



METHODOLOGY MEMORANDUM

Date: Thursday, March 11, 2021

To: Chris Doty, Peter Russell, and Cody Smith, Deschutes County

From: Matt Kittelson, Julia Kuhn, and Carrie Theus

Project: Deschutes County TSP Update

Subject: Methodology Memorandum

This memorandum documents the methodology and key assumptions to be used in preparation of the existing and future conditions and alternatives analyses for the Deschutes County Transportation System Plan (TSP) Update. The methodologies included in this memorandum are based on guidance provided in the Oregon Department of Transportation (ODOT) *Transportation System Plan Guidelines* and the *Analysis Procedures Manual* (APM). The methodology and assumptions described in this memorandum will be used to help identify potential gaps and deficiencies in the transportation system related to:

- Future capacity needs along key roadways within the County;
- Roadway connectivity needs for people driving, emergency services, access to tourism, and the transport of goods and services;
- Traffic safety needs along key County facilities; and,
- Facilities and performance of the bicycle and pedestrian network.

This information will serve as a baseline for identifying a list of existing needs (gaps and deficiencies), identifying and evaluating potential solutions (projects, programs, policies, pilot projects, and studies), and developing a prioritized list of improvements for the TSP update.

The remainder of this memorandum summarizes the following:

- Location of the roadway segments where safety and capacity analyses will be conducted;
- Methodology for developing vehicular analyses volumes for existing and future conditions;
- Methodology for identifying roadway segments that are nearing and/or exceeding capacity;
- Crash analyses procedures; and,
- Pedestrian and bicycle analyses parameters.

Study Area

The TSP update will address the transportation system needs associated with County-operated facilities in areas that are outside the Bend, Redmond, Sisters, and La Pine Urban Growth Boundaries (UGBs).

Transportation facilities that are operated and maintained by ODOT, the Forest Service, Bureau of Land Management, and the four cities are not addressed.

Figure 1 reflects the roadway segments where capacity analysis will be reviewed as part of the TSP. The County has collected daily traffic counts at many of these locations each year, beginning in 2011 through 2019. To the extent possible, the 2019 counts will be used to develop year “2020 proxy volumes” to reflect existing conditions.

Traffic Capacity Review

For the purposes of performing a screening level review of both potential roadway capacity as well as connectivity needs along county roadways, we propose to apply the “Simplified Highway Capacity Method for the Highway Performance System” that was developed for use by the Federal Highway Administration.¹ The rural two-lane highway methodology within this report can be used as one of several helpful tools that can be used to help assess the future needs of the County’s roadway system. For reference purposes, the methodology draws from the applicable roadway characteristics to assess a level of service, including:

- Daily roadway volumes;
- Posted speed;
- Generalized terrain information; and,
- Percentage of trucks.

However, for non-mountainous roadways, the methodology does not reflect any measurable differences in expected level of service for terrain and truck percentages. As an example, level-of-service “D” corresponds to the following:

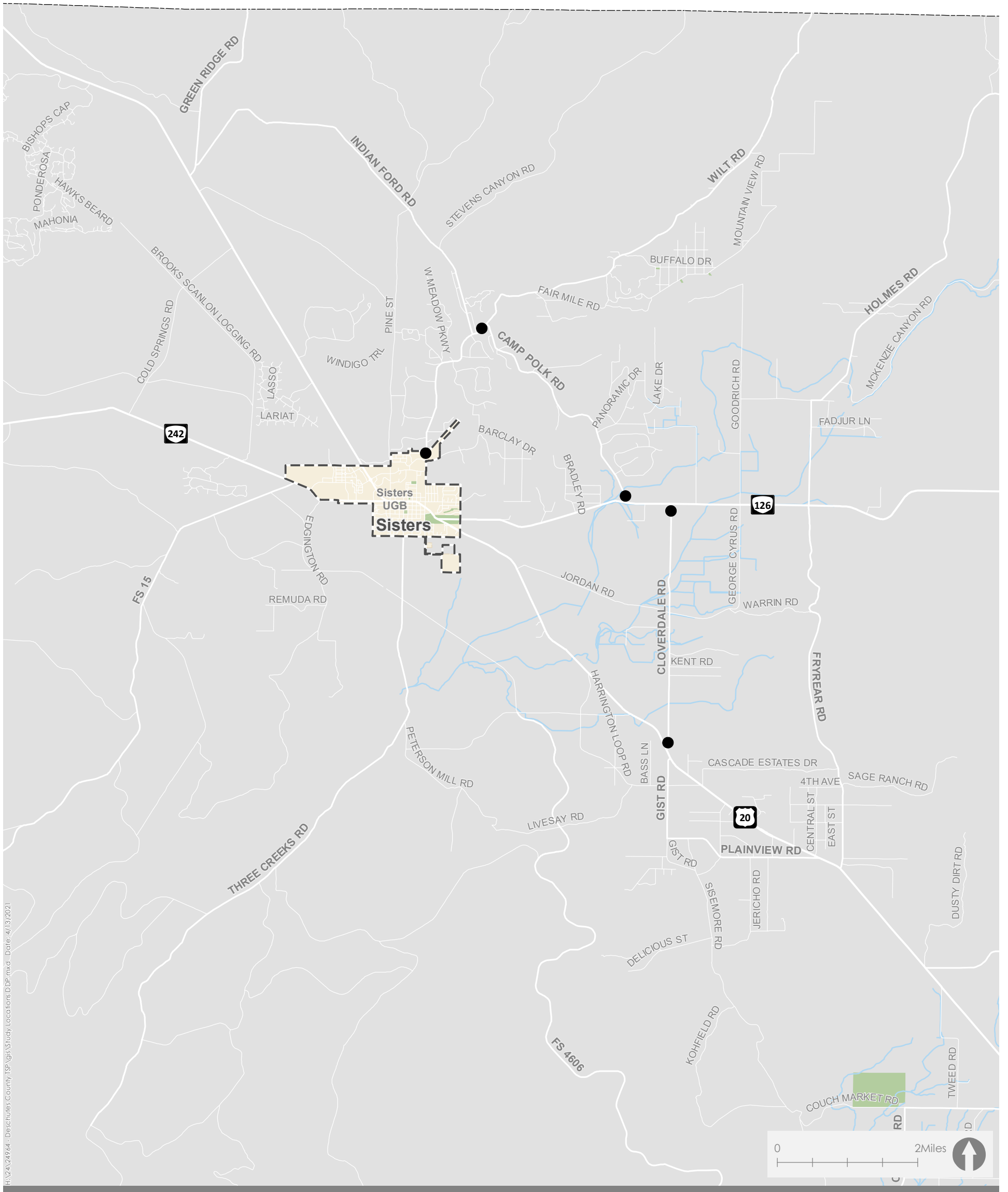
- Posted Speed of 45 miles per hour – daily volumes of less than 13,900 vehicles
- Posted Speed of 50 miles per hour – daily volumes of less than 19,000 vehicles
- Posted Speed of 55 miles per hour – daily volumes of less than 24,000 vehicles

We will use the level-of-service “D” as the metric for which to identify potential changes to the roadway system. This metric can be matched with an assessment of various roadways versus the TSP goals and identified roadway connectivity and/or specific roadway projects needed to support continued economic development, emergency services, freight needs, resiliency efforts, etc.

¹ https://www.fhwa.dot.gov/policyinformation/pubs/pl18003/hpms_cap.pdf



TRANSPORTATION
SYSTEM PLAN



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- Study Location
- +— Railroads
- Parks
- Water
- Cities
- UGB
- County

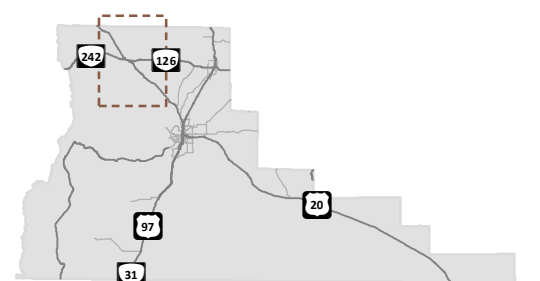
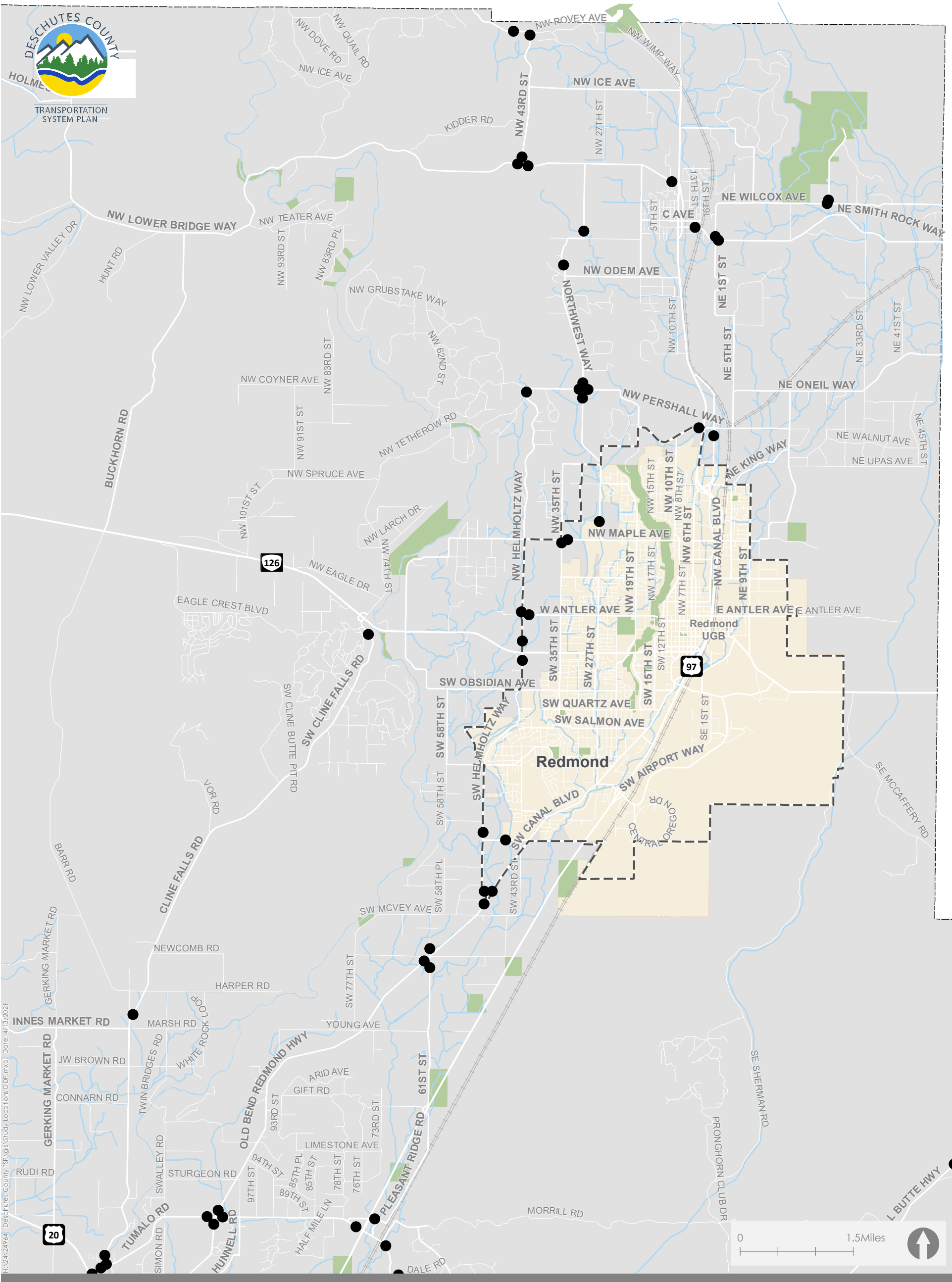


Figure 1

Study Locations Sisters Area, Oregon

Data Source: Deschutes County



- Study Location
- Railroads
- Parks
- Water
- Cities
- UGB
- County

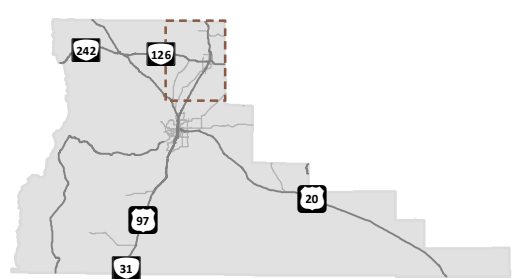
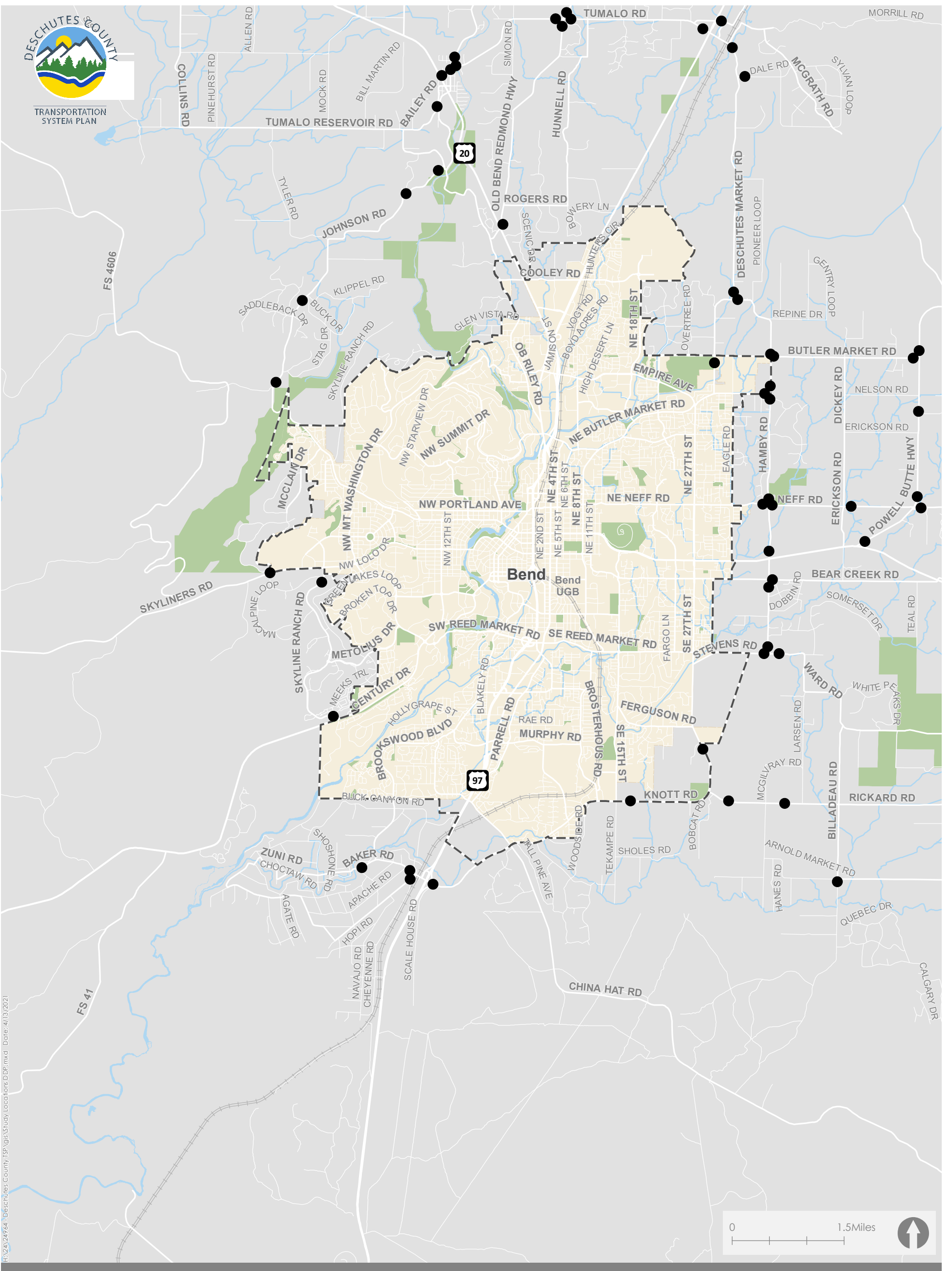


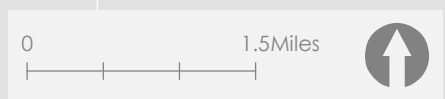
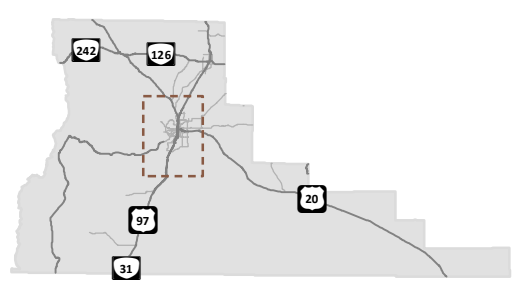
Figure 1

Study Locations Redmond Area, Oregon

Data Source: Deschutes County

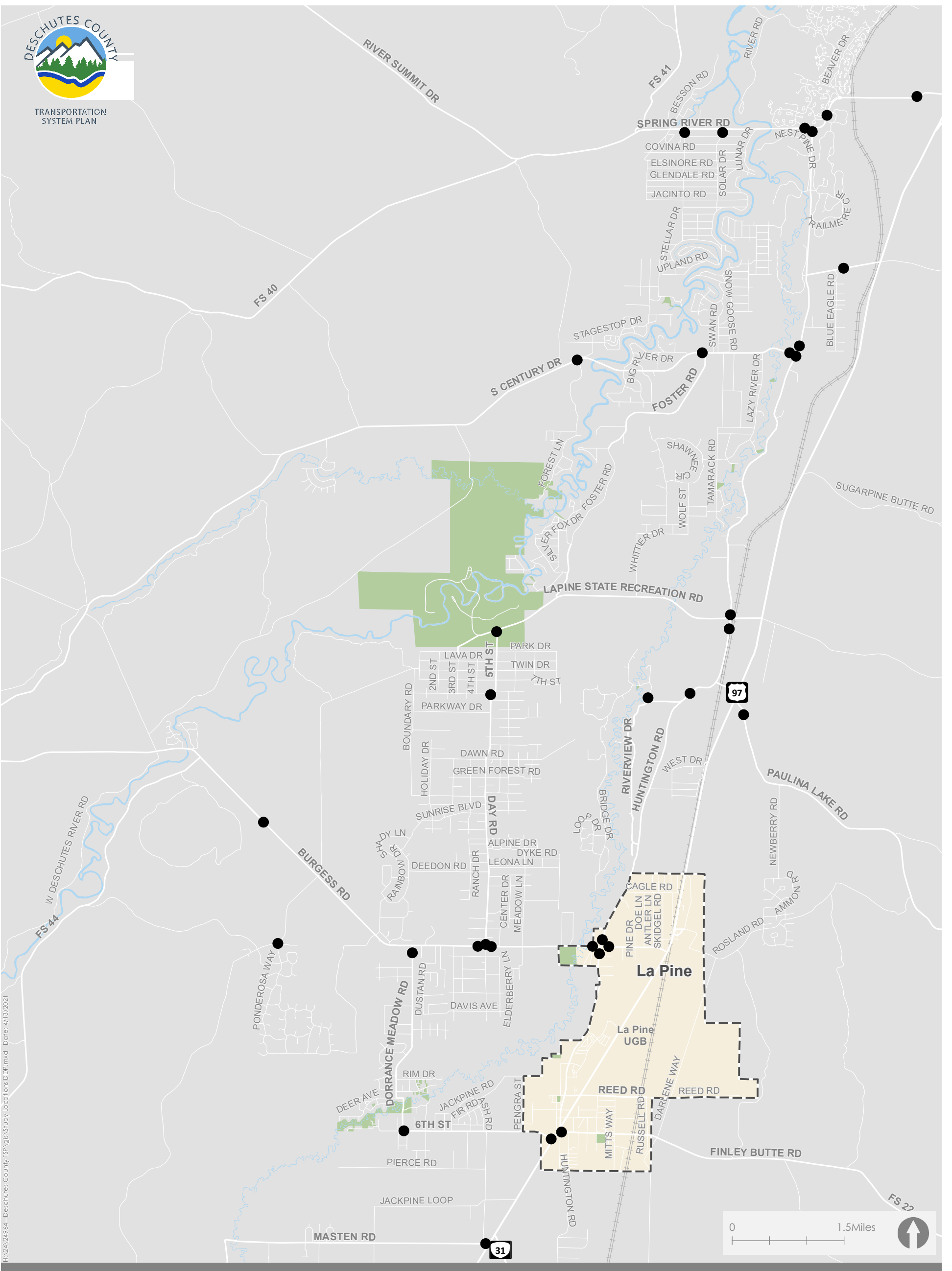


- Study Location
- Railroads
- Parks
- Water
- Cities
- UGB
- County



Data Source: Deschutes County

Figure 1
**Study Locations
 Bend Area, Oregon**



H:\24\24964 - Deschutes County TSP\GIS\Study Locations DDP.mxd Date: 4/13/2021

- Study Location
- +— Railroads
- Parks
- Water
- Cities
- UGB
- County

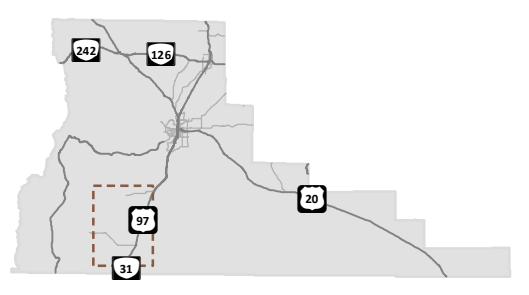
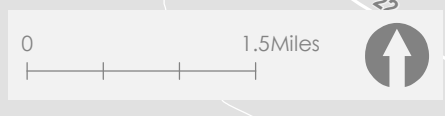


Figure 1

Study Locations South County Area, Oregon

Existing Year Traffic Volumes

With the ongoing COVID pandemic and its effect on “typical” traffic patterns, we propose to apply a two-percent growth factor to the 2019 traffic volumes on most County roadways to approximate 2020 daily volumes. We will coordinate with County staff to identify any specific facilities where a higher growth may be appropriate relative to 2019 counts. Further, given the planning-level screening analyses that we propose to use, we are not intending to apply any seasonal adjustment factors to daily traffic volumes along County roadways.

Forecast Year Traffic Volume Development

The 2012 County TSP relied on travel forecasts from the travel demand model developed by ODOT’s Transportation Planning Analysis Unit (TPAU). This model has not been updated with current land use information for existing conditions or future analysis years so we instead reviewed ODOT’s future highway volume table for potential growth rates to apply to the “existing” volumes to approximate year 2040 conditions. This review revealed that a two percent per year (linear, non-compounded) rate could be used to reflect future growth along County roadways. This review was based on several locations along the state highway system within Deschutes County, such as:

- US 97 at the Jefferson County/Deschutes County line – 1.9 percent per year;
- US 97 north of 1st Street in La Pine – 1.8 percent per year;
- Powell Butte Highway west of Deschutes County/Crook County line – 3.2 percent per year;
- McKenzie Highway west of Sisters – 1.6 percent per year;
- McKenzie-Bend Highway near Cline Falls Highway – 2.1 percent per year; and,
- Santiam Highway west of Sisters – 0.4 percent per year.

Unless otherwise identified by the County at specific roadway segments, we will apply a linear two-percent per year growth rate for screening purposes.

Crash Analyses

The County completed its Transportation Safety Action Plan (TSAP) for the areas outside the City UGBs in 2019. As part of the TSAP, all roads within unincorporated areas of the county were screened for the need for near-term or longer-term safety-oriented changes. Through that work, high priority improvement needs as well as systemic investment strategies were identified. Long-term concepts which may require further refinement are also identified.

As part of the TSP, we propose to include key outcomes of the TSAP, including both the near-term and longer-term projects identified. We do not propose any additional quantitative review of crash history and/or crash countermeasures. We do, however, propose to evaluate the potential for incorporation of the safety-oriented projects into projects being considered to address other TSP goals. Locations where such analysis would be useful will be identified through the existing and future conditions analysis.

Analysis of Bicycling, Walking and Transit Options

The analysis of facilities for people walking, riding bikes and/or taking transit is anticipated to focus on the following:

- Using available GIS data, field observations and online mapping, qualitatively identify key gaps within the bicycle system connecting unincorporated areas of the County with the City's UGBs as well as key recreational areas.
- Within the Terrebonne, Deschutes River Woods, and Tumalo communities, qualitatively identify key gaps within the sidewalk and/or trail system, particularly related to connecting residents with school bus stops.
- Incorporate the Central Eastside Transit (CET) Master Plan recommendations.

Incorporation of Other Plans

We plan to incorporate by reference a number of ongoing and/or recently adopted plans into the TSP update for the County. Examples of these plans include, but are not limited to:

- Redmond TSP;
- Bend TSP;
- Sisters TSP;
- La Pine TSP;
- Deschutes County Transportation Safety Action Plan;
- Redmond and Bend Airport Master Plans;
- Applicable elements of local refinement plans, corridor plans, etc.;
- Interchange Area Management Plans (e.g., Baker Road, Lower Bridge Way), etc.