CITY OF SILVERTON

TRANSPORTATION SYSTEM PLAN

VOLUME 1

EFFECTIVE OCTOBER 5, 2020

ACKNOWLEDGMENTS

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CONTENTS

Volume 2 of the Silverton Transportation System Plan includes background memoranda and meeting summaries that were the basis for its development. The contents of Volume 2 represent an iterative process in the development of the TSP. Refinements to various plan elements occurred throughout the process as new information was obtained. In all cases, the contents of Volume 1 supersede those in Volume 2.

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1 CONTEXT

A Transportation System Plan (TSP) is a long-range plan that sets the vision for a community's transportation system for the next 20 years. This vision is developed through community and stakeholder input and is based on the system's existing needs, opportunities, and anticipated available funding.

PURPOSE OF THE TSP

The Silverton TSP is a guide for future transportation investments to ensure that they align with the community's goals, values, and vision for the future. The TSP is a key resource for implementing transportation system improvements that address current deficiencies and will also serve expected local and regional growth.

The State of Oregon Transportation Planning Rule (TPR) established the requirement for cities to adopt TSPs, and Oregon Administrative Rule (OAR) 660- 012-0015 defines the required primary elements.

A **TSP** MUST INCLUDE:

- A comprehensive understanding of the existing multimodal transportation system that serves the City and how well that system performs its expected function today
- A reasonable basis for estimating how the City and the surrounding region might grow in its population and employment over the next 20 years
- An evaluation of how the expected growth could change the system performance
- A set of goals, policies, and transportation system improvements that address community multimodal transportation needs
- An understanding of the on-going funding required to build and support the transportation system as the city grows and establishment of a financially-constrained project list

In compliance with State requirements, the City of Silverton updated the City's TSP, replacing the previous TSP adopted in 2008. This Silverton TSP update establishes a new 2015 baseline condition and identifies transportation improvements needed through the year 2040. This update is needed to account for changing economic and social circumstances and to ensure consistency with state and regional planning policies. It also ensures the City will be prepared to support land use growth within the urban growth boundary (UGB) through the 2040 planning horizon. Most of the policies and projects come from the prior 2008 TSP, but the 2008 TSP is superseded by this plan.

HISTORICAL TRENDS AND EXPECTED GROWTH

The City of Silverton was incorporated in 1885 and by 1894, the population was nearly 900. Silverton was known for its trading and banking prominence and was considered one of the most progressive towns in western Oregon.

By the early 1900s, Southern Pacific train depot was built and the original covered bridge on Main Street across Silver Creek was replaced. The first hard surface pavement was laid in 1912 and by 1937 almost all of the roads had been improved.

Around 1920, Highway 214 was constructed and connected Silverton to Mt. Angel and other communities to the north. During this time, Silverton industries were producing exports for other areas including foreign countries. The Fischer Flour Mills on South Water Street were among the exporters. The population had grown to around 4,000.

The City adopted its first Comprehensive Plan in 1979 following the incorporation of a new rectilinear road pattern to the fringes of the City. The population had grown to 5,200.

In 1999, the Oregon Garden was opened and welcomed 250,000 visitors during the first year. The population was around 7,400.

Present day, Silverton is known as the gateway to Silver Falls State Park and is host to several tourist destinations including the Oregon Garden. The population has grown to more than 10,600.

SILVERTON'S TRANSPORTATION HISTORY (1850-2000)

FIGURE 1. HISTORICAL TIMELINE OF SILVERTON

LATE 1800s

Silverton was intentionally platted around a large oak tree, which was previously a meeting place for Calapooia, Abiqua, and Molalla Indian tribes. The tree stood in the center of Main Street until the early 1890s

EARLY 1900s

Silverton started out as a pedestrian community: people either walked or were transported by animal-drawn vehicles

1910

The original covered bridge on Main Street across Silver Creek was replaced with a wider steel bridge that supported the continued growth of the community. Over the years, additional bridges have been built at James Street and C Street.

EARLY 1920s

Highway 214 constructed, connecting Silverton to Mt. Angel and other communities to the north, permanently altering traffic patterns. ***Population 4,000.***

1973

Oregon Senate Bill 100 creates new land use plan requirements

RESULTS OF SENATE BILL 100

Statewide

- Established the Land Conservation and Development Commission (LCDC)
- Empowered the Commission to adopt Statewide Planning Goals

Requirements of Silverton

- Adopt a Comprehensive Plan and implement ordinances (dominant legal documents directing land use and development) in conformance with the Statewide Planning Goals
- Coordinate plans with affected units of government (for Silverton, this includes Marion County and the State of Oregon)

1999

Oregon Gardens opens and welcomes 250,000 visitors during the first year. ***Population 7,400.***

1800s | 1900 | 1910 | 1920 | 1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 | 2000

FEBRUARY 16, 1885

Silverton became a city. By 1894 the population ***was nearly 900***.

1854

Polly Crandall Coon Price started selling lots after her late husband , Thomas L. Coon, created and registered the first town plat for Silverton, Oregon

1906

Southern Pacific train depot built in Silverton; however, narrow gauge lines began to be built in the area as early as 1877. The railroad provided passenger service until about 1930, as automobile ownership increased. The old depot was moved downtown and now houses the Silverton Chamber of Commerce. ***Population 1200***.

1912

First hard surface pavement laid by hand at the corner of First and Park Streets. Roadways around town continued to improve over the coming decades and by 1937 most of the roads had been improved.

APRIL 1931

Silver Falls State Park formed through particular efforts by June D. Drake, Charles E. Wilson, Leonard Underwood, and others. ***Population 2,500.***

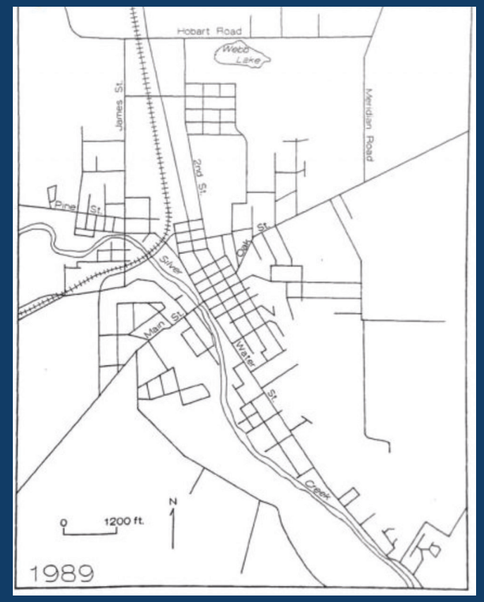
(Due to lumber mill closure, Silverton saw a sharp decline in population in the late 1920s.)

1945-1989

Post-war growth brought a new type of road pattern to the fringes of Silverton: the curved street of the subdivision. In addition, here was infill of the rectilinear pattern. Regulation involving the placement of roads and their right-of-way also increased, and road had to be approved by the City.

1979

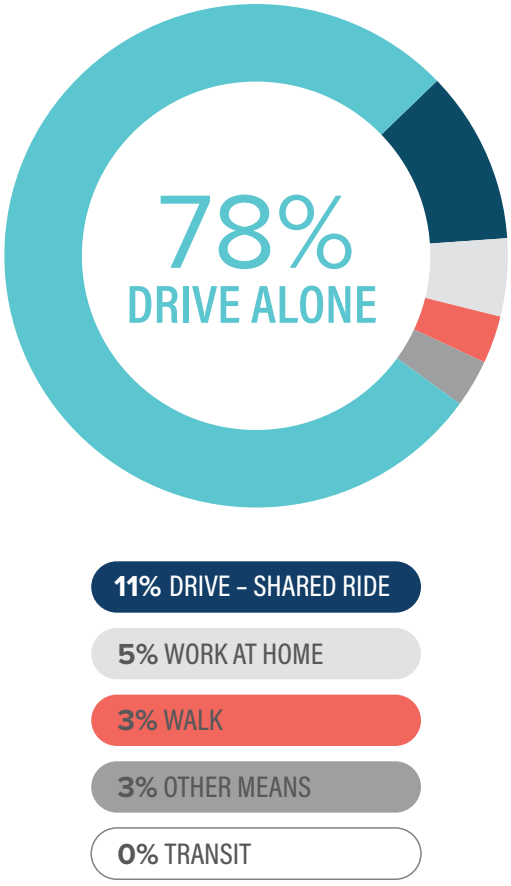
City adopted first Comprehensive Plan (with revisions in 1980, 1989, 2000, and 2002. ***Population 5,200.***



Source: All photographs and historical information courtesy of Silverton Country Historical Society (SCHS).

An important step in planning for the future is an evaluation of the transportation system as it is used and exists today. On a typical day, approximately 3,400 Silverton residents leave town to go to jobs in other cities, while only about 700 live and work in Silverton. At the same time, Silverton imports approximately 2,400 employees from other cities (**Figure 2**). On average, almost 78 percent of Silverton residents commute to work using single-occupant motor vehicles. About 11 percent of residents carpool to work and the remaining 11 percent work from home, walk, or use some other means of travel.

FIGURE 2. SILVERTON COMMUTER MODE SHARE

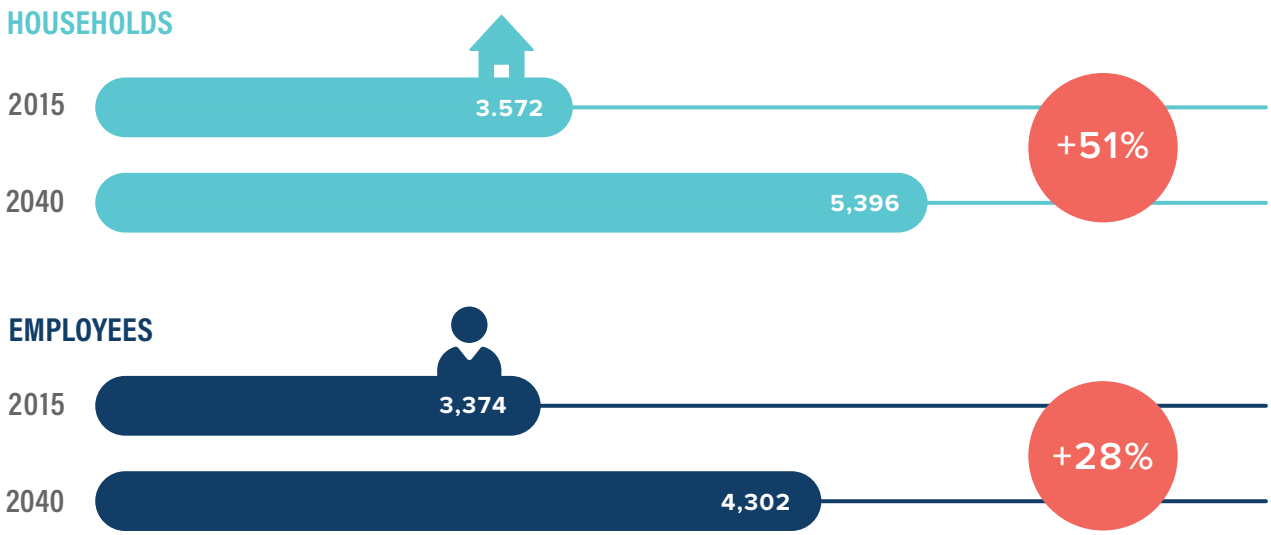


A comprehensive multimodal conditions analysis was conducted to identify what was needed to better accommodate the desired activities of the community. An assessment of current transportation system improvement needs is summarized below, and discussed in more detail in Chapter 4.

- Identification of bicycle and pedestrian friendly routes
- Safe crossing improvements of railroads and highways to improve multimodal access
- Safe routes to schools, including improved pedestrian and bicycle crossings near schools (e.g., the intersection of 1st Street (Highway 214) and Jefferson Street)
- Safety improvements at the intersections of Westfield Street at Main Street and Water Street at Oak Street
- Sidewalk infill or upgrade
- Improved transit service
- Improved street connectivity

Following the evaluation, the future transportation system operation was projected, taking into account the assumed growth in households and employment through the 2040 planning horizon. Using the Comprehensive Plan land use designations, a scenario was created by estimating where growth would occur. In general, the 2040 scenario reflects growth in population and housing of about 51 percent, while employment is projected to grow by only 28 percent (**Figure 3**). This suggests that the trend of having most Silverton residents commuting to other cities for work will continue.

FIGURE 3. HOUSING AND EMPLOYMENT GROWTH (2015 TO 2040)



Sources:

Portland State University Population Research Center, from Population Forecasts for Marion County Oregon, its Cities and Unincorporated Areas, 2017 to 2067, dated June 30, 2017

City of Silverton Economic Opportunities Analysis (prepared by Johnson Reid, January 10, 2011)

FUNDING CHALLENGES

Based on historical funding levels, the City expects to have about $21 million available through the year 2040 to fund the transportation projects in this TSP. This is far below the funding required to implement all of the projects in this plan, which total approximately $99.9 million, but may be sufficient to advance many of the higher priority projects in the community. The City may consider increasing existing fee levels, such as the System Development Charge rates, or adding new funding options to close these gaps and better prepare to accommodate growth.

The current funding sources available to the City of Silverton include the following mix of City and State funding programs. Refer to Chapter 6 for a more complete description of transportation funding issues facing the City.

CITY FUNDING PROGRAMS

Fees and Permits

Fees and Permits include inspection fees, plan review fees, and permits for driveways and sidewalks.

Local Motor Vehicle Fuel Tax

Silverton has also adopted a local, 2 cents per gallon fuel tax (on both gasoline and diesel) that is collected by fuel distributors within the city. These funds do not have any restrictions and may be applied to any transportation improvement.

Transportation System Development Charges

Silverton collects a System Development Charge (SDC) from new developments to fund capacity adding projects, generally for constructing or improving portions of roadways impacted by applicable development. Forecast estimated SDC revenue was based on the current rate per PM peak hour trip used in the City's SDC methodology (about $4,000 per trip end) and the number of new PM peak hour trip ends in the city expected over the planning period (about 1,800 trips).

STATE TRANSPORTATION FUNDING PROGRAMS

State Highway Fund Revenue

Revenue from the State Highway Fund comes from state motor vehicle fuel taxes, vehicle registration fees, and truck weight-mile fees, and are distributed on a per capita basis. Furthermore, House Bill 2017 introduced or increased several taxes and fees such as the state gas tax and vehicle registration fees that provides new revenue to earmarked projects. Cities and counties receive a share of State Highway Trust Fund monies. By statute, the money may be used for any road-related purpose, including walking, biking, bridge, street, signal, and safety improvements.

ODOT Statewide Transportation Improvement Program (STIP) Enhance Funding

ODOT has modified the process for selecting projects that receive STIP funding to allow local agencies to receive funding for projects off the state system. Projects that enhance system connectivity and improve multimodal travel options are the focus. The updated TSP prepares the City to apply for STIP funding.

ODOT All Roads Transportation Safety Program (ARTS)

The ARTS Program aims to address safety challenges on all public roads. ODOT may increase the amount of funding available for safety projects on local roads. Safety funding will be distributed to each ODOT region, which will collaborate with local governments to select projects that can reduce fatalities and serious injuries, regardless of whether they lie on a local road or a state highway. The updated TSP prepares the City to apply for ARTS funding.

2 PROCESS

This chapter describes how the TSP was updated. The process involved structured technical analysis, community engagement, and a formal decision-making structure.

PROJECT ROLES AND DECISION MAKING

The best way to build a community-supported TSP is through an open, inclusive process. The decision-making structure for this TSP was developed to establish clear roles and responsibilities throughout the project. The decision-making structure (**Figure 4**) established a framework for broad-based community support for the project.

The City Council made all final decisions pertaining to this TSP update. The Project Management Team (PMT) made recommendations to the City Council based on technical analysis and community input.

To support development of a credible decision-making process, a Project Advisory Committee (PAC) was formed to provide community-based recommendations. The PAC informed and guided the plan by reviewing draft deliverables, providing insight into community perspectives, commenting on technical and regulatory issues, and providing recommendations for the TSP. This committee included local business and neighborhood representatives, emergency service providers, a school district representative, and agency staff members from the City of Silverton, Marion County, and the Oregon Department of Transportation. PAC meetings were open to the public and included opportunities for public input from non-PAC members.

FIGURE 4. SILVERTON TSP ROLES AND RESPONSIBILITIES

ENGAGING THE PUBLIC

The strategy used to guide stakeholder and public involvement throughout the TSP update reflects the commitment of the City of Silverton to carry out public outreach that provides community members with the opportunity to weigh in on local transportation concerns and to provide input on the future of transportation within their city.

Two community forums/work sessions were held during the project. Each community forum followed a PAC meeting and covered similar topics. Community events were advertised through the City's website, media notices, and outreach at community events. The community events were held in centrally located spaces accessible via transit, walking or biking when feasible given the meeting location.

The City also provided downloadable materials on the project website, with hard copies of project documents available upon request. Lastly, the community was invited to fill out a survey related to the transportation system in Silverton.

TECHNICAL DEVELOPMENT

Figure 5 illustrates the technical tasks involved in updating the TSP. These are categorized in three major stages: the first to understand system needs and constraints, the second to develop solutions, and the third to prepare and adopt the plan. Community input guided the TSP development through all stages.

FIGURE 5. CITY OF SILVERTON TSP DEVELOPMENT TECHNICAL TASKS

UNDERSTAND	EVALUATE	RECOMMEND / ADOPT
• Discuss community values and transportation goals • Evaluate funding for transportation improvements • Evaluate existing conditions and future growth trends • Coordinate with state and regional plans	• Develop draft solutions: projects, programs, and standards for all modes of travel • Evaluate and refine draft solutions through community outreach	• Prepare Draft Transportation System Plan • Public Adoption Hearings (TSP) • Publish Adopted Plan

3 THE VISION

A clear vision combined with attainable goals and well-defined policies is the cornerstone of a TSP that best fits Silverton's values and priorities.

THE VISION FOR SILVERTON IN 2040

The City of Silverton engaged in the Envision Silverton Project from the fall of 2015 through the spring of 2016. During the project, community members participated in conversations around the future of Silverton. The result was a community-based vision and six key focus areas to provide high-level strategic direction. The overall vision statement is described here.

> *We envision a Silverton that honors its history, traditions, and heritage, encouraging thoughtful change while celebrating our past, present, and future. Our future Silverton is a connected community with broad citizen engagement, a clear vision for the future, and a detailed plan of action to achieve it.*
>
> *We envision a Silverton with a strong economy and viable, locally owned businesses, carefully balancing economic growth with our continued small-town livability, quality of life, and affordability. Our Silverton is guided by a comprehensive plan for our future growth, with strong leadership, meaningful public involvement, informed decisions, and agreement on our community's key directions. We envision a Silverton that meets the basic needs of all of its residents, including quality jobs, affordable housing, accessible health care, and community safety. Education in our Silverton is a top priority for the entire community, providing our students with the best start in life, driving our community's progress, and shaping its future.*

GOALS & POLICIES

Following that process, the PAC provided input on a set of goal statements for the TSP. This input was combined with the existing goals and policies from the 2008 TSP and Silverton Comprehensive Plan to develop a new set of goals and policies for this TSP. These goals were used to guide the development, evaluation, and prioritization of solutions that best fit the community and provided the basis for policies to support Plan implementation.

The 2020 Silverton TSP Goals and Policies are documented below. The goals are brief guiding statements, while the supporting policies describe the actions needed to move the community in the direction of completing each goal.

GOAL 1

DEVELOP A TRANSPORTATION SYSTEM TO ENHANCE SILVERTON'S LIVABILITY THROUGH PROPER LOCATION AND DESIGN OF MULTIMODAL TRANSPORTATION FACILITIES, INCLUDING STREETS, SIDEWALKS, BICYCLE LANES, TRAILS, AND TRANSIT.

Policy a. Streets and highways shall be designed to respect the characteristics of the surrounding land uses, natural features, and other community amenities.

Policy b. The City shall strive to identify and address deficiencies with the existing transportation facilities.

Policy c. As appropriate, the City shall require design plans, transportation impact analyses studies and/or other information to ensure that transportation facilities do not negatively impact aesthetic, environmental, functionality, safety and/or other factors that affect livability.

Policy d. The City shall protect neighborhoods from excessive through traffic and travel speeds while providing reasonable access to and from residential areas. Streets shall be designed to minimize speeding.

Policy e. The City shall develop and maintain street design standards and neighborhood traffic management criteria. These regulations will be used in the design of new development and addressing neighborhood traffic concerns.

GOAL 2

CREATE A BALANCED TRANSPORTATION SYSTEM FOR ALL MODES AND REDUCE THE NUMBER OF TRIPS BY SINGLE-OCCUPANT VEHICLES.

Policy a. The City shall plan for, design, and build streets, sidewalks, pathways, bicycle lanes, and other transportation facilities to ensure mobility and connectivity for a full range of travel modes, including pedestrians, bicyclists, and motorized vehicles traveling to, through, and between residential areas, schools, parks, commercial areas, and major employment centers.

Policy b. The City shall support efforts to implement regional off-street connections between Silverton, surrounding communities, and the greater area.

Policy c. The City shall continue to support efforts to expand transit services within the City of Silverton and to maintain and expand regional transit services to surrounding communities.

Policy d. The City shall support demand management programs such as park-and-ride lots, van pools, and carpools to reduce single-occupancy auto trips.

GOAL 3

IMPROVE THE SAFETY OF THE TRANSPORTATION SYSTEM.

Policy a. In partnership with Marion County, the Oregon Department of Transportation, and federal agencies, the City shall strive to improve traffic safety through a comprehensive program of engineering, education, traffic calming, access management, regulation, and enforcement.

Policy b. The City shall enhance pedestrian safety by filling network gaps to provide continuous pedestrian facilities. Where on-street pedestrian and bicycle facilities cannot reasonably be provided on highways and arterials, the City shall identify parallel routes that comply with State and City planning and design standards.

Policy c. The City shall enhance safety by prioritizing and improving high accident locations within the city.

Policy d. The City shall work with area schools and the community to ensure that there are safe pedestrian, bicycle, and bus routes to schools and work and to communicate these routes to the community.

Policy e. The City shall ensure that adequate primary and secondary access for emergency services vehicles is provided throughout the city.

GOAL 4

DEVELOP AN EFFICIENT TRANSPORTATION SYSTEM THAT WILL HANDLE FUTURE TRAFFIC GROWTH.

Policy a. The City shall designate roadway functional classifications that reflect the desired function and characteristics of different roadways, including access management policies.

Policy b. Land use development standards shall consider impacts on transportation facilities, reduce travel demand, and encourage all modes of transportation.

Policy c. Capital improvement projects shall be designed to serve travel demands consistent with the forecast year of the current Transportation System Plan or a 20-year horizon, whichever is greater.

Policy d. The City shall encourage development that effectively mixes land uses to reduce reliance on motor vehicles.

Policy e. The City shall assist in maintaining acceptable levels of service on state roads consistent with the Oregon Transportation Plan. Where appropriate, the City shall support reducing traffic congestion and enhancing traffic flow through such measures as intersection improvements, intelligent transportation systems, signal synchronization, and other similar measures.

Policy f. The City shall implement performance standards for use in evaluating new development proposals.

Policy g. The City shall review comprehensive plan amendments and zone changes for their impacts on transportation facilities. Proposals that are determined to have an impact shall be required to demonstrate that the proposed changes will not significantly affect the transportation system and are consistent with the identified function, capacity, and performance standards of the transportation facility.

GOAL 5

PROVIDE A TRANSPORTATION SYSTEM THAT IS ACCESSIBLE TO ALL MEMBERS OF THE COMMUNITY.

Policy a. The City shall require all new transportation facilities be constructed to meet the requirements of the Americans with Disabilities Act (ADA).

Policy b. Existing transportation facilities that do not meet the ADA standards shall be retrofitted when improvements are being made to that facility or through City transportation improvement projects.

Policy c. The City shall support services to respond to the needs of all groups of transportation system users, including disadvantaged individuals.

Policy d. The City shall develop a plan to upgrade existing public facilities that are noncompliant with accessibility standards.

GOAL 6

DEVELOP A TRANSPORTATION SYSTEM TO PROVIDE FOR EFFICIENT FREIGHT MOVEMENT.

Policy a. The City shall recognize designated truck routes and the need for highway access as essential for efficient movement of goods and these facilities and adjacent land uses shall be designed to reflect the needs of freight movement.

Policy b. The City shall consider the impact of railroad facilities on land use decisions.

Policy c. As part of future roadway improvements, the City shall consider impacts to pipeline facilities.

GOAL 7

CREATE A FUNDING SYSTEM TO IMPLEMENT THE RECOMMENDED TRANSPORTATION SYSTEM IMPROVEMENT PROJECTS.

Policy a. The City shall coordinate with ODOT and other jurisdictions to develop a long-range financial strategy to make needed improvements to the transportation system and support operational and maintenance requirements.

Policy b. The City shall seek adequate funding for maintenance of transportation facilities, including consideration of alternate funding opportunities.

Policy c. The City shall maintain a funding program that requires development to pay for its fair share of transportation improvements as well as mitigate for impacts to the transportation system so that there are no reductions in the level of service, functionality or carrying capacity.

Policy d. The City shall monitor and update the Transportation System Plan as needed so that issues and opportunities are addressed in a timely manner.

Policy e. The City shall prepare and maintain a current capital improvement program that establishes the City's construction and improvement priorities, and allocate the appropriate level of funding.

GOAL 8

DEVELOP A TRANSPORTATION SYSTEM THAT IS CONSISTENT WITH THE ADOPTED PLANS OF STATE, LOCAL, AND REGIONAL JURISDICTIONS.

Policy a. The City shall coordinate with ODOT and other governmental agencies to improve and maintain Highway 213 and Highway 214 consistent with the Oregon Highway Plan (OHP); including participation on ODOT project development teams for improvements that affect the City.

Policy b. The City shall cooperate with Marion County to maintain and improve County roads consistent with the County's Transportation System Plan.

Policy c. The City shall notify ODOT, DLCD, Marion County, and other governmental agencies that rely on the transportation system when changes are proposed to the Silverton Transportation System Plan.

Policy d. The City shall participate with the Mid-Willamette Valley Area Commission on Transportation (MWACT) and identify opportunities for enhanced coordination and assistance with City projects, including by identifying an elected official to join and participate in the Mid-Willamette Valley Area Commission on Transportation (MWACT).

4 NEEDS: SILVERTON TODAY & TOMORROW

This chapter identifies the needs for the Silverton transportation system. The needs reflect where the transportation system can better accommodate the desired activities of the community. Needs were determined based on a comprehensive multimodal existing conditions analysis and projecting future conditions through the planning horizon (2040) based on assumed growth in households and employment.

SILVERTON 2015

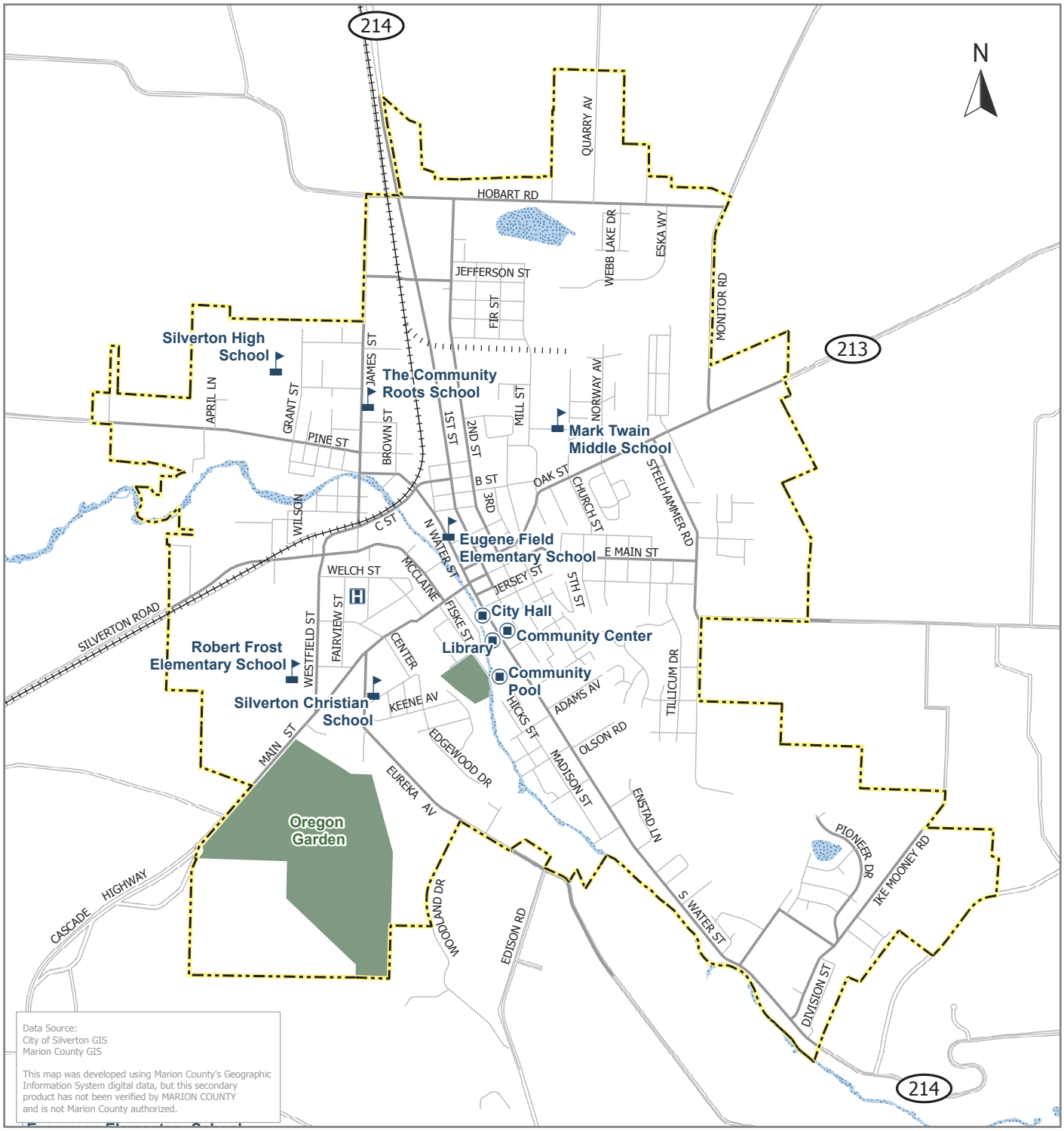
The City of Silverton is located in the eastern plains of the mid-Willamette Valley, with both access to larger metropolitan areas like Salem and Portland and a unique small-town historical character. The city features a well-preserved, connected, and walkable downtown area situated close to Silver Creek, which runs through the heart of the city. The topography is mostly flat in the north and west, with hills rising near Silver Creek in the southern part of the city. More than 10,600 residents call Silverton home today, up from about 7,500 in 2000.

Silverton sits at the junction of two state highways: Highway 213 (Oak Street in the city), which connects the Portland and Salem metropolitan areas through Molalla and Mulino, and Highway 214 (N 1st Street and S Water Street), which connects from Woodburn and I-5 through Silverton to Silver Falls State Park. While these connections provide Silverton with good accessibility to the employment, shopping, and cultural opportunities of the Willamette Valley's larger cities, the city may also experience additional traffic from through trips, particularly between Salem and the eastern Portland metropolitan area. **Figure 6** below shows a map of the study area.

SILVERTON AT A GLANCE:

- Access to larger metropolitan areas like Salem and Portland with unique small-town historical character.
- Topography is mostly flat in the north and west, with hills rising near Silver Creek in the southern part of the city.
- More than 10,600 residents call Silverton home.
- Sits at the junction of two state highways: Highway 213 and Highway 214.

FIGURE 6. CITY OF SILVERTON STUDY AREA



KEY DESTINATIONS

Local Attractions

Silverton's location and amenities make it attractive to visitors. In addition to its charming and vibrant historic downtown area, the city is home to the popular Oregon Garden, a unique destination that showcases the diverse botanical beauty of the Willamette Valley. The 80-acre botanical garden is located on the southwest edge of the city. Adjacent to the Oregon Garden is the Frank Lloyd Wright Gordon House. There are also eight parks within the city, including a skate park, a dog park, and the Silverton Reservoir Marine Park just south of town. Attractions further outside the city include Silver Falls State park to the south, the historic town of Mt. Angel to the north, and the Cascade mountain range to the east, as well as numerous farms and vineyards along the way. The largest employment centers in the area are the City of Salem to the west and the Portland metropolitan area to the north.

Commute Patterns

Because Silverton is surrounded by commercial and recreational attractions, the traffic patterns in and around the city are unique. In the PM peak hour, approximately 75% of the traffic entering Silverton from outside origins has a destination within the city; the remaining 25% of traffic travels through the city to other outside destinations. Of the traffic generated from within Silverton during the PM peak hour, approximately 60% remains within the city while 40% travels to destinations outside of the City.

CURRENT ISSUES

KEY TRANSPORTATION PLANNING OBJECTIVES IDENTIFIED FOR THIS TSP INCLUDED:

- Identify bicycle and pedestrian friendly routes and safe crossing improvements of railroads and highways to improve multimodal access to destinations through Silverton and the surrounding area (the intersection of 1st Street/Jefferson Street is of particular concern)
- Develop a Safe Routes to School Action Plan in conjunction with Silver Falls School District to improve community health and safety and help manage traffic congestion before and after school hours
- Prioritize needed sidewalk improvements
- Address railroad crossing safety

Silverton's transportation system operates acceptably under current demands. All of the study intersections currently have adequate capacity and acceptable levels of delay according to the mobility standards adopted by each jurisdiction. However, several notable issues may warrant further consideration including limited connectivity, sidewalk gaps, lack of a designated bicycle facilities, minimal transit access, and deficient railroad crossings. Further explanation can be found below.

SUMMARY OF EXISTING TRANSPORTATION SYSTEM NEEDS

Several existing transportation system needs were identified, as summarized below by mode of travel.

Connectivity

There is generally good roadway connectivity between the northern and southern portions of the city. However, the east-west crossing opportunities are very limited. The railroad and Silver Creek present barriers to all modes connectivity from the areas north and west of downtown. In other locations, there are cul-de-sacs or dead-end streets that limit local connectivity. These types of roadways not only result in increased travel distance and time for motor vehicles, but also make choosing to walk or bike more difficult.

Network Safety Performance

Overall, there are few safety concerns regarding the Silverton transportation system. There were no fatal crashes during the five years of crash data analyzed, and the frequency of crashes within the city is relatively low compared to similarly sized cities in Oregon. Two intersections were identified as having poorer safety performance than typically expected: Westfield Street at Main Street and Water Street at Oak Street. The intersection of Water Street at Oak Street was also identified as a high-crash location in ODOT's 2013 Safety Priority Index System (SPIS).

Bicycle and Pedestrian Facilities

Notable sidewalk gaps exist in the downtown area. Further from the city center, the sidewalk network becomes intermittent. The railroad and Silver Creek also present barriers to pedestrian connectivity from the areas north and west of downtown.

Walking audits around Silverton's schools helped to identify gaps and deficiencies in pedestrian and bicycle facilities around multiple schools.

- The lack of pedestrian crossing treatments on 1st Street (Highway 214) at Jefferson Street was identified as a crucial safety and connectivity issue for Silverton High School, Silverton Middle School, and Mark Twain Elementary School
- Incomplete and missing sidewalks, missing and inadequate bicycle facilities, and missing pedestrian and bicycle crossing treatments were identified around Silverton Middle School, Mark Twain Elementary School, Robert Frost Elementary School, and Silverton High School

The City currently features about 3.8 miles of marked bike facilities but lacks a designated bicycle network that connects entrance portals, downtown destinations, schools, and other key trip attractors. Collector and higher-level facilities tend to provide the best and the most direct network connections, but several of these were identified as higher stress facilities, including 1st Street (Highway 214) north of C Street, Oak Street (Highway 213) east of Church Street, Water Street south of Peach Street, and Main Street near the Oregon Garden.

Bridges

Three bridges—at James Avenue, Main Street, and C Street—provide motor vehicle, pedestrian, and bicycle access across Silver Creek. The James Avenue and Main Street bridges have been classified by FHWA as structurally obsolete, indicating that they were designed to standards that do not meet today's design code. However, neither bridge has any structural integrity issues and both are considered safe for use. The C Street bridge is classified as "not deficient," indicating no design or safety concerns have been identified.

Rail Crossings

Five at-grade rail crossings—Railway Street, Fossholm Road, Hobart Road, James Street and Jefferson Street—are controlled only by stop signs and do not include gates or other active warning systems. The North Water Street and McClaine Street crossings are gate-controlled.

SILVERTON 2040

Future land use changes and growth in population, housing, and employment within Silverton's UGB will have a significant impact on the existing transportation system and will create new travel demands. These growth projections and how they translate to new trips on the transportation network are key elements of the future conditions and performance analysis.

GROWTH ASSUMPTIONS TO 2040

A small community forecast tool was developed to determine future traffic volumes in Silverton and the surrounding region. The Silverton's small community forecast tool will estimate travel changes in response to future land use and transportation scenarios. This model translates estimated land uses into person trips, selects travel modes and assigns motor vehicle trips to the roadway network. The Silverton small community forecast tool was developed in coordination with the Oregon Department of Transportation's (ODOT) Transportation Planning and Analysis Unit and the City of Silverton. It is an informational tool to assist with decision making, providing objective and quantitative information exploring the potential impacts of alternative transportation system investments.

Silverton's small community forecast tool includes forecasted land uses for the Silverton TSP study area. The land uses were originally developed to reflect Silverton's Comprehensive Plan and growth assumptions identified for the year 2037. Complete land use data sets were developed for both the 2015 base year and 2037 future year (planning horizon). Local land use assumptions were developed with input and review from City staff.

At the time these growth assumptions were being applied to the development of the updated TSP, Portland State University published updated population growth assumptions for Marion County and the area within the Silverton UGB.[1] When comparing the new population forecast to that already applied, it was found that the new forecast showed significantly less population growth within the Silverton UGB. Specifically, the new Portland State University population forecast for the Silverton UGB is 13,759 people by 2040, whereas the previous forecast applied towards the Silverton TSP update estimates 14,486 people by 2037.

In addition, during the later stages of the effort to update the TSP, there was a desire to extend the horizon year of the plan from 2037 to 2040. Considering the above comparison of the population growth forecasts, simply changing the planning horizon year to 2040 without modifying the underlying growth assumptions and associated analysis supporting the TSP would result in the TSP population and housing growth assumptions for 2040 being conservatively high by approximately 5%. Therefore, it was decided to change the horizon year of the TSP to 2040, with the understanding that the population and housing growth assumptions would be conservatively high and that the employment growth assumptions would continue to be appropriate.

Table 1 summarizes the aggregated land use inputs within the Silverton TSP study area for the 2015 and 2040 scenarios. These values indicate that growth in residential development is expected to outpace employment, both overall and as a percentage increase.

1 Portland State University Population Research Center, June 30, 2017.

TABLE 1. SILVERTON UGB GROWTH AND LAND USES SUMMARY

GROWTH CATEGORY	EXISTING 2015	EXISTING 2040*	TOTAL GROWTH 2015 TO 2040	2015 TO 2040 PERCENT INCREASE
POPULATION	9,590	14,486	4,896	51%
HOUSEHOLDS	3,572	5,396	1,824	51%
EMPLOYEES				
RETAIL	348	522	175	50%
SERVICE	1,887	2,449	563	30%
EDUCATION	394	513	118	30%
OTHER	745	819	73	10%
TOTAL	**3,374**	**4,302**	**828**	**28%**

** As discussed above, 2040 population and housing estimates may be conservatively high by approximately 5%.*

Sources:

PSU – Portland State University Medium Growth Forecast from Population Forecasts for Marion County Oregon, its Cities and Unincorporated Area, 2010 to 2030, dated February 2008

EOA – City of Silverton Economic Opportunities Analysis (prepared by Johnson Reid, January 10, 2011)

The future land uses represented in Silverton's small community forecast tool and TSP 2040 Baseline reflect one potential future scenario. The project team recognizes the inherent uncertainty to forecasting. The future land use scenario represents a "best guess" for the sake of analyzing the needs of the future transportation system and for evaluating the impacts of alternative strategies.

NEW TRANSPORTATION SYSTEM NEEDS BY 2040

The objective of the transportation planning process is to provide the information necessary to make decisions on where and when improvements should be made to the transportation system to meet future travel demand. Determining Silverton's future transportation system needs requires an accurate forecast of the travel demand resulting from estimates of future population and employment for the city.

The base roadway network in the 2015 model reflects the current street and roadway system. The future 2040 baseline roadway system in the model consists of a financially committed system, which means that it includes only projects that would change the capacity of the system and for which funding has been identified. Within the Silverton study area, there are no plans for major capital improvements within the UGB, and as such the future 2040 baseline roadway network is identical to the existing 2015 network.

The forecast generated by analysis of the future 2040 baseline roadway system identified the following findings.

- Motor vehicle congestion will increase by 2040 and five study intersections (Main Street/McClaine Street, Water Street/ Main Street, 2nd Street/Oak Street, Westfield Street/McClaine Street and 1st Street/C Street) will fail to meet mobility standards in the future.
- Existing deficiencies in the bicycle and pedestrian system may be exacerbated. Pedestrian and Bicyclist stress increases as the level of adjacent traffic volume, noise, difficulty of crossing major roads, and traffic conflicts increase.
- Some of the major corridors anticipated to experience significant traffic growth are also corridors without dedicated bicycle or pedestrian facilities. These include:
  - » Silverton Road west of Fossholm Street
  - » 1st Street (Highway 214) north of the rail spur
  - » Oak Street (Highway 213) east of Iowa Street
  - » Water Street (Highway 214) south of Peach Street
- Existing deficiencies noted through the Safe Routes to School assessments are likely to remain or worsen in the future as motor vehicle traffic increases.
- There will likely continue to be safety concerns at the two intersections of Westfield Street at Main Street and Water Street at Oak Street.
- The local and regional transit services should be expanded to support the existing community and anticipated growth.
- As motor vehicle, pedestrian and bicycle traffic increases, the five at-grade railroad crossings within the UGB may require improvements to ensure multimodal safety, mobility and connectivity.
- No new air, pipeline, or water-based transportation needs were identified.

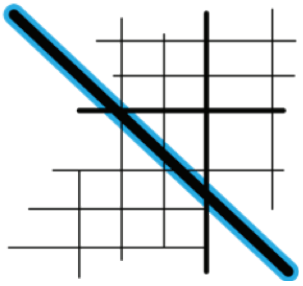
5 STANDARDS

Silverton applies transportation standards and regulation to the construction of new transportation facilities and to the operation of all facilities to ensure that the system functions as intended and that investments are used efficiently. These standards enable consistent future actions that reflect the goals of the City for a safe and efficient transportation system.

STREET FUNCTIONAL CLASSIFICATION

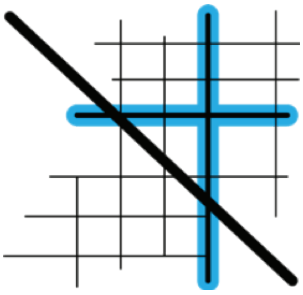
Street functional classification is an important tool for managing the roadway network. The street functional classification system recognizes that individual streets do not act independently of one another but instead form a network that works together to serve travel needs on a local and regional level. By designating the management and design requirements for each roadway classification, this hierarchal system supports a network of streets that perform as desired.

The street functional classification system for roadways in the City of Silverton is described below. The functional classification map (**Figure 7**) shows the designated classification for all roadways in the city, including new street extensions proposed as part of this plan.



ARTERIAL STREETS

Arterial streets serve to interconnect the city. These streets link major commercial, residential, industrial, and institutional areas. Arterial streets are typically spaced about one mile apart to assure accessibility and reduce the incidence of traffic using collectors or local streets for through traffic in lieu of a well-placed arterial street. The maximum interval for arterial spacing within the city shall be 3,000 feet. Access control is the key feature of an arterial route. Arterials are typically multiple miles in length.



COLLECTOR STREETS

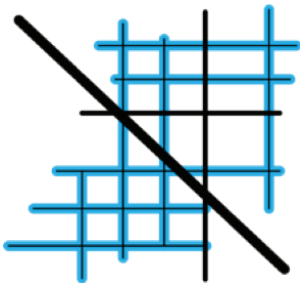
Collector streets provide both access and circulation within and between residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function, do not require as extensive control of access (compared to arterials) and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system. The maximum interval for collector roadways shall be

1,500 feet. Collectors are typically greater than 0.5 to 1.0 miles in length.

There is a new subset of collector streets referred to as constrained collectors. Constrained collectors have limited right-of-way due to built-up residential area. Thus, the right-of-way to accommodate typical collector roadway cross-sections and access spacing is not available or would require the removal of residential houses to provide adequate roadway width and spacing.

Neighborhood Collector

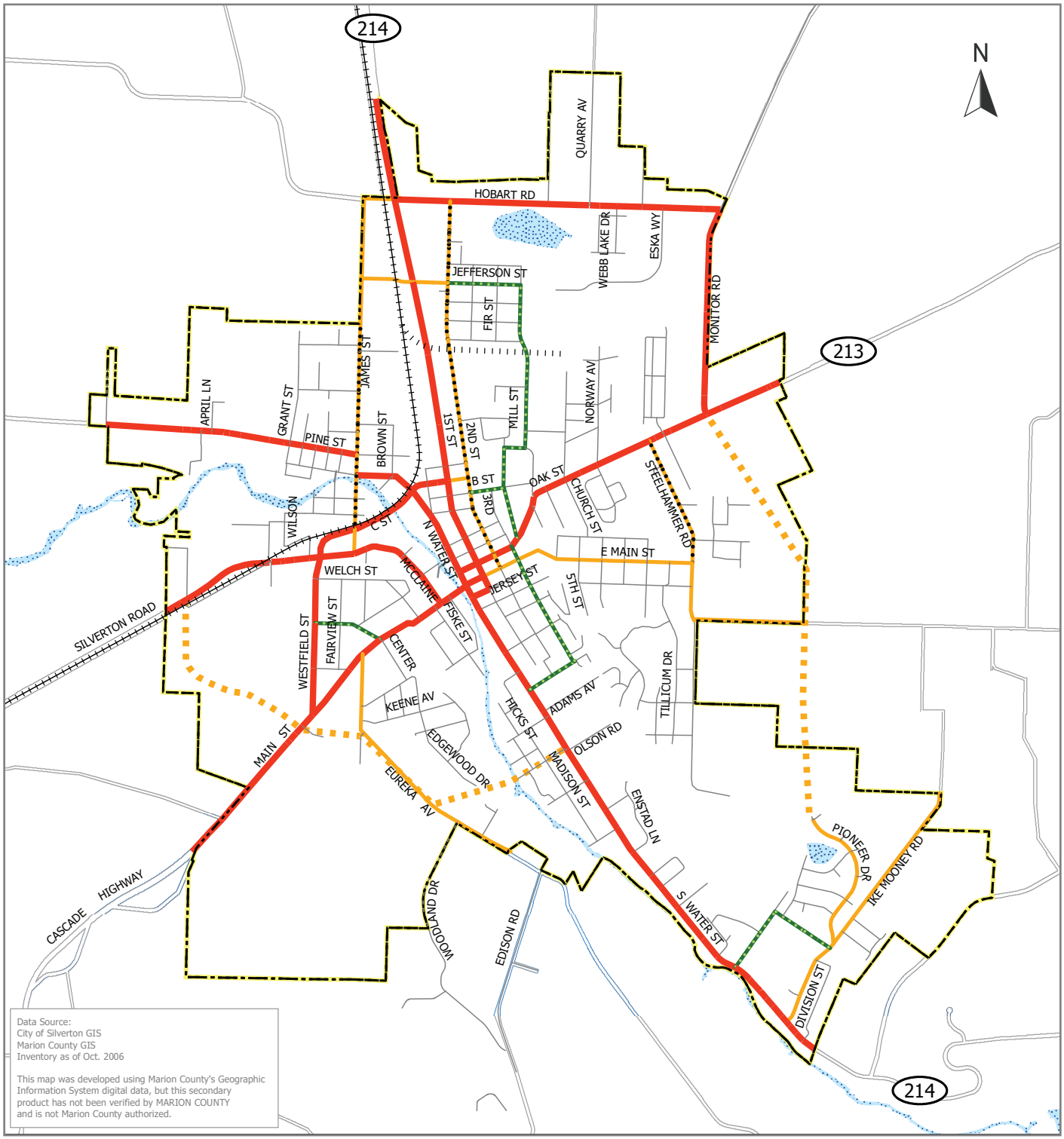
Neighborhood collectors are usually long relative to local streets and provide connectivity to collectors or arterials. Because neighborhood collectors have greater connectivity, they generally have more traffic than local streets and are used by residents in the area to get into and out of the neighborhood, but do not serve citywide/large area circulation. They are typically about a quarter to a half-mile in total length. Traffic from cul-de-sacs and other local streets may drain onto neighborhood collectors to gain access to collectors or arterials. Because traffic needs are greater than a local street, certain measures should be considered to retain the neighborhood character and livability of these routes. Neighborhood traffic management measures are often appropriate (including devices such as speed humps, traffic circles and other devices - refer to the Strategies chapter). However, it should not be construed that neighborhood collectors automatically get speed humps or any other measures. While these routes have special needs, neighborhood traffic management is only one means of retaining neighborhood character and vitality.



LOCAL STREETS

Local streets have the sole function of providing access to immediate adjacent land. Service to "through traffic movement" on local streets is deliberately discouraged by design. All other city streets in Silverton not designated above as arterials, collectors, or neighborhood collectors are considered to be local streets.

FIGURE 7. SILVERTON STREET FUNCTIONAL CLASSIFICATION MAP



CRITERIA FOR CHANGES TO FUNCTIONAL CLASSIFICATION

The criteria used to assess functional classification have two components: the extent of connectivity and the frequency of the facility type. Maps can be used to determine regional, city/district and neighborhood connections. The frequency or need for facilities of certain classifications is not routine or easy to package into a single criterion. While planning textbooks call for arterial spacing of a mile, collector spacing of a quarter to a half-mile, and neighborhood connections at an eighth to a sixteenth of a mile, this does not form the only basis for defining functional classification.

Changes in land use, environmental issues or barriers, topographic constraints, and demand for facilities can change the frequency for routes of certain functional classifications. While spacing standards can be a guide, they must consider other features and potential long term uses in the area (some areas would not experience significant changes in demand, where others will). It is acceptable for the City to re-classify street functional designations to have different naming conventions, however, the general intent and purpose of the facility, whatever the name, should be consistent with regional, state and federal guidelines.

By planning an effective functional classification of Silverton streets, the City can manage public facilities pragmatically and cost effectively. These classifications do not mean that because a route is an arterial it is large and has lots of traffic. Nor do the definitions dictate that a local street should only be small with little traffic. Identification of connectivity does not dictate land use or demand for facilities. The demand for streets is directly related to the land use.

The highest-level connected streets have the greatest potential for higher traffic volumes, but do not necessarily have to have high volumes as an outcome, depending upon land uses in the area. Typically, a significant reason for high traffic volumes on surface streets at any point can be related to the level of land use intensity within a mile or two. Many arterials with the highest level of connectivity have only 35 to 65 percent “through traffic”. Without the connectivity provided by arterials and collectors, the impact of traffic intruding into neighborhoods and on local streets goes up substantially.

FUNCTIONAL CLASSIFICATION CHANGES IN SILVERTON

As part of the TSP update, the previously designated street functional classifications were reviewed and some changes were made to better align with current management objectives. These changes include updating the collector system to reflect the new ‘constrained’ collector classification. Reclassifying these streets will not change the overall function of the roadway to provide collector-level connectivity, but rather recognizes the right-of-way constraints in a built-up residential area. All functional classification changes to existing streets are listed on the following page in **Table 2**.

For new roadways within the community, the appropriate functional classification was selected based on the adjoining land use, expected travel demands, and access requirements for each facility. **Table 3** lists the specific functional classifications for all planned new roadways in Silverton.

TABLE 2. FUNCTIONAL CLASSIFICATION CHANGES TO EXISTING ROADWAYS

ROADWAY	PREVIOUS FUNCTIONAL CLASSIFICATION	NEW FUNCTIONAL CLASSIFICATION
JAMES STREET BETWEEN WESTERN AVENUE AND C STREET	Collector	Constrained Collector
2ND STREET BETWEEN HOBART ROAD AND MAIN STREET	Collector	Constrained Collector
STEELHAMMER STREET BETWEEN OAK STREET AND MAIN STREET	Collector	Constrained Collector
B STREET BETWEEN 2ND STREET AND MILL STREET	Local	Neighborhood Collector

TABLE 3. FUNCTIONAL CLASSIFICATIONS APPLIED TO FUTURE ROADWAYS

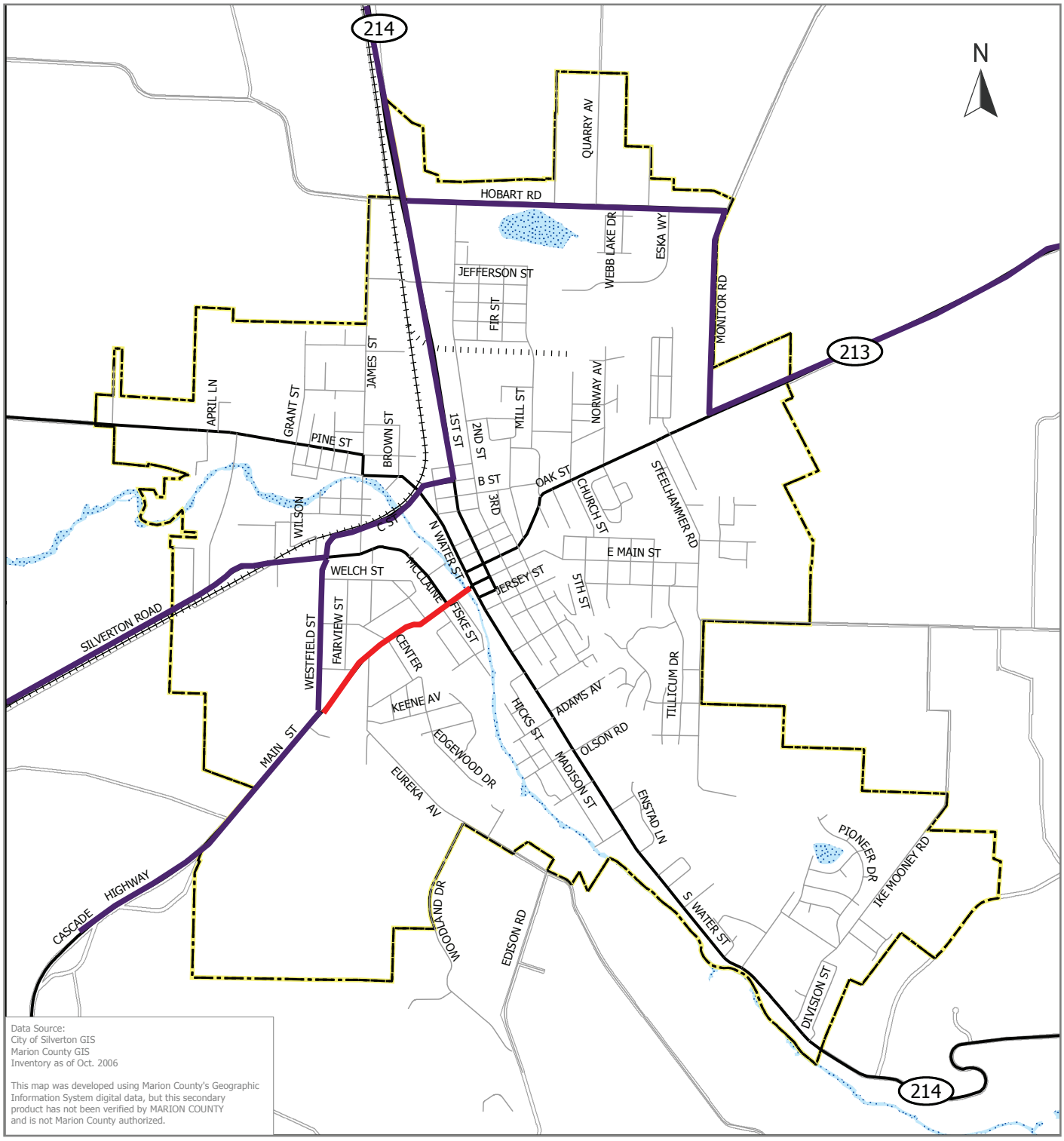
ROADWAY	NEW FUNCTIONAL CLASSIFICATION
BRIDGE CROSSING OVER SILVER CREEK BETWEEN WATER STREET AND BROOK STREET	Local
WESTSIDE NORTH-SOUTH CONNECTOR FROM SILVERTON ROAD (OR213) TO MAIN STREET	Collector
WESTSIDE NORTH-SOUTH CONNECTOR FROM MAIN STREET TO WATER STREET (OR 214)	Collector
EASTSIDE NORTH-SOUTH CONNECTOR FROM MONITOR ROAD TO PIONEER DRIVE	Collector
BRIDGE CROSSING OVER SILVER CREEK CONNECTOR ALONG HIGH STREET	Local

TRUCK ROUTES

Efficient truck movement plays a vital role in the economical movement of raw materials and finished products. The designation of through truck routes provides for this efficient movement while at the same time maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system. Marion County identifies a truck route on the north side of Silverton within the urban growth boundary and includes Hobart Road, Monitor Road and Mt. Angel Highway. Additionally, the City of Silverton has designated freight routes along First Street, Silverton Road, Westfield Street and Cascade Highway. These routes are shown in **Figure 8** on the following page. ODOT does not identify any freight routes within the City of Silverton. Trucks are prohibited on West Main Street, east of Westfield Street.

The designation of truck routes is aimed at addressing the through movement of trucks, not local deliveries. The objective is to allow these routes to focus on design criteria that is “truck friendly”, (i.e. 12 foot travel lanes, longer access spacing, 35 foot (or larger) curb returns and pavement design that accommodates a larger share of trucks). Because these routes are through routes and relate to regional movement, they should relate to the regional freight system.

FIGURE 8. EXISTING TRUCK ROUTES



ROADWAY CROSS SECTION STANDARDS

The street design characteristics in Silverton were developed to meet the function and demand for each facility type. Because the actual design of a roadway can vary from segment to segment due to adjacent land uses and demands, the objective was to define a system that allows standardization of key characteristics to provide consistency, but also to provide criteria for application that provides some flexibility, while meeting standards.

In addition to the city streets, the two state highways within the community have an additional set of design considerations as defined in the *Oregon Highway Plan* (OHP) and in the *Highway Design Manual*. State highways within the central city area have been designated as Special Transportation Areas, which affects highway operations and design parameters in downtown Silverton.

SPECIAL TRANSPORTATION AREA (STA) DESIGNATION

ODOT defines a STA as "a highway segment designation that may be applied to a highway segment when an existing downtown or planned downtown, business district or community center straddles the state highway in existing or certain planned urban centers." The main focus of an STA is to encourage pedestrian and bicycle movement, making an interconnected local street network important to facilitate local automobile and pedestrian circulation. In order to be considered for a STA designation, an area must:

- Straddle a state highway;
- Not be located on a freeway or expressway; and
- Have slow traffic speeds, generally 25 mph or less.

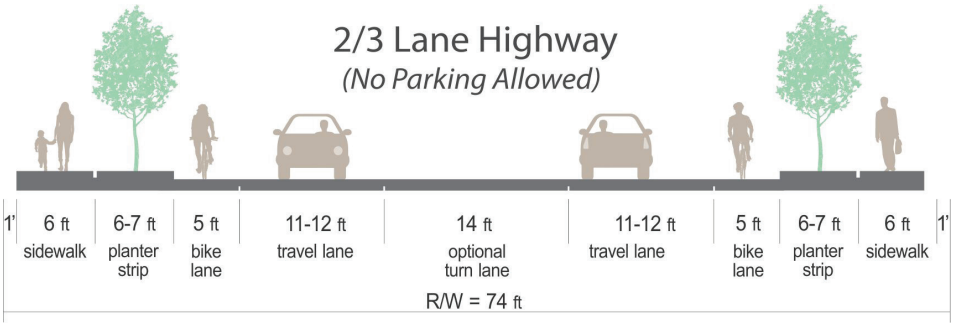
Typically, STAs are located with mixed land uses and buildings spaced close together and developed with little or no setback from the highway. Sidewalks should be wide and located adjacent to the buildings and the highway. In general, public road connections are preferred to private driveway access, which would mean that businesses would combine driveways and have access on the side streets as opposed to direct access to the highway. However, private driveway access would be retained where feasible access alternatives are not available. The key characteristic for a STA designation that correlates to cross section standards is the ability to narrow travel lanes.

ROADWAY CROSS SECTIONS

The street design characteristics for city streets and the two state highways were developed to comply with current planning standards and meet the function and demand for each facility type, with special consideration to the above STA designation requirements for the ODOT highways. The resulting street cross sections are depicted in **Figure 9** through **Figure 14** for arterials, collectors, constrained collectors, neighborhood collectors, local streets and alleys. Because the actual design of a roadway can vary from segment to segment due to adjacent land uses and demands, the objective was to define a system that allows standardization of key characteristics to provide consistency, but also to provide criteria for application that provides some flexibility, while meeting the design standards.

Specific right-of-way needs will need to be monitored continuously through the development review process to reflect current needs and conditions (that is to say that more specific detail may become evident in development review which requires improvements other than these outlined in this 20-year general planning assessment of street needs). On facilities under State jurisdiction, ODOT's design standards from the current Highway Design Manual will apply, with any deviation from those standards requiring approval of a design exception. Within the City of Silverton, this would include Highway 213 east of downtown and Highway 214.

FIGURE 9. ARTERIAL STREETS CROSS SECTIONS



≤ 30 MPH Use 11' Travel Lane & 6.5' Planter Strip

> 30 MPH Use 12' Travel Lane & 5.5' Planter Strip

For 2 Lane Section Use Minimum 34' Curb Width

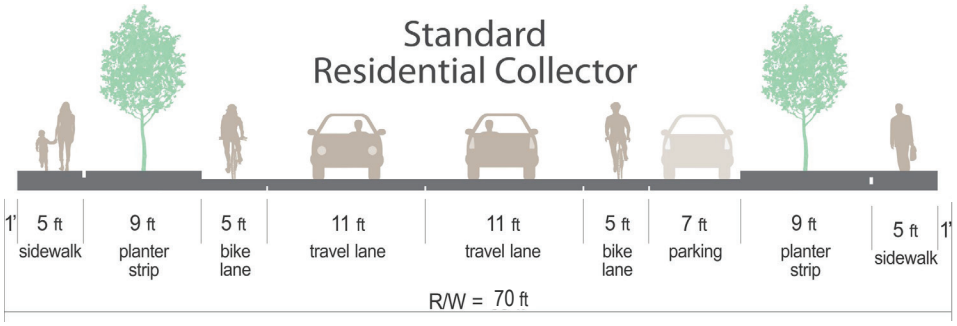
Remove Parking When Turn Lane Used

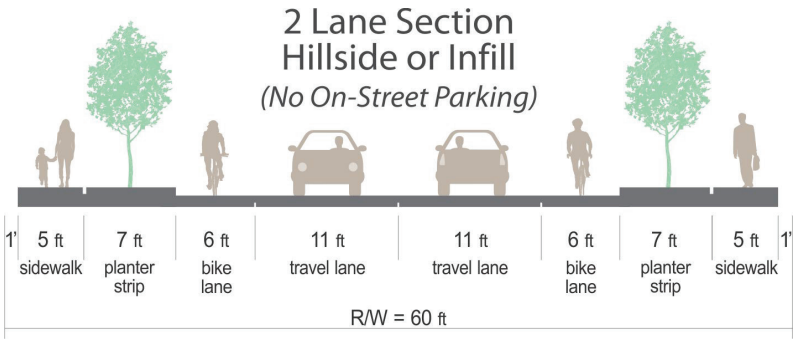
NOTE: Use 5' Building Setback for New Construction

NOTES:

- *For new or reconstructed roadways.*
- *Turn lane warrants should be reviewed using Highway Research Record No. 211, NCHRP Report No. 279 or other updated/superseding reference.*
- *ODOT "Highway Design Manual" requirements supersede City standards.*

FIGURE 10. COLLECTOR STREETS CROSS SECTIONS



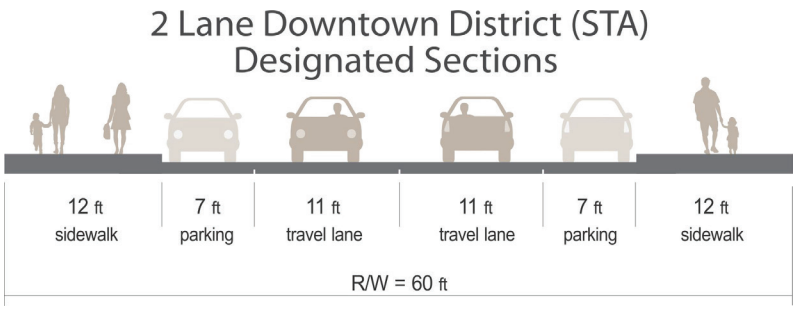


Hillside: Cross Slopes > 3.5H:1V for More than 400'

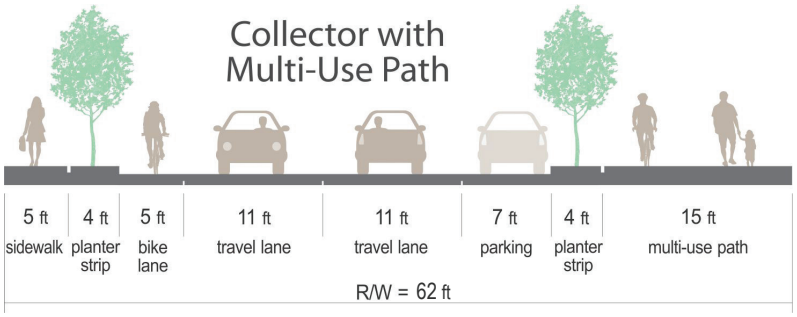
Infill: Defined as > 80% of Lots Already Developed within 500'

ROW Must be 70' within 100' of a Collector Intersection and 200' of Arterials, Plus 50' of ROW Taper

No bike lane needed unless volume is over 5,000 per day or posted speed is greater than 25 mph



No bike lane needed unless volume is over 5,000 per day or posted speed is greater than 25 mph



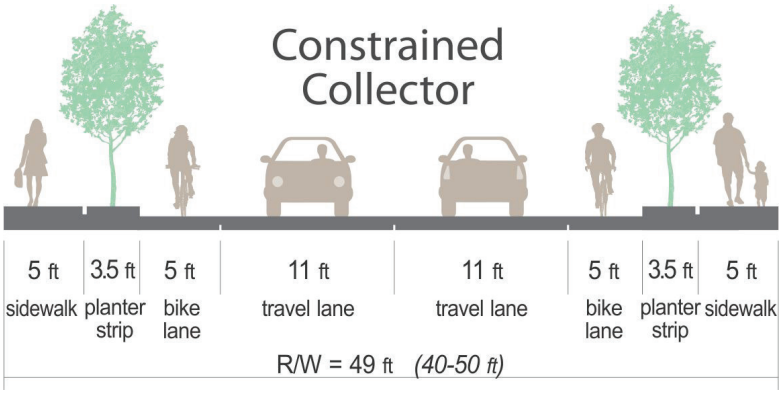
NOTES:

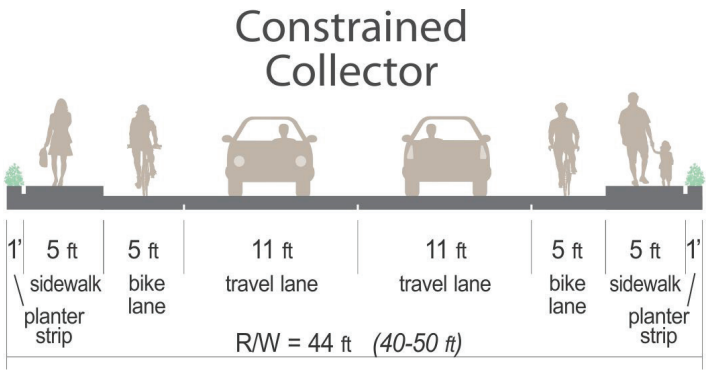
» *For new or reconstructed roadways.*

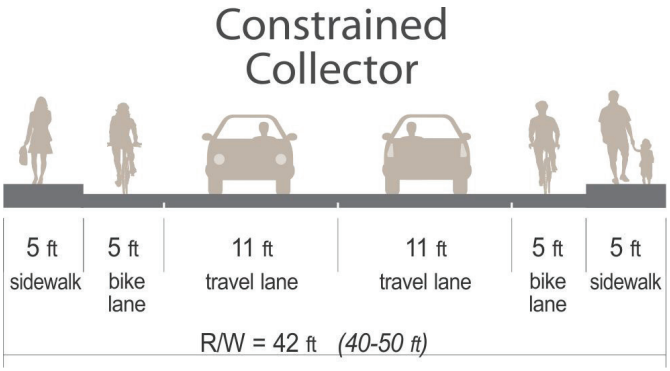
» *Turn lane warrants should be reviewed using Highway Research Record No. 211, NCHRP Report No. 279 or other updated/superseding reference.*

COLLECTOR STREET DESIGN CHARACTERISTICS	
VEHICLE LANE WIDTHS	10 ft – 11 ft
ON-STREET PARKING	7 ft
BICYCLE LANES (MINIMUMS)	5 ft
SIDEWALKS (MINIMUMS)	5 ft
NEIGHBORHOOD TRAFFIC MANAGEMENT (NTM)	Under special conditions
TURN LANES	When warranted
VEHICLES PER DAY BUILDOUT	>1500 but ≤4500
LANDSCAPE STRIPS	4 ft min

FIGURE 11. COLLECTOR STREETS CROSS SECTIONS (CONTINUED)







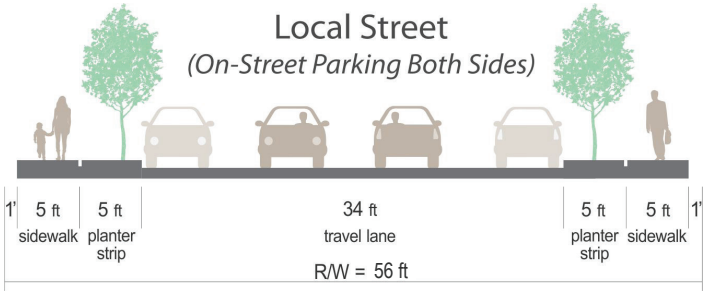
NOTES:

» *For new or reconstructed roadways.*

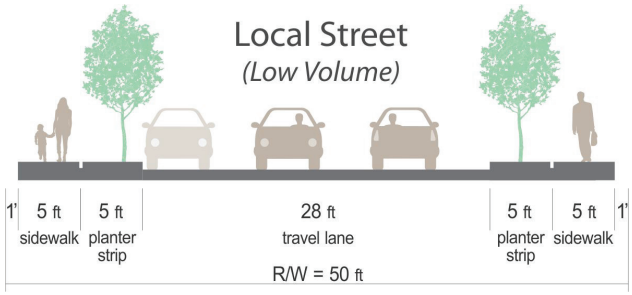
» *Turn lane warrants should be reviewed using Highway Research Record No. 211, NCHRP Report No. 279 or other updated/superseding reference.*

CONSTRAINED COLLECTOR STREET DESIGN CHARACTERISTICS	
VEHICLE LANE WIDTHS	10 ft – 11 ft
ON-STREET PARKING	7 ft
BICYCLE LANES (MINIMUMS)	5 ft
SIDEWALKS (MINIMUMS)	5 ft
NEIGHBORHOOD TRAFFIC MANAGEMENT (NTM)	Under special conditions
TURN LANES	When warranted
VEHICLES PER DAY BUILDOUT	>1500 but ≤4500
LANDSCAPE STRIPS	Variable

FIGURE 12. LOCAL STREETS CROSS SECTIONS



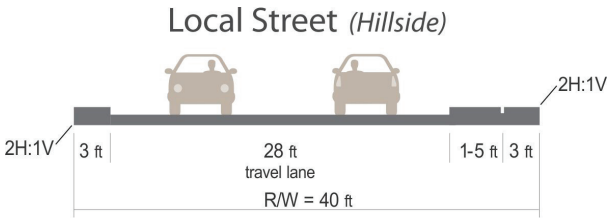
> 30 households with primary access, <1500 vpd



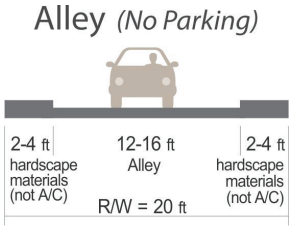
≤ 30 non-multi-family households with primary access

Not on Neighborhood Collectors

Subject to Review for Expected Traffic Volumes



Cross Slopes ≥ 3.5H:1V for More than 300'



NOTES:

- *Selection of placement of sidewalk and planter specific to application. Cross sections show two choices for reference.*
- *Width of curb is included in sidewalk or planter strip width when adjacent to street.*
- *Samples show the desirable applications given number of lanes; minimum standards can be applied case by case.*
- *Actual width of street and sidewalk area can be adjusted within right-of-way based on modal priorities and adjacent lane use.*

LOCAL/NEIGHBORHOOD STREET DESIGN CHARACTERISTICS	
VEHICLE LANE WIDTHS (MINIMUMS)	10 ft
ON-STREET PARKING	7 ft
SIDEWALKS (MINIMUMS)	5 ft
LANDSCAPE STRIPS	Required except for hillside & certain infills
NEIGHBORHOOD TRAFFIC MANAGEMENT (NTM)	Should not be necessary (under special conditions)
BIKE LANES	N/A

MOBILITY STANDARDS

Mobility standards (or "targets" if referring to ODOT facilities) are the thresholds set by an agency for the maximum amount of congestion that is acceptable for a given roadway. The City of Silverton uses Level of Service (LOS) and a volume-to-capacity (v/c) ratio as the measures of congestion for their mobility standards. LOS D is the minimum acceptable operating condition for both signalized and unsignalized intersections in Silverton. LOS D means the maximum allowed average delay per vehicle is 55 seconds at signalized intersections and 35 seconds at stop-controlled intersections.

Silverton allows for facilities under City jurisdiction to operate with a maximum v/c ratio of 0.85 for signalized and all-way stop-controlled intersections. Unsignalized intersections must operate with a maximum v/c ratio of 0.90. The v/c ratio is a decimal representation (between 0.00 to 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection.[1] When calculating the v/c ratio or LOS, the methodology from the latest published Highway Capacity Manual (HCM) by the Transportation Research Board must be applied.

Intersections within the downtown core area must be analyzed using microsimulation software (e.g., Synchro/SimTraffic) as a system. The simulated intersection delay must not exceed 55 seconds at any of the intersections listed below:

- Main Street/Oak Street
- Water Street/Oak Street
- 1st Street/Oak Street
- Water Street/Main Street
- 1st Street/Main Street
- Main Street/McClaine Street
- 2nd Street/Oak Street
- Lewis Street/1st Street
- Lewis Street/Water Street
- Main Street/2nd Street

For roadways within Silverton that are under ODOT or Marion County jurisdiction, the mobility standards/targets of those agencies will apply. All intersections under ODOT jurisdiction must comply with the v/c ratio targets in the Oregon Highway Plan (OHP).[2]

1 The v/c ratio is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, motor vehicle congestion increases, and performance is reduced.

2 1999 Oregon Highway Plan, Oregon Department of Transportation, as amended May 2015.

ACCESS MANAGEMENT

Access Management is a broad set of techniques that balance the need to provide efficient, safe, and timely travel with the ability to allow access to the individual destination. Proper implementation of access management techniques will promote reduced congestion, reduced accident rates, less need for highway widening, conservation of energy, and reduced air pollution.

Access management involves the control or limiting of access on arterial and collector facilities to maximize their capacity and preserve their functional integrity. Numerous driveways erode the capacity of arterial and collector roadways and introduce a series of conflict points that present the potential for crashes and interfere with traffic flow. Preservation of capacity is particularly important on higher volume roadways for maintaining traffic flow and mobility. Whereas local and neighborhood streets primarily function to provide direct access, collector and arterial streets serve greater traffic volume with the objective of facilitating through travel. Silverton, as with every city, needs a balance of streets that provide access with streets that serve mobility.

Several access management strategies were identified to improve access and mobility in Silverton:

- Work with land use development applications to consolidate driveways, provide crossover easements, and take access from lower class roads where feasible. Existing, non-conforming accesses would only be subject to review and revision upon site improvement or a land use application.
- Establish City access spacing standards for new developments and construction, including the prohibition of new single-family residential access on arterials and collectors.
- Access to arterial roadways should only be permitted for public roads. However, parcels shall not be landlocked by access spacing policies.
- Establish City access spacing standards to prohibit the construction of access points within the influence area of intersections. The influence area is that area where queues of traffic commonly form on the approach to an intersection (typically within 150 feet). In a case where a project has less than 150 feet of frontage, the site would need to explore potential shared access, or if that were not practical, place driveways as far from the intersection as the frontage would allow (permitting for 5 feet from the property line). However, full access may not be permitted in these conditions (e.g., restriction to right-in/right-out access).
- Implement City access spacing standards for new construction on County facilities within the UGB.
- Meet ODOT access requirements on State facilities.
- Establish maximum access spacing standards for public streets to promote connectivity.

The City of Silverton has historically struggled with the issue of limiting residential access to collector roadways. This is due to the desire to maintain the roadway as a public place that creates a friendly pedestrian and bicycle environment, as opposed to backing properties with fences that wall-off and isolate the roadway. To address this concern and implement the recommended access restrictions, the following measures shall be required:

- Provide a local street grid with 150-foot to 250-foot spacing that allows back-to-back lots along local streets with side yards to the collector roadway. In addition, prohibit the use of fences along lot lines that front the collector roadway, or
- Require lots with frontage along the collector roadway to orient the front of the home to the collector but provide rear-alley or driveway motor vehicle access.

New development and roadway projects involving City street facilities shall meet the access spacing standards summarized in **Table 4**. In cases where physical constraints or unique site characteristics limit the ability for the access spacing standards shown in Table 4 to be met, the City of Silverton retains the right to grant an access spacing variance. All requests for an access spacing variance will be required to complete an access management plan, which must include at a minimum the following items:

- Review of the existing access conditions within the study area (defined the property frontage plus the distance of the minimum access spacing requirement). This should include a review of the last three years of crash data, as well as collection of traffic volume information and intersection operations analysis.
- Short-term analysis of the study area safety and operations with the proposed access configuration, as well as with a configuration that would meet access spacing standards.
- Long-term analysis of the study area safety and operations with the proposed access configuration. This scenario should also include consideration of the long-term redevelopment potential of the area and discussion of how access spacing standards may be achieved.

Parcels shall not be landlocked by access spacing policies. Opportunities should be explored to provide future access through neighboring parcels and an interim access may be granted. Non- conforming access (defined per Table 4) should work to achieve a condition as close to standard as possible. For example, a private access may be permitted to an arterial roadway if no other option (e.g., access to a side street) exists; however, the private access would then be required to meet the minimum driveway spacing of 250 feet listed in Table 4.

TABLE 4. ACCESS SPACING STANDARDS FOR CITY STREETS

STREET FUNCTIONAL CLASSIFICATION	MAXIMUM SPACING[A] OF ROADWAYS	MINIMUM SPACING[A] OF ROADWAYS	MINIMUM SPACING[B] OF ROADWAY TO DRIVEWAY[C]	MINIMUM SPACING[A] DRIVEWAY TO DRIVEWAY[C]
ARTERIAL	1,000 feet	500 feet	250 feet	250 feet or combine
COLLECTOR/ CONSTRAINED COLLECTOR*	500 feet	250 feet	150 feet	150 feet or combine
NEIGHBORHOOD COLLECTOR/LOCAL	500 feet	250 feet	10 feet	10 feet

NOTES:

[A] Measured centerline to centerline

[B] Measured near street curb to near driveway edge

[C] Private access to arterial roadways shall only be granted through a requested variance of access spacing policies (which shall include an access management plan evaluation)

** For access spacing, the 150' access spacing standard for collectors is also not realistic for infill situations along some of the same constrained collector streets. Rather a minimum spacing of roadway to driveway is 50 feet, for constrained collectors.*

In addition to implementing access spacing standards, the City of Silverton shall require an access report for new access points, proposed to serve commercial and industrial developments, stating that the driveway/roadway is safe as designed and meets adequate stacking, sight distance and deceleration requirements as set by ODOT, Marion County, and American Association of State Highway and Transportation Officials (AASHTO). Generally, the need for an access report is triggered by land use actions, design reviews, or land divisions.

Any proposed accesses to State facilities must be approved by ODOT. The 1999 Oregon Highway Plan identifies access management objectives for all classifications of roadways under State jurisdiction. Both OR 214 and OR 213 are classified as District Highways by ODOT, which maintain a management objective that balances the needs of through traffic movement with direct property access. Based on these objectives, ODOT has established access spacing standards for all highway classifications that vary with proximity to urbanized areas and changes in posted speeds. These standards are also provided in the 1999 Oregon Highway Plan as well as OAR 734-051. Marion County also identifies access management standards in the Marion County Transportation System Plan.

TRAFFIC SIGNAL SPACING

Traffic signals that are spaced too closely on a corridor can result in poor operating conditions and safety issues due to the lack of adequate storage for vehicle queues. A minimum traffic signal spacing of 1,000-feet should be required for arterial and collector facilities outside of the Special Transportation Area. Different signal spacing standards may be applied to lower classifications of roadways. ODOT identifies ½ mile as the desirable spacing of signalized intersections on regional and statewide highways but recognizes that shorter signal spacing may be appropriate due to a number of factors including existing road layout and land use patterns.

LOCAL STREET CONNECTIVITY

Many of the existing local street networks, such as those in the downtown area, provide good connectivity with multiple options for travel in any direction. However, some of the newer residential neighborhoods have been developed with limited opportunities for movement into and out of the developments, with some neighborhoods funneling all traffic onto a single street. This type of street network results in out-of-direction travel for motorists and contributes to an imbalance of traffic volumes, which impacts residential frontage. This can result in the need for investments in wider roads, traffic signals, and turn lanes that could otherwise be avoided.

Providing connectivity between neighborhoods and limiting the number of dead-end streets supports multiple TSP goals related to enhancing livability, encouraging non single-occupant vehicle travel, improving safety, and developing an efficient transportation system.

Benefits include:

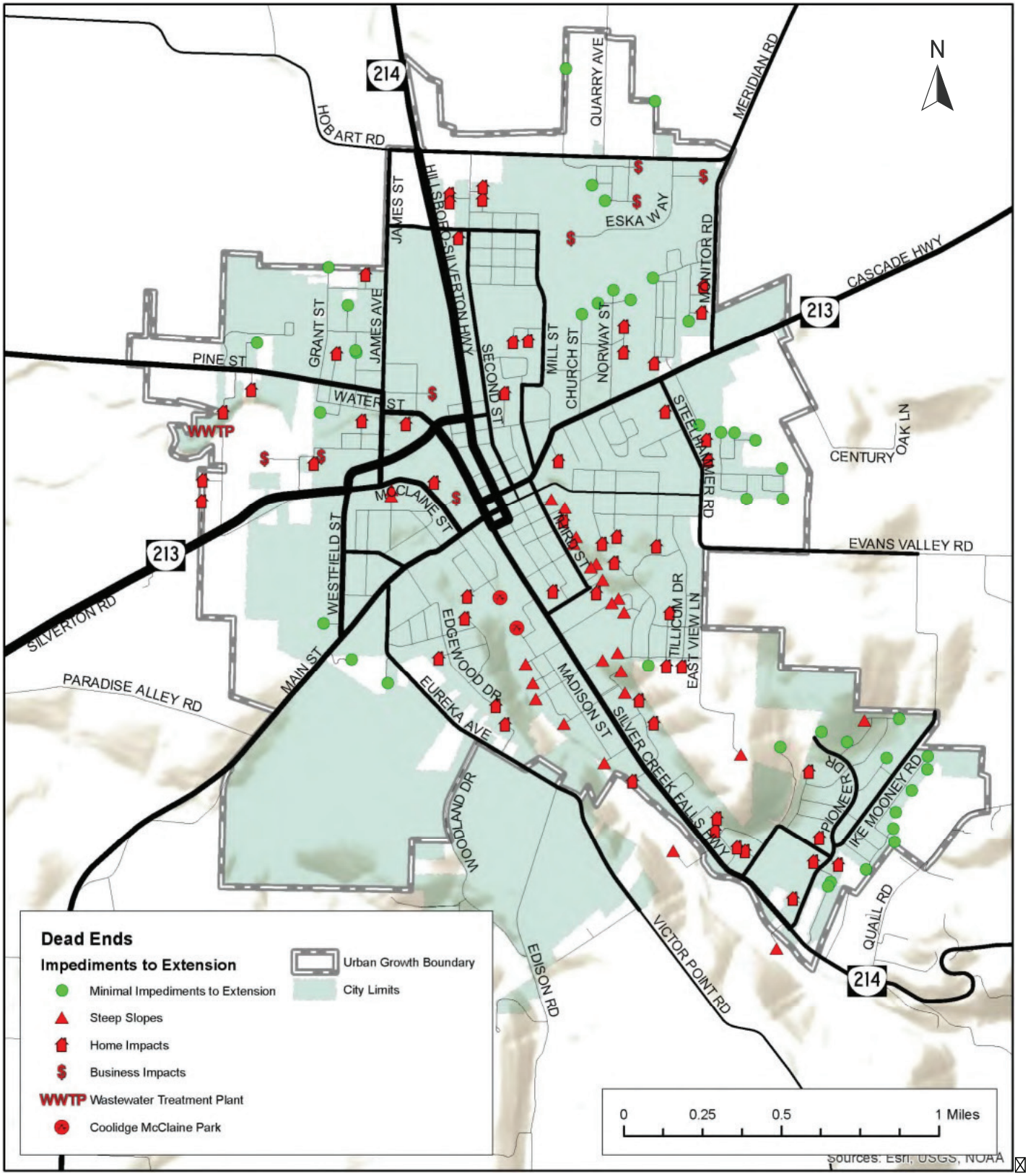
- Reduced congestion, travel time, and vehicle-miles of travel;
- Removal of shorter trips (through and between neighborhoods) from busy arterial streets;
- Shorter and more direct routes that encourage walking and biking;
- Quick and efficient routes for emergency vehicles when responding to calls for service;
- Alternative routes in case of closures due to vehicle crashes or construction activity; and
- Alternative routes for emergency evacuations

Some of these local connections can function in coordination with other street improvements to mitigate capacity deficiencies by better dispersing traffic. Several roadway connections will be needed within neighborhood areas to reduce out of direction travel for vehicles, pedestrians and bicyclists. This is most important in the areas where a significant amount of new development is possible.

A circulation analysis was conducted as part of the City of Silverton Circulation Plan[1] that included an assessment of the ability to extend existing dead-end streets. **Figure 13** illustrates the existing dead-end streets located within Silverton's city limits. Red symbols represent dead-end streets that are unlikely to be extended due to geographic constraints, structures, or city park locations. Green symbols represent dead-end streets that have the possibility of being extended for future connections.

1 City of Silverton Circulation Plan – DRAFT, Keller Associates, March 5, 2020

FIGURE 13. FEASIBILITY OF EXTENDING EXISTING DEAD-END STREETS



To protect existing neighborhoods from potential traffic impacts of extending dead-end streets, connecting roadways shall incorporate neighborhood traffic management into their design and construction. All dead-end streets shall have signs indicating the potential for future connectivity where that is the intent.

Additionally, new development that constructs new streets, or street extensions, must provide a proposed street map that:

- Provides full street connections with spacing of no more than 530 feet between connections except where prevented by barriers
- Provides bike and pedestrian access ways in lieu of streets with spacing of no more than 330 feet except where prevented by barriers
- Limits use of cul-de-sacs and other dead-end street systems to situations where barriers prevent full street connections
- Includes no dead-end street longer than 220 feet
- Includes no dead-end street having more than 25 dwelling units
- Includes turnarounds for fire truck access (96-foot diameter cul-de-sac or hammerhead) for any dead-end street in excess of 150 feet long
- Includes street cross-sections demonstrating dimensions of right-of-way improvements, with streets designed for posted or expected speed limits

Pedestrian connections from the end of any dead-end street that results in a cul-de-sac will be mandatory as future development occurs.

6 PROJECTS

This chapter describes the transportation system improvement projects identified to address the system needs discussed in Chapter 4.

PROCESS FOR DEVELOPING AND EVALUATING PROJECTS

The project team developed the recommended transportation solutions using guidance provided by the project goals and with input from three main sources:

- Stakeholders (via committee meetings and public open houses)
- Previous Plans (such as the 2008 TSP and Comprehensive Plan)
- Independent Project Team Evaluation (Existing and Future Traffic Conditions and Needs Evaluation Memoranda)

Consistent with the project goals, project development focused on improving safety and creating a balanced system able to provide travel options for a wide variety of needs and users. The projects include lower-cost improvements to enhance existing infrastructure and extend its useful life rather than relying solely on the construction of new facilities, which require substantial funding and may have greater impacts on the environment and adjacent property.

The projects were prioritized to guide future funding decisions by scoring how well each project aligned with the TSP goals and objectives. First, the City Council and PAC members reviewed the goals and objectives and assigned a numeric weight to each objective to account for its importance relative to the others. Two City Councilors and two City staff members then individually scored all projects in the TSP using the weighted objectives. The projects were then prioritized by each of the reviewers and each reviewer's priority rank were then averaged to create the overall project priorities by mode of travel.

The final priority ranks are listed in the project tables below. The project priority rankings do not create an obligation to construct projects in any order and it is recognized that these priorities may change over time. The City of Silverton will use the priorities listed in this TSP to guide investment decisions, but will also regularly reassess local priorities to leverage new opportunities and reflect evolving community interests.

FUNDING CONSTRAINTS

The amount of funding assumed to be available to construct projects in this TSP was estimated by reviewing transportation funding sources currently in place and projecting total revenue through 2040 based on past annual allocations. **Table 5** lists all of the revenue sources assumed to be available to the City, and indicates how much revenue is assumed to be available to implement the projects in this TSP. Overall, it is reasonable to assume that Silverton will have approximately $21 million to apply towards project implementation. It should be noted that some revenue sources have restrictions on the types of projects for which they can be used. With an estimated $99.9 million worth of transportation system projects, the City must make reasonable investment decisions to develop a set of transportation improvements that will likely be funded to meet identified needs through 2040.

Additional transportation projects could be funded through grants or if the City develops new revenue sources in the future. As an example, during the update of this TSP is was estimated that as much as $15 million in additional revenue could be generated if the City adopted a transportation utility fee. A transportation utility fee is a recurring monthly charge that is paid by all residences and businesses within the city. The fee can be based on the number of trips a particular land use generates or as a flat fee per unit and can be collected through the City's regular utility billing. Existing law places no express restrictions on the use of transportation utility fee funds, other than the restrictions that normally apply to the use of government funds. However, many cities choose to place self-imposed restrictions or parameters on the use of the funds.

TABLE 5. SUMMARY OF FUNDING EXPECTATIONS AND RESTRICTIONS (2017 DOLLARS)

REVENUE SOURCE	AVERAGE ANNUAL AMOUNT	ESTIMATED AMOUNT THROUGH 2040
STATE HIGHWAY APPORTIONMENT	$545,000	$12,540,000
HOUSE BILL 2017	$225,000	$5,175,000
SYSTEM DEVELOPMENT CHARGES[A]	$297,000	$7,200,000
LOCAL MOTOR VEHICLE FUEL TAX	$173,000	$3,979,000
FEES AND PERMITS	$226,000	$5,200,000
MISCELLANEOUS REVENUE	$114,000	$2,630,000
TOTAL REVENUES (5-YEAR AVERAGE)	**$1,580,000**	**$36,724,000**
EXPENDITURES	**AVERAGE ANNUAL AMOUNT**	**ESTIMATED AMOUNT THROUGH 2040**
PERSONNEL SERVICES	$172,000	$3,950,000
MATERIALS AND SERVICES	$102,000	$2,340,000
CAPITAL OPERATIONS/MAINTENANCE	$248,000	$5,710,000
TRANSFERS	$263,000	$6,060,000
TOTAL EXPENDITURES (5-YEAR AVERAGE)	**$785,000**	**$18,060,000**
REVENUE OVER EXPENDITURES	**$795,000**	**$18,664,000**
ODOT ARTS FUNDING		$2,200,000
TOTAL ESTIMATED FUNDING		**$20,864,000**

[A] *Estimated System Development Charges were based on forecast future trip-ends rather than historical averages.*

PROJECTS AND PROGRAMS

All projects in the TSP were categorized to describe their level of importance and likelihood of being funded. The three category definitions used are:

- **LIKELY-FUNDED TRANSPORTATION SYSTEM:** THIS INCLUDES THE HIGHEST PRIORITY PROJECTS THAT COULD REASONABLY BE EXPECTED TO BE FUNDED BY 2040 GIVEN THE AMOUNT AND TYPE OF FUNDING ASSUMED TO BE AVAILABLE.

- **POSSIBLY-FUNDED TRANSPORTATION SYSTEM:** THIS INCLUDES ADDITIONAL HIGH-PRIORITY PROJECTS THAT MAY BE IMPLEMENTED IF THE CITY DEVELOPS NEW FUNDING SOURCES, SUCH AS A TRANSPORTATION UTILITY FEE. FOR THE PURPOSE OF THIS EXERCISE, THE ADDITIONAL FUNDING THAT WOULD BE AVAILABLE WAS ASSUMED TO BE $15 MILLION.

- **ASPIRATIONAL TRANSPORTATION SYSTEM:** THIS INCLUDES ALL REMAINING PROJECTS THAT ARE NOT PART OF THE LIKELY-FUNDED OR POSSIBLY-FUNDED TRANSPORTATION SYSTEMS. THESE PROJECTS ARE NOT EXPECTED TO BE FUNDED BY 2040.

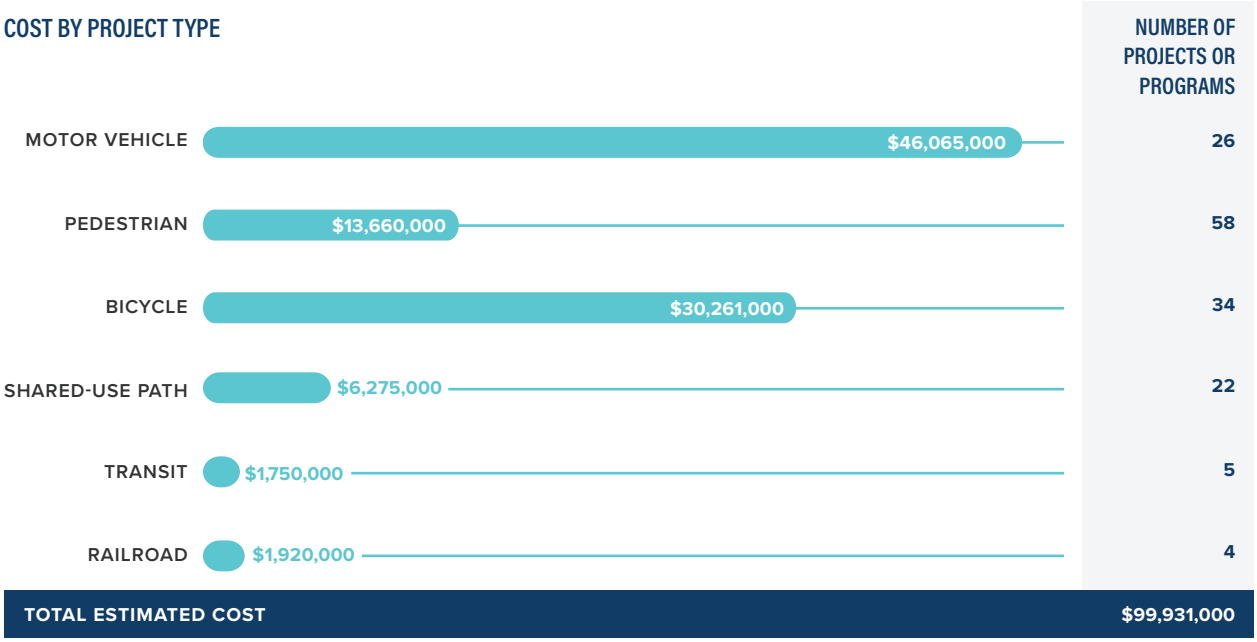
The City is not required to implement projects identified on the Likely-Funded list first. Priorities may change over time and unexpected opportunities may arise to fund particular projects. The City is free to pursue any of these opportunities at any time. The purpose of the Likely-Funded project list is to establish reasonable expectations for the level of improvements that will occur and give the City initial direction on where funds should be allocated.

Taking the network approach to transportation system improvements, the projects in this plan also fall within one of several categories:

- **Motor Vehicle (MV)** projects to improve street connectivity and safety and reduce delay throughout the city. Silverton identified 26 motor vehicle projects that will cost an estimated $46.1 million to complete.
- **Pedestrian (SW and EC)** projects for sidewalk infill and crossing enhancements, providing seamless connections for pedestrians on major routes throughout the city. Sidewalk infill on local streets will be addressed through city code changes and these projects are expected to be financed by developers or property owners. Silverton identified 58 pedestrian projects on collector roadways that will cost an estimated $13.7 million to complete.
- **Bicycle (BP)** projects include an integrated network of bicycle lanes and shared roadways to facilitate convenient travel citywide. Silverton identified 34 bicycle projects that will cost an estimated $30.3 million to complete.
- **Shared-Use Path (OS)** projects provide local off-street travel for people walking and biking. The citywide shared-use path vision includes 22 projects totaling an estimated $6.3 million.
- **Transit (TS)** projects to enhance the quality and convenience for passengers. Silverton identified five transit projects totaling an estimated $1.8 million.
- **Railroad (RR)** projects to improve crossing safety and reduce barriers to bicycle and pedestrian travel. Silverton identified four projects totaling an estimated $1.9 million.

Overall, Silverton identified 149 individual transportation solutions and a downtown connectivity solution, totaling an estimated $99.9 million worth of investments. The level of investment included in this TSP by mode of travel is summarized in **Figure 14**.

FIGURE 14. LEVEL OF INVESTMENT BY MODE OF TRAVEL



The TSP projects are listed below in **Tables 6, 7,** and **8**, and illustrated in **Figures 17, 18,** and **19** as either part of the Likely-Funded Transportation System, the Possibly-Funded Transportation System, or Aspirational Transportation System. In each table, the projects are listed in order of priority and are coded with a project number that is also used to show the project location on the corresponding figure. Sets of tables showing project priority ranking by mode of travel are included in Volume 2. The actual design elements for any project are subject to change and will ultimately be determined through a preliminary and final design process, and are subject to City, County and/or ODOT approval.

LIKELY-FUNDED TRANSPORTATION SYSTEM

The Likely-Funded Transportation System identifies the projects that can be reasonably expected to be funded by 2040 and have the highest priority for implementation. These projects will help to create a connected local and regional transportation network in Silverton, particularly for people who walk and bike. Several of these projects are aimed at creating more designated bicycle facilities and filling the notable sidewalk gaps throughout the city. This includes five Safe Routes to School projects that will enhance access to the high school, middle school, and Mark Twain Elementary School. About $21 million of transportation investments are included in the Likely-Funded Transportation System, refer to **Table 6** and **Figure 15**.

TABLE 6. LIKELY-FUNDED TRANSPORTATION SYSTEM PROJECTS

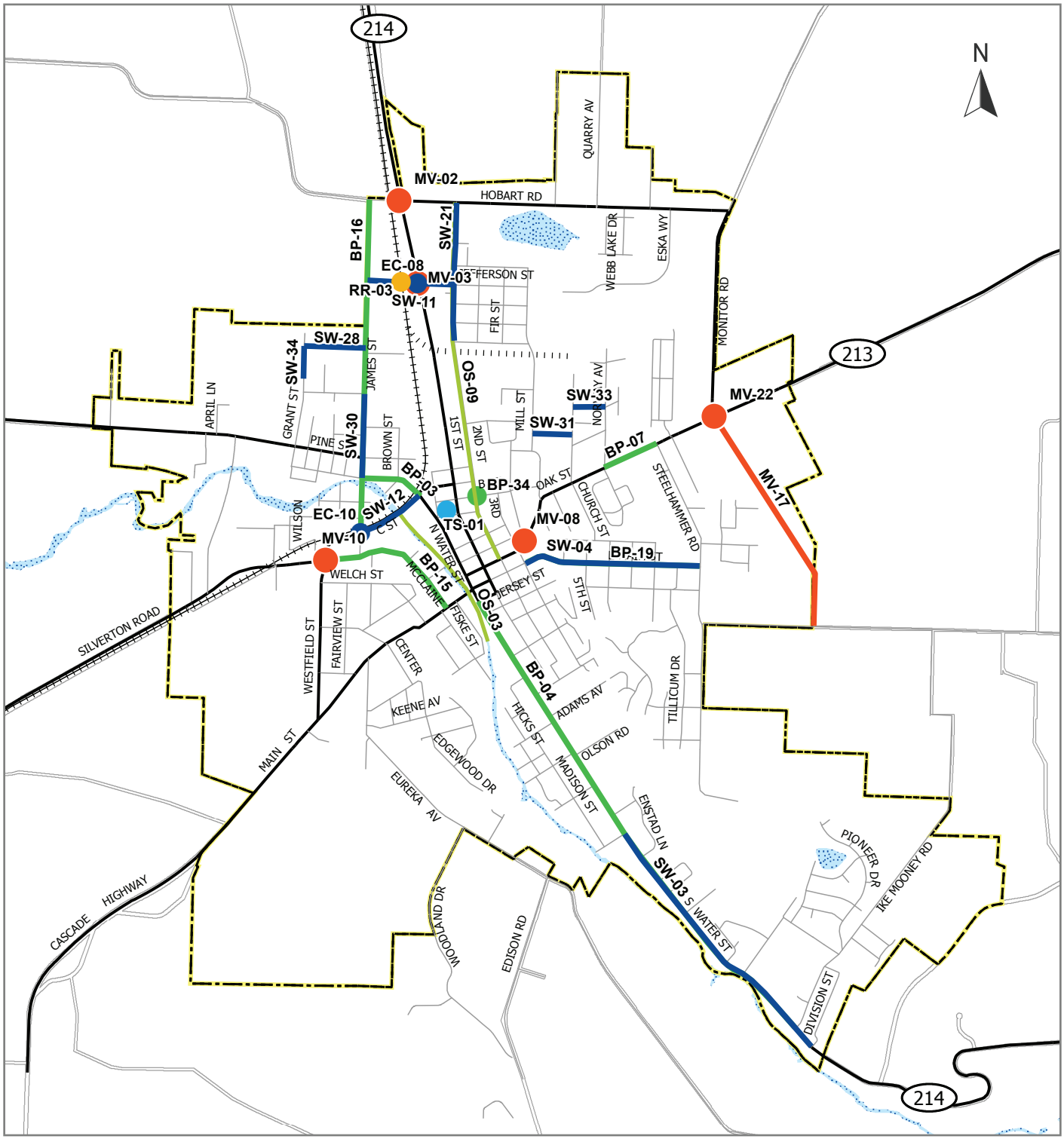
PROJECT NO.	DESCRIPTION	START	END	TOTAL ($)
MV-03	Install a Roundabout or Traffic Signal	1st Street (HWY 214)	Jefferson Street	$840,000
SW-30	Sidewalk Infill and Bike Lanes on James Street	Jefferson Street	C Street	$2,200,000
SW-03	Sidewalk Infill on South Water Street (HWY 214)	Peach Street	City limits	$1,250,000
SW-28	Sidewalk Infill on Western Avenue	Grant Street	James Street	$50,000
SW-31	Sidewalk Infill and Repair on Robinson Street	Mill Street	Mark Twain Elementary	$20,000
EC-08	Pedestrian Crossing Enhancements and Sidewalk Connections	1st Street (HWY 214)/ Jefferson Street		$50,000
MV-08	Improve Sight Distance and Crossing Safety	Oak Street (HWY 213)	Mill Street	$10,000
SW-11	Sidewalk Infill on Jefferson Street	Mill Street	James Street	$280,000
RR-03	Rail/Highway Grade Crossing Improvements on Jefferson Street near Highway 214/1st Street (HWY 214)			$480,000
SW-34	Sidewalk Infill on Grant Street	Western Avenue	High School Driveway	$20,000
BP-34	Bicycle Boulevard with Traffic Calming on 2nd Street and Diverters at B Street	Jefferson Street	Jersey Street	$1,050,000
MV-10	Add Southbound Right Turn Lane, Prohibit Southbound Left Turn	McClaine Street	C Street	$2,000,000
BP-16	Bicycle Lanes on James Avenue	Hobart Road	C Street	$1,000,000
SW-12	Sidewalk Infill on C Street	James Street	N Water Street	$260,000
BP-04	Bicycle Lanes on South Water Street (HWY 214)	Lewis Street	Pioneer Drive	$10,000

TABLE 6. LIKELY-FUNDED TRANSPORTATION SYSTEM PROJECTS (CONTINUED)

PROJECT NO.	DESCRIPTION	START	END	TOTAL ($)
EC-10	Pedestrian Crossing Enhancements (RRFB)	James Street/C Street		$50,000
MV-22	Install a Roundabout, Landscaped Median, or other Calming/Gateway Treatment	Highway 213	Monitor Road	$1,000,000
OS-09	Off-Street path #6 (2nd Street)	Hobart Road	Oak Street (HWY 213)	$180,000
BP-15	Bicycle Lanes on McClaine Street	C Street	Main Street	$50,000
SW-33	Sidewalk Infill on Bartlett Street, Norway Street	Church Street	Oak Street (HWY 213)	$40,000
BP-19	Bicycle Lanes on Main Street*	3rd Street	Steelhammer Road	$560,000
TS-01	Commuter Connection to Salem	Downtown Silverton	Salem	$140,000
MV-17	Eastside North-South Connector #4 (north)	Monitor Road/Oak Street	Evans Valley Road	$6,300,000
SW-21	Sidewalk Infill on 2nd Street	Whittier Street	Hobart Street	$640,000
OS-03	Off-Street path #2 (Creek trail)	C Street	Silver Falls Library	$150,000
BP-03	Bicycle Lanes on North Water Street	James Street	C Street	$190,000
SW-04	Sidewalk Infill on Main Street	3rd Street	Steelhammer Road	$750,000
BP-07	Bicycle Lanes on Oak Street (HWY 213)	Norway Street	Steelhammer Road	$20,000
MV-02	Install a Roundabout or Traffic Signal	1st Street (HWY 214)	Hobart Road	$840,000
			TOTAL	**$20,430,000**

** Denotes projects that will require coordination with ODOT or Marion County.*

FIGURE 15. LIKELY-FUNDED TRANSPORTATION SYSTEM PROJECTS



POSSIBLY-FUNDED TRANSPORTATION SYSTEM

The Possibly-Funded Transportation System identifies additional transportation solutions that could be funded if the City develops a new revenue source, such as a transportation utility fee, which has the potential to generate an estimated $15 million through 2040. Using that as a guide, the Possibly-Funded Project List, see **Table 7** and **Figure 16**, identifies about $15 million in transportation investments. This includes the completion of the east side collector between Highway 213 and Pioneer Drive, which could not be fully funded as part of Likely-Funded Transportation System. It also includes three more Safe Routes to Schools projects that would enhance access to the middle school. Furthermore, there is a strong emphasis on continuing to create more designated bicycle facilities, filling the sidewalk gaps, and providing off-street alternatives for people who walk and bike. With the projected increase in future traffic, off-street facilities provide a low-stress alternative to walking and biking on streets.

TABLE 7. POSSIBLY-FUNDED TRANSPORTATION SYSTEM PROJECTS

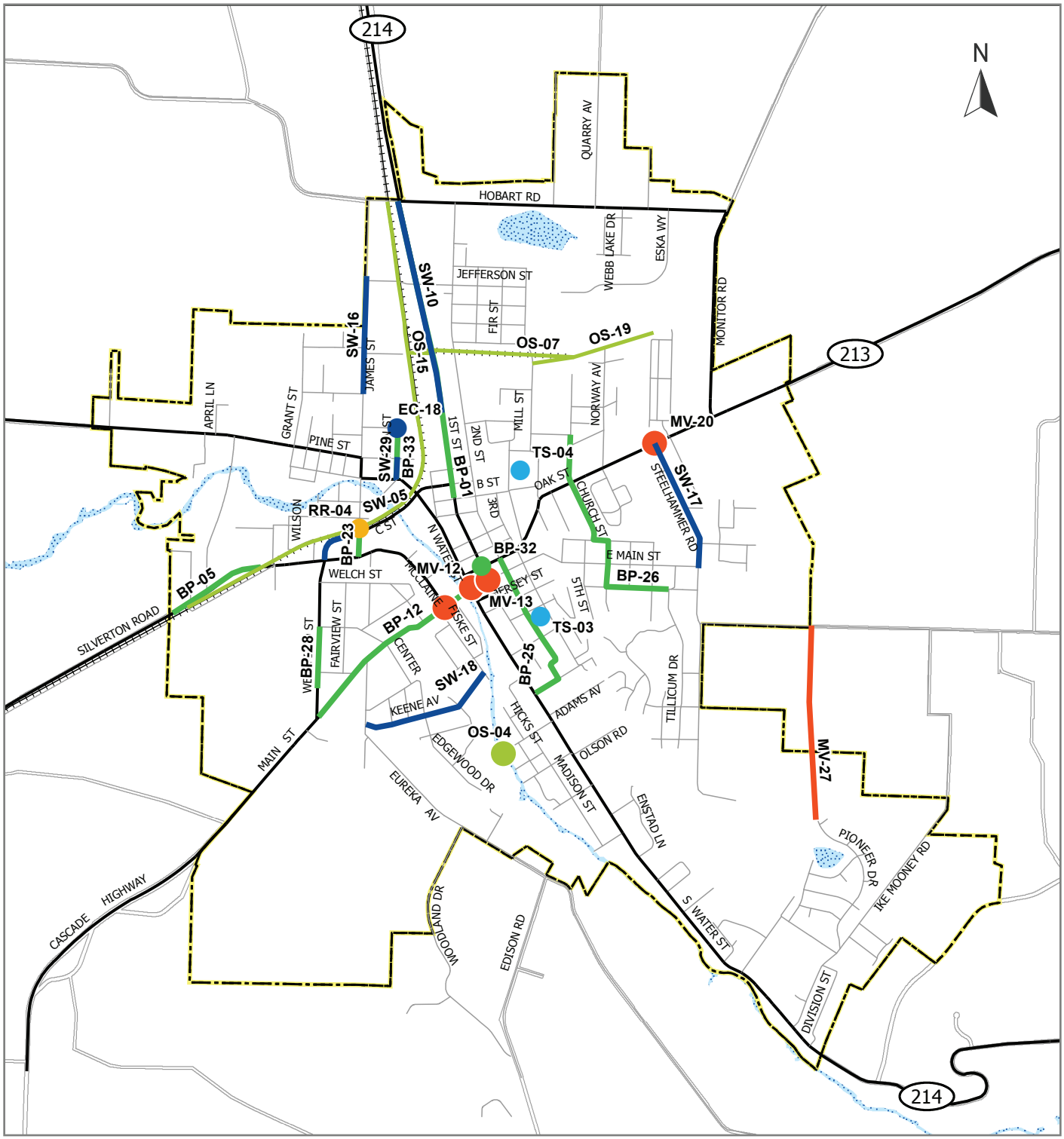
PROJECT NO.	DESCRIPTION	START	END	TOTAL ($)
MV-27	Eastside North-South Connector #4 (south)	Evans Valley Road	Pioneer Drive	$4,700,000
OS-15	Off-Street Path Connection #11	Westfield Street	Connection #9 Alignment	$300,000
SW-18	Sidewalk Infill on Keene Avenue	Eureka Avenue	Coolidge Street	$420,000
BP-28	Two-Way Raised Cycle Path on Westfield Street	Robert Frost Elementary	Center Street	$500,000
BP-32	Bicycle Route Signing (shared facilities) and Bicycle Parking	Downtown Silverton		$30,000
SW-16	Sidewalk Infill on James Street	Florida Drive	City limits	$215,000
MV-20	Install a Roundabout, Landscaped Median, or other Calming/Gateway Treatment	Highway 213	Steelhammer Road	$1,000,000
OS-07	Off-Street path #4	Existing rail line alignment	Church Street extension	$250,000
BP-05	Bicycle Lanes on Silverton road (HWY 213)	West City Limits	Existing sections	$350,000
SW-10	Sidewalk Infill on 1st Street (HWY 214)	Hobart Street	Existing section	$640,000
TS-03	Enhance Dial-a-Ride services			$70,000
BP-25	Bicycle Lanes on 2nd Street, Koons St	Oak Street	S Water Street (HWY 214)	$500,000
SW-05	Sidewalk Infill on C Street	McClaine Street	James Street	$210,000
MV-06	Install a Traffic Signal	Main Street	McClaine Street	$790,000
OS-04	Pedestrian Bridge	Cowing Street		$105,000

TABLE 7. POSSIBLY-FUNDED TRANSPORTATION SYSTEM PROJECTS (CONTINUED)

PROJECT NO.	DESCRIPTION	START	END	TOTAL ($)
BP-23	Bicycle Lanes on James Street	McClaine Street	C Street	$75,000
SW-29	Sidewalk Infill on Brown Street	Water Street	480' North of Water Street	$20,000
BP-12	Bicycle Lanes on Main Street	Westfield Street	Water Street (HWY 214)	$70,000
MV-12	Install a Traffic Signal and add Southbound Right Turn Lane	Main Street	Water Street (HWY 214)	$1,200,000
EC-18	Install Curb Ramps for Existing Crosswalk	Brown Street	Schlador Street	$10,000
BP-26	Bicycle Lanes on Church St, Kent St, Ames St, Reserve St	Robinson Street	Tillicum Street	$730,000
OS-19	Off-Street Path Connection #15	Pioneer Drive	Main Street	$420,000
BP-33	Bicycle Route Signing (shared facility)	Brown Street		$1,000
SW-17	Sidewalk Infill on Steelhammer Road	Oak Street (HWY 213)	City limits	$500,000
RR-04	Rail/Highway Grade Crossing Improvements on James Street near C Street			$480,000
MV-13	Install a Traffic Signal and add Eastbound Left Turn Lane	Main Street	1st Street (HWY 214)	$1,200,000
TS-04	Local Fixed Route Transit Feasibility Study			$70,000
BP-01	Bicycle Lanes on 1st Street (HWY 214)	Hobart Road	B Street	$90,000
			TOTAL	**$14,946,000**

** Denotes projects that will require coordination with ODOT or Marion County.*

FIGURE 16. POSSIBLY-FUNDED TRANSPORTATION SYSTEM PROJECTS



Legend

- Pedestrian Intersection Project
- Bicycle Intersection Project
- Transit Improvement Project
- Railroad Improvement Project
- Motor Vehicle Intersection Project
- Pedestrian Segment Project
- Bicycle Segment Project
- Off-Street Path Segment Project
- Motor Vehicle Segment Project
- Urban Growth Boundary
- City Limit
- Water
- Railroad
- Abandoned

ASPIRATIONAL TRANSPORTATION SYSTEM

The projects and actions outlined within the Likely-Funded Transportation System and Possibly-Funded Transportation System will significantly improve transportation in Silverton. If the City is able to implement a majority of the Likely-Funded System and Possibly-Funded System, nearly two decades from now Silverton residents will have access to a safer, more balanced multimodal transportation network.

The Aspirational Transportation System identifies transportation investments that are not reasonably expected to be funded by 2040. However, many of them are critically important to the transportation system. Some of the projects will require funding and resources beyond what is available in the time frame of this plan. Others are contingent upon redevelopment that makes it possible to create currently missing infrastructure, such as sidewalk connections.

The Aspirational Transportation System, shown in **Table 8** and **Figure 17**, includes about $64.6 million worth of investments.

TABLE 8. ASPIRATIONAL TRANSPORTATION SYSTEM PROJECTS

PROJECT NO.	DESCRIPTION	START	END	TOTAL ($)
OS-16	Off-Street Path Connection #12	Coolidge Street	Anderson Drive	$260,000
SW-02	Sidewalk Infill on Pine Street	Grant Street	City limits	$215,000
BP-06	Bicycle Lanes on Pine Street	West City Limits	James Ave	$460,000
EC-21	Install Crosswalk	East Leg of Mill Street/Robinson Street		$10,000
MV-07	Install Center Two-Way Left-Turn Lane (TWLTL) on C Street	Silver Creek Bridge	James Street	$10,000
BP-02	Bicycle Lanes on Oak Street (HWY 213)	Steelhammer	East City Limits	$340,000
OS-17	Off-Street Path Connection #13	Mallard Street	Sage Street	$400,000
SW-32	Sidewalk Infill on Church Street	Bartlett St	North to Dead End	$10,000
BP-13	Bicycle Lanes on Oak Street (HWY 213)	3rd Street	Church Street	$260,000
MV-14	Install a Traffic Signal	Oak Street (HWY 213)	Water Street (HWY 214)	$840,000
EC-19	Install Curb Ramps for Existing Crosswalk	NW Corner of Mill Street/Robinson Street		$10,000
BP-18	Bicycle Lanes on Hobart Road	James Street	Monitor Road	$1,100,000
OS-22	Off-Street Path Connection #18	Oak Street (HWY 213)	Connection #14 Alignment	$350,000

TABLE 8. ASPIRATIONAL TRANSPORTATION SYSTEM PROJECTS (CONTINUED)

PROJECT NO.	DESCRIPTION	START	END	TOTAL ($)
EC-24	Install Street Lighting	Western Avenue (entire segment)		$90,000
BP-20	Bicycle Lanes on Kromminga Dr, Western St, Jefferson St	Pine Street	Mill Street	$1,530,000
TS-02	Park-and-Ride Lot			$465,000
MV-15	Westside North-South Connector #2	Silverton Road	Main Street	$5,950,000
BP-27	Bicycle Lanes on Ike Mooney Rd, Sun Valley Dr, Frontier St, Pioneer Dr	S Water Street (HWY 214)	OS-15 Alignment	$600,000
EC-11	Pedestrian Crossing Enhancements	Oak Street (HWY 213)/ Church Street		$20,000
OS-18	Off-Street Path Connection #14	Mill Street	Sage Street	$320,000
BP-09	Bicycle Lanes on Ike Mooney Road	Pioneer Drive	East City Limits	$45,000
SW-13	Sidewalk Infill on McClaine Street	Craig Street	Phelpe Street	$25,000
MV-23	Install a Roundabout, Landscaped Median, or other Calming/Gateway Treatment	Highway 214	Pioneer Drive	$1,000,000
BP-21	Bicycle Lanes on Grant St, Water St, James St, Silver St, Alder Ave, Brook St, Wilson St, Short St	Western Street	Fossholm Road	$780,000
SW-01	Sidewalk Infill on Oak Street (HWY 213)	Steelhammer Rd	City limits	$480,000
OS-11	Off-Street path #8	Lincoln Street	East side of Webb Lake	$190,000
BP-11	Bicycle Lanes on Steelhammer Road	Oak Street (HWY 213)	Evans Valley Road	$555,000
EC-22	Install Crosswalk	South Leg of Western Avenue/ Grant Street		$10,000
MV-05	Install a Roundabout	Westfield Street	Main Street	$330,000
BP-14	Bicycle Lanes on Pioneer Drive	South Water Street (HWY 214)	Ike Mooney Road	$50,000
TS-05	Park-and-Ride Lot and Increased Transit Service			$1,005,000
OS-20	Off-Street Path Connection #16	Eastview Lane	Connection #15 Alignment	$400,000
EC-15	Install Median Refuge Island to Reduce Crossing Distance	Water Street (HWY 214)/Lewis Street		$10,000
BP-22	Bicycle Lanes on Peach St, Madison St, Cowing St, Coolidge St	S Water Street (HWY 214)	Main Street	$795,000

TABLE 8. ASPIRATIONAL TRANSPORTATION SYSTEM PROJECTS (CONTINUED)

PROJECT NO.	DESCRIPTION	START	END	TOTAL ($)
MV-16	Westside North-South Connector #3	Main Street	South Water Street (HWY 214)	$2,345,000
BP-24	Bicycle Lanes on Center Street	Westfield Street	Ross Avenue	$370,000
EC-23	Install Crossing Warning Signs and Pavement Markings	Grant Street/Florida Street		$10,000
OS-01	Off-Street path #1	Charles Avenue	Peach Street	$350,000
BP-31	Regional Bikeway Connection	Silverton City Limits	Mt. Angel	$3,300,000
EC-09	Pedestrian Crossing Enhancements and Sight Distance Improvements	Oak Street (HWY 213)/Mill Street		$30,000
MV-21	Install a Roundabout, Landscaped Median, or other Calming/Gateway Treatment	Pioneer Drive	Evans Valley Road	$330,000
BP-30	Regional Bikeway Connection	Silverton City Limits	Salem	$5,000,000
SW-14	Sidewalk Infill on James Street	C Street	N Water Street (HWY 214)	$70,000
OS-05	Pedestrian Stairway Connection	Coolidge Park	Anderson Drive	$80,000
RR-02	Rail/Highway Grade Crossing Improvements on Hobart Road	1st Street (HWY 214)	Hobart Road	$480,000
BP-29	Regional Bikeway Connection	Silverton City Limits	Stayton	$8,000,000
SW-19	Sidewalk Infill on Ike Mooney Road	South Water Street (HWY 214)	Existing section	$400,000
MV-19	Install a Traffic Signal	Oak Street (HWY 213)	1st Street (HWY 214)	$840,000
BP-08	Bicycle Lanes on Eureka Avenue	Main Street	South City Limits	$855,000
EC-02	Pedestrian Crossing Enhancements	South leg of Water Street (HWY 214)/ High Street		$20,000
OS-21	Off-Street Path Connection #17	Pine Street	Monson Road	$415,000
BP-17	Bicycle Lanes on Monitor Road	Oak Street (HWY 213)	Hobart Road	$635,000
MV-11	Close East Leg of Intersection	1st Street (HWY 214)	C Street	$10,000
SW-07	Sidewalk Infill on Westfield Street	Main Street	Existing section	$30,000
BP-10	Bicycle Lanes on Evans Valley Road	Steelhammer Road	East City Limits	$360,000
OS-14	Off-Street Path Connection #10 (rail alignment)	Monson Road	Hobart Road	$805,000
EC-06	Pedestrian Crossing Enhancements	1st Street (HWY 214)/ Bow Tie Lane		$20,000
MV-04	Bridge Crossing over Silver Creek	Water Street	Brook Street	$5,275,000

TABLE 8. ASPIRATIONAL TRANSPORTATION SYSTEM PROJECTS (CONTINUED)

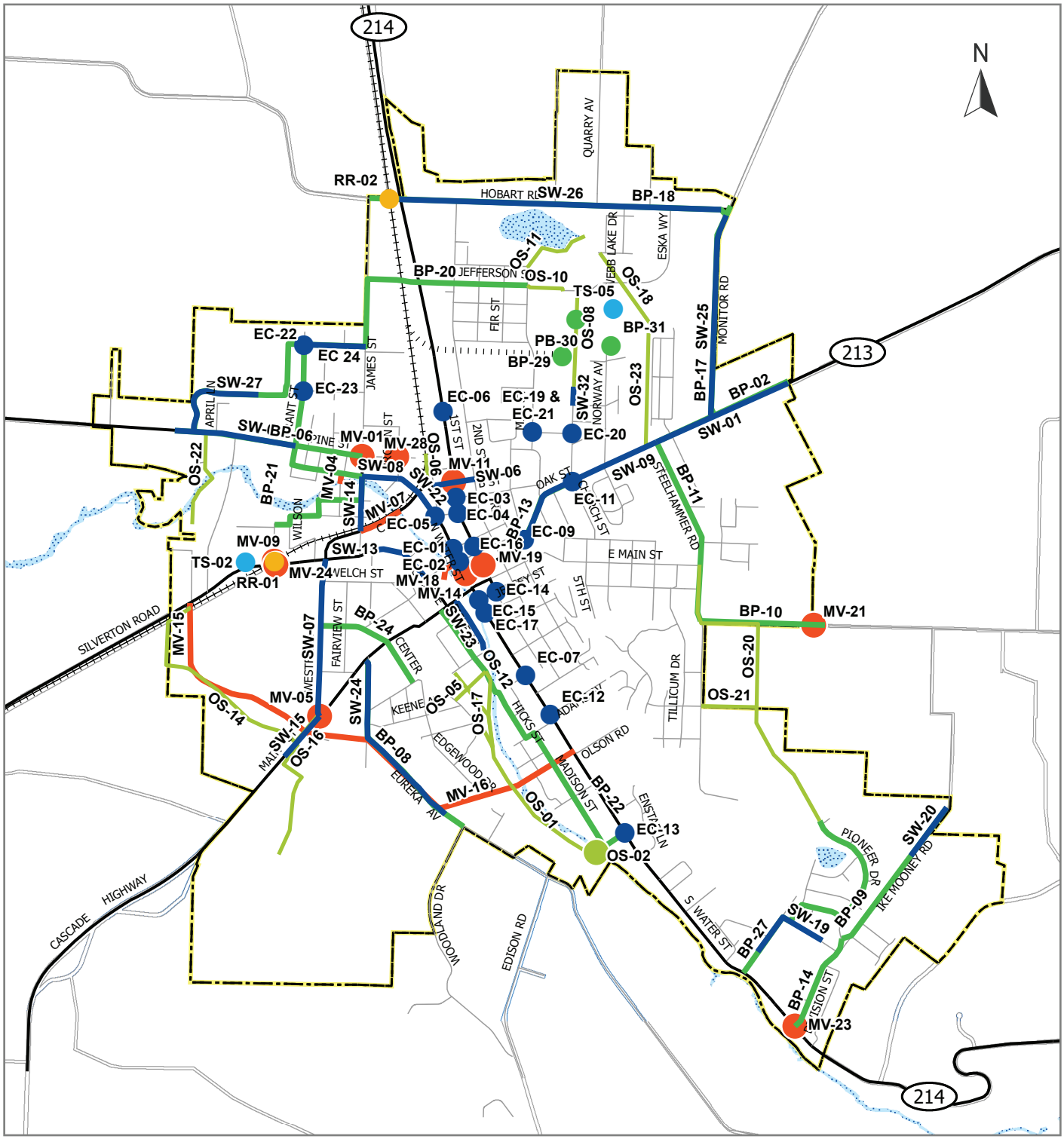
PROJECT NO.	DESCRIPTION	START	END	TOTAL ($)
EC-17	Improve Lighting at Existing Crossing	Water Street (HWY 214)	Jersey Street	$10,000
OS-10	Off-Street path #7	Jefferson Street	Eska Way	$65,000
EC-04	Pedestrian Crossing Enhancements	North leg of 1st Street (HWY 214)/A Street		$20,000
MV-01	Install a Roundabout or Traffic Signal	James Street	Pine Street	$330,000
EC-03	Pedestrian Crossing Enhancements	North/South legs of 1st Street (HWY 214)/ B Street		$30,000
OS-23	Off-Street Path #17 (Silver Cliff Drive)	Oak Street (HWY 213)	Silver Cliff Drive	$350,000
EC-01	Pedestrian Crossing Enhancements	South leg of Water Street (HWY 214)/ Park Street		$20,000
MV-24	Restrict Turning Movements on Northbound and Southbound Approaches	Silverton Road (HWY 213)	Fossholm Road	$10,000
SW-08	Sidewalk Infill on North Water Street	James Street	C Street	$300,000
OS-02	Pedestrian Bridge	Peach Street		$105,000
MV-09	Disconnect Fossholm Road from McClaine Street, extend Industrial Way to Monson Road, and apply traffic calming strategies on Brook Street	McClaine Street	Fossholm Road	$660,000
SW-06	Sidewalk Infill on C Street	Front Street	2nd Street	$35,000
EC-20	Install Curb Ramps for Existing Crosswalk	NW and SE Corners of Robinson Street/ Church Street		$10,000
OS-08	Off-Street path #5	Eska Way	Existing Church Street alignment	$230,000
MV-18	Bridge Crossing over Silver Creek Connector #6	High Street		$5,525,000
EC-07	Pedestrian Crossing Enhancements	Water Street (HWY 214)/Wesley Street		$20,000
OS-12	Salamander Footbridge Connection	Coolidge McClaine Park		$100,000
SW-26	Sidewalk Infill on Hobart Street	1st Street (HWY 214)	Monitor Road	$765,000
RR-01	Address RR Crossing Safety/Ops Issues	McClaine Street	Fossholm Road	$480,000
SW-24	Sidewalk Infill on Eureka Avenue	Main Street	south City limits	$695,000

TABLE 8. ASPIRATIONAL TRANSPORTATION SYSTEM PROJECTS (CONTINUED)

PROJECT NO.	DESCRIPTION	START	END	TOTAL ($)
OS-06	Off-Street path #3	C Street	Off-Street Connection #10 Alignment	$450,000
SW-27	Sidewalk Infill on Kromminga Drive	Pine Street	High School	$430,000
EC-05	Pedestrian Crossing Enhancements	North leg of Water Street (HWY 214)/ A Street		$20,000
EC-13	Pedestrian Crossing Enhancements	S Water Street (Hwy 214)/Peach		$20,000
SW-09	Sidewalk Infill on Oak Street (HWY 213)	Mill Street	Steelhammer Road	$375,000
SW-15	Sidewalk Infill on West Main Street	Westfield Street	City limits	$125,000
SW-23	Sidewalk Infill on Fiske Street	Main Street	Charles Avenue	$265,000
EC-14	Close Crosswalk	West Leg of 1st Street (Hwy 214)/ Lewis Street		$10,000
SW-22	Sidewalk Infill on Fiske Street	Main Street	Charles Avenue	$265,000
SW-20	Sidewalk Infill on Ike Mooney Road	Existing section	City limits	$230,000
EC-12	Pedestrian Crossing Enhancements	S Water Street (Hwy 214)/Adams		$20,000
SW-25	Sidewalk Infill on Monitor Road	Hobart Street	Oak Street (HWY 213)	$890,000
EC-16	Pedestrian Crossing Enhancements	Midblock (one side) 1st Street (Hwy 214) between Park Street and A Street		$20,000
MV-28	Brown Street Realignment	Pine Street/ Brown Street	Brown Street/ Water Street	$2,730,000
			TOTAL	**$64,555,000**

** Denotes projects that will require coordination with ODOT or Marion County.*

FIGURE 17. ASPIRATIONAL TRANSPORTATION SYSTEM PROJECTS



Legend

- Pedestrian Intersection Project
- Bicycle Intersection Project
- Transit Improvement Project
- Railroad Improvement Project
- Motor Vehicle Intersection Project
- Pedestrian Segment Project
- Bicycle Segment Project
- Off-Street Path Segment Project
- Motor Vehicle Segment Project
- Urban Growth Boundary
- City Limit
- Water
- Railroad
- Abandoned

7 STRATEGIES

Finding solutions to identified needs requires strategic approaches to make the most of investments in infrastructure. This chapter presents the strategies around travel demand management, providing travel options, creating safe routes to schools, preparing for advancements in transportation through technology, and monitoring plan implementation. Many of these strategies will help Silverton achieve their transportation goals by supplementing the TSP projects with approaches to changing people's behavior.

NEIGHBORHOOD TRAFFIC MANAGEMENT TOOLS

Neighborhood Traffic Management (NTM) describes strategies that can be deployed to slow traffic, and potentially reduce motor vehicle volumes, creating a more inviting environment for pedestrians and bicyclists. NTM strategies are primarily traffic calming techniques for improving neighborhood livability on local streets, though a limited set of strategies can also be applied to collectors and arterials. Mitigation measures for neighborhood traffic impacts must balance the need to manage vehicle speeds and volumes with the need to maintain mobility, circulation, and function for service providers, such as emergency responders. **Figure 18** includes a visual summary of common neighborhood traffic management strategies.

Following adoption of this TSP, the City of Silverton will develop and implement a formal neighborhood traffic management program guided by the following objectives:

- Provide solutions that improve livability along publicly-owned neighborhood streets through the thoughtful implementation of a traffic management program, by properly controlling vehicular traffic and enhancing the safety and ability to walk and bicycle, while reducing accidents and maintaining emergency vehicle access;
- Provide a means for residents to work together to seek solutions to neighborhood traffic concerns;
- Provide a wide range of solutions to address neighborhood traffic management issues, including devices and street designs that accomplish the goals related to the control of vehicular traffic, without creating adverse impacts to other key areas such as pedestrian and bicycle access, service provider activities, and maintenance;
- Provide an equitable and credible process to evaluate neighborhood traffic calming requests;
- Provide a process that incorporates the input of affected citizens, potentially affected citizens, and service providers into the solution;

- Develop a process based on engineering and factual information;
- Develop solutions that are maintainable after implementation and that minimize maintenance costs

In addition to adopting a neighborhood traffic management program, the City will modify the Traffic Impact Study requirements for development applications. This will include a neighborhood impact assessment and mitigation program if the development is anticipated to add significant traffic volumes (or change vehicle speeds) on surrounding local or neighborhood collector streets in a residential area. Thresholds used to determine an impact may be similar to the following:

- Local residential street volumes should not increase above 1,200 average daily trips.
- Local residential or neighborhood collector residential street speeds should not exceed 28 miles per hour (85th percentile speed).

Impacts should be analyzed if the proposed project would increase volumes on a local residential or neighborhood collector residential street by more than 25 vehicles in a peak hour.

FIGURE 18. NEIGHBORHOOD TRAFFIC MANAGEMENT STRATEGIES

CHICANES

www.pedbikeimages.org/Dan Burden

CHOKERS

www.pedbikeimages.org/Dan Burden

CURB EXTENSIONS

www.pedbikeimages.org/Carl Sundstrom

DIVERTERS

www.pedbikeimages.org/Adam Fukushima

MEDIAN ISLANDS

www.pedbikeimages.org/Dan Burden

RAISED CROSSWALKS

www.pedbikeimages.org/Tom Harned

SPEED CUSHIONS

NACTO Urban Street Design Guide

SPEED HUMP

www.pedbikeimages.org/Dan Burden

TRAFFIC CIRCLES

www.pedbikeimages.org/Carl Sundstrom

Table 9 lists common NTM applications and suggests which types of streets they may be appropriate for. Any NTM project will include coordination with emergency response staff to ensure that public safety is not compromised. NTM strategies proposed on State or County facilities are required to meet the standards and policies of those agencies.

TABLE 9. TRAFFIC CALMING MEASURES BY STREET FUNCTIONAL CLASSIFICATION

NTM APPLICATION	USE BY FUNCTION CLASSIFICATION			IMPACT	
	ARTERIALS	COLLECTORS	NEIGHBORHOOD COLLECTORS & LOCAL STREETS*	SPEED REDUCTION	TRAFFIC DIVERSION
CHICANES			•	•	•
CHOKERS			•	•	•
CURB EXTENSIONS	•	•	•	•	
DIVERTERS (WITH EMERGENCY VEHICLE PASS-THROUGH)		•	•		•
MEDIAN ISLANDS	•	•	•	•	
RAISED CROSSWALKS			•	•	•
SPEED CUSHIONS (WITH EMERGENCY VEHICLE PASS-THROUGH)			•	•	•
SPEED HUMP			•	•	•
TRAFFIC CIRCLES		•		•	•

* Traffic calming measures are appropriate on lesser response routes that have connectivity (more than two accesses) and are accepted and field tested by the Silverton Fire District.

TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is the general term used to describe any action that removes single occupant vehicle trips from the roadway network during peak travel demand periods. Generally, TDM focuses on reducing vehicle miles traveled and promoting alternative modes of travel for large employers of an area. As growth in the Silverton area occurs, the number of vehicle trips and travel demand in the area will also increase. The ability to change travel behaviors and provide alternative mode choices will help accommodate this growth with less spending on projects to add system capacity.

Many of the TDM strategies are tailored towards urban applications, where there are major employment generators and transit opportunities. TDM measures for more rural communities require special development, as compared to those that are implemented in urban areas.

TDM measures in rural environments should focus on increasing travel options and creating an environment that is supportive for walking and cycling. The most effective TDM measure for Silverton includes elements related to increased parking management (parking time limits and pricing) downtown, carpools, improved services for alternative modes of travel and employer incentives for the hospital, schools and BrucePac.

The City of Silverton will coordinate with Marion County to implement the pedestrian, bicycle, and transit system improvements, which offer alternative modes of travel. However, TDM includes a wide variety of actions that are specifically tailored to the individual needs of an area. **Table 10** provides a list of several strategies that will be applied as appropriate within the City of Silverton.

TABLE 10. TRANSPORTATION DEMAND MANAGEMENT STRATEGIES

STRATEGY	DESCRIPTION	POTENTIAL TRIP REDUCTION
TELECOMMUTING	Employees work at home or at a work center closer to home, rather than commuting from home to work. This can be full time or on selected workdays. This can require computer equipment to be most effective.	82-91% (Full Time) 14-36% (1-2 day/wk)
COMPRESSED WORK WEEK	Schedule where employees work their regular scheduled number of hours in fewer days per week.	7-9% (9 day/80 hr) 16-18% (4 day/40 hr) 32-36% (3 day/36 hr)
TRANSIT PASS SUBSIDY	For employees who take transit to work on a regular basis, the employer pays for all or part of the cost of a monthly transit pass.	19-32% (full subsidy, high transit service) 2-3% (half subsidy, medium transit service)
CASH OUT EMPLOYEE PARKING	An employer that has been subsidizing parking (free parking) discontinues the subsidy and charges all employees for parking. An amount equivalent to the previous subsidy is then provided to each employee, who then can decide which mode of travel to use.	**Reduction** — **Transit** 8-20% — High 5-9% — Medium 2-4% — Low

TABLE 10. TRANSPORTATION DEMAND MANAGEMENT STRATEGIES (CONTINUED)

STRATEGY	DESCRIPTION	POTENTIAL TRIP REDUCTION
REDUCED PARKING COST FOR HOVS	Parking costs charged to employees are reduced for high occupancy vehicles (HOV) such as carpools and vanpools.	1-3%
ALTERNATIVE MODE SUBSIDY	For employees that commute to work by modes other than driving alone, the employer provides a monetary bonus to the employee.	21-34% (full subsidy of cost, high alternative modes) 2-4% (half subsidy of cost, medium alternative modes)
BICYCLE PROGRAM	Provides support services to those employees that bicycle to work. Examples include: safe/secure bicycle storage, shower facilities and subsidy of commute bicycle purchase.	0-10%
ON-SITE RIDESHARE MATCHING FOR HOVS	Employees who are interested in carpooling or vanpooling provide information to a transportation coordinator regarding their work hours, availability of a vehicle and place of residence. The coordinator then matches employees who can reasonably rideshare together.	1-2%
PROVIDE VANPOOLS	Employees that live near each other are organized into a vanpool for their trip to work. The employer may subsidize the cost of operation and maintaining the van.	15-25% (company provided van with fee) 30-40% (subsidized van)
GIFT/AWARDS FOR ALTERNATIVE MODE USE	Employees are offered the opportunity to receive a gift or an award for using modes other than driving alone.	0-3%
WALKING PROGRAM	Provide support services for those who walk to work. This could include buying walking shoes or providing lockers and showers.	0-3%
COMPANY CARS FOR BUSINESS TRAVEL	Employees are allowed to use company cars for business-related travel during the day	0-1%
GUARANTEED RIDE HOME PROGRAM	A company owned or leased vehicle or taxi fare is provided in the case of an emergency for employees that use alternative modes.	1-3%
TIME OFF WITH PAY FOR ALTERNATIVE MODE USE	Employees are offered time off with pay as an incentive to use alternative modes.	1-2%

Source: Guidance for Estimating Trip Reductions from Commute Options, Oregon Department of Environmental Quality, August 1996.

SAFE ROUTES TO SCHOOLS

The City of Silverton has expressed interest in starting a Safe Routes to School (SRTS) program to improve the safety of not just students, but all people who bike and walk in the city. In Oregon, SRTS programs and funding are administered by ODOT. As part of the 2017 transportation package passed by the Oregon Legislature, the SRTS program was allocated $10 million per year in funding, increasing to $15 million per year in 2023. In the coming years, there will be ample funding available to improve the safety of students and encourage an active, healthy lifestyle for Silverton's youngest residents.

As part of the Silverton TSP update process, the project team worked in coordination with the Silver Falls School District to help them develop a SRTS Action Plan to complement needed pedestrian and bicycle infrastructure around Robert Frost Elementary School, Mark Twain Elementary School, Silverton Middle School, and Silverton High School. Walking Audits that included Task Force members and community volunteers were conducted for each school. The findings were documented in Walking Audit Reports that included recommendations for infrastructure improvements on school grounds and the surrounding transportation network, as well as programmatic activities to support education, outreach, enforcement, and program evaluation. The Silver Falls School District will use these reports to complete Action Plans, which are required to compete for State funding. The Walking Audit Reports for each school are included in Volume 2 of this TSP. The recommended infrastructure improvements from those reports have been included in Chapter 6 of the TSP.

PREPARING FOR SMART MOBILITY

Emerging vehicle technologies will shape our roads, communities, and daily lives for generations. Vehicles are becoming more connected, automated, shared, and electric. This future is highly uncertain, but it will have significant impacts for how we plan, design, build, and use our transportation system. Below are some important definitions that provide the basis for the impacts, policies, and actions items discussed in the following sections.

Connected Vehicles (CVs) will enable communications between vehicles, infrastructure, and other road users. This means that our vehicles will be able to assist human drivers and prevent crashes while making our system operate more smoothly.

Automated Vehicles (AVs) will, to varying degrees, take over driving functions and allow travelers to focus their attention on other matters. Today, we already have vehicles with combined automated functions such as lane keeping and adaptive cruise control. However, these still require constant driver oversight. In the future, more sophisticated sensing and programming technology will allow vehicles to operate with little to no operator oversight.

Shared Vehicles (SVs) are already on the road today that allow ride-hailing companies to offer customers access to vehicles through s mart phone applications. Ride-hailing applications allow for on-demand transportation with comparable convenience to car ownership without the hassle of maintenance, insurance, and parking. Ride-hailing applications can enable customers to choose whether to share a trip with another person along their route, or travel alone.

Electric Vehicles (EVs) have been on the road for decades and are becoming more economically feasible as the production costs of batteries decline. Many of these vehicles will not be exclusive of the others and it is important to think of the host of implications that arise from the combination of these technologies. When discussing these vehicles as a whole, they can be referred to as connected, automated, shared, and electric (CASE) vehicles.

IMPACTS OF CASE VEHICLES

There are several competing forces that will unfold as connected, automated, and shared vehicles are deployed. It is difficult to predict how these vehicles will influence congestion and road capacity. The following factors will transform how people use our roadways:

- AVs will provide a more relaxing or productive ride experience and people will have less resistance to longer commutes.
- Shared AVs will likely cost significantly less on a per-mile basis which will increase demand for travel.
- CV technology will allow vehicles to operate safely with closer following distance, less unnecessary braking, and better coordinated traffic control. This will increase road capacity in the long run as CVs and AVs comprise increasing portions of the public and private fleet of vehicles.
- In the near term, as AVs still make up a fraction of the fleet of vehicles, road capacity could decrease as AVs will operate more slowly and cautiously than regular vehicles.
- A new class of traffic – zero-occupant vehicles – will increase traffic congestion.

Roadways may need to be redesigned or better maintained to accommodate the needs of automated driving systems. For instance, striping may need to be wider and more consistently maintained.

Congestion and Road Capacity

The following questions remain open and should be followed closely to understand the degree to which CASE vehicles will impact road capacity and congestion:

- How much will AVs cost for people to own them personally?
- How much will AVs cost if they are used as a shared fleet?
- How does cost and the improved ride experience of AVs influence travel behavior?
- How much more efficiently will AVs operate compared to regular human-driven vehicles once they dominate the vehicle fleet?
- How will AVs impact road capacity in the near term as they are deployed in mixed traffic with human-driven vehicles?
- What portion of traffic will be zero-occupant vehicles and what areas will likely generate the highest portion of zero-occupant vehicles looking for parking or waiting for their next passenger?

Transit

AVs could become cost competitive with transit and undermine transit ridership as riders prefer a more convenient alternative. However, transit will remain the most efficient way to move high volumes of people through constricted urban environments. AVs will not eliminate congestion and as discussed above, could exacerbate it – especially in the early phases of AV adoption. In addition, shared AVs may not serve all areas of a community and underserved communities will still require access to transit to meet their daily needs.

Parking

Because AVs will be able to park themselves, travelers will elect to get dropped off at their destination while their vehicle goes to find parking or their next passenger. Shared AVs will have an even greater impact on parking because parking next to your destination will no longer be a priority for the traveling public. This means that parking may be over-supplied in many areas and new opportunities to reconfigure land use will emerge. Outstanding questions related to parking that should be closely followed include:

- How does vehicle ownership impact parking behavior?
- What portion of the AV fleet will be shared?
- How far out of the downtown area will AVs be able to park while remaining convenient and readily available?

Curb Space

In addition to parking impacts, the ability to be dropped off at your destination will create more potential for conflicts in the right-of-way between vehicles that are dropping passengers off, vehicles moving through traffic, and vehicles parked on the street. This issue is already occurring in many urban areas with ride-hailing companies where popular destinations are experiencing significant double-parking problems.

Package Delivery

AVs will also be used to deliver packages, food, and expanded services. This may mean that delivery vehicles will need to be accommodated in new portions of the right-of-way. For instance, if the AV parks at the curb in a neighborhood and smaller robots are used to deliver packages from door to door, new conflicts will arise between vehicles, pedestrians, and bicyclists.

Electric Vehicle Charging

To accommodate a future where electric vehicles will come to dominate our vehicle fleet, we will need to build new charging capacity. In addition to charging stations, cities, electric utilities, regions, and states will need to work together to create enough electricity to supply the significant increase in demand.

Electric Scooters

Fleets of dockless electric scooters have arrived in many cities across the nation. The scooters are activated with a smartphone app and can be left at the end destination. Their convenience and low cost make them an attractive option for many making shorter trips, which could reduce the number of short trips made by motor vehicles. Public safety has been a concern in other cities as many riders do not wear helmets or they ride on sidewalks, which creates conflicts with pedestrians. In addition, many riders do not park them properly and leave them in places that obstruct pedestrian pathways.

POLICIES AND ACTION ITEMS

Mobility Hubs

A mobility hub is a central location that serves as a multimodal connection point for transit, car share, bike share, ride share stations (see **Figure 19**). This system can serve as a tool to encourage travelers to take seamless multimodal trips that are well-timed and convenient. Mobility hubs make the most sense to put in transit centers that are located near urbanized areas with multimodal supportive infrastructure (e.g., protected bike lanes) to maximize connectivity for first and last-mile solutions. During the development of any future park and ride lots, Silverton will consider incorporating mobility hub elements to maximize the utility of these facilities.

FIGURE 19. CONCEPTUAL DESIGN EXAMPLE OF A MOBILITY HUB

ROAD PLANNING AND CAPACITY

It is difficult to plan for the impacts of CASE vehicles on road capacity at this point in their development. Because there is a high potential that ultimately road capacity will increase after CASE vehicles are widely adopted along with a corresponding increase in traffic demand, we can expect that congestion will continue to persist. However, CASE vehicles provide a much greater opportunity for effective transportation demand management solutions because the expected congestion can be used to encourage use of transit, shared vehicles, and bike share. These modes could all be encouraged through pricing mechanisms that are vastly less expensive to implement than building more road capacity. A variety of pricing mechanisms and alternatives to the State gasoline tax are enabled with CASE technology because these vehicles will be tracked geographically, and by time of day. With time/ location data, transportation system operators will be able to develop pricing mechanisms that reduce congestion at a lower cost than other roadway improvements. Larger cities will be the first to implement these strategies, but Silverton will follow these developments closely.

Parking

As CASE vehicles are more widely adopted, Silverton will periodically review its parking standards.

- Consider revising minimum parking requirements for new developments, especially in areas that are within one mile of transit.
- Explore public/private partnerships to fund the installation of electric vehicle charging stations.
- Inventory parking utilization and identify areas that could be converted from parking to curbside pick-up and drop-off zones.

Transit

To avoid potential equity and congestion issues, transit agencies need to work together to integrate the use of automated vehicles and transit. Transit needs to adapt to new competition in the transportation marketplace as well as consider adopting CASE technologies to support transit operations. Silverton may consider:

- Partnering with ride-hailing companies to provide first and last-mile solutions.
- Working with ride-hailing companies and bike share to integrate payment platforms and enable one button purchase of a suite of transportation options for multimodal trips.
- Using fixed route autonomous shuttles to provide first and last-mile solutions.
- Using on-demand autonomous shuttles to provide first and last-mile solutions.

Intelligent Transportation Systems

An Intelligent Transportation System (ITS) utilizes technology and innovative services to promote a safer and “smarter” transportation experience where all types of users are better informed and can make more efficient use of the transportation system. Silverton does not own or operate ITS infrastructure, or even traffic signals, at this time. It is unlikely that the City of Silverton will invest in ITS on its own, but will support regional partners on larger scale efforts that would benefit Silverton residents. Such cooperation could range from agreements to share information and data or allow use of City right-of-way for regional ITS infrastructure.

PERFORMANCE MEASURES

Performance management is an approach to transportation planning that has received increased national and regional attention in recent years. In the most basic sense, performance management consists of using performance data to support decisions to help achieve desired transportation policy and investment outcomes. Because desired outcomes vary from agency to agency, performance management requires a personalized approach for each agency in order to be effective.

The City of Silverton may consider using easy to measure performance metrics to track progress toward implementing the TSP and achieving the TSP goals. Regular monitoring and reporting (e.g., on an annual basis) would be informative, but could also be resource-intensive. Since it will likely take many years to significantly change performance at a citywide level, a more practical alternative would be to apply these performance measures as evaluation criteria at the time of the next TSP update, or to monitor at five-year intervals. **Table 11** provides a sample of performance measures for consideration that support Goals 1 through 5 of this TSP.

TABLE 11. SYSTEM PERFORMANCE MEASURES FOR MONITORING TSP IMPLEMENTATION PROGRESS

PERFORMANCE MEASURE	GOAL 1: LIVABILITY	GOAL 2: REDUCE NUMBER OF SOVS	GOAL 3: SAFETY	GOAL 4: EFFICIENCY	GOAL 5: ACCESSIBILITY
LINEAR FEET OF SIDEWALK CONSTRUCTED	•	•	•		•
NUMBER OF CRASHES RESULTING IN HIGH-SEVERITY INJURIES OR FATALITIES	•		•		
PERCENT OF COMMUTING TRIPS MADE BY SOVS		•		•	
NUMBER OF INTERSECTIONS FAILING TO MEET MOBILITY STANDARDS				•	
PERCENT OF ARTERIAL AND COLLECTOR MILES WITH DEDICATED BICYCLE FACILITIES	•	•	•		•
NUMBER OF PROJECTS OR PROGRAMS IMPLEMENTED FROM SAFE ROUTES TO SCHOOLS PLANS	•		•		•
NUMBER OF ANNUAL TRANSIT RIDERS	•	•			•
NUMBER OF ADA UPGRADE PROJECTS COMPLETED	•		•		•