Route 101 near Brushy Mountain. These systems are all recommended for long-term deployment.

Other ITS applications for Mendocino County in the area of traveler safety and security are shown in Figures F-34 and F-35. In the medium-term, advanced warning systems for narrow lane widths are recommended at two locations along US Route 101: between postmiles 50.7 and 51.2 and around Confusion Hill (near postmile 100.2). Dynamic warning variable message signs are recommended in conjunction with the automated visibility warning system on US Route 101 between postmiles 50.7 and 51.2 to address visibility challenges. Other recommendations for medium-term deployment in Mendocino County include an advanced bicycle/pedestrian warning system for Willits, an animal/vehicle collision warning system for US Route 101 between postmiles 65 and 67, and a HAR/VMS combination on US Route 101 near postmile 92.

Recommendations for long-term deployment of ITS applications related to traveler safety and security in the county include an advance warning system for narrow lane widths along State Route 1, an advisory television station based in Willits, two intersection advance warning systems (one at the US Route 101/State Route 1 junction, and the other at the US Route 101/State Route 162 junction), two lateral safety warning systems (one on US Route 101 near postmile 51 with the other on State Route 20 between State Route 1 and US Route 101), an HAR site at postmile 21.1 on State Route 20, and a VMS location at postmile 30 on State Route 20.

<u>Emergency Services</u>. Regional incident management plans are the primary emphasis of emergency services ITS applications in Mendocino County, as shown in Figure F-36. In addition to the short-term priority for developing a State Route 1 incident management plan, there is a medium-term priority to develop an incident management plan for US Route 101, and a long-term recommendation for State Route 20. There are medium-term recommendations for mayday systems and rural coordinate addressing systems on State Route 162 from US Route 101 to Covelo.

<u>Tourism and Traveler Information Services</u>. Recommendations for ITS applications related to tourism and traveler information systems are shown in Figure F-37. The primary emphasis in Mendocino County is on the usage of 1-800 travel advisory telephone hotlines, to provide both tourist information as well as information on slide or flood-related road closures. Medium-term application areas include State Route 1, US Route 101 between postmiles 46 and 90, and State Route 20. There are long-term recommendations for the location of six kiosks in Mendocino County, with three at rest areas, one at MacKerricher State Park on State Route 1, one at the Ukiah Chamber of Commerce, and one at Fort Bragg. In-vehicle route guidance systems are also recommended for long-term application on State Route 1 and US Route 101, in order to provide vehicles with improved real-time information on road closures.

<u>Public Traveler/Mobility Services</u>. Recommended locations for ITS applications in the area of public traveler/mobility services are shown in Figure F-38. One focal area will be MacKerricher State Park, in addition to other tourist destinations, where improved parking and transit information along with recreational vehicle park and ride lots with surveillance may help to encourage transit access to tourist sites. Long-term recommendations of automated passenger counting, on-board transit safety systems, and transit vehicle routing and scheduling are made for the Mendocino Transit Authority, along with Willits and Laytonville. Smart card applications are recommended for the Mendocino Transit Authority in the long-term as well.

<u>Infrastructure Operations and Maintenance</u>. Several advanced vehicle detection sites are among the ITS applications recommended in this critical program area for Mendocino County, as shown in Figure F-39. These locations, primarily along US Route 101 are intended to gather better traffic information in areas prone to floods (postmiles 46 and 59) and to address narrow clear zone challenges (postmile 50.4). An automated gate closure system is recommended in the long-term for US Route 101 at postmile 60, where road closures due to bad weather may be

frequent. A CCTV camera is recommended for medium-term deployment in conjunction with a planned VMS on US Route 101 at postmile 92. Finally, an RWIS is recommended for medium-term deployment along State Route 1 at postmile 80.

Fleet Operations and Maintenance and Commercial Vehicle Operations. Figure F-40 indicates the ITS applications related to freight operations and maintenance and commercial vehicle operations that have been recommended for Mendocino County. Medium-term implementation of weigh-in-motion and preclearance systems are recommended at existing weigh stations on State Route 20 at postmile 34 and US Route 101 at postmile 49. Probe vehicle instrumentation on State Route 20, continuing into Lake County, is recommended as a way to more effectively utilize fleet vehicles in this area. Improved hazardous materials management is recommended for US Route 101 (medium-term) and State Route 20 (long-term).

### *7.4.6 Modoc County*

Modoc County is bordered by Nevada to the east and Oregon to the north. Travelers mainly use US Route 395, and State Routes 139 and 299 to travel to, from, and through Modoc County. Though located primarily in Siskiyou County, Lava Beds National Monument's primary access is from State Route 139 in Modoc County. When an incident occurs in this area, travelers may experience long notification and response times.

#### 7.4.6.1 Short-term Priorities

Short-term ITS recommendations for Modoc County are focused around Alturas, the county's largest city, where three VMS (two on US Route 395 and one on State Route 299) and a FM HAR site at the Alturas Maintenance Station will help to provide information for travelers about potential road closures and other travel advisories. In addition, a CCTV camera will be located on State Route 299 at Cedar Pass (postmile 51.3).

#### 7.4.6.2 Additional Deployment

A fully developed list of recommended deployments for Modoc County is located in Table F-6. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. As shown in Figure F-41, no ITS applications are recommended for deployment to deal with localized weather conditions, such as automated flood or visibility warning systems. Instead, one of the major transportation challenges in the county is animal-vehicle collisions. As shown in Figure F-42, animal-vehicle collision warning systems are recommended for long-term deployment along State Route 299 and US Route 395, to warn motorists of the presence of large animals near the roadway. Motorist-aide call boxes, recommended in the medium-term on State Route 299 and on US Route 395 from Alturas south to the Lassen County line, may be used to help improve emergency notification time in the county. These may be of value to motorists after collisions with animals or other vehicles.

In the long-term, additional deployment of HAR and VMS is recommended throughout the county, as shown in Figure F-43. One of each would be located near the southern junction of State Routes 139 and 299 in Adin, while one of each would also be located at the northern junction of State Routes 139 and 299 in Canby. Another transportation concern in the county is fatigued or intoxicated drivers; these may be assisted through driver impairment detection systems, which are recommended in the long-term for State Route 139.

Emergency Services. Emergency response and notification time challenges in Modoc County will be addressed through mayday systems and rural coordinate addressing systems, as shown in Figure F-44. Mayday systems are recommended as medium-term solutions for State Route 299 across the county, and on US Route 395 between Alturas and the Lassen County line. Rural coordinate addressing systems are recommended for both of these segments of roadway as well, with State Route 299 being a medium-term recommendation and US Route 395 being a long-term recommendation.

Tourism and Traveler Information Services. As shown in Figure F-45, there are no recommendations for tourist or traveler information systems in Modoc County, beyond the HAR and VMS locations described earlier.

Public Traveler/Mobility Services. There are long-term recommendations for improving public traveler and mobility through ITS applications, as shown in Figure F-46. These recommendations focus on automated passenger counting, on-board transit safety systems, and transit vehicle routing/scheduling software. The software may be valuable in coordinating transit provision across county and jurisdictional lines.

Infrastructure Operations and Maintenance. All recommendations for ITS applications related to infrastructure operations and maintenance are long-term, as shown in Figure F-47. CCTV cameras are recommended for long-term deployment at eight locations in Modoc County. Six of the locations are located on State Route 299, primarily to deal with response time challenges. There are three sites recommended for RWIS stations in the long-term: on State Route 139 at Tionesta Road (the turnoff for Lava Beds National Monument), on State Route 299 at Adin Mountain Summit, and on State Route 299 near the Cedar Pass Sandhouse. Each of these RWIS are collocated with CCTV, in order to better utilize power and communications infrastructure.

Fleet Operations and Maintenance and Commercial Vehicle Operations. In the area of fleet operations and maintenance, there are long-term recommendations for automatic vehicle location in and around Alturas, and for probe vehicle instrumentation along State Route 299, as shown in Figure F-48. These systems should help to improve the utilization of fleet vehicles in this sparsely populated county. There are no recommendations for ITS applications related to commercial vehicle operations in Modoc County.

### *7.4.7 Shasta County*

Shasta County is home to Redding, the largest city in the California portion of the COATS study area, as well as two National Park Service land units: Lassen Volcanic National Park and Whiskeytown-Shasta-Trinity National Recreation Area. Interstate 5 is the major north-south route in the COATS study area, and consequently experiences high commercial vehicle traffic volumes. State Routes 44 and 299 are the county’s primary east-west routes. Some of the transportation challenges include crashes due to drowsy drivers, road closures due to adverse weather conditions and vehicle crashes, long emergency notification and response times, and bicycle and pedestrian traffic.

#### 7.4.7.1 Short-term Priorities

The primary short-term focus of ITS applications in Shasta County is the upgrading of Caltrans/CHP traffic management functions in Redding. The functions will be housed as an Advanced Rural Technology Integration Center (ARTIC) on a demonstration basis, and may be later transitioned into a Satellite Operation Center, connected to the regional transportation management center at Sacramento. The Redding ARTIC will be responsible for traffic management on state-managed roadways in Caltrans District 2, and will consequently utilize significant portions of the ITS infrastructure in District 2.

Other short-term priorities in Shasta County include CCTV cameras, six of which are recommended for deployment. Four of these locations are along Interstate 5 to supplement two existing locations in Redding. Additional locations include State Route 273 in Redding and at the junction of State Routes 89 and 299. Advisory television is recommended for greater Redding to provide pertinent about current travel conditions, perhaps including information on conditions into Oregon on Interstate 5. An advanced bicycle/pedestrian warning system is recommended for the Pit River Bridge along Interstate 5. In addition to these technological solutions, a regional incident management plan is recommended for Interstate 5 through the length of the county, and for State Route 299 between Redding and the Trinity County line. Rural coordinate addressing is recommended as a short-time priority for the entire lengths of State Routes 36, 89 and 299 in Shasta County. This may help to reduce emergency notification times.

#### 7.4.7.2 Additional Deployment

A fully developed list of recommended deployments for Shasta County is located in Table F-7. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. As can be seen in Figures F-49, F-50 and F-51, significant deployment of traveler safety and security ITS applications is recommended for Shasta County. Long-term deployment of automated visibility warning systems is recommended at Churn Creek Bottom on Interstate 5, and on State Route 299 at Hatchet Mountain.

As shown in Figure F-50, an advisory television system is recommended for Burney as a medium-term deployment, to supplement the short-term system recommended for Redding. Motorist-aide call boxes are recommended as medium-term deployments along Interstate 5, and State Routes 89 and 299. These provide motorists with a greater sense of security in the event that they experience a breakdown or incident, especially on the portions of these roads with lower traffic volumes. Advanced bicycle/pedestrian warning systems are recommended for medium-term deployment in the Redding area and at Antlers on Interstate 5. Intersection advance warning systems, which are used to help reduce crash frequency and severity on the fringe of more urbanized areas, are recommended for deployment in Redding (medium-term) and Anderson (long-term). Animal-vehicle collision warning systems are recommended in the long-term for State Route 44 from State Route 89 into Lassen County.

Figure F-51 shows that VMS are the most commonly deployed safety-related application in the county, with eight medium-term and 15 long-term sites recommended to supplement four existing sites in the county. All medium-term sites are located along Interstate 5 through the county, while the long-term sites are on travel routes with lesser traffic volumes, including State Routes 44, 89 and 299. Many signs are typically located to take advantage of existing bridge structures, while others are located near key junctions, such as at the junction of State Routes 44 and 89 near Lassen Volcanic National Park, and the junction of State Routes 89 and 299 east of Burney. Highway advisory radio will be used in conjunction with VMS to provide traveler information. A medium-term deployment is recommended for Castella on Interstate 5, while long-term deployments are recommended for Shingletown and Old Station on State Route 44. Dynamic warning VMS is recommended to warn motorists of sharp curves on State Route 299 eastbound Shasta County, and at postmiles 35 to 40.

<u>Emergency Services</u>. Figure F-52 shows the ITS applications related to emergency services that are recommended for Shasta County. Mayday systems are recommended for medium-term deployment on State Route 299 east of Redding, and on State Route 36. Long-term deployment of these systems, which rely on infrastructure jointly provided through equipped vehicles and the cellular telecommunications companies, is recommended for State Route 89 in the more mountainous eastern part of the county. Regional incident management plans, beyond those recommended in the short-term, are proposed for State Route 44 (medium-term) and State Route 89 between State Route 44 and the Siskiyou County line (long-term). Within cities, traffic signal prioritization for emergency vehicles is recommended as a way to accelerate the passage of emergency vehicles through potentially congested signalized networks in downtown Redding and Anderson. Both of these systems have recommended medium-term deployment. These will require investment in in-vehicle beacons by emergency services providers and in compatible detection equipment at signalized intersections by Caltrans, Shasta County and/or the municipalities.

<u>Tourism and Traveler Information Services</u>. Kiosks are recommended to be the principal technology for disseminating traveler and tourism information in Shasta County, as shown in Figure F-53. Medium-term deployment is recommended for the Lakehead and O’Brien Rest Areas on Interstate 5, at the Churn Creek Bottom truck stop south of Redding, and at the northern entrance to Lassen Volcanic National Park. A kiosk is recommended as a long-term deployment at the Knighton Road truck stop, which is approximately three miles south of the Churn Creek Bottom truck stop. In-vehicle route guidance systems are recommended as a long-term method of providing tourism and traveler information to motorists. Key application areas for this technology include Interstate 5, State Route 299 and State Route 89 north of State Route 299.

<u>Public Traveler/Mobility Services</u>. The Redding Area Bus Authority, along with other local transit providers, represent the prime target for public traveler and mobility ITS applications in Shasta County, as shown in Figure F-54. Systems recommended for application in Redding include automated passenger counting, on-board transit safety systems, parking management and information systems, transit traveler information, and transit vehicle routing/scheduling software. All of these priorities are recommended for long-term implementation, with the exception of the transit vehicle routing/scheduling software, which is recommended for medium-term deployment. Some of these systems are also deemed as having

applicability to inter-city transit providers serving the county. Recreational vehicle park and ride lots are recommended in conjunction with Lassen Volcanic National Park as a medium-term priority.

Infrastructure Operations and Maintenance. CCTV cameras and RWIS are the focus of ITS applications to improve infrastructure operations and maintenance, as shown in Figure F-55. Twelve additional cameras are recommended for the Interstate 5 corridor in the medium-term, with 23 additional cameras recommended for long-term deployment. Aside from two cameras located at rest areas on Interstate 5, the long-term locations are all on state highways. Several are clustered on State Routes 44 and 299 in the immediate vicinity of Redding, while others are located at mountain summits, rest areas, and key interchanges. On Interstate 5, RWIS is a medium-term priority, while it is a long-term priority on other locations in the county. The three medium-term RWIS deployments are located near the Fawndale Interchange, the Packers Bay interchange, and near Dog Creek. Four of the eight long-term RWIS locations are on State Route 299, primarily at mountain summits, with two each on State Routes 44 and 89.

Fleet Operations and Maintenance and Commercial Vehicle Operations. Higher commercial vehicle traffic volumes in Shasta County warrant medium-term deployments in the area of commercial vehicle operations, as shown in Figure F-56. Electronic pre-clearance of commercial vehicles at the State Route 299 weigh station at postmile 54 is recommended as a medium-term deployment to accompany the implementation of weigh-in-motion. Improved hazardous materials management, through maintaining a database of hazardous materials shipments to improve incident response, is recommended for Interstate 5 through the entire length of Shasta County as a medium-term deployment. In the area of fleet operations and maintenance, instrumentation of probe vehicles is recommended in the medium-term (Interstate 5 for most of the county) and the long-term (State Routes 36, 44 and 299 across the county). Automatic vehicle location is recommended for fleets based in Redding as a long-term application to improve fleet vehicle utilization.

### *7.4.8 Siskiyou County*

Siskiyou County, along with Jackson County in Oregon, is the focal area of the COATS early-winner project. The county’s primary travel route is Interstate 5, a major north-south route. which serves high commercial vehicle traffic volumes and may experience weather-related lane closures. Other significant routes in the county include US Route 97, which starts in Weed and provides a north-south alternative to Interstate 5, and State Routes 3, 89 and 96. Challenges within this county include crashes due to drowsy drivers, road closures due to vehicle crashes, and weather-related restrictions.

#### 7.4.8.1 Short-term Priorities

Many of the short-term deployments for Siskiyou County are focused on improving management of Siskiyou Pass, to improve both information gathering and information dissemination capabilities. For information gathering, two CCTV cameras are recommended for deployment within one mile of the state line, and will be strategic in evaluating how traffic is backing up from Siskiyou Pass during winter weather events. Five traffic monitoring stations are recommended for deployment within seventeen miles of the state border on Interstate 5, four of which are within seven miles of the state line. These will supplement information collected by the CCTV cameras to give operations personnel a better understanding of current traffic conditions. Advisory television in Yreka can provide valuable pre-trip information to motorists planning to go over Siskiyou Pass. A HAR site near Bailey Hill Road and a VMS site near Henley Way will help to provide motorists near the pass with better, real-time advisory information. A regional incident management plan is being developed, as a part of the early-winner project, to improve emergency response and coordination and to maximize the utility of real-time data collected near the pass.

There are many other recommendations for short-term deployment of ITS throughout the county. CCTV cameras are a dominant focus of short-term deployment in Siskiyou County, with most cameras located along Interstate 5. Eleven locations beyond those associated with Siskiyou Pass are recommended for short-term deployment of CCTV cameras; seven of which are on Interstate 5. Other camera locations are collocated with existing weather data stations in order to utilize existing structures, power and communications. Three camera locations are recommended for US Route 97, which is a key alternate for long-distance traffic in the event of congested conditions at Siskiyou Pass. Another camera is recommended for short-term deployment at Snowman's Hill Summit on State Route 89.

An upgraded HAR site is recommended at Interstate 5 near Walters Road, collocated with existing VMS in either direction. Two additional VMS are recommended along Interstate 5 in the short-term: one near the Abrams Lake Road interchange, and one north of Walters Road on Interstate 5 to provide information about high wind conditions. While the focus of incident management has been the development of the plan in conjunction with the Siskiyou Pass early winner project, it is recommended that the remainder of Interstate 5 be covered by a similar plan in the short-term. RWIS will be installed near Weed Airport and at Walters Road to work in conjunction with VMS to provide automated wind advisories to motorists.

#### 7.4.8.2 Additional Deployment

A fully developed list of recommended deployments for Siskiyou County is located in Table F-8. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. The area near Siskiyou Pass continues to be a major focal point for ITS deployment in the medium and long-term for traveler safety and security technologies, as shown in Figures F-57, F-58 and F-59. Medium-term deployments in the vicinity of the early-winner project include an additional HAR north of the Hornbrook Road/Ditch Creek Road interchange on Interstate 5, motorist-aide call boxes on Interstate 5, and variable message signs at Henley Way and Bailey Road. In the long-term, additional variable message signs would be located at postmiles 56 and 58 on Interstate 5, south of locations deployed earlier.

Continued expansion of variable message signing in the county is recommended over the medium and long-term. The early focus will be on Interstate 5, which has a significant portion of long distance trips that may benefit from improved en-route traveler information. A total of six signs are recommended for medium-term deployment (including the two near Siskiyou Pass) and four for long-term deployment (including two near Siskiyou Pass) are recommended along Interstate 5. In the long-term, VMS are recommended for deployment on roadways with lesser traffic volumes in the county. Two are located on US Route 97, near Weed and Dorris, to provide information on conditions over that route. Two additional signs are located near the junction of State Routes 96 and 263. Additional signs are located on State Route 3 south of Yreka and on State Route 89 east of McCloud. Long-term deployment of HAR is recommended at State Route 96 at the Trinity County line and on US Route 97 in Dorris, in order to provide more detailed en-route traveler information.

The advisory television system deployed as a short-term project in Yreka is recommended for medium-term expansion into Weed and Mt. Shasta. Motorist-aide call boxes along Interstate 5 and State Route 89 are recommended as medium-term projects to promote traveler security. Animal-vehicle collisions on Interstate 5 between postmiles 24 and 26 warrants a medium-term recommendation for an animal/vehicle collision warning system. Another spot location that may be addressed through ITS is the Sacramento River Bridge in Dunsmuir, where regular ice formation results in a recommendation for deployment of an automated anti-icing system on the bridge. Advanced bicycle/pedestrian warning systems are recommended for Yreka as a medium-term project. Finally, a lateral safety warning system is recommended as a long-term deployment for State Route 3 northeast of Yreka.

Emergency Services. In ITS applications related to emergency services, regional incident management plans are a focal point of effort for Siskiyou County, as shown in Figure F-60. In addition to the short-term plans for the Interstate 5 corridor, a plan is recommended for medium-term deployment on State Route 97, and for long-term deployment on the southern end of State Route 96 and on State Route 89. Rural coordinate addressing systems are recommended for medium-term deployment on State Routes 89 and 96 throughout the county, in order to improve emergency notification time. These would be accompanied by mayday systems in the medium-term on State Route 96 and in the long-term on State Route 89. Mayday systems are also recommended for the entire length of State Route 3 within the county.

Tourism and Traveler Information Services. Traveler information kiosks and 1-800 travel advisory telephone hotlines are key components for disseminating traveler information in Siskiyou County, as shown in Figure F-61. Kiosks are recommended for medium-term deployment at the Randolph Collier and Weed Rest Areas, and at the Dunsmuir truck scales in the long-term. The telephone hotline is recommended specifically for State Route 96 between postmiles 0 and 20 (and continuing into Humboldt County) in the medium-term, in order to provide improved information about road closures due to slides and floods. In the long-term, in-vehicle route guidance systems are recommended to assist travelers in navigating road closures. Focal locations for these systems would be Interstate 5 south of Yreka, State Routes 89 and 97, and State Route 96 between postmiles 0 and 20.

Public Traveler/Mobility Services. ITS applications related to public traveler and mobility services are focused in Dunsmuir and Yreka, as shown in Figure F-62. Parking management and improved transit traveler information would be focused on Yreka, to improve transit utilization to nearby tourist sites. Automated passenger counting, on-board transit safety systems, and transit vehicle routing/scheduling are recommended for long-term implementation on existing fixed-route transit systems.

Infrastructure Operations and Maintenance. Improved management of Siskiyou Pass is a continuing focus of technologies related to infrastructure operations and maintenance, as shown in Figure F-63. Two additional medium-term CCTV cameras and one long-term CCTV camera, along with two additional RWIS sites in the medium-term are all located within ten miles of the state border. These will provide maintenance officials an even more detailed picture about current conditions on this critical regional roadway.

There are many deployment locations recommended outside of Siskiyou Pass as well. Four additional CCTV sites on Interstate 5 are recommended for medium-term deployment. Seven CCTV cameras are recommended for long-term deployment outside of Siskiyou Pass, including three on State Route 89, three on US Route 97, and one on State Route 3. Additional RWIS locations are recommended for the Anderson Grade Summit on Interstate 5 in the medium-term, and for locations along US Route 97 and State Routes 3, 89 and 96 in the long-term. Automated gate closure systems are recommended for long-term deployment just south of the Interstate 5 junction with State Route 89 on both routes, in order to facilitate closure-related detours as appropriate. Other locations are recommended further north on Interstate 5, just south of Yreka, and on State Route 3 near Callahan.

Fleet Operations and Maintenance and Commercial Vehicle Operations. The Weed weigh station on US Route 97 would be upgraded to include both weigh-in-motion and electronic commercial vehicle preclearance, as shown in Figure F-64. Utilization of instrumented probe vehicles and improved management of hazardous materials incidents along Interstate 5 should help to further improve fleet and commercial vehicle mobility in this critical corridor. These are recommended for medium-term implementation.

### *7.4.9 Tehama County*

Travelers, especially commercial vehicles, use Interstate 5 when traveling north and south and State Route 36 when traveling east and west through Tehama County. Tourists visit Tehama County when traveling to and from Lassen Volcanic National Park. The challenges in this area include narrow shoulders/clear zones, crashes due to drowsy drivers, high emergency notification and response times, and road closures due to adverse weather conditions.

#### 7.4.9.1 Short-term Priorities

Interstate 5 is the focal point for short-term ITS applications in Tehama county. Recommendations include a CCTV camera at the State Route 36 junction, an automated flood warning system south of Red Bluff accompanied by advanced vehicle detection, and a regional incident management plan extending from Red Bluff into Shasta County.

#### 7.4.9.2 Additional Deployment

A fully developed list of recommended deployments for Tehama County is located in Table F-9. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. As Figure F-65 indicates, a visibility warning system is recommended for Interstate 5 south of Red Bluff as a long-term priority. Some ITS applications with earlier priority levels are shown in Figure F-66. Motorist-aide call boxes along Interstate 5, advisory television for the Red Bluff vicinity, and advanced bicycle/pedestrian warning systems for Red Bluff are all recommended as medium-term priorities. The implementation of an advanced warning system for narrow lane widths on State Route 36 just west of Mineral is recommended in the long-term.

As indicated by Figure F-67, variable message signs are a major deployment priority in Tehama County. Four medium-term locations and one long-term location are along Interstate 5. Six additional VMS are recommended for deployment along State Route 36, primarily in the vicinity of Red Bluff, with two located near the State Route 89 junction, which provides access to Lassen Volcanic National Park. An additional sign would intercept southbound traffic on State Route 89 near the junction with State Route 36. Highway advisory radio is recommended for long-term deployment in Mineral on State Route 36. Another long-term focus area is State Route 36 between postmiles 76.6 and 78.7, due to narrow clear zone and road surface challenges. In addition to the advanced warning systems for narrow lane widths mentioned earlier, there are recommendations for a lateral safety warning system, automated anti-icing systems, and dynamic warning variable message signage in either direction would be implemented to address these challenges.

Emergency Services. State Route 36 is the focal point for ITS applications related to emergency services in Tehama County. As shown in Figure F-68, mayday systems are a medium-term priority west of Red Bluff and a long-term priority to the east. A regional incident management plan from Red Bluff to the Plumas County line is recommended for medium-term implementation, and rural coordinate addressing is recommended over the length of State Route 36 over the long-term.

Improved incident management through a regional incident management plan is also recommended over the long-term for the segment of State Route 89 from State Route 36 leading into Lassen Volcanic National Park.

Tourism and Traveler Information Services. Tehama County locations for ITS applications related to tourism and traveler information services are shown in Figure F-69. Recommended deployments for the medium-term include a 1-800 travel advisory telephone hotline in the vicinity of Lassen Volcanic National Park, and a kiosk at the Corning truck stop on Interstate 5. Long-term deployment focuses on in-vehicle route guidance systems, for the Park, as well as for State Route 36 from Red Bluff into Plumas County and on Interstate 5 north of Red Bluff.

Public Traveler/Mobility Services. Recommendations for public traveler and mobility services ITS applications are shown in Figure F-70. Lassen Volcanic National Park is recommended as a location that may be better served by transit through parking management systems and the implementation of surveillance at remote parking areas for recreational vehicles. Long-term deployments related to transit would focus on local and inter-city transit in the areas of automated passenger counting, on-board transit safety systems, and transit vehicle routing/scheduling software.

Infrastructure Operations and Maintenance. Numerous additional CCTV are recommended for deployment in Tehama County, as shown in Figure F-71. A medium-term deployment is recommended at the Interstate 5/Corning Road interchange, whereas long-term recommendations are located on Interstate 5 and State Routes 36 and 89. Three locations have been identified for long-term deployment of RWIS along State Route 36, each of which would be collocated with a CCTV camera in order to use power and communications more efficiently. Additional long-term recommendations include advanced vehicle detection on State Route 36 near milepost 77.7, in order to help identify traffic flow disruptions in this area with narrow roadway clearance, and an automated gate closure system for State Route 89 between the Park and State Route 36.

Fleet Operations and Maintenance and Commercial Vehicle Operations. The most immediate concern related to either fleet operations and maintenance or commercial vehicle operations in Tehama County is the improvement of response to hazardous materials accidents on Interstate 5. As shown in Figure F-72, this is recommended as a medium-term project extending on the length of Interstate 5 through the COATS study area. Long-term recommendations for Tehama County include automatic vehicle location for fleets based in Red Bluff, and probe vehicle instrumentation along State Route 36.

### *7.4.10 Trinity County*

State Routes 299 and 36 are the east-west routes and State Route 3 is the north-south route for travelers in Trinity County. Challenges within Trinity County include narrow shoulders/clear zones, high response times and road closures due to vehicle crashes, slides and inclement weather.

#### 7.4.10.1 Short-term Priorities

The short-term emphasis on ITS applications in Trinity County is emergency services. Rural coordinate addressing is a short-term recommendation for State Routes 299 and 36 through the county, in order to improve emergency response times. Regional incident management plans for State Route 299 in the western and eastern parts of the county are also short-term priorities. The only field elements recommended for short-term deployment in Trinity County are CCTV cameras to be located on State Route 299 at Oregon Mountain and Buckhorn Sandhouse. Each of these would be collocated with existing weather data stations.

#### 7.4.10.2 Additional Deployment

A fully developed list of recommended deployments for Trinity County is located in Table F-10. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Flooding is a major concern on Trinity County roadways, and several automated flood warning systems are recommended for medium-term deployment in the county, as shown in Figure F-73. Primary locations include State Route 299 between the Humboldt County line and Burnt Ranch, and on State Route 3 at Coffee Creek and the Swift Creek Bridge.

Another transportation concern in Trinity County are narrow clear zones. Figure F-74 indicates four locations where advanced warning systems for narrow lane widths are recommended to improve motorist information about this hazard. All of these are recommended for long-term implementation, as are lateral safety warning systems for many of the same sections (see Figure F-75). Motorist-aide call boxes along State Route 299 are recommended in the medium-term to reduce emergency notification time. Long-term deployments to provide en-route traveler information include three HAR sites and five VMS.

Emergency Services. Emergency services are a key short-term emphasis for ITS applications in Trinity County. As can be seen in Figure F-76, there are also recommendations for medium and long-term deployment in this functional area. Mayday systems are recommended in the medium-term for State Route 36, and in the long-term for State Route 3. A regional incident management plan is recommended for State Route 36 between postmiles 0 and 25 as a long-term deployment.

Tourism and Traveler Information Services. The primary function of tourism and traveler information systems in this county is to provide information on road closures. As shown in Figure F-77, 1-800 travel advisory telephone hotlines are recommended for medium-term implementation, to provide information on slide or flood-related road closures on State Routes 36 and 299 in the western part of the county. In the long-term, in-vehicle route guidance systems would be expected to fulfill a similar role in these corridors, as well as on the eastern part of State Route 299, east of Douglas City. A kiosk is recommended for long-term deployment at the Salyer Rest Area on State Route 299 as an alternative means for receiving tourism and traveler information.

Public Traveler/Mobility Services. The limited population base and challenging geography of Trinity County creates significant barriers for encouraging transit. Consequently, as shown in Figure F-78, the only ITS application recommended for Trinity County relating to public transit and mobility is dynamic ridesharing and paratransit along State Route 299. Currently, this route is marked with static signs posting a telephone number for those interested in ridesharing. This suggests that there may be a natural market for ridesharing here, perhaps between Redding and the Pacific coast. The dynamic ridesharing and paratransit system could provide improved real-time matching, increasing the convenience and potential of success in ridematching and trip reduction along this challenging highway.

Infrastructure Operations and Maintenance. Recommendations for ITS applications related to infrastructure operations and maintenance are shown in Figure F-79. Here also the focus is on technologies to support improved information gathering about potential or existing floods and slides. There are five medium-term and five long-term recommendations for advanced vehicle detection systems in the county, primarily in connection with areas of frequent road closures. An automated gate closure system is recommended for State Route 3 at postmile 62 to facilitate road closures. There are also recommendations for long-term deployment of CCTV cameras and RWIS. Three of the recommended locations for each technology are at mountain passes, in order to better survey traffic and weather conditions at these locations.

Fleet Operations and Maintenance and Commercial Vehicle Operations. As shown in Figure F-80, probe vehicle instrumentation for fleet vehicles traveling along State Routes 36 and 299 is a long-term recommendation in Trinity County. This information can supplement information collected from a variety of other sources to improve the efficiency and effectiveness of maintenance activities on these roads.

## 7.5 Oregon County-Level Deployment

This section will review existing and planned deployment for each of the Oregon counties that are within the COATS study area[10]. Tables and maps describing this deployment in greater detail may be found in Appendix G.

### *7.5.1 Coos County*

Located along the southern coast of Oregon, Coos County contains a portion of both US Route 101 and Oregon Route 42. Consequently, moving recreational, bicycle, and unfamiliar traffic through the county is a major challenge. Additionally, Coos County must deal with issues related to intersection traffic, poor visibility due to inclement weather, and commercial truck traffic.

#### 7.5.1.1 Short-term Priorities

The emphasis for short-term ITS applications in Coos County is on providing improved information to travelers and tourists, protecting bicycle and pedestrian traffic, and dealing with flood challenges. For traveler information, kiosks are recommended for short-term deployment at several tourist locations in the county, including Cape Arago, Shore Acres and Sunset Bay State Parks, and Face Rock State Scenic Viewpoint. Toll-free travel and tourism advisory hotlines are recommended for short-term implementation at Bullards Beach and Shore Acres State Parks. Bicycle and pedestrian traffic, which is a major concern on US Route 101, would be assisted in the short-term through advanced bicycle/pedestrian detection systems in North Bend and Coos Bay.

Due to local flooding, automated flood warning systems are recommended for three locations in the county: US Route 101 just south of Coos Bay, Oregon Route 42 from US Route 101 to milepost 5, and Oregon Route 42S between US Route 101 and Oregon Route 42. These systems will provide motorists with improved information on the presence of water on roadway conditions. Advanced vehicle detection along each of these segments will help to provide ODOT with real-time information about congestion and traffic slowdowns that may be resulting from flooded roadways or incidents.

In addition to these deployments, a VMS is recommended for short-term deployment on US Route 101 at the junction with Oregon Route 42. Two RWIS are recommended as well: one to deal with visibility challenges on Oregon Route 42 at milepost 10.8, and one at Cape Blanco on US Route 101.

#### 7.5.1.2 Additional Deployment

A fully developed list of recommended deployments for Coos County is located in Table G-2. A series of maps in the Appendices maps these deployments, according to critical program area.

[10] In some cases, deployments are indicated that extend beyond the boundaries of the study area. The specific location and prioritization for these deployments was not verified.

Traveler Safety and Security. Traveler safety and security ITS applications for Coos County are shown in Figures G-1, G-2 and G-3. Advanced bicycle/pedestrian warning systems would be extended to the communities of Coquille and Lakeside as medium-term projects, to help reduce collisions for travelers in this area that is popular for bicycle and foot travel. An advanced warning system for narrow lane widths is recommended for medium-term deployment on Oregon Route 42S due to its narrow, winding alignment. Intersection advance warning systems are recommended for Coquille and Myrtle Point along Oregon Route 42 for long-term deployment. Advisory television would be used to provide pre-trip traveler information on floods or other transportation challenges in Coos Bay. This is recommended for long-term deployment.

Two medium-term and four-long term deployments of VMS are recommended for the county. Medium-term locations are near Bandon and the Curry County line on US Route 101. Long-term locations include US Route 101 between Oregon Routes 42 and 42S, facing either direction on Oregon Route 42S at milepost 7, and on Oregon Route 42 near Coquille. These signs may provide fixed messages to travelers as conditions warrant. Dynamic warning variable message signs might provide vehicle-specific information on recommended speed reductions given reduced visibility. Systems are recommended for medium-term deployment on Oregon Route 42 near its junction with Oregon Route 42S, and for US Route 101 between North Bend and Coos Bay. Highway advisory radio will be used to provide additional information related to visibility challenges, as well as tourist information. HAR sites are recommended for medium-term deployment on US Route 101 near the Curry County line, on US Route 101 near Coos Bay, and at the junction of US Route 101 and Oregon Route 42.

Emergency Services. As shown in Figure G-4, the only recommended deployment in the area of emergency services for Coos County is a regional incident management plan. This is recommended for implementation in the medium-term on Oregon Route 42 from its junction with Oregon Route 42S into Douglas County.

Tourism and Traveler Information Services. Many technologies related to tourism and traveler information are recommended for Coos County in order to better inform tourists and other infrequent regional travelers of transportation challenges as well as tourism-specific information. These are shown in Figure G-5. Four additional kiosks are recommended for medium-term deployment on US Route 101: in North Bend at the Mill Casino, at Bullards Beach State Park, at Bandon State Natural Area, and at the Bandon Cheese Factory. For each of these kiosk locations, as well as the locations where kiosks were recommended for short-term deployment, 1-800 travel advisory telephone hotlines are recommended as an alternative means of providing information to tourists. Medium-term implementation of telephone information is recommended for the Mill Casino, with long-term for the remaining five tourist locations not covered under short-term implementation. In the long-term, it is envisioned that in-vehicle route guidance systems would be used to supplement information provided through kiosks and telephone at these locations, as well as along US Route 101 through Coos Bay and Oregon Route 42 across the county. In these latter two cases, the in-vehicle systems would focus more on providing information on road closures and challenging traveling conditions.

Public Traveler/Mobility Services. Transit traveler information is recommended for medium-term application in conjunction with the major tourist sites just described, in order to provide improved mobility. As shown in Figure G-6, these information systems may be augmented by parking management systems and surveillance-equipped recreational vehicle park and ride lots in the long-term to encourage greater utilization of local transit options to access tourist destinations. Long-term implementation of automated passenger counting, on-board transit safety systems, and transit vehicle routing/scheduling software is anticipated to improve the efficiency of transit service in the county, benefiting both tourists and local residents.

Infrastructure Operations and Maintenance. Little is recommended for infrastructure operations and maintenance outside of existing and short-term deployments in the county. As shown in Figure G-7, medium-term expansion of advanced vehicle detection along Oregon Route 42S is recommended to improve real-time information about potential flood conditions or roadway incidents.

Fleet Operations and Maintenance and Commercial Vehicle Operations. As indicated by Figure G-8, medium-term implementation of weigh-in-motion technology is recommended at the existing weigh station on US Route 101 north of North Bend, and at Myrtle Point on Oregon Route 42. The weigh-in-motion deployment at North Bend would be accompanied by commercial vehicle preclearance technology to improve the efficiency of freight movement on the US Route 101 corridor.

### *7.5.2 Curry County*

As the southwestern-most county in Oregon, Curry County's major travel route is US Route 101. Similar to Coos County, Curry County experiences high levels of tourist and bicycle traffic. Visibility during inclement weather conditions and traversing intersections also pose challenges for drivers along US Route 101.

#### 7.5.2.1 Short-term Priorities

Visibility and wind challenges guide several short-term deployments for Curry County. Dynamic warning variable message signs near Humbug Mountain and at milepost 321, along with an automated wind advisory system at Port Orford are recommended for short-term deployment to improve motorist warning of high-wind situations. Highway advisory radio in Brookings would help to provide information to motorists during low-visibility conditions. These will be supplemented by additional deployment of RWIS at mileposts 330 and 360 on US Route 101.

Tourist information is another key short-term emphasis, which would be addressed with the deployment of new kiosks at Harris Beach State Park, Port Orford, Meyer Creek, and the S.H. Boardman State Scenic Corridor. A regional incident management plan between approximately Port Orford and Gold Beach will help to improve emergency response and coordination. Finally, preclearance for commercial vehicles at the existing weigh station north of Brookings will help to improve commercial vehicle movement through the county.

#### 7.5.2.2 Additional Deployment

A fully developed list of recommended deployments for Curry County is located in Table G-3. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Recommended deployment locations for ITS applications in Curry County are mapped in Figures G-9, G-10 and G-11. Advanced bicycle/pedestrian warning systems are recommended for medium-term deployment in Brookings and Gold Beach, and for long-term deployment at Meyer Creek. Intersection advance warning systems are recommended for medium-term deployment at Paradise Point, and for long-term deployment in Brookings, Gold Beach, Langlois, and Port Orford.

Six variable message signs and an additional two dynamic warning VMS are recommended as additional deployment in the area of traveler safety and security. The VMS would be located in the vicinity of the coastal towns of Port Orford, Gold Beach and Brookings. The dynamic warning VMS would be used to address visibility challenges just north of Brookings. Lateral safety warning systems are recommended for medium-term deployment around Cape Sebastian and Cape Blanco.

Emergency Services. The exact termini of the regional incident management plan described under short-term priorities is shown in Figure G-12. There are no medium-term or long-term deployments recommended for Curry County in this program area.

Tourism and Traveler Information Services. As Figure G-13 indicates, kiosks are the primary technology used to disseminate tourism and traveler information in Curry County. Deployment of 1-800 travel advisory systems, to improve tourist information, is recommended for Brookings (medium-term) and near Pistol River (long-term). Long-term deployment of in-vehicle route guidance systems is recommended for these tourist locations as well.

Public Traveler/Mobility Services. Many ITS applications related to public traveler and mobility services are recommended for Curry County, as shown in Figure G-14. Medium-term priorities include improved provision of transit information for tourists destined toward attractions in the southern part of the county, a countywide program of supporting dynamic ridesharing and paratransit, and countywide application of transit vehicle routing and scheduling software. Long-term ITS applications include automated passenger counting, on-board transit safety systems, and routing and scheduling software for more localized application in Gold Beach and Brookings.

Infrastructure Operations and Maintenance. RWIS is the technology most commonly deployed for infrastructure operations and maintenance in Curry County, and, as Figure G-15 shows, all sites in the county are either existing or are recommended for short-term deployment. Other future deployments in this program area include a long-term recommendation for a CCTV camera at Sebastian Marsh Creek.

Fleet Operations and Maintenance and Commercial Vehicle Operations. As Figure G-16 indicates, the existing weigh station at milepost 355 would be configured to provide pre-clearance (short-term) and weigh-in-motion (medium-term) for commercial vehicles.

### *7.5.3 Deschutes, Jefferson and Linn Counties*

Clustered in central Oregon, these three counties are located at the northern limit of the COATS study area. Only the portions of Jefferson and Linn Counties south of both US Route 20 and Oregon Route 126 are included in the study area. US Routes 20 and 97 are the primary travel routes in these counties. Drivers in these counties encounter poor visibility, animals on the roadway, intersection challenges, and narrow shoulders. Additional challenges to travel in the counties exist in response times, hazardous materials spills, bicycle and pedestrian traffic, and unfamiliar traffic due to tourism around the Bend area.

#### 7.5.3.1 Short-term Priorities

Several of the short-term priorities for ITS in this three-county area relate to challenging conditions on Santiam Pass, located on US Route 20/Oregon Route 126. Alignment, ice and visibility challenges all contribute to make transportation across the pass difficult. The closest state maintained mountain pass to the south that remains open during the winter is Willamette Pass on Oregon Route 58, which is approximately 70 miles to the south. Accordingly, Santiam Pass plays a critical role in east-west traffic across the Cascade Range for central Oregon. Short-term priorities at this pass include a regional incident management plan, an automated gate closure system, and automatic vehicle location for fleets in the area. The incident management plan extends beyond the pass to include Oregon Route 126 between the State Route 242 junction and Sisters. In addition, dynamic warning variable message signs are proposed for short-term implementation just east of the pass in order to deal with visibility challenges.

Another major short-term focus area is US Route 97, which is the primary north-south highway through central Oregon. Animal detection systems, located at key migration crossings between mileposts 143 and the Klamath County line, could reduce the frequency of animal-vehicle collisions. A regional incident management plan, covering approximately the same limits, would help to coordinate emergency response activities to minimize disruptions to traffic. A variable message sign near LaPine would help to provide en-route traveler information about detours or road closures as appropriate. There are short-term recommendations to provide improved information and services to assist tourists who may be willing to use transit. A parking management system in Bend, along with surveillance-equipped recreational vehicle park & ride lots in Bend and at Sun River (serving Mt. Bachelor ski area) may encourage tourists to use shuttles or public transit to access tourist attractions. Other short-term deployments along US weigh-in-motion at Lava Butte, and automatic vehicle location for fleet vehicles operating in the vicinity of Bend.

There are several other short-term deployments recommended for the three-county area. An advanced warning system for narrow lane widths is proposed for Oregon Route 242 from milepost 55 to Sisters. This road is closed during the winter months, but experiences problems with oversize vehicles on the narrow lanes. This system would be accompanied by advanced vehicle detection systems, which could provide earlier notification of incidents or problems with larger vehicles. An automated gate closure system is also recommended for Oregon Route 242, to expedite the initiation and removal of road closures. A variable message sign at Sisters would be used to help inform travelers about conditions to the west, on Santiam Pass or on Oregon Route 242. Kiosks are recommended for Hoodoo ski area, located near Santiam Pass, and Mt. Bachelor, located approximately 20 miles west of Bend. These will be used primarily by skiers or other tourists who are interested in gathering additional information about lodging, restaurants, shopping and other services in central Oregon. A CCTV camera is recommended for short-term deployment on US Route 20 near Horse Ridge Summit. The existing weigh station on US Route 20 east of Bend is recommended for upgrading to include weigh-in-motion technology. A demonstration project utilizing probe vehicle instrumentation is recommended for US Route 20 between Sisters and Bend.

#### 7.5.3.2 Additional Deployment

A fully developed list of recommended deployments for Deschutes, Jefferson and Linn Counties is located in Table G-4. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Numerous technologies aimed to improve traveler safety and security are recommended for the three-county area, as shown in Figures G-17, G-18 and G-19. Additional deployments recommended for the medium-term at Santiam Pass include an automated anti-icing system, an automated visibility system, and a HAR station. Long-term deployments, including an advanced warning system for narrow lane widths and a lateral safety warning system, are intended to assist drivers in navigating the highway’s narrow cross-section.

In the three-county area, four other HAR sites (beyond Santiam Pass) and six VMS sites (two of which were short-term) are recommended for implementation. The HAR locations are all medium-term, and include sites on US Route 20 (five miles west of Bend, in Bend, and just east of Bend in Pilot Butte), and Sisters. Medium-term VMS locations include the Brothers maintenance station on US Route 20, near Baker Road south of Bend, and on State Route 126 just east of Sisters. An additional VMS is recommended for long-term deployment for traffic approaching Sisters from the west on State Route 242.

Animal-vehicle collision warning systems are recommended for medium-term implementation on Oregon Route 126 east of Sisters and on US Route 20 between Sisters and Bend. Other ITS applications designed to address localized challenges include an automated anti-icing system for the Bend viaduct (long-term), a dynamic warning VMS system for Lava Butte, and an advanced bicycle/pedestrian warning system for Bend. Motorist-aide call boxes are recommended for implementation east of Bend on US Route 20 into Lake County, due to emergency notification time challenges.

Emergency Services. Regional incident management plans are a critical ITS application for this part of the study area, as shown in Figure G-20. In addition to the short-term recommendations cited earlier, a plan is recommended for medium-term implementation on US Route 20 between Sisters and Bend. US Route 20 between Bend and the Lake County is an area that experiences higher emergency response and notification times. In addition to the call boxes mentioned earlier, mayday systems and rural coordinate addressing systems are recommended for medium-term implementation, to be followed by a regional incident management plan in the long-term.

Tourism and Traveler Information Services. Kiosks and in-vehicle route guidance systems are the recommended applications for disseminating tourism and traveler information in Deschutes, Jefferson and Linn Counties, as shown in Figure G-21. Three kiosks are recommended for deployment, with two at ski areas as described earlier, and one at the Bend Chamber of Commerce. In-vehicle route guidance systems are recommended for long-term deployment along US Route 97 south of Bend to Klamath County, on Oregon Route 126 from Oregon Route 242 to Sisters, and on US Route 20 between Bend and Lake County.

Public Traveler/Mobility Services. A short-term transit priority was to try to encourage the use of public transit and shuttle systems for tourist-related traffic. As can be seen in Figure G-22, the emphasis of medium-term deployment is on improving transit service in Bend, through transit traveler information at key tourist sites and transit vehicle routing/scheduling software to enhance operations of local transit service. Long-term transit ITS application recommendations for the three-county area include automated passenger counting, on-board transit safety systems, and transit vehicle routing/scheduling software.

Infrastructure Operations and Maintenance. Many of the medium and long-term deployment recommendations for infrastructure operations and maintenance are focused on US Route 20 between Bend and Lake County, as shown in Figure G-23. Four CCTV cameras – two near Bend, one at Brothers, and one near Hampton – are recommended for this corridor. The cameras at Brothers (medium-term) and Hampton (long-term) would be paired with RWIS stations to provide improved information for maintenance staff on this lower-volume portion of US Route 20. The other recommended deployment in this program area is advanced vehicle detection at Santiam Pass, to work in conjunction with the systems identified under the Traveler Safety and Security section.

Fleet Operations and Maintenance and Commercial Vehicle Operations. Applications in the areas of fleet operations and maintenance and commercial vehicle operations are shown in Figure G-24. Probe vehicle instrumentation is recommended for medium-term implementation on fleets at Santiam Pass. In the long-term, automatic vehicle location is recommended for implementation along US Route 20 between Brothers and Burns in Harney County, to more effectively monitor and use fleet vehicles in this remote portion of the county. The weigh station east of Bend on US Route 20 would be upgraded to include preclearance in the medium-term, to build on the short-term application of weigh-in-motion technology.

### *7.5.4 Douglas County*

Several routes intersect Interstate 5 and each other in Douglas County, including US Route 101, and State Routes 38, 42 and 138. Thus, large amounts of truck traffic move through the county and tourists commonly pass through the area. US Route 101 poses a challenge for drivers during inclement weather conditions, and in the more remote areas drivers may become drowsy or fall asleep.

#### 7.5.4.1 Short-term Priorities

Douglas County has considerable geographic variation across the county, from the Pacific coast in Reedsport, with coastal mountain ranges, inland valleys subject to visibility challenges, and State Route 138, which goes through more mountainous regions to provide access to Crater Lake National Park. The variety of geography means that there are no clear trends for short-term ITS priorities in the county. Along the Pacific coast, the primary short-term challenges are flooding and reduced visibility. RWIS, automated flood warning systems and advanced vehicle detection systems are recommended around Reedsport near the junction of US Route 101 with

Oregon Route 38. A kiosk, recommended for deployment at Winchester Bay south of Reedsport, would be used to provide visitors with pertinent travel and tourist information.

RWIS sites are recommended for short-term deployment on Oregon Route 38 at mileposts 20 and 45 to provide weather information at areas susceptible to weather-related road closures. Dynamic warning variable message signs and a RWIS site are recommended for deployment at the Tyee Curves on Oregon Route 138 near milepost 13. An automated anti-icing system is recommended further east on that highway, near milepost 16. On Oregon Route 42, a RWIS is recommended near Winston in association with localized visibility challenges.

On Interstate 5, short-term priorities include automated visibility warning systems from Azalea Pass/Canyonville to Grants Pass, motorist-aide call boxes around milepost 90, and a variable message sign for traffic headed from Grants Pass into the mountain passes to the north. A regional incident management plan from the Josephine County line to Roseburg will help to reduce incident-induced delay along this stretch of interstate. Two CCTV cameras are also recommended for short-term deployment near Roseburg. A kiosk is proposed for short-term implementation at the Seven Feathers Hotel and Casino near milepost 99.

A regional incident management plan is recommended for Oregon Route 138 from Roseburg to the junction with State Route 230 near the north entrance to Crater Lake National Park. A CCTV camera is recommended for deployment at that junction, to provide improved remote surveillance of traffic and weather conditions.

#### 7.5.4.2 Additional Deployment

A fully developed list of recommended deployments for Douglas County is located in Table G-5. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Figures G-25, G-26 and G-27 show the traveler safety and security ITS applications recommended for Douglas County. On Oregon Route 38, there are several medium-term ITS applications. At the Elkton Tunnel, dynamic warning variable message signs would provide motorists with information about the presence of debris in the tunnel. An advanced warning system for narrow lane widths would help to warn motorists of oncoming oversize vehicles in the tunnel. A similar system is recommended for deployment a couple of miles east of the tunnel. An intersection advance warning system is proposed for implementation at Cedar Street in Drain. In the long-term, variable message signs are recommended for Reedsport and at the Interstate 5 interchange.

Medium-term deployments on US Route 101 include an advanced bicycle/pedestrian warning system in Reedsport, dynamic warning variable message signs near Reedsport to warn of visibility challenges, a variable message sign for southbound traffic approaching Reedsport, and a HAR site in Reedsport to provide information about visibility conditions and tourism attractions. In the long-term, an intersection advance warning system is recommended for Reedsport.

On Oregon Route 42, an automated visibility system is proposed for medium-term deployment at Camas Summit outside Roseburg. Advanced bicycle/pedestrian warning and intersection advance warning systems are recommended for medium-term deployment in Winston. A variable message sign is also recommended for long-term deployment on eastbound Oregon Route 42 near Interstate 5.

Several deployments are located on Interstate 5. In the medium-term, dynamic warning variable message signs are recommended for deployment at the Myrtle Creek curves. VMS are recommended for deployment approaching Roseburg from either the north (milepost 125) or the south (milepost 118). Within Roseburg, a HAR site, recommended for medium-term deployment, could provide additional information beyond what the VMS might contain. Long-term recommended deployments include advisory television in Roseburg, a variable message sign just south of the Oregon Route 38 junction, an automated anti-icing system between Oregon Route 38 and the Lane County line, and driver impairment detection between Canyonville and the Josephine County line.

Several ITS applications related to traveler safety and security are recommended on Oregon Route 138. Variable message signs are recommended for medium-term implementation at Interstate 5 and at the Oregon Route 230 junction to provide travelers with information on conditions over the 86 miles in between these locations. HAR implementation is recommended in the medium-term for Mount Bailey, at milepost 72. In the long-term, an automated anti-icing system is recommended between mileposts 80 and 86, near Diamond Lake.

<u>Emergency Services</u>. Emergency services applications for Douglas County are shown in Figure G-28. Regional incident management plans are a focal effort in this area, with medium-term implementation of these plans being recommended for three corridors: Interstate 5 from Roseburg to the Lane County line, on Oregon Route 42, and on Oregon Route 38 between Reedsport and Elkton. Mayday systems are recommended for deployment in the medium-term on Oregon Route 230.

<u>Tourism and Traveler Information Services</u>. Figure G-29 shows the recommended ITS applications pertaining to tourism and traveler information. One kiosk is recommended for medium-term implementation at Oregon Dunes National Recreation Area, in addition to the seven existing and two short-term kiosk locations. Medium-term implementation of 1-800 travel and tourism advisory telephone hotlines are recommended in conjunction with the Seven Feathers Casino and the Oregon Dunes. In-vehicle route guidance systems are recommended for long-term deployment at several locations in the county, including Interstate 5, US Route 101, and State Routes 38, 42 and 138.

<u>Public Traveler/Mobility Services</u>. ITS applications related to public traveler and mobility services for Douglas County are shown in Figure G-30. The geographic spread of recommended locations suggest potential to improve transit and public mobility at several locations in the county. Tourist destinations, such as the Seven Feathers Casino and the Oregon Dunes, as well as the city of Roseburg, may be excellent candidates for improved transit traveler information, recreational vehicle park and ride lots, and parking management systems. These medium-term recommendations can all work in concert to encourage visitors to use alternative modes to access these attractions. Dynamic ridesharing and paratransit systems are recommended for medium-term deployment in Reedsport. Automated passenger counting, on-board transit safety systems,

and transit vehicle routing/scheduling software may find application in Roseburg specifically and Douglas County generally.

Infrastructure Operations and Maintenance. There are few infrastructure operations and maintenance ITS applications recommended for either medium-term or long-term deployment, as shown in Figure G-31. Medium-term recommendations include two advanced vehicle detection locations on Oregon Route 38, in conjunction with advanced warning systems for narrow lane widths. A RWIS site is also recommended for medium-term deployment on the West Diamond Lake Highway (Oregon Route 230) at milepost 19.5. These are in addition to the short-term applications of advanced vehicle detection, CCTV cameras and RWIS stations.

Fleet Operations and Maintenance and Commercial Vehicle Operations. Recommendations for ITS applications related to fleet operations and maintenance and commercial vehicle operations are shown in Figure G-32. Improved management of hazardous materials incidents along Interstate 5 is recommended as a medium-term implementation objective. Long-term deployment priorities include probe vehicle instrumentation on State Route 230 and State Route 138 east of Interstate 5.

### *7.5.5 Harney and Malheur Counties*

Both Harney and Malheur counties encompass a large amount of area in Oregon. They are very rural in nature and contain few major routes. Two major challenges in the area include intersection safety and emergency notification and response times.

#### 7.5.5.1 Short-term Priorities

The two primary short-term priorities are related to improved monitoring of commercial vehicles and reducing emergency notification times. For commercial vehicles, weigh-in-motion with preclearance capabilities will be added to the existing weight stations on US Route 20 in Harney County between Burns and Buchanan. To improve emergency notification and response time, mayday systems are recommended on US Route 20 between Burns and the Idaho border, and CCTV cameras are recommended for implementation at Riley and Burns.

#### 7.5.5.2 Additional Deployment

A fully developed list of recommended deployments for Harney and Malheur Counties is located in Table G-6. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Most recommended ITS applications related to traveler safety and security are designated for medium-term deployment, as shown in Figures G-33, G-34 and G-35. Automated detection of animal presence in roadways, in order to reduce animal-vehicle collisions, is recommended on US Route 20 over the entire length of Harney and Malheur Counties. Dynamic warning variable message signs are recommended for use during high wind conditions near Hines and Burns. Motorist-aide call boxes are recommended for US Routes 20 and 395 between Riley and the Lake County line. Highway advisory radio and an intersection advance warning system are recommended for Burns in the medium-term, with long-term recommendation for advisory television. To provide improved information about road closures, variable message signs are recommended for US Route 20 west of Burns at milepost 115 (medium-term), and on US Route 395 at Riley (long-term).

Emergency Services. Expansion of mayday systems and improved rural coordinate addressing are key ITS applications in Harney and Malheur Counties, as shown in Figure G-36. Both of these technologies would be implemented on a medium-term time frame from Riley to the Lake County line on US Routes 20 and 395. A regional incident management plan is recommended for long-term implementation from the Lake County line to milepost 144 on US Route 20.

Tourism and Traveler Information Services. The only recommended ITS technology related to tourism and traveler information systems in Harney and Malheur Counties, as shown in Figure G-37, is in-vehicle route guidance for US Route 20 between Riley and the Lake County line. This would be used primarily to provide motorists with improved notification on road closure locations.

Public Traveler/Mobility Services. All ITS applications related to public traveler and mobility services are focused in Malheur County, as indicated in Figure G-38: automated passenger counting, on-board transit safety systems, and transit vehicle routing/scheduling software. All of these are recommended for long-term implementation.

Infrastructure Operations and Maintenance. As shown in Figure G-39, there are no medium or long-term recommendations in this critical program area for Harney and Malheur Counties.

Fleet Operations and Maintenance and Commercial Vehicle Operations. As shown in Figure G-40, upgrading weigh stations to include weigh-in-motion is a major emphasis within these counties. Medium-term upgrades are recommended for the existing weigh stations near Burns Junction on US Route 395, and near Burns on Oregon Route 78. Long-term upgrades are recommended for Burns Junction on Oregon Route 78 and for Oregon Route 205 near Burns. Each of the weigh-in-motion installations would be accompanied by preclearance capabilities. Automatic vehicle location is recommended between Burns and the Lake County line as a long-term deployment.

### *7.5.6 Jackson County*

Located along the border with California, Jackson County contains both a major regional city (Medford) and a major mountain pass on the Interstate 5 route (Siskiyou Pass). Therefore, weather conditions, truck traffic, hazardous materials, and tourism are major issues for the county. Additionally, high emergency response times and fatigued drivers are challenges in the more remote areas.

#### 7.5.6.1 Short-term Priorities

Siskiyou Pass, the focal point of the COATS early winner project, is located in Jackson County on Interstate 5. The early winner project has several short-term ITS deployments associated with it. The regional incident management plan, developed as a part of the early-winner project, serves as a foundational operation plan for utilizing many ITS devices in Jackson and Siskiyou Counties to improve management of the Pass. Some of the field elements recommended for the Jackson County side of the border include a variable message sign at milepost 29; dynamic warning variable message signs at the summit (mileposts 4.1 to 5.1) for runaway trucks; motorist-aide call boxes at the summit; advisory television for Ashland and Medford; and a CCTV camera at Medford. It should be noted that these short-term deployments complement several other ITS elements already on Interstate 5 between Medford and the state line.

Other short-term priorities are further north on Interstate 5, including automated anti-icing on the Medford viaduct, and a regional incident management plan from Medford to the Josephine County line. On Oregon Route 140, which connects Medford to Klamath Falls, mayday systems are recommended from Medford into Klamath County. An RWIS site is planned for the highway at milepost 0 (Butte Creek) and a variable message sign is recommended for eastbound traffic at Brownsboro. On Oregon Route 62, a kiosk is recommended for short-term deployment at Tou Velle State Recreation Site. Short-term public traveler and mobility applications are targeted toward the Jacksonville Britt and Ashland Shakespeare Festivals, two of the more popular festivals in the COATS study area. Recreational vehicle park-and-ride lots with surveillance are recommended for both locations, to allow for more remote parking of larger vehicles away from the heart of the festival. Parking management in Ashland will help to maximize the efficiency and utilization of parking within the city during the festival.

#### 7.5.6.2 Additional Deployment

A fully developed list of recommended deployments for Jackson County is located in Table G-7. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Traveler safety and security devices recommended for Jackson County are shown in Figures G-41, G-42 and G-43. Additional technologies are recommended for deployment near Siskiyou Pass, including a medium-term automated visibility warning system just north of the pass, and a long-term HAR site at the summit. Several other deployments are located on Oregon Route 62, including a HAR site at milepost 0 (medium-term), automated visibility warning (medium-term) and intersection advance warning systems (long-term) at White City, and three variable message signs further east (two at the junction with Oregon Route 230 and one in Eagle Point). Another variable message sign is recommended as a long-term deployment for the junction of Oregon Routes 62 and 230.

Emergency Services. Mayday systems and regional incident management plans are the primary emergency services ITS applications in Jackson County. As shown in Figure G-44, mayday coverage on Oregon Route 230 from Oregon Route 62 into Douglas County is designated as a medium-term priority, while developing an incident management plan for Oregon Route 140 is a long-term objective.

Tourism and Traveler Information Services. Four kiosks and enhanced 1-800 travel advisory telephone lines are among the medium-term priority deployments for tourism and traveler information systems in Jackson County, as shown in Figure G-45. Kiosks are recommended for medium-term deployment in conjunction with the Ashland Shakespeare Festival, at Valley of the Rogue State Park near the city of Rogue River on Interstate 5, and at Joseph Stewart State Park and Casey State Recreation Site, both of which are located on State Route 62 between Trail and Prospect. The tourism advisory telephone lines are recommended for medium-term deployment at Ashland, Valley of the Rogue State Park, and Casey State Recreation Site. Long-term applications of this telephone system are recommended for Tou Velle State Recreation Site and Joseph Stewart State Park. In-vehicle route guidance systems are long-term priorities for several tourist locations, as well as to provide information on road closures for Interstate 5 from Medford to Josephine County, and on Oregon Route 140 from Medford to Klamath County.

Public Traveler/Mobility Services. Beyond the short-term transit priorities for the Britt and Shakespeare Festivals, public traveler and mobility services applications in Jackson County continue to focus on tourist destinations, as shown in Figure G-46. Transit traveler information is recommended for medium-term deployment at five tourist locations, where parking management and recreation vehicle park and ride lots with surveillance are typically deployed as well. The implementation of automated passenger counting and transit vehicle routing/scheduling software by Medford's Rogue Valley Transportation District, one of the highest ridership transit services in the COATS study area, is considered to be a medium-term priority; on-board transit safety systems were ranked as a long-term priority. These three types of transit technologies are listed as long-term priorities for other transit providers in Jackson County. Dynamic ridesharing and paratransit systems are recommended as medium-term deployments for Medford and White City.

Infrastructure Operations and Maintenance. Advanced vehicle detection stations are the only technologies to be recommended for medium or long-term deployment in Jackson County in this area, as shown in Figure G-47. These would be located on Interstate 5 in the vicinity of Siskiyou Pass, to supplement traffic monitoring stations deployed on the California side of the state line.

Fleet Operations and Maintenance and Commercial Vehicle Operations. ITS applications related to fleet operations and maintenance and commercial vehicle operations are shown in Figure G-48. Existing weigh stations on Oregon Route 140 in Medford (medium-term), and on Oregon Route 62 near White City (two long-term) are recommended for upgrades to include weigh-in-motion equipment and commercial vehicle electronic preclearance. Other medium-term priorities include improved management of hazardous materials incidents on Interstate 5 and automatic vehicle location for fleets based in Medford or near Siskiyou Summit. Long-term priorities include automatic vehicle location for fleets traveling east of the junction of Oregon Routes 62 and 230 on either of those roadways.

### *7.5.7 Josephine County*

Located on the southern border of Oregon to the west of Jackson County, Josephine County has a rapidly-growing population. The county is traversed by two major routes: US Route 199 and Interstate 5. As a county with a large transit-dependent population, Josephine County experiences demand and supply inequalities for transit use. Additional challenges are posed by commercial vehicle traffic, bicycle and pedestrian traffic in the cities, and tourism.

#### 7.5.7.1 Short-term Priorities

Short-term priorities may be considered in terms of the two major travel corridors through the county. On Interstate 5, regional incident management plans are recommended for short-term implementation. Dynamic warning variable message signs at Smith Hill (milepost 73.8) and variable message signs at mileposts 54, 56 and 66 will be deployed to provide en-route traveler information. VMS are recommended for US Route 199 at both the Grants Pass and the state border sides of the corridor, directed at traffic that will be using the Oregon portion of this roadway. A kiosk is recommended for short-term deployment at the US Route 199 interchange with Oregon Route 46 at the Illinois Valley Visitor Center. This is the turn-off point for traffic headed to Oregon Caves National Monument, a major tourist attraction located in the southeastern portion of the county. Mayday systems are recommended between mileposts 25 and 40, due to the poor communications around the border.

#### 7.5.7.2 Additional Deployment

A fully developed list of recommended deployments for Josephine County is located in Table G-8. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. The medium-term focus of traveler safety and security technologies is on Interstate 5, as shown in Figures G-49, G-50 and G-51. Recommended medium-term deployment technologies and locations include dynamic warning variable message signs and motorist-aide call boxes around Sexton Summit, and a HAR site to provide tourism information at Grants Pass. Long-term recommendations include dynamic warning variable message signs at Wolf Creek Pass/King Mountain, and advisory television for Grants Pass. On US Route 199, additional variable message signs are recommended for long-term implementation at mileposts 4 and 31.

Emergency Services. Figure G-52 shows emergency services applications in Josephine County. In addition to the short-term priorities for mayday systems and regional incident management plans, there are medium-term recommendations for a rural coordinate addressing system and a regional incident management plan for US Route 199 through the county.

Tourism and Traveler Information Services. Aside from the kiosk at the Illinois Valley Visitor Center, the only recommendations for tourism and traveler information services in Josephine County are long-term in-vehicle route guidance systems, as shown in Figure G-53. These would be deployed on the full length of Interstate 5 and US Route 199 in the county.

Public Traveler/Mobility Services. Transit-dependency is considered to be one of the major transportation challenges in Josephine County. As shown in Figure G-54, dynamic ridesharing and paratransit systems and smart cards are the medium-term ITS applications identified to promote transit and mobility in the county. Long-term applications in the county include automated passenger counting, automatic vehicle identification, on-board transit safety systems, and transit vehicle routing and scheduling software.

Infrastructure Operations and Maintenance. The only medium or long-term recommendation within infrastructure operations and maintenance is a CCTV camera recommended for medium-term deployment at milepost 16.1 on US Route 199, as shown in Figure G-55.

Fleet Operations and Maintenance and Commercial Vehicle Operations. As shown in Figure G-56, electronic preclearance is recommended for milepost 33.5 on US Route 199 as a medium-term priority, along with weigh-in-motion. Improved response to hazardous materials incidents is recommended as a medium-term priority on both US Route 199 and Interstate 5.

### *7.5.8 Klamath County*

Due to the location of Crater Lake National Park in the western side of the county, Klamath County receives significant volumes of tourist traffic each year. Additionally, many different routes converge at Klamath Falls adding to challenges with commercial traffic, pedestrians, and hazardous materials. US Route 97, a major north-south alternative to Interstate 5, runs through the length of the county. In addition, as the distance from Klamath Falls grows, response and notification times lengthen.

#### 7.5.8.1 Short-term Priorities

Two major focus areas of short-term ITS applications are US Route 97, and Oregon Route 138 from Diamond Lake Junction to Crater Lake National Park. On US Route 97, there are several major ITS themes reflected in recommended technologies. A regional incident management plan from Diamond Lake Junction south to the California state line reflects both the importance of US Route 97 to regional mobility and response time challenges. Variable message signs at mileposts 203.2, 212, 213, 272 and 278, along with HAR at milepost 196 reflect the need to communicate pertinent detour and road closure information that may or may not be related to incidents. A RWIS recommended for milepost 265 shows the importance of accurate weather information in properly maintaining the highway. Animal-vehicle collision warning systems, recommended for deployment for most of US Route 97 north of Chiloquin, are recommended due to the high levels of animal migration across the highway. Commercial vehicle preclearance systems at the existing weigh station at Klamath Falls reflect the high volume of truck traffic which uses this route.

A kiosk at Kla-Mo-Ya Casino on US Route 97 reflects some of the tourism in the county. However, a more popular tourist destination, especially for out-of-state visitors, will likely be Crater Lake National Park, which is accessible by Oregon Route 138 from US Route 97. Short-term ITS applications in support of tourism at the Park include a 1-800 travel advisory telephone hotline and highway advisory radio, a kiosk near the park entrance, and two RWIS sites.

Other short-term deployments in Klamath County are located on Oregon Route 140, which connects Klamath Falls to Medford in Jackson County to the west, and to Lakeview in Lake County to the east. Recommended technologies include mayday system coverage between Klamath Falls and Jackson County, an automated anti-icing system at Doak Mountain, and a variable message sign for traffic heading westbound on Oregon Route 140 leaving Klamath Falls. A HAR on Oregon Route 62 near its junction with US Route 97 would be used to provide southbound travelers with information about road closure or detour information for US Route 97. Another HAR site along with a variable message sign for westbound traffic on Oregon Route 58 would provide key information for travelers headed over Willamette Pass. Oregon Route 58 between US Route 97 and Lane County is a recommended target area for a 1-800 travel advisory telephone hotline. A kiosk is recommended for short-term implementation at Willamette Pass ski area, on Oregon Route 58.

#### 7.5.8.2 Additional Deployment

A fully developed list of recommended deployments for Klamath County is located in Table G-9. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. US Route 97 is the primary focus of medium and long-term traveler safety and security ITS applications, as shown in Figures G-57, G-58 and G-59. In the medium-term, an additional VMS would be installed north of Diamond Lake Junction at milepost 211. An advanced warning system for narrow lane widths would be installed north of Chemult, where the highway narrows crossing over railroad tracks at milepost 202.7. A lateral safety warning system is recommended in the vicinity of the junction with Oregon Route 58. In the long-term, an additional VMS is proposed at milepost 250.

Other medium-term deployments in the county include an advanced bicycle/pedestrian warning system and an advisory television channel in Klamath Falls, and an animal/vehicle collision warning system on Oregon Route 140 between Klamath Falls and Lake County. Other long-term safety and security recommendations include advisory television for Oregon Route 58 near Crescent Lake, a VMS at the junction of Oregon Route 62 with US Route 97 (to complement the HAR deployed as a short-term priority), and a VMS on State Route 138 for westbound traffic adjacent to the entrance of Crater Lake National Park.

Emergency Services. Regional incident management plans are recommended for three locations in Klamath County, as shown in Figure G-60. In addition to the short-term priority for the US Route 97 corridor, a plan for Oregon Route 58 from Lane County to US Rote 97 is recommended for implementation as a medium-term priority, while an incident management plan for Oregon Route 140 from Jackson County to Klamath Falls is ranked as a long-term priority.

Tourism and Traveler Information Services. More kiosks and enhanced provision of telephone-based tourism and traveler information are key priorities for tourism and traveler information provision in Klamath County, as shown in Figure G-61. Kiosks at Collier Memorial State Park, the Beaver Marsh/Chemult Rest Area and the Crescent Lake Junction Snow Park are ranked as medium-term priorities, as is a 1-800 travel advisory telephone hotline focusing on Kla-Mo-Ya Casino. Long-term priorities include a toll-free tourism and traveler information hotline for Collier Memorial State Park, and in-vehicle route guidance systems for Crater Lake National Park, US Route 97, and Oregon Routes 58, 138 and 140.

Public Traveler/Mobility Services. Figure G-62 shows recommendations for public traveler and mobility ITS applications in Klamath County. Medium-term priorities focus on transit traveler information at Crater Lake National Park, Collier Memorial State Park, and Kla-Mo-Ya Casino. Recreational vehicle park and ride lots with surveillance at Crater Lake National

Park, Collier Memorial State Park, and Crescent Lake are all medium-term priorities as well. Other medium-term priorities include parking management centered around Crater Lake National Park, dynamic ridesharing and paratransit in Klamath Falls, and transit vehicle routing/scheduling software for Klamath County. Long-term applications focus not only on rubber-tire bus service but on improving coordination with Amtrak service at Chemult and Klamath Falls. Some technologies applied to bus service include automated passenger counting, on-board transit safety systems and transit vehicle routing/scheduling software.

Infrastructure Operations and Maintenance. RWIS is the predominant technology used for infrastructure operations and maintenance in Klamath County, as shown in Figure G-63. Two medium-term priority locations are identified, including US Route 97 at Spring Creek, and 31 miles east of Klamath Falls on Oregon Route 140. Other medium-term priorities for the county include advanced vehicle detection in conjunction with narrow clearance at the bridge north of Chemult and an automated gate closure system for Oregon Route 58 at the US Route 97 junction.

Fleet Operations and Maintenance and Commercial Vehicle Operations. As shown in Figure G-64, improved response to hazardous materials incidents is a medium-term priority on US Route 97 from the state line to the Oregon Route 58 junction, and a long-term priority on Oregon Route 58 from US Route 97 to Lane County.

### *7.5.9 Lake County*

Lake County in south central Oregon, tends to experience long notification and response times due to the rural nature of the area. Its primary routes include US Routes 395 and 20 and Oregon Routes 31 and 140.

#### 7.5.9.1 Short-term Priorities

There are three short-term priority projects for Lake County: a variable message sign on US Route 395 entering Oregon, a HAR site in Lakeview, and a kiosk at the Lakeview rest area on US Route 395.

#### 7.5.9.2 Additional Deployment

A fully developed list of recommended deployments for Lake County is located in Table G-10. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Lake County's priorities for traveler safety and security ITS applications are shown in Figures G-65, G-66 and G-67. Medium-term priorities include deployment of motorist-aide call boxes to address emergency notification time challenges on Oregon Route 31 and US Route 20. Variable message signs, located on Oregon Route 140 approaching Lakeview from the west and on US Route 395 southbound into Lakeview, are recommended as medium-term priorities. These would be used to communicate information about road closures to motorists. Advisory television at Lakeview is recommended as a medium-term priority that would provide improved pre-trip traveler information. Animal-vehicle collision warning systems are recommended for Oregon Routes 140 (medium-term) and 31 (long-term).

Dynamic warning variable message signs are recommended in the vicinity of Silver Lake on Oregon Route 31 as long-term priorities.

Emergency Services. Several technology deployments related to emergency services are proposed in order to improve emergency notification and road closure events, as shown in Figure G-68. On US Route 20, mayday and rural coordinate addressing systems are a medium-term priority, while the development of a regional incident management plan (continuing into Deschutes and Harney counties) is a long-term priority. Mayday systems and rural coordinate addressing are both medium-term priorities for US Route 395 between the Harney County line and Valley Falls. A regional incident management plan is also recommended as a medium-term priority for Oregon Route 140 between Lakeview and the Nevada state line.

Tourism and Traveler Information Services. Lower traffic volumes in Lake County make it more difficult to justify the investment in fixed-location ITS applications to improve tourism and traveler information. Consequently, as shown in Figure G-69, the primary emphasis in this technology area will be the utilization of in-vehicle route guidance systems. These are long-term priorities for Oregon Route 140 between Lakeview and the Nevada state line, and for US Route 20.

Public Traveler/Mobility Services. Recommended ITS deployments to support public traveler and mobility in Lake County are shown in Figure G-70. Medium-term deployment of transit vehicle routing/scheduling software is recommended for Lake County. Other recommended technology applications for the county and for the city of Lakeview include automated passenger counting and on-board transit safety systems.

Infrastructure Operations and Maintenance. In the area of infrastructure operations and maintenance, RWIS is a primary priority in Lake County, as shown in Figure G-71, with long-term priority for two sites along Oregon Route 31 – Picture Rock Pass and Summer Lake. Long-term deployment of a CCTV camera at Valley Falls, at the junction of US Route 395 and Oregon Route 31, is recommended as a way to improve emergency response time.

Fleet Operations and Maintenance and Commercial Vehicle Operations. Weigh-in-motion is recommended as a medium-term deployment at the existing northbound weigh station on US Route 395 near Lakeview, and as long-term deployments at the existing weigh stations: one on Oregon Route 140 at milepost 94.4, and for southbound on US Route 395 near Lakeview. Commercial vehicle electronic preclearance technology will accompany weigh-in-motion at the three sites just described. As is shown in Figure G-72, preclearance at each of these locations is a medium-term priority. A long-term priority for fleet operations and maintenance is the implementation of automatic vehicle location for fleet vehicles traveling on US Route 20 between Brothers in Deschutes County and Burns in Harney County.

### *7.5.10 Lane County*

Lane County contains both a portion of Interstate 5 and the largest city in the study area – Eugene. The commercial vehicle traffic and hazardous material shipments associated with the interstate pose challenges for the county, as well as the pedestrian/bicycle traffic and intersection safety issues linked with Eugene. Additionally, the long stretches of Interstate 5 in the county tend to make drivers drowsy.

7.5.10.1 Short-term Priorities

The primary geographic focus of ITS applications in Lane County is on state highways. Oregon Route 126 between Florence and Eugene many locations with short-term priorities for ITS deployment. Three HAR sites (Florence, Veneta and west of Beltline in Eugene), two advanced warning systems for narrow lane widths (Peter Creek Tunnel and Wildcat Bridges), and an automated flood warning section between Florence and Mapleton will be used to provide motorists information about flooding and narrow clear zone challenges. In conjunction with several of these deployments, advanced vehicle detection systems will provide additional information about the movement of vehicles through the corridor. A 1-800 travel advisory telephone hotline is recommended for short-term deployment to provide additional information on road closures due to slides and floods.

The telephone hotline is also recommended for Oregon Route 126 as it continues east of Eugene toward the Cascade Range. Specific “hot spots” include the segment between milepost 55 and Sisters, where narrow clear zones create a short-term priority of an advanced warning system for narrow lane widths, with two accompanying advanced vehicle detection locations. A HAR site is recommended for deployment at the Walterville Scalehouse east of Springfield. Automated gate closure systems are recommended at the Oregon Route 242 junction and further to the east as well.

Oregon Route 58, which goes southeast from Eugene across the Cascade Range toward Klamath County, has several short-term priority ITS applications as well. A HAR at Eugene would provide advanced warning of potential road closures through Willamette Pass, as could a 1-800 travel advisory telephone hotline that would cover the entire length of this highway. Dynamic warning variable messages signs are recommended for the Salt Creek Tunnel, located between mileposts 54.6 and 56.5, to warn of icy conditions in the tunnel.

For Interstate 5, variable message signs are short-term priorities at two locations: mileposts 180 and 190 (southbound). A CCTV camera is a short-term priority for the Gettings Creek Rest Area.

7.5.10.2 Additional Deployment

A fully developed list of recommended deployments for Lane County is located in Table G-11. A series of maps in the Appendices maps these deployments, according to critical program area.

Traveler Safety and Security. Figures G-73, G-74 and G-75 highlight recommended traveler safety and security ITS applications for Lane County. On Oregon Route 126, two variable message signs are recommended between Florence and Eugene: one for eastbound traffic leaving Florence (medium-term) and one for westbound traffic leaving Eugene (long-term). Six miles east of Eugene, an automated visibility warning is recommended for long-term deployment in conjunction with dynamic warning variable message signs. Five miles further to the east, deployment of an advanced warning system for narrow lane widths, and a related lateral safety warning system, is recommended as a long-term priority. Variable message signs approaching Eugene from the east and approaching the Oregon Route 242 junction from the west are medium-term priorities; an additional location two miles further to the east is a long-term priority. A HAR site is recommended as a medium-term priority at Mackenzie Bridge. An intersection advance warning system is recommended as a medium-term priority for Glenwood.

On Interstate 5, an automated visibility warning system at Ward's Butte is a medium-term priority, as are variable message signs at mileposts 187 and 190 (northbound). On US Route 101, variable message signs are recommended for both northbound and southbound approaches into Florence as medium-term priorities. One area where several proposed technologies are collocated is the Salt Creek Tunnel on Oregon Route 58, which had dynamic warning variable message signs as a short-term priority. Medium-term priorities for the tunnel include an advanced warning system for narrow lane widths and an associated lateral safety warning system, an automated visibility warning system, and an automated anti-icing system because of ice formation within the tunnel.

Bicycle and pedestrian safety concerns make advanced bicycle/pedestrian warning systems a medium-term priority in Creswell, Florence, Goshen and Oakridge, and a long-term priority in Eugene. Advisory television is recommended to be a medium-term implementation priority for Eugene, and a long-term priority for Florence, Oakridge, and the Willamette Pass area.

Emergency Services. The only application in this area recommended for Lane County is the regional incident management plan. Three locations are proposed for the county, as shown in Figure G-76: medium-term priorities for Oregon Route 58 and Interstate 5, and long-term for Oregon Route 126. Each of these plans is intended to cover the length of the county, and connects with efforts in adjacent counties.

Tourism and Traveler Information Services. As shown in Figure G-77, 1-800 travel advisory telephone hotlines are the highest priority technology for providing tourism and traveler information in Lane County. Both locations of these systems are recommended for short-term implementation. Medium-term projects include a kiosk at US Route 101 at the Siuslaw Road Bridge. Long-term priorities include in-vehicle route guidance systems across the county, on Interstate 5, and Oregon Routes 58 and 126.

Public Traveler/Mobility Services. Figure G-78 shows the locations of public traveler and mobility services ITS applications in Lane County. Medium-term priorities include providing surveillance to encourage remote parking of recreational vehicles for travelers destined to Gold Lake and Summit, both on Oregon Route 58. Improved transit traveler information is recommended as a medium-term priority for Eugene. Long-term recommendations – automated passenger counting, on-board transit safety systems and transit vehicle routing/scheduling software – are focused on the various private companies that provide inter-city transit to and through Eugene.

Infrastructure Operations and Maintenance. Medium and long-term deployment of technologies to improve infrastructure operations and maintenance will focus on RWIS, as shown in Figure G-79. Medium-term priority RWIS sites include Oregon Route 58 at mileposts 15 and 30, Oregon Route 126 ten miles west of its junction with Oregon Route 242 and at

Badger Mountain. A long-term priority in this technology group is the development of a satellite traffic operations center in the ODOT district office in Springfield. If implemented, this center would likely work together with the Western Regional Dispatch Center in Salem, and with the Medford Transportation Operations Center, in managing traffic in the western part of the state. Other recommendations include advanced vehicle detection in conjunction with narrow clear zone challenges near Willamette Pass (medium-term) and on Route 126 eleven miles east of Eugene (long-term).

Fleet Operations and Maintenance and Commercial Vehicle Operations. Figure G-80 shows recommended locations for fleet operations and maintenance and commercial vehicle operations technologies in Lake County. Weigh-in-motion and electronic commercial vehicle preclearance are recommended for medium-term implementation at two existing weigh stations along Oregon Route 126. Improved hazardous materials management along Interstate 5 and probe vehicle instrumentation at the Salt Creek Tunnel on Oregon Route 58 are medium-term priorities. Hazardous materials management is a long-term priority on Oregon Route 58.

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# 8 COST OF ITS DEPLOYMENT

The next logical question after describing the deployments recommended for the COATS study area is, "What is it going to cost?" One important emphasis in the COATS effort has been to develop a sustained ITS program in the region, in terms of both ITS planning and the deployed ITS infrastructure. Sustaining the ITS program requires continuing the ongoing relationships between stakeholders as envisioned in Chapter 5, as well as securing the funding levels necessary to add new deployment locations and to sustain operations and maintenance of existing deployments.

This chapter will seek to assess the cost associated with the infrastructure described in the previous chapter. At the outset, it should be understood that these are planning-level estimates that may change significantly depending upon several factors, including:

- size of deployment, as an increasing number of devices may lower the cost per device;
- site-specific construction and design costs;
- site-specific communications and power costs, both initial and recurring;
- technological change, both improvements in existing technologies as well as new technologies which may supercede those described in this report; and
- integration costs, both within each state and across state lines.

This chapter will develop assumptions first for estimating the capital costs associated with each technology, and then for estimating operations and maintenance costs. Based on these assumptions, cost estimates for deployment over the whole COATS study area will be presented.

## 8.1 Capital Costs

In an effort to determine actual capital cost associated with the rural focus areas and associated infrastructure to be deployed, WTI contacted vendors, departments of transportation, FHWA and other research secondary sources of information. The capital costs presented in this report are intended to be order of magnitude planning estimates; actual costs may deviate from these estimates for the reasons cited above.

Table 8-1 documents the assumptions and cost factors that were applied to each of the ITS infrastructure elements in the COATS study area. These costs reflect average construction costs associated with each device, but do not include design costs.

## 8.2 Operations and Maintenance Costs

This section will summarize the methodology used for estimating operations and maintenance (O&M) costs for each device in the COATS ITS deployment. Developing these estimates requires many assumptions that will be detailed in the sections that immediately follow.

**Table 8-1:** Cost Assumptions.

| Category | Infrastructure Name | Capital Equipment Costs ($K) | Annual O&M Costs ($K) | Cost Assumptions | Cost Factor | References |
|---|---|---|---|---|---|---|
| Traveler Safety and Security | Adv. Warning for Narrow Lanes | $ 48.10 | $ 3.64 | flashing beacon (2), controller (2), vehicle size detection, communication lines | 1 | 16, 17 |
| | Advanced Bike/Ped Warning | $ 23.50 | $ 2.29 | push button, flashing beacon, controller | Between 1 and 4, with 4 for higher population cities | 16, 17 |
| | Advisory Television | $ 19.00 | $ - | hyperconverter, Pentium PC, TV, converter card, video multiplexer, and demultiplexer; assume no O&M costs through partnership with local cable TV company | 1 | 18 |
| | Animal/Vehicle Collision Warning | $ 100.00 | $ 5.00 | flashing beacon, 1 mile segment, both sides of highway, not including installation or static signs; equipment maint only | One per ten miles | 19 |
| | Automated Anti-Icing | $ 85.00 | $ 7.90 | sensors, 500 feet, totally installed, side mounted system, two-lane roadway | One per three miles | 20, 17 |
| | Automated Flood Warning | $ 40.00 | $ 2.55 | flashing beacons, water level detector, controller, communications | One per ten miles | 21, 17 |
| | Automated Visibility Warning | $ 40.00 | $ 0.60 | similar cost to automated flood warning | 1 | 17 |
| | Automated Wind Advisory | $ 60.00 | $ 3.00 | scaled back RWIS, 2 flashing beacons, controller | 1 | 16, 17, 22 |
| | Bridge Flood | $ 20.00 | $ 2.55 | flashing beacons, water level detector, controller, communications | 1 | 21, 17 |
| | Driver Impairment Detection | $ 0.66 | $ 0.04 | safety collection processor and software, driver condition sensors | 0 - all costs borne by vehicle owners | 16 |
| | Dynamic Warning VMS | $ 250.00 | $ 4.40 | variable message sign + RWIS | 1 | 23, 17 |
| | Extinguishable Message Sign | $ 50.00 | $ 1.83 | roadside message sign | 1 | 18, 17 |
| | Highway Advisory Radio | $ 50.00 | $ 2.00 | per tower; O&M factored by two | 1 | 23, 18 |

**Table 8-1:** Cost Assumptions (cont.).

| Category | Infrastructure Name | Capital Equipment Costs ($K) | Annual O&M Costs ($K) | Cost Assumptions | Cost Factor | References |
|---|---|---|---|---|---|---|
| Traveler Safety and Security (cont.) | Intersection Advance Warning | $ 49.50 | $ 3.55 | flashing beacons, two inductive loops per approach, controller | 1 - 2, based on city population | 18, 17 |
| | Lateral Safety Warning System | $ 0.35 | $ 0.01 | MMW radar, in-vehicle display | 0 - all costs borne by vehicle owners | 24 |
| | Motorist-Aide Call Box | $ 5.00 | $ 0.50 | telephone, including cellular airtime | One per two miles | 25 |
| | Slide Detection Station | $ 27.50 | $ 2.75 | instrumentation, controller, flashing beacon | 1 | 16 |
| | Variable Message Sign | $ 209.00 | $ 2.40 | average cost of small/large VMS mounted on tower; lower value used for O&M based on ODOT experience | 1 | 18 |
| | Variable Message Sign (Portable) | $ 23.50 | $ 1.60 | Trailer mounted VMS (3-line, 8" character display); includes trailer, solar or diesel powered | 1 | 18 |
| Emergency Services Emergency Services (cont.) | Mayday Systems | $ 0.40 | $ 0.01 | collision detector sensor and interface for Mayday processor | 0 - all costs borne by vehicle owners | 18 |
| | Regional Incident Management Plan | $ 1.25 | $ 0.13 | inventory of resources, operation plans, routing plan | per mile; divide by two for multiple states, and by two again for multiple counties | Based on Siskiyou Pass Incident Management Plan Budget |
| | Rural Coordinate Addressing System | $ 0.10 | $ 0.01 | | per mile | |
| | Traffic Signal Priority for Emergency Vehicles | $ 8.50 | $ 0.37 | intersections only; two signal preemption receivers, controller upgrade | one intersection per 1,000 people | 18, 17 |

**Table 8-1:** Cost Assumptions (cont.).

| Category | Infrastructure Name | Capital Equipment Costs ($K) | Annual O&M Costs ($K) | Cost Assumptions | Cost Factor | References |
|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services** | 800 Travel Advisory | $ 187.20 | $ 18.72 | O&M from WTI; multiply by 10 for capital | 1 | 17 |
| | In-Vehicle Route Guidance System | $ 4.00 | $ 0.40 | in-vehicle radio, GPS antenna, GPS route guidance system | 0 - all costs borne by vehicle owners | 24 |
| | Kiosks | $ 10.00 | $ 2.00 | | 1 | 26 |
| **Public Traveler/ Mobility Services** | Automated Passenger Counting | $ 1.20 | $ 1.41 | on-board ridership sensor, flex-fare system, farebox and smart card reader | 2 - 20, with higher values for larger fleets | 25 |
| | Automatic Vehicle Identification System | $ 25.60 | $ 1.51 | roadside equip, transponder | 1 | 16 |
| | Dynamic Ridesharing/Paratransit | $ 26.60 | $ 39.08 | 1/4 cost of urban system, which included 2 additional workstations, rideshare pkg software, communication lines, 2 staff persons @ $50-75K, insurance | 0.5 for local, 1.0 for corridor/ areawide application | 24 |
| | On-Board Transit Safety Systems | $ 4.10 | $ 0.39 | on-board safety sensor processor, on-board CCTV | 5 to 40, based on est. fleet size | 25 |
| | Parking Management & Information System | $ 21.50 | $ 7.17 | entrance/exit ramp meters, tag readers, database, software, computer, communications lines | 1 | 24, 17 |
| | Recreational Veh. Park and Ride Lots | $ 118.10 | $ 5.32 | bus zone amenities, access improvement, storm water detention, landscaping, four CCTV cameras | 1 | 16, 18, 17 |
| | Smart Card | $ 425.00 | $ 2.70 | software, 10 ticket vending machines for smart cards | 1 | 18, 17 |
| | Transit Traveler Information | $ 27.50 | $ 13.00 | LED display installed at five transit stations that provides status information on transit arrival. | 4 for corridors, Eugene; 0.4 elsewhere | 18, 17 |
| | Transit Vehicle Routing/Scheduling | $ 447.00 | $ 11.60 | vehicle location interface, communications, vehicle tracking system, database and info storage, schedule adj. software, traveler info software, integration (reduced by $400K), 3 workstations | 0.1 to 1, based on population | 24, 17 |

**Table 8-1:** Cost Assumptions (cont.).

| Category | Infrastructure Name | Capital Equipment Costs ($K) | Annual O&M Costs ($K) | Cost Assumptions | Cost Factor | References |
|---|---|---|---|---|---|---|
| Infrastructure Operations and Maintenance | Advanced Vehicle Detection | $ 17.50 | $ 0.30 | average of video and radar detection, one sensor for both directions of travel | 1 | 18 |
| | Automated Gate Closure | $ 60.00 | $ 3.70 | remote dial-up, auto swing arm | 1 | 27, 17 |
| | Automatic Traffic Recorder | $ 5.50 | $ 0.80 | double set of loops, controller, power | 1 | 25 |
| | Closed-Circuit Television Camera | $ 20.00 | $ 1.00 | not including communication | 1 | 25 |
| | Flood and Scour Detection | $ 40.00 | $ 2.00 | | 1 | 28 |
| | RWIS | $ 50.00 | $ 2.00 | includes pavement temperature sensor, subsurface temperature sensor, precipitation sensor (type & rate), wind sensor (speed & direction), air temperature and humidity sensors, visibility sensors, and remote processing unit (RPU) | 1 | 18 |
| | Satellite Traffic Operations Center | $ 205.00 | $ 322.50 | remodel existing space, computers, video displays, video decompression hardware, fax machines, telephones, office furniture; maint 1/2 of incident detection costs | 0.5 Susanville, 0.75 Eugene, 1 elsewhere | 29, 24 |
| | Video Image Processing Station | $ 25.35 | $ 0.40 | one detector, both directions | 1 | 18 |
| Fleet Operations and Maintenance | Automatic Vehicle Location | $ 60.00 | $ 3.00 | vehicle location interface from FMS to TMS, software for vehicle scheduling/tracking | 1 | 18 |
| | Probe Vehicle Instrumentation | $ 0.54 | $ 0.41 | software and processor, road sensors (roughness, temp), active tag, tag processor | Based partially on average daily traffic | 25, 17 |
| Commercial Vehicle Operations | Hazmat Management | $ 26.50 | $ 3.77 | tracking and scheduling management, wirelines to ISP, ERMS and TMC, workstation | 0.5 to 1, based on average daily truck traffic | 24, 17 |
| | Preclearance | $ 325.00 | $ 8.10 | design and deployment | 1 | 24, 17 |
| | Weigh in Motion | $ 15.00 | $ 1.50 | load cell, interface to roadside facility, wireline communication | 1 | 24 |

### *8.2.1 Operations Costs*

The operations costs associated with the ITS deployment may be divided into three components: costs associated with the transportation management center[11] (TMC), costs associated with access to field devices, and costs associated with the field devices themselves. The distinction between these costs is depicted in Figure 8-1.

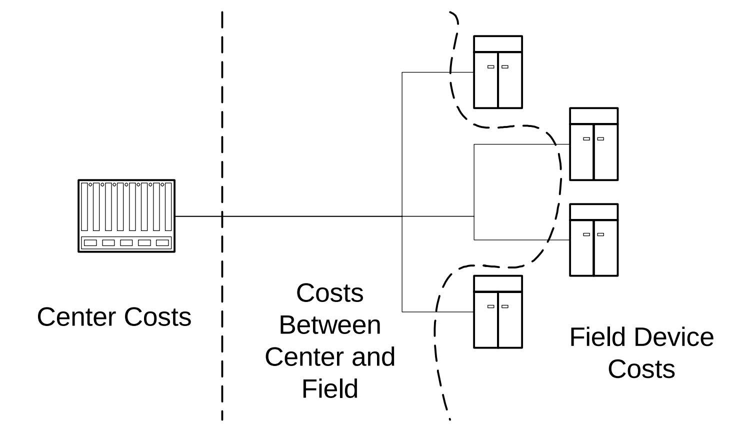


**Figure 8-1:** Distribution of Operations Costs Between Center and Field.

Center Costs. The TMC is critical to successful utilization of ITS technologies to improve transportation in the region. In urban areas, there does not seem to be a clear relationship between the amount of investment into a TMC that is needed and the number and type of ITS devices that are deployed. This is more likely to be true in rural areas that tend to have less experience with TMCs and ITS in general. Therefore, this section will address only in broad terms the costs associated with the TMC.

- Building. The building serves as a physical point of integration where information about the transportation system is collected and distributed. The building serves the obvious functions of providing an indoor working environment for TMC staff as well as housing all of the necessary equipment required for controlling, monitoring and reviewing data from ITS field devices. Several factors will influence the operating costs of the TMC building, including whether the facility leased or owned, the size of the building, the costs of utilities, the range of functions intended to be performed in the TMC and the amount of space these functions would require, and the existence of space-sharing arrangements with other agencies (such as state police).

- Staff. The other critical on-going cost at the TMC will be the cost of staff located at the TMC who help to manage and use the ITS infrastructure. The number and skill set of employees housed at the TMC will depend significantly on the agency's vision for what the TMC's role is. Some potential tasks for TMC staff include conducting traffic surveillance, detecting or responding to incidents, coordinating incident management efforts, monitoring road and weather conditions, and disseminating traffic information. Staffing costs should include salaries, fringe benefits and training, and should reflect the hours of operation of the center (e.g. only during incidents, certain times of year, or 24 hours a day, 7 days a week operations).

[11] TMC is used in this chapter as a generic term to refer to Caltrans' Advanced Rural Technology Integration Centers (ARTIC) in Redding and Eureka, and ODOT's Transportation Operations Centers in Medford and Bend.

- Integration. The TMC needs to be able to integrate information from sources that use different computer systems or data formats. Continuing effort will need to be spent on integration to ensure the seamless and accurate transmission of data across agencies. This cost will primarily be a one-time initial cost associated with computer programming, although on-going effort may be necessary as well.

- Office Support. There are a myriad of other costs associated with the TMC that may not be directly related to device deployment levels, such as overhead costs (to support accounting and payroll functions performed off-site) and office supplies.

Costs Between Center and Field. The second group of costs to consider is related with transmitting information or resources between the TMC and field devices.

- Vehicles. As part of the ongoing operations and maintenance on an ITS infrastructure, vehicles will be necessary for performing some operational tasks (such as moving a portable VMS from one location to another) as well as maintenance tasks. The size of a vehicle fleet based at the TMC depends upon the number of staff assigned to the TMC who have maintenance responsibilities. Vehicle costs will include costs for fuel as well as repair. Costs per vehicle are expected to vary widely depending upon duty cycles.

- Communications. The cost of communications between the field device and the center depends upon the type of medium used and in some cases on the amount of time spent transmitting information. The medium that should be used will depend upon the location of devices with respect to existing communications infrastructure, the amount of bandwidth required for successful operation, the distance to the TMC, and topography. It may be possible to have several field devices share the same communication link to the TMC.

Field Device Costs. The final portion of operating costs is the set of costs associated with the operation of field devices themselves. These costs are expected to be relatively constant for a specific device (unless it has highly seasonal usage), but will vary considerably from one device to another.

- Power. Most ITS devices will need to rely on a certain level of continuous power for successful operations. Three types of power are typically used for ITS field devices: electric, battery and solar. Multiple power sources may also be used to compliment each other, such as a solar-powered device with a battery backup.

  Generated from a variety of sources, electric power is transmitted through power lines to a field device. For field device locations where electric power is already available, this is generally the preferred method of power supply because of its reliability. The costs associated with using electric power include an initialization cost and monthly costs based on usage levels in kilowatt-hours (kWh).

  As opposed to having live lines connected to a power generation center, batteries may be used to provide power to devices. These are best used in applications where power usage is limited, since high power usage will expedite battery replacement. Rechargeable batteries may have some application for ITS technologies, but may not be ideal due to their tendency to lose charge over time independent of usage.

Solar power is well suited to areas where electric service is not currently provided, power demand is low and not constant, and daylight and cloud conditions are adequate to permit for recharging of solar batteries. Solar energy may be generated and stored locally at the device through the use of a solar array consisting of photovoltaic cells and a set of batteries to store power. Solar batteries lose their ability to store charge and must be replaced every few years. For applications where greater power is required, generators (such as diesel or thermoelectric) or fuel cells may be used in conjunction with solar energy to supply power when the batteries are exhausted. The use of generators or fuel cells is recommended for applications where significant power is also required during overnight hours, such as a portable variable message sign warning of lane closures at a construction site.

- Communications. In addition to the costs of providing communication links between field devices and the center, there may be unique communication operating costs associated with each device depending upon the amount of bandwidth required to transmit data to or receive data from a specific field device. Some devices will communicate to the TMC only in the event that a specific event has occurred (i.e. a sensor detecting flooding has been tripped). Other devices will require continuous communications, such as a camera that transmits live images.

Because of the ambiguity of many operational costs, the only operational costs that will be considered are power and communications. Assumptions used to estimate these costs are described in the Operations and Maintenance Technical Report (17).

### *8.2.2 Maintenance Costs*

The predominant recurring cost for intelligent transportation systems applications is maintenance, including both preventative or scheduled maintenance tasks and repair or emergency maintenance tasks. This section will summarize the methodology used to estimate maintenance costs for the ITS infrastructure. More detailed information on actual per-device cost estimates are provided in the Operations and Maintenance Technical Report (17).

Staffing. Developing estimates of staffing cost associated with maintenance involved examining a series of steps.

- Repair time. Maintenance technicians will be dispatched for both preventative and repair maintenance activities. For each type of activity, estimates of typical annual requirements were developed in terms of number of visits per year, number of hours per visit, and type of skill set required. Moreover, in order to fully describe the appropriate skill set required for each device, it was important to look at each device in terms of components, such as sensors, communications, field processor/controller, software, center sub-systems and information delivery. These requirements further reflected that there may be hand-offs because the person dispatched initially to make a repair may not be able to diagnose the problem, so another technician needs to be sent.

- Travel time. Travel time was factored in for each repair visit, because it can represent a significant time cost in rural deployments. Travel times were estimated within each of the regions included in the COATS study area. It was assumed that, when needed, higher-level technicians would need to be dispatched from each DOT's headquarters office.

- Inventory levels. Because future inventory levels for these technologies are uncertain, maintenance cost estimates were prepared on a per-device estimate. There are two disclaimers that are critical to observe. First, travel time on preventative maintenance activities will tend to decrease as deployment levels increase, because multiple devices may be serviced on the same trip. Second, some devices, such as RWIS, have an architecture where there can be an indeterminate number of field devices corresponding to a single center sub-system, such as a server. As the number of field devices increases, average per-device maintenance costs could therefore be expected to decrease.

- Salary and overhead. In order to establish a consistent base, salary levels were obtained from the state of Oregon in order to estimate the typical staff costs for skill levels associated with various types of maintenance activities, such as electronics or information systems[12]. Overhead and fringe benefits were estimated to be 70 percent of staff salary levels. This overhead may be used to include operations costs, such as building and vehicle usage.

Spare Parts and Emergency Device Replacement. Another critical component of the maintenance budget is the cost associated with spare parts or emergency device replacement. Spare parts costs are associated with components that are expected to wear frequently and for which replacement rates can be estimated, such as light bulbs. Emergency device replacement is necessary to consider because events like lightning or seismic disturbances may render a device completely inoperative. Having funds set aside for emergency device replacement can make sure that a device can be replaced without having to wait for a new allocation in the short-range transportation improvement program.

Other Costs. Several other costs could factor into maintenance, but are not considered in this document.

- Vendor Support. Some maintenance activities are so specialized that agency staff could not perform them. The costs of this vendor support have not been considered, as this will depend upon the nature of procurement and vendor selection.

- Contracting. For budgeting purposes, it was assumed that no maintenance would be contracted. The cost of contracting for maintenance on any particular device could

[12] ITS maintenance crosses over several skill areas, so it may be decided to create separate position descriptions, like ITS engineer or ITS technician, to reflect the different skill sets required. These positions may have different salary levels that could affect staffing costs.

differ based on a number of factors, such as contract structure and terms and contractor proficiency.

- Training. It may be necessary to secure training for maintenance staff to handle repair activities not handled by vendor or contracting support. Ideally, training would be initially obtained by product vendors upon installation and deployment of the ITS element, and senior technicians would transfer information on appropriate maintenance practices to junior technicians. This may not be practical in many cases; however, it would be difficult to assess the training costs on a per-device basis without a more detailed understanding of staff abilities and training needs.

- Test/Specialized Equipment. It may be necessary to acquire additional equipment to diagnose, test and repair ITS devices in a timely fashion. The necessity of acquiring such equipment will need to be evaluated on a regional level, based on existing needs and future deployment levels.

## 8.3 Strategic Deployment Costs

Tables 8-2, 8-3 and 8-4 provide estimates of total costs for short-term, medium-term and long-term deployment in the COATS study area[13]. The totals from these tables are summarized in Table 8-5. Cost estimates are broken down into the seven technology focus areas, and are further decomposed according to individual devices. Subtotals are presented for each state as well. For deployments that cross state or county lines, such as developing a regional incident management plan, cost allocation between jurisdictions was based on the portion of the project located within each jurisdiction.

### *8.3.1 Short-term Deployment*

As identified in Condition and Performance Report, the Market Package exercise, and the Infrastructure Report surveys, safety related priorities are the critical short-term need for the study area. As referenced in Table 8-2, approximately 330 separate improvements costing an estimated $24.5 million have been identified in short-term needs in the 80,000 square mile study area. An estimated $1.4 million will be needed in operations and maintenance funding on an annual basis. The number of short-term improvements is split approximately equally across the state line. Short-term again was defined as priorities that should be deployed within four years.

### *8.3.2 Medium-term Deployment*

As defined by the Steering Committee medium-term deployment is established as occurring between four and eight years from now. As shown in Table 8-3, the medium-term priorities begin to address improvements beyond safety and include public transit, fleet management, and commercial vehicle operations and more travel and tourism. Nearly 500 separate improvements have been identified. These priorities cost approximately $45.6 million,

[13] Operations and maintenance costs for existing deployment were excluded in cost estimates.

**Table 8-2:** Cost of Short-Term Deployment.

| | | California | | | Oregon | | |
|---|---|---|---|---|---|---|---|
| **Technology Focus Area** | **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| Traveler Safety and Security | Adv. Warning for Narrow Lanes | - | $ - | $ - | 4 | $ 144 | $ 11 |
| | Advanced Bike/Ped Warning | 1 | $ 24 | $ 2 | 2 | $ 47 | $ 5 |
| | Advisory Television | 2 | $ 38 | $ - | 2 | $ 38 | $ - |
| | Animal/Vehicle Collision Warning | 1 | $ 200 | $ 10 | 3 | $ 1,000 | $ 50 |
| | Automated Anti-Icing | - | $ - | $ - | 3 | $ 255 | $ 24 |
| | Automated Flood Warning | 1 | $ 40 | $ 3 | 6 | $ 200 | $ 13 |
| | Automated Visibility Warning | - | $ - | $ - | 1 | $ 80 | $ 1 |
| | Automated Wind Advisory | 1 | $ 60 | $ 3 | 1 | $ 60 | $ 3 |
| | Dynamic Warning VMS | - | $ - | $ - | 13 | $ 3,250 | $ 57 |
| | Extinguishable Message Sign | 4 | $ 200 | $ 7 | | | |
| | Highway Advisory Radio | 6 | $ 300 | $ 12 | 11 | $ 550 | $ 22 |
| | Motorist-Aide Call Box | - | $ - | $ - | 2 | $ 20 | $ 2 |
| | Slide Detection Station | 1 | $ 28 | $ 3 | | | |
| | Variable Message Sign | 25 | $ 5,225 | $ 60 | 21 | $ 4,389 | $ 50 |
| Emergency Services | Mayday Systems | - | $ - | $ - | 5 | $ - | $ - |
| | Regional Incident Management Plan | 12 | $ 230 | $ 23 | 12 | $ 180 | $ 18 |
| | Rural Coordinate Addressing System | 5 | $ 27 | $ 1 | - | $ - | $ - |
| Tourism and Traveler Information Services | 800 Travel Advisory | - | $ - | $ - | 7 | $ 936 | $ 94 |
| | Kiosks | 2 | $ 20 | $ 4 | 18 | $ 180 | $ 36 |
| Public Traveler/Mobility Services | Parking Management & Information System | - | $ - | $ - | 2 | $ 43 | $ 14 |
| | Recreational Veh. Park and Ride Lots | - | $ - | $ - | 5 | $ 591 | $ 27 |
| Infrastructure Operations and Maintenance | Advanced Vehicle Detection | 14 | $ 245 | $ 4 | 13 | $ 228 | $ 4 |
| | Automated Gate Closure | 2 | $ 120 | $ 7 | 4 | $ 240 | $ 15 |
| | Closed-Circuit Television Camera | 65 | $ 1,300 | $ 65 | 8 | $ 160 | $ 8 |
| | RWIS | 13 | $ 650 | $ 26 | 13 | $ 650 | $ 26 |
| | Satellite Traffic Operations Center (TOC/ARTIC) | 2 | $ 700 | $ 645 | - | $ - | $ - |
| Fleet Operations and Maintenance | Automatic Vehicle Location | - | $ - | $ - | 2 | $ 165 | $ 14 |
| | Probe Vehicle Instrumentation | - | $ - | $ - | 1 | $ 15 | $ 11 |
| Commercial Vehicle Operations | Preclearance | - | $ - | $ - | 5 | $ 1,625 | $ 41 |
| | Weigh in Motion | - | $ - | $ - | 4 | $ 60 | $ 6 |
| **SUBTOTAL** | | **157** | **$ 9,406** | **$ 876** | **168** | **$ 15,105** | **$ 551** |

**Table 8-3:** Cost of Medium-Term Deployment.

| | | California | | | Oregon | | |
|---|---|---|---|---|---|---|---|
| **Technology Focus Area** | **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| Traveler Safety and Security | Adv. Warning for Narrow Lanes | 8 | $384.80 | $29.12 | 5 | $240.50 | $18.20 |
| | Advanced Bike/Ped Warning | 8 | $188.00 | $18.32 | 12 | $282.00 | $27.48 |
| | Advisory Television | 8 | $152.00 | $0.00 | 3 | $57.00 | $0.00 |
| | Animal/Vehicle Collision Warning | 4 | $400.00 | $20.00 | 6 | $3,000.00 | $150.00 |
| | Automated Anti-Icing | 3 | $340.00 | $31.60 | 2 | $170.00 | $15.80 |
| | Automated Flood Warning | 8 | $320.00 | $20.40 | - | $ - | $ - |
| | Automated Visibility Warning | 2 | $120.00 | $1.80 | 5 | $200.00 | $3.00 |
| | Dynamic Warning VMS | 7 | $1,750.00 | $30.80 | 17 | $4,250.00 | $74.80 |
| | Highway Advisory Radio | 8 | $400.00 | $16.00 | 14 | $700.00 | $28.00 |
| | Intersection Advance Warning | 1 | $49.50 | $3.55 | 5 | $247.50 | $17.75 |
| | Lateral Safety Warning System | - | $ - | $ - | 4 | $0.00 | $0.00 |
| | Motorist-Aide Call Box | 13 | $1,162.27 | $116.23 | 6 | $265.53 | $26.55 |
| | Variable Message Sign | 22 | $4,598.00 | $52.80 | 26 | $5,434.00 | $62.40 |
| Emergency Services | Mayday Systems | 16 | $0.00 | $0.00 | 7 | $0.00 | $0.00 |
| | Regional Incident Management Plan | 9 | $225.36 | $22.54 | 10 | $190.63 | $19.06 |
| | Rural Coordinate Addressing System | 8 | $37.80 | $1.89 | 6 | $23.70 | $1.19 |
| | Traffic Signal Priority for Emergency Vehicles | 2 | $17.00 | $0.74 | 1 | $8.50 | $0.37 |
| Tourism and Traveler Information Services | 800 Travel Advisory | 18 | $2,620.80 | $262.08 | 8 | $1,497.60 | $149.76 |
| | Kiosks | 7 | $70.00 | $14.00 | 13 | $130.00 | $26.00 |
| Public Traveler/Mobility Services | Automated Passenger Counting | - | $ - | $ - | 1 | $1.20 | $1.41 |
| | Dynamic Ridesharing/Paratransit | 1 | $26.60 | $39.08 | 7 | $186.20 | $273.56 |
| | On-Board Transit Safety Systems | 1 | $4.10 | $0.39 | - | $ - | $ - |
| | Parking Management & Information System | 1 | $21.50 | $7.17 | 5 | $107.50 | $35.85 |
| | Recreational Veh. Park and Ride Lots | - | $ - | $ - | 8 | $944.80 | $42.56 |
| | Smart Card | - | $ - | $ - | 1 | $425.00 | $2.70 |
| | Transit Traveler Information | 9 | $302.50 | $143.00 | 22 | $605.00 | $286.00 |
| | Transit Vehicle Routing/Scheduling | 1 | $447.00 | $11.60 | 9 | $4,023.00 | $104.40 |
| Infrastructure Operations and Maintenance | Advanced Vehicle Detection | 17 | $297.50 | $5.10 | 8 | $140.00 | $2.40 |
| | Automated Gate Closure | - | $ - | $ - | 1 | $60.00 | $3.70 |
| | Closed-Circuit Television Camera | 22 | $440.00 | $22.00 | 4 | $80.00 | $4.00 |
| | RWIS | 7 | $350.00 | $14.00 | 8 | $400.00 | $16.00 |
| Fleet Operations and Maintenance | Automatic Vehicle Location | 1 | $82.50 | $7.00 | 2 | $165.00 | $14.00 |
| | Probe Vehicle Instrumentation | 6 | $52.38 | $39.77 | 2 | $21.06 | $15.99 |
| Commercial Vehicle Operations | Hazmat Management | 8 | $37.10 | $5.28 | 6 | $53.00 | $7.54 |
| | Preclearance | 6 | $1,950.00 | $48.60 | 14 | $4,550.00 | $113.40 |
| | Weigh in Motion | 6 | $90.00 | $9.00 | 11 | $165.00 | $16.50 |
| **SUBTOTAL** | | **238** | **$ 16,937** | **$ 994** | **259** | **$ 28,624** | **$ 1,560** |

**Table 8-4:** Cost of Long-Term Deployment.

| Technology Focus Area | Infrastructure Name | California No. | California Capital ($K) | California O&M ($K) | Oregon No. | Oregon Capital ($K) | Oregon O&M ($K) |
|---|---|---|---|---|---|---|---|
| Traveler Safety and Security | Adv. Warning for Narrow Lanes | 6 | $ 289 | $ 22 | 2 | $ 96 | $ 7 |
| | Advanced Bike/Ped Warning | 4 | $ 94 | $ 9 | 2 | $ 47 | $ 5 |
| | Advisory Television | 4 | $ 76 | $ - | 8 | $ 152 | $ - |
| | Animal/Vehicle Collision Warning | 5 | $ 2,200 | $ 110 | 1 | $ 700 | $ 35 |
| | Automated Anti-Icing | 4 | $ 595 | $ 55 | 2 | $ 340 | $ 32 |
| | Automated Flood Warning | 7 | $ 240 | $ 15 | - | $ - | $ - |
| | Automated Visibility Warning | 10 | $ 480 | $ 7 | 2 | $ 80 | $ 1 |
| | Driver Impairment Detection | 3 | $ - | $ - | 1 | $ - | $ - |
| | Dynamic Warning VMS | 6 | $ 1,500 | $ 26 | 8 | $ 2,000 | $ 35 |
| | Highway Advisory Radio | 20 | $ 1,000 | $ 40 | 2 | $ 100 | $ 4 |
| | Intersection Advance Warning | 8 | $ 396 | $ 28 | 8 | $ 396 | $ 28 |
| | Lateral Safety Warning System | 14 | $ - | $ - | 2 | $ - | $ - |
| | Variable Message Sign | 48 | $ 10,032 | $ 115 | 22 | $ 4,598 | $ 53 |
| Emergency Services | Mayday Systems | 6 | $ - | $ - | - | $ - | $ - |
| | Regional Incident Management Plan | 10 | $ 129 | $ 13 | 7 | $ 166 | $ 17 |
| | Rural Coordinate Addressing System | 10 | $ 42 | $ 2 | - | $ - | $ - |
| Tourism and Traveler Information Services | 800 Travel Advisory | - | $ - | $ - | 9 | $ 1,685 | $ 168 |
| | In-Vehicle Route Guidance System | 23 | $ - | $ - | 41 | $ 60 | $ 6 |
| | Kiosks | 21 | $ 210 | $ 42 | - | $ - | $ - |
| Public Traveler/Mobility Services | Automated Passenger Counting | 18 | $ 22 | $ 25 | 20 | $ 24 | $ 28 |
| | Automatic Vehicle Identification System | 1 | $ 26 | $ 2 | 1 | $ 26 | $ 2 |
| | Dynamic Ridesharing/Paratransit | 4 | $ 53 | $ 78 | - | $ - | $ - |
| | On-Board Transit Safety Systems | 17 | $ 70 | $ 7 | 21 | $ 86 | $ 8 |
| | Parking Management & Information System | 7 | $ 151 | $ 50 | 7 | $ 151 | $ 50 |
| | Recreational Veh. Park and Ride Lots | 6 | $ 709 | $ 32 | 6 | $ 709 | $ 32 |
| | Smart Card | 2 | $ 850 | $ 5 | - | $ - | $ - |
| | Transit Vehicle Routing/Scheduling | 17 | $ 7,599 | $ 197 | 12 | $ 5,364 | $ 139 |
| Infrastructure Operations and Maintenance | Advanced Vehicle Detection | 23 | $ 403 | $ 7 | 2 | $ 35 | $ 1 |
| | Automated Gate Closure | 8 | $ 480 | $ 30 | - | $ - | $ - |
| | Closed-Circuit Television Camera | 60 | $ 1,200 | $ 60 | 3 | $ 60 | $ 3 |
| | RWIS | 34 | $ 1,700 | $ 68 | 3 | $ 150 | $ 6 |
| | Satellite Traffic Operations Center (TOC/ARTIC) | 1 | $ 350 | $ 323 | 1 | $ 350 | $ 323 |
| Fleet Operations and Maintenance | Automatic Vehicle Location | 4 | $ 330 | $ 28 | 7 | $ 330 | $ 28 |
| | Probe Vehicle Instrumentation | 11 | $ 36 | $ 27 | - | $ - | $ - |
| Commercial Vehicle Operations | Hazmat Management | 4 | $ 40 | $ 6 | 2 | $ 13 | $ 2 |
| | Preclearance | - | $ - | $ - | 2 | $ 650 | $ 16 |
| | Weigh in Motion | - | $ - | $ - | 6 | $ 90 | $ 9 |
| **SUBTOTAL** | | **426** | **$ 31,300** | **$ 1,430** | **210** | **$ 18,457** | **$ 1,038** |

**Table 8-5:** Summary of COATS Deployment Costs.

| Priority Level | Technology Focus Area | California No. | California Capital ($K) | California O&M ($K) | Oregon No. | Oregon Capital ($K) | Oregon O&M ($K) |
|---|---|---|---|---|---|---|---|
| Short-Term | Traveler Safety and Security | 42 | $ 6,114 | $ 100 | 69 | $ 10,033 | $ 238 |
| | Emergency Services | 17 | $ 257 | $ 24 | 17 | $ 180 | $ 18 |
| | Tourism and Traveler Information Services | 2 | $ 20 | $ 4 | 25 | $ 1,116 | $ 130 |
| | Public Traveler/Mobility Services | - | $ - | $ - | 7 | $ 634 | $ 41 |
| | Infrastructure Operations and Maintenance | 96 | $ 3,015 | $ 748 | 38 | $ 1,278 | $ 53 |
| | Fleet Operations and Maintenance | - | $ - | $ - | 3 | $ 180 | $ 25 |
| | Commercial Vehicle Operations | - | $ - | $ - | 9 | $ 1,685 | $ 47 |
| | Subtotal | 157 | $ 9,406 | $ 876 | 168 | $ 15,105 | $ 551 |
| Medium-Term | Traveler Safety and Security | 92 | $ 9,865 | $ 341 | 105 | $ 14,847 | $ 424 |
| | Emergency Services | 35 | $ 280 | $ 25 | 24 | $ 223 | $ 21 |
| | Tourism and Traveler Information Services | 25 | $ 2,691 | $ 276 | 21 | $ 1,628 | $ 176 |
| | Public Traveler/Mobility Services | 13 | $ 802 | $ 201 | 53 | $ 6,293 | $ 746 |
| | Infrastructure Operations and Maintenance | 46 | $ 1,088 | $ 41 | 21 | $ 680 | $ 26 |
| | Fleet Operations and Maintenance | 7 | $ 135 | $ 47 | 4 | $ 186 | $ 30 |
| | Commercial Vehicle Operations | 20 | $ 2,077 | $ 63 | 31 | $ 4,768 | $ 137 |
| | Subtotal | 238 | $ 16,937 | $ 994 | 259 | $ 28,624 | $ 1,560 |
| Long-Term | Traveler Safety and Security | 139 | $ 16,902 | $ 429 | 60 | $ 8,509 | $ 200 |
| | Emergency Services | 26 | $ 171 | $ 15 | 7 | $ 166 | $ 17 |
| | Tourism and Traveler Information Services | 44 | $ 210 | $ 42 | 50 | $ 1,745 | $ 174 |
| | Public Traveler/Mobility Services | 72 | $ 9,478 | $ 396 | 67 | $ 6,359 | $ 259 |
| | Infrastructure Operations and Maintenance | 126 | $ 4,133 | $ 487 | 9 | $ 595 | $ 332 |
| | Fleet Operations and Maintenance | 15 | $ 366 | $ 55 | 7 | $ 330 | $ 28 |
| | Commercial Vehicle Operations | 4 | $ 40 | $ 6 | 10 | $ 753 | $ 27 |
| | Subtotal | 426 | $ 31,300 | $ 1,430 | 210 | $ 18,457 | $ 1,038 |
| **TOTAL** | | **821** | **$ 57,642** | **$ 3,300** | **637** | **$ 62,187** | **$ 3,149** |

of which thirty-seven percent was identified for California and sixty-three percent for Oregon. Also an estimated $2.6 million will be needed annually to support operations and maintenance, in addition to the funds required to support the short-term program.

### *8.3.3 Long-term Deployment*

The long-term deployment time frame was defined as eight to fifteen years. Based on input from Steering Committee members the long-term needs within the study area include approximately 640 separate improvements and are calculated to be approximately $49.8 million, of which 63 percent is allocated for California and 37 percent for Oregon. An additional $2.5 million would be needed to support operations and maintenance annually. These improvements take into consideration all aspects of Advanced Rural Transportation Systems, as shown in Table 8-4.

### *8.3.4 Total Cost*

As shown in Table 8-5, the estimated cost of the 1,458 advanced technology improvements is nearly $120 million for the 80,000 square mile study area. An estimated $6.4 million would be needed annually to support operations and maintenance.

At first glance, these cost estimates may appear high. Therefore, by means of comparison, cost information from other strategic plans was surveyed and compared. It should be noted that these comparisons are somewhat between apples and oranges, as the following plans used different cost assumptions and each plan included at least one urban area larger than those found in the COATS study area.

- Washington IVHS Statewide Strategic Plan (1993). This document was one of the first statewide strategic plans addressing ITS applications. The estimated 20-year capital cost for statewide deployment was $1.4 billion, with $142 million in annual operations and maintenance costs (30).

- Oregon ITS Strategic Plan: 1997-2017. The estimated capital cost for ITS is $216 million, with approximately $7.8 million in O&M and $3.5 million in staffing costs per year (28).

- Nebraska ITS Statewide Strategic Plan. The total program cost over a 20-year period is $320 million, which is all-inclusive (31). Parenthetically, the plan estimates benefits of the overall deployment as $482 million.

The cost estimates for the COATS plan seem reasonably comparable to these other plans. It should be emphasized that financial constraints will determine to what extent the ITS plan may be fulfilled. This will be discussed in the following chapter.

### *8.3.5 County-Level Costs*

Tables in Appendices H and I provide county-level cost estimates for the short, medium and long-term ITS deployment for each county.

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# 9 FUNDING FOR ITS PROJECTS

ITS projects may be funded through a variety of public and private funding sources including, but not limited to: Federal funds, statewide taxes, local taxes, and private agency partnering. It is important to consider that in many cases ITS projects will be competing with conventional construction and maintenance projects for funding. Therefore, to be successful in obtaining funding, ITS projects must:

- demonstrate adequate need,
- employ standard justification methods such as cost-benefit ratios, and
- adhere to all state and Federal regulations related to the project.

The intent of this chapter is to outline several potential funding sources for future COATS projects in general terms. Applicability of a particular program may vary between the two states.

## 9.1 Federal Sources

The Transportation Equity Act of the 21st Century (TEA-21) enacted June 9, 1998 as Public Law 105-178 replaces the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA). Similar to ISTEA, TEA-21 provides for six years of funding for a majority of transportation needs. However, the new legislation replaces the Intelligent Vehicle Highway Systems (IVHS) Act with two new ITS sections and thus dedicates $1.3 billion to ITS. Table 9-1 shows some of the major funding categories designated by TEA-21.

In addition, TEA-21 allows for an "expanded ability to use other major program funds for ITS" (32). For instance, Surface Transportation Program (STP) funds may be transferred at specified amounts to the National Highway System (NHS) funds or Congestion Mitigation and Air Quality (CMAQ) Improvement Program funds and vice versa. The sections below outline several functional areas of the TEA-21 legislation and their intended purpose. In order for a COATS project to compete for most of these programs it would have to compete with traditional transportation projects through each State's statewide planning process (i.e., Statewide Transportation Improvement Program) (33).

### *9.1.1 Surface Transportation Program (STP)*

The STP provides funding for projects on any Federal-aid highway including the NHS, bridge projects on public roads, transit capital projects, and intracity and intercity bus terminals and facilities (34). A portion of the funds may be used for rural collectors. Eligible projects include operational improvements – including capital improvements that will improve or enhance the operational efficiency of a highway – and capital costs, as well as operating costs for traffic monitoring, management and control facilities and programs (35). A notable addition to TEA-21 is the expansion of STP eligibility to specifically include infrastructure-based ITS capital improvements.

Total funding for the STP is approximately $33 billion over the next six years of TEA-21. Funds are distributed to states based on the following equation (34):

**Table 9-1:** Potential Funding Sources from TEA 21. (Source: 33)

| **Program** | **National Authorized Level (millions of dollars)** | **Eligibility** |
|---|---|---|
| Title I: Federal Aid Highways (i.e., interstate maintenance, surface transportation, national highway system, federal land highways) | FY98 $23,816<br>FY99 $28,191<br>FY00 $28,910<br>FY01 $29,487<br>FY02 $30,065<br>FY03 $30,636 | Mostly distributed through state departments of transportation through statewide transportation planning process. |
| Title III: Federal Transit Administration Programs (i.e., formula grants, capital grants, planning, research, clean fuels) | FY98 $4,643<br>FY99 $6,341<br>FY00 $6,810<br>FY01 $7,274<br>FY02 $7,737<br>FY03 $8,194 | Funds for capital and operations of transit agencies are mostly distributed through state departments of transportation. Research grants are distributed mostly through national programs such as Transit Cooperative Research Program |
| Title IV: Motor Carrier Safety | FY98 $85<br>FY99 $100<br>FY00 $105<br>FY01 $112<br>FY02 $117<br>FY03 $125 | Distributed to states for motor carrier safety enforcement and information systems |
| Title V: Transportation Research | $2,881 total | See below for more detail on some programs |
| ITS Standards, Research, Operational Tests and Development | FY98 $95<br>FY99 $95<br>FY00 $98<br>FY01 $100<br>FY02 $105<br>FY03 $110 | |
| ITS Deployment | FY98 $101<br>FY99 $105<br>FY00 $113<br>FY01 $118<br>FY02 $120<br>FY03 $122 | Administered mostly through FHWA for integration and interoperability $482 or commercial vehicle infrastructure $184. All projects must:<br>• Develop guidelines on procurement<br>• Independent evaluation<br>• Use Software Capability Maturity Model<br>• Life-cycle cost analysis<br>• Be consistent with the national architecture and available standards |
| University Transportation Centers | FY98 $26<br>FY99 $26<br>FY00 $27<br>FY01 $27<br>FY02 $27<br>FY03 $27 | Funding distributed to 10 regional centers and 23 other centers for use in transportation research, education and outreach |
| Technology Deployment Initiatives and Partnerships | FY98 $35<br>FY99 $35<br>FY00 $40<br>FY01 $45<br>FY02 $45<br>FY03 $50 | |

- 25 percent based on total lane miles of Federal-aid highways (FAH) in the State as a percent of total FAH lane miles in all states;

- 40 percent based on total vehicle miles traveled (VMT) on lanes of FAH in the State as a percent of total VMT on lanes of FAH in all states; and

- 35 percent based on estimated tax payments attributable to highway users in the State paid into the Highway Account of the Highway Trust Fund (HTF) in the latest fiscal year for which data are available, as a percent of total such payments by all States.

Following distribution to the states, the funding is further suballocated for highway-rail crossings, transportation enhancements, cities with populations greater than 200,000, and areas with populations less than 5,000.

It is clear that STP funding may be applied to capital expenditures for ITS and traffic management projects; however, the application of STP funds to operations and maintenance is not so well defined. While there is provision at the Federal level making such expenditures eligible, current local guidelines are that local agencies provide funding for operations and maintenance (35).

### *9.1.2 National Highway System (NHS)*

ISTEA designated a new highway system of approximately 155,000 miles to be known as the National Highway System (NHS) (35). TEA-21 continues this program and provides funds of approximately $28 billion over the six years of the Act. NHS funds are managed by the State Departments of Transportation. Apportionment to the States is based on the following (36):

- 25 percent based on total lane miles of principal arterials (excluding Interstate System) in each State as a percent of total such principal arterial lane miles in all States;

- 35 percent based on total VMT on lanes of principal arterials (excluding the Interstate System) in each State as a percent of total VMT on lanes of such principal arterials in all States;

- 30 percent based on diesel fuel used on all highways in each State and a percent of diesel fuel used on all highways in all States; and

- 10 percent based on total lane miles of principal arterials in each State divided by total population in each state as a percent of such ratio for all States.

Under the NHS, “start-up” funding for the operations of traffic management and control systems for up to two years can be provided including those for traffic signals and systems (35). Eligible projects include operational improvements to the NHS and operational improvements to non-NHS highways in a NHS corridor as well as infrastructure-based ITS capital improvements (35). However, using NHS funds for operations and maintenance has been viewed as reducing the funds for NHS construction for which these funds are the support (35). As with STP funds, operations and maintenance costs need to be addressed with separate funding.

### *9.1.3 State Planning and Research Funds*

TEA-21, like its predecessor ISTEA, apportions two percent of the total annual transportation disbursement of Federal fuel tax dollars to each state for State Planning and Research (SPR) (37). Of this, 25 percent is specifically set aside for research. Funds in this account may be augmented with support from other sources and/or private business interests. Additionally, funds may be used to support cooperative ventures such as a relationship with a university-based research center (37). The Showcase effort, which builds on the goals, objectives and organizational structure of the COATS project, was funded in part through Caltrans' SPR funds.

It is at the discretion of the states on how to disburse SPR funds. In the State of Montana, for example, research ideas are solicited each year. Submissions are then prioritized and approved by state officials. While ITS projects are eligible for SPR funding, they must compete with other traditional research projects, such as pavement research.

### *9.1.4 Congestion Mitigation and Air Quality Improvement (CMAQ) Program*

The Congestion Mitigation and Air Quality Improvement (CMAQ) Program directs $8 billion over the life of TEA-21 to projects and programs which reduce transportation related emissions in air quality nonattainment and maintenance areas for ozone, carbon monoxide (CO), and small particulate matter (PM-10) (40). As shown in Tables 9-2 and 9-3, several areas within the COATS study area are designated as nonattainment for one or more air pollutants[14]. Traditionally, ITS and traffic management programs have been viewed as being effective in reduction in fuel consumption and pollution, although their effect on VMT is still to be established (35). Funds are distributed to states based on each state's population and pollution severity. Areas with very poor air quality are given greater weight in the formula (35).

**Table 9-2:** Federal Air Quality Nonattainment Areas Within Oregon – COATS Area Only. (Source: 38)

| | Pollutant | |
|---|---|---|
| **City** | CO | PM-10 |
| Eugene-Springfield | | ✓ |
| Grants Pass | ✓ | ✓ |
| Klamath Falls | ✓ | ✓ |
| Lakeview | | ✓ |
| Medford-Ashland | ✓ | ✓ |
| Oakridge | | ✓ |

The Federal share for most eligible activities is 80 or 90 percent if used for certain activities on the Interstate System. Some activities, including traffic control signalization and certain transit related ITS elements may be eligible for funding at 100 percent (35). New to TEA-21, states may form new public-private partnerships by allocating CMAQ funds to private and non-profit entities for land, facilities, vehicles and project development activities (40); however, using CMAQ funding for nongovernmental partnerships on projects that are required under the Clean Air Act, the Energy Policy Act or other Federal legislation is prohibited.

[14] No counties within the California portion of the COATS study area are in nonattainment of Federal air quality standards (38).

Clearly, because of the broad array of projects eligible under CMAQ, use of these funds for ITS will necessarily compete with numerous alternative funding requests (35). The air quality benefits derived from ITS should be demonstrated in the early years of the program in order to establish ITS strategies as an effective use of CMAQ funds (35).

**Table 9-3:** State Air Quality Nonattainment Areas Within California – COATS Area Only). (Source: 39)

| | Pollutant | |
|---|---|---|
| **County** | Ozone | PM |
| Colusa (1) | ✓ | ✓ |
| Del Norte | | ✓ |
| Glenn | ✓ | ✓ |
| Humboldt | | ✓ |
| Lake | | |
| Lassen | | ✓ |
| Mendocino | | ✓ |
| Modoc | | ✓ |
| Plumas | | ✓ |
| Shasta | ✓ | ✓ |
| Siskiyou | | ✓ |
| Tehama | ✓ | ✓ |
| Trinity | | ✓ |

(1) Colusa County is designated as nonattainment-transitional for ozone.

### *9.1.5 Transit Funding*

Funding for ITS in transit applications is somewhat limited in TEA-21. Additionally, ITS projects must compete with traditional transit funding applications such as facility upgrades and vehicle purchase. Funding may be derived from three areas:

- Urbanized Area Formula Grants Program, which provides transit capital and operating assistance to urbanized areas with populations more than 50,000 (41);
- Formula Grants for Other Than Urbanized Areas, which provides transit capital and operating assistance to nonurbanized areas (less than 50,000 in population) (42); and
- Transit Capital Investment Grants and Loans, which provides transit capital assistance for new fixed guideway systems and extensions to existing fixed guideway systems, fixed guideway modernization, and bus and bus related facilities (43).

### *9.1.6 Intelligent Transportation Systems Program*

The Intelligent Transportation Systems Act of 1998 provides approximately $1.3 billion in funding specifically to ITS. This is then divided into two main areas: $679 million for deployment and $603 million for research and development. The purpose of the ITS Deployment section of TEA-21 is to fund small incentive grants to states and local governments to deploy integrated ITS through two ways: the ITS Integration Program and Commercial ITS Infrastructure Deployment (44).

Under the Integration program, metropolitan areas may use the funds for integrating existing or new projects funded from other sources. Rural areas, which automatically receive 10 percent of Integration funds, may use their portion for integration as well as deployment. Fiscal year limitations deployment funding include (45):

- not more than $15 million for a single metropolitan area,
- not more than $2 million for projects in a single rural area, and
- not more than $35 million for projects in any one state.

The commercial vehicle program's goals are to improve the safety and productivity of commercial vehicles and drivers, and to reduce costs associated with operating and regulating commercial vehicles in the United States (44). A majority of the funding is directed towards Commercial Vehicle Information Systems and Networks (CVISN) and the implementation of automated roadside inspections, automated vehicle screening and weighing, and electronic credentialing and tax reporting. In order to be eligible for either program, funding projects must meet several specific guidelines and the Federal share must not exceed 50 percent from ITS program funds or 80 percent overall.

The research and development portion of the ITS program encompasses all other aspects of the program not included under deployment, with specific focus on the Intelligent Vehicle Initiative (IVI), metropolitan travel management, rural ITS services, advanced public transportation systems, and commercial vehicle applications (44). Operational tests are to be designed to permit objective evaluations, obtain cost-benefit information, and develop and implement standards in order to prove the effectiveness and applicability of ITS (45). Federal share of research and development projects should not exceed 80 percent.

### *9.1.7 Earmarks*

Another source of Federal funding is the use of Congressional earmarks. This is funding designated by Congress, either in the transportation authorization bill or as a rider on other legislation, for specific projects. Earmarks should be pursued through the U.S. Senator or U.S. Representative with jurisdiction over the geographic area that a particular project would affect.

## 9.2 State Sources

State sources of funding are generally derived from local taxes or fees and are used to either match Federal funds or to support maintenance and operations. This section outlines several state funding sources.

### *9.2.1 State Levied Taxes and Fees*

Many states levy taxes from the users of the highway and street networks. These may be in the form of a tax on each gallon of fuel sold or a fee to license a vehicle. Such funds are typically dedicated to transportation improvements, with state and local agencies as the recipients. Gas tax funds and other user-based funding sources have classically been a major source of funding for regional freeway systems. They can be used to match Federal funds for selected major projects and are also sources for continuing operations and maintenance. State levied taxes and fees may go towards funding sources of particular significance to the implementation of ITS and traffic management programs (35). Both California and Oregon collect taxes from purchases of motor vehicle fuel, vehicle licenses and registration, and vehicle weight. These monies are then placed in a number of different accounts for distribution.

With regard to ITS in California, two accounts are significant. The Highway Users Tax Account supplies funding to cities and counties "for the acquisition of right of way, construction, reconstruction, improvement, and maintenance of public streets and highways" (46). The Highway Users Tax Account further allocates a portion of its funds to the State Highway

Account. Dollars from this fund are dedicated for "capital outlay support (rehabilitation, operational improvements, and new facilities); program development (research, system management, and programming); maintenance (roadbed, roadside structure, traffic control, and road damage); and administrative and legal expenses." (46)

In addition to the aforementioned recipients, monies from the State Highway Account are also allocated to the Public Transportation Account and the Environmental Enhancement and Mitigation Demonstration Fund; both of which may have some impact on ITS development in California. The former account's funds may be spent on capital outlay to mass transit programs, transit capital improvements and special transportation programs (46). The latter account provides grants, not to exceed $5 million, to projects related to the environmental enhancement or mitigation of existing or new transportation projects.

### *9.2.2 Oregon Transportation Infrastructure Bank*

The Oregon Transportation Infrastructure Bank (OTIB) is "a statewide revolving loan fund designed to promote innovative transportation funding solutions." (47) Borrowers, such as cities, counties, transit districts, tribal governments, and other authorities, receive a direct loan from the fund. Repayment must begin with five years and involves an appropriate interest rate.

Funds are available for several types of projects, many with possible ITS applications. For instance, the following types of programs are eligible for OTIB funding:

- highway projects, such as roads, signals, intersection improvements, and bridges;
- transit capital projects, such as buses, equipment, and maintenance of passenger facilities; and
- bikeway or pedestrian access projects on highway right-of-way (47).

Each project must be Federal-aid eligible and, therefore, be open to the public and functionally classified as a major collector or higher. Additionally, eligible projects must meet appropriate planning, programming, design, and contracting requirements (48).

### *9.2.3 Oregon Immediate Opportunity Fund*

In order to support economic development, the State of Oregon created the Immediate Opportunity Fund (IOF). Dollars from this account are intended for transportation construction or improvement projects that support other developments. ITS projects may not typically be considered eligible for this fund, but they can be applicable. For example, a network of variable message signs may assist visitors traveling to a new tourist attraction.

Two types of projects may receive funding in differing amounts. Type A projects – those that affirm job retention and/or create new job opportunities – may receive up to $500,000 (49). Alternately, Type B projects – those which focus on the revitalization of a business or industrial area – may receive up to $250,000 (49). Both types require a 50/50 match with public or private sources.

## 9.3 Regional/Local Sources

In addition to competing for state funds under the Statewide Transportation Improvement Program, regional and local areas may find financial support for projects from such sources as:

- local sales tax,
- motor vehicle registration fees,
- transit-related funds,
- toll-road funds, and
- privatization.

Using the aforementioned funds for ITS may be challenged by traditional views of county and regional funding. Counties or other local agencies use the typically scarce funds for ongoing maintenance and the occasional new construction project. ITS may, therefore, need to demonstrate its viability as a transportation solution through adequate cost-benefit ratio analysis and operations research of ITS applicability.

### *9.3.1 Impact Fees*

Many local governments charge transportation impact fees or designate special transportation districts that contribute revenues to transportation facilities that are constructed to benefit the designated area. These are implemented principally to fund major highway improvements, such as new freeway interchanges and additional lanes of roadway capacity. This same approach could be applied to fund ITS projects that benefit the areas being developed. However, it is usually more difficult to substantiate the benefits of ITS to a new development than other projects (35). Consequently, until the benefits of ITS solutions can be demonstrated in a land-development setting, it will be difficult to use impact fees for ITS improvements.

### *9.3.2 Vehicle License Fees*

Taxes levied on each registered vehicle may generate substantial income for a particular local region or county – depending on state regulations. For instance, California's annual ad valorum vehicle license fee of two percent raises approximately $3.6 billion a year for local governments, of which three-fourths can be spent for any purpose (50). Oregon vehicle registration fees, with a few exceptions, are dedicated to the construction, improvement, maintenance, operation, and use of public highways, roads, streets, and roadside rest areas (51). Of these funds, approximately 24 percent go to counties and approximately 16 percent are allotted to cities.

### *9.3.3 Local Sales Tax*

A local sales tax – whether this is a resort tax for a specific city, a bed tax for each hotel room rented, or a countywide all-encompassing sales tax – can generate significant funding for regions; the only caveat is voter approval. In California, "in part because of the declining real revenue from the California fuel tax, local jurisdictions are increasingly turning to local sales taxes as a source for infrastructure finance. In recent years, voters in 18 counties have approved sales taxes, with the revenue from these measures generating 10 to 15 percent of all revenue for transportation-related purposes in California. These taxes are generally more attractive than fuel taxes, perhaps because they are local ballot initiatives, easily understood, and are sometimes linked to specific projects." (50)

## 9.4 Partnering

Partnering is a broad term that refers to mutually beneficial relationships or collaborations between public agencies and private companies. These include shared resource arrangements (described in section 9.4.1) or other agreements whereby public and private resources are used together in business deals (50). As was described in Chapter 2, the long-term vision of ITS funding is to increasingly rely on private funding to accomplish system objectives. Since ITS includes the vehicle as part of the system, it necessarily involves the development of privately developed technologies. Therefore, vendors and private investors could be considered partnership sources of private funds for ITS implementation (35). Partnering with academia, a Clean Cities Coalition, the state police, the media, or true private agencies could provide funding for such ITS components as in-vehicle navigation, data collection and dissemination, traveler information, and control system elements. As an example of potential funding sources from the private sector, the Los Angeles drive time radio market … annually generates more than $20 million of advertising revenue (50).

One stumbling block to partnering, particularly with private agencies, is state constitutional prohibition of a state's role as a shareholder or legal partner in profit making ventures. However, the negative effect of this constitutional prohibition may be illusory. Most partnering arrangements are predicated on the assumption that there are public benefits to the public-private relationship, and consequently do not need formation of a formal, legal partnership. For example, a public-private toll road provides the public with a highway facility that would not otherwise exist. In this case, the public sector is helping to structure a financial relationship that results in public benefits – not unlike payments to a contractor for road or transit building. ITS partnering may be viewed in a similar manner (50).

### *9.4.1 Shared Resources*

Shared resource projects represent a subset of public-private partnering opportunities. In ITS, the greatest opportunity for shared resource projects involves highway right of way access to telecommunications companies, in exchange for free or reduced-cost access to the telecommunications infrastructure. Numerous agencies around the country are taking advantage of shared resource opportunities, including Bay Area Rapid Transit (BART), the New York Thruway, Ohio Turnpike, and states of Minnesota, Washington, Virginia, and Colorado. It should be noted that the benefit of these business deals may extend beyond serving the ITS infrastructure and transportation agencies, offering all state and local agencies access to reduced-cost, high-capacity telecommunications services that can improve the efficiency of the provision of many public services (50).

Both legal and institutional barriers exist to prevent shared resource projects with telecommunications companies, but shared resource deals remain one of the single biggest opportunities to finance a telecommunications infrastructure with natural synergies for ITS deployment. There may be several legal methods to use shared resource partnerships, with sufficient political will and administrative effort. One possibility is to lease capacity in conduit owned by public agencies, which already exists along the right-of-way in many areas of the state. Another alternative is to use “air space” leasing authority, which can provide access above or below public right-of-way (50).

### *9.4.2 Direct User Fee*

Another way to tap into private sector funding is to establish a direct user fee, where the public pays to use various ITS technologies. Some user fees are currently assessed in highway transportation, such as toll roads. Revenue sources like gasoline taxes and vehicle license fee are a little more indirect, providing a general link between source and purpose though they cannot accurately be called user fees (50).

An important relationship to consider when implementing direct user fees is the relationship between fees and user benefits. If potential users perceive no gain in paying for a particular service, they will direct their money for other purposes. Users fees may generate operational funding for traveler information systems and commercial vehicle and other vehicle tag applications, particularly toll roads. While not present in the COATS study area, toll facilities open a variety of ITS opportunities. With a variable pricing feature, toll roads offer sophisticated transportation demand management and a data source for transportation management and traveler information services. Wider deployment of electronic toll tags can stimulate the market for other travel-related electronic payment services, such as parking and gasoline, or even entrance to recreational areas like ski areas and National Parks. Toll roads and High Occupancy Toll (HOT) lanes, where single-occupant vehicles pay a premium to save time by using carpool-only lanes, are examples of early success with user fee services. These may be models for other applications in traveler information, goods movement, and other services (50).

### *9.4.3 Private Provision of Public Services*

Contracting out for public services may be a way to spur ITS investment. However, this practice carries the connotation of shifting previously public work to the private sector. Case law has subsequently held that outsourcing, with important exceptions, is a way around such a system and is thus unconstitutional (50).

There are several areas where the prohibition does not apply. First, ITS may be interpreted as a new program that will not divert existing resources and civil service employment to the private sector. This is consistent with most fiscal forecasts of ITS spending, that show ITS as a new market on top of the existing infrastructure. There will be a high level of need and budgetary resources for the maintenance, rehabilitation and reconstruction of the existing transportation system; therefore, there is a need for new program resources and efforts to court private sector investment. Moreover, the prohibition may not apply if the civil service system does not have the skills available for the stated function, which is typically the case where ITS technology is rapidly evolving. Another exception is granted if the outsourcing is for “new state functions,” again a test applicable for ITS services. Other exemptions exist if there are demonstrable cost savings from relying on the private sector, or if services are outsourced as a part of new leases or equipment purchases (50).

### *9.4.4 Selling Data Rights*

In some cases, vendors may fund part of the costs of an ITS deployment in exchange for selling data rights collected by the system. For example, a vendor may split the cost with a state department of transportation for installing cameras for viewing road and traffic conditions. The DOTs would be able to use the cameras to monitor the roadway, but the vendor would maintain the right to sell these real-time video feeds to media, Internet sites, or anyone willing to pay for them. One caution in these agreements is that they can lock an agency into using a specific vendor for all future system expansions. Moreover, the general public may not have free access to this information, which may reduce some of the potential benefits (50).

### *9.4.5 911 Financing Model*

Another financing mechanism for ITS emerges from the telecommunications industry's model for funding emergency 911 services. These services were formerly considered a burden by the telecommunications companies, but are now commonplace. This service expansion was made possible through a tax being assessed on every telephone account. It has been suggested that a similar fee could be imposed to finance traveler information and other ITS services (50).

### *9.4.6 Public Venture*

Many states have developed public venture capital funds as a way to attract and grow high-tech industry. These programs typically bring together a state's academic, private sector, and public partners for the purpose of technology development and transfer. One key benefit of these venture funds is the coordination of private and public sector resources and objectives that lead to a more focused approach to technology transfer and regional economic development. Where a venture fund is used, loans are made to promising private sector offshoots of the programs, with the capital re-paid by successful ventures. Thus, the venture funds are both revenue generating and can be self-perpetuating. The Central Intelligence Agency recently established such a fund to help speed up its acquisition of state of the art commercial information technology (50). This may be potentially applied to ITS as well, provided that there can be a way for private partners to realize adequate financial return.

## 9.5 Case Studies

This chapter has outlined a variety of funding sources that may be used in combination with each other to support ITS deployment. Table 9-4 identifies funding mechanisms used for deployment of several ITS projects across the country. This may help to generate some ideas of potential funding combinations that may be used to support deployment in the COATS study area.

**Table 9-4:** Summary of Case Studies and Funding Sources. (Source: 52)

| Deployment | Case Study | Case Study Funding Sources | Eligible Fund | Funding Types (S)tate, (F)ederal, (P)rivate, (L)ocal |
|---|---|---|---|---|
| Variable Message Signs | Dane County, WI, Portable VMS | 50% county equipment budget, 50% NHTSA | -IM, NHS, STPP, STPS, STPU, SPTHS, STPE and CMAQ Funds<br>-SPR (Research)<br>- Maintenance | S&F<br>F, S&F<br>S Fuel/Gas Tax Funds<br>S&F |
| Interactive Kiosks | Travel Montana Kiosks | Advertisements fund O&M and future deployments. Initial development, deployment costs covered by partner public agencies | - IM, NHS, STPP, STPS, STPU<br>STPE<br>- SPR (Research)<br>- Maintenance | S&F<br>F, S&F<br>S Fuel/Gas Tax Funds<br>S Bed Tax Funds<br>P Advertising |
| Highway Advisory Radio (HAR) | Washington State HAR | Washington State DOT | - IM, NHS, STPP, STPS, STPU,<br>STPE, STPHS Funds<br>- SPR (Research)<br>- Maintenance | S&F<br>F, S&F<br>S Fuel/Gas Tax Funds<br>S&F |
| Weather Information by Fax | Colorado DOT Weather by Fax | Colorado DOT TOC operating funds | -IM, NHS, STPP, STPS, STPU, STPE, STPHS Funds<br>-SPR (Research)<br>-Maintenance | S&F<br>F, S&F<br>S Fuel/Gas Tax Funds<br>S&F P Subscriptions |
| Cellular Connection to Emergency Services | King County, Washington E911 | Mandatory system enhancements covered by cellular providers. O&M financed by $0.25 per month surcharge on users. | -IM, NHS, STPP, STPS, STPU, STPE, STPHS Funds<br>-SPR (Research)<br>-Maintenance<br>-MDOA | S&F<br>F, S&F<br>S Fuel/Gas Tax Funds<br>S&F<br>S 911 Fund<br>P Cellular provider contributions<br>S Excise Tax |

**Table 9-4:** Summary of Case Studies and Funding Sources (cont.).

| Deployment | Case Study | Case Study Funding Sources | Eligible Fund | Funding Types (S)tate, (F)ederal, (P)rivate, (L)ocal |
|---|---|---|---|---|
| Fog and Pavement Detection | I-75 Automated Visibility Warning System | 16% Federal funding, and 84% Georgia DOT safety improvement funds. | -IM, NHS, STPP, STPS, STPU, STPE, STPHS Funds<br>-SPR (Research)<br>-Maintenance | S&F<br>F, S&F<br>S Fuel/Gas Tax Funds<br>S&F |
| Rail Crossing Early Warning Systems | SWS Radar Activation System | Development privately funded. Deployment and O&M State funded. | -STPRR, STPRP, STPHS<br>-SPR<br>-Maintenance | S&F<br>F, S&F<br>S Fuel/Gas Tax Funds<br>S&F |
| Animal/ vehicle Collision Avoidance Systems | Animal Alert Warning System | Development privately funded. No deployment as yet. | -IM, NHS, STPP, STPS, STPU, STPE, STPHS Funds<br>-SPR (Research)<br>-Maintenance | S&F<br>F, S&F<br>S, S&F |
| Integrated Train and Traffic Control | Advanced Railroad Crossing Status-Reno | Proposed funding: railroad company to cover design, development, deployment; City to Cover O&M | -STPRR, STPRP, STPHS<br>SPR (Research)<br>-BNSF RR, UPSP RR, LRFA RR | S&F<br>F, S&F<br>P Rail companies |
| Transit AVL | ARCTIC, Minnesota | 60% Federal op. test funding. Remainder funded by partner state agencies | -STP, FTA, CMAQ<br>-Mt. Transit Association | F, S&F |
| Computer-aided Paratransit Scheduling and Reservations | Sweetwater County Dynamic Dispatching | Various – greatest first: agency contracts, grants, Federal & State subsidies, fares, and donations | -STP, FTA, HHS, CMAQ | S&F<br>F<br>Local |

**Table 9-4:** Summary of Case Studies and Funding Sources (cont.).

| Deployment | Case Study | Case Study Funding Sources | Eligible Fund | Funding Types (S)tate, (F)ederal, (P)rivate, (L)ocal |
|---|---|---|---|---|
| Weigh-in-Motion | Montana WIM | Montana Motor Carrier Services Division, highway construction funds | -State Funds | S&F<br>S<br>P Increased user<br>Fees |
| Electronic CVO Credentialing | MOTRS | Funded by Montana Department of Transportation | -State Funds | S |
| Automated CVO Credentialing | ASPEN software | Not identified | -STP<br>-CVISN<br>-MCSAPS | F, S&F |
| Electronic CVO Pre-Clearance | Montana PrePass | State Construction Plan, Lockheed Martin, STIP | -STP<br>-State Construction Program | S&F<br>S<br>P user fees per use |

# 10 OPERATIONS AND MAINTENANCE CONSIDERATIONS

The goals of the COATS project can be realized only as long as the associated ITS infrastructure is operated and maintained properly. This chapter reviews the key requirements for making sure that operations and maintenance are handled appropriately. The findings build on the work presented in the Operations and Maintenance Technical Guidance prepared for this project (17).

Two general principles need to guide operations and maintenance in the COATS study area. First, a concept of operations should accompany the deployment of any ITS technologies. The concept of operations builds off a project-level architecture by identifying how a particular device will exchange information with other devices and systems. Beyond this, it will describe how humans will interact with the system – who is in charge of controlling the technology, how is the technology to be used, and similar concerns.

Second, a plan for maintenance should also accompany the deployment of ITS. This plan may be as simple as entering into a contractual relationship with the vendor to provide ongoing technical support. Alternatively, the plan could involve developing procedures and training to equip in-house personnel address preventative and repair maintenance. Regardless of the preferred maintenance method, it is important that such a plan exists before maintenance issues arise.

The following sections provide recommendations for more specific aspects of ITS operations and maintenance.

## 10.1 Design and Engineering

The next step in the deployment of an ITS application, after completion of planning and programming phases, is design and engineering. This step, if undertaken appropriately, can alleviate many operations and maintenance concerns that could occur after deployment. The following are a few general principles that should govern design and engineering of ITS projects in the COATS region.

- Design with integration in mind. This is best done through the development of a project-level ITS architecture, as was described in Chapter 6. If a particular device will be used by several different stakeholders, it is important to understand how these stakeholders may use the information to maximize the device's utility. It is important to understand which stakeholders may want to be involved, what information they need, when they need it, and how they want it communicated.

- Design with interoperability and expansion in mind. The use of standards from the National ITS Architecture can provide some direction on how interoperability may be pursued from an information-flow level. Interoperability needs to be addressed at a technology level as well, which would promote interoperability and facilitate system expansion.

- Design with operations in mind. ITS technologies should not be indiscriminately deployed, without regard to how – or if – they might be used. Stakeholder outreach, through the process of developing functional requirements, is needed to ensure that a given deployment would be used, and that it would be useful as deployed. For example, CCTV may be an effective tool for remote incident detection and verification, but in some locations, due to the difficulty of data transmission, it is decided to use it to transmit still images on an intermittent basis, without the ability to pan, tilt or zoom the image. Depending upon stakeholder needs, this could be of limited value.

- Design with attention to desired system reliability. Some deployments may obtain their maximum usage during crisis events or disasters. However, these events may also impede the normal communications or power infrastructure used by these devices, hindering their reliability. The least expensive communications method may not be the most appropriate, depending upon the needs for reliability.

- Design with future maintenance in mind. Ideally, this should be first included as a part of the procurement process through the use of life-cycle cost analysis. Beyond this, technologies should be deployed to reduce the frequency and inconvenience of maintenance activities. This can be done through the use of well-known products that are known to be reliable, modular and standardized components, self-diagnostic and self-healing technologies, and technologies that improve repair access (e.g. CCTV that may be lowered mechanically on their tower as opposed to needing a bucket truck). Using these technologies may require spending more money at the inception of the project, but should result in less maintenance costs during the operations phase of the project.

- Explore opportunities for collocation of field devices to make power and communications provision more economical. Adding a road weather information system (RWIS) to an existing CCTV location will likely be less expensive than installing a new RWIS site elsewhere. Because ITS elements are generally immobile once they are deployed, these opportunities for collocation need to be identified in the planning process.

## 10.2 Operations

This will be the most visible ongoing component of the project, as it will include all resources required to use the COATS infrastructure, including staffing, equipment, facilities, power and telecommunications. For CCTV cameras, for example, operations would include costs including staff time to review images from the field, the TMC where staffing and sensitive equipment are housed, and supplying power and telecommunications to the field site. The following are key strategic goals for operations.

- Identify integration points where information is distributed to and disseminated from. For Caltrans and ODOT, this has been done Caltrans' Advanced Rural Technology Integration Centers (ARTIC) in Redding and Eureka, and through ODOT's Transportation Operations Centers in Medford and Bend. The TMC can serve as an integration point for collecting and disseminating field information, coordinating the activities of many other parties that are affected by or involved in a given situation on the transportation system. While integration points may be virtual, such as a Web site, there should be a clear understanding of who is responsible for ensuring that integration on an ongoing basis.

- Develop an operational plan for how the various stakeholders involved in transportation in the COATS study area will utilize ITS to improve the safety and efficiency of their activities. It may identify types of information that may be shared between stakeholders, how often information is updated, with what communication media the information is communicated, and how time-sensitive the information is to the stakeholders. An operational plan may recommend, for example, that Oregon and California share CCTV images for critical bi-state transportation routes, such as Interstate 5 at Siskiyou Pass.

## 10.3 Maintenance Procedures

Providing for rapid response to maintenance needs of the COATS infrastructure is critical to long-term public acceptance of new technology. The following goals are critical in establishing appropriate maintenance procedures.

- Develop guidelines to identify who is responsible for: fault identification, problem diagnosis and verification, fault correction, repair testing, repair logging, and maintenance coordination and tracking. The coordination aspect is especially critical, because technologies such as VMS may require several different types of maintenance skills depending upon at what point a failure occurs.

- Establish schedules for prioritizing maintenance of the COATS project infrastructure. These schedules should not be solely based on technology type, but on location, function and time of year. For example – a mountain pass VMS will likely have higher repair priority than a CCTV located near a park entrance during the winter.

- Pursue appropriate preventative maintenance activities, such as bulb replacement or camera lens cleaning, for each element of the advanced technology infrastructure. Preventative maintenance will also be required for non-field elements, such as RWIS servers. Preventative maintenance should be accounted for in budgeting and resource allocation decisions, not only for field technicians but also for information technology support. To conserve travel time, preventative maintenance activities should be pursued simultaneously with repair maintenance activities to the extent possible.

## 10.4 Resources

Sustaining adequate staffing and financial resources is critical to maximizing the utility of COATS initiatives. The following strategies should be used in securing resources for ongoing maintenance and operations.

- Identify appropriate staffing levels for both operations and maintenance activities. These need to be determined at a highly disaggregated level, in order to account for different skill sets (electronics skills versus information technology-type skills) and geography. The Operations and Maintenance Guidance Document (17) provides some information on how these resources may be estimated.

- Develop strategies for training agency staff to better operate and maintain the advanced technology infrastructure. This is best accomplished through vendor-led training as a part of procurement of new technologies, and providing time for technicians to upgrade their skills and knowledge base by exchanging information with fellow technicians.

- In the event that adequate staffing cannot be obtained, target operations or maintenance activities where contracting could be most efficient and effective. Contracting is preferred on activities where timing of maintenance is less critical, such as preventative maintenance of RWIS field sites, instead of repair maintenance of a mountain pass VMS.

- Procure appropriate spares and repair equipment in advance to minimize downtime in the event maintenance repairs are required. The specific quantity of spares on-hand will vary according to the time required to obtain spares, the cost of maintaining inventory, and the likelihood of replacement or upgrading of ITS technologies. As a rule of thumb, about 5 percent of the capital cost for a location should be allocated each year for spare part purchases. For less expensive technologies, such as CCTV, it may be best to keep entire spare units on hand to minimize the amount of time that an image is not available at the TMC.

## 10.5 Bi-State Coordination

Perhaps the most significant challenge in the COATS project is developing and sustaining linkages seamlessly across a state boundary. This challenge requires specific strategies for operations and maintenance as well.

- Pursue similar technology standards to facilitate transfer of transportation-related information, such as reports on pass requirements (e.g. chains) and information on highway incidents, between agencies.

- Structure maintenance procedures (including repair prioritization) to promote bi-state cooperation.

- Develop protocols for coordinating and sharing of staffing resources to expedite maintenance activities. This is especially critical for projects located near the state border, such as the Siskiyou Pass early winner project.

## 10.6 Summary

Table 10-1 summarizes the key operations and maintenance issues that need to be addressed in the COATS study area. It is likely that these issues will need to be addressed on an ongoing basis, as the region's ITS infrastructure continues to expand.

**Table 10-1:** Organizational and Institutional Issues.

| **Category** | **Issue** | **Questions to be Answered** | **Recommendations/Comments** |
|---|---|---|---|
| Operations | TMC | • Where should TMCs be located?<br>• What role should the TMCs have?<br>• How do the TMCs interact with other organizational units? | • Skill sets for TMC operators need to be selected to match the desired role of the TMC<br>• Partnerships with other public-sector agencies as well as private-sector firms may help to offset TMC staffing and/or building needs |
| | Communications Networks | • Where is there a need for real-time communications that is not currently supported by wireline or wireless networks?<br>• Can the agency justify building a communications network?<br>• Can the agency enter into a private sector partnership to use a network paid for by others? | • The communication needs should be determined through an architecture development process<br>• Some studies have shown that a combination of private- and public-sector ownership of the communications network is most cost-effective<br>• Ownership issues, especially relating to maintenance, should be resolved at the outset<br>• The value of ITS operations during crisis events or disasters should be considered as a factor |
| | Vehicles | • How many vehicles should be allocated for ITS operations and maintenance support?<br>• Where should these vehicles be located? | • This will be determined as a result of deployment decisions |
| | Power | • Can multiple ITS devices be collocated in order to reduce the costs of running power to the site? | • Solar power may not be consistent enough for many locations, due to cloud cover and limited daylight hours |
| Maintenance Model | Identifying Repairs | • How are maintenance needs identified?<br>• To whom is the repair need reported?<br>• Who is responsible for diagnosing the problem? | • An automated trouble reporting system, or “push” technology – where the device reports failures to a TMC – is desirable<br>• Self-diagnostic technologies are also desirable<br>• Repair needs should be reported to a single person or phone number, from where the repair process may start<br>• To improve response time, it is desirable to have diagnostic capability geographically near to the device<br>• Roles need to be defined clearly at the beginning |

**Table 10-1:** Organizational and Institutional Issues (cont.)

| Category | Issue | Questions to be Answered | Recommendations/Comments |
|---|---|---|---|
| Maintenance Model (cont.) | Coordination and Tracking | • Will more than one unit or division be involved in the maintenance process?<br>• If so, who will coordinate their efforts to ensure the repair gets completed?<br>• Who will be responsible for tracking repair? | • ITS device components may need different skill backgrounds (computer, electronics, radio, etc.), which will necessitate access to staff having a mix of technical capabilities, or outsourcing of maintenance<br>• A single point-of-contact is recommended to coordinate activities across many organizational units<br>• There needs to be buy-in to the process throughout the various organizational units |
| | Performing Repairs | • Which individuals or organizational units will be involved in the repair?<br>• At what point are these individuals brought in?<br>• Where should staff who are involved in the maintenance process be located? | • For each organizational unit involved in the repair process, a single point-of-contact within that unit is recommended<br>• Standard, documented procedures are recommended to provide guidance on how the repair process should proceed<br>• Input from key stakeholders should determine who should be brought in and when<br>• There should be some basic diagnostic and repair capability located at each of the regions, in order to minimize downtime<br>• High-priority devices should have modular components, in order to minimize downtime |
| | Testing Repair | • Who is responsible for testing the repair to ensure that the device is working satisfactorily? | • Agencies need to perform testing of maintenance even when vendors or contractors perform repair for purposes of quality assurance |
| | Logging | • Who is responsible for logging maintenance activity?<br>• What system should be used for logging maintenance activity?<br>• Who is responsible for tracking repair histories? | • The single point-of-contact would logically record maintenance activity<br>• The logging system should be common in structure and accessible to others in the agency and to partnering agencies |
| | Roles and Responsibilities | • What are the maintenance roles and responsibilities for each unit in the organization?<br>• Who reports to whom? | • Outreach to each organizational unit is critical to ensure that there is consensus and buy-in about roles and responsibilities |

**Table 10-1:** Organizational and Institutional Issues (cont.).

| Category | Issue | Questions to be Answered | Recommendations/Comments |
|---|---|---|---|
| Repair Prioritization Guidelines | Development | • How should guidelines be developed for prioritizing repairs?<br>• How are guidelines that are in conflict between regions to be resolved? | • Priority guidelines should reflect regional needs<br>• Guidelines should be based not solely on device technology (e.g. is it a variable message sign?), but on device function (e.g. does it primarily improve safety?)<br>• Guidelines need to be coordinated across regions as well, especially for extra-regional devices (like the Internet) |
| | Enforcement | • How are prioritization guidelines enforced? Where in the organization does this decision come into play? | • Guidelines should specify a desired response time between when a device goes down and when it is brought back to full operations<br>• Guidelines should be published<br>• Guidelines will likely need to have some flexibility to reflect unforeseeable circumstances<br>• For priority devices, it may be necessary to have people on-call from each key organizational unit to ensure that repairs can be completed as needed |
| Preventative Maintenance | | • What are appropriate preventative maintenance recommendations?<br>• What skill sets are required to perform preventative maintenance?<br>• How can it be assured that preventative maintenance will occur? | • Manufacturers and some ITS maintenance plans have guidelines for appropriate preventative maintenance<br>• Checklists should be developed for ensuring preventative maintenance tasks are performed adequately<br>• This may be a good activity to contract because it is not time-critical and may use a more diluted skill set |
| Resource Allocation | Maintenance Staffing Needs | • What staffing resources with what skill base are required to perform maintenance? | • Staffing needs should be estimated at a per-device level<br>• Staff time needs to reflect travel time to access devices, as well as time for regular training and professional development |
| | Operations Staffing Needs | • What staffing resources with what skill base are required for each region? | • Estimates for operations staffing needs will reflect what functions are desired to occur at each TMC |

**Table 10-1:** Organizational and Institutional Issues (cont.).

| **Category** | **Issue** | **Questions to be Answered** | **Recommendations/Comments** |
|---|---|---|---|
| Resource Allocation (cont.) | Other Needs | • How many of what kind of spare parts should be acquired for each device?<br>• How should resources be allocated for emergency device failures? | • Spare parts inventories should reflect vendor recommendations<br>• Standardization of devices, through sole-source vendor relationships or tight procurement specifications, can reduce inventory needs as well as training needs<br>• Spare parts should be acquired in advance, perhaps as part of original device procurement, in order to minimize downtime<br>• A centralized budget is recommended for paying for unexpected replacement of devices |
| | Staffing Availability | • What staffing resources at what skill level are currently available for performing ITS maintenance? | • Current job classifications may be inadequate for ITS maintenance<br>• Review job descriptions of key staff members to identify how much time they are allocated to have |
| | Resource Gaps | • To what extent should contracting be used to close gaps in staffing and/or skill levels?<br>• To what extent may additional staffing or training resources be used to close gaps?<br>• Who decides how staffing and/or training gaps will be addressed? | • Contracting may not be a viable option in some areas due to the availability of service<br>• Adding staff may not be a viable or desirable option due to political reasons<br>• Having technicians capable of making repairs in multiple disciplines is an asset in a rural context |
| Contracting | Area of responsibility | • Which devices, if any, would it be appropriate to contract for maintenance?<br>• Which maintenance tasks (such as preventative maintenance) would be appropriate to contract? | • To promote economies of scale, these decisions should be made for geographic areas with a significant level of deployment |
| | Terms | • What should be the contract duration?<br>• What performance specifications should be included in the contract? | • Two-year contracts with renewal options are fairly common for ITS maintenance<br>• Response time is a common performance measure<br>• Performance specifications may be difficult to enforce |
| | Administration | • Who manages contracts?<br>• What type of contracting should be used (e.g. cost-plus, fixed fee, etc.)? | • It helps to promote achievement of performance specifications by having contract administrators have some involvement in ITS operations as well |

**Table 10-1:** Organizational and Institutional Issues (cont.).

| **Category** | **Issue** | **Questions to be Answered** | **Recommendations/Comments** |
|---|---|---|---|
| Training | | • What are areas where training of maintenance staff should be improved to better address ITS maintenance?<br>• How do maintenance staff obtain training on new technologies? | • Training gaps are best closed by obtaining comprehensive training when a device is deployed and by having technicians train each other as time goes on<br>• Training should focus on areas where there is a current training deficit<br>• Maintenance manuals should be acquired and kept for all field deployments in areas accessible to maintenance personnel |
| Budgeting | Accounting | • How should operations and maintenance costs be allocated? | • Ideally on a per-device basis, to improve planning |
| | Procurement | • Can the budgeting process be structured to reflect operation and maintenance costs? | • Agencies may be seek to apply life-cycle costs into the procurement process |
| Interstate Issues | Maintenance Model | • How does a single point-of-contact coordinate maintenance activities across the state boundary, should it become necessary?<br>• How can repairs be resolved effectively near the state line? | • Stakeholder outreach and education across the state line is critical<br>• Develop memorandum of understanding between Caltrans and ODOT to address issues beforehand<br>• Inter-jurisdictional cooperation and coordination is necessary to improve response time<br>• Applications near state lines should not any affect on allocation of operational costs (i.e. power and telephone) |
| | Maintenance Prioritization | • How are guidelines enforced and coordinated across the state line? | |
| | Resources | • How may staffing resources be shared across the state line? | |

# 11 FUTURE DIRECTION

This Strategic Deployment Plan represents a culmination of the COATS planning effort, and serves as a milestone for the deployment of ITS in the region. In this context, it is valuable to examine lessons learned through the history of the project, as well as to identify appropriate next steps to ensure that ITS may continue to be effectively used in the COATS region.

This chapter starts with reviewing some of the major lessons learned through the course of the COATS project. After this, two sets of future activities are identified. The first set deals with how the COATS vision may be sustained and how ITS projects may be effectively deployed. The second set of future activities, reflecting on the research orientation of this project, identifies future research activities that might provide benefit to COATS stakeholders, as well as to the broader government, research and industry community.

## 11.1 Lessons Learned

Because ITS is new to the COATS study area, it may be expected that this COATS effort to date – from planning and technology demonstration standpoints – would yield significant lessons learned. This section highlights some of these key lessons, reflecting over the past years, providing input into the future direction for both the COATS project and ITS deployment in the region. Lessons identified are not intended to incriminate any person or organization, but are offered instead as means of improving future ITS initiatives.

### *11.1.1 Greater Focus on Demonstration and Evaluation*

The purpose of the COATS project was to identify needs, determine ITS solutions, identify, design and demonstrate small-scale projects, and develop a Model Deployment and Evaluation Plan. To do this, the project's original methodology identified parallel paths of developing an ITS strategic deployment plan while simultaneously demonstrating and evaluating small-scale, early-winner ITS projects. While many of the objectives related to planning activities were achieved, a greater focus and commitment needed to be placed on demonstration and evaluation much earlier in the project schedule.

The early-winner process and project selection in April 1999 helped to solidify the COATS objectives and organization. In order to generate greater stakeholder involvement, it would have been helpful to build on the success of that early-winner process by focusing on initiating the next early-winner or Showcase projects, and starting to evaluate their benefits. Instead, the project focused on the traditional ITS planning methodology steps of architecture development, operations and maintenance needs, model (strategic) plan, etc. Having a greater emphasis on demonstration of technology and evaluation of benefits would have encouraged greater stakeholder involvement and motivated greater involvement from Steering Committee and Regional Team members in the Plan development.

It is recommended that future ITS efforts in the study area should try to preserve the parallel process of planning and ITS demonstration.

### *11.1.2 Promote Stakeholder Involvement and Awareness*

With a Web site, a project newsletter, and approximately 25 meetings to actively involve stakeholders, Caltrans and ODOT should be commended for the time and resources dedicated to the achieving this objective for the COATS project. The rotation of meetings throughout the region was useful in ensuring a broader regional focus for the entire 80,000 square mile area, rather than focusing on only one or two areas.

### *11.1.3 Actively Involve Project Organization*

Beyond the Steering Committee, the COATS project organization also included a Governing Board, Regional Teams and task forces. The Steering Committee provided the primary stakeholder involvement and determination of direction for the COATS project. While Steering Committee members provided valuable input, they represented a small cross-section of the hundreds of agencies and organizations in the study area. A more proactive approach to involve the Governing Board and Regional Teams may have helped to increase regional interest.

### *11.1.4 Need for Stakeholder Commitment and Involvement*

Some of the biggest challenges in the COATS project have not been technical, but rather institutional and geographical, because of the broad number and geographic spread of key stakeholders in this project. The organizational structure of the project, with multiple tiers, sought to alleviate some of these barriers, to reduce the amount of time commitment from project stakeholders while keeping their active involvement. However, the organizational structure did not succeed in securing the stakeholder feedback and involvement needed to sustain a truly regional vision. Moreover, irregular participation and attendance at meetings from Steering Committee at committee meetings – partly resulting from geographic challenges – created some discord and incompatibility with long-term goals. To address this in future ITS planning initiatives in this region, consideration needs to be given about the costs of travel and participation in the planning process, and how this may be alleviated (e.g. through greater use of Regional Teams).

### *11.1.5 Address Multimodal Opportunities*

Recommended COATS infrastructure improvements have been targeted primarily toward safety and highway operations. While it is not disputed that these are needs, transit and multi-modal opportunities do exist and ought to be addressed. The perception among many stakeholders that transit serves a socioeconomic and demographic minority and may be of limited value to the overall regional transportation system. The dozens of transit stakeholders in the COATS study area, many of whom are providing or exploring inter-city service, demonstrates that it is a major component of the regional transportation system. Increased engagement of transit agencies, along with an increased awareness of how transit can help to address the mobility challenges of the region, could have helped to achieve a more coherent vision of multimodal opportunities.

### *11.1.6 Architecture and Outreach Challenges*

The number of subsystems and information flows, the multi-tiered approach, significant data collection efforts supporting identification of market packages, along with extensions to the Architecture based on stakeholder feedback all combined to make the COATS architecture one of the most thorough and sophisticated rural ITS architectures developed in the United States to date. Despite the effort expended on architecture development in the project, significant additional outreach with local stakeholders will be necessary to refine and confirm the identification of stakeholders and subsystems, along with key information flows.

A couple of lessons learned through the development of the architecture may be applicable to the development of other rural ITS architectures. First, the lack of understanding of ITS among workshop participants hindered the ability to get much useful information out of the workshops. The workshops ended up trying to serve a dual function of educating the attendees on ITS and the relevance of architecture development to achieving ITS goals, while trying to acquire input about stakeholders and key information flows. Future architecture development efforts should strive to develop a level of ITS awareness before trying to solicit input needed to complete the regional architecture. This will help stakeholders to understand the value of the architecture as a necessary foundation in ITS deployment.

In addition, while the U.S. Department of Transportation’s Turbo Architecture software package was demonstrated by WTI/MSU nationally as a rural test, it became apparent that it was predominantly urban-focused and needed modification. Future architecture development efforts in rural areas need to be more attuned to the need to be flexible with the National ITS Architecture, with a willingness to introduce new market packages, subsystems and information flows at an earlier stage in the process.

## 11.2 Future Direction

The purpose of this section is to provide recommended actions that would assist in the future direction of the COATS project to allow for improved planning, demonstration and funding. These are divided into two categories: project continuance and outreach, and strategies for implementation.

### *11.2.1 Project Continuance and Outreach*

This section discusses several recommendations for future steps in building upon the COATS vision toward promoting ITS deployment across the region.

Continue Stakeholder Outreach. The COATS project has attempted to build a constituency that recognizes the rural challenges and the ITS opportunities in a geographically and institutionally diverse study area. While significant resources and funding have been devoted to outreach workshops, public information materials and meetings that have led to ITS demonstration and the development of this Strategic Deployment Plan, the outreach efforts should not be discontinued but rather increased in scale and depth.

One lesson learned from the COATS project is that not only do the stakeholder organizations change but also their representatives. As the COATS project moves either toward a dedicated funding source or toward ITS mainstreaming, an outreach effort that recognizes the ever-changing stakeholder make-up must be taken into consideration. Outreach should continue in the study area through a second round of workshops that present the Strategic Deployment Plan, and develops and maintains a newsletter that can be distributed to organizational representatives. These should focus on the organizations where decisions to fund ITS will occur – with the county-level Regional Transportation Planning Agencies in California, for example.

Develop Marketing Strategy. While outreach workshops and newsletters can be effective in raising the awareness of ITS and the COATS project, a more defined marketing strategy may need to be developed. Some of the more successful ITS programs on a national level, such as the I-95 Corridor Coalition, Minnesota Guidestar, Washington State Department of Transportation and others, have provided funding for a defined marketing effort. The marketing effort is aimed at raising awareness with the jurisdictional and project boundaries, but is also targeted directly or indirectly at the Federal agencies.

Provide Updates on National ITS Developments. The ITS frontier is dynamic and constantly changing. As new developments such as architecture conformity, planning regulations, standards and basic guidance materials are released, a significant effort will need to be directed at providing updates to local organizations, especially if mainstreaming is going to be achieved.

Utilize or Eliminate Regional Teams. As discussed earlier in this document, the role of the Regional Teams was to build regional consensus among public and private stakeholder regarding ITS priorities. The Regional Teams were to act as an advisory group to the Steering Committee. While the Regional Team concept was sound, it was not effectively implemented because these representatives did not have an understanding of their role, responsibility, or message to be delivered. The message may better understood now that a Strategic Deployment Plan has been developed. However, it is important for the Regional Teams must be given the resources to carry out their intended mission. It should be noted that the Regional Team concept might have more long-term merit in California than Oregon because of the different institutional arrangements.

Demonstrate the Benefits to RTPAs, MPOs and COGs. If Caltrans and ODOT consider mainstreaming ITS into the traditional planning process, then two related actions may need to be considered. The first action would be to evaluate direct and indirect benefits of COATS deployment to the traveling public, institutions, or local economies. A similar ITS solution used elsewhere may be considered as well, but the example may not be as effective. The second action would be to create outreach and education tools that take into consideration the understanding of ITS and the benefits of COATS planning and demonstration. To date, limited outreach has been conducted to Regional Transportation Planning Agencies, Metropolitan Planning Organizations (MPOs) and Councils of Government (COGs) within the study area. If the goal is to mainstream ITS within the traditional planning process, then Caltrans and ODOT will need to demonstrate the benefits (e.g. cost-benefit) of the implementation strategy over more commonly recognized traditional methods. As the goal of the COATS project is to "research, develop, test and demonstrate ITS implementation" the two previous actions may need to considered before mainstreaming can be achieved.

Expand Architecture Development and Education. As was stated earlier, the regional architecture presented in this document provides a good foundation for conformance to the National ITS Architecture. However, to comply with the conformance rule, more work will need to be done to validate interconnects and information flows with local stakeholders, as projects are developed and deployed. In addition, the architecture needs to be active and updated to reflect changes in stakeholders, information flows, and regional goals. The responsibility for long-term ownership and maintenance of the architecture needs to be determined so that the results of this project are not lost.

When methods to maintain current ITS architectures for each state are examined, it will become important to consider who will collect this information, the frequency of the updates and the understanding of architecture development, on such items as an inventory of stakeholder systems and information to be exchanged between organizations. It may be necessary at some point, when ITS is more readily understood at a local level, to conduct additional architecture development training, especially if the function of a project, sub-regional, regional or statewide architecture were to be a locally distributed (versus centralized State DOT) responsibility.

Maintain ITS Inventory. The COATS project has attempted to inventory all legacy (existing and planned) systems in order to more effectively show regional need for future deployments. While this process has been difficult, it has amassed an inventory that should be maintained through geographical information systems and related to the ongoing architecture development process. As ITS elements are planned for and implemented, it will be important to catalogue those activities and maintain both a GIS database and Turbo Architecture. Second, it will also be important to identify the lead agency in doing these activities and secure finding to perform such activities.

### *11.2.2 Strategy for Implementation*

Several recommendations have been identified for increasing the likelihood and success of ITS deployment in the COATS study area.

Increase Regional Support or Other Alternatives. The ability within Caltrans and ODOT at a district or regional level to develop plans, specification and estimates for COATS demonstration projects with existing resources has met with mixed success. It is evident with existing workloads that local offices will need additional resources or alternatives that need to considered to implement the planned COATS Showcase demonstration efforts. The alternatives that may need to be considered include:

- Centralized Preparation. An option to consider in development of plans, specification and estimates is to have the documents prepared at a centralized location such as Caltrans NTR or ODOT’s ITS Unit, and then have those documents reviewed by the local offices for final approval.

- Additional District/Region Staff. If existing resources are unavailable to produce needed documentation to implement ITS demonstration projects, then additional staff should be hired in each of the district/region offices.

- Roving Engineer. If additional staff cannot be hired, then an alternative that may need to be considered is to have a dedicated staff person from either Caltrans NTR or ODOT's ITS Unit act a roving engineer moving from district/region office to office preparing documentation. Ideally, the roving engineers could help to teach district and regional staff on how to prepare plans, specifications and estimates for ITS and advanced technology projects.

- Design-build. A fourth consideration may be outsourcing the development of plans, specification and estimates (PS&E) through a design-build option. It may be feasible to outsource PS&E to vendors. This may be most feasible for the ITS infrastructure to which Caltrans and ODOT are accustomed, such as variable message signs, highway advisory radio, and road weather information systems.

Mainstream ITS into Program and Project Prioritization. As mentioned earlier, mainstreaming will become an important issue in the future. If this is going to be successful, ITS will need to be incorporated into the program and project prioritization criteria where applicable. This may include additional information on how ITS projects will be considered in the applicable transportation program.

Modify Project Organization. The current COATS project organizational structure includes a Governing Board, Steering Committee, Regional Teams, Task Forces, and a Coordinating Group. To date, the attendees at the COATS meetings have been predominantly managers and administrators. While this characterization should continue at a Governing Board and Steering Committee level, there is a need to have greater involvement from individuals who work with technology applications and integration issues on a daily basis. A portion of this recommendation has been incorporated in the designation of a Coordinating Group; however, this group is currently composed predominantly of Caltrans and ODOT representatives. In the future, there will be a need to have greater stakeholder involvement from organizations other than departments of transportations, including tourism, transit, local public safety, and the private sector, as these organizations become more involved in ITS deployment and utilization.

Emphasize Multimodal and Tourism Opportunities. The predominant challenges in the COATS study area are safety, highway operations, and traveler information; however, it is believed that these challenges have overshadowed the second-tier opportunities such as transit and tourism. It is important to the COATS region and the stakeholder groups who serve on the project organizational committee structure that a greater balance be achieved in the future between highway operations and other areas.

Second, it is equally important, as a next phase of the COATS project is underway, that roadways other than interstate and state highways be considered for demonstration. While some demonstration on secondary roadways is occurring, if COATS is going to increase buy-in at a local level more demonstration of technology may need to occur on lower volume roads. This will help to promote the mainstreaming of ITS into the traditional planning process.

Secure Demonstration and Non-traditional Funding. As highlighted in the chapter on funding, there are both traditional and non-traditional funding sources that can be secured to provide for deployment of COATS priorities. With its increased emphasis on advanced rural transportation systems, the U.S. Department of Transportation will be issuing a variety of field operation test solicitations that should be considered. Also, the opportunity should be considered to secure funding through congressional earmarks, given the wide stakeholder support for the COATS project.

Public Private Partnership Task Force. As highlighted previously there has been a predominant focus on public sector agencies involved in the COATS project. While this may have served the project well in the past, there may be opportunities for the private sector with the creation of the COATS Strategic Deployment Plan. As mentioned earlier in this document, it is envisioned that 80 percent of future ITS investment is expected to come from the private sector and consumer sources. While this may be the goal, there have not been any documented public private partnerships in a rural environment. However, that does not mean that COATS cannot be the first.

To explore these possibilities, a future effort and a COATS project organization structure modification should be the creation of Partnership Task Force. The Task Force would review the COATS Strategic Deployment Plan to determine where private sector partnerships may be most feasible.

#### *11.2.3 Summary*

A summary of the actions and responsible organizations for each action is shown in Table ES-3.

## 11.3 Future Research Opportunities

The COATS project was undertaken as a research effort to assist in ITS planning and demonstration in the rural COATS area. As is typical with most research efforts, various areas have been identified as promising directions for further research. Several of these ideas may be supported through the COATS Showcase effort, an ITS demonstration and evaluation effort funded by WTI (through the U.S. Department of Transportation’s Research and Special Programs Administration) and Caltrans.

#### *11.3.1 Quantify Benefits of ITS*

One of the most critical issues in sustaining ITS investment in the COATS study area is the ability to quantify the benefits of ITS to the traveling public and operating agencies, versus other users of public funding. It is important to have evidence that confirms that ITS provides real, tangible benefits.

During the course of the COATS project, there are several areas of benefits evaluation where it is clear that there are gaps in the research. Some of these include the following.

Operational Impacts of Weather and Lane Closures on Rural Highways. Many of the highway safety-oriented projects relate to providing better information on weather and roadway closures, both pre-trip and en-route. While these will provide a benefit, it would be difficult to determine the magnitude of this benefit without an appropriate base case to compare it against. For example, what is the effective highway capacity given a weather incident? Combined with

**Table 11-1:** List of Actions and Responsible Organizations.

| Action | Responsible Agency: Caltrans New Tech & Research / ODOT ITS Unit | Caltrans District / ODOT Region | CA Highway Patrol / OR State Police | State and Local Tourism | County/ Local | FHWA/FTA |
|---|---|---|---|---|---|---|
| ***Project Continuance and Outreach*** | | | | | | |
| Continue Stakeholder Outreach | ✓ | ✓ | ✓ | ✓ | | |
| Develop Marketing Strategy | ✓ | | | | | |
| Provide Updates on National ITS Developments | ✓ | ✓ | | | | ✓ |
| Utilize or Eliminate Regional Teams | ✓ | | | | | |
| Demonstrate the Benefits to RTPAs, MPOs and COGs | ✓ | ✓ | ✓ | ✓ | | |
| Expand Architecture Development and Education | ✓ | ✓ | | | | ✓ |
| Maintain ITS Inventory | | ✓ | | | ✓ | |
| ***Strategy for Implementation*** | | | | | | |
| Increase Regional Support or Other Alternatives | ✓ | ✓ | | | | |
| Mainstream ITS into Program and Project Prioritization | | ✓ | | ✓ | ✓ | |
| Modify Project Organization | ✓ | | | | | |
| Emphasize Multi-modal and Tourism Opportunities | ✓ | ✓ | | | | |
| Secure Demonstration and non-Traditional Funding | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Public Private Partnership Task Force | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

volume information, this can yield calculations of queue length and delay that could be reduced through the deployment of ITS technologies. Current estimates of capacity reductions due to weather or incident-related lane closures are unreliable, given the few studies that have been done in this area.

Agency Benefit of ITS. Do agencies and organizations that operate the transportation system benefit from ITS deployment? To what extent does it help them to do their jobs more efficiently and effectively? Quantifying these benefits could help to justify ITS expenditures to county and local agencies that might otherwise not consider ITS.

Traveler Benefit of ITS. Do travelers perceive greater safety and security because of ITS? Does it help to make their use of the transportation system, whether for work or recreation, more comfortable? Could this benefit be converted into monetary terms, in a way that could justify future ITS investment, or even suggest potential markets for the private sector?

Safety. Do ITS technologies such as CCTV and motorist-aide call boxes and others have a significant effect on reducing emergency notification and response times? Is this a cost-effective way to improve emergency notification and response times, versus other initiatives (such as in-vehicle mayday systems)? Do traveler information systems, such as variable message signs or various dynamic warning systems, help to reduce the frequency and severity of traffic incidents? Studies could be done for the study area as a whole, as well as for selected "hot spots", such as Siskiyou Pass.

### *11.3.2 Case Studies of Rural Deployment*

The lack of documented experience regarding ITS deployment in rural areas mean that the COATS region could provide valuable lessons to other parts of the country that may be lagging in rural deployment. Several aspects on case studies may prove valuable.

Communications Improvements for Rural Field Devices. The lack of power and communications infrastructure in rural areas, compounded by challenging topography, means that ITS design and demonstration in the COATS area needs to be creative. The use of alternative power sources and various communications means could provide useful lessons to rural parts of the country that may be hesitant to deploy ITS due to fears about the cost of providing power and communications.

ITS Maintenance. Deployment in a rural environment, with extended travel times and a lesser ability to use contractors, complicates the maintenance of ITS. Case studies of deployed devices, with their maintenance history and lessons learned, could provide valuable information on how to successfully sustain a rural ITS program after funding has been obtained for deployment.

Mainstreaming. One of the goals in this project has been to mainstream ITS projects and funding. It would be helpful to know to what extent ITS has been mainstreamed into the traditional planning and programming process. This would be especially interesting in California, where the county-level Regional Transportation Planning Agencies direct the pace and type of ITS deployment to a significant extent.

Rural Public-private Partnerships. Most ITS partnerships have been developed for urban areas, which would likely have a different business model than rural areas. What would be required to make a successful ITS partnership in the rural area? Are these partnerships feasible, or will the long-term support of rural ITS depend on subsidies?

### *11.3.3 New Technologies and Applications*

ITS is a growing, evolving and expanding field of technologies, whose potential increases as technology advances. The many transportation challenges in the COATS study area provide a fertile test-bed for many new technology applications that could provide benefit to local stakeholders while serving as a national showcase. The number of such potential applications is by definition undefined, but there are a couple of examples that have emerged over the course of the project.

Animal-vehicle Collision Warning Systems. The use of automated detection equipment and dynamic warning systems may help to reduce the frequency and severity of animal-vehicle collisions, by providing motorists with more pertinent and current information than static signing. Through a national pooled-fund study, a portion of US Route 97 in Deschutes County (Oregon) south of Bend was identified as a location for demonstration and evaluation of this technology. There are many other locations throughout the study area where such systems could be tested with different species of wildlife, different weather conditions, and different topography and visibility.

Oversize Vehicle Detection. The presence of over-length or over-width vehicles on narrow roads can present a challenge for other vehicles, and in some cases, even for the vehicles themselves. Various systems are capable of detecting vehicle dimensions, but these have not been used in conjunction with traveler information systems to advise larger vehicles to use alternate routes. Since these larger vehicles may cause road closures in some narrow canyons – such as the US 199 Narrows in Del Norte County – the benefits of such a system could be considerable.

### *11.3.4 Second-tier Opportunities*

As was stated earlier in the chapter, safety, highway operations and traveler information were the areas of top emphasis in the identification of ITS projects for the COATS study area. Further research would be recommended into providing a more thorough assessment of the potential for ITS in other areas.

Transit and Public Mobility. ITS may provide a way to improve the cost-effectiveness and reliability of intracity and intercity public transportation. This plan identified several potential technology implementations that may work toward that end. However, most of the projects that were identified did not consider the extent to which ITS requires and fosters cooperation between various service providers. Further research is recommended into potential of ITS to support local mobility providers, which would work toward the identification of additional projects and appropriate funding mechanisms.

Tourism. Similar to transit and public mobility, many technologies were recommended to support tourism in the study area. The integration of these systems together to support regional tourism initiatives has not been explored in depth. Unlike transit and public mobility, multi-county and regional organizations exist to support tourism; these organizations can provide a sound organizational base on which to build ITS projects geared toward tourists. Additional research would help to identify gaps that would hinder the potential effectiveness of ITS, and to identify projects and funding sources that could be used to bridge those gaps. Some projects may be integrated with transit and public mobility, so that tourists might prefer to use transit to access recreational destinations, reducing congestion and environmental degradation.

## 11.4 Summary

The Rural COATS project is an innovative bi-state, rural ITS planning and demonstration effort that has served to advance ITS awareness and deployment in the northern California / southern Oregon area. The project successfully identified opportunities for improved coordination across the state line, as well as between various regional agencies representing many stakeholder groups. The success of the project is a tribute to the time and effort of literally dozens of stakeholders in each state to support the COATS project over an extended period of time.

It is anticipated that this planning document, and the COATS project as a whole, will ultimately benefit travelers in the COATS region through improved transportation safety and convenience. Increased awareness in the study area of the potential of ITS should help to mainstream ITS in the long-term, resulting in the overall enhancement of the transportation system. Projects identified through the COATS process, including but not limited to the Siskiyou Pass Early Winner, should provide demonstrable safety and economic benefits to the traveling public and transportation system managers. The lessons learned through the planning process will help to improve future rural ITS planning initiatives in this region, as well as other parts of the country, ultimately allowing more people to realize the benefits of ITS deployment to improving their quality of life.

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# GLOSSARY OF KEY TERMS

| | |
|---|---|
| **advanced public transportation systems (APTS)** | This ITS program area encompasses the application of advanced electronic technologies to the deployment and operation of high occupancy, shared-ride vehicles, including conventional buses, rail vehicles, and the entire range of paratransit vehicles (54). |
| **advanced rural transportation systems (ARTS)** | This ITS program area focuses on applications of advanced technology to rural transportation systems. It is an umbrella classification that has close identification with other ITS program areas. ARTS is subdivided into seven critical program areas. |
| **advanced traffic management systems (ATMS)** | This ITS program area includes traffic detectors, computerized signals, adjustable speed limit signs and video surveillance equipment to monitor traffic conditions and facilitate the provision of real-time information to travelers about current and expected traffic conditions. The ATMS function is typically conducted through a Traffic Management Center (TMC) and is often very effective in reducing traffic congestion and subsequent delays. ATMS has proven to be an effective tool in facilitating shorter response times for traffic incidents (56). |
| **advanced traveler information systems (ATIS)** | This ITS program area includes technology that provides a variety of information that assists travelers in reaching a desired destination via private vehicle, public transportation, or a combination of the two (55). It may include information provided before a trip (pre-trip), such as through a Web page or kiosks, or during travel (en-route), such as through variable message signs and highway advisory radio. |
| **architecture** | A framework for depicting how different stakeholders need to relate to one another in order to provide ITS user services. It is a technologically-neutral framework depicting what information will be shared between stakeholders now and in the future. |
| **COATS** | The California/Oregon Advanced Transportation Systems (COATS) project is an ITS planning and demonstration effort for a rural region including northern California and southern Oregon. |
| **commercial vehicle operations (CVO)** | This ITS program area includes technologies used to improve motor carrier safety and productivity by improving and targeting inspections, and reduced paperwork through electronic transactions, weigh-in-motion and automatic vehicle technologies (57). |
| **conformance** | In architecture development, this refers to the consistency of a regional architecture with the National ITS Architecture and standards. Requirements for conformance are determined through a rule-making process at the Federal level. |

**critical program area (CPA)** A subcategory of advanced rural transportation systems. Seven CPAs have been designated to relate to specific aspects of rural transportation: traveler safety and security, emergency services, tourism and traveler information, public traveler/mobility services, infrastructure operations and maintenance, fleet operations and maintenance, and commercial vehicle operations.

**early winner** An early winner is a project that is among the first to be implemented as a result of a planning effort. Selected projects have a high likelihood of achieving their objectives, and would ideally be fairly visible to stakeholders and the traveling public.

**Governing Board** The highest layer in the organizational structure of the COATS project, this group was responsible for providing policy guidance for those issues that are beyond the authority of the Steering Committee. This group, comprised of the highest-level managers, dealt with issues relating to long-term agency roles and responsibilities, funding sustainability, and politically sensitive matters.

**intelligent transportation systems (ITS)** This is the application of advanced communications, information processing, control and electronics technology to improve the transportation system in order to save lives, time and money.

**logical architecture** This view of the architecture defines the activities or functions that are required to satisfy the user services. It identifies system functional processes and information flows grouped to form particular transportation functions (57).

**market package** A potential ITS implementation to address specific transportation challenges. It collects different subsystems, terminators, equipment packages (a more detailed breakdown of user services), and architecture flows to perform a specific service. Sixty-three market packages are included in version 3.0 of the National ITS Architecture.

**National ITS Architecture** A set of guidelines and principles that guide the creation of a regional ITS architecture. These guidelines define how ITS functions may be implemented using a prescribed set of information flows and physical entities. Many aspects of it are tied to national standards, to facilitate interoperability and information exchange between different regions.

**physical architecture** This view of the architecture provides a physical representation, though not a detailed design, of the important ITS interfaces and major system components (57). It distributes the functions defined by the logical architecture into systems and subsystems, based on the similarity of functions and the location where functions are to be performed (13).

**Regional Teams** These groups served to provide the Steering Committee with regional recommendations to the Steering Committee for inclusion in the project. There were three such teams designated for the project, each of which appointed one member to represent their region's concerns to the Steering Committee.

**sausage diagram** A typical representation of the physical architecture, which identifies the types of subsystems and communication flows that characterize a region's architecture.

**Showcase** Showcase is a follow-up effort to COATS which demonstrates and evaluates ITS technology throughout the study area in a fashion consistent with COATS goals and objectives.

**standards** These are agreements, by industries and governments, to do things consistently, in order to minimize inefficiency and promote sharing of information. There are three types of ITS standards: communications protocol standards, which define rules for moving data and associated messages; data dictionary standards, which define the organization of a database so that data is given meaning; and message set standards, which identify associated data elements for typical applications (13).

**Steering Committee** The role of the Steering Committee is to provide strategic direction and oversight for the project. Specific functions of the Committee included – but were not limited to – reviewing project progress and project deliverables, participating in project workshops, providing input and guidance to WTI. It consisted of one voting representative from each active member agency.

**subsystem** A physical entity where an ITS function occurs, such as a traffic management center, the roadside, or the vehicle.

**terminator** A physical entity involved in ITS functions that is at the periphery of the architecture. It may exchange information with one or more subsystems, but not with other terminators.

**Turbo Architecture** A software package developed under contract for the U.S. Department of Transportation that accelerates the development of a regional architecture. It is based on the National ITS Architecture.

**user services** These document what ITS should do from the user's perspective. A broad range of users are considered, including the traveling public as well as many different types of system operators (57). There are 31 user services included in version 3.0 of the National ITS Architecture.

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# APPENDIX A: CHALLENGES BY GEOGRAPHIC FOCUS AREA

| **Transportation Challenges** | **Potential Geographic Areas** |
|---|---|
| **Safety** | |
| Railroad grade crossing | • Existing crossings |
| Inclement weather (road surface) | • CA Rt. 36, LAS Co., MP 10.6-11.5<br>• CA Rt. 36, TEH Co., MP 76.6-78.7<br>• OR Rt. 18, MP 54.6-56.5, 60.5-61.4, 64-64.5<br>• OR Rt. 16, MP 79.5-81.3 |
| Inclement weather (poor visibility) | • OR Rt. 35, MP 10.8-12.2, 75.3-76.2<br>• OR Rt. 22, MP 5.9-6.5<br>• OR Rt. 18, MP 54.6-56.5<br>• OR Rt. 16, MP 79.5-81.3<br>• OR Rt. 15, MP 6-6.9<br>• OR Rt. 9, MP 211.6-213.0, 234.6-235.9, 237.9-239.8, 356.4-357.9<br>• CA Rt. 199, DN Co., MP 0.6-1.9<br>• CA Rt. 101, HUM Co., MP 1.2-2.9<br>• CA Rt. 101, DN Co., MP 20.1-22.2<br>• CA Rt. 299, HUM Co., MP 29.9-31.1<br>• CA Rt. 101, MEN Co., MP 50.7-51.23 |
| Intersection safety | • CA Rt. 101, Crescent City<br>• OR Rt. 35, Coquille, Myrtle Point, & Winston<br>• OR Rt. 22, White City<br>• OR Rt. 15, Eugene<br>• OR Rt. 9, Reedsport, Wedderburn, & Brookings<br>• OR Rt. 7, Bend & Burns<br>• OR Rt. 4, Bend |
| Narrow shoulder/clear zone | • CA Rt. 199, DN Co., MP 0.6-1.9<br>• CA Rt. 101, HUM Co., MP 1.2-2.9, 121.8-122.7<br>• CA Rt. 101, DN Co., MP 20.1-22.2<br>• CA Rt. 199, DN Co., MP 26.3-27.8<br>• CA Rt. 299, HUM Co., MP 29.9-32.8<br>• CA Rt. 299, TRI Co., MP 47.7-48.6<br>• CA Rt. 101, MEN Co., MP 50.7-51.2<br>• CA Rt. 36, TEH Co., MP 76.6-78.7<br>• OR Rt. 18, MP 54.6-56.5<br>• OR Rt. 16, MP 79.5-81.3 |
| Animal collision | • OR Rt. 16, MP 79.5-81.3 |
| Speed related crashes | Locations incorporated with weather-road surface |
| Construction zone | • Planned construction sites (see Volume One) |
| Alcohol | Corridor wide |

| **Transportation Challenges** | **Potential Geographic Areas** |
| --- | --- |
| Driver fell asleep | • Throughout the following routes<br>OR I-5<br>CA I-5 (TEH, SHA, & SIS Co.)<br>CA Rt. 101 (MEN & HUM Co.)<br>CA Rt. 299 (SHA Co.)<br>CA Rt. 20 (LAK Co.) |
| Lack of seat belt use | Corridor wide |
| **Non-Recurring Congestion** | • Common road closures |
| **Freight Movement**<br>Truck inspection/high truck traffic | • Existing weigh stations |
| **Incident Response** | |
| Multi-jurisdictional incident | • Slides: Humboldt Co. Routes 96 and 36<br>• Trinity Co. Route 299<br>• Mendocino Routes 1, 101, 20<br>• Vehicle crashes: All of I-5, Routes 299, 101 |
| Long emergency notification and response times | • OR, Routes 395 and 20 Burns/Riley area<br>• CA, Eastern Counties |
| **Mobility** | |
| Bicycle and pedestrian traffic (safety) | • All of Route 101 (touring bicycles) |
| Transit availability | • Lake County, CA<br>• Josephine County, OR |
| **Tourism** | |
| High recreation traffic | • All of Route 101<br>• National Parks and Monuments |
| Economic sustainability | Corridor wide |
| **Environmental Impacts** | Corridor wide |

Legend:

Specific locations were validated by stakeholder input

Additional stakeholder input regarding magnitude and focus area is required

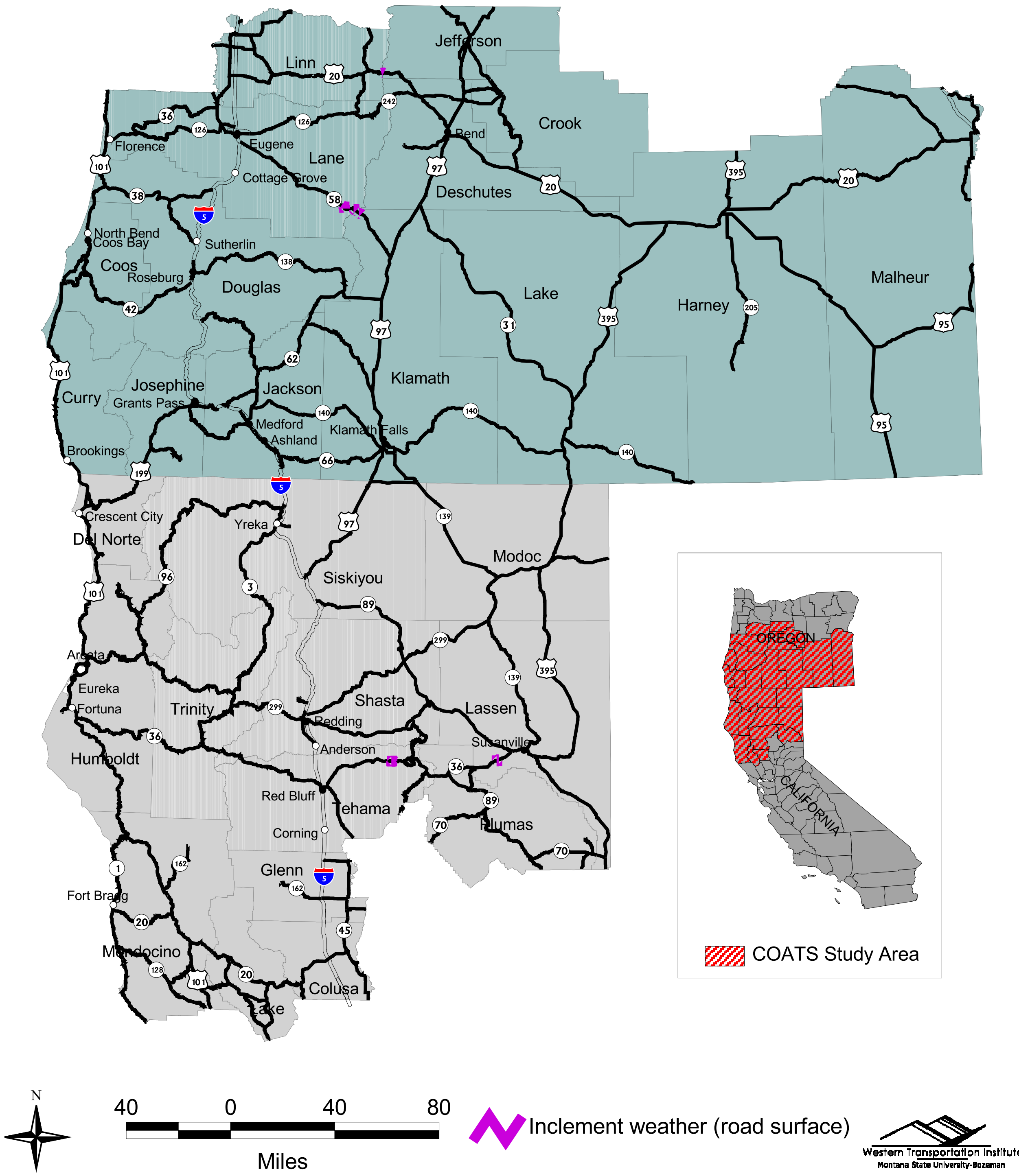


**Figure A-1:** Inclement Weather (Road Surface) Challenges.

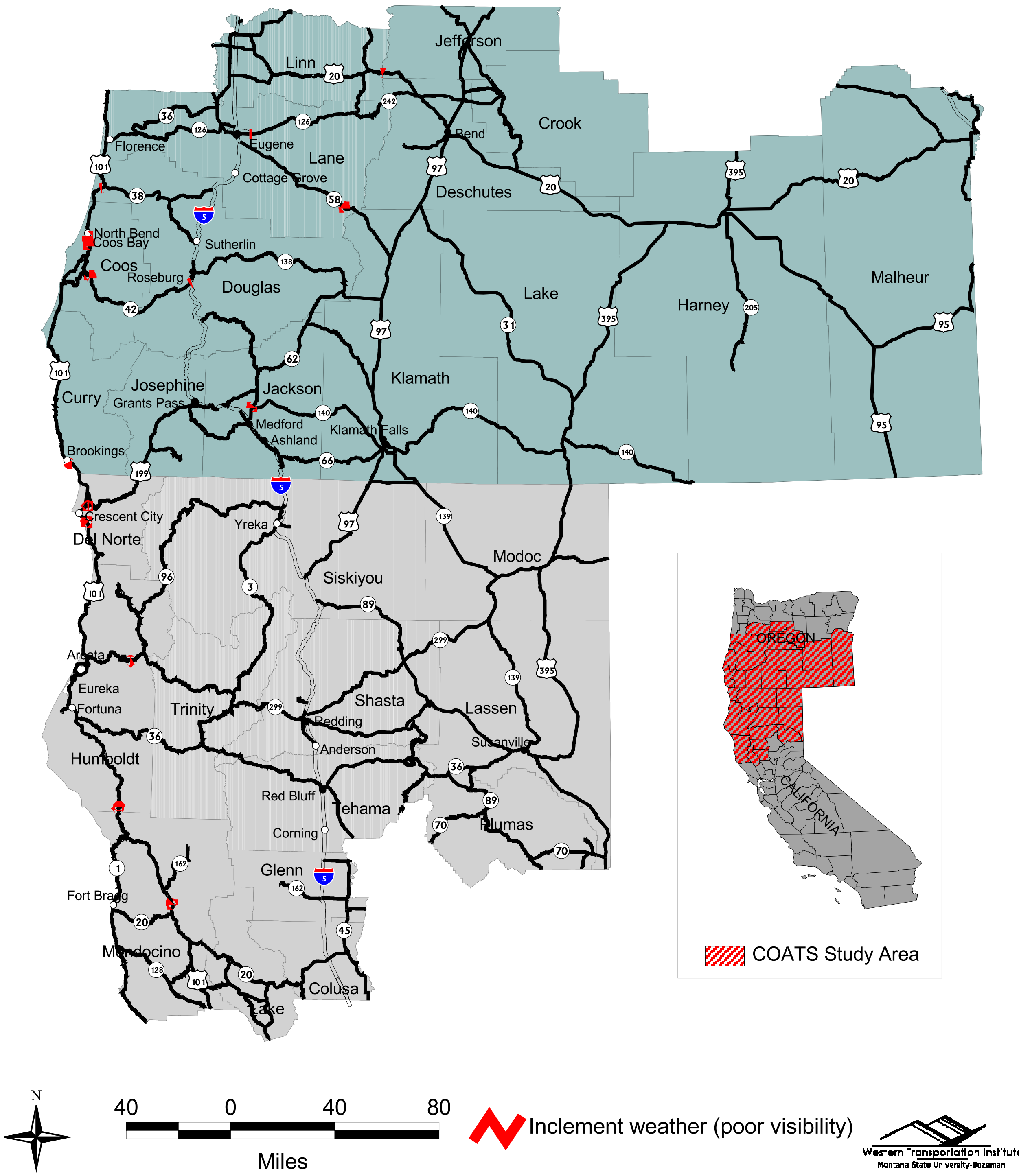


**Figure A-2:** Inclement Weather (Poor Visibility) Challenges.

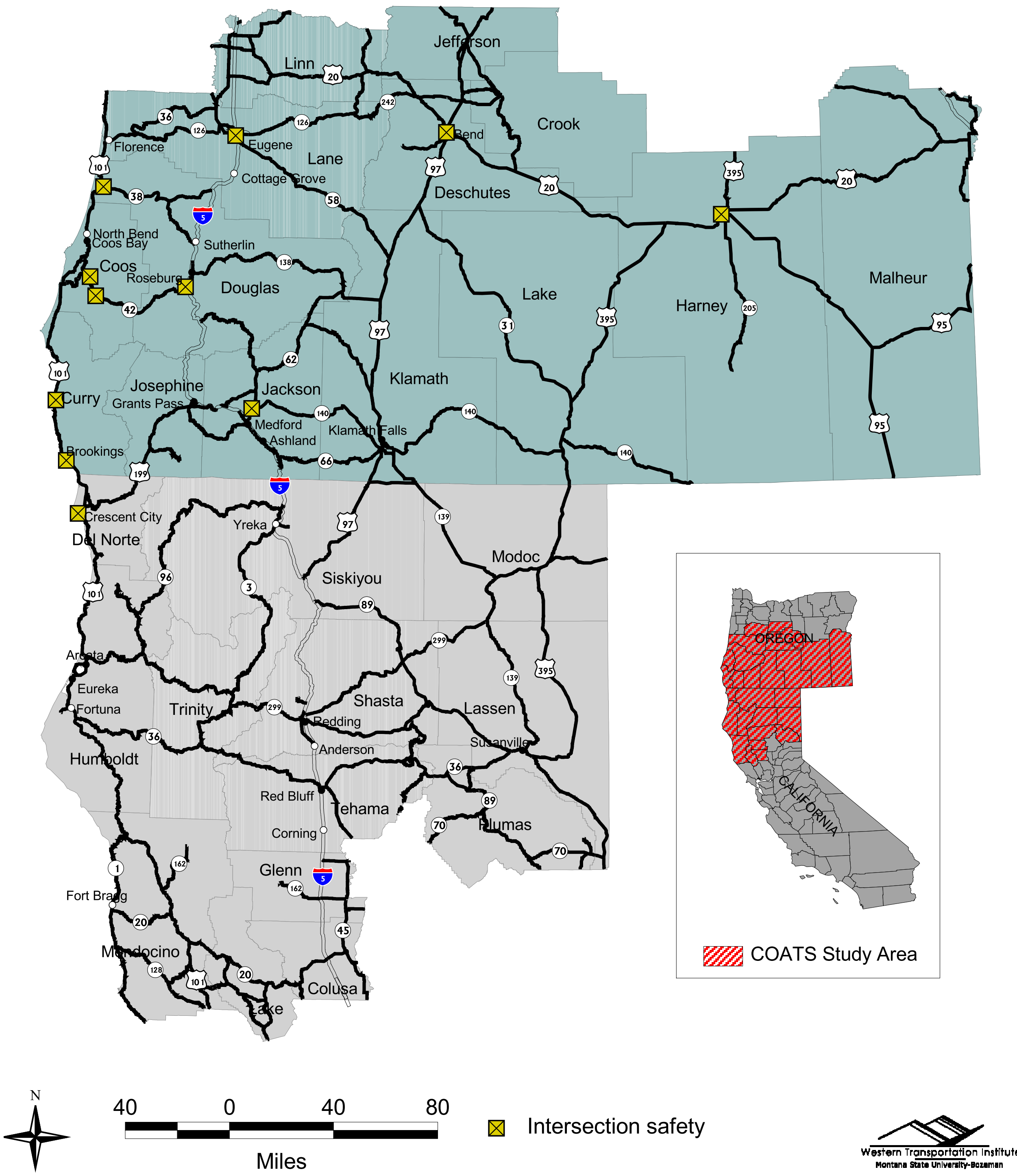


**Figure A-3:** Intersection Safety Challenge.

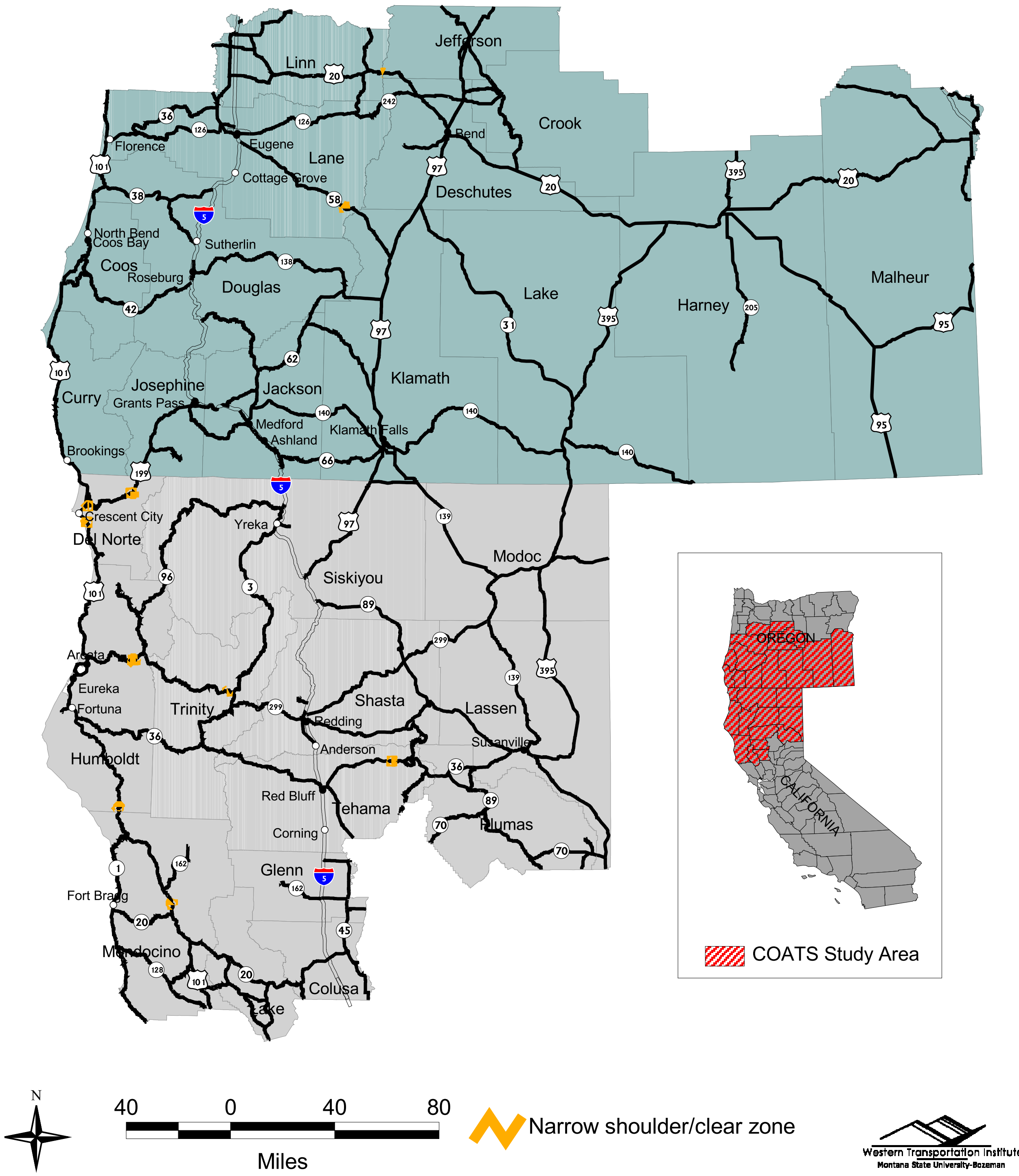


**Figure A-4:** Narrow Shoulder/Clear Zone Challenge.

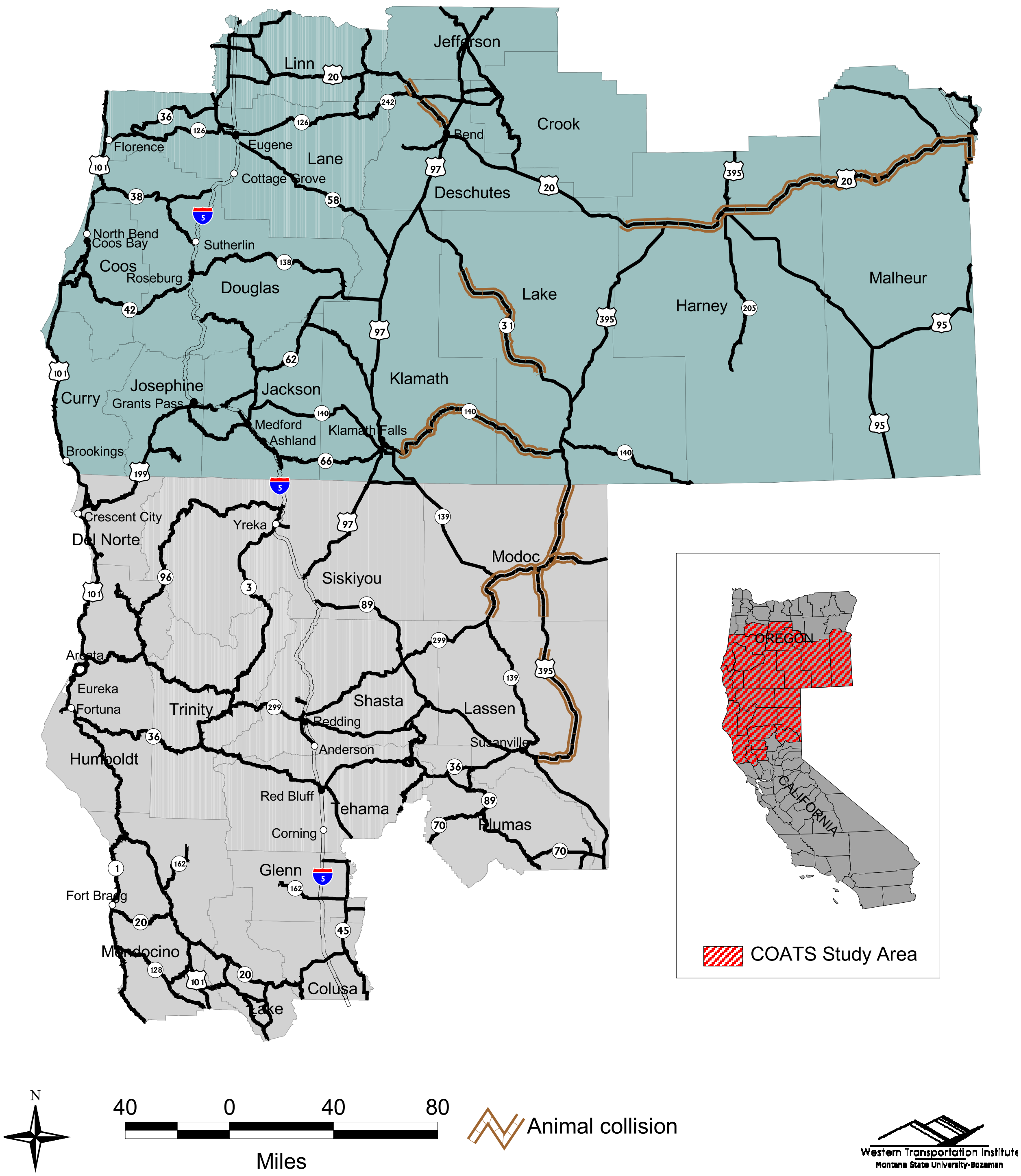


**Figure A-5:** Animal Collision Challenges.

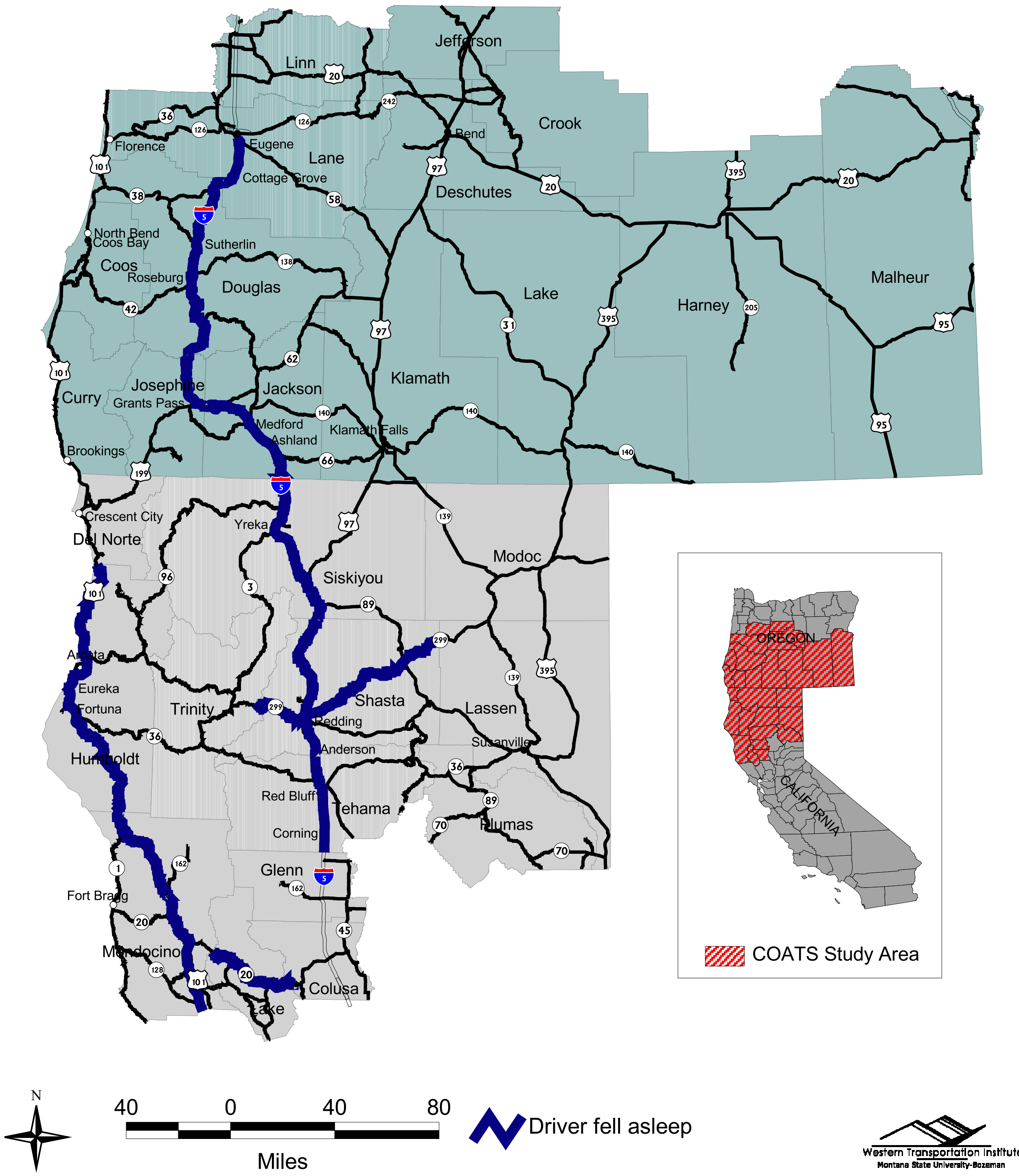


**Figure A-6:** Driver Fell Asleep Challenge.

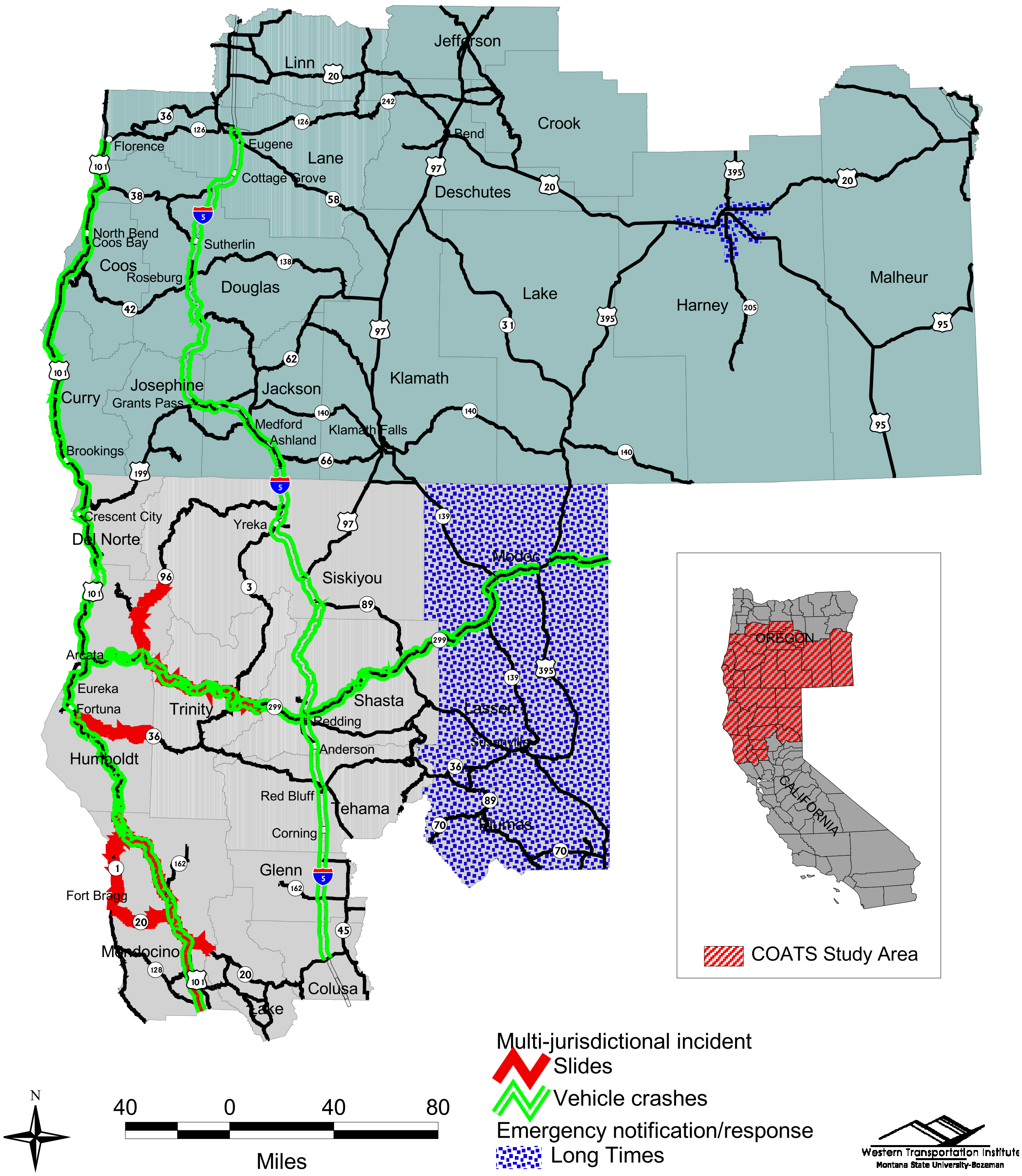


**Figure A-7:** Incident Response Challenges.

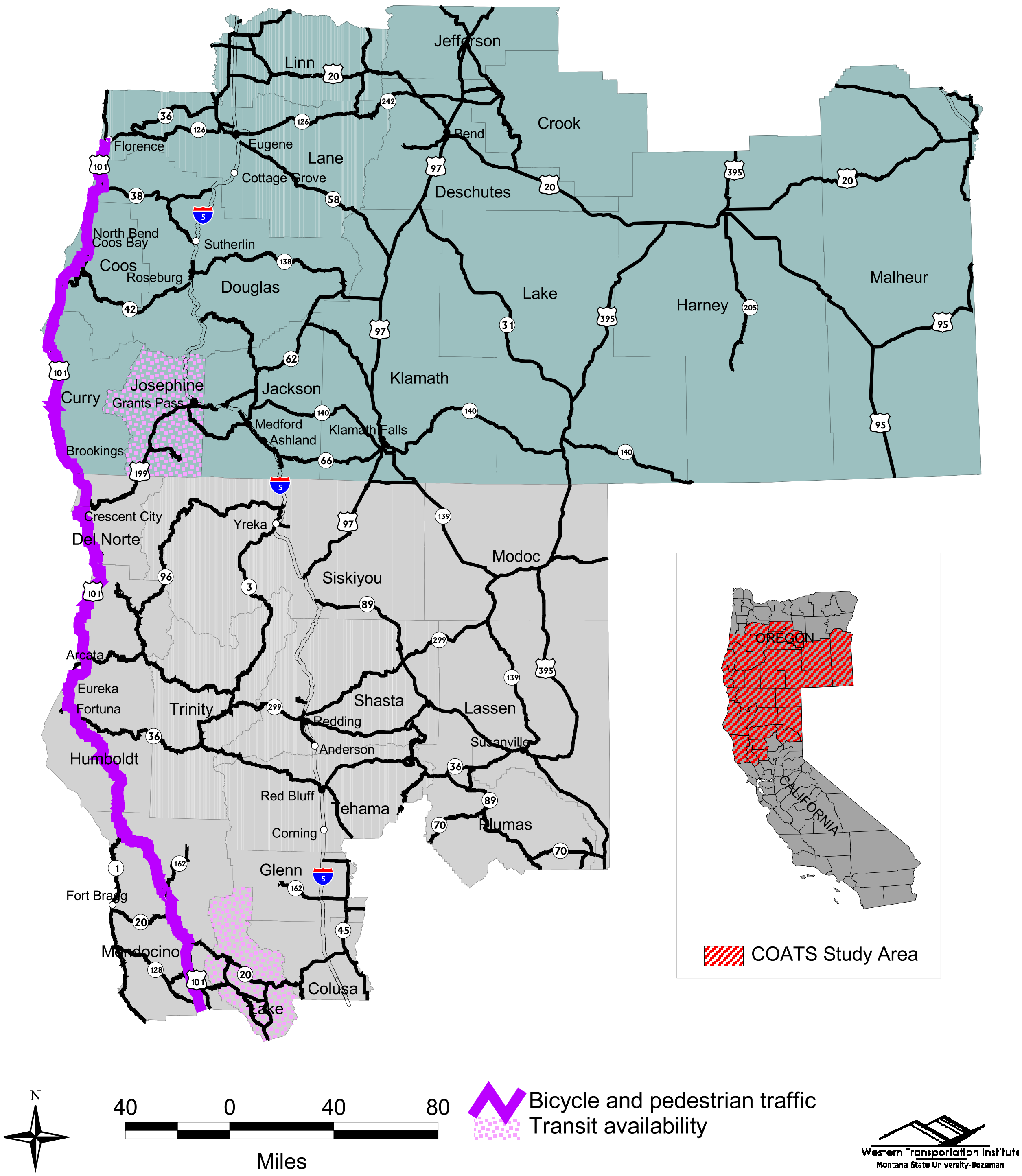


**Figure A-8:** Mobility Challenges.

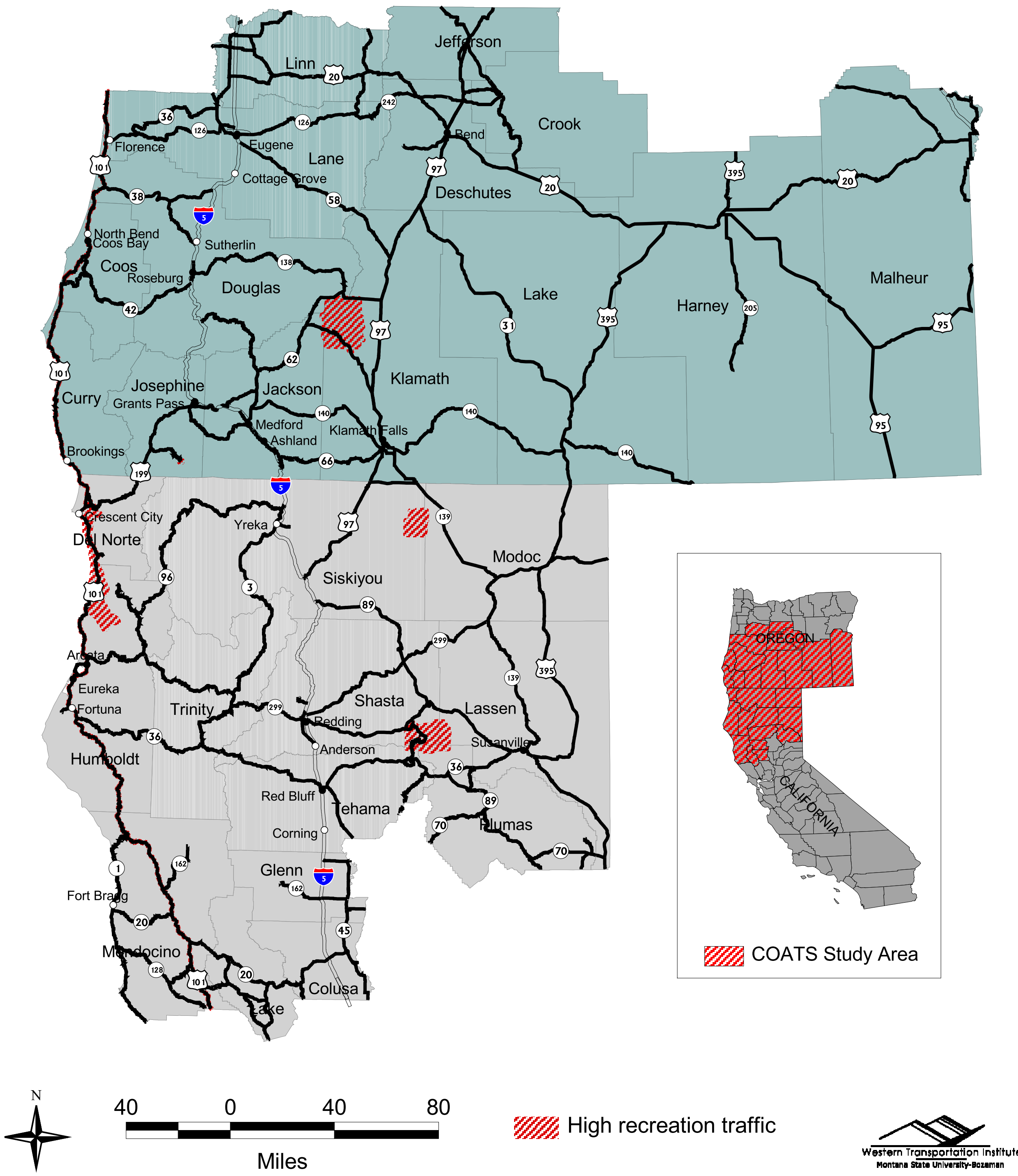


**Figure A-9:** Tourism-Related Challenges.

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## APPENDIX B: INVENTORY OF STAKEHOLDERS AND SYSTEMS

This appendix lists the stakeholders and systems that are included in the COATS Turbo Architecture database. The following information is provided for each subsystem:

- its name, as listed in the database;
- whether it is existing or planned;
- the National ITS Architecture entities to which this subsystem could be mapped (including extensions to the architecture that were added by WTI staff); and
- a description of what this system refers to.

Where it makes sense, the COATS ITS inventory was defined as a relatively short list of general classes of systems, rather than as a detailed enumeration of every individual system in this expansive region. For example, instead of enumerating every law enforcement dispatch system in the COATS inventory, more general "Area Police Dispatch" elements were defined that each represent more than one specific dispatch system.

Defining a more general ITS inventory has two benefits. It substantially simplifies the architecture model since detailed interfaces for every specific system (e.g., every municipal police dispatch system) are not required. This facilitates architecture development when detailed input from every system owner in the region is not available, and it increases the likelihood that the model will be maintained in the future since less effort will be required.

Second, it underscores the fact that all specific systems represented by the more general inventory elements should integrate into the overall COATS architecture in a consistent fashion, using common standards where possible.

The drawback to generalization is that the specific dispatch system for a particular municipal police department is not individually identified in the inventory. This does not affect the validity or usefulness of the architecture in any substantial way. Furthermore, in further architecture development, the generalization may be relaxed if an individual system has distinctively different interface requirements.

Even with this generalization, each element definition includes a comprehensive list of the specific systems that are represented by it. This means that every COATS architecture stakeholder should find a general element that represents their system and also find a specific reference to their system in the definition for that element.

**Table B-1:** Inventory of Stakeholders and Systems.

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| 1-800-427-ROAD | Existing | ▪ Personal Information Access | This is a toll-free number run by Caltrans which provides current road conditions information. This may be superceded by 511 at a later date. |
| 1-800-977-ODOT | Existing | ▪ Personal Information Access | This toll-free number provides current road conditions from all areas within Oregon by touchtone phone (outside of Oregon, this is available at 503-588-2941). The service is provided by ODOT. This may be superceded by 511 at a later date. |
| Airline Schedule Operations | Existing | ▪ Multimodal Transportation Service Provider | Includes Ascot, Horizon, Skywest, United and other airlines offering regular scheduled passenger service. |
| Amtrak Schedule Operations | Existing | ▪ Multimodal Transportation Service Provider | This is the operational entity that provides static and real-time Amtrak schedule information for the COATS architecture. |
| California Highway Information Web Page | Existing | ▪ Information Service Provider<br>▪ Other ISP<br>▪ Personal Information Access | This interactive Web-based service (http://www.dot.ca.gov/hq/roadinfo) provides key road construction, detour and closure information based on user-specified route numbers. |
| California Weigh Stations | Existing | ▪ Commercial Vehicle Check | These are locations where commercial vehicles may be weighed and inspected. |
| Caltrans District 1 Public Affairs | Existing | ▪ Media<br>▪ Public Information Office* | This office is responsible for communicating with local media all news regarding key Caltrans activities in District 1. It may be used to disseminate information about road closures, ongoing construction projects, and other activities that may affect highway travel. |
| Caltrans District 2 Public Affairs | Existing | ▪ Media<br>▪ Public Information Office* | This office is responsible for communicating with local media all news regarding key Caltrans activities in District 2. It may be used to disseminate information about road closures, ongoing construction projects, and other activities that may affect highway travel. |
| Caltrans Field Equip District 1 (Eureka) | Existing | ▪ Roadway Subsystem | This includes the environmental sensors, variable message signs, HAR, signals, traffic detectors, and any other field equipment and instrumentation operated by Caltrans District 1. |
| Caltrans Field Equip District 2 (Redding) | Existing | ▪ Roadway Subsystem | This includes the environmental sensors, variable message signs, HAR, signals, traffic detectors, and any other field equipment and instrumentation operated by Caltrans District 2. |
| Caltrans HQ Construction Program | Existing | ▪ Construction and Maintenance | This program is responsible for implementing the state’s highway construction program. It will provide information to local districts about future construction projects as they are introduced. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Caltrans HQ Permits | Existing | ▪ Permitting Office* | The Encroachment Permits department is a part of the office of development services within Caltrans' Traffic Operations program. As the responsible department for protecting the public's investment in the State highway system, the permits office reviews all requests from utility companies, developers, volunteers, nonprofit organizations, etc., desiring to conduct various activities within the right of way. Such activities could include for example: construction of highway improvements, driveway installation and maintenance, highway landscaping and graffiti removal, commercial filming, special events such as parades commemorating an event, e.g. Independence Day. |
| Caltrans HQ Traffic | Existing | ▪ Archived Data Management Subsystem<br>▪ Other Archives | This office is responsible for coordinating the state's transportation management centers, facilitating data exchange and interoperability. It will also serve as a repository for field data collected at districts across the state. |
| Caltrans Maintenance District 1 (Eureka) | Existing | ▪ Construction and Maintenance<br>▪ Maintenance Dispatch Office*<br>▪ Other Maintenance Dispatch Office* | Covers the resource management and dispatch systems operated by Caltrans District 1. |
| Caltrans Maintenance District 1 (Eureka) Vehicles | Existing | ▪ Maintenance Vehicles*<br>▪ Other Maintenance Vehicles* | These Caltrans vehicles are responsible for maintenance activities, including setting up road closures, assisting in incident removal, and performing winter maintenance. It is assumed that there is seamless communication between the vehicle and its driver, who will actually be directing and performing the maintenance activity. |
| Caltrans Maintenance District 2 (Redding) | Existing | ▪ Construction and Maintenance<br>▪ Maintenance Dispatch Office*<br>▪ Other Maintenance Dispatch Office* | Covers the resource management and dispatch systems operated by Caltrans District 2. |
| Caltrans Maintenance District 2 (Redding) Vehicles | Existing | ▪ Maintenance Vehicles*<br>▪ Other Maintenance Vehicles* | These Caltrans vehicles are responsible for maintenance activities, including setting up road closures, assisting in incident removal, and performing winter maintenance. It is assumed that there is seamless communication between the vehicle and its driver, who will actually be directing and performing the maintenance activity. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Caltrans RWIS | Existing | ▪ Weather Service | These are RWIS stations maintained by Caltrans for providing information on atmospheric and pavement temperature conditions at remote sites. Information from these sites is helpful for maintenance officials in making maintenance decisions. |
| Caltrans Weather Warning Systems | Existing | ▪ Roadway Subsystem | These are driver advisory systems which are activated based on certain meteorological conditions or thresholds (e.g. high wind, icy bridge, etc.). They process information provided by a localized weather station and provide a warning to motorists when specified conditions arise. |
| Caltrans/CHP Eureka ARTIC | Existing | ▪ Other TM<br>▪ Traffic Management | This ARTIC (Advanced Rural Technology Integration Center) plays a central role in the COATS architecture for managing and monitoring the transportation system in Del Norte, Humboldt, Mendocino and Lake Counties. It is a Tier 3 Satellite Operation Center connected to the Oakland Regional TMC. |
| Caltrans/CHP Oakland Regional TMC | Existing | ▪ Other TM | This Tier 1 TMC is tied to Tier 3 Satellite Operation Centers in Eureka and San Luis Obispo. |
| Caltrans/CHP Redding ARTIC | Existing | ▪ Other TM<br>▪ Traffic Management | This ARTIC (Advanced Rural Technology Integration Center) coordinates transportation operations for north central California, serving Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, and Trinity Counties. It is a Tier 3 Satellite Operation Center which is connected to the Sacramento TMC. |
| Caltrans/CHP Sacramento Regional TMC | Existing | ▪ Other TM | This Tier 1 TMC is tied to Tier 2 (Urban) TMCs in Stockton and Fresno and Tier 3 Satellite Operation Centers in Redding and Kingvale |
| CHIN | Existing | ▪ Information Service Provider<br>▪ Other ISP | The California Highway Information Network provides daily adverse travel conditions information. Information is made available to telephone and Internet. |
| CHP Eureka and Humboldt Division Dispatch and 911 Centers | Existing | ▪ Emergency Management<br>▪ Other EM | This includes offices in Crescent City, Humboldt, Garberville, Ukiah and Clearlake. |
| CHP Northern District Dispatch and 911 Centers | Existing | ▪ Emergency Management<br>▪ Other EM | This placeholder includes the Redding, Susanville and Yreka dispatch centers. These centers are responsible for CHP offices in Alturas, Cottonwood, Mt. Shasta, Quincy, Redding, Red Bluff, Susanville, Trinity River, and Yreka, as well as Dunsmuir Grade Inspection Facility. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| CHP Vehicles | Existing | ▪ Emergency Vehicle Subsystem | California Highway Patrol vehicles. |
| COATS Kiosks | Planned | ▪ Remote Traveler Support | This is a planned system which would provide real-time traveler and tourism information to travelers throughout the COATS region. |
| Commercial Vehicle (Onboard) Systems | Existing | ▪ Commercial Vehicle Subsystem | This subsystem resides in a commercial vehicle and provides the sensory, processing, storage, and communications functions necessary to support safe and efficient commercial vehicle operations. The Commercial Vehicle Subsystem provides two-way communications between the commercial vehicle drivers, their fleet managers, and roadside officials, and provides HAZMAT response teams with timely and accurate cargo contents information after a vehicle incident. |
| Commercial Vehicle Driver | Existing | ▪ Commercial Vehicle Driver | This terminator represents the human entity that operates vehicles transporting goods including both long haul trucks and local pick up and delivery vans. |
| Commercial Vehicles | Existing | ▪ Commercial Vehicle | The actual commercial vehicle along with the special aspects of large commercial vehicles and vehicles designed to carry cargo that extend beyond the characteristics defined for the Basic Vehicle. This terminator thus represents a special type of Basic Vehicle that is used to transport goods or services which are operated by professional drivers, typically administered as part of a larger fleet, and regulated by a Commercial Vehicle Manager. |
| Coos Bay-Area City Traffic Control Equip | Existing | ▪ Roadway Subsystem | This includes traffic equipment maintained by the cities of Coos Bay, North Bend, Florence, Reedsport, Coquille, and Roseburg. |
| Coos Bay-Area City Traffic Control Systems | Existing | ▪ Other TM<br>▪ Traffic Management | This includes traffic management activities for the cities of Coos Bay, North Bend, Florence, Reedsport, Coquille, Brookings, Port Orford, Gold Beach, Bandon, Myrtle Point, Elkton, Sutherland, Myrtle Creek, and Wells Creek. |
| Coos Bay-Area County Maintenance Systems | Existing | ▪ Construction and Maintenance | This includes Coos County, Curry County, Douglas County and Lane County Maintenance Department systems. |
| Coos Bay-Area E-911 Comm Centers | Existing | ▪ Emergency Management<br>▪ Other EM | This includes the two communications centers each in Coos and Curry Counties. |
| Coos Bay-Area EMS Provider Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes the broad range of private EMS, ambulance and air evacuation providers that serve the Coos Bay area, including Bay Cities Ambulance, Coquille Valley Ambulance, Lower Umpqua EMS, Medic 4 Ambulance, Myrtle Point, Curry County EMS, and Del Norte. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Coos Bay-Area EMS Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes the broad range of private EMS, ambulance and air evacuation vehicles that serve the Coos Bay area, including Bay Cities Ambulance, Coquille Valley Ambulance, Lower Umpqua EMS, Medic 4 Ambulance, Myrtle Point, Curry County EMS, and Del Norte. |
| Coos Bay-Area Fire and Rescue Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes fire and rescue dispatch centers for Coos Bay, North Bend, Florence, Reedsport, Coquille, Hauser, East Bay, Millington, and Charleston. (The last four cities are volunteer.) |
| Coos Bay-Area Fire and Rescue Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes fire and rescue vehicles serving Coos Bay, North Bend, Florence, Reedsport, Coquille, Hauser, East Bay, Millington, and Charleston. (The last four cities are volunteer.) |
| Coos Bay-Area Paratransit Dispatch | Existing | ▪ Other TRM<br>▪ Transit Management | Includes Curry-Coos County Transit System, Senior Transportation. |
| Coos Bay-Area Paratransit Vehicles | Existing | ▪ Transit Vehicle Subsystem | Includes Curry-Coos County Transit System, Senior Transportation. |
| Coos Bay-Area Planning Agencies | Existing | ▪ Archived Data Management Subsystem<br>▪ Other Archives | This includes various city and county planning agencies that may have use for archived data, including but not limited to the Umpqua Regional Council of Governments. |
| Coos Bay-Area Police and Sheriff Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes the police departments for the cities of Coos Bay, North Bend, Florence, Reedsport, Coquille, Brookings, Port Orford, Gold Beach, Bandon, Myrtle Point, Elkton, Sutherland, Myrtle Creek, and Wells Creek. This also includes county sheriffs from Coos, Curry and Douglas Counties, as well as tribal police. |
| Coos Bay-Area Police and Sheriff Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes law enforcement vehicles for the cities of Coos Bay, North Bend, Florence, Reedsport, Coquille, Brookings, Port Orford, Gold Beach, Bandon, Myrtle Point, Elkton, Sutherland, Myrtle Creek, and Wells Creek. This also includes county sheriffs from Coos, Curry and Douglas Counties, as well as tribal police. |
| Coos Bay-Area Radio Stations and Newspapers | Existing | ▪ Media | Local media that includes traveler information with entertainment, general news and other topical information. In contrast to other traveler information inventory items, this entry represents the radio and print media intended for human, rather than system, processing and interpretation. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Coos Bay-Area Towing/Recovery | Existing | ▪ Other EM | This includes the private tow dispatch systems that clear incidents in the Coos Bay area. This includes numerous individual operators that serve in the region. |
| Coos Bay-Area Traveler Information Resources | Existing | ▪ Yellow Pages Service Providers | This includes Parks and Recreation Departments for the cities of Coos Bay, North Bend, Florence, Reedsport, Coquille, and Roseburg; the Bureau of Land Management; U.S. Forest Service; Oregon Parks & Recreation; Coos County Bikeway Committee; Coos County and Curry County Parks; Bandon Dunes Recreational Area; as well as area hotels, restaurants, gas stations, shopping, etc. |
| Coos Bay-Area Visitor Information Services | Existing | ▪ Information Service Provider<br>▪ Other ISP | This includes City Chambers of Commerce, Central Oregon Coast Association, Southern Oregon Visitors Association, Oregon Tourism Commission, Oregon Lodging Association, and Coos Bay-North Bend Tourism Promotion Bureau. |
| CVO Inspector | Existing | ▪ CVO Inspector | This terminator represents the human entities who perform regulatory inspection of Commercial Vehicles in the field. CVO Inspectors support the roadside inspection, weighing, and checking of credentials either through automated preclearance or manual methods. |
| DEQ Medford Regional Office | Existing | ▪ Emissions Management | DEQ is responsible for protecting and enhancing Oregon's water and air quality, for cleaning up spills and releases of hazardous materials, and for managing the proper disposal of solid and hazardous wastes. DEQ operates a vehicle inspection program in the Rogue Valley to make sure cars are maintained properly to reduce emissions. |
| Downtown Parking District | Existing | ▪ Parking Management | This district covers the downtown Klamath Falls area. |
| Drivers | Existing | ▪ Driver | This terminator represents the human entity that operates a licensed vehicle on the roadway. Included are operators of private, Transit, Commercial, and Emergency vehicles where the data being sent or received is not particular to the type of vehicle. Thus this external originates driver requests and receives driver information that reflects the interactions which might be useful to all drivers, regardless of vehicle classification. |
| Eureka-Area Air Districts | Existing | ▪ Emissions Management | This includes various districts responsible for air quality management, including the North Coast Unified AQMD (responsible for Del Norte, Humboldt and Trinity Counties), the Lake County AQMD and the Mendocino County AQMD. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Eureka-Area City Traffic Control Equip | Existing | ▪ Roadway Subsystem | This includes the field equipment owned and operated by the cities of Arcata, Blue Lake, Clearlake, Crescent City, Eureka, Ferndale, Fort Bragg, Fortuna, Lakeport, Point Arena, Rio Dell, Trinidad. Ukiah and Willits. |
| Eureka-Area City Traffic Control Systems | Existing | ▪ Other TM<br>▪ Traffic Management | This includes the traffic management functions performed by the cities of Arcata, Blue Lake, Clearlake, Crescent City, Eureka, Ferndale, Fort Bragg, Fortuna, Lakeport, Point Arena, Rio Dell, Trinidad. Ukiah and Willits. |
| Eureka-Area County Maintenance Systems | Existing | ▪ Construction and Maintenance | This includes public works or transportation departments for Del Norte, Humboldt, Lake and Mendocino Counties. |
| Eureka-Area E-911 Comm Centers | Existing | ▪ Emergency Management<br>▪ Other EM | This includes the wireline public safety answering points on the northern California coast, including but not limited to a center in Curry County, Oregon which provides service to northern Del Norte County. |
| Eureka-Area EMS Provider Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes the broad range of private EMS, ambulance and air evacuation providers, including Arcata Mad River Ambulance Inc, City Ambulance of Eureka, City of Lakeport, Coast Guard, Del Norte Air Ambulance, Hoopa Ambulance, Medivac (CalSTAR), Mendocino Coast Hospital Ambulance, North Coast EMS, North Pacific Emergency Services, Redwood Empire Life Support, and Ukiah Ambulance. |
| Eureka-Area EMS Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes the broad range of private EMS, ambulance and air evacuation vehicles, including those operated by Arcata Mad River Ambulance Inc, City Ambulance of Eureka, City of Lakeport, Coast Guard, Del Norte Air Ambulance, Hoopa Ambulance, Medivac (CalSTAR), Mendocino Coast Hospital Ambulance, North Coast EMS, North Pacific Emergency Services, Redwood Empire Life Support, and Ukiah Ambulance. |
| Eureka-Area Fire and Rescue Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes dispatch functions provided for Arcata Fire District, Blue Lake Fire District, Brooktrails Fire Dept , California Department of Forestry, Clearlake Fire District, Coast Guard (Clear Lake), Coast Guard (Fort Bragg), Crescent City Volunteer Fire Department, Eureka Fire District, Ferndale Fire District, Fort Bragg Fire Department, Fortuna Fire District, Garberville Rescue, Lakeport Fire Dept, Redwood Valley Fire District, Samoa Peninsula Fire District, South Trinity Area Rescue, Ukiah Fire Dept, Ukiah Valley Fire District, Upper Lake Fire District, and Willits Fire Department. This also includes California Fish & Game, National Park Service, U.S. Fish & Wildlife and U.S. Forest Service. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| **Element Name** | **Status** | **National Architecture Mapping** | **Description** |
|---|---|---|---|
| Eureka-Area Fire and Rescue Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes vehicles owned by Arcata Fire District, Blue Lake Fire District, Brooktrails Fire Dept , California Department of Forestry, Clearlake Fire District, Coast Guard (Clear Lake), Coast Guard (Fort Bragg), Crescent City Volunteer Fire Department, Eureka Fire District, Ferndale Fire District, Fort Bragg Fire Department, Fortuna Fire District, Garberville Rescue, Lakeport Fire Dept, Redwood Valley Fire District, Samoa Peninsula Fire District, South Trinity Area Rescue, Ukiah Fire Dept, Ukiah Valley Fire District, Upper Lake Fire District, and Willits Fire Department. This also includes California Fish & Game, National Park Service, U.S. Fish & Wildlife and U.S. Forest Service. |
| Eureka-Area Fixed Route Dispatch | Existing | ▪ Other TRM<br>▪ Transit Management | This includes dispatch and management operations for the following transit systems: Arcata-Mad River Transit System, which serves Arcata and Eureka; Eureka Transit Service (run by Humboldt Transit Authority), which provides service to Eureka; Mendocino Transit Authority, which connects cities in Mendocino County; Redwood Coast Transit, which serves Crescent City; and Redwood Transit System (Humboldt Transit Authority), which goes throughout Humboldt County. |
| Eureka-Area Fixed Route Vehicles | Existing | ▪ Transit Vehicle Subsystem | This includes transit vehicles for the following transit systems: Arcata-Mad River Transit System, which serves Arcata and Eureka; Eureka Transit Service (run by Humboldt Transit Authority), which provides service to Eureka; Mendocino Transit Authority, which connects cities in Mendocino County; Redwood Coast Transit, which serves Crescent City; and Redwood Transit System (Humboldt Transit Authority), which goes throughout Humboldt County. |
| Eureka-Area Municipal Planning Agencies | Existing | ▪ Archived Data Management Subsystem<br>▪ Other Archives | This includes planning divisions for the cities of Arcata, Blue Lake, Clearlake, Crescent City, Eureka, Ferndale, Fort Bragg, Fortuna, Hoopa, Lakeport, Point Arena, Rio Dell, Trinidad, Ukiah, and Willits. |
| Eureka-Area Paratransit Dispatch | Existing | ▪ Other TRM<br>▪ Transit Management | This includes various paratransit dispatch operations, including Coastal Cab, Crescent City Paratransit Services, Door to Door Airporter, Fortuna Senior Bus, Lake Transit Authority, Mendocino Limousine, Mendocino Transit Authority, Redwood Dial A Ride, Yellow Cab. This also includes various senior centers (such as in Mendocino County) that each have paratransit services. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Eureka-Area Paratransit Vehicles | Existing | ▪ Transit Vehicle Subsystem | This includes transit vehicles to support paratransit operations, including Coastal Cab, Crescent City Paratransit Services, Door to Door Airporter, Fortuna Senior Bus, Lake Transit Authority, Mendocino Limousine, Mendocino Transit Authority, Redwood Dial A Ride, Yellow Cab. This also includes various senior centers (such as in Mendocino County) that each have paratransit services. |
| Eureka-Area Police and Sheriff Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes law enforcement agencies for the cities of Arcata, Blue Lake, Clearlake, Crescent City, Eureka, Ferndale, Fort Bragg, Fortuna, Lakeport, Point Arena, Rio Dell, Trinidad, Ukiah and Willits, and for the Hoopa Tribe. It also includes county sheriff's offices for Del Norte, Humboldt, Lake and Mendocino Counties. This also includes various other law enforcement agencies with specialized jurisdictions, such as California Department of Forestry, California Fish & Game, National Park Service, and the U.S. Forest Service. |
| Eureka-Area Police and Sheriff Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes vehicles used for law enforcement by the cities of Arcata, Blue Lake, Clearlake, Crescent City, Eureka, Ferndale, Fort Bragg, Fortuna, Lakeport, Point Arena, Rio Dell, Trinidad, Ukiah and Willits, and for the Hoopa Tribe. It also includes county sheriff's vehicles for Del Norte, Humboldt, Lake and Mendocino Counties. This also includes vehicles associated with various other law enforcement agencies with specialized jurisdictions, such as California Department of Forestry, California Fish & Game, National Park Service, and the U.S. Forest Service. |
| Eureka-Area Regional Transportation Planning Agencies | Existing | ▪ Archived Data Management Subsystem<br>▪ Other Archives | This includes organizations responsible for transportation planning along the northern California coast, including the Del Norte Local Transportation Commission (LTC); the Humboldt County Association of Governments; the Lake Council of Governments; and the Mendocino Council of Governments. |
| Eureka-Area Towing/Recovery | Existing | ▪ Other EM | This includes the private tow dispatch systems that clear incidents in the Eureka area. This includes numerous individual operators that serve in the region. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Eureka-Area Traveler Information Resources | Existing | ▪ Yellow Pages Service Providers | This includes Bureau of Land Management, California Parks & Recreation, Department of Fish and Game, Harbor Recreation and Conservation, National Forest Service, National Park Service, North Coast Redwoods, Redwood National and State Parks, Six Rivers (includes Smith River), various State Parks (including Anderson Marsh, Clear Lake, Jackson, Jughandle, Richardson Grove, Russian Gulch, Standish-Hickey). This also includes City (Clearlake, Ukiah) and County (Humboldt, Lake and Mendocino) Recreation Departments. This also includes area hotels, restaurants, gas stations, shopping, etc. |
| Eureka-Area Traveler Information Systems | Planned | ▪ Information Service Provider<br>▪ Other ISP | These systems collect traveler information from operational sources (e.g., local traffic and public safety agencies/systems), visitor information systems (e.g. chambers of commerce), and local travel destinations (e.g., Parks). This information is then made available to travelers through both broadcast and interactive digital information services through the Internet and other media. |
| Eureka-Area TV and Radio Stations | Existing | ▪ Media | Local media that includes traveler information with entertainment, general news and other topical information. In contrast to other traveler information inventory items, this entry represents the analog TV, radio and print media intended for human, rather than system, processing and interpretation. |
| Eureka-Area Visitor Information Services | Existing | ▪ Information Service Provider<br>▪ Other ISP | This includes chambers of commerce for Clearlake, Eureka, Hopland, Lakeport, Mendocino Coast/Fort Bragg, Ukiah, and Willits. Eureka Convention and Visitors Bureau, Mendocino County Convention and Visitors Bureau, Northern California Tourism, and Redwood Empire Association. |
| Green Light Admin System | Existing | ▪ Commercial Vehicle Administration<br>▪ Other CVAS | The Green Light program equips trucks with small pager-like devices called transponders. Transponders allow trucks to identify themselves while they're weighed at high speed by sensors and scales in the highway. A truck equipped with a Green Light transponder can go past an Oregon weigh station at normal cruising speed, instead of pulling off the highway and lining up to weigh at static scales. |
| HELP | Existing | ▪ Commercial Vehicle Administration<br>▪ Other CVAS | HELP (Heavy Vehicle Electronic License Plate, Inc.), is a non-profit partnership between motor carriers and government agencies (including Caltrans) whose mission is to develop and deploy advanced technology systems to create a cooperative operating and regulatory environment which improves the efficient and safe movement of commercial vehicles and the performance of highway systems. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Highway Travel Conditions Reporting System | Existing | ▪ Information Service Provider<br>▪ Other ISP | This is an ODOT-run interface in which information about road closures, construction activities and traffic incidents can be entered. The database is accessible in a variety of formats, including a Web-based format (TripCheck) and an 800-number. |
| IFTA Clearinghouse | Existing | ▪ Commercial Vehicle Administration<br>▪ Other CVAS | This is a national clearinghouse designed to allocate fuel taxes between multiple states for motor carrier activities across jurisdictional lines, in accordance with the International Fuel Tax Agreement. |
| Inter-City Transit | Existing | ▪ Other TRM<br>▪ Transit Management | This includes dispatch systems for Amtrak ThruWay Bus, Coastline Enterprises, Greyhound, North Coast Railroad and Porter Stage Lines. |
| Inter-City Transit Vehicles | Existing | ▪ Transit Vehicle Subsystem | This includes transit vehicles for Amtrak ThruWay Bus, Coastline Enterprises, Greyhound, and Porter Stage Lines. |
| IRP Clearinghouse | Existing | ▪ Commercial Vehicle Administration<br>▪ Other CVAS | This is a registration reciprocity agreement among jurisdictions in the United States and Canada which provides for payment of license fees on the basis of fleet miles operated in various jurisdictions |
| Klamath Falls-Area City Traffic Control Equip | Existing | ▪ Roadway Subsystem | This includes traffic control equipment owned and operated by the cities of Klamath Falls and Lakeview. |
| Klamath Falls-Area City Traffic Control Systems | Existing | ▪ Other TM<br>▪ Traffic Management | This includes the traffic control systems operated by the cities of Klamath Falls and Lakeview. |
| Klamath Falls-Area County Maintenance | Existing | ▪ Construction and Maintenance | This includes the maintenance systems (road maintenance, snow removal, etc.) operated in Klamath and Lake Counties. |
| Klamath Falls-Area E-911 Comm Centers | Existing | ▪ Emergency Management<br>▪ Other EM | This represents the public safety answering point for Klamath County that receives 911 calls. |
| Klamath Falls-Area EMS Provider Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes the broad range of private EMS, ambulance and air evacuation providers that serve the Klamath Falls area, including Klamath County Emergency Services. |
| Klamath Falls-Area EMS Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes the broad range of private EMS, ambulance and air evacuation vehicles that serve the Klamath Falls area, including Klamath County Emergency Services. |
| Klamath Falls-Area Fire Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes Klamath County, Lake County and Keno Rural Fire Districts. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Klamath Falls-Area Fire Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes Klamath County, Lake County and Keno Rural Fire Districts. |
| Klamath Falls-Area Fixed Route Dispatch | Existing | ▪ Other TRM<br>▪ Transit Management | This includes all fixed-route transit systems serving the greater Klamath Falls area, including Basin Transit Service Transportation District. |
| Klamath Falls-Area Fixed Route Vehicles | Existing | ▪ Transit Vehicle Subsystem | This includes transit vehicles operating on fixed-route transit systems in the greater Klamath Falls area, including Basin Transit Service Transportation District. |
| Klamath Falls-Area Paratransit Dispatch | Existing | ▪ Other TRM<br>▪ Transit Management | This includes Red Ball Stage Lines Transit Dispatch Operations. |
| Klamath Falls-Area Paratransit Vehicles | Existing | ▪ Transit Vehicle Subsystem | This includes Red Ball Stage Lines Transit. |
| Klamath Falls-Area Planning Agencies | Existing | ▪ Archived Data Management Subsystem<br>▪ Other Archives | This includes city and county planning agencies that may use data archived from ITS. |
| Klamath Falls-Area Police and Sheriff Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes the cities of Klamath Falls and Lakeview. This also includes county sheriffs' dispatch operations in Klamath County and Lake County. |
| Klamath Falls-Area Police and Sheriff Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes law enforcement vehicles for the cities of Klamath Falls and Lakeview, and for county sheriffs in Klamath and Lake Counties. |
| Klamath Falls-Area Towing/Recovery | Existing | ▪ Other EM | This includes the private tow dispatch systems that clear incidents in the Klamath Falls area. This includes numerous individual operators that serve in the region. |
| Klamath Falls-Area Traveler Information Resources | Existing | ▪ Yellow Pages Service Providers | This includes Collier State Park, Crater Lake National Park, Klamath Falls Parks & Recreation, Kla-Mo-Ya Casino, Lava Beds National Monument, Running Y Ranch, and Winema National Forest. It also includes area hotels, restaurants, gas stations, shopping, etc. |
| Klamath Falls-Area TV, Radio Stations and Newspapers | Existing | ▪ Media | Local media that includes traveler information with entertainment, general news and other topical information. In contrast to other traveler information inventory items, this entry represents the analog TV, radio and print media intended for human, rather than system, processing and interpretation. |
| Klamath Falls-Area Visitor Information Services | Existing | ▪ Information Service Provider<br>▪ Other ISP | This includes Klamath County Department of Tourism, Klamath Falls Chamber of Commerce, and Lakeview Chamber of Commerce. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Mayday Service Provider | Existing | ▪ Emergency Management<br>▪ Other EM | Service centers that provide Mayday and other special concierge services for their clients. These centers will typically be outside the COATS region, but will interact with local agencies when their client's have an emergency in the region. Current examples of this system include the service centers operated by GM (OnStar), ATX Technologies (Ford and others), and AAA. |
| MCMIS | Existing | ▪ Commercial Vehicle Administration<br>▪ Other CVAS | MCMIS contains information on the safety fitness of commercial motor carriers and hazardous material shippers subject to the Federal Motor Carrier Safety Regulations and the Hazardous Materials Regulations. This information is available to the general public through the MCMIS Data Dissemination Program. |
| Medford-Area City Traffic Control Equip | Existing | ▪ Roadway Subsystem | This includes field equipment for the cities of Ashland, Central Point, Grants Pass, Medford, Roseburg, and Winston. |
| Medford-Area City Traffic Control Systems | Existing | ▪ Other TM<br>▪ Traffic Management | This includes traffic control systems for the cities of Ashland, Central Point, Grants Pass, Medford, Roseburg, and Winston that are owned and operated by the respective Public Works Departments for each city. |
| Medford-Area County Maintenance Systems | Existing | ▪ Construction and Maintenance | This includes the highway maintenance systems for Douglas County, Jackson County, and Josephine County. |
| Medford-Area E-911 Comm Centers | Existing | ▪ Emergency Management<br>▪ Other EM | This includes public safety answering points for the greater Medford area, including Douglas Co. 911 Comm Center, Jackson Co. 911 Comm Center, Josephine Co. 911 Comm Center, Myrtle Creek Comm Center, Medford Comm Center, Ashland Comm Center, and Southern Oregon Regional Communications Center. |
| Medford-Area EMS Provider Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes Douglas County Emergency Services, Jackson County Emergency Management, Josephine County Emergency Services, Mercy Flights and Pacific Flights. |
| Medford-Area EMS Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes vehicles operated by Douglas County Emergency Services, Jackson County Emergency Management, Josephine County Emergency Services, Mercy Flights and Pacific Flights. |
| Medford-Area Fire/Rescue Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes the Fire/Rescue Dispatch Operations in the Medford region including county fire districts (Douglas, Jackson, and Josephine County) and municipal fire departments (Cities of Ashland, Central Point, Grants Pass, Medford, Roseburg, Winston, and Wolf Creek). |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Medford-Area Fire/Rescue Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes the Fire/Rescue vehicles in the Medford region including those owned by county fire districts (Douglas, Jackson, and Josephine County) and municipal fire departments (Cities of Ashland, Central Point, Grants Pass, Medford, Roseburg, Winston, and Wolf Creek). |
| Medford-Area Fixed Route Dispatch | Existing | ▪ Other TRM<br>▪ Transit Management | This includes all fixed-route transit systems serving the greater Medford area, including Rogue Valley Transportation District and Roseburg Transit. |
| Medford-Area Fixed Route Vehicles | Existing | ▪ Transit Vehicle Subsystem | This includes transit vehicles operating on fixed-route transit systems in the greater Medford area, including Rogue Valley Transportation District and Roseburg Transit. |
| Medford-Area Paratransit Dispatch | Existing | ▪ Other TRM<br>▪ Transit Management | This includes private shuttle services (e.g., Airport Transit) and public services (Southern Oregon Transportation) that provide door-to-door transit services in the Medford area. |
| Medford-Area Paratransit Vehicles | Existing | ▪ Transit Vehicle Subsystem | This includes private shuttle services (e.g., Airport Transit) and public services (Southern Oregon Transportation) that provide door-to-door transit services in the Medford area. |
| Medford-Area Planning Agencies | Existing | ▪ Archived Data Management Subsystem<br>▪ Other Archives | This includes various city and county planning agencies that may have use for archived data, including but not limited to the Rogue Valley Council of Governments. |
| Medford-Area Police and Sheriff Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes the local police department dispatch systems operating in the cities of Ashland, Central Point, Grants Pass, Medford, Roseburg, and Winston. This also includes county sheriffs for Jackson and Josephine Counties. |
| Medford-Area Police and Sheriff Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes law enforcement vehicles serving the cities of Ashland, Central Point, Grants Pass, Medford, Roseburg, and Winston. This also includes county sheriff vehicles for Jackson and Josephine Counties. |
| Medford-Area Towing/Recovery | Existing | ▪ Other EM | This includes the private tow dispatch systems that clear incidents in the Medford area. This includes numerous individual operators that serve in the region. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Medford-Area Traveler Information Resources | Existing | ▪ Yellow Pages Service Providers | This includes the State Parks and Recreation Department, parks and recreation departments for Douglas County, Jackson County, and Josephine County, the City Parks and Recreation areas for the cities in the region (Ashland, Central Point, Grants Pass, Medford, Roseburg, and Winston), Oregon Caves National Monument, Shakespeare Festival, Britt Festival, and Seven Feathers Casino. It also includes area hotels, restaurants, gas stations, shopping, etc. |
| Medford-Area TV and Radio Stations | Existing | ▪ Media | Local media that includes traveler information with entertainment, general news and other topical information. In contrast to other traveler information inventory items, this entry represents the analog TV, radio and print media intended for human, rather than system, processing and interpretation. |
| Medford-Area Visitor Centers | Existing | ▪ Information Service Provider<br>▪ Other ISP | This includes visitor centers in Medford and Ashland. |
| Medford-Area Visitor Information Services | Existing | ▪ Information Service Provider<br>▪ Other ISP | This includes the systems operated by Oregon Tourism Commission, Chambers of Commerce and other organizations that provide tourist information for the local region. |
| Motor Carrier Dispatch and Back Office Systems | Existing | ▪ Fleet and Freight Management | These provide the capability for commercial drivers and dispatchers to receive real-time routing information and access databases containing vehicle and cargo locations as well as carrier, vehicle, cargo, and driver information. |
| ODOT Bend TOC | Existing | ▪ Other TM | This center is at the periphery of the COATS region. It provides traffic control capabilities for the ODOT-operated facilities in eastern Oregon. |
| ODOT Communications Division | Existing | ▪ Media<br>▪ Public Information Office* | The Communications Division produces and/or oversees ODOT's internal and external communications, including the agency's Internet site. It has offices located in each of ODOT's five regions to provide information to local news media outlets. |
| ODOT Field Equip (Medford TOC) | Existing | ▪ Roadway Subsystem | This includes the environmental sensors, variable message signs, HAR, signals, traffic detectors, and any other field equipment and instrumentation operated by ODOT Region 3. |
| ODOT Maintenance Districts (Medford TOC) | Existing | ▪ Construction and Maintenance<br>▪ Maintenance Dispatch Office*<br>▪ Other Maintenance Dispatch Office* | Covers the resource management and dispatch systems operated by ODOT maintenance districts in Coos Bay, Roseburg, Medford and Klamath Falls. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| ODOT Maintenance Vehicles (Medford TOC) | Existing | ▪ Maintenance Vehicles*<br>▪ Other Maintenance Vehicles* | These ODOT vehicles are responsible for maintenance activities, including setting up road closures, assisting in incident removal, and performing winter maintenance. It is assumed that there is seamless communication between the vehicle and its driver, who will actually be directing and performing the maintenance activity. |
| ODOT Medford TOC | Existing | ▪ Other TM<br>▪ Traffic Management | The ODOT Transportation Operations Center in Medford plays a central role in the COATS architecture. It connects to centers in Bend and Salem and Caltrans centers in Eureka and Redding. |
| ODOT RWIS Server | Existing | ▪ Weather Service | This is a central, statewide server which collects data from each of the state's regional RWIS servers. |
| ODOT Salem TOC | Existing | ▪ Other TM | This center is at the periphery of the COATS region. It provides traffic control capabilities for the ODOT-operated facilities in the Lane, Linn and Marion Counties portion of the COATS region. |
| ODOT Statewide Planning | Existing | ▪ Archived Data Management Subsystem<br>▪ Other Archives | This includes all divisions within ODOT that will use archived data. |
| ODOT Weather Warning System | Existing | ▪ Roadway Subsystem | These are driver advisory systems which are activated based on certain meteorological conditions or thresholds (e.g. high wind, icy bridge, etc.). They process information provided by a localized weather station and provide a warning to motorists when specified conditions arise. |
| Oregon Weigh Stations | Existing | ▪ Commercial Vehicle Check | These are locations where commercial vehicles may be weighed and inspected. |
| OSP Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | The Oregon State Police operates several dispatch/communications centers in southern Oregon, all of which operate on a common computer-aided dispatch system for tracking call and response activities. These are often collocated with ODOT facilities for improved incident management, although ODOT and OSP staff will have differing roles in incident management. |
| OSP Vehicles | Existing | ▪ Emergency Vehicle Subsystem | Oregon State Police vehicles. |
| Other Weather Data | Existing | ▪ Weather Service | This terminator refers to weather information received from the National Weather Service or state agencies which also have weather-related information. This could include fully equipped weather stations, isolated stream gauges, or other similar technologies. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Redding-Area Air Districts | Existing | ▪ Emissions Management | This placeholder includes Lassen County APCD, Modoc County APCD, Northern Sierra APCD, Shasta County AQMD, Siskiyou County APCD, and Tehama County APCD |
| Redding-Area City Traffic Control Equip | Existing | ▪ Roadway Subsystem | This includes traffic equipment for the cities of Alturas, Anderson , Corning, Mount Shasta, Red Bluff, Redding, Shasta Lake, Susanville, Weed and Yreka. |
| Redding-Area City Traffic Control Systems | Existing | ▪ Other TM<br>▪ Traffic Management | This includes traffic management functions for the cities of Alturas, Anderson, Corning, Mount Shasta, Red Bluff, Redding, Shasta Lake, Susanville, Weed and Yreka. |
| Redding-Area County Maintenance Systems | Existing | ▪ Construction and Maintenance | This includes public works departments for the following counties: Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, and Trinity. |
| Redding-Area E-911 Comm Centers | Existing | ▪ Emergency Management<br>▪ Other EM | This includes public safety answering points receiving wireline 911 calls in the Redding area. |
| Redding-Area EMS Provider Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes the broad range of private EMS, ambulance, and air evacuation providers that serve the Redding area, including American Med. Response (includes North Valley Ambulance), City of Dorris, Emergency Medical Center, Mount Shasta Ambulance Service, NorCal EMS, Northern Siskiyou Ambulance Service, Shascom, and Trinity County Life Support. |
| Redding-Area EMS Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes the broad range of private EMS, ambulance, and air evacuation vehicles that serve the Redding area, including American Med. Response (includes North Valley Ambulance), City of Dorris, Emergency Medical Center, Mount Shasta Ambulance Service, NorCal EMS, Northern Siskiyou Ambulance Service, Shascom and Trinity County Life Support. |
| Redding-Area Fire Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes fire departments for the communities of Alturas, Anderson, Corning, Cottonwood, Happy Valley, Jones Valley, Mountain Gate, Mount Shasta, Red Bluff, Redding, Shasta County, Shasta, Shasta Lake City, Susanville, Weed and Yreka. This also includes other agencies that have fire/rescue jurisdiction in certain areas, including California Department of Forestry; County Health Departments (Hazmat), National Park Service, Office of Emergency Services (Hazmat), and US Forest Service. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Redding-Area Fire Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes vehicles for community fire departments in Alturas, Anderson, Corning, Cottonwood, Happy Valley, Jones Valley, Mountain Gate, Mount Shasta, Red Bluff, Redding, Shasta County, Shasta, Shasta Lake City, Susanville, Weed and Yreka. This also includes vehicles from other agencies that have fire/rescue jurisdiction in certain areas, including California Department of Forestry; County Health Departments (Hazmat), National Park Service, Office of Emergency Services (Hazmat), and US Forest Service. |
| Redding-Area Fixed Route Dispatch | Existing | ▪ Other TRM<br>▪ Transit Management | This includes the following transit systems: Lassen Rural Bus, serving Lassen County; Modoc Sage Stage; Redding Area Bus Authority (RABA) serving Redding and the surrounding communities; Siskiyou County Transit (the Stage) serving the Yreka area; Tehama Area Rural Express (TRAX) serving the Red Bluff area; and Trinity County Transit. |
| Redding-Area Fixed Route Vehicles | Existing | ▪ Transit Vehicle Subsystem | This includes vehicles operating on the following transit systems: Lassen Rural Bus, serving Lassen County; Modoc Sage Stage; Redding Area Bus Authority (RABA) serving Redding and the surrounding communities; Siskiyou County Transit (the Stage) serving the Yreka area; Tehama Area Rural Express (TRAX) serving the Red Bluff area; and Trinity County Transit. |
| Redding-Area Municipal Planning Agencies | Existing | ▪ Archived Data Management Subsystem<br>▪ Other Archives | These data collection and analysis system(s) provide planning data for cities and towns in Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama and Trinity Counties. |
| Redding-Area Paratransit Dispatch | Existing | ▪ Other TRM<br>▪ Transit Management | This includes California Association for Coordinated Transit, DART, Lassen Rural Bus, Modoc Senior Citizens/Meals on Wheels |
| Redding-Area Paratransit Vehicles | Existing | ▪ Transit Vehicle Subsystem | This includes California Association for Coordinated Transit, DART, Lassen Rural Bus, Modoc Senior Citizens/Meals on Wheels |
| Redding-Area Police and Sheriff Dispatch | Existing | ▪ Emergency Management<br>▪ Other EM | This includes the cities of Alturas, Anderson, Corning, Lake Shastina, Mount Shasta, Red Bluff, Redding, Susanville, Weed, and Yreka. This also includes county sheriffs for Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, and Trinity Counties. |
| Redding-Area Police and Sheriff Vehicles | Existing | ▪ Emergency Vehicle Subsystem | This includes the vehicles for the cities of Alturas, Anderson, Corning, Lake Shastina, Mount Shasta, Red Bluff, Redding, Susanville, Weed and Yreka; and for the county sheriffs for Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, and Trinity Counties. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| **Element Name** | **Status** | **National Architecture Mapping** | **Description** |
|---|---|---|---|
| Redding-Area Regional Transportation Planning Agencies | Existing | ▪ Archived Data Management Subsystem<br>▪ Other Archives | This includes county agencies responsible for transportation planning in the Redding vicinity. This includes the Lassen County Transportation Commission (TC), Modoc County Local Transportation Commission (LTC), Plumas County TC, Shasta County RTPA (also a MPO), Siskiyou County TC, Tehama County TC, and Trinity County TC. |
| Redding-Area Towing/Recovery | Existing | ▪ Other EM | This includes the private tow dispatch systems that clear incidents in the Redding area. This includes numerous individual operators that serve in the region. |
| Redding-Area Traveler Information Resources | Existing | ▪ Yellow Pages Service Providers | This includes Ashland (OR) Shakespeare Festival, BLM-Alturas Resource Area, Castle Crags State Park, Klamath National Forest, Lassen National Forest, Lassen Volcanic National Park, Lavabeds National Monument, Modoc National Forest, Mt. Shasta Ranger Station, Mt. Shasta Ski Park, Redding Recreation Department, Shasta-Trinity National Forest, Turtle Bay Park/ Museum, U.S. Forest Service, Whiskeytown National Recreational Area. It also includes area hotels, restaurants, gas stations, shopping, etc. |
| Redding-Area Traveler Information Systems | Planned | ▪ Information Service Provider<br>▪ Other ISP | These systems collect traveler information from operational sources (e.g., local traffic and public safety agencies/systems), visitor information systems (e.g. chambers of commerce), and local travel destinations (e.g., Parks). This information is then made available to travelers through both broadcast and interactive digital information services through the Internet and other media. |
| Redding-Area TV and Radio Stations | Existing | ▪ Media | Local media that includes traveler information with entertainment, general news and other topical information. In contrast to other traveler information inventory items, this entry represents the analog TV, radio and print media intended for human, rather than system, processing and interpretation. |
| Redding-Area Visitor Information Services | Existing | ▪ Information Service Provider<br>▪ Other ISP | This includes chambers of commerce in Alturas, Dunsmuir, Redding, Trinity County, Weaverville and Yreka. It also includes Northern California Tourism , Redding Convention and Visitors Bureau, Shasta Cascade Wonderland Association, and Siskiyou County Tourism. |
| SAFER | Existing | ▪ Commercial Vehicle Administration<br>▪ Other CVAS | SAFER provides carrier, vehicle, and driver safety and credential information to fixed and mobile roadside inspection stations. This information will allow the roadside inspector to select vehicles and/or drivers for inspection based on the number of prior carrier inspections, as well as carrier, vehicle, and driver safety and credential historical information. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| SOVA Kiosks | Existing | ▪ Remote Traveler Support | These kiosks will be upgraded to be Web-based with potential access to TripCheck and other traveler information services in the Southern Oregon region. |
| Transit Users | Existing | ▪ Transit User | This terminator represents the human entities using Public Transit vehicles. They may be in the act of embarking or debarking the vehicles and are thus sensed for the purpose of determining passenger loading and fares, or on the vehicles and able to request and receive information. |
| Traveler Information Devices | Planned | ▪ Personal Information Access | These are personal devices which may be used to access real-time transportation information. |
| Travelers | Existing | ▪ Traveler | This terminator represents any individual (human) who uses transportation services. At the time that data is passed to or from the terminator the individual is neither a driver, pedestrian, or transit user. This means that the data provided is that for pre-trip planning or multi-modal personal guidance and includes their requests for assistance in an emergency. Subsequent to receipt of pre-trip information, a Traveler may become a vehicle driver, passenger, transit user, or pedestrian. |
| TripCheck | Existing | ▪ Information Service Provider<br>▪ Other ISP<br>▪ Personal Information Access | TripCheck is the latest version of ODOT's travel information Internet Web site. Its goal is to provide the best travel information possible in a way that is easy to access. Tripcheck uses maps extensively, providing users with a convenient interface and a fast way to navigate the site. It includes roadway incident maps, camera images, RWIS information, and other features. |
| Vehicle Information Systems | Existing | ▪ Other Vehicle<br>▪ Vehicle | These are devices installed in passenger vehicles that support access to digital traveler information. A wide range of evolving technologies are available. |
| Vehicle Mayday Systems | Existing | ▪ Other Vehicle<br>▪ Vehicle | These are devices installed in passenger vehicles that provide Mayday services to the vehicle occupants. In many cases, these systems are integrated with Vehicle Information Systems (see related Inventory entry). |
| Vehicles | Existing | ▪ Basic Vehicle | This terminator represents the basic vehicle platform that interfaces with and hosts ITS electronics. The Basic Vehicle terminator provides an interface to drive train, driver convenience and entertainment systems, and other non-ITS electronics on-board the vehicle. This interface allows general vehicle systems (e.g., the stereo speaker system) to be shared by ITS and non-ITS systems. It also allows monitoring and control of the vehicle platform for advanced vehicle control system applications. |

**Table B-1:** Inventory of Stakeholders and Systems (cont.).

| Element Name | Status | National Architecture Mapping | Description |
|---|---|---|---|
| Virtual Transit Mall | Planned | ▪ Information Service Provider<br>▪ Other ISP | This is a Web-based service that will coordinate Oregon's 200-plus transit providers in order to offer: greater access to transit information, statewide trip planning, improved connections between providers, and enhanced transit planning data. |

* – Extension to National Architecture

# APPENDIX C: COATS REGIONAL ARCHITECTURE INTERCONNECT DEFINITIONS

**Table C-1:** COATS Regional Architecture Interconnect Definitions.

| Interconnect | Definition |
|---|---|
| **Commercial Wireline/Wireless Networks** | This interconnect represents the communications channels that connect information providers in the COATS region with their customers. A variety of commercial wireline and wireless communications systems can provide these connections today; on-going technical innovation in this dynamic, market-driven area suggest that new communications options will be offered in the future. Beyond accommodating the information services and delivery mechanisms that develop as marketable products for the region and a general endorsement of those services that are supported by open standards, the regional architecture is not prescriptive for this interconnect since it is strongly influenced by larger market forces. The objective is not to constrain the number of systems that are deployed in the region, but to encourage private sector participation by making public domain information available to information service providers and developing clear policies that encourage broad participation in the region.<br><br>Wireline communications systems that are available in the COATS region include the traditional circuit-switched telephone system (analog today with increasing numbers of higher-speed digital options for the consumer in the future) and cable systems in the larger cities. Perhaps the most relevant wireless media for the region are FM subcarrier and cellular communications in the near term and satellite communications when increasing competition makes this option more affordable. |
| **DSRC** | Dedicated Short Range Communications (DSRC) is a short-range airlink used for close-proximity (less than 50-100 feet) transmissions between a mobile user and a base station. This type of interconnect has many applications in ITS wherever location-specific communication with a vehicle is required. The applications for DSRC that are envisioned in the COATS region are initially limited to mainline screening of commercial vehicles at weigh stations. As depicted, the same communications technologies could also be applied to make parking and other traveler/user fee collections more convenient and efficient in the future.<br><br>The regional architecture suggests that the emerging ITS standards for these interconnects be adopted and applied in the region. |
| **Wide-Area Wireless – Trunked/Dedicated Radio Systems** | This wireless infrastructure includes the 800 MHz radio systems, specialized mobile radio systems, and other wide-area wireless infrastructure that enables vehicle fleet communications for public safety, maintenance, commercial vehicle, and transit fleets in the region. While primarily viewed as voice communications systems today, data applications will increasingly be supported by these systems in the future.<br><br>The regional architecture suggests use of industry standards for these communications where they are available. Emerging Transit Communications Interface Protocol (TCIP) standards should be reviewed for use in the transit fleet communications deployments. Although ITS standards work has not yet been initiated for emergency vehicle fleets, interagency agreements and implementations may be considered to facilitate incident command systems and resource sharing for large incidents which require the involvement of many agencies in the COATS region. |

**Table C-1:** COATS Regional Architecture Interconnect Definitions (cont.).

| Interconnect | Definition |
|---|---|
| **Wireline/Wide-Area Wireless** | Often, wireline communications infrastructure is simply not available at likely deployment locations for roadside ITS infrastructure like variable message signs, highway advisory radio, and environmental sensor stations. The cost-effective alternative for relatively low-bandwidth applications is to use wireless communications to support this field equipment. This interconnect represents the radio systems and cellular infrastructure that will cost-effectively support limited bandwidth communications with remote field equipment. |
| **Wireline Communications (A)** | Safety-critical incident management communications between public safety, transportation, and other allied agencies is supported by this access-restricted network. Since regional agencies rely on this interconnect to coordinate incident management, this communications system should be reliable, secure, and offer deterministic performance. The regional architecture uses bridge systems like the Highway Travel Conditions Reporting System (HTCRS), the California Highway Information Network (CHIN), and successor highway conditions reporting systems to shield this network from direct traveler information requests and serve as a filter that preserves privacy and security of the communications on the network. Wireless as well as traditional wireline communications links will be used for this interconnect, in order to support communications with command posts, staging areas, and other remote command centers that may be established for larger incidents under unified command systems.<br><br>The Institute of Electrical and Electronics Engineers (IEEE) Incident Management Message Sets, Institute of Transportation Engineers (ITE) Traffic Management Data Dictionary and External TMC Communications standards are among the key standards that apply to this interconnect that are recommended by the regional architecture. |
| **Wireline Communications (B)** | This wireline infrastructure makes current transportation information available to information service providers and other stakeholders who desire real-time transportation information, but do not have the direct operations role that would give them access to Wireline Communications (A). While adequate performance and reliability that is scalable to meet future needs is important here, it is less imperative than with Wireline Communications (A). Only data that has been cleansed to support data privacy principles is made available on this network. In the regional architecture, a service like ODOT’s TripCheck is a key source for this traveler information that has been sanitized from the operations version of the same information where necessary. In addition to incident data and other real-time information, this interconnect also makes available more static visitor and traveler information as a resource to information service providers in the region.<br><br>This interface can be implemented using one or more of the many alternative existing public or private networks that may physically include wireless (e.g. microwave) as well as wireline infrastructure.<br><br>This interconnect is supported primarily by the Society of Automotive Engineers (SAE) Advanced Traveler Information Systems (ATIS) Data Dictionary and Message Set standards. |

**Table C-1:** COATS Regional Architecture Interconnect Definitions (cont.).

| Interconnect | Definition |
|---|---|
| **Wireline Communications (C)** | This wireline infrastructure connects centers with distributed field equipment that is monitored and controlled by the center. Since this interface enables the monitoring and control of field equipment, access to this interface must be restricted to those authorized to control the field equipment. In the COATS region, this interconnect allows the remote monitoring and control of roadside devices including variable message signs, highway advisory radio, closed-circuit television (CCTV) cameras, etc. The same class of communications interconnect integrates commercial vehicle administration centers with weigh stations.<br><br>This interface can be implemented using any of the alternative existing public or private networks that may physically include wireless (e.g. microwave) as well as wireline infrastructure. Where relatively inexpensive low-bandwidth wireless communications alternatives are an option, the regional architecture explicitly shows a connection from “Wireline Communications (C)” to “Wireline/Wide Area Wireless.” This reflects the likely scenario where wireline communications is used to carry message traffic between the center and the transceiver that often is remotely located to achieve the best line of sight and coverage.<br><br>The National Transportation Communications for ITS Protocol (NTCIP) standards activities have already published a number of standards that address the interface to traffic management field equipment. The regional architecture suggests that these standards be used for future implementations in the region to avoid proprietary alternatives and ultimately achieve economies of scale by using standards in the region that will be broadly adopted across the United States. |
| **Wireline Communications (D)** | This wireline infrastructure connects the fleet dispatcher operating at a fixed point with the trunked and/or dedicated radio systems that provide the wireless connection to the vehicle fleet. This may represent a fairly short run to a building-top antenna or more extensive use of public or private wireline networks for access to remotely located transceivers or trunked radio services. The regional architecture levies no specific requirements for these “dispatcher to antenna” links. |

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## APPENDIX D: COATS INFRASTRUCTURE ELEMENTS

Many different technological solutions were identified as potentially capable of addressing the transportation needs and challenges of the COATS study area. The following table lists each technology that was so identified. For each technology, the following information is provided:

- a description of the technology;
- potential objectives associated with the technology; and
- potential locations where the technology may be most effectively deployed.

**Table D-1:** Descriptions of Traveler Safety and Security Technologies.

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Advance Warning Systems for Narrow Lane Widths | In various locations within the study area, stakeholders have identified narrow lane widths, limited buffer distance from obstacles (e.g. canyon walls) and limited sight distance. These characteristics cause greater concern to commercial vehicles and recreational vehicles because of their width. The system would identify the vehicle type and speed through weigh-in-motion, and provide upstream warning to other travelers through a flashing beacon. | • Reduce side-swipe or head-on accidents and speed in areas where narrow lanes have been identified<br>• Provide advance warning of conditions for classes of vehicles | • Areas meeting narrow shoulder/clear zone related safety performance criteria |
| Advanced Bicycle/Pedestrian Warning | An Advanced Bicycle/ Pedestrian Warning Systems would consist of a push-button actuated system that would communicate with a dynamic flashing beacon above a fixed sign which reads “BICYCLES (or PEDESTRIANS ON HIGHWAY”. The sign would be located upstream of where the bicycle/ pedestrian is crossing and automatically shut-off after a period of time. | • Provide advance warning to motorist<br>• Increase safety and reduce exposure of crossing bicycle/ pedestrian | • Areas meeting bicycle/pedestrian related safety performance criteria |
| Advisory Television | Local and cable television channels can be used to communicate valuable road condition, weather, and traffic information to a large audience using regional interest and transportation-related programming during emergencies. These channels can also be used to disseminate tourist-related information. The emergency message would be transmitted using FM side-band and shown on the bottom of the television screen. | • Provide pre-trip information to travelers<br>• Provide weather and roadway information<br>• Provide incident and construction information | • Existing locations with cable television availability<br>• Hotels and motels that subscribe to programming<br>• Areas meeting road closure performance criteria |

**Table D-1:** Descriptions of Traveler Safety and Security Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Animal/Vehicle Collision Warning System | Animal/vehicle collision warning systems help to alert the driver of animal presence in the right-of-way, decreasing the driver's chance of animal/vehicle conflict. Systems will use an advanced technology to replicate an electronic fence that detects animal encroachments in areas of high migration routes and transmits signal to upstream dynamic signal/ signing. There are also on-board systems available that detect other objects, such as vehicles, in the roadway and alert the motorist. | • Provide for increased safety in areas with known animal/vehicle collisions<br>• Reduce animal/vehicle conflicts | • Areas with existing high animal migration patterns<br>• Areas meeting animal collision related safety performance criteria |
| Automated Anti-Icing Dispenser for Roads and Bridges | An automated anti-icing dispenser is linked to a road surface sensor, which uses an algorithm dependent on the road surface temperature to automatically dispense anti-icing chemicals on the road or bridge. Another means of deicing bridges without the use of chemicals is to install bridge heaters that are automatically activated based on the same algorithm. These systems can also be used to automatically alert maintenance personnel for more prompt mitigation. | • Increase the efficiency of ice mitigation on roads and bridges<br>• Improve safety<br>• Minimize waste of anti-icing materials<br>• | • Roads and bridges subject to regular icing<br>• Areas meeting speed and slippery surface related safety performance criteria |
| Automated Flood Warning | Automated flood warning is a solar powered, cellular communication system to notify both maintenance personnel and motorists of "water on roadway" conditions. The system would be composed of a sensor connected to a cellular signal with a prerecorded message to notify maintenance crews when the water on the road reaches a significant level. Motorists would be notified by use of a warning sign with beacons triggered by the same sensor. | • Notify travelers of potentially adverse road conditions<br>• Notify maintenance crews of water levels on roadways in a more timely manner | • Routes not frequently surveyed by maintenance crews that are susceptible to high water levels<br>• Areas meeting flood related road closure performance criteria |

**Table D-1:** Descriptions of Traveler Safety and Security Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Automated Visibility Warning | The automated visibility warning system would be composed of sensor, communication, and warning systems (flashing beacon mounted with static sign). | • Regulate the number of travelers on dangerous roads<br>• Increase awareness during poor visibility incidents to travelers, enforcement and road maintenance crews | • Roadways currently requiring manpowered observation to warn motorists and close roads<br>• Areas meeting visibility related safety performance criteria |
| Automated Wind Advisory | The automated wind advisory system would be composed of sensor, communication, and warning systems. | • Increase awareness of drivers with tall-profile vehicles of high-wind conditions | • Areas prone to frequent high-wind conditions<br>• Roadways currently requiring manpowered observation to warn motorists |
| Driver Impairment Detection and Warning | Driver impairment and detection warning systems consist of a vehicle-based system that detects driver inattentiveness, an electronic device that monitors driving patterns and an alert system. The inattentive driver is alerted with an audible warning signal. | • To prevent accidents caused by driver fatigue<br>• Improve safety | • Areas meeting the drowsy driver related safety performance criteria |
| Dynamic Warning Variable Message Signing | Dynamic signing provides real-time, warning of potentially hazardous road conditions. Integration of these signs with environmental sensors, and vehicle speed and weight sensors can help to alert the driver to potentially hazardous situations and make recommendations regarding safe speed, etc. | • To provide safe travel speed advisory for given geometric and road conditions (e.g. steep downgrades, curves, entrance and exit ramps, etc.)<br>• Use of roadway sensors to collect vehicle characteristics (i.e. weight, type, speed, height) and road surface | • Roadway segments which experience accidents associated with speed too fast for conditions<br>• Roadway segments that have horizontal and vertical alignment challenges<br>• Areas with frequent ice build-up on roadway<br>• Areas with poor visibility due to fog, etc. |

**Table D-1:** Descriptions of Traveler Safety and Security Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Highway Advisory Radio | Highway Advisory Radio (HAR) transmits valuable information to travelers through localized radio broadcasts that contain traffic information, road conditions, chain requirements, road closures, etc. Transmission is through low-powered AM or FM broadcasts. | • Provide tourist information and services (e.g. National and State Park information)<br>• Provide real-time weather and roadway information<br>• Supplement Variable Message Signs<br>• Suggest alternative routes and modes<br>• Notify travelers of maintenance and construction activities, and incident locations<br>• Notify travelers of potentially adverse weather conditions, road closures and chain requirements | • In conjunction with existing Variable Message Signs<br>• In conjunction with work zone and travel time/delay advisory systems<br>• Near major highway interchanges and junctions<br>• Near rest areas<br>• Areas meeting road closure performance criteria<br>• Areas meeting tourism performance criteria |
| Intersection Advance Warning Signing | Intersection advance warning detects the presence and speed of vehicles approaching an intersection from a minor roadway and warns the traveler on the major roadway approach of a potential conflict through dynamic signing. This may be used in areas where speed zones decrease more than 20 mph or where rural conditions change to urban development. | • Provide advance information to travelers of approaching intersections<br>• Monitor location and speed of vehicles approaching intersection and provides dynamic warning when potential conflict exists | • Areas where there is a 20 mile/hour decrease in speed<br>• Rural conditions change to urban<br>• Areas meeting intersection conflict related safety performance criteria |

**Table D-1:** Descriptions of Traveler Safety and Security Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Lateral Safety Warning | A lateral safety warning system senses the center of the lane and provides either driver assistance or control to keep the vehicle in the center of the lane. The in-vehicle system would track the vehicle's lateral position, and warn the driver if they are leaving the travel lane, thus increasing the chances that the driver will be able to make an appropriate correction. Communication with highway infrastructure may be required, such as accurate lane markers, imbedded magnetic nails or radar-reflective pavement marking stripes. | • To give warning when vehicle leaves the travel lane<br>• Reduce the number of single vehicle "run off the road" accidents<br>• Reduce infrastructure damage to barrier rail and other roadside devices | • In conjunction with existing vehicle fleets (i.e. rental cars, snow plows, emergency service fleets, DOT vehicles, rural transit)<br>• Areas meeting narrow shoulder/clear zone related safety performance criteria |
| Motorist-Aide Call Boxes | Motorist-aide call boxes provide transportation users with the ability to call for roadside assistance. Each call box location gives the motorists pertinent information, such as a call box telephone number, identification number, post-mile, county and highway information to help motorists identify their exact locations. | • Reduce emergency notification times<br>• Reduce traveler/pedestrian exposure to potentially hazardous situation<br>• Reduce traffic congestion created by a disabled vehicle | • Segments of roadways with minimal services between communities<br>• Areas with limited cellular phone coverage<br>• Areas meeting notification time related emergency service performance criteria |
| Slide Detection System | This system provides automated detection and warning of landslide activity. Each system would include sensors to detect movement in rock formations adjacent to roadways, signs to warn approaching motorists, and communications capabilities to alert maintenance staff. | • Reduce response time to clear landslides<br>• Reduce delay caused by slides<br>• Reduce exposure of traveling public to potential slides | • Areas prone to road closures due to slide activity |

**Table D-1:** Descriptions of Traveler Safety and Security Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Variable Message Sign (referred to as Changeable Message Signs by Caltrans) | Variable Message Signs (VMS) enable the communication of real-time traffic information by displaying a variety of messages. The advisories can be related to traffic incidents, current and forecasted weather conditions, road conditions, and construction activities. VMS may also be able to give tourist information. | • Supplement Highway Advisory Radios<br>• Provide current roadway conditions<br>• Suggest alternative routes and modes<br>• Notify travelers of maintenance and construction activities, and incident locations<br>• Notify travelers of potentially adverse weather conditions, road closures and chain requirements | • In conjunction with existing Highway Advisory Radio<br>• Major/critical highway and freeway route decision points<br>• Areas meeting safety and road closure performance criteria<br>• Areas meeting tourism performance criteria |

**Table D-2:** Descriptions of Emergency Services Technologies.

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Mayday Systems | The Mayday system allows the user to initiate a request for emergency assistance from the vehicle. The request may be either manually or automatically initiated. A simple after-market device in the vehicle or cellular telephone with Global Positioning System (GPS)/Automatic Vehicle Location (AVL) would enable the traveler to access this service. This system requires vehicle location/tracking technology and wireless communications (e.g. cellular, satellite, microwave) to geographically locate and display vehicle at response center. | • Allow stranded motorist or motorists requiring aid to notify emergency managers of needed service (tow truck, medical assistance, police, etc.)<br>• Reduce notification time<br>• Reduce response time by providing more accurate location information to emergency response teams | • Vehicle fleets that commonly travel areas where good or excellent cellular communications coverage exists<br>• Areas meeting notification and response time related emergency service performance criteria |
| Regional Incident Management Plan | Development of a regional incident management plan to assist with detection, and verification, incident response, removal/mitigation, traffic handling and coordination of information dissemination between transportation, tourism, law enforcement and emergency management personnel. The plan will help transportation and management officials to make sound decisions regarding coordination of mitigation measures, resources and release/control of public information. There is no infrastructure associated with this system. | • Develop a set of predefined actions, roles, responsibilities that will assist with incident management activities and provide for coordination with other agencies<br>• Increase coordination in responding to incidents and road closures<br>• Improve incident response time<br>• Provide real-time information to travelers | • Area-wide<br>• Areas meeting road closure performance criteria |

**Table D-2:** Descriptions of Emergency Services Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Rural Coordinate Addressing System | This system will help locate rural residences and businesses through standardized addressing incorporated through location technologies such as a Global Positioning System (GPS). This system uses information from a truncated plane coordinate system and GPS as input into a Geographical Information System (GIS) to produce maps with accuracy of approximately 100 feet. In areas where rural addresses do not provide sufficiently detailed information as to its location, the rural coordinate addressing system can provide this detail to aid emergency response personnel in locating the incident and assist rural transit providers in locating the customers. This system would reduce response times for both emergency situations and service providers. | • Improve emergency services, transit services, and other service providers to more efficiently locate rural destinations<br>• Provide the ability to better geo-locate 911 telephone calls<br>• Add value to other industries such as delivery services, telephone companies, etc. | • Areas that are deemed necessary by enforcement and emergency management officials<br>• Areas meeting notification and response time related emergency service performance criteria |
| Traffic Signal Priority for Emergency Vehicles | Traffic signal preemption for emergency vehicles involves prompting a traffic signal to change so emergency vehicles have safe passage through intersections. Emergency vehicles may be retrofitted with preemption systems to gain control of signals at intersections where delays are frequent or where there are frequent traffic conflicts between emergency vehicles and other vehicles. | • To reduce the probability of accidents during emergency response<br>• To reduce the response times of emergency vehicles to incidents<br>• To further ensure the safety of the general public in emergency situations | • Signalized intersections where there are frequent emergency response traffic delays<br>• Signalized intersections near emergency vehicle stations<br>• Area-wide |

**Table D-3:** Descriptions of Tourism and Traveler Information Technologies.

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| 1-800 Travel Advisory Telephone Hotline | The 1-800 Travel Advisory Telephone Hotline will provide roadside information to travelers regarding current road conditions, travel advisories, and tourist information/services or enhance existing 1-800 travel advisory services. Travel advisory hotlines will be supported through shared resources and a common management center. If supported by state and local enforcement communities, a single number will be used throughout the State and is supported by signing and marketing. | • Provide real-time information on road and weather conditions<br>• Provide information regarding major tourist attractions<br>• Suggest alternative routes and modes<br>• Notify travelers of maintenance and construction activities, and incident locations<br>• Notify travelers of potentially adverse weather conditions, road closures and chain requirements | • Area-wide<br>• Areas where sufficient cellular communications coverage exists<br>• In conjunction with variable message signs<br>• Areas meeting slide and flood related road closure performance criteria<br>• Areas meeting tourism performance criteria |
| Internet | The Internet is a rapidly growing user-supported source for all types of information. However, its success is dependent on the quality and accuracy of information presented and possible even more important the “linking” of website to create synergistic benefits. The focus of this project is to provide the linking of existing and planned websites to provide for increased use and the appearance of seamless services. Internet sites that would be a targeted for linking include sites that provide for access information such as transit, weather conditions, hotel vacancy, admission prices, and other tourist information. | • Provide travelers with pre-trip information, such as road and weather conditions, tourist information, etc.<br>• Provide access to home pages of public sector agencies (transit agencies, State DOT, Department of Commerce/tourism, local Chambers of Commerce, National Parks, etc,) and private tourist businesses. | • Area-wide |

**Table D-3:** Descriptions of Tourism and Traveler Information Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
| --- | --- | --- | --- |
| In-vehicle Route Guidance Systems | In-vehicle route guidance relies on in-vehicle sensors, location determination equipment, a computational map database, and an interactive driver interface to enable route planning and detailed route guidance based on stored information. This system is offered commercially in some automobiles such as Cadillac, Ford and GMC. | • Provide real-time traveler information, services and route guidance | • Existing rental car vehicle fleets<br>• Areas meeting road closure performance criteria<br>• Areas meeting tourism performance criteria<br>• Near airports |
| Touch Screen Interactive Kiosk | Interactive kiosks can provide users with real-time information via databases and touch-screen monitors. Kiosks allow the user to tailor the information presented to their needs and interests such as regional tourist attractions, available accommodations, or road conditions. Kiosks can potentially have Internet access for these types of information. | • Provide tourist information and services<br>• Provide weather and roadway information<br>• Provide incident and construction information<br>• Provide for traveler orientation<br>• Provide National Park and State Park information<br>• Promote California and Oregon commerce<br>• Provide ability for travelers to make reservations<br>• Provide for increased data collection and customer surveys | • All major rest areas, welcome centers and traveler/tourist information areas<br>• Truck stops at major ports of entry<br>• Major airports, hotels, transit and shopping centers<br>• Areas meeting tourism performance criteria |

**Table D-3:** Descriptions of Tourism and Traveler Information Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Work Zone Delay Advisory System | The work zone delay advisory system provides the travelers with an active indication of the actual delays that exist at the work zone. The simplest system is a static sign with flashers that can be activated when there are delays. The second level system uses speed sensors to determine approximate delay through the work zone and variable message signs to transmit information to the travelers. The third level system takes advantage of probe vehicle that more accurately determines delay at work zones. | • Provide traveler information<br>• Provide construction information<br>• Notify travelers of work zone delays<br>• Improve traveler approval of work zone activities | • Planned construction zones |

**Table D-4:** Descriptions of Public Traveler/Mobility Services Technologies.

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Automated Passenger Counting System | The automated passenger counting system allows for increased management of passenger counting and fare payment. The system may be used for obtaining more accurate ridership information. A database would be developed to facilitate more detailed planning to be made regarding transit needs and management. Automated passenger counting systems can be used in conjunction with the smart card system. | • To allow for the development of a more accurate database to be used for effective management of the transit services<br>• To assess the needs of the transit patrons<br>• To assess the demands that are placed on the transit system | • Areas meeting mobility performance criteria<br>• Existing city and county transit services |
| Automatic Vehicle Identification System | Automatic Vehicle Identification (AVI) can be used to allow subscribers to electronically bypass tourist attraction gates without stopping to pay fees. Subscribers would be given small transponders to place in their windshield that will be read by an antenna at the automated gate. Users could pay a one-time, annual, or pay per use fee for using this system. Initial users could include employees, concessionaires, and transit vehicles that pass these gates daily. This system could be expanded to other user groups such as annual pass holders of the destination attraction. By removing these vehicles from the queue, time savings will not only be realized by the AVI users but by other travelers passing through the gate. | • Provide time savings at related access gates for vehicles operated by transit, employees, concessionaires, and locals<br>• Manage gate congestion<br>• Provide for automated fare collection through the use of AVI<br>• Provide rewards to system users | • Participating tourist services<br>• Areas meeting tourism performance criteria |

**Table D-4:** Descriptions of Public Traveler/Mobility Services Technologies (cont.)

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Dynamic Ridesharing/Paratransit Service | Dynamic ridesharing is a dial-in service that matches drivers and riders making the same trips. The system is designed for jitney (non-fixed route) services. It will help reduce person-trips through enabling effective carpooling, and will increase mobility options for the mobility impaired. In areas where there are a greater number of transit dependent residents, this service will provide the means to improve the efficiency transit services and promote carpooling. | • Enhance transit services<br>• Promote carpooling<br>• Reduce congestion<br>• Reduce person-trips<br>• Reduce air pollution<br>• Increase mobility<br>• Provide transportation to the mobility impaired | • Areas meeting mobility performance criteria |
| On-Board Transit Safety Systems | This system provides for the physical security of transit passengers. An on-board security system is deployed to perform surveillance and warn of potentially hazardous situations. Public areas (e.g. stops, park and ride lots, stations) are also monitored. Information is communicated to the transit managers using the existing or emerging wireless or wireline infrastructure. Security related information is also transmitted to the enforcement personnel when an emergency is identified that requires an external response. Incident information is communicated to either enforcement or DOT staff. | • Increase safety of transit patrons and driver<br>• Reduce detection and response time to emergency conditions or incidents | • Transit agencies that have safety concern for patrons<br>• Existing city and county transit services |

**Table D-4:** Descriptions of Public Traveler/Mobility Services Technologies (cont.)

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Parking Management and Information System | Parking management systems are used to monitor the availability of parking use in near real-time, and inform and direct motorists to available parking through the use of variable message signs, highway advisory radio, phone service or the internet. The system cuts localized congestion due to traffic circling, seeking parking in crowded areas. The variable message signs can also be used to inform commercial vehicle operators of parking and unloading situations, inform motorist of traffic conditions ahead, or of public service or event information. This system could be expanded to commercial vehicle operations in the long term. | • Be utilized in conjunction with travel demand management alternatives in high visitation areas such as tourist destinations, special events (Shakespeare Festival), National Parks, or gateway communities<br>• Allow parking system management and operations<br>• Allow for parking availability and access control<br>• Sense and collects parking data<br>• Allow the sharing of information between traffic management subsystems and information providers | • Areas meeting tourism performance criteria |
| Recreational Vehicle Park & Ride Lots with Surveillance | Recreational vehicle, park and ride facilities will be located outside high tourist destinations and/or National Parks and provide shuttle services to the special events or other major attractions within the study area. The park and ride lots would have closed circuit television (CCTV) surveillance for security and to ensure patron satisfaction. CCTV images would be transmitted to the local enforcement agency. The CCTV installation would be the only cost to the project and not the shuttle service. Accessible existing parking lots (shopping plazas, etc.) facilities would be used where security can be provided. | • Reduce congestion to tourist destination<br>• Reduce number of heavy vehicle on the roadway<br>• Provide for increased customer satisfaction of RV market<br>• Increase number of parking spaces for RV's | • Shopping plaza (if agreeable), park and ride lots or other areas where shuttle services may be feasible<br>• Areas meeting tourism performance criteria |

**Table D-4:** Descriptions of Public Traveler/Mobility Services Technologies (cont.)

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Smart Card System | Smart cards could be issued to transit patrons and tourists for common fare medium and reward. Much like a credit card system, smart cards consist of cards carried by travelers and readers located on transit vehicles, at National Park gates, and at local stores. Smart cards allow transactions and other data to be electronically stored on the card. This data can be used by transportation officials to predict transportation needs and commonly used routes. Typically, the smart card does not require contact with the reader, and must only be in close proximity to the reader for a transaction to be made. Smart cards can also act as a congestion management tool by providing incentives, such as merchant discounts for using transit rather than personal vehicles. | • Provides for ability to store transportation and economic activity data<br>• Attract transit patrons through time savings and convenience<br>• Provide for automated fare collection<br>• Provide reward incentives for use<br>• Increase the use of transit in congested areas | • Areas meeting tourism performance related criteria |
| Transit Traveler Information | This system provides transit users at transit stops and on-board transit vehicles with ready access to transit information. The information services include transit stop annunciation, imminent arrival signs, and real-time transit schedule displays that are of general interest to transit users. | • Provide accurate and timely information to transit patrons (elderly, mobility impaired, etc.)<br>• Increase the quality of the transit trip and ultimately ridership | • Areas of inconsistent transit arrival times as identified by stakeholders |

**Table D-4:** Descriptions of Public Traveler/Mobility Services Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Transit Vehicle Routing/Scheduling Software and Vehicle Tracking | Transit vehicle tracking enables the tracking of vehicle locations, development and maintenance of deliver itineraries, and fuel usage monitoring. In-vehicle equipment allows for the measuring of distance traveled and fuel used and is coupled with map-matching techniques. This technology combined with routing and scheduling software would allow for multiple agencies to operate as one and increase the quality of service. The software technology would allow multi-service vehicle (e.g., transit and paratransit) fleets to improve operations and provide for economies of scale. If satellite technology is unavailable, beacon-based vehicle-to-roadside communication technologies can also be deployed to provide vehicle location to the fleet management center. | • Monitor on-time performance and track vehicle fleets<br>• Provide more accurate real-time information to managers and patrons<br>• Assist in routing of fleets to required services | • Areas meeting mobility performance criteria |

**Table D-5:** Descriptions of Infrastructure Operations and Maintenance Technologies.

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Advanced Vehicle Detection | Vehicle detection can be done through the use of inductive loop detectors (ILDs) installed in the roadway subsurface or more advanced detector technologies currently being developed. Vehicle detectors can provide direct measurements of traffic parameters, such as density (vehicles per mile per lane), travel time, and vehicle turning movement. These parameters can be used as inputs to area-wide surveillance and control of signalized intersections and freeways, and support of motorist information services. | • To verify incidents and response actions<br>• To assist in incident/emergency response<br>• Provide added-value to pre-trip information | • In conjunction with CCTV technologies<br>• In conjunction with Advance Warning Systems for Narrow Lane Widths technologies<br>• In conjunction with Automated Flood Warning technologies<br>• Areas meeting response time related emergency service performance criteria<br>• Areas meeting weather related road closure performance criteria |
| Automated Gate Closure System | Automated gate closure systems will enable the safe and efficient closure of highway segments that are frequently closed such as mountain passes and slide areas. Gates will be equipped with flashing warning lights when activated to provide additional warning for motorists. Bridges and roads that are especially susceptible to seismic activity or washout can be fitted with this technology to not only prevent vehicles from crossing the bridge but will alert maintenance personnel to inspect the bridge. This technology can also be coupled with the Internet, kiosks, HAR and variable message signs to provide real-time information to travelers. | • Provide enforcement and DOT's the ability to automatically close<br>• Alert maintenance personnel for inspection purposes | • Near mountain passes<br>• Seismically active areas<br>• Areas meeting speed & slippery surface and visibility related safety performance criteria<br>• Areas meeting slide, flood and weather related road closure performance criteria |

**Table D-5:** Descriptions of Infrastructure Operations and Maintenance Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Closed-Circuit Television Camera | Closed-Circuit Television (CCTV) cameras allow remote verification of road and weather conditions, traffic conditions and incidents. The quality of the camera will determine the compatibility with other communication technologies, such as, cable TV, kiosks, and the Internet. Because response times to incidents in rural areas are often times long, CCTV would give emergency management personnel the opportunity to dispatch a more suitable emergency vehicle, based on a particular incident. It would also give emergency personnel the ability to verify the occurrence of an incident. | • To verify incidents and response actions<br>• To assist in incident/emergency response<br>• To assist in adjoining state response coordination<br>• Monitor and verify road and weather conditions<br>• Provide added-value to pre-trip information | • In conjunction with RWIS technologies<br>• In conjunction with VMS technologies<br>• In conjunction with HAR technologies<br>• Areas meeting response time related emergency service performance criteria<br>• Areas meeting weather related road closure performance criteria<br>• Areas meeting safety performance criteria |
| Regional Server/Coordination Software | This system could build upon existing hardware, connections and software to develop an integrated method for sharing information and management responsibilities for incidents among the various agencies and departments involved. The Highway Closure Information System in Arizona, for example, tracks each incident on the highway system in a user-friendly format using GIS. These incidents can include inclement weather, road closures, construction and maintenance activities, and major events such as a state fair. These incidents are entered and updated by persons from several agencies who are given authority to do so. This improves the accuracy and timeliness of the road conditions information available to both decision-making agencies and the traveling public. | • Increase coordination and data sharing between departments and agencies<br>• Provide ability to coordinate and disseminate real-time transportation information<br>• Provide central point for response coordination | • Provide central point for response coordination |

**Table D-5:** Descriptions of Infrastructure Operations and Maintenance Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Road Weather Information Systems | Road Weather Information Systems (RWIS) collect pavement temperature, visibility, wind speed and direction, and precipitation data. This information is then presented in a useable format to transportation system operators, and potentially the traveling public. | • Provide weather updates pertaining to state roadways<br>• Increase the effectiveness of chemical and mechanical de-icing<br>• Provide input to pre-trip information advisories<br>• Used to activate snow and ice control | • Areas meeting speed & slippery surface and visibility related safety performance criteria<br>• Areas meeting slide, flood and weather related road closure performance criteria<br>• Areas frequently subject to winter chains requirements |
| Satellite Traffic Operations Center (referred to as Advanced Rural Technology Integration Centers [ARTIC] by Caltrans, and Transportation Operations Centers by ODOT) | The Satellite Traffic Operations Center (STOC) center will provide a centralized control center to effectively monitor, and manage traffic, analyze data from multiple sources, and operate other systems. The STOC will also assist with traffic and incident management coordination. | • Allow traffic managers the ability to monitor and manage traffic flows on major highways and intersections, and to identify incidents<br>• Allow traffic managers to analyze collected data and make available to private information providers and other public agencies<br>• Provide the ability to coordinate transportation decisions<br>• Increase coordination between DOT's emergency managers, enforcement staff, and tourist organization staff at state boundaries | • Facilities with 24-hour dispatch operations<br>• Cities near areas meeting notification and response time related emergency service performance criteria |

**Table D-6:** Descriptions of Fleet Operations and Maintenance Technologies.

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Automatic Vehicle Location | Automatic Vehicle Location (AVL) technology allows vehicles within a fleet to be tracked and located with the aide of a computer. This system allows more effective coordination and dispatch of vehicles within that fleet. Fleets may include emergency services, DOT maintenance forces, transit services, fire, and enforcement vehicles. | • Provide vehicle location of DOT maintenance, and highway patrol vehicles to aid in dispatching<br>• Assist in transit vehicle routing and monitoring<br>• Reduce response times to incidents | • Existing vehicle fleets where resources and needs are unbalanced<br>• Cities near areas meeting response time related emergency service performance criteria |
| Probe Vehicle Instrumentation | Instrumented probe vehicles are utilized for detecting road and weather conditions in areas where chronically bad weather conditions occur. These vehicles are typically instrumented with a Global Positioning System (GPS) so that it can be tracked and a transponder so that its location can be mapped at all times. Vehicle may be part of a public sector fleet (maintenance, enforcement, etc.) or a private sector fleet (rental vehicles, transit providers, power companies). Vehicles could transmit stored data periodically or save data and upload later. | • Increase accuracy and timeliness of traffic and weather data<br>• Minimize data collection infrastructure cost | • Areas meeting slippery surface related safety performance criteria |

**Table D-7:** Descriptions of Commercial Vehicle Operations Technologies.

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Electronic AVI Preclearance | Electronic preclearance allows approved commercial vehicles to bypass weigh and inspection stations, increasing efficiency for the carriers, and helping enforcement personnel to effectively focus enforcement and compliance activities. | • Provide automated bypass of commercial vehicles meeting selected criteria<br>• Allow Port of Entry operators to focus increased attention on non-compliant operators<br>• Provide means of automatically verifying vehicle credentials<br>• Provide means of identifying vehicles/carriers with safe driving records, which do not require safety inspections | • Near weigh stations and ports of entry |
| HAZMAT Management | Hazardous materials management (HAZMAT) focuses on providing incident response personnel with accurate information regarding hazardous materials involved in vehicle incidents. This can be accomplished by maintaining an updated national or regional database of current hazardous material shipments. Emergency management centers or dispatchers could be able to access this database when an incident involving hazardous materials occurs. Additional elements may include on-board cargo monitoring to determine the quantity of material spilled and an in-vehicle system that automatically informs emergency management centers when an incident occurs (similar to the Mayday system), updating the dispatcher with accurate HAZMAT information. Automatic Vehicle Location systems can also be used to map the locations of all vehicles hauling hazardous materials. | • Provide efficient and appropriate response to incidents involving hazardous materials<br>• Decrease the environmental impact of hazardous material spills<br>• Reduce health danger caused by hazardous material spills | • Areas near existing emergency services **AND**<br>• Corridors with greater than 4000 average daily truck traffic **AND**<br>• Areas with higher concentrations of hazardous material spills |

**Table D-7:** Descriptions of Commercial Vehicle Operations Technologies (cont.).

| Technology | Description | Objectives | Potential Locations |
|---|---|---|---|
| Weigh-in-Motion | Weigh-in-Motion (WIM) allows vehicle weight data to be collected remotely, without stopping the vehicle. In addition to collecting planning data, WIM is often a vital part of commercial-vehicle pre-clearance systems. | • Provide vehicle weight without stopping<br>• Provide data for pavement design, research and planning<br>• Provide data for Strategic Highway Research Program<br>• Provide data for DOT Structures' Sections<br>• Provide data for Transportation Planning Divisions<br>• Provide data for Motor Carrier Services<br>• Provide data for percent of overweight vehicles | • Near weigh stations<br>• Areas where weigh data would be beneficial to designers, researchers and planners |

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## APPENDIX E: ITS DEPLOYMENT BY PRIORITY LEVEL

The following legend applies to all tables in this appendix:

| | |
|---|---|
| **Infrastructure Type** | See Appendix D |
| **ID #** | The unique number of a particular technology. If two locations share the same number, they are treated as a package for deployment purposes. |
| **State** | Self-explanatory |
| **County** | Self-explanatory |
| **Hwy** | In California, this is the Interstate Number, U.S. Highway Number, or State Highway Number; in Oregon, this is the Oregon highway number |
| **From** | Starting post mile or milepost |
| **To** | Ending post mile or milepost |
| **Direction** | The direction that a particular technology is facing |
| **Description** | Additional detail about the reason or location for deployment. |
| ✓ | Checked if the location is within the COATS region |

**Table E-1:** Short-Term COATS Deployment.

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 1 | Oregon | Lane | 62 | 20.5 | 21.5 | | Oversize Veh Warning (Peter Creek Tunnel) | ✓ |
| Adv. Warning for Narrow Lanes | 2 | Oregon | Lane | 15<br>15 | 55<br>76.65 | 76.65<br>88 | | Oversize Veh Warning (MP 55 to Sisters) | ✓ |
| Adv. Warning for Narrow Lanes | 3 | Oregon | Lane | 62 | 27 | 28 | | Wildcat Bridges | ✓ |
| Advanced Bike/Ped Warning | 1 | Oregon | Coos | 9<br>9 | 234<br>236.8 | | | Bike/ped challenge (North Bend)<br>Bike/ped challenge (Coos Bay) | ✓ |
| Advanced Bike/Ped Warning | 2 | California | Shasta | 5 | 28 | 29 | | Bicycle warning on Pit River bridge | ✓ |
| Advisory Television | 2 | Oregon | Jackson | 1 | 19.1 | | | Ashland | ✓ |
| Advisory Television | 3 | California | Shasta | 5 | 14.46 | | | Redding | ✓ |
| Advisory Television | 4 | California | Siskiyou | 5 | 47.56 | | | Yreka | ✓ |
| Advisory Television | 5 | Oregon | Jackson | 1 | 28.33 | | | Medford | ✓ |
| Animal/Vehicle Collision Warning | 1 | Oregon | Deschutes<br>Klamath | 4<br>4 | 143<br>172.19 | 172.19<br>202 | | animal migration | ✓ |
| Animal/Vehicle Collision Warning | 2 | Oregon | Klamath | 4 | 206 | 242 | | animal migration | ✓ |
| Animal/Vehicle Collision Warning | 3 | California | Humboldt | 101 | 122.2 | 137.1 | | Elk crossings | ✓ |
| Automated Anti-Icing | 1 | Oregon | Jackson | 1 | 28.4 | 28.9 | | Medford Viaduct | ✓ |
| Automated Anti-Icing | 2 | Oregon | Douglas | 231 | 15.5 | 16.5 | | | ✓ |
| Automated Anti-Icing | 3 | Oregon | Klamath | 270 | 58.2 | 59.2 | | By Doak Mountain | ✓ |
| Automated Flood Warning | 1 | California | Tehama | 5 | 19.5 | 20.5 | | Local creek floods I-5 lanes | ✓ |
| Automated Flood Warning | 2 | Oregon | Coos | 244 | 0 | 16.94 | | | ✓ |
| Automated Flood Warning | 3 | Oregon | Lane | 62 | 0 | 14 | | Highway 126 Mapleton to Florence | ✓ |
| Automated Flood Warning | 4 | Oregon | Douglas | 9<br>45 | 211.46<br>0 | 214.46<br>2.5 | | Highway 38/101 (around Reedsport) | ✓ |
| Automated Flood Warning | 5 | Oregon | Coos | 35 | 0 | 5 | | Hwy 42 approaching 101 | ✓ |
| Automated Flood Warning | 6 | Oregon | Coos | 9 | 240 | 242 | | | ✓ |
| Automated Visibility Warning | 1 | Oregon | Douglas | 1 | 80.8 | 101 | | Azalea Pass/Canyonville to Grants Pass | ✓ |
| Automated Wind Advisory | 2 | Oregon | Curry | 9 | 299.83 | | | At Port Orford | ✓ |
| Automated Wind Advisory | 3 | California | Lassen | 395 | 5.7 | | | Near Junction of Routes 70/395 Wind Warning | |
| Automated Wind Advisory | 4 | California | Lassen | 395 | 51.5 | | | Near Janesville Wind Warning | |
| Automated Wind Advisory | 5 | California | Siskiyou | 5 | 44.3 | | N | Walters Rd | ✓ |
| Dynamic Warning VMS | 1 | Oregon | Jackson | 1<br>1 | 4.1<br>5.1 | | N<br>S | Siskiyou Summit for runaway trucks | ✓ |
| Dynamic Warning VMS | 2 | Oregon | Douglas | 231<br>231 | 12.5<br>13.5 | | E<br>W | Tyee Curves | ✓ |
| Dynamic Warning VMS | 3 | Oregon | Lane | 18<br>18 | 54.6<br>56.5 | | East<br>West | Icy Conditions in Salt Creek Tunnel | ✓ |
| Dynamic Warning VMS | 4 | Oregon | Jefferson | 16<br>16 | 83.1<br>84.9 | | East<br>West | Visibility Challenge | ✓ |
| Dynamic Warning VMS | 5 | Oregon | Curry | 9<br>9 | 303.5<br>304.5 | | S<br>N | Humbug Mt | ✓ |
| Dynamic Warning VMS | 6 | Oregon | Curry | 9 | 321 | | N | High wind gust problem | ✓ |
| Dynamic Warning VMS | 7 | Oregon | Josephine | 1<br>1 | 73.31<br>74.31 | | N<br>S | Smith Hill | ✓ |
| Extinguishable Message Sign | 4 | California | Lassen | 36 | 10.5 | | E | West Side of Fredonyer Summit | ✓ |
| Extinguishable Message Sign | 5 | California | Lassen | 36 | 11.5 | | W | West Side of Fredonyer Summit | ✓ |
| Extinguishable Message Sign | 6 | California | Lassen | 36 | 13 | | E | East Side of Fredonyer Summit | ✓ |
| Extinguishable Message Sign | 7 | California | Lassen | 36 | 14.1 | | W | East Side of Fredonyer Summit | ✓ |

**Table E-1:** Short-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Highway Advisory Radio | 15 | California | Modoc | 395 | 26.9 | | | In Alturas (Super HAR) | ✓ |
| Highway Advisory Radio | 16 | California | Siskiyou | 5 | 44.3 | | | At Walters Road (Super HAR) | ✓ |
| Highway Advisory Radio | 17 | California | Siskiyou | 5 | 65.21 | | | Near Bailey Hill Road COATS Early Winner Project | ✓ |
| Highway Advisory Radio | 18 | California | Del Norte | 199 | 33.4 | | | Road Closure (@ Collier Rest Area) | ✓ |
| Highway Advisory Radio | 19 | Oregon | Curry | 9 | 357 | | | Visibility | ✓ |
| Highway Advisory Radio | 20 | Oregon | Lane | 62 | 0 | | | Road Closure (Florence area) | ✓ |
| Highway Advisory Radio | 21 | Oregon | Lane | 18 | 0 | | | Road Closure, Visibility (Eugene/Springfield) | ✓ |
| Highway Advisory Radio | 22 | Oregon | Klamath | 4 | 196 | | | Road Closure | ✓ |
| Highway Advisory Radio | 23 | Oregon | Klamath | 425 | 93 | | | Tourism | ✓ |
| Highway Advisory Radio | 24 | Oregon | Klamath | 22 | 103.95 | | | Tourism | ✓ |
| Highway Advisory Radio | 25 | California | Del Norte | 101 | 27 | | | Visibility, Road Closure, Tourist (@ Crescent City Maint Yard) | ✓ |
| Highway Advisory Radio | 26 | Oregon | Lake (OR) | 431 | 0 | | | Road Closure | ✓ |
| Highway Advisory Radio | 27 | California | Humboldt | 299 | 0 | | | Eureka | ✓ |
| Highway Advisory Radio | 28 | Oregon | Klamath | 18 | 69 | | | Crescent Lake | ✓ |
| Highway Advisory Radio | 29 | Oregon | Lane | 62 | 40 | | | Veneta | ✓ |
| Highway Advisory Radio | 30 | Oregon | Lane | 62 | 52 | | | W. of Beltline | ✓ |
| Highway Advisory Radio | 31 | Oregon | Lane | 15 | 12 | | | Walterville Scalehouse (E. of Springfield) | ✓ |
| Motorist-Aide Call Box | 73 | Oregon | Jackson | 1 | 3.8 | 4.8 | | Siskiyou Summit | ✓ |
| Motorist-Aide Call Box | 74 | Oregon | Douglas | 1 | 89 | 92 | | | ✓ |
| Slide Detection Station | 1 | California | Del Norte | 199 | 23.8 | | | Blue Slide (Near Patrick's Creek) | ✓ |
| Variable Message Sign | 21 | Oregon | Lake (OR) | 19 | 157.73 | | North | All Criteria | ✓ |
| Variable Message Sign | 22 | Oregon | Klamath | 270 | 68.76 | | West | All Criteria | ✓ |
| Variable Message Sign | 23 | Oregon | Josephine | 25 | 41.69 | | East | All Criteria | ✓ |
| Variable Message Sign | 24 | Oregon | Josephine | 1 | 54 | | North | All Criteria | ✓ |
| Variable Message Sign | 25 | Oregon | Josephine | 1 | 56 | | South | All Criteria | ✓ |
| Variable Message Sign | 26 | Oregon | Klamath | 4 | 272 | | North | All Criteria | ✓ |
| Variable Message Sign | 27 | Oregon | Klamath | 4 | 213 | | North | All Criteria | ✓ |
| Variable Message Sign | 28 | Oregon | Klamath | 4 | 203.2 | | North | All Criteria | ✓ |
| Variable Message Sign | 29 | Oregon | Josephine | 1 | 66 | | N | For management of passes north of Grants Pass | ✓ |
| Variable Message Sign | 30 | Oregon | Douglas | 1 | 81 | | S | For management of passes north of Grants Pass | ✓ |
| Variable Message Sign | 31 | California | Mendocino | 20 | 0 | | E | Traveler information | ✓ |
| Variable Message Sign | 32 | California | Lake (CA) | 20 | 46.48 | | W | Traveler information | ✓ |
| Variable Message Sign | 33 | California | Mendocino | 101 | 89 | | West | All Criteria | ✓ |
| Variable Message Sign | 34 | Oregon | Lane | 1 | 180 | | N | Eugene, Medford | ✓ |
| Variable Message Sign | 35 | Oregon | Coos | 9 | 245 | | N | Coos Bay | ✓ |
| Variable Message Sign | 36 | Oregon | Jackson | 1 | 29 | | N | Medford | ✓ |
| Variable Message Sign | 37 | Oregon | Josephine | 25 | 1.5 | | W | Grants Pass | ✓ |
| Variable Message Sign | 38 | Oregon | Klamath | 4 | 212.09 | | South | Moved from 425/14 | ✓ |
| Variable Message Sign | 39 | Oregon | Klamath | 4 | 278 | | North | All criteria | ✓ |
| Variable Message Sign | 40 | Oregon | Klamath | 18 | 69 | | W | Crescent Lake Junction | ✓ |
| Variable Message Sign | 41 | California | Del Norte | 101 | 28.5 | | N | Near 101/199 Interchange | ✓ |
| Variable Message Sign | 42 | Oregon | Lane | 1 | 190 | | S | | ✓ |
| Variable Message Sign | 43 | California | Del Norte | 199 | 36.2 | | S | S of State Line | ✓ |
| Variable Message Sign | 44 | California | Del Norte | 101 | 37.4 | | S | Near 101/197 Interchange | ✓ |
| Variable Message Sign | 45 | California | Mendocino | 101 | 31.6 | | S | N of 101/20 SEP | ✓ |
| Variable Message Sign | 46 | California | Mendocino | 1 | 105 | | North | All Criteria | ✓ |
| Variable Message Sign | 47 | California | Siskiyou | 5 | 13.18 | | N | At N. Mt. Shasta (W/ RWIS @ SIS-5-25.7) Wind Warning | ✓ |

**Table E-1:** Short-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Variable Message Sign | 48 | California | Siskiyou | 5 | 45.3 | | | CMS Just North of Walters Road Wind Warning | ✓ |
| Variable Message Sign | 49 | California | Siskiyou | 5 | 62 | | N | Near Henley Way COATS Early Winner Project | ✓ |
| Variable Message Sign | 50 | California | Modoc | 395 | 21 | | S | Near Alturas | ✓ |
| Variable Message Sign | 51 | California | Modoc | 395 | 25.2 | | N | Near Alturas | ✓ |
| Variable Message Sign | 52 | California | Modoc | 299 | 39.5 | | W | Near Alturas | ✓ |
| Variable Message Sign | 53 | Oregon | Jackson | 270 | 8 | | East | All Criteria (at Brownsboro) | ✓ |
| Variable Message Sign | 54 | Oregon | Deschutes | 17 | 0 | | North | All Criteria | ✓ |
| Variable Message Sign | 55 | Oregon | Deschutes | 4 | 168.04 | | North | La Pine | ✓ |
| Variable Message Sign | 56 | California | Lake (CA) | 20 | 7.4 | | W | | ✓ |
| Variable Message Sign | 57 | California | Humboldt | 101 | 89.4 | | S | N of 101/299 SEP | ✓ |
| Variable Message Sign | 58 | California | Humboldt | 101 | 87.7 | | N | S of 101/299 Sep | ✓ |
| Variable Message Sign | 59 | California | Humboldt | 101 | 58.7 | | S | N of Jct 36 | ✓ |
| Variable Message Sign | 60 | California | Humboldt | 101 | 56.5 | | N | S of Jct 36 | ✓ |
| Variable Message Sign | 61 | California | Lake (CA) | 20 | 32.6 | | W | E of Jct 53 | ✓ |
| Variable Message Sign | 62 | California | Lake (CA) | 20 | 30.6 | | E | W of Jct 53 | ✓ |
| Variable Message Sign | 63 | California | Lake (CA) | 53 | 5.1 | | N | S of Jct 20 | |
| Variable Message Sign | 64 | California | Mendocino | 101 | 49.2 | | N | N of Willits | ✓ |
| Variable Message Sign | 65 | California | Mendocino | 101 | 29.8 | | N | S of 101/20 Sep | ✓ |
| Variable Message Sign | 66 | California | Mendocino | 20 | 32.6 | | W | E of 20/101 Sep | ✓ |
| Variable Message Sign | 67 | California | Del Norte | 101 | 20.57 | | N | Near Cushing Creek | ✓ |
| Variable Message Sign | 68 | California | Lassen | 395 | 51.5 | | N | Junction Buntingville Rd Back | |
| Variable Message Sign | 69 | California | Lassen | 395 | 5.75 | | N | North Junction Route 70 | |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 1 | Oregon | Josephine | 25 | 25 | 40 | | poor communication around border | ✓ |
| Mayday Systems | 2 | Oregon | Harney<br>Malheur | 7<br>7 | 130<br>180.15 | 180.15<br>260 | | | ✓ |
| Mayday Systems | 3 | Oregon | Jackson<br>Klamath | 270<br>270 | 0<br>32.25 | 32.25<br>68.76 | | | ✓ |
| Regional Incident Management Plan | 1 | California<br>Oregon | Siskiyou<br>Jackson | 5<br>1 | 47.56<br>0 | 69.29<br>28.33 | | Siskiyou Pass Early Winner | ✓ |
| Regional Incident Management Plan | 2 | California | Mendocino | 1 | 59.8 | 105.58 | | Road Closure | ✓ |
| Regional Incident Management Plan | 3 | California | Trinity<br>Shasta | 299<br>299 | 58<br>0 | 72.25<br>25 | | Road Closure | ✓ |
| Regional Incident Management Plan | 4 | California | Trinity | 299 | 0 | 30 | | Road Closure | ✓ |
| Regional Incident Management Plan | 5 | California | Humboldt<br>Del Norte | 101<br>101 | 88<br>0 | 137.14<br>30 | | Road Closure | ✓ |
| Regional Incident Management Plan | 6 | California | Del Norte | 199 | 0 | 36.41 | | Road Closure | ✓ |
| Regional Incident Management Plan | 7 | California | Tehama<br>Shasta<br>Siskiyou | 5<br>5<br>5 | 27<br>0<br>0 | 42.12<br>67.02<br>47.56 | | Road Closure | ✓ |
| Regional Incident Management Plan | 8 | California | Humboldt | 299 | 0 | 43.04 | | | ✓ |
| Regional Incident Management Plan | 9 | Oregon | Jackson<br>Josephine | 1<br>1 | 30.1<br>52.19 | 52.19<br>58 | | Road Closure | ✓ |
| Regional Incident Management Plan | 10 | Oregon | Curry | 9 | 300 | 330 | | | ✓ |
| Regional Incident Management Plan | 11 | Oregon | Josephine<br>Douglas | 1<br>1 | 58.1<br>80.8 | 80.8<br>119 | | Road Closure | ✓ |

**Table E-1:** Short-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Regional Incident Management Plan | 12 | Oregon | Klamath | 4 | 213.1 | 291.73 | | Road Closure | ✓ |
| Regional Incident Management Plan | 13 | Oregon | Deschutes | 4 | 138.1 | 170 | | Road Closure | ✓ |
| Regional Incident Management Plan | 14 | Oregon | Linn<br>Jefferson<br>Deschutes | 16<br>16<br>16 | 71.5<br>81<br>90.85 | 81<br>90.85<br>101 | | Road Closure | ✓ |
| Regional Incident Management Plan | 15 | Oregon | Douglas | 73 | 0 | 86.01 | | Road Closure | ✓ |
| Rural Coordinate Addressing System | 1 | California | Trinity<br>Shasta | 299<br>299 | 0<br>0 | 72.25<br>99.36 | | Notification time challenge & Stakeholder Input | ✓ |
| Rural Coordinate Addressing System | 2 | California | Shasta | 89 | 0 | 43.35 | | Notification time challenge | ✓ |
| Rural Coordinate Addressing System | 3 | California | Trinity<br>Shasta | 36<br>36 | 0<br>0 | 41.14<br>11.93 | | Stakeholder Input | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 1 | Oregon | Klamath | 425 | 94 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 2 | Oregon | Coos | 9 | 273 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 3 | Oregon | Coos | 9 | 253 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 4 | Oregon | Lane<br>Klamath | 18<br>18 | 0<br>62.07 | 62.07<br>86 | | Road Closures Due to Slides & Floods | ✓ |
| 800 Travel Advisory | 5 | Oregon | Lane<br>Lane | 62<br>15 | 0<br>0 | 52.69<br>55 | | Road Closures Due to Slides & Floods | ✓ |
| Kiosks | 28 | Oregon | Curry | 9 | 358 | | | Harris Beach State Park | ✓ |
| Kiosks | 29 | Oregon | Curry | 9 | 345 | | | S.H. Boardman State Scenic Corridor | ✓ |
| Kiosks | 30 | Oregon | Jackson | 22 | 6 | | | Tou Velle State Recreation Site | ✓ |
| Kiosks | 31 | Oregon | Klamath | 4 | 247.44 | | | Kla-Mo-Ya Casino | ✓ |
| Kiosks | 32 | Oregon | Klamath | 425 | 87 | | | Crater Lake National Park | ✓ |
| Kiosks | 33 | Oregon | Coos | 9 | 277 | | | Face Rock State Scenic Viewpoint | ✓ |
| Kiosks | 34 | Oregon | Coos | 9 | 251 | | | Sunset Bay State Park | ✓ |
| Kiosks | 35 | Oregon | Coos | 9 | 253 | | | Shore Acres State Park | ✓ |
| Kiosks | 36 | Oregon | Coos | 9 | 255 | | | Cape Arago State Park | ✓ |
| Kiosks | 37 | Oregon | Douglas | 1 | 99.09 | | | Seven Feathers Hotel and Gaming Casino | ✓ |
| Kiosks | 38 | Oregon | Josephine | 25 | 29 | | | Illinois Valley Visitor Center (US 199/OR 46) | ✓ |
| Kiosks | 39 | Oregon | Lake (OR) | 19 | 143 | | | Lakeview area-outback scenic byway rest area | ✓ |
| Kiosks | 40 | Oregon | Douglas | 9 | 215 | | | Wayfunding pt: Winchester Bay | ✓ |
| Kiosks | 41 | Oregon | Curry | 9 | 300 | | | Wayfunding pts: Port Orford | ✓ |
| Kiosks | 42 | Oregon | Curry | 9 | 339 | | | Wayfunding pt: Meyer Creek | ✓ |
| Kiosks | 43 | Oregon | Klamath | 18 | 62.07 | | | Willamette Pass | ✓ |
| Kiosks | 44 | Oregon | Deschutes | 372 | 21.98 | | | Mt. Bachelor | ✓ |
| Kiosks | 45 | Oregon | Jefferson | 16 | 80.77 | | | Hoodoo/Santiam Pass | ✓ |
| Kiosks | 46 | California | Del Norte | 199 | 4.8 | | | Jedediah Smith Redwoods State Park | ✓ |
| Kiosks | 47 | California | Del Norte | 199 | 14.4 | | | Gasquet Ranger Station | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Parking Management & Information System | 1 | Oregon | Jackson | 1 | 15 | | | Ashland | ✓ |
| Parking Management & Information System | 2 | Oregon | Deschutes | 4 | 139 | | | Bend | ✓ |
| Recreational Veh. Park and Ride Lots | 1 | Oregon | Jackson | 272 | 32 | | | Jacksonville (Britt Festival) | ✓ |
| Recreational Veh. Park and Ride Lots | 2 | Oregon | Jackson | 1 | 15 | | | Ashland | ✓ |
| Recreational Veh. Park and Ride Lots | 3 | Oregon | Deschutes | 4 | 139 | | | Bend | ✓ |
| Recreational Veh. Park and Ride Lots | 4 | Oregon | Deschutes | 4 | 145 | | | Mt. Bachelor Park & Ride - Bend | ✓ |

**Table E-1:** Short-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Public Traveler/Mobility Services (cont.)** | | | | | | | | | |
| Recreational Veh. Park and Ride Lots | 4 | Oregon | Deschutes | 7 | 0 | | | Mt. Bachelor Park & Ride - Bend | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 1 | Oregon | Lane | 62 | 21 | | | Oversize Veh Warning (Peter Creek Tunnel) | ✓ |
| Advanced Vehicle Detection | 2 | Oregon | Lane | 15 | 55 | | | Oversize Veh Warning (MP 55 to Sisters) | ✓ |
| Advanced Vehicle Detection | 3 | Oregon | Lane | 15 | 71.5 | | | Oversize Veh Warning (MP 55 to Sisters) | ✓ |
| Advanced Vehicle Detection | 4 | Oregon | Deschutes | 15 | 88 | | | Oversize Veh Warning (MP 55 to Sisters) | ✓ |
| Advanced Vehicle Detection | 5 | Oregon | Lane | 62 | 27.5 | | | Wildcat Bridges | ✓ |
| Advanced Vehicle Detection | 6 | California | Tehama | 5 | 20 | | | Local creek floods I-5 lanes | ✓ |
| Advanced Vehicle Detection | 7 | Oregon | Coos | 244 | 8.47 | | | | ✓ |
| Advanced Vehicle Detection | 8 | Oregon | Lane | 62 | 0 | | | Highway 126 Mapleton to Florence | ✓ |
| Advanced Vehicle Detection | 9 | Oregon | Lane | 62 | 7 | | | Highway 126 Mapleton to Florence | ✓ |
| Advanced Vehicle Detection | 10 | Oregon | Lane | 62 | 14 | | | Highway 126 Mapleton to Florence | ✓ |
| Advanced Vehicle Detection | 11 | Oregon | Douglas | 9 | 212.96 | | | Highway 38/101 (around Reedsport) | ✓ |
| Advanced Vehicle Detection | 12 | Oregon | Douglas | 45 | 1.25 | | | Highway 38/101 (around Reedsport) | ✓ |
| Advanced Vehicle Detection | 13 | Oregon | Coos | 35 | 2.5 | | | Hwy 42 approaching 101 | ✓ |
| Advanced Vehicle Detection | 14 | Oregon | Coos | 9 | 241 | | | | ✓ |
| Advanced Vehicle Detection | 15 | California | Humboldt | 101 | 82.7 | | | Near Indianola TMS(RTMS) | ✓ |
| Advanced Vehicle Detection | 16 | California | Mendocino | 101 | 53 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 17 | California | Siskiyou | 5 | 52.7 | | | On Anderson Grade TMS(RTMS) COATS Early Winner Project | ✓ |
| Advanced Vehicle Detection | 18 | California | Siskiyou | 5 | 62 | | | Near Henley Way TMS(RTMS) COATS Showcase RTMS Project | ✓ |
| Advanced Vehicle Detection | 19 | California | Siskiyou | 5 | 66.6 | | | Near Baily Hill TMS(RTMS) COATS Early Winner Project | ✓ |
| Advanced Vehicle Detection | 20 | California | Siskiyou | 5 | 68.6 | | | Near Hilt TMS(RTMS) COATS Showcase RTMS Project | ✓ |
| Advanced Vehicle Detection | 21 | California | Siskiyou | 5 | 65.21 | | | Near Bailey Hill HAR TMS(RTMS) | ✓ |
| Advanced Vehicle Detection | 22 | California | Humboldt | 101 | 74.8 | | | North of Herrick Rd. TMS(RTMS) | ✓ |
| Advanced Vehicle Detection | 23 | California | Humboldt | 101 | 76.7 | | | North of Henderson TMS(RTMS) | ✓ |
| Advanced Vehicle Detection | 24 | California | Humboldt | 101 | 79.2 | | | NB Near 5th and R St TMS(RTMS) | ✓ |
| Advanced Vehicle Detection | 25 | California | Humboldt | 101 | 78 | | | SB Broadway and 4th TMS(RTMS) | ✓ |
| Advanced Vehicle Detection | 26 | California | Humboldt | 101 | 79.4 | | | SB 4th Near V St TMS(RTMS) | ✓ |
| Advanced Vehicle Detection | 27 | California | Humboldt | 101 | 80.2 | | | Near Cole TMS(RTMS) | ✓ |
| Automated Gate Closure | 1 | Oregon | Jefferson | 16 | 80.77 | | | Santiam Pass | ✓ |
| Automated Gate Closure | 2 | Oregon | Lane | 15 | 66 | | | Replaces an existing one | ✓ |
| Automated Gate Closure | 3 | Oregon | Lane | 15 | 71 | | | | ✓ |
| Automated Gate Closure | 4 | Oregon | Deschutes | 15 | 77 | | | | ✓ |
| Automated Gate Closure | 5 | California | Humboldt | 255 | 0.2 | | | Eureka Channel Bridge | ✓ |
| Automated Gate Closure | 6 | California | Humboldt | 255 | 1.8 | | | Eureka Channel Bridge | ✓ |
| Closed-Circuit Television Camera | 27 | California | Lassen | 299 | 8.27 | | | At Big Valley Mountain Summit | ✓ |
| Closed-Circuit Television Camera | 28 | California | Siskiyou | 5 | 25.8 | | | Weed Rest Area | ✓ |
| Closed-Circuit Television Camera | 29 | California | Siskiyou | 5 | 8.58 | | | At 5 / 89 Separation | ✓ |
| Closed-Circuit Television Camera | 30 | California | Modoc | 299 | 51.3 | | | Cedar Pass | ✓ |
| Closed-Circuit Television Camera | 31 | California | Lassen | 395 | 49.5 | | | Near Honey Lake SRRA | |
| Closed-Circuit Television Camera | 32 | California | Lassen | 395 | 17.4 | | | Near Constantia Road (Wind Warning CCTV at RWIS) | |
| Closed-Circuit Television Camera | 33 | California | Humboldt | 101 | 133.34 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 34 | California | Del Norte | 101 | 28.5 | | N | S of 101/199 Sep (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 35 | California | Humboldt | 101 | 89.4 | | S | N of 101/299 SEP (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 36 | California | Humboldt | 101 | 87.7 | | N | S of 101/299 Sep (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 37 | California | Humboldt | 101 | 58.7 | | S | N of Jct 36 (@ CMS) | ✓ |

**Table E-1:** Short-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Closed-Circuit Television Camera | 38 | California | Humboldt | 101 | 56.5 | | N | S of Jct 36 (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 39 | California | Mendocino | 101 | 49.2 | | N | N of Willits (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 40 | California | Humboldt | 101 | 75.3 | | N | Eureka Corridor - Kmart and Broadway | ✓ |
| Closed-Circuit Television Camera | 41 | California | Humboldt | 101 | 75.8 | | N | Eureka Corridor - McCullens and Broadway | ✓ |
| Closed-Circuit Television Camera | 42 | California | Humboldt | 101 | 76.3 | | N | Eureka Corridor - Broadway and N Mall | ✓ |
| Closed-Circuit Television Camera | 43 | California | Humboldt | 101 | 76.7 | | N | Eureka Corridor - Broadway and Henderson | ✓ |
| Closed-Circuit Television Camera | 44 | California | Humboldt | 101 | 77.5 | | N | Eureka Corridor - Broadway and 14th Street | ✓ |
| Closed-Circuit Television Camera | 45 | California | Humboldt | 101 | 78.7 | | N | NB Eureka Corridor - 5th and J St | ✓ |
| Closed-Circuit Television Camera | 46 | California | Humboldt | 101 | 78 | | N | NB Eureka Corridor - 5th and V St | ✓ |
| Closed-Circuit Television Camera | 47 | California | Humboldt | 101 | 78 | | N | SB Eureka Corridor - 4th and Broadway | ✓ |
| Closed-Circuit Television Camera | 48 | California | Humboldt | 101 | 78.6 | | N | SB Eureka Corridor - 4th and H St | ✓ |
| Closed-Circuit Television Camera | 49 | California | Humboldt | 101 | 79.4 | | N | SB Eureka Corridor - 4th and V St | ✓ |
| Closed-Circuit Television Camera | 50 | California | Humboldt | 101 | 80.2 | | N | Near Cole Ave. | ✓ |
| Closed-Circuit Television Camera | 51 | California | Humboldt | 101 | 81.3 | | N | Near Mid-City | ✓ |
| Closed-Circuit Television Camera | 52 | California | Humboldt | 101 | 82.7 | | N | Near Indianola | ✓ |
| Closed-Circuit Television Camera | 53 | California | Humboldt | 101 | 83.4 | | N | Near Bracut | ✓ |
| Closed-Circuit Television Camera | 54 | California | Mendocino | 101 | 29.8 | | N | S of 101/20 Sep (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 55 | California | Humboldt | 101 | 128.94 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 56 | California | Del Norte | 199 | 36.2 | | S | S of State Line (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 57 | California | Mendocino | 20 | 32.6 | | W | E of 20/101 Sep (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 58 | California | Del Norte | 101 | 37.4 | | S | Near 101/197 Interchange | ✓ |
| Closed-Circuit Television Camera | 59 | California | Del Norte | 199 | 33.4 | | N | Collier Rest Area | ✓ |
| Closed-Circuit Television Camera | 60 | Oregon | Douglas | 1 | 124.5 | | | Roseburg | ✓ |
| Closed-Circuit Television Camera | 61 | Oregon | Douglas | 1 | 120 | | | Near Roseburg | ✓ |
| Closed-Circuit Television Camera | 62 | Oregon | Lane | 1 | 177 | | | Gettings Creek Rest Area | ✓ |
| Closed-Circuit Television Camera | 63 | California | Tehama | 5 | 26.52 | | | In Red Bluff at the 5/36 Separation | ✓ |
| Closed-Circuit Television Camera | 64 | California | Lassen | 395 | 132.09 | | | At Sage Hen Summit | ✓ |
| Closed-Circuit Television Camera | 65 | Oregon | Jackson | 1 | 28.33 | | | Medford | ✓ |
| Closed-Circuit Television Camera | 66 | California | Siskiyou | 5 | 2.62 | | | At Central Dunsmuir Interchange at Existing RWIS/RAWS Sites | ✓ |
| Closed-Circuit Television Camera | 67 | California | Siskiyou | 5 | 14.45 | | | At Black Butte Summit at Existing RWIS/RAWS Sites | ✓ |
| Closed-Circuit Television Camera | 68 | California | Siskiyou | 5 | 22.2 | | | At North Weed Interchange at Existing RWIS/RAWS Sites | ✓ |
| Closed-Circuit Television Camera | 69 | California | Siskiyou | 89 | 29.25 | | | At Snowmans Hill Summit at Existing RWIS/RAWS Sites | ✓ |
| Closed-Circuit Television Camera | 70 | California | Trinity | 299 | 48 | | | At Oregon Mountain at Existing RWIS/RAWS Sites | ✓ |
| Closed-Circuit Television Camera | 71 | California | Trinity | 299 | 69.7 | | | At Buckhorn Sandhouse at Existing RWIS/RAWS Sites | ✓ |
| Closed-Circuit Television Camera | 72 | California | Siskiyou | 97 | 52 | | | At Dorris Hill at Existing RWIS/RAWS Sites | ✓ |
| Closed-Circuit Television Camera | 73 | California | Siskiyou | 5 | 68.59 | | | North of the Hilt OC | ✓ |
| Closed-Circuit Television Camera | 74 | California | Shasta | 5 | 12.15 | | | At South Bonnyview Road COATS Expanded CCTV | ✓ |
| Closed-Circuit Television Camera | 75 | California | Siskiyou | 5 | 47.7 | | | Just South of the Route 3/5 Separation | ✓ |
| Closed-Circuit Television Camera | 76 | California | Siskiyou | 5 | 68.33 | | | At Hilt OC COATS Expanded CCTV | ✓ |
| Closed-Circuit Television Camera | 77 | California | Lassen | 36 | 19.2 | | | At Junction Route 36/44 COATS Expanded CCTV | ✓ |
| Closed-Circuit Television Camera | 78 | California | Lassen | 36 | 24.04 | | | At West Susanville COATS Expanded CCTV | ✓ |
| Closed-Circuit Television Camera | 79 | California | Lassen | 36 | 26.52 | | | At East Riverside Drive (Susanville) COATS Expanded CCTV | ✓ |
| Closed-Circuit Television Camera | 80 | California | Lassen | 36 | 29.39 | | | At Junction Routes 36/395 COATS Expanded CCTV | ✓ |
| Closed-Circuit Television Camera | 81 | California | Siskiyou | 5 | 5.89 | | | At the Mott Road Interchange | ✓ |
| Closed-Circuit Television Camera | 82 | California | Shasta | 5 | 4.29 | | | At Deschutes Road / Factory Outlet Drive | ✓ |
| Closed-Circuit Television Camera | 83 | California | Plumas | 70 | 33.03 | | | At Greenville Wye COATS Expanded CCTV | |
| Closed-Circuit Television Camera | 84 | California | Del Norte | 101 | 20.57 | | N | Near Cushing Creek (@ CMS) | ✓ |

**Table E-1:** Short-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Closed-Circuit Television Camera | 85 | California | Mendocino | 101 | 89 | | West | All Criteria (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 86 | California | Lake (CA) | 53 | 5.1 | | N | S of Jct 20 (@ CMS) | |
| Closed-Circuit Television Camera | 87 | California | Siskiyou | 97 | 20.19 | | | At the Grass Lake Maintenance Station COATS Expanded CCTV | ✓ |
| Closed-Circuit Television Camera | 88 | California | Siskiyou | 97 | 34.45 | | | Route 97 WIM COATS Expanded CCTV | ✓ |
| Closed-Circuit Television Camera | 89 | California | Tehama | 99 | 4.49 | | | At South Ave COATS Expanded CCTV | |
| Closed-Circuit Television Camera | 90 | California | Shasta | 273 | 18.62 | | | At Lake Blvd COATS Expanded CCTV | ✓ |
| Closed-Circuit Television Camera | 91 | California | Shasta | 299 | 80.08 | | | At Junction Routes 89/299 COATS Expanded CCTV | ✓ |
| Closed-Circuit Television Camera | 92 | California | Shasta | 5 | 6.9 | | | At Riverside Avenue | ✓ |
| Closed-Circuit Television Camera | 93 | California | Shasta | 5 | 26.03 | | | At Fawndale Interchange | ✓ |
| Closed-Circuit Television Camera | 94 | California | Lake (CA) | 20 | 7.4 | | E | W of Jct 29 (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 95 | California | Lassen | 36 | 11.85 | | | At Fredonyer Summit Icy Curve Warning System CCTV at Summit | ✓ |
| Closed-Circuit Television Camera | 96 | Oregon | Deschutes | 7 | 15 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 97 | Oregon | Harney | 7 | 104.62 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 98 | Oregon | Douglas | 233 | 23.8 | | | | ✓ |
| Closed-Circuit Television Camera | 99 | Oregon | Harney | 49 | 0 | | | Emergency verification around Burns | ✓ |
| Closed-Circuit Television Camera | 100 | California | Mendocino | 1 | 105 | | North | All Criteria (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 101 | California | Mendocino | 20 | 0 | | E | Traveler information (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 102 | California | Lake (CA) | 20 | 46.48 | | W | Traveler information (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 103 | California | Lake (CA) | 20 | 32.6 | | W | E of Jct 53 (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 104 | California | Lake (CA) | 20 | 30.6 | | E | W of Jct 53 (@ CMS) | ✓ |
| RWIS | 35 | California | Lassen | 395 | 5.7 | | | Near Junction of Routes 70/395 Wind Warning | |
| RWIS | 36 | California | Lassen | 395 | 51.5 | | | Near Janesville Wind Warning | |
| RWIS | 37 | California | Siskiyou | 5 | 45.3 | | | Just north of Walters Road Wind Warning | ✓ |
| RWIS | 38 | California | Humboldt | 101 | 30 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 39 | California | Humboldt | 299 | 29.08 | | | Visibility Challenge (Berry Summit) | ✓ |
| RWIS | 40 | Oregon | Curry | 9 | 360 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 41 | Oregon | Klamath | 4 | 265 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 42 | Oregon | Curry | 9 | 330 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 43 | Oregon | Coos | 35 | 10.8 | | | Visibility Challenge | ✓ |
| RWIS | 44 | Oregon | Douglas | 35 | 75.3 | | | Visibility Challenge | ✓ |
| RWIS | 45 | Oregon | Douglas | 9 | 211.6 | | | Visibility Challenge | ✓ |
| RWIS | 46 | Oregon | Douglas | 45 | 20 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 47 | Oregon | Douglas | 45 | 45 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 48 | Oregon | Coos | 9 | 255 | | | Cape Blanco | ✓ |
| RWIS | 49 | Oregon | Klamath | 425 | 93 | | | Around Crater Lake | ✓ |
| RWIS | 50 | California | Humboldt | 101 | 1.2 | | | Visibility Challenge | ✓ |
| RWIS | 51 | California | Humboldt | 101 | 133.34 | | | Boyce Creek Viaduct (moved) | ✓ |
| RWIS | 52 | California | Del Norte | 199 | 32.5 | | | Collier Rest Area | ✓ |
| RWIS | 53 | Oregon | Douglas | 231 | 13 | | | Tyee Curves | ✓ |
| RWIS | 54 | Oregon | Jackson | 270 | 0 | | | Butte Creek RWIS | ✓ |
| RWIS | 55 | Oregon | Klamath | 425 | 86 | | | | ✓ |
| RWIS | 56 | California | Siskiyou | 5 | 25.7 | | | At Weed Airport (W/ CMS @ SIS-5-13.18) Wind Warning | ✓ |
| RWIS | 57 | California | Lassen | 36 | 11 | | | West Side of Fredonyer Summit Icy Curve Warning System W/ 2 EMS | ✓ |
| RWIS | 58 | California | Lassen | 36 | 13.5 | | | East Side of Fredonyer Summit Icy Curve Warning System W/ 2 EMS | ✓ |
| RWIS | 59 | California | Lassen | 299 | 8.27 | | | At Big Valley Mountain Summit | ✓ |
| RWIS | 60 | California | Lassen | 395 | 132.09 | | | At Sage Hen Summit | ✓ |
| RWIS | 61 | California | Mendocino | 101 | 41.17 | | | Visibility Challenge (Ridgewood Summit) | ✓ |

**Table E-1:** Short-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| RWIS | 62 | California | Mendocino | 101 | 82.2 | | | Road Closure Due to Bad Weather (Rattlesnake Sandouse) | ✓ |
| Satellite Traffic Operations Center | 8 | California | Humboldt | 101 | 75.91 | | | Eureka | ✓ |
| Satellite Traffic Operations Center | 9 | California | Shasta | 5 | 18 | | | Redding Caltrans/CHP upgrade | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 1 | Oregon | Deschutes | 4 | 135.97 | | | Bend | ✓ |
| Automatic Vehicle Location | 2 | Oregon | Jefferson | 16 | 80.77 | | | Santiam Pass | ✓ |
| Probe Vehicle Instrumentation | 1 | Oregon | Deschutes | 17 | 0 | 18.51 | | Bend-to-Sisters Demo Project | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Preclearance | 6 | Oregon | Curry | 9 | 355 | | N/S | Near Existing Weigh Station | ✓ |
| Preclearance | 7 | Oregon | Harney | 7 | 133.17 | | W | Near Existing Weigh Station | ✓ |
| Preclearance | 8 | Oregon | Harney | 7 | 135.17 | | E | Near Existing Weigh Station | ✓ |
| Preclearance | 9 | Oregon | Klamath | 4 | 271.41 | | S | Klamath Falls | ✓ |
| Preclearance | 10 | Oregon | Klamath | 4 | 271.73 | | N | Klamath Falls | ✓ |
| Weigh in Motion | 11 | Oregon | Harney | 7 | 133.17 | | W | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 12 | Oregon | Harney | 7 | 135.17 | | E | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 13 | Oregon | Deschutes | 7 | 11.6 | | E/W | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 14 | Oregon | Deschutes | 4 | 142.27 | | | Lava Butte | ✓ |

**Table E-2:** Medium-Term COATS Deployment.

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 4 | California | Mendocino | 101 | 50.7 | 51.2 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 5 | California | Humboldt | 101 | 1.2 | 2.9 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 6 | California | Humboldt | 299 | 29.9 | 32.8 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 7 | California | Humboldt | 101 | 121.8 | 122.7 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 8 | California | Del Norte | 101 | 20.1 | 22.2 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 9 | California | Del Norte | 199 | 0.6 | 1.9 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 10 | California | Del Norte | 199 | 26.3 | 27.8 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 11 | Oregon | Lane | 18 | 54.6 | 56.5 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 12 | Oregon | Klamath | 4 | 202.2 | 203.2 | | N. of Chemult over RR Tracks | ✓ |
| Adv. Warning for Narrow Lanes | 13 | California | Mendocino | 101 | 99.17 | 101.17 | | Around Confusion Hill | ✓ |
| Adv. Warning for Narrow Lanes | 14 | Oregon | Coos | 244 | 0 | 16.94 | | | ✓ |
| Adv. Warning for Narrow Lanes | 15 | Oregon | Douglas | 45 | 42 | 46 | | | ✓ |
| Adv. Warning for Narrow Lanes | 16 | Oregon | Douglas | 45 | 38.5 | 39.5 | | Elkton Tunnel | ✓ |
| Advanced Bike/Ped Warning | 3 | California | Del Norte | 101 | 25.84 | | | Bike/ped challenge (Crescent City) | ✓ |
| Advanced Bike/Ped Warning | 4 | California | Humboldt | 101 | 85.83 | | | Bike/ped challenge (Arcata) | ✓ |
| Advanced Bike/Ped Warning | 5 | California | Humboldt | 101 | 75.91 | | | Bike/ped challenge (Eureka) | ✓ |
| Advanced Bike/Ped Warning | 6 | California | Mendocino | 101 | 45.17 | | | Bike/ped challenge (Willits) | ✓ |
| Advanced Bike/Ped Warning | 7 | California | Tehama | 36 | 40.32 | | | Bike/ped challenge (Red Bluff) | ✓ |
| Advanced Bike/Ped Warning | 8 | California | Shasta | 299 | 21.65 | | | Bike/ped challenge (Redding) | ✓ |
| Advanced Bike/Ped Warning | 9 | California | Siskiyou | 3 | 47.38 | | | Bike/ped challenge (Yreka) | ✓ |
| Advanced Bike/Ped Warning | 10 | Oregon | Curry | 9 | 355.38 | | | Bike/ped challenge (Brookings) | ✓ |
| Advanced Bike/Ped Warning | 11 | Oregon | Curry | 9 | 327.85 | | | Bike/ped challenge (Gold Beach) | ✓ |
| Advanced Bike/Ped Warning | 12 | Oregon | Coos | 35 | 10.85 | | | Bike/ped challenge (Coquille) | ✓ |
| Advanced Bike/Ped Warning | 13 | Oregon | Lane<br>Lane | 1<br>1 | 182.8<br>187.83 | | | Bike/ped challenge (Creswell)<br>Bike/ped challenge (Goshen) | ✓ |
| Advanced Bike/Ped Warning | 14 | Oregon | Douglas | 35 | 72.74 | | | Bike/ped challenge (Winston) | ✓ |
| Advanced Bike/Ped Warning | 15 | Oregon | Klamath | 20 | 0 | | | Bike/ped challenge (Klamath Falls) | ✓ |
| Advanced Bike/Ped Warning | 16 | Oregon | Lane | 18 | 34.13 | | | Bike/ped challenge (Oakridge) | ✓ |
| Advanced Bike/Ped Warning | 17 | Oregon | Deschutes | 4 | 135.97 | | | Bike/ped challenge (Bend) | ✓ |
| Advanced Bike/Ped Warning | 18 | Oregon | Lane<br>Douglas<br>Coos | 9<br>9<br>9 | 190.23<br>211.11<br>222.01 | | | Bike/ped challenge (Florence)<br>Bike/ped challenge (Reedsport)<br>Bike/ped challenge (Lakeside) | ✓ |
| Advanced Bike/Ped Warning | 19 | California | Shasta | 5 | 40 | | | Bicycle warning on Antlers | ✓ |
| Advisory Television | 6 | California | Humboldt | 101 | 75.91 | | | Eureka | ✓ |
| Advisory Television | 7 | California | Tehama | 5 | 24.87 | | | Red Bluff | ✓ |
| Advisory Television | 8 | California | Lassen | 36 | 24.46 | | | Susanville | ✓ |
| Advisory Television | 9 | California | Siskiyou | 5 | 10.49 | | | Mt. Shasta | ✓ |
| Advisory Television | 10 | California | Siskiyou | 5 | 19.07 | | | Weed | ✓ |
| Advisory Television | 11 | California | Shasta | 299 | 74.98 | | | Burney | ✓ |
| Advisory Television | 12 | California | Del Norte | 101 | 25.84 | | | Crescent City | ✓ |
| Advisory Television | 13 | California | Lake (CA) | 20 | 31.62 | | | Clearlake (@ 53 junction) | ✓ |
| Advisory Television | 14 | Oregon | Klamath | 4 | 272.31 | | | Klamath Falls | ✓ |
| Advisory Television | 15 | Oregon | Lake (OR) | 19 | 142.64 | | | Lakeview | ✓ |
| Advisory Television | 16 | Oregon | Lane | 1 | 191 | | | Eugene | ✓ |
| Animal/Vehicle Collision Warning | 4 | Oregon | Klamath<br>Lake (OR) | 20<br>20 | 6.04<br>63.39 | 63.39<br>90 | | Animal related challenge | ✓ |

**Table E-2:** Medium-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Animal/Vehicle Collision Warning | 5 | Oregon | Harney<br>Malheur | 7<br>7 | 85.1<br>180.15 | 180.15<br>262.34 | | Animal related challenge | ✓ |
| Animal/Vehicle Collision Warning | 6 | Oregon | Deschutes | 16 | 92.94 | 99.4 | | Animal related challenge | ✓ |
| Animal/Vehicle Collision Warning | 7 | Oregon | Deschutes | 17 | 2.15 | 16.49 | | Animal related challenge | ✓ |
| Animal/Vehicle Collision Warning | 8 | California | Siskiyou | 5 | 24 | 26 | | Warn drivers about deer on freeway | ✓ |
| Animal/Vehicle Collision Warning | 9 | California | Humboldt | 101 | 114 | 115 | | Prevent/reduce elk hits | ✓ |
| Animal/Vehicle Collision Warning | 10 | California | Humboldt | 101 | 69 | 71 | | | ✓ |
| Animal/Vehicle Collision Warning | 11 | California | Mendocino | 101 | 65 | 67 | | | ✓ |
| Automated Anti-Icing | 4 | California | Mendocino | 101 | 76 | 78 | | Stakeholder Input (near Brushy Mountain) | ✓ |
| Automated Anti-Icing | 5 | Oregon | Lane | 18 | 56 | 56.5 | | Road surface challenge (Salt Creek Tunnel) | ✓ |
| Automated Anti-Icing | 6 | Oregon | Jefferson | 16 | 79.5 | 81.3 | | Road surface challenge | ✓ |
| Automated Anti-Icing | 7 | California | Siskiyou | 5 | 2.9 | 3.4 | | Keep ice off Sac. River bridge in Dunsmuir | ✓ |
| Automated Anti-Icing | 8 | California | Humboldt | 101 | 133 | 134 | | | ✓ |
| Automated Flood Warning | 7 | California | Humboldt | 96 | 13 | 15.5 | | Road Closures Due to Slides & Floods | ✓ |
| Automated Flood Warning | 8 | California | Trinity | 3 | 71.87 | 73.87 | | Coffee Creek | ✓ |
| Automated Flood Warning | 9 | California | Trinity | 3 | 59.39 | 61.39 | | Swift Creek Bridge | ✓ |
| Automated Flood Warning | 10 | California | Trinity | 299 | 1.2 | 4 | | Road Closures Due to Slides & Floods | ✓ |
| Automated Flood Warning | 11 | California | Trinity | 299 | 5.8 | 6.5 | | Road Closures Due to Slides & Floods | ✓ |
| Automated Flood Warning | 12 | California | Trinity | 299 | 11.8 | 13.4 | | Road Closures Due to Slides & Floods | ✓ |
| Automated Flood Warning | 13 | California | Humboldt | 96 | 0 | 2.4 | | Road Closures Due to Slides & Floods | ✓ |
| Automated Flood Warning | 14 | California | Humboldt | 96 | 6.2 | 10.7 | | Road Closures Due to Slides & Floods | ✓ |
| Automated Visibility Warning | 2 | California | Del Norte | 199 | 0.6 | 1.9 | | Visibility challenge | ✓ |
| Automated Visibility Warning | 3 | Oregon | Lane | 18 | 54.6 | 56.5 | | Visibility challenge | ✓ |
| Automated Visibility Warning | 4 | Oregon | Jefferson | 16 | 79.5 | 81.3 | | Visibility challenge | ✓ |
| Automated Visibility Warning | 5 | California | Lassen | 44 | 15 | 30 | | Snow white-out warning | ✓ |
| Automated Visibility Warning | 6 | Oregon | Douglas | 35 | 57.53 | 59.53 | | Camas Summit (outside Roseburg) | ✓ |
| Automated Visibility Warning | 7 | Oregon | Jackson | 1 | 4 | 6 | | N. of Siskiyou Pass | ✓ |
| Automated Visibility Warning | 8 | Oregon | Lane | 1 | 172.74 | | | Ward's Butte | ✓ |
| Dynamic Warning VMS | 8 | Oregon | Harney | 7<br>7 | 129.1<br>131.1 | | E<br>W | Burns | ✓ |
| Dynamic Warning VMS | 9 | California | Lake (CA) | 20<br>20 | 40.4<br>41.4 | | E<br>W | | ✓ |
| Dynamic Warning VMS | 10 | Oregon | Douglas | 45<br>45 | 38.5<br>39.5 | | E<br>W | Tunnel Debris | ✓ |
| Dynamic Warning VMS | 11 | California | Shasta | 299<br>299 | 35<br>40 | | E<br>W | Sharp Curves | ✓ |
| Dynamic Warning VMS | 12 | California | Humboldt | 299<br>299 | 29.9<br>31.1 | | East<br>West | Visibility Challenge | ✓ |
| Dynamic Warning VMS | 13 | Oregon | Curry | 9<br>9 | 356.4<br>357.9 | | South<br>North | Visibility Challenge | ✓ |
| Dynamic Warning VMS | 14 | Oregon | Coos | 35<br>35 | 10.8<br>12.2 | | East<br>West | Visibility Challenge | ✓ |
| Dynamic Warning VMS | 16 | Oregon | Coos | 9<br>9 | 234.6<br>239.8 | | South<br>North | Visibility Challenge | ✓ |
| Dynamic Warning VMS | 17 | Oregon | Douglas | 9<br>9 | 211.6<br>213 | | South<br>North | Visibility Challenge | ✓ |
| Dynamic Warning VMS | 18 | California | Shasta | 299 | 0 | | E | Warn about sharp curves | ✓ |

**Table E-2:** Medium-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Dynamic Warning VMS | 19 | Oregon | Douglas | 1<br>1 | 107.5<br>108.5 | | N<br>S | Myrtle Creek curves | ✓ |
| Dynamic Warning VMS | 20 | Oregon | Harney | 7 | 128.3 | | W | High wind warning for mobile homes (near Hines) | ✓ |
| Dynamic Warning VMS | 21 | Oregon | Josephine | 1 | 68.58 | | N | Sexton MT | ✓ |
| Dynamic Warning VMS | 21 | Oregon | Josephine | 1 | 69.58 | | S | Sexton MT | ✓ |
| Highway Advisory Radio | 32 | California | Glenn | 5 | 24.6 | | | Dist 2/3 Border (Orland) | ✓ |
| Highway Advisory Radio | 33 | California | Shasta | 5 | 65 | | | Near Castella | ✓ |
| Highway Advisory Radio | 34 | California | Siskiyou | 5 | 63.27 | | | Near Hornbrook MTC Sta | ✓ |
| Highway Advisory Radio | 35 | California | Humboldt | 101 | 35.11 | | | Road Closure, Visibility, Tourist | ✓ |
| Highway Advisory Radio | 36 | California | Mendocino | 101 | 92 | | | Road Closure | ✓ |
| Highway Advisory Radio | 37 | California | Colusa | 5 | 20 | | | Rest Area | ✓ |
| Highway Advisory Radio | 38 | Oregon | Coos | 9 | 275 | | | Tourism | ✓ |
| Highway Advisory Radio | 39 | Oregon | Coos | 35 | 0 | | | Visibility | ✓ |
| Highway Advisory Radio | 40 | Oregon | Coos | 9 | 236 | | | Visibility, Tourism | ✓ |
| Highway Advisory Radio | 41 | Oregon | Douglas | 9 | 212 | | | Visibility, Tourism | ✓ |
| Highway Advisory Radio | 42 | Oregon | Deschutes | 7 | 0 | | | Major Junction | ✓ |
| Highway Advisory Radio | 43 | Oregon | Harney | 7 | 130.1 | | | Major Junction | ✓ |
| Highway Advisory Radio | 44 | Oregon | Jackson | 22 | 0 | | | Visibility, Tourism | ✓ |
| Highway Advisory Radio | 45 | Oregon | Josephine | 1 | 55.78 | | | Tourism | ✓ |
| Highway Advisory Radio | 46 | Oregon | Douglas | 1 | 122 | | | Roseburg | ✓ |
| Highway Advisory Radio | 47 | Oregon | Jefferson | 16 | 80.77 | | | Santiam Pass | ✓ |
| Highway Advisory Radio | 48 | Oregon | Deschutes | 16 | 100.03 | | | Sisters | ✓ |
| Highway Advisory Radio | 49 | Oregon | Deschutes | 17 | 12 | | | Hwy 17 to Sisters | ✓ |
| Highway Advisory Radio | 50 | Oregon | Deschutes | 7 | 4 | | | Pilot Butte | ✓ |
| Highway Advisory Radio | 51 | California | Humboldt | 101 | 11.13 | | | Garberville | ✓ |
| Highway Advisory Radio | 52 | California | Humboldt | 299 | 19 | | | | ✓ |
| Highway Advisory Radio | 53 | Oregon | Lane | 15 | 49 | | | Mackenzie Bridge | ✓ |
| Intersection Advance Warning | 1 | Oregon | Douglas | 35 | 72.74 | | | Intersection safety challenge | ✓ |
| Intersection Advance Warning | 2 | Oregon | Lane | 15 | 0.5 | | | Intersection safety challenge (Glenwood) | ✓ |
| Intersection Advance Warning | 3 | Oregon | Harney | 7 | 130.1 | | | Intersection safety challenge | ✓ |
| Intersection Advance Warning | 4 | Oregon | Curry | 9 | 292 | | | Paradise Point | ✓ |
| Intersection Advance Warning | 5 | Oregon | Douglas | 45 | 50.2 | | | Drain/Cedar Street | ✓ |
| Intersection Advance Warning | 6 | California | Shasta | 299 | 21.65 | | | Redding | ✓ |
| Lateral Safety Warning System | 1 | Oregon | Lane | 18 | 54.6 | 56.5 | | Salt Creek Tunnel Area | ✓ |
| Lateral Safety Warning System | 2 | Oregon | Curry | 9 | 331 | 336 | | Cape Sebastian | ✓ |
| Lateral Safety Warning System | 3 | Oregon | Curry | 9 | 294 | 297 | | Cape Blanco | ✓ |
| Lateral Safety Warning System | 4 | Oregon | Klamath | 4 | 193 | 197 | | Klamath Falls and OR58 | ✓ |
| Motorist-Aide Call Box | 75 | California | Modoc | 299 | 0 | 66.63 | | Notification time challenge | ✓ |
| Motorist-Aide Call Box | 76 | California | Siskiyou | 89 | 0 | 34.62 | | Notification time challenge | ✓ |
| Motorist-Aide Call Box | 77 | California | Lassen<br>Modoc | 395<br>395 | 61.09<br>0 | 138.98<br>20 | | Notification time challenge | ✓ |
| Motorist-Aide Call Box | 78 | California | Shasta | 299 | 25 | 80 | | Notification time challenge | ✓ |
| Motorist-Aide Call Box | 79 | California | Colusa | 20 | 0 | 22.12 | | Notification time challenge | ✓ |
| Motorist-Aide Call Box | 80 | California | Shasta | 89 | 0 | 43.35 | | Notification time challenge | ✓ |
| Motorist-Aide Call Box | 81 | Oregon | Harney<br>Lake (OR) | 49<br>49 | 0<br>30 | 30<br>90.02 | | Notification time challenge | ✓ |

**Table E-2:** Medium-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Motorist-Aide Call Box | 82 | Oregon | Deschutes<br>Lake (OR)<br>Harney | 7<br>7<br>7 | 0<br>69.25<br>83.79 | 69.25<br>83.79<br>105 | | Notification time challenge | ✓ |
| Motorist-Aide Call Box | 83 | California | Colusa<br>Glenn<br>Tehama<br>Shasta<br>Siskiyou | 5<br>5<br>5<br>5<br>5 | 18.72<br>0<br>0<br>0<br>0 | 34<br>29<br>42.12<br>67.02<br>69.29 | | | ✓ |
| Motorist-Aide Call Box | 84 | California | Trinity | 299 | 0 | 72.25 | | | ✓ |
| Motorist-Aide Call Box | 85 | Oregon | Josephine | 1 | 68 | 70 | | Sexton Summit | ✓ |
| Variable Message Sign | 70 | California | Mendocino | 101 | 92 | | South | All Criteria | ✓ |
| Variable Message Sign | 71 | California | Humboldt | 299 | 43 | | East | All Criteria | ✓ |
| Variable Message Sign | 72 | California | Humboldt | 96 | 0 | | South | All Criteria | ✓ |
| Variable Message Sign | 73 | Oregon | Lake (OR) | 20 | 95 | | East | Road Closure | ✓ |
| Variable Message Sign | 74 | Oregon | Lake (OR) | 19 | 137 | | South | Road Closure | ✓ |
| Variable Message Sign | 75 | Oregon | Klamath | 4 | 211 | | South | All Criteria | ✓ |
| Variable Message Sign | 76 | Oregon | Douglas | 73 | 86.01 | | South | All Criteria | ✓ |
| Variable Message Sign | 77 | Oregon | Douglas | 1 | 118 | | North | All Criteria | ✓ |
| Variable Message Sign | 78 | Oregon | Douglas | 73 | 0 | | West | All Criteria | ✓ |
| Variable Message Sign | 79 | Oregon | Douglas | 1 | 125 | | South | All Criteria | ✓ |
| Variable Message Sign | 80 | Oregon | Coos | 9 | 278 | | North | All Criteria | ✓ |
| Variable Message Sign | 81 | Oregon | Coos | 9 | 256 | | South | All Criteria | ✓ |
| Variable Message Sign | 82 | Oregon | Harney | 7 | 115 | | West | Road Closure | ✓ |
| Variable Message Sign | 83 | Oregon | Douglas | 9 | 208 | | South | All Criteria | ✓ |
| Variable Message Sign | 84 | Oregon | Lane | 62 | 0 | | East | All Criteria (leaving Florence) | ✓ |
| Variable Message Sign | 85 | Oregon | Lane | 1 | 187 | | North | All Criteria | ✓ |
| Variable Message Sign | 86 | Oregon | Lane | 1 | 190 | | North | All Criteria | ✓ |
| Variable Message Sign | 87 | Oregon | Lane | 15 | 2 | | West | All Criteria (between Mohawk & Pioneer) | ✓ |
| Variable Message Sign | 88 | Oregon | Lane | 15 | 55 | | East | All Criteria | ✓ |
| Variable Message Sign | 89 | Oregon | Deschutes | 15 | 95 | | West | All Criteria | ✓ |
| Variable Message Sign | 90 | Oregon | Curry | 9 | 299.5 | | S | Port Orford | ✓ |
| Variable Message Sign | 91 | Oregon | Curry | 9 | 300.5 | | N | Port Orford | ✓ |
| Variable Message Sign | 92 | Oregon | Curry | 9 | 329.5 | | S | Gold Beach | ✓ |
| Variable Message Sign | 93 | Oregon | Curry | 9 | 330.5 | | N | Gold Beach | ✓ |
| Variable Message Sign | 94 | Oregon | Curry | 9 | 359.5 | | S | Brookings | ✓ |
| Variable Message Sign | 95 | Oregon | Curry | 9 | 360.5 | | N | Brookings | ✓ |
| Variable Message Sign | 96 | Oregon | Deschutes | 7 | 42.64 | | East | Brothers Maintenance Station | ✓ |
| Variable Message Sign | 97 | Oregon | Deschutes | 4 | 140 | | North | Before Baker Road | ✓ |
| Variable Message Sign | 98 | Oregon | Lane | 9 | 185 | | S | Near Florence | |
| Variable Message Sign | 99 | Oregon | Lane | 9 | 194 | | N | Near Florence | ✓ |
| Variable Message Sign | 100 | California | Glenn | 5 | 23.8 | | N | Just South of 5/32 Jct | ✓ |
| Variable Message Sign | 101 | California | Tehama | 5 | 3.51 | | S | Kirkwood Road OC | ✓ |
| Variable Message Sign | 102 | California | Tehama | 5 | 5.75 | | N | Just South of Corning | ✓ |
| Variable Message Sign | 103 | California | Tehama | 5 | 9.97 | | S | South of Corning | ✓ |
| Variable Message Sign | 104 | California | Tehama | 5 | 38.72 | | N | Relocated from Trk Scale To Snively | ✓ |
| Variable Message Sign | 105 | California | Shasta | 5 | 6.75 | | N | Riverside Dr OC | ✓ |
| Variable Message Sign | 106 | California | Shasta | 5 | 10.85 | | S | Smith Road OC | ✓ |

**Table E-2:** Medium-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Variable Message Sign | 107 | California | Shasta | 5 | 13.95 | | N | Hartnell Ave OC | ✓ |
| Variable Message Sign | 108 | California | Shasta | 5 | 24.08 | | N | Mountain Gate OC | ✓ |
| Variable Message Sign | 109 | California | Shasta | 5 | 36.83 | | N | Gilman Road OC | ✓ |
| Variable Message Sign | 110 | California | Shasta | 5 | 43.5 | | S | Lakehead Rest Area | ✓ |
| Variable Message Sign | 111 | California | Shasta | 5 | 49.15 | | N | LaMoine Road OC | ✓ |
| Variable Message Sign | 112 | California | Shasta | 5 | 61.74 | | N | Sweetbrier OC | ✓ |
| Variable Message Sign | 113 | California | Siskiyou | 5 | 3 | | N | Central Dunsmuir | ✓ |
| Variable Message Sign | 114 | California | Siskiyou | 5 | 7.4 | | S | Truck Inspection Facility | ✓ |
| Variable Message Sign | 115 | California | Siskiyou | 5 | 13.18 | | S | Near North Weed | ✓ |
| Variable Message Sign | 116 | California | Siskiyou | 5 | 45.4 | | S | Just South of Yreka | ✓ |
| Variable Message Sign | 117 | California | Siskiyou | 5 | 61.55 | | S | Henley Way UC | ✓ |
| Variable Message Sign | 118 | California | Siskiyou | 5 | 65.52 | | N | Bailey Hill Road OC | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 4 | California | Modoc | 299 | 40.28 | 66.63 | | Response & notification time challenge | ✓ |
| Mayday Systems | 5 | California | Modoc | 299 | 0 | 40 | | Response & notification time challenge | ✓ |
| Mayday Systems | 6 | California | Lassen<br>Modoc | 395<br>395 | 61.09<br>0 | 138.98<br>20 | | Response & notification time challenge | ✓ |
| Mayday Systems | 7 | California | Shasta | 299 | 25 | 80 | | Notification time challenge | ✓ |
| Mayday Systems | 8 | California | Humboldt<br>Siskiyou | 96<br>96 | 0<br>0 | 44.98<br>105.82 | | Stakeholder Input | ✓ |
| Mayday Systems | 9 | California | Humboldt | 299 | 0 | 43.04 | | Notification time challenge | ✓ |
| Mayday Systems | 10 | California | Humboldt<br>Del Norte | 101<br>101 | 90<br>0 | 137.14<br>30 | | Response & notification time challenge | ✓ |
| Mayday Systems | 11 | California | Del Norte | 199 | 0 | 36.41 | | Notification time challenge | ✓ |
| Mayday Systems | 12 | Oregon | Harney<br>Lake (OR) | 49<br>49 | 0<br>30 | 30<br>90.02 | | Notification time challenge | ✓ |
| Mayday Systems | 13 | Oregon | Deschutes<br>Lake (OR)<br>Harney | 7<br>7<br>7 | 0<br>69.25<br>83.79 | 69.25<br>83.79<br>105 | | Notification time challenge | ✓ |
| Mayday Systems | 14 | California | Humboldt<br>Trinity<br>Shasta<br>Tehama | 36<br>36<br>36<br>36 | 0<br>0<br>0<br>0 | 45.68<br>41.14<br>11.93<br>40 | | | ✓ |
| Mayday Systems | 15 | California | Mendocino | 162 | 0 | 34.05 | | | ✓ |
| Mayday Systems | 16 | Oregon | Jackson<br>Douglas | 233<br>233 | 0<br>5.99 | 5.99<br>24.25 | | | ✓ |
| Regional Incident Management Plan | 16 | California | Mendocino<br>Humboldt | 101<br>101 | 58<br>0 | 104.15<br>57 | | Road Closure | ✓ |
| Regional Incident Management Plan | 17 | California | Tehama<br>Plumas<br>Lassen | 36<br>36<br>36 | 41<br>0<br>0 | 104<br>18.42<br>24 | | Road Closure | ✓ |
| Regional Incident Management Plan | 18 | California | Shasta | 44 | 0 | 48 | | Road Closure | ✓ |
| Regional Incident Management Plan | 19 | California | Siskiyou | 97 | 0 | 54.09 | | Road Closure | ✓ |
| Regional Incident Management Plan | 20 | California | Del Norte | 101 | 30 | 46.49 | | | ✓ |
| Regional Incident Management Plan | 21 | California | Mendocino | 101 | 30.83 | 58 | | | ✓ |
| Regional Incident Management Plan | 22 | Oregon | Josephine | 25 | 0 | 41.69 | | Road Closure | ✓ |

**Table E-2:** Medium-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Emergency Services (cont.)** | | | | | | | | | |
| Regional Incident Management Plan | 23 | Oregon | Douglas | 45 | 0 | 36.44 | | Debris-related closure | ✓ |
| Regional Incident Management Plan | 24 | Oregon | Douglas<br>Lane | 1<br>1 | 119<br>168.01 | 168.01<br>191 | | | ✓ |
| Regional Incident Management Plan | 25 | Oregon | Lake (OR) | 431 | 0 | 65.28 | | Road Closure | ✓ |
| Regional Incident Management Plan | 26 | Oregon | Lane<br>Klamath | 18<br>18 | 0<br>62.07 | 62.07<br>86.45 | | Road Closure | ✓ |
| Regional Incident Management Plan | 27 | Oregon | Coos<br>Douglas | 35<br>35 | 11.1<br>44.95 | 44.95<br>77 | | Road Closure | ✓ |
| Regional Incident Management Plan | 28 | Oregon | Deschutes | 17 | 0 | 18.51 | | | ✓ |
| Rural Coordinate Addressing System | 4 | California | Lassen<br>Modoc | 299<br>299 | 0<br>0 | 25.64<br>66.63 | | Response & notification time challenge | ✓ |
| Rural Coordinate Addressing System | 5 | California | Humboldt | 299 | 0 | 43.04 | | Stakeholder Input | ✓ |
| Rural Coordinate Addressing System | 6 | California | Siskiyou | 89 | 0 | 34.62 | | Notification time challenge | ✓ |
| Rural Coordinate Addressing System | 7 | California | Colusa | 20 | 0 | 22.12 | | Notification time challenge | ✓ |
| Rural Coordinate Addressing System | 8 | California | Mendocino | 162 | 0 | 34.05 | | Notification time challenge | ✓ |
| Rural Coordinate Addressing System | 9 | California | Humboldt<br>Siskiyou | 96<br>96 | 0<br>0 | 44.98<br>105.82 | | Stakeholder Input | ✓ |
| Rural Coordinate Addressing System | 10 | Oregon | Josephine | 25 | 0 | 41.69 | | Stakeholder Input | ✓ |
| Rural Coordinate Addressing System | 11 | Oregon | Deschutes<br>Lake (OR)<br>Harney | 7<br>7<br>7 | 0<br>69.25<br>83.79 | 69.25<br>83.79<br>105 | | Notification time challenge | ✓ |
| Rural Coordinate Addressing System | 12 | Oregon | Lake (OR)<br>Harney | 49<br>49 | 30<br>0 | 90.02<br>30 | | Notification time challenge | ✓ |
| Traffic Signal Priority for Emergency Vehicles | 1 | California | Shasta | 5 | 17 | | | Signal preemption - downtown Redding | ✓ |
| Traffic Signal Priority for Emergency Vehicles | 2 | California | Shasta | 5 | 5 | | | Signal preemption - downtown Anderson | ✓ |
| Traffic Signal Priority for Emergency Vehicles | 3 | Oregon | Deschutes | 15 | 111.9 | | | Signal preemption - downtown Redmond | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 6 | California | Humboldt<br>Trinity | 36<br>36 | 0<br>0 | 45.68<br>25 | | Road Closures Due to Slides & Floods | ✓ |
| 800 Travel Advisory | 7 | California | Humboldt | 101 | 108.22 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 8 | California | Humboldt<br>Del Norte | 101<br>101 | 88<br>0 | 137.14<br>30 | | Road Closures Due to Slides & Floods | ✓ |
| 800 Travel Advisory | 9 | California | Humboldt | 101 | 126.1 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 10 | California | Humboldt<br>Siskiyou<br>Trinity | 96<br>96<br>299 | 0<br>0<br>0 | 44.98<br>20<br>30 | | Road Closures Due to Slides & Floods | ✓ |
| 800 Travel Advisory | 11 | California | Del Norte | 199 | 9 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 12 | California | Del Norte | 199 | 0 | 36.41 | | Road Closures Due to Slides & Floods | ✓ |
| 800 Travel Advisory | 13 | Oregon | Curry | 9 | 358 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 14 | California | Mendocino | 1 | 64.86 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 15 | Oregon | Jackson | 1 | 19.1 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 16 | Oregon | Jackson | 1 | 50 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 17 | California | Mendocino | 1 | 60 | 104 | | Road Closures Due to Slides & Floods | ✓ |
| 800 Travel Advisory | 18 | California | Mendocino | 101 | 46 | 90 | | Road Closures Due to Slides & Floods | ✓ |
| 800 Travel Advisory | 19 | Oregon | Jackson | 22 | 24 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 20 | California | Tehama | 89 | 0 | | | Tourist Locations | ✓ |

**Table E-2:** Medium-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services (cont.)** | | | | | | | | | |
| 800 Travel Advisory | 21 | Oregon | Klamath | 4 | 247.44 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 22 | Oregon | Douglas | 1 | 99.09 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 23 | California | Humboldt | 101 | 35.11 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 24 | California | Mendocino | 20 | 0 | 44.11 | | Traveler information | ✓ |
| 800 Travel Advisory | 25 | California | Lake (CA) | 20 | 0 | 46.48 | | Traveler information | ✓ |
| 800 Travel Advisory | 26 | Oregon | Coos | 9 | 234.03 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 27 | Oregon | Douglas | 9 | 205 | | | Tourist Locations | ✓ |
| Kiosks | 48 | California | Shasta | 89 | 0 | | | Lassen Volcanic National Park | ✓ |
| Kiosks | 49 | Oregon | Jackson | 1 | 50 | | | Valley of the Rogue State Park | ✓ |
| Kiosks | 50 | Oregon | Klamath | 4 | 244 | | | Collier Memorial State Park | ✓ |
| Kiosks | 51 | Oregon | Jackson | 22 | 27 | | | Joseph Stewart State Park | ✓ |
| Kiosks | 52 | Oregon | Jackson | 22 | 24 | | | Casey State Recreation Site | ✓ |
| Kiosks | 53 | Oregon | Coos | 9 | 273 | | | Bullards Beach State Park | ✓ |
| Kiosks | 54 | Oregon | Coos | 9 | 275 | | | Bandon State Natural Area | ✓ |
| Kiosks | 55 | Oregon | Coos | 9 | 260.64 | | | Bandon Cheese Factory | ✓ |
| Kiosks | 56 | Oregon | Coos | 9 | 234.03 | | | The Mill Casino, North Bend | ✓ |
| Kiosks | 57 | Oregon | Douglas | 9 | 205 | | | Oregon Dunes Nation Rec Area | ✓ |
| Kiosks | 58 | Oregon | Jackson | 1 | 19.4 | | | Oregon Shakespeare Festival | ✓ |
| Kiosks | 59 | California | Shasta | 5 | 13 | | | Churn Creek Bottom truck stop | ✓ |
| Kiosks | 60 | California | Tehama | 5 | 12 | | | Corning truck stop | ✓ |
| Kiosks | 61 | California | Siskiyou | 5 | 60.83 | | | Redding to Border Rest Areas (Randolph Collier Rest Area) | ✓ |
| Kiosks | 62 | California | Siskiyou | 5 | 25.8 | | | Redding to Border Rest Areas (Weed Rest Area) | ✓ |
| Kiosks | 63 | California | Shasta | 5 | 43.5 | | | Redding to Border Rest Areas (Lakehead Rest Area) | ✓ |
| Kiosks | 64 | California | Shasta | 5 | 31.03 | | | Redding to Border Rest Areas (O'Brien Rest Area) | ✓ |
| Kiosks | 65 | Oregon | Lane | 9 | 191 | | | Siuslaw Road Bridge | ✓ |
| Kiosks | 66 | Oregon | Deschutes | 4 | 125.54 | | | Bend Chamber of Commerce | |
| Kiosks | 67 | Oregon | Klamath | 4 | 208 | | | Beaver Marsh/Chemult Rest Area | ✓ |
| Kiosks | 68 | Oregon | Klamath | 18 | 69 | | | Crescent Lake Jct. Snow Park | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 1 | Oregon | Jackson | 1 | 28.33 | | | Medford | ✓ |
| Dynamic Ridesharing/Paratransit | 1 | California | Lake (CA) | | | | | Lake Transit Authority | ✓ |
| Dynamic Ridesharing/Paratransit | 2 | Oregon | Josephine | | | | | Josephine County | ✓ |
| Dynamic Ridesharing/Paratransit | 3 | Oregon | Douglas | 9 | 214 | | | Reedsport | ✓ |
| Dynamic Ridesharing/Paratransit | 4 | Oregon | Curry | | | | | Southern Curry County | ✓ |
| Dynamic Ridesharing/Paratransit | 5 | Oregon | Josephine | 1 | 58 | | | Grants Pass | ✓ |
| Dynamic Ridesharing/Paratransit | 6 | Oregon | Jackson | 1 | 28 | | | Medford | ✓ |
| Dynamic Ridesharing/Paratransit | 7 | Oregon | Klamath | 4 | 276 | | | Klamath Falls | ✓ |
| Dynamic Ridesharing/Paratransit | 8 | Oregon | Jackson | 22 | 6 | | | White City | ✓ |
| On-Board Transit Safety Systems | 1 | California | Siskiyou | 5 | 2.51 | | | Dunsmuir | ✓ |
| Parking Management & Information System | 3 | California | Siskiyou | 3 | 47.38 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 4 | Oregon | Douglas | 1 | 99.09 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 5 | Oregon | Klamath | 425 | 86 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 6 | Oregon | Jackson | 272 | 32 | | | Jacksonville (Britt Festival) | ✓ |
| Parking Management & Information System | 7 | Oregon | Douglas | 1 | 122 | | | Roseburg | ✓ |
| Parking Management & Information System | 8 | Oregon | Deschutes | 15 | 111.9 | | | Redmond Fairgrounds | ✓ |
| Recreational Veh. Park and Ride Lots | 5 | Oregon | Klamath | 4 | 244 | | | Collier Memorial State Park | ✓ |

**Table E-2:** Medium-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Public Traveler/Mobility Services (cont.)** | | | | | | | | | |
| Recreational Veh. Park and Ride Lots | 6 | Oregon | Klamath | 425 | 86 | | | Crater Lake National Park | ✓ |
| Recreational Veh. Park and Ride Lots | 7 | Oregon | Douglas | 1 | 99.09 | | | Seven Feathers Hotel and Gaming Casino | ✓ |
| Recreational Veh. Park and Ride Lots | 8 | Oregon | Douglas | 1 | 122 | | | Roseburg | ✓ |
| Recreational Veh. Park and Ride Lots | 9 | Oregon | Deschutes | 15 | 111.9 | | | Redmond Fairgrounds | ✓ |
| Recreational Veh. Park and Ride Lots | 10 | Oregon | Lane | 18 | 61 | | | Gold Lake | ✓ |
| Recreational Veh. Park and Ride Lots | 11 | Oregon | Lane | 18 | 62 | | | Summit | ✓ |
| Recreational Veh. Park and Ride Lots | 12 | Oregon | Klamath | 18 | 69 | | | Crescent Lake | ✓ |
| Smart Card | 1 | Oregon | Josephine | | | | | Josephine County | ✓ |
| Transit Traveler Information | 1 | California | Humboldt<br>Humboldt | 299<br>101 | 0<br>70 | 20<br>110 | | Stakeholder Input | ✓ |
| Transit Traveler Information | 2 | California | Mendocino | 1 | 64.86 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 3 | California | Humboldt | 101 | 35.11 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 4 | California | Tehama | 89 | 0 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 5 | California | Shasta | 5 | 14.46 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 6 | California | Humboldt | 101 | 126.1 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 7 | California | Siskiyou | 3 | 47.38 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 8 | California | Del Norte | 199 | 9 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 9 | Oregon | Curry | 9 | 358 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 10 | Oregon | Curry | 9 | 345 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 11 | Oregon | Jackson | 1 | 19.1 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 12 | Oregon | Jackson | 22 | 6 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 13 | Oregon | Jackson | 1 | 50 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 14 | Oregon | Jackson | 22 | 24 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 15 | Oregon | Jackson | 22 | 27 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 16 | Oregon | Klamath | 4 | 244 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 17 | Oregon | Klamath | 4 | 247.44 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 18 | Oregon | Douglas | 1 | 99.09 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 19 | Oregon | Coos | 9 | 234.03 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 20 | Oregon | Klamath | 425 | 87 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 21 | Oregon | Coos | 9 | 251 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 22 | Oregon | Coos | 9 | 253 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 23 | Oregon | Coos | 9 | 255 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 24 | Oregon | Coos | 9 | 273 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 25 | Oregon | Coos | 9 | 275 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 26 | Oregon | Coos | 9 | 277 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 27 | Oregon | Coos | 9 | 260.64 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 28 | Oregon | Douglas | 9 | 205 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 29 | Oregon | Deschutes | 4 | 135.97 | | | RV and non-RV Park and ride locations | ✓ |
| Transit Traveler Information | 30 | Oregon | Lane | 1 | 191 | | | Eugene | ✓ |
| Transit Vehicle Routing/Scheduling | 1 | Oregon | Coos | | | | | Coos County | ✓ |
| Transit Vehicle Routing/Scheduling | 2 | Oregon | Crook | | | | | Crook, Jefferson, Deschutes Co | |
| Transit Vehicle Routing/Scheduling | 3 | Oregon | Curry | | | | | Curry County | ✓ |
| Transit Vehicle Routing/Scheduling | 4 | Oregon | Douglas | | | | | Douglas County | ✓ |
| Transit Vehicle Routing/Scheduling | 5 | Oregon | Jackson | | | | | Jackson County | ✓ |
| Transit Vehicle Routing/Scheduling | 6 | Oregon | Klamath | | | | | Klamath County | ✓ |
| Transit Vehicle Routing/Scheduling | 7 | Oregon | Lake (OR) | | | | | Lake County | ✓ |
| Transit Vehicle Routing/Scheduling | 8 | Oregon | Jackson | 1 | 28.33 | | | Medford | ✓ |

**Table E-2:** Medium-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Public Traveler/Mobility Services (cont.)** | | | | | | | | | |
| Transit Vehicle Routing/Scheduling | 9 | Oregon | Deschutes | 4 | 135.97 | | | Bend | ✓ |
| Transit Vehicle Routing/Scheduling | 10 | Oregon | Lane | 1 | 191 | | | Eugene Intercity Transit Services | ✓ |
| Transit Vehicle Routing/Scheduling | 11 | California | Shasta | 5 | 14.46 | | | Redding | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 28 | California | Humboldt | 96 | 14.25 | | | Road Closures Due to Slides & Floods | ✓ |
| Advanced Vehicle Detection | 29 | Oregon | Jackson | 1 | 4 | | | At Siskiyou Summit TMS(RTMS) | ✓ |
| Advanced Vehicle Detection | 30 | Oregon | Jackson | 1 | 1 | | | At MP 1 TMS(RTMS) | ✓ |
| Advanced Vehicle Detection | 31 | California | Mendocino | 101 | 50.45 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 32 | California | Humboldt | 101 | 2.05 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 33 | California | Humboldt | 299 | 31.35 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 34 | California | Humboldt | 101 | 122.25 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 35 | California | Del Norte | 101 | 21.15 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 36 | California | Del Norte | 199 | 1.25 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 37 | California | Del Norte | 199 | 27.05 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 38 | Oregon | Lane | 18 | 55.55 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 39 | Oregon | Klamath | 4 | 202.7 | | | N. of Chemult over RR Tracks | ✓ |
| Advanced Vehicle Detection | 40 | California | Mendocino | 101 | 100.17 | | | Around Confusion Hill | ✓ |
| Advanced Vehicle Detection | 41 | Oregon | Coos | 244 | 1 | | | | ✓ |
| Advanced Vehicle Detection | 42 | Oregon | Coos | 244 | 15.94 | | | | ✓ |
| Advanced Vehicle Detection | 43 | Oregon | Douglas | 45 | 44 | | | | ✓ |
| Advanced Vehicle Detection | 44 | Oregon | Douglas | 45 | 39 | | | Elkton Tunnel | ✓ |
| Advanced Vehicle Detection | 45 | California | Trinity | 3 | 72.87 | | | Coffee Creek | ✓ |
| Advanced Vehicle Detection | 46 | California | Trinity | 3 | 60.39 | | | Swift Creek Bridge | ✓ |
| Advanced Vehicle Detection | 47 | California | Trinity | 299 | 2.6 | | | Road Closures Due to Slides & Floods | ✓ |
| Advanced Vehicle Detection | 48 | California | Trinity | 299 | 6.15 | | | Road Closures Due to Slides & Floods | ✓ |
| Advanced Vehicle Detection | 49 | California | Trinity | 299 | 12.6 | | | Road Closures Due to Slides & Floods | ✓ |
| Advanced Vehicle Detection | 50 | California | Humboldt | 96 | 1.2 | | | Road Closures Due to Slides & Floods | ✓ |
| Advanced Vehicle Detection | 51 | California | Humboldt | 96 | 6.2 | | | Road Closures Due to Slides & Floods | ✓ |
| Advanced Vehicle Detection | 52 | California | Humboldt | 96 | 10.7 | | | Road Closures Due to Slides & Floods | ✓ |
| Automated Gate Closure | 7 | Oregon | Klamath | 18 | 86.45 | | | Road Closure Due to Bad Weather | ✓ |
| Closed-Circuit Television Camera | 105 | Oregon | Deschutes | 7 | 0 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 106 | Oregon | Deschutes | 7 | 4 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 107 | Oregon | Deschutes | 7 | 42.64 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 108 | California | Humboldt | 96 | 0 | | South | All Criteria (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 109 | California | Mendocino | 101 | 92 | | South | All Criteria (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 110 | California | Humboldt | 299 | 43 | | East | All Criteria (@ CMS) | ✓ |
| Closed-Circuit Television Camera | 111 | Oregon | Josephine | 25 | 16.1 | | | | ✓ |
| Closed-Circuit Television Camera | 112 | California | Tehama | 5 | 8.98 | | | At Corning Road OC | ✓ |
| Closed-Circuit Television Camera | 113 | California | Shasta | 5 | 3.81 | | | At the Junction of Routes 5 / 273 | ✓ |
| Closed-Circuit Television Camera | 114 | California | Shasta | 5 | 9.77 | | | At Knighton Road | ✓ |
| Closed-Circuit Television Camera | 115 | California | Shasta | 5 | 14.44 | | | At Cypress Ave | ✓ |
| Closed-Circuit Television Camera | 116 | California | Shasta | 5 | 17.31 | | | At 5 / 299 Separation | ✓ |
| Closed-Circuit Television Camera | 117 | California | Shasta | 5 | 18.07 | | | At Twin View Blvd UC | ✓ |
| Closed-Circuit Television Camera | 118 | California | Shasta | 5 | 24.08 | | | At Mountain Gate OC | ✓ |
| Closed-Circuit Television Camera | 119 | California | Shasta | 5 | 30.5 | | | Near Packers Bay S/B On | ✓ |
| Closed-Circuit Television Camera | 120 | California | Shasta | 5 | 36 | | | Near Salt Creek | ✓ |

**Table E-2:** Medium-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Closed-Circuit Television Camera | 121 | California | Shasta | 5 | 45.54 | | | Near Dog Creek | ✓ |
| Closed-Circuit Television Camera | 122 | California | Siskiyou | 5 | 0.68 | | | At the South Dunsmuir Interchange | ✓ |
| Closed-Circuit Television Camera | 123 | California | Siskiyou | 5 | 3.84 | | | At the North Dunsmuir Ave UC | ✓ |
| Closed-Circuit Television Camera | 124 | California | Shasta | 5 | 49.15 | | | Road Closure | ✓ |
| Closed-Circuit Television Camera | 125 | California | Siskiyou | 5 | 13.8 | | | At Weed Airport | ✓ |
| Closed-Circuit Television Camera | 126 | California | Siskiyou | 5 | 52.77 | | | Anderson Grade Summit | ✓ |
| Closed-Circuit Television Camera | 127 | California | Siskiyou | 5 | 61 | | | Near Hornbrook | ✓ |
| Closed-Circuit Television Camera | 128 | California | Siskiyou | 5 | 65.52 | | | At the Baily Hill Road OC | ✓ |
| Closed-Circuit Television Camera | 129 | California | Shasta | 5 | 61.74 | | | Road Closure | ✓ |
| Closed-Circuit Television Camera | 130 | California | Shasta | 5 | 65 | | | Road Closure | ✓ |
| RWIS | 63 | Oregon | Lane | 18 | 15 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 64 | Oregon | Lane | 15 | 45 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 65 | Oregon | Deschutes | 7 | 42.64 | | | Brothers Maintenance Station | ✓ |
| RWIS | 66 | Oregon | Klamath | 4 | 235.5 | | | Spring Creek @ US 97 ? | ✓ |
| RWIS | 67 | Oregon | Lane | 18 | 30 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 68 | Oregon | Lane | 62 | 36 | | | Badger Mountain/Cougar Pass | ✓ |
| RWIS | 69 | Oregon | Douglas | 233 | 19.53 | | | W. Diamond Lake Hwy | ✓ |
| RWIS | 70 | Oregon | Klamath | 20 | 31 | | | Klamath Falls - Lakeview Hwy | ✓ |
| RWIS | 71 | California | Shasta | 5 | 26.03 | | | Near the Fawndale Interchange | ✓ |
| RWIS | 72 | California | Shasta | 5 | 30.5 | | | Near Packers Bay S/B On | ✓ |
| RWIS | 73 | California | Shasta | 5 | 45.54 | | | Near Dog Creek | ✓ |
| RWIS | 74 | California | Siskiyou | 5 | 52.77 | | | Anderson Grade Summit | ✓ |
| RWIS | 75 | California | Siskiyou | 5 | 61 | | | Near Hornbrook | ✓ |
| RWIS | 76 | California | Siskiyou | 5 | 68.33 | | | Near Hilt Road OC | ✓ |
| RWIS | 77 | California | Mendocino | 1 | 80 | | | Road Closure Due to Bad Weather | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 3 | California | Humboldt | 101 | 75.91 | | | Eureka | ✓ |
| Automatic Vehicle Location | 4 | Oregon | Jackson | 1 | 28 | | | Medford | ✓ |
| Automatic Vehicle Location | 5 | Oregon | Jackson | 1 | 4 | | | Siskiyou Pass | ✓ |
| Probe Vehicle Instrumentation | 2 | Oregon | Lane | 18 | 54.6 | 56.5 | | Road Surface and Speed Challenge | ✓ |
| Probe Vehicle Instrumentation | 3 | Oregon | Jefferson | 16 | 79.5 | 81.3 | | Road Surface and Speed Challenge | ✓ |
| Probe Vehicle Instrumentation | 4 | California | Humboldt | 36 | 0 | 45.68 | | E/W California routes | ✓ |
| Probe Vehicle Instrumentation | 5 | California | Humboldt | 299 | 0 | 43.04 | | E/W California routes | ✓ |
| Probe Vehicle Instrumentation | 6 | California | Mendocino<br>Lake (CA) | 20<br>20 | 0<br>0 | 44.11<br>46.48 | | E/W California routes | ✓ |
| Probe Vehicle Instrumentation | 7 | California | Shasta<br>Siskiyou | 5<br>5 | 14.46<br>0 | 67.02<br>69.29 | | | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 1 | California | Colusa<br>Glenn<br>Tehama<br>Shasta<br>Siskiyou | 5<br>5<br>5<br>5<br>5 | 18.72<br>0<br>0<br>0<br>0 | 34<br>28.82<br>42.12<br>67.02<br>69.29 | | | ✓ |

**Table E-2:** Medium-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Commercial Vehicle Operations (cont.)** | | | | | | | | | |
| Hazmat Management | 2 | Oregon | Jackson<br>Josephine<br>Douglas<br>Lane | 1<br>1<br>1<br>1 | 0<br>52.19<br>80.8<br>168.01 | 52.19<br>80.8<br>168<br>190 | | | ✓ |
| Hazmat Management | 3 | California | Mendocino<br>Humboldt<br>Del Norte | 101<br>101<br>101 | 30.83<br>0<br>0 | 104.15<br>137.14<br>46.49 | | | ✓ |
| Hazmat Management | 4 | Oregon | Josephine | 25 | 0 | 41.69 | | | ✓ |
| Hazmat Management | 5 | Oregon | Klamath | 4 | 194.8 | 291.73 | | State Line to Or 58 Junction | ✓ |
| Preclearance | 11 | California | Mendocino | 20 | 34 | | N | Near Existing Weigh Station | ✓ |
| Preclearance | 12 | California | Mendocino | 101 | 49 | | S | Near Existing Weigh Station | ✓ |
| Preclearance | 13 | California | Humboldt | 101 | 34 | | N/S | Near Existing Weigh Station | ✓ |
| Preclearance | 14 | California | Shasta | 299 | 54.3 | | E/W | Near Existing Weigh Station | ✓ |
| Preclearance | 15 | California | Humboldt | 101 | 97 | | N/S | Near Existing Weigh Station | ✓ |
| Preclearance | 16 | California | Siskiyou | 97 | 3 | | N/S | Near Existing Weigh Station | ✓ |
| Preclearance | 17 | Oregon | Lake (OR) | 19 | 146 | | N | Near Existing Weigh Station | ✓ |
| Preclearance | 18 | Oregon | Lake (OR) | 20 | 94.36 | | W | Near Existing Weigh Station | ✓ |
| Preclearance | 19 | Oregon | Lake (OR) | 19 | 144 | | S | Near Existing Weigh Station | ✓ |
| Preclearance | 20 | Oregon | Josephine | 25 | 33.45 | | N/S | Near Existing Weigh Station | ✓ |
| Preclearance | 21 | Oregon | Jackson | 22 | 6.66 | | N | Near Existing Weigh Station | ✓ |
| Preclearance | 22 | Oregon | Jackson | 270 | 1 | | W | Near Existing Weigh Station | ✓ |
| Preclearance | 23 | Oregon | Jackson | 22 | 8.66 | | S | Near Existing Weigh Station | ✓ |
| Preclearance | 24 | Oregon | Malheur | 456 | 67 | | S | Near Existing Weigh Station | ✓ |
| Preclearance | 25 | Oregon | Malheur | 456 | 65 | | N | Near Existing Weigh Station | ✓ |
| Preclearance | 26 | Oregon | Harney | 442 | 1 | | N | Near Existing Weigh Station | ✓ |
| Preclearance | 27 | Oregon | Coos | 9 | 227.89 | | N/S | Near Existing Weigh Station | ✓ |
| Preclearance | 28 | Oregon | Deschutes | 7 | 11.6 | | E/W | Near Existing Weigh Station | ✓ |
| Preclearance | 29 | Oregon | Lane | 15 | 12.95 | | E/W | Near Existing Weigh Station | ✓ |
| Preclearance | 30 | Oregon | Lane | 62 | 43 | | E/W | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 15 | California | Mendocino | 20 | 34 | | N | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 16 | California | Mendocino | 101 | 49 | | S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 17 | California | Humboldt | 101 | 34 | | N/S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 18 | California | Shasta | 299 | 54.3 | | E/W | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 19 | California | Humboldt | 101 | 97 | | N/S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 20 | California | Siskiyou | 97 | 3 | | N/S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 21 | Oregon | Lake (OR) | 19 | 146 | | N | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 22 | Oregon | Curry | 9 | 355 | | N/S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 23 | Oregon | Josephine | 25 | 33.45 | | N/S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 24 | Oregon | Jackson | 270 | 1 | | W | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 25 | Oregon | Malheur | 456 | 67 | | S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 26 | Oregon | Malheur | 456 | 65 | | N | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 27 | Oregon | Harney | 442 | 1 | | N | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 28 | Oregon | Coos | 9 | 227.89 | | N/S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 29 | Oregon | Lane | 15 | 12.95 | | E/W | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 30 | Oregon | Lane | 62 | 43 | | E/W | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 31 | Oregon | Coos | 35 | 21.87 | | | Myrtle Point | ✓ |

**Table E-3:** Long-Term COATS Deployment.

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 17 | California | Tehama | 36 | 76.6 | 78.7 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 18 | California | Trinity | 3 | 0 | 3 | | Stakeholder Input | ✓ |
| Adv. Warning for Narrow Lanes | 19 | California | Trinity | 3 | 25 | 40 | | Stakeholder Input | ✓ |
| Adv. Warning for Narrow Lanes | 20 | California | Trinity | 299 | 47.7 | 48.6 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 21 | Oregon | Lane | 15 | 11 | 11.7 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 22 | Oregon | Jefferson | 16 | 79.5 | 81.3 | | Narrow shoulder/clear zone challenge | ✓ |
| Adv. Warning for Narrow Lanes | 23 | California | Mendocino | 1 | 88 | 102 | | Improve safety | ✓ |
| Adv. Warning for Narrow Lanes | 24 | California | Trinity | 3 | 83 | 85 | | Scott Mountain | ✓ |
| Advanced Bike/Ped Warning | 20 | California | Lassen | 36 | 24.46 | | | Bike/ped challenge (Susanville) | ✓ |
| Advanced Bike/Ped Warning | 21 | Oregon | Lane | 1 | 191 | | | Bike/ped challenge (Eugene) | ✓ |
| Advanced Bike/Ped Warning | 22 | Oregon | Curry | 9 | 339 | | | Meyer Creek | ✓ |
| Advanced Bike/Ped Warning | 23 | California | Humboldt | 101 | 89.6 | | | Mad River Bridge | ✓ |
| Advanced Bike/Ped Warning | 24 | California | Del Norte | 101 | 20 | | | Cushing Creek | ✓ |
| Advanced Bike/Ped Warning | 25 | California | Del Norte | 199 | 36 | | | Collier Tunnel | ✓ |
| Advisory Television | 17 | California | Colusa | 5 | 18.72 | | | Williams | ✓ |
| Advisory Television | 18 | California | Mendocino | 101 | 45.17 | | | Willits | ✓ |
| Advisory Television | 19 | California | Humboldt | 101 | 61.53 | | | Fortuna | ✓ |
| Advisory Television | 20 | California | Humboldt | 101 | 91.47 | | | McKinleyville | ✓ |
| Advisory Television | 21 | Oregon | Josephine | 1 | 55.78 | | | Grants Pass | ✓ |
| Advisory Television | 22 | Oregon | Douglas | 1 | 124.14 | | | Roseburg | ✓ |
| Advisory Television | 23 | Oregon | Coos | 9 | 236.77 | | | Coos Bay | ✓ |
| Advisory Television | 24 | Oregon | Lane | 9 | 190.23 | | | Florence | ✓ |
| Advisory Television | 25 | Oregon | Harney | 7 | 130.1 | | | Burns | ✓ |
| Advisory Television | 26 | Oregon | Lane | 18 | 34.13 | | | Oakridge | ✓ |
| Advisory Television | 27 | Oregon | Lane | 18 | 61 | | | Willamette Pass | ✓ |
| Advisory Television | 28 | Oregon | Klamath | 18 | 76 | | | Crescent Lake in Snow Park (10 mi. e of CL) | ✓ |
| Animal/Vehicle Collision Warning | 12 | California | Lassen | 395 | 63.99 | 126.93 | | Animal related challenge | ✓ |
| Animal/Vehicle Collision Warning | 13 | California | Modoc | 299 | 1.79 | 53.61 | | Animal related challenge | ✓ |
| Animal/Vehicle Collision Warning | 14 | California | Modoc | 395 | 2 | 60.9 | | Animal related challenge | ✓ |
| Animal/Vehicle Collision Warning | 15 | Oregon | Lake (OR) | 19 | 35 | 100.7 | | Animal related challenge | ✓ |
| Animal/Vehicle Collision Warning | 16 | California | Shasta<br>Lassen | 44<br>44 | 62.69<br>0 | 71.39<br>37.25 | | Stakeholder input | ✓ |
| Automated Anti-Icing | 9 | California | Tehama | 36 | 76.6 | 78.7 | | Road surface challenge | ✓ |
| Automated Anti-Icing | 10 | California | Lassen | 36 | 10.6 | 11.5 | | Road surface challenge | ✓ |
| Automated Anti-Icing | 11 | California | Mendocino | 20 | 20 | 29 | | Improve safety | ✓ |
| Automated Anti-Icing | 12 | Oregon | Douglas | 73 | 80 | 86.01 | | Diamond Lake Section | ✓ |
| Automated Anti-Icing | 13 | Oregon | Deschutes | 4 | 125.1 | 126.1 | | Bend Viaduct | |
| Automated Anti-Icing | 14 | California | Humboldt | 299 | 29 | 31 | | | ✓ |
| Automated Anti-Icing | 15 | Oregon | Douglas | 1 | 162 | 168 | | | ✓ |
| Automated Flood Warning | 15 | California | Humboldt | 101 | 67 | 69 | | | ✓ |
| Automated Flood Warning | 16 | California | Humboldt<br>Del Norte | 101<br>101 | 88<br>0 | 137.14<br>30 | | Flood challenge | ✓ |
| Automated Flood Warning | 17 | California | Mendocino | 101 | 46 | 59 | | Flood challenge | ✓ |
| Automated Flood Warning | 18 | California | Lake (CA) | 20 | 23 | 25 | | Improve safety | ✓ |
| Automated Flood Warning | 19 | California | Humboldt | 211 | 73.2 | 74 | | Around Ferndale | ✓ |
| Automated Flood Warning | 20 | California | Humboldt | 36 | 12 | 14 | | | ✓ |
| Automated Flood Warning | 21 | California | Lassen | 395 | 4 | 6 | | Long Valley Creek | |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Automated Visibility Warning | 9 | California | Del Norte | 101 | 20.1 | 22.2 | | Visibility challenge | ✓ |
| Automated Visibility Warning | 10 | California | Humboldt | 299 | 29.9 | 31.1 | | Visibility challenge | ✓ |
| Automated Visibility Warning | 11 | California | Humboldt | 101 | 1.2 | 2.9 | | Visibility challenge | ✓ |
| Automated Visibility Warning | 12 | California | Mendocino | 101 | 50.7 | 51.23 | | Visibility challenge | ✓ |
| Automated Visibility Warning | 13 | Oregon | Jackson | 22 | 5.9 | 6.5 | | Visibility challenge | ✓ |
| Automated Visibility Warning | 14 | Oregon | Lane | 15 | 6 | 6.9 | | Visibility challenge | ✓ |
| Automated Visibility Warning | 15 | California | Shasta | 5 | 12 | | | Fog warning in Churn Creek bottom | ✓ |
| Automated Visibility Warning | 16 | California | Tehama | 5 | 0 | 26 | | Fog warning south of Red Bluff | ✓ |
| Automated Visibility Warning | 17 | California | Del Norte | 101 | 23 | 25 | | Fog | ✓ |
| Automated Visibility Warning | 18 | California | Mendocino | 101 | 90 | 92 | | | ✓ |
| Automated Visibility Warning | 19 | California | Humboldt | 255 | 0 | 2 | | Bridge | ✓ |
| Automated Visibility Warning | 20 | California | Shasta | 299 | 67.17 | 69.17 | | Hatchet Mt. | ✓ |
| Driver Impairment Detection | 1 | California | Lake (CA) | 20 | 2.47 | 43.24 | | Fatigue challenge | ✓ |
| Driver Impairment Detection | 2 | California | Lassen | 395 | 78.25 | 137.22 | | Fatigue challenge | ✓ |
| Driver Impairment Detection | 3 | California | Modoc | 139 | 3.4 | 48 | | Fatigue challenge | ✓ |
| Driver Impairment Detection | 4 | Oregon | Douglas | 1 | 80.8 | 101 | | Azalea Pass/Canyonville to Grants Pass | ✓ |
| Dynamic Warning VMS | 22 | Oregon | Josephine | 1<br>1 | 79.28<br>80.28 | | S<br>N | Wolf Creek Pass/King Mt | ✓ |
| Dynamic Warning VMS | 23 | Oregon | Lake (OR) | 19<br>19 | 46.35<br>48.35 | | W<br>E | Silver Lake | ✓ |
| Dynamic Warning VMS | 24 | Oregon | Deschutes | 4<br>4 | 141.3<br>143.3 | | S<br>N | Lava Butte | ✓ |
| Dynamic Warning VMS | 25 | California | Mendocino | 101<br>101 | 50.7<br>512.34 | | South<br>North | Visibility Challenge | ✓ |
| Dynamic Warning VMS | 26 | California | Humboldt | 101<br>101 | 1.2<br>2.9 | | North<br>South | Visibility Challenge | ✓ |
| Dynamic Warning VMS | 27 | California | Tehama | 36<br>36 | 76.6<br>78.7 | | East<br>West | Road Surface Challenge | ✓ |
| Dynamic Warning VMS | 28 | Oregon | Lane | 15<br>15 | 6<br>6.9 | | East<br>West | Visibility Challenge | ✓ |
| Highway Advisory Radio | 54 | California | Modoc | 299 | 0.9 | | | At the Junction of 299/139 | ✓ |
| Highway Advisory Radio | 55 | California | Modoc | 299 | 22.41 | | | At Canby MTC Sta | ✓ |
| Highway Advisory Radio | 56 | California | Humboldt | 36 | 0 | | | Road Closure, Tourist | ✓ |
| Highway Advisory Radio | 57 | California | Siskiyou | 96 | 0 | | | Road Closure | ✓ |
| Highway Advisory Radio | 58 | California | Trinity | 299 | 58.2 | | | In Douglas City / Weaverville | ✓ |
| Highway Advisory Radio | 59 | California | Lassen | 395 | 90 | | | Rest Area | ✓ |
| Highway Advisory Radio | 60 | California | Humboldt | 299 | 38.83 | | | Visibility Challenge | ✓ |
| Highway Advisory Radio | 61 | California | Mendocino | 20 | 21.1 | | | Traveler information | ✓ |
| Highway Advisory Radio | 62 | California | Lake (CA) | 20 | 23.2 | | | Traveler information | ✓ |
| Highway Advisory Radio | 63 | California | Humboldt | 101 | 120.4 | | | Orick | ✓ |
| Highway Advisory Radio | 64 | California | Del Norte | 101 | 4.64 | | | Klamath | ✓ |
| Highway Advisory Radio | 65 | Oregon | Douglas | 73 | 72 | | | Mt. Bailey | ✓ |
| Highway Advisory Radio | 66 | Oregon | Jackson | 1 | 4.5 | | | Siskiyou Summit | ✓ |
| Highway Advisory Radio | 67 | California | Trinity | 3 | 0 | | | Near Peanut | ✓ |
| Highway Advisory Radio | 68 | California | Tehama | 99 | 5.9 | | | Vina | |
| Highway Advisory Radio | 69 | California | Lassen | 36 | 0.76 | | | Near Jct 147 | ✓ |
| Highway Advisory Radio | 70 | California | Lassen | 36 | 22 | | | Near Eagle Lake Road (RPT Sta) | ✓ |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Highway Advisory Radio | 71 | California | Plumas | 36 | 12.5 | | | At the Rest Area | ✓ |
| Highway Advisory Radio | 72 | California | Tehama | 36 | 83.14 | | | Mineral | ✓ |
| Highway Advisory Radio | 73 | California | Trinity | 36 | 2.39 | | | Near Mad River | ✓ |
| Highway Advisory Radio | 74 | California | Shasta | 44 | 32 | | | Near Shingletown | ✓ |
| Highway Advisory Radio | 75 | California | Shasta | 44 | 49 | | | Near Old Station | ✓ |
| Highway Advisory Radio | 76 | California | Plumas | 70 | 14.95 | | | Near Beldon | |
| Highway Advisory Radio | 77 | California | Plumas | 70 | 43.1 | | | At Quincey | |
| Highway Advisory Radio | 78 | California | Plumas | 70 | 66.63 | | | Near Jct 89 | |
| Highway Advisory Radio | 79 | California | Plumas | 70 | 92.07 | | | Near Jct 49 | |
| Highway Advisory Radio | 80 | California | Siskiyou | 97 | 51 | | | In Dorris | ✓ |
| Intersection Advance Warning | 7 | California | Del Norte | 101 | 25.84 | | | Intersection safety challenge | ✓ |
| Intersection Advance Warning | 8 | Oregon | Curry | 9 | 355.38 | | | Intersection safety challenge | ✓ |
| Intersection Advance Warning | 9 | Oregon | Curry | 9 | 327.49 | | | Intersection safety challenge | ✓ |
| Intersection Advance Warning | 10 | Oregon | Jackson | 22 | 6.04 | | | Intersection safety challenge | ✓ |
| Intersection Advance Warning | 11 | Oregon | Coos | 35 | 20.01 | | | Intersection safety challenge | ✓ |
| Intersection Advance Warning | 12 | Oregon | Coos | 35 | 10.85 | | | Intersection safety challenge | ✓ |
| Intersection Advance Warning | 13 | Oregon | Douglas | 9 | 211.11 | | | Intersection safety challenge | ✓ |
| Intersection Advance Warning | 14 | California | Lake (CA) | 20 | 31.6 | | | Rte 20/53 intersection | ✓ |
| Intersection Advance Warning | 15 | California | Humboldt | 101 | 72 | | | Moved s. of lake per workshop feedback | ✓ |
| Intersection Advance Warning | 16 | Oregon | Curry | 9 | 287.5 | | | In Langlois | ✓ |
| Intersection Advance Warning | 17 | Oregon | Curry | 9 | 301 | | | approaches to Port Orford | ✓ |
| Intersection Advance Warning | 18 | California | Mendocino | 101 | 90 | | | Rte 1/101 intersection | ✓ |
| Intersection Advance Warning | 19 | California | Mendocino | 162 | 0 | | | Rte 101/162 intersection | ✓ |
| Intersection Advance Warning | 20 | California | Humboldt | 36 | 0 | | | Rte 101/36 intersection | ✓ |
| Intersection Advance Warning | 21 | California | Shasta | 5 | 4.29 | | | Anderson | ✓ |
| Intersection Advance Warning | 22 | California | Lassen | 36 | 24.46 | | | Susanville | ✓ |
| Lateral Safety Warning System | 5 | California | Tehama | 36 | 76.6 | 78.7 | | Narrow shoulder/clear zone challenge | ✓ |
| Lateral Safety Warning System | 6 | California | Mendocino | 101 | 50.7 | 51.2 | | Narrow shoulder/clear zone challenge | ✓ |
| Lateral Safety Warning System | 7 | California | Humboldt | 101 | 1.2 | 2.9 | | Narrow shoulder/clear zone challenge | ✓ |
| Lateral Safety Warning System | 8 | California | Trinity | 3 | 0 | 3 | | Stakeholder Input | ✓ |
| Lateral Safety Warning System | 9 | California | Trinity | 3 | 25 | 40 | | Stakeholder Input | ✓ |
| Lateral Safety Warning System | 10 | California | Trinity | 299 | 47.7 | 48.6 | | Narrow shoulder/clear zone challenge | ✓ |
| Lateral Safety Warning System | 11 | California | Humboldt | 299 | 29.9 | 32.8 | | Narrow shoulder/clear zone challenge | ✓ |
| Lateral Safety Warning System | 12 | California | Humboldt | 101 | 121.8 | 122.7 | | Narrow shoulder/clear zone challenge | ✓ |
| Lateral Safety Warning System | 13 | California | Del Norte | 101 | 20.1 | 22.2 | | Narrow shoulder/clear zone challenge | ✓ |
| Lateral Safety Warning System | 14 | California | Del Norte | 199 | 0.6 | 1.9 | | Narrow shoulder/clear zone challenge | ✓ |
| Lateral Safety Warning System | 15 | California | Del Norte | 199 | 26.3 | 27.8 | | Narrow shoulder/clear zone challenge | ✓ |
| Lateral Safety Warning System | 16 | California | Siskiyou | 3 | 52 | 54.19 | | Stakeholder Input | ✓ |
| Lateral Safety Warning System | 17 | Oregon | Lane | 15 | 12.8 | 13.2 | | Narrow shoulder/clear zone challenge @ Bridge 13 | ✓ |
| Lateral Safety Warning System | 18 | Oregon | Jefferson | 16 | 79.5 | 81.3 | | Narrow shoulder/clear zone challenge | ✓ |
| Lateral Safety Warning System | 19 | California | Lake (CA) | 20 | 0 | 46.48 | | Reduced ROR accident | ✓ |
| Lateral Safety Warning System | 20 | California | Mendocino | 20 | 0 | 33.16 | | Reduced ROR accident | ✓ |
| Variable Message Sign | 119 | California | Colusa | 5 | 20 | | South | Road Closure | ✓ |
| Variable Message Sign | 120 | California | Tehama | 5 | 27 | | North | All Criteria | ✓ |
| Variable Message Sign | 121 | California | Tehama | 36 | 43 | | West | All Criteria | ✓ |
| Variable Message Sign | 122 | California | Tehama | 36 | 85 | | West | All Criteria | ✓ |
| Variable Message Sign | 123 | California | Tehama | 36 | 87 | | East | All Criteria | ✓ |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Variable Message Sign | 124 | California | Tehama | 89 | 0 | | South | All Criteria | ✓ |
| Variable Message Sign | 125 | California | Siskiyou | 5 | 8 | | North | All Criteria | ✓ |
| Variable Message Sign | 126 | California | Siskiyou | 89 | 34 | | West | All Criteria | ✓ |
| Variable Message Sign | 127 | California | Trinity | 299 | 0 | | West | All Criteria | ✓ |
| Variable Message Sign | 128 | California | Siskiyou | 5 | 21 | | South | All Criteria | ✓ |
| Variable Message Sign | 129 | California | Siskiyou | 5 | 56 | | North | All Criteria | ✓ |
| Variable Message Sign | 130 | California | Siskiyou | 5 | 58 | | South | All Criteria | ✓ |
| Variable Message Sign | 131 | Oregon | Jackson | 22 | 10 | | North | All Criteria | ✓ |
| Variable Message Sign | 132 | Oregon | Klamath | 22 | 103.95 | | South | All Criteria | ✓ |
| Variable Message Sign | 133 | Oregon | Klamath | 4 | 250 | | South | All Criteria | ✓ |
| Variable Message Sign | 134 | Oregon | Jackson | 22 | 56 | | North | All Criteria | ✓ |
| Variable Message Sign | 135 | Oregon | Jackson | 22 | 58 | | West | All Criteria | ✓ |
| Variable Message Sign | 136 | Oregon | Douglas | 233 | 23.8 | | South | All Criteria | ✓ |
| Variable Message Sign | 137 | Oregon | Jackson | 233 | 0 | | East | All Criteria | ✓ |
| Variable Message Sign | 138 | Oregon | Klamath | 425 | 86 | | West | All Criteria | ✓ |
| Variable Message Sign | 139 | Oregon | Douglas | 35 | 76.75 | | East | All Criteria | ✓ |
| Variable Message Sign | 140 | Oregon | Coos | 244 | 7 | | West | All Criteria | ✓ |
| Variable Message Sign | 141 | Oregon | Coos | 35 | 14 | | North | All Criteria | ✓ |
| Variable Message Sign | 142 | Oregon | Coos | 244 | 7 | | East | All Criteria | ✓ |
| Variable Message Sign | 143 | Oregon | Coos | 9 | 247 | | South | All Criteria | ✓ |
| Variable Message Sign | 144 | Oregon | Harney | 49 | 0 | | North | Road Closure | ✓ |
| Variable Message Sign | 145 | Oregon | Douglas | 1 | 161 | | North | All Criteria | ✓ |
| Variable Message Sign | 146 | Oregon | Douglas | 45 | 57.13 | | East | All Criteria | ✓ |
| Variable Message Sign | 147 | Oregon | Douglas | 45 | 0 | | West | All Criteria | ✓ |
| Variable Message Sign | 148 | Oregon | Lane | 62 | 52.69 | | West | All Criteria | ✓ |
| Variable Message Sign | 149 | Oregon | Lane | 15 | 57 | | West | All Criteria | ✓ |
| Variable Message Sign | 150 | Oregon | Deschutes | 15 | 91 | | East | All Criteria | ✓ |
| Variable Message Sign | 151 | Oregon | Josephine | 25 | 31 | | S | | ✓ |
| Variable Message Sign | 152 | Oregon | Josephine | 25 | 4 | | S | | ✓ |
| Variable Message Sign | 153 | California | Mendocino | 20 | 30 | | E | | ✓ |
| Variable Message Sign | 154 | California | Lassen | 395 | 70.8 | | S | Junction Standish Rd Ahead | ✓ |
| Variable Message Sign | 155 | California | Siskiyou | 3 | 46.2 | | S | Just South of Yreka | ✓ |
| Variable Message Sign | 156 | California | Trinity | 3 | 32 | | N | Just North of Weaverville | ✓ |
| Variable Message Sign | 157 | California | Tehama | 36 | 39.6 | | E | West of Baker Road | ✓ |
| Variable Message Sign | 158 | California | Tehama | 36 | 43 | | E | In Red Bluff | ✓ |
| Variable Message Sign | 159 | California | Tehama | 36 | 44 | | E | Junction of Route 99 Back | ✓ |
| Variable Message Sign | 160 | California | Lassen | 36 | 21.1 | | W | West of Susanville | ✓ |
| Variable Message Sign | 161 | California | Lassen | 36 | 1 | | E | Junction of Route 147 Ahead | ✓ |
| Variable Message Sign | 162 | California | Shasta | 44 | 2.08 | | E | Shasta View OC | ✓ |
| Variable Message Sign | 163 | California | Shasta | 44 | 2.08 | | W | Shasta View OC | ✓ |
| Variable Message Sign | 164 | California | Shasta | 44 | 6.81 | | W | West of Deschutes Road UC | ✓ |
| Variable Message Sign | 165 | California | Shasta | 44 | 62.6 | | E | Junction Rte 89 Back | ✓ |
| Variable Message Sign | 166 | California | Shasta | 44 | 63 | | W | Junction Rte 89 Ahead | ✓ |
| Variable Message Sign | 167 | California | Plumas | 70 | 32.5 | | E | Just West of Jct Rte 89 | |
| Variable Message Sign | 168 | California | Plumas | 70 | 36.48 | | W | Just West of Keddie | |
| Variable Message Sign | 169 | California | Lassen | 70 | 3.62 | | E | Just West of Rte 395 | |
| Variable Message Sign | 170 | California | Plumas | 89 | 11.45 | | S | Just North of the Jct with Rte 70 | |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Variable Message Sign | 171 | California | Plumas | 89 | 42 | | S | Junction of Route 36 Back | |
| Variable Message Sign | 172 | California | Plumas | 89 | 41.5 | | N | Just South of the Jct with Rte 36 | |
| Variable Message Sign | 173 | California | Shasta | 89 | 21.3 | | N | Junction Route 299 Back | ✓ |
| Variable Message Sign | 174 | California | Shasta | 89 | 22.1 | | S | Junction Route 299 Ahead | ✓ |
| Variable Message Sign | 175 | California | Siskiyou | 89 | 23.5 | | S | Just East of McCloud | ✓ |
| Variable Message Sign | 176 | California | Siskiyou | 96 | 105 | | W | Junction Route 263 Ahead | ✓ |
| Variable Message Sign | 177 | California | Siskiyou | 97 | 2 | | N | Just North of Weed | ✓ |
| Variable Message Sign | 178 | California | Siskiyou | 97 | 52.36 | | S | Just North of Dorris | ✓ |
| Variable Message Sign | 179 | California | Tehama | 99 | 24 | | N | Junction of Route 36 Back | |
| Variable Message Sign | 180 | California | Modoc | 139 | 1 | | N | Junction Route 299 Ahead | ✓ |
| Variable Message Sign | 181 | California | Lassen | 139 | 4 | | E | Junction Route 161 Back | ✓ |
| Variable Message Sign | 182 | California | Siskiyou | 263 | 57.5 | | N | Junction Route 96 Back | ✓ |
| Variable Message Sign | 183 | California | Trinity | 299 | 51.3 | | W | Just West of Weaverville | ✓ |
| Variable Message Sign | 184 | California | Trinity | 299 | 54.9 | | E | Just East of Little Browns Cr | ✓ |
| Variable Message Sign | 185 | California | Trinity | 299 | 58.5 | | E | Just East Route 3 | ✓ |
| Variable Message Sign | 186 | California | Shasta | 299 | 22 | | W | West of Buenaventura Blvd | ✓ |
| Variable Message Sign | 187 | California | Shasta | 299 | 23.16 | | W | East of Buenaventura Blvd | ✓ |
| Variable Message Sign | 188 | California | Shasta | 299 | 25.3 | | W | West of Hawley Road UC | ✓ |
| Variable Message Sign | 189 | California | Shasta | 299 | 27.22 | | W | Old Oregon Trail UC | ✓ |
| Variable Message Sign | 190 | California | Shasta | 299 | 73.13 | | W | West End of Burney | ✓ |
| Variable Message Sign | 191 | California | Shasta | 299 | 78.85 | | E | Johnson Park | ✓ |
| Variable Message Sign | 192 | California | Shasta | 299 | 79.5 | | E | Just South of Jct 299/89 | ✓ |
| Variable Message Sign | 193 | California | Shasta | 299 | 81.2 | | W | Just East of Jct 299/89 | ✓ |
| Variable Message Sign | 194 | California | Lassen | 299 | 14.9 | | W | Just West of Look Out Rd | ✓ |
| Variable Message Sign | 195 | California | Modoc | 299 | 0.4 | | E | In Adin East Jct Rte 139 | ✓ |
| Variable Message Sign | 196 | California | Lassen | 395 | 27.1 | | N | At the Junction of Routes 36/395 | |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 17 | California | Tehama | 36 | 40 | 90 | | Response time challenge | ✓ |
| Mayday Systems | 18 | California | Shasta<br>Siskiyou | 89<br>89 | 0<br>0 | 43.35<br>34.62 | | Notification time challenge | ✓ |
| Mayday Systems | 19 | California | Colusa | 20 | 0 | 22.12 | | Notification time challenge | ✓ |
| Mayday Systems | 20 | California | Trinity<br>Siskiyou | 3<br>3 | 0<br>0 | 85.07<br>54.19 | | Stakeholder Input | ✓ |
| Regional Incident Management Plan | 29 | California | Colusa | 20 | 0 | 22.12 | | Road Closure | ✓ |
| Regional Incident Management Plan | 30 | California | Humboldt<br>Trinity | 36<br>36 | 0<br>0 | 45.68<br>25 | | | ✓ |
| Regional Incident Management Plan | 31 | California | Tehama | 89 | 0 | 4.4 | | Road Closure | ✓ |
| Regional Incident Management Plan | 32 | California | Humboldt<br>Siskiyou | 96<br>96 | 0<br>0 | 44.98<br>20 | | Road Closure | ✓ |
| Regional Incident Management Plan | 33 | California | Shasta<br>Siskiyou | 89<br>89 | 22<br>0 | 43.35<br>34.62 | | Road Closure | ✓ |
| Regional Incident Management Plan | 34 | Oregon | Jackson<br>Klamath | 270<br>270 | 0<br>32.25 | 32.25<br>68.76 | | Road Closure | ✓ |
| Regional Incident Management Plan | 35 | Oregon | Deschutes<br>Lake (OR)<br>Harney | 7<br>7<br>7 | 0<br>69.25<br>83.79 | 69.25<br>83.79<br>144 | | Road Closure | ✓ |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Emergency Services (cont.)** | | | | | | | | | |
| Regional Incident Management Plan | 36 | Oregon | Lane<br>Lane | 62<br>15 | 0<br>0 | 52.69<br>54 | | Road Closure | ✓ |
| Regional Incident Management Plan | 37 | California | Mendocino<br>Lake (CA) | 20<br>20 | 0<br>0 | 44.11<br>46.48 | | | ✓ |
| Rural Coordinate Addressing System | 13 | California | Lassen<br>Modoc | 395<br>395 | 61.09<br>0 | 138.98<br>20 | | Response & notification time challenge | ✓ |
| Rural Coordinate Addressing System | 14 | California | Humboldt | 36 | 0 | 45.68 | | Stakeholder Input | ✓ |
| Rural Coordinate Addressing System | 15 | California | Tehama<br>Plumas<br>Lassen | 36<br>36<br>36 | 0<br>0<br>0 | 104<br>18.42<br>25.64 | | Response time challenge & stakeholder Input | ✓ |
| Rural Coordinate Addressing System | 16 | California | Glenn | 162 | 50 | 65.52 | | Notification time challenge | ✓ |
| Rural Coordinate Addressing System | 17 | California | Humboldt<br>Del Norte<br>Del Norte | 101<br>101<br>199 | 90<br>0<br>0 | 137.14<br>30<br>36.41 | | Response & notification time challenge | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 28 | Oregon | Jackson | 22 | 6 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 29 | Oregon | Coos | 9 | 255 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 30 | Oregon | Coos | 9 | 260.64 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 31 | Oregon | Coos | 9 | 277 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 32 | Oregon | Coos | 9 | 251 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 33 | Oregon | Jackson | 22 | 27 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 34 | Oregon | Klamath | 4 | 244 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 35 | Oregon | Coos | 9 | 275 | | | Tourist Locations | ✓ |
| 800 Travel Advisory | 36 | Oregon | Curry | 9 | 345 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 1 | California | Mendocino<br>Humboldt | 101<br>101 | 58<br>0 | 104.15<br>58 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 2 | California | Mendocino | 1 | 59.8 | 105.58 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 3 | California | Humboldt<br>Trinity | 36<br>36 | 0<br>0 | 45.68<br>30 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 4 | California | Tehama<br>Plumas<br>Lassen | 36<br>36<br>36 | 35<br>0<br>0 | 104<br>18.42<br>29.39 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 5 | California | Tehama | 89 | 0 | 4.4 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 6 | California | Trinity<br>Shasta | 299<br>299 | 60<br>0 | 72.25<br>25 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 7 | California | Tehama<br>Shasta<br>Siskiyou | 5<br>5<br>5 | 30<br>0<br>0 | 42.12<br>67.02<br>45 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 8 | California | Humboldt<br>Siskiyou<br>Trinity | 96<br>96<br>299 | 0<br>0<br>0 | 45<br>20<br>20 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 9 | California | Shasta<br>Siskiyou | 89<br>89 | 22<br>0 | 43.35<br>34.62 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 10 | California | Humboldt<br>Del Norte | 101<br>101 | 90<br>0 | 137.14<br>30 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 11 | California | Del Norte | 199 | 0 | 36.41 | | Road Closure Locations | ✓ |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services (cont.)** | | | | | | | | | |
| In-Vehicle Route Guidance System | 12 | California | Siskiyou | 97 | 0 | 54.09 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 13 | Oregon | Josephine | 25 | 0 | 41.69 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 14 | Oregon | Jackson | 1 | 19.1 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 15 | Oregon | Lake (OR) | 431 | 0 | 65.28 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 16 | Oregon | Curry | 9 | 358 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 17 | Oregon | Curry | 9 | 345 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 18 | Oregon | Jackson | 22 | 6 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 19 | Oregon | Jackson<br>Klamath | 270<br>270 | 0<br>32.25 | 32.25<br>68.76 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 20 | Oregon | Jackson | 22 | 24 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 21 | Oregon | Jackson | 22 | 27 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 22 | Oregon | Klamath | 4 | 215 | 270 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 23 | Oregon | Jackson<br>Josephine<br>Douglas | 1<br>1<br>1 | 30<br>52.19<br>80.8 | 52.19<br>80.8<br>120 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 24 | Oregon | Klamath | 425 | 86 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 25 | Oregon | Coos<br>Douglas | 35<br>35 | 0<br>44.95 | 44.96<br>76.75 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 26 | Oregon | Coos | 9 | 273 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 27 | Oregon | Coos | 9 | 275 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 28 | Oregon | Coos | 9 | 277 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 29 | Oregon | Coos | 9 | 253 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 30 | Oregon | Coos | 9 | 255 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 31 | Oregon | Coos | 9 | 251 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 32 | Oregon | Coos | 9 | 260.64 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 33 | Oregon | Coos | 9 | 220.58 | 250 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 34 | Oregon | Douglas | 73 | 0 | 86.01 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 35 | Oregon | Douglas | 9 | 205 | | | Tourist Locations | ✓ |
| In-Vehicle Route Guidance System | 36 | Oregon | Douglas | 45 | 0 | 57.13 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 37 | Oregon | Douglas<br>Lane | 1<br>1 | 160<br>168.01 | 168<br>190 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 38 | Oregon | Lane<br>Klamath | 18<br>18 | 0<br>62.07 | 62.07<br>86.45 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 39 | Oregon | Deschutes | 4 | 140 | 170 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 40 | Oregon | Deschutes<br>Lake (OR)<br>Harney | 7<br>7<br>7 | 0<br>69.25<br>83.79 | 69.25<br>83.79<br>105 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 41 | Oregon | Lane<br>Lane | 62<br>15 | 0<br>0 | 52.69<br>60 | | Road Closure Locations | ✓ |
| In-Vehicle Route Guidance System | 42 | Oregon | Linn<br>Jefferson<br>Deschutes | 16<br>16<br>16 | 71.5<br>81<br>90.85 | 81<br>90.85<br>100.36 | | Road Closure Locations | ✓ |
| Kiosks | 69 | California | Mendocino | 1 | 64.86 | | | MacKerricher State Park | ✓ |
| Kiosks | 70 | California | Humboldt | 101 | 35.11 | | | Humboldt Redwoods State Park | ✓ |
| Kiosks | 71 | California | Humboldt | 101 | 108.22 | | | Humboldt Lagoons State Park | ✓ |
| Kiosks | 72 | California | Humboldt | 101 | 126.1 | | | Prairie Creek Redwoods State Park | ✓ |
| Kiosks | 73 | California | Humboldt | 101 | 127 | | | Redwood Nat'l Park | ✓ |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services (cont.)** | | | | | | | | | |
| Kiosks | 74 | California | Humboldt | 101 | 89 | | | CA Welcome Center, Arcata | ✓ |
| Kiosks | 75 | California | Lake (CA) | 20 | 8.34 | | | Traveler information | ✓ |
| Kiosks | 76 | California | Lake (CA) | 20 | 31.62 | | | Traveler information | ✓ |
| Kiosks | 77 | California | Humboldt | 101 | 75.91 | | | Eureka Chamber of Commerce | ✓ |
| Kiosks | 78 | California | Humboldt | 101 | 120.4 | | | Redwood Nat'l Park @ Orick | ✓ |
| Kiosks | 79 | California | Del Norte | 101 | 25.84 | | | Crescent City | ✓ |
| Kiosks | 80 | California | Mendocino | 101 | 20.4 | | | Ukiah Chamber of Commerce | |
| Kiosks | 81 | California | Mendocino | 1 | 60.68 | | | Fort Bragg | ✓ |
| Kiosks | 82 | California | Humboldt | 96 | 0 | | | Willow Creek | ✓ |
| Kiosks | 83 | California | Humboldt | 101 | 106.6 | | | Trinidad Rest Area | ✓ |
| Kiosks | 84 | California | Del Norte | 199 | 33.41 | | | Collier Rest Area | ✓ |
| Kiosks | 85 | California | Trinity | 299 | 4 | | | Salyer Rest Area | ✓ |
| Kiosks | 86 | California | Mendocino | 101 | 82.19 | | | Empire Camp Rest Area | ✓ |
| Kiosks | 87 | California | Mendocino | 101 | 60.88 | | | Irvine Lodge Rest Area | ✓ |
| Kiosks | 88 | California | Mendocino | 101 | 58.28 | | | Moss Cove Rest Area | ✓ |
| Kiosks | 89 | California | Siskiyou | 5 | 7.1 | | S | Truck Scales | ✓ |
| Kiosks | 90 | California | Shasta | 5 | 9.77 | | | Knighton Rd Truck Stop | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 2 | California | Mendocino | 101 | 45.17 | | | Willits Bus Stations | ✓ |
| Automated Passenger Counting | 3 | California | Mendocino | 101 | 68.78 | | | Laytonville Bus Stations | ✓ |
| Automated Passenger Counting | 4 | California | Tehama | 36 | 40.32 | | | Red Bluff | ✓ |
| Automated Passenger Counting | 5 | California | Lassen | 36 | 24.46 | | | Mt Lassen Cab, Shuttle | ✓ |
| Automated Passenger Counting | 6 | California | Shasta | 5 | 14.46 | | | Redding | ✓ |
| Automated Passenger Counting | 7 | California | Humboldt | 101 | 75.91 | | | Eureka Transit Service | ✓ |
| Automated Passenger Counting | 8 | California | Humboldt | 101 | 85.83 | | | Arcata | ✓ |
| Automated Passenger Counting | 9 | California | Siskiyou | 5 | 2.51 | | | Dunsmuir | ✓ |
| Automated Passenger Counting | 10 | California | Del Norte | 101 | 25.84 | | | Redwood Dial-a-Ride | ✓ |
| Automated Passenger Counting | 11 | Oregon | Lake (OR) | 19 | 142.64 | | | Lakeview | ✓ |
| Automated Passenger Counting | 12 | Oregon | Klamath | 4 | 272.31 | | | Klamath Falls Amtrak | ✓ |
| Automated Passenger Counting | 13 | Oregon | Josephine | 1 | 55.78 | | | Grants Pass | ✓ |
| Automated Passenger Counting | 14 | Oregon | Douglas | 1 | 124.14 | | | Roseburg | ✓ |
| Automated Passenger Counting | 15 | Oregon | Klamath | 4 | 203.2 | | | Chemult Amtrak | ✓ |
| Automated Passenger Counting | 16 | Oregon | Deschutes | 4 | 135.97 | | | Bend | ✓ |
| Automated Passenger Counting | 17 | Oregon | Lane | 1 | 191 | | | Eugene Intercity Transit Services | ✓ |
| Automated Passenger Counting | 18 | Oregon | Coos | 9 | 260.64 | | | Bandon | ✓ |
| Automated Passenger Counting | 19 | Oregon | Curry | 9 | 327.85 | | | Gold Beach | ✓ |
| Automated Passenger Counting | 20 | Oregon | Curry | 9 | 355.38 | | | Brookings | ✓ |
| Automated Passenger Counting | 21 | California | Lake (CA) | | | | | Lake Transit Authority | ✓ |
| Automated Passenger Counting | 22 | California | Humboldt | | | | | Arcata, Mad River, Humboldt Transit Authority | ✓ |
| Automated Passenger Counting | 23 | California | Lassen | | | | | Lassen Transit Authority | ✓ |
| Automated Passenger Counting | 24 | California | Mendocino | | | | | Mendocino Transit Authority | ✓ |
| Automated Passenger Counting | 25 | California | Modoc | | | | | Sage Stage | ✓ |
| Automated Passenger Counting | 26 | California | Plumas | | | | | Plumas County Transit | ✓ |
| Automated Passenger Counting | 27 | California | Shasta | | | | | Trailways Lines, Inc | ✓ |
| Automated Passenger Counting | 28 | California | Siskiyou | | | | | Stage (Siskiyou Transit & General Express) | ✓ |
| Automated Passenger Counting | 29 | California | Tehama | | | | | Trailways Lines, Inc | ✓ |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Public Traveler/Mobility Services (cont.)** | | | | | | | | | |
| Automated Passenger Counting | 30 | Oregon | Coos | | | | | Coos County | ✓ |
| Automated Passenger Counting | 31 | Oregon | Crook | | | | | Crook, Jefferson, Deschutes Co | |
| Automated Passenger Counting | 32 | Oregon | Curry | | | | | Curry County | ✓ |
| Automated Passenger Counting | 33 | Oregon | Deschutes | | | | | Crook, Jefferson, Deschutes Co | ✓ |
| Automated Passenger Counting | 34 | Oregon | Douglas | | | | | Douglas County | ✓ |
| Automated Passenger Counting | 35 | Oregon | Jackson | | | | | Jackson County | ✓ |
| Automated Passenger Counting | 36 | Oregon | Jefferson | | | | | Deschutes & Jefferson County | ✓ |
| Automated Passenger Counting | 37 | Oregon | Josephine | | | | | Josephine County | ✓ |
| Automated Passenger Counting | 38 | Oregon | Klamath | | | | | Klamath County | ✓ |
| Automated Passenger Counting | 39 | Oregon | Lake (OR) | | | | | Lake County | ✓ |
| Automated Passenger Counting | 40 | Oregon | Malheur | | | | | Malheur County | ✓ |
| Automatic Vehicle Identification System | 1 | Oregon | Josephine | | | | | Josephine County | ✓ |
| Automatic Vehicle Identification System | 2 | California | Lake (CA) | | | | | Lake Transit Authority | ✓ |
| Dynamic Ridesharing/Paratransit | 9 | California | Humboldt<br>Trinity<br>Shasta | 299<br>299<br>299 | 0<br>0<br>0 | 43.04<br>72.25<br>21.65 | | Stakeholder Input | ✓ |
| Dynamic Ridesharing/Paratransit | 10 | California | Humboldt | 101 | 75.91 | 137.14 | | Stakeholder Input | ✓ |
| On-Board Transit Safety Systems | 2 | California | Mendocino | 101 | 45.17 | | | Willits Bus Stations | ✓ |
| On-Board Transit Safety Systems | 3 | California | Mendocino | 101 | 68.78 | | | Laytonville Bus Stations | ✓ |
| On-Board Transit Safety Systems | 4 | California | Tehama | 36 | 40.32 | | | Red Bluff | ✓ |
| On-Board Transit Safety Systems | 5 | California | Lassen | 36 | 24.46 | | | Mt Lassen Cab, Shuttle | ✓ |
| On-Board Transit Safety Systems | 6 | California | Shasta | 5 | 14.46 | | | Redding | ✓ |
| On-Board Transit Safety Systems | 7 | California | Humboldt | 101 | 75.91 | | | Eureka Transit Service | ✓ |
| On-Board Transit Safety Systems | 8 | California | Humboldt | 101 | 85.83 | | | Arcata | ✓ |
| On-Board Transit Safety Systems | 9 | California | Del Norte | 101 | 25.84 | | | Redwood Dial-a-Ride | ✓ |
| On-Board Transit Safety Systems | 10 | Oregon | Lake (OR) | 19 | 142.64 | | | Lakeview | ✓ |
| On-Board Transit Safety Systems | 11 | Oregon | Klamath | 4 | 272.31 | | | Klamath Falls Amtrak | ✓ |
| On-Board Transit Safety Systems | 12 | Oregon | Jackson | 1 | 28.33 | | | Medford | ✓ |
| On-Board Transit Safety Systems | 13 | Oregon | Josephine | 1 | 55.78 | | | Grants Pass | ✓ |
| On-Board Transit Safety Systems | 14 | Oregon | Douglas | 1 | 124.14 | | | Roseburg | ✓ |
| On-Board Transit Safety Systems | 15 | Oregon | Klamath | 4 | 203.2 | | | Chemult Amtrak | ✓ |
| On-Board Transit Safety Systems | 16 | Oregon | Deschutes | 4 | 135.97 | | | Bend | ✓ |
| On-Board Transit Safety Systems | 17 | Oregon | Lane | 1 | 191 | | | Eugene Intercity Transit Services | ✓ |
| On-Board Transit Safety Systems | 18 | Oregon | Coos | 9 | 260.64 | | | Bandon | ✓ |
| On-Board Transit Safety Systems | 19 | Oregon | Curry | 9 | 327.85 | | | Gold Beach | ✓ |
| On-Board Transit Safety Systems | 20 | Oregon | Curry | 9 | 355.38 | | | Brookings | ✓ |
| On-Board Transit Safety Systems | 21 | California | Lake (CA) | | | | | Lake Transit Authority | ✓ |
| On-Board Transit Safety Systems | 22 | California | Humboldt | | | | | Arcata, Mad River, Humboldt Transit Authority | ✓ |
| On-Board Transit Safety Systems | 23 | California | Lassen | | | | | Lassen Transit Authority | ✓ |
| On-Board Transit Safety Systems | 24 | California | Mendocino | | | | | Mendocino Transit Authority | ✓ |
| On-Board Transit Safety Systems | 25 | California | Modoc | | | | | Sage Stage | ✓ |
| On-Board Transit Safety Systems | 26 | California | Plumas | | | | | Plumas County Transit | ✓ |
| On-Board Transit Safety Systems | 27 | California | Shasta | | | | | Trailways Lines, Inc | ✓ |
| On-Board Transit Safety Systems | 28 | California | Siskiyou | | | | | Stage (Siskiyou Transit & General Express) | ✓ |
| On-Board Transit Safety Systems | 29 | California | Tehama | | | | | Trailways Lines, Inc | ✓ |
| On-Board Transit Safety Systems | 30 | Oregon | Coos | | | | | Coos County | ✓ |
| On-Board Transit Safety Systems | 31 | Oregon | Crook | | | | | Crook, Jefferson, Deschutes Co | |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Transit Vehicle Routing/Scheduling | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Public Traveler/Mobility Services (cont.)** | | | | | | | | | |
| On-Board Transit Safety Systems | 32 | Oregon | Curry | | | | | Curry County | ✓ |
| On-Board Transit Safety Systems | 33 | Oregon | Deschutes | | | | | Crook, Jefferson, Deschutes Co | ✓ |
| On-Board Transit Safety Systems | 34 | Oregon | Douglas | | | | | Douglas County | ✓ |
| On-Board Transit Safety Systems | 35 | Oregon | Jackson | | | | | Jackson County | ✓ |
| On-Board Transit Safety Systems | 36 | Oregon | Jefferson | | | | | Deschutes & Jefferson County | ✓ |
| On-Board Transit Safety Systems | 37 | Oregon | Josephine | | | | | Josephine County | ✓ |
| On-Board Transit Safety Systems | 38 | Oregon | Klamath | | | | | Klamath County | ✓ |
| On-Board Transit Safety Systems | 39 | Oregon | Lake (OR) | | | | | Lake County | ✓ |
| On-Board Transit Safety Systems | 40 | Oregon | Malheur | | | | | Malheur County | ✓ |
| Parking Management & Information System | 9 | California | Mendocino | 1 | 64.86 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 10 | California | Humboldt | 101 | 35.11 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 11 | California | Tehama | 89 | 0 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 12 | California | Shasta | 5 | 14.46 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 13 | California | Humboldt | 101 | 108.22 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 14 | California | Humboldt | 101 | 126.1 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 15 | California | Del Norte | 199 | 9 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 16 | Oregon | Curry | 9 | 358 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 17 | Oregon | Jackson | 22 | 6 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 18 | Oregon | Jackson | 1 | 50 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 19 | Oregon | Klamath<br>Klamath | 4<br>4 | 244<br>247.4 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 20 | Oregon | Coos | 9 | 234.03 | | | Tourist Locations | ✓ |
| Parking Management & Information System | 21 | Oregon | Douglas | 9 | 205 | | | Tourist Locations | ✓ |
| Recreational Veh. Park and Ride Lots | 13 | California | Shasta | 89 | 0 | | | Lassen Volcanic National Park | ✓ |
| Recreational Veh. Park and Ride Lots | 14 | California | Mendocino | 1 | 64.86 | | | MacKerricher State Park | ✓ |
| Recreational Veh. Park and Ride Lots | 15 | California | Humboldt | 101 | 35.11 | | | Humboldt Redwoods State Park | ✓ |
| Recreational Veh. Park and Ride Lots | 16 | California | Humboldt | 101 | 108.22 | | | Humboldt Lagoons State Park | ✓ |
| Recreational Veh. Park and Ride Lots | 17 | California | Humboldt | 101 | 126.1 | | | Prairie Creek Redwoods State Park | ✓ |
| Recreational Veh. Park and Ride Lots | 18 | California | Del Norte | 199 | 9 | | | Jedediah Smith Redwoods State Park | ✓ |
| Recreational Veh. Park and Ride Lots | 19 | Oregon | Curry | 9 | 358 | | | Harris Beach State Park | ✓ |
| Recreational Veh. Park and Ride Lots | 20 | Oregon | Jackson | 1 | 50 | | | Valley of the Rogue State Park | ✓ |
| Recreational Veh. Park and Ride Lots | 21 | Oregon | Klamath | 4 | 247.44 | | | Kla-Mo-Ya Casino | ✓ |
| Recreational Veh. Park and Ride Lots | 22 | Oregon | Coos | 9 | 234.03 | | | The Mill Casino, North Bend | ✓ |
| Recreational Veh. Park and Ride Lots | 23 | Oregon | Douglas | 9 | 205 | | | Oregon Dunes Nation Rec Area | ✓ |
| Recreational Veh. Park and Ride Lots | 24 | Oregon | Coos | 9 | 243 | | | Coos Bay | ✓ |
| Smart Card | 2 | California | Lake (CA) | | | | | Lake Transit Authority | ✓ |
| Smart Card | 3 | California | Mendocino | | | | | Transit operations | ✓ |
| Transit Vehicle Routing/Scheduling | 12 | California | Modoc | | | | | Sage Stage | ✓ |
| Transit Vehicle Routing/Scheduling | 13 | California | Plumas | | | | | Plumas County Transit | ✓ |
| Transit Vehicle Routing/Scheduling | 14 | California | Shasta | | | | | Trailways Lines, Inc | ✓ |
| Transit Vehicle Routing/Scheduling | 15 | California | Siskiyou | | | | | Stage (Siskiyou Transit & General Express) | ✓ |
| Transit Vehicle Routing/Scheduling | 16 | California | Tehama | | | | | Trailways Lines, Inc | ✓ |
| Transit Vehicle Routing/Scheduling | 17 | Oregon | Deschutes | | | | | Crook, Jefferson, Deschutes Co | ✓ |
| Transit Vehicle Routing/Scheduling | 18 | Oregon | Jefferson | | | | | Deschutes & Jefferson County | ✓ |
| Transit Vehicle Routing/Scheduling | 19 | Oregon | Josephine | | | | | Josephine County | ✓ |
| Transit Vehicle Routing/Scheduling | 20 | Oregon | Malheur | | | | | Malheur County | ✓ |
| Transit Vehicle Routing/Scheduling | 21 | California | Lake (CA) | | | | | Lake Transit Authority | ✓ |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Public Traveler/Mobility Services (cont.)** | | | | | | | | | |
| Transit Vehicle Routing/Scheduling | 22 | California | Humboldt | | | | | Arcata, Mad River, Humboldt Transit Authority | ✓ |
| Transit Vehicle Routing/Scheduling | 23 | California | Lassen | | | | | Lassen Transit Authority | ✓ |
| Transit Vehicle Routing/Scheduling | 24 | California | Mendocino | | | | | Mendocino Transit Authority | ✓ |
| Transit Vehicle Routing/Scheduling | 25 | California | Mendocino | 101 | 45.17 | | | Willits Bus Stations | ✓ |
| Transit Vehicle Routing/Scheduling | 26 | California | Mendocino | 101 | 68.78 | | | Laytonville Bus Stations | ✓ |
| Transit Vehicle Routing/Scheduling | 27 | California | Tehama | 36 | 40.32 | | | Red Bluff | ✓ |
| Transit Vehicle Routing/Scheduling | 28 | California | Lassen | 36 | 24.46 | | | Mt Lassen Cab, Shuttle | ✓ |
| Transit Vehicle Routing/Scheduling | 29 | California | Humboldt | 101 | 75.91 | | | Eureka Transit Service | ✓ |
| Transit Vehicle Routing/Scheduling | 30 | California | Humboldt | 101 | 85.83 | | | Arcata | ✓ |
| Transit Vehicle Routing/Scheduling | 31 | California | Siskiyou | 5 | 2.51 | | | Dunsmuir | ✓ |
| Transit Vehicle Routing/Scheduling | 32 | California | Del Norte | 101 | 25.84 | | | Redwood Dial-a-Ride | ✓ |
| Transit Vehicle Routing/Scheduling | 33 | Oregon | Lake (OR) | 19 | 142.64 | | | Lakeview | ✓ |
| Transit Vehicle Routing/Scheduling | 34 | Oregon | Klamath | 4 | 272.31 | | | Klamath Falls Amtrak | ✓ |
| Transit Vehicle Routing/Scheduling | 35 | Oregon | Josephine | 1 | 55.78 | | | Grants Pass | ✓ |
| Transit Vehicle Routing/Scheduling | 36 | Oregon | Douglas | 1 | 124.14 | | | Roseburg | ✓ |
| Transit Vehicle Routing/Scheduling | 37 | Oregon | Klamath | 4 | 203.2 | | | Chemult Amtrak | ✓ |
| Transit Vehicle Routing/Scheduling | 38 | Oregon | Coos | 9 | 260.64 | | | Bandon | ✓ |
| Transit Vehicle Routing/Scheduling | 39 | Oregon | Curry | 9 | 327.85 | | | Gold Beach | ✓ |
| Transit Vehicle Routing/Scheduling | 40 | Oregon | Curry | 9 | 355.38 | | | Brookings | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 53 | California | Lassen | 395 | 5 | | | Long Valley Creek | |
| Advanced Vehicle Detection | 54 | California | Tehama | 36 | 77.65 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 55 | California | Trinity | 3 | 1.5 | | | Stakeholder Input | ✓ |
| Advanced Vehicle Detection | 56 | California | Trinity | 3 | 25 | | | Stakeholder Input | ✓ |
| Advanced Vehicle Detection | 57 | California | Trinity | 3 | 40 | | | Stakeholder Input | ✓ |
| Advanced Vehicle Detection | 58 | California | Trinity | 299 | 48.15 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 59 | Oregon | Lane | 15 | 11.35 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 60 | Oregon | Jefferson | 16 | 80.4 | | | Narrow shoulder/clear zone challenge | ✓ |
| Advanced Vehicle Detection | 61 | California | Mendocino | 1 | 95 | | | Improve safety | ✓ |
| Advanced Vehicle Detection | 62 | California | Trinity | 3 | 84 | | | Scott Mountain | ✓ |
| Advanced Vehicle Detection | 63 | California | Humboldt | 101 | 88 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 64 | California | Humboldt | 101 | 97.83 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 65 | California | Humboldt | 101 | 107.66 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 66 | California | Humboldt | 101 | 117.49 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 67 | California | Humboldt | 101 | 127.31 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 68 | California | Humboldt | 101 | 137.14 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 69 | California | Del Norte | 101 | 0 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 70 | California | Del Norte | 101 | 10 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 71 | California | Del Norte | 101 | 20 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 72 | California | Del Norte | 101 | 30 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 73 | California | Mendocino | 101 | 46 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 74 | California | Mendocino | 101 | 59 | | | Flood challenge | ✓ |
| Advanced Vehicle Detection | 75 | California | Lake (CA) | 20 | 24 | | | Improve safety | ✓ |
| Advanced Vehicle Detection | 76 | California | Humboldt | 211 | 73.5 | | | Around Ferndale | ✓ |
| Advanced Vehicle Detection | 77 | California | Humboldt | 36 | 13 | | | | ✓ |
| Advanced Vehicle Detection | 78 | California | Humboldt | 101 | 68 | | | | ✓ |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Automated Gate Closure | 8 | California | Siskiyou<br>Trinity | 3<br>3 | 8<br>62 | | | Road Closure Due to Bad Weather | ✓ |
| Automated Gate Closure | 9 | California | Mendocino | 101 | 60 | | | Road Closure Due to Bad Weather | ✓ |
| Automated Gate Closure | 10 | California | Tehama | 89 | 4.4 | | | Road Closure Due to Bad Weather | ✓ |
| Automated Gate Closure | 11 | California | Humboldt | 36 | 0 | | | Road Closure Due to Bad Weather | ✓ |
| Automated Gate Closure | 12 | California | Siskiyou | 5 | 5 | | | Road Closure Due to Bad Weather | ✓ |
| Automated Gate Closure | 13 | California | Siskiyou | 89 | 34.62 | | | Road Closure Due to Bad Weather | ✓ |
| Automated Gate Closure | 14 | California | Siskiyou | 5 | 43 | | | Road Closure Due to Bad Weather | ✓ |
| Automated Gate Closure | 15 | California | Tehama<br>Tehama | 172<br>172 | 0<br>8.92 | | | Road Closure Due to Bad Weather | |
| Closed-Circuit Television Camera | 131 | California | Tehama | 5 | 27 | | | Road Closure | ✓ |
| Closed-Circuit Television Camera | 132 | California | Humboldt | 101 | 120.4 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 133 | California | Del Norte | 101 | 4.64 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 134 | California | Lassen | 395 | 51.5 | | | Southbound | |
| Closed-Circuit Television Camera | 135 | California | Lassen | 395 | 5.7 | | | Northbound | |
| Closed-Circuit Television Camera | 136 | California | Modoc | 299 | 50.2 | | | At Cedar Pass Sandhouse | ✓ |
| Closed-Circuit Television Camera | 137 | California | Modoc | 299 | 12.73 | | | At Adin Mountain Summit | ✓ |
| Closed-Circuit Television Camera | 138 | California | Tehama | 5 | 38.72 | | | Road Closure | ✓ |
| Closed-Circuit Television Camera | 139 | California | Shasta | 299 | 89.4 | | | On PIT 1 Grade | ✓ |
| Closed-Circuit Television Camera | 140 | California | Siskiyou | 89 | 34 | | | Road Closure | ✓ |
| Closed-Circuit Television Camera | 141 | California | Modoc | 299 | 42 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 142 | California | Lassen | 395 | 70.8 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 143 | California | Lassen | 395 | 90 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 144 | California | Modoc | 395 | 2.09 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 145 | California | Modoc | 395 | 21 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 146 | Oregon | Deschutes | 7 | 62 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 147 | Oregon | Lake (OR) | 49 | 90.02 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 148 | Oregon | Curry | 9 | 333.5 | | | Sebastian Marsh Creek | ✓ |
| Closed-Circuit Television Camera | 149 | California | Siskiyou | 5 | 60.83 | | | Randolph Collier Rest Area | ✓ |
| Closed-Circuit Television Camera | 150 | California | Modoc | 299 | 39.5 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 151 | California | Siskiyou | 97 | 19.8 | | | Grass Lake Rest Area | ✓ |
| Closed-Circuit Television Camera | 152 | California | Shasta | 5 | 43.5 | | | Lakehead Rest Area | ✓ |
| Closed-Circuit Television Camera | 153 | California | Shasta | 5 | 31.03 | | | O'Brien Rest Area | ✓ |
| Closed-Circuit Television Camera | 154 | California | Trinity | 299 | 56.03 | | | Moon Lim Lee Rest Area | ✓ |
| Closed-Circuit Television Camera | 155 | California | Shasta | 299 | 60.58 | | | Hillcrest Rest Area | ✓ |
| Closed-Circuit Television Camera | 156 | California | Shasta | 44 | 34.67 | | | Shingletown Rest Area | ✓ |
| Closed-Circuit Television Camera | 157 | California | Lassen | 44 | 14.53 | | | Bogard Rest Area | ✓ |
| Closed-Circuit Television Camera | 158 | California | Lassen | 395 | 96.5 | | | Secret Valley Rest Area | ✓ |
| Closed-Circuit Television Camera | 159 | California | Plumas | 36 | 12.8 | | | Lake Almanor Rest Area | ✓ |
| Closed-Circuit Television Camera | 160 | California | Siskiyou | 3 | 8.5 | | | Near Callahan | ✓ |
| Closed-Circuit Television Camera | 161 | California | Trinity | 3 | 18.67 | | | At Hayfork Summit | ✓ |
| Closed-Circuit Television Camera | 162 | California | Trinity | 3 | 83 | | | Scott Mountain Summit | ✓ |
| Closed-Circuit Television Camera | 163 | California | Tehama | 32 | 16 | | | Near Deer Creek | |
| Closed-Circuit Television Camera | 164 | California | Tehama | 36 | 73 | | | Near Battle Creek Vista Point | ✓ |
| Closed-Circuit Television Camera | 165 | California | Tehama | 36 | 82.2 | | | At Mineral Maintenance Sta | ✓ |
| Closed-Circuit Television Camera | 166 | California | Tehama | 36 | 87.79 | | | At Morgan Summit | ✓ |
| Closed-Circuit Television Camera | 167 | California | Trinity | 36 | 10.26 | | | South Fork Mountain | ✓ |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Closed-Circuit Television Camera | 168 | California | Shasta | 44 | 1.24 | | | At Victor Avenue OC | ✓ |
| Closed-Circuit Television Camera | 169 | California | Shasta | 44 | 3.63 | | | At Airport Road OC | ✓ |
| Closed-Circuit Television Camera | 170 | California | Shasta | 44 | 37.05 | | | Starlite Pines Road | ✓ |
| Closed-Circuit Television Camera | 171 | California | Shasta | 44 | 50.52 | | | At Eskimo Hill | ✓ |
| Closed-Circuit Television Camera | 172 | California | Lassen | 44 | 0 | | | At the County Line | ✓ |
| Closed-Circuit Television Camera | 173 | California | Modoc | 299 | 22.41 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 174 | California | Modoc | 299 | 0 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 175 | California | Plumas | 70 | 55.24 | | | Lee Summit | |
| Closed-Circuit Television Camera | 176 | California | Plumas | 70 | 70.68 | | | Near the Sandhouse | |
| Closed-Circuit Television Camera | 177 | California | Plumas | 89 | 29.6 | | | Near Canyon Dam | |
| Closed-Circuit Television Camera | 178 | California | Shasta | 89 | 11 | | | Near the Hat Creek Ranger Station | ✓ |
| Closed-Circuit Television Camera | 179 | California | Shasta | 89 | 36.89 | | | Near Red Hill Cut | ✓ |
| Closed-Circuit Television Camera | 180 | California | Siskiyou | 89 | 3.23 | | | At Deadhorse Summit | ✓ |
| Closed-Circuit Television Camera | 181 | California | Tehama | 89 | 0 | | | Road Closure | ✓ |
| Closed-Circuit Television Camera | 182 | California | Siskiyou | 97 | 29.91 | | | At Mt Hebron Summit | ✓ |
| Closed-Circuit Television Camera | 183 | California | Siskiyou | 97 | 49.83 | | | At Dorris Inspection Sta | ✓ |
| Closed-Circuit Television Camera | 184 | California | Lassen | 139 | 20.46 | | | Near Willow Creek Hill | ✓ |
| Closed-Circuit Television Camera | 185 | California | Modoc | 139 | 27.91 | | | Near Tionesta Rd | ✓ |
| Closed-Circuit Television Camera | 186 | California | Shasta | 89 | 21.3 | | | Road Closure | ✓ |
| Closed-Circuit Television Camera | 187 | California | Tehama | 36 | 39.6 | | | Response time challenge | ✓ |
| Closed-Circuit Television Camera | 188 | California | Shasta | 299 | 0.03 | | | At Buckhorn Summit | ✓ |
| Closed-Circuit Television Camera | 189 | California | Shasta | 299 | 8.72 | | | At Clear Crk | ✓ |
| Closed-Circuit Television Camera | 190 | California | Shasta | 299 | 14.49 | | | At Shasta Divide | ✓ |
| Closed-Circuit Television Camera | 191 | California | Shasta | 299 | 22.23 | | | At Buenaventura Blvd. | ✓ |
| Closed-Circuit Television Camera | 192 | California | Shasta | 299 | 25.05 | | | At Park Marina | ✓ |
| Closed-Circuit Television Camera | 193 | California | Shasta | 299 | 25.05 | | | At Park Marina | ✓ |
| Closed-Circuit Television Camera | 194 | California | Shasta | 299 | 25.54 | | | At Hawley Road UC | ✓ |
| Closed-Circuit Television Camera | 195 | California | Shasta | 299 | 27.22 | | | At Old Oregon Trail UC | ✓ |
| Closed-Circuit Television Camera | 196 | California | Shasta | 299 | 29.89 | | | At Future Dana Ramp | ✓ |
| Closed-Circuit Television Camera | 197 | California | Shasta | 299 | 68.17 | | | At Hatchet Mt Summit | ✓ |
| Closed-Circuit Television Camera | 198 | California | Shasta | 299 | 75.47 | | | At Mountain View Road | ✓ |
| Closed-Circuit Television Camera | 199 | California | Siskiyou | 89 | 23.5 | | | Road Closure | ✓ |
| RWIS | 78 | California | Tehama | 36 | 82.2 | | | At Mineral Maintenance Sta | ✓ |
| RWIS | 79 | California | Tehama | 36 | 87.79 | | | At Morgan Summit | ✓ |
| RWIS | 80 | California | Trinity | 36 | 10.26 | | | South Fork Mountain | ✓ |
| RWIS | 81 | California | Shasta | 44 | 37.05 | | | Starlite Pines Road | ✓ |
| RWIS | 82 | California | Shasta | 44 | 50.52 | | | At Eskimo Hill | ✓ |
| RWIS | 83 | California | Lassen | 44 | 0 | | | At the County Line | ✓ |
| RWIS | 84 | California | Lassen | 44 | 14.53 | | | Near Bogard Rest Area | ✓ |
| RWIS | 85 | California | Trinity | 299 | 15 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 86 | California | Plumas | 70 | 55.24 | | | Lee Summit | |
| RWIS | 87 | California | Plumas | 70 | 70.68 | | | Near the Sandhouse | |
| RWIS | 88 | California | Plumas | 89 | 29.6 | | | Near Canyon Dam | |
| RWIS | 89 | California | Shasta | 89 | 11 | | | Near the Hat Creek Ranger Station | ✓ |
| RWIS | 90 | California | Shasta | 89 | 36.89 | | | Near Red Hill Cut | ✓ |
| RWIS | 91 | California | Siskiyou | 89 | 3.23 | | | At Deadhorse Summit | ✓ |
| RWIS | 92 | California | Siskiyou | 97 | 29.91 | | | At Mt Hebron Summit | ✓ |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| RWIS | 93 | California | Siskiyou | 97 | 49.83 | | | At Dorris Inspection Sta | ✓ |
| RWIS | 94 | California | Lassen | 139 | 20.46 | | | Near Willow Creek Hill | ✓ |
| RWIS | 95 | California | Modoc | 139 | 27.91 | | | Near Tionesta Rd | ✓ |
| RWIS | 96 | California | Shasta | 299 | 0.03 | | | At Buckhorn Summit | ✓ |
| RWIS | 97 | California | Shasta | 299 | 8.72 | | | At Clear Crk | ✓ |
| RWIS | 98 | California | Trinity | 36 | 25 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 99 | California | Trinity | 36 | 0 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 100 | California | Humboldt | 96 | 15 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 101 | California | Siskiyou | 96 | 0 | | | Road Closure Due to Bad Weather | ✓ |
| RWIS | 102 | California | Del Norte | 101 | 20.1 | | | Visibility Challenge | ✓ |
| RWIS | 103 | Oregon | Deschutes | 7 | 62 | | | Hampton | ✓ |
| RWIS | 104 | Oregon | Lake (OR) | 19 | 69.09 | | | Summer Lake | ✓ |
| RWIS | 105 | California | Modoc | 299 | 12.73 | | | At Adin Mountain Summit | ✓ |
| RWIS | 106 | California | Lake (CA) | 20 | 0 | | | | ✓ |
| RWIS | 107 | California | Lake (CA) | 20 | 23 | | | | ✓ |
| RWIS | 108 | California | Lake (CA) | 20 | 46.48 | | | | ✓ |
| RWIS | 109 | California | Colusa | 20 | 3.45 | | | Hwy 16 junction | ✓ |
| RWIS | 110 | Oregon | Lake (OR) | 19 | 63.01 | | | Picture Rock Pass | ✓ |
| RWIS | 111 | California | Modoc | 299 | 50.2 | | | At Cedar Pass Sandhouse | ✓ |
| RWIS | 112 | California | Tehama | 32 | 16 | | | Near Deer Creek | |
| RWIS | 113 | California | Shasta | 299 | 14.49 | | | At Shasta Divide | ✓ |
| RWIS | 114 | California | Siskiyou | 3 | 8.5 | | | Near Callahan | ✓ |
| RWIS | 115 | California | Trinity | 3 | 18.67 | | | At Hayfork Summit | ✓ |
| RWIS | 116 | California | Trinity | 3 | 83 | | | Scott Mountain Summit | ✓ |
| RWIS | 117 | California | Shasta | 299 | 68.17 | | | At Hatchet Mt Summit | ✓ |
| RWIS | 118 | California | Tehama | 36 | 73 | | | Near Battle Creek Vista Point | ✓ |
| Satellite Traffic Operations Center | 10 | California | Lassen | 36 | 24.46 | | | Susanville | ✓ |
| Satellite Traffic Operations Center | 11 | Oregon | Lane | 1 | 191 | | | At District Office In Springfield | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 6 | California | Modoc | 299 | 40.28 | | | Alturas | ✓ |
| Automatic Vehicle Location | 7 | California | Lassen | 36 | 24.46 | | | Susanville | ✓ |
| Automatic Vehicle Location | 8 | California | Tehama | 5 | 24.87 | | | Red Bluff | ✓ |
| Automatic Vehicle Location | 9 | California | Shasta | 5 | 14.46 | | | Redding | ✓ |
| Automatic Vehicle Location | 10 | Oregon | Jackson | 22 | 57.28 | 65.45 | | | ✓ |
| Automatic Vehicle Location | 11 | Oregon | Jackson | 233 | 0 | 5.99 | | | ✓ |
| | | | Douglas | 233 | 5.99 | 24.25 | | | |
| Automatic Vehicle Location | 12 | Oregon | Deschutes | 7 | 42.64 | 69.25 | | Brothers to Burns | ✓ |
| | | Oregon | Lake (OR) | 7 | 69.25 | 83.79 | | | |
| | | Oregon | Harney | 7 | 83.79 | 130 | | | |
| Automatic Vehicle Location | 13 | Oregon | Douglas | 73 | 0 | 86.01 | | | ✓ |
| Probe Vehicle Instrumentation | 8 | California | Lassen | 36 | 10.6 | 11.5 | | Road Surface and Speed Challenge | ✓ |
| Probe Vehicle Instrumentation | 9 | California | Trinity | 36 | 0 | 41.14 | | E/W California routes | ✓ |
| | | California | Shasta | 36 | 0 | 11.93 | | | |
| | | California | Tehama | 36 | 0 | 104 | | | |
| | | California | Plumas | 36 | 0 | 18.42 | | | |

**Table E-3:** Long-Term COATS Deployment (cont.).

| Infrastructure Name | ID# | State | County | Hwy | From | To | Direction | Description | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Fleet Operations and Maintenance (cont.)** | | | | | | | | | |
| Probe Vehicle Instrumentation | 10 | California | Shasta<br>Lassen | 44<br>44 | 0<br>0 | 71.39<br>37.25 | | E/W California routes | ✓ |
| Probe Vehicle Instrumentation | 11 | California<br>California<br>California<br>California | Trinity<br>Shasta<br>Lassen<br>Modoc | 299<br>299<br>299<br>299 | 0<br>0<br>0<br>0 | 72.25<br>99.36<br>25.64<br>66.63 | | E/W California routes | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 6 | California | Del Norte | 199 | 0 | 36.41 | | | ✓ |
| Hazmat Management | 7 | California | Humboldt | 299 | 0 | 43.04 | | | ✓ |
| Hazmat Management | 8 | California | Mendocino<br>Lake (CA) | 20<br>20 | 0<br>0 | 44.11<br>46.48 | | | ✓ |
| Hazmat Management | 9 | Oregon | Lane<br>Klamath | 18<br>18 | 0<br>62.07 | 62.007<br>86.45 | | | ✓ |
| Preclearance | 31 | Oregon | Harney | 440 | 1 | | N | Near Existing Weigh Station | ✓ |
| Preclearance | 32 | Oregon | Malheur | 442 | 90 | | S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 32 | Oregon | Lake (OR) | 20 | 94.36 | | W | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 33 | Oregon | Lake (OR) | 19 | 144 | | S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 34 | Oregon | Jackson | 22 | 6.66 | | N | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 35 | Oregon | Jackson | 22 | 8.66 | | S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 36 | Oregon | Malheur | 442 | 90 | | S | Near Existing Weigh Station | ✓ |
| Weigh in Motion | 37 | Oregon | Harney | 440 | 1 | | N | Near Existing Weigh Station | ✓ |

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# APPENDIX F: NORTHERN CALIFORNIA ITS DEPLOYMENT

The following legend applies to all tables in this appendix:

| | |
|---|---|
| **Infrastructure Type** | See Appendix D |
| **ID #** | The unique number of a particular technology. If two locations share the same number, they are treated as a package for deployment purposes. |
| **County** | Self-explanatory |
| **Hwy** | Interstate Number, U.S. Highway Number, or State Highway Number |
| **From** | Starting post mile |
| **To** | Ending post mile |
| **Direction** | The direction that a particular technology is facing |
| **Description** | Additional detail about the reason or location for deployment. |
| **Priority** | Existing refers to technologies in the ground as of December 2000; Short-term refers to deployment within the next four years; Medium-term refers to deployment within four to eight years; Long-term refers to deployment within eight to fifteen years. |

**Table F-1:** Deployment Locations in Colusa, Glenn and Lake Counties.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Advisory Television | 13 | Lake (CA) | 20 | 31.62 | | | Clearlake (@ 53 junction) | Medium-Term | ✓ |
| Advisory Television | 17 | Colusa | 5 | 18.72 | | | Williams | Long-Term | ✓ |
| Automated Flood Warning | 18 | Lake (CA) | 20 | 23 | 25 | | Improve safety | Long-Term | ✓ |
| Driver Impairment Detection | 1 | Lake (CA) | 20 | 2.47 | 43.24 | | Fatigue challenge | Long-Term | ✓ |
| Dynamic Warning VMS | 9 | Lake (CA) | 20 | 41.4 | | W | | Medium-Term | ✓ |
| | | | | 40.4 | | E | | | |
| Highway Advisory Radio | 3 | Lake (CA) | 53 | 1.47 | | | Clearlake at Dam Rd | Existing | |
| Highway Advisory Radio | 32 | Glenn | 5 | 24.6 | | | Dist 2/3 Border (Orland) | Medium-Term | |
| Highway Advisory Radio | 37 | Colusa | 5 | 20 | | | Rest Area | Medium-Term | |
| Highway Advisory Radio | 62 | Lake (CA) | 20 | 23.2 | | | Traveler information | Long-Term | ✓ |
| Intersection Advance Warning | 14 | Lake (CA) | 20 | 31.6 | | | Rte 20/53 intersection | Long-Term | ✓ |
| Lateral Safety Warning System | 19 | Lake (CA) | 20 | 0 | 46.48 | | Reduced ROR accident | Long-Term | ✓ |
| Motorist-Aide Call Box | 39 | Lake (CA) | 20 | 4.45 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 40 | Lake (CA) | 20 | 5.94 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 41 | Lake (CA) | 20 | 10.85 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 42 | Lake (CA) | 20 | 12.68 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 43 | Lake (CA) | 20 | 15.52 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 44 | Lake (CA) | 20 | 21.16 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 45 | Lake (CA) | 20 | 23.09 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 46 | Lake (CA) | 20 | 32.82 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 47 | Lake (CA) | 20 | 34.42 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 48 | Lake (CA) | 20 | 36.4 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 49 | Lake (CA) | 20 | 38.66 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 50 | Lake (CA) | 20 | 40.85 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 51 | Lake (CA) | 20 | 42.36 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 52 | Lake (CA) | 20 | 44.7 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 53 | Lake (CA) | 20 | 46.22 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 54 | Lake (CA) | 20 | 31.05 | | | Lake County | Existing | ✓ |
| Motorist-Aide Call Box | 55 | Lake (CA) | 29 | 3.33 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 56 | Lake (CA) | 29 | 8.04 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 57 | Lake (CA) | 29 | 12.06 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 58 | Lake (CA) | 29 | 14.28 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 59 | Lake (CA) | 29 | 16.78 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 60 | Lake (CA) | 29 | 18.02 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 61 | Lake (CA) | 29 | 22.5 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 62 | Lake (CA) | 29 | 24.47 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 63 | Lake (CA) | 29 | 26.81 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 64 | Lake (CA) | 29 | 29.65 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 65 | Lake (CA) | 29 | 31.05 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 66 | Lake (CA) | 29 | 33.59 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 67 | Lake (CA) | 29 | 35.71 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 68 | Lake (CA) | 29 | 38.2 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 69 | Lake (CA) | 29 | 48.63 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 70 | Lake (CA) | 29 | 51.43 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 71 | Lake (CA) | 53 | 4.13 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 72 | Lake (CA) | 53 | 6.43 | | | Lake County | Existing | |
| Motorist-Aide Call Box | 79 | Colusa | 20 | 0 | 22.12 | | Notification time challenge | Medium-Term | ✓ |

**Table F-1:** Deployment Locations in Colusa, Glenn and Lake Counties (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Motorist-Aide Call Box | 83 | Colusa | 5 | 18.72 | 34 | | | Medium-Term | ✓ |
| | | Glenn | 5 | 0 | 29 | | | | |
| Variable Message Sign | 17 | Lake (CA) | 20 | 31.62 | | N | At 20/53 Intersection | Existing | ✓ |
| Variable Message Sign | 32 | Lake (CA) | 20 | 46.48 | | W | Traveler information | Short-Term | ✓ |
| Variable Message Sign | 56 | Lake (CA) | 20 | 7.4 | | W | | Short-Term | ✓ |
| Variable Message Sign | 61 | Lake (CA) | 20 | 32.6 | | W | E of Jct 53 | Short-Term | ✓ |
| Variable Message Sign | 62 | Lake (CA) | 20 | 30.6 | | E | W of Jct 53 | Short-Term | ✓ |
| Variable Message Sign | 63 | Lake (CA) | 53 | 5.1 | | N | S of Jct 20 | Short-Term | |
| Variable Message Sign | 100 | Glenn | 5 | 23.8 | | N | Just South of 5/32 Jct | Medium-Term | ✓ |
| Variable Message Sign | 119 | Colusa | 5 | 20 | | South | Road Closure | Long-Term | ✓ |
| Variable Message Sign (Portable) | 8 | Lake (CA) | 20 | 25.97 | | S | Clearlake Oaks | Existing | ✓ |
| Variable Message Sign (Portable) | 9 | Lake (CA) | 29 | 41 | | S | Lakeport | Existing | |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 19 | Colusa | 20 | 0 | 22.12 | | Notification time challenge | Long-Term | ✓ |
| Regional Incident Management Plan | 29 | Colusa | 20 | 0 | 22.12 | | Road Closure | Long-Term | ✓ |
| Regional Incident Management Plan | 37 | Lake (CA) | 20 | 0 | 46.48 | | | Long-Term | ✓ |
| Rural Coordinate Addressing System | 7 | Colusa | 20 | 0 | 22.12 | | Notification time challenge | Medium-Term | ✓ |
| Rural Coordinate Addressing System | 16 | Glenn | 162 | 50 | 65.52 | | Notification time challenge | Long-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 25 | Lake (CA) | 20 | 0 | 46.48 | | Traveler information | Medium-Term | ✓ |
| Kiosks | 75 | Lake (CA) | 20 | 8.34 | | | Traveler information | Long-Term | ✓ |
| Kiosks | 76 | Lake (CA) | 20 | 31.62 | | | Traveler information | Long-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 21 | Lake (CA) | | | | | Lake Transit Authority | Long-Term | ✓ |
| Automatic Vehicle Identification System | 2 | Lake (CA) | | | | | Lake Transit Authority | Long-Term | ✓ |
| Dynamic Ridesharing/Paratransit | 1 | Lake (CA) | | | | | Lake Transit Authority | Medium-Term | ✓ |
| On-Board Transit Safety Systems | 21 | Lake (CA) | | | | | Lake Transit Authority | Long-Term | ✓ |
| Smart Card | 2 | Lake (CA) | | | | | Lake Transit Authority | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 21 | Lake (CA) | | | | | Lake Transit Authority | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 75 | Lake (CA) | 20 | 24 | | | Improve safety | Long-Term | ✓ |
| Closed-Circuit Television Camera | 86 | Lake (CA) | 53 | 5.1 | | N | S of Jct 20 (@ CMS) | Short-Term | |
| Closed-Circuit Television Camera | 94 | Lake (CA) | 20 | 7.4 | | E | W of Jct 29 (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 102 | Lake (CA) | 20 | 46.48 | | W | Traveler information (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 103 | Lake (CA) | 20 | 32.6 | | W | E of Jct 53 (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 104 | Lake (CA) | 20 | 30.6 | | E | W of Jct 53 (@ CMS) | Short-Term | ✓ |
| RWIS | 106 | Lake (CA) | 20 | 0 | | | | Long-Term | ✓ |
| RWIS | 107 | Lake (CA) | 20 | 23 | | | | Long-Term | ✓ |
| RWIS | 108 | Lake (CA) | 20 | 46.48 | | | | Long-Term | ✓ |
| RWIS | 109 | Colusa | 20 | 3.45 | | | Hwy 16 junction | Long-Term | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Probe Vehicle Instrumentation | 6 | Lake (CA) | 20 | 0 | 46.48 | | E/W California routes | Medium-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 1 | Glenn | 5 | 0 | 28.82 | | | Medium-Term | ✓ |
| | | Colusa | 5 | 18.72 | 34 | | | | |
| Hazmat Management | 8 | Lake (CA) | 20 | 0 | 46.48 | | | Long-Term | ✓ |

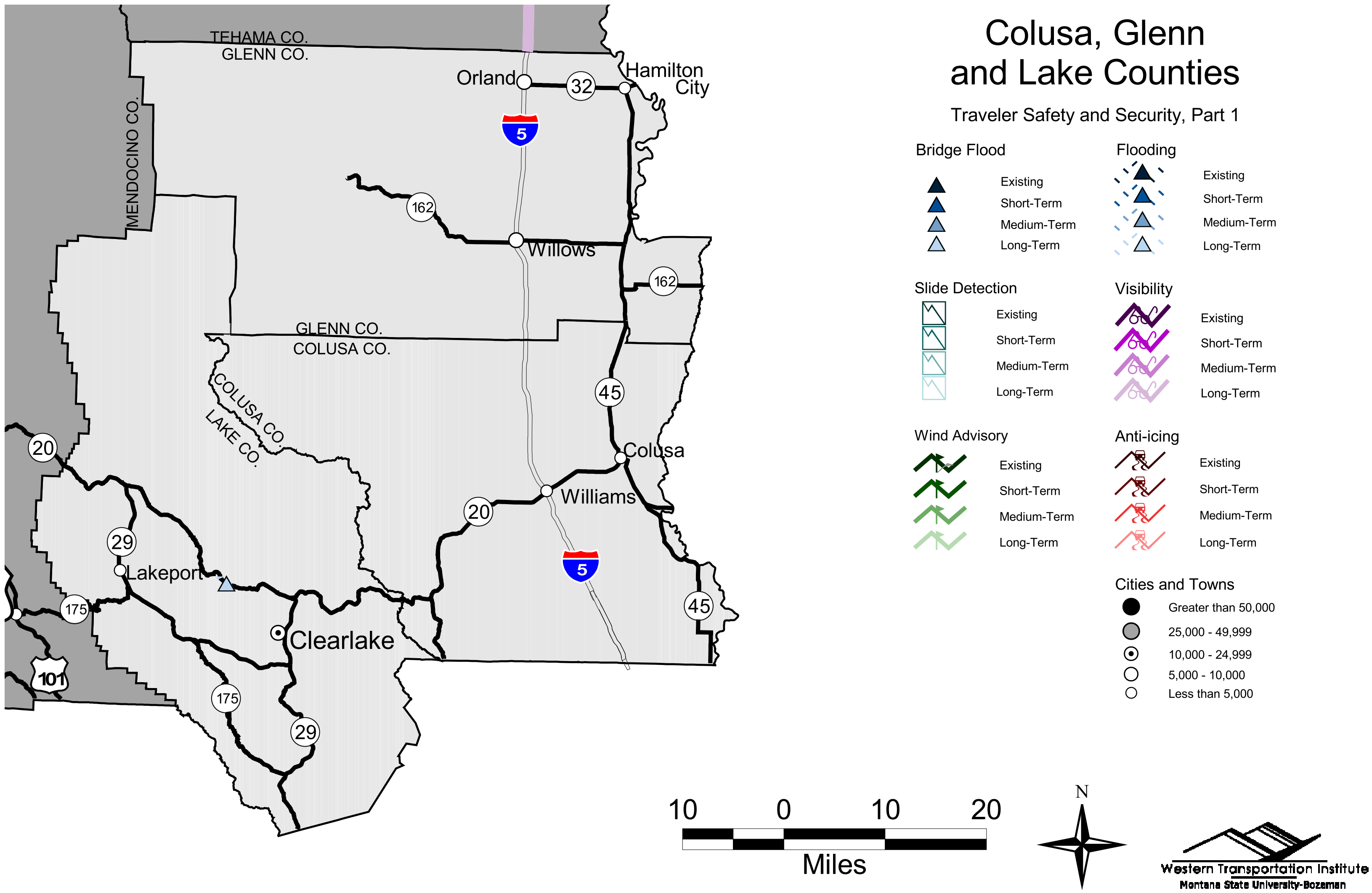


**Figure F-1:** Traveler Safety and Security (Part 1) in Colusa, Glenn and Lake Counties.

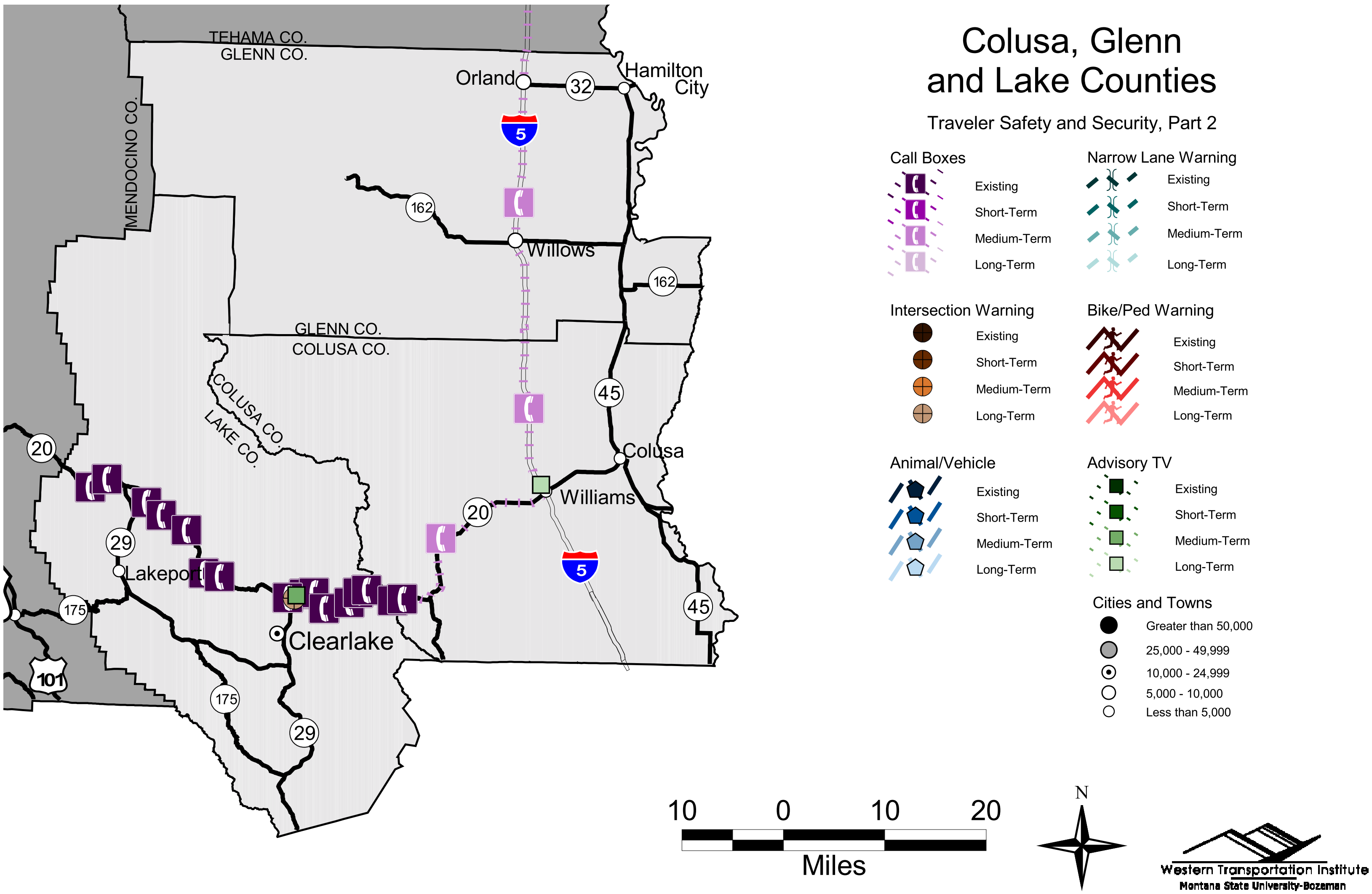


**Figure F-2:** Traveler Safety and Security (Part 2) in Colusa, Glenn and Lake Counties.

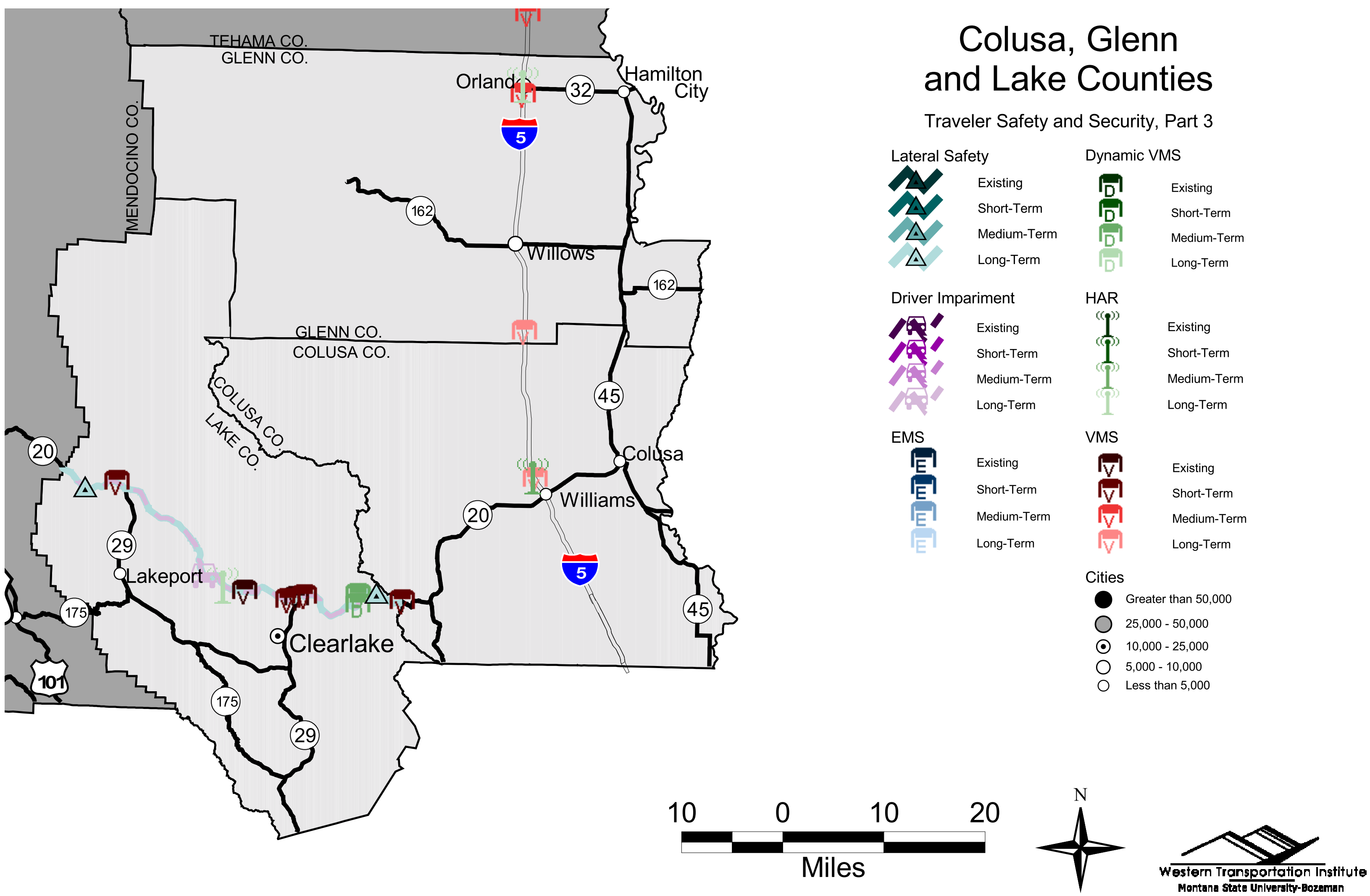


**Figure F-3:** Traveler Safety and Security (Part 3) in Colusa, Glenn and Lake Counties.

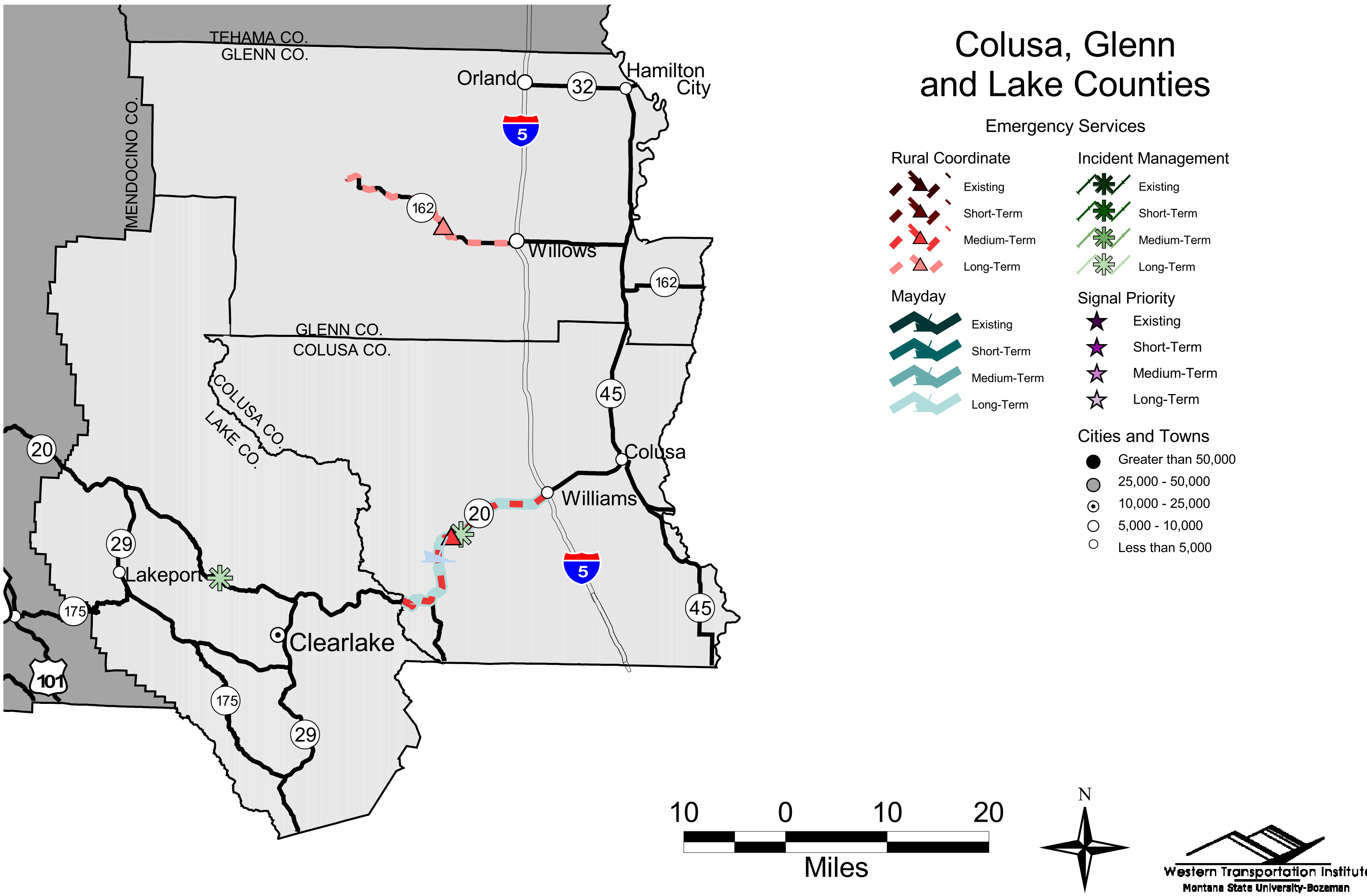


**Figure F-4:** Emergency Services in Colusa, Glenn and Lake Counties.

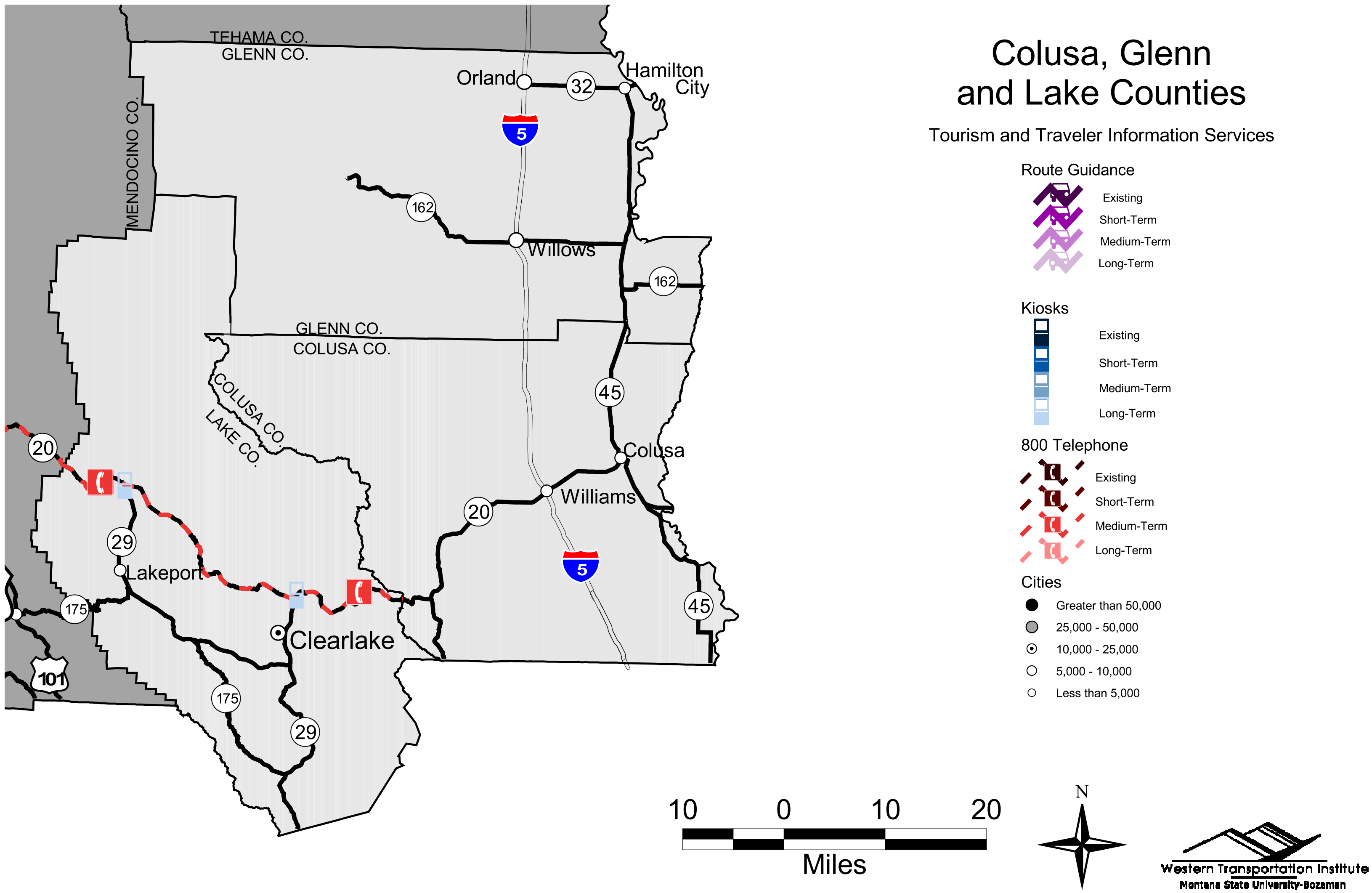


**Figure F-5:** Tourism and Traveler Information Services in Colusa, Glenn and Lake Counties.

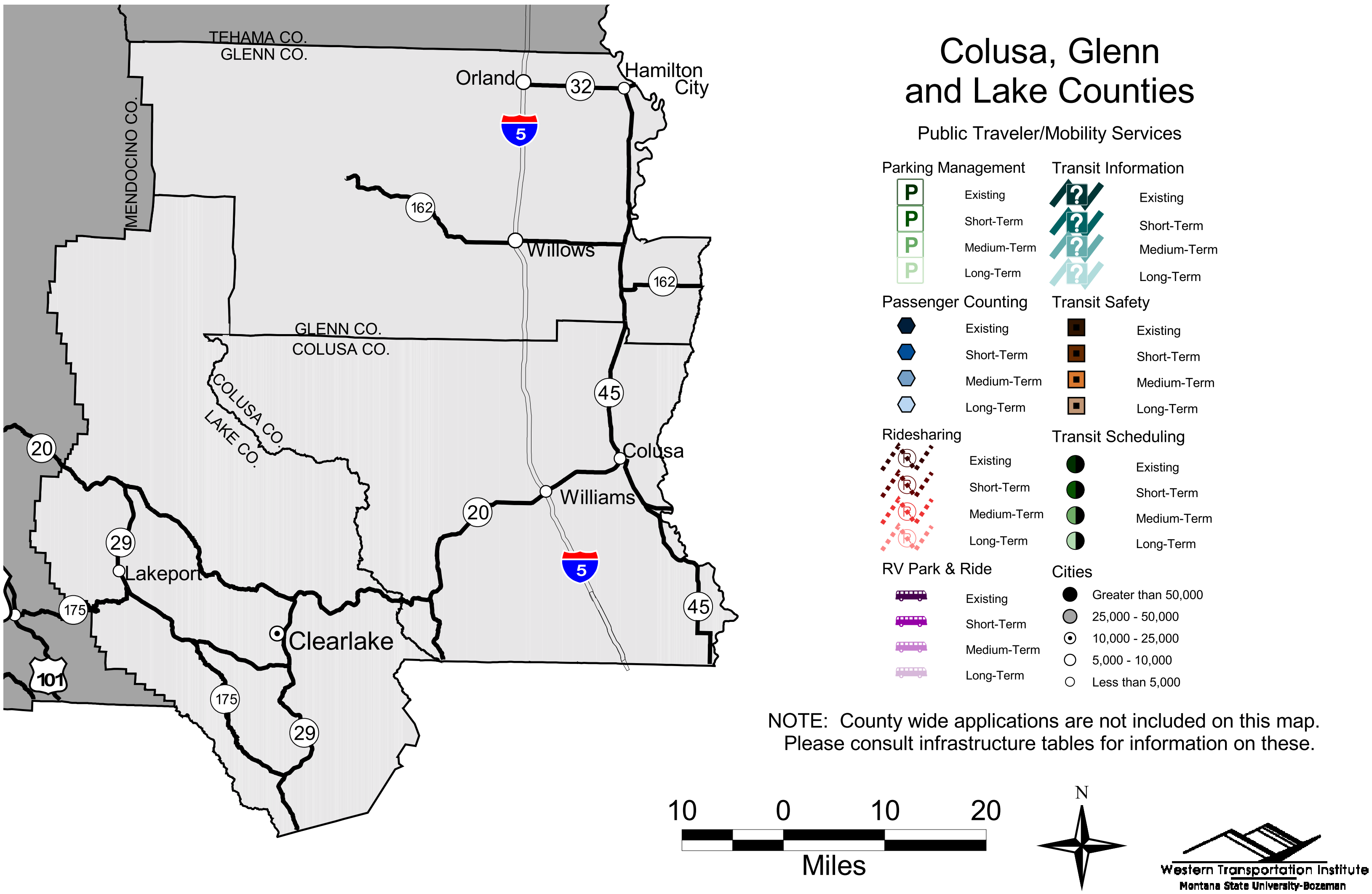


**Figure F-6:** Public Traveler/Mobility Services in Colusa, Glenn and Lake Counties.

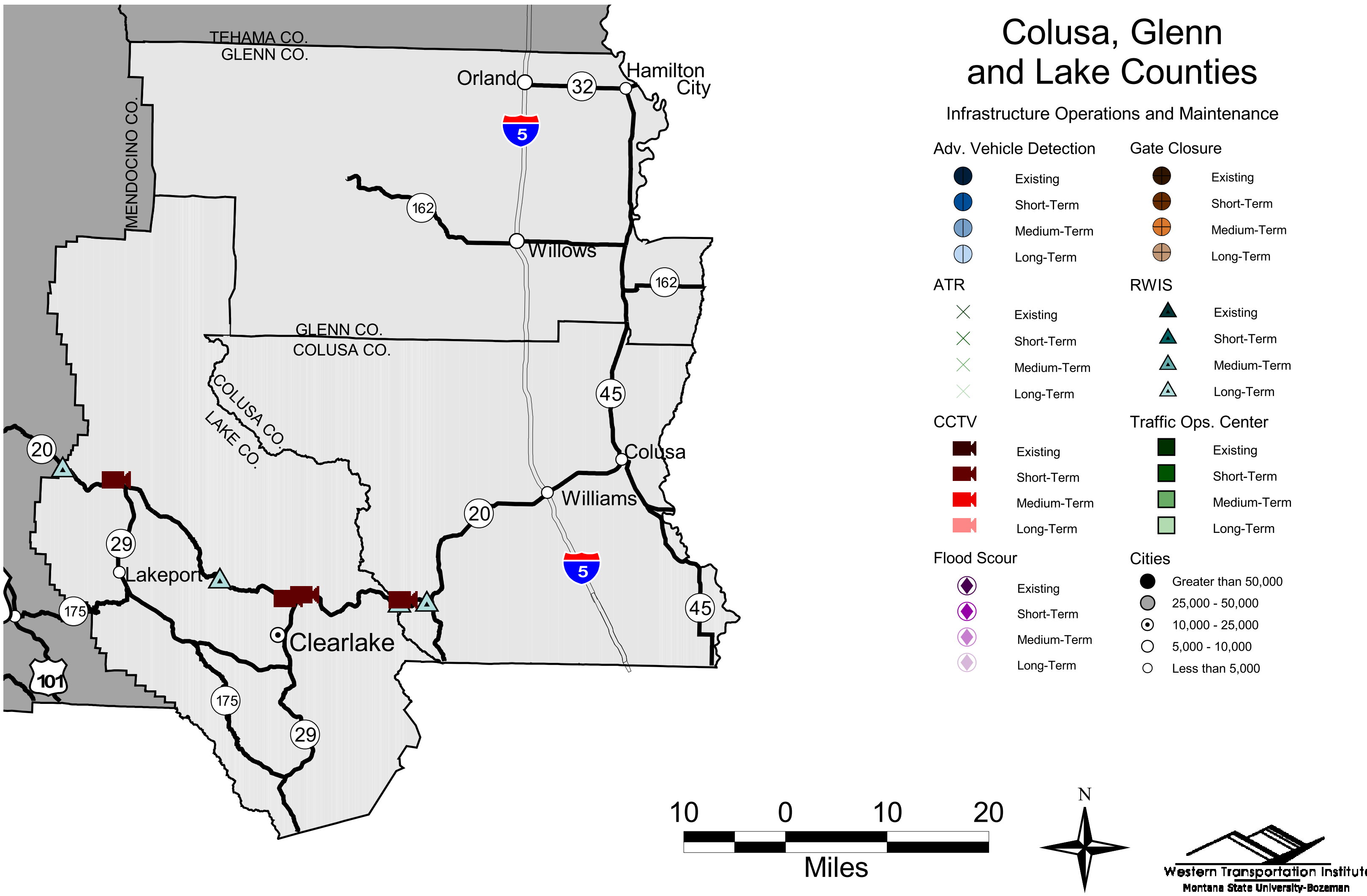


**Figure F-7:** Infrastructure Operations and Maintenance in Colusa, Glenn and Lake Counties.

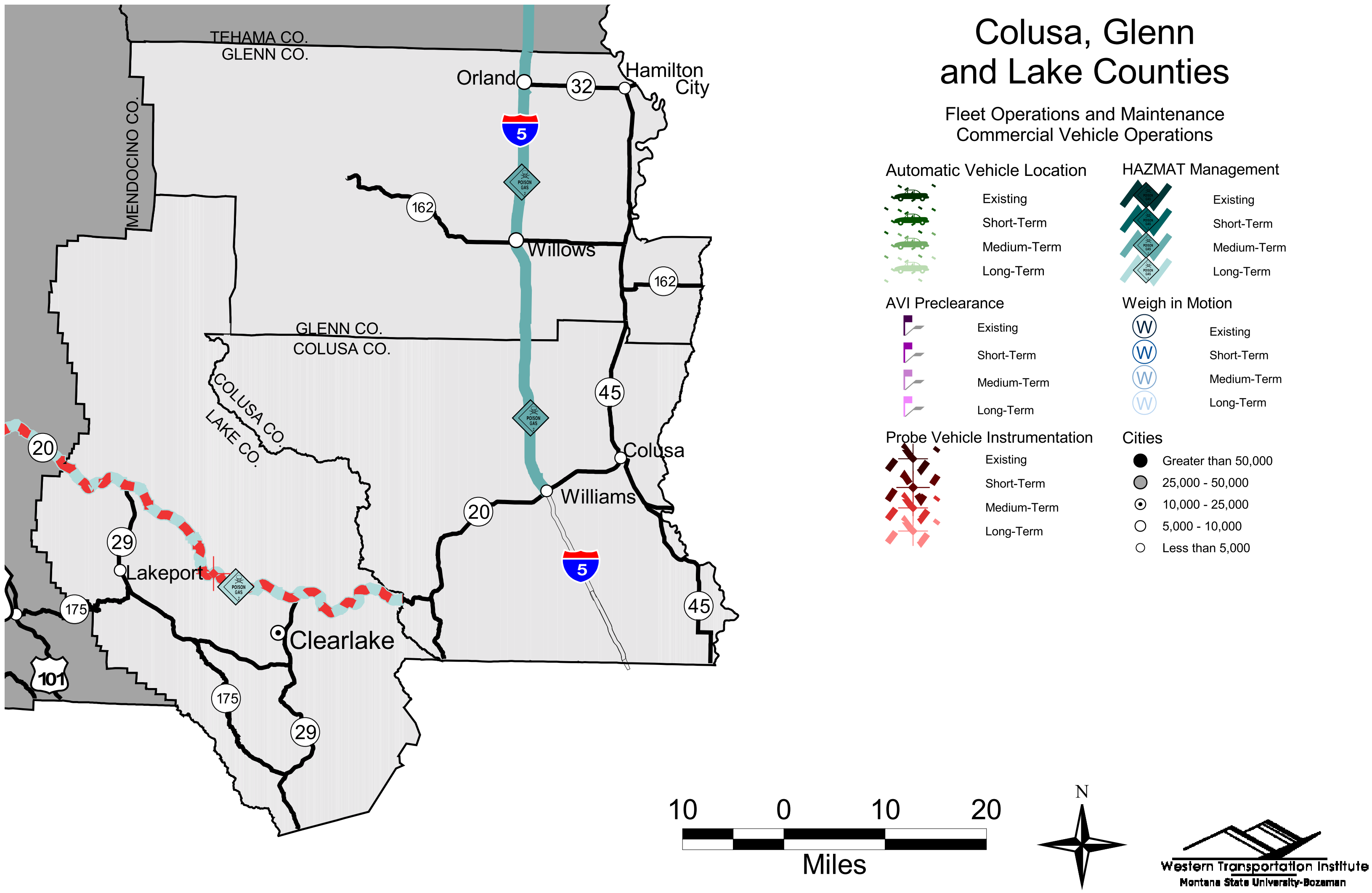


**Figure F-8:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Colusa, Glenn and Lake Counties.

**Table F-2:** Deployment Locations in Del Norte County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 8 | Del Norte | 101 | 20.1 | 22.2 | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Adv. Warning for Narrow Lanes | 9 | Del Norte | 199 | 0.6 | 1.9 | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Adv. Warning for Narrow Lanes | 10 | Del Norte | 199 | 26.3 | 27.8 | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 3 | Del Norte | 101 | 25.84 | | | Bike/ped challenge (Crescent City) | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 24 | Del Norte | 101 | 20 | | | Cushing Creek | Long-Term | ✓ |
| Advanced Bike/Ped Warning | 25 | Del Norte | 199 | 36 | | | Collier Tunnel | Long-Term | ✓ |
| Advisory Television | 12 | Del Norte | 101 | 25.84 | | | Crescent City | Medium-Term | ✓ |
| Automated Flood Warning | 16 | Del Norte | 101 | 0 | 30 | | Flood challenge | Long-Term | ✓ |
| Automated Visibility Warning | 2 | Del Norte | 199 | 0.6 | 1.9 | | Visibility challenge | Medium-Term | ✓ |
| Automated Visibility Warning | 9 | Del Norte | 101 | 20.1 | 22.2 | | Visibility challenge | Long-Term | ✓ |
| Automated Visibility Warning | 17 | Del Norte | 101 | 23 | 25 | | Fog | Long-Term | ✓ |
| Highway Advisory Radio | 18 | Del Norte | 199 | 33.4 | | | Road Closure (@ Collier Rest Area) | Short-Term | ✓ |
| Highway Advisory Radio | 25 | Del Norte | 101 | 27 | | | Visibility, Road Closure, Tourist (@ Crescent City Maint Yard) | Short-Term | ✓ |
| Highway Advisory Radio | 64 | Del Norte | 101 | 4.64 | | | Klamath | Long-Term | ✓ |
| Intersection Advance Warning | 7 | Del Norte | 101 | 25.84 | | | Intersection safety challenge | Long-Term | ✓ |
| Lateral Safety Warning System | 13 | Del Norte | 101 | 20.1 | 22.2 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Lateral Safety Warning System | 14 | Del Norte | 199 | 0.6 | 1.9 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Lateral Safety Warning System | 15 | Del Norte | 199 | 26.3 | 27.8 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Motorist-Aide Call Box | 2 | Del Norte | 199 | 1 | | Right | Del Norte County | Existing | ✓ |
| Motorist-Aide Call Box | 3 | Del Norte | 199 | 3 | | Right | Del Norte County | Existing | ✓ |
| Motorist-Aide Call Box | 4 | Del Norte | 199 | 8 | | Left | Del Norte County | Existing | ✓ |
| Motorist-Aide Call Box | 5 | Del Norte | 199 | 10.81 | | Right | Del Norte County | Existing | ✓ |
| Motorist-Aide Call Box | 6 | Del Norte | 199 | 20.07 | | Right | Del Norte County | Existing | ✓ |
| Motorist-Aide Call Box | 7 | Del Norte | 199 | 23.13 | | Right | Del Norte County | Existing | ✓ |
| Motorist-Aide Call Box | 8 | Del Norte | 199 | 26.12 | | Right | Del Norte County | Existing | ✓ |
| Motorist-Aide Call Box | 9 | Del Norte | 199 | 33.32 | | Left | Del Norte County | Existing | ✓ |
| Motorist-Aide Call Box | 10 | Del Norte | 101 | 14.8 | | Left | Del Norte County | Existing | ✓ |
| Motorist-Aide Call Box | 11 | Del Norte | 101 | 18.97 | | Right | Del Norte County | Existing | ✓ |
| Motorist-Aide Call Box | 12 | Del Norte | 101 | 36.53 | | Left | Del Norte County | Existing | ✓ |
| Slide Detection Station | 1 | Del Norte | 199 | 23.8 | | | Blue Slide (Near Patrick's Creek) | Short-Term | ✓ |
| Variable Message Sign | 41 | Del Norte | 101 | 28.5 | | N | Near 101/199 Interchange | Short-Term | ✓ |
| Variable Message Sign | 43 | Del Norte | 199 | 36.2 | | S | S of State Line | Short-Term | ✓ |
| Variable Message Sign | 44 | Del Norte | 101 | 37.4 | | S | Near 101/197 Interchange | Short-Term | ✓ |
| Variable Message Sign | 67 | Del Norte | 101 | 20.57 | | N | Near Cushing Creek | Short-Term | ✓ |
| Variable Message Sign (Portable) | 7 | Del Norte | 101 | 25.84 | | N | Crescent City | Existing | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 10 | Del Norte | 101 | 0 | 30 | | Response & notification time challenge | Medium-Term | ✓ |
| Mayday Systems | 11 | Del Norte | 199 | 0 | 36.41 | | Notification time challenge | Medium-Term | ✓ |
| Regional Incident Management Plan | 5 | Del Norte | 101 | 0 | 30 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 6 | Del Norte | 199 | 0 | 36.41 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 20 | Del Norte | 101 | 30 | 46.49 | | | Medium-Term | ✓ |
| Rural Coordinate Addressing System | 17 | Del Norte | 199 | 0 | 36.41 | | Response & notification time challenge | Long-Term | ✓ |
| | | Del Norte | 101 | 0 | 30 | | | | |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 8 | Del Norte | 101 | 0 | 30 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| 800 Travel Advisory | 11 | Del Norte | 199 | 9 | | | Tourist Locations | Medium-Term | ✓ |

**Table F-2:** Deployment Locations in Del Norte County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services (cont.)** | | | | | | | | | |
| 800 Travel Advisory | 12 | Del Norte | 199 | 0 | 36.41 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| In-Vehicle Route Guidance System | 10 | Del Norte | 101 | 0 | 30 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 11 | Del Norte | 199 | 0 | 36.41 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 46 | Del Norte | 199 | 4.8 | | | Jedediah Smith Redwoods State Park | Short-Term | ✓ |
| Kiosks | 47 | Del Norte | 199 | 14.4 | | | Gasquet Ranger Station | Short-Term | ✓ |
| Kiosks | 79 | Del Norte | 101 | 25.84 | | | Crescent City | Long-Term | ✓ |
| Kiosks | 84 | Del Norte | 199 | 33.41 | | | Collier Rest Area | Long-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 10 | Del Norte | 101 | 25.84 | | | Redwood Dial-a-Ride | Long-Term | ✓ |
| On-Board Transit Safety Systems | 9 | Del Norte | 101 | 25.84 | | | Redwood Dial-a-Ride | Long-Term | ✓ |
| Parking Management & Information System | 15 | Del Norte | 199 | 9 | | | Tourist Locations | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 18 | Del Norte | 199 | 9 | | | Jedediah Smith Redwoods State Park | Long-Term | ✓ |
| Transit Traveler Information | 8 | Del Norte | 199 | 9 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 32 | Del Norte | 101 | 25.84 | | | Redwood Dial-a-Ride | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 35 | Del Norte | 101 | 21.15 | | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Advanced Vehicle Detection | 36 | Del Norte | 199 | 1.25 | | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Advanced Vehicle Detection | 37 | Del Norte | 199 | 27.05 | | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Advanced Vehicle Detection | 69 | Del Norte | 101 | 0 | | | Flood challenge | Long-Term | ✓ |
| Advanced Vehicle Detection | 70 | Del Norte | 101 | 10 | | | Flood challenge | Long-Term | ✓ |
| Advanced Vehicle Detection | 71 | Del Norte | 101 | 20 | | | Flood challenge | Long-Term | ✓ |
| Advanced Vehicle Detection | 72 | Del Norte | 101 | 30 | | | Flood challenge | Long-Term | ✓ |
| Closed-Circuit Television Camera | 34 | Del Norte | 101 | 28.5 | | N | S of 101/199 Sep (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 56 | Del Norte | 199 | 36.2 | | S | S of State Line (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 58 | Del Norte | 101 | 37.4 | | S | Near 101/197 Interchange | Short-Term | ✓ |
| Closed-Circuit Television Camera | 59 | Del Norte | 199 | 33.4 | | N | Collier Rest Area | Short-Term | ✓ |
| Closed-Circuit Television Camera | 84 | Del Norte | 101 | 20.57 | | N | Near Cushing Creek (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 133 | Del Norte | 101 | 4.64 | | | Response time challenge | Long-Term | ✓ |
| RWIS | 52 | Del Norte | 199 | 32.5 | | | Collier Rest Area | Short-Term | ✓ |
| RWIS | 102 | Del Norte | 101 | 20.1 | | | Visibility Challenge | Long-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 3 | Del Norte | 101 | 0 | 46.49 | | | Medium-Term | ✓ |
| Hazmat Management | 6 | Del Norte | 199 | 0 | 36.41 | | | Long-Term | ✓ |

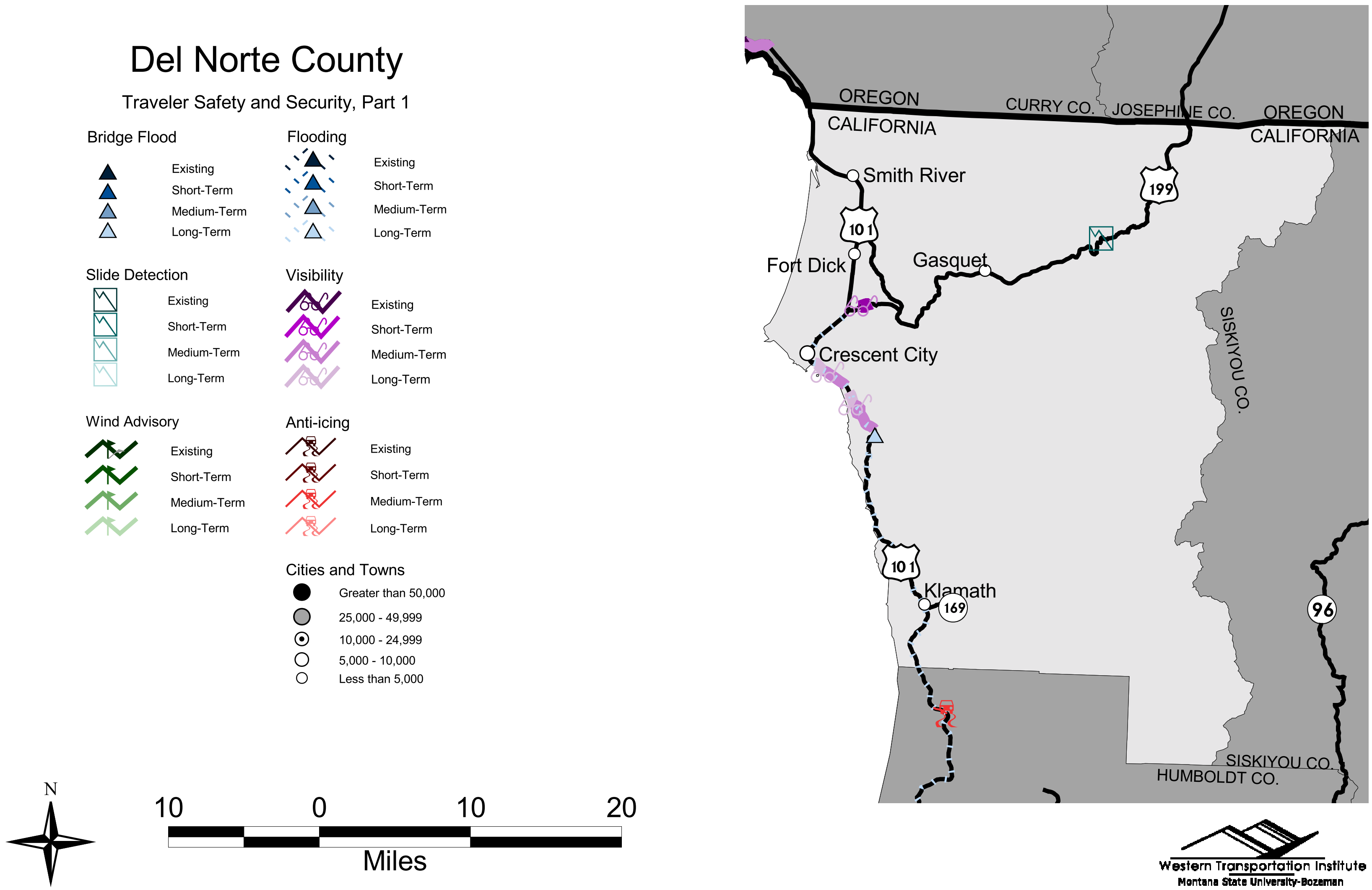


**Figure F-9:** Traveler Safety and Security (Part 1) in Del Norte County.

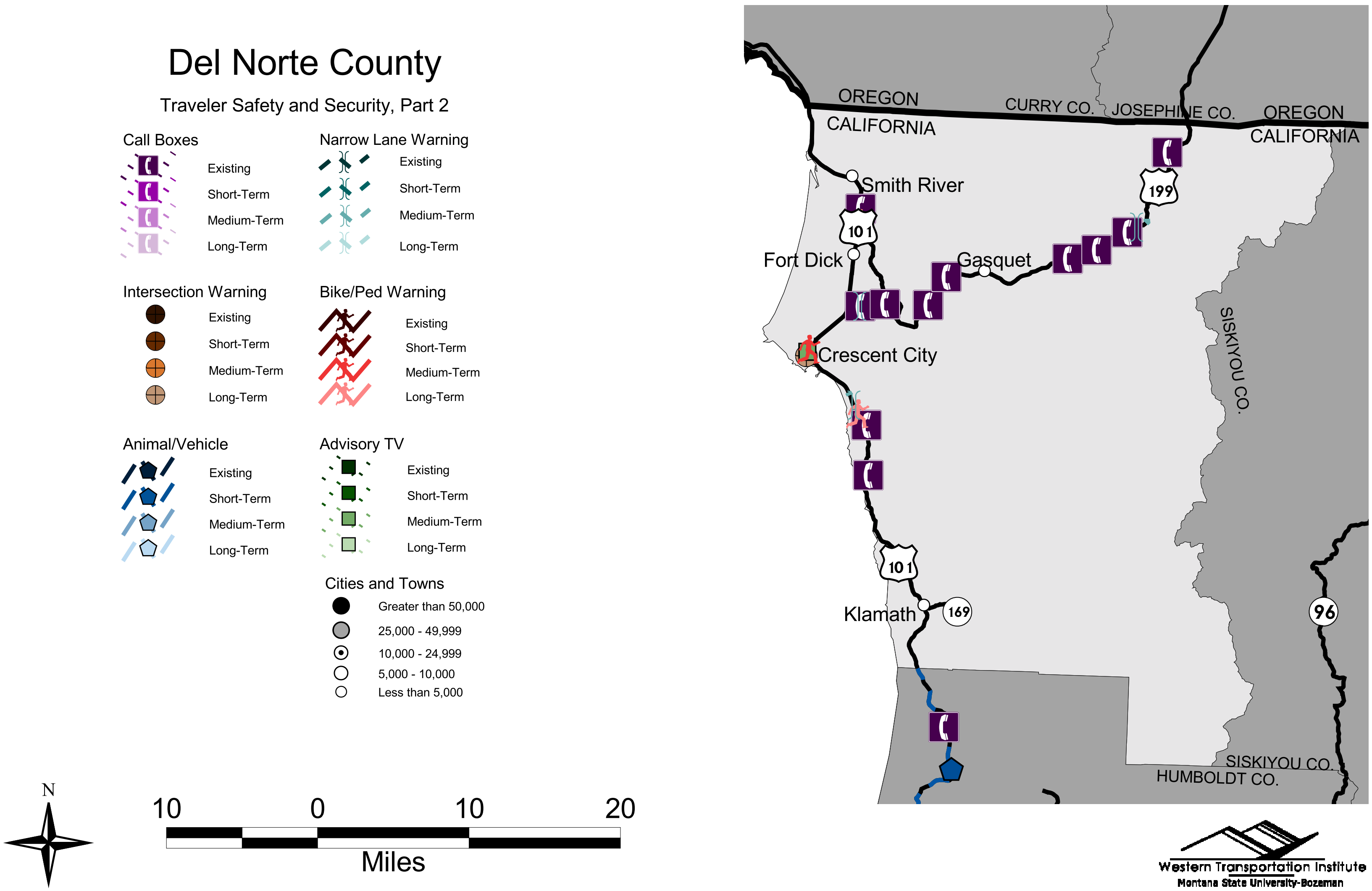


**Figure F-10:** Traveler Safety and Security (Part 2) in Del Norte County.

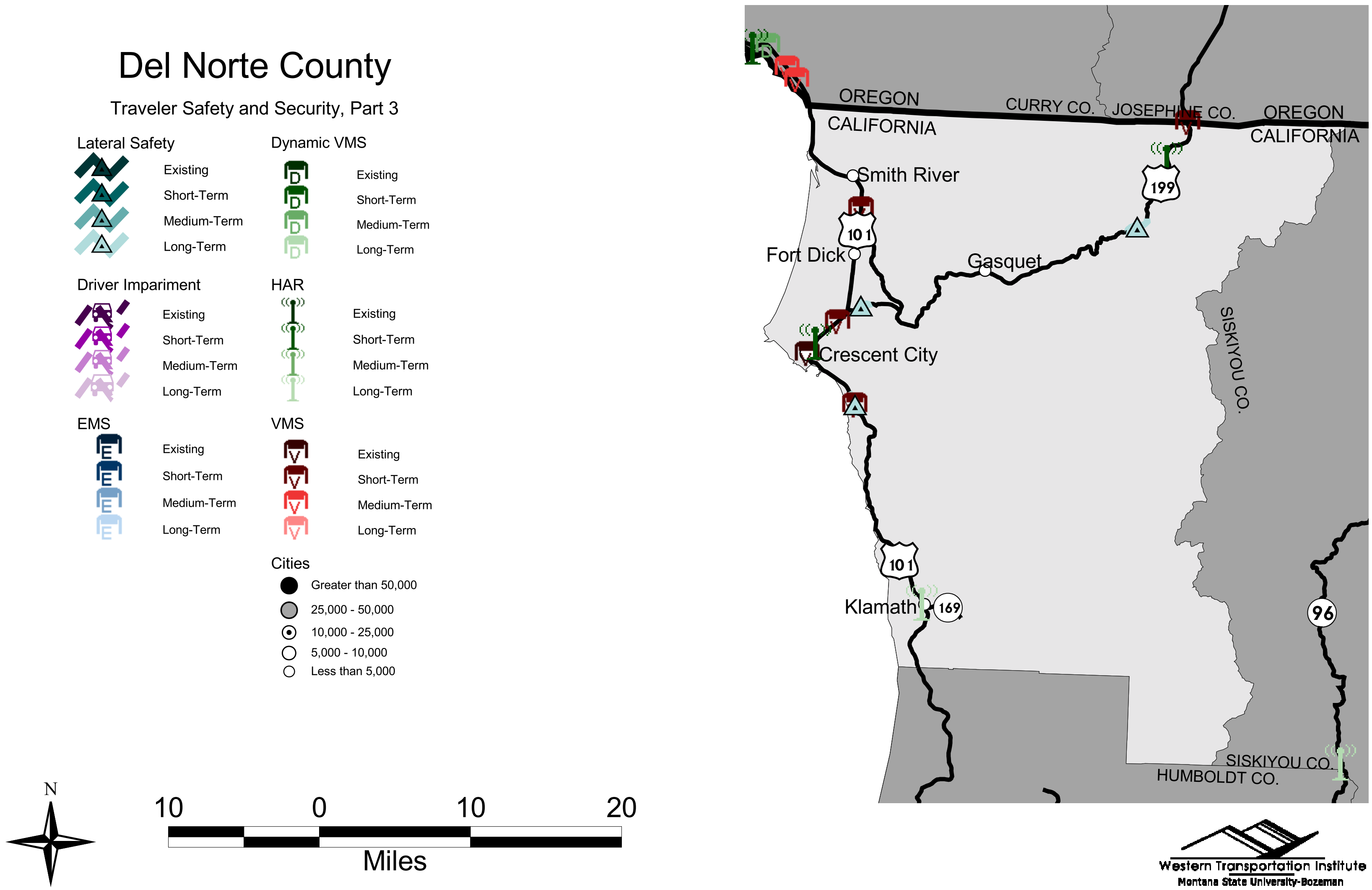


**Figure F-11:** Traveler Safety and Security (Part 3) in Del Norte County.

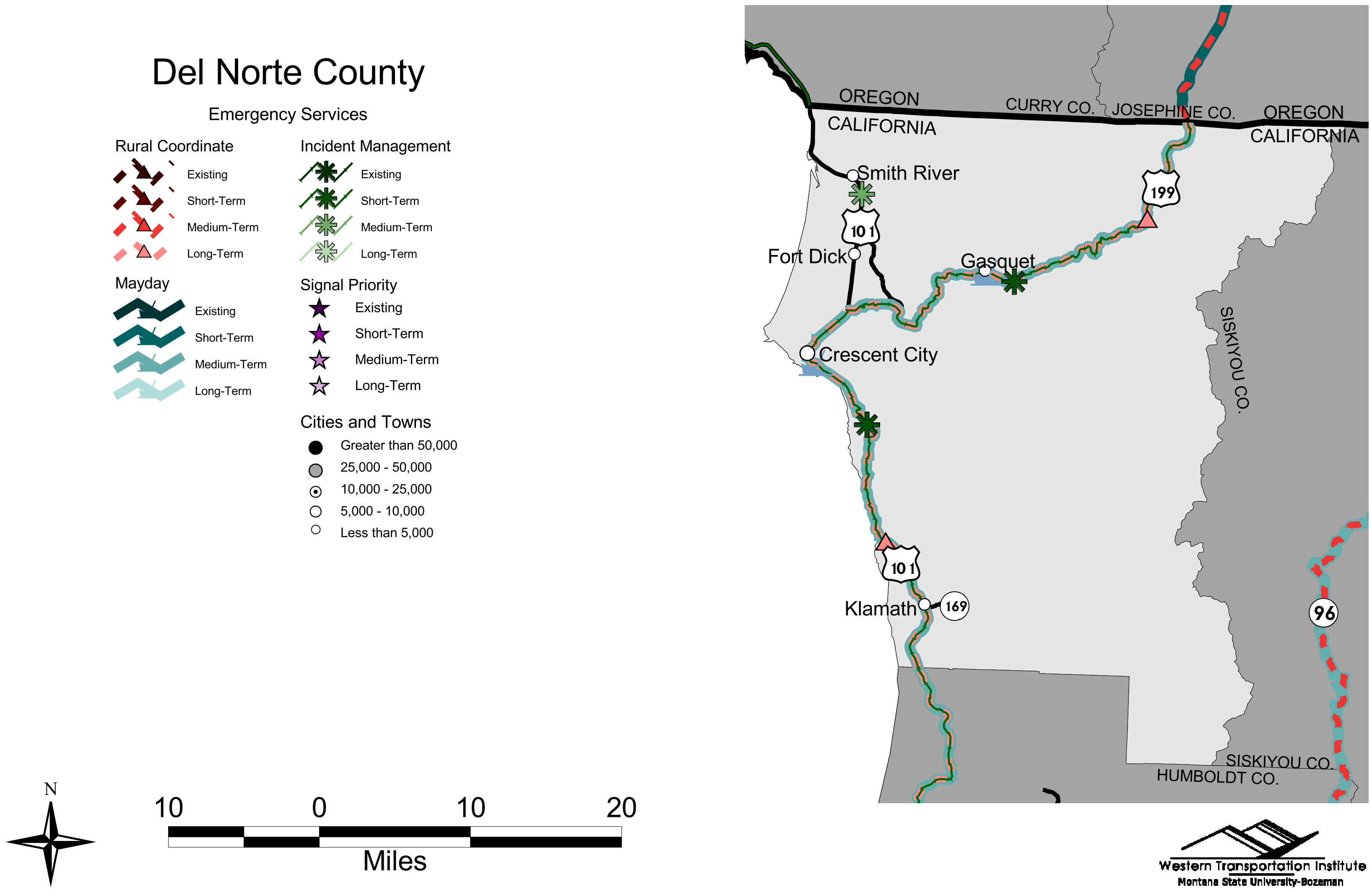


**Figure F-12:** Emergency Services in Del Norte County.

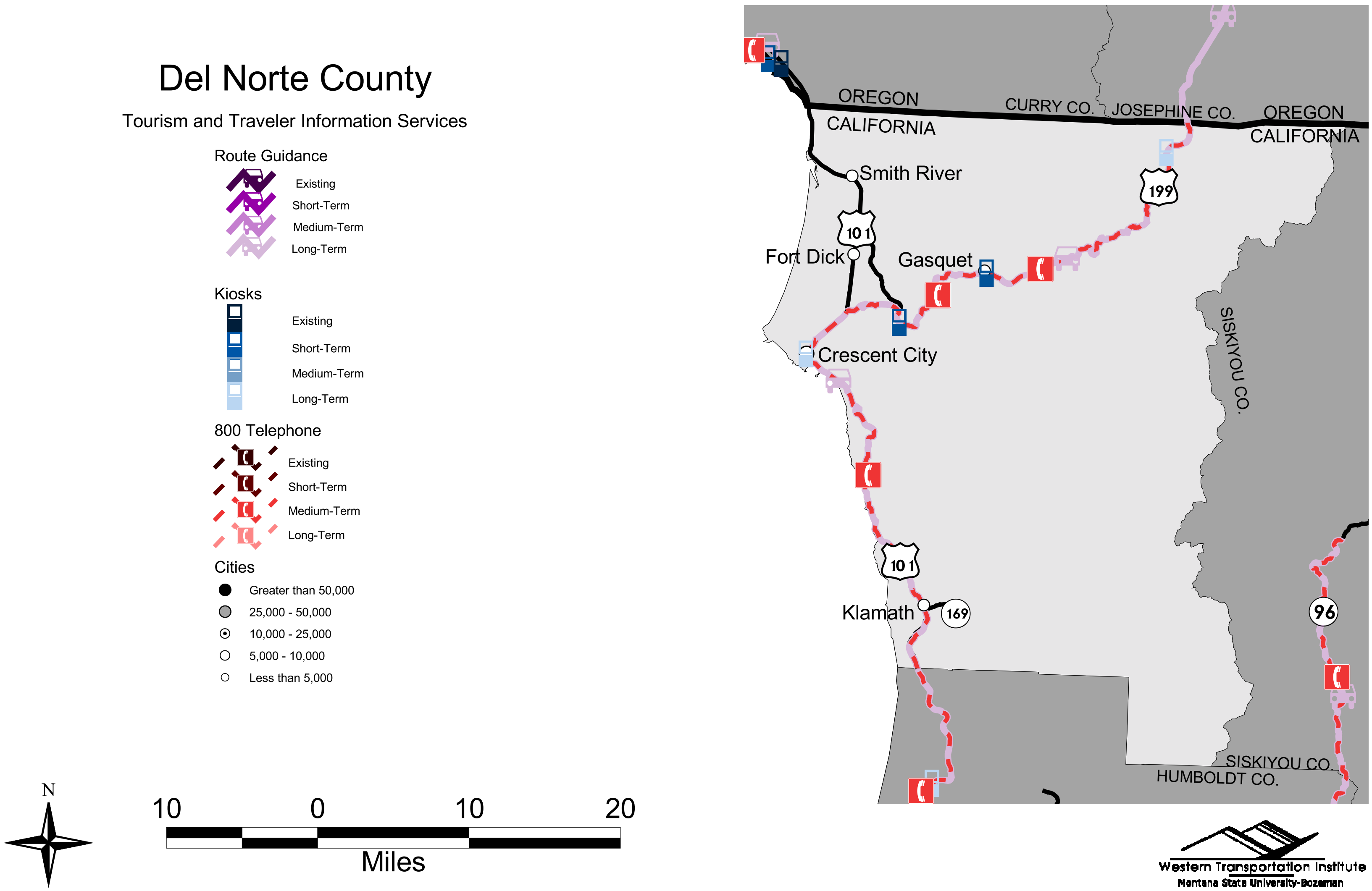


**Figure F-13:** Tourism and Traveler Information Services in Del Norte County.

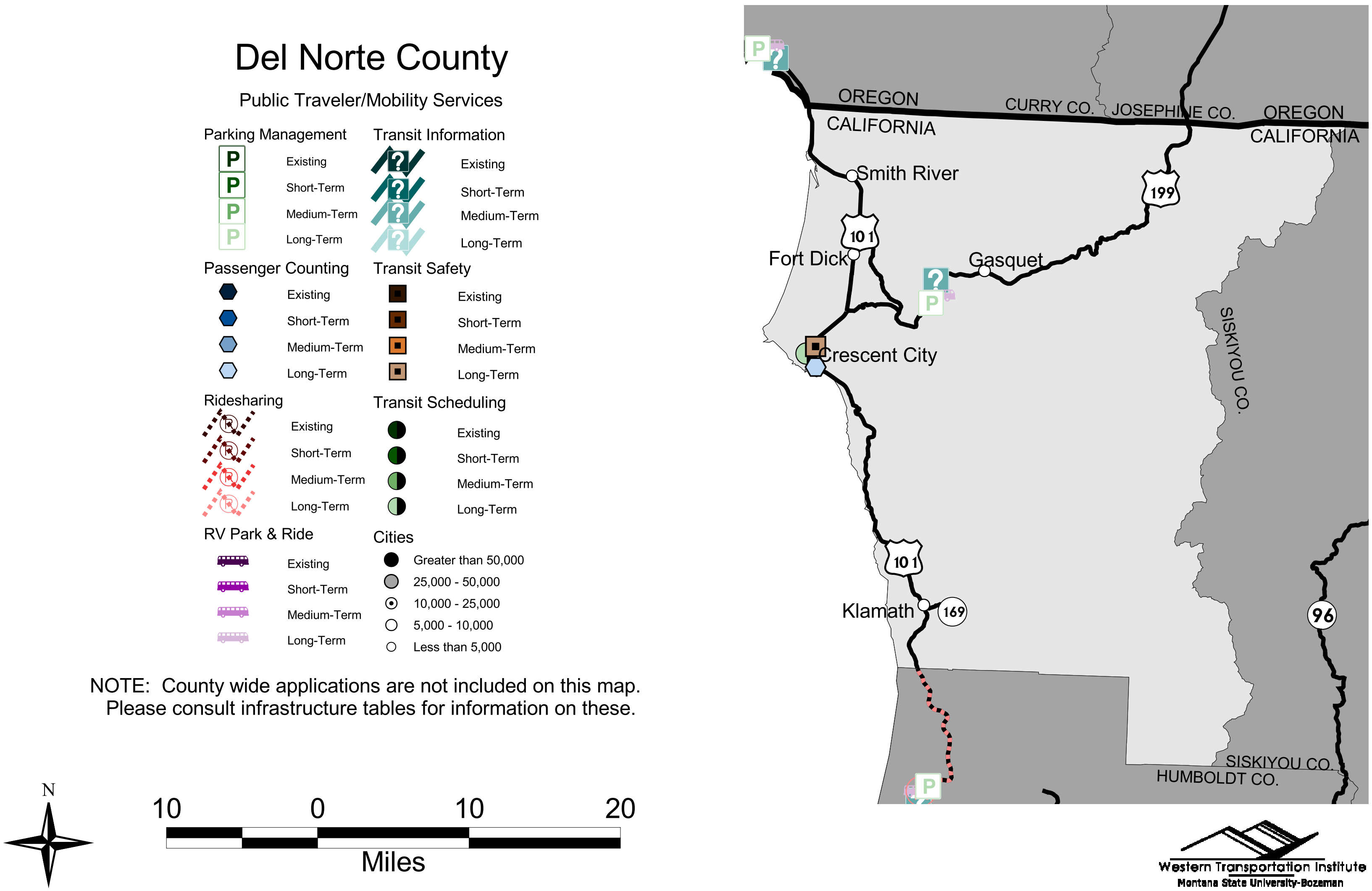


**Figure F-14:** Public Traveler/Mobility Services in Del Norte County.

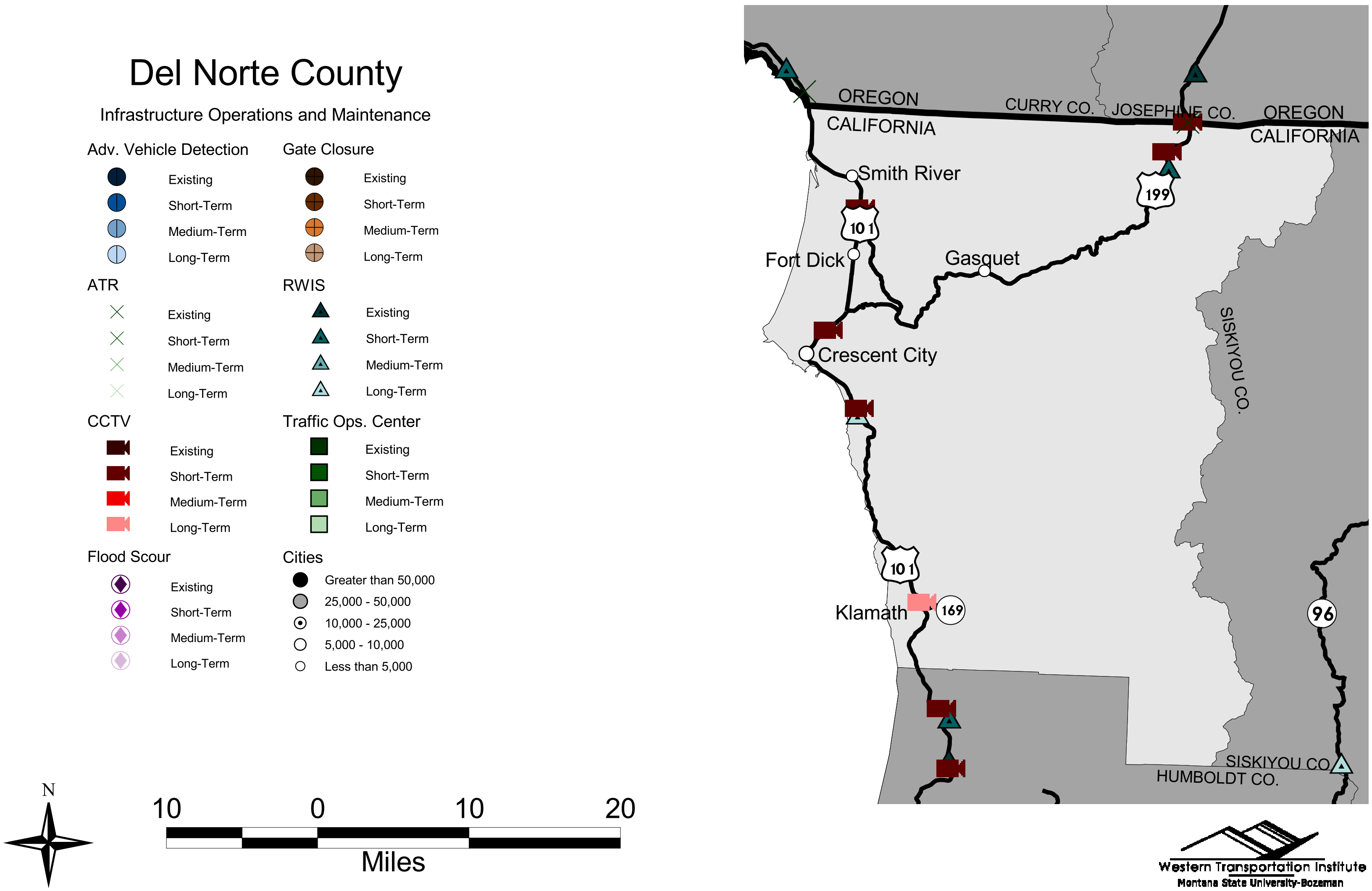


**Figure F-15:** Infrastructure Operations and Maintenance in Del Norte County.

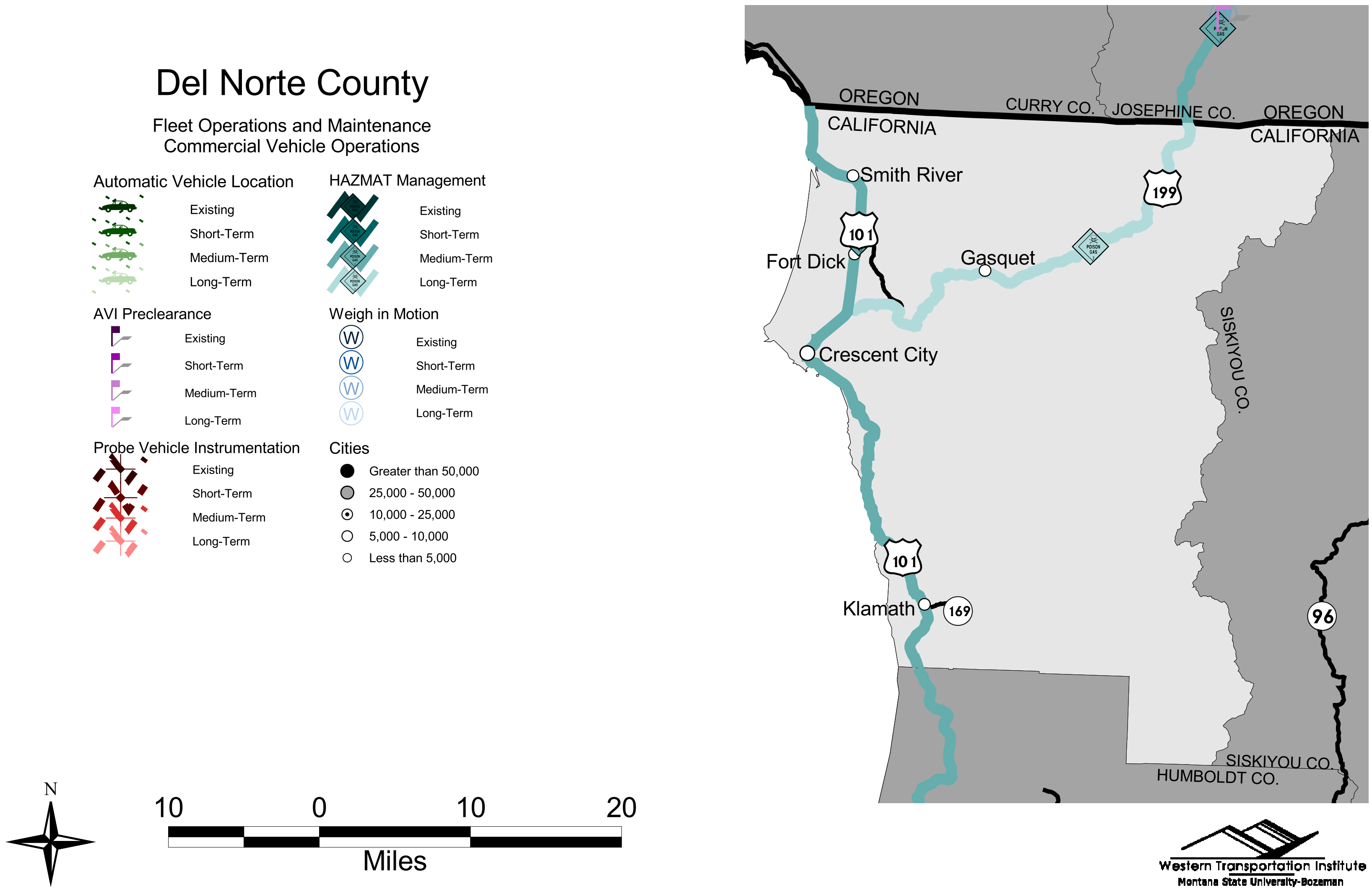


**Figure F-16:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Del Norte County.

**Table F-3:** Deployment Locations in Humboldt County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 5 | Humboldt | 101 | 1.2 | 2.9 | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Adv. Warning for Narrow Lanes | 6 | Humboldt | 299 | 29.9 | 32.8 | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Adv. Warning for Narrow Lanes | 7 | Humboldt | 101 | 121.8 | 122.7 | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 4 | Humboldt | 101 | 85.83 | | | Bike/ped challenge (Arcata) | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 5 | Humboldt | 101 | 75.91 | | | Bike/ped challenge (Eureka) | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 23 | Humboldt | 101 | 89.6 | | | Mad River Bridge | Long-Term | ✓ |
| Advisory Television | 6 | Humboldt | 101 | 75.91 | | | Eureka | Medium-Term | ✓ |
| Advisory Television | 19 | Humboldt | 101 | 61.53 | | | Fortuna | Long-Term | ✓ |
| Advisory Television | 20 | Humboldt | 101 | 91.47 | | | McKinleyville | Long-Term | ✓ |
| Animal/Vehicle Collision Warning | 3 | Humboldt | 101 | 122.2 | 137.1 | | Elk crossings | Short-Term | ✓ |
| Animal/Vehicle Collision Warning | 9 | Humboldt | 101 | 114 | 115 | | Prevent/reduce elk hits | Medium-Term | ✓ |
| Animal/Vehicle Collision Warning | 10 | Humboldt | 101 | 69 | 71 | | | Medium-Term | ✓ |
| Automated Anti-Icing | 8 | Humboldt | 101 | 133 | 134 | | | Medium-Term | ✓ |
| Automated Anti-Icing | 14 | Humboldt | 299 | 29 | 31 | | | Long-Term | ✓ |
| Automated Flood Warning | 7 | Humboldt | 96 | 13 | 15.5 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Automated Flood Warning | 13 | Humboldt | 96 | 0 | 2.4 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Automated Flood Warning | 14 | Humboldt | 96 | 6.2 | 10.7 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Automated Flood Warning | 15 | Humboldt | 101 | 67 | 69 | | | Long-Term | ✓ |
| Automated Flood Warning | 16 | Humboldt | 101 | 88 | 137.14 | | Flood challenge | Long-Term | ✓ |
| Automated Flood Warning | 19 | Humboldt | 211 | 73.2 | 74 | | Around Ferndale | Long-Term | ✓ |
| Automated Flood Warning | 20 | Humboldt | 36 | 12 | 14 | | | Long-Term | ✓ |
| Automated Visibility Warning | 10 | Humboldt | 299 | 29.9 | 31.1 | | Visibility challenge | Long-Term | ✓ |
| Automated Visibility Warning | 11 | Humboldt | 101 | 1.2 | 2.9 | | Visibility challenge | Long-Term | ✓ |
| Automated Visibility Warning | 19 | Humboldt | 255 | 0 | 2 | | Bridge | Long-Term | ✓ |
| Dynamic Warning VMS | 12 | Humboldt | 299 | 31.1<br>29.9 | | West<br>East | Visibility Challenge | Medium-Term | ✓ |
| Dynamic Warning VMS | 26 | Humboldt | 101 | 2.9<br>1.2 | | South<br>North | Visibility Challenge | Long-Term | ✓ |
| Highway Advisory Radio | 2 | Humboldt | 101 | 46.4 | | | Willits at Jct 20 | Existing | ✓ |
| Highway Advisory Radio | 4 | Humboldt | 101 | 77.3 | | | Eureka-Dist Office | Existing | ✓ |
| Highway Advisory Radio | 5 | Humboldt | 101 | 88.8 | | | Arcata/McKinleyville | Existing | ✓ |
| Highway Advisory Radio | 27 | Humboldt | 299 | 0 | | | Eureka | Short-Term | ✓ |
| Highway Advisory Radio | 35 | Humboldt | 101 | 35.11 | | | Road Closure, Visibility, Tourist | Medium-Term | ✓ |
| Highway Advisory Radio | 51 | Humboldt | 101 | 11.13 | | | Garberville | Medium-Term | ✓ |
| Highway Advisory Radio | 52 | Humboldt | 299 | 19 | | | | Medium-Term | ✓ |
| Highway Advisory Radio | 56 | Humboldt | 36 | 0 | | | Road Closure, Tourist | Long-Term | ✓ |
| Highway Advisory Radio | 60 | Humboldt | 299 | 38.83 | | | Visibility Challenge | Long-Term | ✓ |
| Highway Advisory Radio | 63 | Humboldt | 101 | 120.4 | | | Orick | Long-Term | ✓ |
| Intersection Advance Warning | 15 | Humboldt | 101 | 72 | | | Moved s. of lake per workshop feedback | Long-Term | ✓ |
| Intersection Advance Warning | 20 | Humboldt | 36 | 0 | | | Rte 101/36 intersection | Long-Term | ✓ |
| Lateral Safety Warning System | 7 | Humboldt | 101 | 1.2 | 2.9 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Lateral Safety Warning System | 11 | Humboldt | 299 | 29.9 | 32.8 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Lateral Safety Warning System | 12 | Humboldt | 101 | 121.8 | 122.7 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Motorist-Aide Call Box | 13 | Humboldt | 299 | 12.6 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 14 | Humboldt | 299 | 21.1 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 15 | Humboldt | 299 | 27.8 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 16 | Humboldt | 299 | 37.7 | | | Humboldt County | Existing | ✓ |

**Table F-3:** Deployment Locations in Humboldt County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Motorist-Aide Call Box | 17 | Humboldt | 299 | 42.5 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 18 | Humboldt | 101 | 97.6 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 19 | Humboldt | 101 | 97.5 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 20 | Humboldt | 101 | 107.2 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 21 | Humboldt | 101 | 107.3 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 22 | Humboldt | 101 | 56.1 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 23 | Humboldt | 101 | 56 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 24 | Humboldt | 101 | 47.1 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 25 | Humboldt | 101 | 39.3 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 26 | Humboldt | 101 | 39.2 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 27 | Humboldt | 101 | 32.1 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 28 | Humboldt | 101 | 32 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 29 | Humboldt | 101 | 23.1 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 30 | Humboldt | 101 | 23 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 31 | Humboldt | 101 | 15.7 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 32 | Humboldt | 101 | 15.6 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 33 | Humboldt | 101 | 8.1 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 34 | Humboldt | 101 | 8 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 35 | Humboldt | 101 | 68.4 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 36 | Humboldt | 101 | 68.5 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 37 | Humboldt | 101 | 131.6 | | | Humboldt County | Existing | ✓ |
| Motorist-Aide Call Box | 38 | Humboldt | 101 | 131.7 | | | Humboldt County | Existing | ✓ |
| Variable Message Sign | 57 | Humboldt | 101 | 89.4 | | S | N of 101/299 SEP | Short-Term | ✓ |
| Variable Message Sign | 58 | Humboldt | 101 | 87.7 | | N | S of 101/299 Sep | Short-Term | ✓ |
| Variable Message Sign | 59 | Humboldt | 101 | 58.7 | | S | N of Jct 36 | Short-Term | ✓ |
| Variable Message Sign | 60 | Humboldt | 101 | 56.5 | | N | S of Jct 36 | Short-Term | ✓ |
| Variable Message Sign | 71 | Humboldt | 299 | 43 | | East | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 72 | Humboldt | 96 | 0 | | South | All Criteria | Medium-Term | ✓ |
| Variable Message Sign (Portable) | 1 | Humboldt | 101 | 80.6 | | N | Bracut | Existing | ✓ |
| Variable Message Sign (Portable) | 2 | Humboldt | 101 | 80.6 | | N | Bracut | Existing | ✓ |
| Variable Message Sign (Portable) | 6 | Humboldt | 101 | 61.53 | | N | Fortuna | Existing | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 8 | Humboldt | 96 | 0 | 44.98 | | Stakeholder Input | Medium-Term | ✓ |
| Mayday Systems | 9 | Humboldt | 299 | 0 | 43.04 | | Notification time challenge | Medium-Term | ✓ |
| Mayday Systems | 10 | Humboldt | 101 | 90 | 137.14 | | Response & notification time challenge | Medium-Term | ✓ |
| Mayday Systems | 14 | Humboldt | 36 | 0 | 45.68 | | | Medium-Term | ✓ |
| Regional Incident Management Plan | 5 | Humboldt | 101 | 88 | 137.14 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 8 | Humboldt | 299 | 0 | 43.04 | | | Short-Term | ✓ |
| Regional Incident Management Plan | 16 | Humboldt | 101 | 0 | 57 | | Road Closure | Medium-Term | ✓ |
| Regional Incident Management Plan | 30 | Humboldt | 36 | 0 | 45.68 | | | Long-Term | ✓ |
| Regional Incident Management Plan | 32 | Humboldt | 96 | 0 | 44.98 | | Road Closure | Long-Term | ✓ |
| Rural Coordinate Addressing System | 5 | Humboldt | 299 | 0 | 43.04 | | Stakeholder Input | Medium-Term | ✓ |
| Rural Coordinate Addressing System | 9 | Humboldt | 96 | 0 | 44.98 | | Stakeholder Input | Medium-Term | ✓ |
| Rural Coordinate Addressing System | 14 | Humboldt | 36 | 0 | 45.68 | | Stakeholder Input | Long-Term | ✓ |
| Rural Coordinate Addressing System | 17 | Humboldt | 101 | 90 | 137.14 | | Response & notification time challenge | Long-Term | ✓ |

**Table F-3:** Deployment Locations in Humboldt County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 6 | Humboldt | 36 | 0 | 45.68 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| 800 Travel Advisory | 7 | Humboldt | 101 | 108.22 | | | Tourist Locations | Medium-Term | ✓ |
| 800 Travel Advisory | 8 | Humboldt | 101 | 88 | 137.14 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| 800 Travel Advisory | 9 | Humboldt | 101 | 126.1 | | | Tourist Locations | Medium-Term | ✓ |
| 800 Travel Advisory | 10 | Humboldt | 96 | 0 | 44.98 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| 800 Travel Advisory | 23 | Humboldt | 101 | 35.11 | | | Tourist Locations | Medium-Term | ✓ |
| In-Vehicle Route Guidance System | 1 | Humboldt | 101 | 0 | 58 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 3 | Humboldt | 36 | 0 | 45.68 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 8 | Humboldt | 96 | 0 | 45 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 10 | Humboldt | 101 | 90 | 137.14 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 70 | Humboldt | 101 | 35.11 | | | Humboldt Redwoods State Park | Long-Term | ✓ |
| Kiosks | 71 | Humboldt | 101 | 108.22 | | | Humboldt Lagoons State Park | Long-Term | ✓ |
| Kiosks | 72 | Humboldt | 101 | 126.1 | | | Prairie Creek Redwoods State Park | Long-Term | ✓ |
| Kiosks | 73 | Humboldt | 101 | 127 | | | Redwood Nat'l Park | Long-Term | ✓ |
| Kiosks | 74 | Humboldt | 101 | 89 | | | CA Welcome Center, Arcata | Long-Term | ✓ |
| Kiosks | 77 | Humboldt | 101 | 75.91 | | | Eureka Chamber of Commerce | Long-Term | ✓ |
| Kiosks | 78 | Humboldt | 101 | 120.4 | | | Redwood Nat'l Park @ Orick | Long-Term | ✓ |
| Kiosks | 82 | Humboldt | 96 | 0 | | | Willow Creek | Long-Term | ✓ |
| Kiosks | 83 | Humboldt | 101 | 106.6 | | | Trinidad Rest Area | Long-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 7 | Humboldt | 101 | 75.91 | | | Eureka Transit Service | Long-Term | ✓ |
| Automated Passenger Counting | 8 | Humboldt | 101 | 85.83 | | | Arcata | Long-Term | ✓ |
| Automated Passenger Counting | 22 | Humboldt | | | | | Arcata, Mad River, Humboldt Transit Authority | Long-Term | ✓ |
| Dynamic Ridesharing/Paratransit | 9 | Humboldt | 299 | 0 | 43.04 | | Stakeholder Input | Long-Term | ✓ |
| Dynamic Ridesharing/Paratransit | 10 | Humboldt | 101 | 75.91 | 137.14 | | Stakeholder Input | Long-Term | ✓ |
| On-Board Transit Safety Systems | 7 | Humboldt | 101 | 75.91 | | | Eureka Transit Service | Long-Term | ✓ |
| On-Board Transit Safety Systems | 8 | Humboldt | 101 | 85.83 | | | Arcata | Long-Term | ✓ |
| On-Board Transit Safety Systems | 22 | Humboldt | | | | | Arcata, Mad River, Humboldt Transit Authority | Long-Term | ✓ |
| Parking Management & Information System | 10 | Humboldt | 101 | 35.11 | | | Tourist Locations | Long-Term | ✓ |
| Parking Management & Information System | 13 | Humboldt | 101 | 108.22 | | | Tourist Locations | Long-Term | ✓ |
| Parking Management & Information System | 14 | Humboldt | 101 | 126.1 | | | Tourist Locations | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 15 | Humboldt | 101 | 35.11 | | | Humboldt Redwoods State Park | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 16 | Humboldt | 101 | 108.22 | | | Humboldt Lagoons State Park | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 17 | Humboldt | 101 | 126.1 | | | Prairie Creek Redwoods State Park | Long-Term | ✓ |
| Transit Traveler Information | 1 | Humboldt | 299<br>101 | 0<br>70 | 20<br>110 | | Stakeholder Input | Medium-Term | ✓ |
| Transit Traveler Information | 3 | Humboldt | 101 | 35.11 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 6 | Humboldt | 101 | 126.1 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 22 | Humboldt | | | | | Arcata, Mad River, Humboldt Transit Authority | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 29 | Humboldt | 101 | 75.91 | | | Eureka Transit Service | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 30 | Humboldt | 101 | 85.83 | | | Arcata | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 15 | Humboldt | 101 | 82.7 | | | Near Indianola TMS(RTMS) | Short-Term | ✓ |
| Advanced Vehicle Detection | 22 | Humboldt | 101 | 74.8 | | | North of Herrick Rd. TMS(RTMS) | Short-Term | ✓ |
| Advanced Vehicle Detection | 23 | Humboldt | 101 | 76.7 | | | North of Henderson TMS(RTMS) | Short-Term | ✓ |
| Advanced Vehicle Detection | 24 | Humboldt | 101 | 79.2 | | | NB Near 5th and R St TMS(RTMS) | Short-Term | ✓ |

**Table F-3:** Deployment Locations in Humboldt County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Advanced Vehicle Detection | 25 | Humboldt | 101 | 78 | | | SB Broadway and 4th TMS(RTMS) | Short-Term | ✓ |
| Advanced Vehicle Detection | 26 | Humboldt | 101 | 79.4 | | | SB 4th Near V St TMS(RTMS) | Short-Term | ✓ |
| Advanced Vehicle Detection | 27 | Humboldt | 101 | 80.2 | | | Near Cole TMS(RTMS) | Short-Term | ✓ |
| Advanced Vehicle Detection | 28 | Humboldt | 96 | 14.25 | | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Advanced Vehicle Detection | 32 | Humboldt | 101 | 2.05 | | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Advanced Vehicle Detection | 33 | Humboldt | 299 | 31.35 | | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Advanced Vehicle Detection | 34 | Humboldt | 101 | 122.25 | | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Advanced Vehicle Detection | 50 | Humboldt | 96 | 1.2 | | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Advanced Vehicle Detection | 51 | Humboldt | 96 | 6.2 | | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Advanced Vehicle Detection | 52 | Humboldt | 96 | 10.7 | | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Advanced Vehicle Detection | 63 | Humboldt | 101 | 88 | | | Flood challenge | Long-Term | ✓ |
| Advanced Vehicle Detection | 64 | Humboldt | 101 | 97.83 | | | Flood challenge | Long-Term | ✓ |
| Advanced Vehicle Detection | 65 | Humboldt | 101 | 107.66 | | | Flood challenge | Long-Term | ✓ |
| Advanced Vehicle Detection | 66 | Humboldt | 101 | 117.49 | | | Flood challenge | Long-Term | ✓ |
| Advanced Vehicle Detection | 67 | Humboldt | 101 | 127.31 | | | Flood challenge | Long-Term | ✓ |
| Advanced Vehicle Detection | 68 | Humboldt | 101 | 137.14 | | | Flood challenge | Long-Term | ✓ |
| Advanced Vehicle Detection | 76 | Humboldt | 211 | 73.5 | | | Around Ferndale | Long-Term | ✓ |
| Advanced Vehicle Detection | 77 | Humboldt | 36 | 13 | | | | Long-Term | ✓ |
| Advanced Vehicle Detection | 78 | Humboldt | 101 | 68 | | | | Long-Term | ✓ |
| Automated Gate Closure | 5 | Humboldt | 255 | 0.2 | | | Eureka Channel Bridge | Short-Term | ✓ |
| Automated Gate Closure | 6 | Humboldt | 255 | 1.8 | | | Eureka Channel Bridge | Short-Term | ✓ |
| Automated Gate Closure | 11 | Humboldt | 36 | 0 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| Closed-Circuit Television Camera | 33 | Humboldt | 101 | 133.34 | | | Response time challenge | Short-Term | ✓ |
| Closed-Circuit Television Camera | 35 | Humboldt | 101 | 89.4 | | S | N of 101/299 SEP (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 36 | Humboldt | 101 | 87.7 | | N | S of 101/299 Sep (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 37 | Humboldt | 101 | 58.7 | | S | N of Jct 36 (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 38 | Humboldt | 101 | 56.5 | | N | S of Jct 36 (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 40 | Humboldt | 101 | 75.3 | | N | Eureka Corridor - Kmart and Broadway | Short-Term | ✓ |
| Closed-Circuit Television Camera | 41 | Humboldt | 101 | 75.8 | | N | Eureka Corridor - McCullens and Broadway | Short-Term | ✓ |
| Closed-Circuit Television Camera | 42 | Humboldt | 101 | 76.3 | | N | Eureka Corridor - Broadway and N Mall | Short-Term | ✓ |
| Closed-Circuit Television Camera | 43 | Humboldt | 101 | 76.7 | | N | Eureka Corridor - Broadway and Henderson | Short-Term | ✓ |
| Closed-Circuit Television Camera | 44 | Humboldt | 101 | 77.5 | | N | Eureka Corridor - Broadway and 14th Street | Short-Term | ✓ |
| Closed-Circuit Television Camera | 45 | Humboldt | 101 | 78.7 | | N | NB Eureka Corridor - 5th and J St | Short-Term | ✓ |
| Closed-Circuit Television Camera | 46 | Humboldt | 101 | 78 | | N | NB Eureka Corridor - 5th and V St | Short-Term | ✓ |
| Closed-Circuit Television Camera | 47 | Humboldt | 101 | 78 | | N | SB Eureka Corridor - 4th and Broadway | Short-Term | ✓ |
| Closed-Circuit Television Camera | 48 | Humboldt | 101 | 78.6 | | N | SB Eureka Corridor - 4th and H St | Short-Term | ✓ |
| Closed-Circuit Television Camera | 49 | Humboldt | 101 | 79.4 | | N | SB Eureka Corridor - 4th and V St | Short-Term | ✓ |
| Closed-Circuit Television Camera | 50 | Humboldt | 101 | 80.2 | | N | Near Cole Ave. | Short-Term | ✓ |
| Closed-Circuit Television Camera | 51 | Humboldt | 101 | 81.3 | | N | Near Mid-City | Short-Term | ✓ |
| Closed-Circuit Television Camera | 52 | Humboldt | 101 | 82.7 | | N | Near Indianola | Short-Term | ✓ |
| Closed-Circuit Television Camera | 53 | Humboldt | 101 | 83.4 | | N | Near Bracut | Short-Term | ✓ |
| Closed-Circuit Television Camera | 55 | Humboldt | 101 | 128.94 | | | Response time challenge | Short-Term | ✓ |
| Closed-Circuit Television Camera | 108 | Humboldt | 96 | 0 | | South | All Criteria (@ CMS) | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 110 | Humboldt | 299 | 43 | | East | All Criteria (@ CMS) | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 132 | Humboldt | 101 | 120.4 | | | Response time challenge | Long-Term | ✓ |
| RWIS | 4 | Humboldt | 101 | 128.94 | | | Boyce Creek Viaduct | Existing | ✓ |
| RWIS | 38 | Humboldt | 101 | 30 | | | Road Closure Due to Bad Weather | Short-Term | ✓ |

**Table F-3:** Deployment Locations in Humboldt County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| RWIS | 39 | Humboldt | 299 | 29.08 | | | Visibility Challenge (Berry Summit) | Short-Term | ✓ |
| RWIS | 50 | Humboldt | 101 | 1.2 | | | Visibility Challenge | Short-Term | ✓ |
| RWIS | 51 | Humboldt | 101 | 133.34 | | | Boyce Creek Viaduct (moved) | Short-Term | ✓ |
| RWIS | 100 | Humboldt | 96 | 15 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| Satellite Traffic Operations Center | 8 | Humboldt | 101 | 75.91 | | | Eureka | Short-Term | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 3 | Humboldt | 101 | 75.91 | | | Eureka | Medium-Term | ✓ |
| Probe Vehicle Instrumentation | 4 | Humboldt | 36 | 0 | 45.68 | | E/W California routes | Medium-Term | ✓ |
| Probe Vehicle Instrumentation | 5 | Humboldt | 299 | 0 | 43.04 | | E/W California routes | Medium-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 3 | Humboldt | 101 | 0 | 137.14 | | | Medium-Term | ✓ |
| Hazmat Management | 7 | Humboldt | 299 | 0 | 43.04 | | | Long-Term | ✓ |
| Preclearance | 13 | Humboldt | 101 | 34 | | N/S | Near Existing Weigh Station | Medium-Term | ✓ |
| Preclearance | 15 | Humboldt | 101 | 97 | | N/S | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 6 | Humboldt | 101 | 65.6 | | | | Existing | ✓ |
| Weigh in Motion | 17 | Humboldt | 101 | 34 | | N/S | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 19 | Humboldt | 101 | 97 | | N/S | Near Existing Weigh Station | Medium-Term | ✓ |

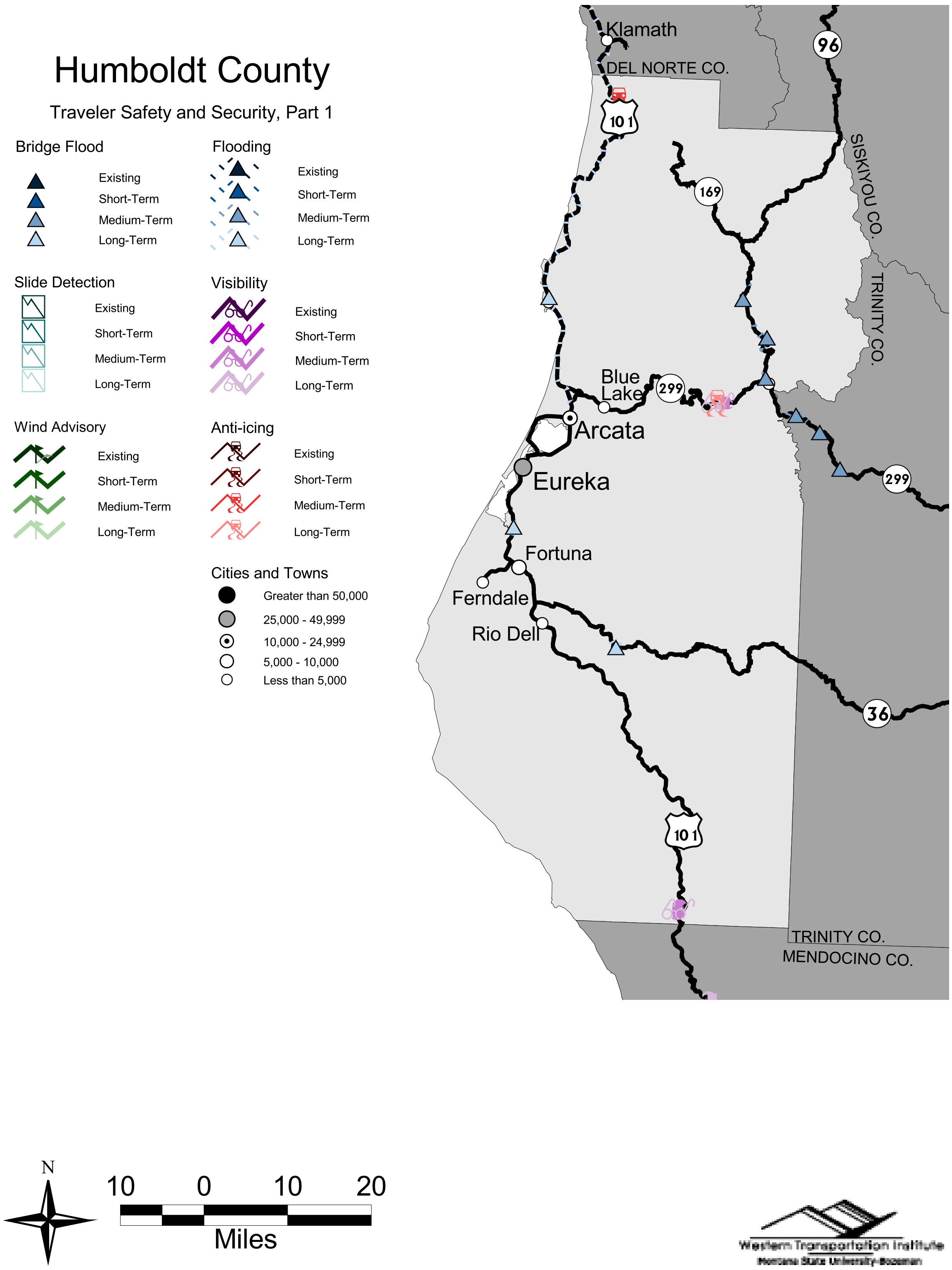


**Figure F-17:** Traveler Safety and Security (Part 1) in Humboldt County.

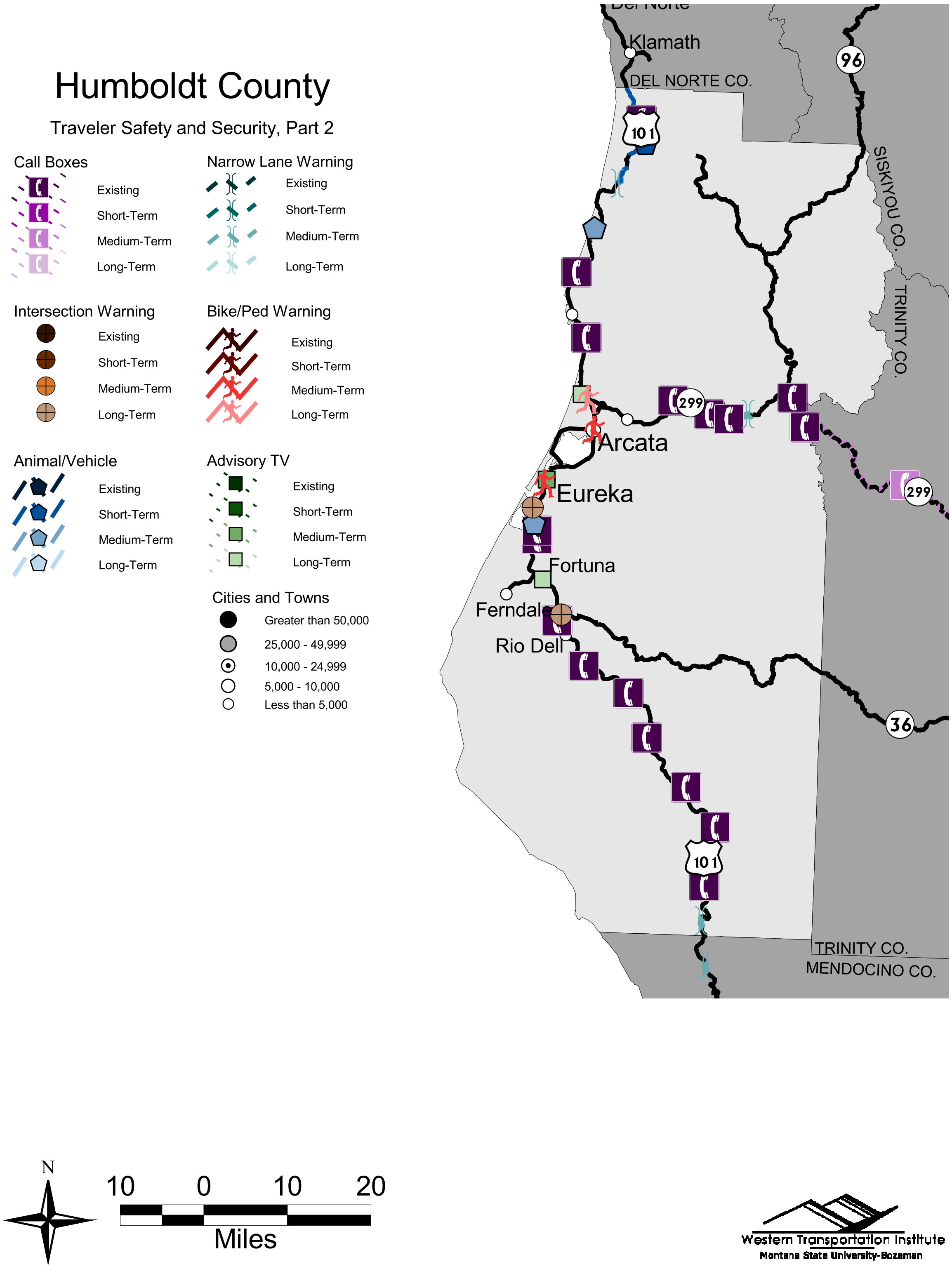


**Figure F-18:** Traveler Safety and Security (Part 2) in Humboldt County.

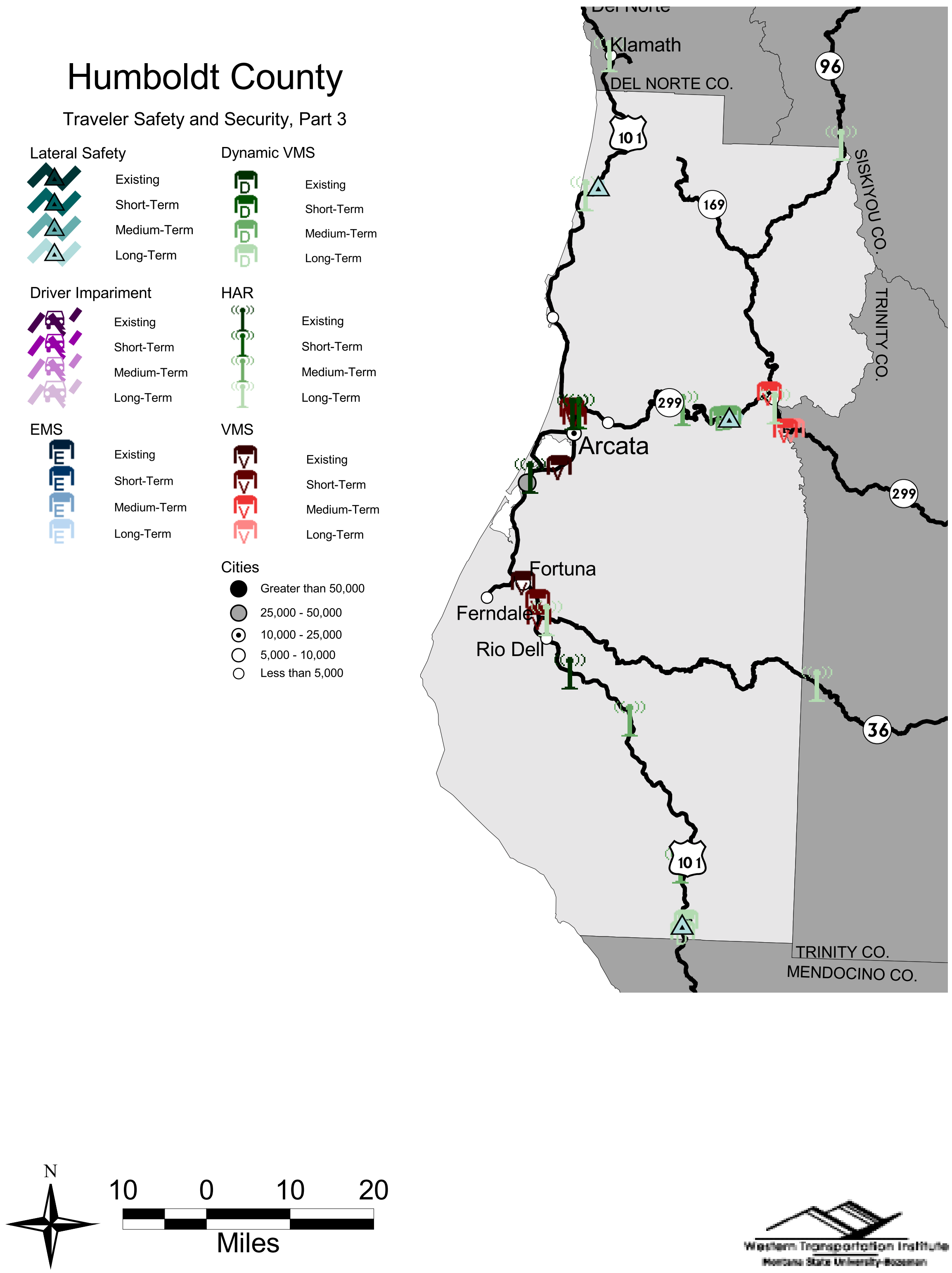


**Figure F-19:** Traveler Safety and Security (Part 3) in Humboldt County.

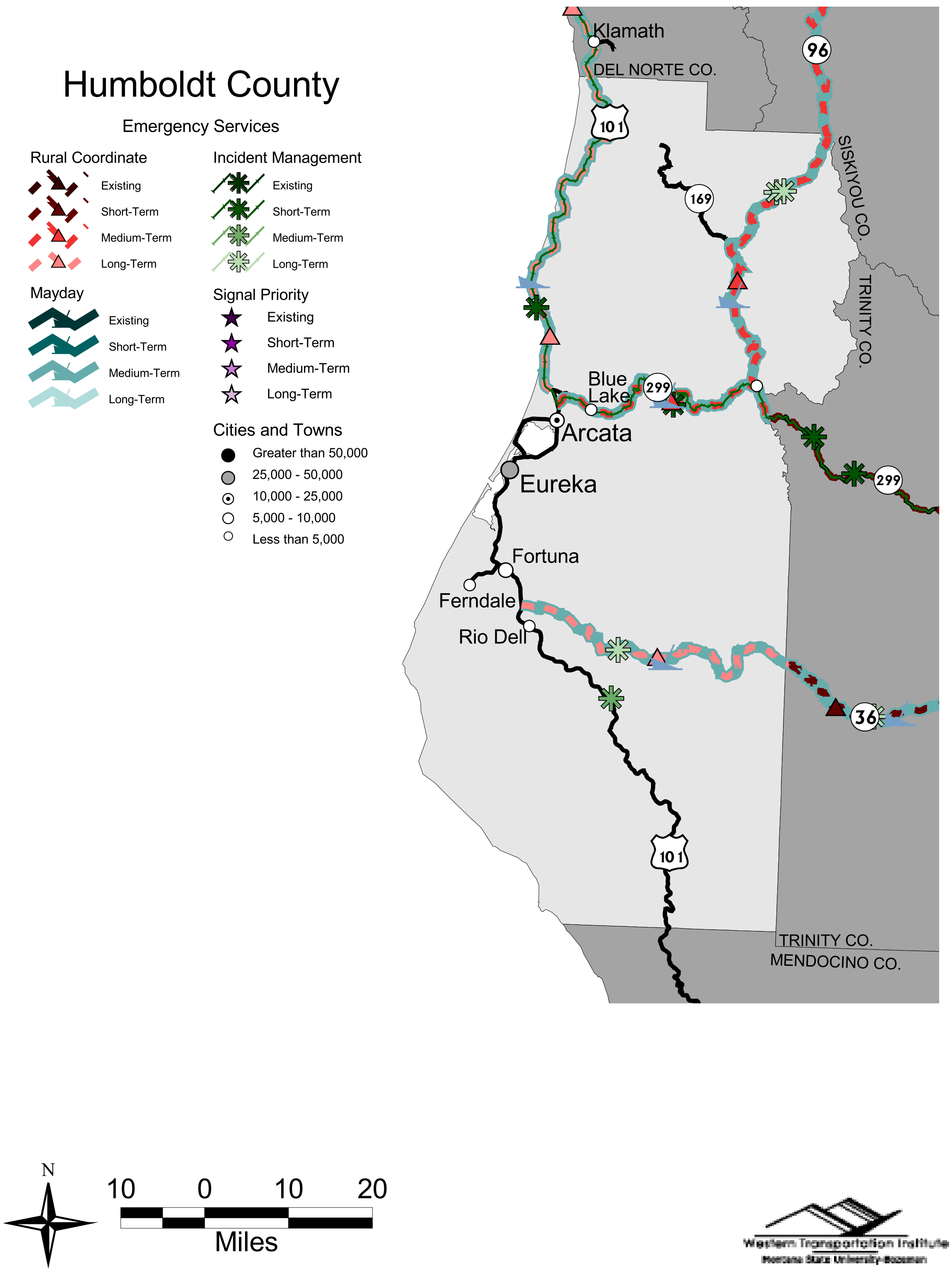


**Figure F-20:** Emergency Services in Humboldt County.

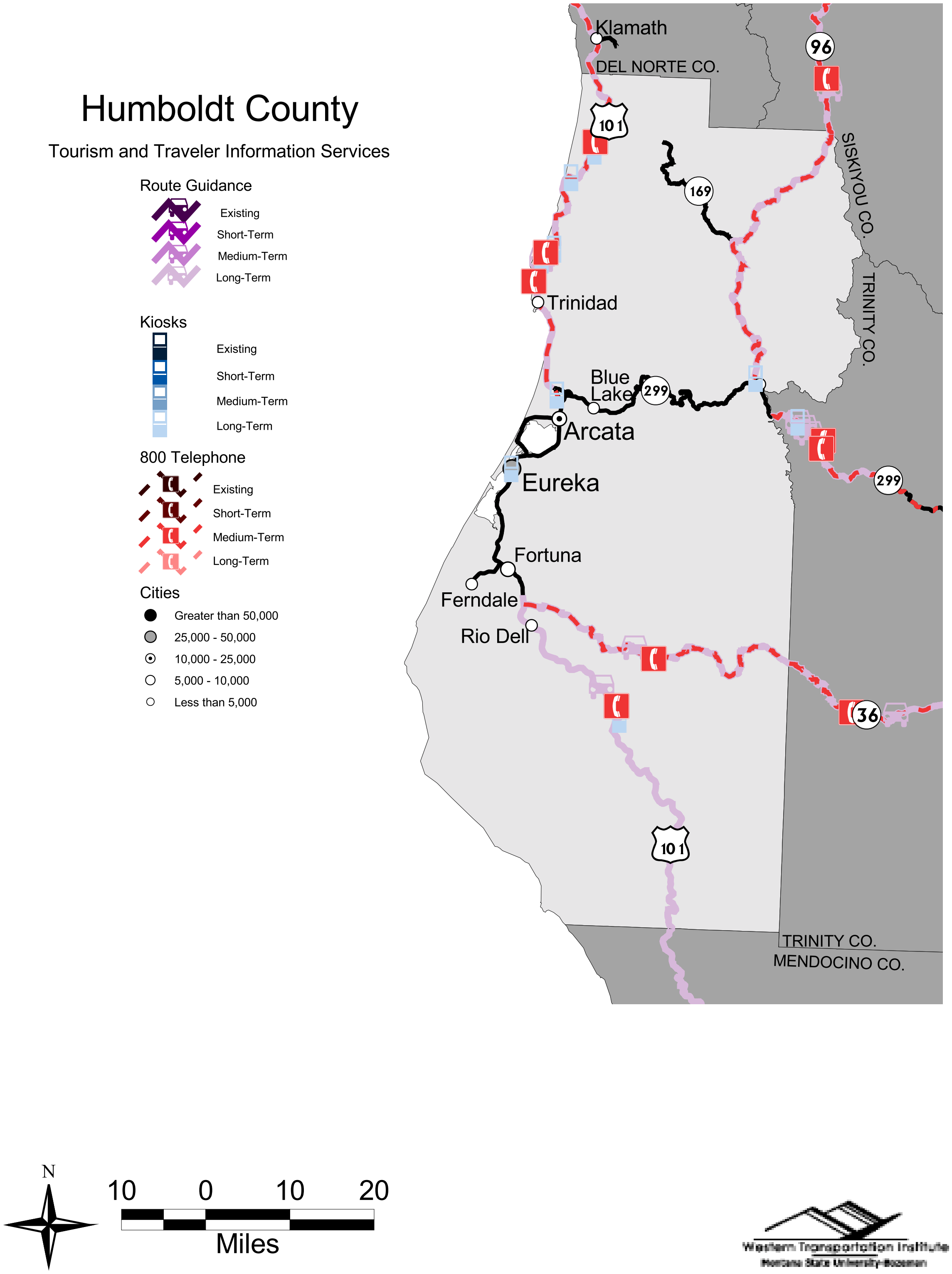


**Figure F-21:** Tourism and Traveler Information Services in Humboldt County.

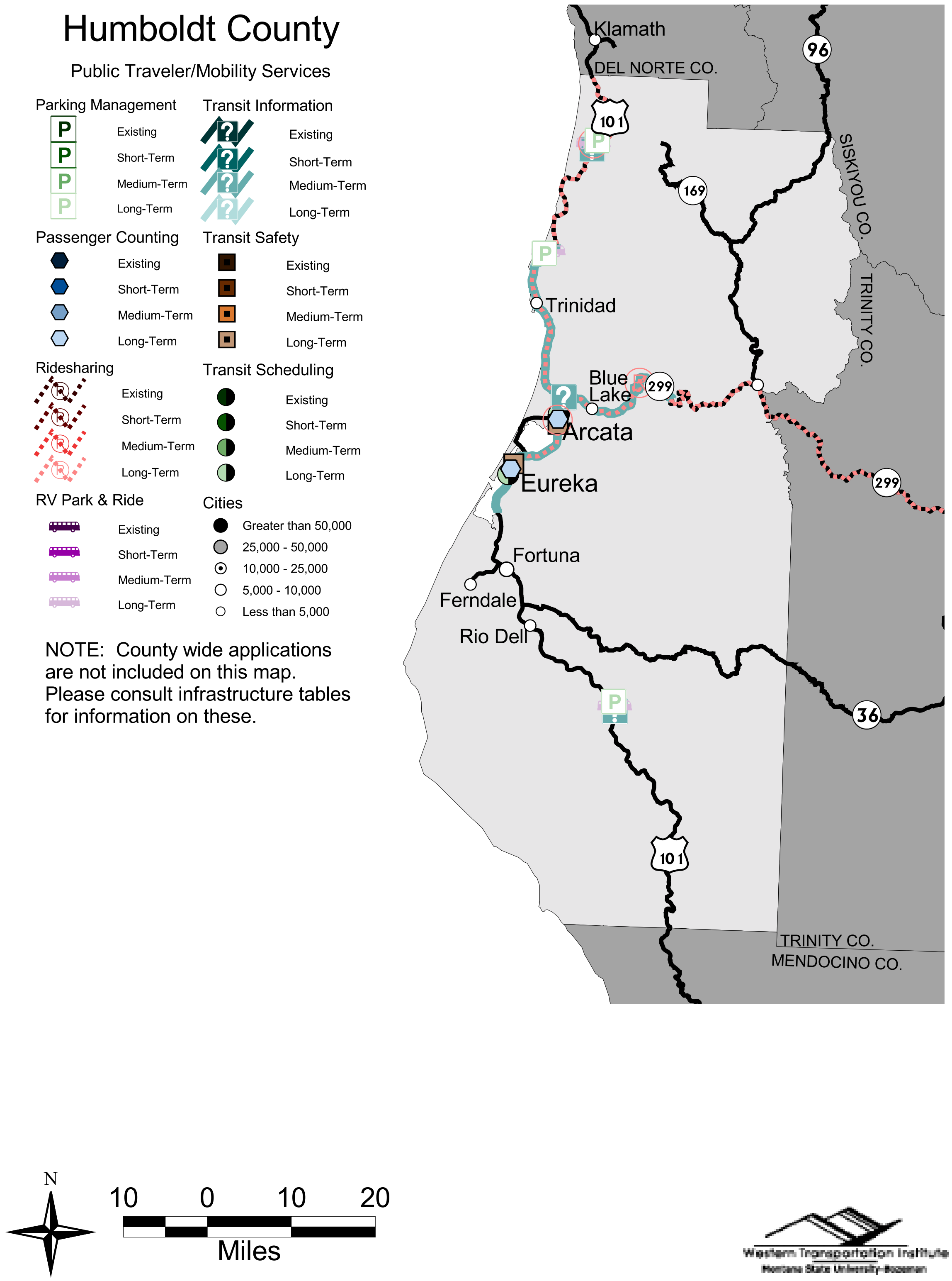


**Figure F-22:** Public Traveler/Mobility Services in Humboldt County.

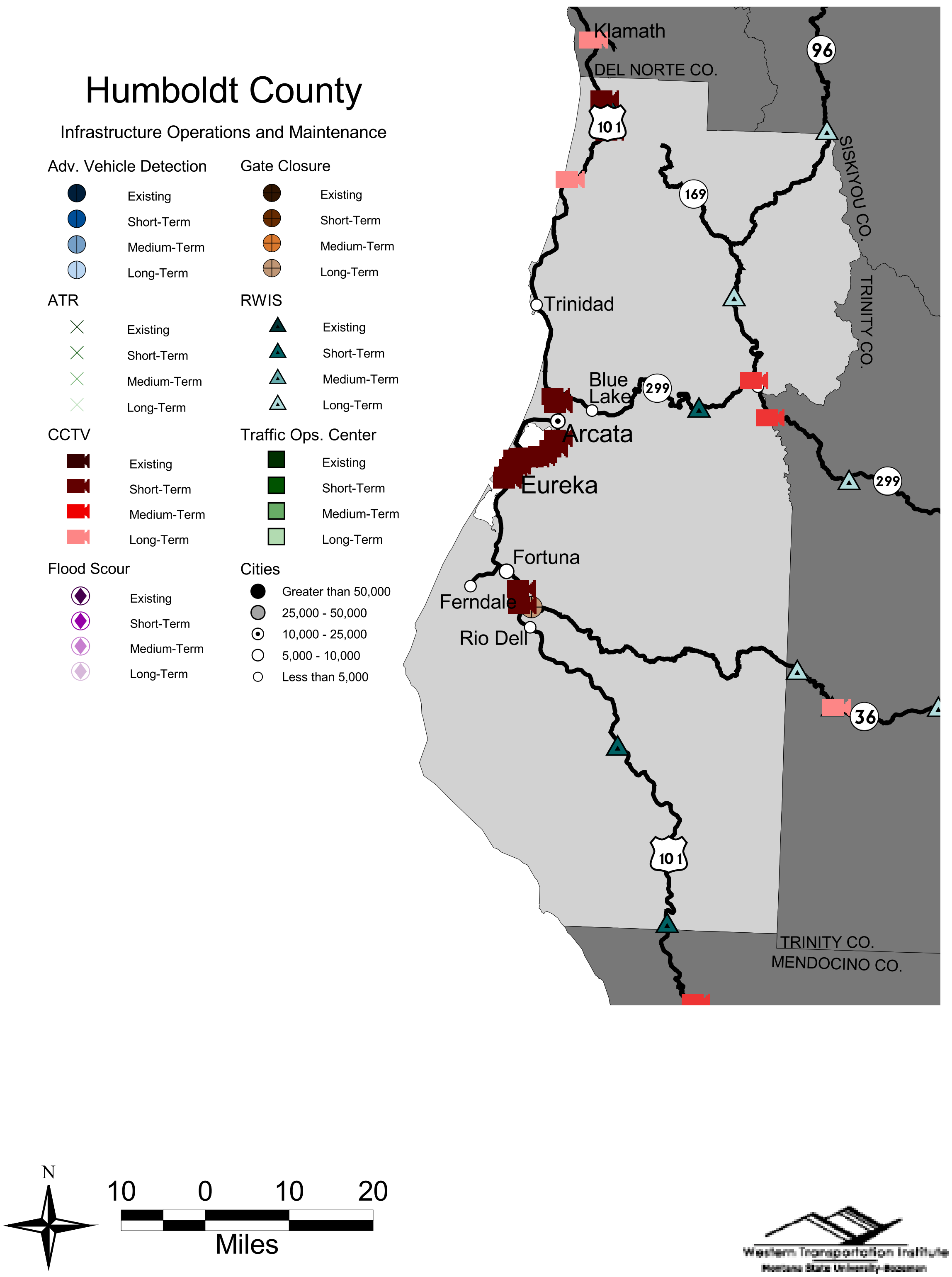


**Figure F-23:** Infrastructure Operations and Maintenance in Humboldt County.

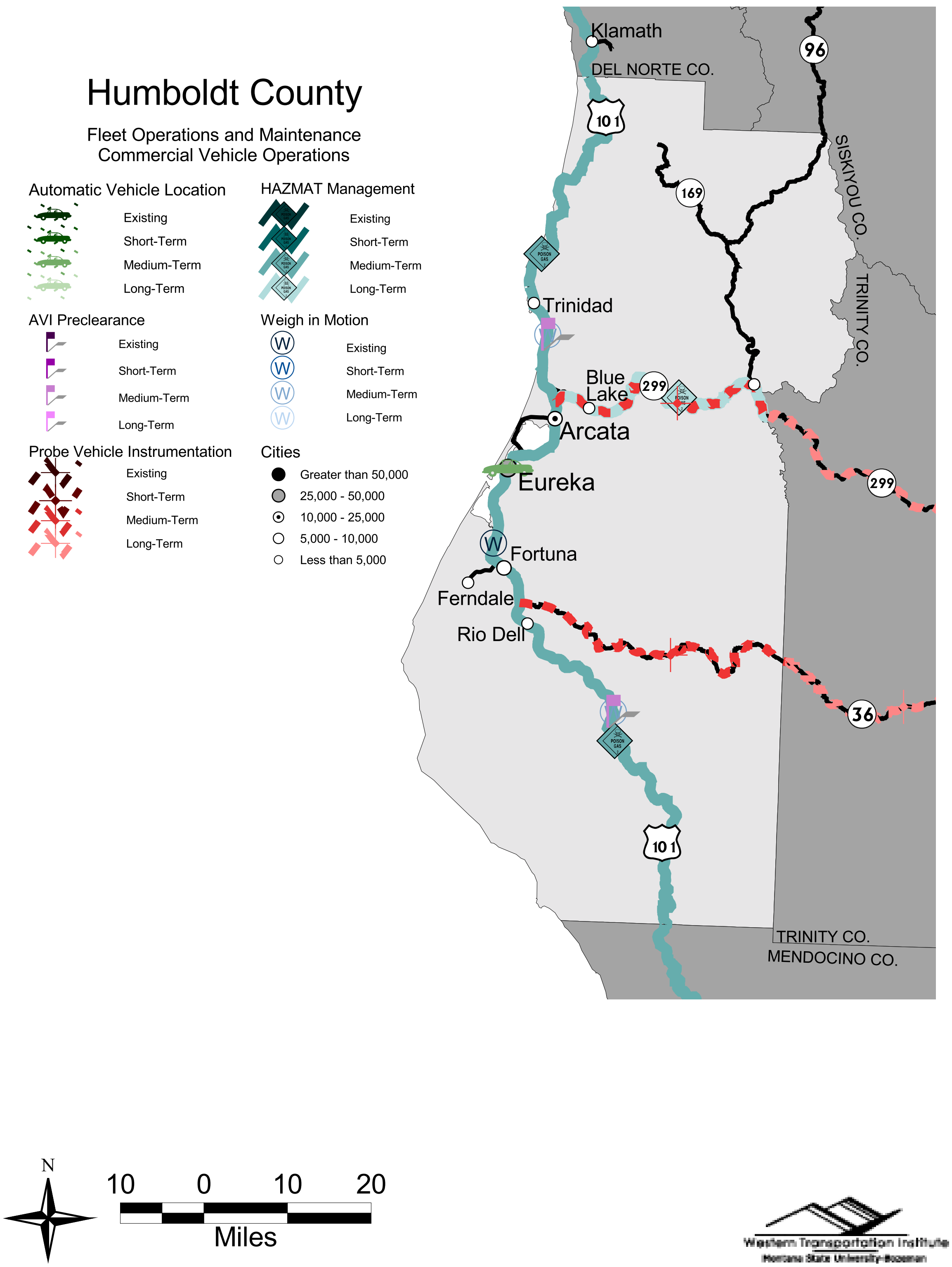


**Figure F-24:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Humboldt County.

**Table F-4:** Deployment Locations in Lassen and Plumas Counties.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Advanced Bike/Ped Warning | 20 | Lassen | 36 | 24.46 | | | Bike/ped challenge (Susanville) | Long-Term | ✓ |
| Advisory Television | 8 | Lassen | 36 | 24.46 | | | Susanville | Medium-Term | ✓ |
| Animal/Vehicle Collision Warning | 12 | Lassen | 395 | 63.99 | 126.93 | | Animal related challenge | Long-Term | ✓ |
| Animal/Vehicle Collision Warning | 16 | Lassen | 44 | 0 | 37.25 | | Stakeholder input | Long-Term | ✓ |
| Automated Anti-Icing | 10 | Lassen | 36 | 10.6 | 11.5 | | Road surface challenge | Long-Term | ✓ |
| Automated Flood Warning | 21 | Lassen | 395 | 4 | 6 | | Long Valley Creek | Long-Term | |
| Automated Visibility Warning | 5 | Lassen | 44 | 15 | 30 | | Snow white-out warning | Medium-Term | ✓ |
| Automated Wind Advisory | 3 | Lassen | 395 | 5.7 | | | Near Junction of Routes 70/395 Wind Warning | Short-Term | |
| Automated Wind Advisory | 4 | Lassen | 395 | 51.5 | | | Near Janesville Wind Warning | Short-Term | |
| Driver Impairment Detection | 2 | Lassen | 395 | 78.25 | 137.22 | | Fatigue challenge | Long-Term | ✓ |
| Extinguishable Message Sign | 4 | Lassen | 36 | 10.5 | | E | West Side of Fredonyer Summit | Short-Term | ✓ |
| Extinguishable Message Sign | 5 | Lassen | 36 | 11.5 | | W | West Side of Fredonyer Summit | Short-Term | ✓ |
| Extinguishable Message Sign | 6 | Lassen | 36 | 13 | | E | East Side of Fredonyer Summit | Short-Term | ✓ |
| Extinguishable Message Sign | 7 | Lassen | 36 | 14.1 | | W | East Side of Fredonyer Summit | Short-Term | ✓ |
| Highway Advisory Radio | 10 | Lassen | 395 | 60.1 | | | Susanville (Super HAR) | Existing | ✓ |
| Highway Advisory Radio | 13 | Lassen | 395 | 1.5 | | | At the Inspection Station Jct 70/395 | Existing | |
| Highway Advisory Radio | 59 | Lassen | 395 | 90 | | | Rest Area | Long-Term | ✓ |
| Highway Advisory Radio | 69 | Lassen | 36 | 0.76 | | | Near Jct 147 | Long-Term | ✓ |
| Highway Advisory Radio | 70 | Lassen | 36 | 22 | | | Near Eagle Lake Road (RPT Sta) | Long-Term | ✓ |
| Highway Advisory Radio | 71 | Plumas | 36 | 12.5 | | | At the Rest Area | Long-Term | ✓ |
| Highway Advisory Radio | 76 | Plumas | 70 | 14.95 | | | Near Beldon | Long-Term | |
| Highway Advisory Radio | 77 | Plumas | 70 | 43.1 | | | At Quincey | Long-Term | |
| Highway Advisory Radio | 78 | Plumas | 70 | 66.63 | | | Near Jct 89 | Long-Term | |
| Highway Advisory Radio | 79 | Plumas | 70 | 92.07 | | | Near Jct 49 | Long-Term | |
| Intersection Advance Warning | 22 | Lassen | 36 | 24.46 | | | Susanville | Long-Term | ✓ |
| Motorist-Aide Call Box | 77 | Lassen | 395 | 61.09 | 138.98 | | Notification time challenge | Medium-Term | ✓ |
| Variable Message Sign | 16 | Lassen | 70 | 3.5 | | W | At Junction of Routes 70/395 | Existing | |
| Variable Message Sign | 68 | Lassen | 395 | 51.5 | | N | Junction Buntingville Rd Back | Short-Term | |
| Variable Message Sign | 69 | Lassen | 395 | 5.75 | | N | North Junction Route 70 | Short-Term | |
| Variable Message Sign | 154 | Lassen | 395 | 70.8 | | S | Junction Standish Rd Ahead | Long-Term | ✓ |
| Variable Message Sign | 160 | Lassen | 36 | 21.1 | | W | West of Susanville | Long-Term | ✓ |
| Variable Message Sign | 161 | Lassen | 36 | 1 | | E | Junction of Route 147 Ahead | Long-Term | ✓ |
| Variable Message Sign | 167 | Plumas | 70 | 32.5 | | E | Just West of Jct Rte 89 | Long-Term | |
| Variable Message Sign | 168 | Plumas | 70 | 36.48 | | W | Just West of Keddie | Long-Term | |
| Variable Message Sign | 169 | Lassen | 70 | 3.62 | | E | Just West of Rte 395 | Long-Term | |
| Variable Message Sign | 170 | Plumas | 89 | 11.45 | | S | Just North of the Jct with Rte 70 | Long-Term | |
| Variable Message Sign | 171 | Plumas | 89 | 42 | | S | Junction of Route 36 Back | Long-Term | |
| Variable Message Sign | 172 | Plumas | 89 | 41.5 | | N | Just South of the Jct with Rte 36 | Long-Term | |
| Variable Message Sign | 181 | Lassen | 139 | 4 | | E | Junction Route 161 Back | Long-Term | ✓ |
| Variable Message Sign | 194 | Lassen | 299 | 14.9 | | W | Just West of Look Out Rd | Long-Term | ✓ |
| Variable Message Sign | 196 | Lassen | 395 | 27.1 | | N | At the Junction of Routes 36/395 | Long-Term | |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 6 | Lassen | 395 | 61.09 | 138.98 | | Response & notification time challenge | Medium-Term | ✓ |
| Regional Incident Management Plan | 17 | Lassen | 36 | 0 | 24 | | Road Closure | Medium-Term | ✓ |
| Regional Incident Management Plan | 17 | Plumas | 36 | 0 | 18.42 | | Road Closure | Medium-Term | ✓ |
| Rural Coordinate Addressing System | 4 | Lassen | 299 | 0 | 25.64 | | Response & notification time challenge | Medium-Term | ✓ |

**Table F-4:** Deployment Locations in Lassen and Plumas Counties (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Emergency Services (cont.)** | | | | | | | | | |
| Rural Coordinate Addressing System | 13 | Lassen | 395 | 61.09 | 138.98 | | Response & notification time challenge | Long-Term | ✓ |
| Rural Coordinate Addressing System | 15 | Plumas | 36 | 0 | 18.42 | | Response time challenge & stakeholder Input | Long-Term | ✓ |
| Rural Coordinate Addressing System | 15 | Lassen | 36 | 0 | 25.64 | | Response time challenge & stakeholder Input | Long-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| In-Vehicle Route Guidance System | 4 | Lassen | 36 | 0 | 29.39 | | Road Closure Locations | Long-Term | ✓ |
| | | Plumas | 36 | 0 | 18.42 | | | | |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 5 | Lassen | 36 | 24.46 | | | Mt Lassen Cab, Shuttle | Long-Term | ✓ |
| Automated Passenger Counting | 23 | Lassen | | | | | Lassen Transit Authority | Long-Term | ✓ |
| Automated Passenger Counting | 26 | Plumas | | | | | Plumas County Transit | Long-Term | ✓ |
| On-Board Transit Safety Systems | 5 | Lassen | 36 | 24.46 | | | Mt Lassen Cab, Shuttle | Long-Term | ✓ |
| On-Board Transit Safety Systems | 23 | Lassen | | | | | Lassen Transit Authority | Long-Term | ✓ |
| On-Board Transit Safety Systems | 26 | Plumas | | | | | Plumas County Transit | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 13 | Plumas | | | | | Plumas County Transit | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 23 | Lassen | | | | | Lassen Transit Authority | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 28 | Lassen | 36 | 24.46 | | | Mt Lassen Cab, Shuttle | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 53 | Lassen | 395 | 5 | | | Long Valley Creek | Long-Term | |
| Automatic Traffic Recorder | 86 | Plumas | 36 | 6.05 | | | Jct Rte 89 South | Existing | ✓ |
| Automatic Traffic Recorder | 87 | Plumas | 36 | 6.54 | | | Jct Rte 89 South | Existing | ✓ |
| Automatic Traffic Recorder | 88 | Plumas | 36 | 8.89 | | | Chester, N. Fork Feather River Br. | Existing | ✓ |
| Automatic Traffic Recorder | 89 | Plumas | 36 | 9.18 | | | Chester, Mellisa Ave | Existing | ✓ |
| Automatic Traffic Recorder | 90 | Plumas | 36 | 18.4 | | | Jct Rte 147 | Existing | ✓ |
| Automatic Traffic Recorder | 91 | Lassen | 36 | 18.95 | | | Jct Rte 44 | Existing | ✓ |
| Automatic Traffic Recorder | 92 | Lassen | 36 | 19.67 | | | Jct Rte 44 | Existing | ✓ |
| Automatic Traffic Recorder | 93 | Lassen | 36 | 24.45 | | | Cottage Street | Existing | ✓ |
| Automatic Traffic Recorder | 94 | Lassen | 36 | 24.99 | | | Susanville, Pacific St. | Existing | ✓ |
| Automatic Traffic Recorder | 95 | Lassen | 36 | 26.01 | | | Riverside Drive | Existing | ✓ |
| Automatic Traffic Recorder | 96 | Lassen | 36 | 28 | | | Jct Rte 395 | Existing | ✓ |
| Automatic Traffic Recorder | 130 | Lassen | 44 | 37.25 | | | Jct Rte 36 | Existing | ✓ |
| Automatic Traffic Recorder | 131 | Plumas | 49 | 7.42 | | | Jct Rte 70 | Existing | |
| Automatic Traffic Recorder | 132 | Plumas | 89 | 8.65 | | | Blairsden, Jct Rte 70 | Existing | |
| Automatic Traffic Recorder | 133 | Plumas | 89 | 14.5 | | | Jct Rte 70 | Existing | |
| Automatic Traffic Recorder | 134 | Plumas | 89 | 20.47 | | | Greenville Beckwourth Rd | Existing | |
| Automatic Traffic Recorder | 135 | Plumas | 89 | 41.73 | | | Jct Rte 36 | Existing | |
| Automatic Traffic Recorder | 161 | Lassen | 139 | 0.09 | | | Susanville, Jct Rte 36 Main St | Existing | ✓ |
| Automatic Traffic Recorder | 162 | Lassen | 139 | 3.4 | | | Susanville Dump Road | Existing | ✓ |
| Automatic Traffic Recorder | 168 | Plumas | 147 | 0.13 | | | Jct Rte 89 | Existing | |
| Automatic Traffic Recorder | 169 | Lassen | 147 | 1.79 | | | Jct Rte 36 | Existing | |
| Automatic Traffic Recorder | 196 | Plumas | 284 | 0.04 | | | Jct Rte 70 | Existing | |
| Automatic Traffic Recorder | 220 | Lassen | 299 | 3.77 | | | Cemetery Road | Existing | ✓ |
| Automatic Traffic Recorder | 221 | Lassen | 299 | 14.42 | | | Lookout-Susanville Rd | Existing | ✓ |
| Automatic Traffic Recorder | 222 | Lassen | 299 | 15.31 | | | Lookout-Susanville Rd | Existing | ✓ |
| Automatic Traffic Recorder | 228 | Lassen | 395 | 1.5 | | | Jct. Rte. 70 | Existing | |
| Automatic Traffic Recorder | 229 | Lassen | 395 | 7.75 | | | Jct. Rte. 70 | Existing | |
| Automatic Traffic Recorder | 230 | Lassen | 395 | 31.35 | | | Garnier Road | Existing | |

**Table F-4:** Deployment Locations in Lassen and Plumas Counties (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | ✓ |
| Automatic Traffic Recorder | 231 | Lassen | 395 | 51.83 | | | Buntingville-Standish Rd Co Rd A 3 | Existing | |
| Automatic Traffic Recorder | 232 | Lassen | 395 | 60.93 | | | Jct. Rte. 36 | Existing | ✓ |
| Automatic Traffic Recorder | 233 | Lassen | 395 | 61.29 | | | Jct. Rte. 36 | Existing | ✓ |
| Automatic Traffic Recorder | 234 | Lassen | 395 | 69.98 | | | Buntingville Co Rd A 3 | Existing | ✓ |
| Automatic Traffic Recorder | 235 | Lassen | 395 | 70.2 | | | Standish County Rd. A3 | Existing | ✓ |
| Closed-Circuit Television Camera | 27 | Lassen | 299 | 8.27 | | | At Big Valley Mountain Summit | Short-Term | ✓ |
| Closed-Circuit Television Camera | 31 | Lassen | 395 | 49.5 | | | Near Honey Lake SRRA | Short-Term | |
| Closed-Circuit Television Camera | 32 | Lassen | 395 | 17.4 | | | Near Constantia Road (Wind Warning CCTV at RWIS) | Short-Term | |
| Closed-Circuit Television Camera | 64 | Lassen | 395 | 132.09 | | | At Sage Hen Summit | Short-Term | ✓ |
| Closed-Circuit Television Camera | 77 | Lassen | 36 | 19.2 | | | At Junction Route 36/44 COATS Expanded CCTV | Short-Term | ✓ |
| Closed-Circuit Television Camera | 78 | Lassen | 36 | 24.04 | | | At West Susanville COATS Expanded CCTV | Short-Term | ✓ |
| Closed-Circuit Television Camera | 79 | Lassen | 36 | 26.52 | | | At East Riverside Drive (Susanville) COATS Expanded CCTV | Short-Term | ✓ |
| Closed-Circuit Television Camera | 80 | Lassen | 36 | 29.39 | | | At Junction Routes 36/395 COATS Expanded CCTV | Short-Term | ✓ |
| Closed-Circuit Television Camera | 83 | Plumas | 70 | 33.03 | | | At Greenville Wye COATS Expanded CCTV | Short-Term | |
| Closed-Circuit Television Camera | 95 | Lassen | 36 | 11.85 | | | At Fredonyer Summit Icy Curve Warning System CCTV at Summit | Short-Term | ✓ |
| Closed-Circuit Television Camera | 134 | Lassen | 395 | 51.5 | | | Southbound | Long-Term | |
| Closed-Circuit Television Camera | 135 | Lassen | 395 | 5.7 | | | Northbound | Long-Term | |
| Closed-Circuit Television Camera | 142 | Lassen | 395 | 70.8 | | | Response time challenge | Long-Term | ✓ |
| Closed-Circuit Television Camera | 143 | Lassen | 395 | 90 | | | Response time challenge | Long-Term | ✓ |
| Closed-Circuit Television Camera | 157 | Lassen | 44 | 14.53 | | | Bogard Rest Area | Long-Term | ✓ |
| Closed-Circuit Television Camera | 158 | Lassen | 395 | 96.5 | | | Secret Valley Rest Area | Long-Term | ✓ |
| Closed-Circuit Television Camera | 159 | Plumas | 36 | 12.8 | | | Lake Almanor Rest Area | Long-Term | ✓ |
| Closed-Circuit Television Camera | 172 | Lassen | 44 | 0 | | | At the County Line | Long-Term | ✓ |
| Closed-Circuit Television Camera | 175 | Plumas | 70 | 55.24 | | | Lee Summit | Long-Term | |
| Closed-Circuit Television Camera | 176 | Plumas | 70 | 70.68 | | | Near the Sandhouse | Long-Term | |
| Closed-Circuit Television Camera | 177 | Plumas | 89 | 29.6 | | | Near Canyon Dam | Long-Term | |
| Closed-Circuit Television Camera | 184 | Lassen | 139 | 20.46 | | | Near Willow Creek Hill | Long-Term | ✓ |
| RWIS | 35 | Lassen | 395 | 5.7 | | | Near Junction of Routes 70/395 Wind Warning | Short-Term | |
| RWIS | 36 | Lassen | 395 | 51.5 | | | Near Janesville Wind Warning | Short-Term | |
| RWIS | 57 | Lassen | 36 | 11 | | | West Side of Fredonyer Summit Icy Curve Warning System W/ 2 EMS | Short-Term | ✓ |
| RWIS | 58 | Lassen | 36 | 13.5 | | | East Side of Fredonyer Summit Icy Curve Warning System W/ 2 EMS | Short-Term | ✓ |
| RWIS | 59 | Lassen | 299 | 8.27 | | | At Big Valley Mountain Summit | Short-Term | ✓ |
| RWIS | 60 | Lassen | 395 | 132.09 | | | At Sage Hen Summit | Short-Term | ✓ |
| RWIS | 83 | Lassen | 44 | 0 | | | At the County Line | Long-Term | ✓ |
| RWIS | 84 | Lassen | 44 | 14.53 | | | Near Bogard Rest Area | Long-Term | ✓ |
| RWIS | 86 | Plumas | 70 | 55.24 | | | Lee Summit | Long-Term | |
| RWIS | 87 | Plumas | 70 | 70.68 | | | Near the Sandhouse | Long-Term | |
| RWIS | 88 | Plumas | 89 | 29.6 | | | Near Canyon Dam | Long-Term | |
| RWIS | 94 | Lassen | 139 | 20.46 | | | Near Willow Creek Hill | Long-Term | ✓ |
| Satellite Traffic Operations Center | 10 | Lassen | 36 | 24.46 | | | Susanville | Long-Term | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automated Snow Plow | 1 | Lassen | 44 | 15.5 | | | E of Bogard | Existing | ✓ |
| Automatic Vehicle Location | 7 | Lassen | 36 | 24.46 | | | Susanville | Long-Term | ✓ |
| Probe Vehicle Instrumentation | 8 | Lassen | 36 | 10.6 | 11.5 | | Road Surface and Speed Challenge | Long-Term | ✓ |
| Probe Vehicle Instrumentation | 9 | Plumas | 36 | 0 | 18.42 | | E/W California routes | Long-Term | ✓ |
| Probe Vehicle Instrumentation | 10 | Lassen | 44 | 0 | 37.25 | | E/W California routes | Long-Term | ✓ |

**Table F-4:** Deployment Locations in Lassen and Plumas Counties (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Fleet Operations and Maintenance (cont.)** | | | | | | | | | |
| Probe Vehicle Instrumentation | 11 | Lassen | 299 | 0 | 25.64 | | E/W California routes | Long-Term | ✓ |

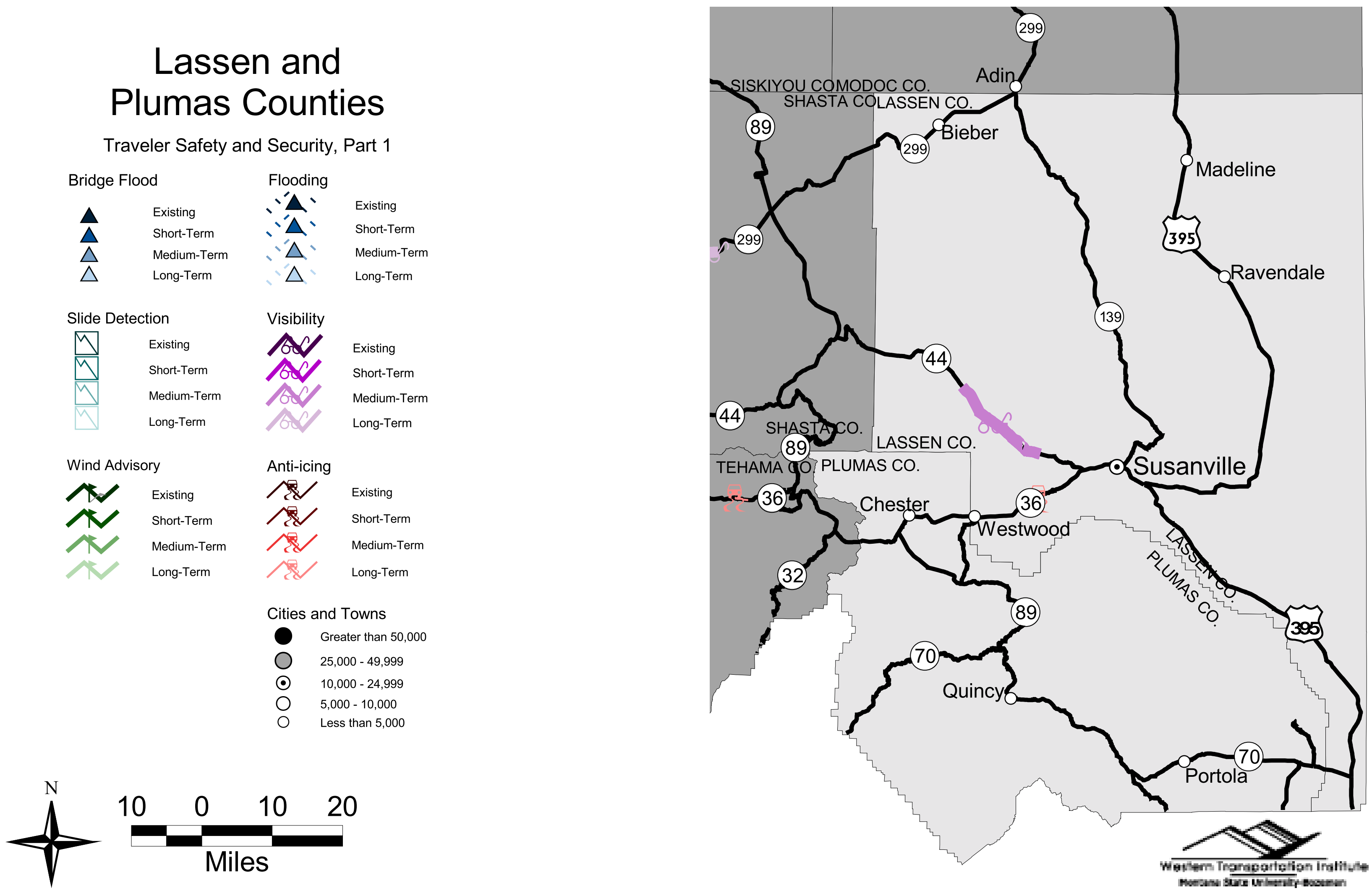


**Figure F-25:** Traveler Safety and Security (Part 1) in Lassen and Plumas Counties.

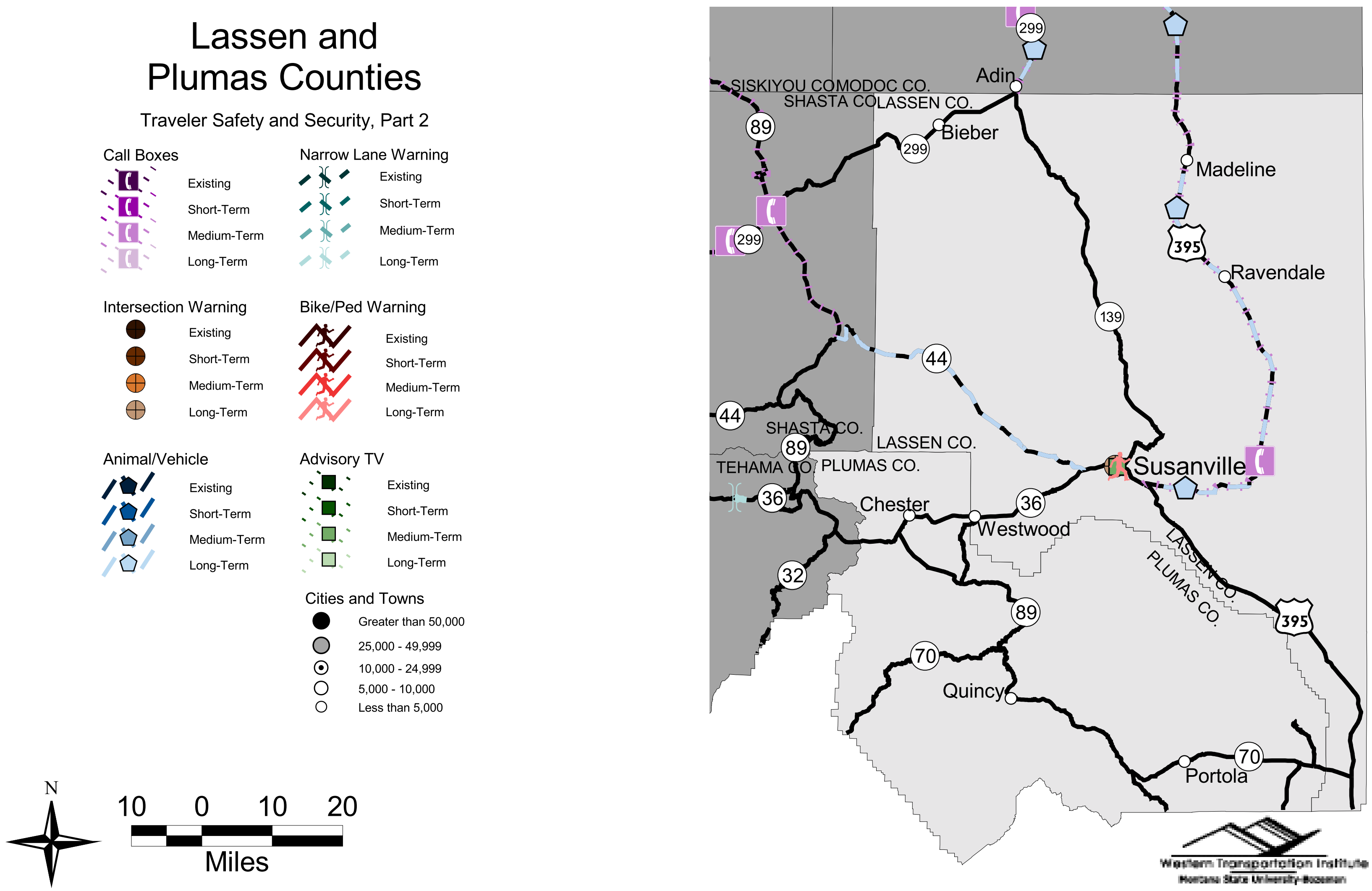


**Figure F-26:** Traveler Safety and Security (Part 2) in Lassen and Plumas Counties.

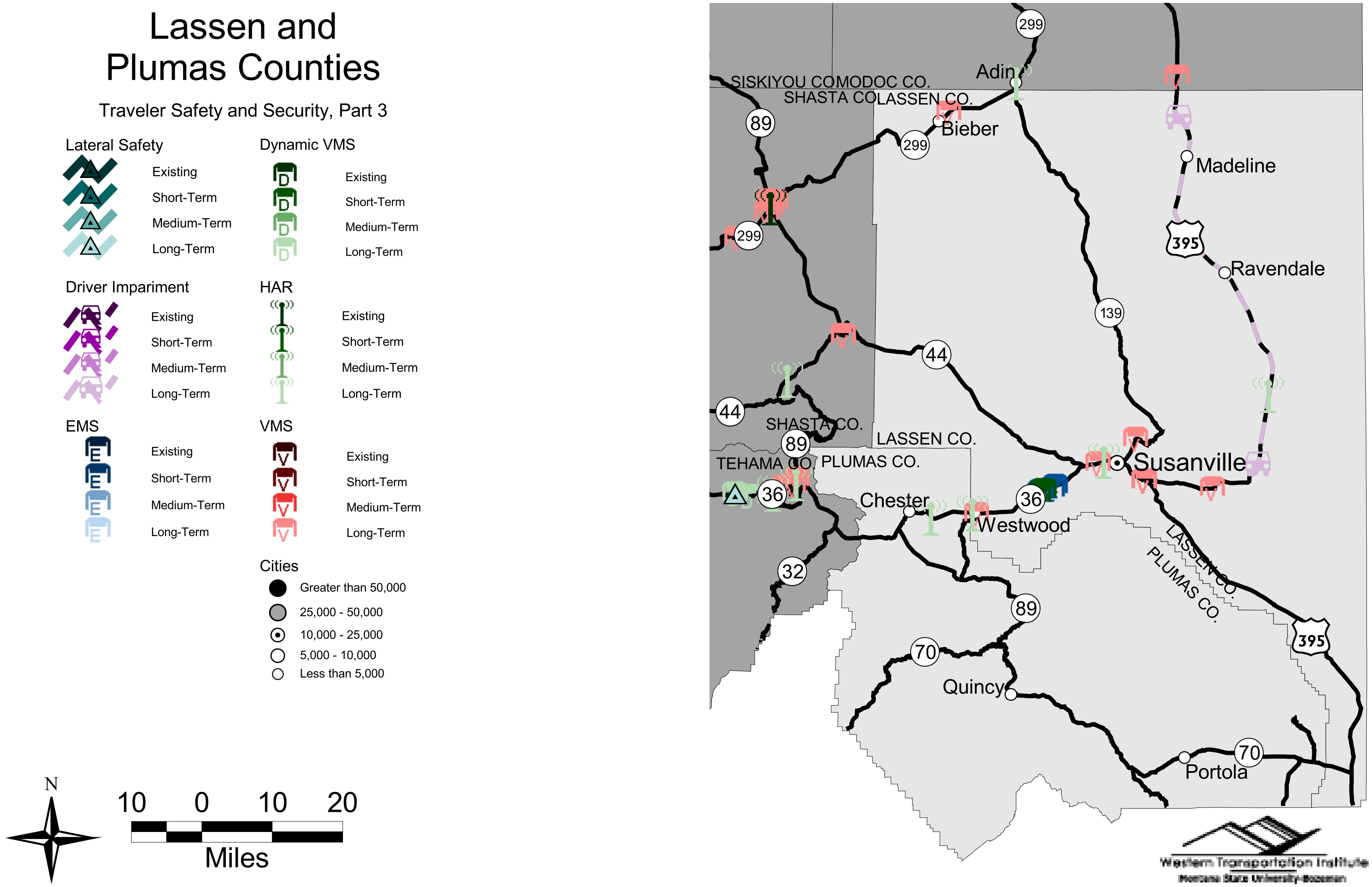


**Figure F-27:** Traveler Safety and Security (Part 3) in Lassen and Plumas Counties.

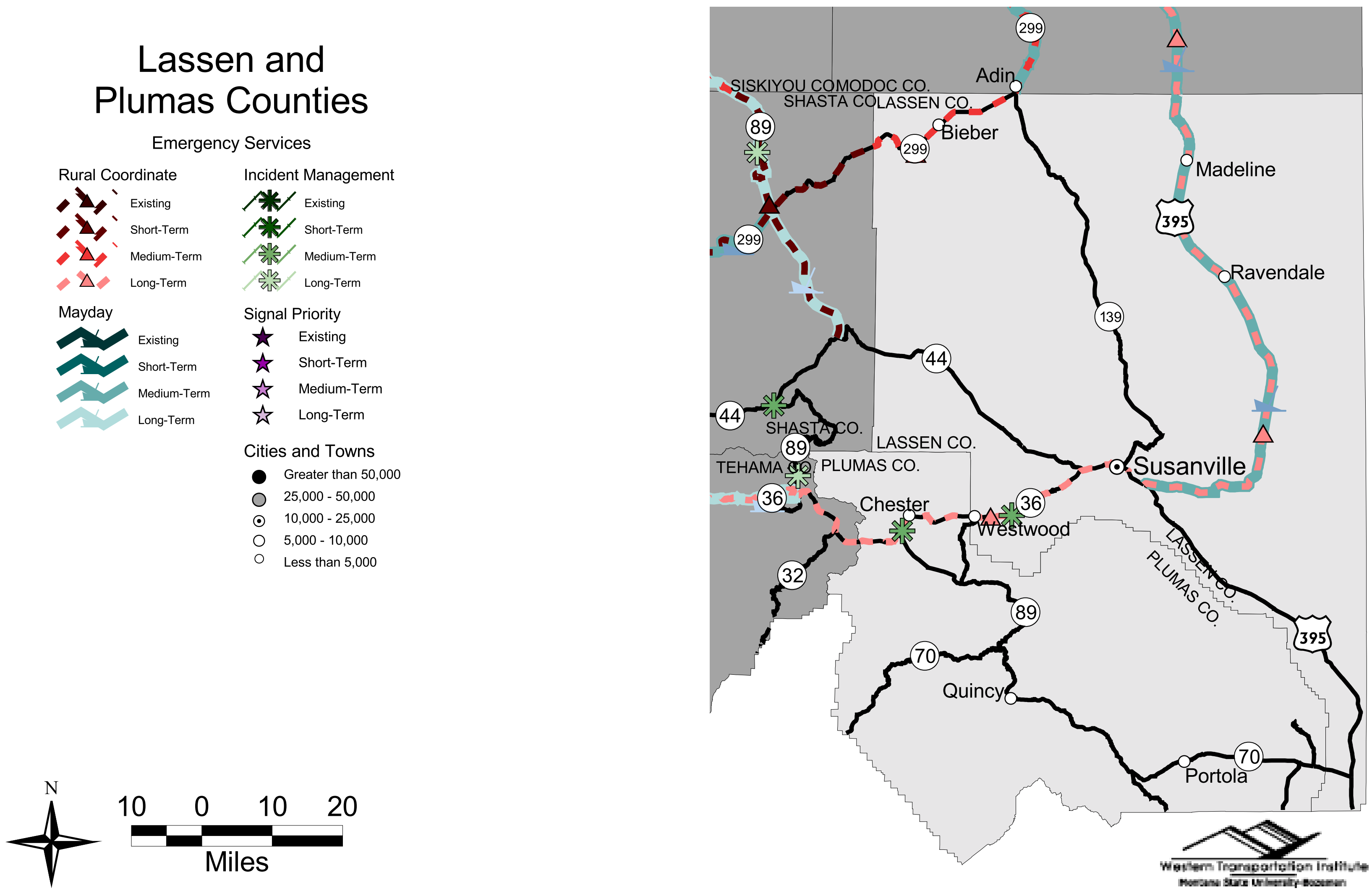


**Figure F-28:** Emergency Services in Lassen and Plumas Counties.

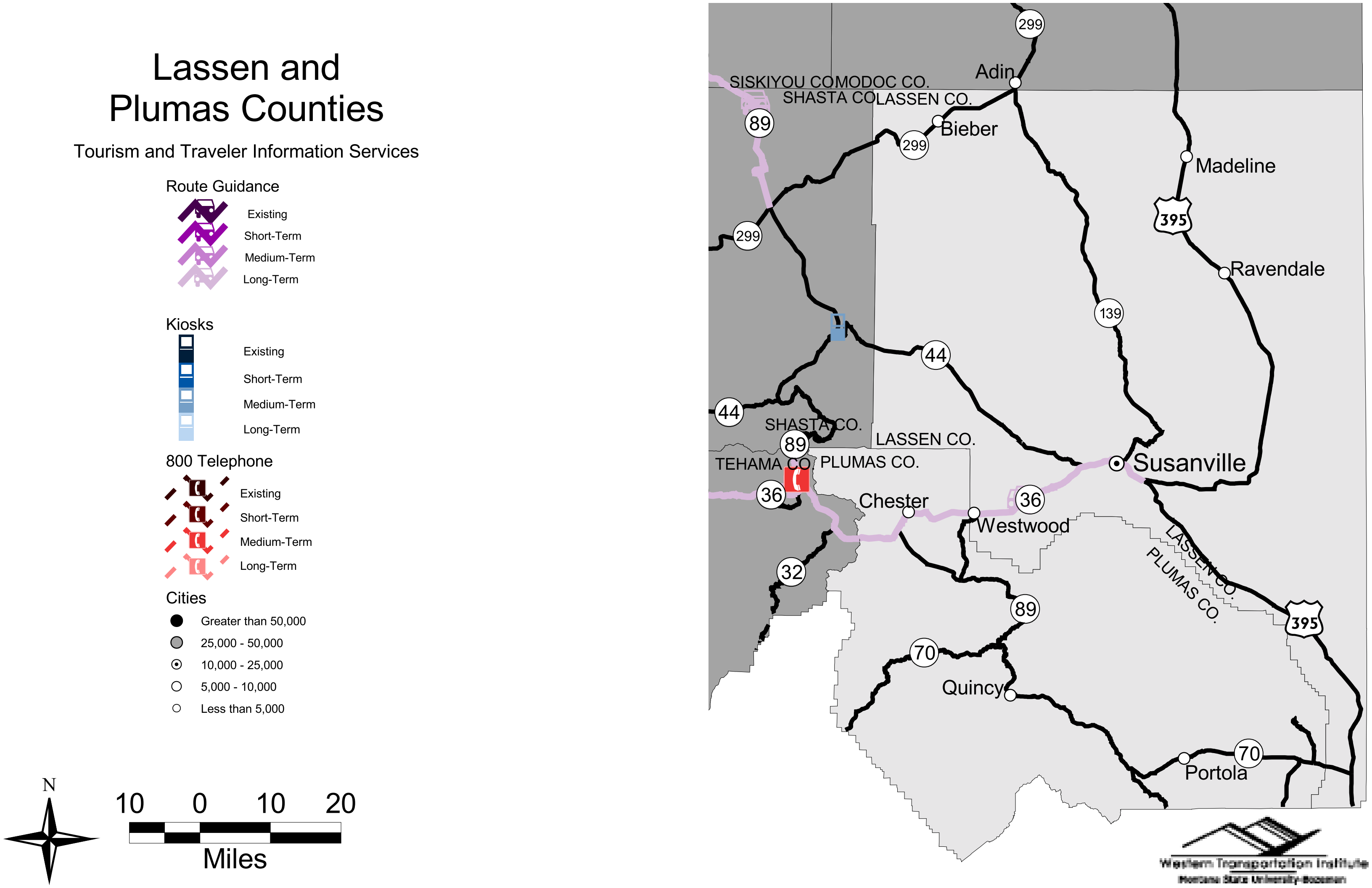


**Figure F-29:** Tourism and Traveler Information Services in Lassen and Plumas Counties.

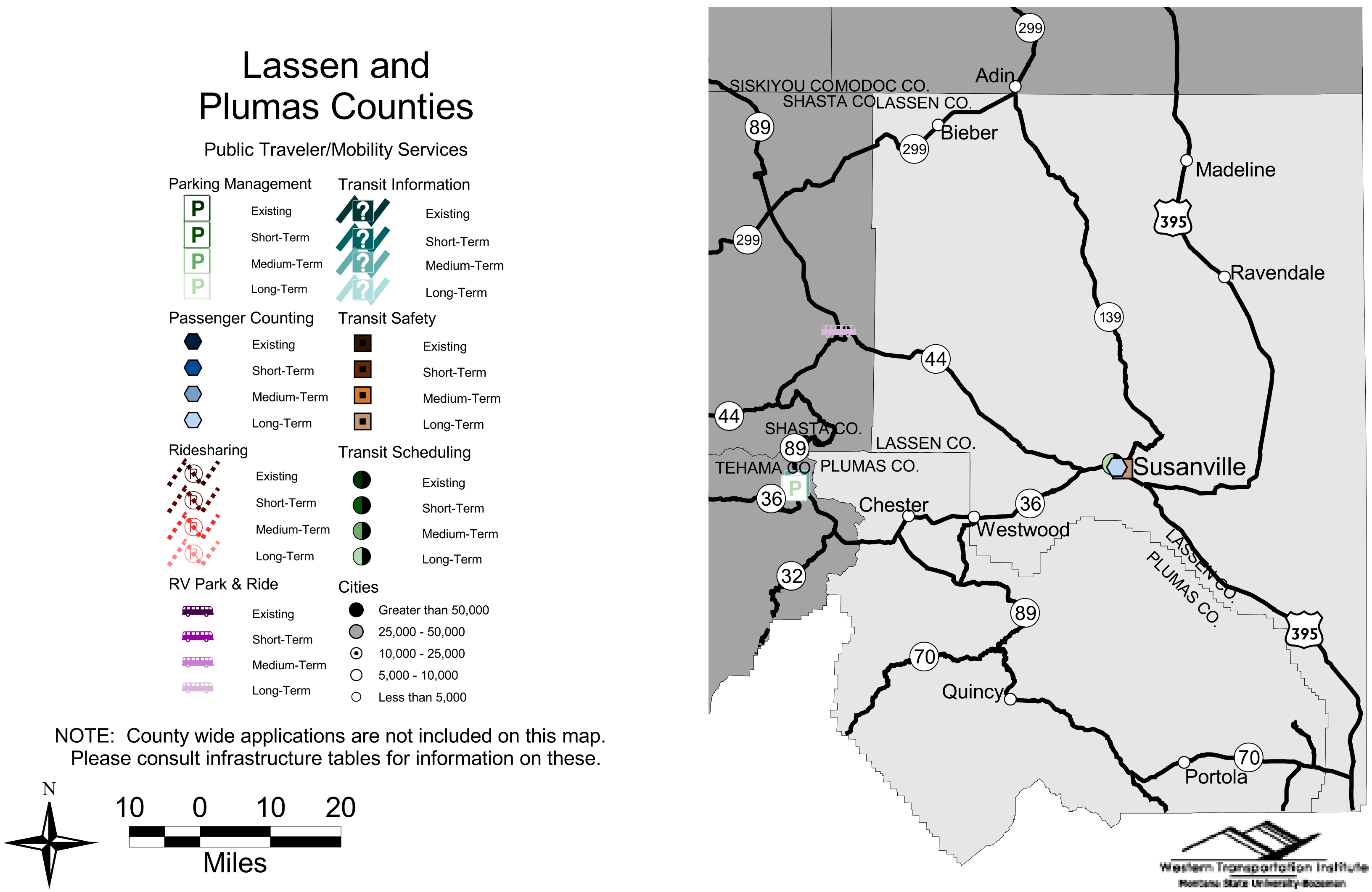


**Figure F-30:** Public Traveler/Mobility Services in Lassen and Plumas Counties.

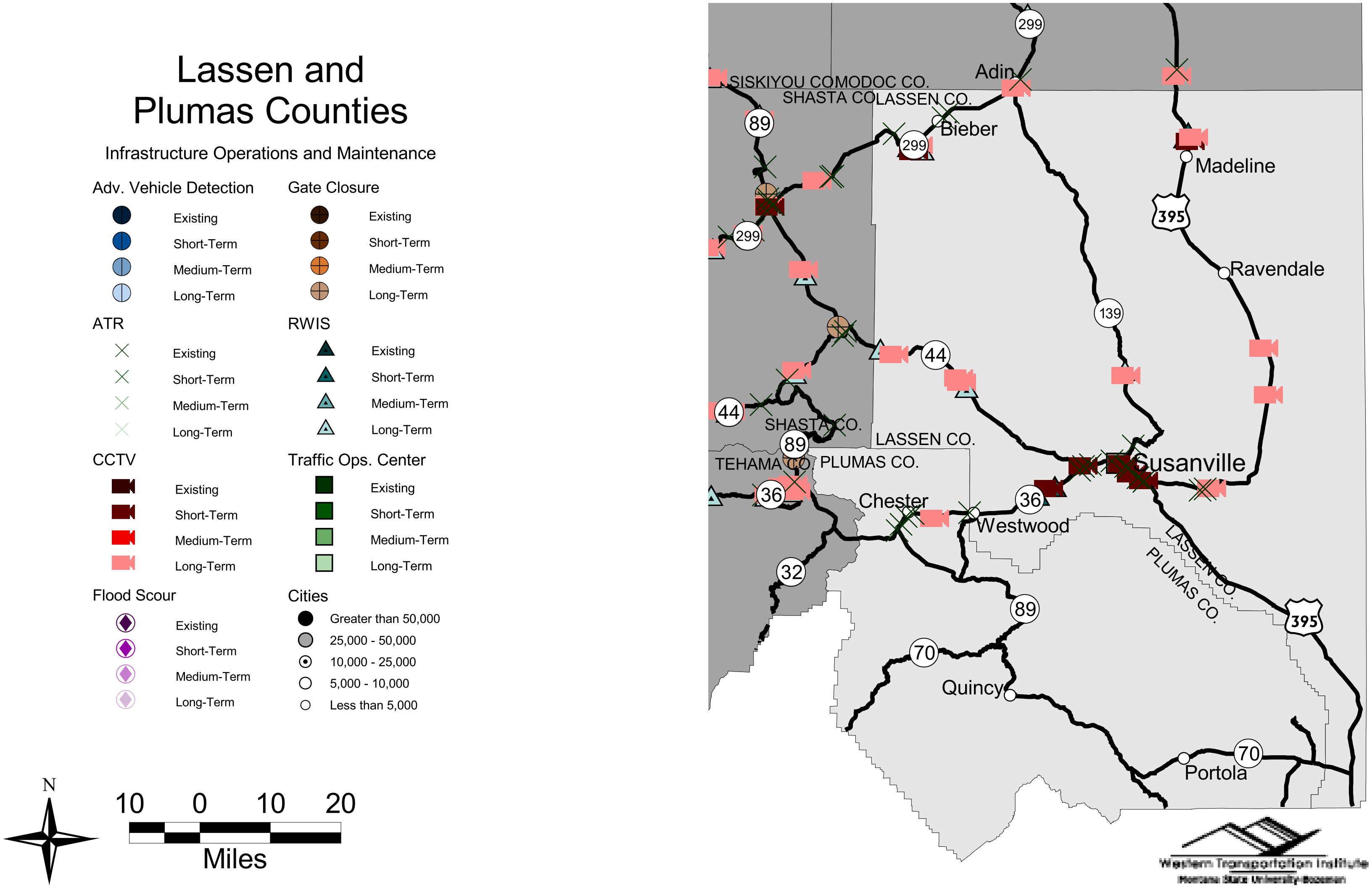


**Figure F-31:** Infrastructure Operations and Maintenance in Lassen and Plumas Counties.

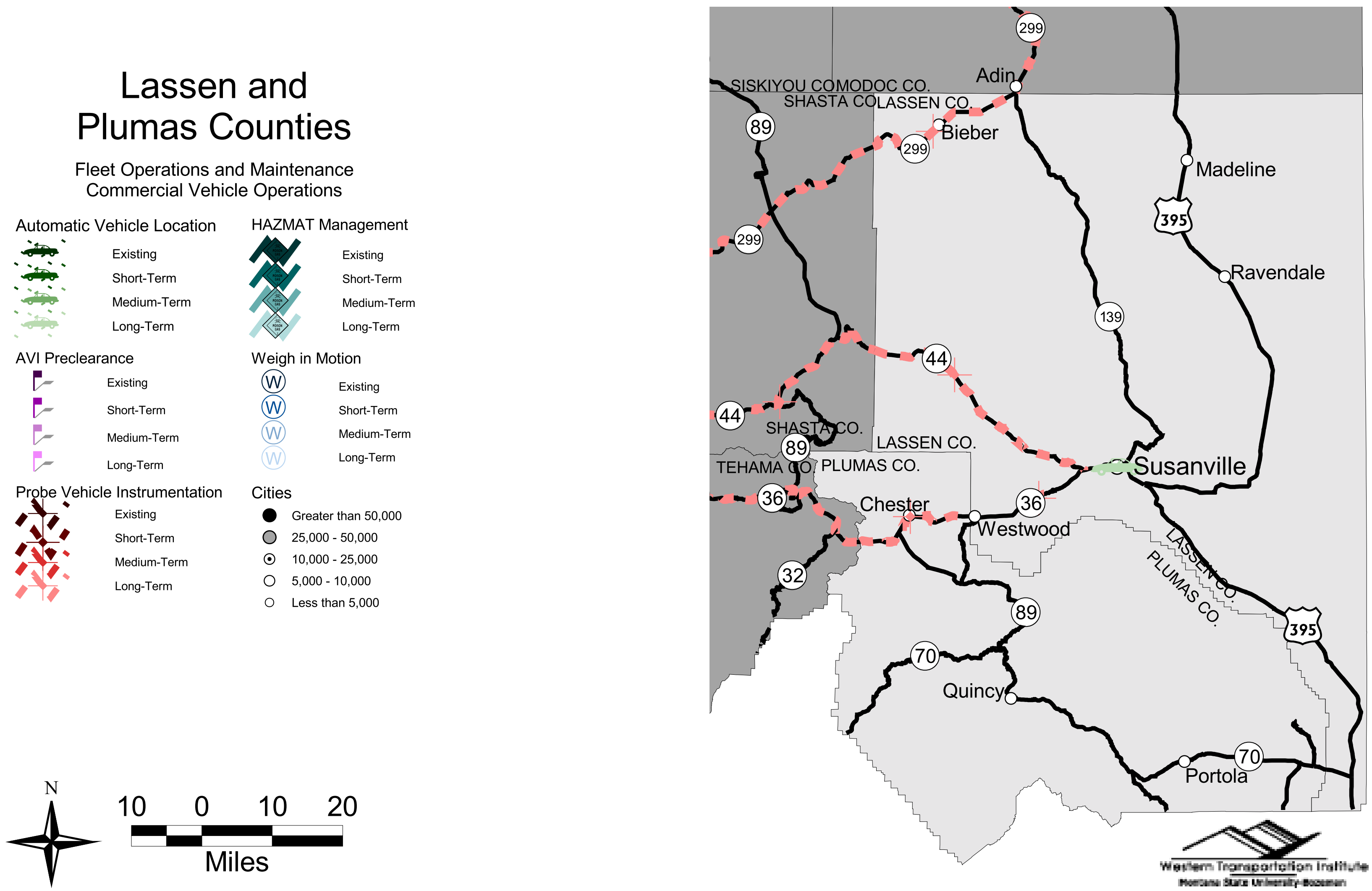


**Figure F-32:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Lassen and Plumas Counties.

**Table F-5:** Deployment Locations in Mendocino County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 4 | Mendocino | 101 | 50.7 | 51.2 | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Adv. Warning for Narrow Lanes | 13 | Mendocino | 101 | 99.17 | 101.17 | | Around Confusion Hill | Medium-Term | ✓ |
| Adv. Warning for Narrow Lanes | 23 | Mendocino | 1 | 88 | 102 | | Improve safety | Long-Term | ✓ |
| Advanced Bike/Ped Warning | 6 | Mendocino | 101 | 45.17 | | | Bike/ped challenge (Willits) | Medium-Term | ✓ |
| Advisory Television | 18 | Mendocino | 101 | 45.17 | | | Willits | Long-Term | ✓ |
| Animal/Vehicle Collision Warning | 11 | Mendocino | 101 | 65 | 67 | | | Medium-Term | ✓ |
| Automated Anti-Icing | 4 | Mendocino | 101 | 76 | 78 | | Stakeholder Input (near Brushy Mountain) | Medium-Term | ✓ |
| Automated Anti-Icing | 11 | Mendocino | 20 | 20 | 29 | | Improve safety | Long-Term | ✓ |
| Automated Flood Warning | 17 | Mendocino | 101 | 46 | 59 | | Flood challenge | Long-Term | ✓ |
| Automated Visibility Warning | 12 | Mendocino | 101 | 50.7 | 51.23 | | Visibility challenge | Long-Term | ✓ |
| Automated Visibility Warning | 18 | Mendocino | 101 | 90 | 92 | | | Long-Term | ✓ |
| Dynamic Warning VMS | 25 | Mendocino | 101 | 51.23 | | South | Visibility Challenge | Long-Term | ✓ |
| | | | | 50.7 | | North | | | |
| Extinguishable Message Sign | 1 | Mendocino | 101 | 42.3 | | N | S of Willits | Existing | ✓ |
| Extinguishable Message Sign | 2 | Mendocino | 101 | 49.2 | | S | N of Willits | Existing | ✓ |
| Extinguishable Message Sign | 3 | Mendocino | 20 | 32.6 | | E | W of Willits | Existing | ✓ |
| Highway Advisory Radio | 8 | Mendocino | 1 | 60 | | | Road Closure, Tourist (@ Fort Bragg) | Existing | ✓ |
| Highway Advisory Radio | 36 | Mendocino | 101 | 92 | | | Road Closure | Medium-Term | ✓ |
| Highway Advisory Radio | 61 | Mendocino | 20 | 21.1 | | | Traveler information | Long-Term | ✓ |
| Intersection Advance Warning | 18 | Mendocino | 101 | 90 | | | Rte 1/101 intersection | Long-Term | ✓ |
| Intersection Advance Warning | 19 | Mendocino | 162 | 0 | | | Rte 101/162 intersection | Long-Term | ✓ |
| Lateral Safety Warning System | 6 | Mendocino | 101 | 50.7 | 51.2 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Lateral Safety Warning System | 20 | Mendocino | 20 | 0 | 33.16 | | Reduced ROR accident | Long-Term | ✓ |
| Variable Message Sign | 31 | Mendocino | 20 | 0 | | E | Traveler information | Short-Term | ✓ |
| Variable Message Sign | 33 | Mendocino | 101 | 89 | | West | All Criteria | Short-Term | ✓ |
| Variable Message Sign | 45 | Mendocino | 101 | 31.6 | | S | N of 101/20 SEP | Short-Term | ✓ |
| Variable Message Sign | 46 | Mendocino | 1 | 105 | | North | All Criteria | Short-Term | ✓ |
| Variable Message Sign | 64 | Mendocino | 101 | 49.2 | | N | N of Willits | Short-Term | ✓ |
| Variable Message Sign | 65 | Mendocino | 101 | 29.8 | | N | S of 101/20 Sep | Short-Term | ✓ |
| Variable Message Sign | 66 | Mendocino | 20 | 32.6 | | W | E of 20/101 Sep | Short-Term | ✓ |
| Variable Message Sign | 70 | Mendocino | 101 | 92 | | South | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 153 | Mendocino | 20 | 30 | | E | | Long-Term | ✓ |
| Variable Message Sign (Portable) | 3 | Mendocino | 101 | 20.4 | | S | Ukiah | Existing | |
| Variable Message Sign (Portable) | 4 | Mendocino | 101 | 20.4 | | S | Ukiah | Existing | |
| Variable Message Sign (Portable) | 5 | Mendocino | 101 | 20.4 | | S | Ukiah | Existing | |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 15 | Mendocino | 162 | 0 | 34.05 | | | Medium-Term | ✓ |
| Regional Incident Management Plan | 2 | Mendocino | 1 | 59.8 | 105.58 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 16 | Mendocino | 101 | 58 | 104.15 | | Road Closure | Medium-Term | ✓ |
| Regional Incident Management Plan | 21 | Mendocino | 101 | 30.83 | 58 | | | Medium-Term | ✓ |
| Regional Incident Management Plan | 37 | Mendocino | 20 | 0 | 44.11 | | | Long-Term | ✓ |
| Rural Coordinate Addressing System | 8 | Mendocino | 162 | 0 | 34.05 | | Notification time challenge | Medium-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 14 | Mendocino | 1 | 64.86 | | | Tourist Locations | Medium-Term | ✓ |
| 800 Travel Advisory | 17 | Mendocino | 1 | 60 | 104 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| 800 Travel Advisory | 18 | Mendocino | 101 | 46 | 90 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |

**Table F-5:** Deployment Locations in Mendocino County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services (cont.)** | | | | | | | | | |
| 800 Travel Advisory | 24 | Mendocino | 20 | 0 | 44.11 | | Traveler information | Medium-Term | ✓ |
| In-Vehicle Route Guidance System | 1 | Mendocino | 101 | 58 | 104.15 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 2 | Mendocino | 1 | 59.8 | 105.58 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 69 | Mendocino | 1 | 64.86 | | | MacKerricher State Park | Long-Term | ✓ |
| Kiosks | 80 | Mendocino | 101 | 20.4 | | | Ukiah Chamber of Commerce | Long-Term | ✓ |
| Kiosks | 81 | Mendocino | 1 | 60.68 | | | Fort Bragg | Long-Term | ✓ |
| Kiosks | 86 | Mendocino | 101 | 82.19 | | | Empire Camp Rest Area | Long-Term | ✓ |
| Kiosks | 87 | Mendocino | 101 | 60.88 | | | Irvine Lodge Rest Area | Long-Term | ✓ |
| Kiosks | 88 | Mendocino | 101 | 58.28 | | | Moss Cove Rest Area | Long-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 2 | Mendocino | 101 | 45.17 | | | Willits Bus Stations | Long-Term | ✓ |
| Automated Passenger Counting | 3 | Mendocino | 101 | 68.78 | | | Laytonville Bus Stations | Long-Term | ✓ |
| Automated Passenger Counting | 24 | Mendocino | | | | | Mendocino Transit Authority | Long-Term | ✓ |
| On-Board Transit Safety Systems | 2 | Mendocino | 101 | 45.17 | | | Willits Bus Stations | Long-Term | ✓ |
| On-Board Transit Safety Systems | 3 | Mendocino | 101 | 68.78 | | | Laytonville Bus Stations | Long-Term | ✓ |
| On-Board Transit Safety Systems | 24 | Mendocino | | | | | Mendocino Transit Authority | Long-Term | ✓ |
| Parking Management & Information System | 9 | Mendocino | 1 | 64.86 | | | Tourist Locations | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 14 | Mendocino | 1 | 64.86 | | | MacKerricher State Park | Long-Term | ✓ |
| Smart Card | 3 | Mendocino | | | | | Transit operations | Long-Term | ✓ |
| Transit Traveler Information | 2 | Mendocino | 1 | 64.86 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 24 | Mendocino | | | | | Mendocino Transit Authority | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 25 | Mendocino | 101 | 45.17 | | | Willits Bus Stations | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 26 | Mendocino | 101 | 68.78 | | | Laytonville Bus Stations | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 16 | Mendocino | 101 | 53 | | | Flood challenge | Short-Term | ✓ |
| Advanced Vehicle Detection | 31 | Mendocino | 101 | 50.45 | | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Advanced Vehicle Detection | 40 | Mendocino | 101 | 100.17 | | | Around Confusion Hill | Medium-Term | ✓ |
| Advanced Vehicle Detection | 61 | Mendocino | 1 | 95 | | | Improve safety | Long-Term | ✓ |
| Advanced Vehicle Detection | 73 | Mendocino | 101 | 46 | | | Flood challenge | Long-Term | ✓ |
| Advanced Vehicle Detection | 74 | Mendocino | 101 | 59 | | | Flood challenge | Long-Term | ✓ |
| Automated Gate Closure | 9 | Mendocino | 101 | 60 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| Closed-Circuit Television Camera | 5 | Mendocino | 101 | 31.6 | | S | N of 101/20 SEP (@ CMS) | Existing | ✓ |
| Closed-Circuit Television Camera | 39 | Mendocino | 101 | 49.2 | | N | N of Willits (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 54 | Mendocino | 101 | 29.8 | | N | S of 101/20 Sep (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 57 | Mendocino | 20 | 32.6 | | W | E of 20/101 Sep (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 85 | Mendocino | 101 | 89 | | West | All Criteria (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 100 | Mendocino | 1 | 105 | | North | All Criteria (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 101 | Mendocino | 20 | 0 | | E | Traveler information (@ CMS) | Short-Term | ✓ |
| Closed-Circuit Television Camera | 109 | Mendocino | 101 | 92 | | South | All Criteria (@ CMS) | Medium-Term | ✓ |
| RWIS | 61 | Mendocino | 101 | 41.17 | | | Visibility Challenge (Ridgewood Summit) | Short-Term | ✓ |
| RWIS | 62 | Mendocino | 101 | 82.2 | | | Road Closure Due to Bad Weather (Rattlesnake Sandouse) | Short-Term | ✓ |
| RWIS | 77 | Mendocino | 1 | 80 | | | Road Closure Due to Bad Weather | Medium-Term | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Probe Vehicle Instrumentation | 6 | Mendocino | 20 | 0 | 44.11 | | E/W California routes | Medium-Term | ✓ |

**Table F-5:** Deployment Locations in Mendocino County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 3 | Mendocino | 101 | 30.83 | 104.15 | | | Medium-Term | ✓ |
| Hazmat Management | 8 | Mendocino | 20 | 0 | 44.11 | | | Long-Term | ✓ |
| Preclearance | 11 | Mendocino | 20 | 34 | | N | Near Existing Weigh Station | Medium-Term | ✓ |
| Preclearance | 12 | Mendocino | 101 | 49 | | S | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 15 | Mendocino | 20 | 34 | | N | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 16 | Mendocino | 101 | 49 | | S | Near Existing Weigh Station | Medium-Term | ✓ |

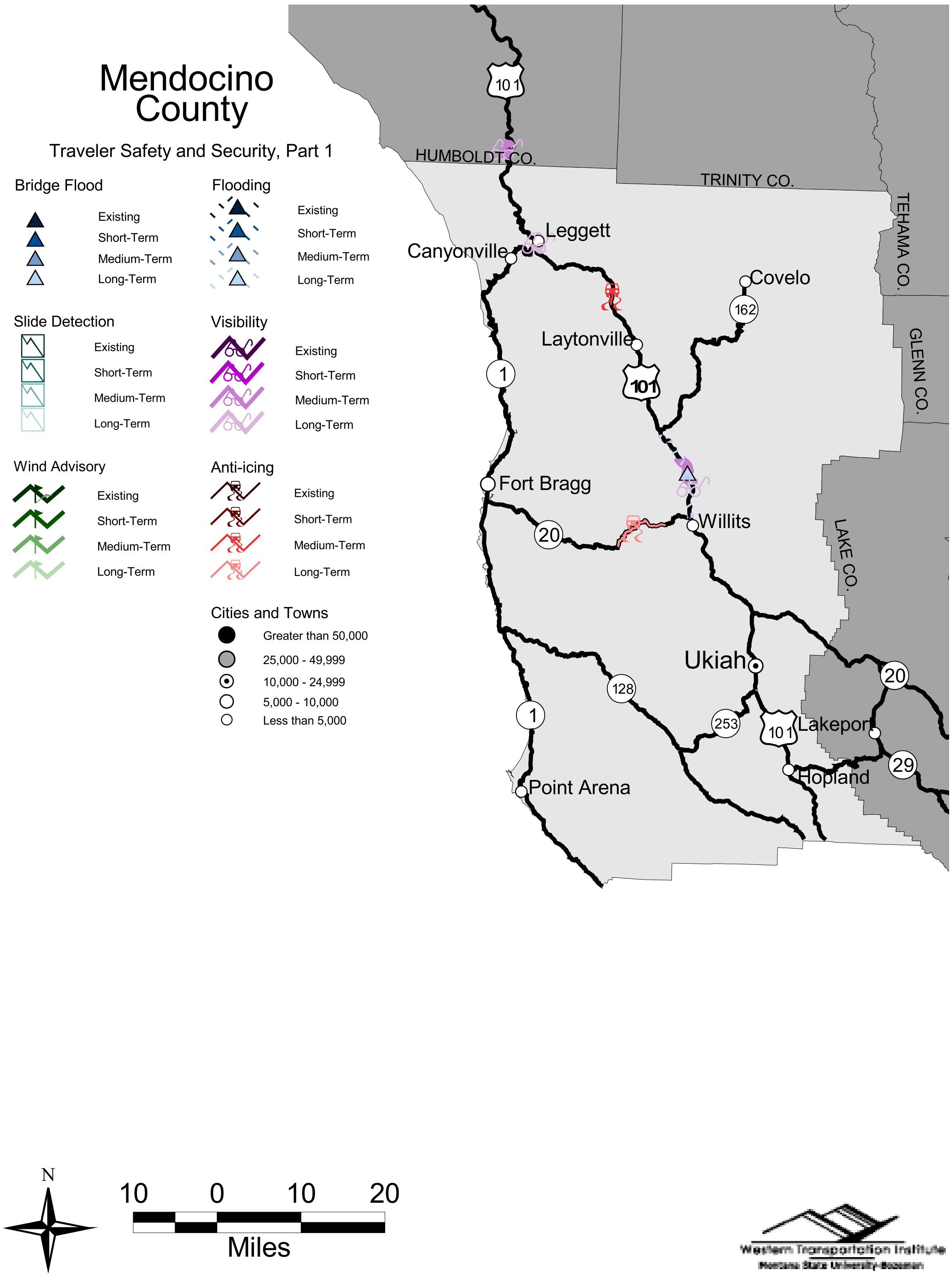


**Figure F-33:** Traveler Safety and Security (Part 1) in Mendocino County.

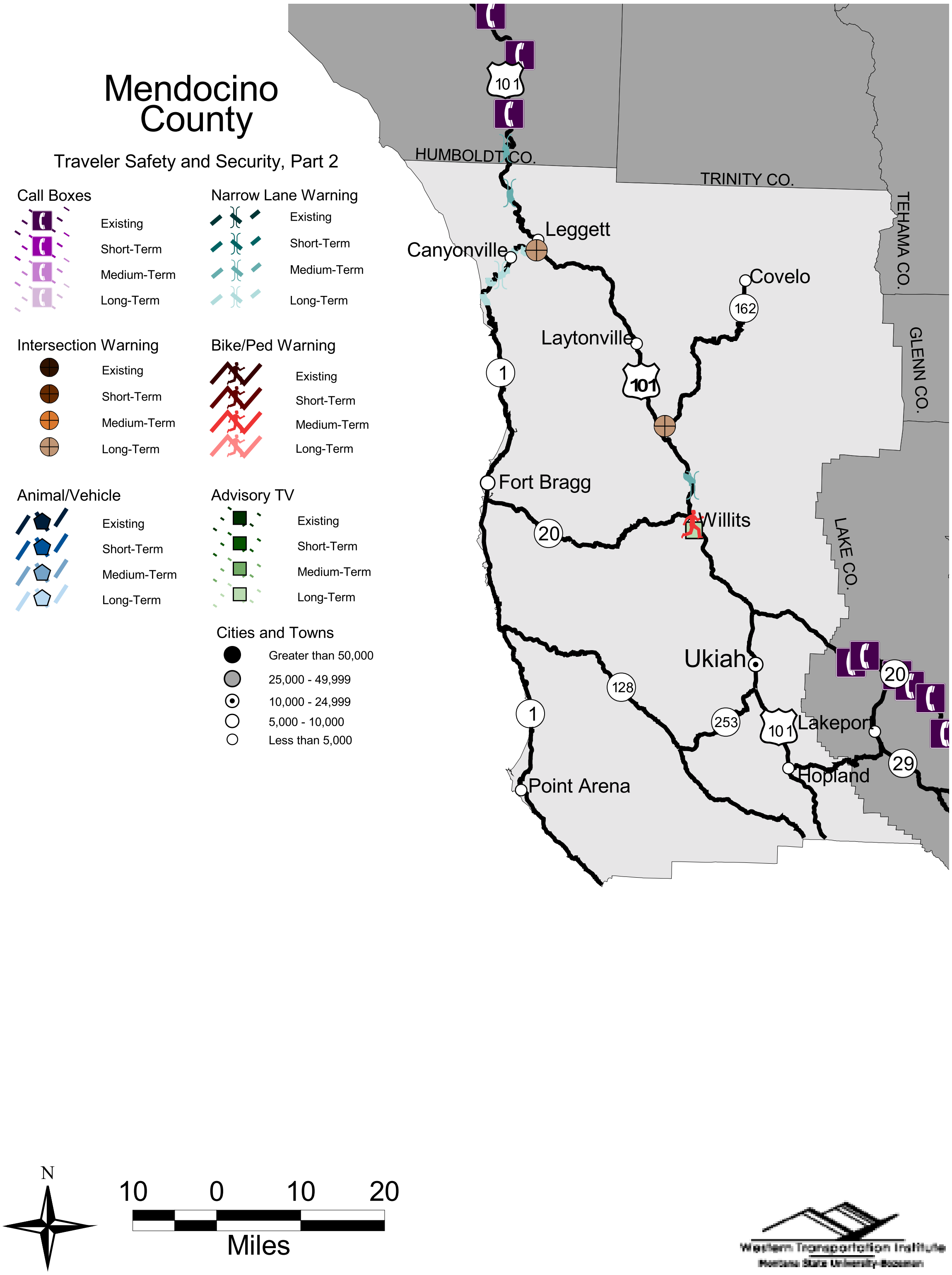


**Figure F-34:** Traveler Safety and Security (Part 2) in Mendocino County.

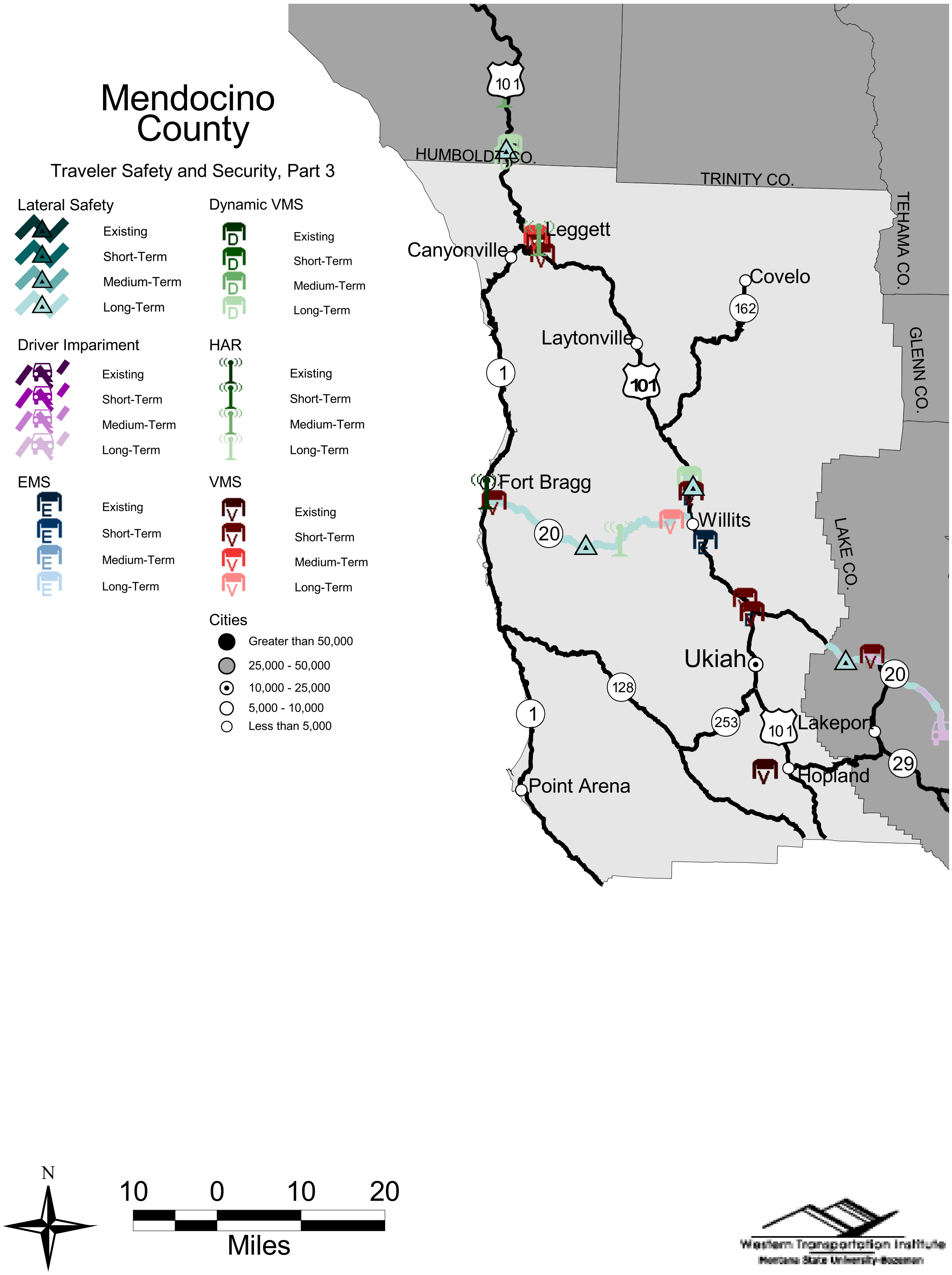


**Figure F-35:** Traveler Safety and Security (Part 3) in Mendocino County.

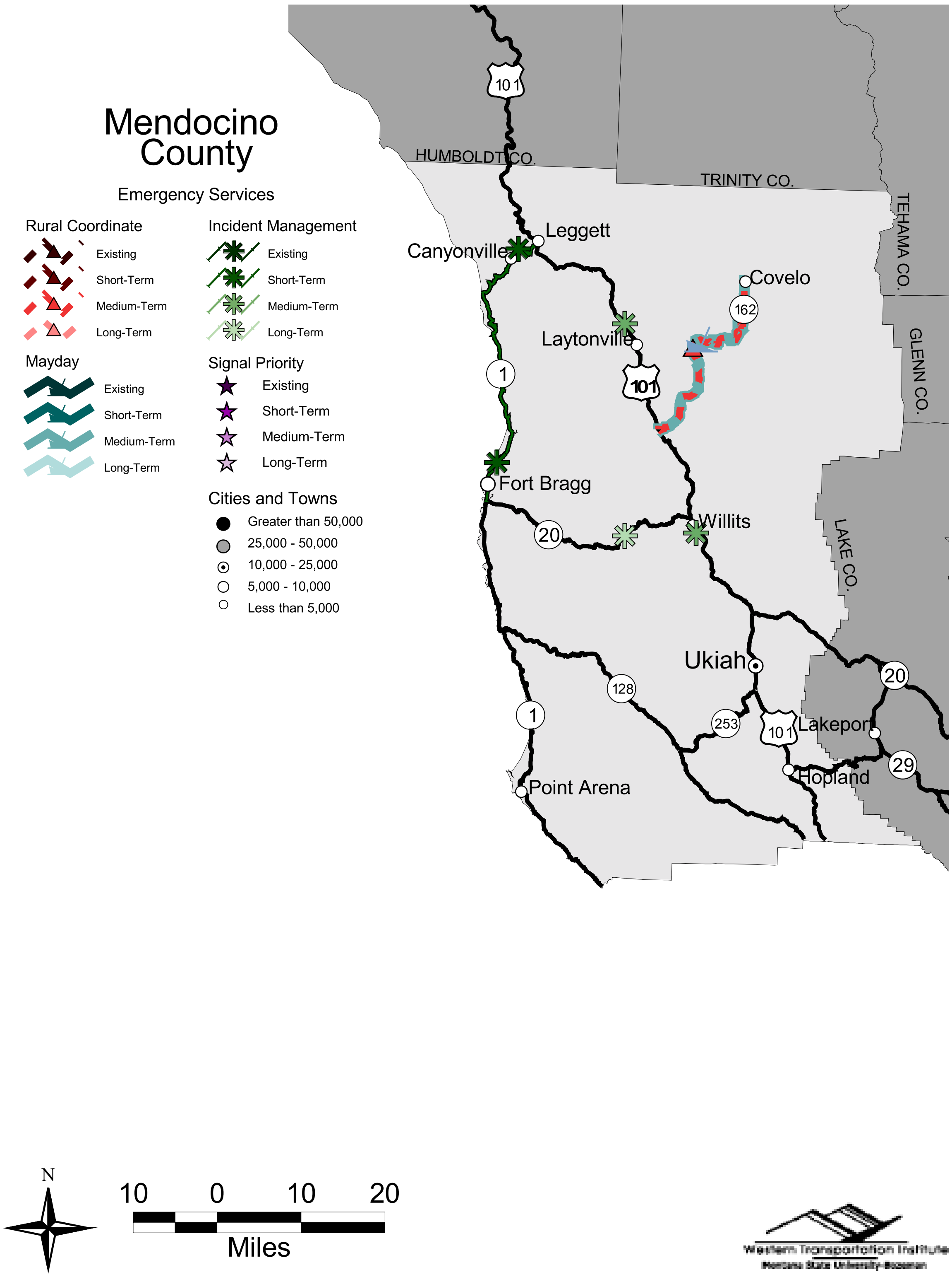


**Figure F-36:** Emergency Services in Mendocino County.

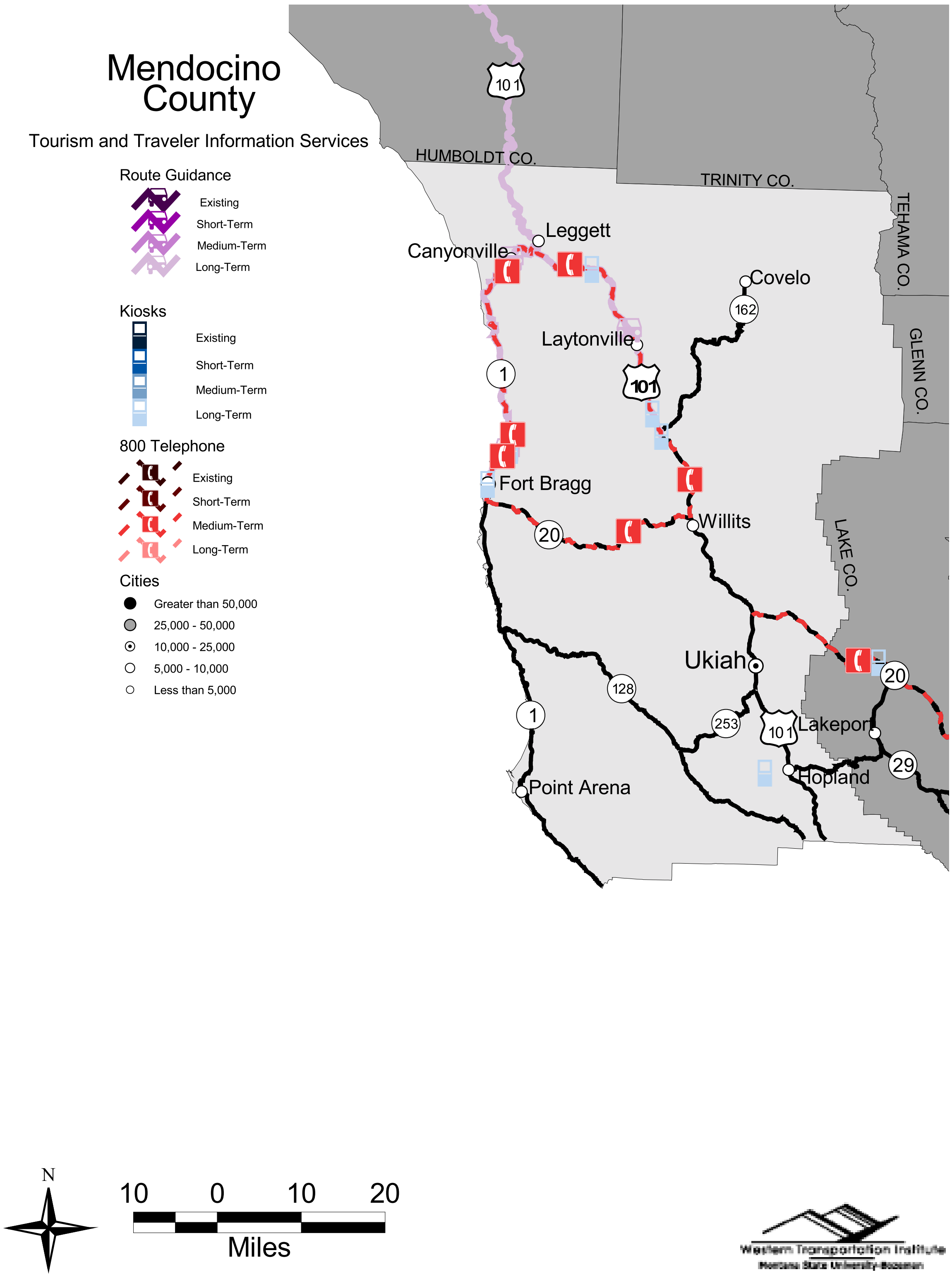


**Figure F-37:** Tourism and Traveler Information Services in Mendocino County.

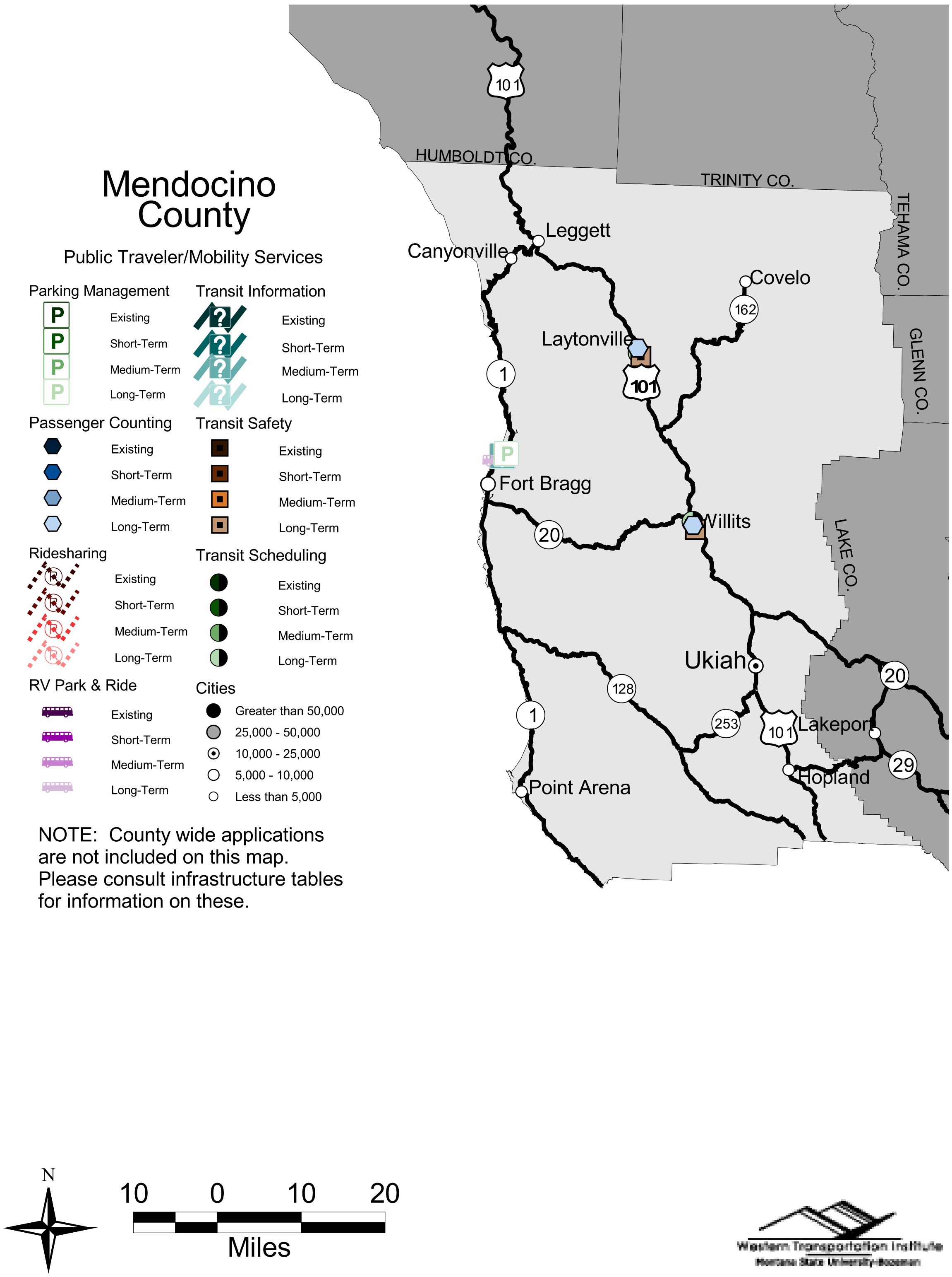


**Figure F-38:** Public Traveler/Mobility Services in Mendocino County.

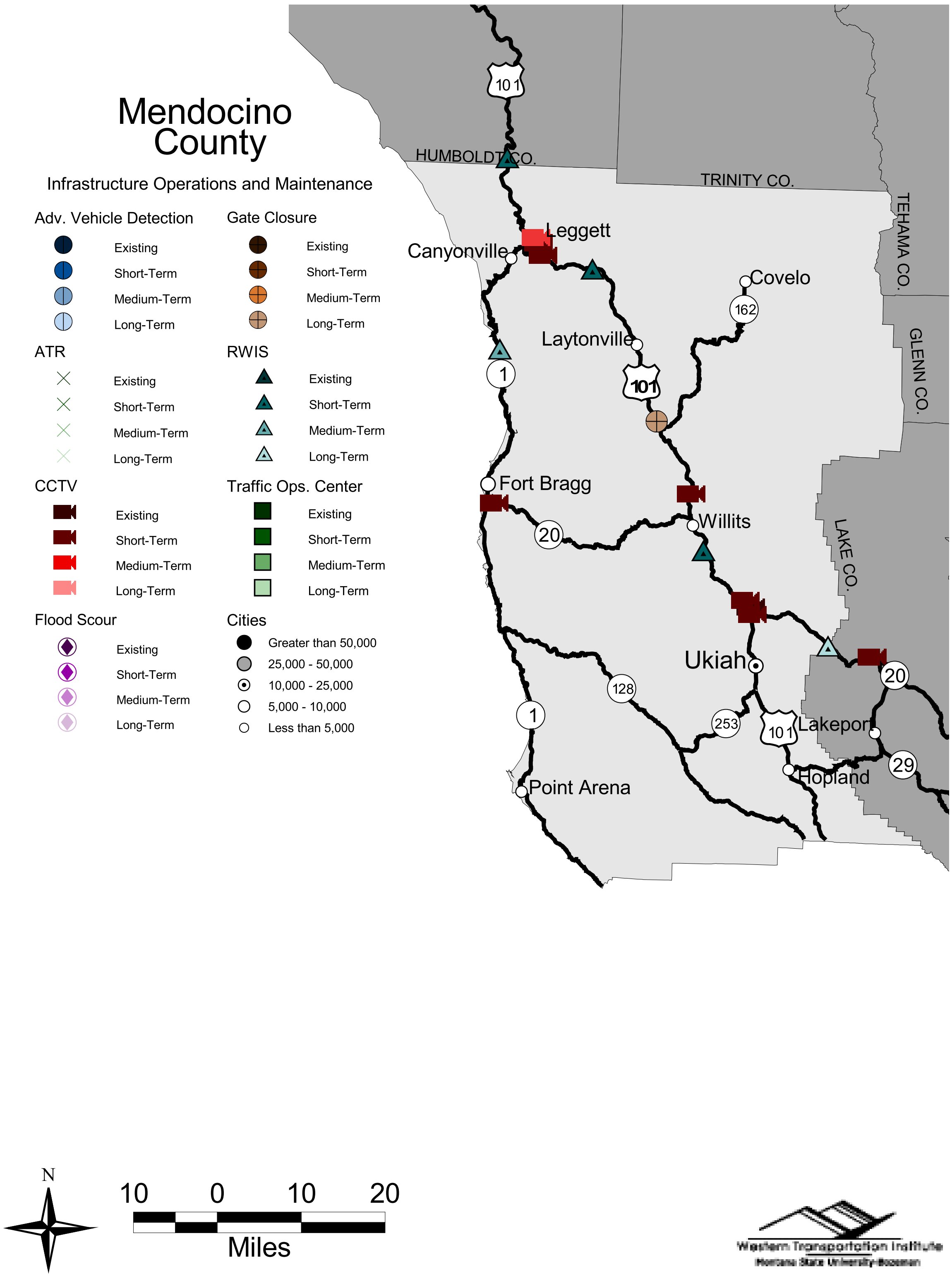


**Figure F-39:** Infrastructure Operations and Maintenance in Mendocino County.

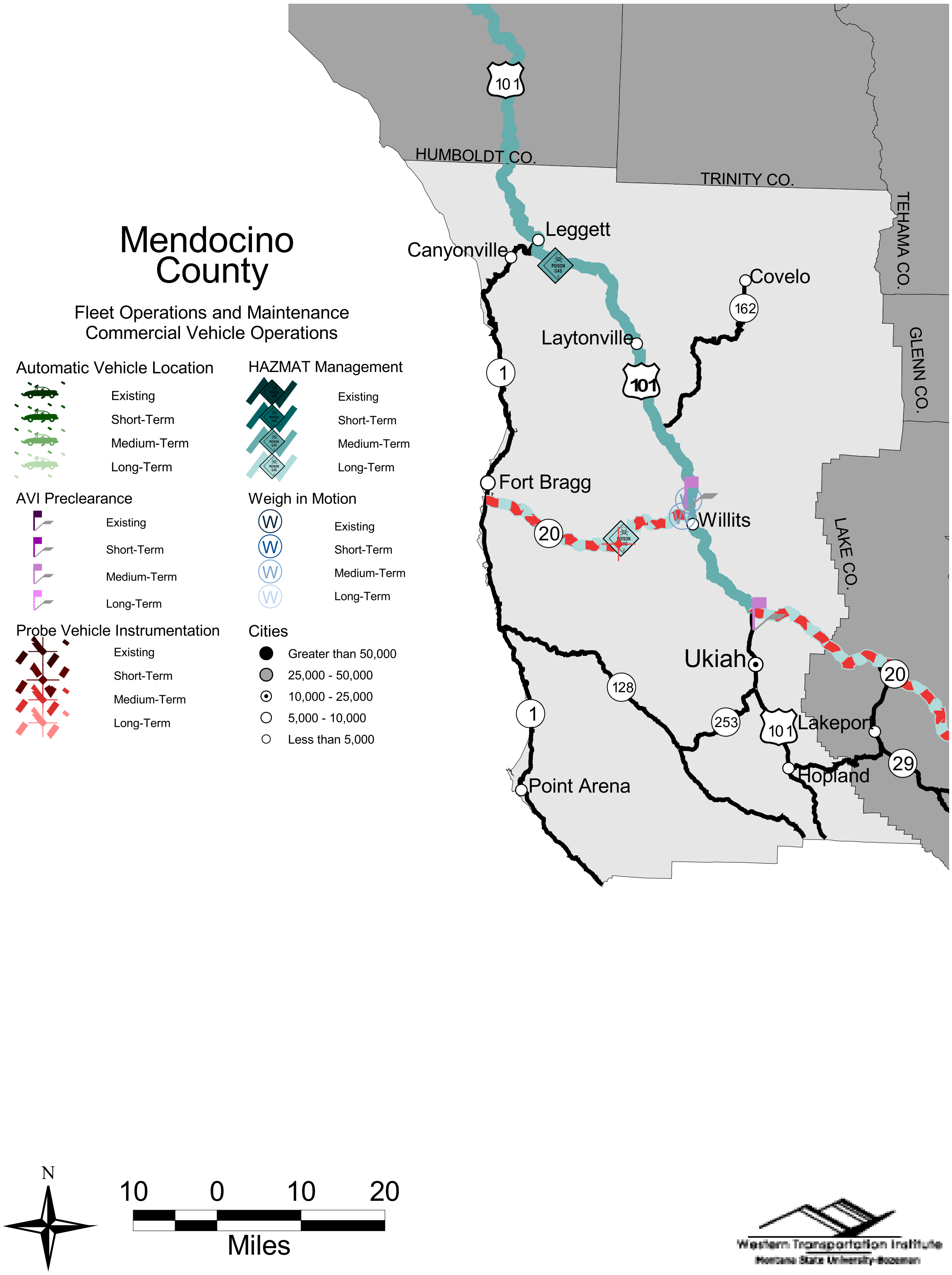


**Figure F-40:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Mendocino County.

**Table F-6:** Deployment Locations in Modoc County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Animal/Vehicle Collision Warning | 13 | Modoc | 299 | 1.79 | 53.61 | | Animal related challenge | Long-Term | ✓ |
| Animal/Vehicle Collision Warning | 14 | Modoc | 395 | 2 | 60.9 | | Animal related challenge | Long-Term | ✓ |
| Driver Impairment Detection | 3 | Modoc | 139 | 3.4 | 48 | | Fatigue challenge | Long-Term | ✓ |
| Highway Advisory Radio | 15 | Modoc | 395 | 26.9 | | | In Alturas (Super HAR) | Short-Term | ✓ |
| Highway Advisory Radio | 54 | Modoc | 299 | 0.9 | | | At the Junction of 299/139 | Long-Term | ✓ |
| Highway Advisory Radio | 55 | Modoc | 299 | 22.41 | | | At Canby MTC Sta | Long-Term | ✓ |
| Motorist-Aide Call Box | 75 | Modoc | 299 | 0 | 66.63 | | Notification time challenge | Medium-Term | ✓ |
| Motorist-Aide Call Box | 77 | Modoc | 395 | 0 | 20 | | Notification time challenge | Medium-Term | ✓ |
| Variable Message Sign | 50 | Modoc | 395 | 21 | | S | Near Alturas | Short-Term | ✓ |
| Variable Message Sign | 51 | Modoc | 395 | 25.2 | | N | Near Alturas | Short-Term | ✓ |
| Variable Message Sign | 52 | Modoc | 299 | 39.5 | | W | Near Alturas | Short-Term | ✓ |
| Variable Message Sign | 180 | Modoc | 139 | 1 | | N | Junction Route 299 Ahead | Long-Term | ✓ |
| Variable Message Sign | 195 | Modoc | 299 | 0.4 | | E | In Adin East Jct Rte 139 | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 4 | Modoc | 299 | 40.28 | 66.63 | | Response & notification time challenge | Medium-Term | ✓ |
| Mayday Systems | 5 | Modoc | 299 | 0 | 40 | | Response & notification time challenge | Medium-Term | ✓ |
| Mayday Systems | 6 | Modoc | 395 | 0 | 20 | | Response & notification time challenge | Medium-Term | ✓ |
| Rural Coordinate Addressing System | 4 | Modoc | 299 | 0 | 66.63 | | Response & notification time challenge | Medium-Term | ✓ |
| Rural Coordinate Addressing System | 13 | Modoc | 395 | 0 | 20 | | Response & notification time challenge | Long-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 25 | Modoc | | | | | Sage Stage | Long-Term | ✓ |
| On-Board Transit Safety Systems | 25 | Modoc | | | | | Sage Stage | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 12 | Modoc | | | | | Sage Stage | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Automatic Traffic Recorder | 163 | Modoc | 139 | 0.03 | | | Adin, Jct Rte 299 | Existing | ✓ |
| Automatic Traffic Recorder | 164 | Modoc | 139 | 17.12 | | | Canby, Jct Rte 299 | Existing | ✓ |
| Automatic Traffic Recorder | 165 | Modoc | 139 | 17.86 | | | Tulelake Qrntine Sta | Existing | ✓ |
| Automatic Traffic Recorder | 166 | Modoc | 139 | 50.684 | | | Modoc-Siskiyou Co Line | Existing | ✓ |
| Automatic Traffic Recorder | 167 | Modoc | 139 | 4.77 | | | Jct Rte 161 Or State Line | Existing | ✓ |
| Automatic Traffic Recorder | 223 | Modoc | 299 | 0.1 | | | Adin, Jct. Rte. 139 | Existing | ✓ |
| Automatic Traffic Recorder | 224 | Modoc | 299 | 17.94 | | | Jct. Rte. 139, North | Existing | ✓ |
| Automatic Traffic Recorder | 225 | Modoc | 299 | 39.33 | | | Juniper Street | Existing | ✓ |
| Automatic Traffic Recorder | 226 | Modoc | 299 | 40.38 | | | Alturas Jct. Rte. 395 S. | Existing | ✓ |
| Automatic Traffic Recorder | 227 | Modoc | 299 | 41.17 | | | Alturas Jct. Rte. 395 N. | Existing | ✓ |
| Automatic Traffic Recorder | 236 | Modoc | 395 | 2.68 | | | Likely Jess Valley Rd. | Existing | ✓ |
| Automatic Traffic Recorder | 237 | Modoc | 395 | 22.07 | | | Alturas First Street | Existing | ✓ |
| Automatic Traffic Recorder | 238 | Modoc | 395 | 22.76 | | | Jct Rte 299 | Existing | ✓ |
| Automatic Traffic Recorder | 239 | Modoc | 395 | 23.04 | | | Alturas Maint Sta | Existing | ✓ |
| Automatic Traffic Recorder | 240 | Modoc | 395 | 28.37 | | | Jct. Rte. 299 East | Existing | ✓ |
| Closed-Circuit Television Camera | 30 | Modoc | 299 | 51.3 | | | Cedar Pass | Short-Term | ✓ |
| Closed-Circuit Television Camera | 136 | Modoc | 299 | 50.2 | | | At Cedar Pass Sandhouse | Long-Term | ✓ |
| Closed-Circuit Television Camera | 137 | Modoc | 299 | 12.73 | | | At Adin Mountain Summit | Long-Term | ✓ |
| Closed-Circuit Television Camera | 141 | Modoc | 299 | 42 | | | Response time challenge | Long-Term | ✓ |
| Closed-Circuit Television Camera | 144 | Modoc | 395 | 2.09 | | | Response time challenge | Long-Term | ✓ |
| Closed-Circuit Television Camera | 145 | Modoc | 395 | 21 | | | Response time challenge | Long-Term | ✓ |
| Closed-Circuit Television Camera | 150 | Modoc | 299 | 39.5 | | | Response time challenge | Long-Term | ✓ |

**Table F-6:** Deployment Locations in Modoc County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Closed-Circuit Television Camera | 173 | Modoc | 299 | 22.41 | | | Response time challenge | Long-Term | ✓ |
| Closed-Circuit Television Camera | 174 | Modoc | 299 | 0 | | | Response time challenge | Long-Term | ✓ |
| Closed-Circuit Television Camera | 185 | Modoc | 139 | 27.91 | | | Near Tionesta Rd | Long-Term | ✓ |
| RWIS | 95 | Modoc | 139 | 27.91 | | | Near Tionesta Rd | Long-Term | ✓ |
| RWIS | 105 | Modoc | 299 | 12.73 | | | At Adin Mountain Summit | Long-Term | ✓ |
| RWIS | 111 | Modoc | 299 | 50.2 | | | At Cedar Pass Sandhouse | Long-Term | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 6 | Modoc | 299 | 40.28 | | | Alturas | Long-Term | ✓ |
| Probe Vehicle Instrumentation | 11 | Modoc | 299 | 0 | 66.63 | | E/W California routes | Long-Term | ✓ |

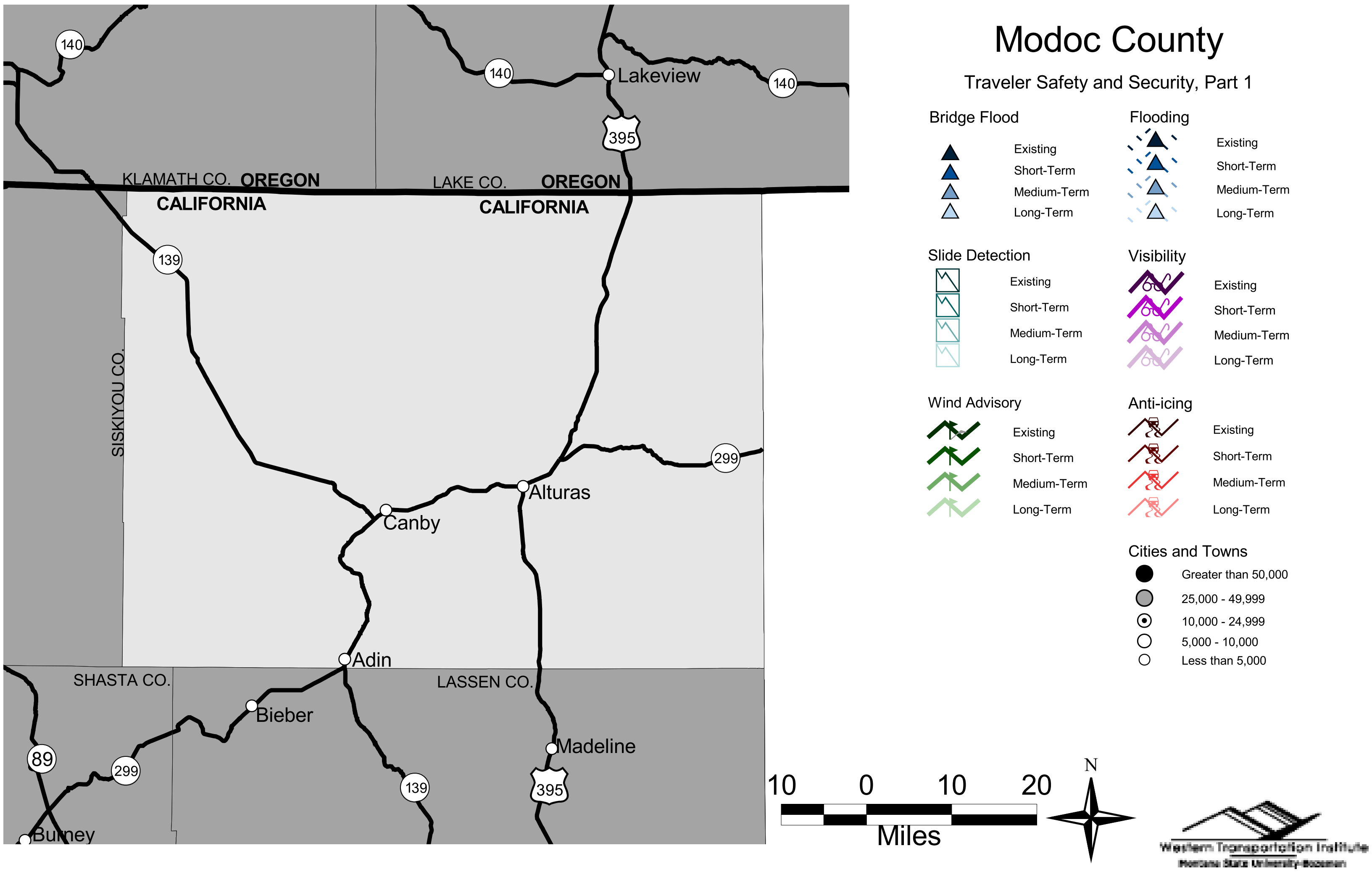


**Figure F-41:** Traveler Safety and Security (Part 1) in Modoc County.

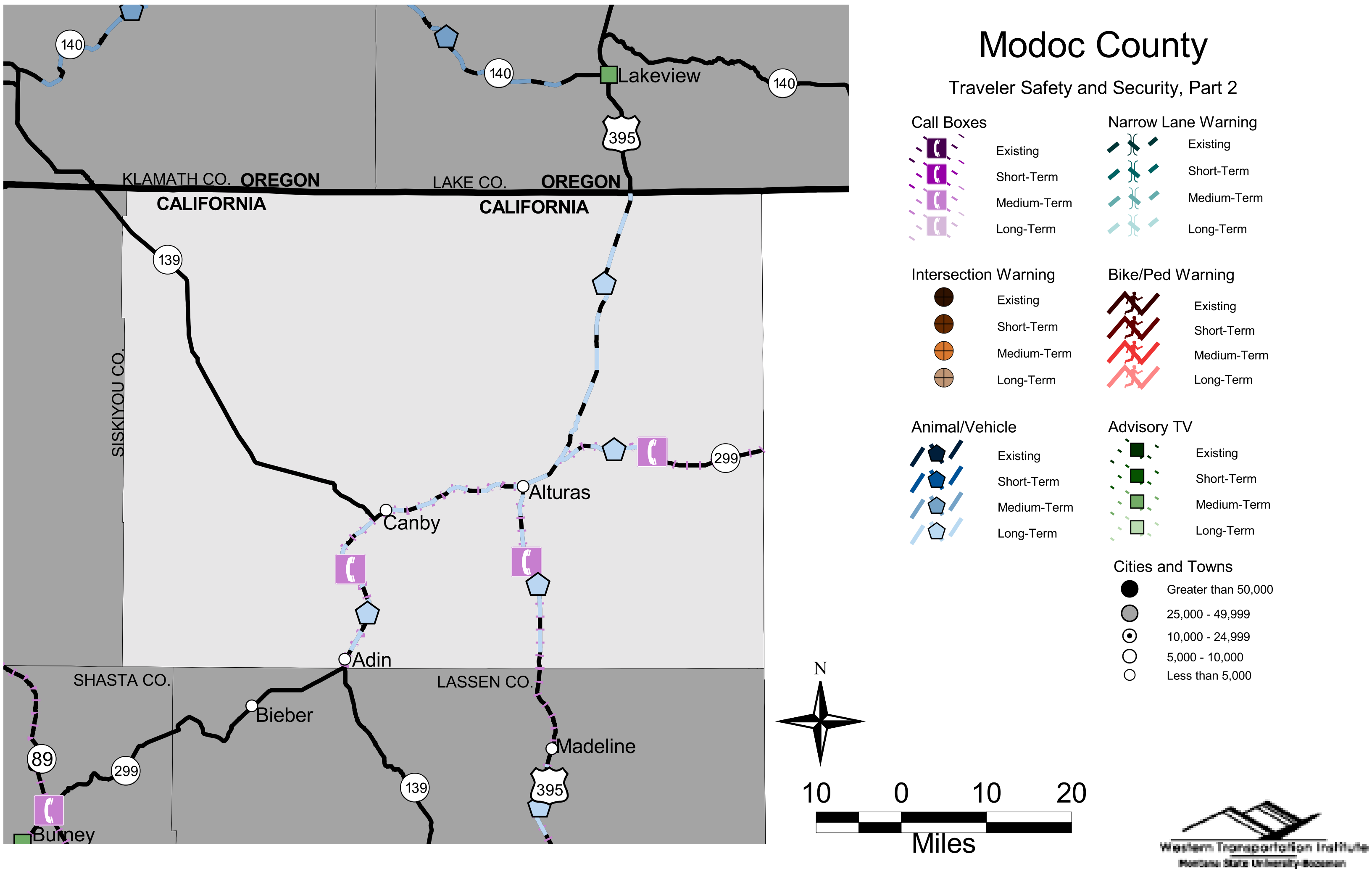


**Figure F-42:** Traveler Safety and Security (Part 2) in Modoc County.

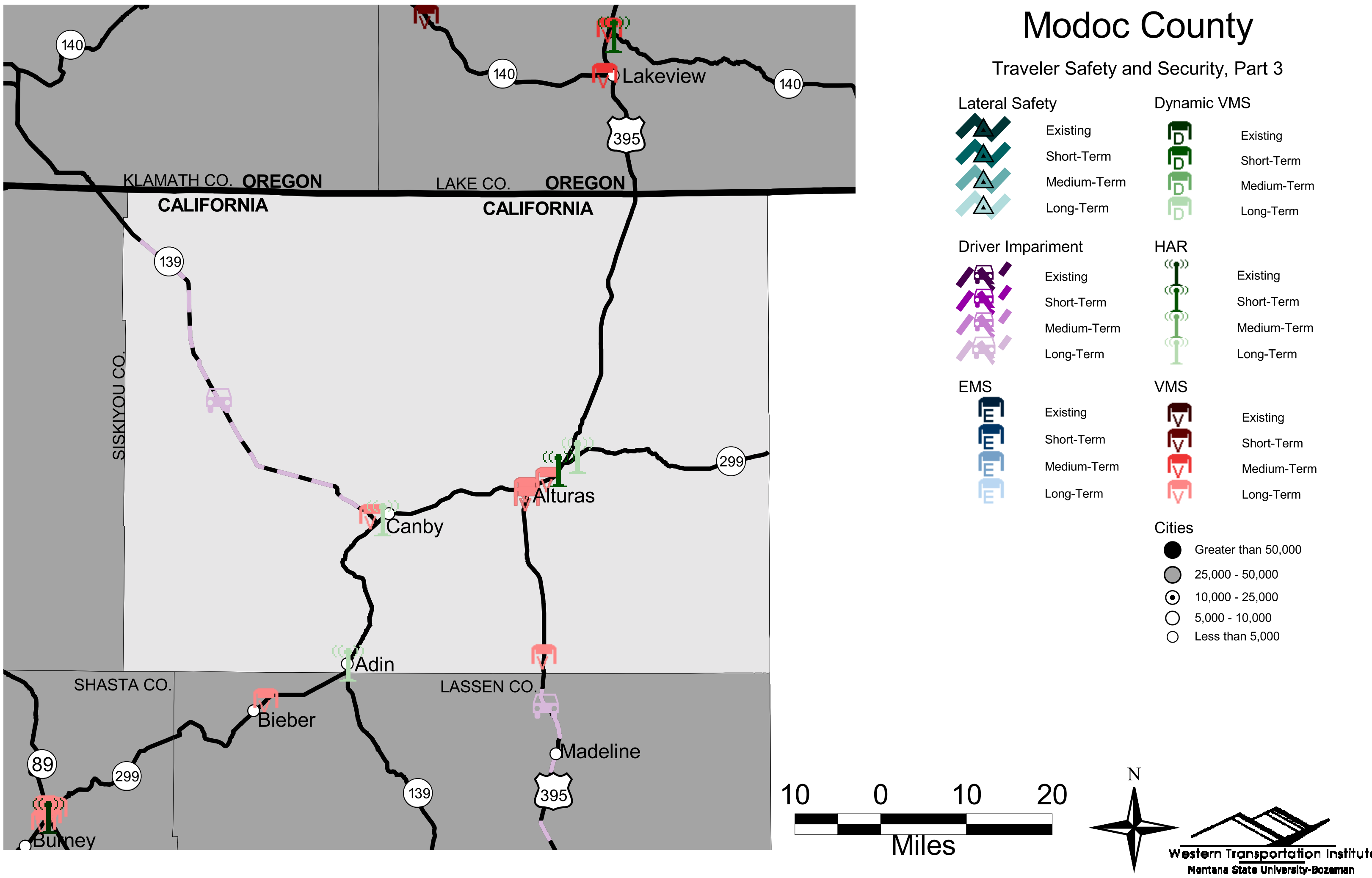


**Figure F-43:** Traveler Safety and Security (Part 3) in Modoc County.

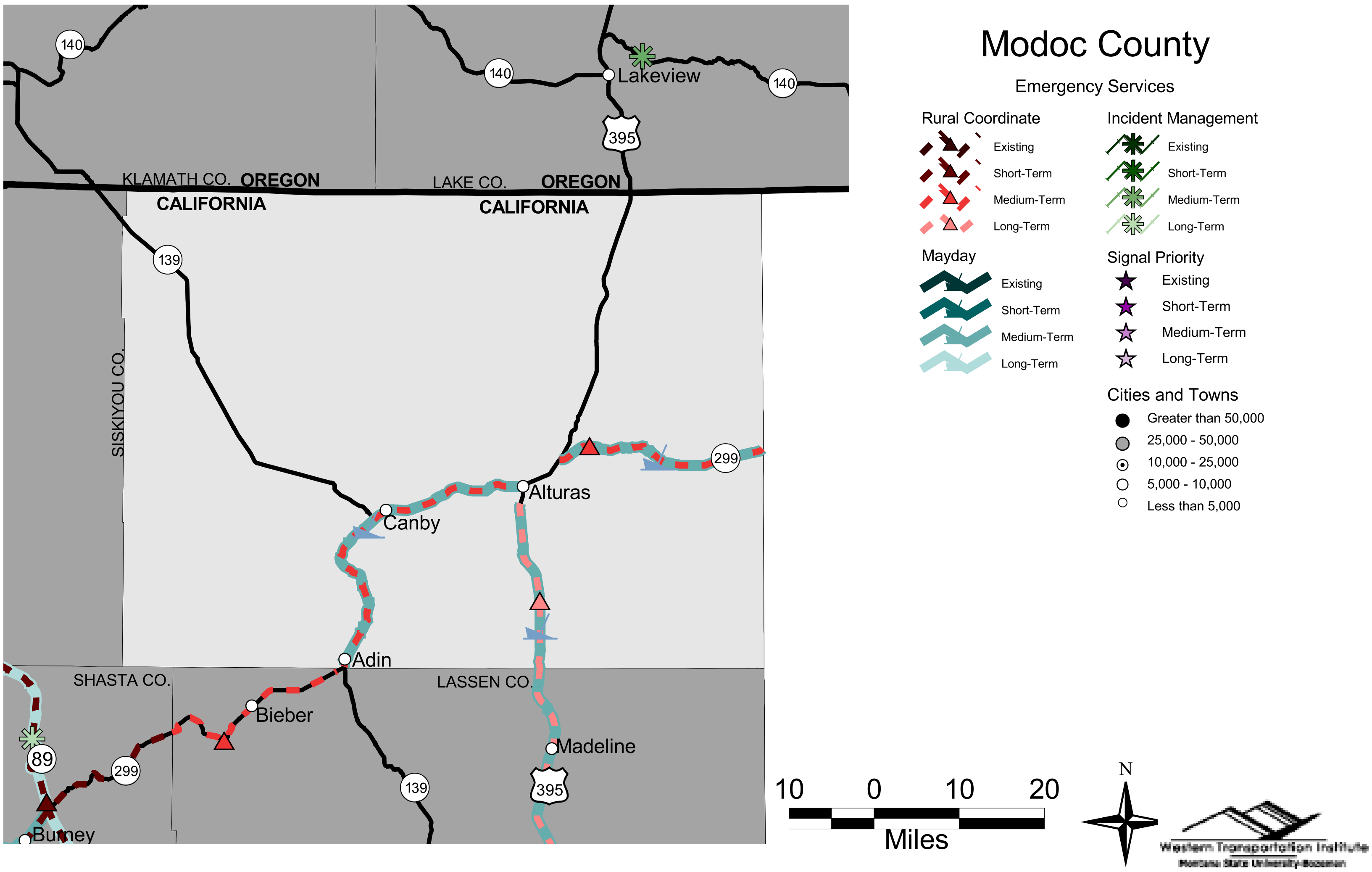


**Figure F-44:** Emergency Services in Modoc County.

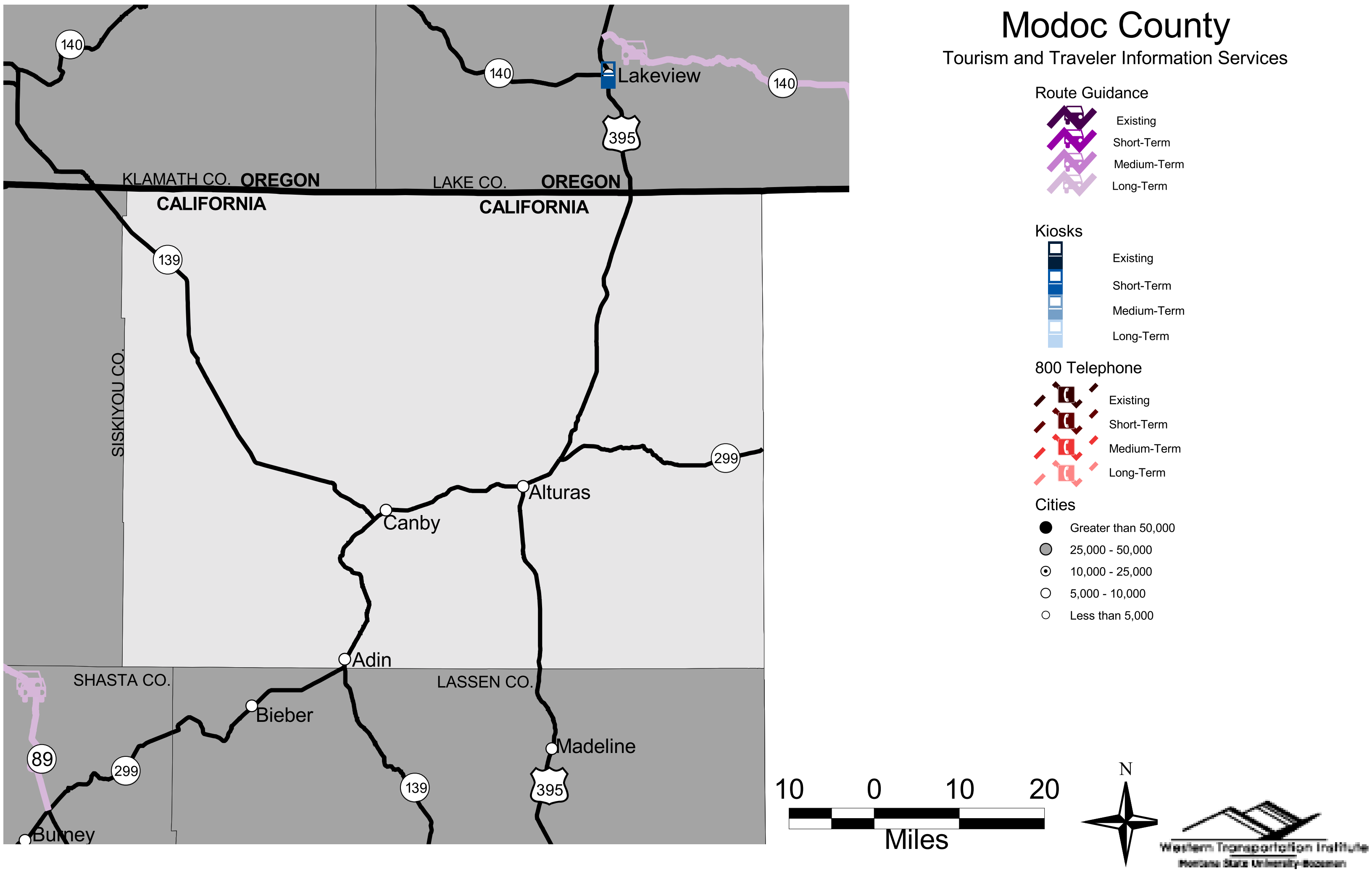


**Figure F-45:** Tourism and Traveler Information Services in Modoc County.

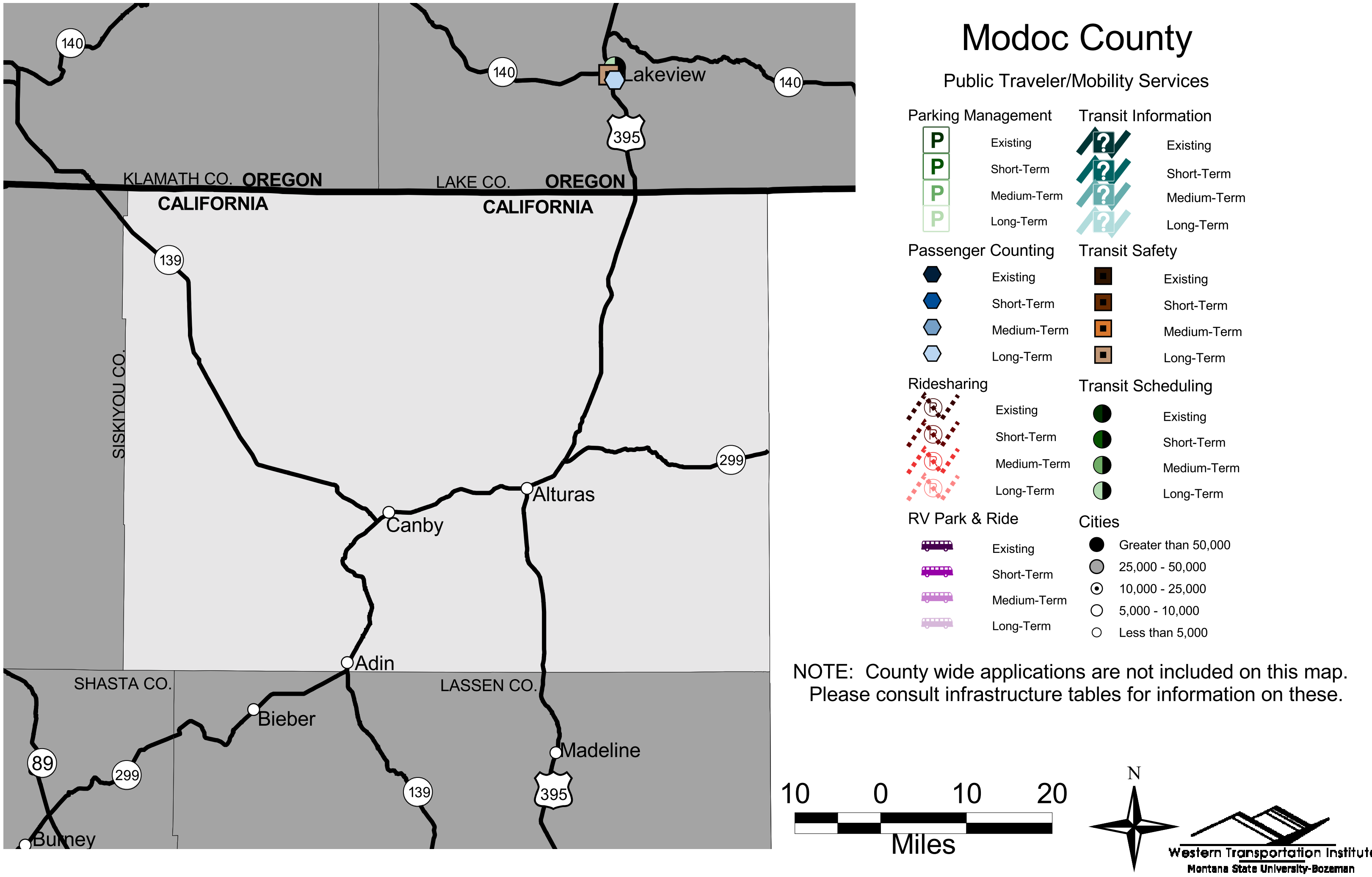


Figure F-46: Public Traveler/Mobility Services in Modoc County.

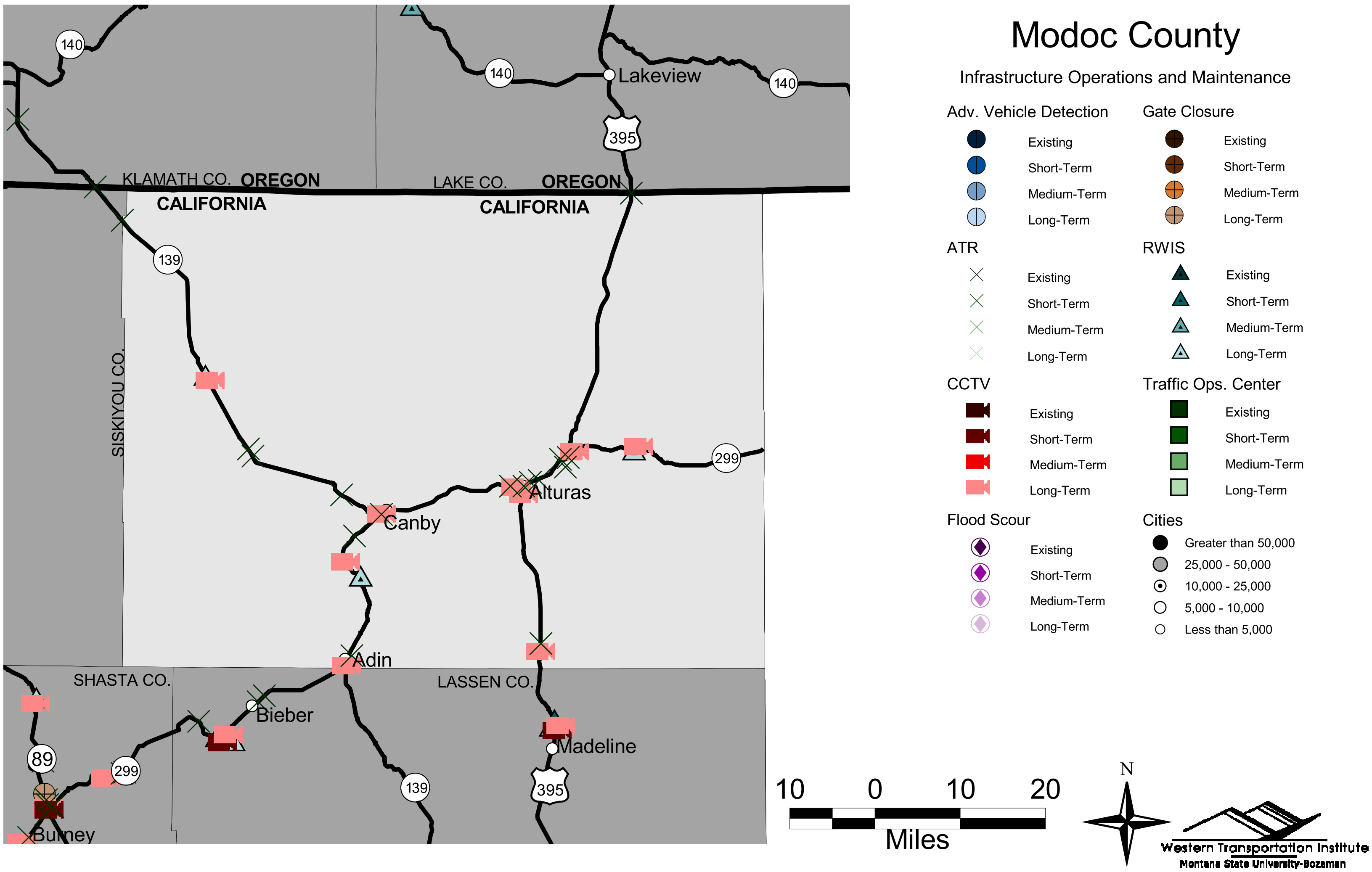


**Figure F-47:** Infrastructure Operations and Maintenance in Modoc County.

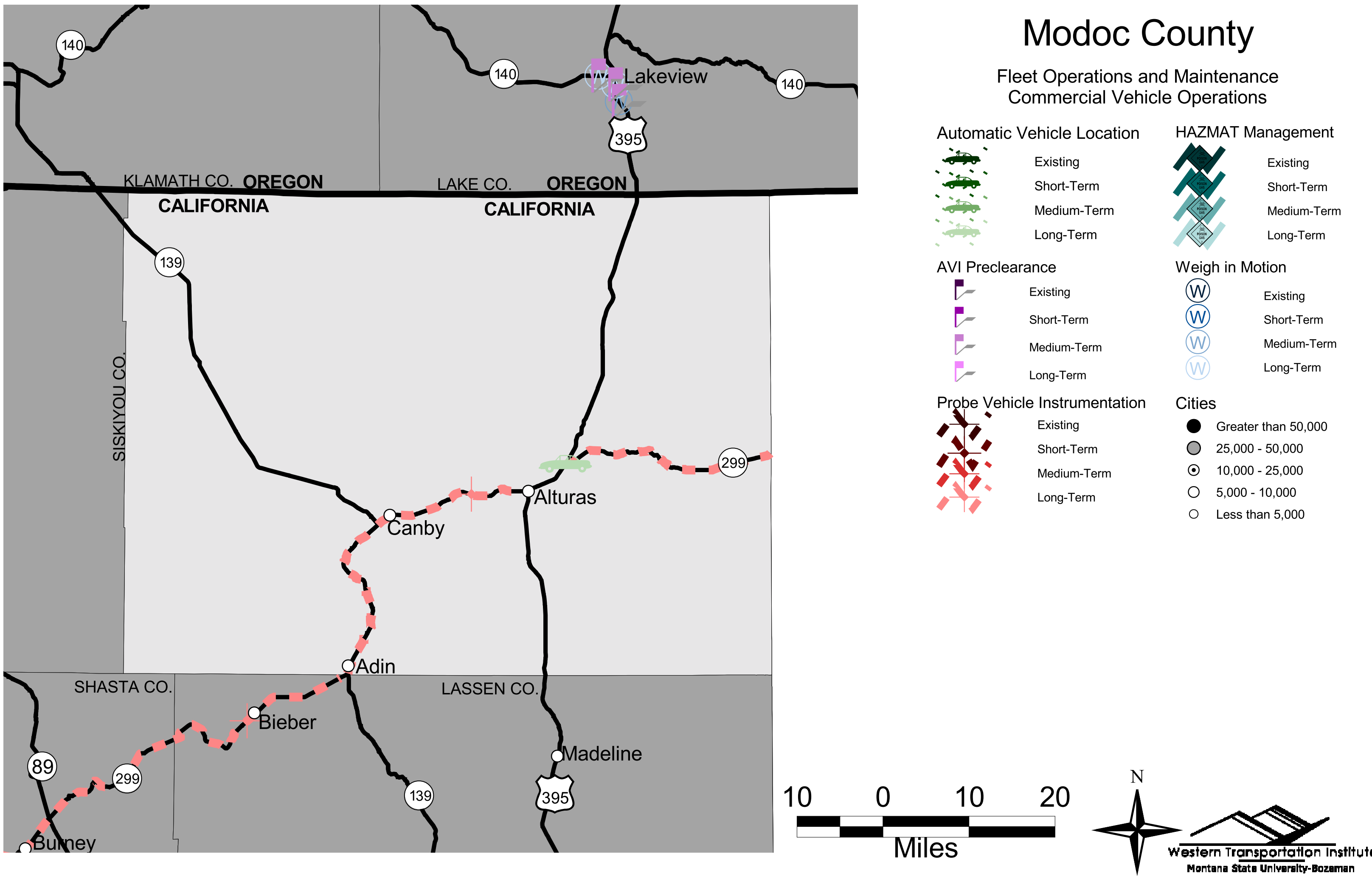


**Figure F-48:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Modoc County.

## **Table F-7:** Deployment Locations in Shasta County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Advanced Bike/Ped Warning | 2 | Shasta | 5 | 28 | 29 | | Bicycle warning on Pit River bridge | Short-Term | ✓ |
| Advanced Bike/Ped Warning | 8 | Shasta | 299 | 21.65 | | | Bike/ped challenge (Redding) | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 19 | Shasta | 5 | 40 | | | Bicycle warning on Antlers | Medium-Term | ✓ |
| Advisory Television | 3 | Shasta | 5 | 14.46 | | | Redding | Short-Term | ✓ |
| Advisory Television | 11 | Shasta | 299 | 74.98 | | | Burney | Medium-Term | ✓ |
| Animal/Vehicle Collision Warning | 16 | Shasta | 44 | 62.69 | 71.39 | | Stakeholder input | Long-Term | ✓ |
| Automated Visibility Warning | 15 | Shasta | 5 | 12 | | | Fog warning in Churn Creek bottom | Long-Term | ✓ |
| Automated Visibility Warning | 20 | Shasta | 299 | 67.17 | 69.17 | | Hatchet Mt. | Long-Term | ✓ |
| Dynamic Warning VMS | 11 | Shasta | 299 | 40<br>35 | | W<br>E | Sharp Curves | Medium-Term | ✓ |
| Dynamic Warning VMS | 18 | Shasta | 299 | 0 | | E | Warn about sharp curves | Medium-Term | ✓ |
| Highway Advisory Radio | 7 | Shasta | 299 | 79.68 | | | Jct. 89/299 | Existing | ✓ |
| Highway Advisory Radio | 9 | Shasta | 5 | 16.15 | | | At Hilltop Drive OC (Super HAR) | Existing | ✓ |
| Highway Advisory Radio | 33 | Shasta | 5 | 65 | | | Near Castella | Medium-Term | ✓ |
| Highway Advisory Radio | 74 | Shasta | 44 | 32 | | | Near Shingletown | Long-Term | ✓ |
| Highway Advisory Radio | 75 | Shasta | 44 | 49 | | | Near Old Station | Long-Term | ✓ |
| Intersection Advance Warning | 6 | Shasta | 299 | 21.65 | | | Redding | Medium-Term | ✓ |
| Intersection Advance Warning | 21 | Shasta | 5 | 4.29 | | | Anderson | Long-Term | ✓ |
| Motorist-Aide Call Box | 78 | Shasta | 299 | 25 | 80 | | Notification time challenge | Medium-Term | ✓ |
| Motorist-Aide Call Box | 80 | Shasta | 89 | 0 | 43.35 | | Notification time challenge | Medium-Term | ✓ |
| Motorist-Aide Call Box | 83 | Shasta | 5 | 0 | 67.02 | | | Medium-Term | ✓ |
| Variable Message Sign | 7 | Shasta | 5 | 10.9 | | N | At Smith Road | Existing | ✓ |
| Variable Message Sign | 8 | Shasta | 5 | 19.4 | | S | At Oasis Road | Existing | ✓ |
| Variable Message Sign | 9 | Shasta | 5 | 19.4 | | N | At Oasis Road | Existing | ✓ |
| Variable Message Sign | 10 | Shasta | 5 | 21 | | N | At Pine Grove Ave | Existing | ✓ |
| Variable Message Sign | 105 | Shasta | 5 | 6.75 | | N | Riverside Dr OC | Medium-Term | ✓ |
| Variable Message Sign | 106 | Shasta | 5 | 10.85 | | S | Smith Road OC | Medium-Term | ✓ |
| Variable Message Sign | 107 | Shasta | 5 | 13.95 | | N | Hartnell Ave OC | Medium-Term | ✓ |
| Variable Message Sign | 108 | Shasta | 5 | 24.08 | | N | Mountain Gate OC | Medium-Term | ✓ |
| Variable Message Sign | 109 | Shasta | 5 | 36.83 | | N | Gilman Road OC | Medium-Term | ✓ |
| Variable Message Sign | 110 | Shasta | 5 | 43.5 | | S | Lakehead Rest Area | Medium-Term | ✓ |
| Variable Message Sign | 111 | Shasta | 5 | 49.15 | | N | LaMoine Road OC | Medium-Term | ✓ |
| Variable Message Sign | 112 | Shasta | 5 | 61.74 | | N | Sweetbrier OC | Medium-Term | ✓ |
| Variable Message Sign | 162 | Shasta | 44 | 2.08 | | E | Shasta View OC | Long-Term | ✓ |
| Variable Message Sign | 163 | Shasta | 44 | 2.08 | | W | Shasta View OC | Long-Term | ✓ |
| Variable Message Sign | 164 | Shasta | 44 | 6.81 | | W | West of Deschutes Road UC | Long-Term | ✓ |
| Variable Message Sign | 165 | Shasta | 44 | 62.6 | | E | Junction Rte 89 Back | Long-Term | ✓ |
| Variable Message Sign | 166 | Shasta | 44 | 63 | | W | Junction Rte 89 Ahead | Long-Term | ✓ |
| Variable Message Sign | 173 | Shasta | 89 | 21.3 | | N | Junction Route 299 Back | Long-Term | ✓ |
| Variable Message Sign | 174 | Shasta | 89 | 22.1 | | S | Junction Route 299 Ahead | Long-Term | ✓ |
| Variable Message Sign | 186 | Shasta | 299 | 22 | | W | West of Buenaventura Blvd | Long-Term | ✓ |
| Variable Message Sign | 187 | Shasta | 299 | 23.16 | | W | East of Buenaventura Blvd | Long-Term | ✓ |
| Variable Message Sign | 188 | Shasta | 299 | 25.3 | | W | West of Hawley Road UC | Long-Term | ✓ |
| Variable Message Sign | 189 | Shasta | 299 | 27.22 | | W | Old Oregon Trail UC | Long-Term | ✓ |
| Variable Message Sign | 190 | Shasta | 299 | 73.13 | | W | West End of Burney | Long-Term | ✓ |
| Variable Message Sign | 191 | Shasta | 299 | 78.85 | | E | Johnson Park | Long-Term | ✓ |
| Variable Message Sign | 192 | Shasta | 299 | 79.5 | | E | Just South of Jct 299/89 | Long-Term | ✓ |

**Table F-7:** Deployment Locations in Shasta County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security (cont.)** | | | | | | | | | |
| Variable Message Sign | 193 | Shasta | 299 | 81.2 | | W | Just East of Jct 299/89 | Long-Term | ✓ |
| Variable Message Sign (Radar) | 1 | Shasta | 5 | 29.97 | | S | At Sidehill Viaduct | Existing | ✓ |
| Variable Message Sign (Radar) | 2 | Shasta | 5 | 31.94 | | S | At OBrien Interchange | Existing | ✓ |
| Variable Message Sign (Radar) | 3 | Shasta | 5 | 36.72 | | S | At Salt Creek | Existing | ✓ |
| Variable Message Sign (Radar) | 4 | Shasta | 5 | 48.78 | | S | At LaMoine | Existing | ✓ |
| Variable Message Sign (Radar) | 5 | Shasta | 5 | 57.95 | | N | At Sims Road OC | Existing | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 7 | Shasta | 299 | 25 | 80 | | Notification time challenge | Medium-Term | ✓ |
| Mayday Systems | 14 | Shasta | 36 | 0 | 11.93 | | | Medium-Term | ✓ |
| Mayday Systems | 18 | Shasta | 89 | 0 | 43.35 | | Notification time challenge | Long-Term | ✓ |
| Regional Incident Management Plan | 3 | Shasta | 299 | 0 | 25 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 7 | Shasta | 5 | 0 | 67.02 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 18 | Shasta | 44 | 0 | 48 | | Road Closure | Medium-Term | ✓ |
| Regional Incident Management Plan | 33 | Shasta | 89 | 22 | 43.35 | | Road Closure | Long-Term | ✓ |
| Rural Coordinate Addressing System | 1 | Shasta | 299 | 0 | 99.36 | | Notification time challenge & Stakeholder Input | Short-Term | ✓ |
| Rural Coordinate Addressing System | 2 | Shasta | 89 | 0 | 43.35 | | Notification time challenge | Short-Term | ✓ |
| Rural Coordinate Addressing System | 3 | Shasta | 36 | 0 | 11.93 | | Stakeholder Input | Short-Term | ✓ |
| Traffic Signal Priority for Emergency Vehicles | 1 | Shasta | 5 | 17 | | | Signal preemption - downtown Redding | Medium-Term | ✓ |
| Traffic Signal Priority for Emergency Vehicles | 2 | Shasta | 5 | 5 | | | Signal preemption - downtown Anderson | Medium-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| In-Vehicle Route Guidance System | 6 | Shasta | 299 | 0 | 25 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 7 | Shasta | 5 | 0 | 67.02 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 9 | Shasta | 89 | 22 | 43.35 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 48 | Shasta | 89 | 0 | | | Lassen Volcanic National Park | Medium-Term | ✓ |
| Kiosks | 59 | Shasta | 5 | 13 | | | Churn Creek Bottom truck stop | Medium-Term | ✓ |
| Kiosks | 63 | Shasta | 5 | 43.5 | | | Redding to Border Rest Areas (Lakehead Rest Area) | Medium-Term | ✓ |
| Kiosks | 64 | Shasta | 5 | 31.03 | | | Redding to Border Rest Areas (O'Brien Rest Area) | Medium-Term | ✓ |
| Kiosks | 90 | Shasta | 5 | 9.77 | | | Knighton Rd Truck Stop | Long-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 6 | Shasta | 5 | 14.46 | | | Redding | Long-Term | ✓ |
| Automated Passenger Counting | 27 | Shasta | | | | | Trailways Lines, Inc | Long-Term | ✓ |
| Dynamic Ridesharing/Paratransit | 9 | Shasta | 299 | 0 | 21.65 | | Stakeholder Input | Long-Term | ✓ |
| On-Board Transit Safety Systems | 6 | Shasta | 5 | 14.46 | | | Redding | Long-Term | ✓ |
| On-Board Transit Safety Systems | 27 | Shasta | | | | | Trailways Lines, Inc | Long-Term | ✓ |
| Parking Management & Information System | 12 | Shasta | 5 | 14.46 | | | Tourist Locations | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 13 | Shasta | 89 | 0 | | | Lassen Volcanic National Park | Long-Term | ✓ |
| Transit Traveler Information | 5 | Shasta | 5 | 14.46 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 11 | Shasta | 5 | 14.46 | | | Redding | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 14 | Shasta | | | | | Trailways Lines, Inc | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Automatic Traffic Recorder | 23 | Shasta | 5 | 3.39 | | | Jct Rte 273 | Existing | ✓ |
| Automatic Traffic Recorder | 24 | Shasta | 5 | 6.53 | | N | Off To Riverside Ave | Existing | ✓ |
| Automatic Traffic Recorder | 25 | Shasta | 5 | 6.6 | | S | On from Riverside Ave | Existing | ✓ |
| Automatic Traffic Recorder | 26 | Shasta | 5 | 6.7 | | N | On from Riverside Ave | Existing | ✓ |
| Automatic Traffic Recorder | 27 | Shasta | 5 | 6.9 | | S | Off To Riverside Ave | Existing | ✓ |
| Automatic Traffic Recorder | 28 | Shasta | 5 | 7.9 | | | 0.8 Mi. N. of Sacto. River | Existing | ✓ |

**Table F-7:** Deployment Locations in Shasta County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Automatic Traffic Recorder | 29 | Shasta | 5 | 13.95 | | | Hartnell Ave. | Existing | ✓ |
| Automatic Traffic Recorder | 30 | Shasta | 5 | 14.23 | | | Cypress St NB Off | Existing | ✓ |
| Automatic Traffic Recorder | 31 | Shasta | 5 | 14.28 | | | Cypress St SB On | Existing | ✓ |
| Automatic Traffic Recorder | 32 | Shasta | 5 | 14.65 | | | Cypress St SB Off | Existing | ✓ |
| Automatic Traffic Recorder | 33 | Shasta | 5 | 14.76 | | | Cypress St NB On | Existing | ✓ |
| Automatic Traffic Recorder | 34 | Shasta | 5 | 14.91 | | | Redding, Cypress St | Existing | ✓ |
| Automatic Traffic Recorder | 35 | Shasta | 5 | 15.15 | | N | Off To WB 299 | Existing | ✓ |
| Automatic Traffic Recorder | 36 | Shasta | 5 | 15.27 | | N | Off To Hilltop | Existing | ✓ |
| Automatic Traffic Recorder | 37 | Shasta | 5 | 15.39 | | S | Off To EB 299 | Existing | ✓ |
| Automatic Traffic Recorder | 38 | Shasta | 5 | 15.71 | | S | Off To WB 299 | Existing | ✓ |
| Automatic Traffic Recorder | 39 | Shasta | 5 | 16.15 | | N | Hilltop at Off from I-5 | Existing | ✓ |
| Automatic Traffic Recorder | 40 | Shasta | 5 | 23.91 | | N | Off To Mtn Gate | Existing | ✓ |
| Automatic Traffic Recorder | 41 | Shasta | 5 | 23.92 | | S | On from Mtn Gate | Existing | ✓ |
| Automatic Traffic Recorder | 42 | Shasta | 5 | 24.24 | | S | Off To Mtn Gate | Existing | ✓ |
| Automatic Traffic Recorder | 43 | Shasta | 5 | 24.26 | | N | On from Mtn Gate | Existing | ✓ |
| Automatic Traffic Recorder | 44 | Shasta | 5 | 24.88 | | | 0.8 Mi N/O Mntn Gate OC | Existing | ✓ |
| Automatic Traffic Recorder | 45 | Shasta | 5 | 25.86 | | | Fawndale Overcrossing | Existing | ✓ |
| Automatic Traffic Recorder | 46 | Shasta | 5 | 26.22 | | | Fawndale N/B On | Existing | ✓ |
| Automatic Traffic Recorder | 47 | Shasta | 5 | 26.23 | | | Fawndale S/B Off | Existing | ✓ |
| Automatic Traffic Recorder | 48 | Shasta | 5 | 27.46 | | | Bridge Bay N/B Off | Existing | ✓ |
| Automatic Traffic Recorder | 49 | Shasta | 5 | 27.6 | | | Bridge Bay S/B On | Existing | ✓ |
| Automatic Traffic Recorder | 50 | Shasta | 5 | 27.62 | | | Bridge Bay N/B On | Existing | ✓ |
| Automatic Traffic Recorder | 51 | Shasta | 5 | 27.77 | | | Bridge Bay S/B Off | Existing | ✓ |
| Automatic Traffic Recorder | 52 | Shasta | 5 | 45.74 | | | Vollmers Rd N/B Off | Existing | ✓ |
| Automatic Traffic Recorder | 53 | Shasta | 5 | 45.86 | | | Vollmers Rd S/B On | Existing | ✓ |
| Automatic Traffic Recorder | 54 | Shasta | 5 | 45.91 | | | Vollmers Rd N/B On | Existing | ✓ |
| Automatic Traffic Recorder | 55 | Shasta | 5 | 46.19 | | | Vollmers Rd S/B Off | Existing | ✓ |
| Automatic Traffic Recorder | 56 | Shasta | 5 | 48.96 | | | La Moine S/B On | Existing | ✓ |
| Automatic Traffic Recorder | 57 | Shasta | 5 | 49.18 | | | La Moine Rd N/B Off | Existing | ✓ |
| Automatic Traffic Recorder | 58 | Shasta | 5 | 49.32 | | | La Moine Rd S/B Off | Existing | ✓ |
| Automatic Traffic Recorder | 59 | Shasta | 5 | 49.38 | | | La Moine N/B On | Existing | ✓ |
| Automatic Traffic Recorder | 60 | Shasta | 5 | 50.55 | | | Pollard Flat S/B On | Existing | ✓ |
| Automatic Traffic Recorder | 61 | Shasta | 5 | 50.58 | | | Pollard Flat N/B Off | Existing | ✓ |
| Automatic Traffic Recorder | 62 | Shasta | 5 | 50.91 | | | Pollard Flat N/B On | Existing | ✓ |
| Automatic Traffic Recorder | 63 | Shasta | 5 | 50.99 | | | Pollard Flat S/B Off | Existing | ✓ |
| Automatic Traffic Recorder | 64 | Shasta | 5 | 57.33 | | | Sims Rd IC | Existing | ✓ |
| Automatic Traffic Recorder | 97 | Shasta | 44 | 0.07 | | E | Off To NB Rte 5 | Existing | ✓ |
| Automatic Traffic Recorder | 98 | Shasta | 44 | 0.1 | | W | Off To NB Rte 5 | Existing | ✓ |
| Automatic Traffic Recorder | 99 | Shasta | 44 | 0.13 | | | On Hilltop Rd | Existing | ✓ |
| Automatic Traffic Recorder | 100 | Shasta | 44 | 0.13 | | | On Hilltop Rd | Existing | ✓ |
| Automatic Traffic Recorder | 101 | Shasta | 44 | 0.16 | | E | Off To Hilltop | Existing | ✓ |
| Automatic Traffic Recorder | 102 | Shasta | 44 | 0.18 | | E | On fr NB 5/Hilltop | Existing | ✓ |
| Automatic Traffic Recorder | 103 | Shasta | 44 | 0.62 | | W | On fr Dana/Friendly | Existing | ✓ |
| Automatic Traffic Recorder | 104 | Shasta | 44 | 0.79 | | E | Off To Dana/Friendly | Existing | ✓ |
| Automatic Traffic Recorder | 105 | Shasta | 44 | 1.09 | | W | Off fr Victor Ave. | Existing | ✓ |
| Automatic Traffic Recorder | 106 | Shasta | 44 | 1.14 | | E | Off To Victor Ave. | Existing | ✓ |
| Automatic Traffic Recorder | 107 | Shasta | 44 | 1.4 | | | On Victor Ave. | Existing | ✓ |

**Table F-7:** Deployment Locations in Shasta County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Automatic Traffic Recorder | 108 | Shasta | 44 | 1.37 | | W | Off To Victor Ave. | Existing | ✓ |
| Automatic Traffic Recorder | 109 | Shasta | 44 | 1.43 | | E | On fr Victor Ave. | Existing | ✓ |
| Automatic Traffic Recorder | 110 | Shasta | 44 | 1.51 | | | Redding, Victor Avenue | Existing | ✓ |
| Automatic Traffic Recorder | 111 | Shasta | 44 | 1.87 | | W | On from Shasta View Dr | Existing | ✓ |
| Automatic Traffic Recorder | 112 | Shasta | 44 | 1.88 | | E | Off To Shasta View Dr | Existing | ✓ |
| Automatic Traffic Recorder | 113 | Shasta | 44 | 2.11 | | W | On from N Shasta View Dr | Existing | ✓ |
| Automatic Traffic Recorder | 114 | Shasta | 44 | 2.26 | | W | Off To Shasta View Dr | Existing | ✓ |
| Automatic Traffic Recorder | 115 | Shasta | 44 | 2.27 | | E | On from Shasta View Dr | Existing | ✓ |
| Automatic Traffic Recorder | 116 | Shasta | 44 | 4.3 | | | Airport Road | Existing | ✓ |
| Automatic Traffic Recorder | 117 | Shasta | 44 | 6.71 | | | Deschutes Rd IC | Existing | ✓ |
| Automatic Traffic Recorder | 118 | Shasta | 44 | 6.77 | | W | WB On Ramp | Existing | ✓ |
| Automatic Traffic Recorder | 119 | Shasta | 44 | 6.81 | | E | EB Off Ramp | Existing | ✓ |
| Automatic Traffic Recorder | 120 | Shasta | 44 | 7.21 | | W | WB Off Ramp | Existing | ✓ |
| Automatic Traffic Recorder | 121 | Shasta | 44 | 7.23 | | E | EB On Ramp | Existing | ✓ |
| Automatic Traffic Recorder | 122 | Shasta | 44 | 7.38 | | | Deschutes Road | Existing | ✓ |
| Automatic Traffic Recorder | 123 | Shasta | 44 | 18.87 | | | Dersch Road | Existing | ✓ |
| Automatic Traffic Recorder | 124 | Shasta | 44 | 19.03 | | | Dersch Road | Existing | ✓ |
| Automatic Traffic Recorder | 125 | Shasta | 44 | 32 | | | Shingletown | Existing | ✓ |
| Automatic Traffic Recorder | 126 | Shasta | 44 | 42.48 | | | Viola | Existing | ✓ |
| Automatic Traffic Recorder | 127 | Shasta | 44 | 49.1 | | | Lassen Natl Park Entr | Existing | ✓ |
| Automatic Traffic Recorder | 128 | Shasta | 44 | 62.6 | | | Jct Rte 89 | Existing | ✓ |
| Automatic Traffic Recorder | 129 | Shasta | 44 | 63.55 | | | Jct Rte 89 | Existing | ✓ |
| Automatic Traffic Recorder | 137 | Shasta | 89 | 0.07 | | | Jct Rte 44 | Existing | ✓ |
| Automatic Traffic Recorder | 138 | Shasta | 89 | 21.69 | | | 4 Corners Jct Rte 299 | Existing | ✓ |
| Automatic Traffic Recorder | 139 | Shasta | 89 | 22.06 | | | 4 Corners Jct Rte 299 | Existing | ✓ |
| Automatic Traffic Recorder | 140 | Shasta | 89 | 28.6 | | | Lake Britton | Existing | ✓ |
| Automatic Traffic Recorder | 170 | Shasta | 151 | 0.08 | | | Shasta Dam | Existing | ✓ |
| Automatic Traffic Recorder | 171 | Shasta | 151 | 3.97 | | | Lake Blvd | Existing | ✓ |
| Automatic Traffic Recorder | 172 | Shasta | 151 | 5.51 | | | Sprr Underpass | Existing | ✓ |
| Automatic Traffic Recorder | 173 | Shasta | 151 | 6.76 | | | Cascade Blvd; Jct Rte 5 | Existing | ✓ |
| Automatic Traffic Recorder | 181 | Shasta | 273 | 3.41 | | | S. Jct Route 5 | Existing | ✓ |
| Automatic Traffic Recorder | 182 | Shasta | 273 | 3.56 | | | S.Jct Route 5 | Existing | ✓ |
| Automatic Traffic Recorder | 183 | Shasta | 273 | 11.08 | | | Canyon Road | Existing | ✓ |
| Automatic Traffic Recorder | 184 | Shasta | 273 | 11.16 | | N | Canyon Road | Existing | ✓ |
| Automatic Traffic Recorder | 185 | Shasta | 273 | 11.2 | | S | Canyon Road | Existing | ✓ |
| Automatic Traffic Recorder | 186 | Shasta | 273 | 12.57 | | | Bonneyview/Cedars Rd. | Existing | ✓ |
| Automatic Traffic Recorder | 187 | Shasta | 273 | 14.08 | | | Breslauer | Existing | ✓ |
| Automatic Traffic Recorder | 188 | Shasta | 273 | 14.32 | | | Breslauer | Existing | ✓ |
| Automatic Traffic Recorder | 189 | Shasta | 273 | 15.76 | | | Market / Cypress & Pine | Existing | ✓ |
| Automatic Traffic Recorder | 190 | Shasta | 273 | 15.97 | | | Market / Pine | Existing | ✓ |
| Automatic Traffic Recorder | 191 | Shasta | 273 | 17.35 | | | Quartz Hill Rd-LT R1RT | Existing | ✓ |
| Automatic Traffic Recorder | 192 | Shasta | 273 | 18.5 | | | Lake Blvd | Existing | ✓ |
| Automatic Traffic Recorder | 193 | Shasta | 273 | 18.65 | | | Lake Blvd | Existing | ✓ |
| Automatic Traffic Recorder | 194 | Shasta | 273 | 19.9 | | | N. Jct Route 5 | Existing | ✓ |
| Automatic Traffic Recorder | 195 | Shasta | 273 | 20.03 | | | N. Jct Route 5 | Existing | ✓ |
| Automatic Traffic Recorder | 202 | Shasta | 299 | 8.72 | | | French Gulch Rd. | Existing | ✓ |
| Automatic Traffic Recorder | 203 | Shasta | 299 | 21.86 | | | Redding West City Limit | Existing | ✓ |

**Table F-7:** Deployment Locations in Shasta County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Automatic Traffic Recorder | 204 | Shasta | 299 | 23.81 | | | Court Street | Existing | ✓ |
| Automatic Traffic Recorder | 205 | Shasta | 299 | 24.06 | | | Redding Jct Rte 273 | Existing | ✓ |
| Automatic Traffic Recorder | 206 | Shasta | 299 | 24.47 | | | Redding Butte St Overcrossing | Existing | ✓ |
| Automatic Traffic Recorder | 207 | Shasta | 299 | 25.56 | | | Redding Jct. Rte. 5 | Existing | ✓ |
| Automatic Traffic Recorder | 208 | Shasta | 299 | 25.65 | | | E/B Off Ramp To S/B I-5 | Existing | ✓ |
| Automatic Traffic Recorder | 209 | Shasta | 299 | 25.82 | | | W/B Off Ramp To S/B I-5 | Existing | ✓ |
| Automatic Traffic Recorder | 210 | Shasta | 299 | 25.13 | | | N Jct Rte 5 Lake Blvd IC | Existing | ✓ |
| Automatic Traffic Recorder | 211 | Shasta | 299 | 28.43 | | | Old Or Trail Intrsctn | Existing | ✓ |
| Automatic Traffic Recorder | 212 | Shasta | 299 | 31.71 | | | Bella Vista Dschts Rd | Existing | ✓ |
| Automatic Traffic Recorder | 213 | Shasta | 299 | 58.62 | | | Big Bend Road | Existing | ✓ |
| Automatic Traffic Recorder | 214 | Shasta | 299 | 71.69 | | | Tamarack Road | Existing | ✓ |
| Automatic Traffic Recorder | 215 | Shasta | 299 | 75.63 | | | Burney Maint Sta | Existing | ✓ |
| Automatic Traffic Recorder | 216 | Shasta | 299 | 79.68 | | | 4 Corners Jct Rte 89 | Existing | ✓ |
| Automatic Traffic Recorder | 217 | Shasta | 299 | 80.24 | | | 4 Corners Jct Rte 89 | Existing | ✓ |
| Automatic Traffic Recorder | 218 | Shasta | 299 | 91.42 | | | Fall River Mills | Existing | ✓ |
| Automatic Traffic Recorder | 219 | Shasta | 299 | 91.42 | | | Fall River Mills | Existing | ✓ |
| Closed-Circuit Television Camera | 7 | Shasta | 5 | 16.8 | | | At the Central Redding Interchange | Existing | ✓ |
| Closed-Circuit Television Camera | 8 | Shasta | 5 | 20.98 | | | At Pine Grove | Existing | ✓ |
| Closed-Circuit Television Camera | 74 | Shasta | 5 | 12.15 | | | At South Bonnyview Road COATS Expanded CCTV | Short-Term | ✓ |
| Closed-Circuit Television Camera | 82 | Shasta | 5 | 4.29 | | | At Deschutes Road / Factory Outlet Drive | Short-Term | ✓ |
| Closed-Circuit Television Camera | 90 | Shasta | 273 | 18.62 | | | At Lake Blvd COATS Expanded CCTV | Short-Term | ✓ |
| Closed-Circuit Television Camera | 91 | Shasta | 299 | 80.08 | | | At Junction Routes 89/299 COATS Expanded CCTV | Short-Term | ✓ |
| Closed-Circuit Television Camera | 92 | Shasta | 5 | 6.9 | | | At Riverside Avenue | Short-Term | ✓ |
| Closed-Circuit Television Camera | 93 | Shasta | 5 | 26.03 | | | At Fawndale Interchange | Short-Term | ✓ |
| Closed-Circuit Television Camera | 113 | Shasta | 5 | 3.81 | | | At the Junction of Routes 5 / 273 | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 114 | Shasta | 5 | 9.77 | | | At Knighton Road | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 115 | Shasta | 5 | 14.44 | | | At Cypress Ave | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 116 | Shasta | 5 | 17.31 | | | At 5 / 299 Separation | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 117 | Shasta | 5 | 18.07 | | | At Twin View Blvd UC | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 118 | Shasta | 5 | 24.08 | | | At Mountain Gate OC | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 119 | Shasta | 5 | 30.5 | | | Near Packers Bay S/B On | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 120 | Shasta | 5 | 36 | | | Near Salt Creek | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 121 | Shasta | 5 | 45.54 | | | Near Dog Creek | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 124 | Shasta | 5 | 49.15 | | | Road Closure | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 129 | Shasta | 5 | 61.74 | | | Road Closure | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 130 | Shasta | 5 | 65 | | | Road Closure | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 139 | Shasta | 299 | 89.4 | | | On PIT 1 Grade | Long-Term | ✓ |
| Closed-Circuit Television Camera | 152 | Shasta | 5 | 43.5 | | | Lakehead Rest Area | Long-Term | ✓ |
| Closed-Circuit Television Camera | 153 | Shasta | 5 | 31.03 | | | O'Brien Rest Area | Long-Term | ✓ |
| Closed-Circuit Television Camera | 155 | Shasta | 299 | 60.58 | | | Hillcrest Rest Area | Long-Term | ✓ |
| Closed-Circuit Television Camera | 156 | Shasta | 44 | 34.67 | | | Shingletown Rest Area | Long-Term | ✓ |
| Closed-Circuit Television Camera | 168 | Shasta | 44 | 1.24 | | | At Victor Avenue OC | Long-Term | ✓ |
| Closed-Circuit Television Camera | 169 | Shasta | 44 | 3.63 | | | At Airport Road OC | Long-Term | ✓ |
| Closed-Circuit Television Camera | 170 | Shasta | 44 | 37.05 | | | Starlite Pines Road | Long-Term | ✓ |
| Closed-Circuit Television Camera | 171 | Shasta | 44 | 50.52 | | | At Eskimo Hill | Long-Term | ✓ |
| Closed-Circuit Television Camera | 178 | Shasta | 89 | 11 | | | Near the Hat Creek Ranger Station | Long-Term | ✓ |
| Closed-Circuit Television Camera | 179 | Shasta | 89 | 36.89 | | | Near Red Hill Cut | Long-Term | ✓ |

**Table F-7:** Deployment Locations in Shasta County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Closed-Circuit Television Camera | 186 | Shasta | 89 | 21.3 | | | Road Closure | Long-Term | ✓ |
| Closed-Circuit Television Camera | 188 | Shasta | 299 | 0.03 | | | At Buckhorn Summit | Long-Term | ✓ |
| Closed-Circuit Television Camera | 189 | Shasta | 299 | 8.72 | | | At Clear Crk | Long-Term | ✓ |
| Closed-Circuit Television Camera | 190 | Shasta | 299 | 14.49 | | | At Shasta Divide | Long-Term | ✓ |
| Closed-Circuit Television Camera | 191 | Shasta | 299 | 22.23 | | | At Buenaventura Blvd. | Long-Term | ✓ |
| Closed-Circuit Television Camera | 192 | Shasta | 299 | 25.05 | | | At Park Marina | Long-Term | ✓ |
| Closed-Circuit Television Camera | 193 | Shasta | 299 | 25.05 | | | At Park Marina | Long-Term | ✓ |
| Closed-Circuit Television Camera | 194 | Shasta | 299 | 25.54 | | | At Hawley Road UC | Long-Term | ✓ |
| Closed-Circuit Television Camera | 195 | Shasta | 299 | 27.22 | | | At Old Oregon Trail UC | Long-Term | ✓ |
| Closed-Circuit Television Camera | 196 | Shasta | 299 | 29.89 | | | At Future Dana Ramp | Long-Term | ✓ |
| Closed-Circuit Television Camera | 197 | Shasta | 299 | 68.17 | | | At Hatchet Mt Summit | Long-Term | ✓ |
| Closed-Circuit Television Camera | 198 | Shasta | 299 | 75.47 | | | At Mountain View Road | Long-Term | ✓ |
| RWIS | 14 | Shasta | 5 | 36 | | | South of Gilman Road (RAWS) | Existing | ✓ |
| RWIS | 71 | Shasta | 5 | 26.03 | | | Near the Fawndale Interchange | Medium-Term | ✓ |
| RWIS | 72 | Shasta | 5 | 30.5 | | | Near Packers Bay S/B On | Medium-Term | ✓ |
| RWIS | 73 | Shasta | 5 | 45.54 | | | Near Dog Creek | Medium-Term | ✓ |
| RWIS | 81 | Shasta | 44 | 37.05 | | | Starlite Pines Road | Long-Term | ✓ |
| RWIS | 82 | Shasta | 44 | 50.52 | | | At Eskimo Hill | Long-Term | ✓ |
| RWIS | 89 | Shasta | 89 | 11 | | | Near the Hat Creek Ranger Station | Long-Term | ✓ |
| RWIS | 90 | Shasta | 89 | 36.89 | | | Near Red Hill Cut | Long-Term | ✓ |
| RWIS | 96 | Shasta | 299 | 0.03 | | | At Buckhorn Summit | Long-Term | ✓ |
| RWIS | 97 | Shasta | 299 | 8.72 | | | At Clear Crk | Long-Term | ✓ |
| RWIS | 113 | Shasta | 299 | 14.49 | | | At Shasta Divide | Long-Term | ✓ |
| RWIS | 117 | Shasta | 299 | 68.17 | | | At Hatchet Mt Summit | Long-Term | ✓ |
| Satellite Traffic Operations Center | 7 | Shasta | 5 | 14.46 | | | Redding | Existing | ✓ |
| Satellite Traffic Operations Center | 9 | Shasta | 5 | 18 | | | Redding Caltrans/CHP upgrade | Short-Term | ✓ |
| Video Image Processing Station | 1 | Shasta | 5 | 29.97 | | S | At Sidehill Viaduct | Existing | ✓ |
| Video Image Processing Station | 2 | Shasta | 5 | 31.94 | | S | At OBrien Interchange | Existing | ✓ |
| Video Image Processing Station | 3 | Shasta | 5 | 36.72 | | S | At Salt Creek | Existing | ✓ |
| Video Image Processing Station | 4 | Shasta | 5 | 48.78 | | S | At LaMoine | Existing | ✓ |
| Video Image Processing Station | 5 | Shasta | 5 | 57.95 | | N | At Sims Road OC | Existing | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 9 | Shasta | 5 | 14.46 | | | Redding | Long-Term | ✓ |
| Probe Vehicle Instrumentation | 7 | Shasta | 5 | 14.46 | 67.02 | | | Medium-Term | ✓ |
| Probe Vehicle Instrumentation | 9 | Shasta | 36 | 0 | 11.93 | | E/W California routes | Long-Term | ✓ |
| Probe Vehicle Instrumentation | 10 | Shasta | 44 | 0 | 71.39 | | E/W California routes | Long-Term | ✓ |
| Probe Vehicle Instrumentation | 11 | Shasta | 299 | 0 | 99.36 | | E/W California routes | Long-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 1 | Shasta | 5 | 0 | 67.02 | | | Medium-Term | ✓ |
| Preclearance | 14 | Shasta | 299 | 54.3 | | E/W | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 4 | Shasta | 5 | 22.14 | | | N of N. Jct 151/I-5 | Existing | ✓ |
| Weigh in Motion | 18 | Shasta | 299 | 54.3 | | E/W | Near Existing Weigh Station | Medium-Term | ✓ |

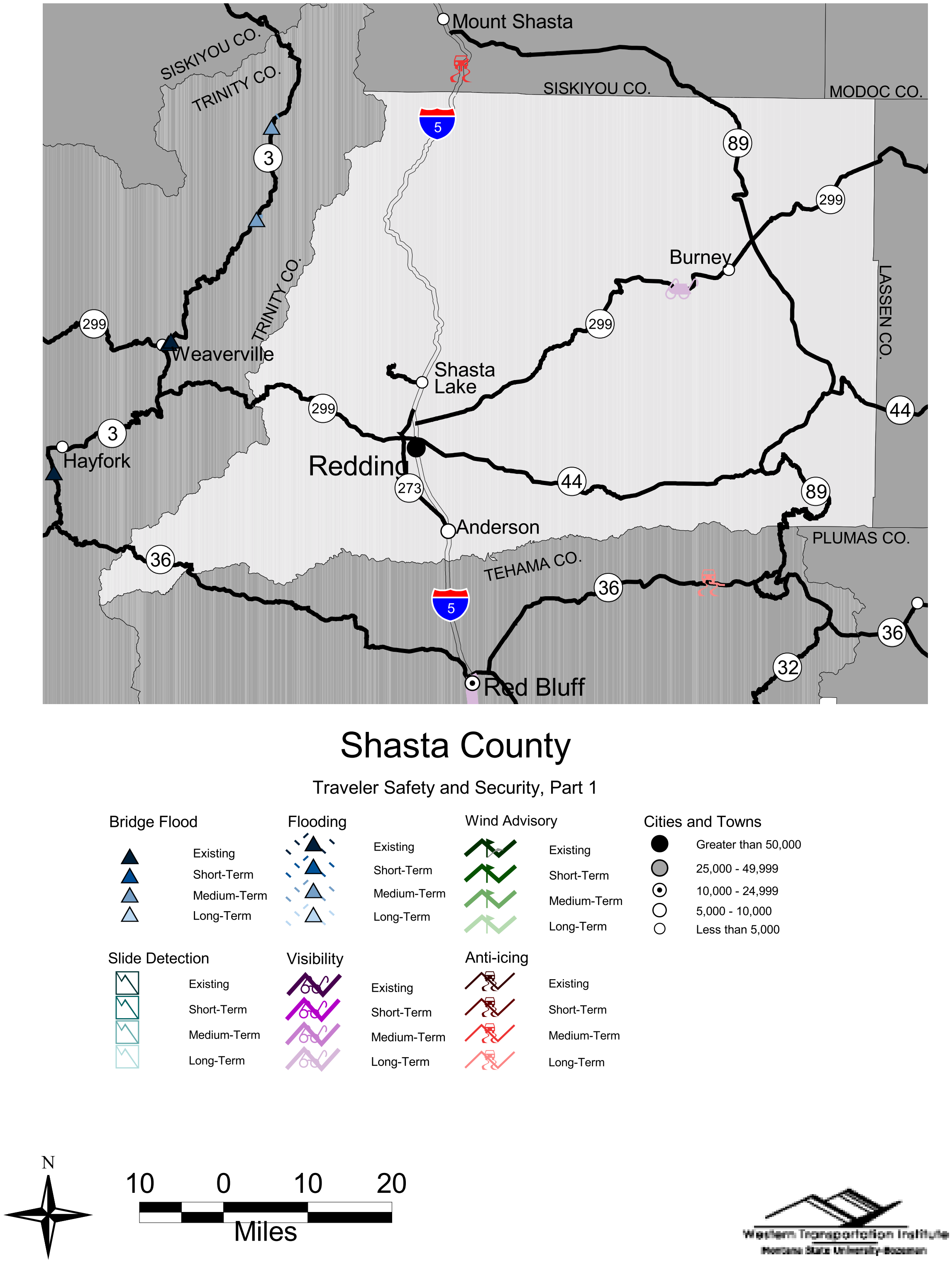


**Figure F-49:** Traveler Safety and Security (Part 1) in Shasta County.

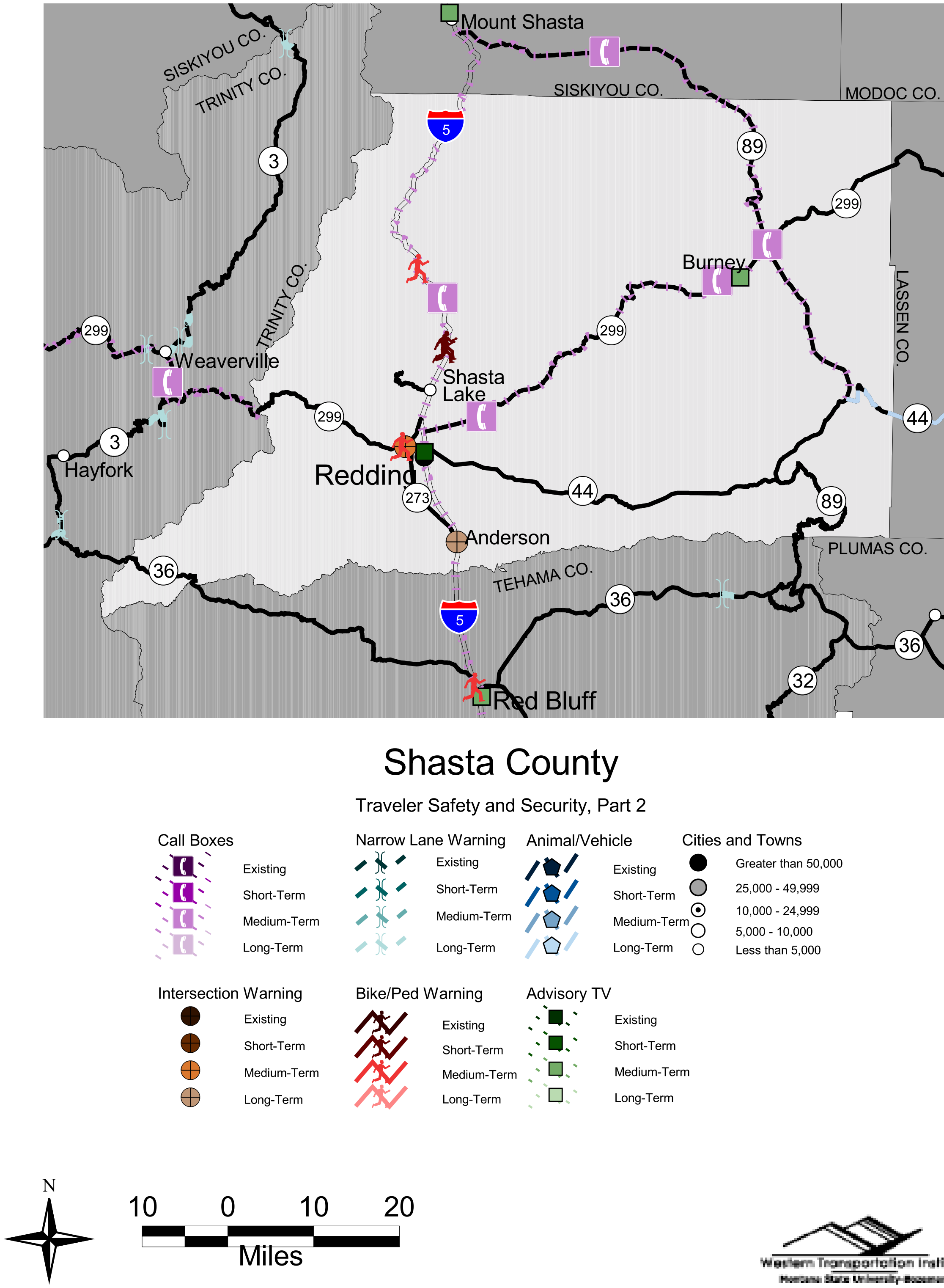


**Figure F-50:** Traveler Safety and Security (Part 2) in Shasta County.

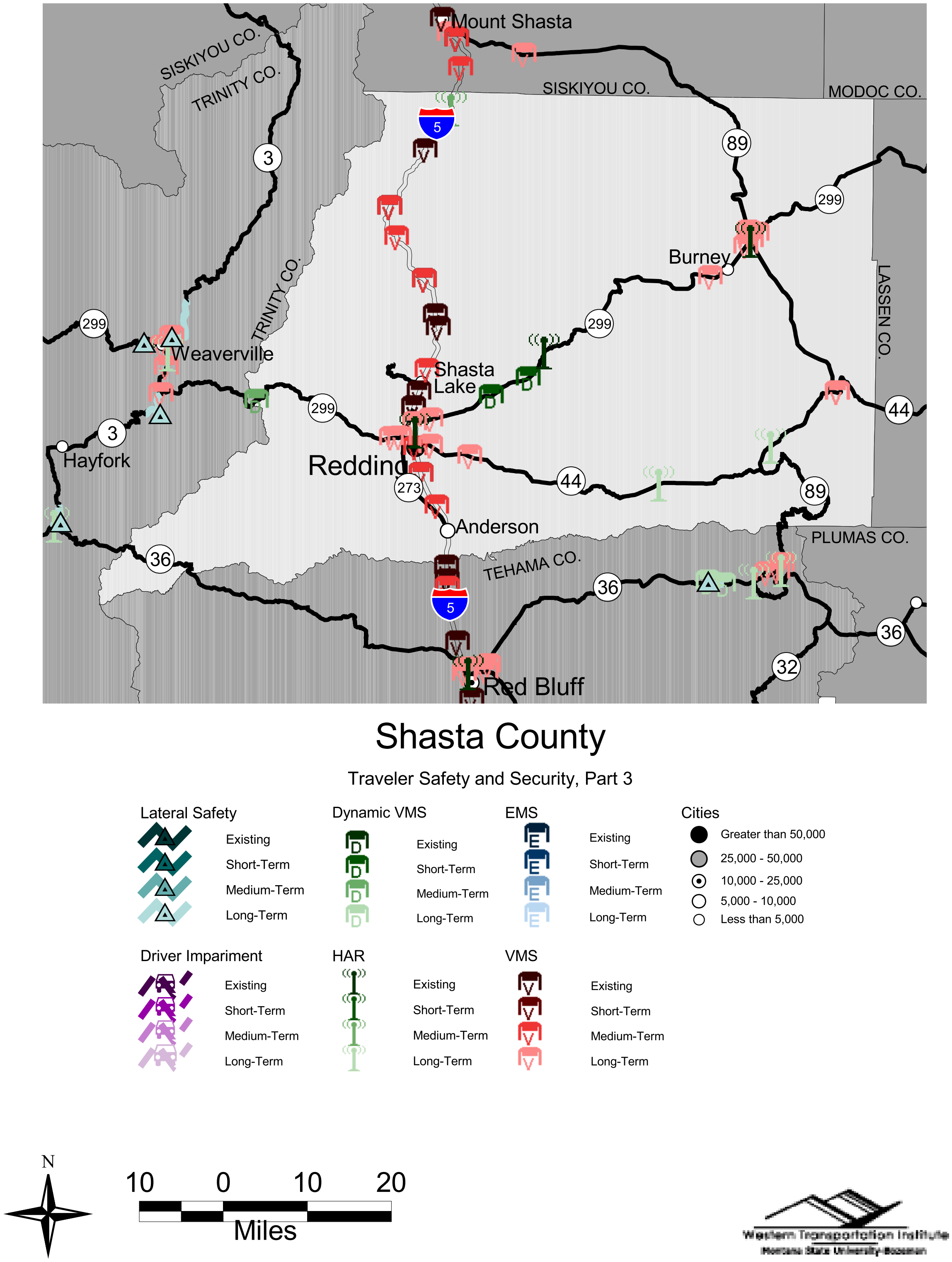


**Figure F-51:** Traveler Safety and Security (Part 3) in Shasta County.

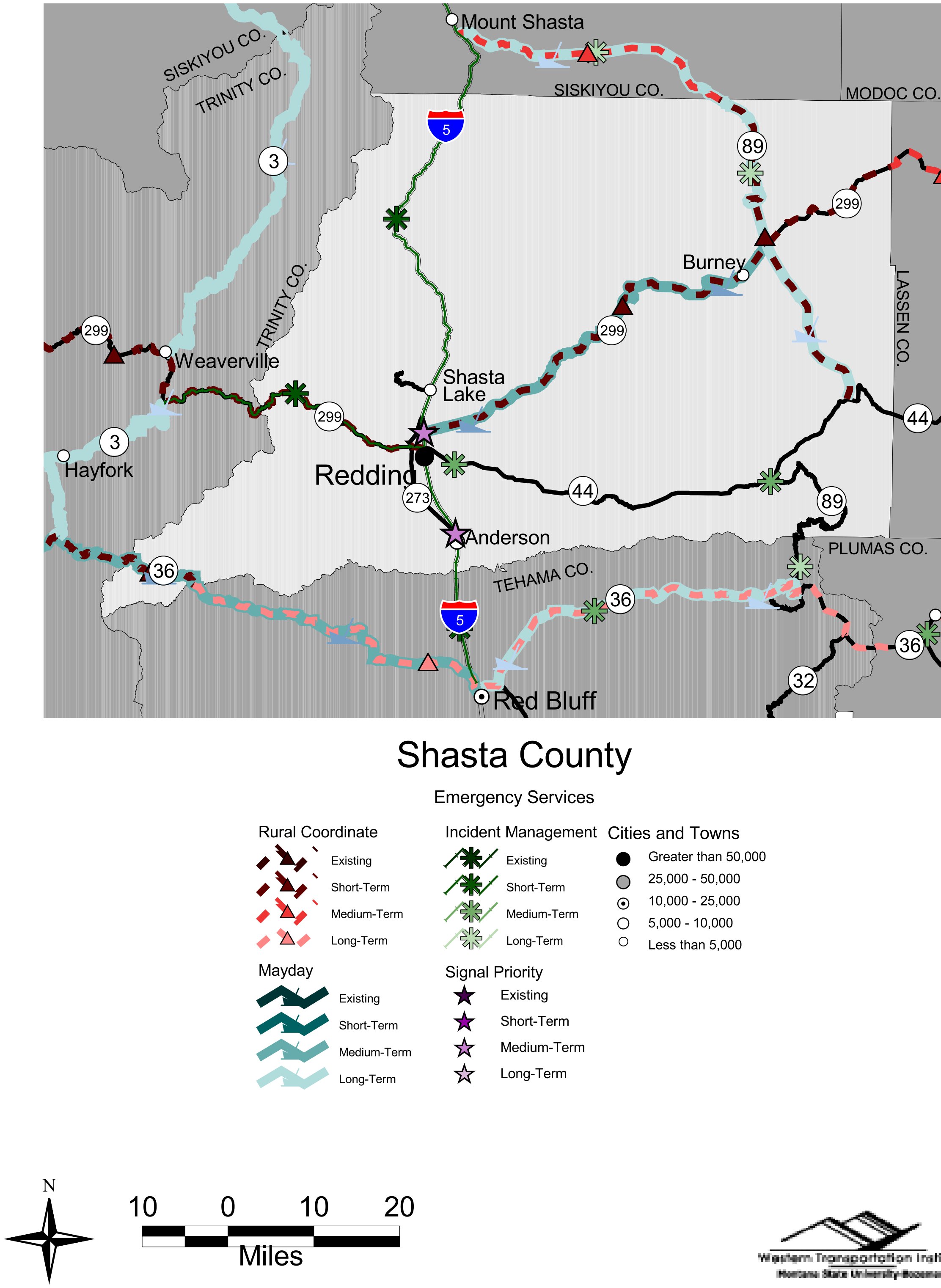


**Figure F-52:** Emergency Services in Shasta County.

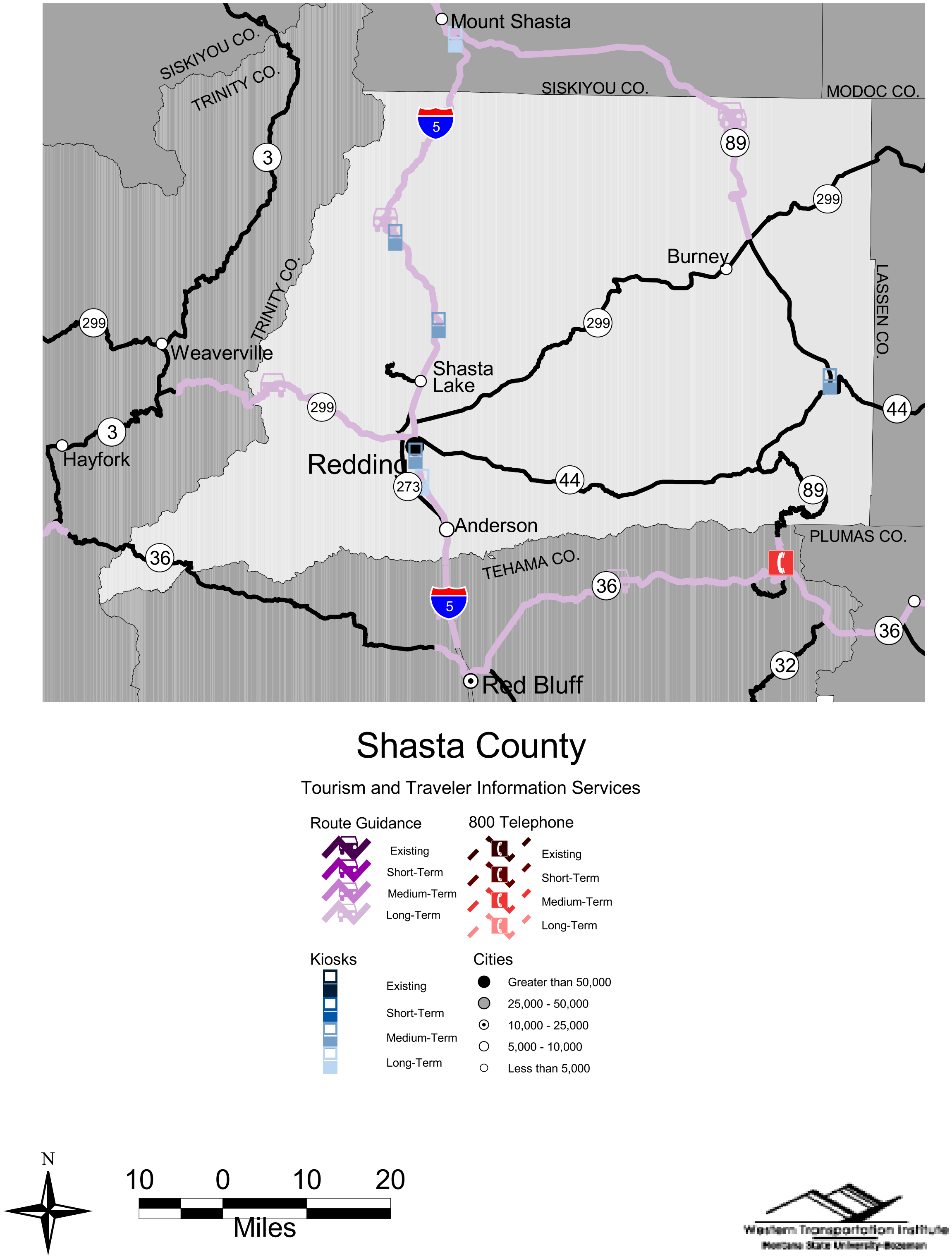


**Figure F-53:** Tourism and Traveler Information Services in Shasta County.

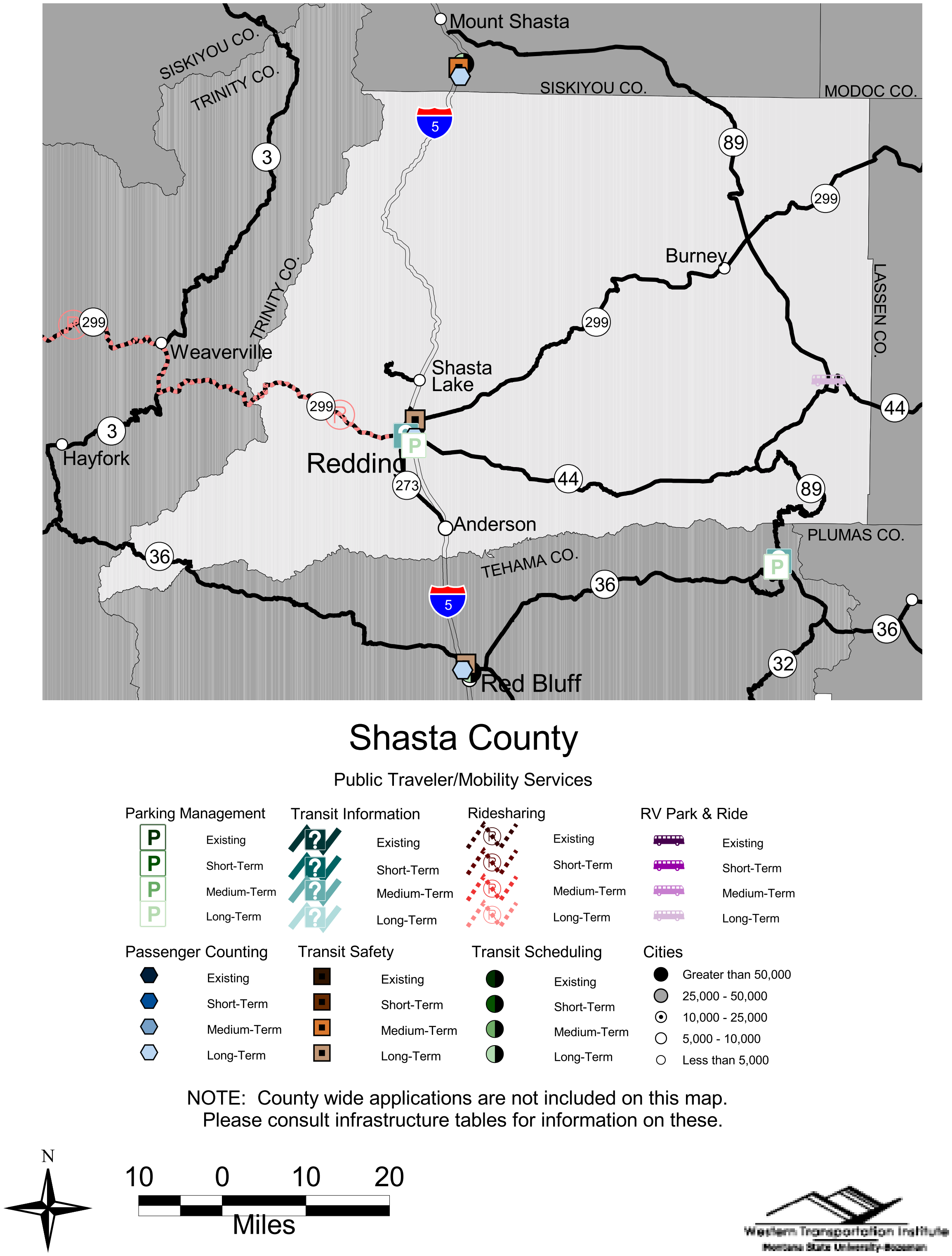


**Figure F-54:** Public Traveler/Mobility Services in Shasta County.

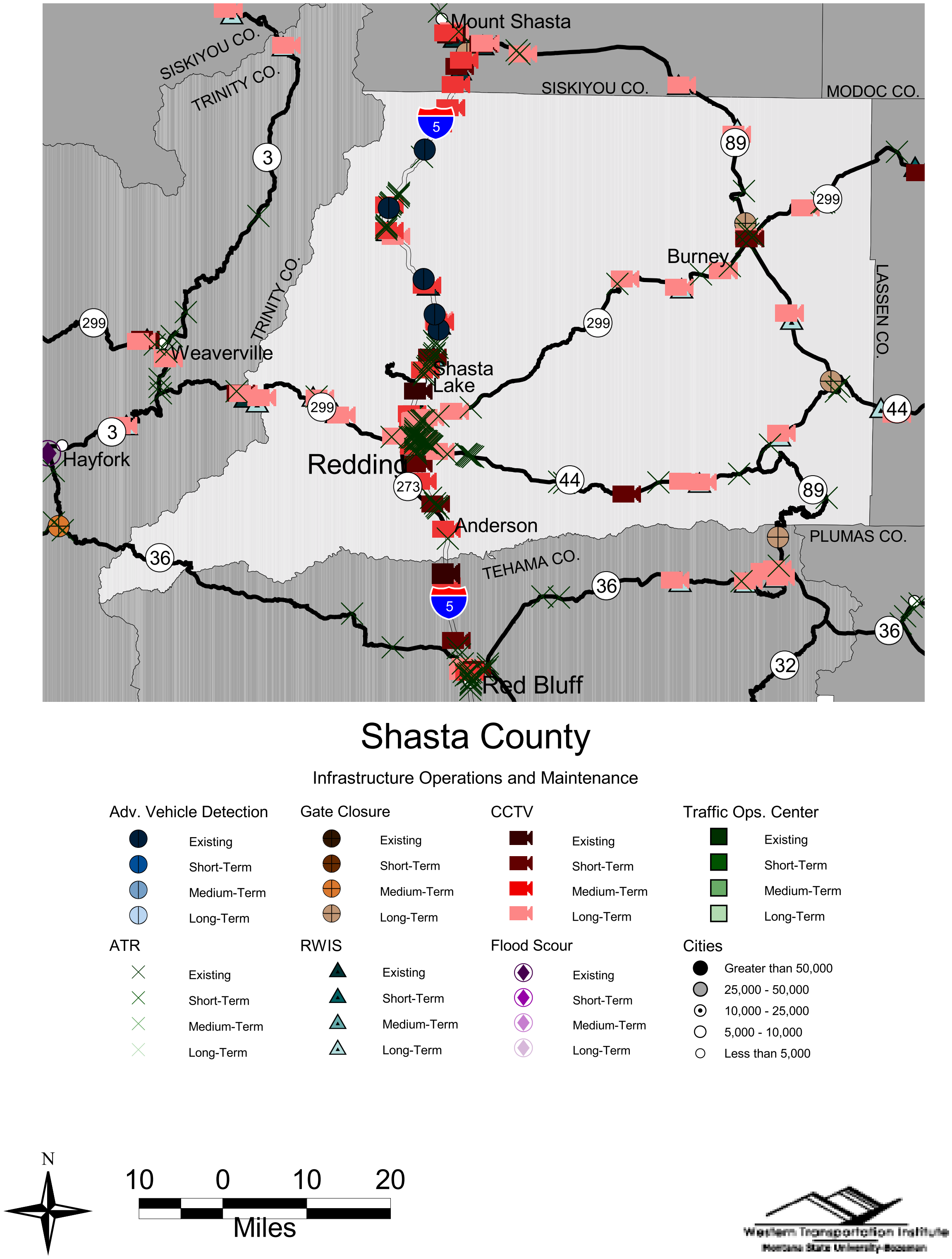


**Figure F-55:** Infrastructure Operations and Maintenance in Shasta County.

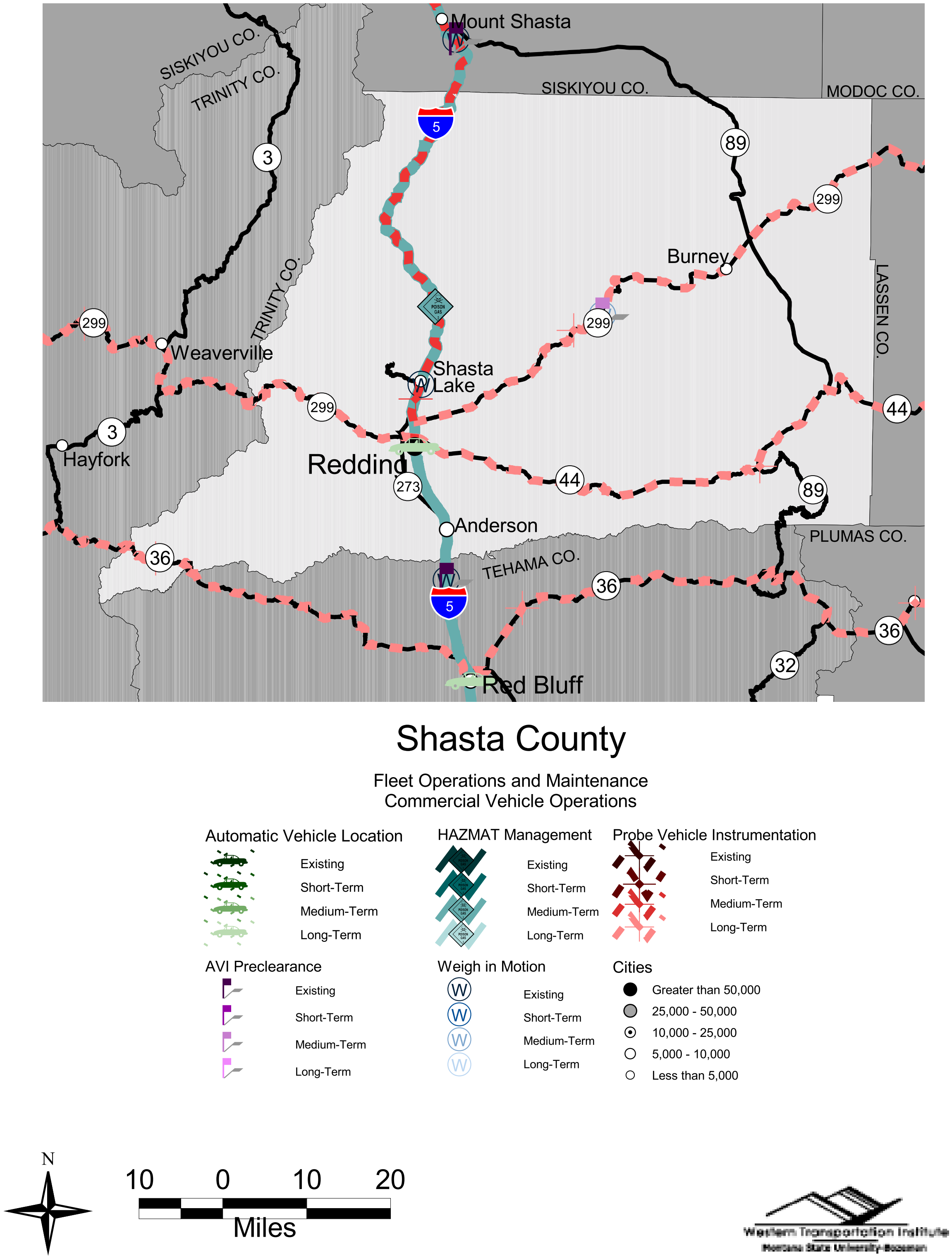


**Figure F-56:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Shasta County.

**Table F-8:** Deployment Locations in Siskiyou County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Advanced Bike/Ped Warning | 9 | Siskiyou | 3 | 47.38 | | | Bike/ped challenge (Yreka) | Medium-Term | ✓ |
| Advisory Television | 4 | Siskiyou | 5 | 47.56 | | | Yreka | Short-Term | ✓ |
| Advisory Television | 9 | Siskiyou | 5 | 10.49 | | | Mt. Shasta | Medium-Term | ✓ |
| Advisory Television | 10 | Siskiyou | 5 | 19.07 | | | Weed | Medium-Term | ✓ |
| Animal/Vehicle Collision Warning | 8 | Siskiyou | 5 | 24 | 26 | | Warn drivers about deer on freeway | Medium-Term | ✓ |
| Automated Anti-Icing | 7 | Siskiyou | 5 | 2.9 | 3.4 | | Keep ice off Sac. River bridge in Dunsmuir | Medium-Term | ✓ |
| Automated Wind Advisory | 1 | Siskiyou | 5 | 18.5 | | N | Weed Airport | Existing | ✓ |
| Automated Wind Advisory | 5 | Siskiyou | 5 | 44.3 | | N | Walters Rd | Short-Term | ✓ |
| Highway Advisory Radio | 6 | Siskiyou | 5 | 44.3 | | | At Walters Road COATS Showcase Project | Existing | ✓ |
| Highway Advisory Radio | 12 | Siskiyou | 5 | 13.6 | | | At Abrams Lake Road | Existing | ✓ |
| Highway Advisory Radio | 16 | Siskiyou | 5 | 44.3 | | | At Walters Road (Super HAR) | Short-Term | ✓ |
| Highway Advisory Radio | 17 | Siskiyou | 5 | 65.21 | | | Near Bailey Hill Road COATS Early Winner Project | Short-Term | ✓ |
| Highway Advisory Radio | 34 | Siskiyou | 5 | 63.27 | | | Near Hornbrook MTC Sta | Medium-Term | ✓ |
| Highway Advisory Radio | 57 | Siskiyou | 96 | 0 | | | Road Closure | Long-Term | ✓ |
| Highway Advisory Radio | 80 | Siskiyou | 97 | 51 | | | In Dorris | Long-Term | ✓ |
| Lateral Safety Warning System | 16 | Siskiyou | 3 | 52 | 54.19 | | Stakeholder Input | Long-Term | ✓ |
| Motorist-Aide Call Box | 76 | Siskiyou | 89 | 0 | 34.62 | | Notification time challenge | Medium-Term | ✓ |
| Motorist-Aide Call Box | 83 | Siskiyou | 5 | 0 | 69.29 | | | Medium-Term | ✓ |
| Variable Message Sign | 11 | Siskiyou | 5 | 7.2 | | S | At the Dunsmuir Grade Truck Scales | Existing | ✓ |
| Variable Message Sign | 12 | Siskiyou | 5 | 9.68 | | N | At Ream Road | Existing | ✓ |
| Variable Message Sign | 13 | Siskiyou | 5 | 13.17 | | S | At Abrams Lake Road | Existing | ✓ |
| Variable Message Sign | 14 | Siskiyou | 5 | 44.31 | | S | At Walters Road | Existing | ✓ |
| Variable Message Sign | 15 | Siskiyou | 5 | 44.31 | | N | At Walters Road | Existing | ✓ |
| Variable Message Sign | 47 | Siskiyou | 5 | 13.18 | | N | At N. Mt. Shasta (W/ RWIS @ SIS-5-25.7) Wind Warning | Short-Term | ✓ |
| Variable Message Sign | 48 | Siskiyou | 5 | 45.3 | | | CMS Just North of Walters Road Wind Warning | Short-Term | ✓ |
| Variable Message Sign | 49 | Siskiyou | 5 | 62 | | N | Near Henley Way COATS Early Winner Project | Short-Term | ✓ |
| Variable Message Sign | 113 | Siskiyou | 5 | 3 | | N | Central Dunsmuir | Medium-Term | ✓ |
| Variable Message Sign | 114 | Siskiyou | 5 | 7.4 | | S | Truck Inspection Facility | Medium-Term | ✓ |
| Variable Message Sign | 115 | Siskiyou | 5 | 13.18 | | S | Near North Weed | Medium-Term | ✓ |
| Variable Message Sign | 116 | Siskiyou | 5 | 45.4 | | S | Just South of Yreka | Medium-Term | ✓ |
| Variable Message Sign | 117 | Siskiyou | 5 | 61.55 | | S | Henley Way UC | Medium-Term | ✓ |
| Variable Message Sign | 118 | Siskiyou | 5 | 65.52 | | N | Bailey Hill Road OC | Medium-Term | ✓ |
| Variable Message Sign | 125 | Siskiyou | 5 | 8 | | North | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 126 | Siskiyou | 89 | 34 | | West | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 128 | Siskiyou | 5 | 21 | | South | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 129 | Siskiyou | 5 | 56 | | North | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 130 | Siskiyou | 5 | 58 | | South | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 155 | Siskiyou | 3 | 46.2 | | S | Just South of Yreka | Long-Term | ✓ |
| Variable Message Sign | 175 | Siskiyou | 89 | 23.5 | | S | Just East of McCloud | Long-Term | ✓ |
| Variable Message Sign | 176 | Siskiyou | 96 | 105 | | W | Junction Route 263 Ahead | Long-Term | ✓ |
| Variable Message Sign | 177 | Siskiyou | 97 | 2 | | N | Just North of Weed | Long-Term | ✓ |
| Variable Message Sign | 178 | Siskiyou | 97 | 52.36 | | S | Just North of Dorris | Long-Term | ✓ |
| Variable Message Sign | 182 | Siskiyou | 263 | 57.5 | | N | Junction Route 96 Back | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 8 | Siskiyou | 96 | 0 | 105.82 | | Stakeholder Input | Medium-Term | ✓ |
| Mayday Systems | 18 | Siskiyou | 89 | 0 | 34.62 | | Notification time challenge | Long-Term | ✓ |

**Table F-8:** Deployment Locations in Siskiyou County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Emergency Services (cont.)** | | | | | | | | | |
| Mayday Systems | 20 | Siskiyou | 3 | 0 | 54.19 | | Stakeholder Input | Long-Term | ✓ |
| Regional Incident Management Plan | 1 | Siskiyou | 5 | 47.56 | 69.29 | | Siskiyou Pass Early Winner | Short-Term | ✓ |
| Regional Incident Management Plan | 7 | Siskiyou | 5 | 0 | 47.56 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 19 | Siskiyou | 97 | 0 | 54.09 | | Road Closure | Medium-Term | ✓ |
| Regional Incident Management Plan | 32 | Siskiyou | 96 | 0 | 20 | | Road Closure | Long-Term | ✓ |
| Regional Incident Management Plan | 33 | Siskiyou | 89 | 0 | 34.62 | | Road Closure | Long-Term | ✓ |
| Rural Coordinate Addressing System | 6 | Siskiyou | 89 | 0 | 34.62 | | Notification time challenge | Medium-Term | ✓ |
| Rural Coordinate Addressing System | 9 | Siskiyou | 96 | 0 | 105.82 | | Stakeholder Input | Medium-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 10 | Siskiyou | 96 | 0 | 20 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| In-Vehicle Route Guidance System | 7 | Siskiyou | 5 | 0 | 45 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 8 | Siskiyou | 96 | 0 | 20 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 9 | Siskiyou | 89 | 0 | 34.62 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 12 | Siskiyou | 97 | 0 | 54.09 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 61 | Siskiyou | 5 | 60.83 | | | Redding to Border Rest Areas (Randolph Collier Rest Area) | Medium-Term | ✓ |
| Kiosks | 62 | Siskiyou | 5 | 25.8 | | | Redding to Border Rest Areas (Weed Rest Area) | Medium-Term | ✓ |
| Kiosks | 89 | Siskiyou | 5 | 7.1 | | S | Truck Scales | Long-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 9 | Siskiyou | 5 | 2.51 | | | Dunsmuir | Long-Term | ✓ |
| Automated Passenger Counting | 28 | Siskiyou | | | | | Stage (Siskiyou Transit & General Express) | Long-Term | ✓ |
| On-Board Transit Safety Systems | 1 | Siskiyou | 5 | 2.51 | | | Dunsmuir | Medium-Term | ✓ |
| On-Board Transit Safety Systems | 28 | Siskiyou | | | | | Stage (Siskiyou Transit & General Express) | Long-Term | ✓ |
| Parking Management & Information System | 3 | Siskiyou | 3 | 47.38 | | | Tourist Locations | Medium-Term | ✓ |
| Transit Traveler Information | 7 | Siskiyou | 3 | 47.38 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 15 | Siskiyou | | | | | Stage (Siskiyou Transit & General Express) | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 31 | Siskiyou | 5 | 2.51 | | | Dunsmuir | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 17 | Siskiyou | 5 | 52.7 | | | On Anderson Grade TMS(RTMS) COATS Early Winner Project | Short-Term | ✓ |
| Advanced Vehicle Detection | 18 | Siskiyou | 5 | 62 | | | Near Henley Way TMS(RTMS) COATS Showcase RTMS Project | Short-Term | ✓ |
| Advanced Vehicle Detection | 19 | Siskiyou | 5 | 66.6 | | | Near Baily Hill TMS(RTMS) COATS Early Winner Project | Short-Term | ✓ |
| Advanced Vehicle Detection | 20 | Siskiyou | 5 | 68.6 | | | Near Hilt TMS(RTMS) COATS Showcase RTMS Project | Short-Term | ✓ |
| Advanced Vehicle Detection | 21 | Siskiyou | 5 | 65.21 | | | Near Bailey Hill HAR TMS(RTMS) | Short-Term | ✓ |
| Automated Gate Closure | 8 | Siskiyou | 3 | 8 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| Automated Gate Closure | 12 | Siskiyou | 5 | 5 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| Automated Gate Closure | 13 | Siskiyou | 89 | 34.62 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| Automated Gate Closure | 14 | Siskiyou | 5 | 43 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| Automatic Traffic Recorder | 8 | Siskiyou | 3 | 32.23 | | | Ft. Jones Scott Rvr Rd | Existing | ✓ |
| Automatic Traffic Recorder | 9 | Siskiyou | 3 | 45.18 | | | Forest Mntn Ranch | Existing | ✓ |
| Automatic Traffic Recorder | 10 | Siskiyou | 3 | 46.87 | | | Jerrys Rd (Conn To I-5) | Existing | ✓ |
| Automatic Traffic Recorder | 11 | Siskiyou | 3 | 49.2 | | | West Center Street | Existing | ✓ |
| Automatic Traffic Recorder | 12 | Siskiyou | 3 | 48.3 | | | N Jct Rte 5 | Existing | ✓ |
| Automatic Traffic Recorder | 65 | Siskiyou | 5 | 11.37 | | | O.2 Mi N/O Lassen Ave OC | Existing | ✓ |
| Automatic Traffic Recorder | 66 | Siskiyou | 5 | 12.91 | | | Abrams Lake Rd Intchnge | Existing | ✓ |
| Automatic Traffic Recorder | 67 | Siskiyou | 5 | 23.17 | | | Edgewood IC | Existing | ✓ |
| Automatic Traffic Recorder | 68 | Siskiyou | 5 | 68.17 | | | Hilt Road Interchange | Existing | ✓ |
| Automatic Traffic Recorder | 141 | Siskiyou | 89 | 24.52 | | | Minnesota Ave | Existing | ✓ |

**Table F-8:** Deployment Locations in Siskiyou County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Automatic Traffic Recorder | 142 | Siskiyou | 89 | 25.1 | | | Broadway & S Ave | Existing | ✓ |
| Automatic Traffic Recorder | 143 | Siskiyou | 89 | 33.94 | | | Mount Shasta Blvd. | Existing | ✓ |
| Automatic Traffic Recorder | 144 | Siskiyou | 96 | 38.92 | | | Happy Camp Maint Sta | Existing | ✓ |
| Automatic Traffic Recorder | 145 | Siskiyou | 96 | 41.32 | | | Happy Camp, Main St. | Existing | ✓ |
| Automatic Traffic Recorder | 146 | Siskiyou | 96 | 60.75 | | | Seiad Maint. Station | Existing | ✓ |
| Automatic Traffic Recorder | 147 | Siskiyou | 96 | 103.31 | | | Jct Rte 263 | Existing | ✓ |
| Automatic Traffic Recorder | 148 | Siskiyou | 96 | 105.82 | | | Jct Rte 5 Klmth Rvr Br | Existing | ✓ |
| Automatic Traffic Recorder | 149 | Siskiyou | 97 | 0.09 | | | Jct Rte 5 | Existing | ✓ |
| Automatic Traffic Recorder | 150 | Siskiyou | 97 | 0.96 | | | Jct. Rte 265 | Existing | ✓ |
| Automatic Traffic Recorder | 151 | Siskiyou | 97 | 1.14 | | | Lincoln Street, Weed | Existing | ✓ |
| Automatic Traffic Recorder | 152 | Siskiyou | 97 | 20.2 | | | Grass Lake | Existing | ✓ |
| Automatic Traffic Recorder | 153 | Siskiyou | 97 | 34.53 | | | 1.7 Mi. S/O Ball Mtn Road | Existing | ✓ |
| Automatic Traffic Recorder | 154 | Siskiyou | 97 | 50.9 | | | Dorris, First Street | Existing | ✓ |
| Automatic Traffic Recorder | 155 | Siskiyou | 97 | 53.69 | | | Jct. Rte 161 East | Existing | ✓ |
| Automatic Traffic Recorder | 174 | Siskiyou | 161 | 1.11 | | | Jct Rte 97 | Existing | ✓ |
| Automatic Traffic Recorder | 175 | Siskiyou | 161 | 19.18 | | | Jct Rte 139 | Existing | ✓ |
| Automatic Traffic Recorder | 178 | Siskiyou | 263 | 49.39 | | | Jct Rte 3 Tebee Street | Existing | ✓ |
| Automatic Traffic Recorder | 179 | Siskiyou | 263 | 56.34 | | | Jct Rt 96 Shasta Rvr Br | Existing | ✓ |
| Automatic Traffic Recorder | 180 | Siskiyou | 265 | 20.21 | | | Weed, Jct Rte 5 | Existing | ✓ |
| Closed-Circuit Television Camera | 12 | Siskiyou | 5 | 7.1 | | | At the Dunsmuir Grade Truck Insp. Sta. S/B Off | Existing | ✓ |
| Closed-Circuit Television Camera | 28 | Siskiyou | 5 | 25.8 | | | Weed Rest Area | Short-Term | ✓ |
| Closed-Circuit Television Camera | 29 | Siskiyou | 5 | 8.58 | | | At 5 / 89 Separation | Short-Term | ✓ |
| Closed-Circuit Television Camera | 66 | Siskiyou | 5 | 2.62 | | | At Central Dunsmuir Interchange at Existing RWIS/RAWS Sites | Short-Term | ✓ |
| Closed-Circuit Television Camera | 67 | Siskiyou | 5 | 14.45 | | | At Black Butte Summit at Existing RWIS/RAWS Sites | Short-Term | ✓ |
| Closed-Circuit Television Camera | 68 | Siskiyou | 5 | 22.2 | | | At North Weed Interchange at Existing RWIS/RAWS Sites | Short-Term | ✓ |
| Closed-Circuit Television Camera | 69 | Siskiyou | 89 | 29.25 | | | At Snowmans Hill Summit at Existing RWIS/RAWS Sites | Short-Term | ✓ |
| Closed-Circuit Television Camera | 72 | Siskiyou | 97 | 52 | | | At Dorris Hill at Existing RWIS/RAWS Sites | Short-Term | ✓ |
| Closed-Circuit Television Camera | 73 | Siskiyou | 5 | 68.59 | | | North of the Hilt OC | Short-Term | ✓ |
| Closed-Circuit Television Camera | 75 | Siskiyou | 5 | 47.7 | | | Just South of the Route 3/5 Separation | Short-Term | ✓ |
| Closed-Circuit Television Camera | 76 | Siskiyou | 5 | 68.33 | | | At Hilt OC COATS Expanded CCTV | Short-Term | ✓ |
| Closed-Circuit Television Camera | 81 | Siskiyou | 5 | 5.89 | | | At the Mott Road Interchange | Short-Term | ✓ |
| Closed-Circuit Television Camera | 87 | Siskiyou | 97 | 20.19 | | | At the Grass Lake Maintenance Station COATS Expanded CCTV | Short-Term | ✓ |
| Closed-Circuit Television Camera | 88 | Siskiyou | 97 | 34.45 | | | Route 97 WIM COATS Expanded CCTV | Short-Term | ✓ |
| Closed-Circuit Television Camera | 122 | Siskiyou | 5 | 0.68 | | | At the South Dunsmuir Interchange | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 123 | Siskiyou | 5 | 3.84 | | | At the North Dunsmuir Ave UC | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 125 | Siskiyou | 5 | 13.8 | | | At Weed Airport | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 126 | Siskiyou | 5 | 52.77 | | | Anderson Grade Summit | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 127 | Siskiyou | 5 | 61 | | | Near Hornbrook | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 128 | Siskiyou | 5 | 65.52 | | | At the Baily Hill Road OC | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 140 | Siskiyou | 89 | 34 | | | Road Closure | Long-Term | ✓ |
| Closed-Circuit Television Camera | 149 | Siskiyou | 5 | 60.83 | | | Randolph Collier Rest Area | Long-Term | ✓ |
| Closed-Circuit Television Camera | 151 | Siskiyou | 97 | 19.8 | | | Grass Lake Rest Area | Long-Term | ✓ |
| Closed-Circuit Television Camera | 160 | Siskiyou | 3 | 8.5 | | | Near Callahan | Long-Term | ✓ |
| Closed-Circuit Television Camera | 180 | Siskiyou | 89 | 3.23 | | | At Deadhorse Summit | Long-Term | ✓ |
| Closed-Circuit Television Camera | 182 | Siskiyou | 97 | 29.91 | | | At Mt Hebron Summit | Long-Term | ✓ |
| Closed-Circuit Television Camera | 183 | Siskiyou | 97 | 49.83 | | | At Dorris Inspection Sta | Long-Term | ✓ |
| Closed-Circuit Television Camera | 199 | Siskiyou | 89 | 23.5 | | | Road Closure | Long-Term | ✓ |

**Table F-8:** Deployment Locations in Siskiyou County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Flood and Scour Detection | 1 | Siskiyou | 96 | 75.01 | | | Horse Creek | Existing | ✓ |
| RWIS | 5 | Siskiyou | 5 | 14.45 | | N | Black Butte Summit | Existing | ✓ |
| RWIS | 13 | Siskiyou | 97 | 52 | | | At Dorris Hill (RAWS) | Existing | ✓ |
| RWIS | 19 | Siskiyou | 89 | 29.25 | | | At Snowmans Hill Summit | Existing | ✓ |
| RWIS | 27 | Siskiyou | 5 | 22.2 | | | North Weed Interchange | Existing | ✓ |
| RWIS | 32 | Siskiyou | 5 | 2.62 | | | At the Central Dunsmuir Interchange | Existing | ✓ |
| RWIS | 37 | Siskiyou | 5 | 45.3 | | | Just north of Walters Road Wind Warning | Short-Term | ✓ |
| RWIS | 56 | Siskiyou | 5 | 25.7 | | | At Weed Airport (W/ CMS @ SIS-5-13.18) Wind Warning | Short-Term | ✓ |
| RWIS | 74 | Siskiyou | 5 | 52.77 | | | Anderson Grade Summit | Medium-Term | ✓ |
| RWIS | 75 | Siskiyou | 5 | 61 | | | Near Hornbrook | Medium-Term | ✓ |
| RWIS | 76 | Siskiyou | 5 | 68.33 | | | Near Hilt Road OC | Medium-Term | ✓ |
| RWIS | 91 | Siskiyou | 89 | 3.23 | | | At Deadhorse Summit | Long-Term | ✓ |
| RWIS | 92 | Siskiyou | 97 | 29.91 | | | At Mt Hebron Summit | Long-Term | ✓ |
| RWIS | 93 | Siskiyou | 97 | 49.83 | | | At Dorris Inspection Sta | Long-Term | ✓ |
| RWIS | 101 | Siskiyou | 96 | 0 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| RWIS | 114 | Siskiyou | 3 | 8.5 | | | Near Callahan | Long-Term | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Probe Vehicle Instrumentation | 7 | Siskiyou | 5 | 0 | 69.29 | | | Medium-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 1 | Siskiyou | 5 | 0 | 69.29 | | | Medium-Term | ✓ |
| Preclearance | 2 | Siskiyou | 5 | 7.1 | | | Dunsmuir Scales | Existing | ✓ |
| Preclearance | 16 | Siskiyou | 97 | 3 | | N/S | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 2 | Siskiyou | 97 | 45 | | | Between Mt. Hebron Summit & Macdoel | Existing | ✓ |
| Weigh in Motion | 5 | Siskiyou | 5 | 7.1 | | | Dunsmuir Scales | Existing | ✓ |
| Weigh in Motion | 20 | Siskiyou | 97 | 3 | | N/S | Near Existing Weigh Station | Medium-Term | ✓ |

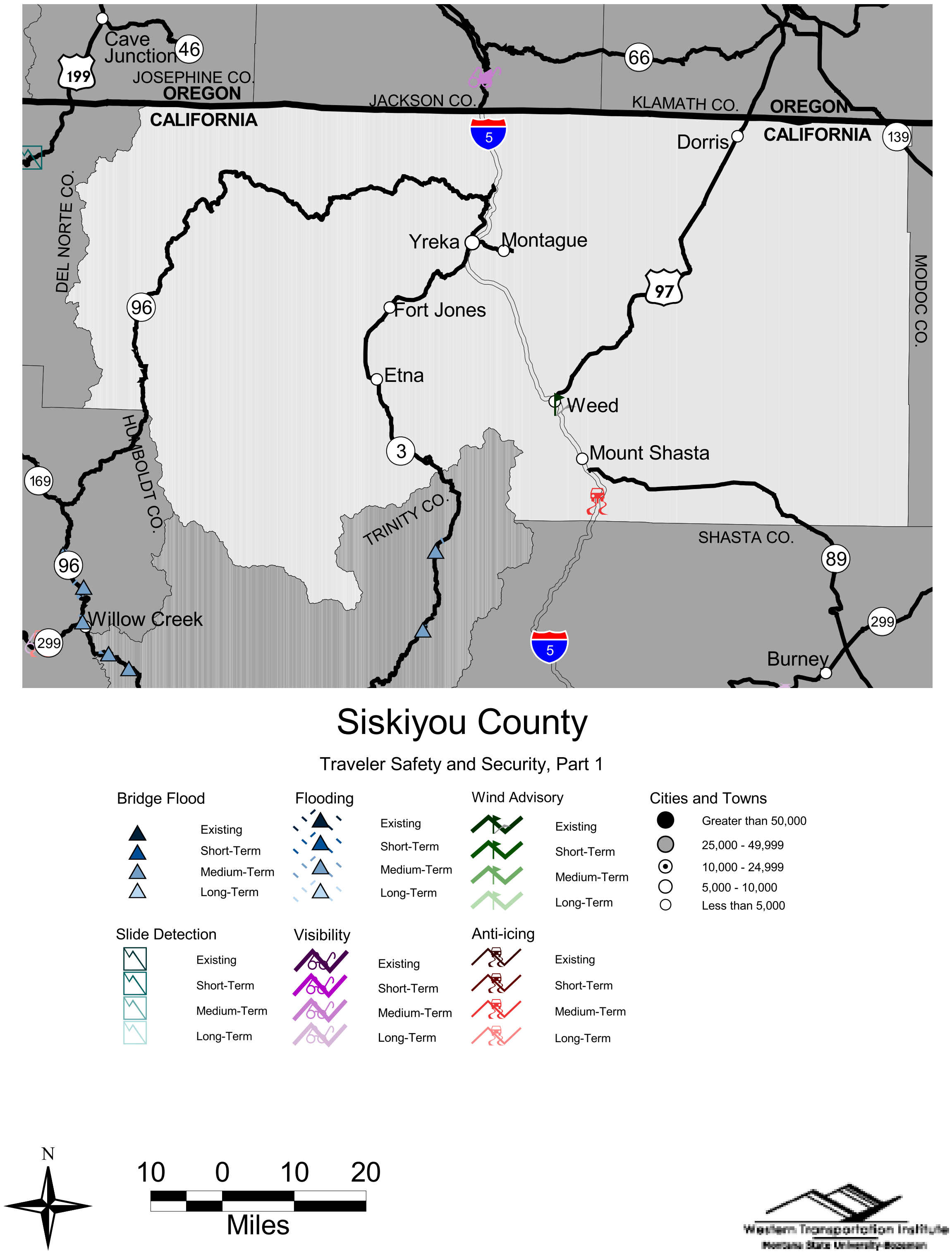


**Figure F-57:** Traveler Safety and Security (Part 1) in Siskiyou County.

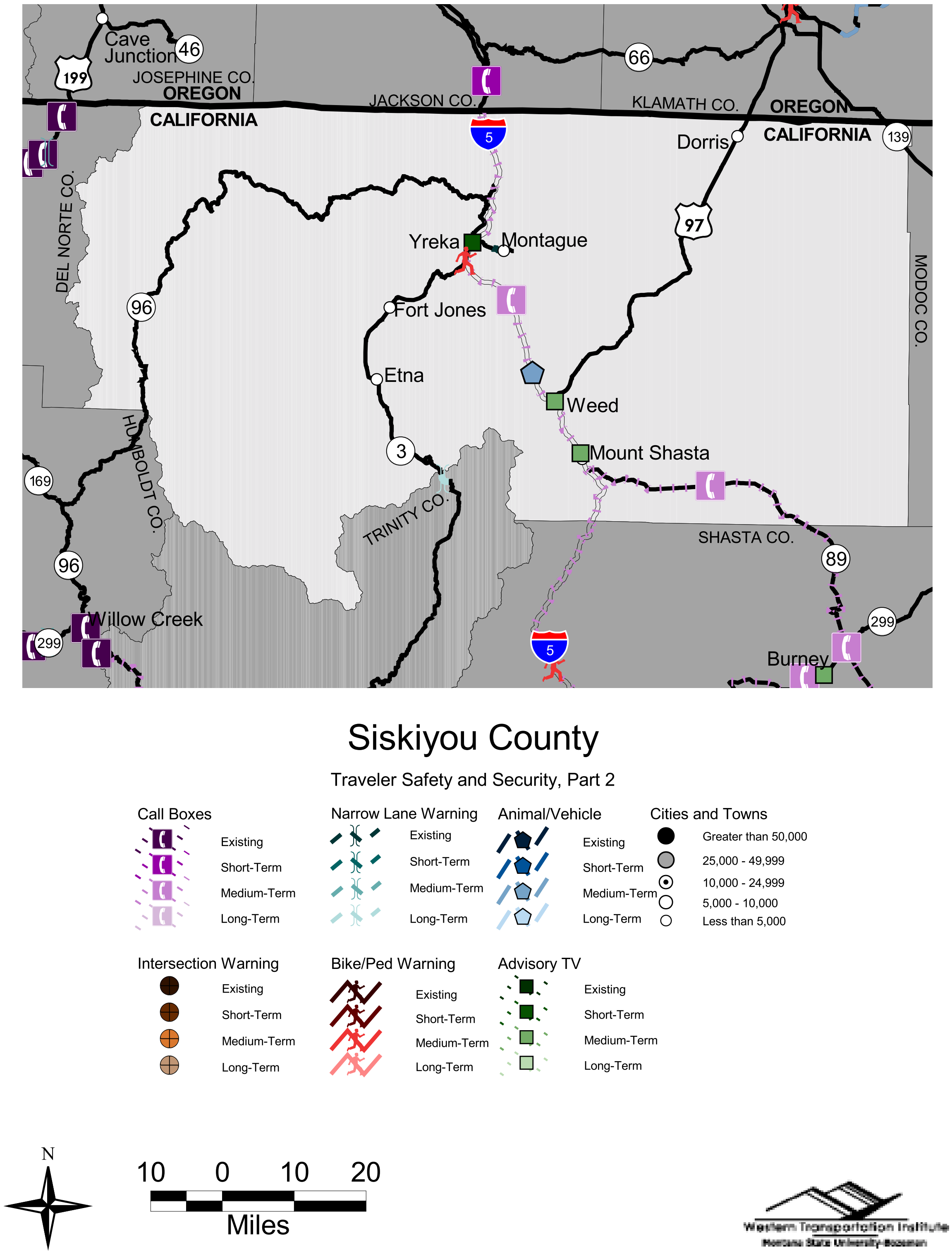


**Figure F-58:** Traveler Safety and Security (Part 2) in Siskiyou County.

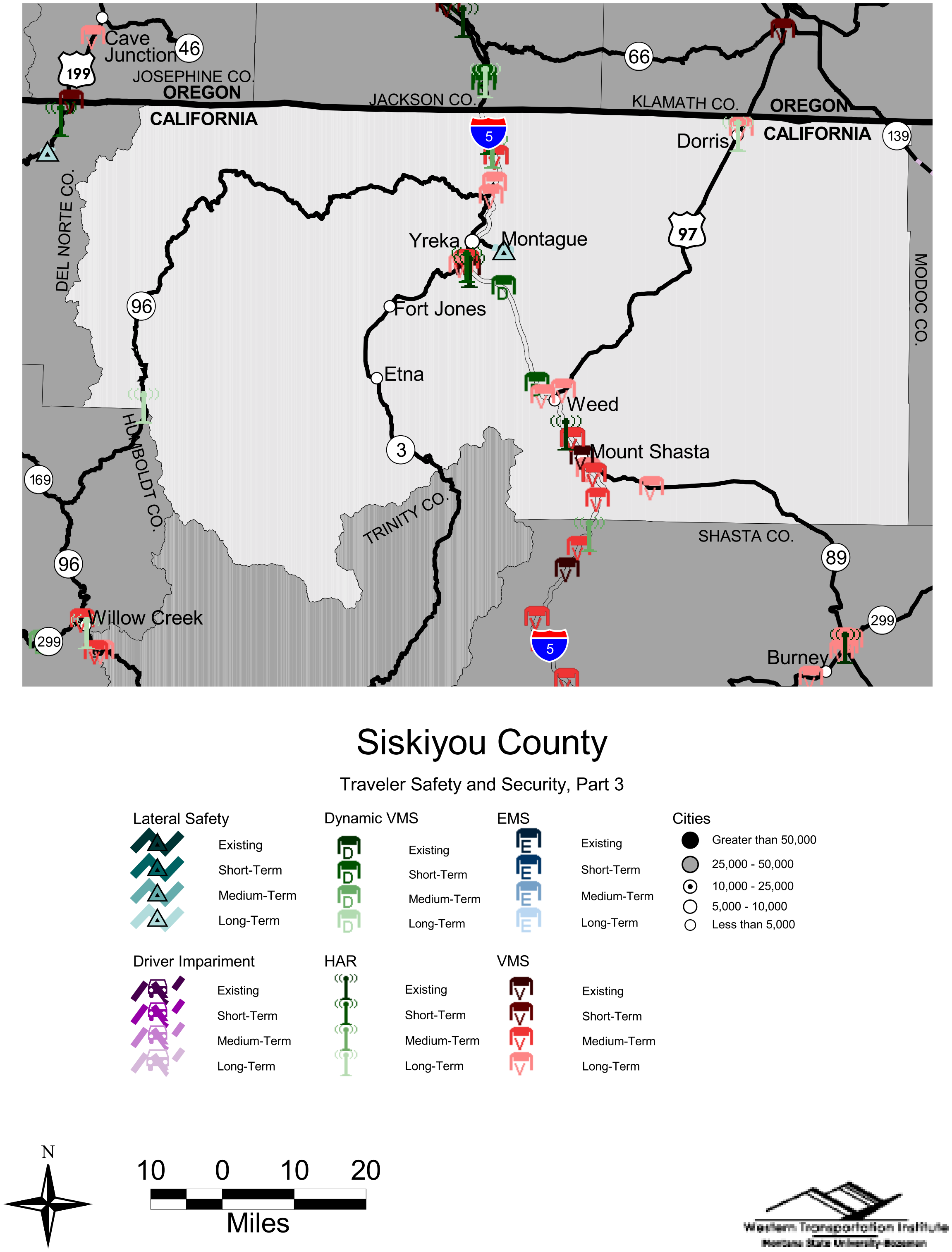


**Figure F-59:** Traveler Safety and Security (Part 3) in Siskiyou County.

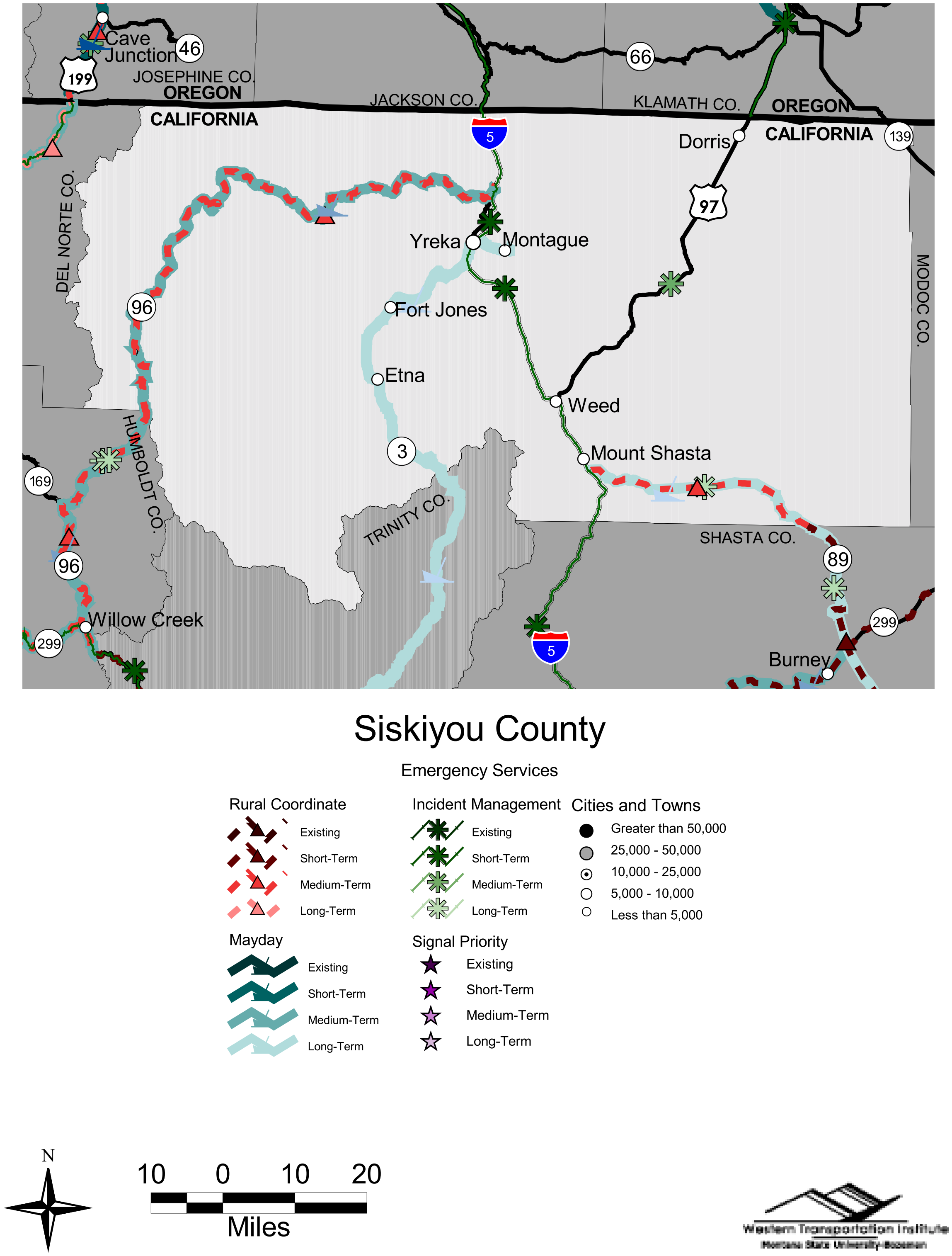


**Figure F-60:** Emergency Services in Siskiyou County.

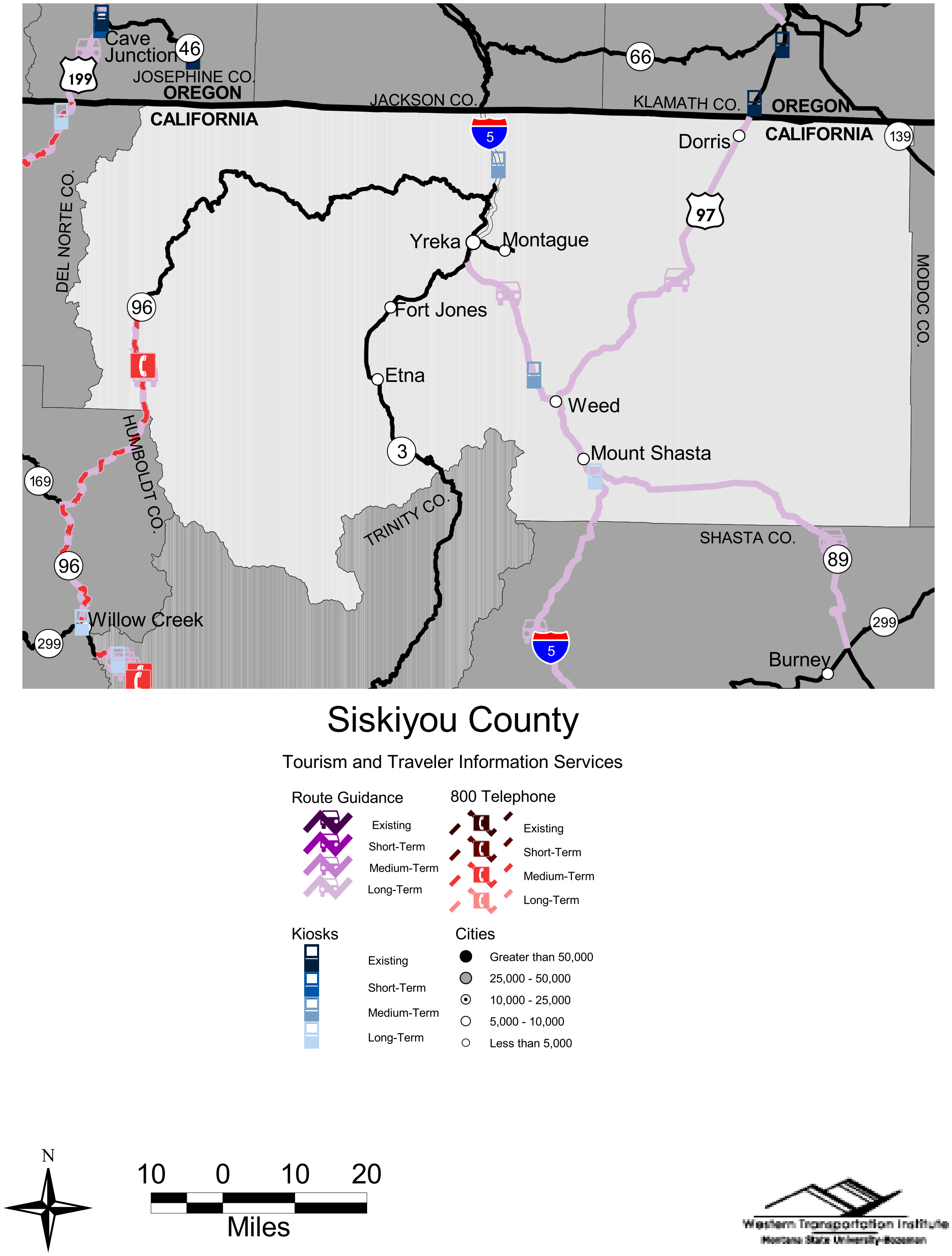


**Figure F-61:** Tourism and Traveler Information Services in Siskiyou County.

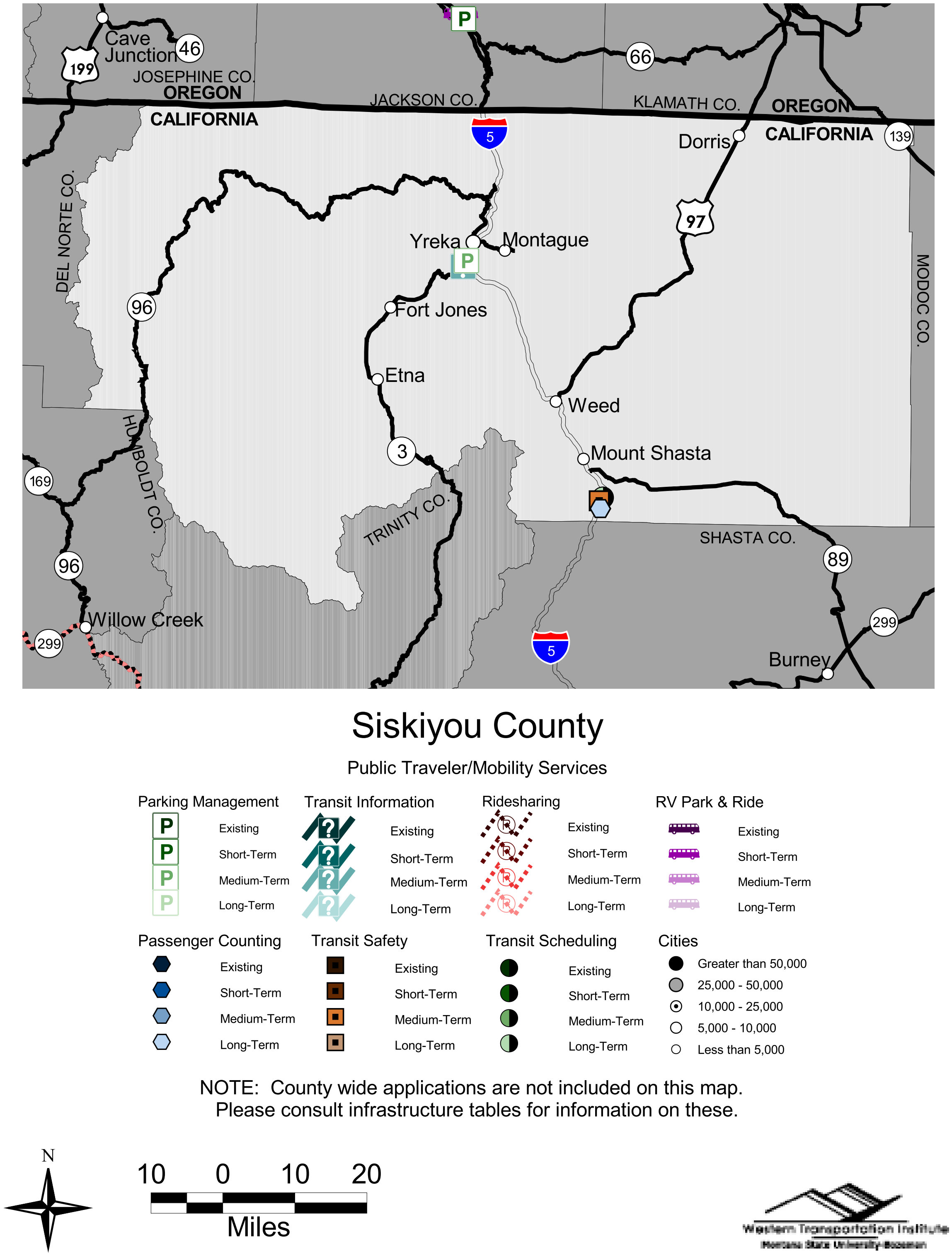


**Figure F-62:** Public Traveler/Mobility Services in Siskiyou County.

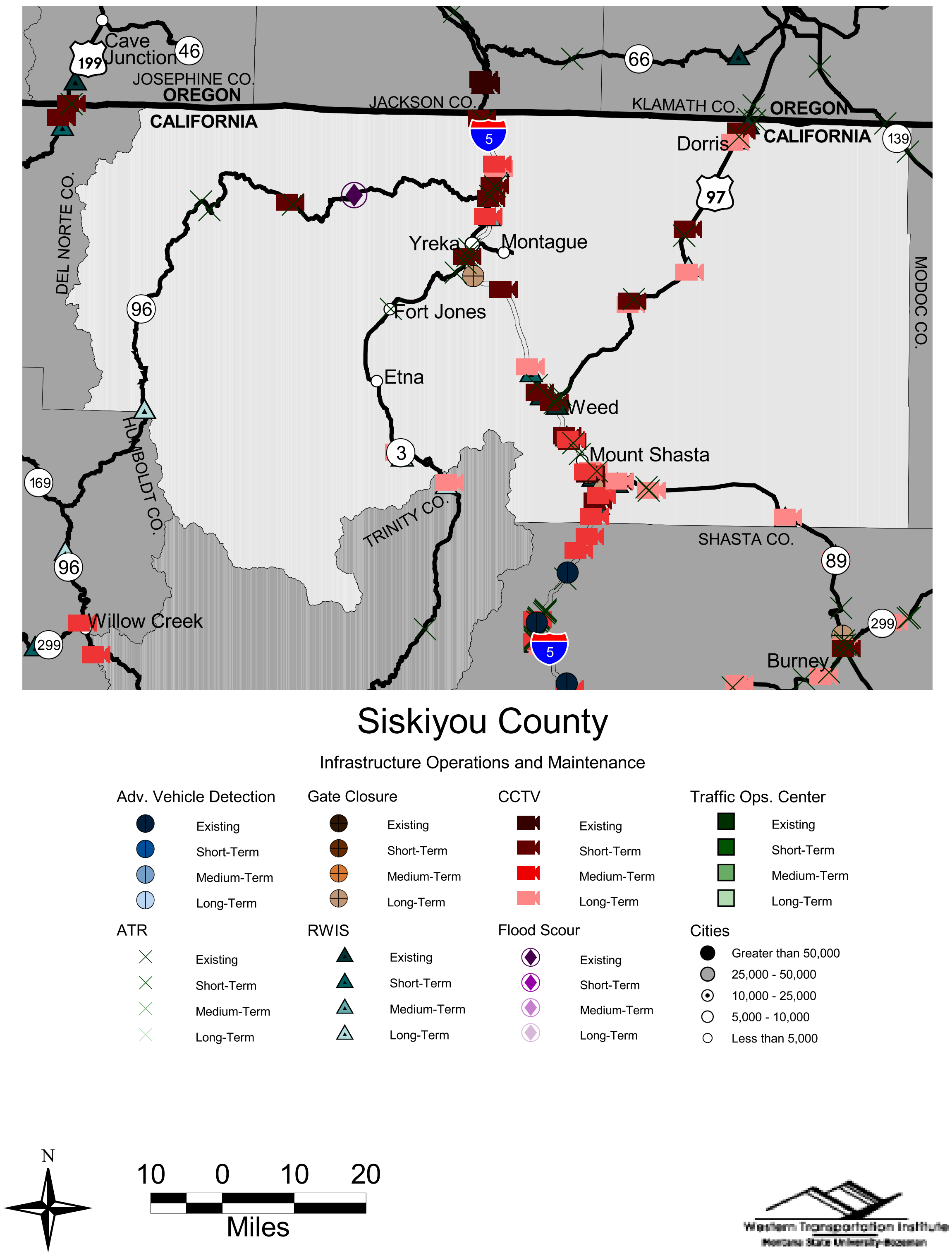


**Figure F-63:** Infrastructure Operations and Maintenance in Siskiyou County.

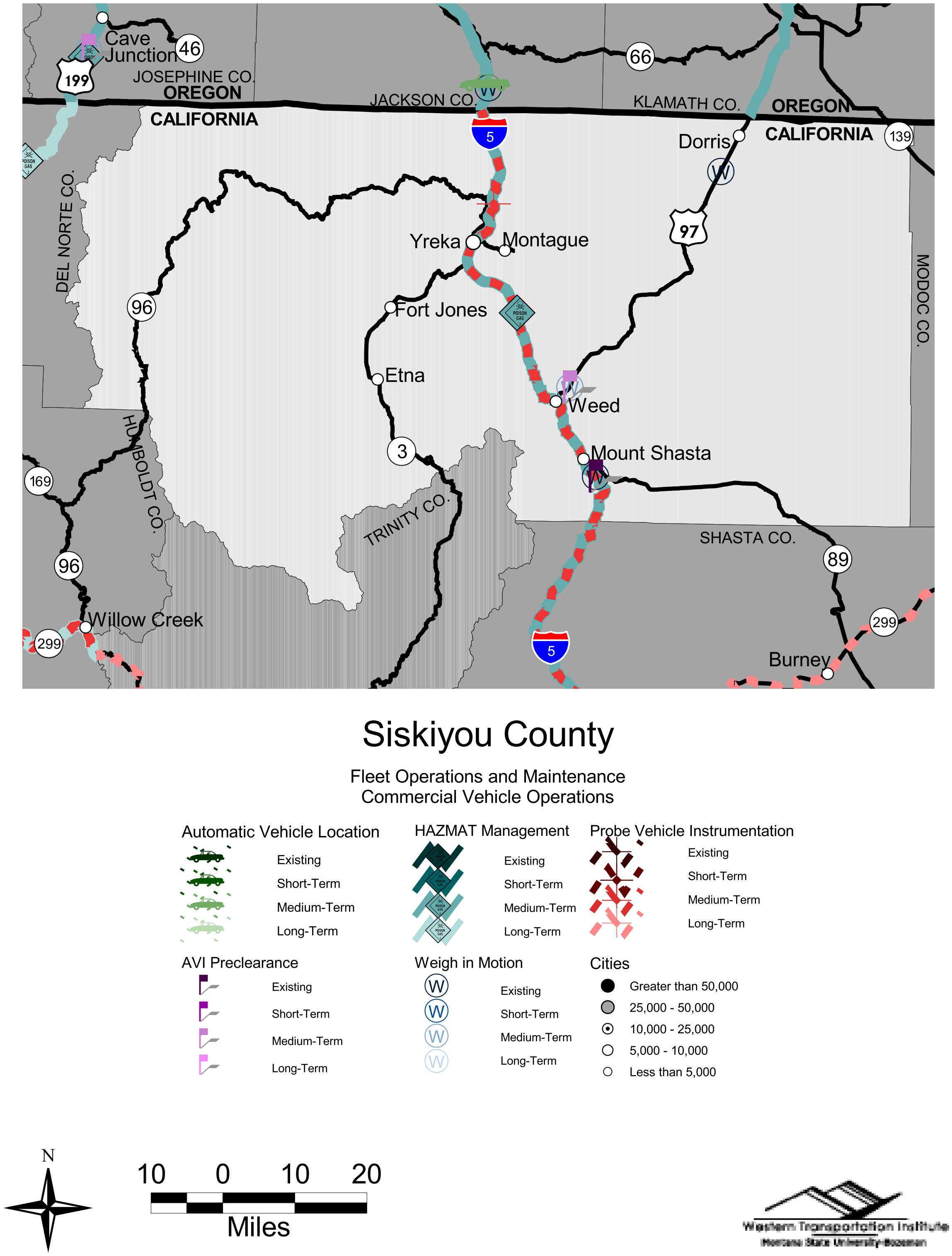


**Figure F-64:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Siskiyou County.

**Table F-9:** Deployment Locations in Tehama County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 17 | Tehama | 36 | 76.6 | 78.7 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Advanced Bike/Ped Warning | 7 | Tehama | 36 | 40.32 | | | Bike/ped challenge (Red Bluff) | Medium-Term | ✓ |
| Advisory Television | 7 | Tehama | 5 | 24.87 | | | Red Bluff | Medium-Term | ✓ |
| Automated Anti-Icing | 9 | Tehama | 36 | 76.6 | 78.7 | | Road surface challenge | Long-Term | ✓ |
| Automated Flood Warning | 1 | Tehama | 5 | 19.5 | 20.5 | | Local creek floods I-5 lanes | Short-Term | ✓ |
| Automated Visibility Warning | 16 | Tehama | 5 | 0 | 26 | | Fog warning south of Red Bluff | Long-Term | ✓ |
| Bridge Flood | 4 | Tehama | 99 | 5.9 | | | At Deer Creek | Existing | ✓ |
| Bridge Flood | 5 | Tehama | 99 | 13.3 | | | At Mill Creek | Existing | ✓ |
| Dynamic Warning VMS | 27 | Tehama | 36 | 76.6<br>78.7 | | East<br>West | Road Surface Challenge | Long-Term | ✓ |
| Highway Advisory Radio | 11 | Tehama | 5 | 26.6 | | | Red Bluff Central Interchange | Existing | ✓ |
| Highway Advisory Radio | 68 | Tehama | 99 | 5.9 | | | Vina | Long-Term | |
| Highway Advisory Radio | 72 | Tehama | 36 | 83.14 | | | Mineral | Long-Term | ✓ |
| Lateral Safety Warning System | 5 | Tehama | 36 | 76.6 | 78.7 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Motorist-Aide Call Box | 83 | Tehama | 5 | 0 | 42.12 | | | Medium-Term | ✓ |
| Variable Message Sign | 2 | Tehama | 5 | 23.4 | | N | At Riverside Avenue OC | Existing | ✓ |
| Variable Message Sign | 3 | Tehama | 5 | 31 | | S | At Wilcox Road OC | Existing | ✓ |
| Variable Message Sign | 4 | Tehama | 5 | 39.6 | | N | For the Cottonwood Truck Scales | Existing | ✓ |
| Variable Message Sign | 5 | Tehama | 5 | 39.8 | | N | At the Cottonwood Truck Scales | Existing | ✓ |
| Variable Message Sign | 6 | Tehama | 5 | 41.53 | | S | At Bowman Road | Existing | ✓ |
| Variable Message Sign | 101 | Tehama | 5 | 3.51 | | S | Kirkwood Road OC | Medium-Term | ✓ |
| Variable Message Sign | 102 | Tehama | 5 | 5.75 | | N | Just South of Corning | Medium-Term | ✓ |
| Variable Message Sign | 103 | Tehama | 5 | 9.97 | | S | South of Corning | Medium-Term | ✓ |
| Variable Message Sign | 104 | Tehama | 5 | 38.72 | | N | Relocated from Trk Scale To Snively | Medium-Term | ✓ |
| Variable Message Sign | 120 | Tehama | 5 | 27 | | North | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 121 | Tehama | 36 | 43 | | West | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 122 | Tehama | 36 | 85 | | West | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 123 | Tehama | 36 | 87 | | East | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 124 | Tehama | 89 | 0 | | South | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 157 | Tehama | 36 | 39.6 | | E | West of Baker Road | Long-Term | ✓ |
| Variable Message Sign | 158 | Tehama | 36 | 43 | | E | In Red Bluff | Long-Term | ✓ |
| Variable Message Sign | 159 | Tehama | 36 | 44 | | E | Junction of Route 99 Back | Long-Term | ✓ |
| Variable Message Sign | 179 | Tehama | 99 | 24 | | N | Junction of Route 36 Back | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 14 | Tehama | 36 | 0 | 40 | | | Medium-Term | ✓ |
| Mayday Systems | 17 | Tehama | 36 | 40 | 90 | | Response time challenge | Long-Term | ✓ |
| Regional Incident Management Plan | 7 | Tehama | 5 | 27 | 42.12 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 17 | Tehama | 36 | 41 | 104 | | Road Closure | Medium-Term | ✓ |
| Regional Incident Management Plan | 31 | Tehama | 89 | 0 | 4.4 | | Road Closure | Long-Term | ✓ |
| Rural Coordinate Addressing System | 15 | Tehama | 36 | 0 | 104 | | Response time challenge & stakeholder Input | Long-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 20 | Tehama | 89 | 0 | | | Tourist Locations | Medium-Term | ✓ |
| In-Vehicle Route Guidance System | 4 | Tehama | 36 | 35 | 104 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 5 | Tehama | 89 | 0 | 4.4 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 7 | Tehama | 5 | 30 | 42.12 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 60 | Tehama | 5 | 12 | | | Corning truck stop | Medium-Term | ✓ |

**Table F-9:** Deployment Locations in Tehama County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 4 | Tehama | 36 | 40.32 | | | Red Bluff | Long-Term | ✓ |
| Automated Passenger Counting | 29 | Tehama | | | | | Trailways Lines, Inc | Long-Term | ✓ |
| On-Board Transit Safety Systems | 4 | Tehama | 36 | 40.32 | | | Red Bluff | Long-Term | ✓ |
| On-Board Transit Safety Systems | 29 | Tehama | | | | | Trailways Lines, Inc | Long-Term | ✓ |
| Parking Management & Information System | 11 | Tehama | 89 | 0 | | | Tourist Locations | Long-Term | ✓ |
| Transit Traveler Information | 4 | Tehama | 89 | 0 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 16 | Tehama | | | | | Trailways Lines, Inc | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 27 | Tehama | 36 | 40.32 | | | Red Bluff | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 6 | Tehama | 5 | 20 | | | Local creek floods I-5 lanes | Short-Term | ✓ |
| Advanced Vehicle Detection | 54 | Tehama | 36 | 77.65 | | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Automated Gate Closure | 10 | Tehama | 89 | 4.4 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| Automated Gate Closure | 15 | Tehama | 172 | 8.92<br>0 | | | Road Closure Due to Bad Weather | Long-Term | |
| Automatic Traffic Recorder | 13 | Tehama | 5 | 9.97 | | | Gallagher Ave. O.C. | Existing | ✓ |
| Automatic Traffic Recorder | 14 | Tehama | 5 | 10.06 | | | Corning N Rdside Rest | Existing | ✓ |
| Automatic Traffic Recorder | 15 | Tehama | 5 | 24.47 | | N | Off To So. RdBL | Existing | ✓ |
| Automatic Traffic Recorder | 16 | Tehama | 5 | 24.57 | | S | On fr So. RdBL | Existing | ✓ |
| Automatic Traffic Recorder | 17 | Tehama | 5 | 24.71 | | N | On fr So. RdBL | Existing | ✓ |
| Automatic Traffic Recorder | 18 | Tehama | 5 | 24.83 | | S | Off To So. RdBL | Existing | ✓ |
| Automatic Traffic Recorder | 19 | Tehama | 5 | 25.12 | | | Diamond Ave 8-100 N On | Existing | ✓ |
| Automatic Traffic Recorder | 20 | Tehama | 5 | 25.15 | | | Diamond Ave 8-100 S Off | Existing | ✓ |
| Automatic Traffic Recorder | 21 | Tehama | 5 | 28.53 | | S | Off To Hoft Rd/Old 99 | Existing | ✓ |
| Automatic Traffic Recorder | 22 | Tehama | 5 | 30.15 | | | Wilcox Rd Interchange | Existing | ✓ |
| Automatic Traffic Recorder | 69 | Tehama | 32 | 24.63 | | | Jct Rte 36 | Existing | ✓ |
| Automatic Traffic Recorder | 71 | Tehama | 36 | 22.05 | | | Bowman Rd. | Existing | ✓ |
| Automatic Traffic Recorder | 72 | Tehama | 36 | 30 | | | Cannon Road | Existing | ✓ |
| Automatic Traffic Recorder | 73 | Tehama | 36 | 39.4 | | | Baker Road | Existing | ✓ |
| Automatic Traffic Recorder | 74 | Tehama | 36 | 41.24 | | | Main Street | Existing | ✓ |
| Automatic Traffic Recorder | 75 | Tehama | 36 | 39.75 | | | Main Street | Existing | ✓ |
| Automatic Traffic Recorder | 76 | Tehama | 36 | 41.1 | | | Red Bluff, Walnut St | Existing | ✓ |
| Automatic Traffic Recorder | 77 | Tehama | 36 | 41.2 | | | Red Bluff, Walnut St | Existing | ✓ |
| Automatic Traffic Recorder | 78 | Tehama | 36 | 41.4 | | | Red Bluff Sacto Rvr Br | Existing | ✓ |
| Automatic Traffic Recorder | 79 | Tehama | 36 | 42.72 | | | Red Bluff Chestnut Ave | Existing | ✓ |
| Automatic Traffic Recorder | 80 | Tehama | 36 | 42.87 | | | Red Bluff Chestnut Ave | Existing | ✓ |
| Automatic Traffic Recorder | 81 | Tehama | 36 | 43.9 | | | Jct Rte 99 | Existing | ✓ |
| Automatic Traffic Recorder | 82 | Tehama | 36 | 44.37 | | | Jct Rte 99 Red Bluff E | Existing | ✓ |
| Automatic Traffic Recorder | 83 | Tehama | 36 | 55.2 | | | Co Rd A6 Manton Rd | Existing | ✓ |
| Automatic Traffic Recorder | 84 | Tehama | 36 | 57.21 | | | Co Rd A6 Manton Rd | Existing | ✓ |
| Automatic Traffic Recorder | 85 | Tehama | 36 | 82.19 | | | Mineral Maint Sta | Existing | ✓ |
| Automatic Traffic Recorder | 136 | Tehama | 89 | 0.24 | | | West Jct Rte 36 | Existing | ✓ |
| Automatic Traffic Recorder | 156 | Tehama | 99 | 0.11 | | | Butte-Tehama Co Line | Existing | |
| Automatic Traffic Recorder | 157 | Tehama | 99 | 5.08 | | | South Avenue | Existing | |
| Automatic Traffic Recorder | 158 | Tehama | 99 | 11.18 | | | Sherman Street | Existing | |
| Automatic Traffic Recorder | 159 | Tehama | 99 | 12.31 | | | Aramayo Way | Existing | |
| Automatic Traffic Recorder | 160 | Tehama | 99 | 24.76 | | | Jct Rte 36 Red Bluff E | Existing | |

**Table F-9:** Deployment Locations in Tehama County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Automatic Traffic Recorder | 176 | Tehama | 172 | 0.05 | | | Jct Rte 36 | Existing | |
| Automatic Traffic Recorder | 177 | Tehama | 172 | 8.84 | | | Jct Rte 36 | Existing | |
| Closed-Circuit Television Camera | 9 | Tehama | 5 | 40.6 | | | At the Cottonwood Truck Insp. Sta. N/B Off | Existing | ✓ |
| Closed-Circuit Television Camera | 10 | Tehama | 5 | 40.7 | | | At the Cottonwood Truck Insp. Sta. | Existing | ✓ |
| Closed-Circuit Television Camera | 11 | Tehama | 5 | 40.8 | | | At the Cottonwood Truck Insp. Sta. S/B Off | Existing | ✓ |
| Closed-Circuit Television Camera | 63 | Tehama | 5 | 26.52 | | | In Red Bluff at the 5/36 Separation | Short-Term | ✓ |
| Closed-Circuit Television Camera | 89 | Tehama | 99 | 4.49 | | | At South Ave COATS Expanded CCTV | Short-Term | |
| Closed-Circuit Television Camera | 112 | Tehama | 5 | 8.98 | | | At Corning Road OC | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 131 | Tehama | 5 | 27 | | | Road Closure | Long-Term | ✓ |
| Closed-Circuit Television Camera | 138 | Tehama | 5 | 38.72 | | | Road Closure | Long-Term | ✓ |
| Closed-Circuit Television Camera | 163 | Tehama | 32 | 16 | | | Near Deer Creek | Long-Term | |
| Closed-Circuit Television Camera | 164 | Tehama | 36 | 73 | | | Near Battle Creek Vista Point | Long-Term | ✓ |
| Closed-Circuit Television Camera | 165 | Tehama | 36 | 82.2 | | | At Mineral Maintenance Sta | Long-Term | ✓ |
| Closed-Circuit Television Camera | 166 | Tehama | 36 | 87.79 | | | At Morgan Summit | Long-Term | ✓ |
| Closed-Circuit Television Camera | 181 | Tehama | 89 | 0 | | | Road Closure | Long-Term | ✓ |
| Closed-Circuit Television Camera | 187 | Tehama | 36 | 39.6 | | | Response time challenge | Long-Term | ✓ |
| RWIS | 78 | Tehama | 36 | 82.2 | | | At Mineral Maintenance Sta | Long-Term | ✓ |
| RWIS | 79 | Tehama | 36 | 87.79 | | | At Morgan Summit | Long-Term | ✓ |
| RWIS | 112 | Tehama | 32 | 16 | | | Near Deer Creek | Long-Term | |
| RWIS | 118 | Tehama | 36 | 73 | | | Near Battle Creek Vista Point | Long-Term | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 8 | Tehama | 5 | 24.87 | | | Red Bluff | Long-Term | ✓ |
| Probe Vehicle Instrumentation | 9 | Tehama | 36 | 0 | 104 | | E/W California routes | Long-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 1 | Tehama | 5 | 0 | 42.12 | | | Medium-Term | ✓ |
| Preclearance | 1 | Tehama | 5 | 39.7 | | | Cottonwood Scales | Existing | ✓ |
| Weigh in Motion | 3 | Tehama | 5 | 39.7 | | | Cottonwood Scales | Existing | ✓ |

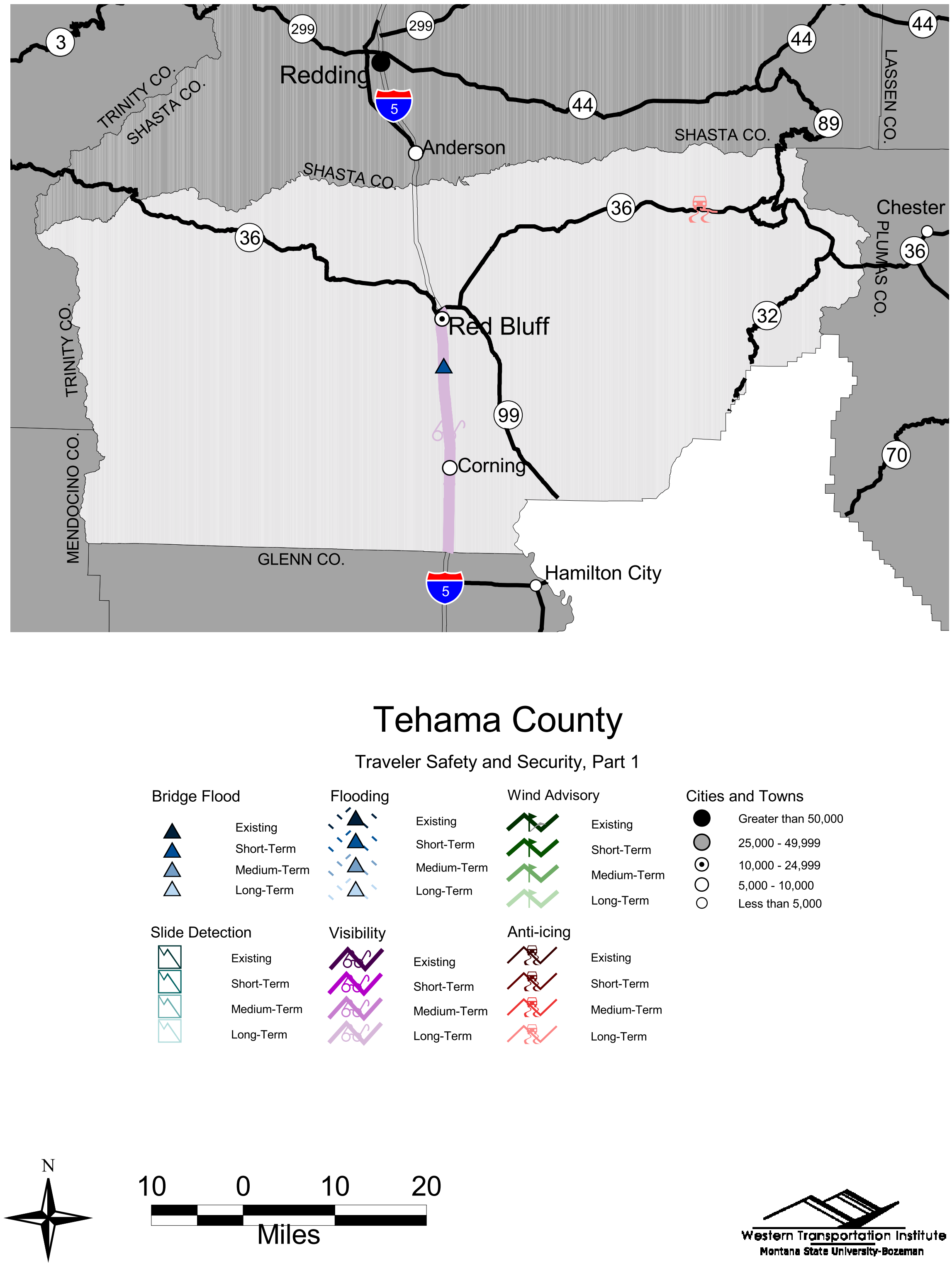


**Figure F-65:** Traveler Safety and Security (Part 1) in Tehama County.

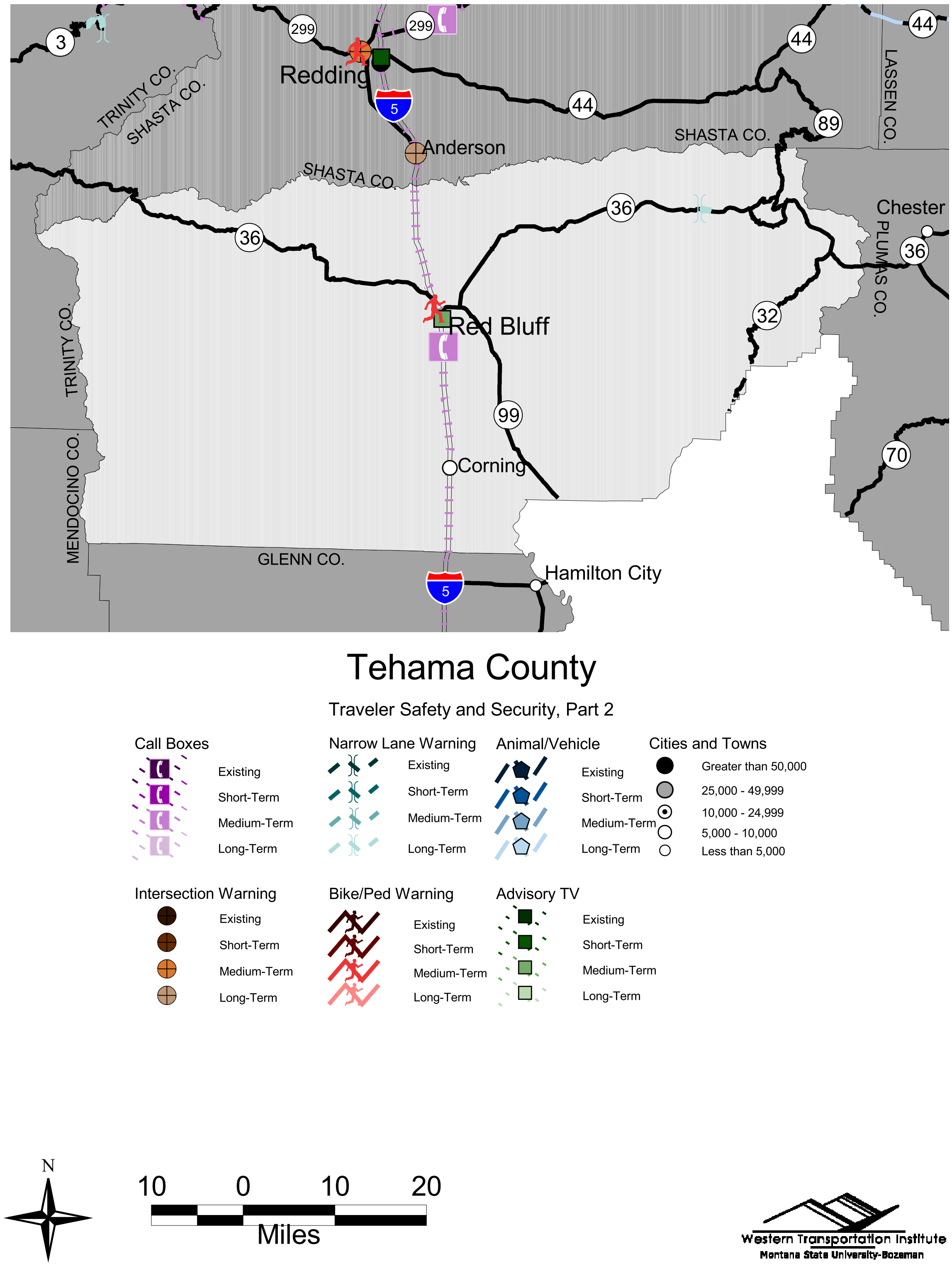


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**Figure F-66:** Traveler Safety and Security (Part 2) in Tehama County.

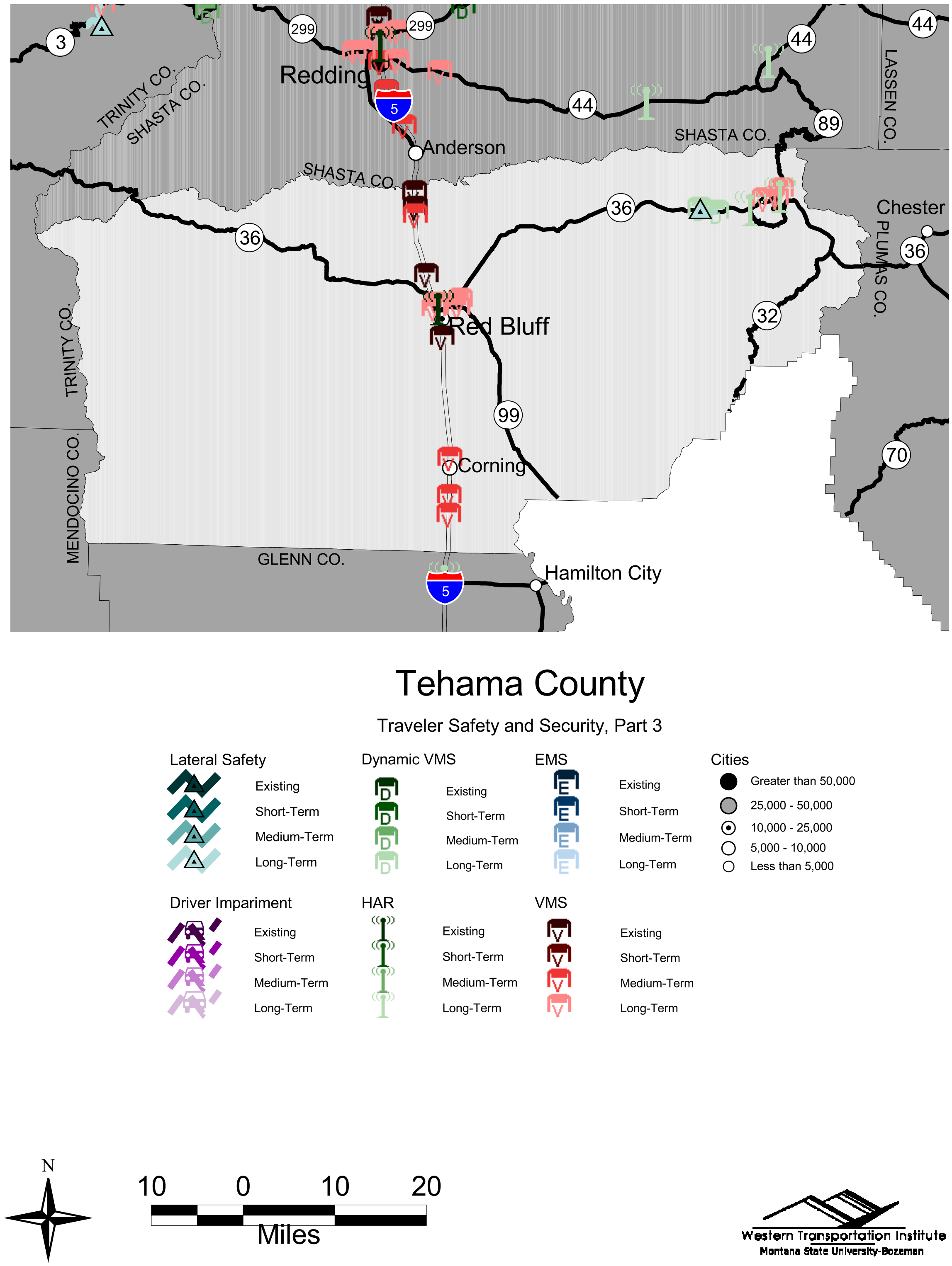



**Figure F-67:** Traveler Safety and Security (Part 3) in Tehama County.

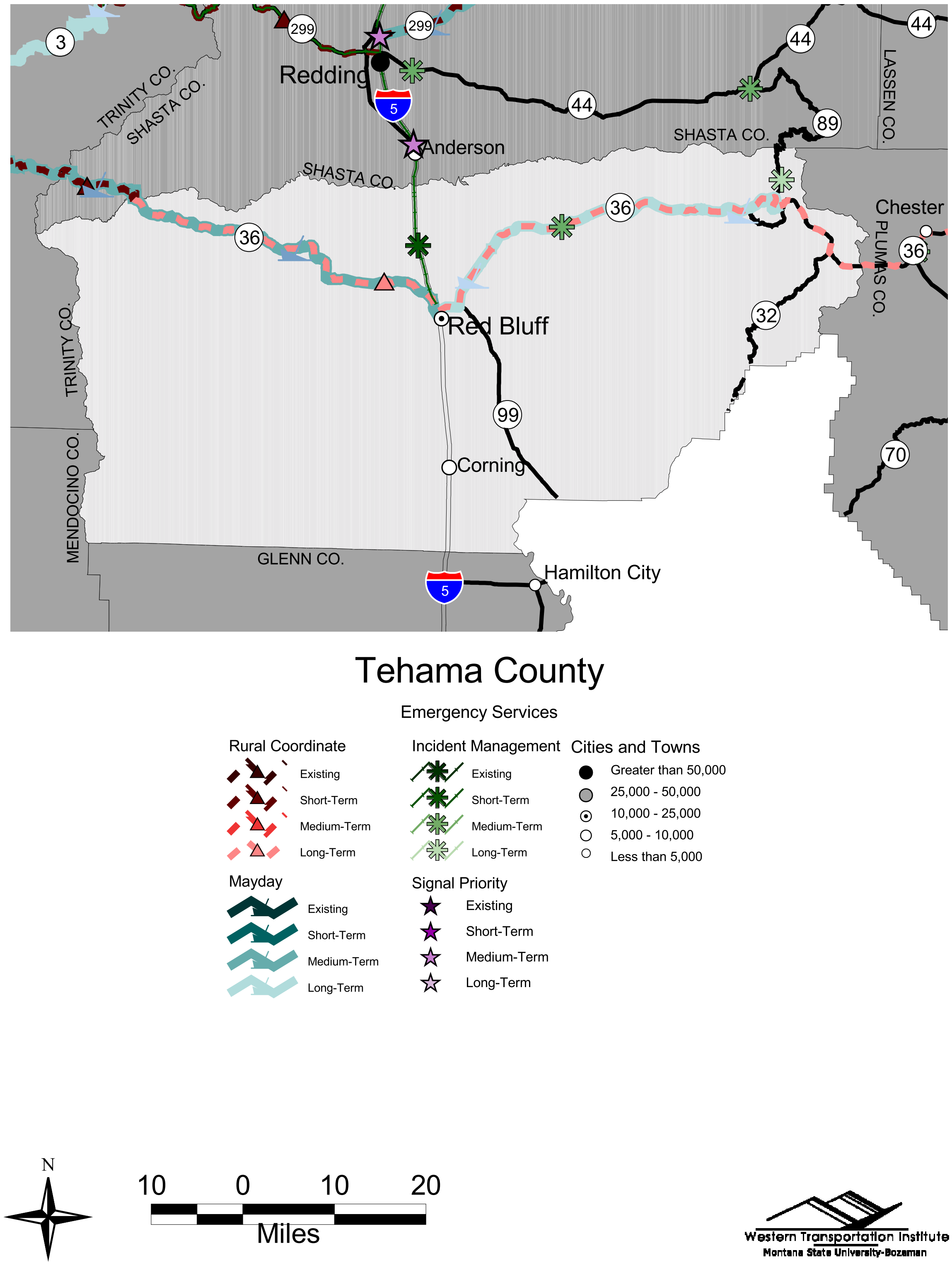



**Figure F-68:** Emergency Services in Tehama County.

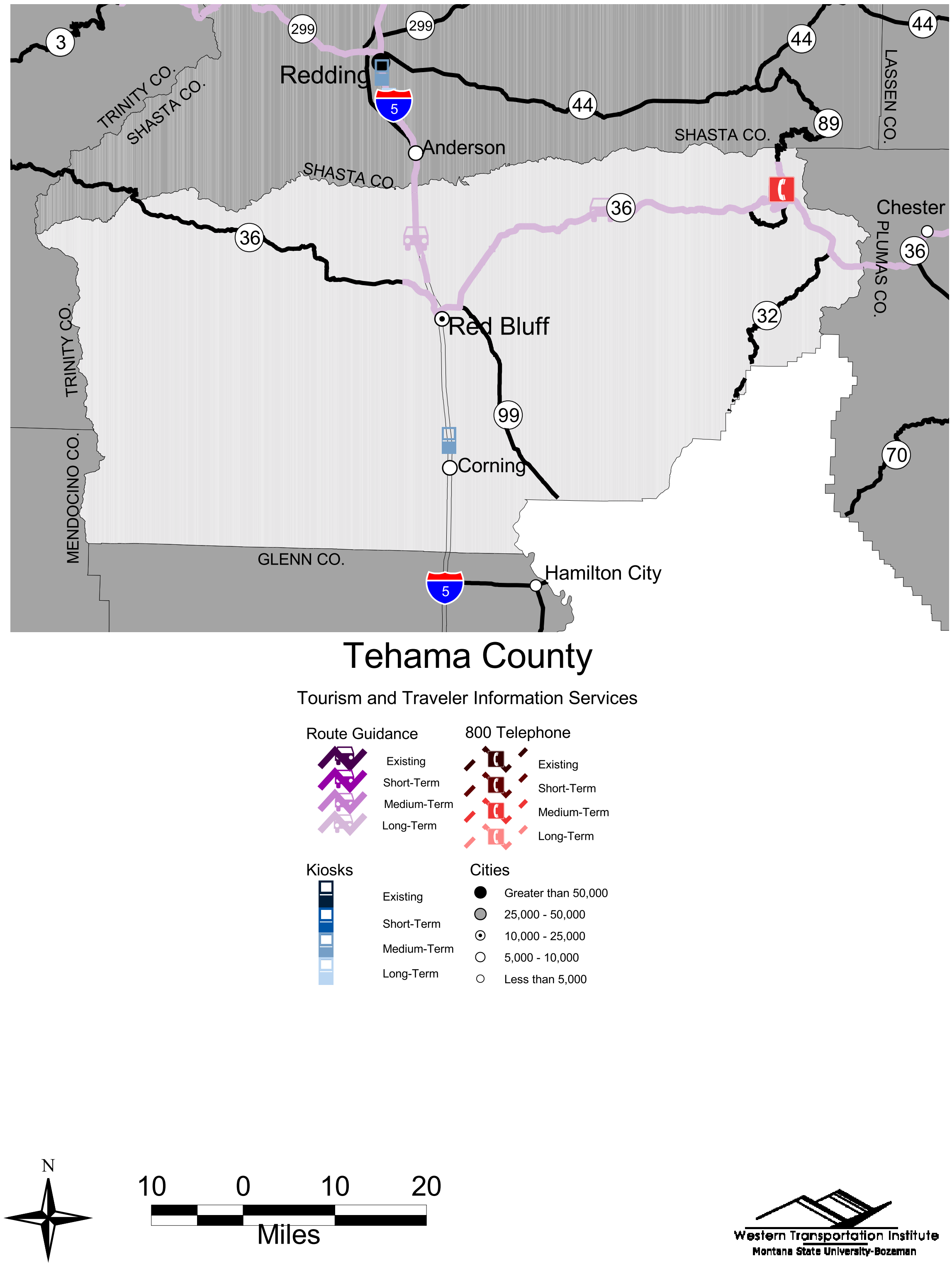



**Figure F-69:** Tourism and Traveler Information Services in Tehama County.

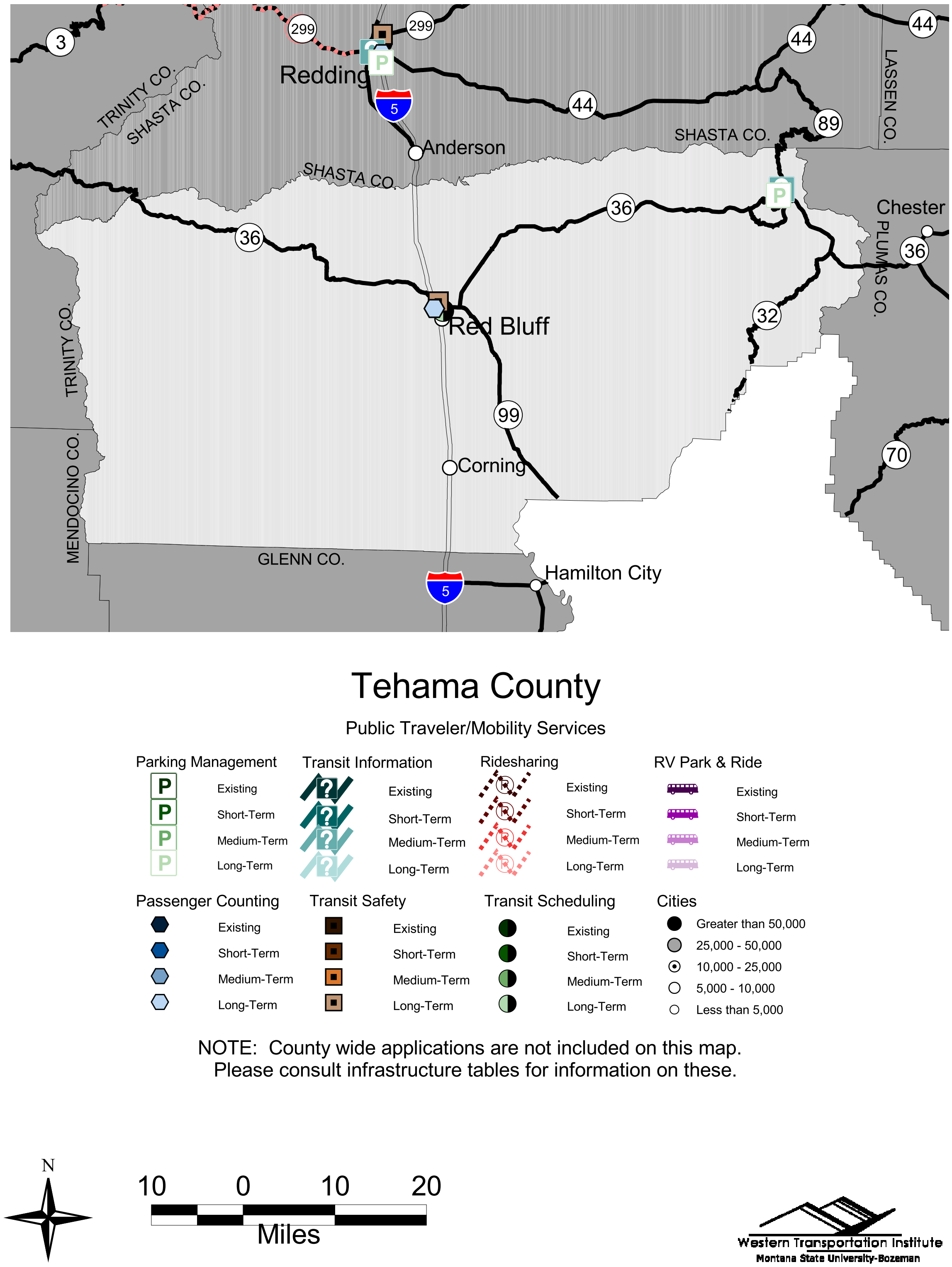



**Figure F-70:** Public Traveler/Mobility Services in Tehama County.

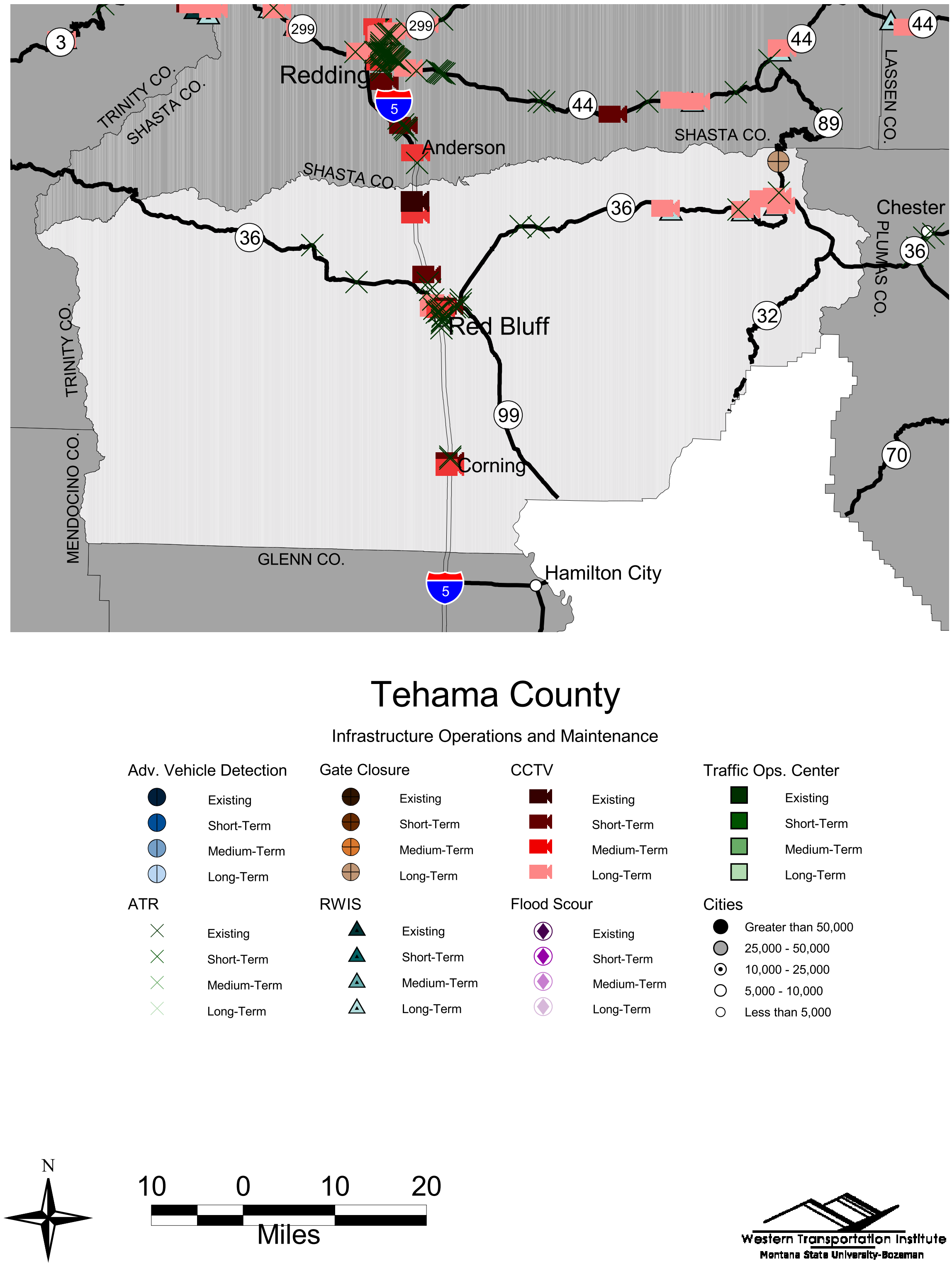



**Figure F-71:** Infrastructure Operations and Maintenance in Tehama County.

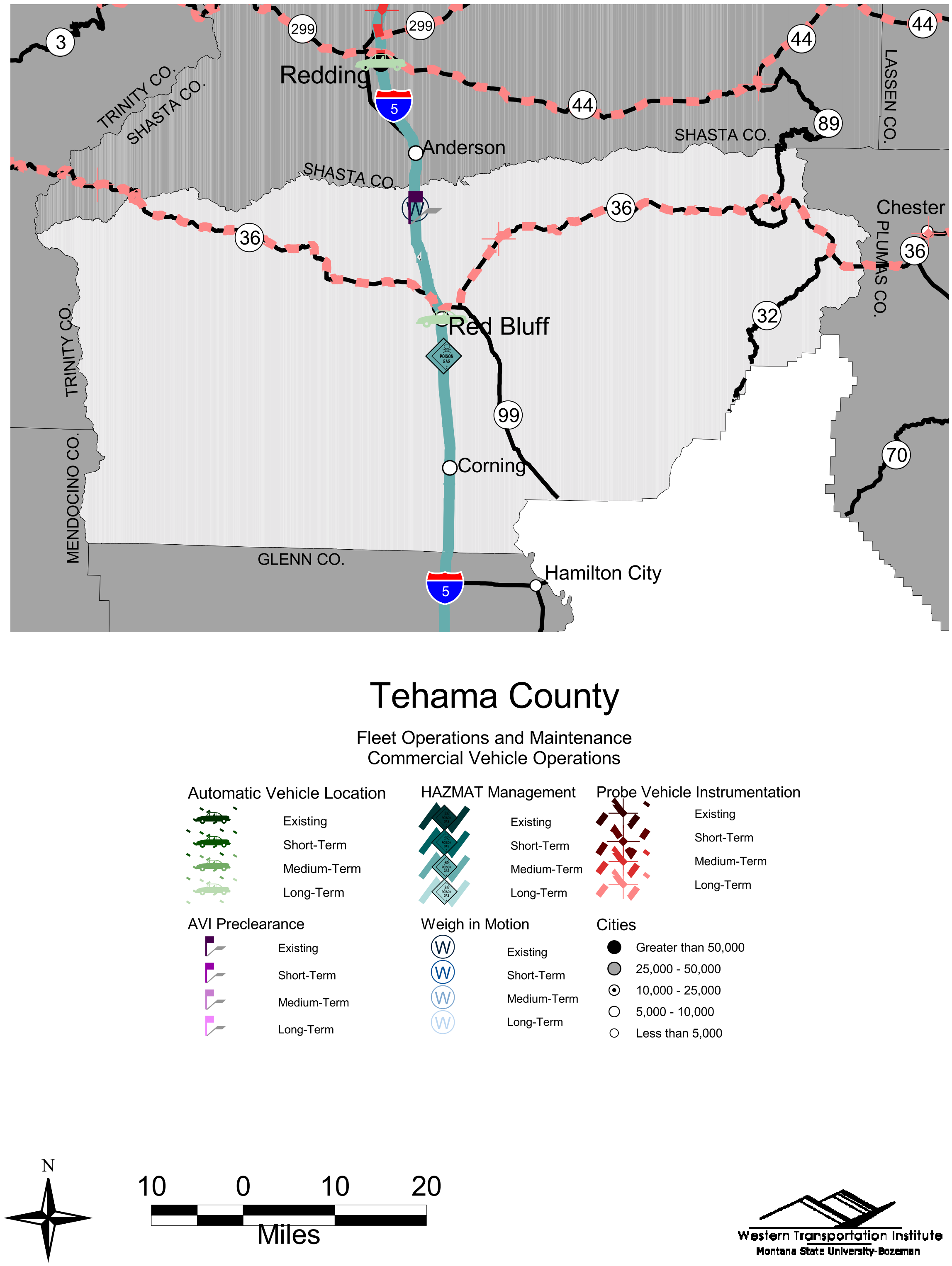



**Figure F-72:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Tehama County.

**Table F-10:** Deployment Locations in Trinity County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 18 | Trinity | 3 | 0 | 3 | | Stakeholder Input | Long-Term | ✓ |
| Adv. Warning for Narrow Lanes | 19 | Trinity | 3 | 25 | 40 | | Stakeholder Input | Long-Term | ✓ |
| Adv. Warning for Narrow Lanes | 20 | Trinity | 299 | 47.7 | 48.6 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Adv. Warning for Narrow Lanes | 24 | Trinity | 3 | 83 | 85 | | Scott Mountain | Long-Term | ✓ |
| Automated Flood Warning | 8 | Trinity | 3 | 71.87 | 73.87 | | Coffee Creek | Medium-Term | ✓ |
| Automated Flood Warning | 9 | Trinity | 3 | 59.39 | 61.39 | | Swift Creek Bridge | Medium-Term | ✓ |
| Automated Flood Warning | 10 | Trinity | 299 | 1.2 | 4 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Automated Flood Warning | 11 | Trinity | 299 | 5.8 | 6.5 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Automated Flood Warning | 12 | Trinity | 299 | 11.8 | 13.4 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Bridge Flood | 1 | Trinity | 3 | 6.52 | | | At Hayfork Creek | Existing | ✓ |
| Bridge Flood | 2 | Trinity | 3 | 31.2 | | | At Kidder Creek | Existing | ✓ |
| Bridge Flood | 3 | Trinity | 3 | 31.7 | | | At Scott River | Existing | ✓ |
| Highway Advisory Radio | 58 | Trinity | 299 | 58.2 | | | In Douglas City / Weaverville | Long-Term | ✓ |
| Highway Advisory Radio | 67 | Trinity | 3 | 0 | | | Near Peanut | Long-Term | ✓ |
| Highway Advisory Radio | 73 | Trinity | 36 | 2.39 | | | Near Mad River | Long-Term | ✓ |
| Lateral Safety Warning System | 8 | Trinity | 3 | 0 | 3 | | Stakeholder Input | Long-Term | ✓ |
| Lateral Safety Warning System | 9 | Trinity | 3 | 25 | 40 | | Stakeholder Input | Long-Term | ✓ |
| Lateral Safety Warning System | 10 | Trinity | 299 | 47.7 | 48.6 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Motorist-Aide Call Box | 84 | Trinity | 299 | 0 | 72.25 | | | Medium-Term | ✓ |
| Variable Message Sign | 127 | Trinity | 299 | 0 | | West | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 156 | Trinity | 3 | 32 | | N | Just North of Weaverville | Long-Term | ✓ |
| Variable Message Sign | 183 | Trinity | 299 | 51.3 | | W | Just West of Weaverville | Long-Term | ✓ |
| Variable Message Sign | 184 | Trinity | 299 | 54.9 | | E | Just East of Little Browns Cr | Long-Term | ✓ |
| Variable Message Sign | 185 | Trinity | 299 | 58.5 | | E | Just East Route 3 | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 14 | Trinity | 36 | 0 | 41.14 | | | Medium-Term | ✓ |
| Mayday Systems | 20 | Trinity | 3 | 0 | 85.07 | | Stakeholder Input | Long-Term | ✓ |
| Regional Incident Management Plan | 3 | Trinity | 299 | 58 | 72.25 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 4 | Trinity | 299 | 0 | 30 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 30 | Trinity | 36 | 0 | 25 | | | Long-Term | ✓ |
| Rural Coordinate Addressing System | 1 | Trinity | 299 | 0 | 72.25 | | Notification time challenge & Stakeholder Input | Short-Term | ✓ |
| Rural Coordinate Addressing System | 3 | Trinity | 36 | 0 | 41.14 | | Stakeholder Input | Short-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 6 | Trinity | 36 | 0 | 25 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| 800 Travel Advisory | 10 | Trinity | 299 | 0 | 30 | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| In-Vehicle Route Guidance System | 3 | Trinity | 36 | 0 | 30 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 6 | Trinity | 299 | 60 | 72.25 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 8 | Trinity | 299 | 0 | 20 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 85 | Trinity | 299 | 4 | | | Salyer Rest Area | Long-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Dynamic Ridesharing/Paratransit | 9 | Trinity | 299 | 0 | 72.25 | | Stakeholder Input | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 45 | Trinity | 3 | 72.87 | | | Coffee Creek | Medium-Term | ✓ |
| Advanced Vehicle Detection | 46 | Trinity | 3 | 60.39 | | | Swift Creek Bridge | Medium-Term | ✓ |
| Advanced Vehicle Detection | 47 | Trinity | 299 | 2.6 | | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Advanced Vehicle Detection | 48 | Trinity | 299 | 6.15 | | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |

**Table F-10:** Deployment Locations in Trinity County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Advanced Vehicle Detection | 49 | Trinity | 299 | 12.6 | | | Road Closures Due to Slides & Floods | Medium-Term | ✓ |
| Advanced Vehicle Detection | 55 | Trinity | 3 | 1.5 | | | Stakeholder Input | Long-Term | ✓ |
| Advanced Vehicle Detection | 56 | Trinity | 3 | 25 | | | Stakeholder Input | Long-Term | ✓ |
| Advanced Vehicle Detection | 57 | Trinity | 3 | 40 | | | Stakeholder Input | Long-Term | ✓ |
| Advanced Vehicle Detection | 58 | Trinity | 299 | 48.15 | | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Advanced Vehicle Detection | 62 | Trinity | 3 | 84 | | | Scott Mountain | Long-Term | ✓ |
| Automated Gate Closure | 8 | Trinity | 3 | 62 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| Automatic Traffic Recorder | 1 | Trinity | 3 | 0.1 | | | Jct Rte 36 | Existing | ✓ |
| Automatic Traffic Recorder | 2 | Trinity | 3 | 6.56 | | | Hayfork | Existing | ✓ |
| Automatic Traffic Recorder | 3 | Trinity | 3 | 30.31 | | | Jct Rte 299 | Existing | ✓ |
| Automatic Traffic Recorder | 4 | Trinity | 3 | 30.88 | | | Weaverville Jct Rte 299 | Existing | ✓ |
| Automatic Traffic Recorder | 5 | Trinity | 3 | 32.31 | | | Weaverville Cty Dmp Rd | Existing | ✓ |
| Automatic Traffic Recorder | 6 | Trinity | 3 | 37.6 | | | Rush Creek Road | Existing | ✓ |
| Automatic Traffic Recorder | 7 | Trinity | 3 | 59.64 | | | Trinity Cntr Maint Sta | Existing | ✓ |
| Automatic Traffic Recorder | 70 | Trinity | 36 | 28.96 | | | Jct Rte 3 North | Existing | ✓ |
| Automatic Traffic Recorder | 197 | Trinity | 299 | 50.24 | | | Weaverville W City Lmt | Existing | ✓ |
| Automatic Traffic Recorder | 198 | Trinity | 299 | 52.15 | | | Weaverville Wash St. | Existing | ✓ |
| Automatic Traffic Recorder | 199 | Trinity | 299 | 52.92 | | | Weaverville Martin Rd | Existing | ✓ |
| Automatic Traffic Recorder | 200 | Trinity | 299 | 56.87 | | | Jct Rte 3 South | Existing | ✓ |
| Automatic Traffic Recorder | 201 | Trinity | 299 | 69.08 | | | Tri/Sha County Line | Existing | ✓ |
| Closed-Circuit Television Camera | 70 | Trinity | 299 | 48 | | | At Oregon Mountain at Existing RWIS/RAWS Sites | Short-Term | ✓ |
| Closed-Circuit Television Camera | 71 | Trinity | 299 | 69.7 | | | At Buckhorn Sandhouse at Existing RWIS/RAWS Sites | Short-Term | ✓ |
| Closed-Circuit Television Camera | 154 | Trinity | 299 | 56.03 | | | Moon Lim Lee Rest Area | Long-Term | ✓ |
| Closed-Circuit Television Camera | 161 | Trinity | 3 | 18.67 | | | At Hayfork Summit | Long-Term | ✓ |
| Closed-Circuit Television Camera | 162 | Trinity | 3 | 83 | | | Scott Mountain Summit | Long-Term | ✓ |
| Closed-Circuit Television Camera | 167 | Trinity | 36 | 10.26 | | | South Fork Mountain | Long-Term | ✓ |
| Flood and Scour Detection | 2 | Trinity | 3 | 8.66 | | | Scott River | Existing | ✓ |
| RWIS | 17 | Trinity | 299 | 69.7 | | | At the Buckhorn Sandhouse | Existing | ✓ |
| RWIS | 18 | Trinity | 299 | 48 | | | At Oregon Mountain | Existing | ✓ |
| RWIS | 80 | Trinity | 36 | 10.26 | | | South Fork Mountain | Long-Term | ✓ |
| RWIS | 85 | Trinity | 299 | 15 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| RWIS | 98 | Trinity | 36 | 25 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| RWIS | 99 | Trinity | 36 | 0 | | | Road Closure Due to Bad Weather | Long-Term | ✓ |
| RWIS | 115 | Trinity | 3 | 18.67 | | | At Hayfork Summit | Long-Term | ✓ |
| RWIS | 116 | Trinity | 3 | 83 | | | Scott Mountain Summit | Long-Term | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Probe Vehicle Instrumentation | 9 | Trinity | 36 | 0 | 41.14 | | E/W California routes | Long-Term | ✓ |
| Probe Vehicle Instrumentation | 11 | Trinity | 299 | 0 | 72.25 | | E/W California routes | Long-Term | ✓ |

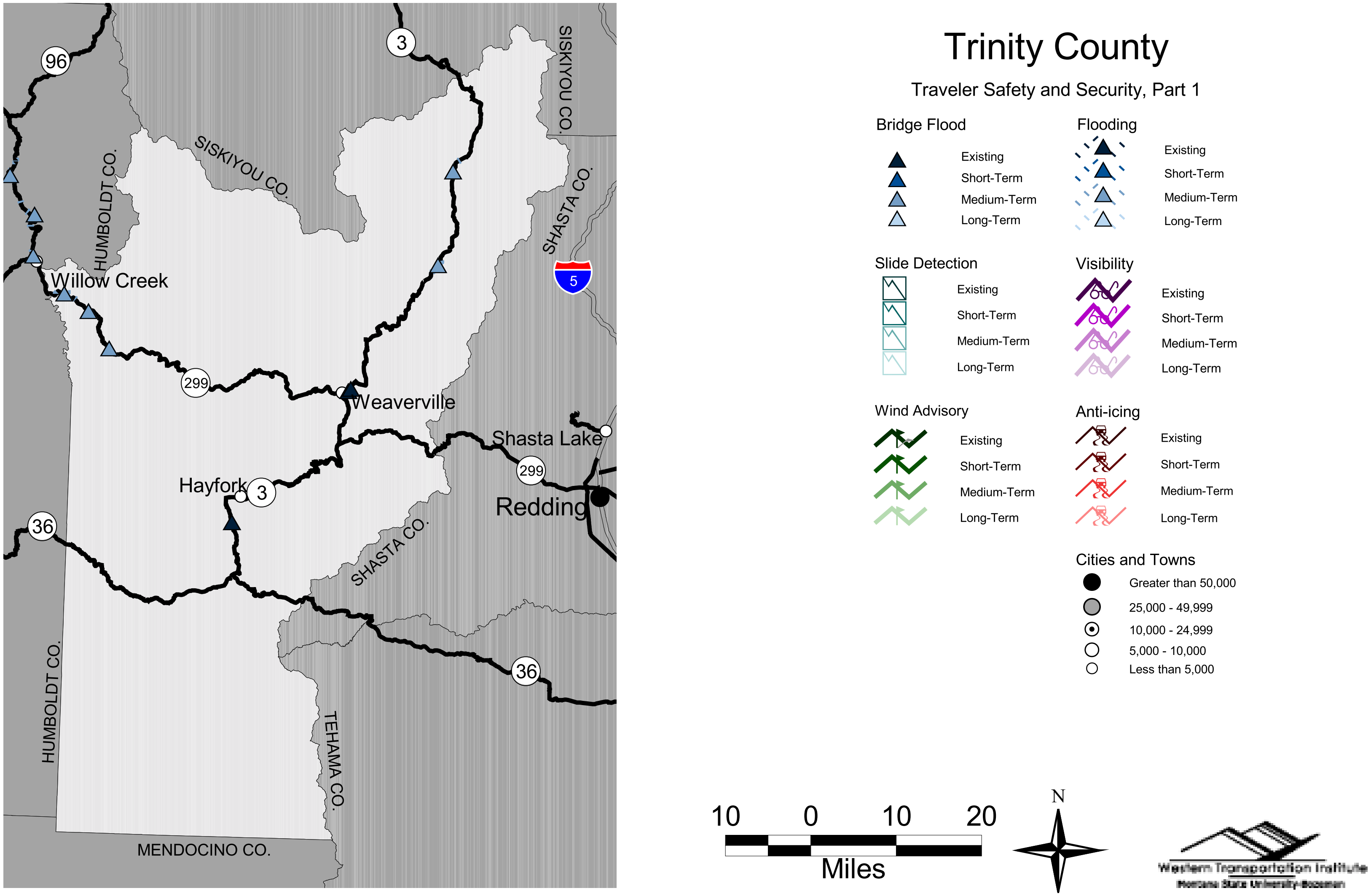



**Figure F-73:** Traveler Safety and Security (Part 1) in Trinity County.

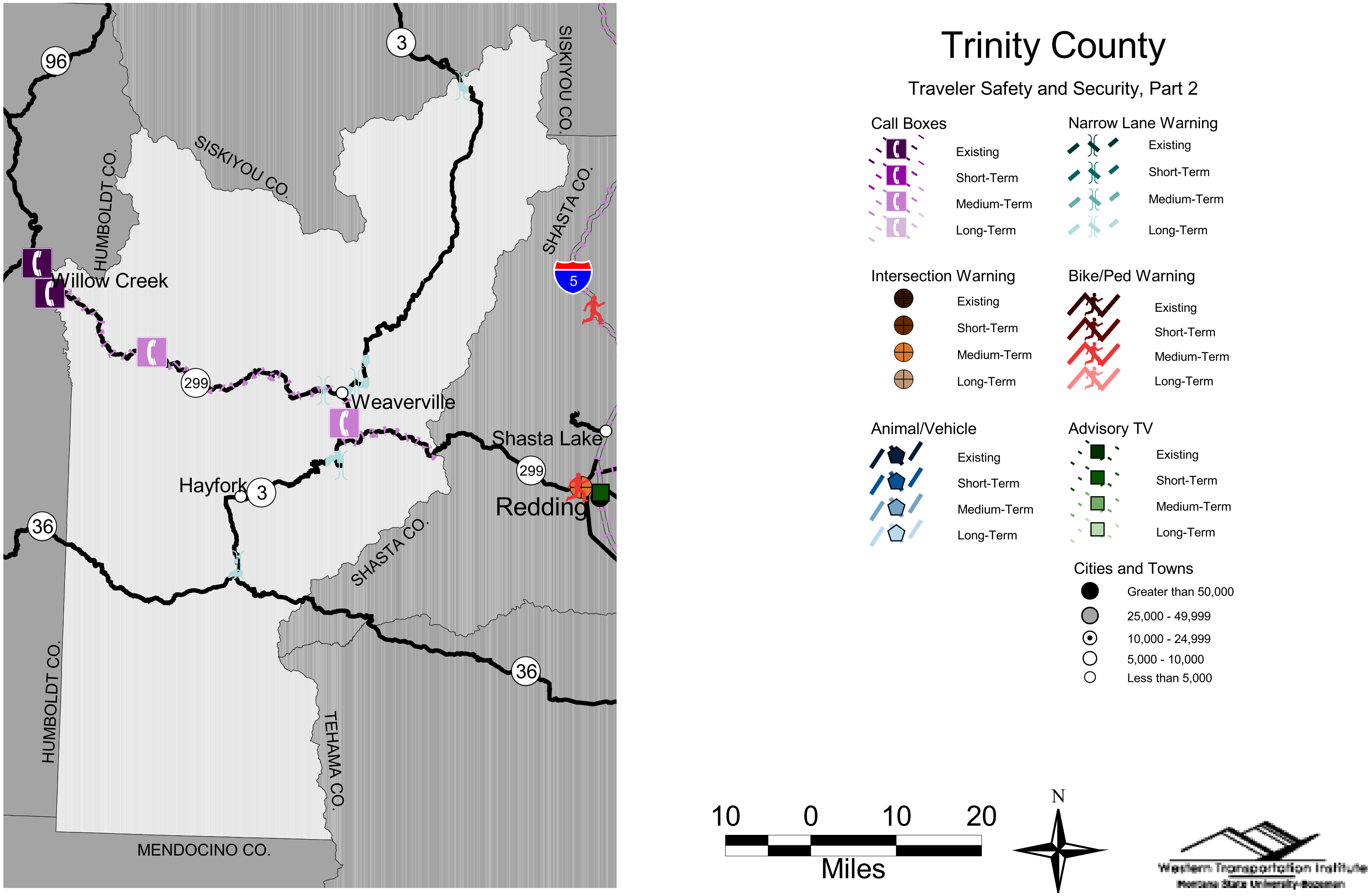



**Figure F-74:** Traveler Safety and Security (Part 2) in Trinity County.

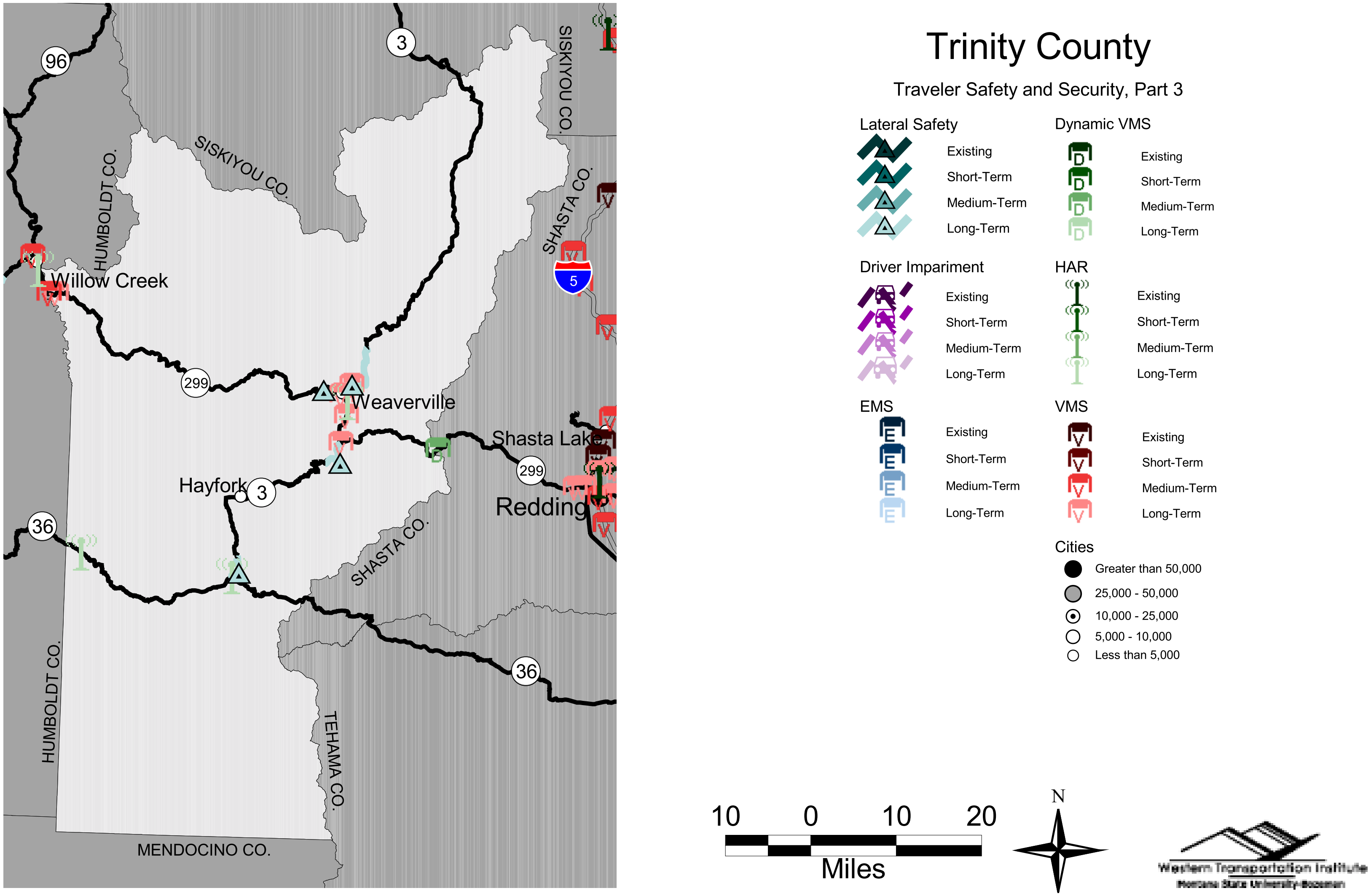



**Figure F-75:** Traveler Safety and Security (Part 3) in Trinity County.

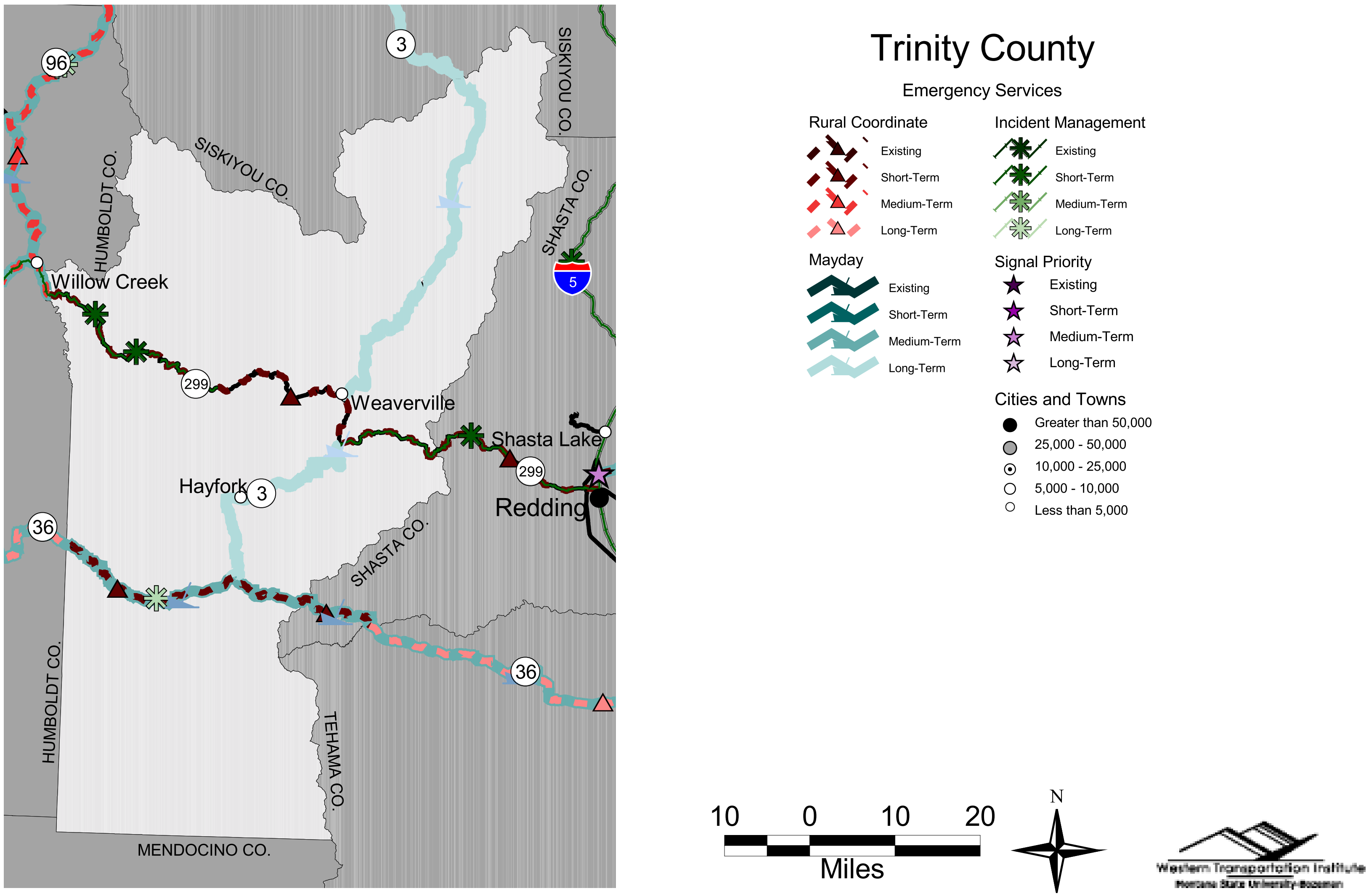



**Figure F-76:** Emergency Services in Trinity County.

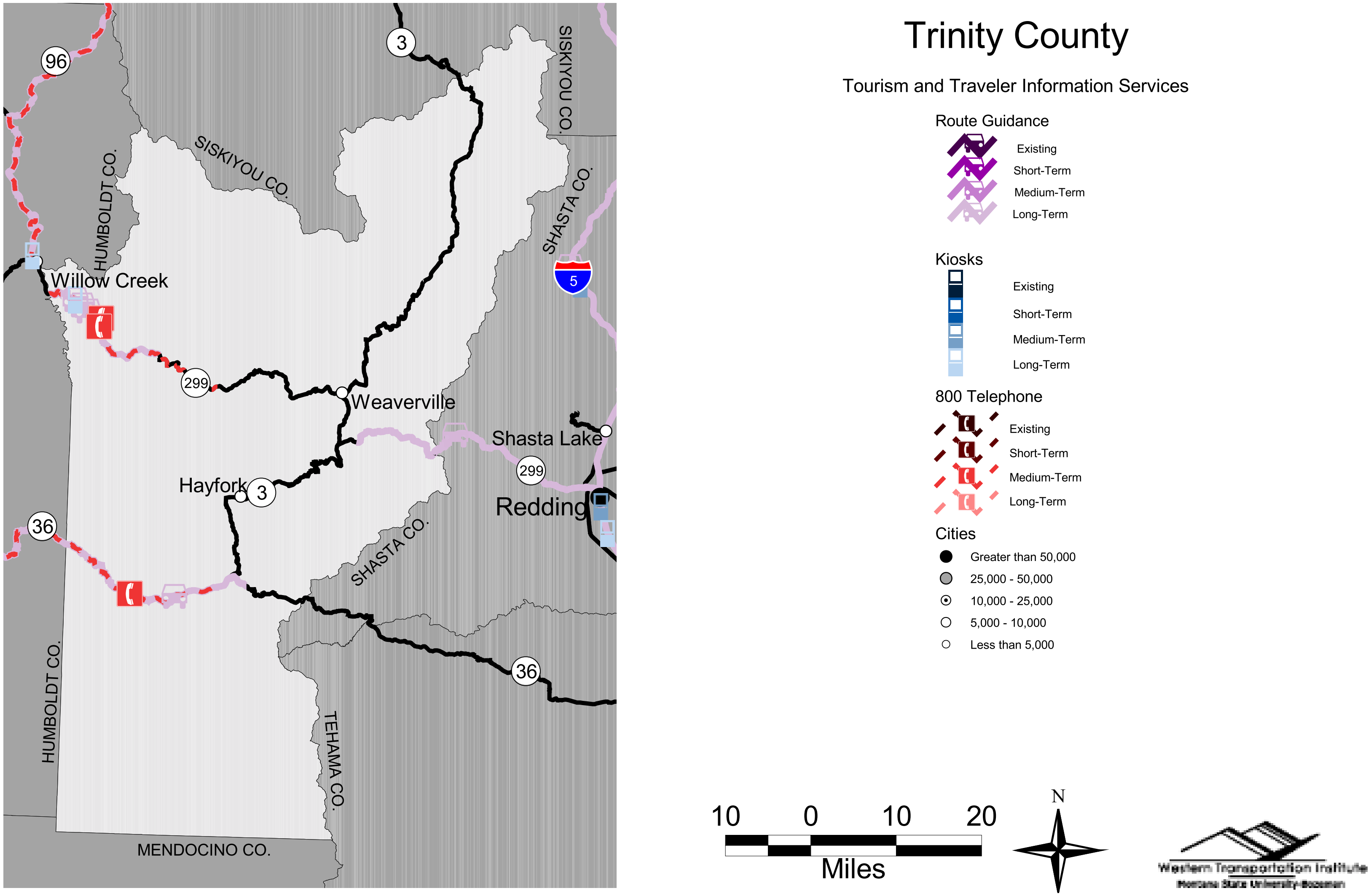



**Figure F-77:** Tourism and Traveler Information Services in Trinity County.

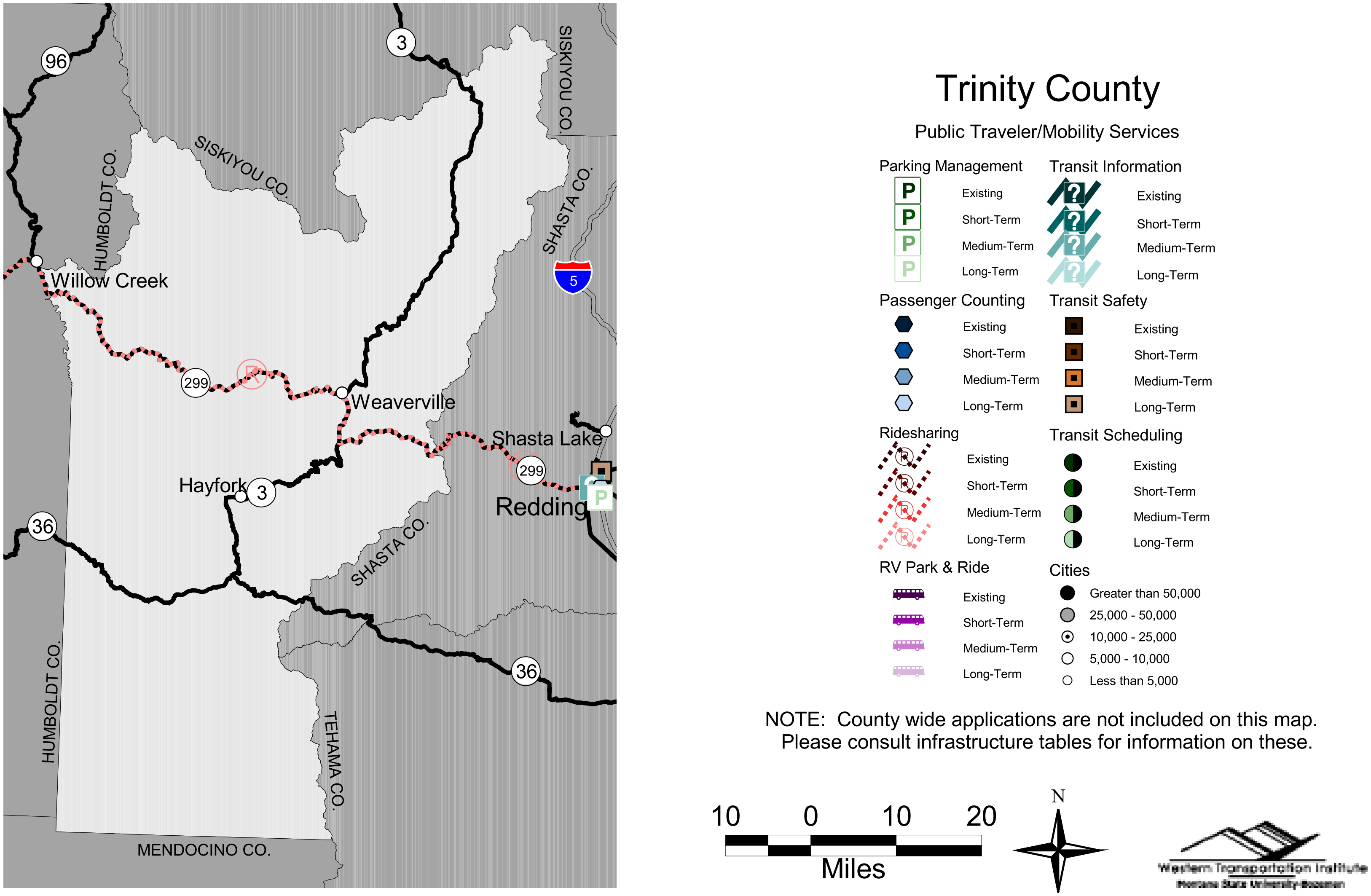



**Figure F-78:** Public Traveler/Mobility Services in Trinity County.

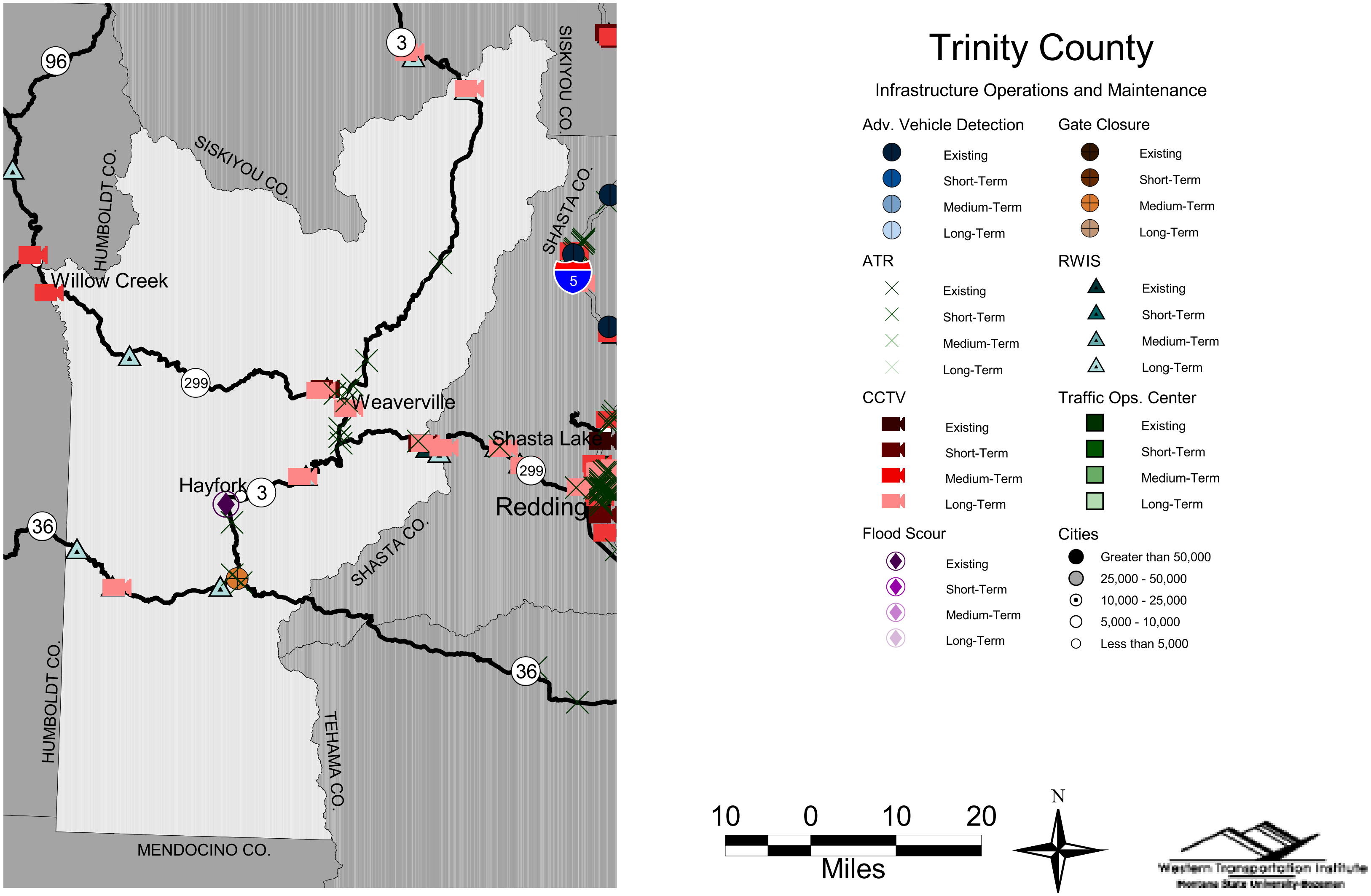



**Figure F-79:** Infrastructure Operations and Maintenance in Trinity County.

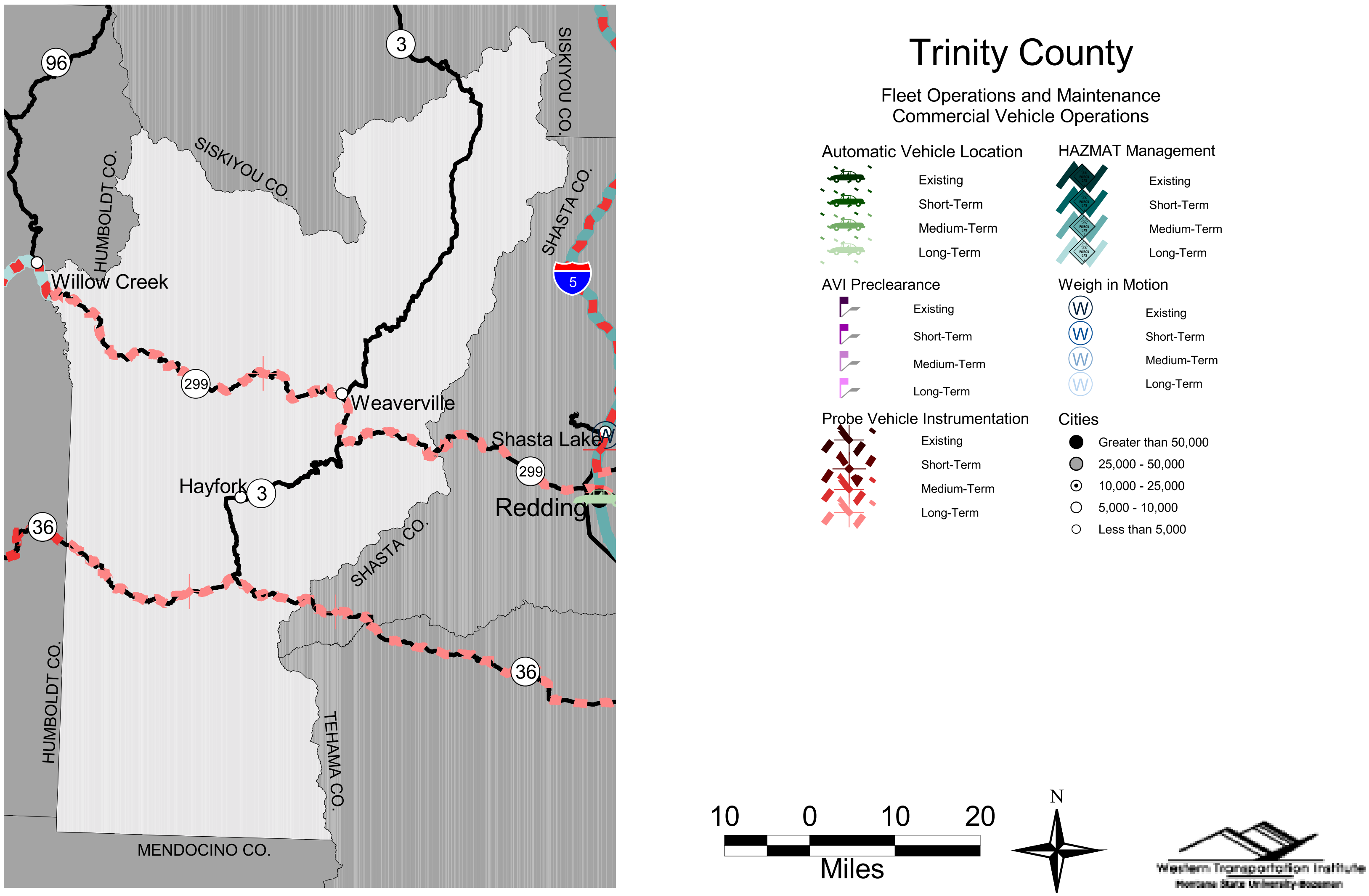



**Figure F-80:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Trinity County.

# APPENDIX G: SOUTHERN OREGON ITS DEPLOYMENT

The following legend applies to all tables in this appendix:

| | |
|---|---|
| **Infrastructure Type** | See Appendix D |
| **ID #** | The unique number of a particular technology. If two locations share the same number, they are treated as a package for deployment purposes. |
| **County** | Self-explanatory |
| **Highway** | Oregon Highway Number, which does not necessarily correspond to Interstate number, US Highway number, or State Route number. See Table G-1 for information on converting Oregon Highway Numbers to other designations. |
| **From** | Starting milepost |
| **To** | Ending milepost |
| **Direction** | The direction that a particular technology is facing |
| **Description** | Additional detail about the reason or location for deployment. |
| **Priority** | Existing refers to technologies in the ground as of December 2000; Short-term refers to deployment within the next four years; Medium-term refers to deployment within four to eight years; Long-term refers to deployment within eight to fifteen years. |

**Table G-1:** Oregon Route Conversion Table.

| Oregon Highway Number | Highway Name | Posted Route Number | Mileposts | | Landmark | |
|---|---|---|---|---|---|---|
| | | | Start | End | Origin | Termination |
| 1 | Pacific Highway | I-5 | 0 | 192.01 | California/Oregon border | Eugene |
| 4 | Dallas-California | US 97 | 125.14 | 291.73 | Bend | California/Oregon border |
| 7 | Central Oregon | US 20 | 0 | 264.15 | Bend | Oregon/Idaho border |
| 9 | Oregon Coast | US 101 | 202.22 | 363.11 | Florence | California/Oregon border |
| 15 | McKenzie | OR 126 | 6.32 | 55.22 | Eugene | Jct.w/ OR 242, Lane County |
| | | OR 242 | 55.22 | 92.28 | Jct. w/ OR 126, Lane County | Sisters |
| | | OR 126 | 92.28 | 110.3 | Sisters | Redmond |
| 16 | Santiam | US 20 | 71.5 | 100.69 | Santiam Jct. | Sisters |
| 17 | McKenzie-Bend | US 20 | 0 | 18.51 | Sisters | Bend |
| 18 | Willamette | OR 58 | 0 | 86.45 | Jct. w/ OR 99 | Jct.w/ US 97 |
| 19 | Fremont | OR 31 | 0 | 120.57 | Jct. w/ US 97 | Valley Falls |
| | | US 395 | 120.57 | 157.73 | Valley Falls | California/Oregon border |
| 20 | Klamath Falls-Lakeview | OR 140 | 0 | 96.37 | Klamath Falls | Lakeview |
| 21 | Green Springs | OR 66 | 0 | 59.05 | Medford | Klamath Falls |
| 22 | Crater Lake | OR 62 | 0 | 103.95 | Medford | Jct. w/ US 97 |
| 25 | Redwood | US 199 | 0 | 41.69 | California/Oregon border | Grants Pass |
| 35 | Coos Bay – Roseburg | OR 42 | 0 | 76.65 | Coos Bay | Roseburg |
| 45 | Umpqua | OR 38 | 0 | 57.18 | Reedsport | Anlauf |
| 49 | Lakeview-Burns | US 395 | 0 | 90.02 | Riley | Valley Falls |
| 50 | Klamath Falls-Malin | OR 39 | 0 | 27.1 | Klamath Falls | California/Oregon Border |
| 62 | Florence Eugene | OR 126 | 0 | 55.67 | Florence | Eugene |
| 73 | North Umpqua | OR 138 | 0 | 83.16 | Roseburg | Jct.w/ OR 230 |
| 215 | Crater Lake-Belknap Springs | OR 126 | 0 | 19.81 | Jct. w/ OR 242 | Santiam Jct. |
| 231 | Elkton-Sutherlin | OR 138 | 0 | 24.22 | Elkton | Sutherlin |
| 233 | West Diamond Lake | OR 230 | 0 | 23.8 | Union Creek | Jct. w/ OR 138 |
| 244 | Coquille-Bandon | OR 42S | 0 | 16.99 | Bandon | Coquille |
| 270 | Lake of the Woods | OR 140 | 0 | 68.76 | JCT. w/ OR 62 | Klamath Falls |
| 272 | Jacksonville | OR 238 | 0 | 39.22 | Grants Pass | Medford |
| 425 | East Diamond Lake | OR 138 | 83.16 | 100.87 | Jct. w/ OR 138 | Jct.w/ US 97 |
| 431 | Warner | OR 140 | 0 | 65.28 | Jct. w/ US 395 N. of Lakeview | California/Oregon Border |
| 440 | Frenchglen | OR 205 | 0 | 73.35 | Burns | Roaring Springs Ranch |
| 442 | Steens | OR 78 | 0 | 91.65 | Burns | Burns Jct. |
| 456 | I.O.N. | US 95 | 0 | 121.36 | Oregon/Idaho Border | California/Oregon Border |

**Table G-2:** Deployment Locations in Coos County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 14 | Coos | 244 | 0 | 16.94 | | | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 1 | Coos | 9 | 234.03<br>236.77 | | | Bike/ped challenge (Coos Bay)<br>Bike/ped challenge (North Bend) | Short-Term | ✓ |
| Advanced Bike/Ped Warning | 12 | Coos | 35 | 10.85 | | | Bike/ped challenge (Coquille) | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 18 | Coos | 9 | 222.01 | | | Bike/ped challenge (Florence) | Medium-Term | ✓ |
| Advisory Television | 23 | Coos | 9 | 236.77 | | | Coos Bay | Long-Term | ✓ |
| Automated Flood Warning | 2 | Coos | 244 | 0 | 16.94 | | | Short-Term | ✓ |
| Automated Flood Warning | 5 | Coos | 35 | 0 | 5 | | Hwy 42 approaching 101 | Short-Term | ✓ |
| Automated Flood Warning | 6 | Coos | 9 | 240 | 242 | | | Short-Term | ✓ |
| Dynamic Warning VMS | 14 | Coos | 35 | 10.8<br>12.2 | | East<br>West | Visibility Challenge | Medium-Term | ✓ |
| Dynamic Warning VMS | 15 | Coos | 9 | 239.8 | | North | Visibility Challenge | Medium-Term | ✓ |
| Dynamic Warning VMS | 16 | Coos | 9 | 234.6 | | South | Visibility Challenge | Medium-Term | ✓ |
| Highway Advisory Radio | 38 | Coos | 9 | 275 | | | Tourism | Medium-Term | ✓ |
| Highway Advisory Radio | 39 | Coos | 35 | 0 | | | Visibility | Medium-Term | ✓ |
| Highway Advisory Radio | 40 | Coos | 9 | 236 | | | Visibility, Tourism | Medium-Term | ✓ |
| Intersection Advance Warning | 11 | Coos | 35 | 20.01 | | | Intersection safety challenge | Long-Term | ✓ |
| Intersection Advance Warning | 12 | Coos | 35 | 10.85 | | | Intersection safety challenge | Long-Term | ✓ |
| Variable Message Sign | 35 | Coos | 9 | 245 | | N | Coos Bay | Short-Term | ✓ |
| Variable Message Sign | 80 | Coos | 9 | 278 | | North | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 81 | Coos | 9 | 256 | | South | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 140 | Coos | 244 | 7 | | West | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 141 | Coos | 35 | 14 | | North | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 142 | Coos | 244 | 7 | | East | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 143 | Coos | 9 | 247 | | South | All Criteria | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Regional Incident Management Plan | 27 | Coos | 35 | 11.1 | 44.95 | | Road Closure | Medium-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 2 | Coos | 9 | 273 | | | Tourist Locations | Short-Term | ✓ |
| 800 Travel Advisory | 3 | Coos | 9 | 253 | | | Tourist Locations | Short-Term | ✓ |
| 800 Travel Advisory | 26 | Coos | 9 | 234.03 | | | Tourist Locations | Medium-Term | ✓ |
| 800 Travel Advisory | 29 | Coos | 9 | 255 | | | Tourist Locations | Long-Term | ✓ |
| 800 Travel Advisory | 30 | Coos | 9 | 260.64 | | | Tourist Locations | Long-Term | ✓ |
| 800 Travel Advisory | 31 | Coos | 9 | 277 | | | Tourist Locations | Long-Term | ✓ |
| 800 Travel Advisory | 32 | Coos | 9 | 251 | | | Tourist Locations | Long-Term | ✓ |
| 800 Travel Advisory | 35 | Coos | 9 | 275 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 25 | Coos | 35 | 0 | 44.96 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 26 | Coos | 9 | 273 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 27 | Coos | 9 | 275 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 28 | Coos | 9 | 277 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 29 | Coos | 9 | 253 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 30 | Coos | 9 | 255 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 31 | Coos | 9 | 251 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 32 | Coos | 9 | 260.64 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 33 | Coos | 9 | 220.58 | 250 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 1 | Coos | 9 | 234.03 | | | North Bend | Existing | ✓ |

**Table G-2:** Deployment Locations in Coos County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services (cont.)** | | | | | | | | | |
| Kiosks | 2 | Coos | 9 | 260.64 | | | Bandon | Existing | ✓ |
| Kiosks | 33 | Coos | 9 | 277 | | | Face Rock State Scenic Viewpoint | Short-Term | ✓ |
| Kiosks | 34 | Coos | 9 | 251 | | | Sunset Bay State Park | Short-Term | ✓ |
| Kiosks | 35 | Coos | 9 | 253 | | | Shore Acres State Park | Short-Term | ✓ |
| Kiosks | 36 | Coos | 9 | 255 | | | Cape Arago State Park | Short-Term | ✓ |
| Kiosks | 53 | Coos | 9 | 273 | | | Bullards Beach State Park | Medium-Term | ✓ |
| Kiosks | 54 | Coos | 9 | 275 | | | Bandon State Natural Area | Medium-Term | ✓ |
| Kiosks | 55 | Coos | 9 | 260.64 | | | Bandon Cheese Factory | Medium-Term | ✓ |
| Kiosks | 56 | Coos | 9 | 234.03 | | | The Mill Casino, North Bend | Medium-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 18 | Coos | 9 | 260.64 | | | Bandon | Long-Term | ✓ |
| Automated Passenger Counting | 30 | Coos | | | | | Coos County | Long-Term | ✓ |
| On-Board Transit Safety Systems | 18 | Coos | 9 | 260.64 | | | Bandon | Long-Term | ✓ |
| On-Board Transit Safety Systems | 30 | Coos | | | | | Coos County | Long-Term | ✓ |
| Parking Management & Information System | 20 | Coos | 9 | 234.03 | | | Tourist Locations | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 22 | Coos | 9 | 234.03 | | | The Mill Casino, North Bend | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 24 | Coos | 9 | 243 | | | Coos Bay | Long-Term | ✓ |
| Transit Traveler Information | 19 | Coos | 9 | 234.03 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 21 | Coos | 9 | 251 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 22 | Coos | 9 | 253 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 23 | Coos | 9 | 255 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 24 | Coos | 9 | 273 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 25 | Coos | 9 | 275 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 26 | Coos | 9 | 277 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 27 | Coos | 9 | 260.64 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 1 | Coos | | | | | Coos County | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 38 | Coos | 9 | 260.64 | | | Bandon | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 7 | Coos | 244 | 8.47 | | | | Short-Term | ✓ |
| Advanced Vehicle Detection | 13 | Coos | 35 | 2.5 | | | Hwy 42 approaching 101 | Short-Term | ✓ |
| Advanced Vehicle Detection | 14 | Coos | 9 | 241 | | | | Short-Term | ✓ |
| Advanced Vehicle Detection | 41 | Coos | 244 | 1 | | | | Medium-Term | ✓ |
| Advanced Vehicle Detection | 42 | Coos | 244 | 15.94 | | | | Medium-Term | ✓ |
| Automatic Traffic Recorder | 260 | Coos | 9 | 221.67 | | | 1.09 mile S of Coos-Douglas Co line | Existing | ✓ |
| Automatic Traffic Recorder | 261 | Coos | 9 | 261.94 | | | 1.3 miles south of Bandon | Existing | ✓ |
| RWIS | 33 | Coos | 35 | 42 | | | Coos Bay - Roseburg Hwy | Existing | ✓ |
| RWIS | 43 | Coos | 35 | 10.8 | | | Visibility Challenge | Short-Term | ✓ |
| RWIS | 48 | Coos | 9 | 255 | | | Cape Blanco | Short-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Preclearance | 27 | Coos | 9 | 227.89 | | N/S | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 28 | Coos | 9 | 227.89 | | N/S | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 31 | Coos | 35 | 21.87 | | | Myrtle Point | Medium-Term | ✓ |

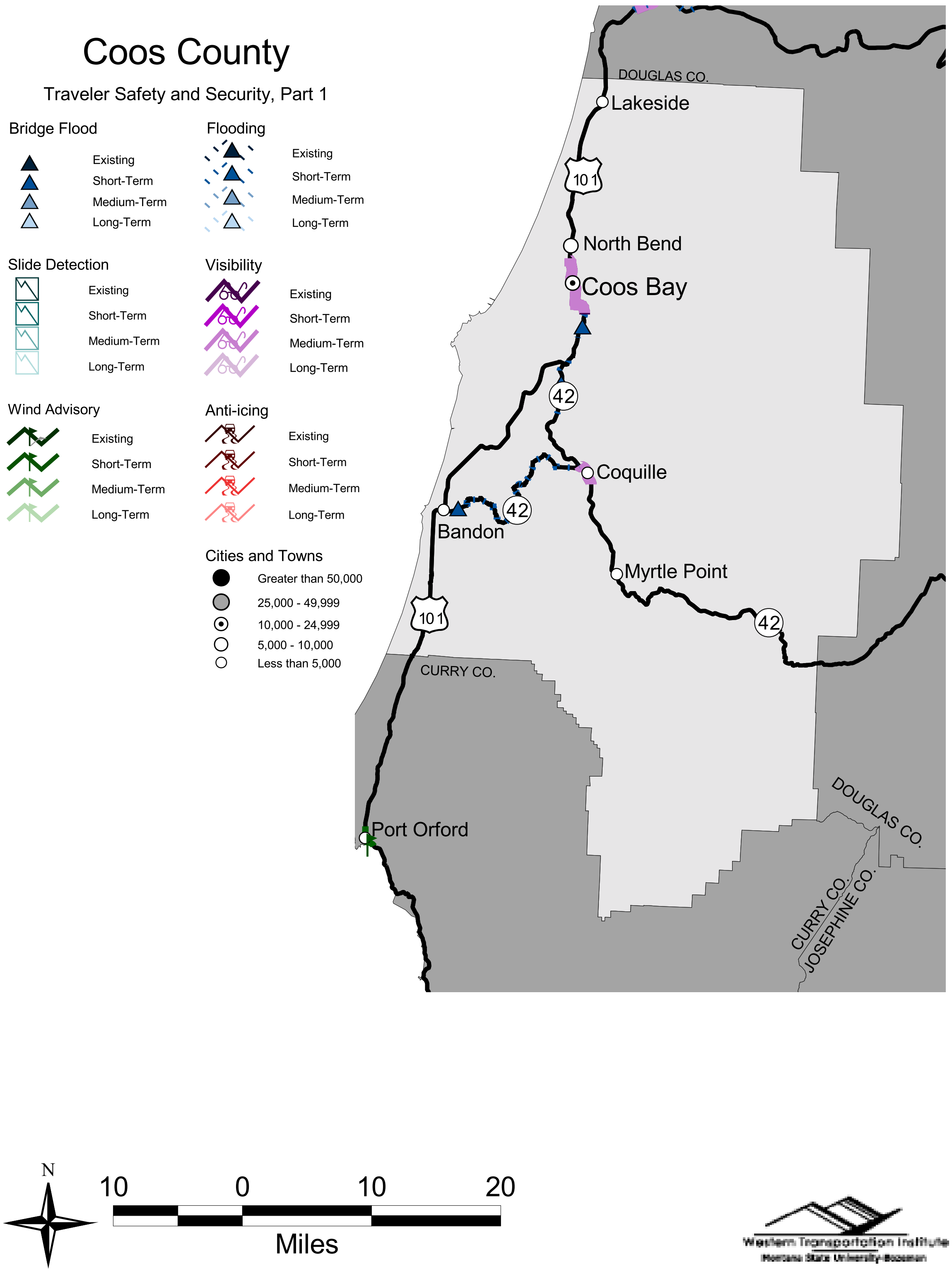



**Figure G-1:** Traveler Safety and Security (Part 1) in Coos County.

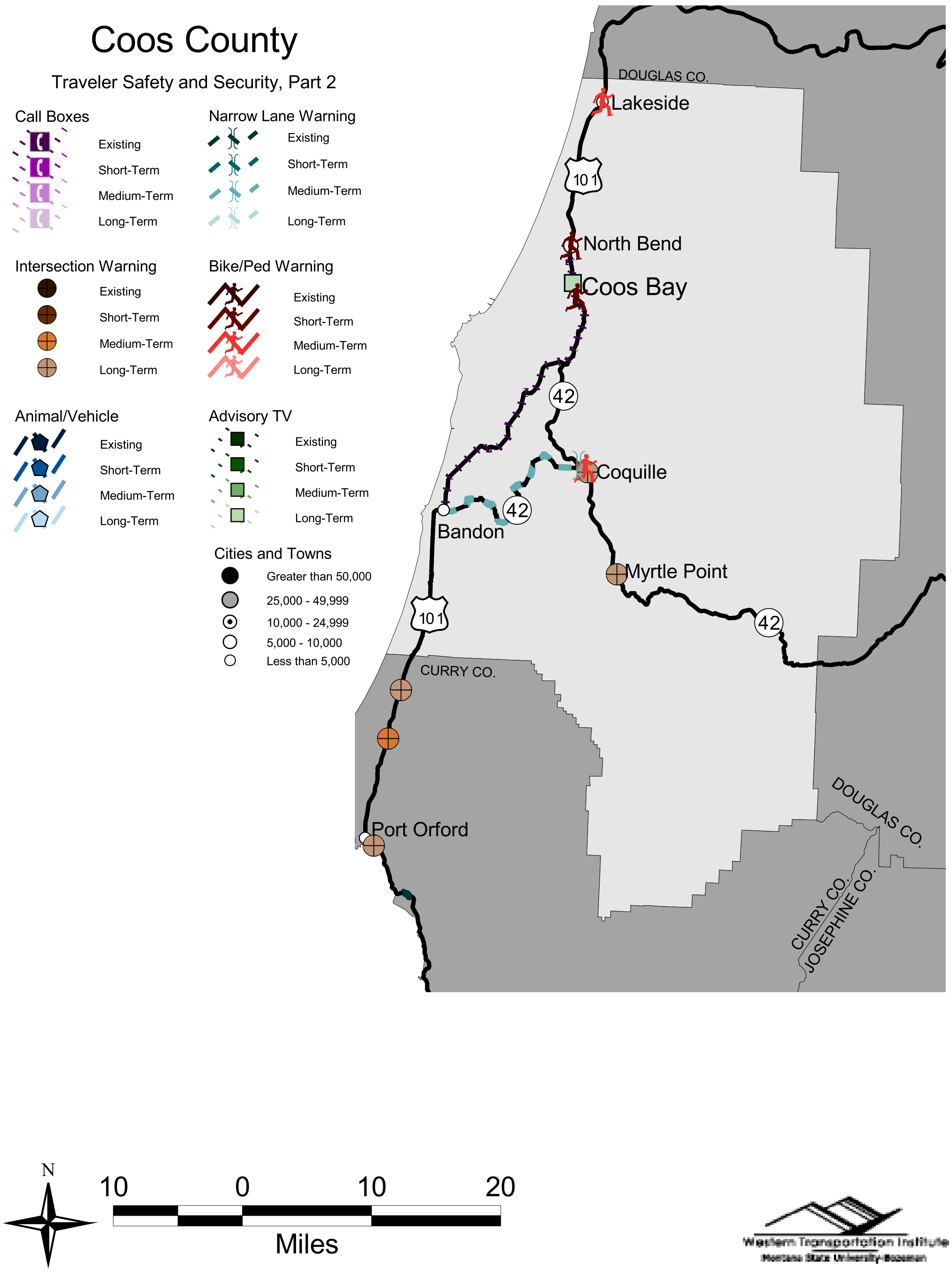



**Figure G-2:** Traveler Safety and Security (Part 2) in Coos County.

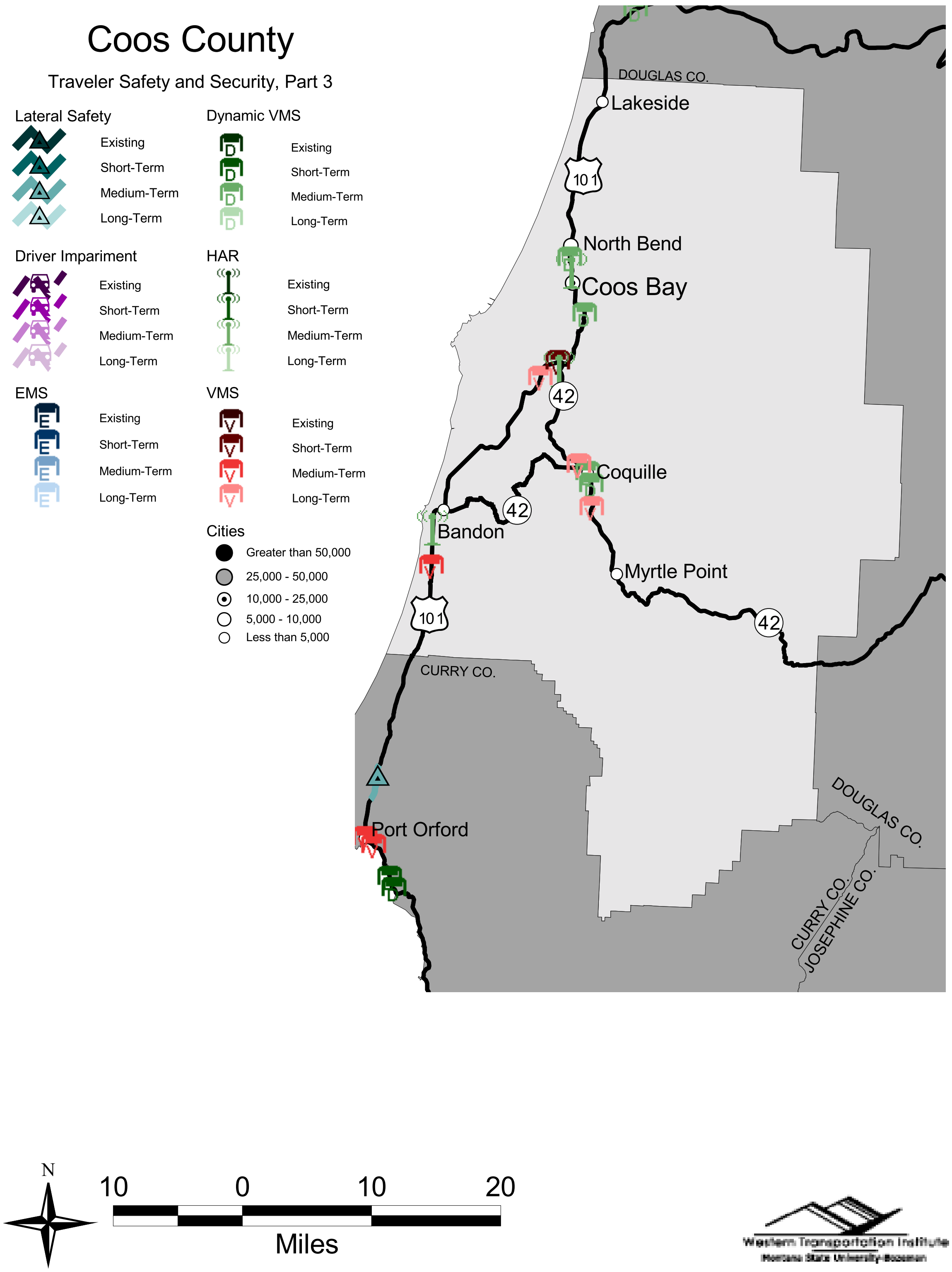
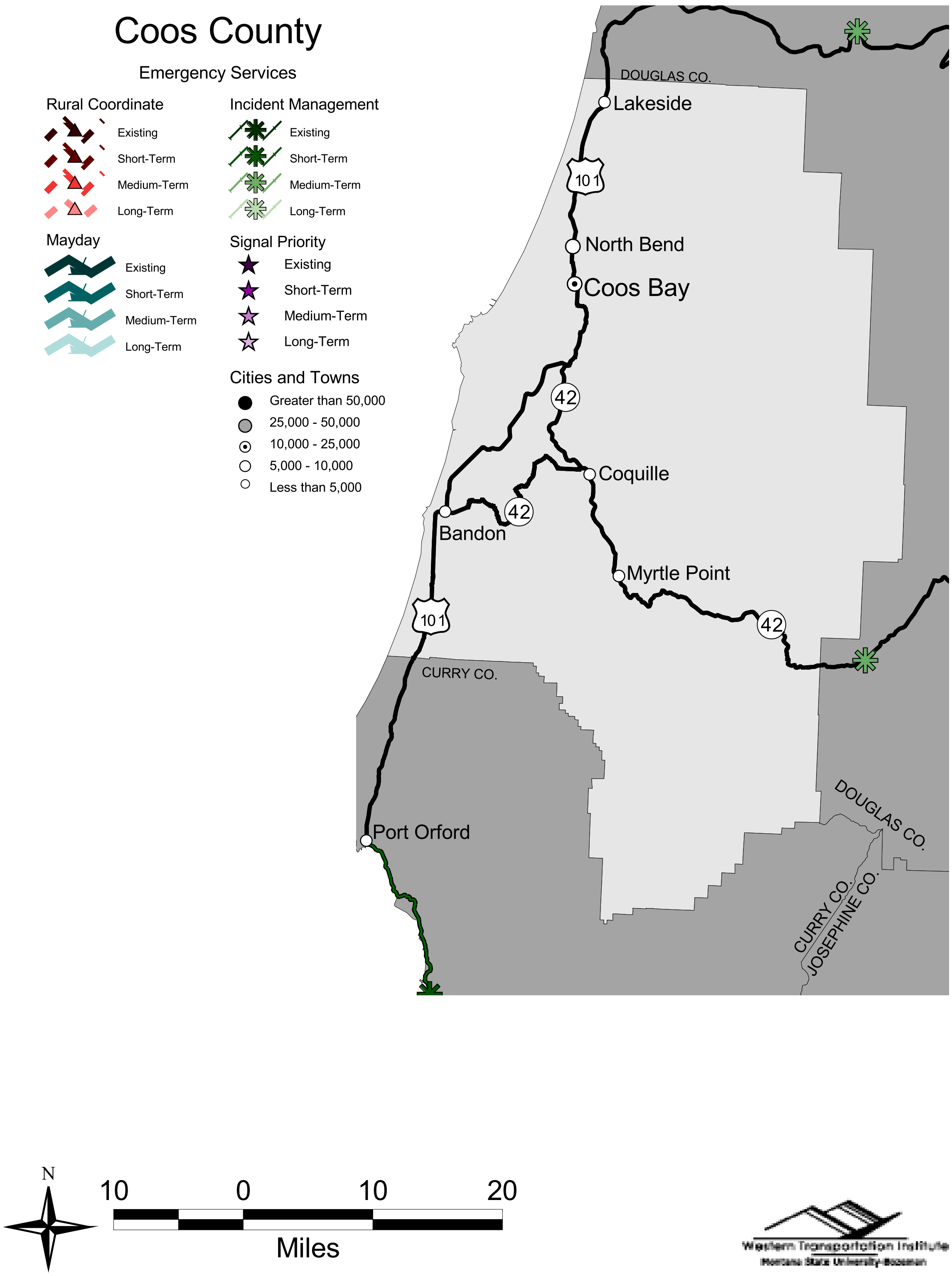



**Figure G-3:** Traveler Safety and Security (Part 3) in Coos County.




Western Transportation Institute
Montana State University-Bozeman

**Figure G-4:** Emergency Services in Coos County.

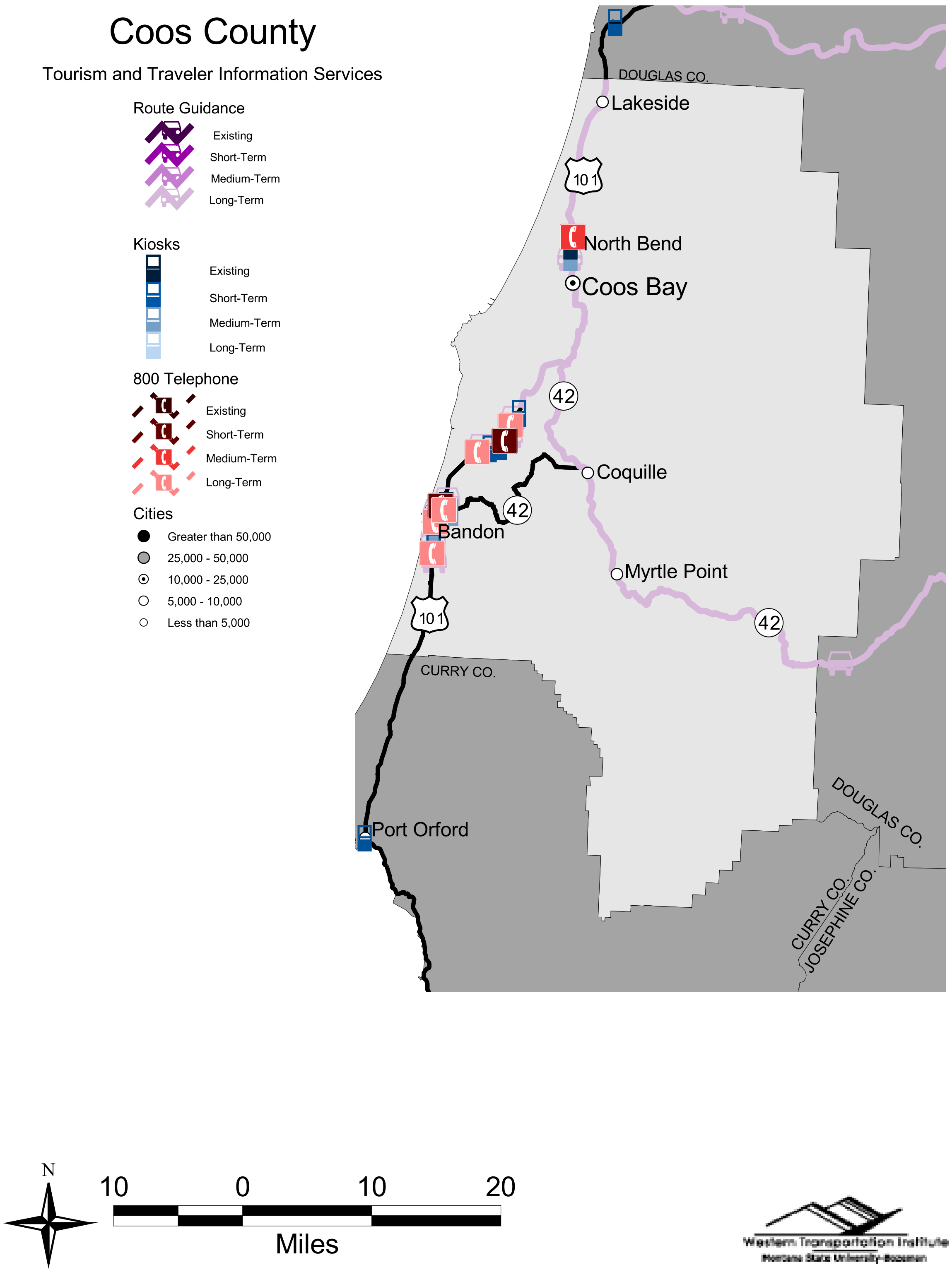



**Figure G-5:** Tourism and Traveler Information Services in Coos County.

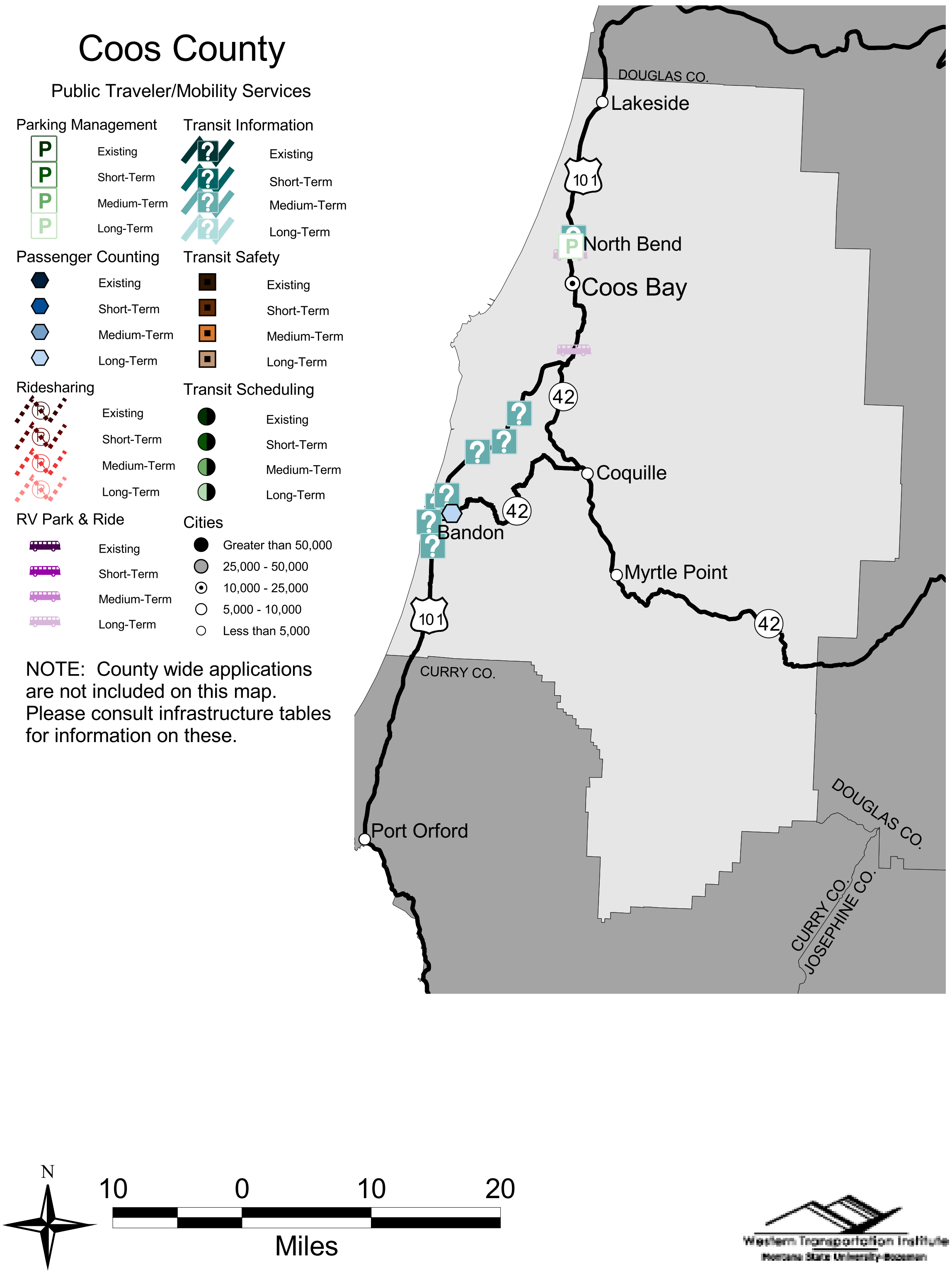



**Figure G-6:** Public Traveler/Mobility Services in Coos County.

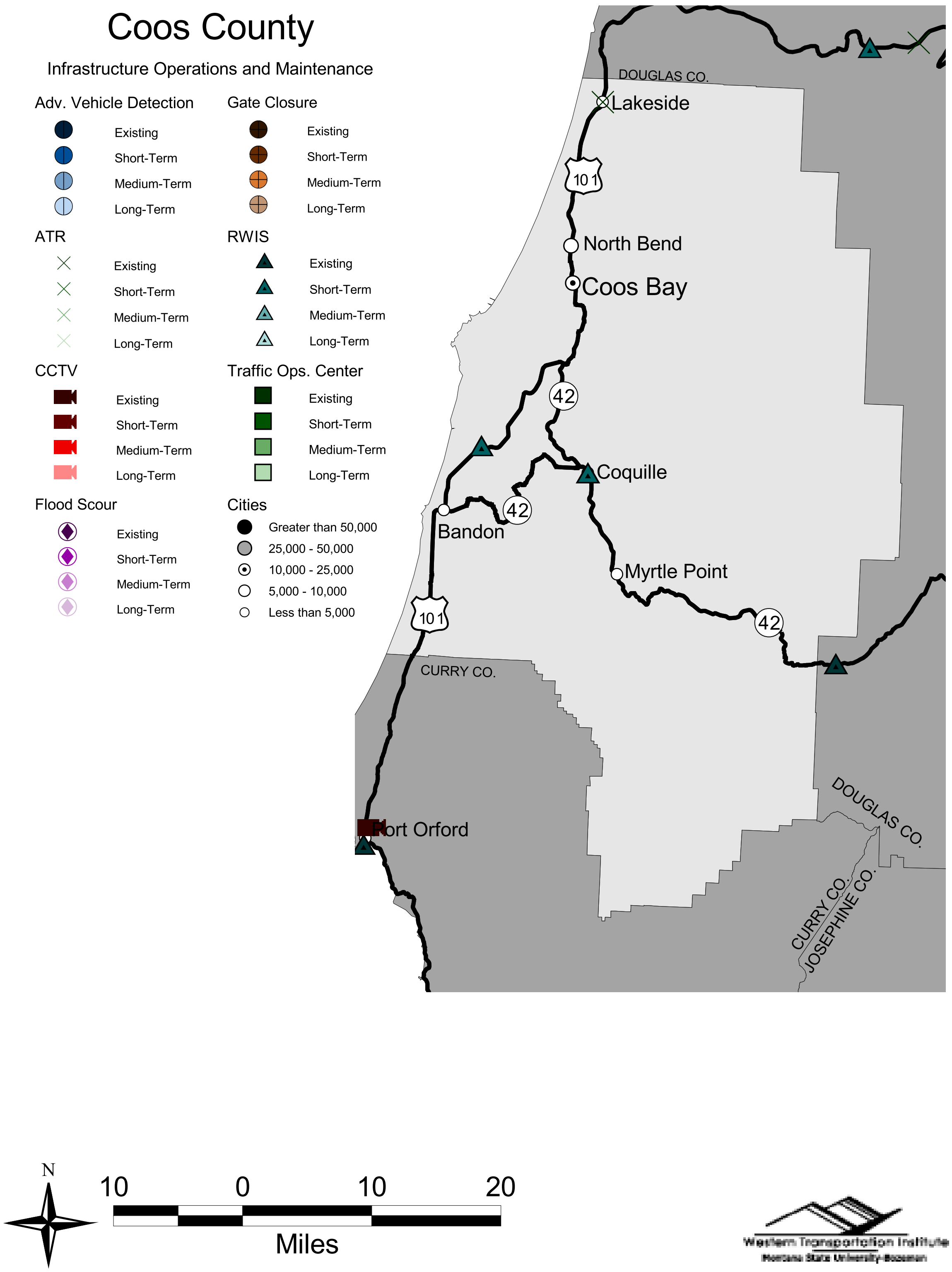



**Figure G-7:** Infrastructure Operations and Maintenance in Coos County.

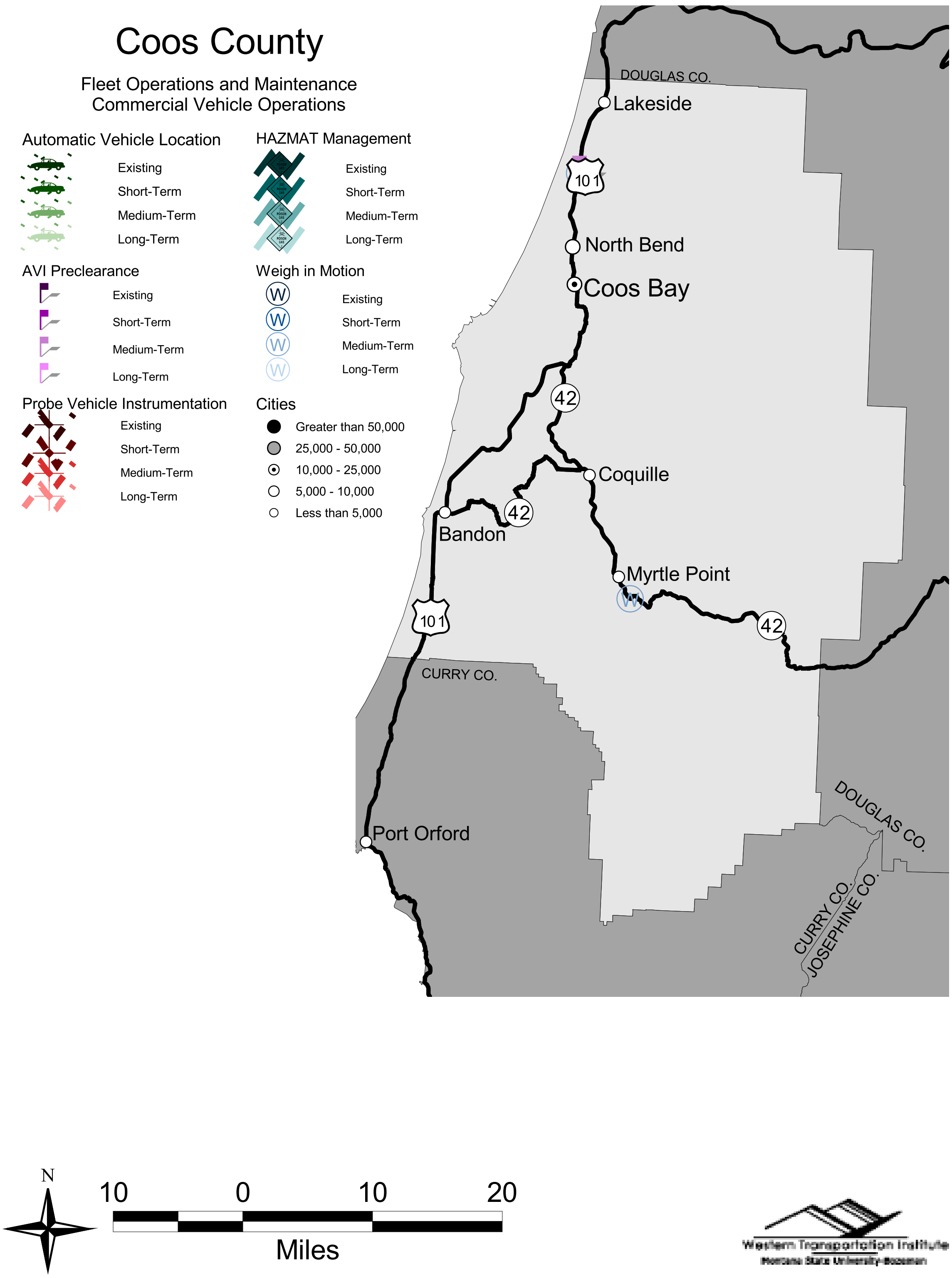



**Figure G-8:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Coos County.

**Table G-3:** Deployment Locations in Curry County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Advanced Bike/Ped Warning | 10 | Curry | 9 | 355.38 | | | Bike/ped challenge (Brookings) | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 11 | Curry | 9 | 327.85 | | | Bike/ped challenge (Gold Beach) | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 22 | Curry | 9 | 339 | | | Meyer Creek | Long-Term | ✓ |
| Automated Wind Advisory | 2 | Curry | 9 | 299.83 | | | At Port Orford | Short-Term | ✓ |
| Dynamic Warning VMS | 5 | Curry | 9 | 303.5<br>304.5 | | S<br>N | Humbug Mt | Short-Term | ✓ |
| Dynamic Warning VMS | 6 | Curry | 9 | 321 | | N | High wind gust problem | Short-Term | ✓ |
| Dynamic Warning VMS | 13 | Curry | 9 | 357.9<br>356.4 | | North<br>South | Visibility Challenge | Medium-Term | ✓ |
| Highway Advisory Radio | 19 | Curry | 9 | 357 | | | Visibility | Short-Term | ✓ |
| Intersection Advance Warning | 4 | Curry | 9 | 292 | | | Paradise Point | Medium-Term | ✓ |
| Intersection Advance Warning | 8 | Curry | 9 | 355.38 | | | Intersection safety challenge | Long-Term | ✓ |
| Intersection Advance Warning | 9 | Curry | 9 | 327.49 | | | Intersection safety challenge | Long-Term | ✓ |
| Intersection Advance Warning | 16 | Curry | 9 | 287.5 | | | In Langlois | Long-Term | ✓ |
| Intersection Advance Warning | 17 | Curry | 9 | 301 | | | approaches to Port Orford | Long-Term | ✓ |
| Lateral Safety Warning System | 2 | Curry | 9 | 331 | 336 | | Cape Sebastian | Medium-Term | ✓ |
| Lateral Safety Warning System | 3 | Curry | 9 | 294 | 297 | | Cape Blanco | Medium-Term | ✓ |
| Variable Message Sign | 90 | Curry | 9 | 299.5 | | S | Port Orford | Medium-Term | ✓ |
| Variable Message Sign | 91 | Curry | 9 | 300.5 | | N | Port Orford | Medium-Term | ✓ |
| Variable Message Sign | 92 | Curry | 9 | 329.5 | | S | Gold Beach | Medium-Term | ✓ |
| Variable Message Sign | 93 | Curry | 9 | 330.5 | | N | Gold Beach | Medium-Term | ✓ |
| Variable Message Sign | 94 | Curry | 9 | 359.5 | | S | Brookings | Medium-Term | ✓ |
| Variable Message Sign | 95 | Curry | 9 | 360.5 | | N | Brookings | Medium-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Regional Incident Management Plan | 10 | Curry | 9 | 300 | 330 | | | Short-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 13 | Curry | 9 | 358 | | | Tourist Locations | Medium-Term | ✓ |
| 800 Travel Advisory | 36 | Curry | 9 | 345 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 16 | Curry | 9 | 358 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 17 | Curry | 9 | 345 | | | Tourist Locations | Long-Term | ✓ |
| Kiosks | 3 | Curry | 9 | 327.85 | | | Gold Beach | Existing | ✓ |
| Kiosks | 4 | Curry | 9 | 354.73 | | | Rest Area N.E. of Brookings | Existing | ✓ |
| Kiosks | 5 | Curry | 9 | 355.38 | | | Brookings | Existing | ✓ |
| Kiosks | 6 | Curry | 9 | 358.76 | | | Harbor | Existing | ✓ |
| Kiosks | 28 | Curry | 9 | 358 | | | Harris Beach State Park | Short-Term | ✓ |
| Kiosks | 29 | Curry | 9 | 345 | | | S.H. Boardman State Scenic Corridor | Short-Term | ✓ |
| Kiosks | 41 | Curry | 9 | 300 | | | Wayfunding pts: Port Orford | Short-Term | ✓ |
| Kiosks | 42 | Curry | 9 | 339 | | | Wayfunding pt: Meyer Creek | Short-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 19 | Curry | 9 | 327.85 | | | Gold Beach | Long-Term | ✓ |
| Automated Passenger Counting | 20 | Curry | 9 | 355.38 | | | Brookings | Long-Term | ✓ |
| Automated Passenger Counting | 32 | Curry | | | | | Curry County | Long-Term | ✓ |
| Dynamic Ridesharing/Paratransit | 4 | Curry | | | | | Southern Curry County | Medium-Term | ✓ |
| On-Board Transit Safety Systems | 19 | Curry | 9 | 327.85 | | | Gold Beach | Long-Term | ✓ |
| On-Board Transit Safety Systems | 20 | Curry | 9 | 355.38 | | | Brookings | Long-Term | ✓ |
| On-Board Transit Safety Systems | 32 | Curry | | | | | Curry County | Long-Term | ✓ |

**Table G-3:** Deployment Locations in Curry County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Public Traveler/Mobility Services (cont.)** | | | | | | | | | |
| Parking Management & Information System | 16 | Curry | 9 | 358 | | | Tourist Locations | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 19 | Curry | 9 | 358 | | | Harris Beach State Park | Long-Term | ✓ |
| Transit Traveler Information | 9 | Curry | 9 | 358 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 10 | Curry | 9 | 345 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 3 | Curry | | | | | Curry County | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 39 | Curry | 9 | 327.85 | | | Gold Beach | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 40 | Curry | 9 | 355.38 | | | Brookings | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Automatic Traffic Recorder | 262 | Curry | 9 | 362.01 | | | 1.1 miles N of OR-CA Border | Existing | ✓ |
| Closed-Circuit Television Camera | 6 | Curry | 9 | 299.84 | | | Port Orford | Existing | ✓ |
| Closed-Circuit Television Camera | 148 | Curry | 9 | 333.5 | | | Sebastian Marsh Creek | Long-Term | ✓ |
| RWIS | 3 | Curry | 9 | 301.5 | | | Port Orford | Existing | ✓ |
| RWIS | 40 | Curry | 9 | 360 | | | Road Closure Due to Bad Weather | Short-Term | ✓ |
| RWIS | 42 | Curry | 9 | 330 | | | Road Closure Due to Bad Weather | Short-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Preclearance | 6 | Curry | 9 | 355 | | N/S | Near Existing Weigh Station | Short-Term | ✓ |
| Weigh in Motion | 22 | Curry | 9 | 355 | | N/S | Near Existing Weigh Station | Medium-Term | ✓ |

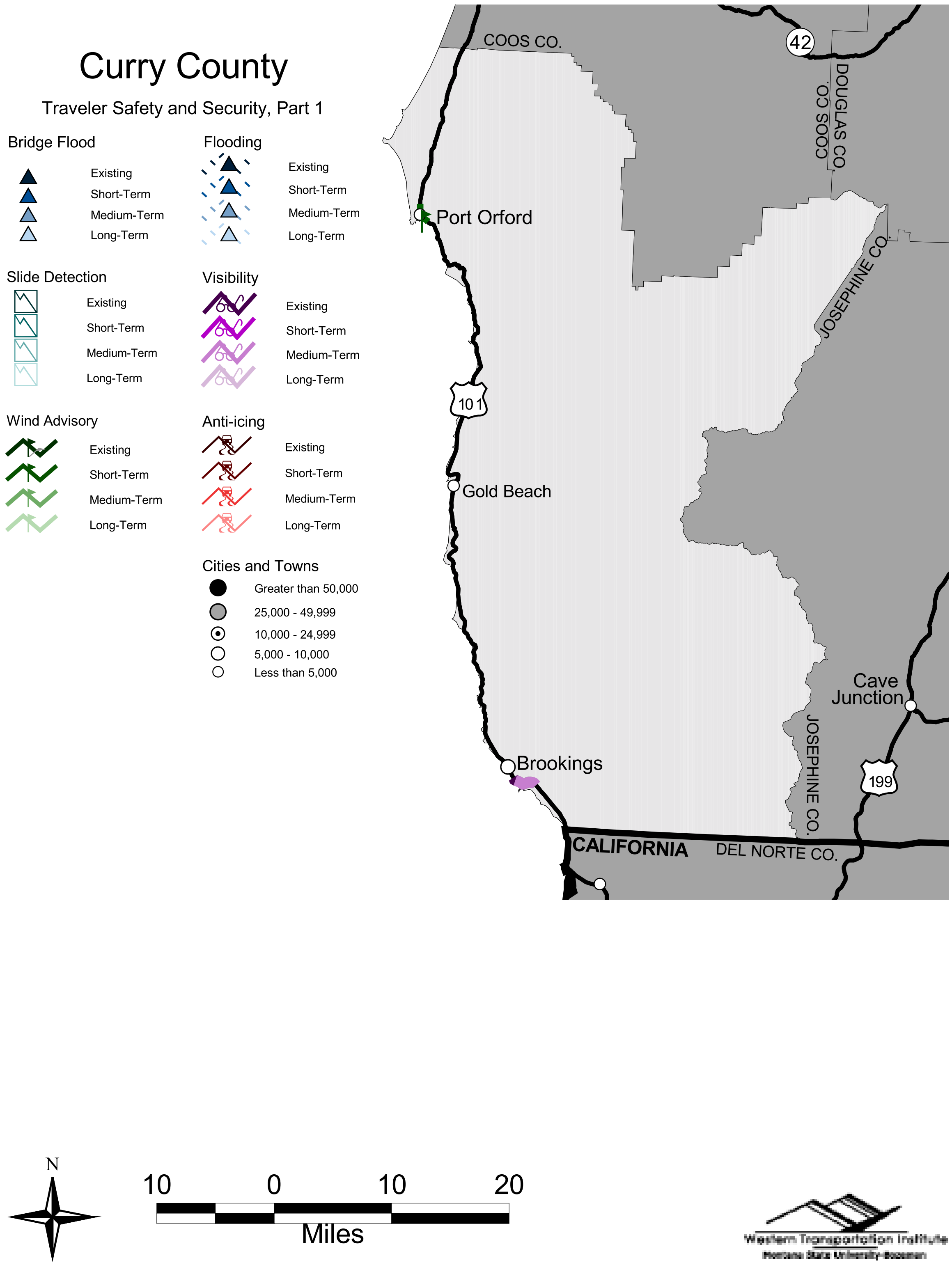



**Figure G-9:** Traveler Safety and Security (Part 1) in Curry County.

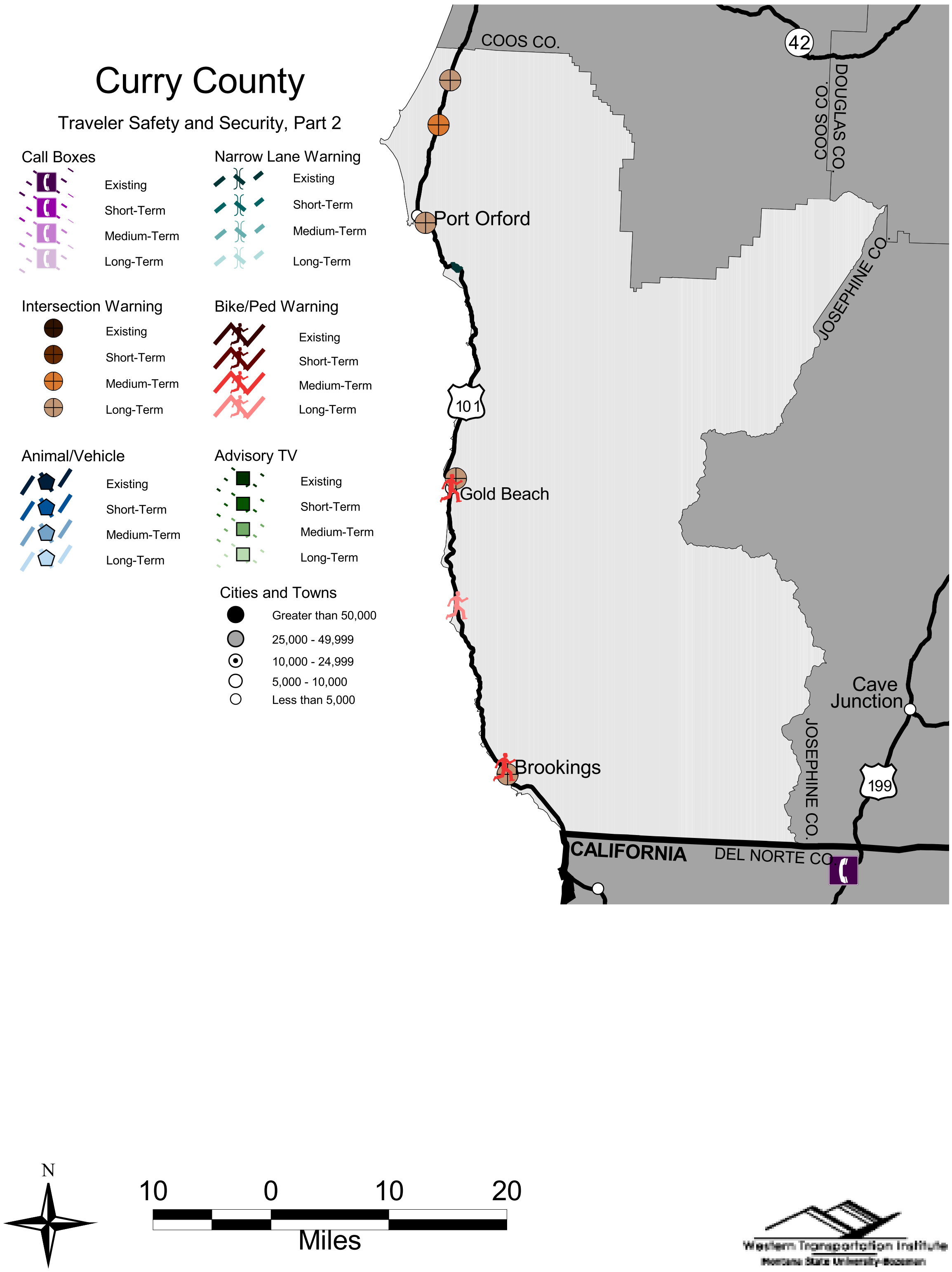



**Figure G-10:** Traveler Safety and Security (Part 2) in Curry County.

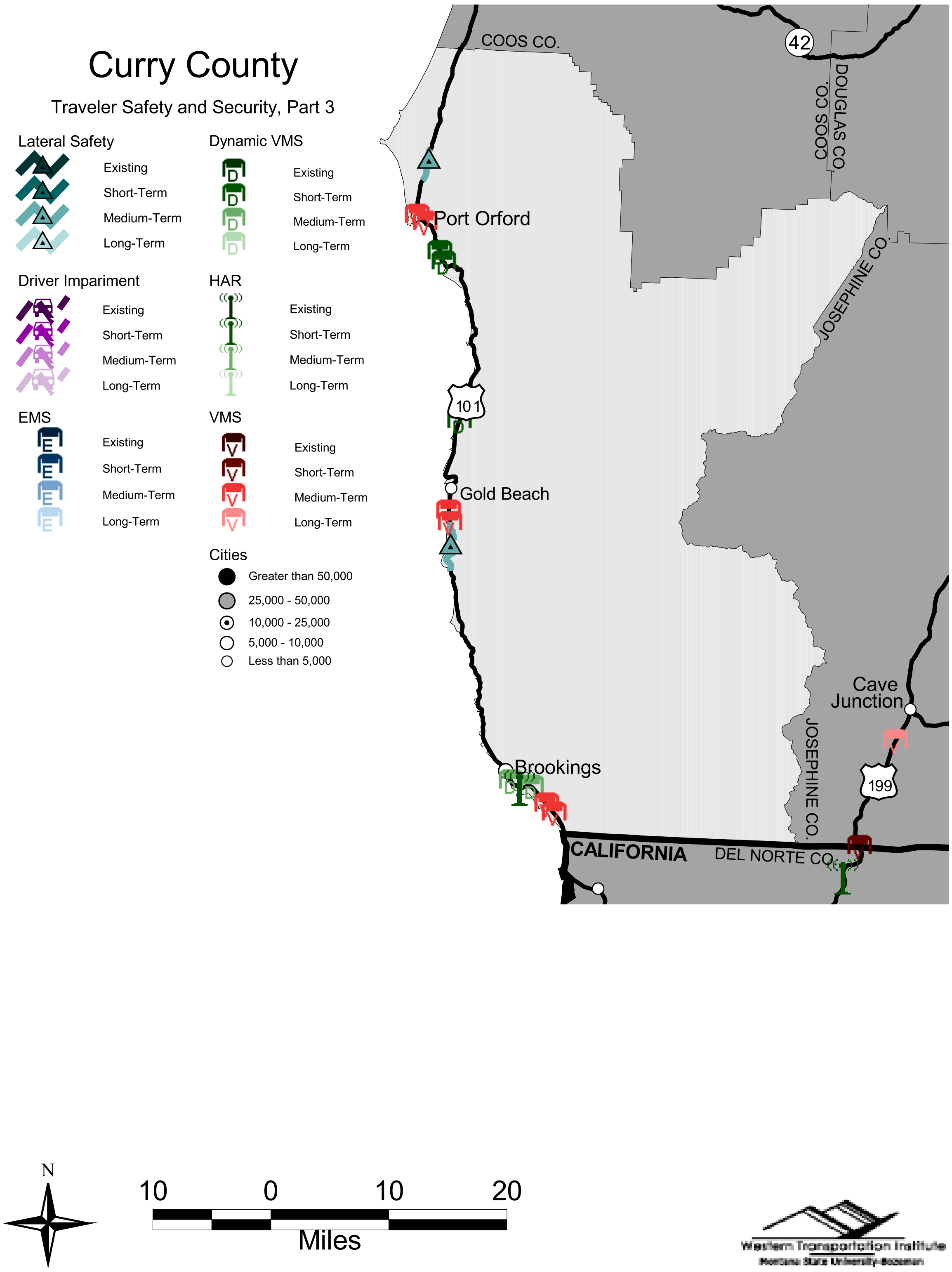



**Figure G-11:** Traveler Safety and Security (Part 3) in Curry County.

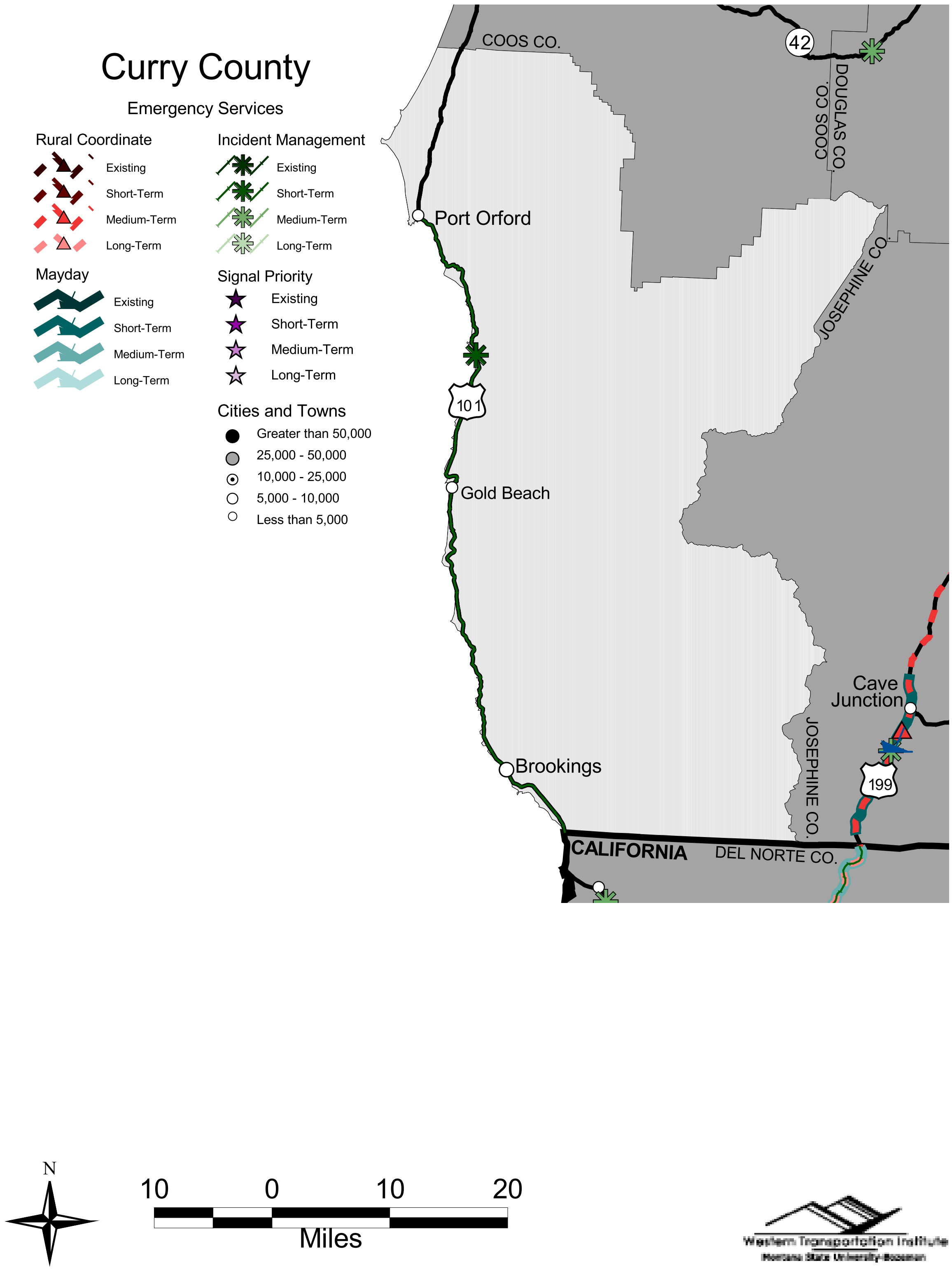



**Figure G-12:** Emergency Services in Curry County.

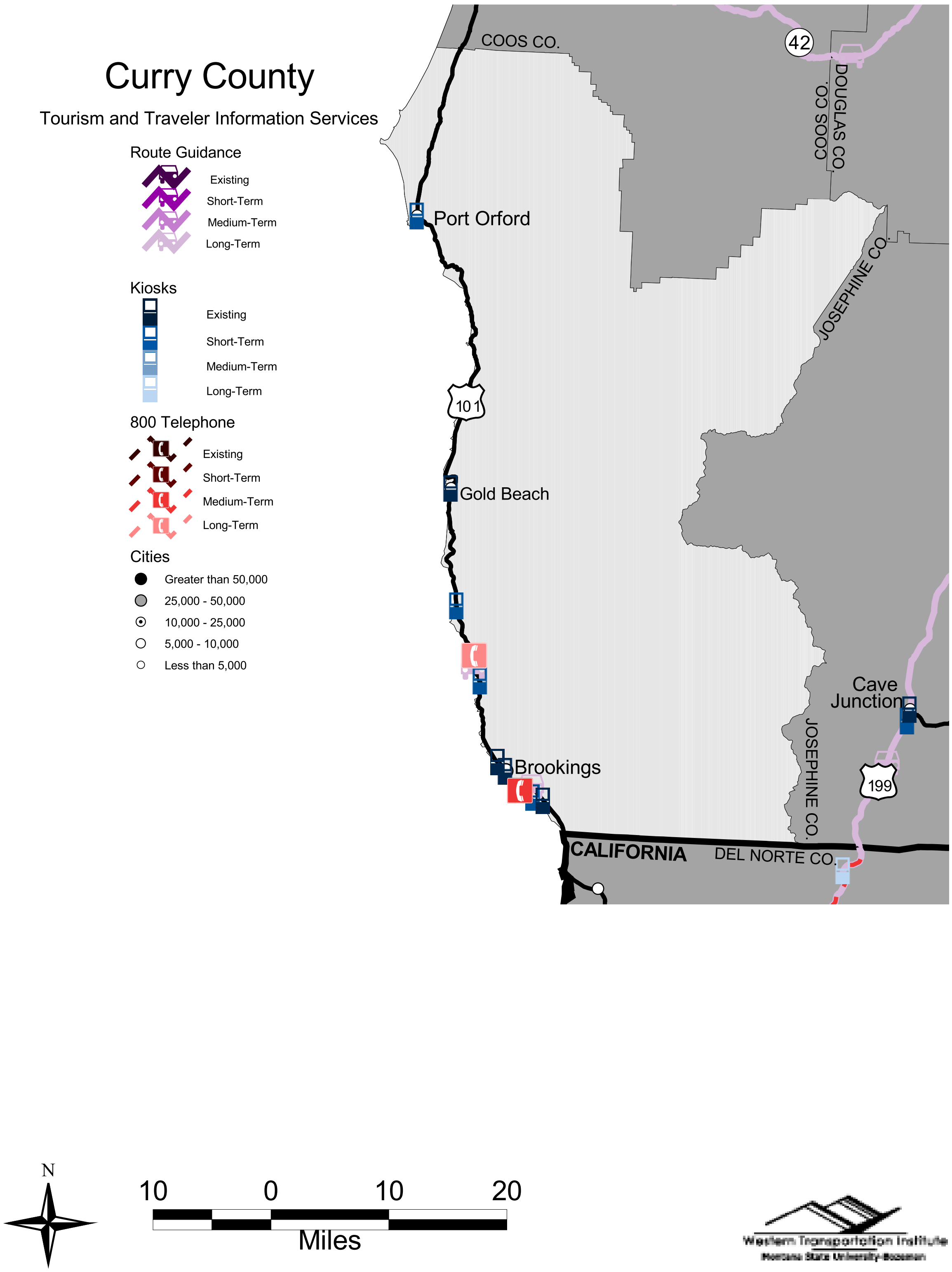



**Figure G-13:** Tourism and Traveler Information Services in Curry County.

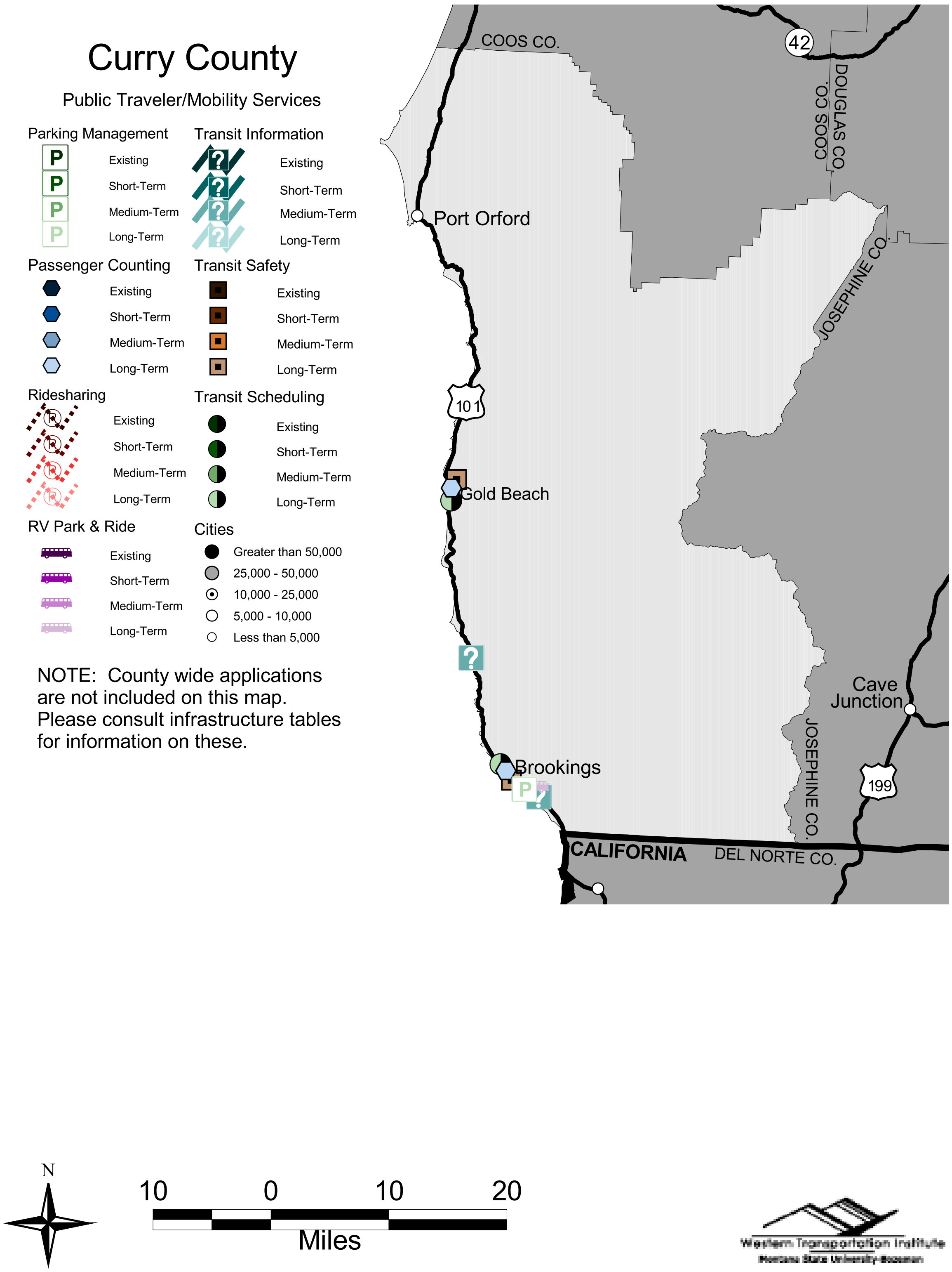



**Figure G-14:** Public Traveler/Mobility Services in Curry County.

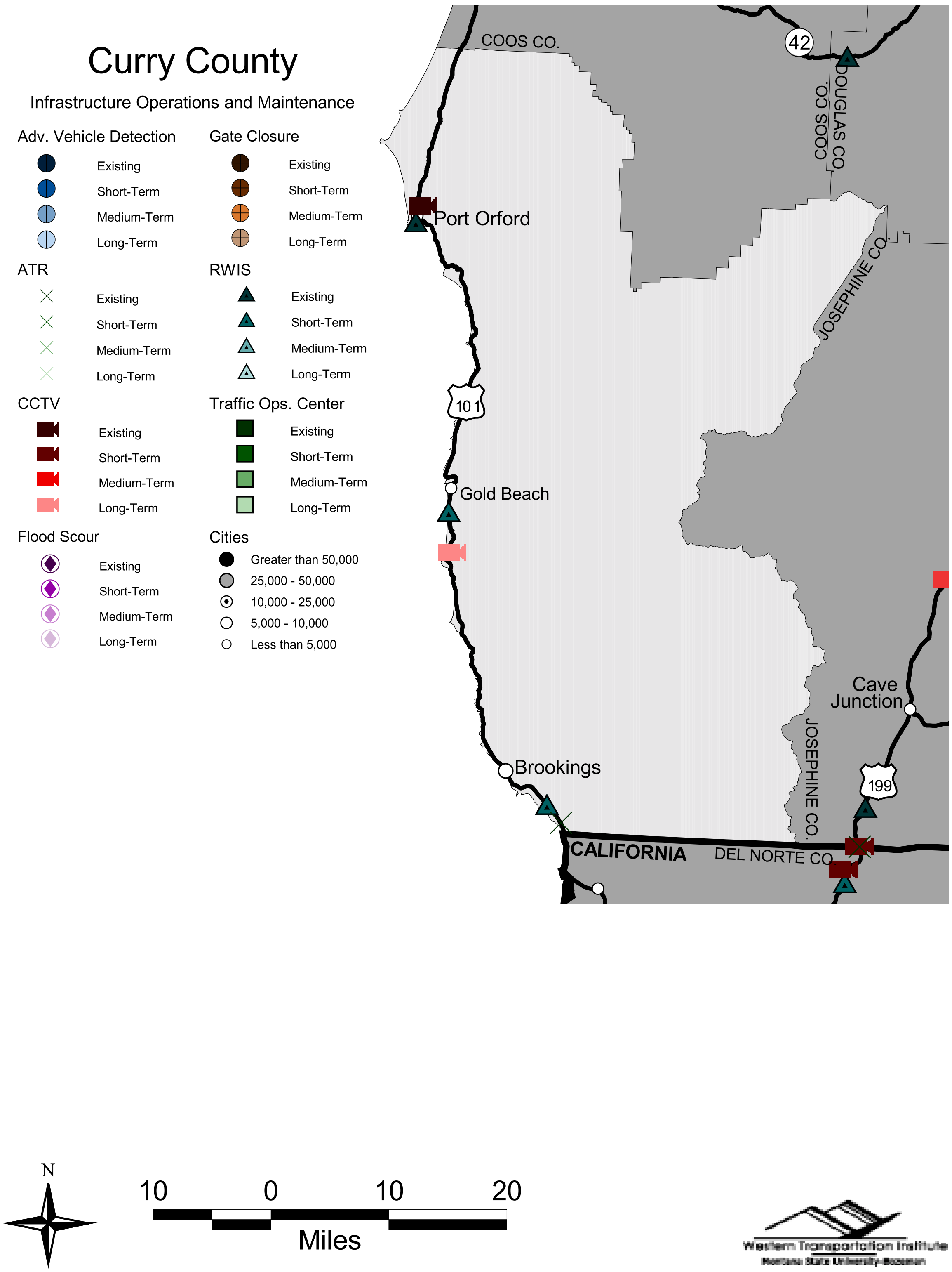



**Figure G-15:** Infrastructure Operations and Maintenance in Curry County.

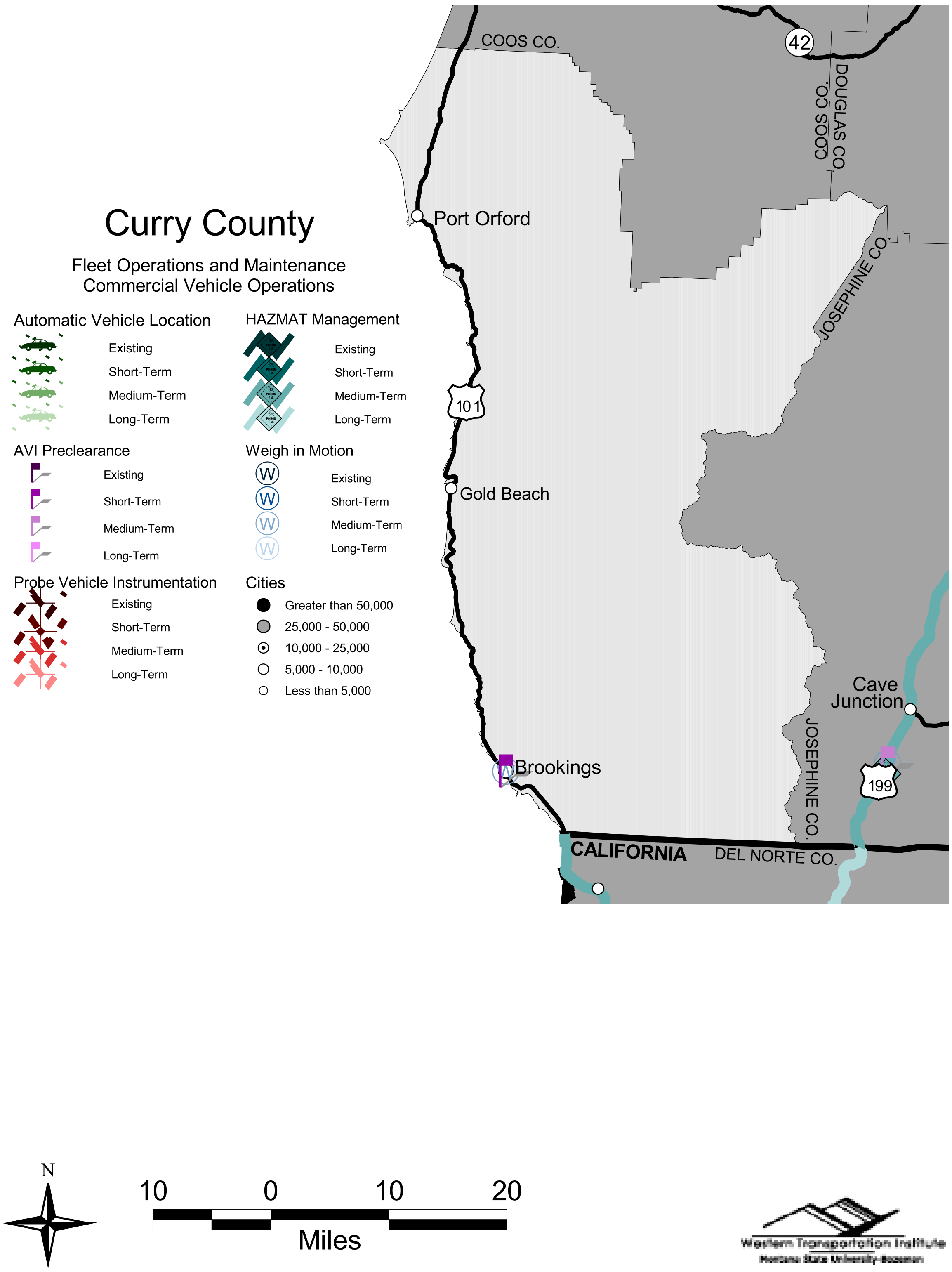



**Figure G-16:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Curry County.

**Table G-4:** Deployment Locations in Deschutes, Jefferson and Linn Counties.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 2 | Deschutes | 15 | 76.65 | 88 | | Oversize Veh Warning (MP 55 to Sisters) | Short-Term | ✓ |
| Adv. Warning for Narrow Lanes | 22 | Jefferson | 16 | 79.5 | 81.3 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Advanced Bike/Ped Warning | 17 | Deschutes | 4 | 135.97 | | | Bike/ped challenge (Bend) | Medium-Term | ✓ |
| Advisory Television | 1 | Deschutes | 4 | 135.97 | | | Bend | Existing | ✓ |
| Animal/Vehicle Collision Warning | 1 | Deschutes | 4 | 143 | 172.19 | | animal migration | Short-Term | ✓ |
| Animal/Vehicle Collision Warning | 6 | Deschutes | 16 | 92.94 | 99.4 | | Animal related challenge | Medium-Term | ✓ |
| Animal/Vehicle Collision Warning | 7 | Deschutes | 17 | 2.15 | 16.49 | | Animal related challenge | Medium-Term | ✓ |
| Automated Anti-Icing | 6 | Jefferson | 16 | 79.5 | 81.3 | | Road surface challenge | Medium-Term | ✓ |
| Automated Anti-Icing | 13 | Deschutes | 4 | 125.1 | 126.1 | | Bend Viaduct | Long-Term | ✓ |
| Automated Visibility Warning | 4 | Jefferson | 16 | 79.5 | 81.3 | | Visibility challenge | Medium-Term | ✓ |
| Dynamic Warning VMS | 4 | Jefferson | 16 | 84.9 | | West | Visibility Challenge | Short-Term | ✓ |
| | | | | 83.1 | | East | | | |
| Dynamic Warning VMS | 24 | Deschutes | 4 | 141.3 | | N | Lava Butte | Long-Term | ✓ |
| | | | | 143.3 | | S | | | |
| Highway Advisory Radio | 42 | Deschutes | 7 | 0 | | | Major Junction | Medium-Term | ✓ |
| Highway Advisory Radio | 47 | Jefferson | 16 | 80.77 | | | Santiam Pass | Medium-Term | ✓ |
| Highway Advisory Radio | 48 | Deschutes | 16 | 100.03 | | | Sisters | Medium-Term | ✓ |
| Highway Advisory Radio | 49 | Deschutes | 17 | 12 | | | Hwy 17 to Sisters | Medium-Term | ✓ |
| Highway Advisory Radio | 50 | Deschutes | 7 | 4 | | | Pilot Butte | Medium-Term | ✓ |
| Lateral Safety Warning System | 18 | Jefferson | 16 | 79.5 | 81.3 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Motorist-Aide Call Box | 82 | Deschutes | 7 | 0 | 69.25 | | Notification time challenge | Medium-Term | ✓ |
| Variable Message Sign | 20 | Linn | 162 | 81.74 | | East | Santiam Jct | Existing | ✓ |
| Variable Message Sign | 54 | Deschutes | 17 | 0 | | North | All Criteria | Short-Term | ✓ |
| Variable Message Sign | 55 | Deschutes | 4 | 168.04 | | North | La Pine | Short-Term | ✓ |
| Variable Message Sign | 89 | Deschutes | 15 | 95 | | West | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 96 | Deschutes | 7 | 42.64 | | East | Brothers Maintenance Station | Medium-Term | ✓ |
| Variable Message Sign | 97 | Deschutes | 4 | 140 | | North | Before Baker Road | Medium-Term | ✓ |
| Variable Message Sign | 150 | Deschutes | 15 | 91 | | East | All Criteria | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 13 | Deschutes | 7 | 0 | 69.25 | | Notification time challenge | Medium-Term | ✓ |
| Regional Incident Management Plan | 13 | Deschutes | 4 | 138.1 | 170 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 14 | Linn | 16 | 71.5 | 81 | | Road Closure | Short-Term | ✓ |
| | | Jefferson | 16 | 81 | 90.85 | | | | |
| | | Deschutes | 16 | 90.85 | 101 | | | | |
| Regional Incident Management Plan | 28 | Deschutes | 17 | 0 | 18.51 | | | Medium-Term | ✓ |
| Regional Incident Management Plan | 35 | Deschutes | 7 | 0 | 69.25 | | Road Closure | Long-Term | ✓ |
| Rural Coordinate Addressing System | 11 | Deschutes | 7 | 0 | 69.25 | | Notification time challenge | Medium-Term | ✓ |
| Traffic Signal Priority for Emergency Vehicles | 3 | Deschutes | 15 | 111.9 | | | Signal preemption - downtown Redmond | Medium-Term | |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| In-Vehicle Route Guidance System | 39 | Deschutes | 4 | 140 | 170 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 40 | Deschutes | 7 | 0 | 69.25 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 42 | Linn | 16 | 71.5 | 81 | | Road Closure Locations | Long-Term | ✓ |
| | | Jefferson | 16 | 81 | 90.85 | | | | |
| | | Deschutes | 16 | 90.85 | 100.36 | | | | |
| Kiosks | 44 | Deschutes | 372 | 21.98 | | | Mt. Bachelor | Short-Term | ✓ |
| Kiosks | 45 | Jefferson | 16 | 80.77 | | | Hoodoo/Santiam Pass | Short-Term | ✓ |

**Table G-4:** Deployment Locations in Deschutes, Jefferson and Linn Counties (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services (cont.)** | | | | | | | | | |
| Kiosks | 66 | Deschutes | 4 | 125.54 | | | Bend Chamber of Commerce | Medium-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 16 | Deschutes | 4 | 135.97 | | | Bend | Long-Term | ✓ |
| Automated Passenger Counting | 31 | Crook | | | | | Crook, Jefferson, Deschutes Co | Long-Term | |
| Automated Passenger Counting | 33 | Deschutes | | | | | Crook, Jefferson, Deschutes Co | Long-Term | ✓ |
| Automated Passenger Counting | 36 | Jefferson | | | | | Deschutes & Jefferson County | Long-Term | ✓ |
| On-Board Transit Safety Systems | 16 | Deschutes | 4 | 135.97 | | | Bend | Long-Term | ✓ |
| On-Board Transit Safety Systems | 31 | Crook | | | | | Crook, Jefferson, Deschutes Co | Long-Term | |
| On-Board Transit Safety Systems | 33 | Deschutes | | | | | Crook, Jefferson, Deschutes Co | Long-Term | ✓ |
| On-Board Transit Safety Systems | 36 | Jefferson | | | | | Deschutes & Jefferson County | Long-Term | ✓ |
| Parking Management & Information System | 2 | Deschutes | 4 | 139 | | | Bend | Short-Term | ✓ |
| Parking Management & Information System | 8 | Deschutes | 15 | 111.9 | | | Redmond Fairgrounds | Medium-Term | |
| Recreational Veh. Park and Ride Lots | 3 | Deschutes | 4 | 139 | | | Bend | Short-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 4 | Deschutes | 7<br>4 | 0<br>145 | | | Mt. Bachelor Park & Ride - Bend | Short-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 9 | Deschutes | 15 | 111.9 | | | Redmond Fairgrounds | Medium-Term | |
| Transit Traveler Information | 29 | Deschutes | 4 | 135.97 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 2 | Crook | | | | | Crook, Jefferson, Deschutes Co | Medium-Term | |
| Transit Vehicle Routing/Scheduling | 9 | Deschutes | 4 | 135.97 | | | Bend | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 17 | Deschutes | | | | | Crook, Jefferson, Deschutes Co | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 18 | Jefferson | | | | | Deschutes & Jefferson County | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 4 | Deschutes | 15 | 88 | | | Oversize Veh Warning (MP 55 to Sisters) | Short-Term | ✓ |
| Advanced Vehicle Detection | 60 | Jefferson | 16 | 80.4 | | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Automated Gate Closure | 1 | Jefferson | 16 | 80.77 | | | Santiam Pass | Short-Term | ✓ |
| Automated Gate Closure | 4 | Deschutes | 15 | 77 | | | | Short-Term | ✓ |
| Automatic Traffic Recorder | 241 | Deschutes | 7 | 5 | | | 5 miles east of Bend | Existing | ✓ |
| Automatic Traffic Recorder | 256 | Deschutes | 4 | 138.57 | | | 2.6 miles south of Bend | Existing | ✓ |
| Automatic Traffic Recorder | 270 | Deschutes | 372 | 19.25 | | | 0.4 mile west of road to Sunriver | Existing | ✓ |
| Closed-Circuit Television Camera | 13 | Deschutes | 4 | 167 | | | La Pine | Existing | ✓ |
| Closed-Circuit Television Camera | 14 | Jefferson | 4 | 106 | | | Juniper Butte | Existing | |
| Closed-Circuit Television Camera | 15 | Deschutes | 4 | 113 | | | Crooked River Bridge Construction Project | Existing | |
| Closed-Circuit Television Camera | 16 | Deschutes | 4 | 136.39 | | | Bend: Hill @ Division | Existing | ✓ |
| Closed-Circuit Television Camera | 17 | Deschutes | 4 | 137.12 | | | Bend: Division @ Revere | Existing | ✓ |
| Closed-Circuit Television Camera | 19 | Jefferson | 16 | 80 | | | Santiam Pass | Existing | ✓ |
| Closed-Circuit Television Camera | 20 | Deschutes | 4 | 151 | | | Lava Butte | Existing | ✓ |
| Closed-Circuit Television Camera | 21 | Deschutes | 4 | 136.3 | | | Bend: Butler Market @ Division | Existing | ✓ |
| Closed-Circuit Television Camera | 96 | Deschutes | 7 | 15 | | | Response time challenge | Short-Term | ✓ |
| Closed-Circuit Television Camera | 105 | Deschutes | 7 | 0 | | | Response time challenge | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 106 | Deschutes | 7 | 4 | | | Response time challenge | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 107 | Deschutes | 7 | 42.64 | | | Response time challenge | Medium-Term | ✓ |
| Closed-Circuit Television Camera | 146 | Deschutes | 7 | 62 | | | Response time challenge | Long-Term | ✓ |
| RWIS | 9 | Jefferson | 16 | 80.77 | | | Santiam Pass | Existing | ✓ |
| RWIS | 20 | Deschutes | 4 | 136 | | | Bend | Existing | ✓ |
| RWIS | 23 | Jefferson | 4 | 106 | | | Juniper Butte | Existing | |
| RWIS | 24 | Deschutes | 4 | 167 | | | La Pine | Existing | ✓ |

**Table G-4:** Deployment Locations in Deschutes, Jefferson and Linn Counties (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| RWIS | 25 | Deschutes | 4 | 135 | | | North Canal | Existing | ✓ |
| RWIS | 29 | Deschutes | 4 | 151 | | | Lava Butte | Existing | ✓ |
| RWIS | 30 | Jefferson | 16 | 87 | | | Suttle Lake | Existing | ✓ |
| RWIS | 31 | Deschutes | 372 | 17 | | | Wanoga Butte | Existing | ✓ |
| RWIS | 34 | Deschutes | 7 | 21 | | | Horse Ridge | Existing | ✓ |
| RWIS | 65 | Deschutes | 7 | 42.64 | | | Brothers Maintenance Station | Medium-Term | ✓ |
| RWIS | 103 | Deschutes | 7 | 62 | | | Hampton | Long-Term | ✓ |
| Satellite Traffic Operations Center | 5 | Deschutes | 7 | 0 | | | Bend | Existing | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 1 | Deschutes | 4 | 135.97 | | | Bend | Short-Term | ✓ |
| Automatic Vehicle Location | 2 | Jefferson | 16 | 80.77 | | | Santiam Pass | Short-Term | ✓ |
| Automatic Vehicle Location | 12 | Deschutes | 7 | 42.64 | 69.25 | | Brothers to Burns | Long-Term | ✓ |
| Probe Vehicle Instrumentation | 1 | Deschutes | 17 | 0 | 18.51 | | Bend-to-Sisters Demo Project | Short-Term | ✓ |
| Probe Vehicle Instrumentation | 3 | Jefferson | 16 | 79.5 | 81.3 | | Road Surface and Speed Challenge | Medium-Term | ✓ |
| **Commerical Vehicle Operations** | | | | | | | | | |
| Preclearance | 28 | Deschutes | 7 | 11.6 | | E/W | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 13 | Deschutes | 7 | 11.6 | | E/W | Near Existing Weigh Station | Short-Term | ✓ |
| Weigh in Motion | 14 | Deschutes | 4 | 142.27 | | | Lava Butte | Short-Term | ✓ |

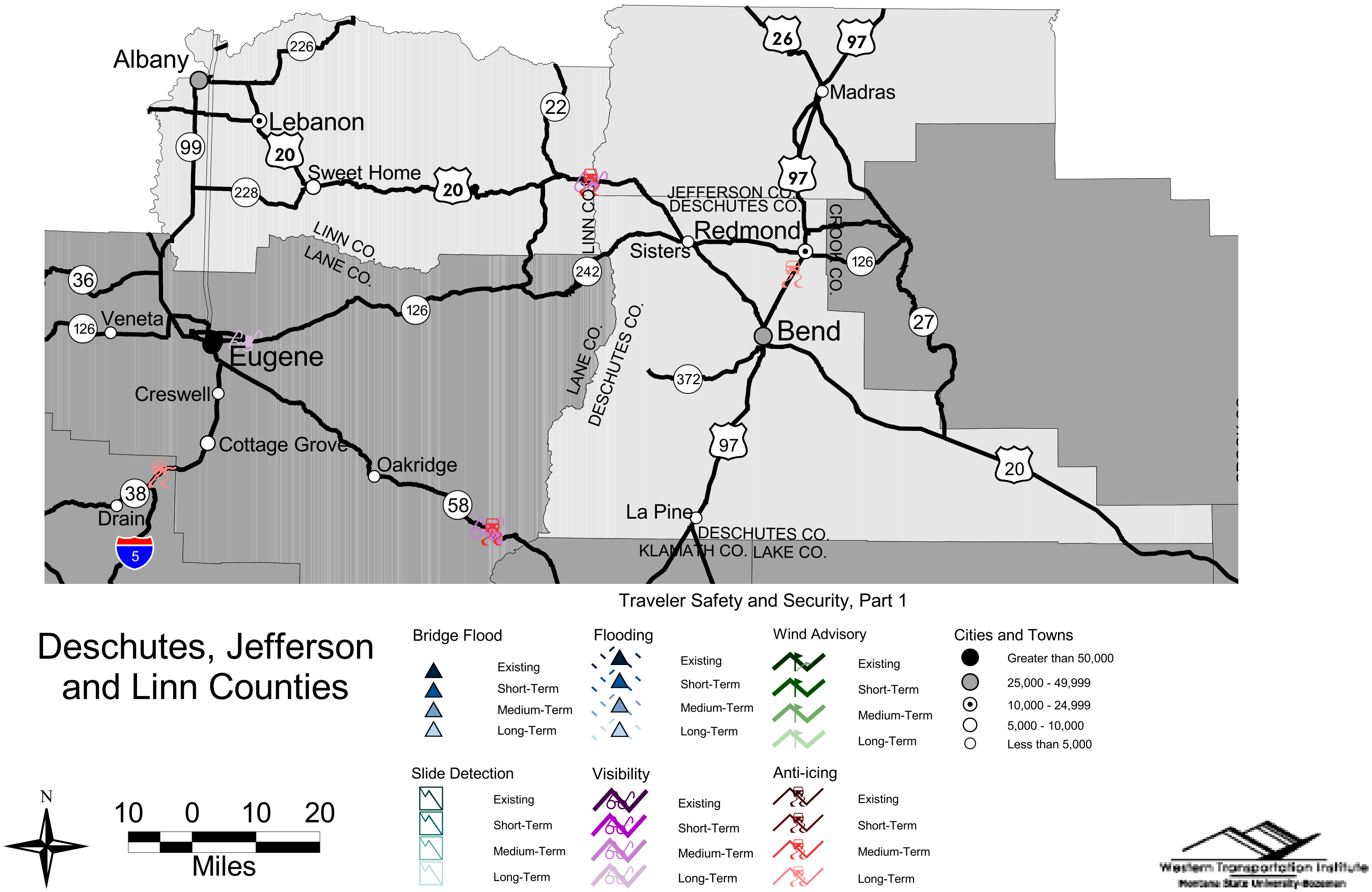



**Figure G-17:** Traveler Safety and Security (Part 1) in Deschutes, Jefferson and Linn Counties.

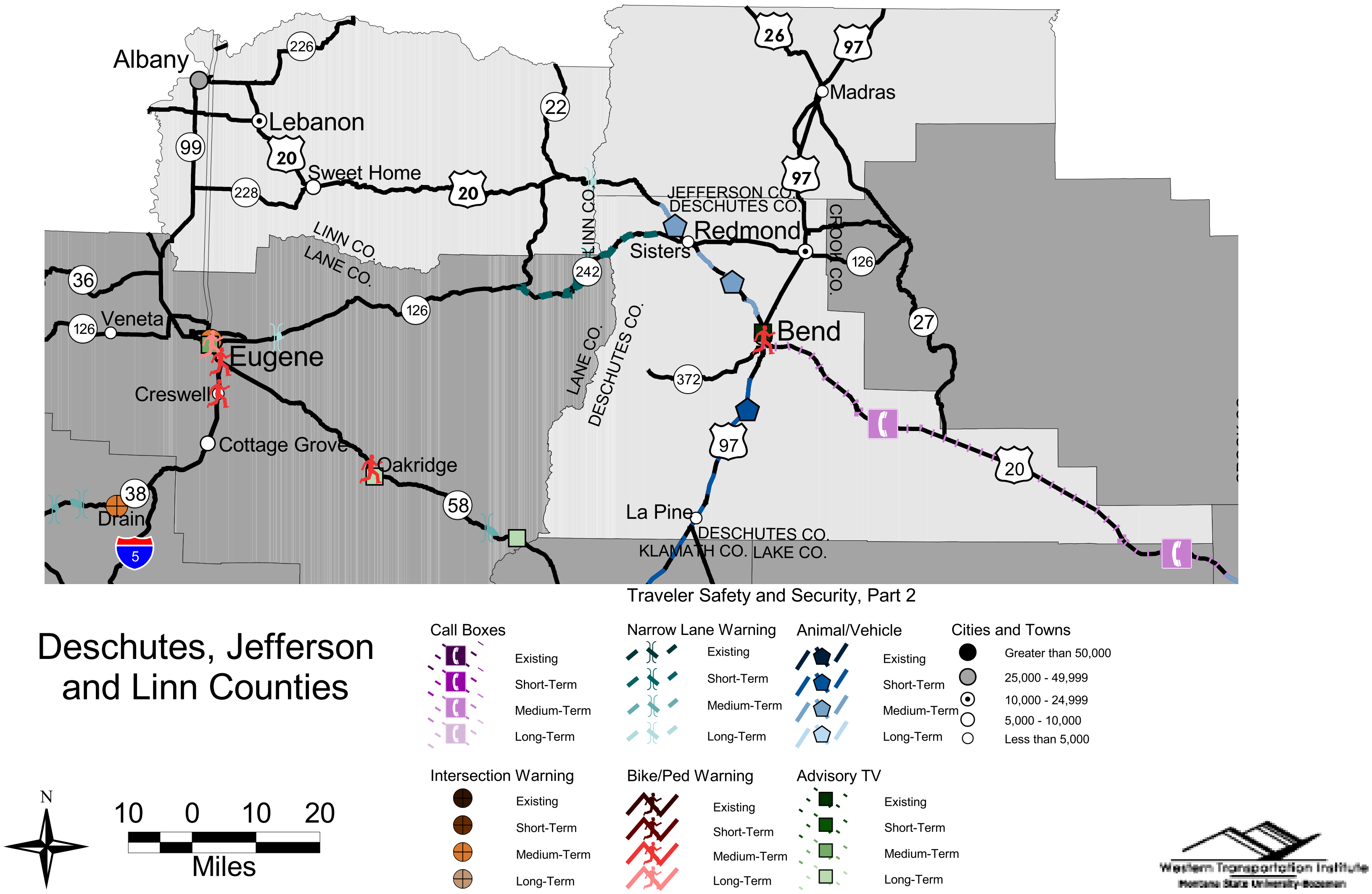



**Figure G-18:** Traveler Safety and Security (Part 2) in Deschutes, Jefferson and Linn Counties.

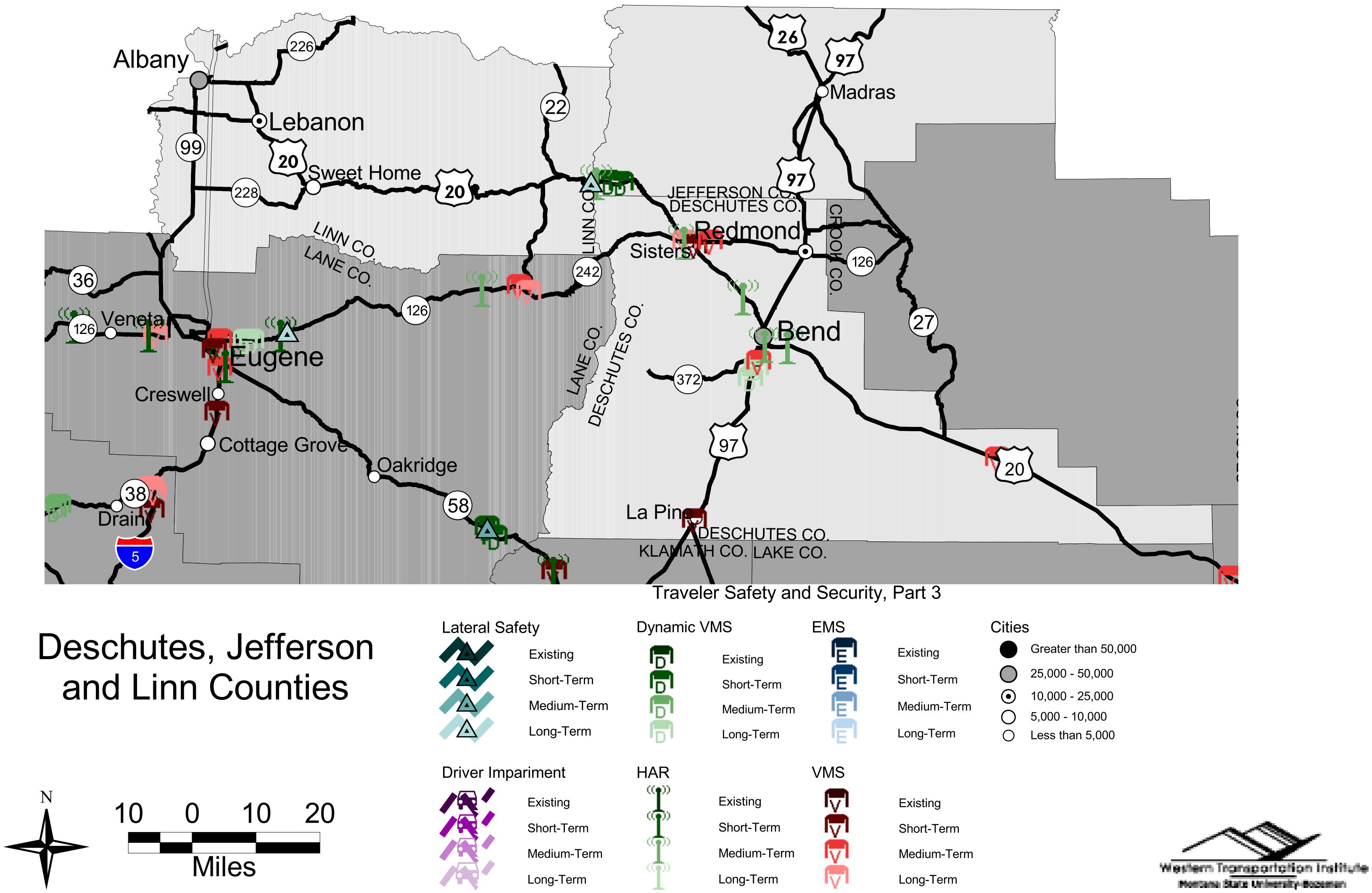



**Figure G-19:** Traveler Safety and Security (Part 3) in Deschutes, Jefferson and Linn Counties.

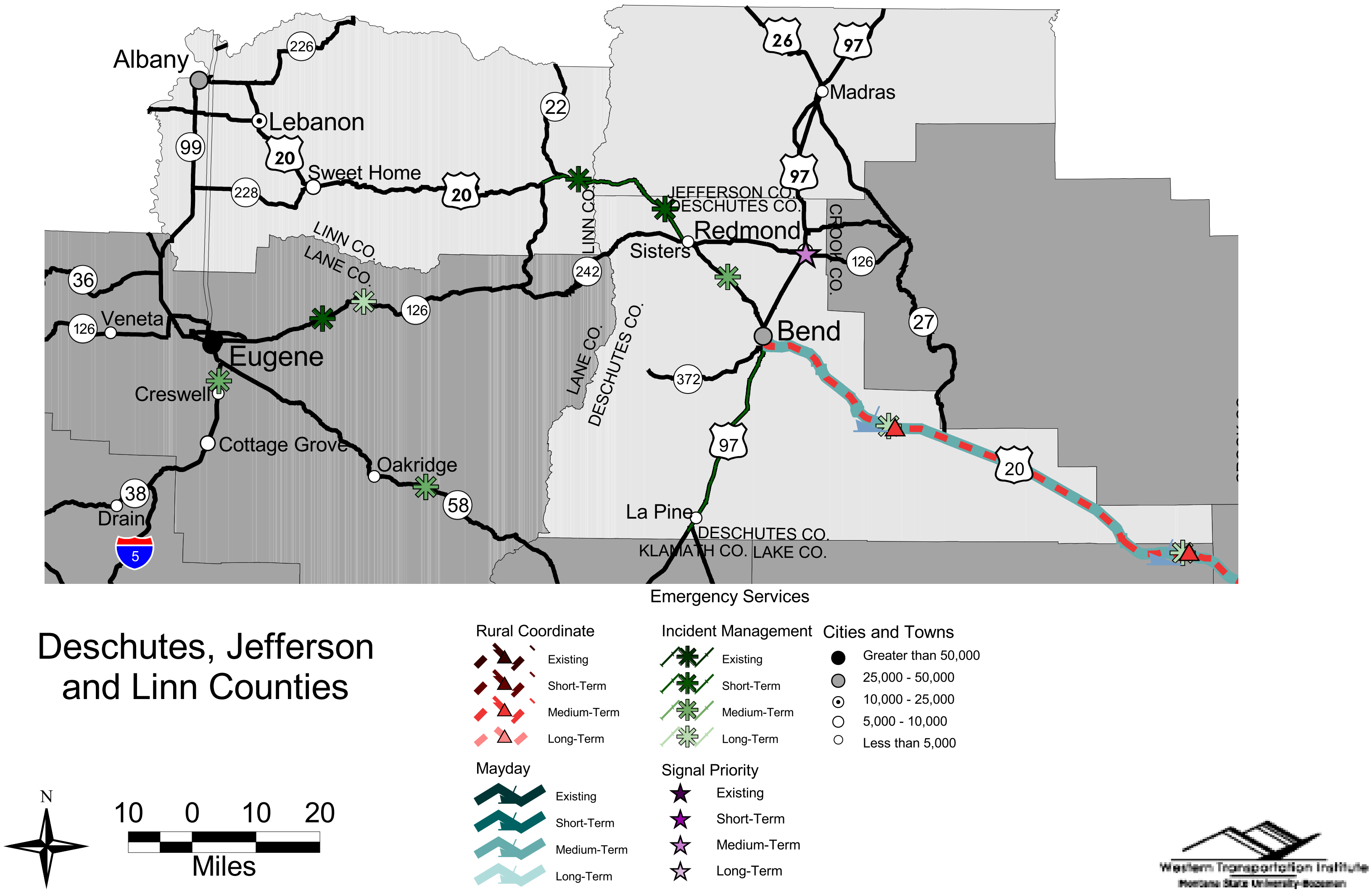



**Figure G-20:** Emergency Services in Deschutes, Jefferson and Linn Counties.

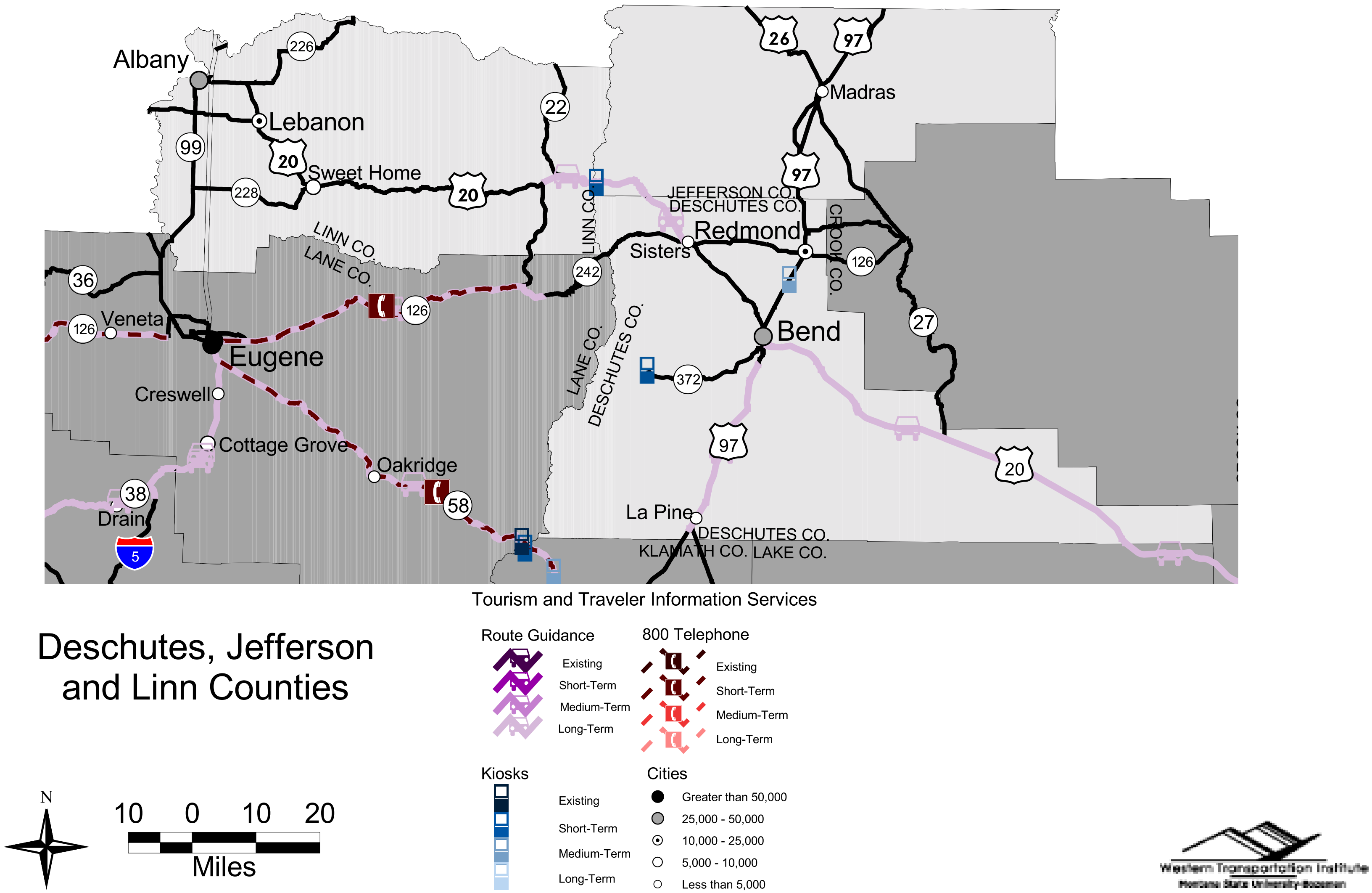



**Figure G-21:** Tourism and Traveler Information Services in Deschutes, Jefferson and Linn Counties.

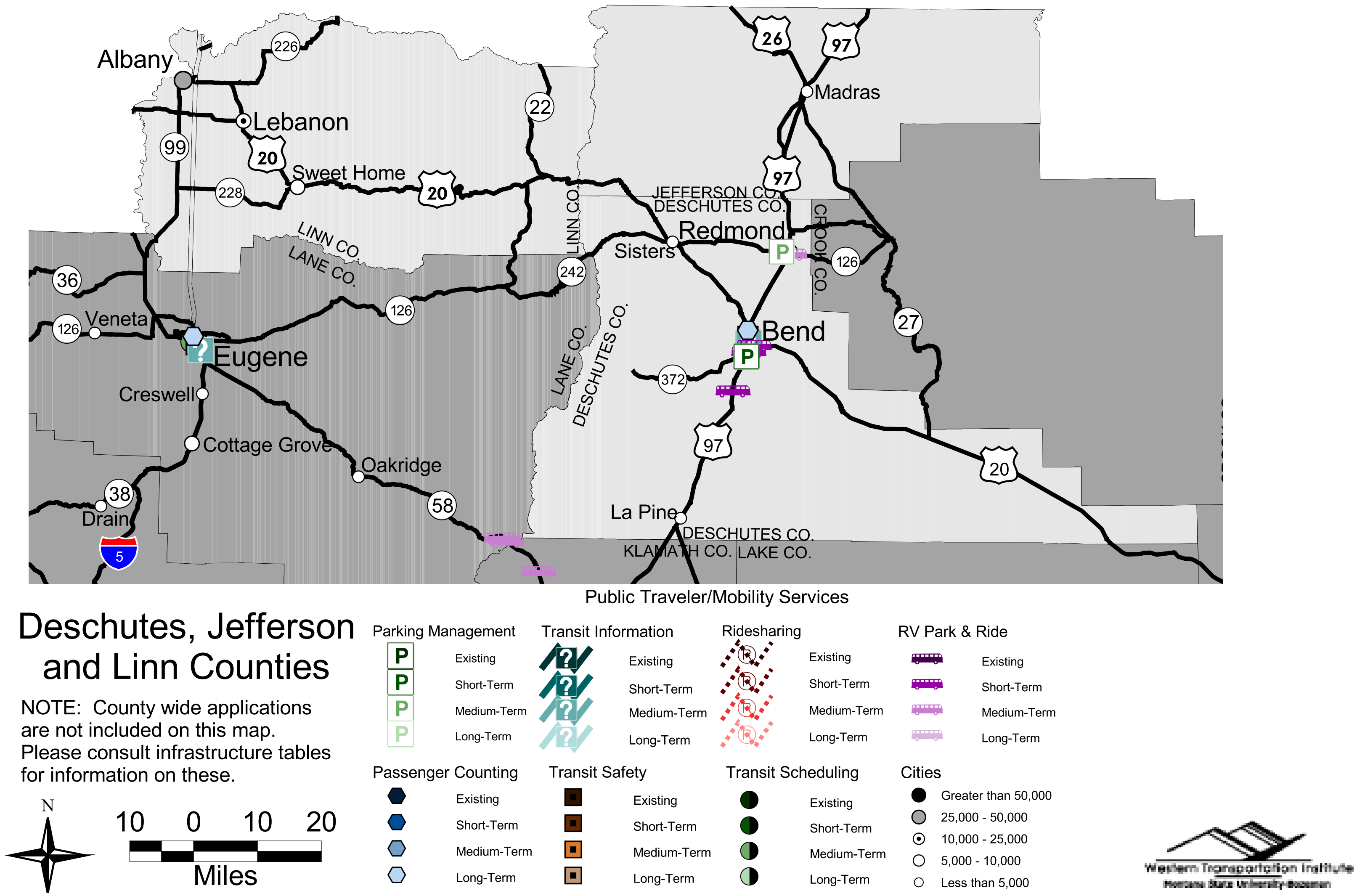



**Figure G-22:** Public Traveler/Mobility Services in Deschutes, Jefferson and Linn Counties.

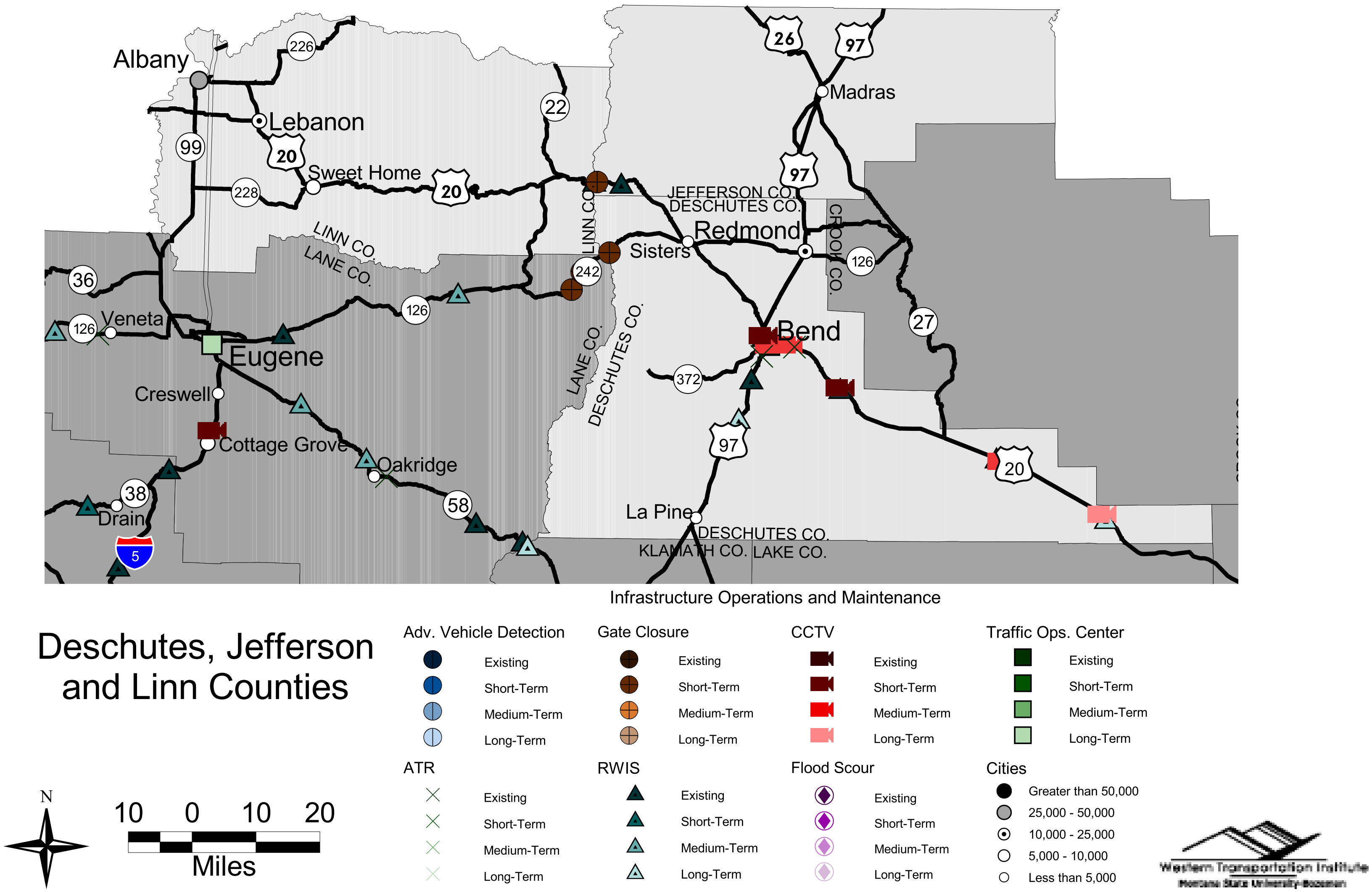



**Figure G-23:** Infrastructure Operations and Maintenance in Deschutes, Jefferson and Linn Counties.

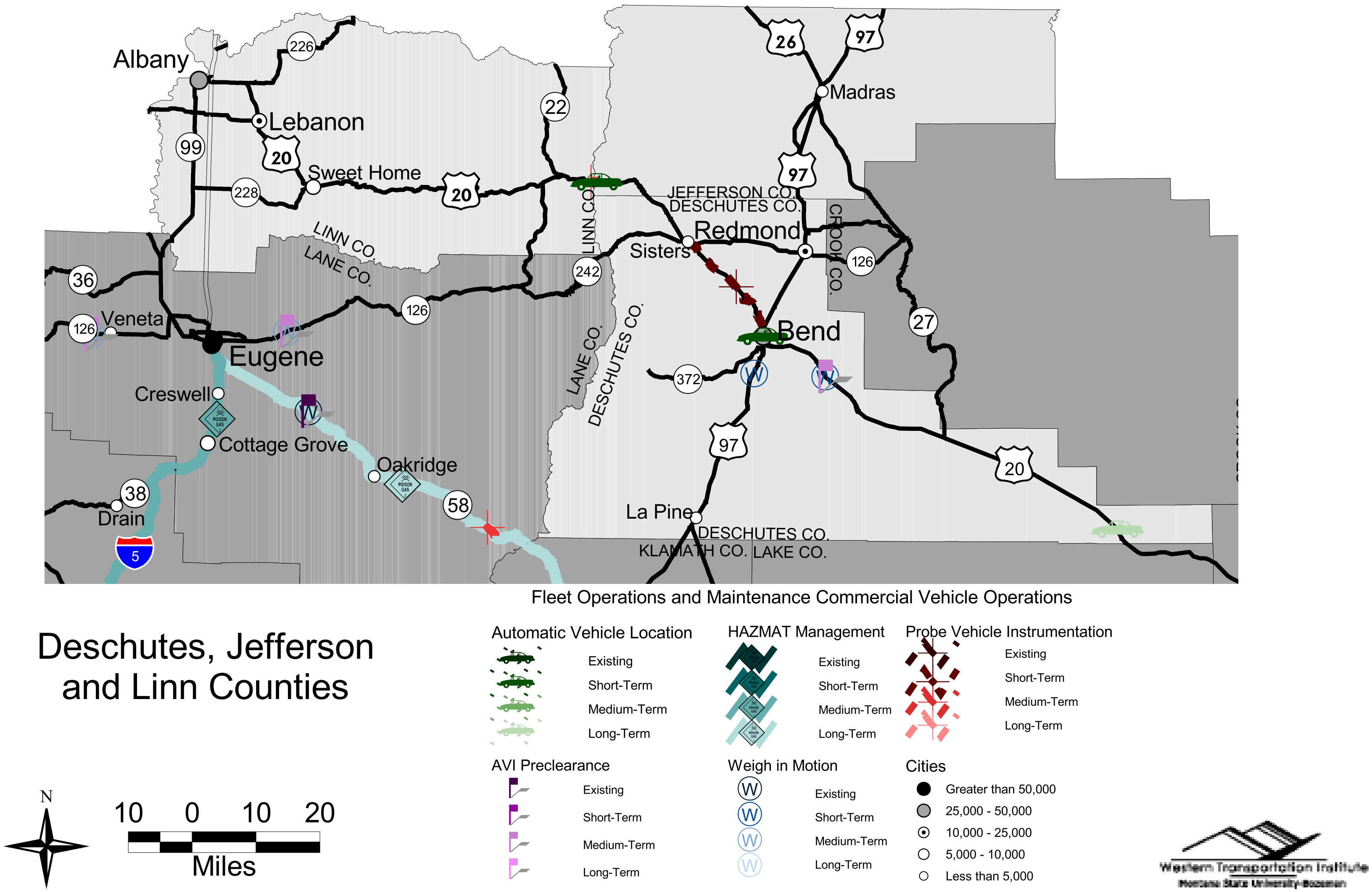



**Figure G-24:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Deschutes, Jefferson and Linn Counties.

**Table G-5:** Deployment Locations in Douglas County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 15 | Douglas | 45 | 42 | 46 | | | Medium-Term | ✓ |
| Adv. Warning for Narrow Lanes | 16 | Douglas | 45 | 38.5 | 39.5 | | Elkton Tunnel | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 14 | Douglas | 35 | 72.74 | | | Bike/ped challenge (Winston) | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 18 | Douglas | 9 | 211.11 | | | Bike/ped challenge (Florence) | Medium-Term | ✓ |
| Advisory Television | 22 | Douglas | 1 | 124.14 | | | Roseburg | Long-Term | ✓ |
| Automated Anti-Icing | 2 | Douglas | 231 | 15.5 | 16.5 | | | Short-Term | ✓ |
| Automated Anti-Icing | 12 | Douglas | 73 | 80 | 86.01 | | Diamond Lake Section | Long-Term | ✓ |
| Automated Anti-Icing | 15 | Douglas | 1 | 162 | 168 | | | Long-Term | ✓ |
| Automated Flood Warning | 4 | Douglas | 9 | 211.46 | 214.46 | | Highway 38/101 (around Reedsport) | Short-Term | ✓ |
| Automated Flood Warning | 4 | Douglas | 45 | 0 | 2.5 | | Highway 38/101 (around Reedsport) | Short-Term | ✓ |
| Automated Visibility Warning | 1 | Douglas | 1 | 80.8 | 101 | | Azalea Pass/Canyonville to Grants Pass | Short-Term | ✓ |
| Automated Visibility Warning | 6 | Douglas | 35 | 57.53 | 59.53 | | Camas Summit (outside Roseburg) | Medium-Term | ✓ |
| Driver Impairment Detection | 4 | Douglas | 1 | 80.8 | 101 | | Azalea Pass/Canyonville to Grants Pass | Long-Term | ✓ |
| Dynamic Warning VMS | 2 | Douglas | 231 | 13.5 | | W | Tyee Curves | Short-Term | ✓ |
| | | | | 12.5 | | E | | | |
| Dynamic Warning VMS | 10 | Douglas | 45 | 39.5 | | W | Tunnel Debris | Medium-Term | ✓ |
| | | | | 38.5 | | E | | | |
| Dynamic Warning VMS | 17 | Douglas | 9 | 211.6 | | South | Visibility Challenge | Medium-Term | ✓ |
| | | | | 213 | | North | | | |
| Dynamic Warning VMS | 19 | Douglas | 1 | 108.5 | | S | Myrtle Creek curves | Medium-Term | ✓ |
| | | | | 107.5 | | N | | | |
| Highway Advisory Radio | 41 | Douglas | 9 | 212 | | | Visibility, Tourism | Medium-Term | ✓ |
| Highway Advisory Radio | 46 | Douglas | 1 | 122 | | | Roseburg | Medium-Term | ✓ |
| Highway Advisory Radio | 65 | Douglas | 73 | 72 | | | Mt. Bailey | Long-Term | ✓ |
| Intersection Advance Warning | 1 | Douglas | 35 | 72.74 | | | Intersection safety challenge | Medium-Term | ✓ |
| Intersection Advance Warning | 5 | Douglas | 45 | 50.2 | | | Drain/Cedar Street | Medium-Term | ✓ |
| Intersection Advance Warning | 13 | Douglas | 9 | 211.11 | | | Intersection safety challenge | Long-Term | ✓ |
| Motorist-Aide Call Box | 74 | Douglas | 1 | 89 | 92 | | | Short-Term | ✓ |
| Variable Message Sign | 30 | Douglas | 1 | 81 | | S | For management of passes north of Grants Pass | Short-Term | ✓ |
| Variable Message Sign | 76 | Douglas | 73 | 86.01 | | South | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 77 | Douglas | 1 | 118 | | North | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 78 | Douglas | 73 | 0 | | West | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 79 | Douglas | 1 | 125 | | South | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 83 | Douglas | 9 | 208 | | South | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 136 | Douglas | 233 | 23.8 | | South | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 139 | Douglas | 35 | 76.75 | | East | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 145 | Douglas | 1 | 161 | | North | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 146 | Douglas | 45 | 57.13 | | East | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 147 | Douglas | 45 | 0 | | West | All Criteria | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 16 | Douglas | 233 | 5.99 | 24.25 | | | Medium-Term | ✓ |
| Regional Incident Management Plan | 11 | Douglas | 1 | 80.8 | 119 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 15 | Douglas | 73 | 0 | 86.01 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 23 | Douglas | 45 | 0 | 36.44 | | Debris-related closure | Medium-Term | ✓ |
| Regional Incident Management Plan | 24 | Douglas | 1 | 119 | 168.01 | | | Medium-Term | ✓ |
| Regional Incident Management Plan | 27 | Douglas | 35 | 44.95 | 77 | | Road Closure | Medium-Term | ✓ |

**Table G-5:** Deployment Locations in Douglas County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 22 | Douglas | 1 | 99.09 | | | Tourist Locations | Medium-Term | ✓ |
| 800 Travel Advisory | 27 | Douglas | 9 | 205 | | | Tourist Locations | Medium-Term | ✓ |
| In-Vehicle Route Guidance System | 23 | Douglas | 1 | 80.8 | 120 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 25 | Douglas | 35 | 44.95 | 76.75 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 34 | Douglas | 73 | 0 | 86.01 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 35 | Douglas | 9 | 205 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 36 | Douglas | 45 | 0 | 57.13 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 37 | Douglas | 1 | 160 | 168 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 17 | Douglas | 1 | 98.28 | | | Canyonville | Existing | ✓ |
| Kiosks | 18 | Douglas | 1 | 124.14 | | | Roseburg | Existing | ✓ |
| Kiosks | 19 | Douglas | 1 | 124.14 | | | Roseburg | Existing | ✓ |
| Kiosks | 20 | Douglas | 35 | 72.74 | | | Winston | Existing | ✓ |
| Kiosks | 22 | Douglas | 73 | 16.34 | | | Glide | Existing | ✓ |
| Kiosks | 23 | Douglas | 73 | 50 | | | | Existing | ✓ |
| Kiosks | 24 | Douglas | 73 | 78.83 | | | Diamond Lake | Existing | ✓ |
| Kiosks | 37 | Douglas | 1 | 99.09 | | | Seven Feathers Hotel and Gaming Casino | Short-Term | ✓ |
| Kiosks | 40 | Douglas | 9 | 215 | | | Wayfunding pt: Winchester Bay | Short-Term | ✓ |
| Kiosks | 57 | Douglas | 9 | 205 | | | Oregon Dunes Nation Rec Area | Medium-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 14 | Douglas | 1 | 124.14 | | | Roseburg | Long-Term | ✓ |
| Automated Passenger Counting | 34 | Douglas | | | | | Douglas County | Long-Term | ✓ |
| Dynamic Ridesharing/Paratransit | 3 | Douglas | 9 | 214 | | | Reedsport | Medium-Term | ✓ |
| On-Board Transit Safety Systems | 14 | Douglas | 1 | 124.14 | | | Roseburg | Long-Term | ✓ |
| On-Board Transit Safety Systems | 34 | Douglas | | | | | Douglas County | Long-Term | ✓ |
| Parking Management & Information System | 4 | Douglas | 1 | 99.09 | | | Tourist Locations | Medium-Term | ✓ |
| Parking Management & Information System | 7 | Douglas | 1 | 122 | | | Roseburg | Medium-Term | ✓ |
| Parking Management & Information System | 21 | Douglas | 9 | 205 | | | Tourist Locations | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 7 | Douglas | 1 | 99.09 | | | Seven Feathers Hotel and Gaming Casino | Medium-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 8 | Douglas | 1 | 122 | | | Roseburg | Medium-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 23 | Douglas | 9 | 205 | | | Oregon Dunes Nation Rec Area | Long-Term | ✓ |
| Transit Traveler Information | 18 | Douglas | 1 | 99.09 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 28 | Douglas | 9 | 205 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 4 | Douglas | | | | | Douglas County | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 36 | Douglas | 1 | 124.14 | | | Roseburg | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 11 | Douglas | 9 | 212.96 | | | Highway 38/101 (around Reedsport) | Short-Term | ✓ |
| Advanced Vehicle Detection | 12 | Douglas | 45 | 1.25 | | | Highway 38/101 (around Reedsport) | Short-Term | ✓ |
| Advanced Vehicle Detection | 43 | Douglas | 45 | 44 | | | | Medium-Term | ✓ |
| Advanced Vehicle Detection | 44 | Douglas | 45 | 39 | | | Elkton Tunnel | Medium-Term | ✓ |
| Automatic Traffic Recorder | 247 | Douglas | 45 | 23.68 | | | 6.8 miles east of Scottsburg | Existing | ✓ |
| Automatic Traffic Recorder | 249 | Douglas | 35 | 70.51 | | | 1.2 miles west of Brockway | Existing | ✓ |
| Automatic Traffic Recorder | 265 | Douglas | 73 | 28.3 | | | 1 mile E of Susan Creek State Park | Existing | ✓ |
| Automatic Traffic Recorder | 274 | Douglas | 1 | 143.26 | | | 4.9 miles north of Oakland Junction | Existing | ✓ |
| Closed-Circuit Television Camera | 4 | Douglas | 1 | 168 | | | Wards Butte | Existing | ✓ |
| Closed-Circuit Television Camera | 60 | Douglas | 1 | 124.5 | | | Roseburg | Short-Term | ✓ |
| Closed-Circuit Television Camera | 61 | Douglas | 1 | 120 | | | Near Roseburg | Short-Term | ✓ |

**Table G-5:** Deployment Locations in Douglas County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| Closed-Circuit Television Camera | 98 | Douglas | 233 | 23.8 | | | | Short-Term | ✓ |
| RWIS | 16 | Douglas | 1 | 170 | | | Wards Butte | Existing | ✓ |
| RWIS | 44 | Douglas | 35 | 75.3 | | | Visibility Challenge | Short-Term | ✓ |
| RWIS | 45 | Douglas | 9 | 211.6 | | | Visibility Challenge | Short-Term | ✓ |
| RWIS | 46 | Douglas | 45 | 20 | | | Road Closure Due to Bad Weather | Short-Term | ✓ |
| RWIS | 47 | Douglas | 45 | 45 | | | Road Closure Due to Bad Weather | Short-Term | ✓ |
| RWIS | 53 | Douglas | 231 | 13 | | | Tyee Curves | Short-Term | ✓ |
| RWIS | 69 | Douglas | 233 | 19.53 | | | W. Diamond Lake Hwy | Medium-Term | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 11 | Douglas | 233 | 5.99 | 24.25 | | | Long-Term | ✓ |
| Automatic Vehicle Location | 13 | Douglas | 73 | 0 | 86.01 | | | Long-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 2 | Douglas | 1 | 80.8 | 168 | | | Medium-Term | ✓ |
| Preclearance | 4 | Douglas | 1 | 130.03 | | S | Wilbur | Existing | ✓ |
| Weigh in Motion | 7 | Douglas | 1 | 130.03 | | S | Wilbur | Existing | ✓ |

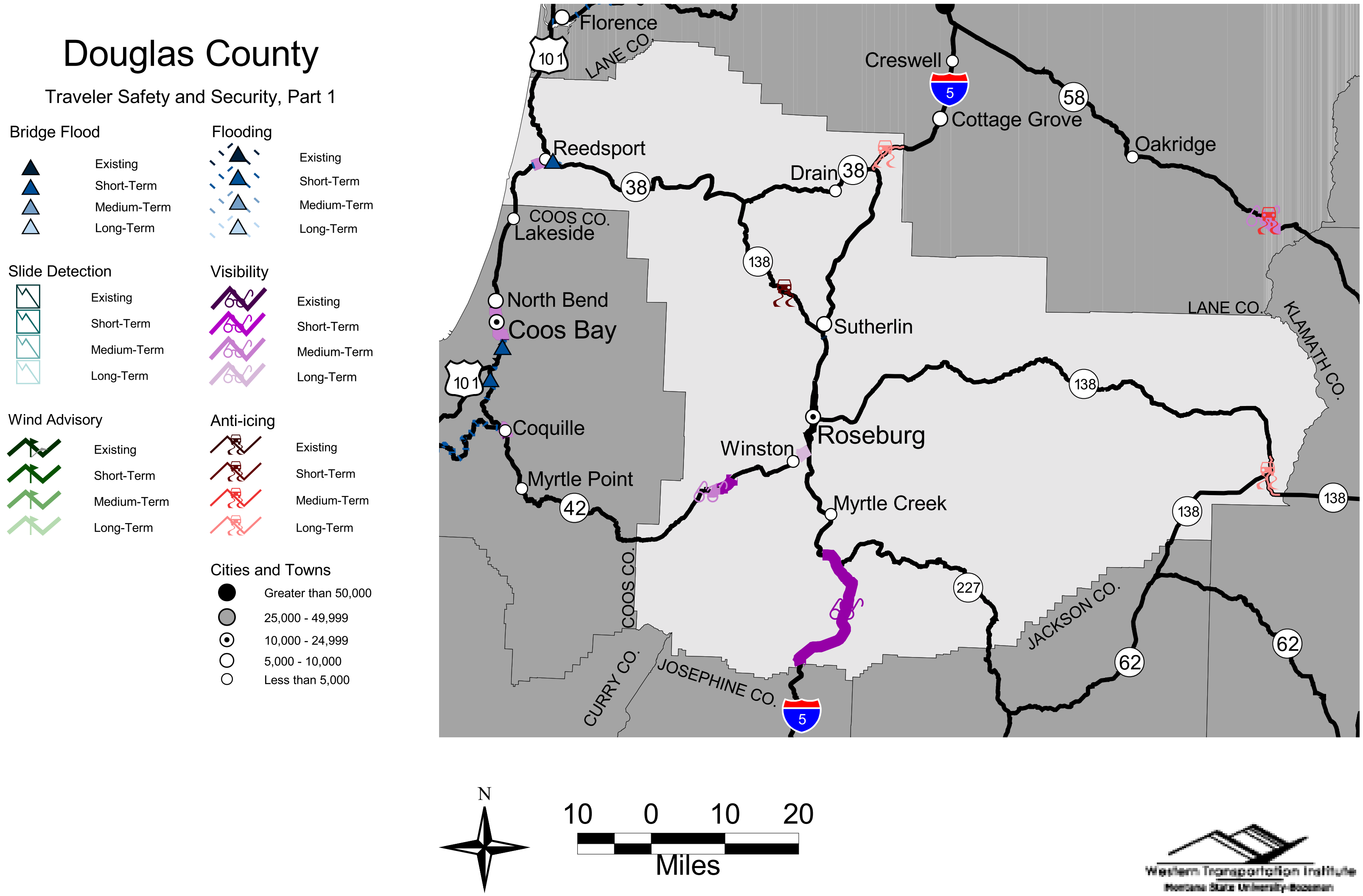



**Figure G-25:** Traveler Safety and Security (Part 1) in Douglas County.

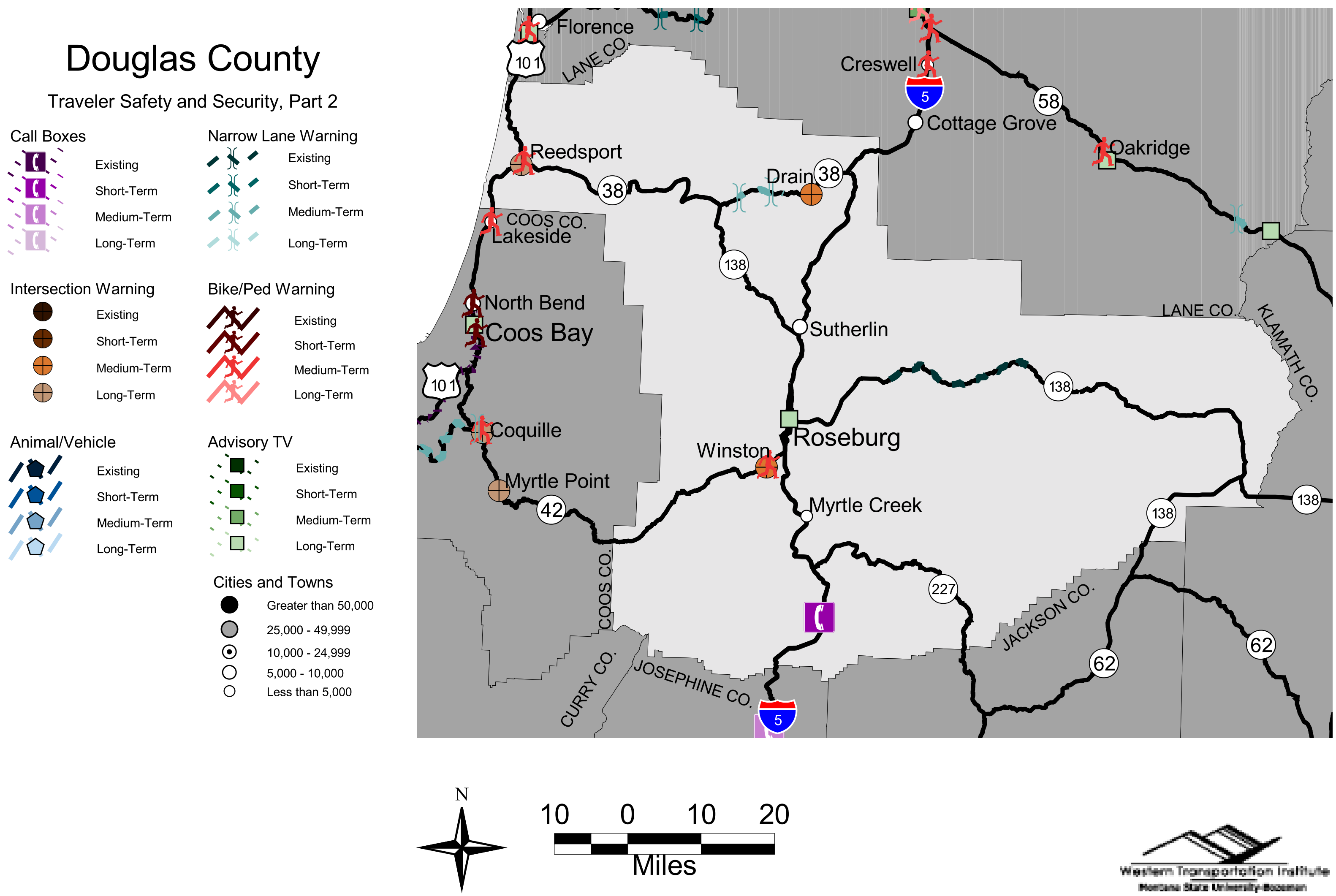



**Figure G-26:** Traveler Safety and Security (Part 2) in Douglas County.

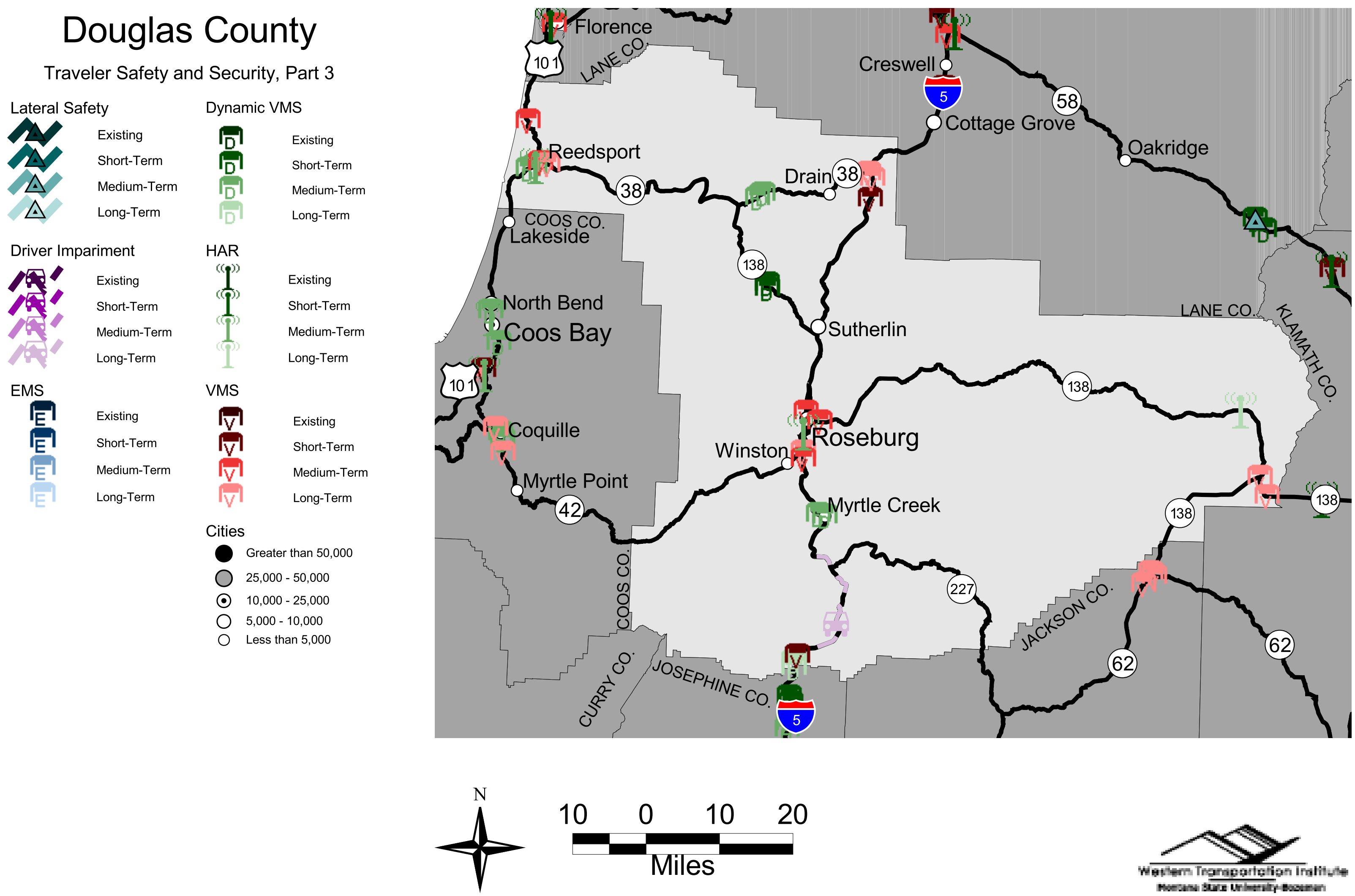



**Figure G-27:** Traveler Safety and Security (Part 3) in Douglas County.

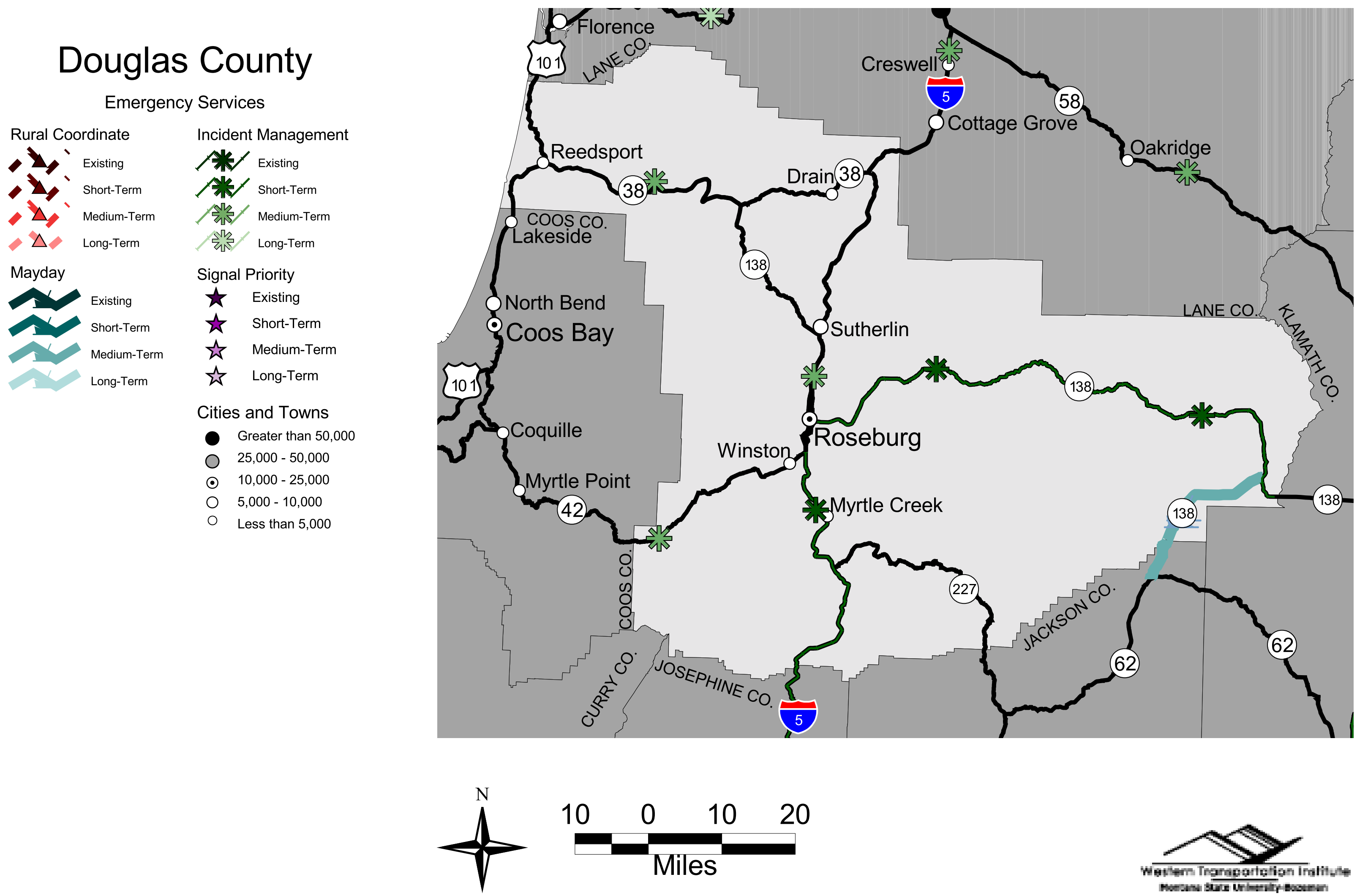



**Figure G-28:** Emergency Services in Douglas County.

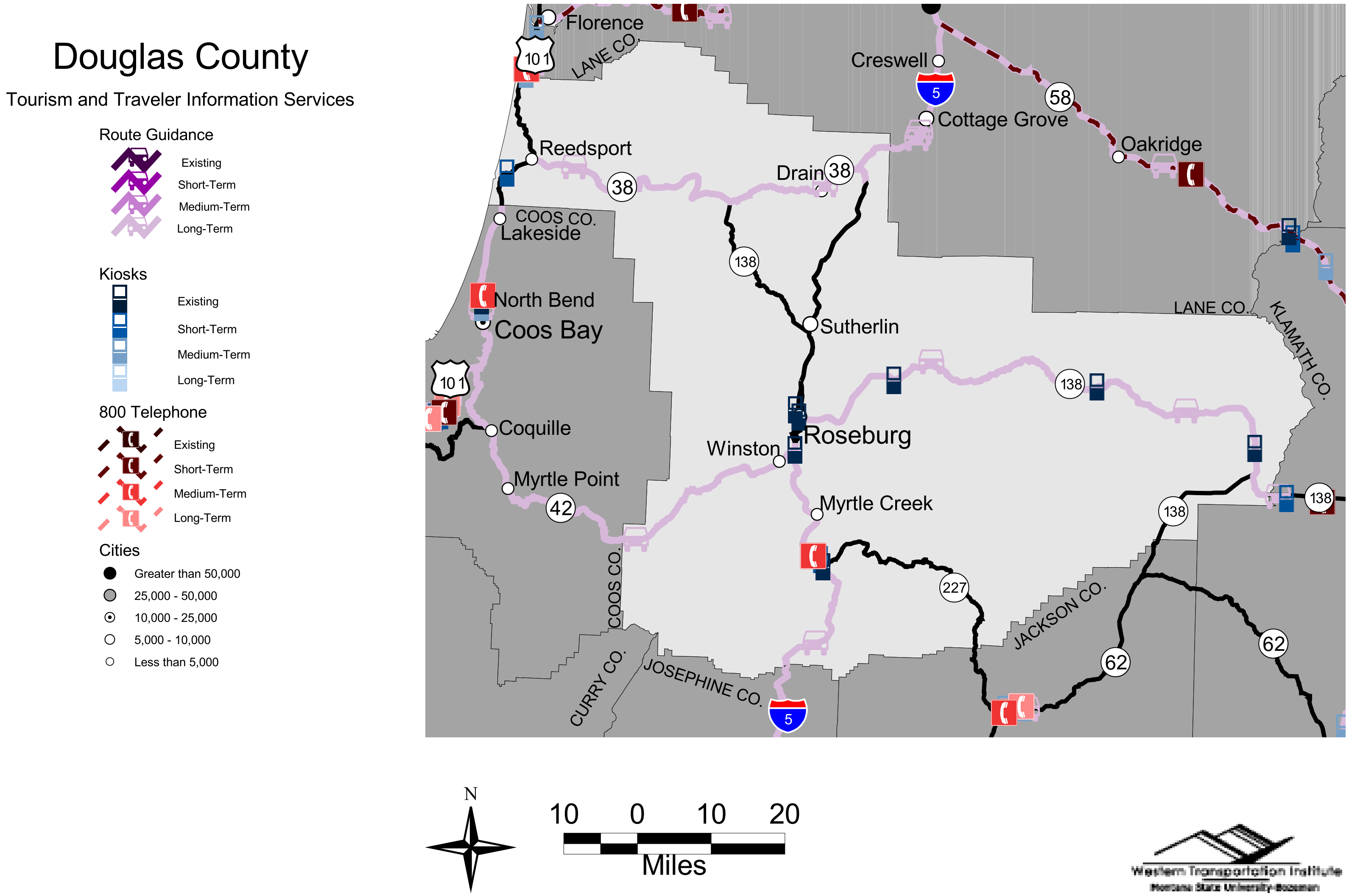



**Figure G-29:** Tourism and Traveler Information Services in Douglas County.

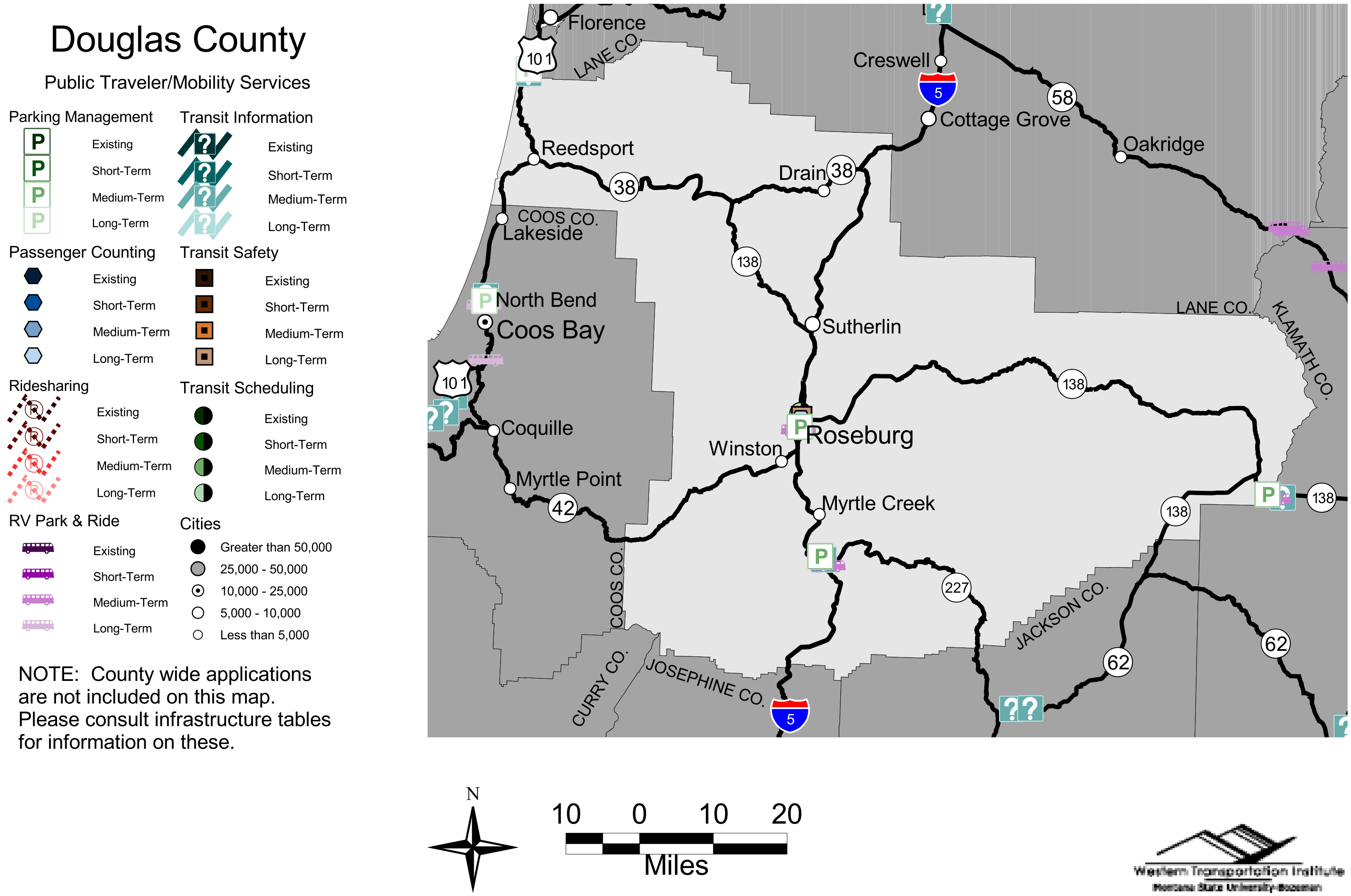



**Figure G-30:** Public Traveler/Mobility Services in Douglas County.

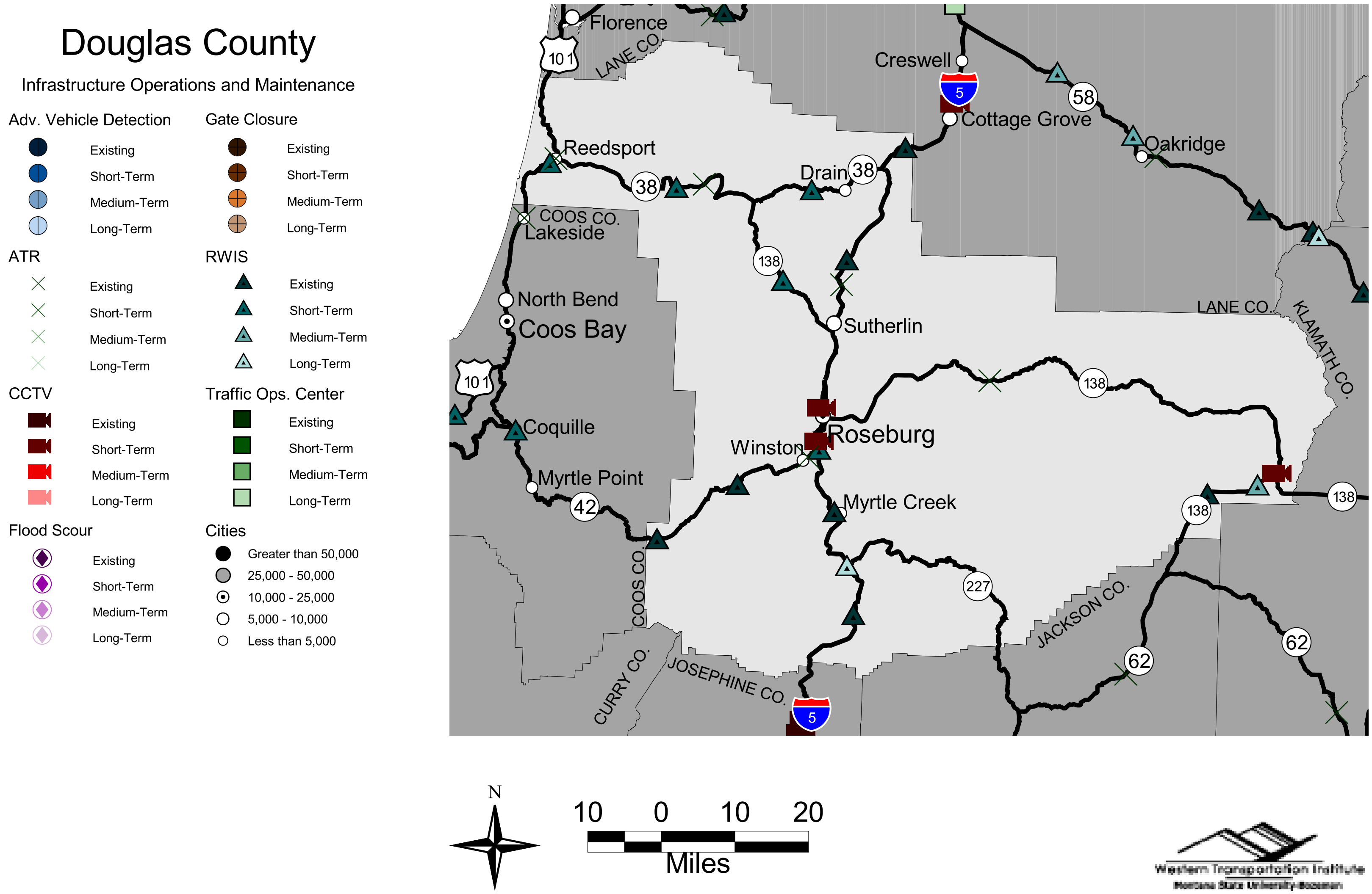



**Figure G-31:** Infrastructure Operations and Maintenance in Douglas County.

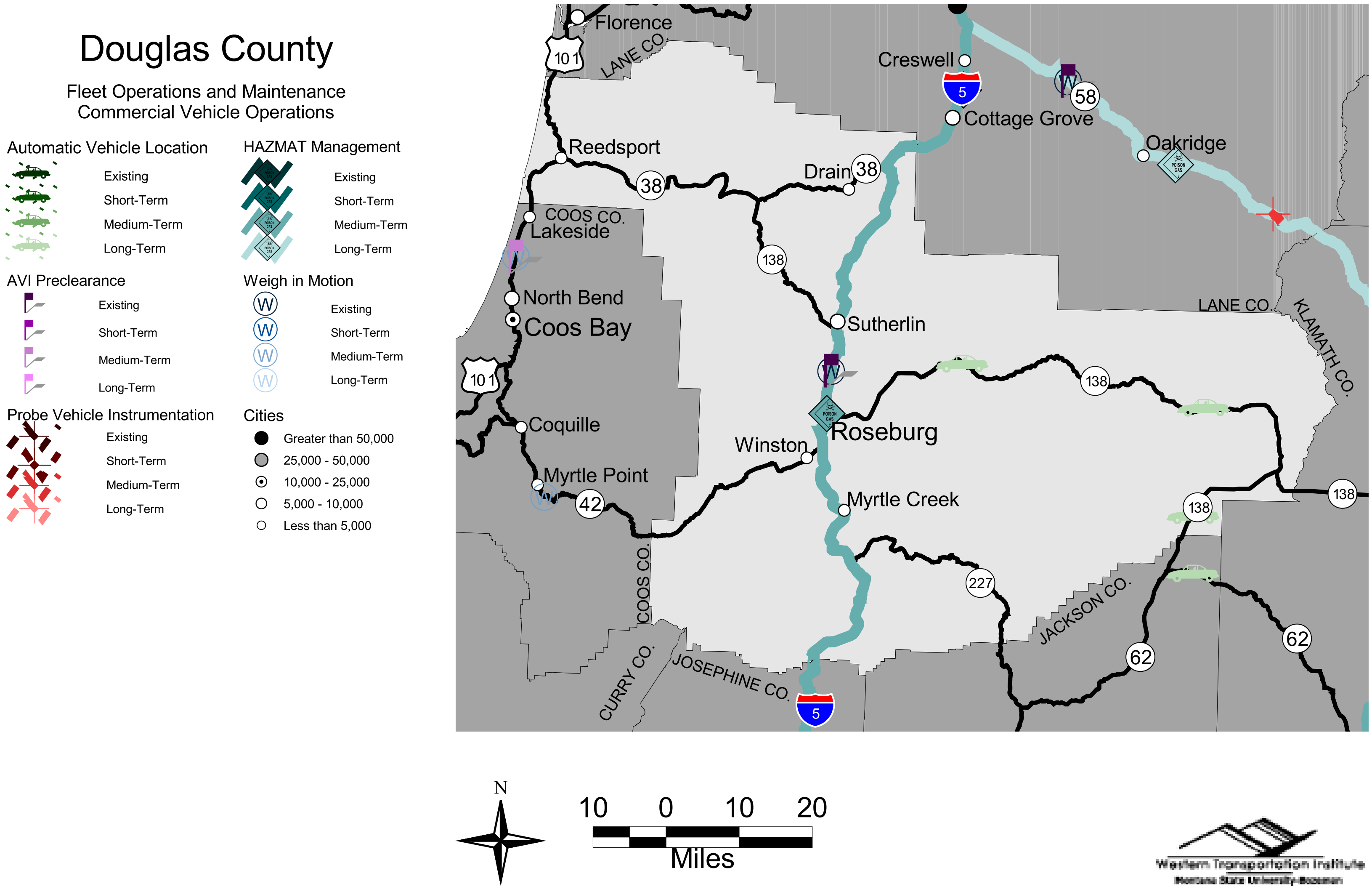



**Figure G-32:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Douglas County.

**Table G-6:** Deployment Locations in Harney and Malheur Counties.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Advisory Television | 25 | Harney | 7 | 130.1 | | | Burns | Long-Term | ✓ |
| Animal/Vehicle Collision Warning | 5 | Harney | 7 | 85.1 | 180.15 | | Animal related challenge | Medium-Term | ✓ |
| | | Malheur | 7 | 180.15 | 262.34 | | | | |
| Dynamic Warning VMS | 8 | Harney | 7 | 131.1 | | W | Burns | Medium-Term | ✓ |
| | | | | 129.1 | | E | | | |
| Dynamic Warning VMS | 20 | Harney | 7 | 128.3 | | W | High wind warning for mobile homes (near Hines) | Medium-Term | ✓ |
| Highway Advisory Radio | 43 | Harney | 7 | 130.1 | | | Major Junction | Medium-Term | ✓ |
| Intersection Advance Warning | 3 | Harney | 7 | 130.1 | | | Intersection safety challenge | Medium-Term | ✓ |
| Motorist-Aide Call Box | 81 | Harney | 49 | 0 | 30 | | Notification time challenge | Medium-Term | ✓ |
| Motorist-Aide Call Box | 82 | Harney | 7 | 83.79 | 105 | | Notification time challenge | Medium-Term | ✓ |
| Variable Message Sign | 1 | Malheur | 6 | 377.9 | | W | Ontario-Snake River | Existing | |
| Variable Message Sign | 82 | Harney | 7 | 115 | | West | Road Closure | Medium-Term | ✓ |
| Variable Message Sign | 144 | Harney | 49 | 0 | | North | Road Closure | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 2 | Harney | 7 | 130 | 180.15 | | | Short-Term | ✓ |
| | | Malheur | 7 | 180.15 | 260 | | | | |
| Mayday Systems | 12 | Harney | 49 | 0 | 30 | | Notification time challenge | Medium-Term | ✓ |
| Mayday Systems | 13 | Harney | 7 | 83.79 | 105 | | Notification time challenge | Medium-Term | ✓ |
| Regional Incident Management Plan | 35 | Harney | 7 | 83.79 | 144 | | Road Closure | Long-Term | ✓ |
| Rural Coordinate Addressing System | 11 | Harney | 7 | 83.79 | 105 | | Notification time challenge | Medium-Term | ✓ |
| Rural Coordinate Addressing System | 12 | Harney | 49 | 0 | 30 | | Notification time challenge | Medium-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| In-Vehicle Route Guidance System | 40 | Harney | 7 | 83.79 | 105 | | Road Closure Locations | Long-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 40 | Malheur | | | | | Malheur County | Long-Term | ✓ |
| On-Board Transit Safety Systems | 40 | Malheur | | | | | Malheur County | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 20 | Malheur | | | | | Malheur County | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Automatic Traffic Recorder | 242 | Harney | 7 | 126.63 | | | 2.1 miles south of Hines | Existing | ✓ |
| Automatic Traffic Recorder | 243 | Malheur | 7 | 258.44 | | | 0.3 mile west of Cairo Junction | Existing | ✓ |
| Automatic Traffic Recorder | 244 | Malheur | 7 | 189.35 | | | at Juntura | Existing | ✓ |
| Automatic Traffic Recorder | 255 | Malheur | 456 | 101.17 | | | 3.0 miles S of Blue Mtn Pass Summit | Existing | |
| Automatic Traffic Recorder | 271 | Harney | 48 | 49.6 | | | 0.3 mile N. of Central Oregon Hwy. | Existing | |
| Closed-Circuit Television Camera | 97 | Harney | 7 | 104.62 | | | Response time challenge | Short-Term | ✓ |
| Closed-Circuit Television Camera | 99 | Harney | 49 | 0 | | | Emergency verification around Burns | Short-Term | ✓ |
| RWIS | 11 | Harney | 7 | 104.62 | | | Riley | Existing | ✓ |
| RWIS | 21 | Malheur | 450 | 8 | | | Succor Creek | Existing | |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 12 | Harney | 7 | 83.79 | 130 | | Brothers to Burns | Long-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Preclearance | 7 | Harney | 7 | 133.17 | | W | Near Existing Weigh Station | Short-Term | ✓ |
| Preclearance | 8 | Harney | 7 | 135.17 | | E | Near Existing Weigh Station | Short-Term | ✓ |
| Preclearance | 24 | Malheur | 456 | 67 | | S | Near Existing Weigh Station | Medium-Term | ✓ |
| Preclearance | 25 | Malheur | 456 | 65 | | N | Near Existing Weigh Station | Medium-Term | ✓ |
| Preclearance | 26 | Harney | 442 | 1 | | N | Near Existing Weigh Station | Medium-Term | ✓ |
| Preclearance | 31 | Harney | 440 | 1 | | N | Near Existing Weigh Station | Long-Term | ✓ |

**Table G-6:** Deployment Locations in Harney and Malheur Counties (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Commercial Vehicle Operations (cont.)** | | | | | | | | | |
| Preclearance | 32 | Malheur | 442 | 90 | | S | Near Existing Weigh Station | Long-Term | ✓ |
| Weigh in Motion | 11 | Harney | 7 | 133.17 | | W | Near Existing Weigh Station | Short-Term | ✓ |
| Weigh in Motion | 12 | Harney | 7 | 135.17 | | E | Near Existing Weigh Station | Short-Term | ✓ |
| Weigh in Motion | 25 | Malheur | 456 | 67 | | S | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 26 | Malheur | 456 | 65 | | N | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 27 | Harney | 442 | 1 | | N | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 36 | Malheur | 442 | 90 | | S | Near Existing Weigh Station | Long-Term | ✓ |
| Weigh in Motion | 37 | Harney | 440 | 1 | | N | Near Existing Weigh Station | Long-Term | ✓ |

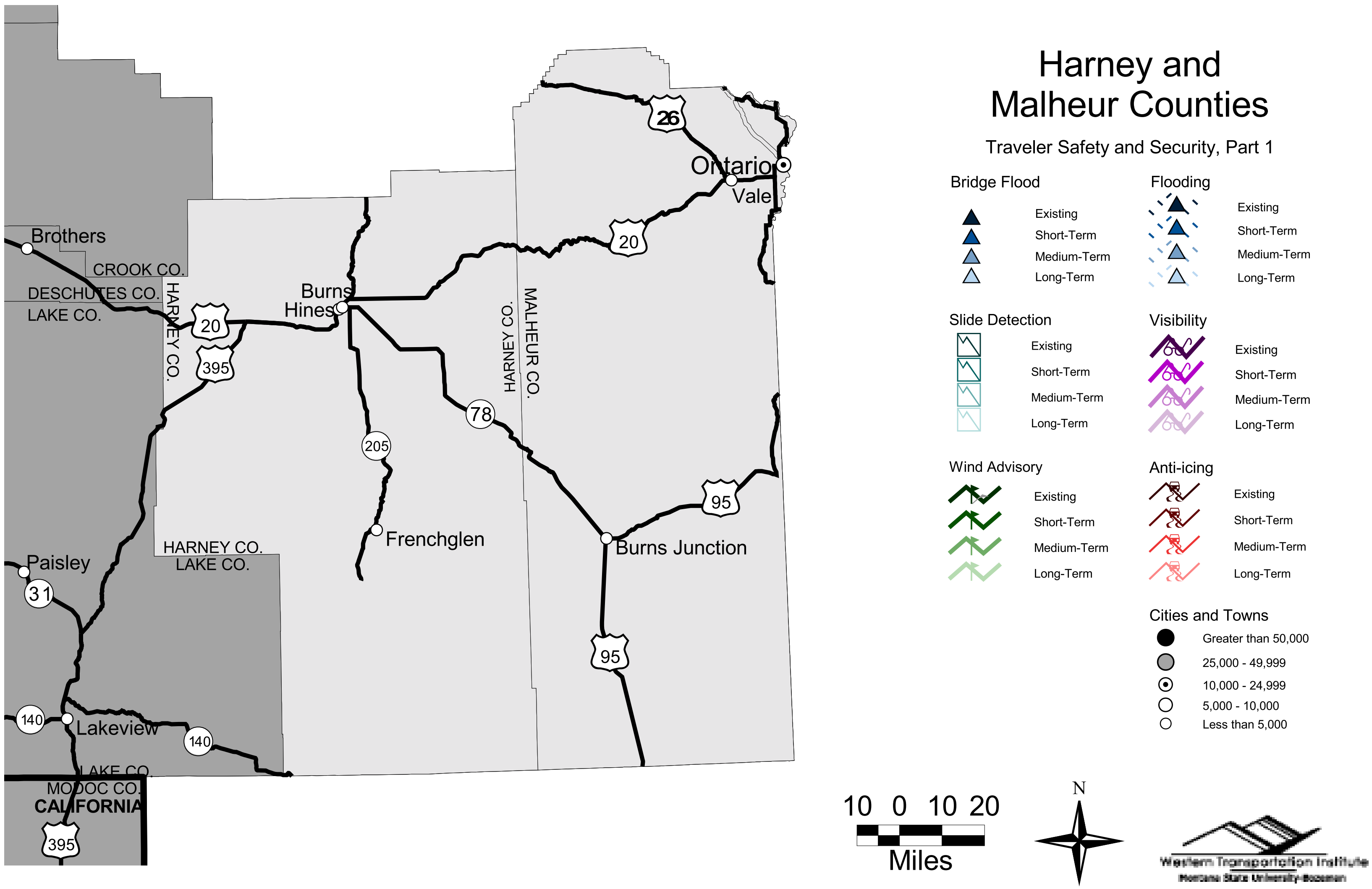



**Figure G-33:** Traveler Safety and Security (Part 1) in Harney and Malheur Counties.

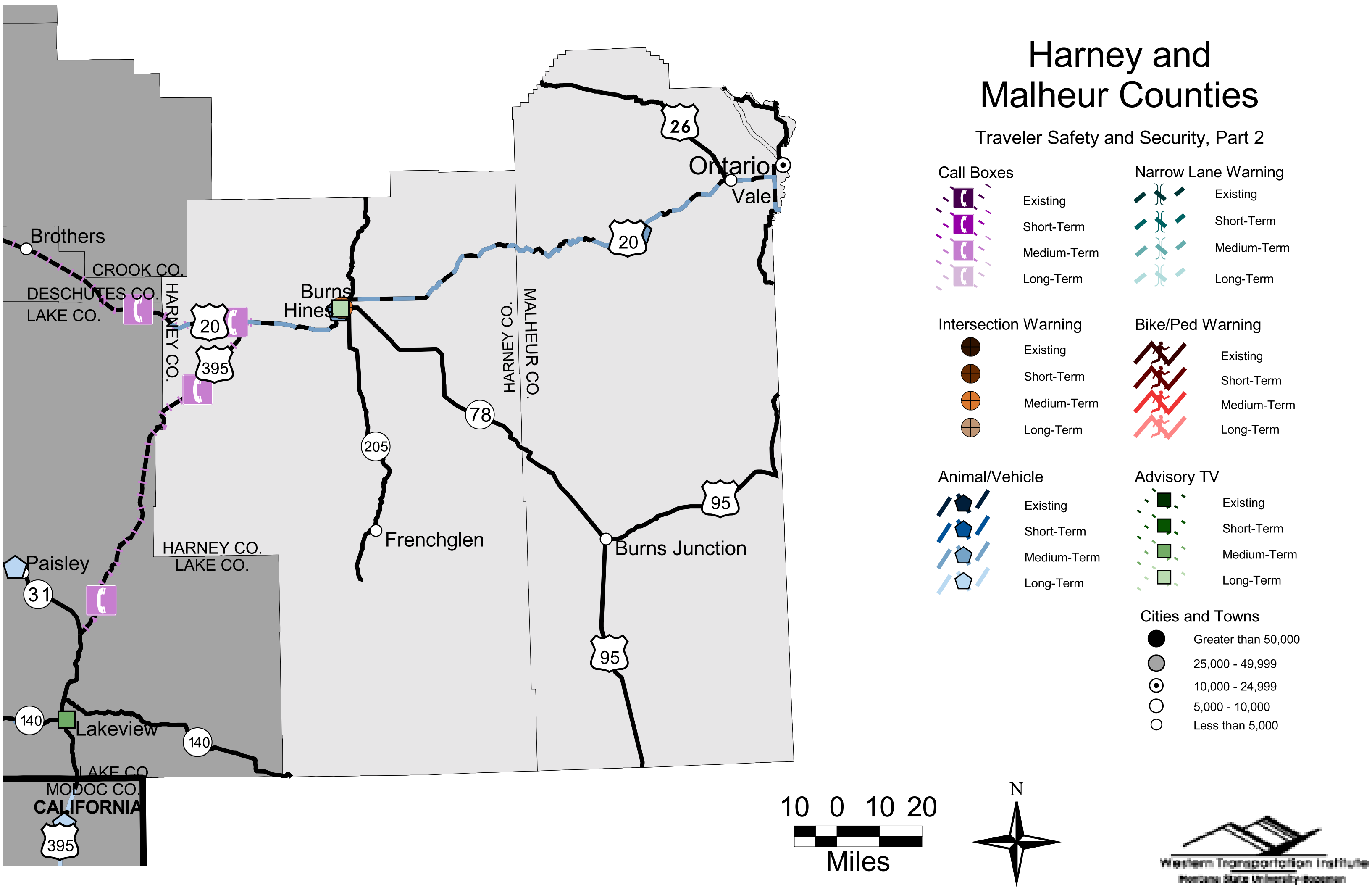



**Figure G-34:** Traveler Safety and Security (Part 2) in Harney and Malheur Counties.

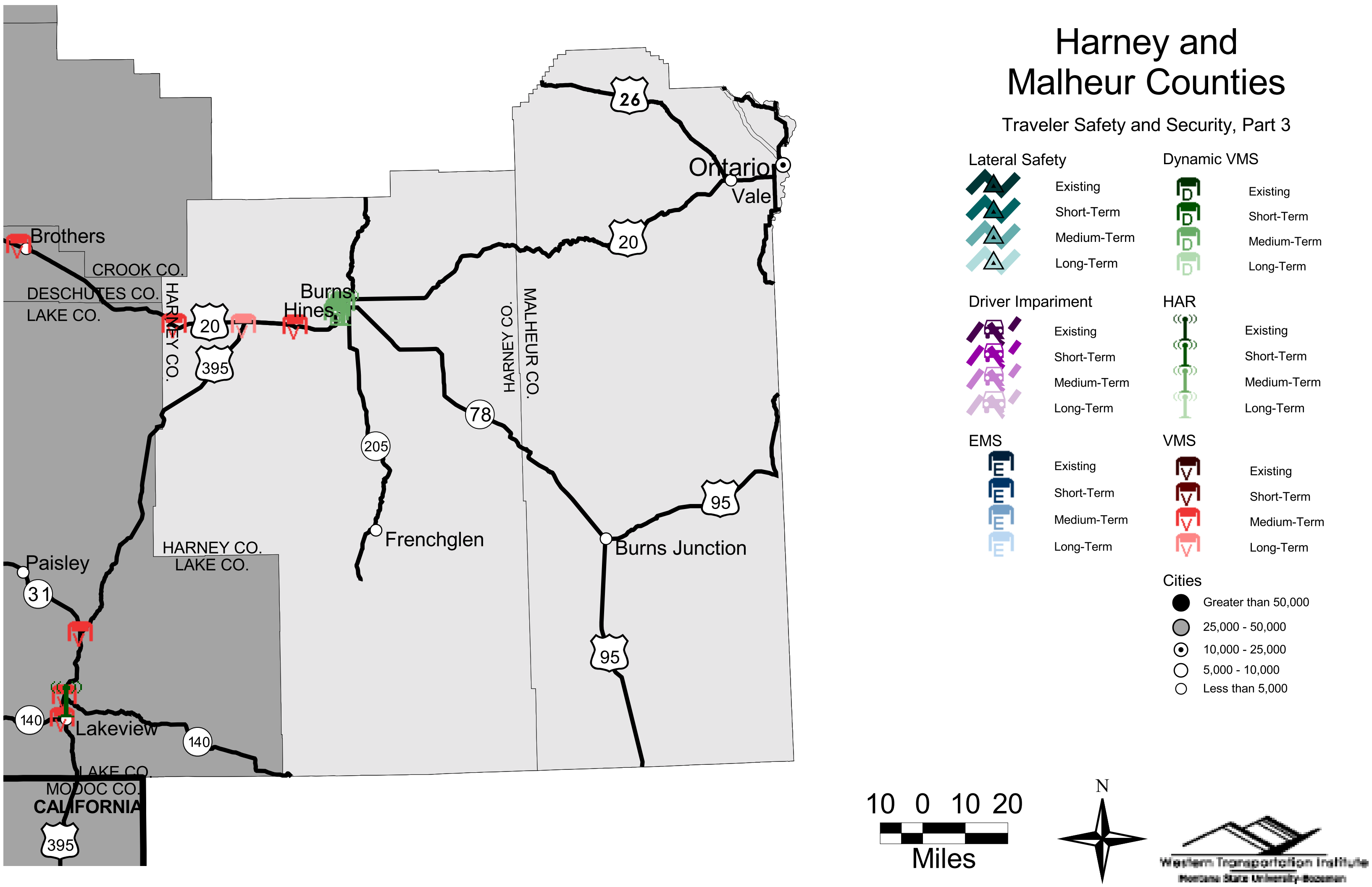



**Figure G-35:** Traveler Safety and Security (Part 3) in Harney and Malheur Counties.

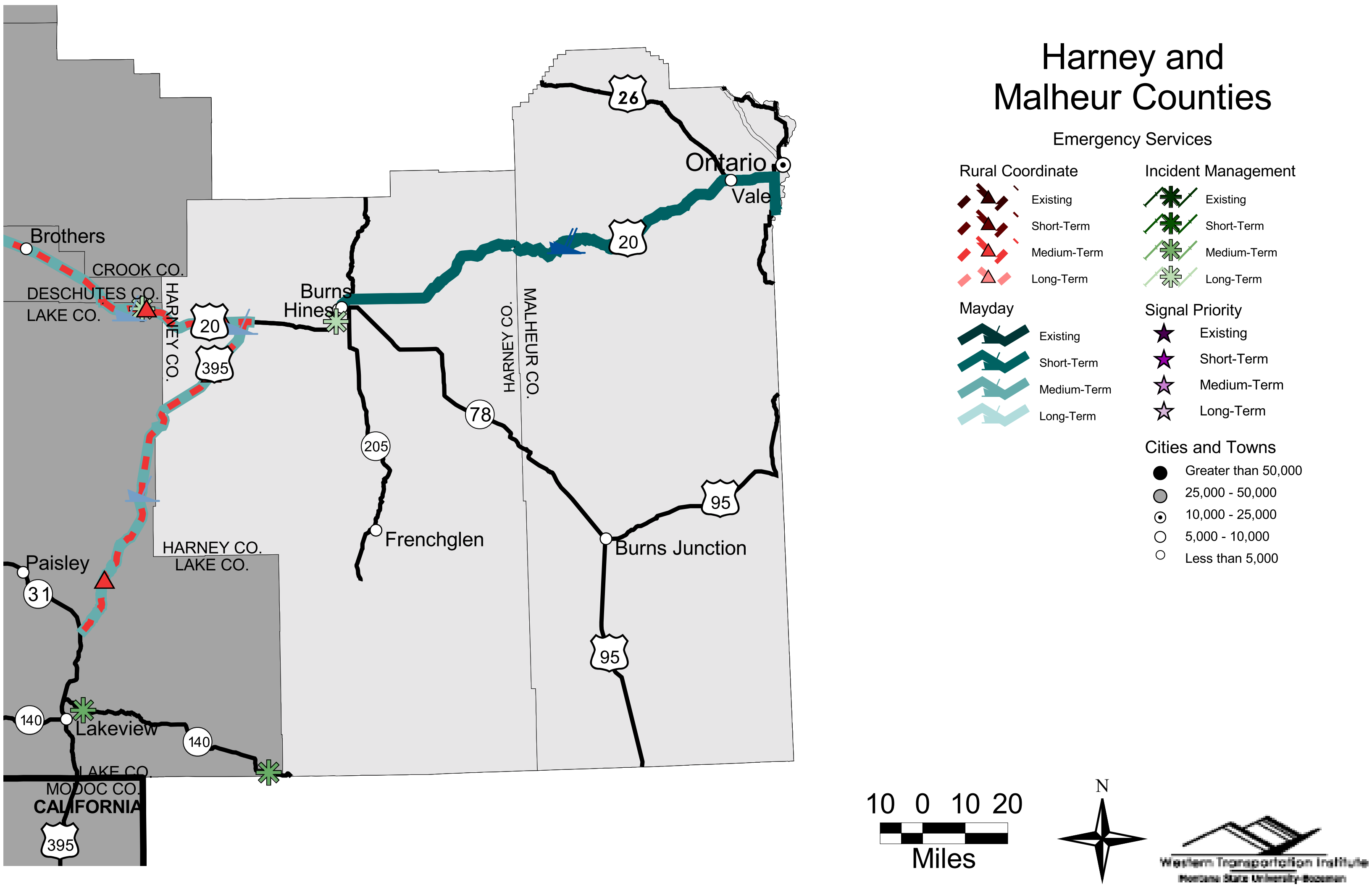



**Figure G-36:** Emergency Services in Harney and Malheur Counties.

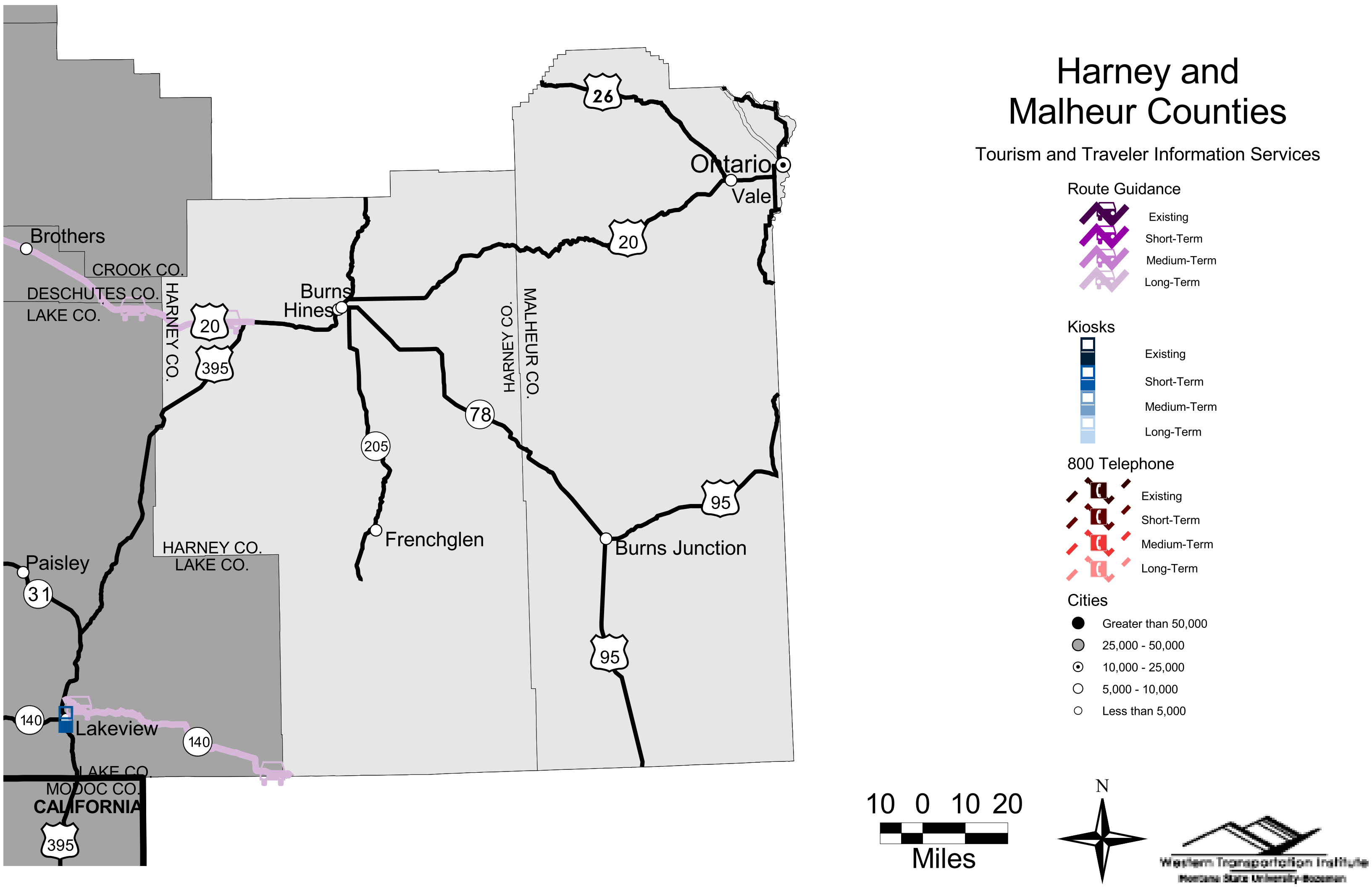



**Figure G-37:** Tourism and Traveler Information Services in Harney and Malheur Counties.

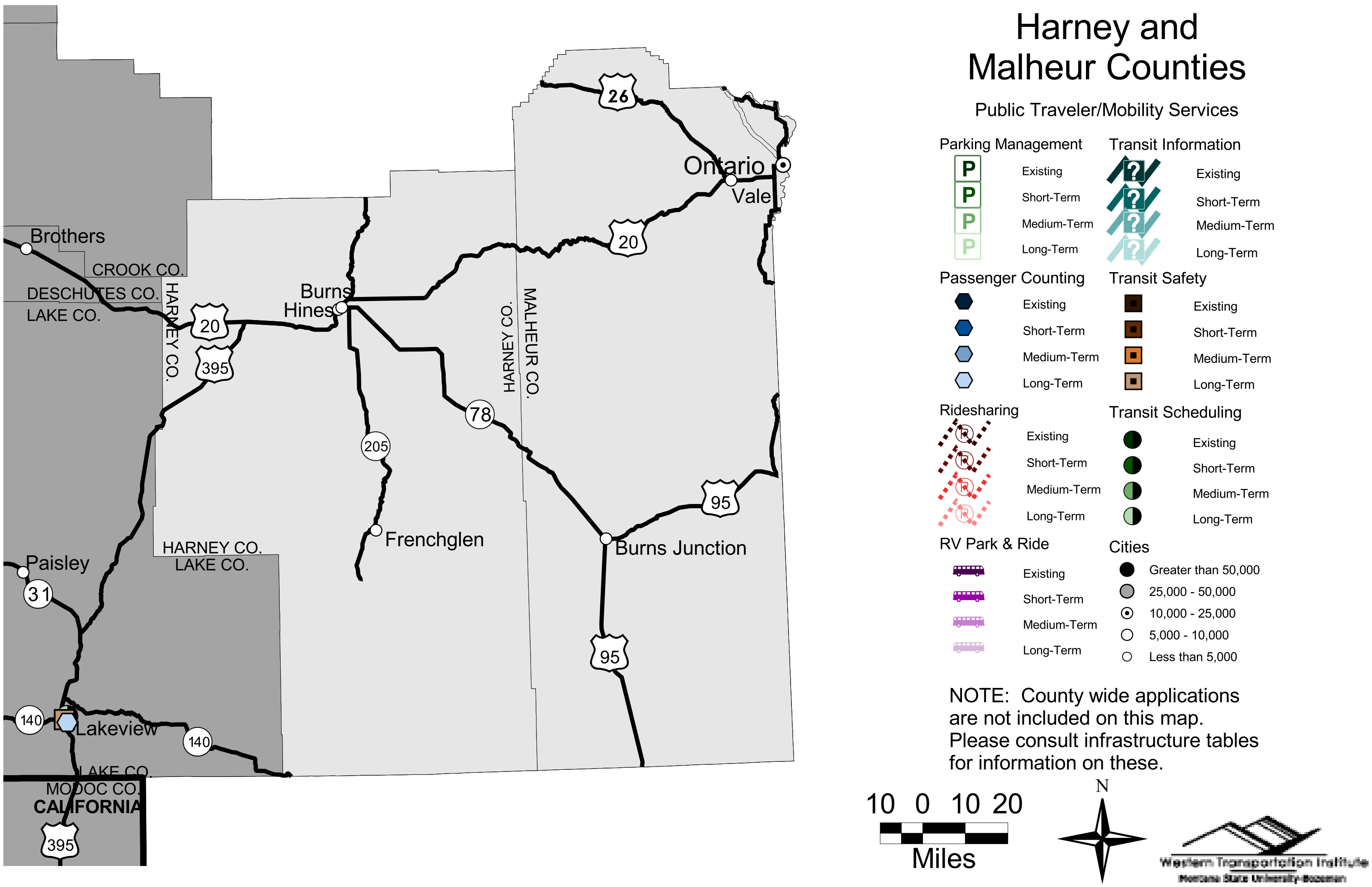



**Figure G-38:** Public Traveler/Mobility Services in Harney and Malheur Counties.

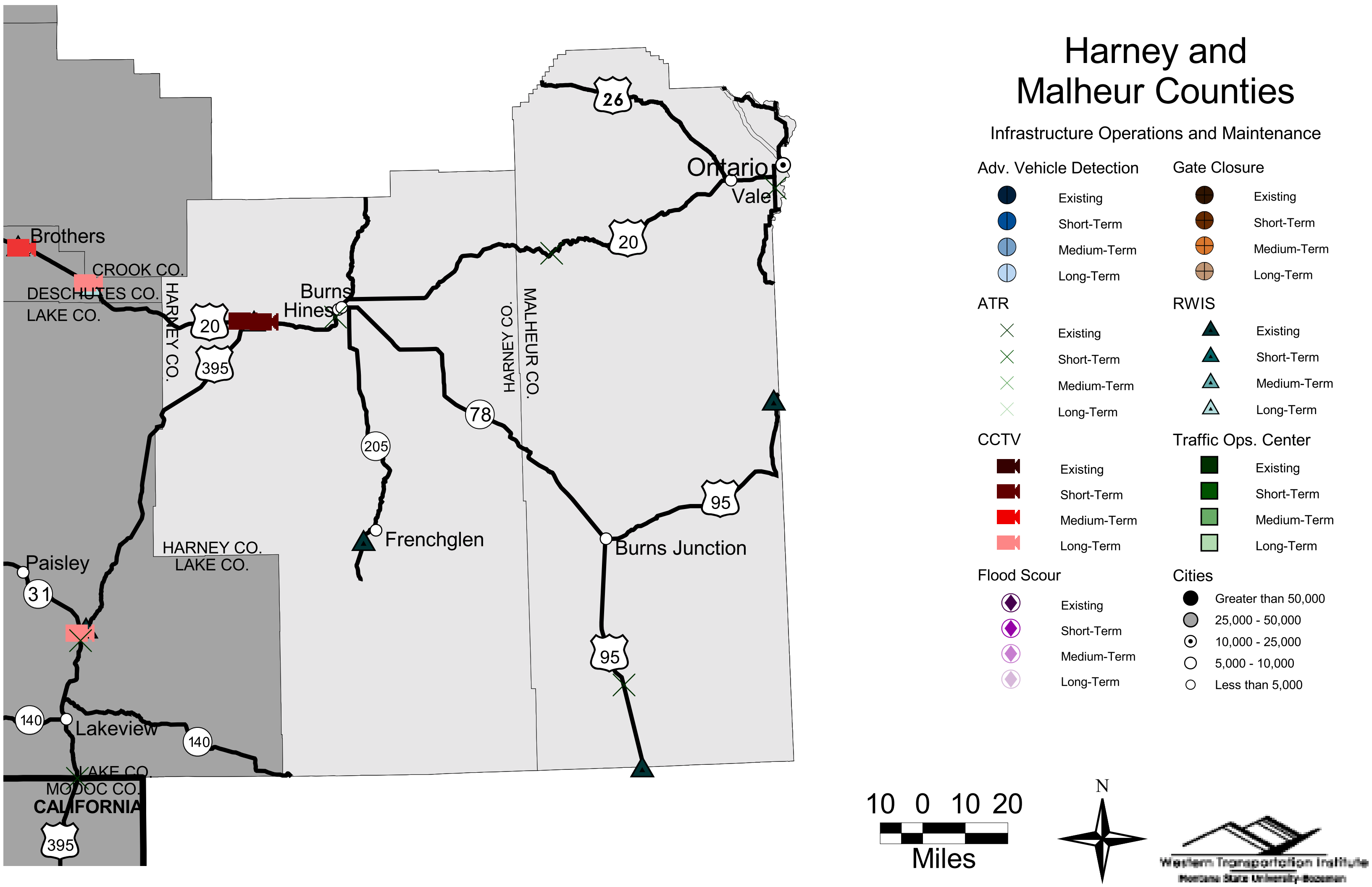



**Figure G-39:** Infrastructure Operations and Maintenance in Harney and Malheur Counties.

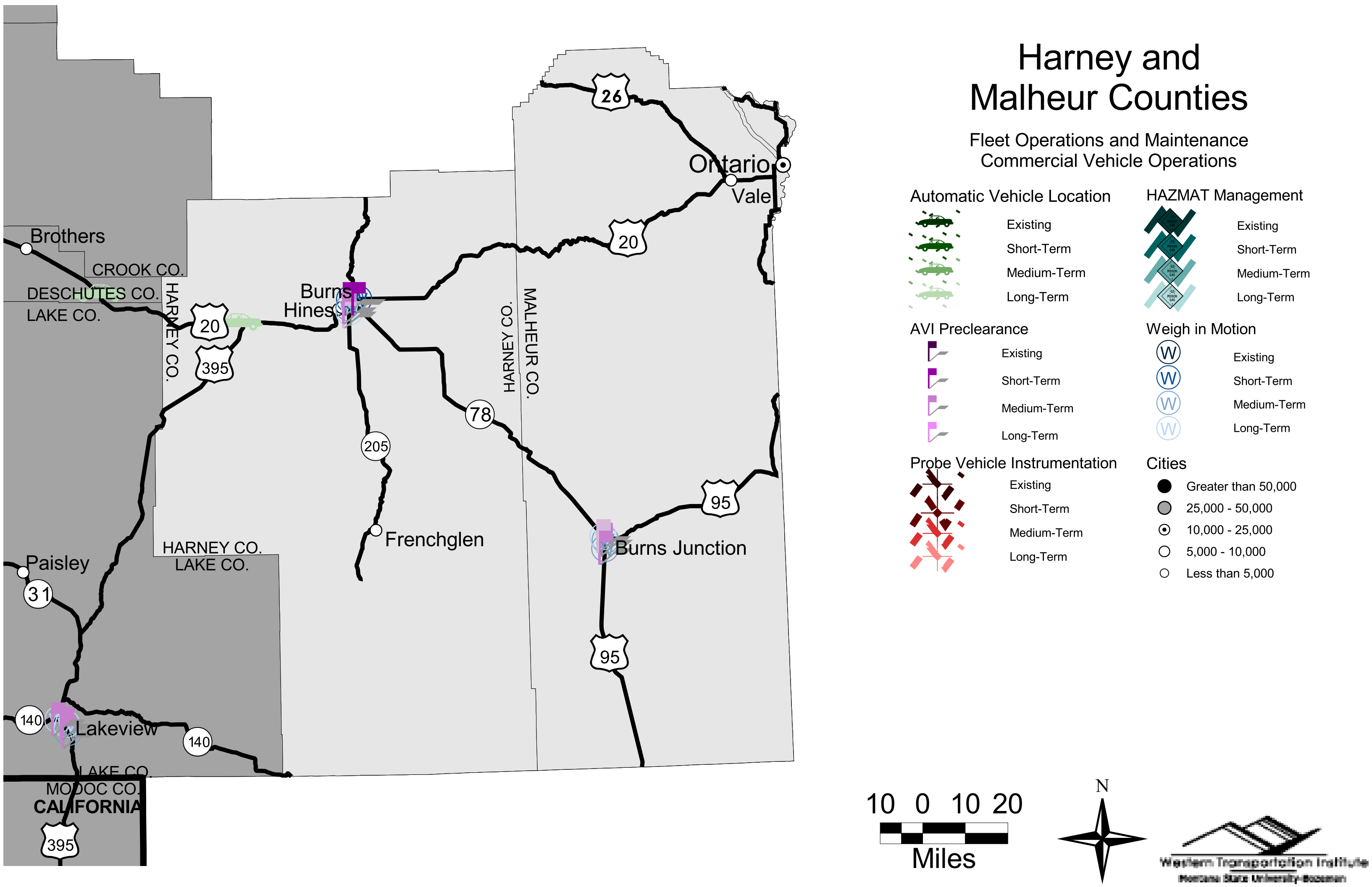



**Figure G-40:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Harney and Malheur Counties.

**Table G-7:** Deployment Locations in Jackson County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Advisory Television | 2 | Jackson | 1 | 19.1 | | | Ashland | Short-Term | ✓ |
| Advisory Television | 5 | Jackson | 1 | 28.33 | | | Medford | Short-Term | ✓ |
| Automated Anti-Icing | 1 | Jackson | 1 | 28.4 | 28.9 | | Medford Viaduct | Short-Term | ✓ |
| Automated Visibility Warning | 7 | Jackson | 1 | 4 | 6 | | N. of Siskiyou Pass | Medium-Term | ✓ |
| Automated Visibility Warning | 13 | Jackson | 22 | 5.9 | 6.5 | | Visibility challenge | Long-Term | ✓ |
| Dynamic Warning VMS | 7 | Jackson | 1 | 4.1<br>5.1 | | N<br>S | Siskiyou Summit for runaway trucks | Short-Term | ✓ |
| Highway Advisory Radio | 1 | Jackson | 21 | 0 | | | Tourism | Existing | ✓ |
| Highway Advisory Radio | 14 | Jackson | 1 | 28.33 | | | Existing VMS | Existing | ✓ |
| Highway Advisory Radio | 44 | Jackson | 22 | 0 | | | Visibility, Tourism | Medium-Term | ✓ |
| Highway Advisory Radio | 66 | Jackson | 1 | 4.5 | | | Siskiyou Summit | Long-Term | ✓ |
| Intersection Advance Warning | 10 | Jackson | 22 | 6.04 | | | Intersection safety challenge | Long-Term | ✓ |
| Motorist-Aide Call Box | 1 | Jackson | 1 | 28.16 | 29.16 | | Medford Viaduct | Existing | ✓ |
| Motorist-Aide Call Box | 73 | Jackson | 1 | 3.8 | 4.8 | | Siskiyou Summit | Short-Term | ✓ |
| Variable Message Sign | 18 | Jackson | 1 | 16.72 | | S | | Existing | ✓ |
| Variable Message Sign | 19 | Jackson | 1 | 31.31 | | S | | Existing | ✓ |
| Variable Message Sign | 36 | Jackson | 1 | 29 | | N | Medford | Short-Term | ✓ |
| Variable Message Sign | 53 | Jackson | 270 | 8 | | East | All Criteria (at Brownsboro) | Short-Term | ✓ |
| Variable Message Sign | 131 | Jackson | 22 | 10 | | North | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 134 | Jackson | 22 | 56 | | North | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 135 | Jackson | 22 | 58 | | West | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 137 | Jackson | 233 | 0 | | East | All Criteria | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 3 | Jackson | 270 | 0 | 32.25 | | | Short-Term | ✓ |
| Mayday Systems | 16 | Jackson | 233 | 0 | 5.99 | | | Medium-Term | ✓ |
| Regional Incident Management Plan | 1 | Jackson | 1 | 0 | 28.33 | | Siskiyou Pass Early Winner | Short-Term | ✓ |
| Regional Incident Management Plan | 9 | Jackson | 1 | 30.1 | 52.19 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 34 | Jackson | 270 | 0 | 32.25 | | Road Closure | Long-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 15 | Jackson | 1 | 19.1 | | | Tourist Locations | Medium-Term | ✓ |
| 800 Travel Advisory | 16 | Jackson | 1 | 50 | | | Tourist Locations | Medium-Term | ✓ |
| 800 Travel Advisory | 19 | Jackson | 22 | 24 | | | Tourist Locations | Medium-Term | ✓ |
| 800 Travel Advisory | 28 | Jackson | 22 | 6 | | | Tourist Locations | Long-Term | ✓ |
| 800 Travel Advisory | 33 | Jackson | 22 | 27 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 14 | Jackson | 1 | 19.1 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 18 | Jackson | 22 | 6 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 19 | Jackson | 270 | 0 | 32.25 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 20 | Jackson | 22 | 24 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 21 | Jackson | 22 | 27 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 23 | Jackson | 1 | 30 | 52.19 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 9 | Jackson | 1 | 19.1 | | | Ashland | Existing | ✓ |
| Kiosks | 10 | Jackson | 1 | 28.33 | | | Medford | Existing | ✓ |
| Kiosks | 11 | Jackson | 1 | 28.33 | | | Medford | Existing | ✓ |
| Kiosks | 12 | Jackson | 1 | 28.33 | | | Medford | Existing | ✓ |
| Kiosks | 13 | Jackson | 1 | 28.33 | | | Medford | Existing | ✓ |
| Kiosks | 14 | Jackson | 1 | 35.44 | | | Central Point | Existing | ✓ |

**Table G-7:** Deployment Locations in Jackson County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services (cont.)** | | | | | | | | | |
| Kiosks | 30 | Jackson | 22 | 6 | | | Tou Velle State Recreation Site | Short-Term | ✓ |
| Kiosks | 49 | Jackson | 1 | 50 | | | Valley of the Rogue State Park | Medium-Term | ✓ |
| Kiosks | 51 | Jackson | 22 | 27 | | | Joseph Stewart State Park | Medium-Term | ✓ |
| Kiosks | 52 | Jackson | 22 | 24 | | | Casey State Recreation Site | Medium-Term | ✓ |
| Kiosks | 58 | Jackson | 1 | 19.4 | | | Oregon Shakespeare Festival | Medium-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 1 | Jackson | 1 | 28.33 | | | Medford | Medium-Term | ✓ |
| Automated Passenger Counting | 35 | Jackson | | | | | Jackson County | Long-Term | ✓ |
| Dynamic Ridesharing/Paratransit | 6 | Jackson | 1 | 28 | | | Medford | Medium-Term | ✓ |
| Dynamic Ridesharing/Paratransit | 8 | Jackson | 22 | 6 | | | White City | Medium-Term | ✓ |
| On-Board Transit Safety Systems | 12 | Jackson | 1 | 28.33 | | | Medford | Long-Term | ✓ |
| On-Board Transit Safety Systems | 35 | Jackson | | | | | Jackson County | Long-Term | ✓ |
| Parking Management & Information System | 1 | Jackson | 1 | 15 | | | Ashland | Short-Term | ✓ |
| Parking Management & Information System | 6 | Jackson | 272 | 32 | | | Jacksonville (Britt Festival) | Medium-Term | ✓ |
| Parking Management & Information System | 17 | Jackson | 22 | 6 | | | Tourist Locations | Long-Term | ✓ |
| Parking Management & Information System | 18 | Jackson | 1 | 50 | | | Tourist Locations | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 1 | Jackson | 272 | 32 | | | Jacksonville (Britt Festival) | Short-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 2 | Jackson | 1 | 15 | | | Ashland | Short-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 20 | Jackson | 1 | 50 | | | Valley of the Rogue State Park | Long-Term | ✓ |
| Transit Traveler Information | 11 | Jackson | 1 | 19.1 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 12 | Jackson | 22 | 6 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 13 | Jackson | 1 | 50 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 14 | Jackson | 22 | 24 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 15 | Jackson | 22 | 27 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 5 | Jackson | | | | | Jackson County | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 8 | Jackson | 1 | 28.33 | | | Medford | Medium-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 29 | Jackson | 1 | 4 | | | At Siskiyou Summit TMS(RTMS) | Medium-Term | ✓ |
| Advanced Vehicle Detection | 30 | Jackson | 1 | 1 | | | At MP 1 TMS(RTMS) | Medium-Term | ✓ |
| Automatic Traffic Recorder | 251 | Jackson | 22 | 15.47 | | | 2.9 miles south of Shady Cove | Existing | ✓ |
| Automatic Traffic Recorder | 252 | Jackson | 22 | 0.66 | | | 0.1 mile NE of Biddle Rd Overpass | Existing | ✓ |
| Automatic Traffic Recorder | 254 | Jackson | 21 | 23.3 | | | 4.2 miles east of Ashland | Existing | ✓ |
| Automatic Traffic Recorder | 259 | Jackson | 63 | 15.82 | | | 1.4 miles south of Talent | Existing | ✓ |
| Automatic Traffic Recorder | 266 | Jackson | 270 | 16.03 | | | 1.27 mile E of Lake Creek Rd (E Jct) | Existing | ✓ |
| Automatic Traffic Recorder | 269 | Jackson | 272 | 24.94 | | | 0.5 mile west of Ruch | Existing | ✓ |
| Automatic Traffic Recorder | 275 | Jackson | 1 | 42.84 | | | 2 miles west of Gold Hill | Existing | ✓ |
| Automatic Traffic Recorder | 276 | Jackson | 1 | 16 | | | 3.1 miles south of Ashland | Existing | ✓ |
| Automatic Traffic Recorder | 277 | Jackson | 1 | 22.3 | | | 3.2 miles north of Ashland | Existing | ✓ |
| Automatic Traffic Recorder | 278 | Jackson | 1 | 28.33 | | | South approach of Medford Viaduct | Existing | ✓ |
| Closed-Circuit Television Camera | 1 | Jackson | 1 | 4 | | | Siskiyou Summit | Existing | ✓ |
| Closed-Circuit Television Camera | 2 | Jackson | 1 | 5 | | | Siskiyou Summit | Existing | ✓ |
| Closed-Circuit Television Camera | 65 | Jackson | 1 | 28.33 | | | Medford | Short-Term | ✓ |
| RWIS | 26 | Jackson | 1 | 4.5 | | | Siskiyou Summit | Existing | ✓ |
| RWIS | 28 | Jackson | 1 | 28.94 | | | Medford Viaduct | Existing | ✓ |
| RWIS | 54 | Jackson | 270 | 0 | | | Butte Creek RWIS | Short-Term | ✓ |
| Satellite Traffic Operations Center | 6 | Jackson | 1 | 28.33 | | | Medford | Existing | ✓ |

**Table G-7:** Deployment Locations in Jackson County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 4 | Jackson | 1 | 28 | | | Medford | Medium-Term | ✓ |
| Automatic Vehicle Location | 5 | Jackson | 1 | 4 | | | Siskiyou Pass | Medium-Term | ✓ |
| Automatic Vehicle Location | 10 | Jackson | 22 | 57.28 | 65.45 | | | Long-Term | ✓ |
| Automatic Vehicle Location | 11 | Jackson | 233 | 0 | 5.99 | | | Long-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 2 | Jackson | 1 | 0 | 52.19 | | | Medium-Term | ✓ |
| Preclearance | 3 | Jackson | 1 | 19.1 | | N/S | Ashland | Existing | ✓ |
| Preclearance | 21 | Jackson | 22 | 6.66 | | N | Near Existing Weigh Station | Medium-Term | ✓ |
| Preclearance | 22 | Jackson | 270 | 1 | | W | Near Existing Weigh Station | Medium-Term | ✓ |
| Preclearance | 23 | Jackson | 22 | 8.66 | | S | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 1 | Jackson | 1 | 4 | | N | | Existing | ✓ |
| Weigh in Motion | 24 | Jackson | 270 | 1 | | W | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 34 | Jackson | 22 | 6.66 | | N | Near Existing Weigh Station | Long-Term | ✓ |
| Weigh in Motion | 35 | Jackson | 22 | 8.66 | | S | Near Existing Weigh Station | Long-Term | ✓ |

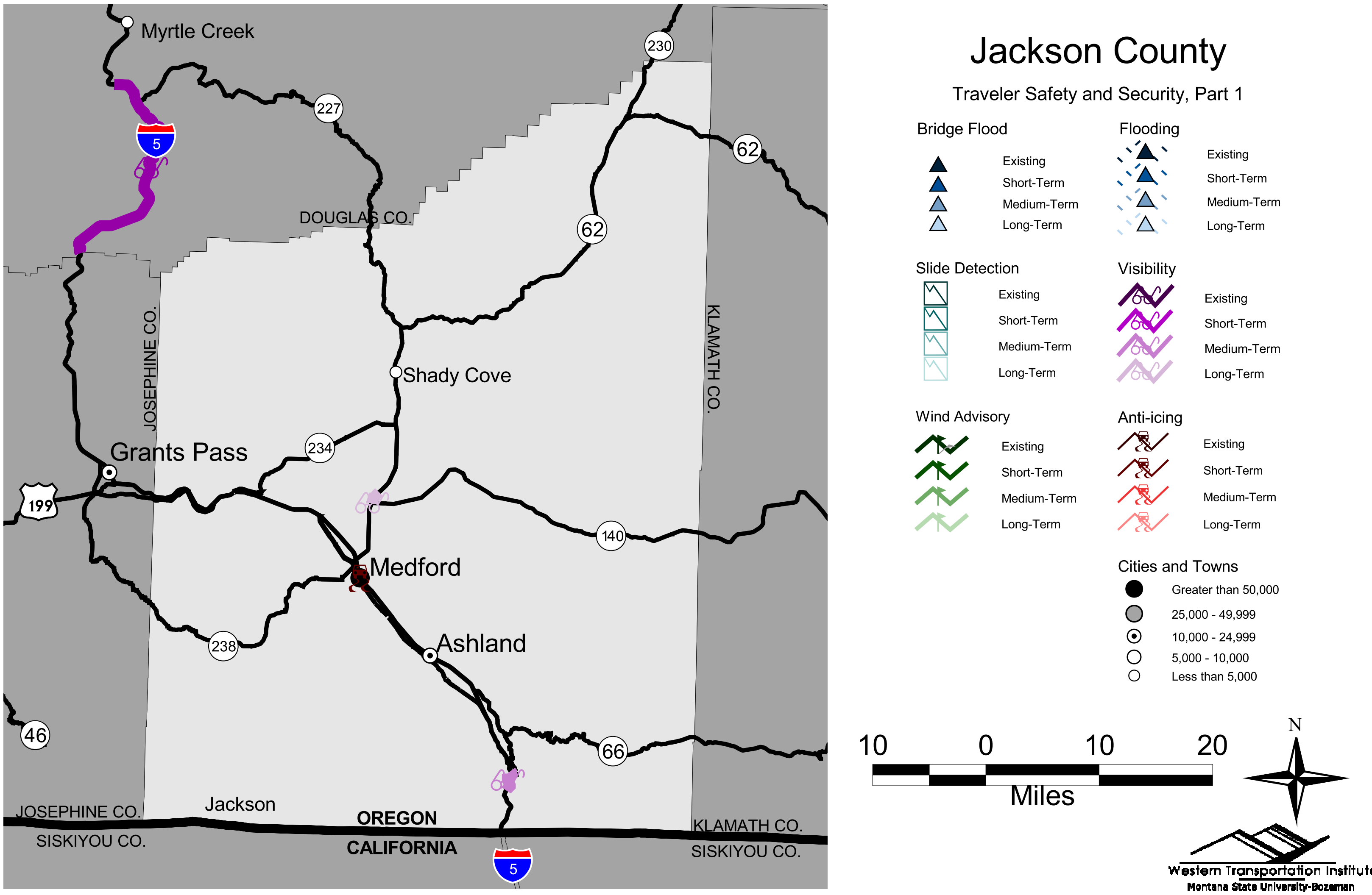



**Figure G-41:** Traveler Safety and Security (Part 1) in Jackson County.

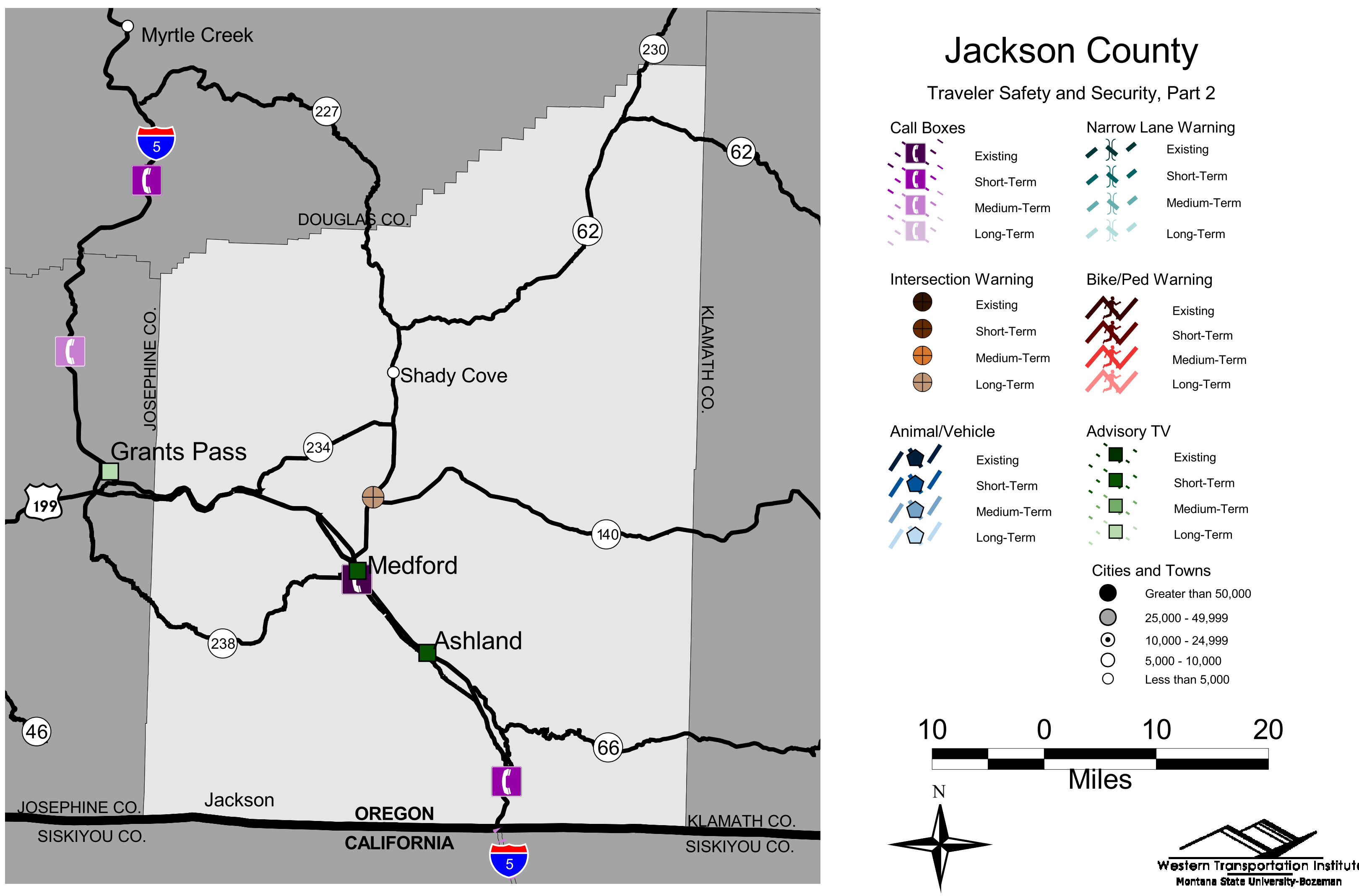



**Figure G-42:** Traveler Safety and Security (Part 2) in Jackson County.

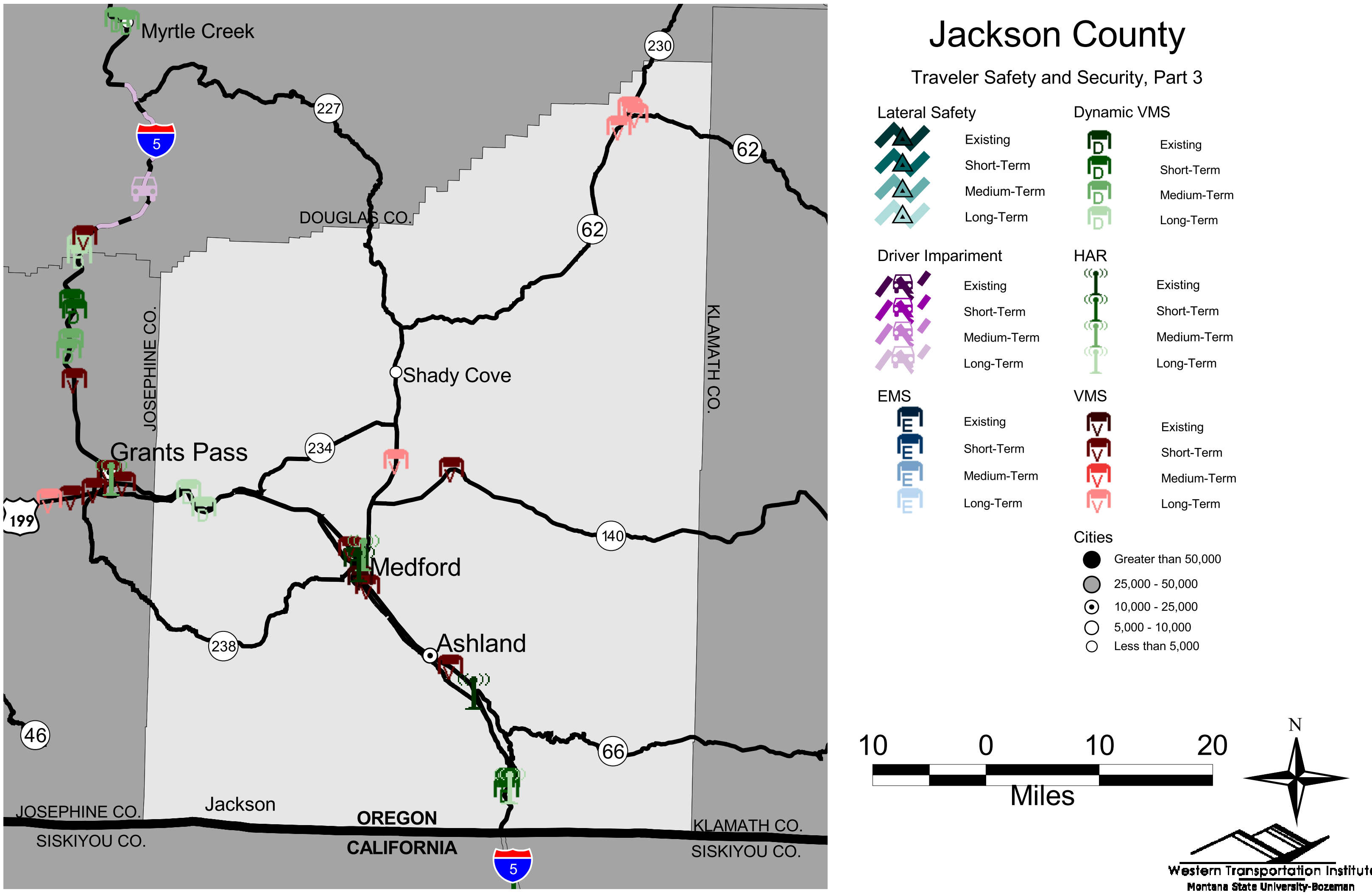



**Figure G-43:** Traveler Safety and Security (Part 3) in Jackson County.

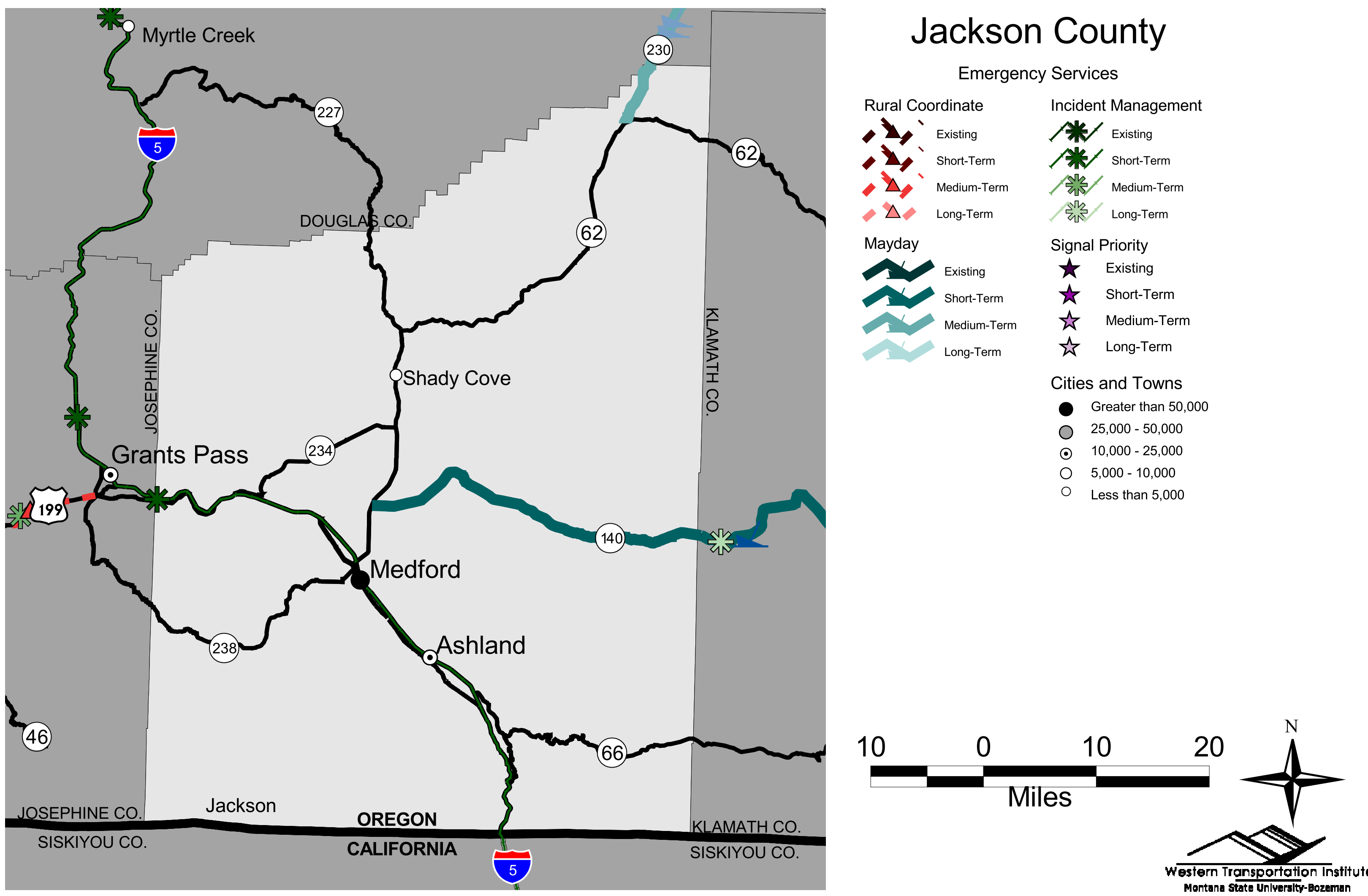



**Figure G-44:** Emergency Services in Jackson County.

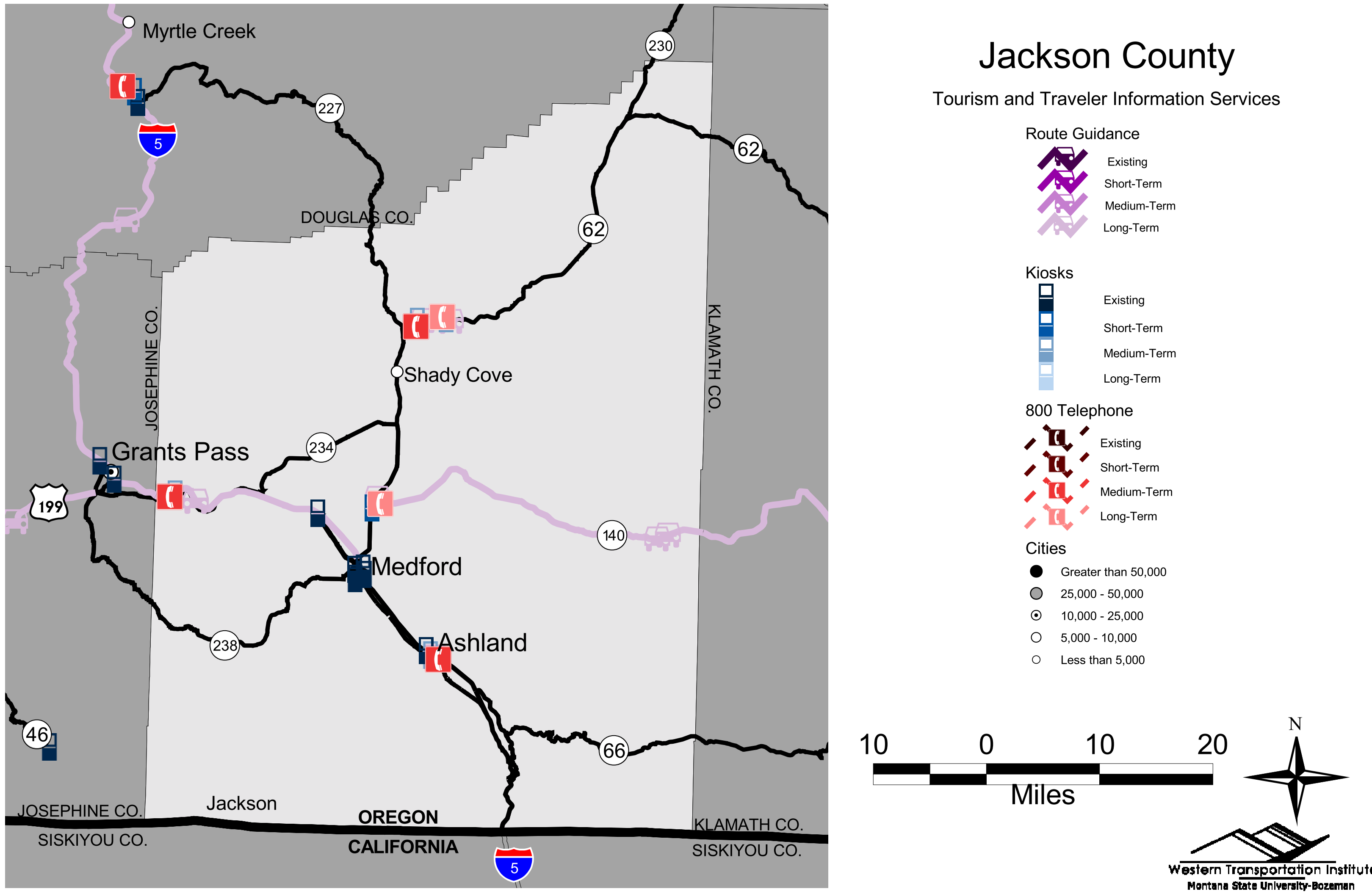



**Figure G-45:** Tourism and Traveler Information Services in Jackson County.

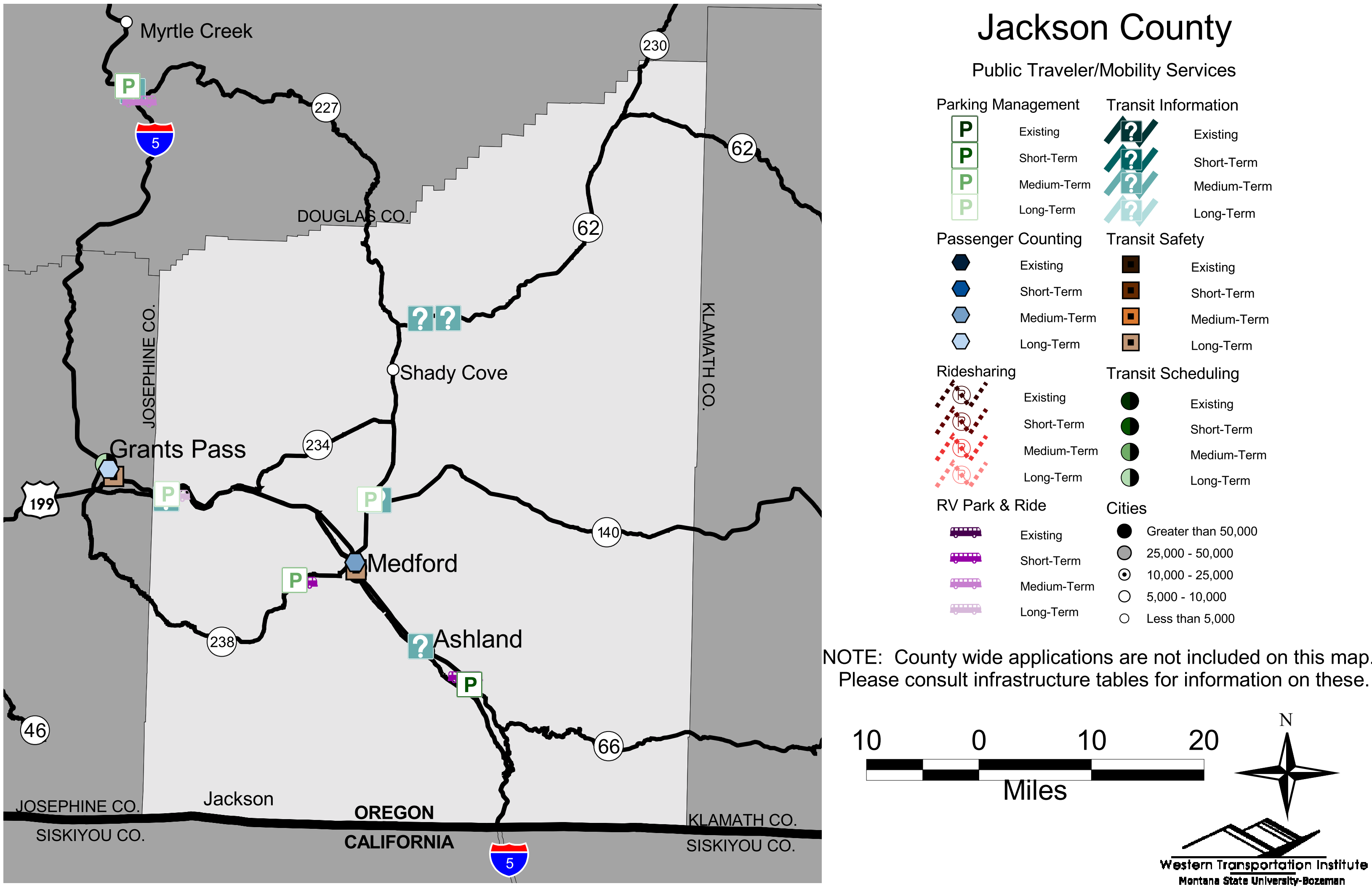



**Figure G-46:** Public Traveler/Mobility Services in Jackson County.

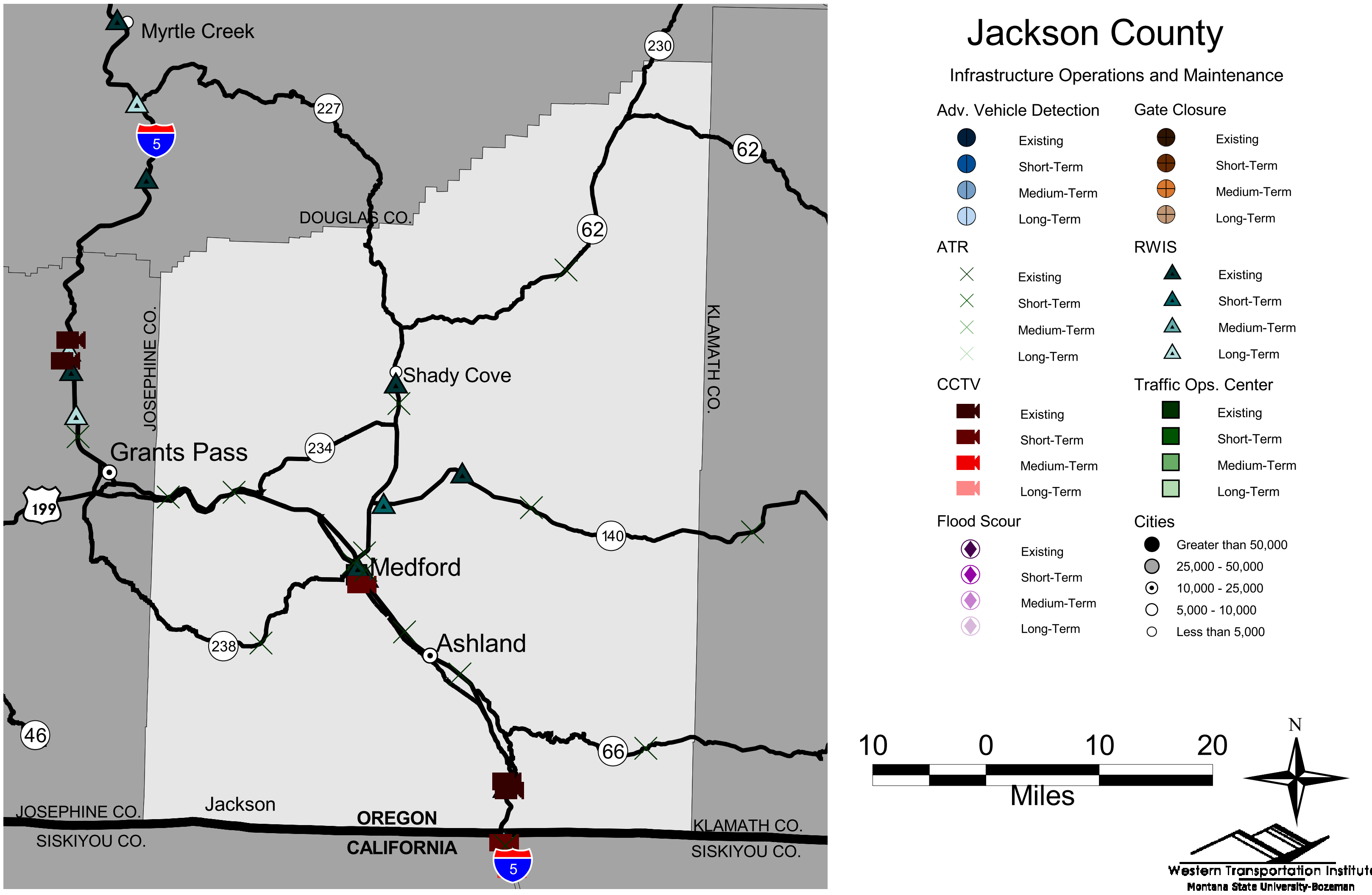



**Figure G-47:** Infrastructure Operations and Maintenance in Jackson County.

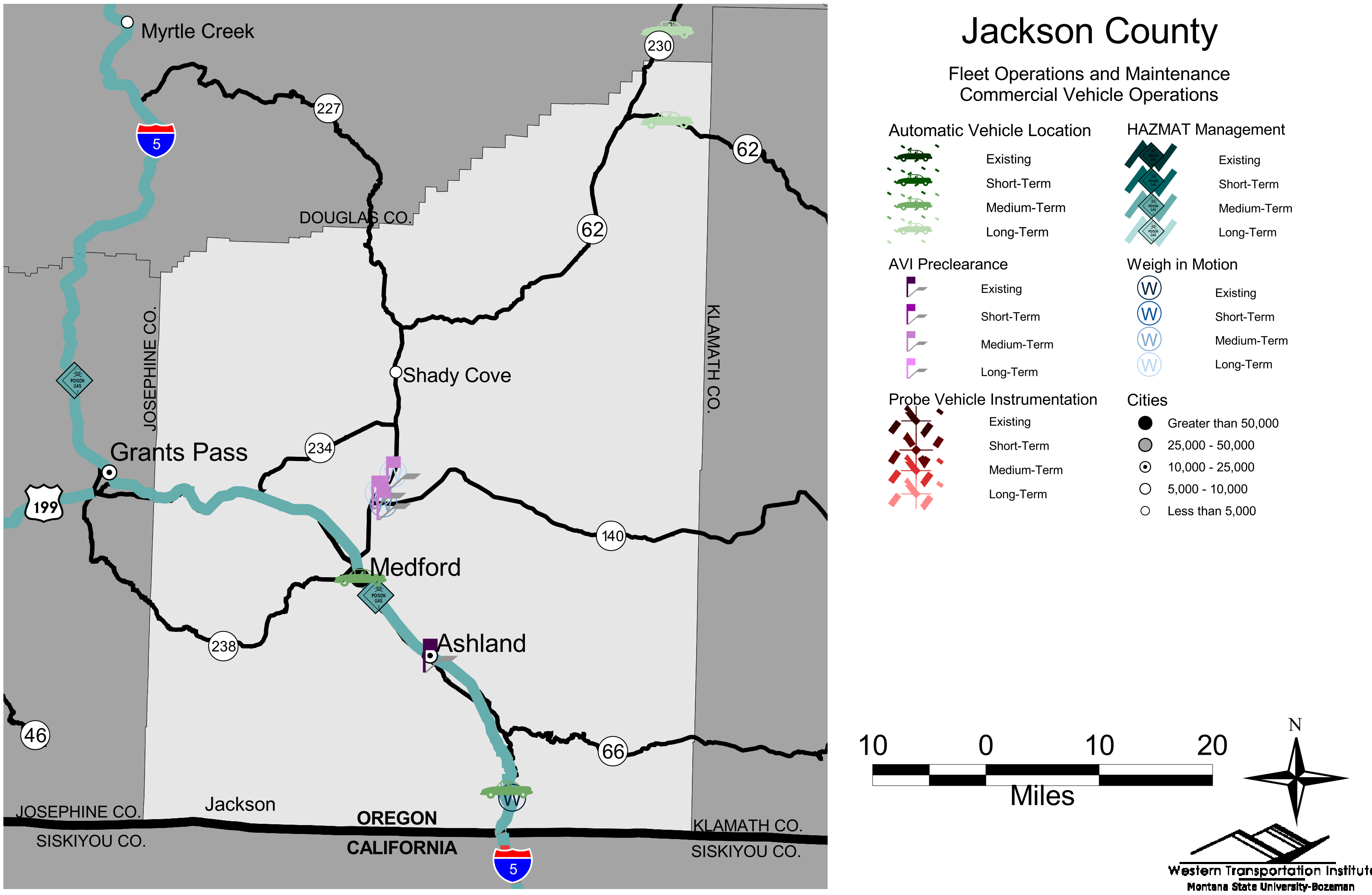



**Figure G-48:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Jackson County.

**Table G-8:** Deployment Locations in Josephine County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Advisory Television | 21 | Josephine | 1 | 55.78 | | | Grants Pass | Long-Term | ✓ |
| Dynamic Warning VMS | 7 | Josephine | 1 | 73.31<br>74.31 | | N<br>S | Smith Hill | Short-Term | ✓ |
| Dynamic Warning VMS | 21 | Josephine | 1 | 69.58<br>68.58 | | S<br>N | Sexton MT | Medium-Term | ✓ |
| Dynamic Warning VMS | 22 | Josephine | 1 | 79.28<br>80.28 | | N<br>S | Wolf Creek Pass/King Mt | Long-Term | ✓ |
| Highway Advisory Radio | 45 | Josephine | 1 | 55.78 | | | Tourism | Medium-Term | ✓ |
| Motorist-Aide Call Box | 85 | Josephine | 1 | 68 | 70 | | Sexton Summit | Medium-Term | ✓ |
| Variable Message Sign | 23 | Josephine | 25 | 41.69 | | East | All Criteria | Short-Term | ✓ |
| Variable Message Sign | 24 | Josephine | 1 | 54 | | North | All Criteria | Short-Term | ✓ |
| Variable Message Sign | 25 | Josephine | 1 | 56 | | South | All Criteria | Short-Term | ✓ |
| Variable Message Sign | 29 | Josephine | 1 | 66 | | N | For management of passes north of Grants Pass | Short-Term | ✓ |
| Variable Message Sign | 37 | Josephine | 25 | 1.5 | | W | Grants Pass | Short-Term | ✓ |
| Variable Message Sign | 151 | Josephine | 25 | 31 | | S | | Long-Term | ✓ |
| Variable Message Sign | 152 | Josephine | 25 | 4 | | S | | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 1 | Josephine | 25 | 25 | 40 | | poor communication around border | Short-Term | ✓ |
| Regional Incident Management Plan | 9 | Josephine | 1 | 52.19 | 58 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 11 | Josephine | 1 | 58.1 | 80.8 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 22 | Josephine | 25 | 0 | 41.69 | | Road Closure | Medium-Term | ✓ |
| Rural Coordinate Addressing System | 10 | Josephine | 25 | 0 | 41.69 | | Stakeholder Input | Medium-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| In-Vehicle Route Guidance System | 13 | Josephine | 25 | 0 | 41.69 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 23 | Josephine | 1 | 52.19 | 80.8 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 7 | Josephine | 25 | 27.71 | | | Cave Junction | Existing | ✓ |
| Kiosks | 8 | Josephine | 38 | 19.51 | | | Oregon Caves National Monument | Existing | ✓ |
| Kiosks | 15 | Josephine | 1 | 55.38 | | | Grants Pass | Existing | ✓ |
| Kiosks | 16 | Josephine | 1 | 58.06 | | | Grants Pass | Existing | ✓ |
| Kiosks | 38 | Josephine | 25 | 29 | | | Illinois Valley Visitor Center (US 199/OR 46) | Short-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 13 | Josephine | 1 | 55.78 | | | Grants Pass | Long-Term | ✓ |
| Automated Passenger Counting | 37 | Josephine | | | | | Josephine County | Long-Term | ✓ |
| Automatic Vehicle Identification System | 1 | Josephine | | | | | Josephine County | Long-Term | ✓ |
| Dynamic Ridesharing/Paratransit | 2 | Josephine | | | | | Josephine County | Medium-Term | ✓ |
| Dynamic Ridesharing/Paratransit | 5 | Josephine | 1 | 58 | | | Grants Pass | Medium-Term | ✓ |
| On-Board Transit Safety Systems | 13 | Josephine | 1 | 55.78 | | | Grants Pass | Long-Term | ✓ |
| On-Board Transit Safety Systems | 37 | Josephine | | | | | Josephine County | Long-Term | ✓ |
| Smart Card | 1 | Josephine | | | | | Josephine County | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 19 | Josephine | | | | | Josephine County | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 35 | Josephine | 1 | 55.78 | | | Grants Pass | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Automatic Traffic Recorder | 268 | Josephine | 25 | 41.29 | | | 0.4 mile N of OR-CA Border | Existing | ✓ |
| Automatic Traffic Recorder | 279 | Josephine | 1 | 61.48 | | | 5.7 miles north of Grants Pass | Existing | ✓ |
| Closed-Circuit Television Camera | 3 | Josephine | 1 | 69 | | | Sexton Summit | Existing | ✓ |
| Closed-Circuit Television Camera | 111 | Josephine | 25 | 16.1 | | | | Medium-Term | ✓ |

**Table G-8:** Deployment Locations in Josephine County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Operations and Maintenance (cont.)** | | | | | | | | | |
| RWIS | 1 | Josephine | 25 | 16.39 | | | Hayes Hill | Existing | ✓ |
| RWIS | 2 | Josephine | 1 | 69 | | | Road Closure Due to Bad Weather | Existing | ✓ |
| RWIS | 15 | Josephine | 25 | 41.05 | | | O'Brien | Existing | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 2 | Josephine | 1 | 52.19 | 80.8 | | | Medium-Term | ✓ |
| Hazmat Management | 4 | Josephine | 25 | 0 | 41.69 | | | Medium-Term | ✓ |
| Preclearance | 20 | Josephine | 25 | 33.45 | | N/S | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 23 | Josephine | 25 | 33.45 | | N/S | Near Existing Weigh Station | Medium-Term | ✓ |

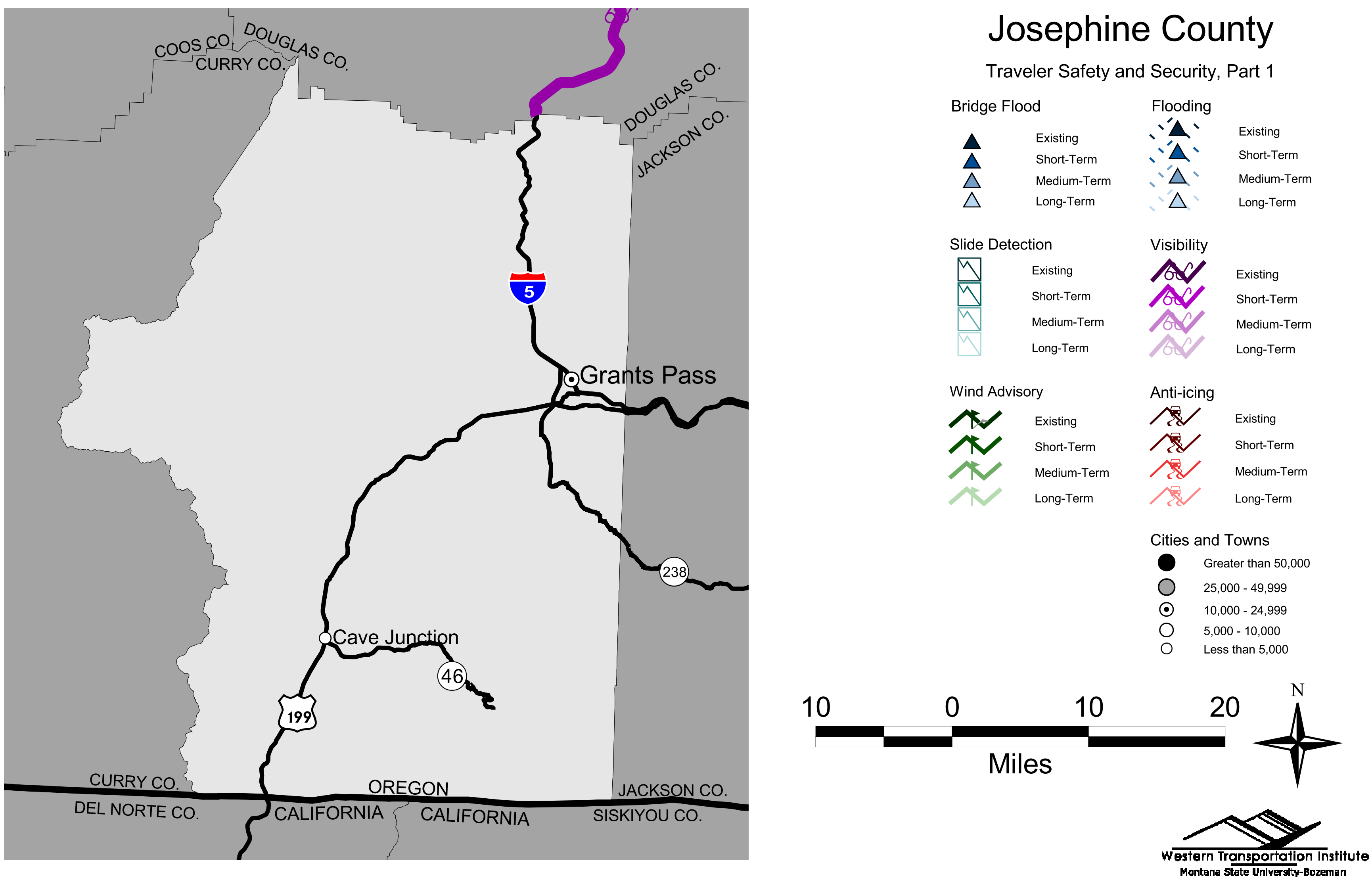



**Figure G-49:** Traveler Safety and Security (Part 1) in Josephine County.

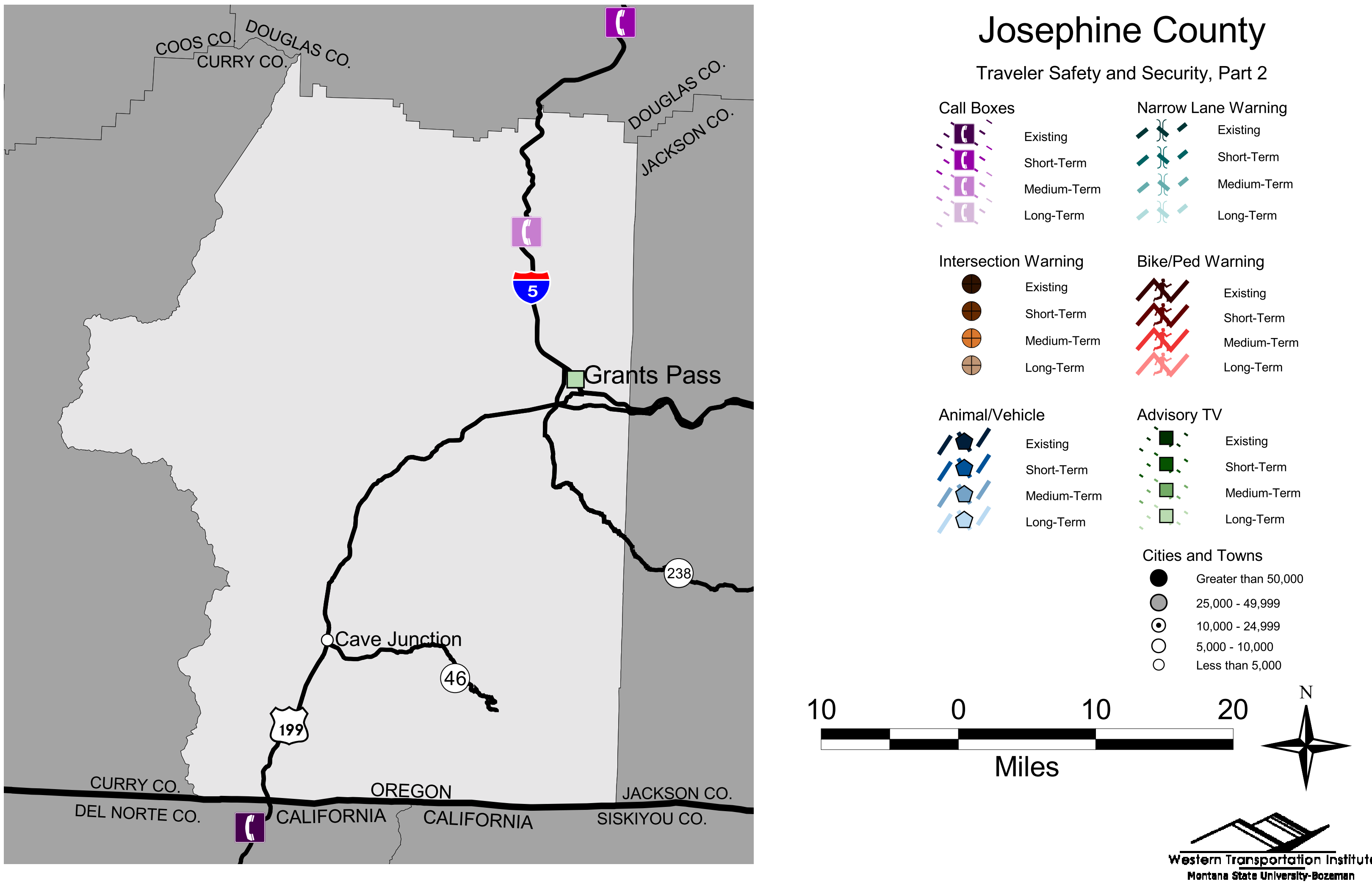



**Figure G-50:** Traveler Safety and Security (Part 2) in Josephine County.

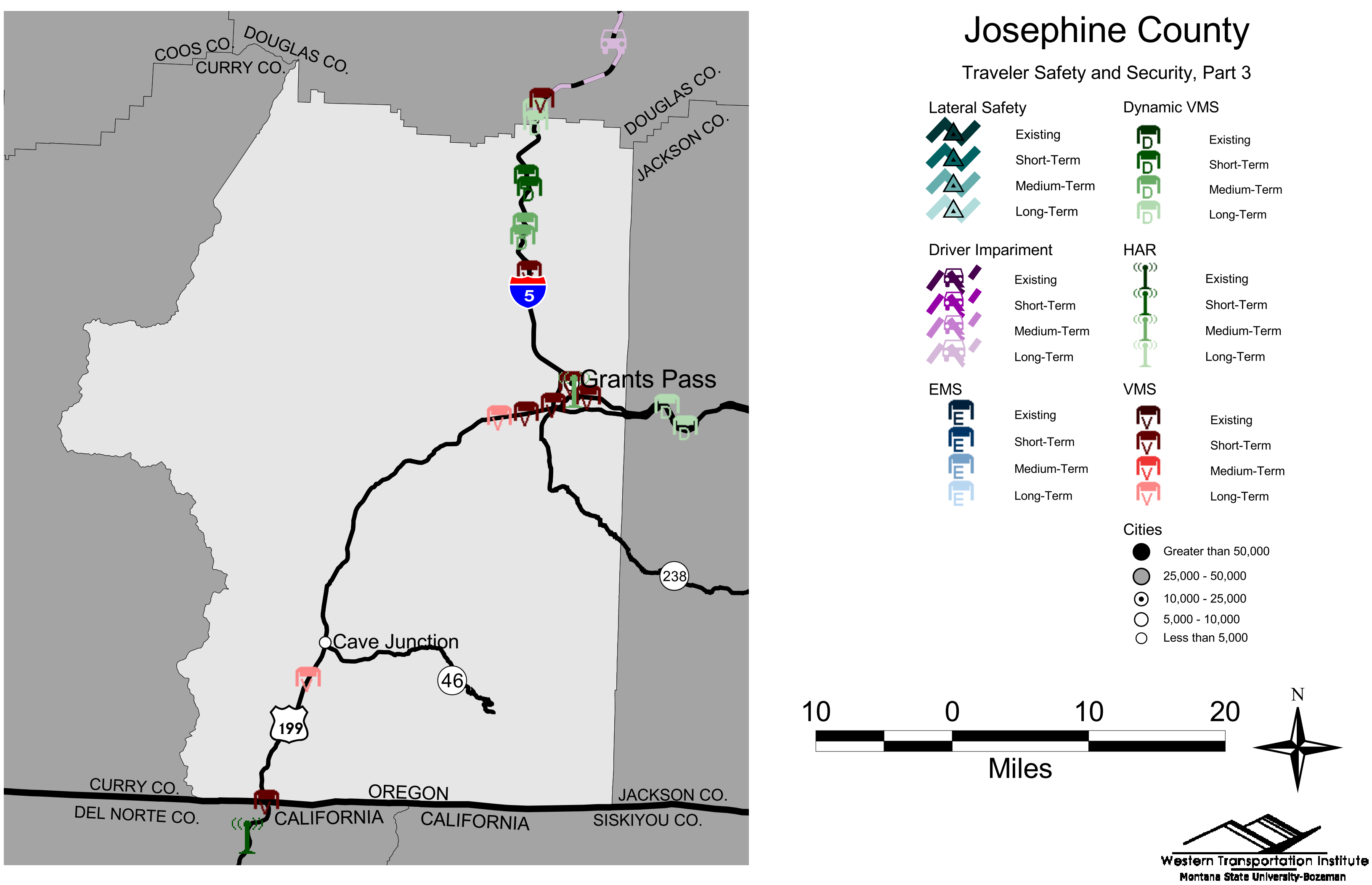



**Figure G-51:** Traveler Safety and Security (Part 3) in Josephine County.

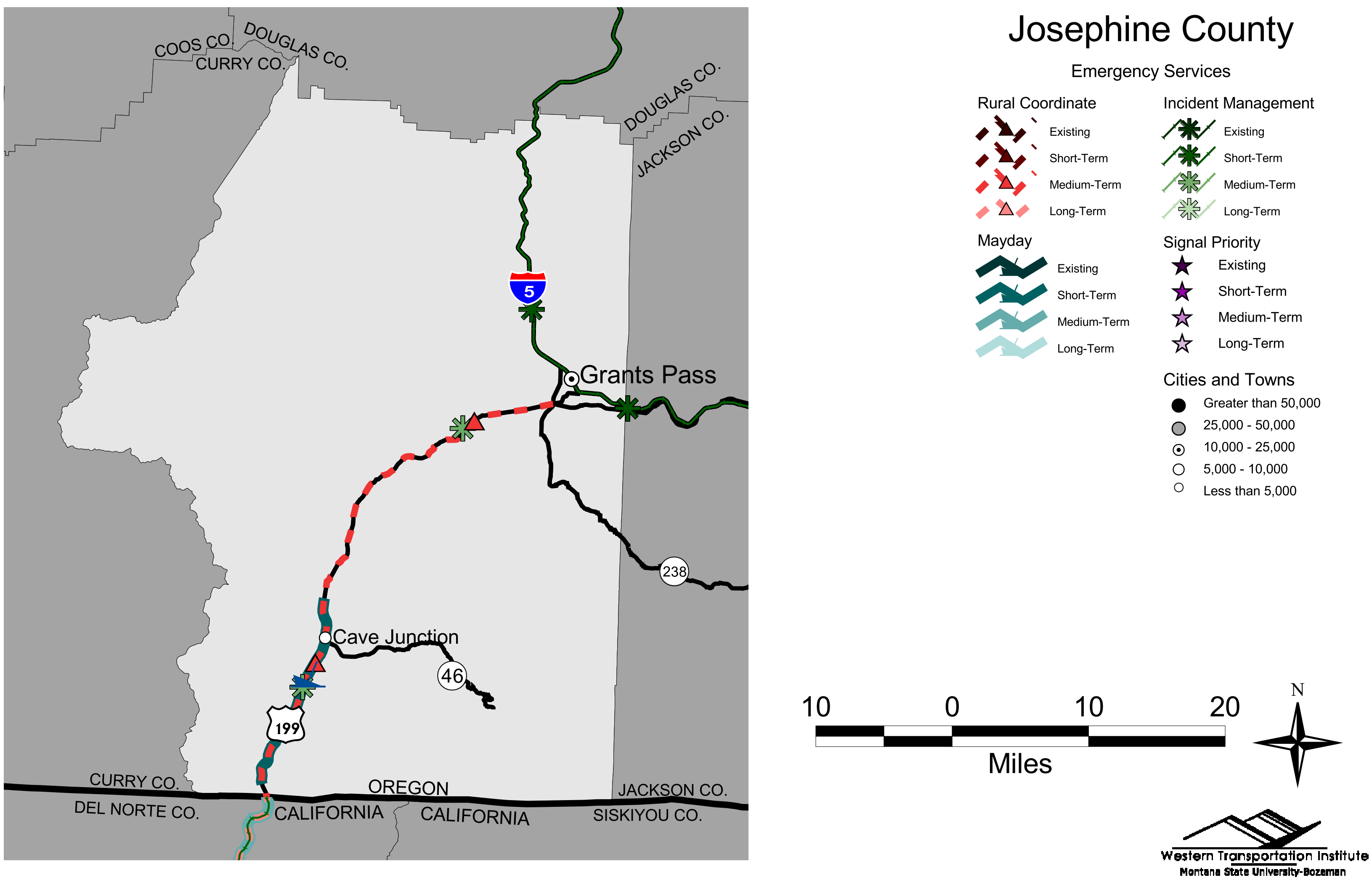



**Figure G-52:** Emergency Services in Josephine County.

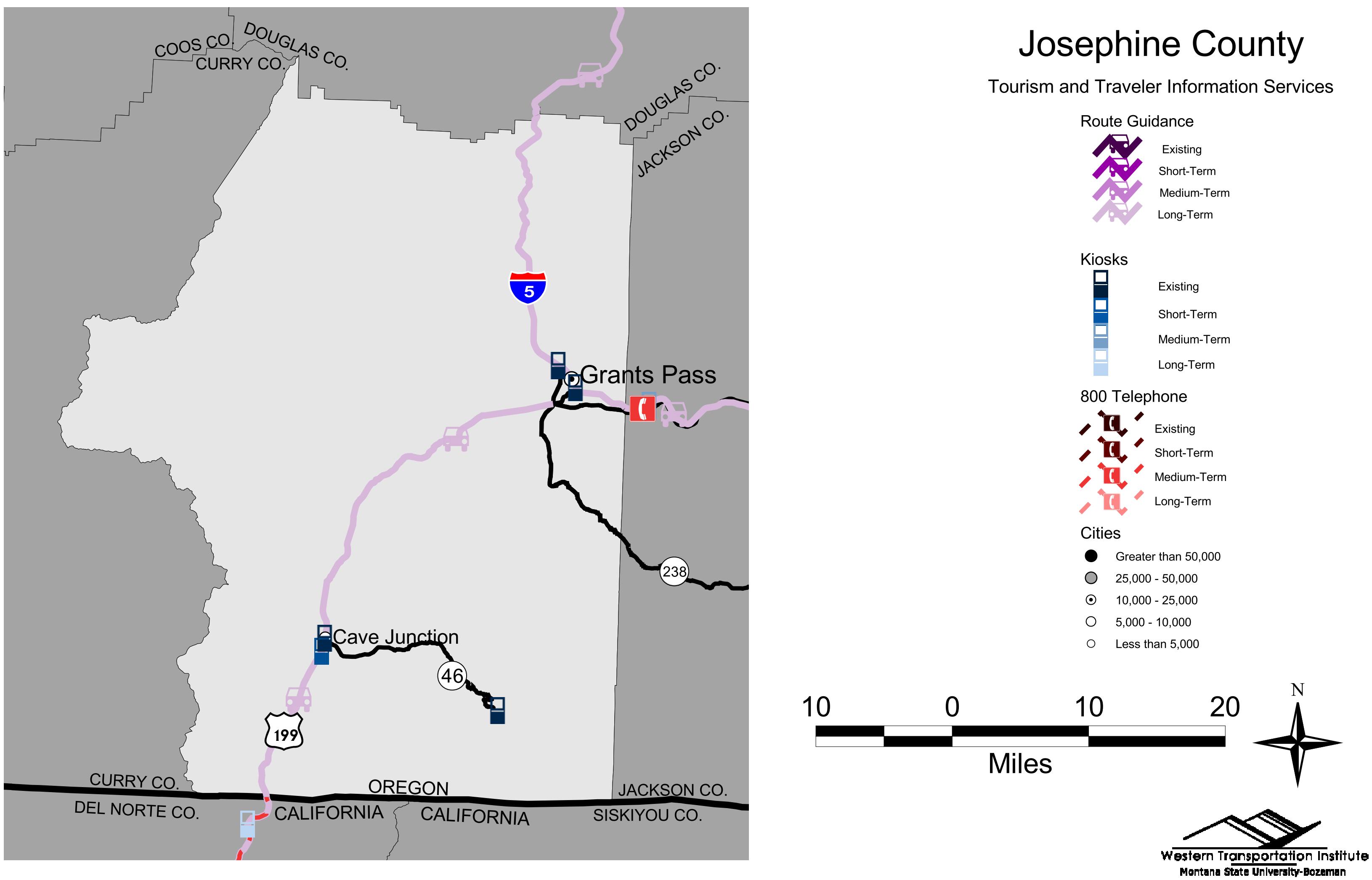



**Figure G-53:** Tourism and Traveler Information Services in Josephine County.

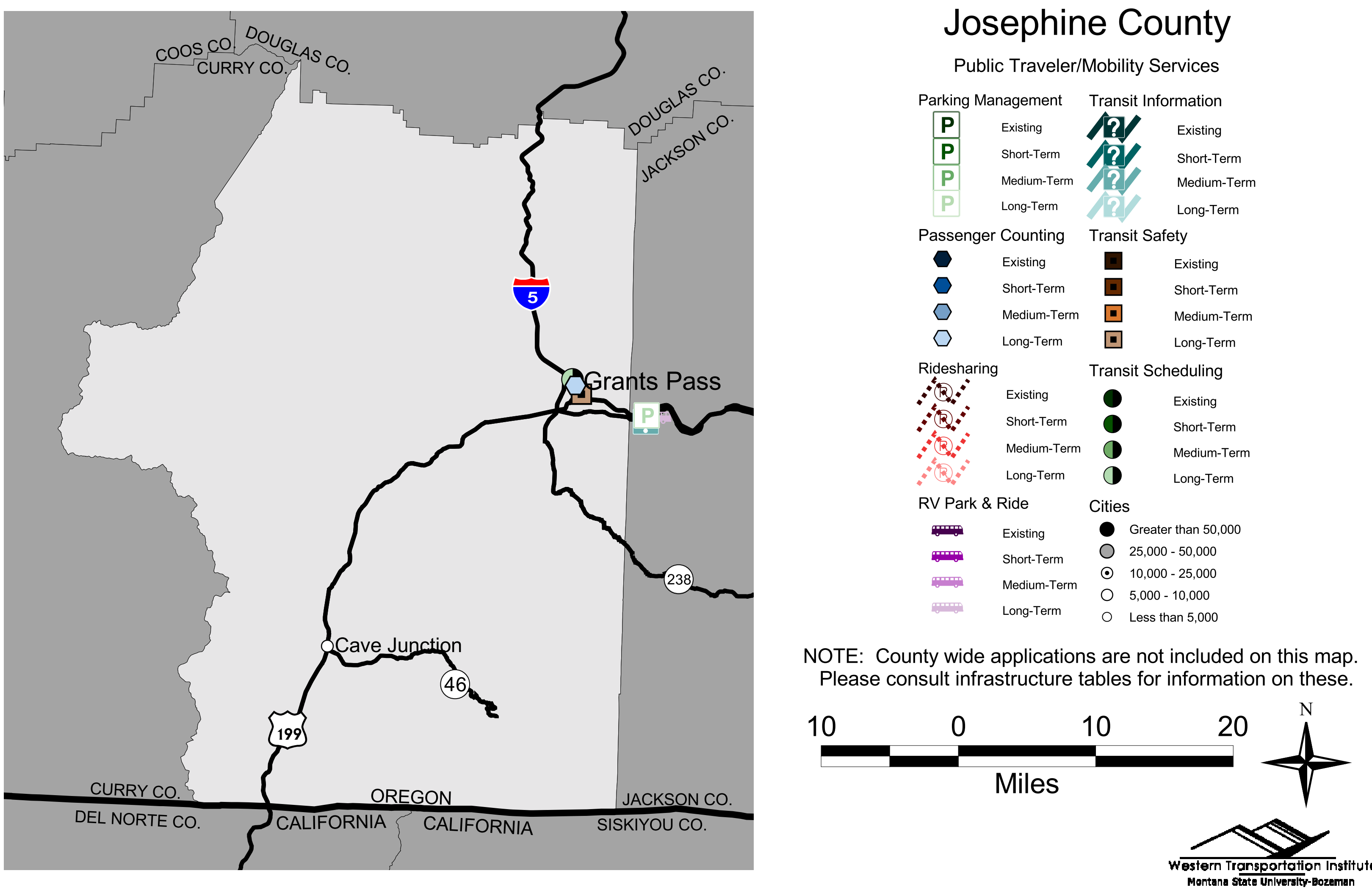



**Figure G-54:** Public Traveler/Mobility Services in Josephine County.

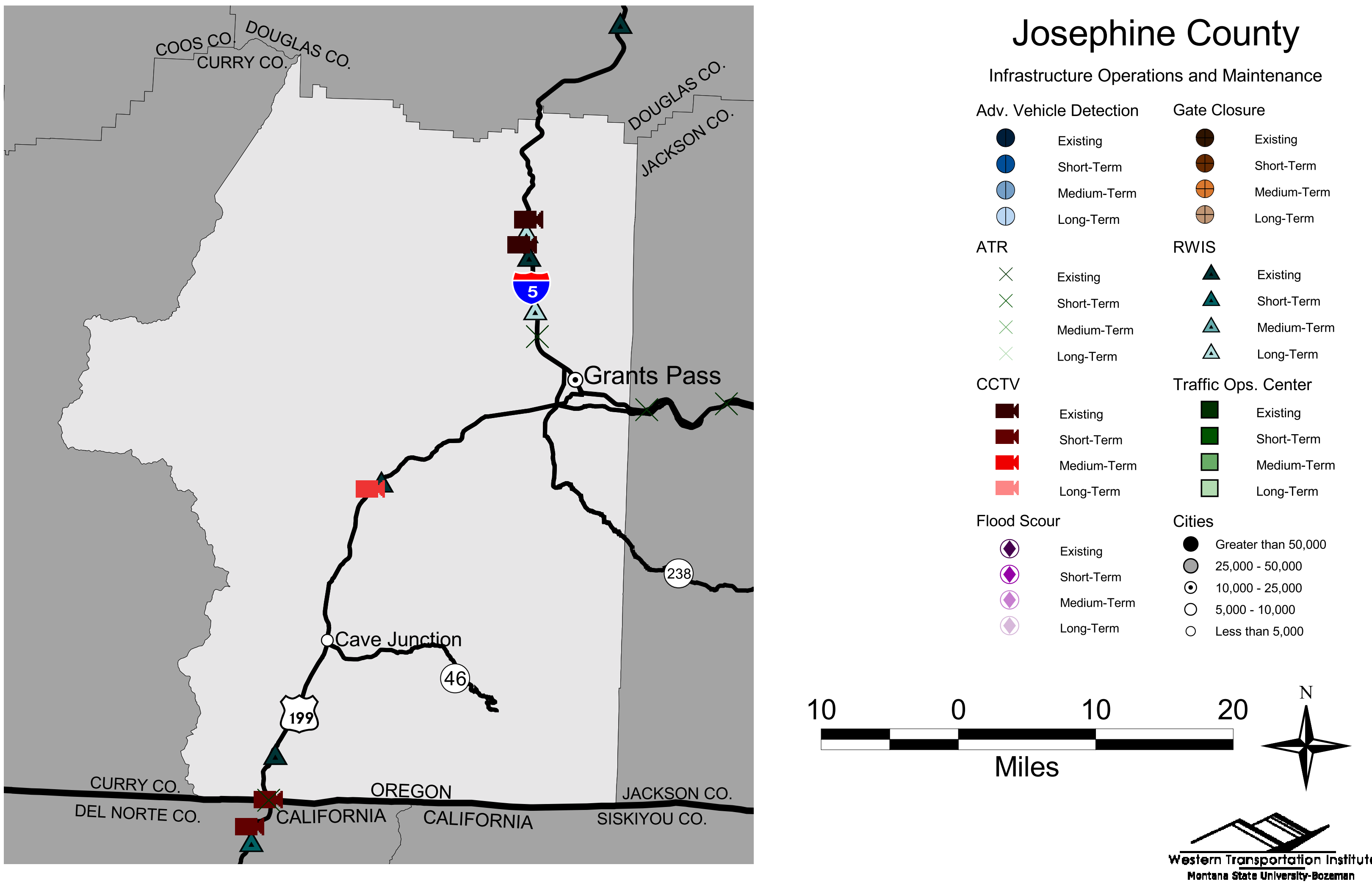



**Figure G-55:** Infrastructure Operations and Maintenance in Josephine County.

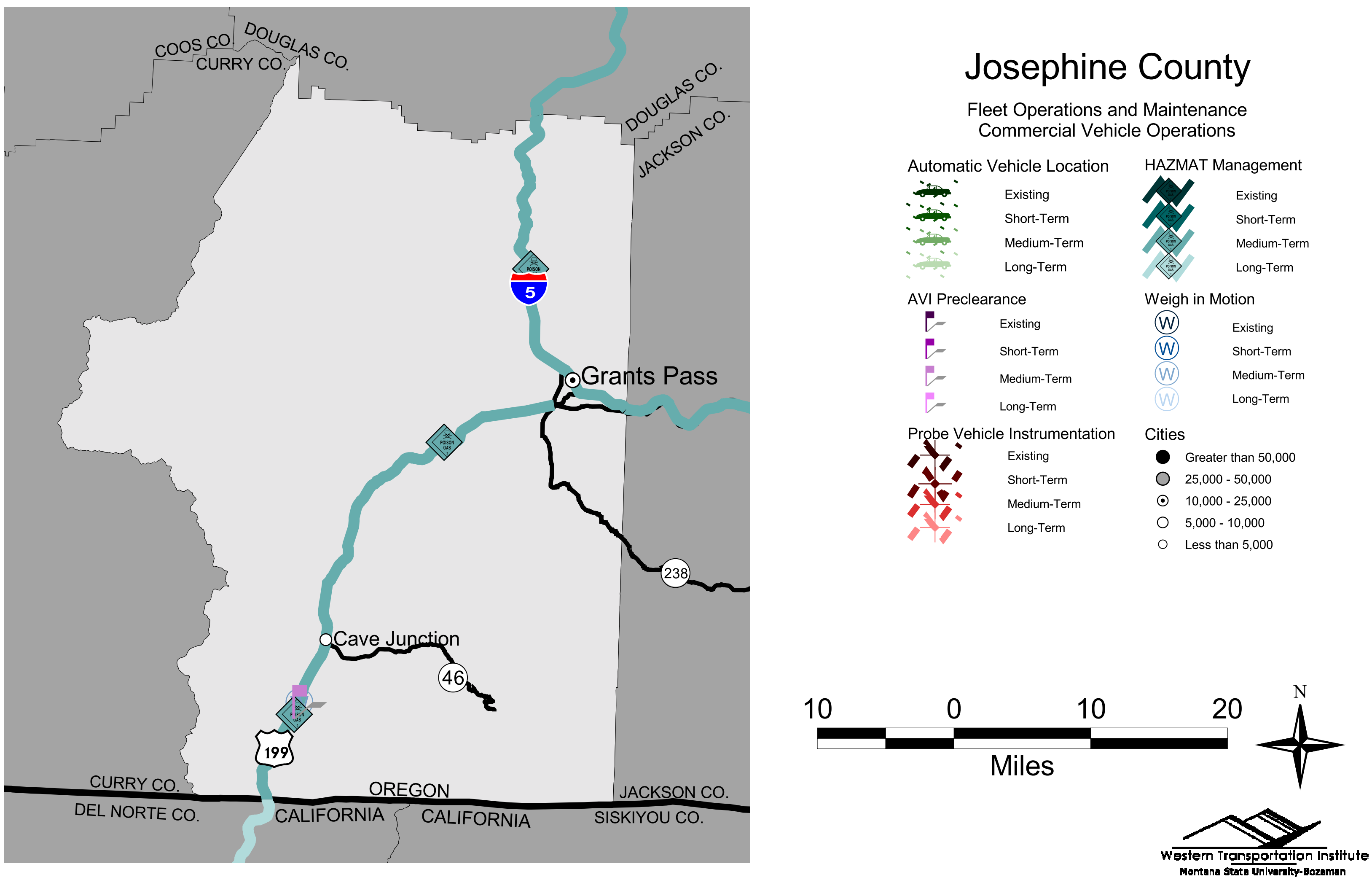



**Figure G-56:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Josephine County.

**Table G-9:** Deployment Locations in Klamath County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 12 | Klamath | 4 | 202.2 | 203.2 | | N. of Chemult over RR Tracks | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 15 | Klamath | 20 | 0 | | | Bike/ped challenge (Klamath Falls) | Medium-Term | ✓ |
| Advisory Television | 14 | Klamath | 4 | 272.31 | | | Klamath Falls | Medium-Term | ✓ |
| Advisory Television | 28 | Klamath | 18 | 76 | | | Crescent Lake in Snow Park (10 mi. e of CL) | Long-Term | ✓ |
| Animal/Vehicle Collision Warning | 1 | Klamath | 4 | 172.19 | 202 | | animal migration | Short-Term | ✓ |
| Animal/Vehicle Collision Warning | 2 | Klamath | 4 | 206 | 242 | | animal migration | Short-Term | ✓ |
| Animal/Vehicle Collision Warning | 4 | Klamath | 20 | 6.04 | 63.39 | | Animal related challenge | Medium-Term | ✓ |
| Automated Anti-Icing | 3 | Klamath | 270 | 58.2 | 59.2 | | By Doak Mountain | Short-Term | ✓ |
| Highway Advisory Radio | 22 | Klamath | 4 | 196 | | | Road Closure | Short-Term | ✓ |
| Highway Advisory Radio | 23 | Klamath | 425 | 93 | | | Tourism | Short-Term | ✓ |
| Highway Advisory Radio | 24 | Klamath | 22 | 103.95 | | | Tourism | Short-Term | ✓ |
| Highway Advisory Radio | 28 | Klamath | 18 | 69 | | | Crescent Lake | Short-Term | ✓ |
| Lateral Safety Warning System | 4 | Klamath | 4 | 193 | 197 | | Klamath Falls and OR58 | Medium-Term | ✓ |
| Variable Message Sign | 22 | Klamath | 270 | 68.76 | | West | All Criteria | Short-Term | ✓ |
| Variable Message Sign | 26 | Klamath | 4 | 272 | | North | All Criteria | Short-Term | ✓ |
| Variable Message Sign | 27 | Klamath | 4 | 213 | | North | All Criteria | Short-Term | ✓ |
| Variable Message Sign | 28 | Klamath | 4 | 203.2 | | North | All Criteria | Short-Term | ✓ |
| Variable Message Sign | 38 | Klamath | 4 | 212.09 | | South | Moved from 425/14 | Short-Term | ✓ |
| Variable Message Sign | 39 | Klamath | 4 | 278 | | North | All criteria | Short-Term | ✓ |
| Variable Message Sign | 40 | Klamath | 18 | 69 | | W | Crescent Lake Junction | Short-Term | ✓ |
| Variable Message Sign | 75 | Klamath | 4 | 211 | | South | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 132 | Klamath | 22 | 103.95 | | South | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 133 | Klamath | 4 | 250 | | South | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 138 | Klamath | 425 | 86 | | West | All Criteria | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 3 | Klamath | 270 | 32.25 | 68.76 | | | Short-Term | ✓ |
| Regional Incident Management Plan | 12 | Klamath | 4 | 213.1 | 291.73 | | Road Closure | Short-Term | ✓ |
| Regional Incident Management Plan | 26 | Klamath | 18 | 62.07 | 86.45 | | Road Closure | Medium-Term | ✓ |
| Regional Incident Management Plan | 34 | Klamath | 270 | 32.25 | 68.76 | | Road Closure | Long-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 1 | Klamath | 425 | 94 | | | Tourist Locations | Short-Term | ✓ |
| 800 Travel Advisory | 4 | Klamath | 18 | 62.07 | 86 | | Road Closures Due to Slides & Floods | Short-Term | ✓ |
| 800 Travel Advisory | 21 | Klamath | 4 | 247.44 | | | Tourist Locations | Medium-Term | ✓ |
| 800 Travel Advisory | 34 | Klamath | 4 | 244 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 19 | Klamath | 270 | 32.25 | 68.76 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 22 | Klamath | 4 | 215 | 270 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 24 | Klamath | 425 | 86 | | | Tourist Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 38 | Klamath | 18 | 62.07 | 86.45 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 21 | Klamath | 18 | 62.07 | | | Willamette Pass | Existing | ✓ |
| Kiosks | 25 | Klamath | 4 | 272.61 | | | Klamath Falls | Existing | ✓ |
| Kiosks | 26 | Klamath | 4 | 280.16 | | | Klamath Falls | Existing | ✓ |
| Kiosks | 27 | Klamath | 4 | 289.44 | | | Worden | Existing | ✓ |
| Kiosks | 31 | Klamath | 4 | 247.44 | | | Kla-Mo-Ya Casino | Short-Term | ✓ |
| Kiosks | 32 | Klamath | 425 | 87 | | | Crater Lake National Park | Short-Term | ✓ |
| Kiosks | 43 | Klamath | 18 | 62.07 | | | Willamette Pass | Short-Term | ✓ |
| Kiosks | 50 | Klamath | 4 | 244 | | | Collier Memorial State Park | Medium-Term | ✓ |

**Table G-9:** Deployment Locations in Klamath County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Tourism and Traveler Information Services (cont.)** | | | | | | | | | |
| Kiosks | 67 | Klamath | 4 | 208 | | | Beaver Marsh/Chemult Rest Area | Medium-Term | ✓ |
| Kiosks | 68 | Klamath | 18 | 69 | | | Crescent Lake Jct. Snow Park | Medium-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 12 | Klamath | 4 | 272.31 | | | Klamath Falls Amtrak | Long-Term | ✓ |
| Automated Passenger Counting | 15 | Klamath | 4 | 203.2 | | | Chemult Amtrak | Long-Term | ✓ |
| Automated Passenger Counting | 38 | Klamath | | | | | Klamath County | Long-Term | ✓ |
| Dynamic Ridesharing/Paratransit | 7 | Klamath | 4 | 276 | | | Klamath Falls | Medium-Term | ✓ |
| On-Board Transit Safety Systems | 11 | Klamath | 4 | 272.31 | | | Klamath Falls Amtrak | Long-Term | ✓ |
| On-Board Transit Safety Systems | 15 | Klamath | 4 | 203.2 | | | Chemult Amtrak | Long-Term | ✓ |
| On-Board Transit Safety Systems | 38 | Klamath | | | | | Klamath County | Long-Term | ✓ |
| Parking Management & Information System | 5 | Klamath | 425 | 86 | | | Tourist Locations | Medium-Term | ✓ |
| Parking Management & Information System | 19 | Klamath | 4 | 244<br>247.44 | | | Tourist Locations | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 5 | Klamath | 4 | 244 | | | Collier Memorial State Park | Medium-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 6 | Klamath | 425 | 86 | | | Crater Lake National Park | Medium-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 12 | Klamath | 18 | 69 | | | Crescent Lake | Medium-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 21 | Klamath | 4 | 247.44 | | | Kla-Mo-Ya Casino | Long-Term | ✓ |
| Transit Traveler Information | 16 | Klamath | 4 | 244 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 17 | Klamath | 4 | 247.44 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Traveler Information | 20 | Klamath | 425 | 87 | | | RV and non-RV Park and ride locations | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 6 | Klamath | | | | | Klamath County | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 34 | Klamath | 4 | 272.31 | | | Klamath Falls Amtrak | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 37 | Klamath | 4 | 203.2 | | | Chemult Amtrak | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 39 | Klamath | 4 | 202.7 | | | N. of Chemult over RR Tracks | Medium-Term | ✓ |
| Automated Gate Closure | 7 | Klamath | 18 | 86.45 | | | Road Closure Due to Bad Weather | Medium-Term | ✓ |
| Automatic Traffic Recorder | 248 | Klamath | 50 | 11.89 | | | 1.7 miles east of Merrill | Existing | ✓ |
| Automatic Traffic Recorder | 253 | Klamath | 22 | 92.58 | | | 0.3 mile south of Fort Klamath | Existing | ✓ |
| Automatic Traffic Recorder | 257 | Klamath | 4 | 204.7 | | | 1.5 miles south of Chemult | Existing | ✓ |
| Automatic Traffic Recorder | 258 | Klamath | 4 | 289.43 | | | 2.3 miles N of OR-CA Border | Existing | ✓ |
| Automatic Traffic Recorder | 267 | Klamath | 270 | 36.58 | | | 4.2 miles east of Beatty | Existing | ✓ |
| Closed-Circuit Television Camera | 26 | Klamath | 270 | 36 | | | Lake of the Woods | Existing | ✓ |
| RWIS | 6 | Klamath | 270 | 53.6 | | | Bly Mountain Summit | Existing | ✓ |
| RWIS | 10 | Klamath | 18 | 62.3 | | | Willamette Pass Ski Area | Existing | ✓ |
| RWIS | 41 | Klamath | 4 | 265 | | | Road Closure Due to Bad Weather | Short-Term | ✓ |
| RWIS | 49 | Klamath | 425 | 93 | | | Around Crater Lake | Short-Term | ✓ |
| RWIS | 55 | Klamath | 425 | 86 | | | | Short-Term | ✓ |
| RWIS | 66 | Klamath | 4 | 235.5 | | | Spring Creek @ US 97 ? | Medium-Term | ✓ |
| RWIS | 70 | Klamath | 20 | 31 | | | Klamath Falls - Lakeview Hwy | Medium-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 5 | Klamath | 4 | 194.8 | 291.73 | | State Line to Or 58 Junction | Medium-Term | ✓ |
| Hazmat Management | 9 | Klamath | 18 | 62.07 | 86.45 | | | Long-Term | ✓ |
| Preclearance | 9 | Klamath | 4 | 271.41 | | S | Klamath Falls | Short-Term | ✓ |
| Preclearance | 10 | Klamath | 4 | 271.73 | | N | Klamath Falls | Short-Term | ✓ |
| Weigh in Motion | 9 | Klamath | 4 | 271.41 | | N/S | Klamath Falls | Existing | ✓ |
| Weigh in Motion | 10 | Klamath | 4 | 271.73 | | N | Klamath Falls | Existing | ✓ |

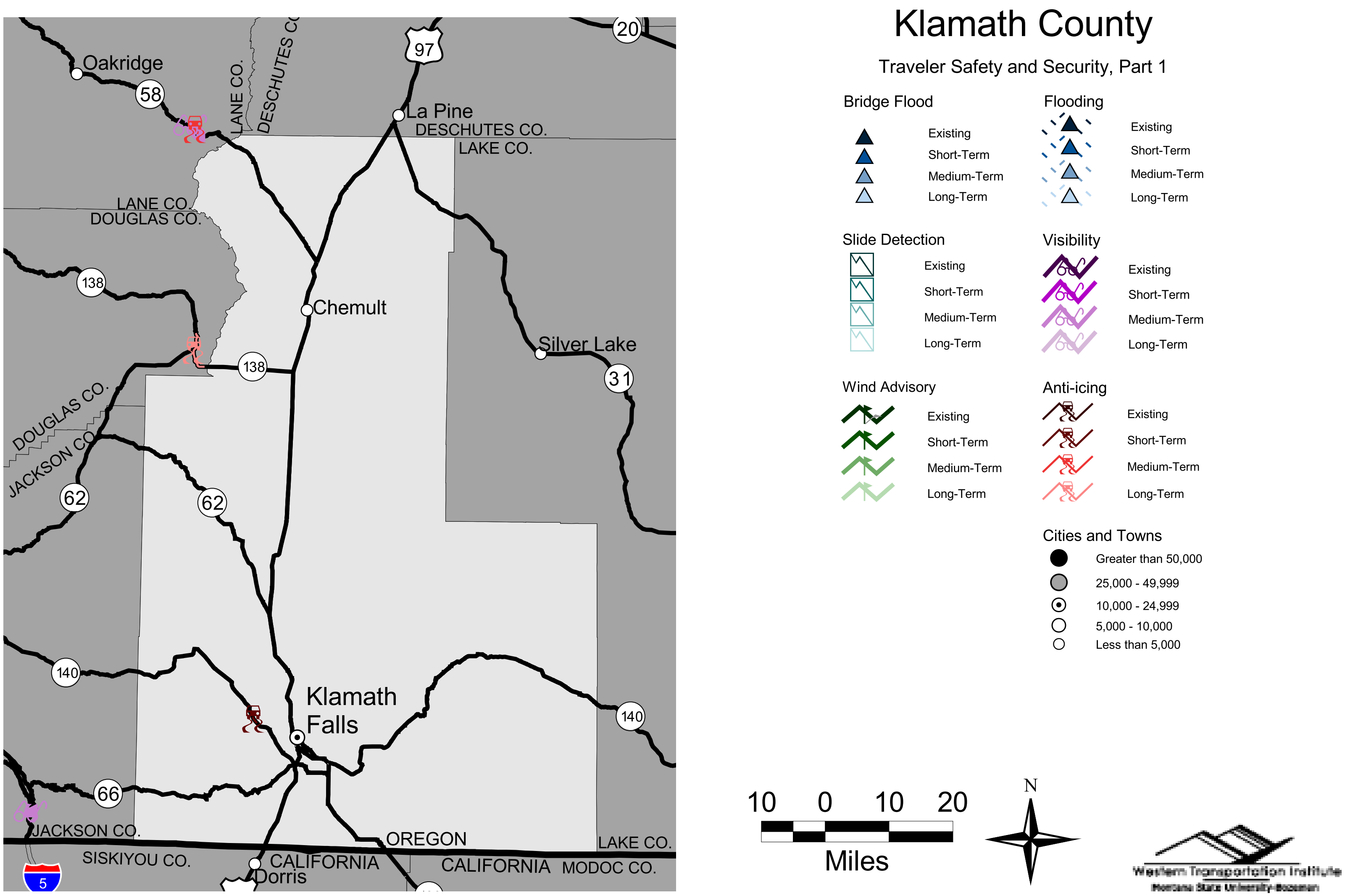



**Figure G-57:** Traveler Safety and Security (Part 1) in Klamath County.

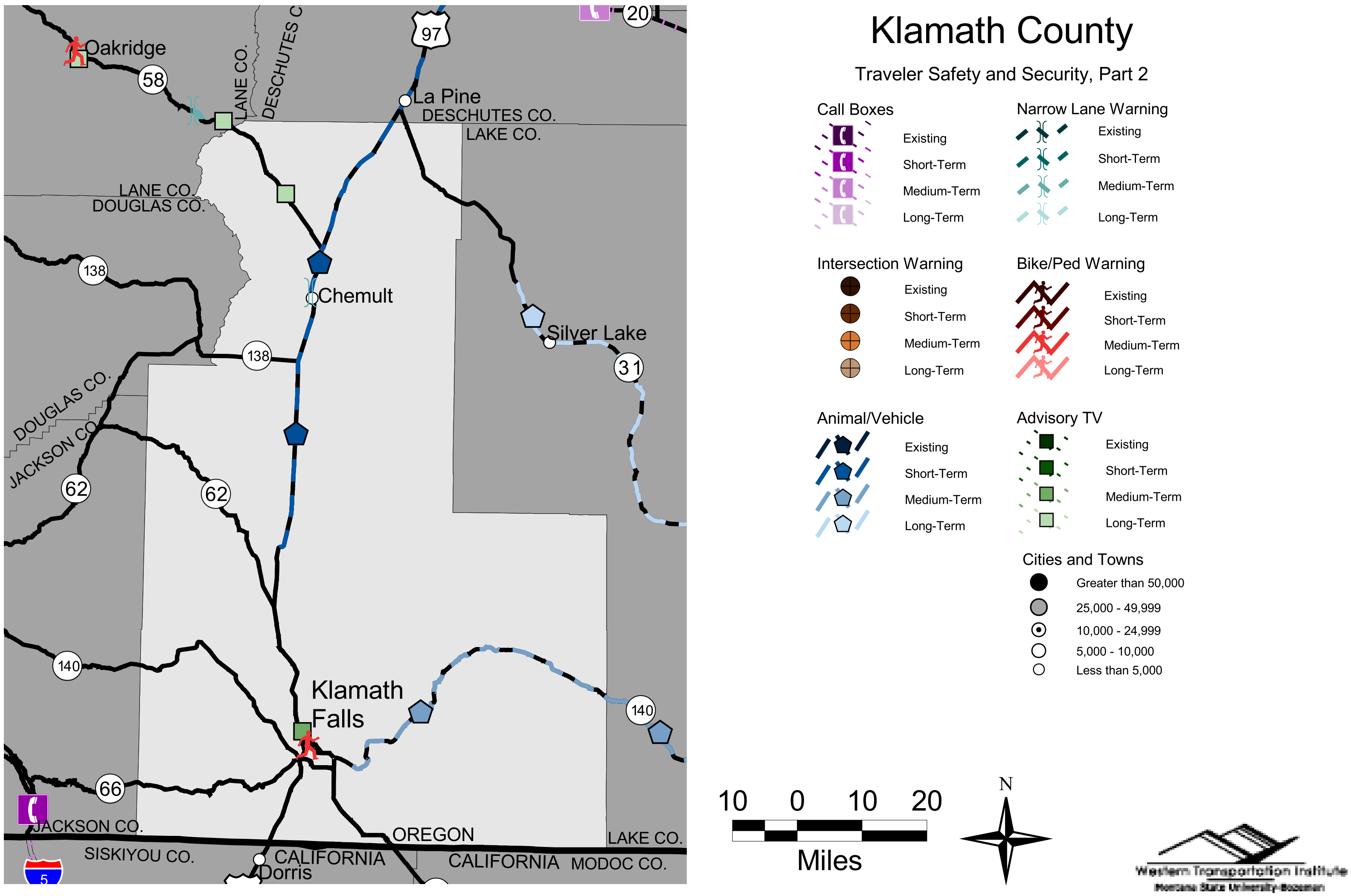



**Figure G-58:** Traveler Safety and Security (Part 2) in Klamath County.

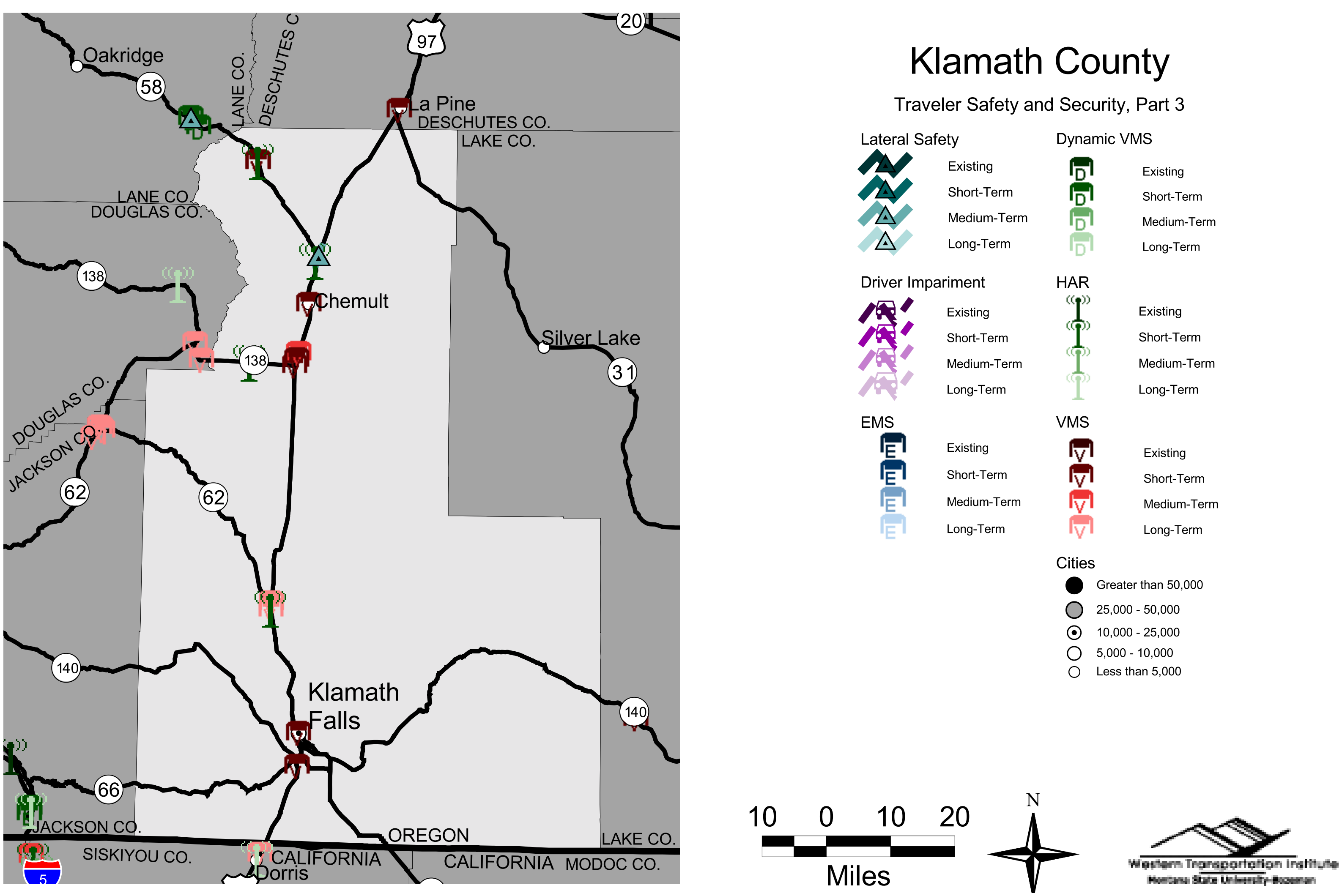



**Figure G-59:** Traveler Safety and Security (Part 3) in Klamath County.

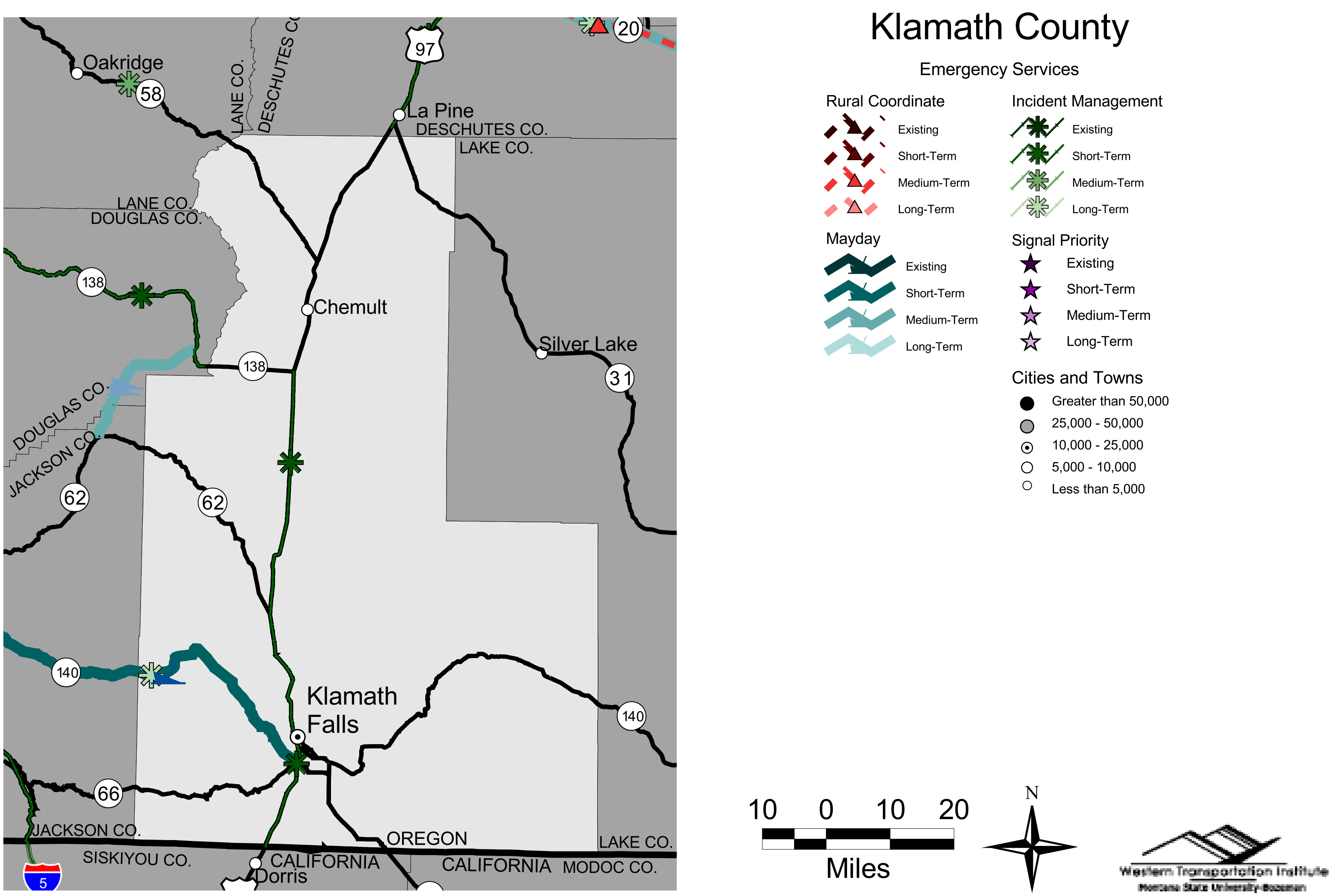



**Figure G-60:** Emergency Services in Klamath County.

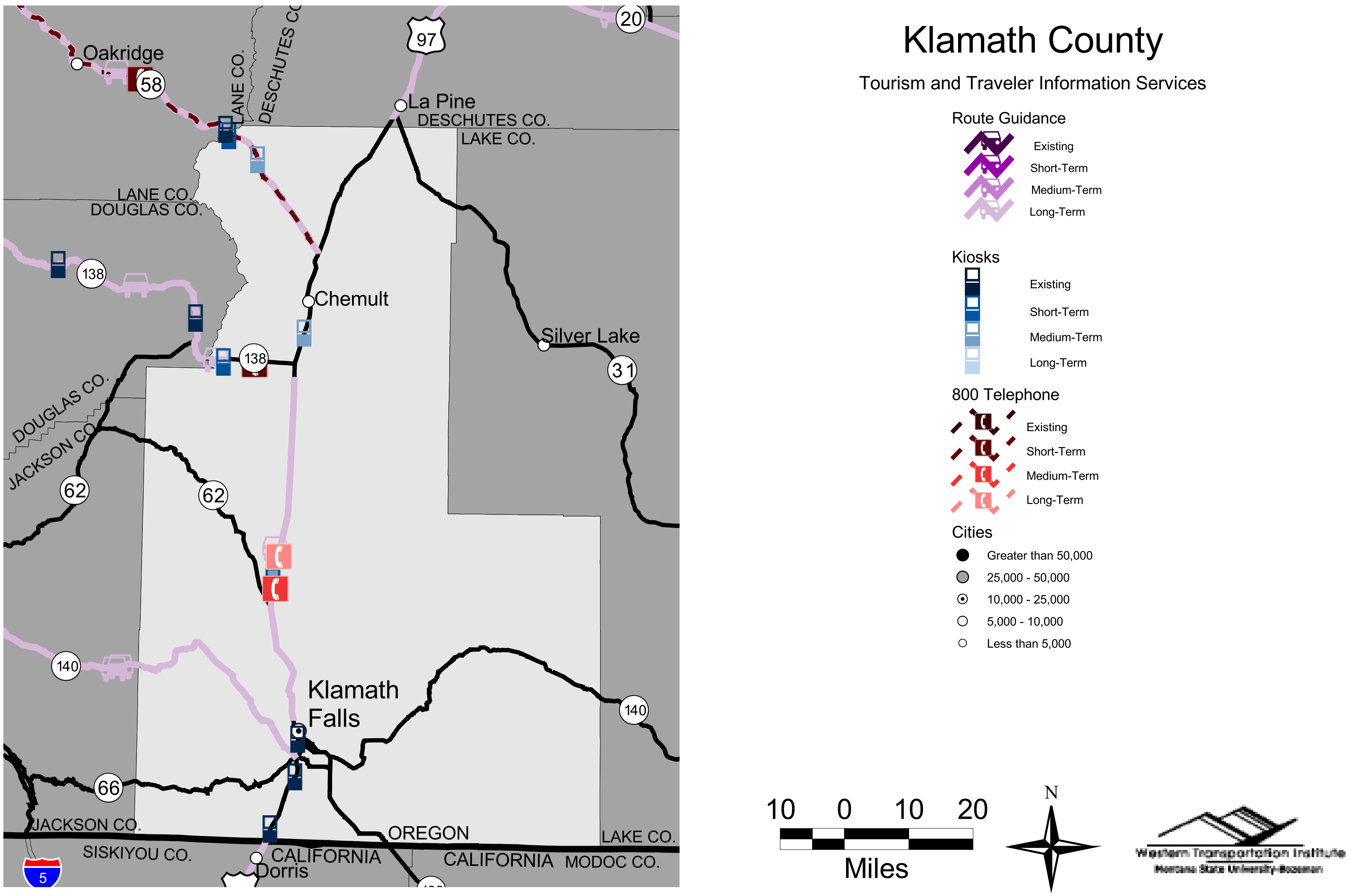



**Figure G-61:** Tourism and Traveler Information Services in Klamath County.

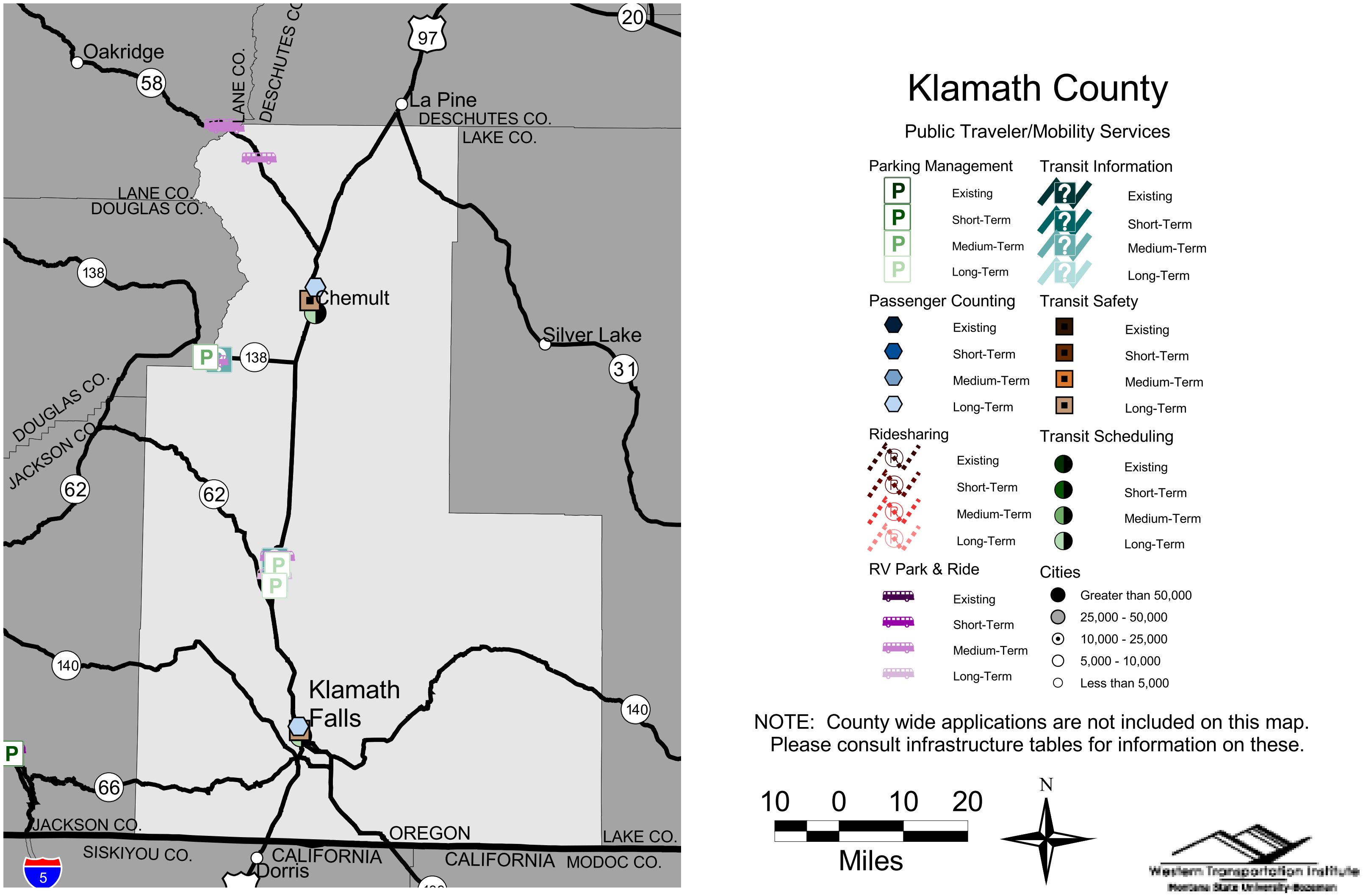



**Figure G-62:** Public Traveler/Mobility Services in Klamath County.

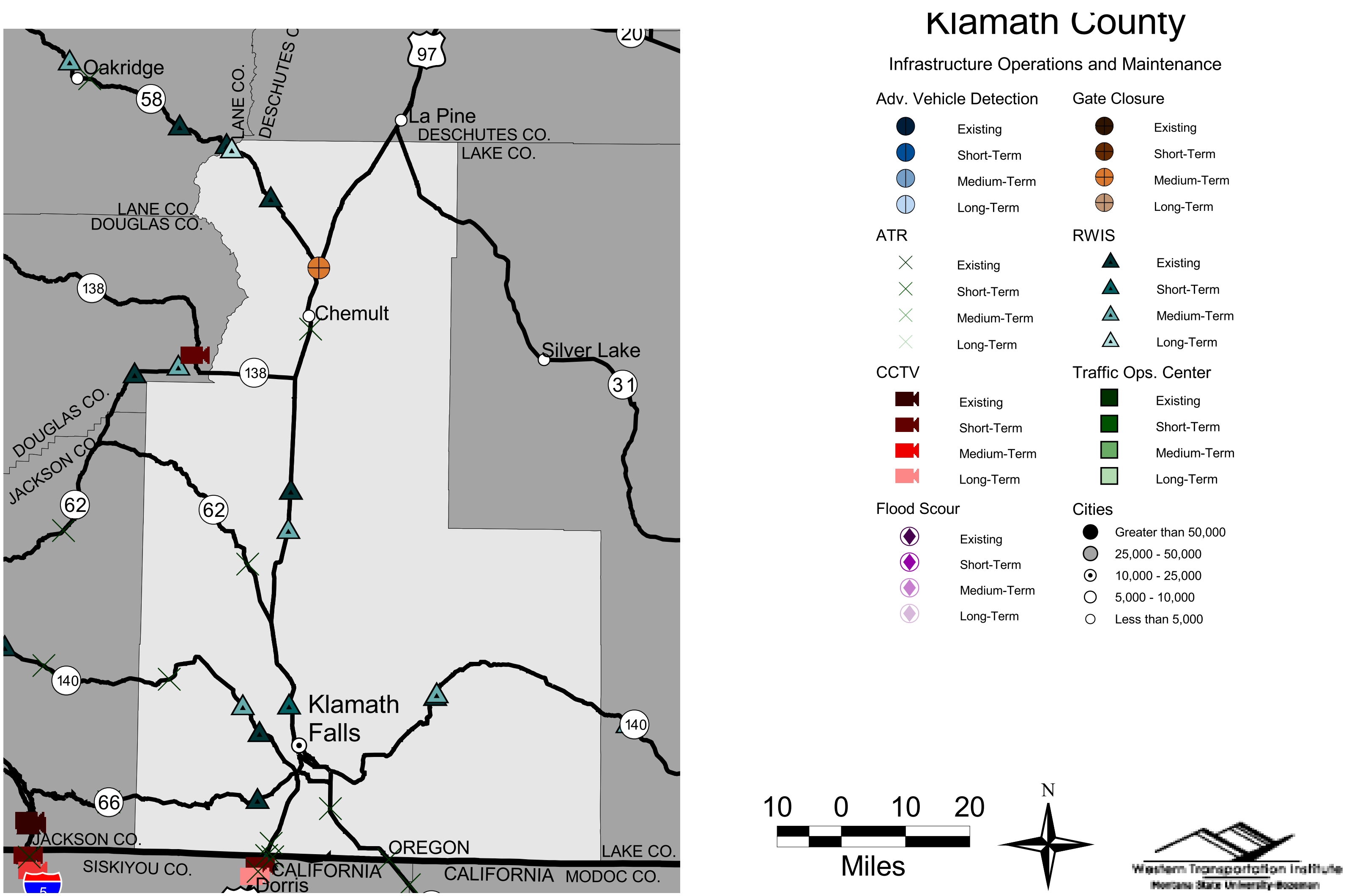



**Figure G-63:** Infrastructure Operations and Maintenance in Klamath County.

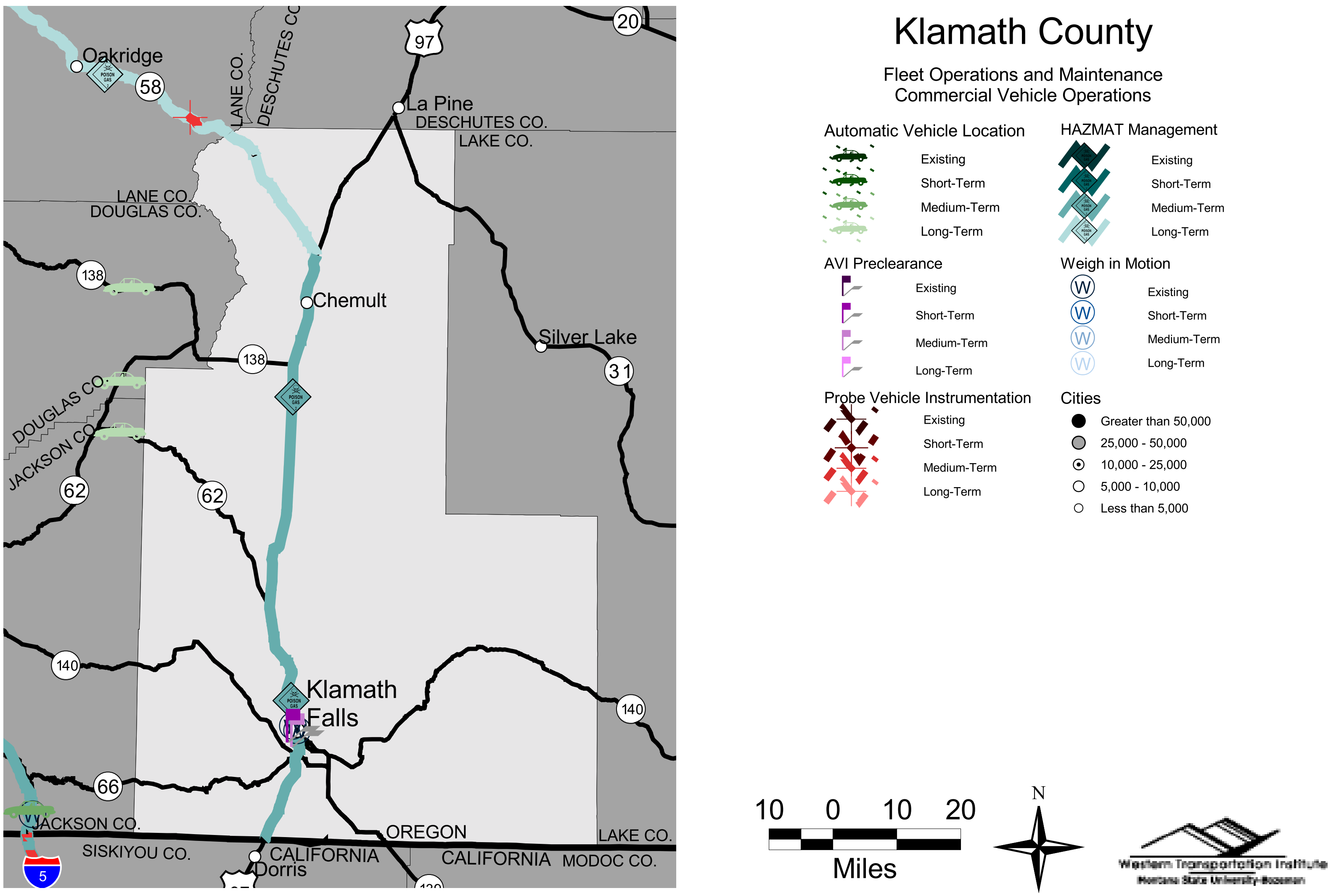



**Figure G-64:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Klamath County.

**Table G-10:** Deployment Locations in Lake County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Advisory Television | 15 | Lake (OR) | 19 | 142.64 | | | Lakeview | Medium-Term | ✓ |
| Animal/Vehicle Collision Warning | 4 | Lake (OR) | 20 | 63.39 | 90 | | Animal related challenge | Medium-Term | ✓ |
| Animal/Vehicle Collision Warning | 15 | Lake (OR) | 19 | 35 | 100.7 | | Animal related challenge | Long-Term | ✓ |
| Dynamic Warning VMS | 23 | Lake (OR) | 19 | 46.35<br>48.35 | | E<br>W | Silver Lake | Long-Term | ✓ |
| Highway Advisory Radio | 26 | Lake (OR) | 431 | 0 | | | Road Closure | Short-Term | ✓ |
| Motorist-Aide Call Box | 81 | Lake (OR) | 49 | 30 | 90.02 | | Notification time challenge | Medium-Term | ✓ |
| Motorist-Aide Call Box | 82 | Lake (OR) | 7 | 69.25 | 83.79 | | Notification time challenge | Medium-Term | ✓ |
| Variable Message Sign | 21 | Lake (OR) | 19 | 157.73 | | North | All Criteria | Short-Term | ✓ |
| Variable Message Sign | 73 | Lake (OR) | 20 | 95 | | East | Road Closure | Medium-Term | ✓ |
| Variable Message Sign | 74 | Lake (OR) | 19 | 137 | | South | Road Closure | Medium-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Mayday Systems | 12 | Lake (OR) | 49 | 30 | 90.02 | | Notification time challenge | Medium-Term | ✓ |
| Mayday Systems | 13 | Lake (OR) | 7 | 69.25 | 83.79 | | Notification time challenge | Medium-Term | ✓ |
| Regional Incident Management Plan | 25 | Lake (OR) | 431 | 0 | 65.28 | | Road Closure | Medium-Term | ✓ |
| Regional Incident Management Plan | 35 | Lake (OR) | 7 | 69.25 | 83.79 | | Road Closure | Long-Term | ✓ |
| Rural Coordinate Addressing System | 11 | Lake (OR) | 7 | 69.25 | 83.79 | | Notification time challenge | Medium-Term | ✓ |
| Rural Coordinate Addressing System | 12 | Lake (OR) | 49 | 30 | 90.02 | | Notification time challenge | Medium-Term | ✓ |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| In-Vehicle Route Guidance System | 15 | Lake (OR) | 431 | 0 | 65.28 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 40 | Lake (OR) | 7 | 69.25 | 83.79 | | Road Closure Locations | Long-Term | ✓ |
| Kiosks | 39 | Lake (OR) | 19 | 143 | | | Lakeview area-outback scenic byway rest area | Short-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 11 | Lake (OR) | 19 | 142.64 | | | Lakeview | Long-Term | ✓ |
| Automated Passenger Counting | 39 | Lake (OR) | | | | | Lake County | Long-Term | ✓ |
| On-Board Transit Safety Systems | 10 | Lake (OR) | 19 | 142.64 | | | Lakeview | Long-Term | ✓ |
| On-Board Transit Safety Systems | 39 | Lake (OR) | | | | | Lake County | Long-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 7 | Lake (OR) | | | | | Lake County | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 33 | Lake (OR) | 19 | 142.64 | | | Lakeview | Long-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Automatic Traffic Recorder | 245 | Lake (OR) | 19 | 49.65 | | | 2.3 miles east of SilverLake | Existing | ✓ |
| Automatic Traffic Recorder | 272 | Lake (OR) | 19 | 120.83 | | | 0.3 mile of Jct w/Lakeview-Burns Hwy | Existing | ✓ |
| Automatic Traffic Recorder | 273 | Lake (OR) | 19 | 157.43 | | | 0.3 mile N of OR-CA Border | Existing | ✓ |
| Closed-Circuit Television Camera | 22 | Lake (OR) | 19 | 98 | | | Paisley | Existing | ✓ |
| Closed-Circuit Television Camera | 23 | Lake (OR) | 19 | 144 | | | Lakeview | Existing | ✓ |
| Closed-Circuit Television Camera | 24 | Lake (OR) | 20 | 68 | | | Quartz Mountain | Existing | ✓ |
| Closed-Circuit Television Camera | 25 | Lake (OR) | 431 | 4 | | | Warner Mountain | Existing | ✓ |
| Closed-Circuit Television Camera | 147 | Lake (OR) | 49 | 90.02 | | | Response time challenge | Long-Term | ✓ |
| RWIS | 7 | Lake (OR) | 19 | 98.22 | | | Paisley | Existing | ✓ |
| RWIS | 8 | Lake (OR) | 431 | 4 | | | Warner Mountain | Existing | ✓ |
| RWIS | 12 | Lake (OR) | 20 | 66.75 | | | Quartz Mountain Summit | Existing | ✓ |
| RWIS | 22 | Lake (OR) | 19 | 144 | | | Lakeview | Existing | ✓ |
| RWIS | 104 | Lake (OR) | 19 | 69.09 | | | Summer Lake | Long-Term | ✓ |
| RWIS | 110 | Lake (OR) | 19 | 63.01 | | | Picture Rock Pass | Long-Term | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Automatic Vehicle Location | 12 | Lake (OR) | 7 | 69.25 | 83.79 | | Brothers to Burns | Long-Term | ✓ |

**Table G-10:** Deployment Locations in Lake County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Commercial Vehicle Operations** | | | | | | | | | |
| Preclearance | 17 | Lake (OR) | 19 | 146 | | N | Near Existing Weigh Station | Medium-Term | ✓ |
| Preclearance | 18 | Lake (OR) | 20 | 94.36 | | W | Near Existing Weigh Station | Medium-Term | ✓ |
| Preclearance | 19 | Lake (OR) | 19 | 144 | | S | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 21 | Lake (OR) | 19 | 146 | | N | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 32 | Lake (OR) | 20 | 94.36 | | W | Near Existing Weigh Station | Long-Term | ✓ |
| Weigh in Motion | 33 | Lake (OR) | 19 | 144 | | S | Near Existing Weigh Station | Long-Term | ✓ |

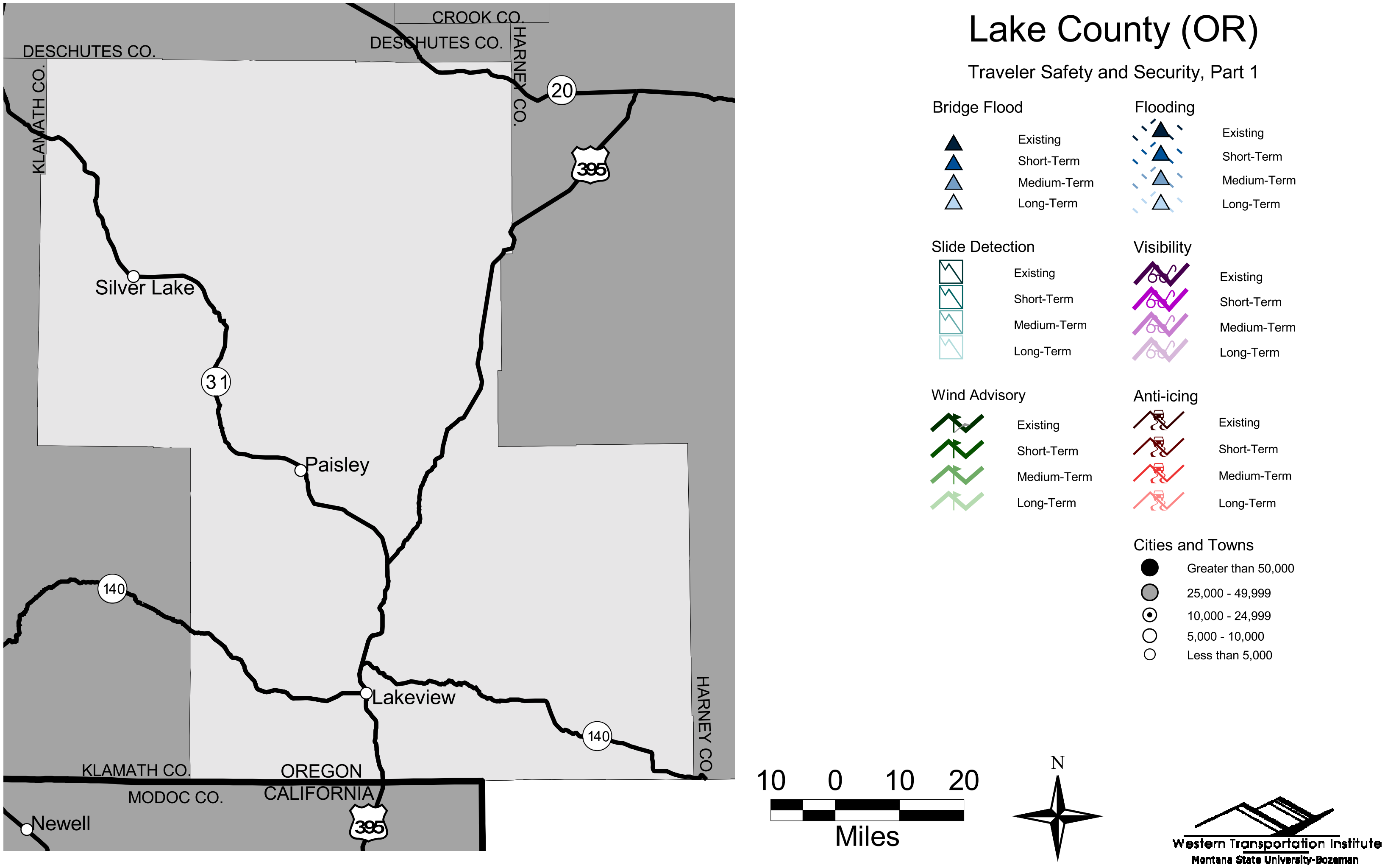



**Figure G-65:** Traveler Safety and Security (Part 1) in Lake County.

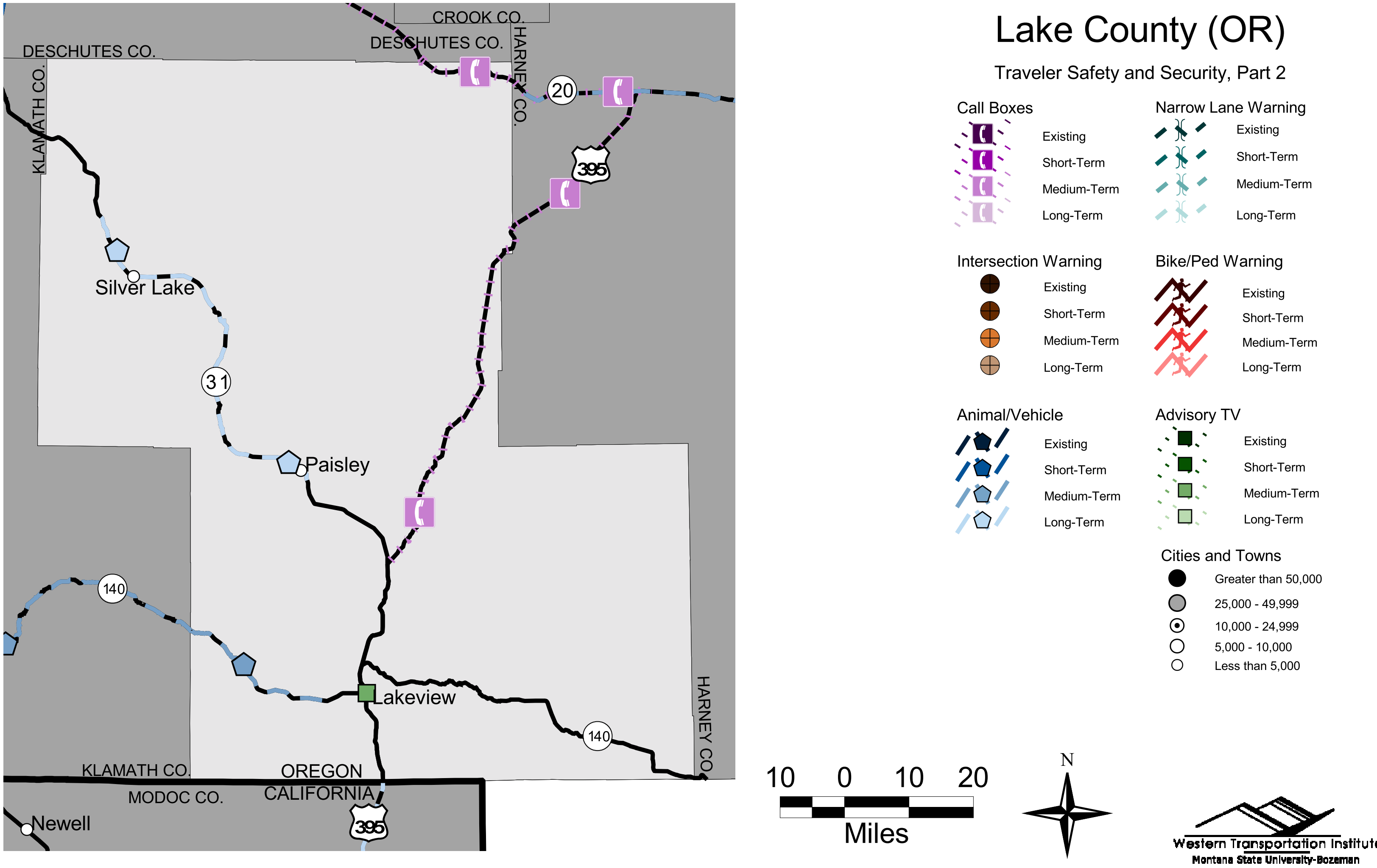



**Figure G-66:** Traveler Safety and Security (Part 2) in Lake County.

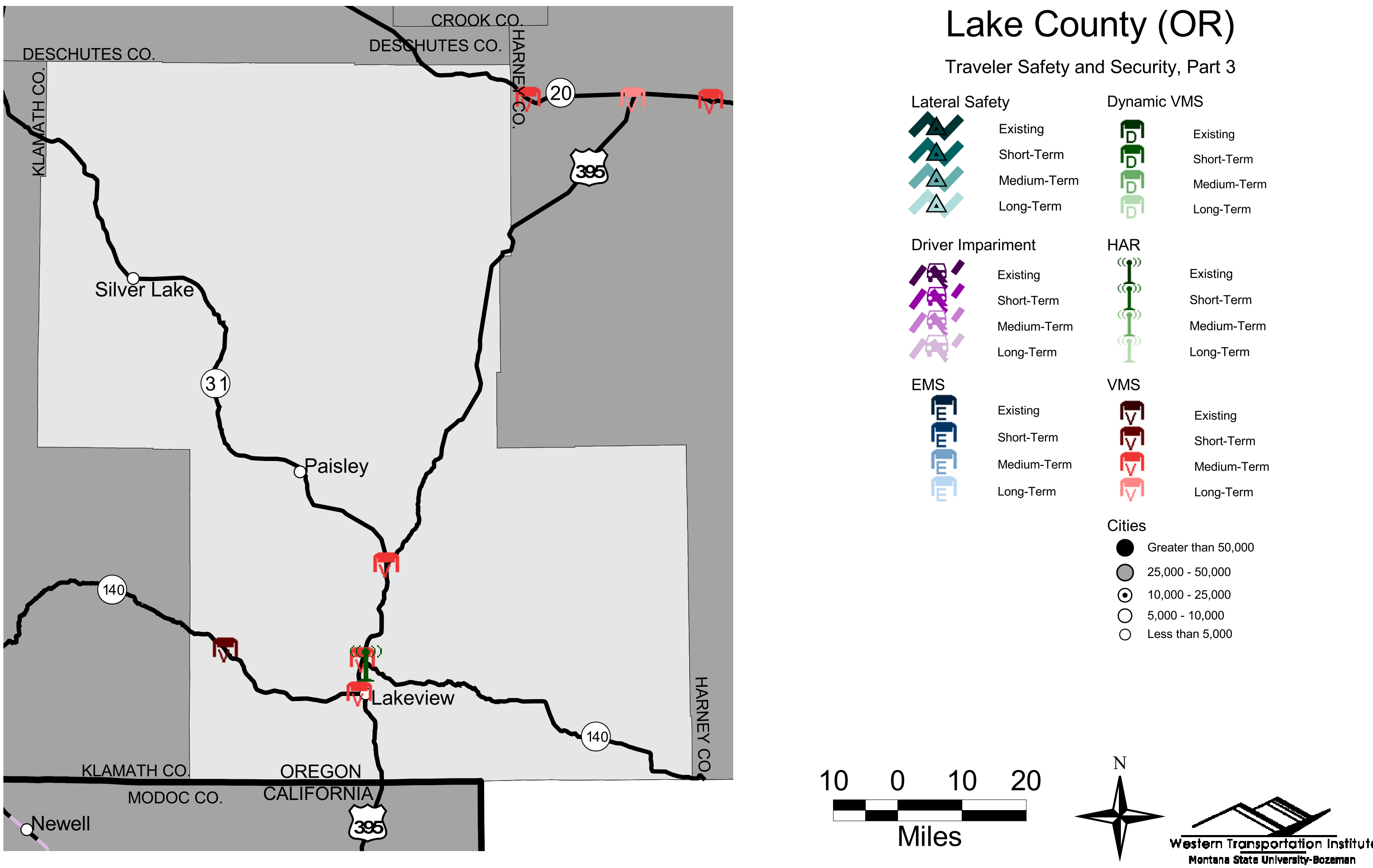



**Figure G-67:** Traveler Safety and Security (Part 3) in Lake County.

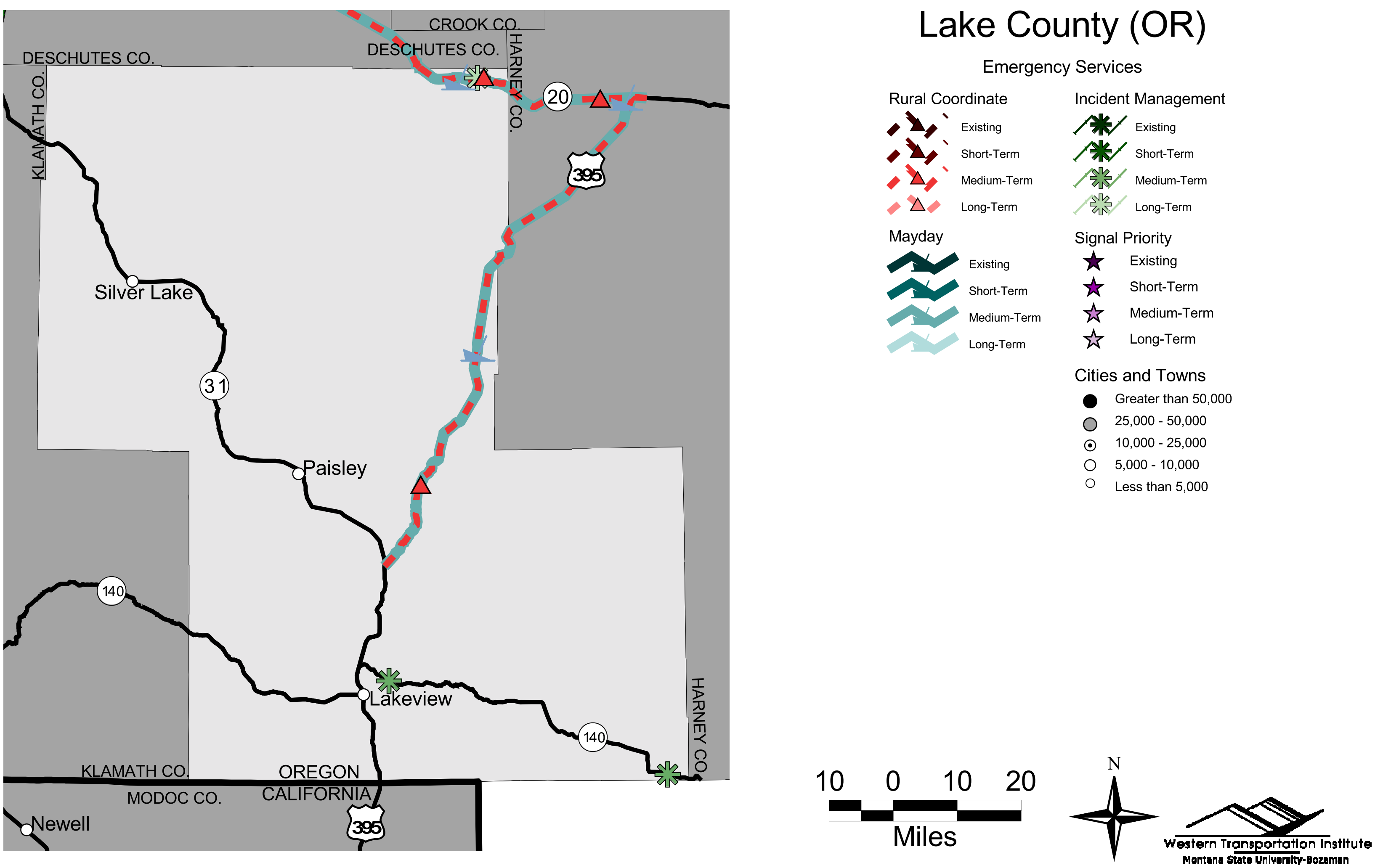



**Figure G-68:** Emergency Services in Lake County.

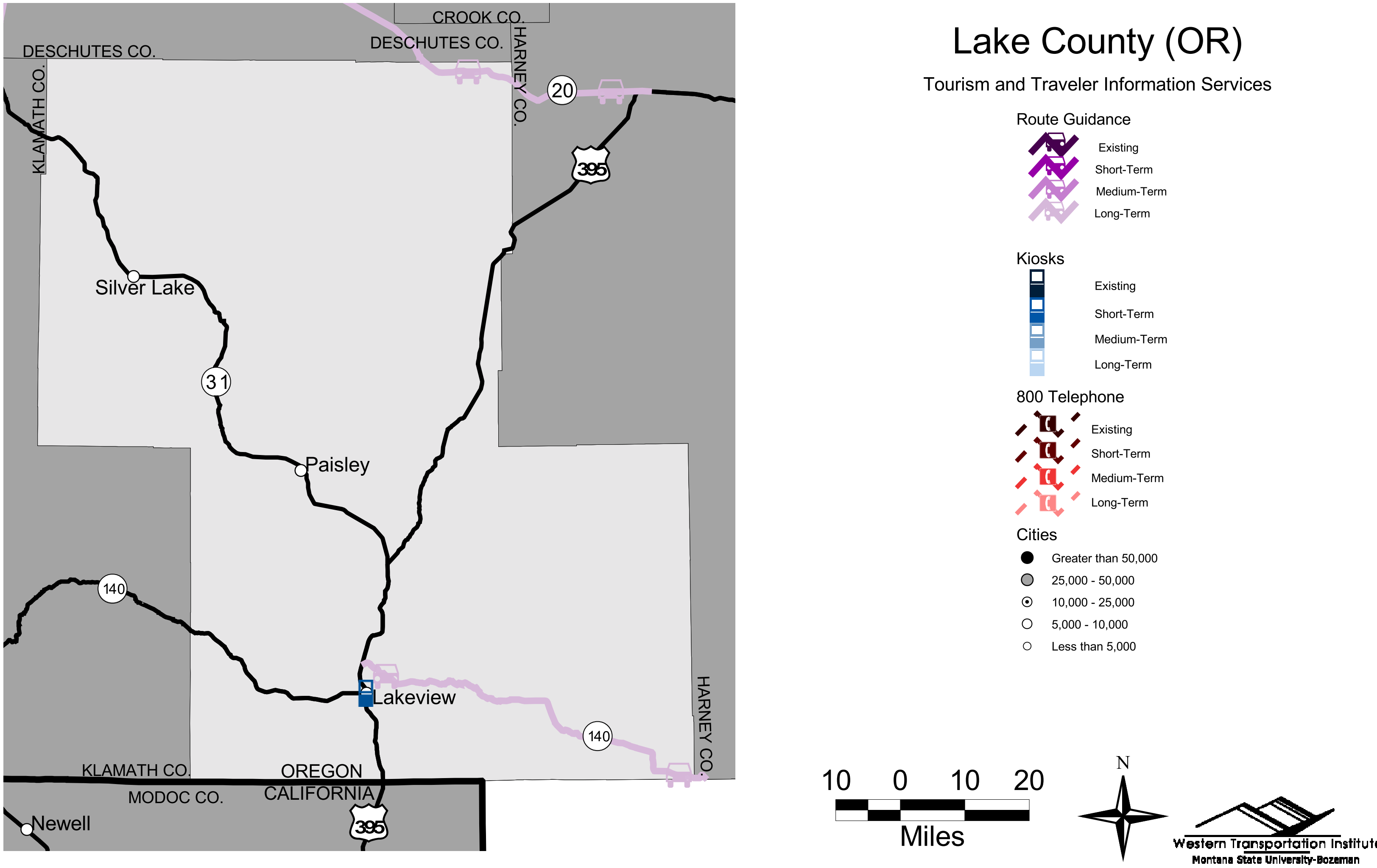



**Figure G-69:** Tourism and Traveler Information Services in Lake County.

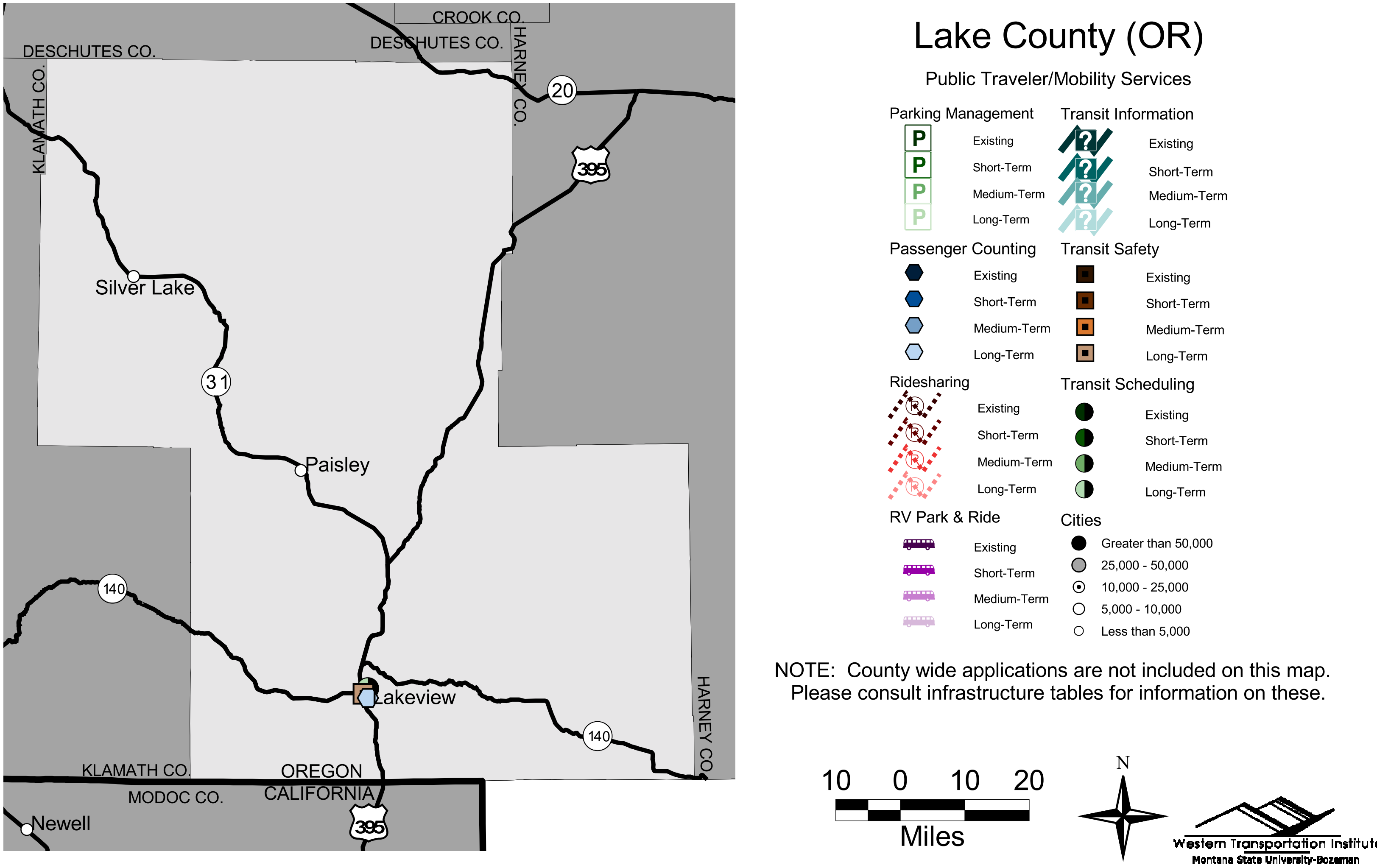



**Figure G-70:** Public Traveler/Mobility Services in Lake County.

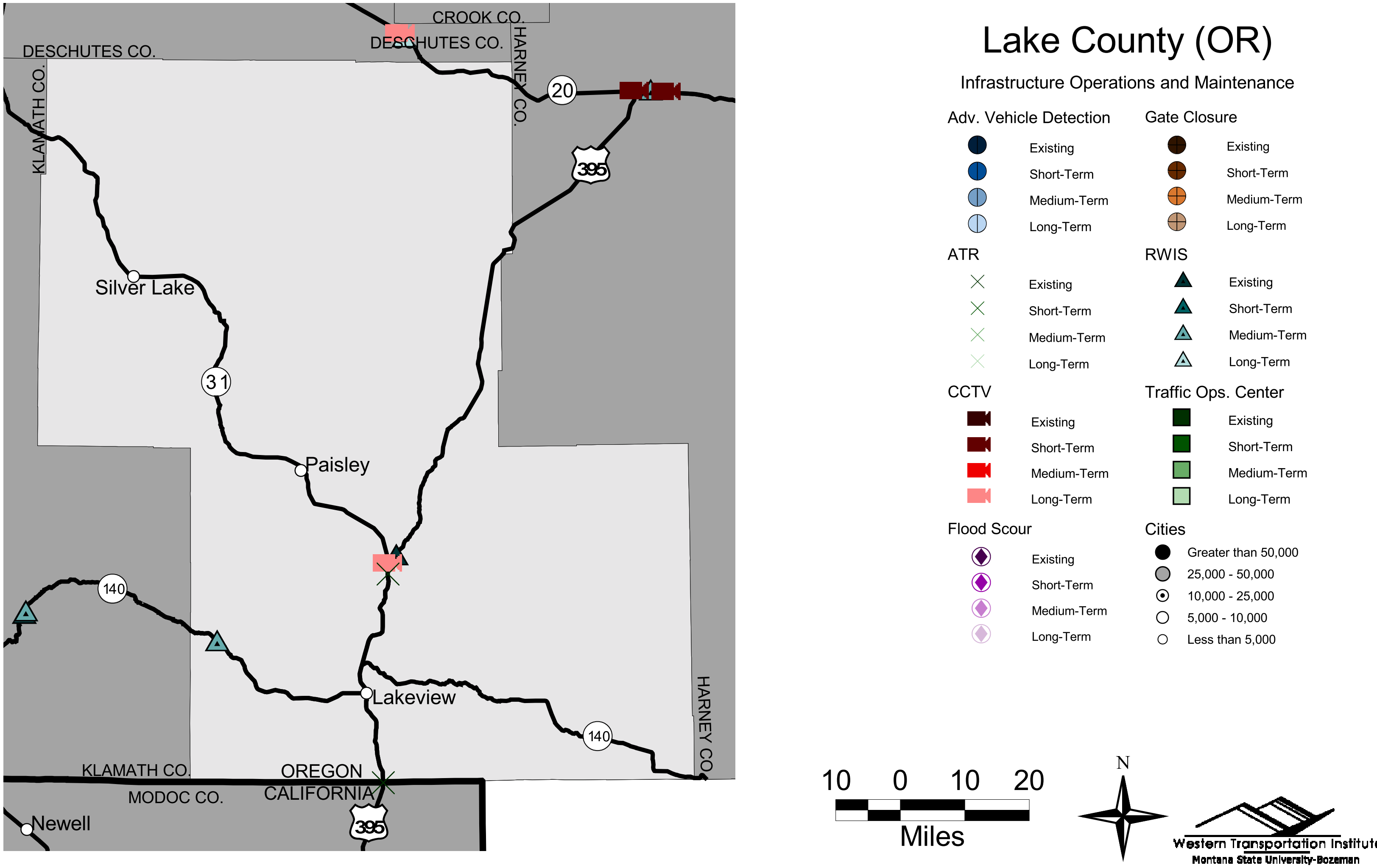



**Figure G-71:** Infrastructure Operations and Maintenance in Lake County.

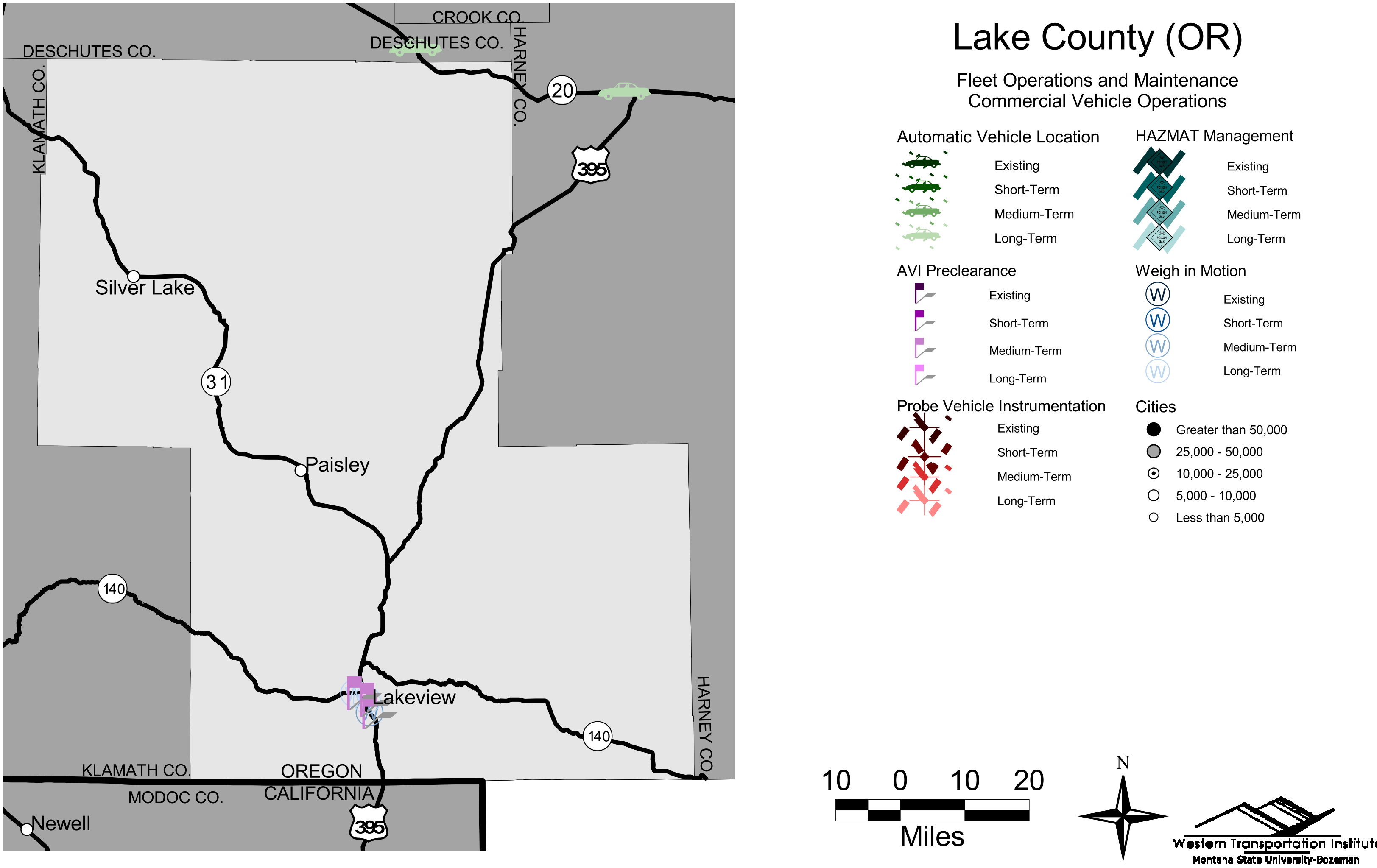



**Figure G-72:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Lake County.

**Table G-11:** Deployment Locations in Lane County.

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Traveler Safety and Security** | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 1 | Lane | 62 | 20.5 | 21.5 | | Oversize Veh Warning (Peter Creek Tunnel) | Short-Term | ✓ |
| Adv. Warning for Narrow Lanes | 2 | Lane | 15 | 55 | 76.65 | | Oversize Veh Warning (MP 55 to Sisters) | Short-Term | ✓ |
| Adv. Warning for Narrow Lanes | 3 | Lane | 62 | 27 | 28 | | Wildcat Bridges | Short-Term | ✓ |
| Adv. Warning for Narrow Lanes | 11 | Lane | 18 | 54.6 | 56.5 | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Adv. Warning for Narrow Lanes | 21 | Lane | 15 | 11 | 11.7 | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Advanced Bike/Ped Warning | 13 | Lane | 1 | 182.83<br>187.83 | | | Bike/ped challenge (Creswell)<br>Bike/ped challenge (Goshen) | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 16 | Lane | 18 | 34.13 | | | Bike/ped challenge (Oakridge) | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 18 | Lane | 9 | 190.23 | | | Bike/ped challenge (Florence) | Medium-Term | ✓ |
| Advanced Bike/Ped Warning | 21 | Lane | 1 | 191 | | | Bike/ped challenge (Eugene) | Long-Term | ✓ |
| Advisory Television | 16 | Lane | 1 | 191 | | | Eugene | Medium-Term | ✓ |
| Advisory Television | 24 | Lane | 9 | 190.23 | | | Florence | Long-Term | ✓ |
| Advisory Television | 26 | Lane | 18 | 34.13 | | | Oakridge | Long-Term | ✓ |
| Advisory Television | 27 | Lane | 18 | 61 | | | Willamette Pass | Long-Term | ✓ |
| Automated Anti-Icing | 5 | Lane | 18 | 56 | 56.5 | | Road surface challenge (Salt Creek Tunnel) | Medium-Term | ✓ |
| Automated Flood Warning | 3 | Lane | 62 | 0 | 14 | | Highway 126 Mapleton to Florence | Short-Term | ✓ |
| Automated Visibility Warning | 3 | Lane | 18 | 54.6 | 56.5 | | Visibility challenge | Medium-Term | ✓ |
| Automated Visibility Warning | 8 | Lane | 1 | 172.74 | | | Ward's Butte | Medium-Term | ✓ |
| Automated Visibility Warning | 14 | Lane | 15 | 6 | 6.9 | | Visibility challenge | Long-Term | ✓ |
| Dynamic Warning VMS | 3 | Lane | 18 | 54.6<br>56.5 | | East<br>West | Icy Conditions in Salt Creek Tunnel | Short-Term | ✓ |
| Dynamic Warning VMS | 28 | Lane | 15 | 6<br>6.9 | | East<br>West | Visibility Challenge | Long-Term | ✓ |
| Highway Advisory Radio | 20 | Lane | 62 | 0 | | | Road Closure (Florence area) | Short-Term | ✓ |
| Highway Advisory Radio | 21 | Lane | 18 | 0 | | | Road Closure, Visibility (Eugene/Springfield) | Short-Term | ✓ |
| Highway Advisory Radio | 29 | Lane | 62 | 40 | | | Veneta | Short-Term | ✓ |
| Highway Advisory Radio | 30 | Lane | 62 | 52 | | | W. of Beltline | Short-Term | ✓ |
| Highway Advisory Radio | 31 | Lane | 15 | 12 | | | Walterville Scalehouse (E. of Springfield) | Short-Term | ✓ |
| Highway Advisory Radio | 53 | Lane | 15 | 49 | | | Mackenzie Bridge | Medium-Term | ✓ |
| Intersection Advance Warning | 2 | Lane | 15 | 0.5 | | | Intersection safety challenge (Glenwood) | Medium-Term | ✓ |
| Lateral Safety Warning System | 1 | Lane | 18 | 54.6 | 56.5 | | Salt Creek Tunnel Area | Medium-Term | ✓ |
| Lateral Safety Warning System | 17 | Lane | 15 | 12.8 | 13.2 | | Narrow shoulder/clear zone challenge @ Bridge 13 | Long-Term | ✓ |
| Variable Message Sign | 34 | Lane | 1 | 180 | | N | Eugene, Medford | Short-Term | ✓ |
| Variable Message Sign | 42 | Lane | 1 | 190 | | S | | Short-Term | ✓ |
| Variable Message Sign | 84 | Lane | 62 | 0 | | East | All Criteria (leaving Florence) | Medium-Term | ✓ |
| Variable Message Sign | 85 | Lane | 1 | 187 | | North | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 86 | Lane | 1 | 190 | | North | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 87 | Lane | 15 | 2 | | West | All Criteria (between Mohawk & Pioneer) | Medium-Term | ✓ |
| Variable Message Sign | 88 | Lane | 15 | 55 | | East | All Criteria | Medium-Term | ✓ |
| Variable Message Sign | 98 | Lane | 9 | 185 | | S | Near Florence | Medium-Term | ✓ |
| Variable Message Sign | 99 | Lane | 9 | 194 | | N | Near Florence | Medium-Term | ✓ |
| Variable Message Sign | 148 | Lane | 62 | 52.69 | | West | All Criteria | Long-Term | ✓ |
| Variable Message Sign | 149 | Lane | 15 | 57 | | West | All Criteria | Long-Term | ✓ |
| **Emergency Services** | | | | | | | | | |
| Regional Incident Management Plan | 24 | Lane | 1 | 168.01 | 191 | | | Medium-Term | ✓ |
| Regional Incident Management Plan | 26 | Lane | 18 | 0 | 62.07 | | Road Closure | Medium-Term | ✓ |

## **Table G-11:** Deployment Locations in Lane County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Emergency Services (cont.)** | | | | | | | | | |
| Regional Incident Management Plan | 36 | Lane | 62 | 0 | 52.69 | | Road Closure | Long-Term | ✓ |
| | | | 15 | 0 | 54 | | | | |
| **Tourism and Traveler Information Services** | | | | | | | | | |
| 800 Travel Advisory | 4 | Lane | 18 | 0 | 62.07 | | Road Closures Due to Slides & Floods | Short-Term | ✓ |
| 800 Travel Advisory | 5 | Lane | 62 | 0 | 52.69 | | Road Closures Due to Slides & Floods | Short-Term | ✓ |
| | | | 15 | 0 | 55 | | | | |
| In-Vehicle Route Guidance System | 37 | Lane | 1 | 168.01 | 190 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 38 | Lane | 18 | 0 | 62.07 | | Road Closure Locations | Long-Term | ✓ |
| In-Vehicle Route Guidance System | 41 | Lane | 62 | 0 | 52.69 | | Road Closure Locations | Long-Term | ✓ |
| | | | 15 | 0 | 60 | | | | |
| Kiosks | 65 | Lane | 9 | 191 | | | Siuslaw Road Bridge | Medium-Term | ✓ |
| **Public Traveler/Mobility Services** | | | | | | | | | |
| Automated Passenger Counting | 17 | Lane | 1 | 191 | | | Eugene Intercity Transit Services | Long-Term | ✓ |
| On-Board Transit Safety Systems | 17 | Lane | 1 | 191 | | | Eugene Intercity Transit Services | Long-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 10 | Lane | 18 | 61 | | | Gold Lake | Medium-Term | ✓ |
| Recreational Veh. Park and Ride Lots | 11 | Lane | 18 | 62 | | | Summit | Medium-Term | ✓ |
| Transit Traveler Information | 30 | Lane | 1 | 191 | | | Eugene | Medium-Term | ✓ |
| Transit Vehicle Routing/Scheduling | 10 | Lane | 1 | 191 | | | Eugene Intercity Transit Services | Medium-Term | ✓ |
| **Infrastructure Operations and Maintenance** | | | | | | | | | |
| Advanced Vehicle Detection | 1 | Lane | 62 | 21 | | | Oversize Veh Warning (Peter Creek Tunnel) | Short-Term | ✓ |
| Advanced Vehicle Detection | 2 | Lane | 15 | 55 | | | Oversize Veh Warning (MP 55 to Sisters) | Short-Term | ✓ |
| Advanced Vehicle Detection | 3 | Lane | 15 | 71.5 | | | Oversize Veh Warning (MP 55 to Sisters) | Short-Term | ✓ |
| Advanced Vehicle Detection | 5 | Lane | 62 | 27.5 | | | Wildcat Bridges | Short-Term | ✓ |
| Advanced Vehicle Detection | 8 | Lane | 62 | 0 | | | Highway 126 Mapleton to Florence | Short-Term | ✓ |
| Advanced Vehicle Detection | 9 | Lane | 62 | 7 | | | Highway 126 Mapleton to Florence | Short-Term | ✓ |
| Advanced Vehicle Detection | 10 | Lane | 62 | 14 | | | Highway 126 Mapleton to Florence | Short-Term | ✓ |
| Advanced Vehicle Detection | 38 | Lane | 18 | 55.55 | | | Narrow shoulder/clear zone challenge | Medium-Term | ✓ |
| Advanced Vehicle Detection | 59 | Lane | 15 | 11.35 | | | Narrow shoulder/clear zone challenge | Long-Term | ✓ |
| Automated Gate Closure | 2 | Lane | 15 | 66 | | | Replaces an existing one | Short-Term | ✓ |
| Automated Gate Closure | 3 | Lane | 15 | 71 | | | | Short-Term | ✓ |
| Automatic Traffic Recorder | 246 | Lane | 229 | 41.04 | | | 6.6 miles west of | Existing | |
| Automatic Traffic Recorder | 250 | Lane | 18 | 35.53 | | | 1.4 miles east of Oakridge | Existing | ✓ |
| Automatic Traffic Recorder | 263 | Lane | 62 | 43.86 | | | 2.7 miles west of Elmira | Existing | ✓ |
| Automatic Traffic Recorder | 264 | Lane | 62 | 23.7 | | | 2.7 miles east of Vida | Existing | ✓ |
| Closed-Circuit Television Camera | 18 | Lane | 18 | 62.3 | | | Willamette Pass | Existing | ✓ |
| Closed-Circuit Television Camera | 62 | Lane | 1 | 177 | | | Gettings Creek Rest Area | Short-Term | ✓ |
| RWIS | 63 | Lane | 18 | 15 | | | Road Closure Due to Bad Weather | Medium-Term | ✓ |
| RWIS | 64 | Lane | 15 | 45 | | | Road Closure Due to Bad Weather | Medium-Term | ✓ |
| RWIS | 67 | Lane | 18 | 30 | | | Road Closure Due to Bad Weather | Medium-Term | ✓ |
| RWIS | 68 | Lane | 62 | 36 | | | Badger Mountain/Cougar Pass | Medium-Term | ✓ |
| Satellite Traffic Operations Center | 11 | Lane | 1 | 191 | | | At District Office In Springfield | Long-Term | ✓ |
| **Fleet Operations and Maintenance** | | | | | | | | | |
| Probe Vehicle Instrumentation | 2 | Lane | 18 | 54.6 | 56.5 | | Road Surface and Speed Challenge | Medium-Term | ✓ |
| **Commercial Vehicle Operations** | | | | | | | | | |
| Hazmat Management | 2 | Lane | 1 | 168.01 | 190 | | | Medium-Term | ✓ |
| Hazmat Management | 9 | Lane | 18 | 0 | 62.007 | | | Long-Term | ✓ |

**Table G-11:** Deployment Locations in Lane County (cont.).

| Infrastructure Name | ID# | County | Hwy | From | To | Dir | Description | Priority | ✓ |
|---|---|---|---|---|---|---|---|---|---|
| **Commercial Vehicle Operations (cont.)** | | | | | | | | | |
| Preclearance | 5 | Lane | 18 | 17.17 | | E/W | Lowell | Existing | ✓ |
| Preclearance | 29 | Lane | 15 | 12.95 | | E/W | Near Existing Weigh Station | Medium-Term | ✓ |
| Preclearance | 30 | Lane | 62 | 43 | | E/W | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 8 | Lane | 18 | 17.17 | | E/W | Lowell | Existing | ✓ |
| Weigh in Motion | 29 | Lane | 15 | 12.95 | | E/W | Near Existing Weigh Station | Medium-Term | ✓ |
| Weigh in Motion | 30 | Lane | 62 | 43 | | E/W | Near Existing Weigh Station | Medium-Term | ✓ |

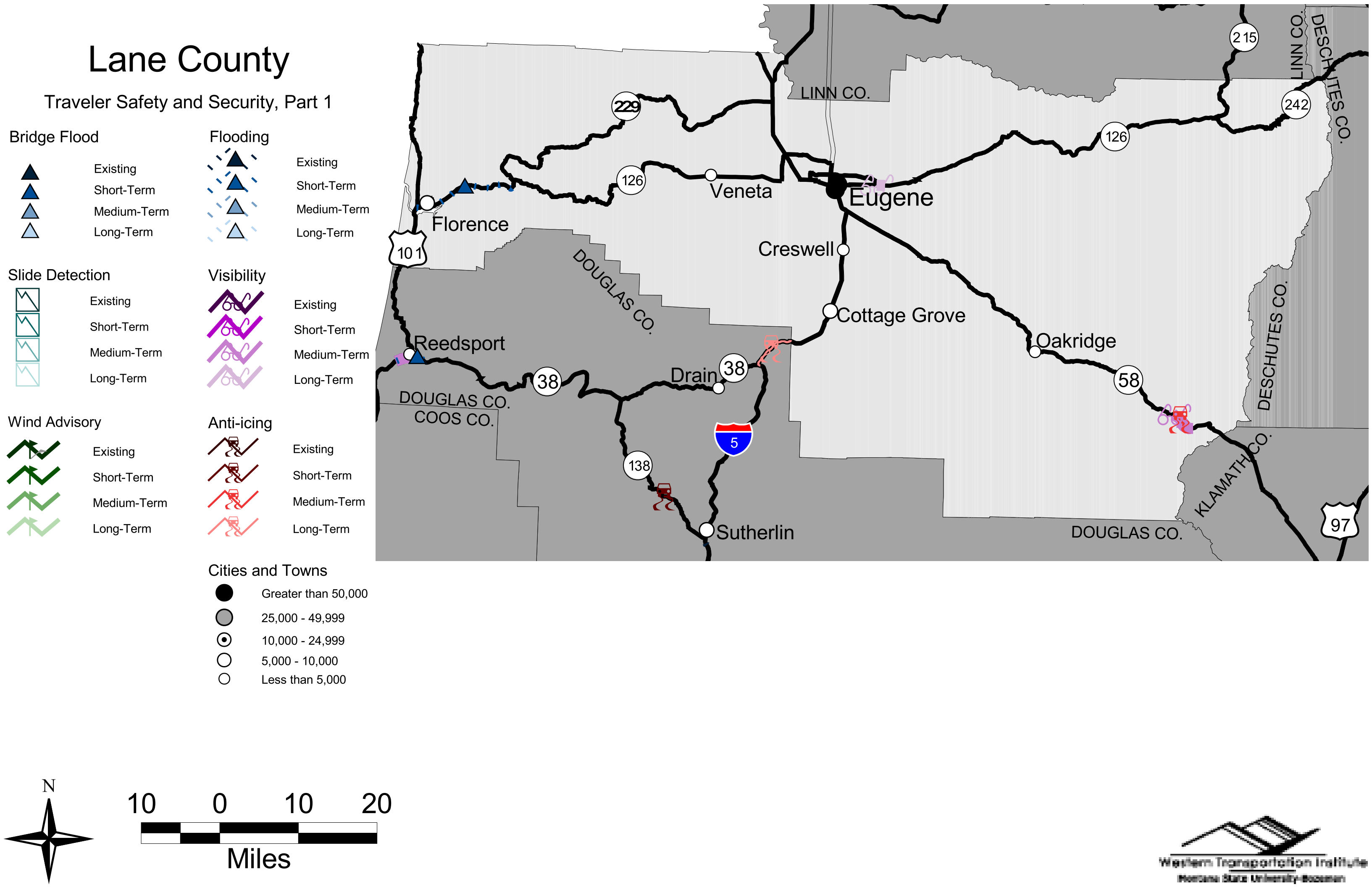



**Figure G-73:** Traveler Safety and Security (Part 1) in Lane County.

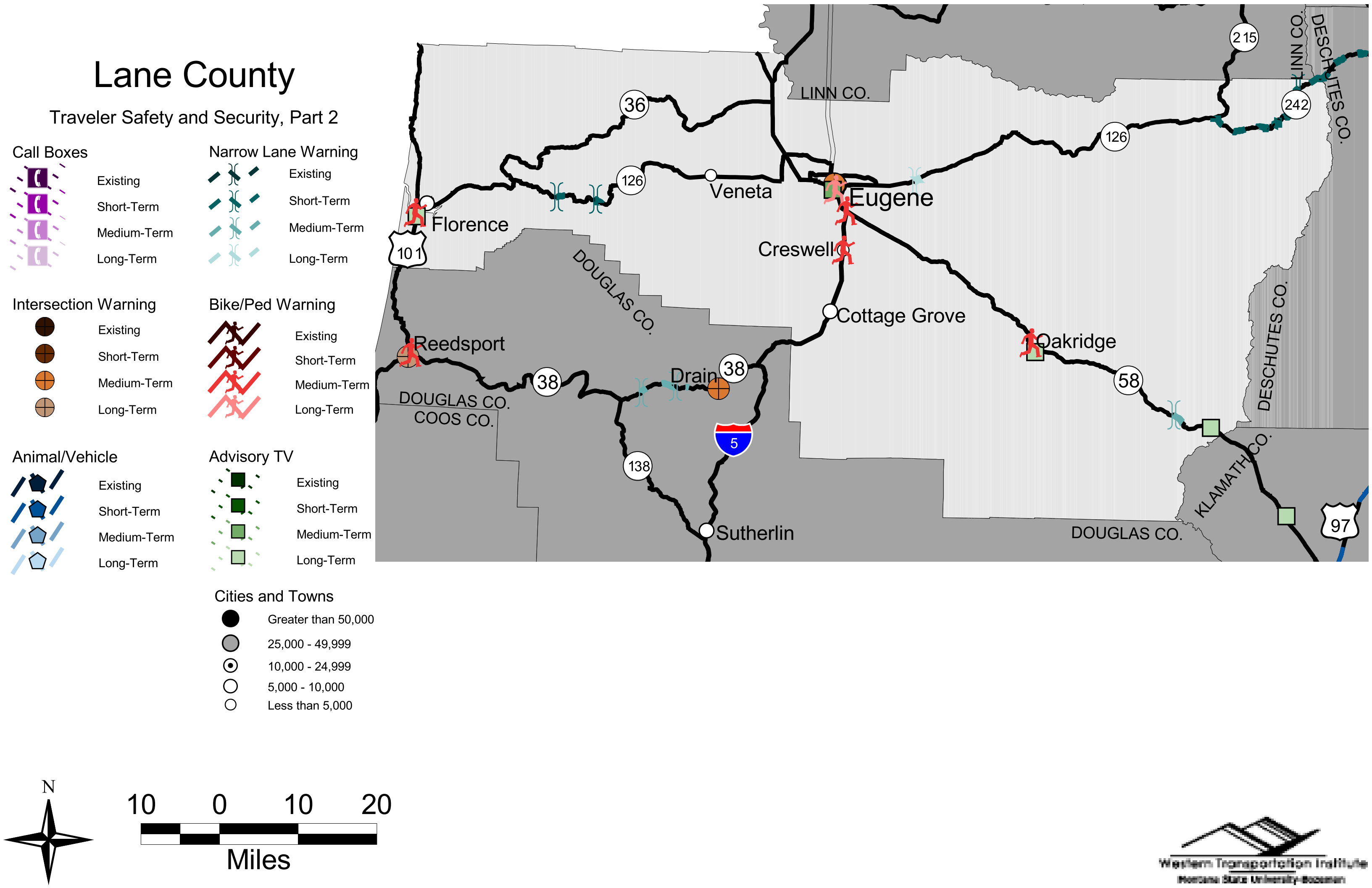



**Figure G-74:** Traveler Safety and Security (Part 2) in Lane County.

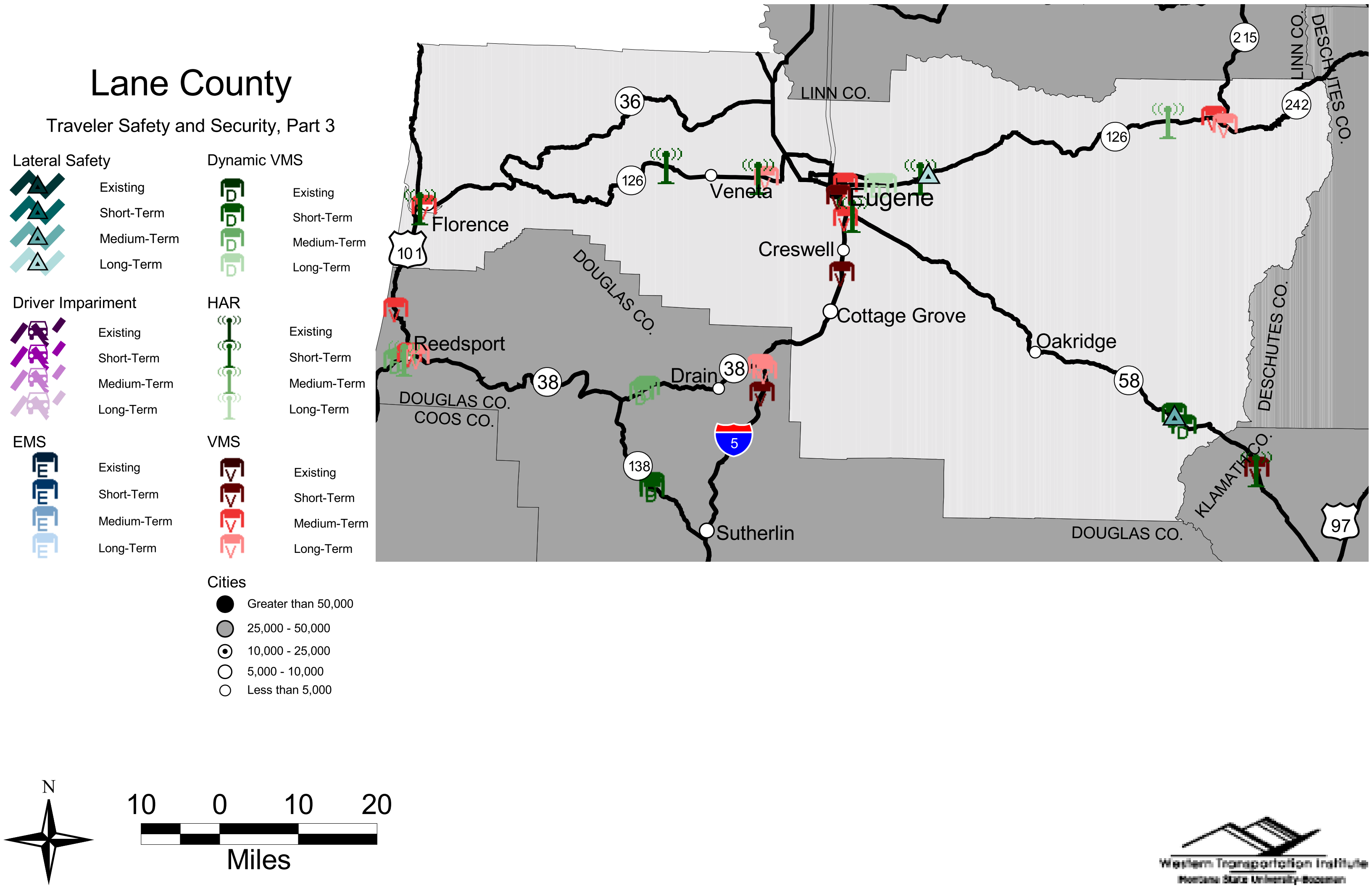
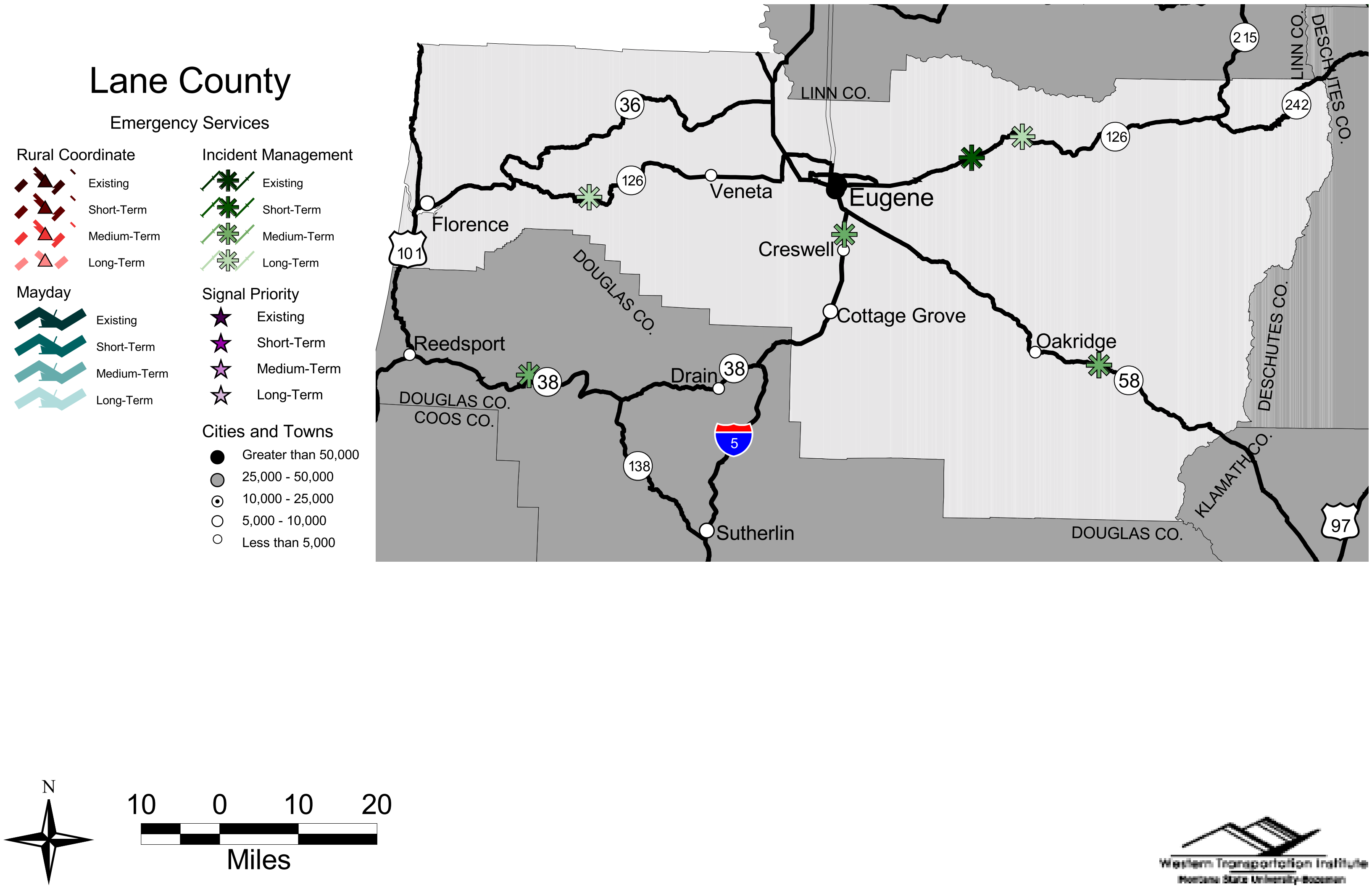



**Figure G-75:** Traveler Safety and Security (Part 3) in Lane County.

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Montana State University-Bozeman

**Figure G-76:** Emergency Services in Lane County.

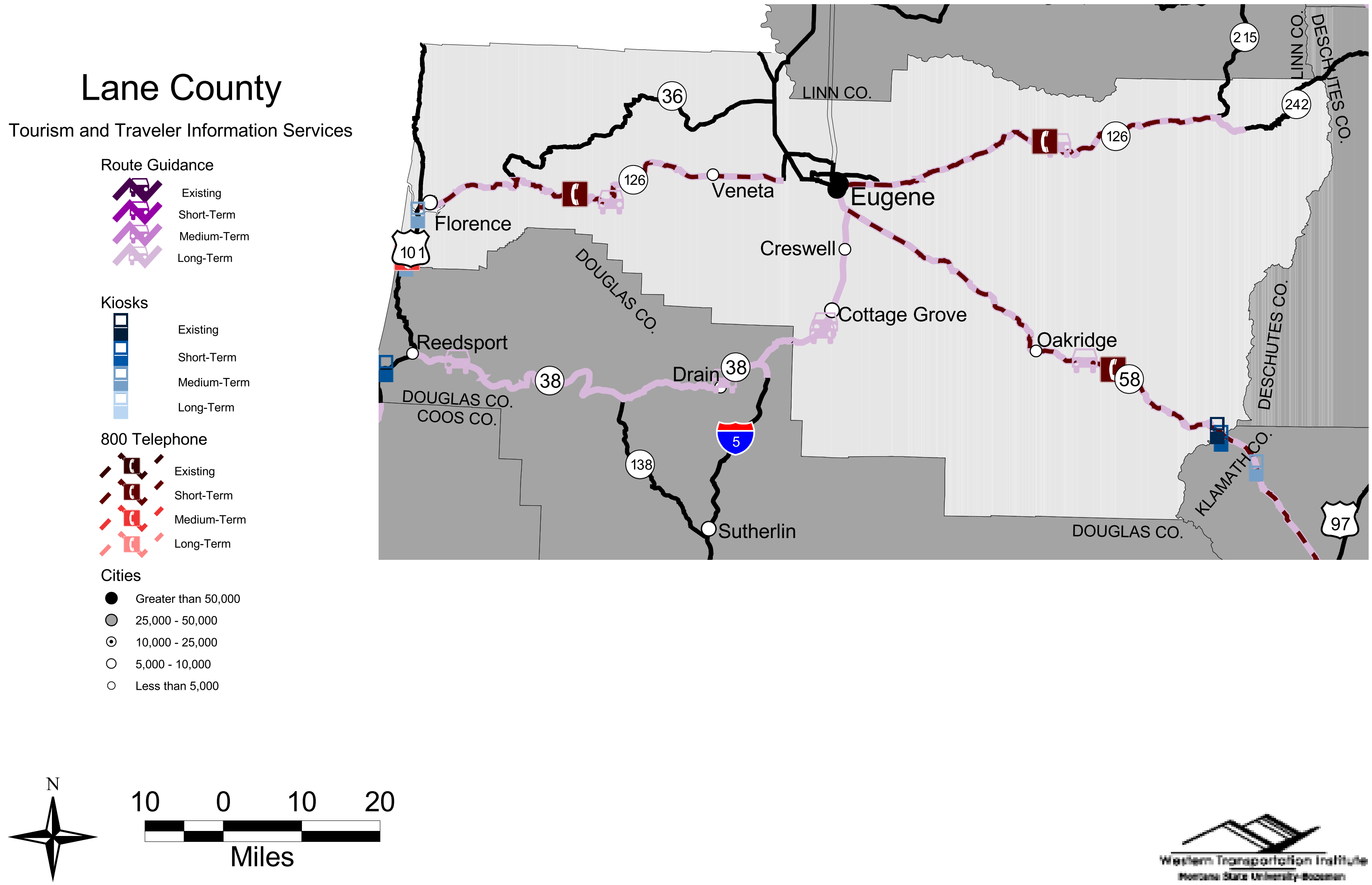


**Figure G-77:** Tourism and Traveler Information Services in Lane County.

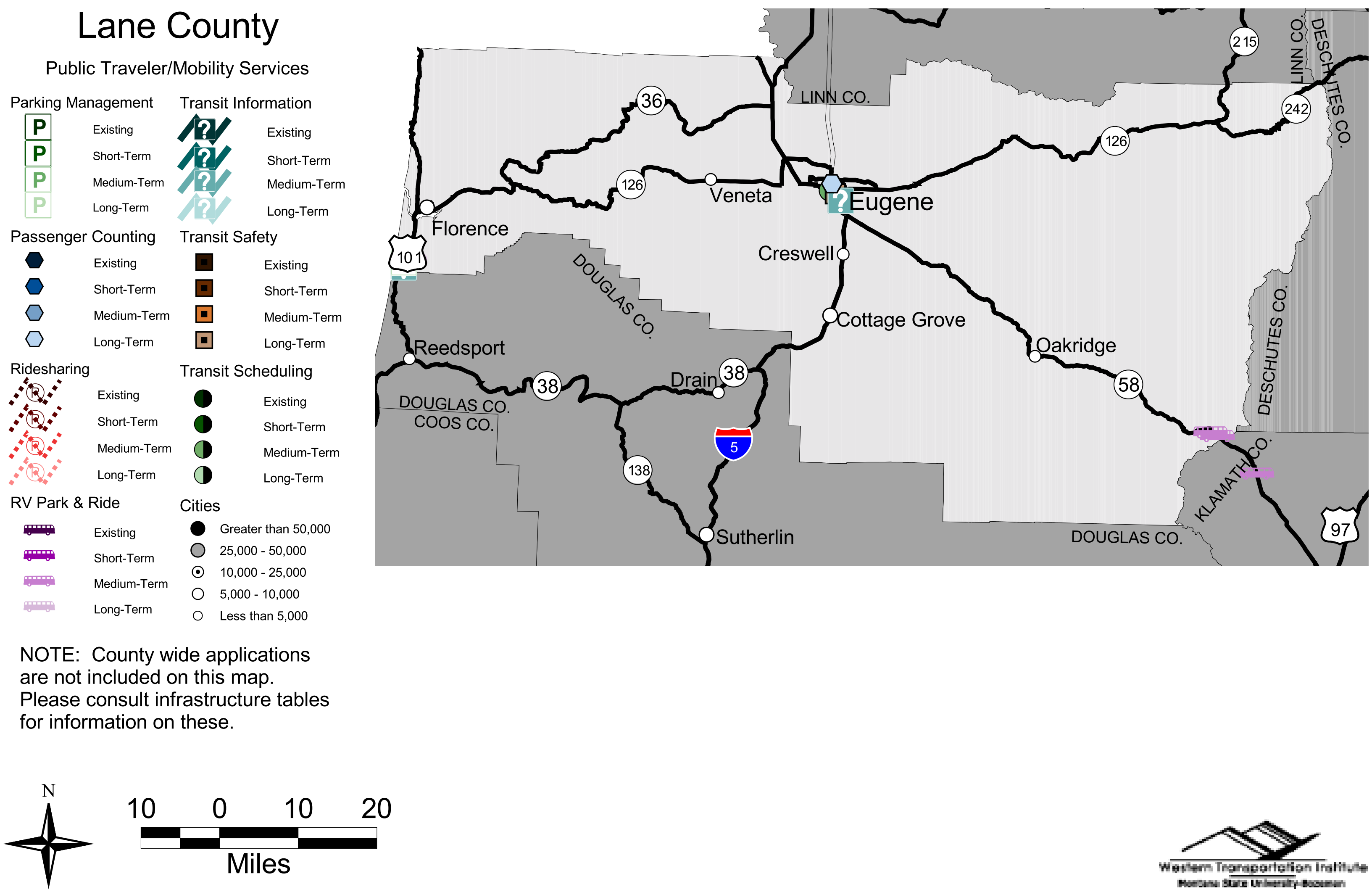


**Figure G-78:** Public Traveler/Mobility Services in Lane County.

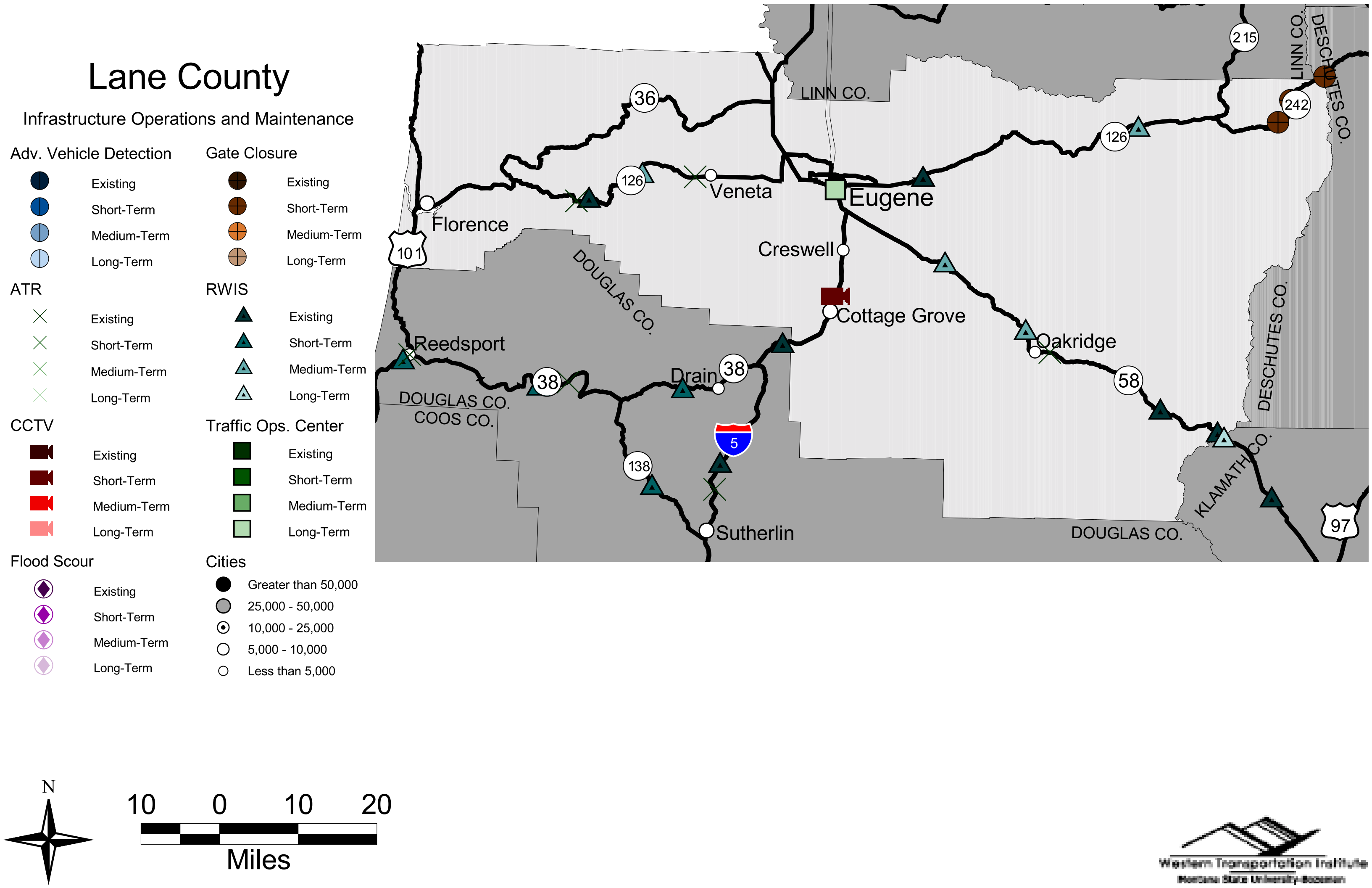


**Figure G-79:** Infrastructure Operations and Maintenance in Lane County.

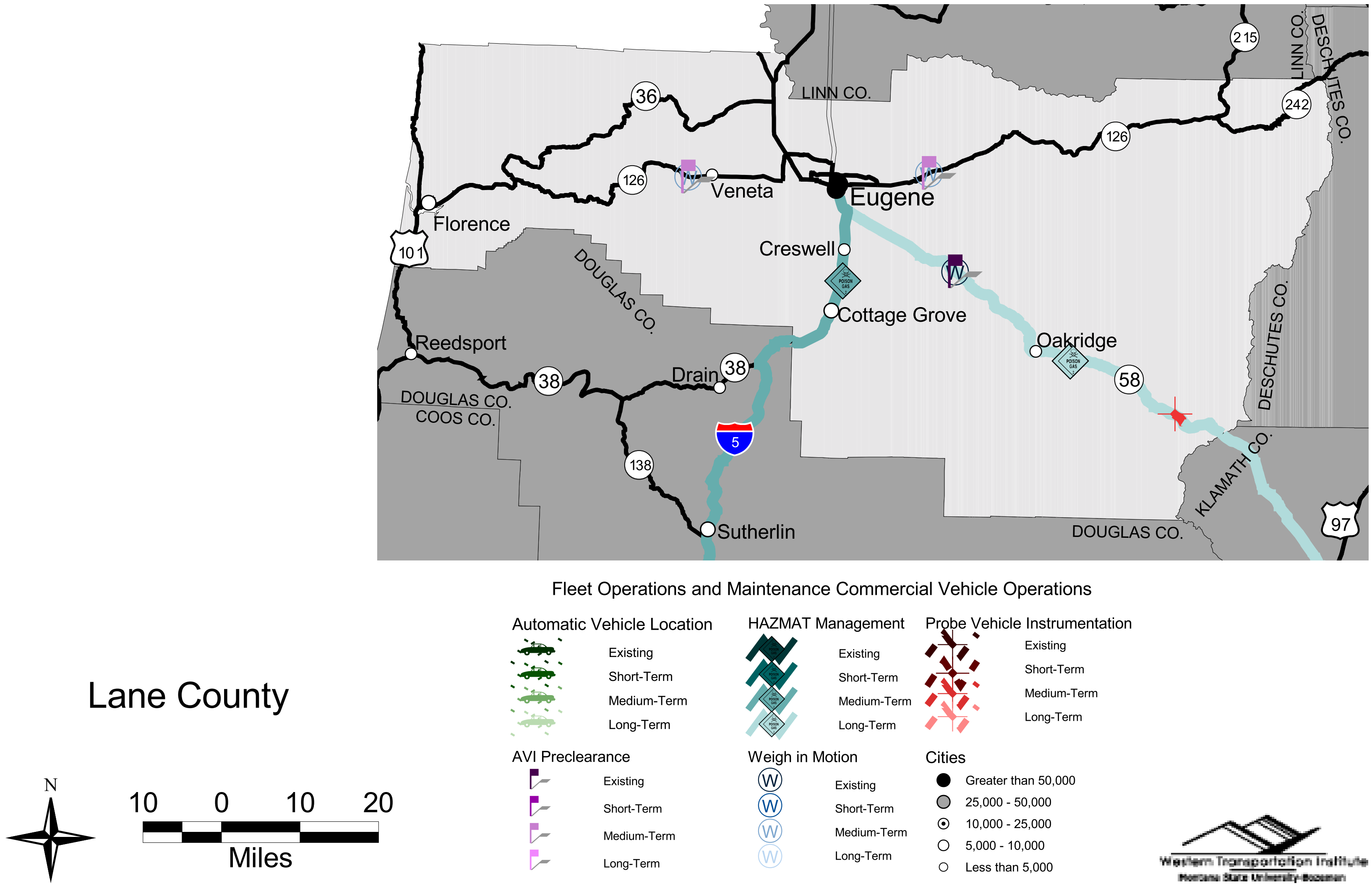


**Figure G-80:** Fleet Operations and Maintenance and Commercial Vehicle Operations in Lane County.

# APPENDIX H: NORTHERN CALIFORNIA ITS DEPLOYMENT COSTS

This appendix provides county-level cost data for short, medium and long-term ITS deployment in Northern California as recommended in this plan. Operations and maintenance (O&M) costs do not reflect the costs associated with the existing ITS infrastructure. See Chapter 8 for information on how cost estimates were developed.

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**Table H-1:** Costs of Recommended Deployment for Colusa, Glenn and Lake Counties.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Advisory Television | - | $ - | $ - | 1 | $ 19 | $ - | 1 | $ 19 | $ - | 2 | $ 38 | $ - |
| Automated Flood Warning | - | $ - | $ - | - | $ - | $ - | 1 | $ 40 | $ 3 | 1 | $ 40 | $ 3 |
| Driver Impairment Detection | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - |
| Dynamic Warning VMS | - | $ - | $ - | 2 | $ 500 | $ 9 | - | $ - | $ - | 2 | $ 500 | $ 9 |
| Highway Advisory Radio | - | $ - | $ - | 2 | $ 100 | $ 4 | 1 | $ 50 | $ 2 | 3 | $ 150 | $ 6 |
| Intersection Advance Warning | - | $ - | $ - | - | $ - | $ - | 1 | $ 50 | $ 4 | 1 | $ 50 | $ 4 |
| Lateral Safety Warning System | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - |
| Motorist-Aide Call Box | - | $ - | $ - | 3 | $ 79 | $ 8 | - | $ - | $ - | 3 | $ 79 | $ 8 |
| Variable Message Sign | 4 | $ 836 | $ 10 | 1 | $ 209 | $ 2 | 1 | $ 209 | $ 2 | 6 | $ 1,254 | $ 14 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - |
| Regional Incident Management Plan | - | $ - | $ - | - | $ - | $ - | 2 | $ 8 | $ 1 | 2 | $ 8 | $ 1 |
| Rural Coordinate Addressing System | - | $ - | $ - | 1 | $ 2 | $ 0 | 1 | $ 2 | $ 0 | 2 | $ 4 | $ 0 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | - | $ - | $ - | 1 | $ 187 | $ 19 | - | $ - | $ - | 1 | $ 187 | $ 19 |
| Kiosks | - | $ - | $ - | - | $ - | $ - | 2 | $ 20 | $ 4 | 2 | $ 20 | $ 4 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 1 | $ 1 | $ 1 | 1 | $ 1 | $ 1 |
| Automatic Vehicle Identification System | - | $ - | $ - | - | $ - | $ - | 1 | $ 26 | $ 2 | 1 | $ 26 | $ 2 |
| Dynamic Ridesharing/Paratransit | - | $ - | $ - | 1 | $ 27 | $ 39 | - | $ - | $ - | 1 | $ 27 | $ 39 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 1 | $ 4 | $ 0 | 1 | $ 4 | $ 0 |
| Smart Card | - | $ - | $ - | - | $ - | $ - | 1 | $ 425 | $ 3 | 1 | $ 425 | $ 3 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | - | $ - | $ - | 1 | $ 447 | $ 12 | 1 | $ 447 | $ 12 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | - | $ - | $ - | - | $ - | $ - | 1 | $ 18 | $ 0 | 1 | $ 18 | $ 0 |
| Closed-Circuit Television Camera | 4 | $ 80 | $ 4 | - | $ - | $ - | - | $ - | $ - | 4 | $ 80 | $ 4 |
| RWIS | - | $ - | $ - | - | $ - | $ - | 4 | $ 200 | $ 8 | 4 | $ 200 | $ 8 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Probe Vehicle Instrumentation | - | $ - | $ - | 1 | $ 6 | $ 5 | - | $ - | $ - | 1 | $ 6 | $ 5 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 2 | $ 5 | $ 1 | 1 | $ 7 | $ 1 | 3 | $ 12 | $ 2 |
| **Total** | **8** | **$ 916** | **$ 14** | **15** | **$ 1,134** | **$ 87** | **24** | **$ 1,524** | **$ 42** | **47** | **$ 3,574** | **$ 142** |

**Table H-2:** Costs of Recommended Deployment for Del Norte County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Adv. Warning for Narrow Lanes | - | $ - | $ - | 3 | $ 144 | $ 11 | - | $ - | $ - | 3 | $ 144 | $ 11 |
| Advanced Bike/Ped Warning | - | $ - | $ - | 1 | $ 24 | $ 2 | 2 | $ 47 | $ 5 | 3 | $ 71 | $ 7 |
| Advisory Television | - | $ - | $ - | 1 | $ 19 | $ - | - | $ - | $ - | 1 | $ 19 | $ - |
| Automated Flood Warning | - | $ - | $ - | - | $ - | $ - | 1 | $ 15 | $ 1 | 1 | $ 15 | $ 1 |
| Automated Visibility Warning | - | $ - | $ - | 1 | $ 40 | $ 1 | 2 | $ 80 | $ 1 | 3 | $ 120 | $ 2 |
| Highway Advisory Radio | 2 | $ 100 | $ 4 | - | $ - | $ - | 1 | $ 50 | $ 2 | 3 | $ 150 | $ 6 |
| Intersection Advance Warning | - | $ - | $ - | - | $ - | $ - | 1 | $ 50 | $ 4 | 1 | $ 50 | $ 4 |
| Lateral Safety Warning System | - | $ - | $ - | - | $ - | $ - | 3 | $ - | $ - | 3 | $ - | $ - |
| Slide Detection Station | 1 | $ 28 | $ 3 | - | $ - | $ - | - | $ - | $ - | 1 | $ 28 | $ 3 |
| Variable Message Sign | 4 | $ 836 | $ 10 | - | $ - | $ - | - | $ - | $ - | 4 | $ 836 | $ 10 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 2 | $ - | $ - | - | $ - | $ - | 2 | $ - | $ - |
| Regional Incident Management Plan | 2 | $ 30 | $ 3 | 1 | $ 5 | $ 1 | - | $ - | $ - | 3 | $ 35 | $ 3 |
| Rural Coordinate Addressing System | - | $ - | $ - | - | $ - | $ - | 2 | $ 7 | $ 0 | 2 | $ 7 | $ 0 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | - | $ - | $ - | 3 | $ 445 | $ 45 | - | $ - | $ - | 3 | $ 445 | $ 45 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 2 | $ - | $ - | 2 | $ - | $ - |
| Kiosks | 2 | $ 20 | $ 4 | - | $ - | $ - | 2 | $ 20 | $ 4 | 4 | $ 40 | $ 8 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 1 | $ 1 | $ 1 | 1 | $ 1 | $ 1 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 1 | $ 4 | $ 0 | 1 | $ 4 | $ 0 |
| Parking Management & Information System | - | $ - | $ - | - | $ - | $ - | 1 | $ 22 | $ 7 | 1 | $ 22 | $ 7 |
| Recreational Veh. Park and Ride Lots | - | $ - | $ - | - | $ - | $ - | 1 | $ 118 | $ 5 | 1 | $ 118 | $ 5 |
| Transit Traveler Information | - | $ - | $ - | 1 | $ 28 | $ 13 | - | $ - | $ - | 1 | $ 28 | $ 13 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | - | $ - | $ - | 1 | $ 447 | $ 12 | 1 | $ 447 | $ 12 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | - | $ - | $ - | 3 | $ 53 | $ 1 | 4 | $ 70 | $ 1 | 7 | $ 123 | $ 2 |
| Closed-Circuit Television Camera | 5 | $ 100 | $ 5 | - | $ - | $ - | 1 | $ 20 | $ 1 | 6 | $ 120 | $ 6 |
| RWIS | 1 | $ 50 | $ 2 | - | $ - | $ - | 1 | $ 50 | $ 2 | 2 | $ 100 | $ 4 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 1 | $ 2 | $ 0 | 1 | $ 13 | $ 2 | 2 | $ 16 | $ 2 |
| **Total** | **17** | **$ 1,163** | **$ 30** | **17** | **$ 760** | **$ 73** | **28** | **$ 1,013** | **$ 49** | **62** | **$ 2,936** | **$ 152** |

**Table H-3:** Costs of Recommended Deployment for Humboldt County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Adv. Warning for Narrow Lanes | - | $ - | $ - | 3 | $ 144 | $ 11 | - | $ - | $ - | 3 | $ 144 | $ 11 |
| Advanced Bike/Ped Warning | - | $ - | $ - | 2 | $ 47 | $ 5 | 1 | $ 24 | $ 2 | 3 | $ 71 | $ 7 |
| Advisory Television | - | $ - | $ - | 1 | $ 19 | $ - | 2 | $ 38 | $ - | 3 | $ 57 | $ - |
| Animal/Vehicle Collision Warning | 1 | $ 200 | $ 10 | 2 | $ 200 | $ 10 | - | $ - | $ - | 3 | $ 400 | $ 20 |
| Automated Anti-Icing | - | $ - | $ - | 1 | $ 85 | $ 8 | 1 | $ 85 | $ 8 | 2 | $ 170 | $ 16 |
| Automated Flood Warning | - | $ - | $ - | 3 | $ 120 | $ 8 | 4 | $ 145 | $ 9 | 7 | $ 265 | $ 17 |
| Automated Visibility Warning | - | $ - | $ - | - | $ - | $ - | 3 | $ 120 | $ 2 | 3 | $ 120 | $ 2 |
| Dynamic Warning VMS | - | $ - | $ - | 2 | $ 500 | $ 9 | 2 | $ 500 | $ 9 | 4 | $ 1,000 | $ 18 |
| Highway Advisory Radio | 1 | $ 50 | $ 2 | 3 | $ 150 | $ 6 | 3 | $ 150 | $ 6 | 7 | $ 350 | $ 14 |
| Intersection Advance Warning | - | $ - | $ - | - | $ - | $ - | 2 | $ 99 | $ 7 | 2 | $ 99 | $ 7 |
| Lateral Safety Warning System | - | $ - | $ - | - | $ - | $ - | 3 | $ - | $ - | 3 | $ - | $ - |
| Variable Message Sign | 4 | $ 836 | $ 10 | 2 | $ 418 | $ 5 | - | $ - | $ - | 6 | $ 1,254 | $ 14 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 4 | $ - | $ - | - | $ - | $ - | 4 | $ - | $ - |
| Regional Incident Management Plan | 2 | $ 44 | $ 4 | 1 | $ 36 | $ 4 | 2 | $ 57 | $ 6 | 5 | $ 136 | $ 14 |
| Rural Coordinate Addressing System | - | $ - | $ - | 2 | $ 9 | $ 0 | 2 | $ 9 | $ 0 | 4 | $ 18 | $ 1 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | - | $ - | $ - | 6 | $ 887 | $ 89 | - | $ - | $ - | 6 | $ 887 | $ 89 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 4 | $ - | $ - | 4 | $ - | $ - |
| Kiosks | - | $ - | $ - | - | $ - | $ - | 9 | $ 90 | $ 18 | 9 | $ 90 | $ 18 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 3 | $ 4 | $ 4 | 3 | $ 4 | $ 4 |
| Dynamic Ridesharing/Paratransit | - | $ - | $ - | - | $ - | $ - | 2 | $ 35 | $ 51 | 2 | $ 35 | $ 51 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 3 | $ 12 | $ 1 | 3 | $ 12 | $ 1 |
| Parking Management & Information System | - | $ - | $ - | - | $ - | $ - | 3 | $ 65 | $ 22 | 3 | $ 65 | $ 22 |
| Recreational Veh. Park and Ride Lots | - | $ - | $ - | - | $ - | $ - | 3 | $ 354 | $ 16 | 3 | $ 354 | $ 16 |
| Transit Traveler Information | - | $ - | $ - | 4 | $ 165 | $ 78 | - | $ - | $ - | 4 | $ 165 | $ 78 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | - | $ - | $ - | 3 | $ 1,341 | $ 35 | 3 | $ 1,341 | $ 35 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | 7 | $ 123 | $ 2 | 7 | $ 123 | $ 2 | 9 | $ 158 | $ 3 | 23 | $ 403 | $ 7 |
| Automated Gate Closure | 2 | $ 120 | $ 7 | - | $ - | $ - | 1 | $ 60 | $ 4 | 3 | $ 180 | $ 11 |
| Closed-Circuit Television Camera | 20 | $ 400 | $ 20 | 2 | $ 40 | $ 2 | 1 | $ 20 | $ 1 | 23 | $ 460 | $ 23 |
| RWIS | 4 | $ 200 | $ 8 | - | $ - | $ - | 1 | $ 50 | $ 2 | 5 | $ 250 | $ 10 |
| Satellite Traffic Operations Center (TOC/ARTIC) | 1 | $ 350 | $ 323 | - | $ - | $ - | - | $ - | $ - | 1 | $ 350 | $ 323 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Automatic Vehicle Location | - | $ - | $ - | 1 | $ 83 | $ 7 | - | $ - | $ - | 1 | $ 83 | $ 7 |
| Probe Vehicle Instrumentation | - | $ - | $ - | 2 | $ 18 | $ 14 | - | $ - | $ - | 2 | $ 18 | $ 14 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 1 | $ 7 | $ 1 | 1 | $ 13 | $ 2 | 2 | $ 20 | $ 3 |
| Preclearance | - | $ - | $ - | 2 | $ 650 | $ 16 | - | $ - | $ - | 2 | $ 650 | $ 16 |
| Weigh in Motion | - | $ - | $ - | 2 | $ 30 | $ 3 | - | $ - | $ - | 2 | $ 30 | $ 3 |
| **Total** | **42** | **$ 2,323** | **$ 386** | **53** | **$ 3,731** | **$ 277** | **68** | **$ 3,428** | **$ 208** | **163** | **$ 9,481** | **$ 870** |

**Table H-4:** Costs of Recommended Deployment for Lassen and Plumas Counties.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Advanced Bike/Ped Warning | - | $ - | $ - | - | $ - | $ - | 1 | $ 24 | $ 2 | 1 | $ 24 | $ 2 |
| Advisory Television | - | $ - | $ - | 1 | $ 19 | $ - | - | $ - | $ - | 1 | $ 19 | $ - |
| Animal/Vehicle Collision Warning | - | $ - | $ - | - | $ - | $ - | 2 | $ 1,005 | $ 50 | 2 | $ 1,005 | $ 50 |
| Automated Anti-Icing | - | $ - | $ - | - | $ - | $ - | 1 | $ 85 | $ 8 | 1 | $ 85 | $ 8 |
| Automated Visibility Warning | - | $ - | $ - | 1 | $ 80 | $ 1 | - | $ - | $ - | 1 | $ 80 | $ 1 |
| Driver Impairment Detection | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - |
| Extinguishable Message Sign | 4 | $ 200 | $ 7 | - | $ - | $ - | - | $ - | $ - | 4 | $ 200 | $ 7 |
| Highway Advisory Radio | - | $ - | $ - | - | $ - | $ - | 4 | $ 200 | $ 8 | 4 | $ 200 | $ 8 |
| Intersection Advance Warning | - | $ - | $ - | - | $ - | $ - | 1 | $ 50 | $ 4 | 1 | $ 50 | $ 4 |
| Motorist-Aide Call Box | - | $ - | $ - | 1 | $ 155 | $ 16 | - | $ - | $ - | 1 | $ 155 | $ 16 |
| Variable Message Sign | - | $ - | $ - | - | $ - | $ - | 5 | $ 1,045 | $ 12 | 5 | $ 1,045 | $ 12 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 1 | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - |
| Regional Incident Management Plan | - | $ - | $ - | 2 | $ 47 | $ 5 | - | $ - | $ - | 2 | $ 47 | $ 5 |
| Rural Coordinate Addressing System | - | $ - | $ - | 1 | $ 3 | $ 0 | 3 | $ 12 | $ 1 | 4 | $ 15 | $ 1 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 2 | $ - | $ - | 2 | $ - | $ - |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 3 | $ 4 | $ 4 | 3 | $ 4 | $ 4 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 3 | $ 12 | $ 1 | 3 | $ 12 | $ 1 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | - | $ - | $ - | 3 | $ 1,341 | $ 35 | 3 | $ 1,341 | $ 35 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Closed-Circuit Television Camera | 7 | $ 140 | $ 7 | - | $ - | $ - | 7 | $ 140 | $ 7 | 14 | $ 280 | $ 14 |
| RWIS | 4 | $ 200 | $ 8 | - | $ - | $ - | 3 | $ 150 | $ 6 | 7 | $ 350 | $ 14 |
| Satellite Traffic Operations Center (TOC/ARTIC) | - | $ - | $ - | - | $ - | $ - | 1 | $ 350 | $ 323 | 1 | $ 350 | $ 323 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Automatic Vehicle Location | - | $ - | $ - | - | $ - | $ - | 1 | $ 83 | $ 7 | 1 | $ 83 | $ 7 |
| Probe Vehicle Instrumentation | - | $ - | $ - | - | $ - | $ - | 4 | $ 14 | $ 11 | 4 | $ 14 | $ 11 |
| **Total** | **15** | **$ 540** | **$ 22** | **7** | **$ 303** | **$ 21** | **45** | **$ 4,514** | **$ 478** | **67** | **$ 5,357** | **$ 522** |

**Table H-5:** Costs of Recommended Deployment for Mendocino County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Adv. Warning for Narrow Lanes | - | $ - | $ - | 2 | $ 96 | $ 7 | 1 | $ 48 | $ 4 | 3 | $ 144 | $ 11 |
| Advanced Bike/Ped Warning | - | $ - | $ - | 1 | $ 24 | $ 2 | - | $ - | $ - | 1 | $ 24 | $ 2 |
| Advisory Television | - | $ - | $ - | - | $ - | $ - | 1 | $ 19 | $ - | 1 | $ 19 | $ - |
| Animal/Vehicle Collision Warning | - | $ - | $ - | 1 | $ 100 | $ 5 | - | $ - | $ - | 1 | $ 100 | $ 5 |
| Automated Anti-Icing | - | $ - | $ - | 1 | $ 170 | $ 16 | 1 | $ 255 | $ 24 | 2 | $ 425 | $ 40 |
| Automated Flood Warning | - | $ - | $ - | - | $ - | $ - | 1 | $ 40 | $ 3 | 1 | $ 40 | $ 3 |
| Automated Visibility Warning | - | $ - | $ - | - | $ - | $ - | 2 | $ 80 | $ 1 | 2 | $ 80 | $ 1 |
| Dynamic Warning VMS | - | $ - | $ - | - | $ - | $ - | 2 | $ 500 | $ 9 | 2 | $ 500 | $ 9 |
| Highway Advisory Radio | - | $ - | $ - | 1 | $ 50 | $ 2 | 1 | $ 50 | $ 2 | 2 | $ 100 | $ 4 |
| Intersection Advance Warning | - | $ - | $ - | - | $ - | $ - | 2 | $ 99 | $ 7 | 2 | $ 99 | $ 7 |
| Lateral Safety Warning System | - | $ - | $ - | - | $ - | $ - | 2 | $ - | $ - | 2 | $ - | $ - |
| Variable Message Sign | 7 | $ 1,463 | $ 17 | 1 | $ 209 | $ 2 | 1 | $ 209 | $ 2 | 9 | $ 1,881 | $ 22 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 1 | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - |
| Regional Incident Management Plan | 1 | $ 14 | $ 1 | 2 | $ 37 | $ 4 | 1 | $ 1 | $ 0 | 4 | $ 52 | $ 5 |
| Rural Coordinate Addressing System | - | $ - | $ - | 1 | $ 3 | $ 0 | - | $ - | $ - | 1 | $ 3 | $ 0 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | - | $ - | $ - | 4 | $ 749 | $ 75 | - | $ - | $ - | 4 | $ 749 | $ 75 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 2 | $ - | $ - | 2 | $ - | $ - |
| Kiosks | - | $ - | $ - | - | $ - | $ - | 5 | $ 50 | $ 10 | 5 | $ 50 | $ 10 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 3 | $ 4 | $ 4 | 3 | $ 4 | $ 4 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 3 | $ 12 | $ 1 | 3 | $ 12 | $ 1 |
| Parking Management & Information System | - | $ - | $ - | - | $ - | $ - | 1 | $ 22 | $ 7 | 1 | $ 22 | $ 7 |
| Recreational Veh. Park and Ride Lots | - | $ - | $ - | - | $ - | $ - | 1 | $ 118 | $ 5 | 1 | $ 118 | $ 5 |
| Smart Card | - | $ - | $ - | - | $ - | $ - | 1 | $ 425 | $ 3 | 1 | $ 425 | $ 3 |
| Transit Traveler Information | - | $ - | $ - | 1 | $ 28 | $ 13 | - | $ - | $ - | 1 | $ 28 | $ 13 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | - | $ - | $ - | 3 | $ 1,341 | $ 35 | 3 | $ 1,341 | $ 35 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | 1 | $ 18 | $ 0 | 2 | $ 35 | $ 1 | 3 | $ 53 | $ 1 | 6 | $ 105 | $ 2 |
| Automated Gate Closure | - | $ - | $ - | - | $ - | $ - | 1 | $ 60 | $ 4 | 1 | $ 60 | $ 4 |
| Closed-Circuit Television Camera | 6 | $ 120 | $ 6 | 1 | $ 20 | $ 1 | - | $ - | $ - | 7 | $ 140 | $ 7 |
| RWIS | 2 | $ 100 | $ 4 | 1 | $ 50 | $ 2 | - | $ - | $ - | 3 | $ 150 | $ 6 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Probe Vehicle Instrumentation | - | $ - | $ - | 1 | $ 6 | $ 5 | - | $ - | $ - | 1 | $ 6 | $ 5 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 1 | $ 4 | $ 1 | 1 | $ 6 | $ 1 | 2 | $ 10 | $ 1 |
| Preclearance | - | $ - | $ - | 2 | $ 650 | $ 16 | - | $ - | $ - | 2 | $ 650 | $ 16 |
| Weigh in Motion | - | $ - | $ - | 2 | $ 30 | $ 3 | - | $ - | $ - | 2 | $ 30 | $ 3 |
| **Total** | **17** | **$ 1,715** | **$ 29** | **26** | **$ 2,261** | **$ 154** | **39** | **$ 3,391** | **$ 122** | **82** | **$ 7,367** | **$ 305** |

**Table H-6:** Costs of Recommended Deployment for Modoc County.

| Infrastructure Name | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Capital ($K) | O&M ($K) | No. | Capital ($K) | O&M ($K) | No. | Capital ($K) | O&M ($K) | No. | Capital ($K) | O&M ($K) |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Animal/Vehicle Collision Warning | - | $ - | $ - | - | $ - | $ - | 2 | $ 1,100 | $ 55 | 2 | $ 1,100 | $ 55 |
| Driver Impairment Detection | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - |
| Highway Advisory Radio | 1 | $ 50 | $ 2 | - | $ - | $ - | 2 | $ 100 | $ 4 | 3 | $ 150 | $ 6 |
| Motorist-Aide Call Box | - | $ - | $ - | 2 | $ 175 | $ 18 | - | $ - | $ - | 2 | $ 175 | $ 18 |
| Variable Message Sign | 3 | $ 627 | $ 7 | - | $ - | $ - | 2 | $ 418 | $ 5 | 5 | $ 1,045 | $ 12 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 3 | $ - | $ - | - | $ - | $ - | 3 | $ - | $ - |
| Rural Coordinate Addressing System | - | $ - | $ - | 1 | $ 7 | $ 0 | 1 | $ 2 | $ 0 | 2 | $ 9 | $ 0 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 1 | $ 1 | $ 1 | 1 | $ 1 | $ 1 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 1 | $ 4 | $ 0 | 1 | $ 4 | $ 0 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | - | $ - | $ - | 1 | $ 447 | $ 12 | 1 | $ 447 | $ 12 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Closed-Circuit Television Camera | 1 | $ 20 | $ 1 | - | $ - | $ - | 9 | $ 180 | $ 9 | 10 | $ 200 | $ 10 |
| RWIS | - | $ - | $ - | - | $ - | $ - | 3 | $ 150 | $ 6 | 3 | $ 150 | $ 6 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Automatic Vehicle Location | - | $ - | $ - | - | $ - | $ - | 1 | $ 83 | $ 7 | 1 | $ 83 | $ 7 |
| Probe Vehicle Instrumentation | - | $ - | $ - | - | $ - | $ - | 1 | $ 2 | $ 2 | 1 | $ 2 | $ 2 |
| **Total** | **5** | **$ 697** | **$ 10** | **6** | **$ 182** | **$ 18** | **25** | **$ 2,487** | **$ 101** | **36** | **$ 3,366** | **$ 129** |

**Table H-7:** Costs of Recommended Deployment for Shasta County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Advanced Bike/Ped Warning | 1 | $ 24 | $ 2 | 2 | $ 47 | $ 5 | - | $ - | $ - | 3 | $ 71 | $ 7 |
| Advisory Television | 1 | $ 19 | $ - | 1 | $ 19 | $ - | - | $ - | $ - | 2 | $ 38 | $ - |
| Animal/Vehicle Collision Warning | - | $ - | $ - | - | $ - | $ - | 1 | $ 95 | $ 5 | 1 | $ 95 | $ 5 |
| Automated Visibility Warning | - | $ - | $ - | - | $ - | $ - | 2 | $ 80 | $ 1 | 2 | $ 80 | $ 1 |
| Dynamic Warning VMS | - | $ - | $ - | 3 | $ 750 | $ 13 | - | $ - | $ - | 3 | $ 750 | $ 13 |
| Highway Advisory Radio | - | $ - | $ - | 1 | $ 50 | $ 2 | 2 | $ 100 | $ 4 | 3 | $ 150 | $ 6 |
| Intersection Advance Warning | - | $ - | $ - | 1 | $ 50 | $ 4 | 1 | $ 50 | $ 4 | 2 | $ 99 | $ 7 |
| Motorist-Aide Call Box | - | $ - | $ - | 3 | $ 341 | $ 34 | - | $ - | $ - | 3 | $ 341 | $ 34 |
| Variable Message Sign | - | $ - | $ - | 8 | $ 1,672 | $ 19 | 15 | $ 3,135 | $ 36 | 23 | $ 4,807 | $ 55 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 2 | $ - | $ - | 1 | $ - | $ - | 3 | $ - | $ - |
| Regional Incident Management Plan | 2 | $ 58 | $ 6 | 1 | $ 15 | $ 2 | 1 | $ 13 | $ 1 | 4 | $ 86 | $ 9 |
| Rural Coordinate Addressing System | 3 | $ 15 | $ 1 | - | $ - | $ - | - | $ - | $ - | 3 | $ 15 | $ 1 |
| Traffic Signal Priority for Emergency Vehicles | - | $ - | $ - | 2 | $ 17 | $ 1 | - | $ - | $ - | 2 | $ 17 | $ 1 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 3 | $ - | $ - | 3 | $ - | $ - |
| Kiosks | - | $ - | $ - | 4 | $ 40 | $ 8 | 1 | $ 10 | $ 2 | 5 | $ 50 | $ 10 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 2 | $ 2 | $ 3 | 2 | $ 2 | $ 3 |
| Dynamic Ridesharing/Paratransit | - | $ - | $ - | - | $ - | $ - | 1 | $ 4 | $ 6 | 1 | $ 4 | $ 6 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 2 | $ 8 | $ 1 | 2 | $ 8 | $ 1 |
| Parking Management & Information System | - | $ - | $ - | - | $ - | $ - | 1 | $ 22 | $ 7 | 1 | $ 22 | $ 7 |
| Recreational Veh. Park and Ride Lots | - | $ - | $ - | - | $ - | $ - | 1 | $ 118 | $ 5 | 1 | $ 118 | $ 5 |
| Transit Traveler Information | - | $ - | $ - | 1 | $ 28 | $ 13 | - | $ - | $ - | 1 | $ 28 | $ 13 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | 1 | $ 447 | $ 12 | 1 | $ 447 | $ 12 | 2 | $ 894 | $ 23 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Closed-Circuit Television Camera | 6 | $ 120 | $ 6 | 12 | $ 240 | $ 12 | 23 | $ 460 | $ 23 | 41 | $ 820 | $ 41 |
| RWIS | - | $ - | $ - | 3 | $ 150 | $ 6 | 8 | $ 400 | $ 16 | 11 | $ 550 | $ 22 |
| Satellite Traffic Operations Center (TOC/ARTIC) | 1 | $ 350 | $ 323 | - | $ - | $ - | - | $ - | $ - | 1 | $ 350 | $ 323 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Automatic Vehicle Location | - | $ - | $ - | - | $ - | $ - | 1 | $ 83 | $ 7 | 1 | $ 83 | $ 7 |
| Probe Vehicle Instrumentation | - | $ - | $ - | 1 | $ 9 | $ 7 | 3 | $ 11 | $ 8 | 4 | $ 20 | $ 15 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 1 | $ 7 | $ 1 | - | $ - | $ - | 1 | $ 7 | $ 1 |
| Preclearance | - | $ - | $ - | 1 | $ 325 | $ 8 | - | $ - | $ - | 1 | $ 325 | $ 8 |
| Weigh in Motion | - | $ - | $ - | 1 | $ 15 | $ 2 | - | $ - | $ - | 1 | $ 15 | $ 2 |
| **Total** | **14** | **$ 585** | **$ 337** | **49** | **$ 4,221** | **$ 147** | **70** | **$ 5,037** | **$ 141** | **133** | **$ 9,844** | **$ 625** |

**Table H-8:** Costs of Recommended Deployment for Siskiyou County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Advanced Bike/Ped Warning | - | $ - | $ - | 1 | $ 24 | $ 2 | - | $ - | $ - | 1 | $ 24 | $ 2 |
| Advisory Television | 1 | $ 19 | $ - | 2 | $ 38 | $ - | - | $ - | $ - | 3 | $ 57 | $ - |
| Animal/Vehicle Collision Warning | - | $ - | $ - | 1 | $ 100 | $ 5 | - | $ - | $ - | 1 | $ 100 | $ 5 |
| Automated Anti-Icing | - | $ - | $ - | 1 | $ 85 | $ 8 | - | $ - | $ - | 1 | $ 85 | $ 8 |
| Automated Wind Advisory | 1 | $ 60 | $ 3 | - | $ - | $ - | - | $ - | $ - | 1 | $ 60 | $ 3 |
| Highway Advisory Radio | 2 | $ 100 | $ 4 | 1 | $ 50 | $ 2 | 2 | $ 100 | $ 4 | 5 | $ 250 | $ 10 |
| Lateral Safety Warning System | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - |
| Motorist-Aide Call Box | - | $ - | $ - | 2 | $ 192 | $ 19 | - | $ - | $ - | 2 | $ 192 | $ 19 |
| Variable Message Sign | 3 | $ 627 | $ 7 | 6 | $ 1,254 | $ 14 | 11 | $ 2,299 | $ 26 | 20 | $ 4,180 | $ 48 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 1 | $ - | $ - | 2 | $ - | $ - | 3 | $ - | $ - |
| Regional Incident Management Plan | 2 | $ 57 | $ 6 | 1 | $ 17 | $ 2 | 2 | $ 34 | $ 3 | 5 | $ 108 | $ 11 |
| Rural Coordinate Addressing System | - | $ - | $ - | 2 | $ 14 | $ 1 | - | $ - | $ - | 2 | $ 14 | $ 1 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | - | $ - | $ - | 1 | $ 39 | $ 4 | - | $ - | $ - | 1 | $ 39 | $ 4 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 4 | $ - | $ - | 4 | $ - | $ - |
| Kiosks | - | $ - | $ - | 2 | $ 20 | $ 4 | 1 | $ 10 | $ 2 | 3 | $ 30 | $ 6 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 2 | $ 2 | $ 3 | 2 | $ 2 | $ 3 |
| On-Board Transit Safety Systems | - | $ - | $ - | 1 | $ 4 | $ 0 | 1 | $ 4 | $ 0 | 2 | $ 8 | $ 1 |
| Parking Management & Information System | - | $ - | $ - | 1 | $ 22 | $ 7 | - | $ - | $ - | 1 | $ 22 | $ 7 |
| Transit Traveler Information | - | $ - | $ - | 1 | $ 28 | $ 13 | - | $ - | $ - | 1 | $ 28 | $ 13 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | - | $ - | $ - | 2 | $ 894 | $ 23 | 2 | $ 894 | $ 23 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | 5 | $ 88 | $ 2 | - | $ - | $ - | - | $ - | $ - | 5 | $ 88 | $ 2 |
| Automated Gate Closure | - | $ - | $ - | - | $ - | $ - | 4 | $ 240 | $ 15 | 4 | $ 240 | $ 15 |
| Closed-Circuit Television Camera | 13 | $ 260 | $ 13 | 6 | $ 120 | $ 6 | 8 | $ 160 | $ 8 | 27 | $ 540 | $ 27 |
| RWIS | 2 | $ 100 | $ 4 | 3 | $ 150 | $ 6 | 5 | $ 250 | $ 10 | 10 | $ 500 | $ 20 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Probe Vehicle Instrumentation | - | $ - | $ - | 1 | $ 12 | $ 9 | - | $ - | $ - | 1 | $ 12 | $ 9 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 1 | $ 7 | $ 1 | - | $ - | $ - | 1 | $ 7 | $ 1 |
| Preclearance | - | $ - | $ - | 1 | $ 325 | $ 8 | - | $ - | $ - | 1 | $ 325 | $ 8 |
| Weigh in Motion | - | $ - | $ - | 1 | $ 15 | $ 2 | - | $ - | $ - | 1 | $ 15 | $ 2 |
| **Total** | **29** | **$ 1,310** | **$ 38** | **37** | **$ 2,516** | **$ 114** | **45** | **$ 3,994** | **$ 95** | **111** | **$ 7,820** | **$ 247** |

**Table H-9:** Costs of Recommended Deployment for Tehama County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Adv. Warning for Narrow Lanes | - | $ - | $ - | - | $ - | $ - | 1 | $ 48 | $ 4 | 1 | $ 48 | $ 4 |
| Advanced Bike/Ped Warning | - | $ - | $ - | 1 | $ 24 | $ 2 | - | $ - | $ - | 1 | $ 24 | $ 2 |
| Advisory Television | - | $ - | $ - | 1 | $ 19 | $ - | - | $ - | $ - | 1 | $ 19 | $ - |
| Automated Anti-Icing | - | $ - | $ - | - | $ - | $ - | 1 | $ 170 | $ 16 | 1 | $ 170 | $ 16 |
| Automated Flood Warning | 1 | $ 40 | $ 3 | - | $ - | $ - | - | $ - | $ - | 1 | $ 40 | $ 3 |
| Automated Visibility Warning | - | $ - | $ - | - | $ - | $ - | 1 | $ 120 | $ 2 | 1 | $ 120 | $ 2 |
| Dynamic Warning VMS | - | $ - | $ - | - | $ - | $ - | 2 | $ 500 | $ 9 | 2 | $ 500 | $ 9 |
| Highway Advisory Radio | - | $ - | $ - | - | $ - | $ - | 1 | $ 50 | $ 2 | 1 | $ 50 | $ 2 |
| Lateral Safety Warning System | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - |
| Motorist-Aide Call Box | - | $ - | $ - | 1 | $ 40 | $ 4 | - | $ - | $ - | 1 | $ 40 | $ 4 |
| Variable Message Sign | - | $ - | $ - | 4 | $ 836 | $ 10 | 8 | $ 1,672 | $ 19 | 12 | $ 2,508 | $ 29 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - | 2 | $ - | $ - |
| Regional Incident Management Plan | 1 | $ 9 | $ 1 | 1 | $ 69 | $ 7 | 1 | $ 1 | $ 0 | 3 | $ 80 | $ 8 |
| Rural Coordinate Addressing System | - | $ - | $ - | - | $ - | $ - | 1 | $ 10 | $ 1 | 1 | $ 10 | $ 1 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | - | $ - | $ - | 1 | $ 187 | $ 19 | - | $ - | $ - | 1 | $ 187 | $ 19 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 3 | $ - | $ - | 3 | $ - | $ - |
| Kiosks | - | $ - | $ - | 1 | $ 10 | $ 2 | - | $ - | $ - | 1 | $ 10 | $ 2 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 2 | $ 2 | $ 3 | 2 | $ 2 | $ 3 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 2 | $ 8 | $ 1 | 2 | $ 8 | $ 1 |
| Parking Management & Information System | - | $ - | $ - | - | $ - | $ - | 1 | $ 22 | $ 7 | 1 | $ 22 | $ 7 |
| Transit Traveler Information | - | $ - | $ - | 1 | $ 28 | $ 13 | - | $ - | $ - | 1 | $ 28 | $ 13 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | - | $ - | $ - | 2 | $ 894 | $ 23 | 2 | $ 894 | $ 23 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | 1 | $ 18 | $ 0 | - | $ - | $ - | 1 | $ 18 | $ 0 | 2 | $ 35 | $ 1 |
| Automated Gate Closure | - | $ - | $ - | - | $ - | $ - | 1 | $ 60 | $ 4 | 1 | $ 60 | $ 4 |
| Closed-Circuit Television Camera | 1 | $ 20 | $ 1 | 1 | $ 20 | $ 1 | 7 | $ 140 | $ 7 | 9 | $ 180 | $ 9 |
| RWIS | - | $ - | $ - | - | $ - | $ - | 3 | $ 150 | $ 6 | 3 | $ 150 | $ 6 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Automatic Vehicle Location | - | $ - | $ - | - | $ - | $ - | 1 | $ 83 | $ 7 | 1 | $ 83 | $ 7 |
| Probe Vehicle Instrumentation | - | $ - | $ - | - | $ - | $ - | 1 | $ 4 | $ 3 | 1 | $ 4 | $ 3 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 1 | $ 5 | $ 1 | - | $ - | $ - | 1 | $ 5 | $ 1 |
| **Total** | **4** | **$ 87** | **$ 5** | **14** | **$ 1,237** | **$ 58** | **42** | **$ 3,952** | **$ 113** | **60** | **$ 5,276** | **$ 176** |

**Table H-10:** Costs of Recommended Deployment for Trinity County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Adv. Warning for Narrow Lanes | - | $ - | $ - | - | $ - | $ - | 4 | $ 192 | $ 15 | 4 | $ 192 | $ 15 |
| Automated Flood Warning | - | $ - | $ - | 5 | $ 200 | $ 13 | - | $ - | $ - | 5 | $ 200 | $ 13 |
| Highway Advisory Radio | - | $ - | $ - | - | $ - | $ - | 3 | $ 150 | $ 6 | 3 | $ 150 | $ 6 |
| Lateral Safety Warning System | - | $ - | $ - | - | $ - | $ - | 3 | $ - | $ - | 3 | $ - | $ - |
| Motorist-Aide Call Box | - | $ - | $ - | 1 | $ 180 | $ 18 | - | $ - | $ - | 1 | $ 180 | $ 18 |
| Variable Message Sign | - | $ - | $ - | - | $ - | $ - | 5 | $ 1,045 | $ 12 | 5 | $ 1,045 | $ 12 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - | 2 | $ - | $ - |
| Regional Incident Management Plan | 2 | $ 18 | $ 2 | - | $ - | $ - | 1 | $ 16 | $ 2 | 3 | $ 34 | $ 3 |
| Rural Coordinate Addressing System | 2 | $ 11 | $ 1 | - | $ - | $ - | - | $ - | $ - | 2 | $ 11 | $ 1 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | - | $ - | $ - | 2 | $ 125 | $ 13 | - | $ - | $ - | 2 | $ 125 | $ 13 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 3 | $ - | $ - | 3 | $ - | $ - |
| Kiosks | - | $ - | $ - | - | $ - | $ - | 1 | $ 10 | $ 2 | 1 | $ 10 | $ 2 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Dynamic Ridesharing/Paratransit | - | $ - | $ - | - | $ - | $ - | 1 | $ 14 | $ 21 | 1 | $ 14 | $ 21 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | - | $ - | $ - | 5 | $ 88 | $ 2 | 5 | $ 88 | $ 2 | 10 | $ 175 | $ 3 |
| Automated Gate Closure | - | $ - | $ - | - | $ - | $ - | 1 | $ 60 | $ 4 | 1 | $ 60 | $ 4 |
| Closed-Circuit Television Camera | 2 | $ 40 | $ 2 | - | $ - | $ - | 4 | $ 80 | $ 4 | 6 | $ 120 | $ 6 |
| RWIS | - | $ - | $ - | - | $ - | $ - | 6 | $ 300 | $ 12 | 6 | $ 300 | $ 12 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Probe Vehicle Instrumentation | - | $ - | $ - | - | $ - | $ - | 2 | $ 4 | $ 3 | 2 | $ 4 | $ 3 |
| **Total** | **6** | **$ 70** | **$ 4** | **14** | **$ 593** | **$ 45** | **40** | **$ 1,959** | **$ 81** | **60** | **$ 2,621** | **$ 130** |

# APPENDIX I: SOUTHERN OREGON ITS DEPLOYMENT COSTS

This appendix provides county-level cost data for short, medium and long-term ITS deployment in Southern Oregon as recommended in this plan. Operations and maintenance (O&M) costs do not reflect the costs associated with the existing ITS infrastructure. See Chapter 8 for information on how cost estimates were developed.

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**Table I-1:** Costs of Recommended Deployment for Coos County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Adv. Warning for Narrow Lanes | - | $ - | $ - | 1 | $ 48 | $ 4 | - | $ - | $ - | 1 | $ 48 | $ 4 |
| Advanced Bike/Ped Warning | 2 | $ 47 | $ 5 | 2 | $ 47 | $ 5 | - | $ - | $ - | 4 | $ 94 | $ 9 |
| Advisory Television | - | $ - | $ - | - | $ - | $ - | 1 | $ 19 | $ - | 1 | $ 19 | $ - |
| Automated Flood Warning | 3 | $ 120 | $ 8 | - | $ - | $ - | - | $ - | $ - | 3 | $ 120 | $ 8 |
| Dynamic Warning VMS | - | $ - | $ - | 4 | $ 1,000 | $ 18 | - | $ - | $ - | 4 | $ 1,000 | $ 18 |
| Highway Advisory Radio | - | $ - | $ - | 3 | $ 150 | $ 6 | - | $ - | $ - | 3 | $ 150 | $ 6 |
| Intersection Advance Warning | - | $ - | $ - | - | $ - | $ - | 2 | $ 99 | $ 7 | 2 | $ 99 | $ 7 |
| Variable Message Sign | 1 | $ 209 | $ 2 | 2 | $ 418 | $ 5 | 4 | $ 836 | $ 10 | 7 | $ 1,463 | $ 17 |
| **Emergency Services** | | | | | | | | | | | | |
| Regional Incident Management Plan | - | $ - | $ - | 1 | $ 21 | $ 2 | - | $ - | $ - | 1 | $ 21 | $ 2 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | 2 | $ 374 | $ 37 | 1 | $ 187 | $ 19 | 5 | $ 936 | $ 94 | 8 | $ 1,498 | $ 150 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 9 | $ 28 | $ 3 | 9 | $ 28 | $ 3 |
| Kiosks | 4 | $ 40 | $ 8 | 4 | $ 40 | $ 8 | - | $ - | $ - | 8 | $ 80 | $ 16 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 2 | $ 2 | $ 3 | 2 | $ 2 | $ 3 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 2 | $ 8 | $ 1 | 2 | $ 8 | $ 1 |
| Parking Management & Information System | - | $ - | $ - | - | $ - | $ - | 1 | $ 22 | $ 7 | 1 | $ 22 | $ 7 |
| Recreational Veh. Park and Ride Lots | - | $ - | $ - | - | $ - | $ - | 2 | $ 236 | $ 11 | 2 | $ 236 | $ 11 |
| Transit Traveler Information | - | $ - | $ - | 8 | $ 220 | $ 104 | - | $ - | $ - | 8 | $ 220 | $ 104 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | 1 | $ 447 | $ 12 | 1 | $ 447 | $ 12 | 2 | $ 894 | $ 23 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | 3 | $ 53 | $ 1 | 2 | $ 35 | $ 1 | - | $ - | $ - | 5 | $ 88 | $ 2 |
| RWIS | 2 | $ 100 | $ 4 | - | $ - | $ - | - | $ - | $ - | 2 | $ 100 | $ 4 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Preclearance | - | $ - | $ - | 1 | $ 325 | $ 8 | - | $ - | $ - | 1 | $ 325 | $ 8 |
| Weigh in Motion | - | $ - | $ - | 2 | $ 30 | $ 3 | - | $ - | $ - | 2 | $ 30 | $ 3 |
| **Total** | **17** | **$ 943** | **$ 65** | **32** | **$ 2,968** | **$ 193** | **29** | **$ 2,633** | **$ 146** | **78** | **$ 6,545** | **$ 404** |

**Table I-2:** Costs of Recommended Deployment for Curry County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Advanced Bike/Ped Warning | - | $ - | $ - | 2 | $ 47 | $ 5 | 1 | $ 24 | $ 2 | 3 | $ 71 | $ 7 |
| Automated Wind Advisory | 1 | $ 60 | $ 3 | - | $ - | $ - | - | $ - | $ - | 1 | $ 60 | $ 3 |
| Dynamic Warning VMS | 3 | $ 750 | $ 13 | 2 | $ 500 | $ 9 | - | $ - | $ - | 5 | $ 1,250 | $ 22 |
| Highway Advisory Radio | 1 | $ 50 | $ 2 | - | $ - | $ - | - | $ - | $ - | 1 | $ 50 | $ 2 |
| Intersection Advance Warning | - | $ - | $ - | 1 | $ 50 | $ 4 | 4 | $ 198 | $ 14 | 5 | $ 248 | $ 18 |
| Lateral Safety Warning System | - | $ - | $ - | 2 | $ - | $ - | - | $ - | $ - | 2 | $ - | $ - |
| Variable Message Sign | - | $ - | $ - | 6 | $ 1,254 | $ 14 | - | $ - | $ - | 6 | $ 1,254 | $ 14 |
| **Emergency Services** | | | | | | | | | | | | |
| Regional Incident Management Plan | 1 | $ 9 | $ 1 | - | $ - | $ - | - | $ - | $ - | 1 | $ 9 | $ 1 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | - | $ - | $ - | 1 | $ 187 | $ 19 | 1 | $ 187 | $ 19 | 2 | $ 374 | $ 37 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 2 | $ 8 | $ 1 | 2 | $ 8 | $ 1 |
| Kiosks | 4 | $ 40 | $ 8 | - | $ - | $ - | - | $ - | $ - | 4 | $ 40 | $ 8 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 3 | $ 4 | $ 4 | 3 | $ 4 | $ 4 |
| Dynamic Ridesharing/Paratransit | - | $ - | $ - | 1 | $ 27 | $ 39 | - | $ - | $ - | 1 | $ 27 | $ 39 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 3 | $ 12 | $ 1 | 3 | $ 12 | $ 1 |
| Parking Management & Information System | - | $ - | $ - | - | $ - | $ - | 1 | $ 22 | $ 7 | 1 | $ 22 | $ 7 |
| Recreational Veh. Park and Ride Lots | - | $ - | $ - | - | $ - | $ - | 1 | $ 118 | $ 5 | 1 | $ 118 | $ 5 |
| Transit Traveler Information | - | $ - | $ - | 2 | $ 55 | $ 26 | - | $ - | $ - | 2 | $ 55 | $ 26 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | 1 | $ 447 | $ 12 | 2 | $ 894 | $ 23 | 3 | $ 1,341 | $ 35 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Closed-Circuit Television Camera | - | $ - | $ - | - | $ - | $ - | 1 | $ 20 | $ 1 | 1 | $ 20 | $ 1 |
| RWIS | 2 | $ 100 | $ 4 | - | $ - | $ - | - | $ - | $ - | 2 | $ 100 | $ 4 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Preclearance | 1 | $ 325 | $ 8 | - | $ - | $ - | - | $ - | $ - | 1 | $ 325 | $ 8 |
| Weigh in Motion | - | $ - | $ - | 1 | $ 15 | $ 2 | - | $ - | $ - | 1 | $ 15 | $ 2 |
| **Total** | **13** | **$ 1,334** | **$ 39** | **19** | **$ 2,581** | **$ 128** | **19** | **$ 1,486** | **$ 78** | **51** | **$ 5,402** | **$ 246** |

**Table I-3:** Costs of Recommended Deployment for Deschutes, Jefferson and Linn Counties.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 1 | $ 17 | $ 1 | - | $ - | $ - | 1 | $ 48 | $ 4 | 2 | $ 65 | $ 5 |
| Advanced Bike/Ped Warning | - | $ - | $ - | 1 | $ 24 | $ 2 | - | $ - | $ - | 1 | $ 24 | $ 2 |
| Animal/Vehicle Collision Warning | 1 | $ 297 | $ 15 | 2 | $ 300 | $ 15 | - | $ - | $ - | 3 | $ 597 | $ 30 |
| Automated Anti-Icing | - | $ - | $ - | 1 | $ 85 | $ 8 | - | $ - | $ - | 1 | $ 85 | $ 8 |
| Automated Visibility Warning | - | $ - | $ - | 1 | $ 40 | $ 1 | - | $ - | $ - | 1 | $ 40 | $ 1 |
| Dynamic Warning VMS | 2 | $ 500 | $ 9 | - | $ - | $ - | 2 | $ 500 | $ 9 | 4 | $ 1,000 | $ 18 |
| Highway Advisory Radio | - | $ - | $ - | 5 | $ 250 | $ 10 | - | $ - | $ - | 5 | $ 250 | $ 10 |
| Lateral Safety Warning System | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - |
| Motorist-Aide Call Box | - | $ - | $ - | 1 | $ 112 | $ 11 | - | $ - | $ - | 1 | $ 112 | $ 11 |
| Variable Message Sign | 2 | $ 418 | $ 5 | 3 | $ 627 | $ 7 | 1 | $ 209 | $ 2 | 6 | $ 1,254 | $ 14 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 1 | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - |
| Regional Incident Management Plan | 4 | $ 28 | $ 3 | 1 | $ 6 | $ 1 | 1 | $ 43 | $ 4 | 6 | $ 78 | $ 8 |
| Rural Coordinate Addressing System | - | $ - | $ - | 1 | $ 7 | $ 0 | - | $ - | $ - | 1 | $ 7 | $ 0 |
| Traffic Signal Priority for Emergency Vehicles | - | $ - | $ - | 1 | $ 9 | $ 0 | - | $ - | $ - | 1 | $ 9 | $ 0 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 5 | $ - | $ - | 5 | $ - | $ - |
| Kiosks | 2 | $ 20 | $ 4 | - | $ - | $ - | - | $ - | $ - | 2 | $ 20 | $ 4 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 3 | $ 4 | $ 4 | 3 | $ 4 | $ 4 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 3 | $ 12 | $ 1 | 3 | $ 12 | $ 1 |
| Parking Management & Information System | 1 | $ 22 | $ 7 | 1 | $ 22 | $ 7 | - | $ - | $ - | 2 | $ 43 | $ 14 |
| Recreational Veh. Park and Ride Lots | 3 | $ 354 | $ 16 | 1 | $ 118 | $ 5 | - | $ - | $ - | 4 | $ 472 | $ 21 |
| Transit Traveler Information | - | $ - | $ - | 1 | $ 28 | $ 13 | - | $ - | $ - | 1 | $ 28 | $ 13 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | 1 | $ 447 | $ 12 | 2 | $ 894 | $ 23 | 3 | $ 1,341 | $ 35 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | 1 | $ 18 | $ 0 | - | $ - | $ - | 1 | $ 18 | $ 0 | 2 | $ 35 | $ 1 |
| Automated Gate Closure | 2 | $ 120 | $ 7 | - | $ - | $ - | - | $ - | $ - | 2 | $ 120 | $ 7 |
| Closed-Circuit Television Camera | 1 | $ 20 | $ 1 | 3 | $ 60 | $ 3 | 1 | $ 20 | $ 1 | 5 | $ 100 | $ 5 |
| RWIS | - | $ - | $ - | 1 | $ 50 | $ 2 | 1 | $ 50 | $ 2 | 2 | $ 100 | $ 4 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Automatic Vehicle Location | 2 | $ 165 | $ 14 | - | $ - | $ - | 1 | $ 25 | $ 2 | 3 | $ 190 | $ 16 |
| Probe Vehicle Instrumentation | 1 | $ 15 | $ 11 | 1 | $ 11 | $ 8 | - | $ - | $ - | 2 | $ 26 | $ 20 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Preclearance | - | $ - | $ - | 1 | $ 325 | $ 8 | - | $ - | $ - | 1 | $ 325 | $ 8 |
| Weigh in Motion | 2 | $ 30 | $ 3 | - | $ - | $ - | - | $ - | $ - | 2 | $ 30 | $ 3 |
| **Total** | **25** | **$ 2,023** | **$ 97** | **28** | **$ 2,519** | **$ 114** | **23** | **$ 1,823** | **$ 53** | **76** | **$ 6,365** | **$ 264** |

**Table I-4:** Costs of Recommended Deployment for Douglas County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Adv. Warning for Narrow Lanes | - | $ - | $ - | 2 | $ 96 | $ 7 | - | $ - | $ - | 2 | $ 96 | $ 7 |
| Advanced Bike/Ped Warning | - | $ - | $ - | 2 | $ 47 | $ 5 | - | $ - | $ - | 2 | $ 47 | $ 5 |
| Advisory Television | - | $ - | $ - | - | $ - | $ - | 1 | $ 19 | $ - | 1 | $ 19 | $ - |
| Automated Anti-Icing | 1 | $ 85 | $ 8 | - | $ - | $ - | 2 | $ 340 | $ 32 | 3 | $ 425 | $ 40 |
| Automated Flood Warning | 2 | $ 40 | $ 3 | - | $ - | $ - | - | $ - | $ - | 2 | $ 40 | $ 3 |
| Automated Visibility Warning | 1 | $ 80 | $ 1 | 1 | $ 40 | $ 1 | - | $ - | $ - | 2 | $ 120 | $ 2 |
| Driver Impairment Detection | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - |
| Dynamic Warning VMS | 2 | $ 500 | $ 9 | 6 | $ 1,500 | $ 26 | - | $ - | $ - | 8 | $ 2,000 | $ 35 |
| Highway Advisory Radio | - | $ - | $ - | 2 | $ 100 | $ 4 | 1 | $ 50 | $ 2 | 3 | $ 150 | $ 6 |
| Intersection Advance Warning | - | $ - | $ - | 2 | $ 99 | $ 7 | 1 | $ 50 | $ 4 | 3 | $ 149 | $ 11 |
| Motorist-Aide Call Box | 1 | $ 10 | $ 1 | - | $ - | $ - | - | $ - | $ - | 1 | $ 10 | $ 1 |
| Variable Message Sign | 1 | $ 209 | $ 2 | 5 | $ 1,045 | $ 12 | 5 | $ 1,045 | $ 12 | 11 | $ 2,299 | $ 26 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 1 | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - |
| Regional Incident Management Plan | 2 | $ 51 | $ 5 | 3 | $ 62 | $ 6 | - | $ - | $ - | 5 | $ 113 | $ 11 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | - | $ - | $ - | 2 | $ 374 | $ 37 | - | $ - | $ - | 2 | $ 374 | $ 37 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 6 | $ 4 | $ 0 | 6 | $ 4 | $ 0 |
| Kiosks | 2 | $ 20 | $ 4 | 1 | $ 10 | $ 2 | - | $ - | $ - | 3 | $ 30 | $ 6 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 2 | $ 2 | $ 3 | 2 | $ 2 | $ 3 |
| Dynamic Ridesharing/Paratransit | - | $ - | $ - | 1 | $ 27 | $ 39 | - | $ - | $ - | 1 | $ 27 | $ 39 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 2 | $ 8 | $ 1 | 2 | $ 8 | $ 1 |
| Parking Management & Information System | - | $ - | $ - | 2 | $ 43 | $ 14 | 1 | $ 22 | $ 7 | 3 | $ 65 | $ 22 |
| Recreational Veh. Park and Ride Lots | - | $ - | $ - | 2 | $ 236 | $ 11 | 1 | $ 118 | $ 5 | 3 | $ 354 | $ 16 |
| Transit Traveler Information | - | $ - | $ - | 2 | $ 55 | $ 26 | - | $ - | $ - | 2 | $ 55 | $ 26 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | 1 | $ 447 | $ 12 | 1 | $ 447 | $ 12 | 2 | $ 894 | $ 23 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | 2 | $ 35 | $ 1 | 2 | $ 35 | $ 1 | - | $ - | $ - | 4 | $ 70 | $ 1 |
| Closed-Circuit Television Camera | 3 | $ 60 | $ 3 | - | $ - | $ - | - | $ - | $ - | 3 | $ 60 | $ 3 |
| RWIS | 5 | $ 250 | $ 10 | 1 | $ 50 | $ 2 | - | $ - | $ - | 6 | $ 300 | $ 12 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Automatic Vehicle Location | - | $ - | $ - | - | $ - | $ - | 2 | $ 145 | $ 12 | 2 | $ 145 | $ 12 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 1 | $ 12 | $ 2 | - | $ - | $ - | 1 | $ 12 | $ 2 |
| **Total** | **22** | **$ 1,340** | **$ 47** | **39** | **$ 4,279** | **$ 214** | **26** | **$ 2,249** | **$ 90** | **87** | **$ 7,868** | **$ 350** |

**Table I-5:** Costs of Recommended Deployment for Harney and Malheur Counties.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Advisory Television | - | $ - | $ - | - | $ - | $ - | 1 | $ 19 | $ - | 1 | $ 19 | $ - |
| Animal/Vehicle Collision Warning | - | $ - | $ - | 2 | $ 1,800 | $ 90 | - | $ - | $ - | 2 | $ 1,800 | $ 90 |
| Dynamic Warning VMS | - | $ - | $ - | 3 | $ 750 | $ 13 | - | $ - | $ - | 3 | $ 750 | $ 13 |
| Highway Advisory Radio | - | $ - | $ - | 1 | $ 50 | $ 2 | - | $ - | $ - | 1 | $ 50 | $ 2 |
| Intersection Advance Warning | - | $ - | $ - | 1 | $ 50 | $ 4 | - | $ - | $ - | 1 | $ 50 | $ 4 |
| Motorist-Aide Call Box | - | $ - | $ - | 2 | $ 35 | $ 4 | - | $ - | $ - | 2 | $ 35 | $ 4 |
| Variable Message Sign | - | $ - | $ - | 1 | $ 209 | $ 2 | 1 | $ 209 | $ 2 | 2 | $ 418 | $ 5 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | 2 | $ - | $ - | 2 | $ - | $ - | - | $ - | $ - | 4 | $ - | $ - |
| Regional Incident Management Plan | - | $ - | $ - | - | $ - | $ - | 1 | $ 38 | $ 4 | 1 | $ 38 | $ 4 |
| Rural Coordinate Addressing System | - | $ - | $ - | 2 | $ 5 | $ 0 | - | $ - | $ - | 2 | $ 5 | $ 0 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 1 | $ 1 | $ 1 | 1 | $ 1 | $ 1 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 1 | $ 4 | $ 0 | 1 | $ 4 | $ 0 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | - | $ - | $ - | 1 | $ 447 | $ 12 | 1 | $ 447 | $ 12 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Closed-Circuit Television Camera | 2 | $ 40 | $ 2 | - | $ - | $ - | - | $ - | $ - | 2 | $ 40 | $ 2 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Automatic Vehicle Location | - | $ - | $ - | - | $ - | $ - | 1 | $ 44 | $ 4 | 1 | $ 44 | $ 4 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Preclearance | 2 | $ 650 | $ 16 | 3 | $ 975 | $ 24 | 2 | $ 650 | $ 16 | 7 | $ 2,275 | $ 57 |
| Weigh in Motion | 2 | $ 30 | $ 3 | 3 | $ 45 | $ 5 | 2 | $ 30 | $ 3 | 7 | $ 105 | $ 11 |
| **Total** | **8** | **$ 720** | **$ 21** | **20** | **$ 3,919** | **$ 144** | **12** | **$ 1,442** | **$ 42** | **40** | **$ 6,080** | **$ 207** |

**Table I-6:** Costs of Recommended Deployment for Jackson County.

| Infrastructure Name | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Capital ($K) | O&M ($K) | No. | Capital ($K) | O&M ($K) | No. | Capital ($K) | O&M ($K) | No. | Capital ($K) | O&M ($K) |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Advisory Television | 2 | $ 38 | $ - | - | $ - | $ - | - | $ - | $ - | 2 | $ 38 | $ - |
| Automated Anti-Icing | 1 | $ 85 | $ 8 | - | $ - | $ - | - | $ - | $ - | 1 | $ 85 | $ 8 |
| Automated Visibility Warning | - | $ - | $ - | 1 | $ 40 | $ 1 | 1 | $ 40 | $ 1 | 2 | $ 80 | $ 1 |
| Dynamic Warning VMS | 2 | $ 500 | $ 9 | - | $ - | $ - | - | $ - | $ - | 2 | $ 500 | $ 9 |
| Highway Advisory Radio | - | $ - | $ - | 1 | $ 50 | $ 2 | 1 | $ 50 | $ 2 | 2 | $ 100 | $ 4 |
| Intersection Advance Warning | - | $ - | $ - | - | $ - | $ - | 1 | $ 50 | $ 4 | 1 | $ 50 | $ 4 |
| Motorist-Aide Call Box | 1 | $ 10 | $ 1 | - | $ - | $ - | - | $ - | $ - | 1 | $ 10 | $ 1 |
| Variable Message Sign | 2 | $ 418 | $ 5 | - | $ - | $ - | 4 | $ 836 | $ 10 | 6 | $ 1,254 | $ 14 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | 1 | $ - | $ - | 1 | $ - | $ - | - | $ - | $ - | 2 | $ - | $ - |
| Regional Incident Management Plan | 2 | $ 49 | $ 5 | - | $ - | $ - | 1 | $ 20 | $ 2 | 3 | $ 69 | $ 7 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | - | $ - | $ - | 3 | $ 562 | $ 56 | 2 | $ 374 | $ 37 | 5 | $ 936 | $ 94 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 6 | $ 16 | $ 2 | 6 | $ 16 | $ 2 |
| Kiosks | 1 | $ 10 | $ 2 | 4 | $ 40 | $ 8 | - | $ - | $ - | 5 | $ 50 | $ 10 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | 1 | $ 1 | $ 1 | 1 | $ 1 | $ 1 | 2 | $ 2 | $ 3 |
| Dynamic Ridesharing/Paratransit | - | $ - | $ - | 2 | $ 53 | $ 78 | - | $ - | $ - | 2 | $ 53 | $ 78 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 2 | $ 8 | $ 1 | 2 | $ 8 | $ 1 |
| Parking Management & Information System | 1 | $ 22 | $ 7 | 1 | $ 22 | $ 7 | 2 | $ 43 | $ 14 | 4 | $ 86 | $ 29 |
| Recreational Veh. Park and Ride Lots | 2 | $ 236 | $ 11 | - | $ - | $ - | 1 | $ 118 | $ 5 | 3 | $ 354 | $ 16 |
| Transit Traveler Information | - | $ - | $ - | 5 | $ 138 | $ 65 | - | $ - | $ - | 5 | $ 138 | $ 65 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | 2 | $ 894 | $ 23 | - | $ - | $ - | 2 | $ 894 | $ 23 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | - | $ - | $ - | 2 | $ 35 | $ 1 | - | $ - | $ - | 2 | $ 35 | $ 1 |
| Closed-Circuit Television Camera | 1 | $ 20 | $ 1 | - | $ - | $ - | - | $ - | $ - | 1 | $ 20 | $ 1 |
| RWIS | 1 | $ 50 | $ 2 | - | $ - | $ - | - | $ - | $ - | 1 | $ 50 | $ 2 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Automatic Vehicle Location | - | $ - | $ - | 2 | $ 165 | $ 14 | 2 | $ 103 | $ 9 | 4 | $ 268 | $ 23 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 1 | $ 7 | $ 1 | - | $ - | $ - | 1 | $ 7 | $ 1 |
| Preclearance | - | $ - | $ - | 3 | $ 975 | $ 24 | - | $ - | $ - | 3 | $ 975 | $ 24 |
| Weigh in Motion | - | $ - | $ - | 1 | $ 15 | $ 2 | 2 | $ 30 | $ 3 | 3 | $ 45 | $ 5 |
| **Total** | **17** | **$ 1,438** | **$ 50** | **30** | **$ 2,996** | **$ 283** | **26** | **$ 1,689** | **$ 90** | **73** | **$ 6,123** | **$ 424** |

**Table I-7:** Costs of Recommended Deployment for Josephine County.

| Infrastructure Name | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Capital ($K) | O&M ($K) | No. | Capital ($K) | O&M ($K) | No. | Capital ($K) | O&M ($K) | No. | Capital ($K) | O&M ($K) |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Advisory Television | - | $ - | $ - | - | $ - | $ - | 1 | $ 19 | $ - | 1 | $ 19 | $ - |
| Dynamic Warning VMS | 2 | $ 500 | $ 9 | 2 | $ 500 | $ 9 | 2 | $ 500 | $ 9 | 6 | $ 1,500 | $ 26 |
| Highway Advisory Radio | - | $ - | $ - | 1 | $ 50 | $ 2 | - | $ - | $ - | 1 | $ 50 | $ 2 |
| Motorist-Aide Call Box | - | $ - | $ - | 1 | $ 10 | $ 1 | - | $ - | $ - | 1 | $ 10 | $ 1 |
| Variable Message Sign | 5 | $ 1,045 | $ 12 | - | $ - | $ - | 2 | $ 418 | $ 5 | 7 | $ 1,463 | $ 17 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | 1 | $ - | $ - | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - |
| Regional Incident Management Plan | 2 | $ 18 | $ 2 | 1 | $ 13 | $ 1 | - | $ - | $ - | 3 | $ 31 | $ 3 |
| Rural Coordinate Addressing System | - | $ - | $ - | 1 | $ 4 | $ 0 | - | $ - | $ - | 1 | $ 4 | $ 0 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 2 | $ - | $ - | 2 | $ - | $ - |
| Kiosks | 1 | $ 10 | $ 2 | - | $ - | $ - | - | $ - | $ - | 1 | $ 10 | $ 2 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 2 | $ 2 | $ 3 | 2 | $ 2 | $ 3 |
| Automatic Vehicle Identification System | - | $ - | $ - | - | $ - | $ - | 1 | $ 26 | $ 2 | 1 | $ 26 | $ 2 |
| Dynamic Ridesharing/Paratransit | - | $ - | $ - | 2 | $ 53 | $ 78 | - | $ - | $ - | 2 | $ 53 | $ 78 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 2 | $ 8 | $ 1 | 2 | $ 8 | $ 1 |
| Smart Card | - | $ - | $ - | 1 | $ 425 | $ 3 | - | $ - | $ - | 1 | $ 425 | $ 3 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | - | $ - | $ - | 2 | $ 894 | $ 23 | 2 | $ 894 | $ 23 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Closed-Circuit Television Camera | - | $ - | $ - | 1 | $ 20 | $ 1 | - | $ - | $ - | 1 | $ 20 | $ 1 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 2 | $ 17 | $ 2 | - | $ - | $ - | 2 | $ 17 | $ 2 |
| Preclearance | - | $ - | $ - | 1 | $ 325 | $ 8 | - | $ - | $ - | 1 | $ 325 | $ 8 |
| Weigh in Motion | - | $ - | $ - | 1 | $ 15 | $ 2 | - | $ - | $ - | 1 | $ 15 | $ 2 |
| **Total** | **11** | **$ 1,573** | **$ 25** | **14** | **$ 1,433** | **$ 107** | **14** | **$ 1,867** | **$ 42** | **39** | **$ 4,873** | **$ 174** |

**Table I-8:** Costs of Recommended Deployment for Klamath County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Adv. Warning for Narrow Lanes | - | $ - | $ - | 1 | $ 48 | $ 4 | - | $ - | $ - | 1 | $ 48 | $ 4 |
| Advanced Bike/Ped Warning | - | $ - | $ - | 1 | $ 24 | $ 2 | - | $ - | $ - | 1 | $ 24 | $ 2 |
| Advisory Television | - | $ - | $ - | 1 | $ 19 | $ - | 1 | $ 19 | $ - | 2 | $ 38 | $ - |
| Animal/Vehicle Collision Warning | 2 | $ 703 | $ 35 | 1 | $ 615 | $ 31 | - | $ - | $ - | 3 | $ 1,318 | $ 66 |
| Automated Anti-Icing | 1 | $ 85 | $ 8 | - | $ - | $ - | - | $ - | $ - | 1 | $ 85 | $ 8 |
| Highway Advisory Radio | 4 | $ 200 | $ 8 | - | $ - | $ - | - | $ - | $ - | 4 | $ 200 | $ 8 |
| Lateral Safety Warning System | - | $ - | $ - | 1 | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - |
| Variable Message Sign | 7 | $ 1,463 | $ 17 | 1 | $ 209 | $ 2 | 3 | $ 627 | $ 7 | 11 | $ 2,299 | $ 26 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | 1 | $ - | $ - | - | $ - | $ - | - | $ - | $ - | 1 | $ - | $ - |
| Regional Incident Management Plan | 1 | $ 25 | $ 2 | 1 | $ 15 | $ 2 | 1 | $ 23 | $ 2 | 3 | $ 63 | $ 6 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | 2 | $ 239 | $ 24 | 1 | $ 187 | $ 19 | 1 | $ 187 | $ 19 | 4 | $ 614 | $ 61 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 4 | $ 4 | $ 0 | 4 | $ 4 | $ 0 |
| Kiosks | 3 | $ 30 | $ 6 | 3 | $ 30 | $ 6 | - | $ - | $ - | 6 | $ 60 | $ 12 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 3 | $ 4 | $ 4 | 3 | $ 4 | $ 4 |
| Dynamic Ridesharing/Paratransit | - | $ - | $ - | 1 | $ 27 | $ 39 | - | $ - | $ - | 1 | $ 27 | $ 39 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 3 | $ 12 | $ 1 | 3 | $ 12 | $ 1 |
| Parking Management & Information System | - | $ - | $ - | 1 | $ 22 | $ 7 | 2 | $ 43 | $ 14 | 3 | $ 65 | $ 22 |
| Recreational Veh. Park and Ride Lots | - | $ - | $ - | 3 | $ 354 | $ 16 | 1 | $ 118 | $ 5 | 4 | $ 472 | $ 21 |
| Transit Traveler Information | - | $ - | $ - | 3 | $ 83 | $ 39 | - | $ - | $ - | 3 | $ 83 | $ 39 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | 1 | $ 447 | $ 12 | 2 | $ 894 | $ 23 | 3 | $ 1,341 | $ 35 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | - | $ - | $ - | 1 | $ 18 | $ 0 | - | $ - | $ - | 1 | $ 18 | $ 0 |
| Automated Gate Closure | - | $ - | $ - | 1 | $ 60 | $ 4 | - | $ - | $ - | 1 | $ 60 | $ 4 |
| RWIS | 3 | $ 150 | $ 6 | 2 | $ 100 | $ 4 | - | $ - | $ - | 5 | $ 250 | $ 10 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 1 | $ 13 | $ 2 | 1 | $ 4 | $ 1 | 2 | $ 17 | $ 2 |
| Preclearance | 2 | $ 650 | $ 16 | - | $ - | $ - | - | $ - | $ - | 2 | $ 650 | $ 16 |
| **Total** | **26** | **$ 3,545** | **$ 122** | **25** | **$ 2,269** | **$ 188** | **22** | **$ 1,935** | **$ 77** | **73** | **$ 7,749** | **$ 388** |

**Table I-9:** Costs of Recommended Deployment for Lake County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Advisory Television | - | $ - | $ - | 1 | $ 19 | $ - | - | $ - | $ - | 1 | $ 19 | $ - |
| Animal/Vehicle Collision Warning | - | $ - | $ - | 1 | $ 285 | $ 14 | 1 | $ 700 | $ 35 | 2 | $ 985 | $ 49 |
| Dynamic Warning VMS | - | $ - | $ - | - | $ - | $ - | 2 | $ 500 | $ 9 | 2 | $ 500 | $ 9 |
| Highway Advisory Radio | 1 | $ 50 | $ 2 | - | $ - | $ - | - | $ - | $ - | 1 | $ 50 | $ 2 |
| Motorist-Aide Call Box | - | $ - | $ - | 2 | $ 108 | $ 11 | - | $ - | $ - | 2 | $ 108 | $ 11 |
| Variable Message Sign | 1 | $ 209 | $ 2 | 2 | $ 418 | $ 5 | - | $ - | $ - | 3 | $ 627 | $ 7 |
| **Emergency Services** | | | | | | | | | | | | |
| Mayday Systems | - | $ - | $ - | 2 | $ - | $ - | - | $ - | $ - | 2 | $ - | $ - |
| Regional Incident Management Plan | - | $ - | $ - | 1 | $ 20 | $ 2 | 1 | $ 9 | $ 1 | 2 | $ 29 | $ 3 |
| Rural Coordinate Addressing System | - | $ - | $ - | 2 | $ 7 | $ 0 | - | $ - | $ - | 2 | $ 7 | $ 0 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 2 | $ - | $ - | 2 | $ - | $ - |
| Kiosks | 1 | $ 10 | $ 2 | - | $ - | $ - | - | $ - | $ - | 1 | $ 10 | $ 2 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 2 | $ 2 | $ 3 | 2 | $ 2 | $ 3 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 2 | $ 8 | $ 1 | 2 | $ 8 | $ 1 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | 1 | $ 447 | $ 12 | 1 | $ 447 | $ 12 | 2 | $ 894 | $ 23 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Closed-Circuit Television Camera | - | $ - | $ - | - | $ - | $ - | 1 | $ 20 | $ 1 | 1 | $ 20 | $ 1 |
| RWIS | - | $ - | $ - | - | $ - | $ - | 2 | $ 100 | $ 4 | 2 | $ 100 | $ 4 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Automatic Vehicle Location | - | $ - | $ - | - | $ - | $ - | 1 | $ 14 | $ 1 | 1 | $ 14 | $ 1 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Preclearance | - | $ - | $ - | 3 | $ 975 | $ 24 | - | $ - | $ - | 3 | $ 975 | $ 24 |
| Weigh in Motion | - | $ - | $ - | 1 | $ 15 | $ 2 | 2 | $ 30 | $ 3 | 3 | $ 45 | $ 5 |
| **Total** | **3** | **$ 269** | **$ 6** | **16** | **$ 2,295** | **$ 70** | **17** | **$ 1,830** | **$ 69** | **36** | **$ 4,395** | **$ 145** |

**Table I-10:** Costs of Recommended Deployment for Lane County.

| | Short-Term | | | Medium-Term | | | Long-Term | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Infrastructure Name** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** | **No.** | **Capital ($K)** | **O&M ($K)** |
| **Traveler Safety and Security** | | | | | | | | | | | | |
| Adv. Warning for Narrow Lanes | 3 | $ 128 | $ 10 | 1 | $ 48 | $ 4 | 1 | $ 48 | $ 4 | 5 | $ 224 | $ 17 |
| Advanced Bike/Ped Warning | - | $ - | $ - | 4 | $ 94 | $ 9 | 1 | $ 24 | $ 2 | 5 | $ 118 | $ 11 |
| Advisory Television | - | $ - | $ - | 1 | $ 19 | $ - | 3 | $ 57 | $ - | 4 | $ 76 | $ - |
| Automated Anti-Icing | - | $ - | $ - | 1 | $ 85 | $ 8 | - | $ - | $ - | 1 | $ 85 | $ 8 |
| Automated Flood Warning | 1 | $ 40 | $ 3 | - | $ - | $ - | - | $ - | $ - | 1 | $ 40 | $ 3 |
| Automated Visibility Warning | - | $ - | $ - | 2 | $ 80 | $ 1 | 1 | $ 40 | $ 1 | 3 | $ 120 | $ 2 |
| Dynamic Warning VMS | 2 | $ 500 | $ 9 | - | $ - | $ - | 2 | $ 500 | $ 9 | 4 | $ 1,000 | $ 18 |
| Highway Advisory Radio | 5 | $ 250 | $ 10 | 1 | $ 50 | $ 2 | - | $ - | $ - | 6 | $ 300 | $ 12 |
| Intersection Advance Warning | - | $ - | $ - | 1 | $ 50 | $ 4 | - | $ - | $ - | 1 | $ 50 | $ 4 |
| Lateral Safety Warning System | - | $ - | $ - | 1 | $ - | $ - | 1 | $ - | $ - | 2 | $ - | $ - |
| Variable Message Sign | 2 | $ 418 | $ 5 | 6 | $ 1,254 | $ 14 | 2 | $ 418 | $ 5 | 10 | $ 2,090 | $ 24 |
| **Emergency Services** | | | | | | | | | | | | |
| Regional Incident Management Plan | - | $ - | $ - | 2 | $ 53 | $ 5 | 2 | $ 33 | $ 3 | 4 | $ 86 | $ 9 |
| **Tourism and Traveler Information Services** | | | | | | | | | | | | |
| 800 Travel Advisory | 3 | $ 322 | $ 32 | - | $ - | $ - | - | $ - | $ - | 3 | $ 322 | $ 32 |
| In-Vehicle Route Guidance System | - | $ - | $ - | - | $ - | $ - | 4 | $ - | $ - | 4 | $ - | $ - |
| Kiosks | - | $ - | $ - | 1 | $ 10 | $ 2 | - | $ - | $ - | 1 | $ 10 | $ 2 |
| **Public Traveler/Mobility Services** | | | | | | | | | | | | |
| Automated Passenger Counting | - | $ - | $ - | - | $ - | $ - | 1 | $ 1 | $ 1 | 1 | $ 1 | $ 1 |
| On-Board Transit Safety Systems | - | $ - | $ - | - | $ - | $ - | 1 | $ 4 | $ 0 | 1 | $ 4 | $ 0 |
| Recreational Veh. Park and Ride Lots | - | $ - | $ - | 2 | $ 236 | $ 11 | - | $ - | $ - | 2 | $ 236 | $ 11 |
| Transit Traveler Information | - | $ - | $ - | 1 | $ 28 | $ 13 | - | $ - | $ - | 1 | $ 28 | $ 13 |
| Transit Vehicle Routing/Scheduling | - | $ - | $ - | 1 | $ 447 | $ 12 | - | $ - | $ - | 1 | $ 447 | $ 12 |
| **Infrastructure Operations and Maintenance** | | | | | | | | | | | | |
| Advanced Vehicle Detection | 7 | $ 123 | $ 2 | 1 | $ 18 | $ 0 | 1 | $ 18 | $ 0 | 9 | $ 158 | $ 3 |
| Automated Gate Closure | 2 | $ 120 | $ 7 | - | $ - | $ - | - | $ - | $ - | 2 | $ 120 | $ 7 |
| Closed-Circuit Television Camera | 1 | $ 20 | $ 1 | - | $ - | $ - | - | $ - | $ - | 1 | $ 20 | $ 1 |
| RWIS | - | $ - | $ - | 4 | $ 200 | $ 8 | - | $ - | $ - | 4 | $ 200 | $ 8 |
| Satellite Traffic Operations Center (TOC/ARTIC) | - | $ - | $ - | - | $ - | $ - | 1 | $ 350 | $ 323 | 1 | $ 350 | $ 323 |
| **Fleet Operations and Maintenance** | | | | | | | | | | | | |
| Probe Vehicle Instrumentation | - | $ - | $ - | 1 | $ 10 | $ 8 | - | $ - | $ - | 1 | $ 10 | $ 8 |
| **Commercial Vehicle Operations** | | | | | | | | | | | | |
| Hazmat Management | - | $ - | $ - | 1 | $ 3 | $ 0 | 1 | $ 10 | $ 1 | 2 | $ 13 | $ 2 |
| Preclearance | - | $ - | $ - | 2 | $ 650 | $ 16 | - | $ - | $ - | 2 | $ 650 | $ 16 |
| Weigh in Motion | - | $ - | $ - | 2 | $ 30 | $ 3 | - | $ - | $ - | 2 | $ 30 | $ 3 |
| **Total** | **26** | **$ 1,921** | **$ 79** | **36** | **$ 3,364** | **$ 120** | **22** | **$ 1,502** | **$ 349** | **84** | **$ 6,787** | **$ 548** |