Newberg

ADA/Pedestrian/Bike Route Improvement Plan

alta
PLANNING + DESIGN

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I. Introduction

Plan Overview

The City of Newberg is a fast-growing city of 20,567 people southwest of the Portland metropolitan area, and the transforming population demands more intensive urban services. The historical rural nature of the community means that much of the city's alternative transportation mode infrastructure (sidewalks, bike lanes) has developed intermittently. Many of the streets in Newberg have large gaps where some and/or all of these alternative transportation mode infrastructures are missing. In addition, many of the old facilities, like sidewalks, are in poor condition.

Newberg residents desire to make their city more attractive for biking and walking, and to address constraints for bicyclists and pedestrians, especially outside the downtown. In various areas throughout Newberg, especially around schools, parks, and community destinations, there is a need for pedestrian and bicycle infrastructure upgrades. These include intersection improvements, sidewalk completion, Americans with Disabilities Act (ADA) compliance, landscaping, and connectivity. In addition, the Safer Routes to School program and other innovative programs covered in this Plan seek to address the needs of people of all ages and abilities.

Missing sidewalks force pedestrians into the road, decreasing safety for the pedestrian.

The ADA/Pedestrian/Bike Route Improvement Plan (referred to as "the Plan") identifies the primary critical routes between residential, commercial, and industrial areas that have service gaps and deficiencies for ADA accessibility, sidewalks, and bicycling infrastructure. The primary goals of the Plan is to: (1) develop a prioritized list of improvement projects along the identified critical routes that will address these gaps and deficiencies; (2) determine the cost of constructing the improvements as well as identifying funding sources to finance the improvements; and (3) lay out a timeline to complete the needed projects.

Downtown Newberg accommodates bicyclists and pedestrians.

This Plan is designed to take Newberg's bicycle and pedestrian system to the next level: to help develop a comprehensive bicyclist and pedestrian system that enhances and increases the city's walkability to the extent that all people will feel safe walking, to increase connections to destinations throughout the city, and to increase the number of children who walk and bike

to school.

This Plan would not have come together without the time and energy dedicated by Task Force members and City staff, who worked for months to ensure that the needs of pedestrians and bicyclists, including those with mobility limitations, in the City of Newberg were identified and prioritized for funding and constructing improvements.

Benefits of Walking and Bicycling

Walking and bicycling are healthy, efficient, low cost modes of travel, available to nearly everyone. Walking is the most basic form of transportation. Almost everyone is a pedestrian at some point in the day, as walking is often the quickest way to accomplish short trips in urban areas. Pedestrians also include persons using wheelchairs and other forms of mobility devices. Bicycling is the most energy efficient form of transportation today. A car will only travel 280 feet on the number of calories that a bicyclist needs to travel three miles.

Walking and bicycling help communities develop and maintain "livable communities;" making neighborhoods safer and friendlier; and reducing transportation related environmental impacts, mobile emissions, and noise. They provide transportation system flexibility by providing alternative mobility options, particularly in combination with transit systems, to people of all ages and abilities. There is also growing interest in encouraging walking and bicycling as a means for improving public health. Planners and city leaders are encouraged to create more walkable and bikeable communities that promote healthier lifestyles.

Walking and biking help increase physical fitness.

Walking and bicycling are important to the health of all those living and working in Newberg, not just to those doing the walking or cycling. People choosing to ride or walk rather than drive are typically replacing short automobile trips, which contribute disproportionately high amounts of pollutant emissions. Since bicycling and walking contribute no pollution, require no external energy source, and use land efficiently, they effectively move people from one place to another with minimal environmental impacts.

Bicycling and walking can also help alleviate congestion and stressed transportation systems. Nationally, the number of vehicle miles traveled (VMT), rates of car ownership, and trips have continued to grow, which has increasingly stressed transportation systems (primarily roadways) and contributed to congestion (NPTS, 2003).

Bicycling and walking require less space and infrastructure when compared to automobile facilities. Improvements made for bicyclists often result in better conditions for other transportation users as well. For instance, paved shoulders, wide curb lanes, and bicycle lanes not only provide improved conditions for bicyclists, but also often contribute to safer conditions for motorists and a reduction in roadway maintenance costs as well.

Walking and bicycling are also good choices for families. A bicycle enables a young person to explore her neighborhood, visit places without being driven by her parents, and experience the freedom of personal decision-making. More trips by bicycle and on foot mean fewer trips by car. In turn, this means less traffic congestion around schools and in the community, and less time spent by parents driving kids around.

Many kids walk or ride bikes to the skatepark.

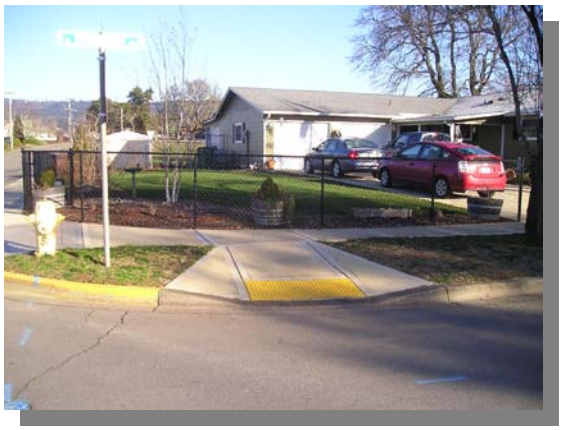
Bicycling and walking create opportunities to speak to neighbors and put more "eyes on the street" to discourage crime and violence. It is no accident that communities with high levels of walking and bicycling have low crime rates are generally attractive and friendly places to live.

The extent of bicycling and walking in a community has been described as a barometer of how well that community is advancing its citizens' quality of life. Streets that are busy with bicyclists and walkers are considered to be environments that work at a human scale, and foster a heightened sense of neighborhood and community.

Accommodating People with Disabilities

With the advent of the Americans with Disabilities Act (ADA) in 1990, the nation recognized the need to provide equal access to all residents. Since its inception, ADA has significantly changed the design requirements for the construction of public space. However, much of the pedestrian environment built prior to the ADA's inception does not adequately accommodate people with disabilities. The City of Newberg's approach is to gradually change this situation through land development project requirements, unrelated capital street improvement projects, and capital projects that specifically retrofit antiquated public pedestrian facilities.

It is important to note that a pedestrian environment that is strategically built to be accessible for people with disabilities is also more accessible for all. Curb ramps, for instance, can accommodate strollers, shopping carts and dollies for the movement of goods. Accessible intersection crossings can increase the safety for people regardless of ability. In recognition of this, the City's philosophical approach is to create pedestrian environments that are attractive, functional, and accessible to all people.



Accessible ramps provide access to all pedestrians.

In order to adequately plan the pedestrian environment for people with disabilities, the Plan must take into account each of the disabilities and the limitations they present. It is also important to be aware of how planning for people with one disability affects people with another. For example, gradual

ramps and smooth transitions to the street help people in wheelchairs, but present challenges for the sight-impaired if they cannot easily find the end of the sidewalk and beginning of the street. Additionally, the Plan should also consider the needs of children and older adults.

The section below identifies populations whose needs must be taken into account in creating an accessible pedestrian environment.

People with Mobility Impairments

People with mobility impairments range from those who use wheelchairs, crutches, canes, orthotics, and prosthetic devices, to those who do not use such devices but face constraints for many reasons when walking long distances, on non-level surfaces, or on steep grades. Curb ramps are particularly important to people with mobility impairments. Prosthesis users often move slowly and often have difficulty with steep grades or cross slopes.

An accessible pedestrian environment serves all users.

People with mobility impairments are affected by:

- Uneven surfaces that hinder movement or cause loss of balance
- Rough surfaces that make rolling difficult, cause a loss of balance, or cause pain especially for people with back injuries
- Steep uphill slopes that can make movement slow or impossible
- Steep downhill slopes that can cause a loss of control or are difficult to negotiate
- Cross slopes that cause instability or loss of balance
- Narrow sidewalks that impede the ability of users to turn or to cross paths with others
- Devices that are hard to reach, such as push buttons for walk signals and doors
- Long distances
- Situations that require fast reaction time
- Signalized walk phases that are shorter than the time it takes for them to cross the street

People with Sensory Impairments

People with sensory impairments include those who are partially or fully blind or deaf. They also include people whose perception of touch or balance is not good, as well as those who are colorblind.

Visually impaired people have the following characteristics:

- Limited or no perception of the path ahead

- Limited or no information about their surroundings, especially in a new place
- Changing environments in which they rely on memory
- Lack of non-visual information
- Inability to react quickly
- Unpredictable situations, such as complex intersections that are not at 90 degrees
- Inability to distinguish the edge of the sidewalk from the street
- Compromised ability to detect the proper time to cross a street
- Compromised ability to cross a street along the correct path (especially when a curb ramp is oriented diagonally toward an intersection's center point)
- Need for more time to cross the street
- Hearing impaired people rely on visual information, which is often inadequate. They face most of their mobility difficulties in not being able to hear approaching vehicles and not being able to detect the time of their arrival. This is especially an issue in locations with limited sight distances, such as where streets curve or landscaping blocks the view.

People with Cognitive Impairments

People with cognitive impairments encounter difficulties in thinking, learning, responding, and performing coordinated motor skills. Cognitive disabilities can cause some to become lost, or to have difficulty finding their way. They may also not understand standard street signage. People who are not able to read benefit from signs with symbols and colors.

Children and Other Adults

Children and many older adults do not fall under specific categories for disabilities, but must be taken into account in pedestrian planning. Children are less mentally and physically developed than adults. They have the following characteristics:

- Less peripheral vision
- Less ability to judge speed and distance
- Difficulty locating sounds
- Read less than adults or not at all, so do not understand text signs
- Sometimes act impulsively or unpredictably
- Lack familiarity with traffic
- Face difficulty carrying packages

Other adults often exhibit degrading sensory or physical capabilities. This can cause them to:

- Gradually lose vision, especially at night
- Have decreased ability to hear sounds and detect where they come from

- Have less endurance; have less strength to walk up hills
- Have less balance, especially on uneven or sloped sidewalks
- React slowly to dangerous situations
- Walk slowly

Standards and Guidelines

To address the needs of bicyclists and pedestrians, the federal and state governments have developed a number of standards and guidelines that are highlighted below.

Federal Standards and Guidelines

Accommodating Bicycle and Pedestrian Travel: A Recommended Approach

A Policy Statement drafted by the U.S. Department of Transportation with the input and assistance of public agencies, professional associations and advocacy groups. The Policy Statement says that bicycle and pedestrian facilities will be incorporated into all transportation projects unless exceptional circumstances exist.

Americans with Disability Act (ADA)

The ADA prohibits State and local governments from discriminating against people with disabilities in all programs, services, and activities. Under the ADA, the U.S. Access Board has developed and continues to maintain design guidelines for accessible buildings and facilities known as the ADA Accessibility Guidelines (ADAAG). These guidelines were adopted by the Department of Transportation and published as the *ADA Standards for Accessible Design* and are enforceable under the ADA.

"The implementing regulations for Titles II and III of the ADA require curb ramps to be provided in all existing facilities and for new construction and alterations"[1] However, with the exception of curb ramps, accessibility standards have not yet been developed for sidewalks and trails.

Despite the current lack of enforceable standards, "public and private entities who design and construct sidewalks and trails are still obligated under ADA to make them accessible to and usable by people with disabilities. Until specific standards are adopted as part of ADAAG, some of the existing scoping and technical provisions for new construction and alterations can be applied to the design of pedestrian facilities, such as"[2]:

- Accessible Routes (ADAAG 4.3)
- Curb Ramps (ADAAG 4.7)
- Ramps (ADAAG 4.8)

[1] Federal Highway Administration, U.S. Department of Transportation. "Designing Sidewalks and Trails for Access, Part I of II: Review of Existing Guidelines and Practices" Barbara McMillen, Program Manager; Beneficial Designs, Inc. Author. Clay Butler, Illustrations. September 2001. http://www.fhwa.dot.gov/environment/sidewalk2/
[2] *ibid*

Rights-of-Way Accessibility Guidelines

In addition to maintaining the ADAAG, the U.S. Access Board has published draft public rights-of-way accessibility guidelines. While these guidelines have not been adopted into the ADAAG yet, the Access Board recommends that where ADA standards don't include applicable provisions, the November 23, 2005 draft *Public Rights-of-Way Accessibility Guidelines* be referenced as a best practices manual.[3] The draft guidelines address the following:

- Pedestrian Access Route
- Alternate Circulation Path
- Curb Ramps and Blended Transitions
- Detectable Warning Surfaces
- Pedestrian Crossings
- Accessible Pedestrian Signals
- Street Furniture
- On-Street Parking
- Call Boxes

Federal Highway Administration (FHWA)

In an effort to highlight when ADAAG provisions apply to sidewalks and trails, and how to bridge the remaining gaps, the Federal Highway Administration released *Designing Sidewalks and Trails for Access* as a two-part guidebook – Part I: Review of Existing Guidelines and Practices and Part II: Best Practices Design Guide. Part I is a compilation of data, designs, and guidelines collected from literature reviews and site visits. Part II focuses on the design process and identifying best practices for designing sidewalks and trails for access by all users.

American Association of State Highway and Transportation Officials' (AASHTO)

AASHTO has published two books, the Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004) and Guide for the Development of Bicycle Facilities (1999) that are intended to provide guidance on the planning, design, and development of bicycle and pedestrian facilities to ensure a safe accommodation for all modes of travel on public rights-of-way.

Manual on Uniform Traffic Control Devices (MUTCD)[4]

The FHWA, with the active assistance from the National Committee on Uniform Traffic Control Devices, adopted a new manual in 2003. Pedestrian and bicycle provisions in the MUTCD are located in a number of the parts of the manual. In general, the manual provides directives for traffic control devices that are to be used as standards, including warrants and design of pedestrian markings, signs, and signals. Relevant sections include:

- Section 3B.17 Crosswalk Markings

[3] Available at http://www.access-board.gov/prowac/draft.htm
[4] Federal Highway Administration, U.S. Department of Transportation. "Manual on Uniform Traffic Control Devices 2003 edition".

- Section 4C.05. Warrant 4. Pedestrian Volume
- Section 4D.03. Provisions for Pedestrians
- Section 4E.03 Application of Pedestrian Signal Heads
- Section 4E.06 Accessible Pedestrian Signals
- Section 4E.09 Accessible Pedestrian Signal Detectors
- Section 9C.04 Markings for Bicycle Lanes

State Standards and Guidelines

The 1995 Oregon Bicycle and Pedestrian Plan sets forth the standards and guidelines for bikeways, walkways, and other pedestrian facilities, including crossing treatments that should be followed within the state of Oregon. Many of the standards and guidelines are based on federal standards and guidelines.

On-Road Bikeways[5]

Bicycles are legally classified as vehicles in Oregon, and roadways must be designed to allow bicyclists to ride in a manner consistent with the vehicle code. A bikeway is created when a road has the appropriate design treatment to accommodate bicyclists, based on motor vehicle traffic volumes and speed. The basic design treatments to accommodate bicycle travel on the road are: shared roadway, shoulder roadway, or bike lane. Another type of facility is separated from the roadway: multi-use path.

There are no specific bicycle standards for most shared roadways; they are simply the roads as constructed. Shared roadways function well on local streets and minor collectors, and on low-volume rural roads and highways. Shared roadways are suitable in urban areas on streets with low speeds – 25 mph or less – or low traffic volumes (3,000 Average Daily Traffic or less, depending on speed and land use). A wide curb lane may be provided where there is inadequate width to provide a bike lane. Bike lanes are provided on urban arterial and major collector streets. Bike lanes may also be provided on rural roadways near urban areas, where there is high potential bicycle use.

Walkways[6]

Pedestrian facilities include walkways, traffic signals, crosswalks and other amenities such as illumination and benches.

[5] Oregon Bicycle and Pedestrian Plan (1995), II.1. On-Road Bikeways
[6] Oregon Bicycle and Pedestrian Plan (1995), II.4 Walkways, B. Standards

A walkway is a transportation facility built for use by pedestrians and persons in wheelchairs. Walkways include:

- Sidewalks
- Paths

Sidewalks
Sidewalks are located along roadways, separated with a curb and/or planting strip, and have a hard, smooth surface. Bicyclists sometimes use sidewalks in residential areas, but cities may ban bicycle riding on sidewalks.

Paths
Paths are typically used by pedestrians, cyclists, skaters and joggers (Multi-Use Paths). It is not realistic to plan and design a path for the exclusive use by pedestrians, as other users will be attracted to the facility. Paths may be unpaved, constructed with packed gravel or asphalt grindings, if they are smooth and firm enough to meet ADA requirements.

- Multi-Use Paths. Well-planned and well-designed multi-use paths can provide good pedestrian and bicycle mobility. Paths can serve both commuter and recreational cyclists. The key components to successful paths include: continuous separation from traffic, scenic qualities, connection to land uses, well-designed street crossings, visibility, good design, and proper maintenance[7].
- Unpaved Paths. The standard width of an unpaved path is the same for sidewalks. An unpaved path should not be constructed where a sidewalk is more appropriate. The surface material should be packed hard enough to be usable by wheelchairs and children on bicycles (the roadway should be designed to accommodate more experienced bicyclists).

Roadway Crossing Policies and Treatments

ODOT Crosswalk Policy[8]
An engineering study is required before establishing marked crosswalks at locations other than signalized approaches at intersections, stop signs or at roundabouts. Marked crosswalks should only be considered at uncontrolled approaches when an engineering study demonstrates their need. These include criteria and considerations for the determination of when a pedestrian crossing should be marked with a parallel crosswalk and when it is appropriate to consider using continental (ladder) style crosswalks.

Crosswalks at Signalized Intersections
Marked crosswalks are required at all signalized approaches of an intersection, unless a traffic engineering investigation shows that a crosswalk should not be allowed. Pedestrian push buttons shall be accessible, preferably from an all-weather level landing. Crosswalks should be marked at channelized turn lanes controlled by a traffic signal or stop sign where there are crosswalks marked across the other controlled approaches. At other locations where the turn lane is controlled by a yield sign or uncontrolled, marking of pedestrian crosswalks may be considered.

[7] Oregon Bicycle and Pedestrian Plan (1995), II.6. Multi-Use Paths
[8] ODOT Traffic Manual (2005), Chapter 6, Section 6.10, Crosswalk Approval

Pedestrian signal heads shall be installed unless the crosswalk is closed by official action. Barrier and signs shall be posted for all officially closed crosswalks. All crosswalk closures at signalized intersections on state highways require the approval of the State Traffic Engineer based on a traffic engineering investigation. The primary reason for closing a crosswalk is safety, however geometric and operational factors may also be considered. Installation or removal of any sign prohibiting pedestrian traffic or closing a crosswalk requires the approval of the State Traffic Engineer.

Criteria for Marking Crosswalks @ Mid-Block Locations
Generally mid-block crosswalks are discouraged for the same reasons as uncontrolled approaches. Mid-block crosswalks often do not generate good compliance from motorists. Mid-block crosswalks should only be considered when an engineering study demonstrates their need and the location meets specific criteria outlined in the ODOT Traffic Manual.

Street Crossing Amenities
The Oregon Highway Design Manual (OHDM) also provides information about crossing treatments that improve the visibility and safety of and for pedestrians crossing the roadway. Providing raised medians and illumination, and improving sight distance are several treatments recommended by the OHDM. Every effort should be made to remove or relocate objects that could obscure the view of and by pedestrians. Efforts should also be made to ensure that objects that could be a distraction to drivers are not located close to a crossing point. These include neon and other illuminated signs that are located on private property.

A raised median must be a minimum of four feet wide, preferably 8 feet or more. They must be large enough to provide refuge for several pedestrians waiting at once and, ideally, several bicyclists. For wheelchair accessibility, it is preferable to provide at-grade cuts rather than ramps. Poles must be mounted away from curb cuts and out of the pedestrian path.

Oregon Supplement to the Manual on Uniform Traffic Control Devices (MUTCD)

Pedestrian Activated Signal
A pedestrian activated signal may be warranted where a significant number of people are expected to cross a roadway at a particular location. Anticipated use must be high enough for motorists to get used to stopping frequently for a red light (a light that is rarely activated may be ignored when in use). Additionally, sight-distance must be adequate to ensure that motorists will see the light in time to stop. Warning signs should be installed on the approaching roadway.

New Traffic Signals[9][10],
The Oregon Transportation Commission has authority to place, maintain and operate traffic control devices on state highways. By this rule, the Oregon Transportation Commission delegates to the State Traffic Engineer the authority to approve the installation of traffic control devices on state highways.

On major projects, when a project team considers signalization, the Transportation Planning Analysis Unit (TPAU) is contacted to do a preliminary analysis of the projected warrants for a traffic signal. TPAU should forward a copy of the warrants and any analysis to the Traffic Management Section as well as the project team. This will provide notice to TMS and provide an early opportunity to identify relevant issues. When the project team decides to recommend a signal on a

[9] Oregon Administrative Rules (2004), 734-020-0410, Traffic Signal Approval Process
[10] ODOT Traffic Manual (2001), Chapter 6, Section 6.14, Delegated Authority

project, a request should be sent through the Region Traffic Manager, requesting the approval of the State Traffic Engineer.

Local Plans, Policies, and Standards

This section summarizes local policies and standards guiding Newberg's bicycle/pedestrian facilities development. Local planning documents include the following:

- Yamhill County Transportation System Plan
- Yamhill County Bikeway Master Plan
- Yamhill County Comprehensive Plan
- Newberg Comprehensive Plan
- Newberg Transportation System Plan
- Newberg Development Code
- Newberg Riverfront Master Plan
- Newberg-Dundee Transportation Improvement Project
- Springbrook Oaks Specific Plan
- Northwest Newberg Specific Plan
- Sportsman Airpark Land Use Master Plan

Yamhill County Transportation System Plan

The Yamhill County Transportation System Plan (TSP) was updated in September 2004. The TSP examines both short and long-term transportation needs within the county, focusing on the areas outside of Newberg and McMinnville, which have their own TSPs. The Yamhill County TSP is intended to:

- Provide a multimodal interconnectivity between Yamhill County and neighboring counties and cities
- Maintain a positive livability for Yamhill County residents
- Accommodate growth as it occurs

Because a high priority is placed on mobility, large commitments in money and land have been made to provide transportation which is fast, efficient and safe. The present system is heavily dominated by roads, reflecting a dependence on automobiles and trucks.

The lack of safe and convenient bicycle and pedestrian facilities is a deterrent to increased use, and the County must look ahead to the increasing demand for alternatives modes of transportation to the automobile.

Yamhill County Bikeway Master Plan

The Yamhill County Bikeway Master Plan was developed in 1993 by the Yamhill County Bikeway Task Force to address the specific needs of bicyclists and pedestrians. It promotes bicycling in Yamhill County and outlines the tasks and responsibilities. Future bicycle and sidewalk improvements identified in conjunction with roadway improvements are intended to provide bicyclists with a safe, convenient, and aesthetic bicycle system that is integrated with other forms of transportation. The objectives identified in the Yamhill County Bikeway Master Plan are:

- Development of a bicycle facility plan that meets the identified needs of cyclists and fosters the growth of bicycle travel throughout the regional transportation system.
- Development of a map for the public that describes opportunities for bicycling in Yamhill County.
- Providing uniform bicycle route signs, markings, and design standards that meet state and national requirements.
- Establishing priorities for facility designation, new construction, and maintenance of the existing system. Each priority is based on need, opportunity, and resource availability.
- Evaluating the plan annually to determine how well objectives are being met.
- Encourage and support education and safety programs for all ages, improve riding skills, encourage observance of traffic laws, increase awareness of cyclists and pedestrian rights, and monitor and analyze bicycle accident data to determine safety problems.
- The plan identifies among other things policies, classification of bikeways, construction and maintenance guidelines, and suggested route improvement to achieve these objectives.

The Goals and Policies identified in the Plan are as follows:

1. It is the goal of Yamhill County to provide and maintain a safe, convenient, and aesthetic bicycle system that is integrated with other forms of transportation.
2. It is the goal of Yamhill County to encourage and support education and safety programs for all ages, improve riding skills, encourage observance of traffic laws, increase awareness of cyclists and pedestrian rights, and monitor and analyze bicycle accident data to determine safety problem areas.
3. Yamhill County will coordinate local plans for pedestrian and bicycle facilities with the 1994 Oregon Bicycle and Pedestrian Plan. The statewide plan provides a framework for a local bicycle route system and design standards.
4. It is the policy of Yamhill County to provide bikeways on arterials and major collectors that are located within an urban growth boundary and such other locations that provide access within and between residential subdivisions, schools, shopping centers and industrial parks when financially feasible.

Yamhill County Comprehensive Plan

The Yamhill County Comprehensive Plan was most recently amended in 1996. The Plan identifies the need for efforts to be coordinated among local, regional, state and federal agencies in order to

develop a sound transportation system for the county. A major concern of the county is to develop a transportation system that will maintain and enhance the quality of life enjoyed by its residents.

The provision of adequate bicycling and pedestrian paths within the county is a concern of the county residents. Such modes of transportation lend themselves particularly to the rural nature of the county.

Policy I states that "Yamhill County will encourage bicycle and pedestrian traffic as an element of the transportation system by coordinating with the cities within the county to develop an integrated system of safe and convenient bicycle and pedestrian ways to complement other modes of transportation."

Policy M notes, "Transportation needs for the disadvantaged, such as the low income, the handicapped, and the elderly, will be considered in the development of the county transportation system."

Newberg Comprehensive Plan

Originally adopted in 1979, the Newberg Comprehensive Plan was updated in 1999. The Plan contains numerous goals and policies pertaining to bicycle and pedestrian facilities.

Appendix A provides a full list of relevant policies, while the following section provides a summarized discussion.

The Comprehensive Plan's recreation and Willamette River Greenway policies reference the need for bicycle/pedestrian amenities. Policies include providing shared-use paths along natural drainageways, encouraging trail development to connect the Willamette River with other city parks, and developing a regional trail along and across the river.[11]

The Comprehensive Plan includes several urban design policies addressing bicycling and walking. General policies include integrating "walking paths" with neighborhood design to promote safety and interaction among neighbors. Curbs, gutters and sidewalks are required with new streets, along with curb ramps at intersections and crosswalks where new curbs are installed.[12] "Downtown" policies include providing benches, street trees and other pedestrian amenities. The Plan's "Riverfront District" policies include encouraging development of a pedestrian-friendly environment, with on street parking (to buffer sidewalk traffic from moving vehicles) as one possible tool.[13]

The Comprehensive Plan's Transportation Element contains several goals with supporting bicycle/pedestrian policies. Bicycle- and pedestrian-related goals are summarized below. Appendix A lists all relevant policies.

- Goal 3: "Promote reliance on multiple modes of transportation and reduce reliance on the automobile."
- Goal 4: "Minimize the impact of regional traffic on the local transportation system."

[11] Section G, Policies 4e, 4m, 4n, 5f and 5j.
[12] Section J, Policies c, 1j and 1k.
[13] Section J, Policies 6a and 6b.

- Goal 5: "Maximize pedestrian, bicycle and other non-motorized travel throughout the City."
- Goal 6: "Provide effective levels of non-auto oriented support facilities (e.g. bus shelters, bicycle racks, etc.)."
- Goal 7: "Minimize the capital improvement and community costs to implement the transportation plan."
- Goal 8: "Maintain and enhance the City's image, character and quality of life."
- Goal 9: "Create effective circulation and access for the local transportation system."
- Goal 12: "Minimize the negative impact of a Highway 99 bypass on the Newberg community."

Bicycle/pedestrian facilities are also addressed in the Comprehensive Plan's Public Facilities Element. General policies include encouraging property owners along unimproved streets to develop their streets to City standards; and requiring new residential areas to include paved streets, "pedestrian ways" and streetlights.[14] When adding streetlights to existing streets, the City is directed to assign priority to Arterial and Collector streets, intersections, "pedestrian paths" and bikeways.[15] Another policy requires that schools be located in a matter that provides adequate and safe pedestrian, bicycle and auto access. This policy also requires that nearby streets be fully developed with intersection signalization as necessary.[16]

Newberg Transportation System Plan

Completed in 2005, the Newberg Transportation System Plan (TSP) provides a long-term plan for addressing the city's multi-modal transportation needs. The TSP identifies bicycle and pedestrian system gaps, proposes general and specific improvement strategies, and offers evaluation criteria for prioritizing recommended projects.

Bicycle System

With the exception of bicycle lanes on Oregon 99W and a few city streets, Newberg's bicycle system generally consists of shared lanes serving motorists and cyclists. The TSP recommends that dedicated bicycle facilities be included on streets with the following characteristics:

- Average daily traffic volumes greater than 3,000 vehicles
- High bicycle volumes
- Posted speeds greater than 25 miles per hour
- Poor motorist sight distance areas

To complete system gaps and create a comprehensive bicycle network, the TSP recommends that dedicated bicycle facilities be included on Newberg's existing and new Arterial and Major Collector streets (where possible). In most cases, existing streets would be retrofitted in conjunction with planned capacity expansions. The Plan also recommends that some form of bicycle facilities be integrated with the proposed Newberg-Dundee Bypass, along with connections between the bypass

[14] Section L, Policies 1e and 1h.
[15] Section L, Policy 3a.
[16] Section L, Policy 5g.

and city streets. Proposed off-street facilities include paths along Hess Creek and near Jaquith Park, and a bicycle/pedestrian bridge linking Rogers Landing Drive with Champoeg Park south of the Willamette River. Other recommended bicycle amenities include bikeway signage and end-of-trip facilities (e.g., secure bicycle parking and workplace changing facilities).

The TSP proposes evaluation criteria for the City of Newberg to use in prioritizing bicycle projects. Priority should go to:

- Areas near schools, parks, commercial areas, or other bicycle traffic generators
- Areas frequently used by bicyclists
- Areas where small gaps need to be filled to provide continuous bicycle facilities
- Areas where modest improvements are needed to provide planned bicycle facilities (e.g., roads where additional pavement width is not needed to stripe bicycle lanes)
- Roads with high traffic volumes and/or narrow shoulders

Pedestrian System

Generally, sidewalks exist on most streets within downtown Newberg, in newer residential and commercial developments, and along Oregon 99W. Several streets either lack sidewalks or have sidewalks on one side only. The TSP provides the following recommendations for completing Newberg's sidewalk system:

- Include sidewalks with all new street construction or reconstruction
- Construct sidewalks on streets as part of adjacent property development
- Construct sidewalks on all existing and new streets classified as "Collector" or above, regardless of whether capacity expansions or adjacent development is planned
- Sidewalks and curb ramps should comply with ADA standards

The TSP also includes recommendations for addressing pedestrian street crossings. The City should evaluate the need for mid-block crosswalks at locations where sidewalks abruptly end on one side of the street, and resume on the other side of the street. Crosswalks should also be considered on Arterial and Collector streets with high vehicle or pedestrian volumes.

The TSP proposes evaluation criteria for the City of Newberg to use in prioritizing pedestrian projects. Priority should go to:

- Areas near schools or other pedestrian generators
- Areas frequently used by pedestrians or disabled persons
- Areas where modest improvements are needed to create continuous pedestrian systems
- Roads with high traffic volumes and/or narrow shoulders

Newberg Development Code

Newberg's Development Code outlines bicycle and pedestrian facility standards. The Code addresses facilities in the public right-of-way including bicycle lanes, sidewalks and public walkways; as well as requirements associated with private development.

The Code prescribes standards regarding street layout and design. To maintain street system connectivity, block lengths must not exceed 500 feet in length.[17] Grades must not exceed 6 percent on arterial streets, 10 percent on collectors and 12 percent on local streets.[18] Summarized in Table I-1, the street design standards also address bicycle/pedestrian facilities within the public right-of-way. Sidewalks must be provided on both sides of all public streets, and striped bicycle lanes must be included on arterials and major collectors, as shown in the Transportation System Plan.[19] The Code also states that planter strips must be provided on public streets, though available right-of-way would dictate widths on a case-by-case basis. Street trees must also be provided along all public rights-of-way abutting or within subdivisions and land partitions.[20]

Table I-1. City of Newberg Street Design Standards

Functional Classification	Bicycle Lanes	Sidewalks
Major Arterial	6'	5' minimum
Minor Arterial	5' minimum	5' minimum
Major Collector	5' minimum	5' minimum
Minor Collector	Not required	5' minimum
Local Street	Not required	5' minimum

Source: Newberg Development Code, Section 151.685.

The Development Code also outlines standards for "public walkways" which provide off-street connections between cul-de-sacs, long blocks, schools, parks and other destinations. Public walkway easements must measure at least 15 feet wide, with the paved path measuring at least 5 feet wide. The Code also specifies that public walkways must provide reasonably direct travel between public rights-of-way and comply with ADA standards. Walkways over 250 feet long must also include lighting.[21]

The Development Code outlines bicycle parking standards for private development. Parking facilities must either consist of an enclosed locker, a designated area within the ground floor of a building, or a "firmly secured loop, bar, rack or similar facility that accommodates locking the bicycle frame and both wheels using a cable or U-shaped lock."[22] Bicycle parking spaces must be located within 50 feet of a development's building entrance, and measure at least 6 feet long and 2.5 feet wide. Facilities may be located within the public right-of-way (subject to approval).[23]

Table I-2 summarizes bicycle parking requirements in terms of the required number of spaces. The number of required spaces largely depends on the type of development under focus.

[17] Section 151.695.
[18] Section 151.693.
[19] Section 151.685.
[20] Section 151.725.
[21] Section 151.705(A) through (H).
[22] Section 151.625.3.
[23] Section 151.625.3.

Table I-2. City of Newberg Bicycle Parking Requirements

Land Use	Minimum Required # of Spaces
New multiple dwellings (including additions creating additional dwelling units)	1 space per 4 dwelling units
New commercial, industrial, office, and institutional developments (including additions that total 4,000 square-feet or more)	1 space per 10,000 square feet of gross floor area. In C-4 districts, 2 spaces or 1 per 5,000 square-feet of building area (whichever is greater)
Transit transfer stations and park-and-ride lots	1 space for every 20 vehicle parking spaces
Parks	2 spaces within 50 feet of each developed playground, ball field or shelter

Source: Newberg Development Code, Section 151.625.2.

Newberg Riverfront Master Plan

Adopted in 2002, the Newberg Riverfront Master Plan provides a long-term development plan for lands between downtown Newberg and the Willamette River. The plan proposes a commercial district surrounded by open space and housing of varying densities, supplemented by a network of upgraded streets and shared-use paths.

The Master Plan identifies general and specific projects for improving non-motorized travel to, from and within the project area. Recommended projects include the following:

- An esplanade following the Willamette River floodplain's upper bank
- Wide sidewalks on River Road and 14th Street within the Riverfront Commercial District
- Continuous sidewalks on College and River streets between downtown Newberg and the project area
- Enhanced pedestrian crossings at existing and planned street intersections
- A shared-use path connecting downtown Newberg with the project area via the Newberg School District site between 6th and 8th streets
- Completing the Willamette Greenway Trail through the project area
- "Local connecting pathways" linking destinations within the project area
- A bicycle/pedestrian bridge spanning the Willamette River
- Upgrading existing streets to provide shared vehicle/bicycle lanes

Newberg-Dundee Transportation Improvement Project

The Newberg-Dundee Transportation Improvement Project "Tier 1" Final Environmental Impact Statement identifies a preferred alignment for the Newberg-Dundee Bypass. Consisting of a four-lane "expressway", the 11-mile corridor would follow the south sides of Newberg and Dundee. Interchanges would be located at the corridor's western terminus (near the existing Oregon 99W/Oregon 18 junction); between the cities of Newberg and Dundee; at Oregon 219 in southern Newberg; and at the corridor's eastern terminus near Oregon 99W at Rex Hill.

Bicycle/pedestrian travel would either be accommodated as part of the roadway cross-section or as a separate facility (to be determined in the "Tier 2" evaluation). The project would also include potential improvements on Oregon 99W and local streets within Newberg and Dundee (specific projects not specified). Bicycle and pedestrian crossings along the bypass would also be addressed.

Springbrook Oaks Specific Plan

The primary purpose of the Springbrook Oaks Specific Plan (adopted August 2, 1999) was to establish a vision for the project area that helps meet the current and future needs of the local community. One of the guiding principals for the Specific Plan stated, "A strong pedestrian circulation system should be developed to provide connectivity and to reduce vehicular traffic."

In identifying the existing pedestrian circulation routes, the Specific Plan notes that, "Sidewalks currently exist along the south side of Highway 99W. Brutscher Street has sidewalks on the east side and on the west side from Highway 99W to Fred Meyer." For bicycle circulation, the bike lanes on Springbrook Road and Brutscher Street are identified.

Regarding transportation for bicycle and pedestrians, the Specific Plan states the following:

Pedestrian and bicycle paths/sidewalks (on- or off-street) shall be provided:

- Over the east and west forks of Springbrook Creek (subject to approval by applicable local, state, and federal agencies);
- Along Brutscher Road to Fernwood Road;
- To Fred Meyer (subject to Fred Meyer approval);
- As interconnections between developments within the Springbrook Oaks area; and
- To local parks and schools.

The plan also calls for locating major pedestrian pathways along public streets rather than along stream corridors.

Northwest Newberg Specific Plan

The primary purpose of the Northwest Newberg Specific Plan (August 1993) is to create a coordinated network of land uses, transportation and utilities. Some of the objectives of the plan include:

- A unique pedestrian-oriented neighborhood that is compatible with the larger Newberg community.
- Safe and convenient routes for bicycling and walking.

The circulation plan notes that the extension of Foothills Road through the site is a key component of the circulation plan, and that for pedestrian safety; a signal will be placed at the Foothills Drive/College Avenue intersection. The circulation plan also notes that the local street network is highly connected in order to promote direct and convenient routes for pedestrians and bicyclists. Several mid-block pedestrian paths are provided to reduce walking and biking distances.

Sportsman Airpark Land Use Master Plan

The Sportsman Airpark Land Use Master Plan (June 5, 2006) provides a potential location for a pedestrian/"golf cart" access bridge between the medium density residential area identified in the Master Plan and the airport to promote aircraft ownership by adjacent properties.

How Citizens Can Use This Plan

Citizens can use this Plan to ensure that pedestrian needs and conditions were properly identified, and assist the City in keeping this Plan accurate over time as it is updated. Citizens can also identify City priorities and proposals and how and when they may impact their own neighborhoods or walking routes. Parents can use the Safer Routes to School chapter to assist in selecting the best path to school for their children. Perhaps most importantly, citizens can use this Plan to learn about the various tools and strategies that are available to improve conditions on their streets, and work with the City to help fund and implement those improvements

How the City Will Use This Plan

This document will serve as a technical resource for the City to guide implementation. The City will use this document to identify appropriate programs and capital improvement projects; seek further neighborhood input; prioritize projects; understand the feasibility, benefits, and impacts of proposals; obtain funding; and update City design and management policies, guidelines, and practices.

Plan Contents

The Newberg ADA/Sidewalk Improvement/Bike Route Plan is organized as follows:

Chapter 2: Existing Conditions, provides a description of the existing general bicycling and walking conditions in Newberg. This chapter also outlines the critical routes selection, providing a summary description of existing conditions along the identified critical routes. Chapter 2 also provides a summary of the inventory methodology and results obtained along the critical routes.

Chapter 3: Recommended Network Improvements, outlines the recommended improvements along the identified critical routes, as well as additional opportunities for improvements through the ADA Spot Improvement Program. Chapter 3 also includes individual Project Sheets for selected critical routes that provide additional detail and highlight design and feasibility issues for the primary critical routes.

Chapter 4: Design Guidelines, provides underlying principles and descriptions of the various bicyclist and pedestrian facilities identified in Chapter 3.

Chapter 5: Programmatic Opportunities, highlights the educational, encouragement, and enforcement opportunities available to the City of Newberg.

Appendices

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II. Existing Conditions

This chapter examines the existing bicycle and pedestrian facilities in Newberg –first through a general overview and then more location-specific based on the identified critical routes. Next, the chapter looks at the inventory data collection methodology and results. Finally, the chapter briefly touches upon the existing roadway classifications in Newberg.

General Existing Conditions

This section examines the existing state of bicycle and pedestrian facilities within the City of Newberg in general geographic terms.

East of Downtown

East of downtown, the primary east-west connector leading into downtown is OR99W. OR99W has bike lanes and sidewalks with curb cuts along the roadway west of Brutscher Street, with some missing segments of sidewalk east of Brutscher Street. Haworth Avenue also provides some east-west connectivity, but is also missing sidewalks and curb ramps in locations. Of the major north-south streets in this area (Springbrook, Deborah, Elliott, Villa/Highway 219), all are missing sidewalks and curb ramps along portions of the roadway.

Downtown Business District

The downtown business area has sidewalks with accessible ramps, providing good access for all users. There are some locations where a sidewalk is in need of minor repair, but overall the pedestrian conditions are excellent. Bike lanes exist on 99W in the downtown area as well as from Hess Creek to the eastern edge of the city. There are no bike lanes on any of the cross streets through the downtown area.

South of Downtown

South of downtown there is generally good sidewalk coverage, however the condition and dimensions of the sidewalk vary greatly. River Street has sidewalks on both sides of the road from downtown to 12th Street. In many places sidewalks are too narrow due to encroachment from nearby trees and bushes, while tree roots have uprooted several segments of sidewalk, making travel difficult for all pedestrians. While there are several marked pedestrian crossings, there is a significant lack of curb ramps throughout this area. Blaine Street only has a sidewalk on one side of the street for a large stretch of the road. There is also a noticeable lack of bicycle and pedestrian connections to important destinations such as the riverfront and the skate park. There are no dedicated bicycle facilities south of downtown.

North of Downtown

The area north of downtown has a greater number of gaps within the sidewalk network, particularly on major routes such as Main Street, College Street, and Villa Road. The lack of continuous pedestrian facilities is the major impediment in this section of town. Throughout the existing

segments of the pedestrian network there is varied condition and dimensions, based on when the surrounding development occurred. Therefore, the more northern areas of Newberg generally have more consistent sidewalks that conform to ADA standards and guidelines. Some portions of the roads (Main Street, Mountainview Drive) have bicycle lanes, while most roads have no dedicated bicycle facilities.

Opportunities and Constraints

Several patterns of issues have arisen out of the field review of existing conditions. Some of these are citywide and some affect particular areas of Newberg. Some of the more significant issues include the following.

- *Urban Form*. The layout and organization of land use and streets in the City can enhance the walkability of Newberg. The urban form – a connected street grid system - in the Downtown and area south of Downtown provides for greater opportunities for walking. Dense activity and the location of different land uses close together make walking convenient and generate an environment that encourages activity and pedestrian-friendliness.
- *Curb Ramps*. Properly designed curb ramps are key pedestrian accessibility features. Many corners in the City do not have curb ramps, which are a critical component of an accessible pedestrian system. The vast majority of the existing curb ramps are single ramps that direct people into the intersection rather than into the crosswalk.
- *Sidewalk Continuity*. Many streets, especially in residential areas, have discontinuous or no sidewalks. This is the result of the way Newberg grew over time. To some extent, this contributes to the 'rural' feeling of older neighborhoods. Unfortunately, with no sidewalks present, people, including children, are forced to walk in streets or may not walk at all. Areas that are near schools, commercial establishments, parks, hospitals, civic buildings, and transit stops are critical areas that should have continuous sidewalks along the street.
- *Speed of Traffic*. Fast moving traffic inhibits pedestrian activity and can pose serious safety problems for pedestrians crossing streets. The faster motorists travel, the less likely they are to yield to pedestrians crossing the street. This is especially true on streets with few traffic control devices, such as Main Street and College Street.
- *Distance of Pedestrian Crossings*. Pedestrian exposure to traffic at intersections directly affects safety, especially for older persons and children who may not be able to cross streets quickly or discern (or be seen by) on-coming traffic. In some locations, wide curb radii create unnecessarily long pedestrian crossings and encourage higher speed turning movements.
- *Street Lighting*. There are some locations where lighting could be improved for pedestrian visibility and safety at night, particularly along walking corridors. Street lights can be designed to be pedestrian oriented with lower level lighting directed on the sidewalk.
- *Landscaping*. In many locations, untrimmed landscaping has narrowed the walking space on sidewalks. In other locations, tree roots have damaged sidewalks and made them unusable by persons with disabilities.

Critical Route Identification

Prior to performing a field inventory of the existing bicycle and pedestrian facilities, the critical routes needed to be identified. Both on-street and off-street routes were considered when selecting critical routes. Routes were identified that would have the greatest impact on the following:

- Network Connectivity
- Land Use
- Access

All key local and major streets were considered when identifying the critical routes. In addition, there was an evaluation of the need for off-street connections to provide greater connectivity to key neighborhood and community destinations.

Network Connectivity

Does the proposed route:

- Extend the local bicycle and pedestrian network?
- Provide safe, direct and convenient connections?
- Reduce out-of-direction travel?
- Connect to a regional bicycle and pedestrian system?

Land Use

Does the proposed route:

- Connect to schools?
- Connect to parks/natural areas?
- Connect to shopping areas?
- Connect to existing and planned residential neighborhoods?
- Connect to transit stops?
- Connect to major employment centers?
- Connect to civic and cultural institutions (hospitals, churches, libraries, etc)
- Connect to senior and affordable housing?
- Connect to other important destinations?

Access

Does the proposed route:

- Improve north-south connections?

- Improve east-west connections?
- Reduce out-of-direction travel?
- Provide accessibility across railroad crossings?

Critical Bicycle and Pedestrian Routes

Map II-I shows the critical on- and off-street routes identified by the Task Force using the criteria described above (see Appendix A). Those routes are:

- 1st Street
- 2nd Street (Main St to River St)
- 4th Street (Willamette St to College St)
- 6th Street (Blaine St to River St)
- 9th Street (Blaine St to Pacific St)
- 11th Street (River St to Wynooski St)
- 14th Street / Waterfront Street
- Aspen Way
- Blaine Street (Skate Park to Sherman St)
- Brutscher Street (OR99W to Fernwood Rd)
- Chehalem Drive (Highway 240 to North Valley Rd)
- College Street (14th Street to Bell Rd)
- Columbia Drive / Crestview Drive (Chehalem Dr to Villa Rd)
- Crater Lane / Lynn Drive (Foothills Dr to Main St)
- Crestview Drive (Emery Dr to OR99W)
- Dayton Avenue (Fifth St to UGB)
- Deborah Road (OR99W to Douglas Ave)
- Elliott Road (2nd Street to Newberg High School)
- Emery Drive / Douglas Avenue / Vittoria Way (Crestview Dr to OR99W)
- Fernwood Road / 2nd Street
- Foothills Drive (Chehalem Dr to Aldersgate Dr)
- Hancock Street (River St to Harrison St)
- Hayes Street / Providence Drive
- Highway 219 (for bicyclists)
- Highway 240 (Main St to Chehalem Dr)
- Hoskins Street (Crestview Dr to Pennington Drive)
- Howard Street (Sheridan St to 6th St)
- Illinois Street / Vermillion Street (College – Meridian) / Fulton Street (Meridian – Villa) / Haworth Avenue
- Main Street (Dayton Ave to Foothills Dr)
- Meridian Street (1st – Crestview)/ Center Street (Crestview to Mountainview)
- Morton Street (1st St to Hwy 240)
- Mountainview Drive
- OR 99W
- River Street
- Rogers Landing Road
- Sitka Avenue / Hancock Street
- Springbrook Road
- Villa Road
- Wilsonville Road
- Wynooski Street
- Zimri Drive
- Hess Creek (off-street)
- Chehalem Creek (off-street)
- Paths along Willamette River (off-street)
- Springbrook Creek crossing (off-street)

Map II-1. Critical Bicycle and Pedestrian Routes

Critical Routes Existing Conditions Summary

1st Street

The eastbound street of the downtown couplet, 1st Street provides access to City Hall and other downtown businesses.

Pedestrian Network: There are 8-10-foot wide sidewalks along both sides of 1st Street, with on-street parking allowed on both sides of the street. All the crosswalks are striped. The sidewalks are in good condition with sufficient room provided for pedestrian movement as well as street furniture.

Bicycle Network: There is a striped bike lane along the south side of the road, as this is a one-way street heading east.

2nd Street (Main Street to River Street)

Second Street provides an alternative east-west route to the busier 1st Street / Hancock Street couplet, providing a connection to Herbert Hoover Park on the east side while also providing access to many of the businesses that have their fronts on 1st Street.

Pedestrian Network: 2nd Street has a completed sidewalk on both sides of the street; however there is the occasional rough surface which makes passage difficult for some pedestrians. The sidewalk also has a variable width, from under four feet to five feet, and in places greater than seven feet. In addition, there are several corners that are lacking curb ramps, including two intersections (2nd/Meridian and 2nd/Washington) that are completely lacking curb ramps.

Bicycle Network: There are no dedicated bicycle facilities along 2nd Street between Main Street and River Street. Bicyclists are expected to share the road with motor vehicles.

4th Street (Willamette Street to College Street)

This route continues from the Wynooski Street route and is designated a minor collector for vehicles. Provides a through connection to the critical route along College Street for bicyclists and pedestrians.

Pedestrian Network: 4th Street has a completed sidewalk on both sides of the street; however there is the occasional rough surface which makes passage difficult for some pedestrians. In addition, there are several corners that are lacking curb ramps, including two intersections (4th/Meridian and 4th/Edwards) that are completely lacking curb ramps.

Bicycle Network: There are no dedicated bicycle facilities along 4th Street between Wynooski Street and College Street. Bicyclists are expected to share the road with motor vehicles.

6th Street (Blaine Street to River Street)

Connects two other critical routes in River Street and Blaine Street that connect to the downtown core while connecting the residential areas of southern Newberg with Edwards Elementary School and Memorial Park.

Pedestrian network: 6th Street has a completed four-foot-wide sidewalk in fair to good condition along both sides of the road between Blaine St and River St. Curb ramps are inconsistently located, particularly near the school and where crosswalks are marked.

Bicycle network: 6th Street has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and sharing the lane should not be too difficult or uncomfortable for most bicyclists.

9th Street (Blaine Street to Pacific Street)

Connects two other critical routes in River Street and Blaine Street that connect to the downtown core and city parks, while connecting the residential areas of southern Newberg with Edwards Elementary School.

Pedestrian network: 9th Street has a completed five-foot-wide sidewalk in good condition along the north side of the road between Blaine St and College St. At College Street, the sidewalk becomes intermittent along the north south while it is continuous on the south side from College to River. This sidewalk is also five feet wide and generally in good condition. There are two accessible curb ramps at College and Blaine, however there are none at River and Blaine, making usage difficult for many users. Currently, to access the sidewalk, users must find a driveway cut to provide access.

Bicycle network: Ninth Street has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and sharing the lane should not be too difficult or uncomfortable for most bicyclists. On-street parking is allowed along 9th Street.

9th Street (Commerce Parkway to Hwy 219)

Connects to other critical routes along a proposed pathway system that parallels the creek. Provides a connection to businesses and residences along Highway 219 and the southern end of Springbrook Road.

Pedestrian network: 9th Street has a completed five-foot-wide sidewalk in good condition along the south side of the road up to Commerce Parkway. Development on the north side will most likely bring sidewalks to that side of the road.

Bicycle network: Ninth Street has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and sharing the lane should not be too difficult or uncomfortable for most bicyclists. On-street parking is allowed along 9th Street.

11th Street (River Street to Wynooski Street)

Connects from the critical route on River Street and the surrounding residential areas to Scott Leavitt Park.

Pedestrian network: Eleventh Street has an intermittent sidewalk network that is four feet wide and only in poor to fair conditions. There is not a consistent side that the sidewalk appears on, switching from the south to the north side, with a gap at the park in between. There are also no curb ramps along this route, except for much older curb cuts at 11th and River.

Bicycle network: 11th Street has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and sharing the lane should not be too difficult or uncomfortable for most bicyclists.

14th Street / Waterfront Street

This route provides access to the west, overlooking the Willamette River and ultimately connecting with a planned trail along Chehalem Creek that will connect down to the Willamette River as well as the skate park. The road currently dead-ends a little after three-quarters of a mile along the route. Riverfront trails will eventually connect to Dundee and Champoeg.

Pedestrian Network: There are no dedicated pedestrian facilities along 14th Street/Waterfront Street. Pedestrians are forced to walk in the road, or along the side of the road weather permitting. A drainage ditch is located along 14th Street.

Bicycle Network: There are no dedicated bicycle facilities along 14th Street/ Waterfront Street. Bicyclists are expected to share the road with motor vehicles.

Aspen Way

This route is considered primarily as a local/regional bicycle route, providing connections north to Bell Road / North Valley Road, a regional east west route just north of Newberg.

Pedestrian Network: There are no dedicated pedestrian facilities along Aspen Way. Pedestrians are forced to use the roadway, as there are drainage ditches located on both sides of Aspen Way.

Bicycle Network: There are no dedicated bicycle facilities along Aspen Way. Bicyclists are expected to share the travel lane with motorists. The roadway gains in elevation as the route heads north towards Bell Road.

Blaine Street (Newberg Chehalem Skate Park to Sherman Street)

Provides a connection to the Newberg Chehalem BMX and skate park, a desirable destination for younger residents of Newberg. Also connects to Edwards Elementary School and through the downtown core. Will eventually connect to the future cultural and arts center.

Pedestrian network: Blaine Street has a completed four-foot-wide sidewalk along the west side of the street from 9th to Sherman. This sidewalk is in generally fair condition, although there are several small segments of sidewalk near downtown that need repair to make the sidewalk more accessible. In addition, there are almost no curb ramps north or south of the downtown core area along either side of the road, making it challenging for anyone with mobility difficulties to travel safely and successfully along Blaine Street.

Bicycle network: Blaine Street has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and taking the lane should not be too difficult or uncomfortable for most bicyclists. On-street parking is allowed along portions of Blaine Street.

Brutscher Street (Highway 99W to Fernwood Road)

Provides a vital north-south connection in eastern Newberg, particularly to the commercial properties along Highway 99W and the nearby senior housing complexes.

Pedestrian network: Brutscher Street has a completed five-foot-wide sidewalk in good condition along both sides of the road between OR 99W and Oak Meadows. Just south of Oak Meadows the sidewalk along the east side of the road disappears, waiting for development of the open parcel at Fernwood and Brutscher. Curb ramps are fairly new and located at all intersections.

Bicycle network: Bicycle lanes from OR 99W to Fernwood Road.

Chehalem Drive (Highway 240 to North Valley Road)

Provides bicycle connection to area north of town, as well as to North Valley Road / Bell Road, an existing east-west route used by bicyclists. Also provides connection to Chehalem Valley Middle School, Crater Elementary School, Chehalem Valley Senior Center, and the Sports Complex.

Pedestrian network: Considered primarily as a critical bicycle route, there are no dedicated pedestrian facilities along this route south of Mountainview Drive. North of Mountainview Drive, there is a good, five-foot-wide sidewalk along the east side of the road with relatively new, accessible curb ramps up to Foothills Drive.

Bicycle network: There are no bicycle facilities along this route from Highway 240 to just south of Mountainview Drive. Bicyclists must share the roadway, where the travel lanes are less than 11 feet wide in either direction. Widening the roadway to provide additional shoulder room will require covering and piping the adjacent ditch, as well as moving several utility poles. The roadway widens at Mountainview Drive, with a 14-foot-wide travel lane in the northbound direction, and a 12-foot-wide travel lane heading south. There is no existing bicycle signage, which would increase driver awareness to the possible presence of bicyclists along this route.

College Street (14th Street to Bell Road)

College Street between 6th Street and Foothills Drive Provides excellent north-south connectivity through Newberg, connecting to Edwards Elementary School, Jaquith Park, existing residential areas, and the downtown core.

Pedestrian network: College Street, particularly north of Vermillion and south of 9th Street, has a number of large gaps in the sidewalk network on both sides of the street. Where the sidewalk is present north of Vermillion it is generally in good to fair condition and five feet wide. South of Vermillion the sidewalk is typically only four feet wide, and generally in poor to fair condition. Few curb ramps are provided north of the downtown area. North of Foothills Drive there is only a short segment of sidewalk on the east side of the road.

Bicycle network: College Street has a striped shoulder that varies in width from four to six feet along the entire corridor. On-street parking is allowed, making bicycle travel difficult at times.

Columbia Drive / Crestview Drive (Chehalem Drive to Villa Road)

This route provides an additional east-west route north of OR99W from Chehalem Drive to Villa Road. The route provides connections to residential areas. This route also connects to Austin Elementary and the future George Fox University sports complex.

Pedestrian Network: Between Chehalem Drive and College Street there is only one existing segment of sidewalk, which is on the north side of Columbia Drive just east of Main Street. Drainage ditches currently exist on both sides of Columbia Drive between Chehalem Drive and Main Street. East of

Main Street there is a drainage ditch on the south side of the road for about 600 feet, and then on the north side of the road for about 300 feet just east of the existing portion of sidewalk. East of College Street, the sidewalk exists on the north side of the road just past Hoskins. The sidewalk then switches to the south side of the road between Hoskins and Aldersgate.

Bicycle Network: There are no dedicated bicycle facilities along Columbia Drive or Crestview Drive. Bicyclists are expected to share the travel lane with motorists.

Crater Lane / Lynn Drive (Foothills Drive to Main Street)

Provides an alternate north-south connection within the residential area of northwest Newberg. This route provides a parallel route to both Chehalem Drive and Main Street while connecting to Chehalem Valley Middle School, Crater Elementary School, and Chehalem Valley Senior Center.

Pedestrian network: This route is generally a good pedestrian route. North of Mountainview there is only minor gaps in the sidewalk network, primarily on the east side of the road, and most of these gaps will be filled in with future residential development. The sidewalks are five feet wide in good condition with a planter strip between the sidewalk and the on-street parking. South of Mountainview the sidewalk network is primarily non-existent, with only short segments complete, most noticeably on the north side of Lynn. What sidewalks do exist are in good condition. Curb ramps are in good condition and accessible for almost the entire route.

Bicycle network: This route has no provisions for bicyclists. Bicyclists are expected to share the road with motor vehicles.

Crestview Drive (Emery Drive to OR 99W)

Provides connections to multiple critical routes in the northeastern section of Newberg, as well as connecting to the proposed mixed-use Springbrook development. Also provides excellent connections to A-dec, one of the largest employers within the city, as well as Mountainview Middle School.

Pedestrian network: Crestview is almost entirely lacking in pedestrian facilities, and portions of Crestview (a segment east of Springbrook Road) remain unpaved. There is a short segment of four-foot-wide sidewalk along the south side of the road near Libra. The sidewalk starts out in fair conditions and improves once it reaches the newer residential development. There are a few existing curb ramps along this existing segment of sidewalk. Crestview does not currently go through to OR 99W, ending just south of Birdhaven Loop / Robin Court.

Bicycle network: This route has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and sharing the lane should not be too difficult or uncomfortable for most bicyclists, except where the roadway is currently unpaved.

Dayton Avenue (Fifth Street to UGB)

Dayton Avenue is one of the few identified bicycle routes within the Yamhill County Transportation System Plan. Dayton Avenue provides an alternate route to Dundee for bicyclists who prefer to not use OR99W while providing a connection to downtown Newberg.

Pedestrian network: Considered primarily as a critical bicycle route, there are sidewalks for a short segment south of 5th Street, and then there are no dedicated pedestrian facilities along this route.

Bicycle network: Directly south of 5th Street, the roadway is ~ 34 feet wide with on-street parking. This is sufficient width for bicyclists to share the road. Further southwest, the road narrows to ~ 22 feet wide as it crosses over the creek and continues towards Dundee. There is no existing signage, which would increase driver awareness to the possible presence of bicyclists along this route.

Deborah Road (OR99W to Douglas Avenue)

Provides a connection to Mabel Rush Elementary School as well as Newberg High School. Connects Haworth Avenue critical route with Douglas Avenue critical route.

Pedestrian network: A good pedestrian route. There are no gaps in the sidewalk system, with five-foot-wide sidewalks on both sides of the street. Curb ramps are provided at the intersections of Deborah Road with Haworth Avenue and Deborah Road with Douglas Avenue, as well as at the striped mid-block crossing that provides access to the elementary school.

Bicycle Network: This route has no dedicated bicycle facilities. Bicyclists are expected to share the road with motor vehicles.

Elliott Road (2nd Street to Newberg High School)

Provides a north-south connection across OR99W east of downtown. Also provides a connection from the residential areas south of OR99W directly to Newberg High School.

Pedestrian network: Elliott Road, particularly south of OR 99W, is a good pedestrian route. There are a few small segments of missing sidewalk, and then only on one side of the street. The sidewalk is 5' wide and in good condition up to 2nd Street. North of OR 99W, the pedestrian network is less friendly, with large gaps on both sides of the street and the existing sidewalk varying between four to five feet wide and from poor to fair condition. This remains true all the way to the high school. Curb ramps are located at many of the intersections, however important curb ramps are missing from the intersection of Haworth and Elliott.

Bicycle network: Elliott Drive has no provisions for bicyclists. Bicyclists are expected to share the road with motor vehicles.

Emery Drive / Douglas Avenue / Vittoria Way (Crestview Drive to OR 99W)

Connects Mabel Rush Elementary School, Mountain View Middle School and Newberg High School with multiple parks, as well as residential areas to the east. Provides an alternate route from OR99W to the middle school and high school.

Pedestrian network: This east-west connector route generally provides good connectivity with five-foot-wide sidewalks west of Villa, and four-foot-wide sidewalks the rest of the route. There are a few minor segments of sidewalk that have been uprooted by adjacent trees, but overall the sidewalks are in good condition, and most of the intersections have existing curb ramps.

Bicycle network: This route has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and taking the lane should not be too difficult or uncomfortable for most bicyclists.

Fernwood Road / 2nd Street

This route provides east-west connections to the residential area east of Hwy 219, the golf course, and the newer residential properties east of the golf course.

Pedestrian Network: There are no dedicated pedestrian facilities along 2nd Street between Hwy 219 and Springbrook Road. There is an existing drainage ditch along the north side of 2nd Street in this location. Between Springbrook Road and Brutscher Road there are no pedestrian facilities on the south side, while a sidewalk begins about 870 feet from Brutscher Road on the north side of Fernwood. The sidewalk on the north side continues along Fernwood past the golf course and ends just past the entrance to The Greens residential neighborhood. No pedestrian facilities are currently provided on the south side of the road.

Bicycle Network: Bike lanes exist on Fernwood Road. There are no dedicated bicycle facilities on 2nd Street between Hwy 219 and Springbrook Road.

Foothills Drive (Chehalem Drive to Aldersgate Drive)

Provides an east-west connection in the northern section of the city between five identified critical routes. Also provides a safe connection to Chehalem Valley Middle School, Crater Elementary School, Chehalem Valley Senior Center, and the existing park from those critical routes and the surrounding neighborhood.

Pedestrian network: Foothills Drive has a completed five-foot-wide sidewalk in good condition along both sides of the road between Chehalem Drive and Jones Road. From Jones to College, the sidewalk is four feet wide, and the conditions vary from poor to good, as a few segments of sidewalk have been uprooted by nearby trees. After crossing College, the sidewalk is five feet wide in good condition until the end of the road. Curb ramps are fairly new and located at nearly all intersections.

Bicycle network: Bicycle lanes present between Chehalem Drive and Jones, and again from College Street until Burlington. The remaining portions of Foothills Drive have no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and taking the lane should not be too difficult or uncomfortable for most bicyclists. On-street parking is allowed along portions of Foothills Drive.

Hancock Street (River Street to Harrison Street)

The westbound street of the downtown couplet, Hancock Street provides access to the library, city hall, the future cultural and arts center, the Post Office, and other downtown businesses.

Pedestrian Network: There are eight to 10-foot-wide sidewalks along both sides of Hancock Street, with on-street parking allowed on the south side of the street. All the crosswalks are striped. The sidewalks are in good condition with sufficient room provided for pedestrian movement as well as street furniture.

Bicycle Network: There is a striped bike lane along the north side of the road, as this is a one-way street heading west.

Hayes Street / Providence Drive

Provides a safe connection in the eastern part of the city while connecting to Fred Meyer, the hospital, and senior housing. When Hayes Street is completed, it will be a good alternative to using OR99W.

Pedestrian network: Currently two separate, unconnected routes, the streets will eventually be connected with additional development. Both streets have excellent sidewalk networks with five-foot-wide sidewalks in good condition. Hayes Street has minor gaps just east of Springbrook Road, but those will be completed as the adjacent parcels are developed. Curb ramps are fairly new and located at nearly all intersections.

Bicycle network: Hayes Street has bicycle lanes along the entire length of the existing road. There are no bicycle lanes on Providence Drive.

Highway 219 (OR99W to Wynooski Street)(bicyclists)

Provides regional bicycle connections to Wilsonville, Champoeg State Park, and the southern Willamette Valley.

Pedestrian network: Considered primarily as a critical bicycle route, there are no dedicated pedestrian facilities along this route. There is a wide shoulder that is appropriate for the roadway type and location that pedestrians may use.

Bicycle network: There is a wide shoulder for shared-use between bicyclists, pedestrians, and vehicles needing to pull over. This is the appropriate type of facility for a more rural highway. There is no existing signage, which would increase driver awareness to the possible presence of bicyclists along this route.

Highway 240 (Main Street to Chehalem Drive)

This route is a regional bicycle route, connecting to Yamhill, Carlton, and Oregon wine country to the west of Newberg.

Pedestrian Network: There are no dedicated pedestrian facilities along Highway 240. Pedestrians are forced to use the roadway or the narrow shoulder (where provided).

Bicycle Network: There are no dedicated bicycle facilities along Highway 240. Bicyclists are forced to take the lane or use the narrow shoulder (where provided).

Hoskins Street (Crestview Drive to Pennington Drive)

This route provides a connection to and from Austin Elementary School to the residences in the surrounding area. This route will also provide a connection to the future George Fox University sports complex.

Pedestrian Network: There is a generally complete sidewalk network, one however that does not extend to Crestview Drive. The sidewalk on the east side of the street begins in front of the church and continues south to the end of the road. The sidewalk on the west side is intermittent, with a short segment opposite the church, and then again before the intersection with Arabian. The sidewalk then disappears after Palomino for a short segment before appearing and continuing to the

end of the street. Access to the sidewalk is difficult in certain locations, such as at the church on the east side, and where the sidewalk drops in locations on the west side. Otherwise access by curb ramps is good. The sidewalk width varies from four to five feet wide and is in generally good condition, with a few locations where an obstruction exists, such as a mailbox or power pole, or where the sidewalk has buckled, creating a lip greater than a ½ inch.

Bicycle Network: There are no dedicated bicycle facilities along Hoskins Street. Bicyclists are expected to share the road with motor vehicles.

Howard Street (Sheridan Street to 6th Street)

Known as the "civic corridor", Howard provides connections to the Community Center, the library, City Hall, Fire Station #2, the Public Safety Building, Memorial Park, and Edwards Elementary School. This route will also provide a connection to the future cultural and arts center.

Pedestrian Network: Howard Street has a fairly complete sidewalk network, although a critical piece is missing along Memorial Park on the west side between 4th and 5th Street. Most of the intersections have accessible curb ramps, although Howard and 4th have no curb ramps, and Howard and Vista only has one curb ramp. The sidewalk is in decent condition along the entire route and varies in width from 10 feet to five feet.

Bicycle Network: There are no dedicated bicycle facilities along Howard Street. Bicyclists are expected to share the road with motor vehicles.

Illinois Street / College Street / Vermillion Street / Meridian Street / Fulton Street / Villa Road / Haworth Avenue (Hwy 240 to Springbrook Road)

Illinois, Fulton Street and Haworth Avenue provide a connected east-west route that parallels Highway 99W. This route connects to the swimming pool and Pool Park, senior housing, George Fox University, Mabel Rush Elementary School, Mountainview Middle School, and Newberg High School.

Pedestrian network: This east-west connector route generally provides good connectivity and sidewalk conditions, at least on one side of the road. From Main Street, Illinois has an existing sidewalk on the south side that varies from four feet wide to seven feet wide until Illinois intersects with College Street. There is no sidewalk on the north side, and locating one there would require negotiating with private property owners. The most difficult segment of this route is between College Street and Meridian Street. There is no good connection or crossing of the railroad tracks making it extremely difficult to reach Vermillion Street. And once users reach Vermillion, there is very little sidewalk provided. Users are forced to use the road until reaching Fulton Street. At Fulton, with the exception of a small gap on the south side, the sidewalks are complete and in good condition on both sides of the road. Another difficult crossing is of Villa Street, and reaching Haworth Avenue. Once at Haworth, the sidewalk on the south side disappears at the park and users are routed onto an asphalt path that winds through the park before rejoining the sidewalk. There are also small missing segments of sidewalk along the north of Haworth, and a larger gap on the south side at the intersection of Haworth and Elliott. Curb ramps are intermittent along this entire route.

Bicycle network: This route has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and taking the lane should not be too difficult or uncomfortable for most bicyclists.

Main Street (Dayton Ave to Foothills Drive)

Provides excellent north-south connectivity through Newberg, connecting to Chehalem Valley Middle School, Crater Elementary School, Jaquith Park, the Senior Center, existing residential areas, and the downtown core.

Pedestrian network: Main Street, particularly north of Columbia, is a very good pedestrian route. There are a few small segments of missing sidewalk, and then only on one side of the street. The sidewalk is 5' wide and in good condition up to Foothills Drive. South of Columbia the pedestrian network is less friendly, with large gaps on both sides of the street and the existing sidewalk varying between 4'-5' wide and from poor to fair condition. This remains true until Main Street enters the downtown area. The location of curb ramps is inconsistent along the length of Main Street from to Columbia.

Bicycle network: Main Street has no specific provisions for bicycle use south of Mountainview Drive. Bicycle lanes are provided between Mountainview Drive and Foothills Drive.

Meridian Street, Crestview Drive, Center Street (Mountainview Drive to 1st Street)

Provides an alternate north-south route to College Street and Main Street while connecting downtown Newberg, George Fox University, Joan Austin Elementary School and residential areas.

Pedestrian network: This route is generally a decent pedestrian route. South of Vermillion there are no gaps in the sidewalk network on either side of the road, and the sidewalks are four to five feet wide in good condition. Between Vermillion and the railroad tracks is the most difficult section. The sidewalk exists primarily on the west side and is in fairly poor condition, including the crossing of the railroad tracks. North of the railroad tracks there are intermittent gaps in the sidewalk network that increase on the west side approaching Crestview. The sidewalks are typically in fair to good condition along this segment, although curb ramps are inconsistent north of the railroad tracks.

Bicycle network: This route has no provisions for bicyclists. Bicyclists are expected to share the road with motor vehicles.

Morton Street (1st Street to Highway 240)

This route provides one of the only through connections in this part of town, connecting the residences with the Armory, its park, and east-west routes along Highway 240/Illinois Street and OR99W.

Pedestrian Network: There is an intermittent sidewalk network with no connectivity or consistency on either side of the street. Where the sidewalk does exist it is generally in good condition and is 5-feet wide. Curb ramps are inconsistent as well, and where they do exist many do meet the ADA standards for accessible ramps.

Bicycle Network: There are no dedicated bicycle facilities along Morton Street. Bicyclists are expected to share the road with motor vehicles.

Mountainview Drive / Aspen Way (Chehalem Drive to Crestview Drive)

Provides a vital east-west connection in northern Newberg. Connects older residential areas with the growing northeast section of Newberg, as well as providing a connection to Joan Austin Elementary

School, Newberg High School, and Mountain View Middle School. Mountainview Drive also provides connections to several other north-south critical routes.

Pedestrian network: Mountainview Drive has a completed 5' wide sidewalk in good condition along both sides of the road between Chehalem Drive and Villa Road. Curb ramps are fairly new and located at nearly all intersections. There are no pedestrian facilities provided east of Villa Road. However, this will most certainly change with the development of the Austin property north of Mountainview Drive.

Bicycle network: Bicycle lanes present between Crater Street and Main Street, and again from College Street until Villa Road. The remaining portions of Mountainview Drive have no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and taking the lane should not be too difficult or uncomfortable for most bicyclists.

OR 99W(Through City, OR 99W, Portland Road)

Provides a direct connection to the businesses and restaurants located in eastern Newberg. A busy state highway that connects Newberg to the northeast with Sherwood, Wilsonville, Tigard, McMinnville, and Portland and to Dundee to the southeast.

Pedestrian Network: OR99W has six-foot-wide sidewalks in good condition on both sides of the road from the downtown couplet at River Street east until Brutscher Street. The sidewalk on the north side of OR99W ends about 250 feet east of this intersection. The sidewalk on the south continues east in front of the hospital to the edge of the Urban Growth Boundary, approximately 400 feet past Providence Drive.

Bicycle Network: There are five-foot-wide bike lanes striped from Providence Drive west to the downtown couplet.

River Street (Sheridan Street to 14th Street)

River Street provides connections to Hoover Park, George Fox University, the neighborhoods to the south and east of downtown, as well as the Rogers Landing Park and boat launch and Willamette River.

Pedestrian network: River Street has a complete sidewalk network on both sides of the street between Sheridan Street and 11th Street. The sidewalks are predominantly four feet wide, with a few exceptions, such as near the church on 4th Street where the west side sidewalk becomes nearly 10 feet wide for a block. However, the condition of the sidewalks makes it very difficult for many people to use comfortably. There are many older, large trees along River Street that have lifted a number of sidewalk panels with their roots, some as much as three inches or more. In addition, there are almost no curb ramps south of the downtown area along either side of the road, even where crosswalks are marked. These conditions make it challenging for anyone with mobility difficulties to travel safely and successfully along River Street without resorting to using the roadway itself.

Bicycle network: River Street has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and taking the lane should not be too difficult or uncomfortable for most bicyclists.

Rogers Landing Road (14th Street to Willamette River)

The route provides access from 14th Street down to Rogers Landing Park and the boat launch. The route will eventually connect to a planned trail that parallels the Willamette River.

Pedestrian Network: There are no dedicated pedestrian facilities along Rogers Landing Road. Pedestrians are forced to walk in the road, or along the side of the road weather permitting. There is a significant elevation drop heading into the park.

Bicycle Network: There are no dedicated bicycle facilities along Rogers Landing Road. Bicyclists are expected to share the road. The route is downhill heading into the park, however the elevation gained in leaving the park presents difficulties to many bicyclists.

Sitka Avenue / Hancock Street (Highway 219 to Elliott Road)

Connects two critical routes while providing connections to the WIC offices as well as a senior center.

Pedestrian network: The majority of this route is lacking sidewalks. In the few places where sidewalks do exist, they are five feet wide and in good condition. Curb ramps are non-existent for the most part.

Bicycle network: This route has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and taking the lane should not be too difficult or uncomfortable for most bicyclists.

Springbrook Road (Wilsonville Road to Mountainview Drive)

Provides north-south connections in the eastern area of the city. Provides access to Mabel Rush Elementary School, Mountain View Middle School, and Newberg High School. Provides access to shopping on 99W, including the Fred Meyer, Crossroads Plaza, and Springbrook Plaza, as well as to major employers such as A-dec.

Pedestrian network: Springbrook Road has good sidewalk conditions with five feet wide sidewalks directly north and south of OR 99W. This continues in the northern direction until Middlebrook, where the sidewalk then ends on both sides of the road. Heading south, the sidewalks disappear on both sides of the road before reaching Hayes Street. Once past Hayes, a narrow asphalt path appears on the west side of the road across from the ditch next to the fence line. Continuing south, past the older developments, sidewalks appear, hopping back forth from the west side to the east and back to the west before reaching Wilsonville Road. Curb ramps are located at all the intersections where sidewalk currently exists, and at least one intersection (Springbrook and Hayes) where sidewalks currently are not yet installed.

Bicycle network: Springbrook Road has one very short segment of bicycle lane between OR 99W and Haworth Avenue. Other than this block of bicycle lane, bicyclists are expected to ride in the roadway with the vehicles. Springbrook Road heading northeast out of the city is a nice bicycle route.

Villa Road (Portland Road to Mountainview Drive)

Villa provides a critical north-south route in a portion of the city where very few choices exist. Provides connections to the swimming pool and Pool Park, Joan Austin Elementary School, and George Fox University. Provides connections to residential areas as well as the school and the commercial area along Highway 99W. Will provide a connection to the future George Fox sports complex.

Pedestrian network: Villa Road has a highly inconsistent sidewalk network with very few completed portions. The majority of the existing sidewalk can be found on the west side, but there are still existing gaps between OR 99W and Haworth Avenue. Furthermore, some of the existing segments are less than 3' wide, making them inaccessible for people with mobility difficulties. The remaining existing portions of sidewalk vary in length between four and five feet, depending on the age of the adjacent development. North of Haworth Avenue there is only a short portion of existing sidewalk on the east side just south of Crestview. With the exception of the intersection of Villa Road and OR 99W, curb ramps are sporadic.

Bicycle network: Villa Road has no existing bicycle network provisions, although there is an existing striped shoulder in the north bound direction as Villa Road travels down and up through the creek gully and under the railroad bridge.

Wilsonville Road (Highway 219 to the east)

Wilsonville Road is considered primarily as a regional bicycle route, providing access to the Willamette River and Wilsonville.

Pedestrian Network: There are no dedicated pedestrian facilities along Wilsonville Road within the Newberg Urban Growth Boundary. Pedestrians are forced to use the roadway or the narrow shoulder (where provided).

Bicycle Network: There are no dedicated bicycle facilities along Wilsonville Road within the Newberg Urban Growth Boundary. Bicyclists are forced to take the lane or use the narrow shoulder (where provided). This is the appropriate type of facility for a more rural highway. There is no existing signage, which would increase driver awareness to the possible presence of bicyclists along this route.

Wynooski Street (Willamette Street to Highway 219)

Wynooski Street provides an alternate route to Hwy 219 for bicyclists. It also provides more direct access into downtown Newberg without having to use Highway 219 and OR99W.

Pedestrian network: Considered primarily as a critical bicycle route, there is an intermittent sidewalk that varies in width from three to five feet on the east side of the road between River Street and 11th Street. The condition of this sidewalk also varies from poor to good, with short segments being practically inaccessible for some users.

Bicycle network: South of 11th Street the roadway is wide enough to be a comfortable shared use road. North of 11th Street the roadway narrows considerably. However the posted speed limit drops to 25 mph, which should be a comfortable riding environment for most bicyclists. There is no existing signage, which would increase driver awareness to the possible presence of bicyclists along this route.

Zimri Drive (Mountainview Road to Bell Road)

This route is considered primarily as a local/regional bicycle route, providing connections north to Bell Road / North Valley Road, a regional east west route just north of Newberg.

Pedestrian Network: There are no dedicated pedestrian facilities along Zimri Drive. Pedestrians are forced to use the roadway, as there are drainage ditches located on both sides of Zimri.

Bicycle Network: There are no dedicated bicycle facilities along Zimri Drive. Bicyclists are expected to share the travel lane with motorists. The roadway gains in elevation as the route heads north towards Bell Road.

Inventory Data Collection Methodology

The data collection team spent several days in Newberg collecting nearly 1200 points of interest for the critical route inventory. At each intersection, the data collection team noted the corner number and letter based on Figure II-1. At each location, a GPS coordinate was tagged with a note regarding curb ramp / no curb ramp and a photo was taken. If a curb ramp was present, the slope of the curb ramp was recorded.

The data team also identified obstructions along the critical route such as drains, power poles, shrubbery/trees/foliage protruding into the pedestrian realm, or bad sidewalk surface with more than a ½ inch height difference.

In addition, the data team also reconciled the existing sidewalk GIS layer with the latest ground conditions.

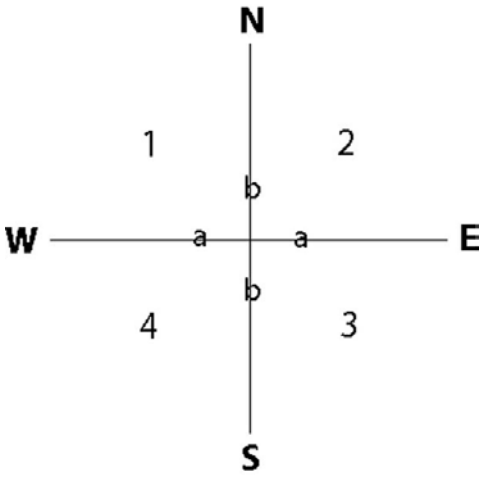


Figure II-1. Corner Identification

Inventory Data Summary

The data collection and critical route summary discussed earlier focuses solely on identified critical bicycle and pedestrian routes on existing streets. Data could not be collected for roads or routes that are planned, but do not yet exist. This includes all of the identified trails, proposed road sections, and the proposed bypass.

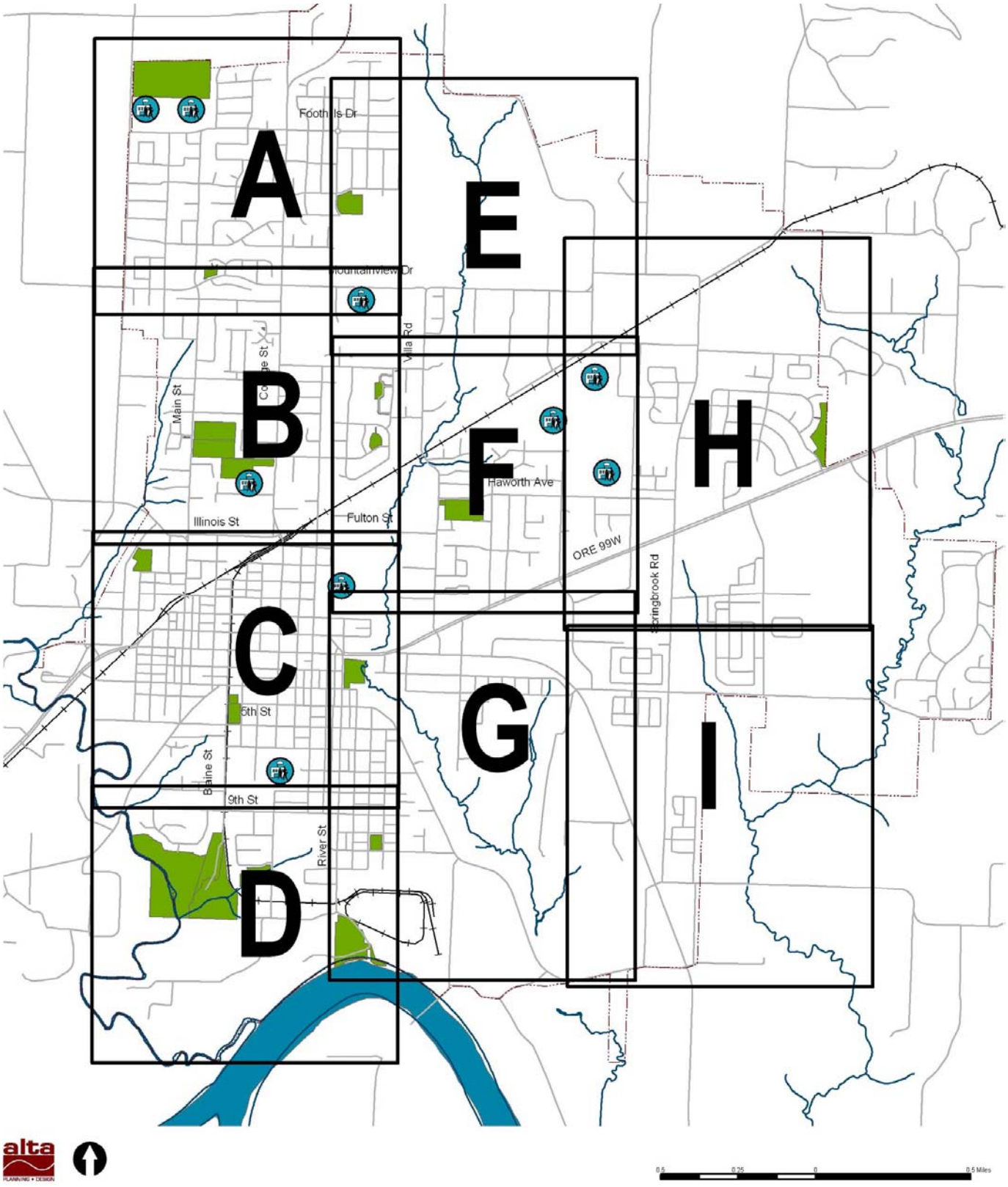
Table II-1 summarizes the major findings for all the critical routes.

Table II-1. Inventory Data Summary

Item	Count / length
Missing curb ramps	445
Major obstacles	99
Missing sidewalk (miles)	24
Existing bike lanes (miles)	5.9

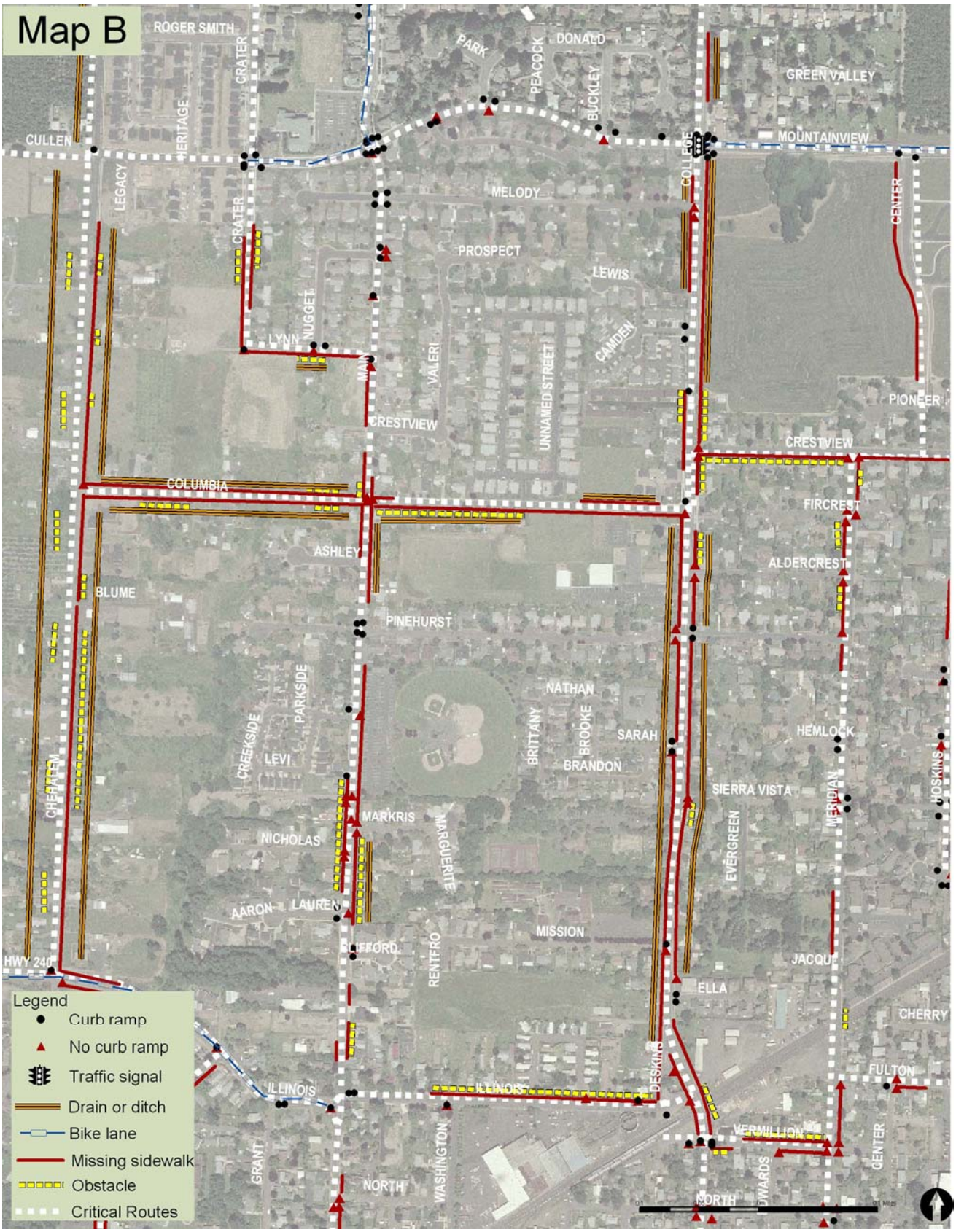
Map II-2 shows the nine sub-map zones, followed by the nine sub-maps. On the sub-maps, the major obstacle points are shown. The shortest lines are incidences of sidewalk in extremely poor condition. The other lines generally refer to right-of-way issues such as potential private property impacts, or a narrowing of the roadway. Data was collected for the routes listed earlier in this chapter.

Map II-2. Newberg Subzone Map

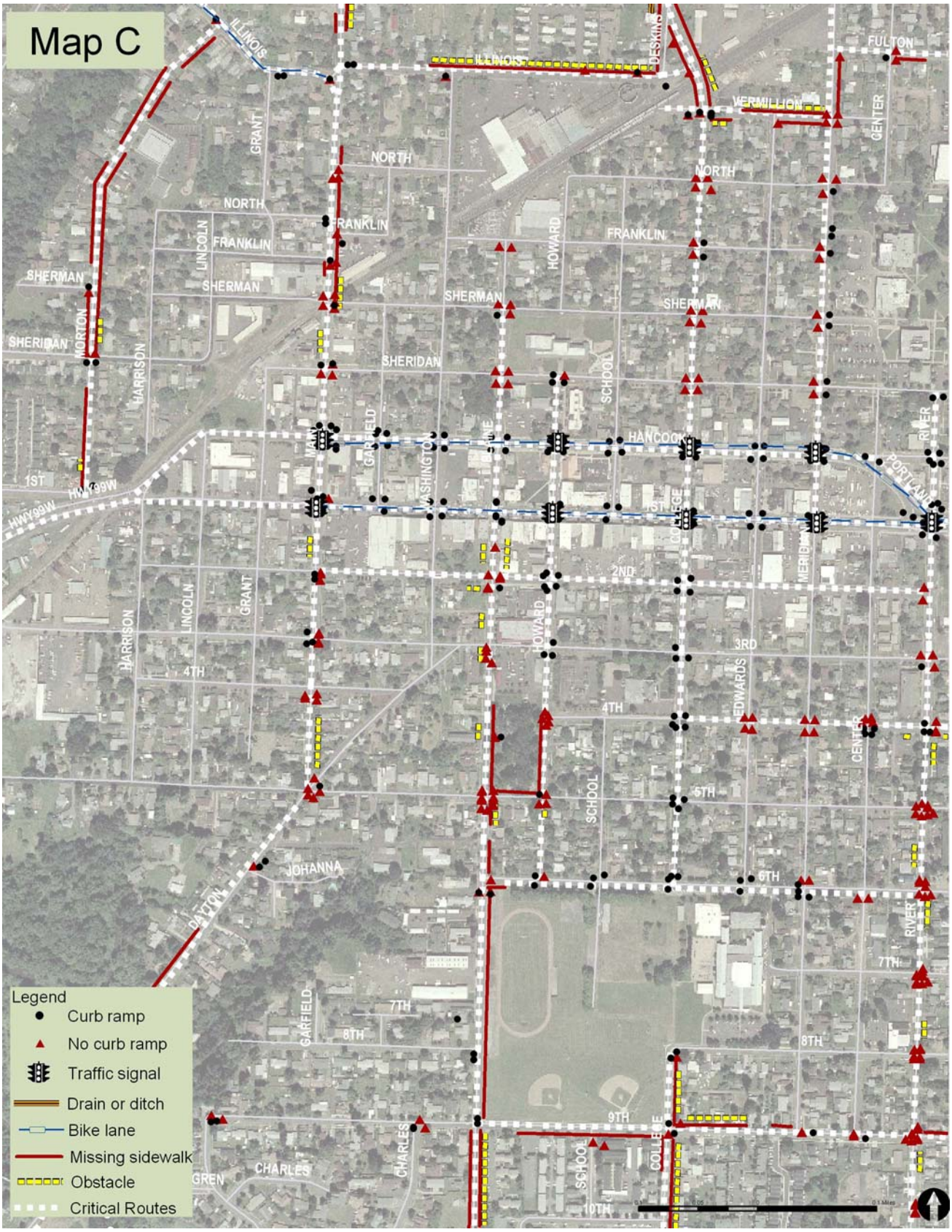


Map II-3. Newberg Point Map A

Map II-4. Newberg Point Map B



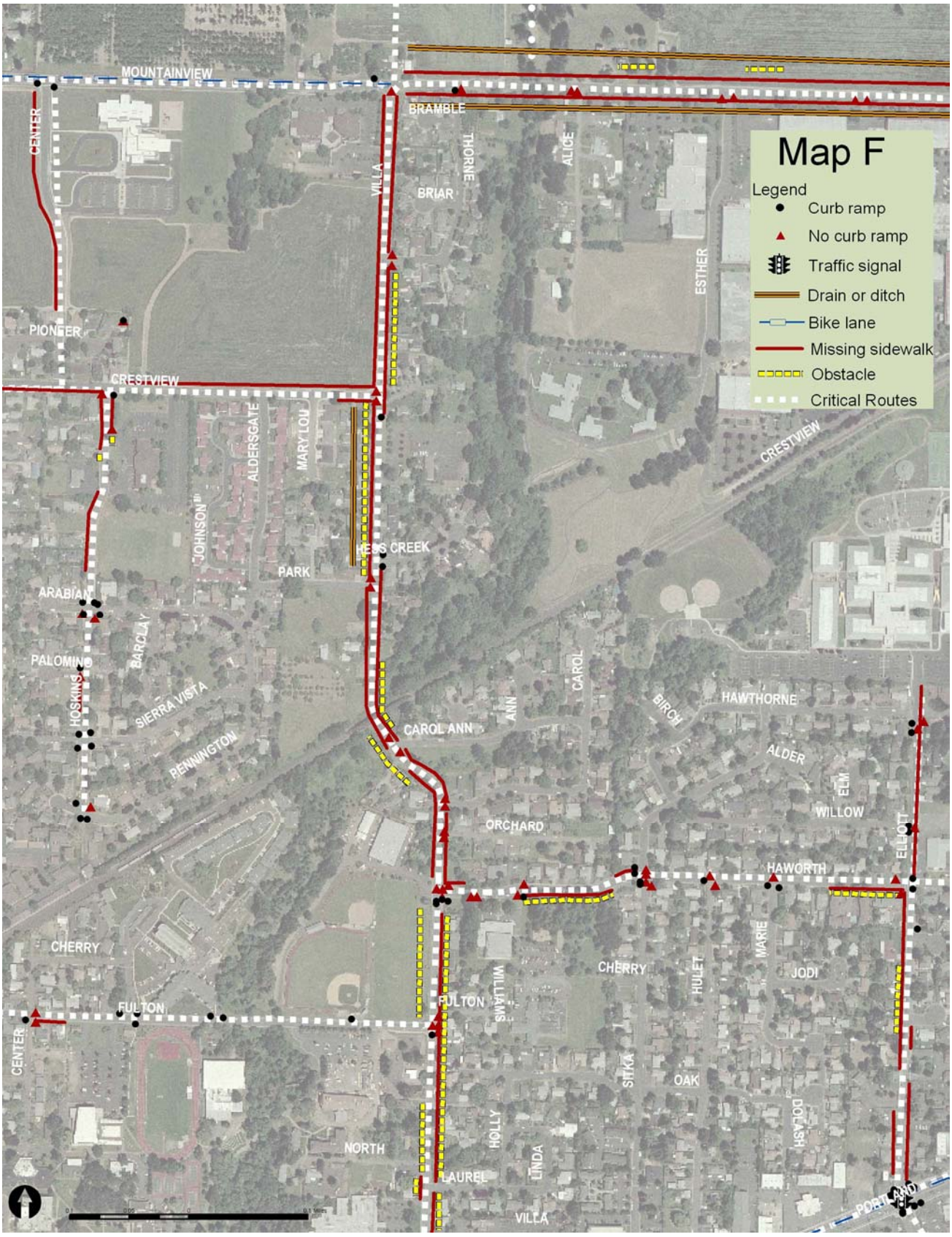
Map II-5. Newberg Point Map C



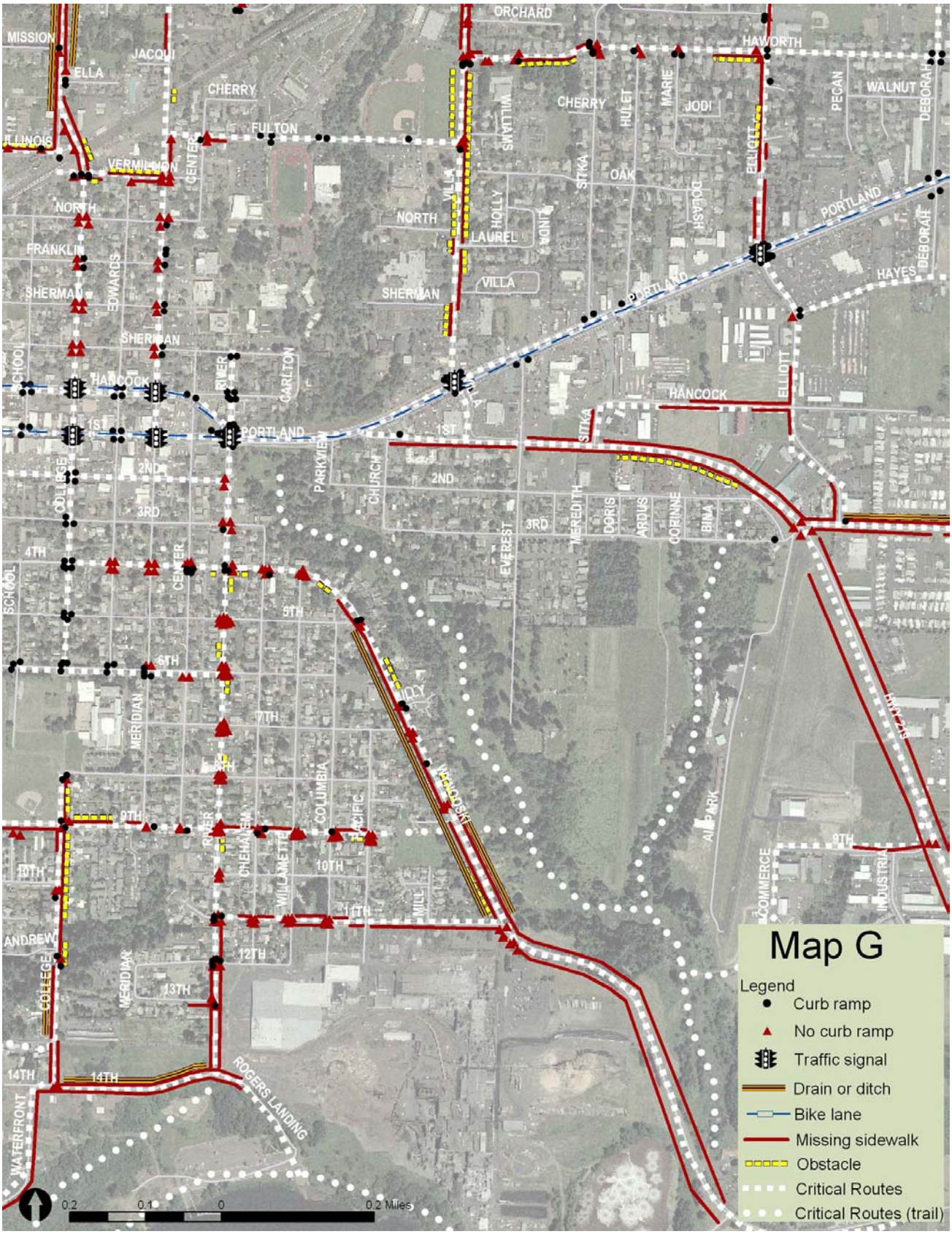
Map II-6. Newberg Point Map D

Map II-7. Newberg Point Map E

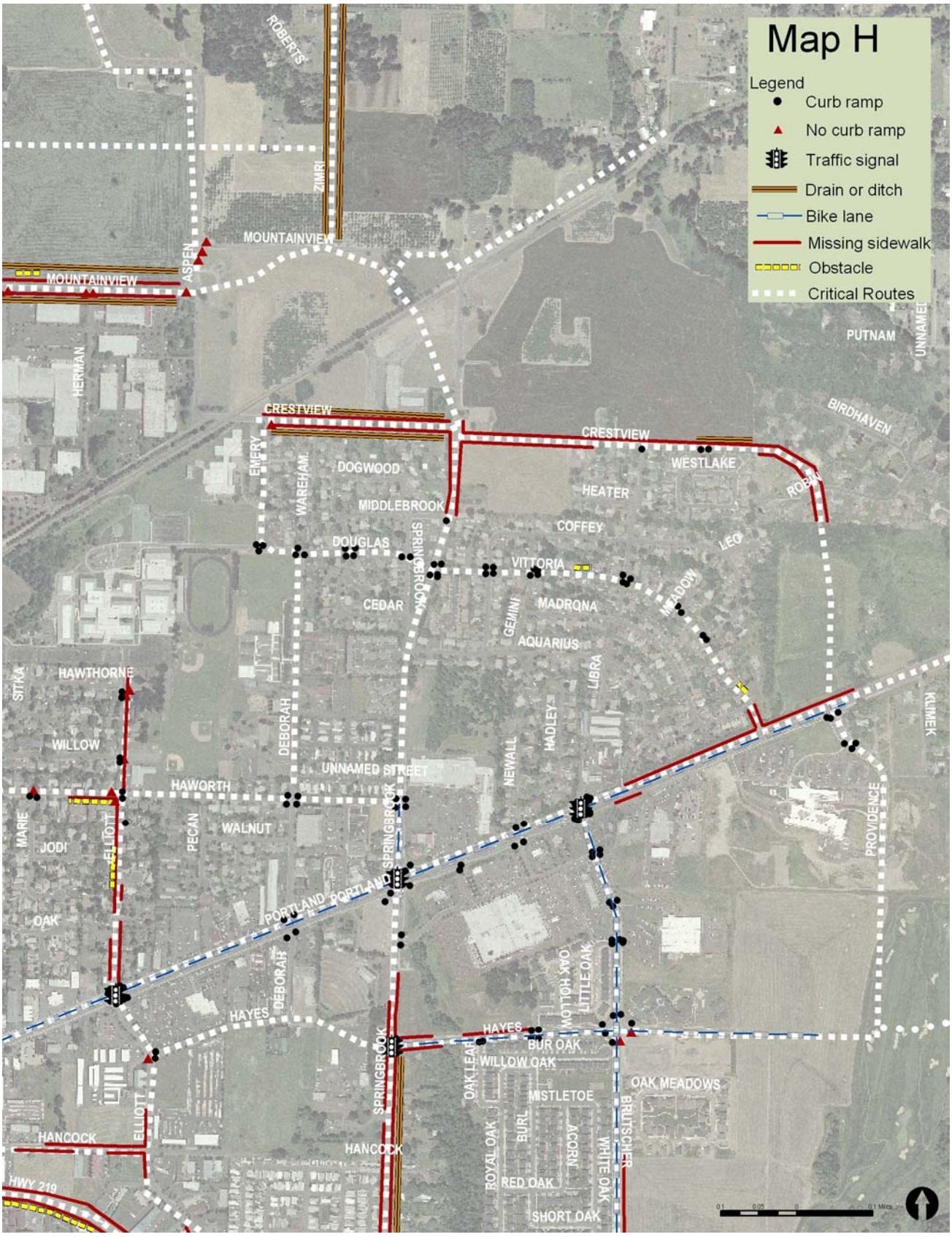
Map II-8. Newberg Point Map F



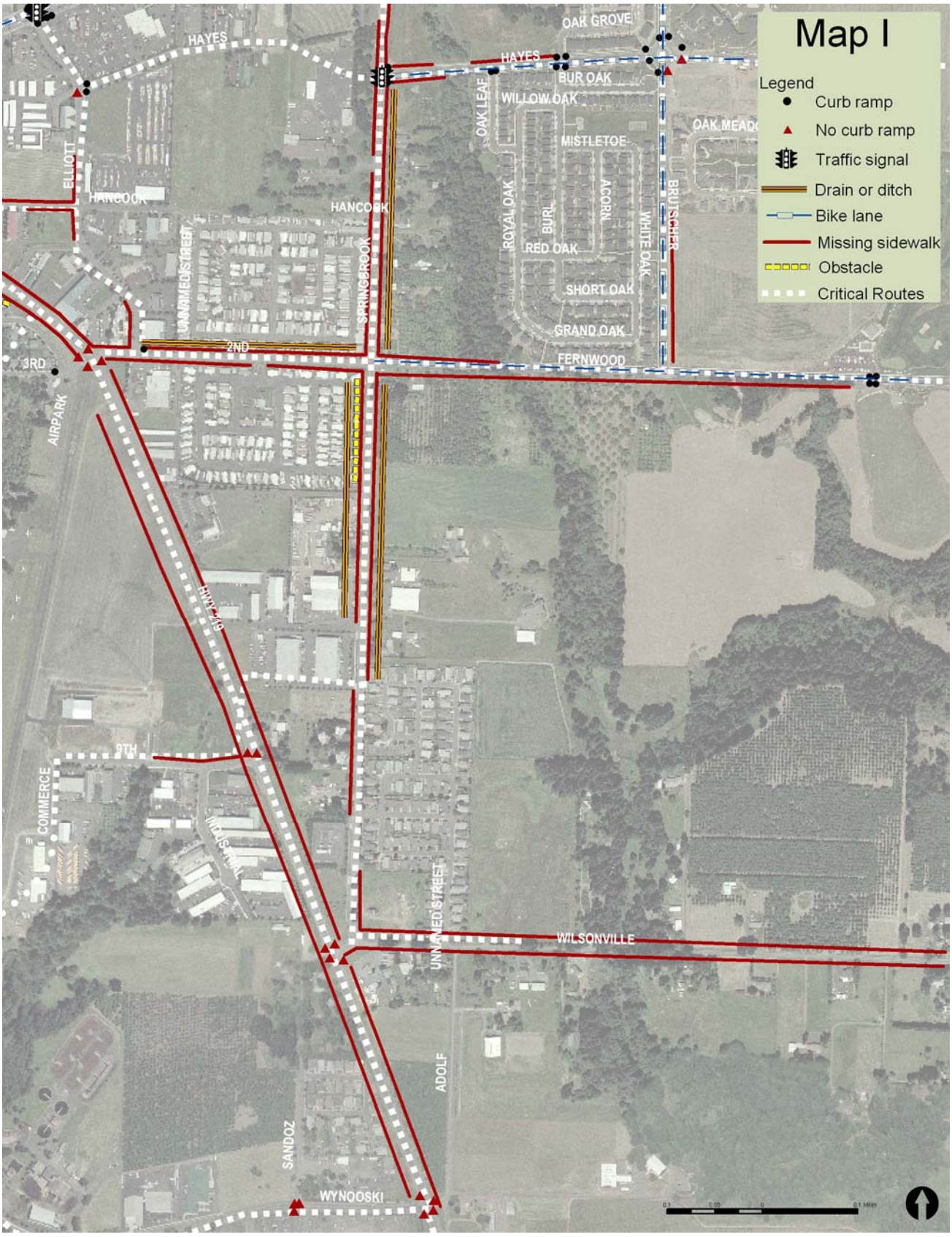
Map II-9. Newberg Point Map G



Map II-10. Newberg Point Map H



Map II-11. Newberg Point Map I



Accessibility

Based on the inventory data collected and described above, an Accessibility Map (Map II-12) was created that highlights the accessible critical routes. To be identified as accessible, the route needed accessible curb ramps at each intersection with a complete and flat sidewalk between intersections. Anything less – incomplete/missing sidewalk, missing curb ramp - resulted in the segment being designated inaccessible. As the map shows, there are a number of routes that currently not accessible to someone with mobility issues.

Existing TSP Classifications

The City of Newberg roadway functional classifications are set out in the Transportation System Plan adopted in 2005. Table II-2, Figure II-2, and Map II-13 summarize the design standards for the variety of roads within the city. This is noted here since many of the streets identified as priority routes do not conform to the existing design standards, and identifying and prioritizing those roads that should be brought up to standard will be an important question for Newberg.

Table II-2. Functional Classification Design Standards Summary

Street Classification	Minimum ROW	Median Type	Street Improvement	Travel Lanes	Bike Lanes	Sidewalk	On-Street Parking	Planter Strip
Major Arterial	ODOT	CL or Median	ODOT	ODOT	Yes	Yes	ODOT	ODOT
Minor Arterial	60’ – 80’	CL or Median	46’	2	Yes	Yes	No	Yes
Major Collector	60’ – 80’	No Median	34’	2	Yes	Yes	No	Yes
Minor Collector	56’-65’	No Median	36’	2	No	Yes	Yes	Yes
Local Street	54’ – 65’	No Median	32’	2	No	Yes	Yes	Yes

Notes:
ODOT = This is an ODOT facility and the final design authority rests with ODOT
CL = Center turn lane.

Map II-12. Accessibility

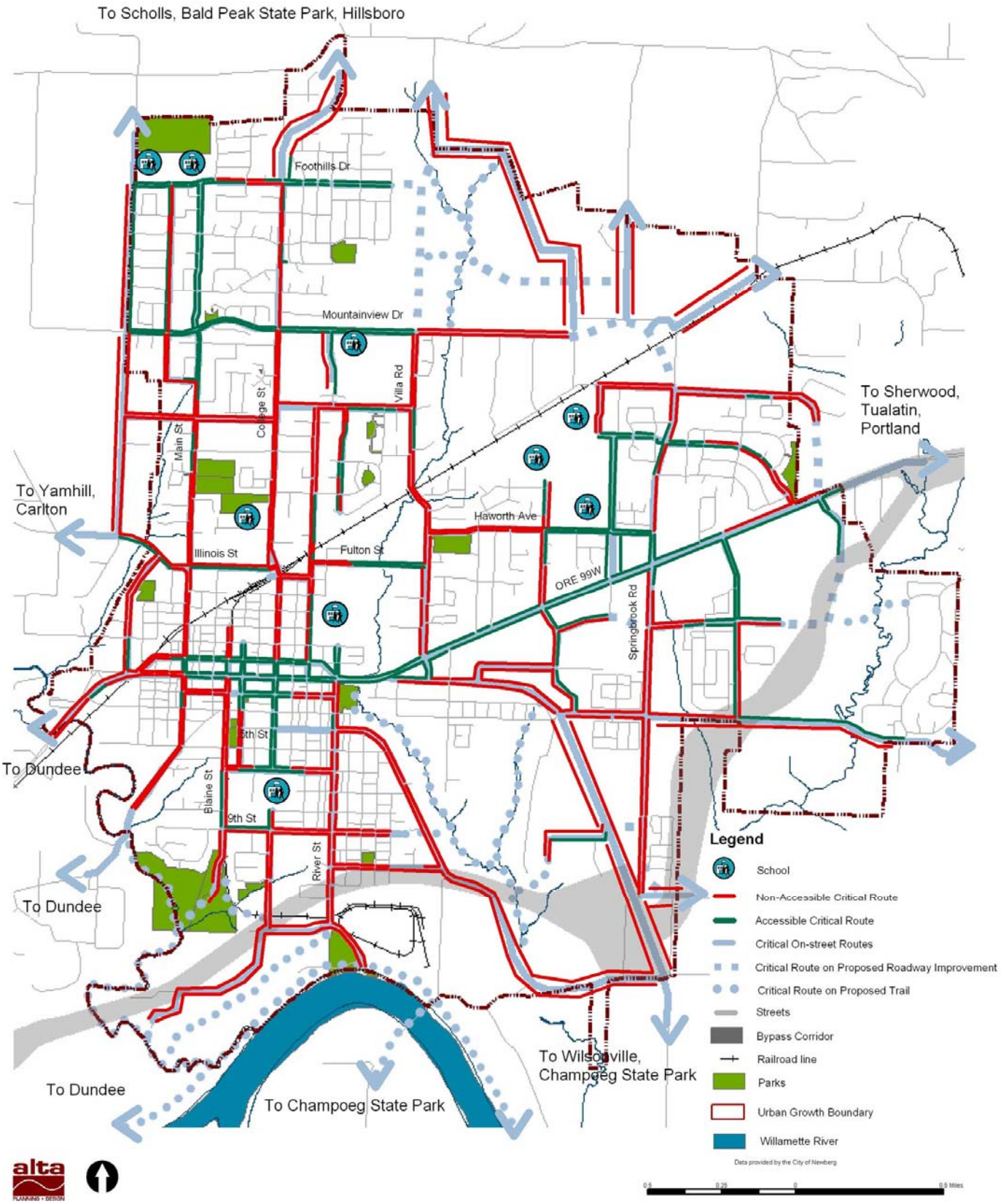
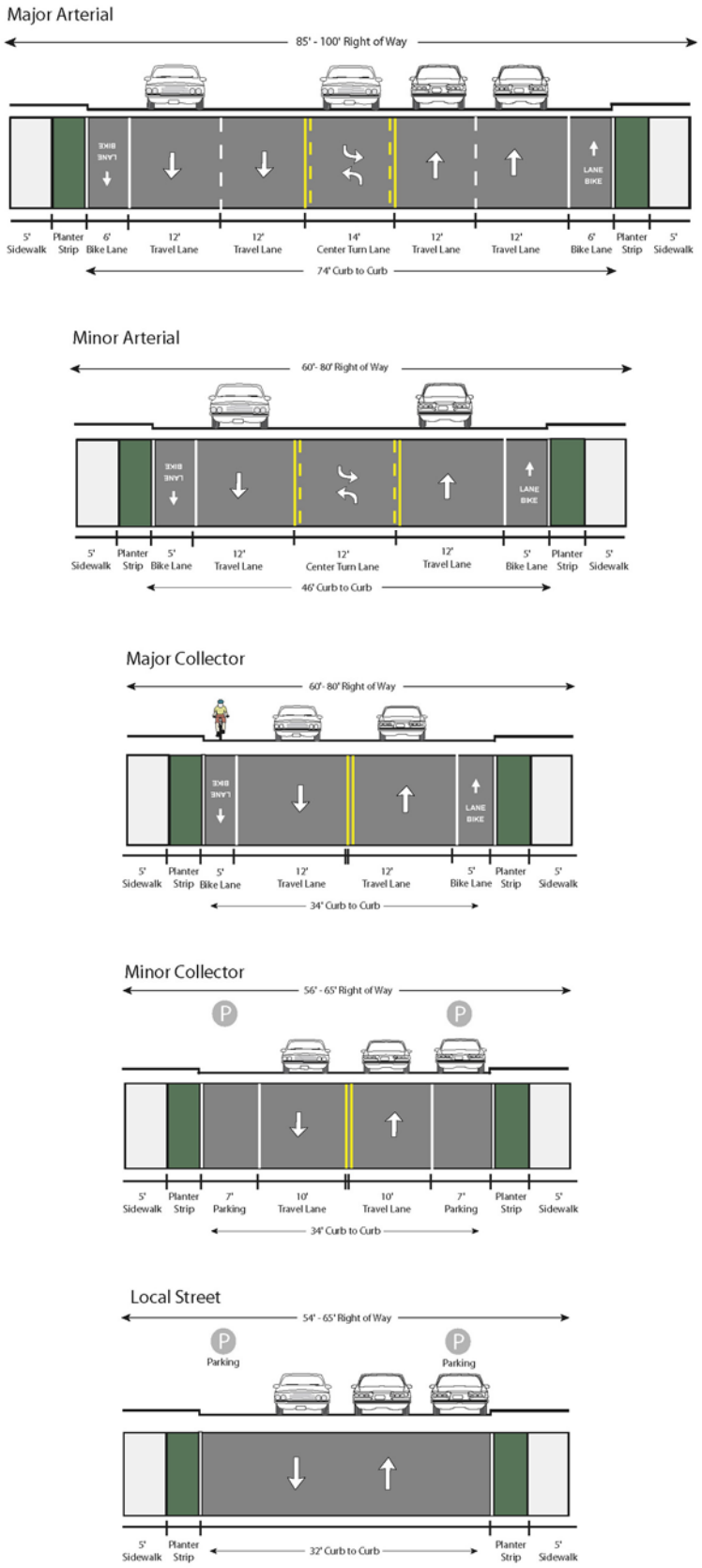
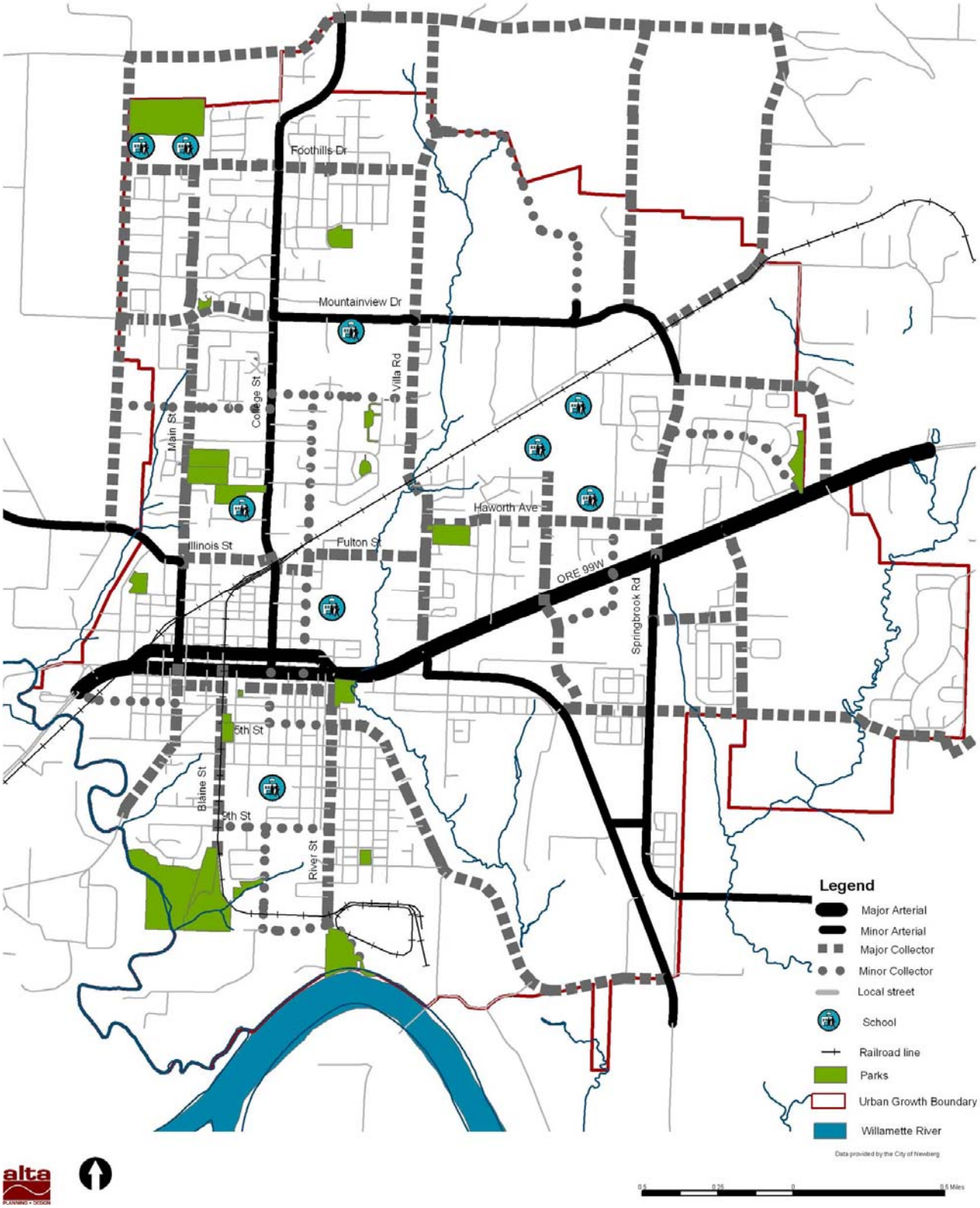


Figure II-2. Street Classifications



Map II-13. Transportation System Plan



III. Recommended Improvements & Implementation

Introduction

This chapter builds on the Existing Conditions discussed in the previous chapter and the identification of the critical bicycle and pedestrian routes for the City of Newberg. The recommended improvements include a focus on primary critical routes and the establishment of an ADA Spot Improvement Program. In addition, there is a prioritized list of improvements with project cost estimates, as well as a discussion of potential funding sources for implementing the recommended improvements.

Primary Critical Routes

The primary critical routes are the bicyclist, pedestrian, or bicyclist and pedestrian routes that have been identified through the application of selection criteria balanced with local knowledge from members of the Task Force. The result is a list of primary critical routes and secondary critical routes. From these lists the city of Newberg will develop funding priorities for bicycle and pedestrian projects for inclusion in the Capital Improvement Plan and when pursuing other funding opportunities. The projects on the primary critical route list will receive the highest priority when pursuing funding. The projects and corridors on the secondary list, while obviously important, will be viewed as longer-term projects for Newberg.

Selection Criteria

Two tools were used to analyze route priorities and sort the projects into a list of primary and secondary critical routes. The first tool, the *Potential Index*, measures the potential for bicycling and walking along the route based on the factors identified in Table III-1 and Table III-2 below. The second tool, the *Deficiency Index*, measures the deficiencies of the network and how critically improvements are needed based on the factors identified in Table III-3 and Table III-4 below. This tool was only applied to the pedestrian network, as the criteria selected did not apply to bicyclists. In general, routes that have both a high potential and a high deficiency (pedestrian only) should have the greatest priority.

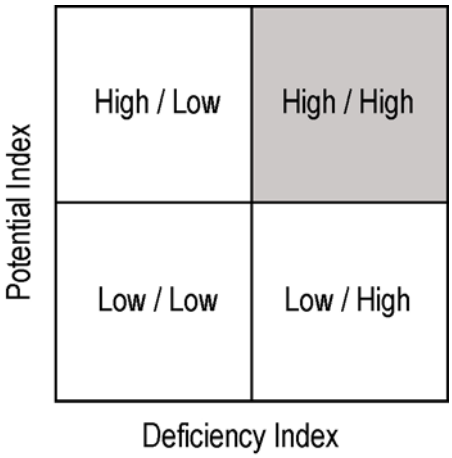


Figure III-1. Pedestrian Route Selection Matrix

For the pedestrian routes, the *Potential Index* and a weighted *Deficiency Index* were added together and then sorted based on the matrix in Figure III-1 to select the preliminary primary critical pedestrian routes. The *Deficiency Index* was weighted at 0.5 it's total value so that the potential for the route lent more weight to the final scoring.

For the bicycle routes, the *Potential Index* scores were sorted and separated to select the preliminary primary critical bicycle routes.

Table III-1. Pedestrian and Bicycle *Potential Index* Criteria and Weighting

Criteria	Weighting	Comments
Land Uses	High	This criterion evaluates connectivity and access to schools, parks, residential, commercial or employment areas, and nearby regional destinations.
Lack of alternative routes	Medium	This criterion takes into account the lack of accessible parallel routes.
Aesthetics/Comfort	Medium	This criterion measures the quality of the walking and biking environment from the perspective of the user. It considers potential views, environmental aesthetics, and characteristics such as noise and air quality.
Ease of Implementation	Low	This criterion considers environmental, political, and topographical constraints, including the potential impact on private property.
Overcomes Major Barriers	Low	This criterion considers major barriers such as railroad tracks and major roadways.

Table III-2. Potential Index Criteria and Scoring

Factors	Possible Scores	Conditions
1 Land Uses	15	Easy to access local destinations, little out of direction travel
	8	Somewhat difficult to access destinations, some out of direction travel
	3	Difficult to access local destinations, lots of out-of-direction travel
3 Lack of alternative routes	10	There are no alternative routes
	5	The alternative route is somewhat out-of-direction or slightly difficult to reach
	1	There is at least one easily accessed alternative route
5 Aesthetics/Comfort	10	Attractive and comfortable environment
	5	Somewhat attractive and comfortable
	1	Unattractive and uncomfortable
7 Ease of Implementation	5	Easy to construct, no major structures or traffic construction impacts, Few political difficulties
	3	Minor structural and construction impacts or political challenges.
	1	Extremely difficult to construct
Overcomes Major Barriers	5	Overcomes 2 or more major barriers
	3	Overcomes 1 major barrier
	0	Does not overcome a major barrier

Table III-3. Pedestrian *Deficiency Index* Criteria and Weighting

Criteria	Weighting	Comments
Sidewalk condition	Medium	This criterion evaluates the condition of the sidewalk as well as the usable width of the existing sidewalk. The worse off the condition of the sidewalk, the higher the score.
Sidewalk gaps	High	This criterion evaluates the number and length of the sidewalk gaps on the critical routes. The more gaps, the higher the score.
% ADA accessible	High	This criterion evaluates the presence/absence of curb ramps at intersections.

Table III-4. *Deficiency Index* Criteria and Scoring

Factors	Possible Scores	Conditions
Sidewalk condition	10	Poor sidewalk conditions along a majority of the route
	5	Good to Fair sidewalk conditions along a majority of the route
	1	Good or better sidewalk conditions along the majority of the route
Sidewalk gaps	15	> 75% of the route missing sidewalk on one side or the other
	8	> 40% of the route missing sidewalk on one side or the other
	3	< 40% of the route missing sidewalk on one side or the other
% ADA accessible	15	> 75% of the route missing curb ramps
	8	> 40% of the route missing curb ramps
	3	< 40% of the route missing curb ramps

Primary Critical Routes

After analyzing the critical routes using the methods documented above and supplementing that with local knowledge supplied by Task Force members (see Appendix B), the following routes were identified as the primary critical routes:

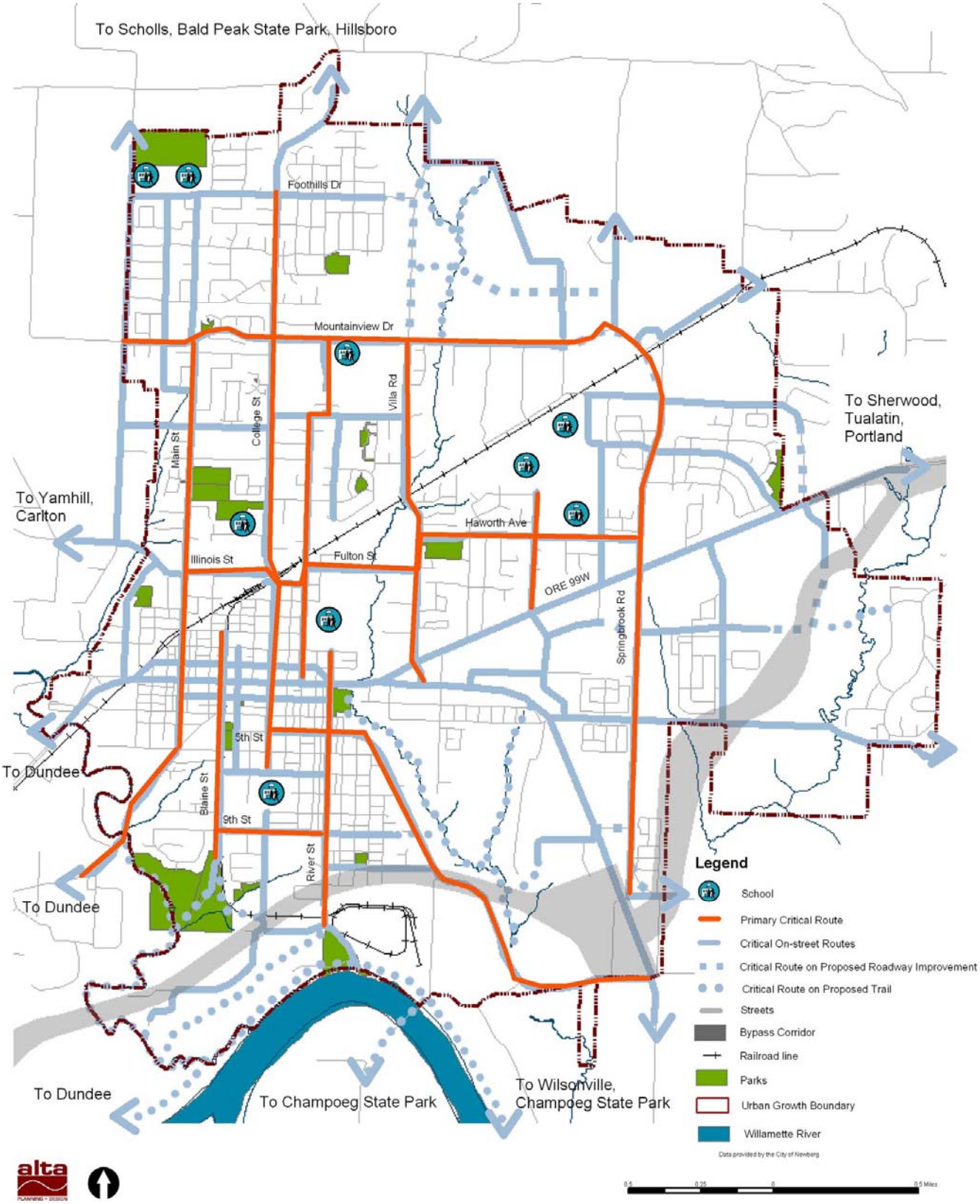
- 9th Street (Blaine Street to River Street)
- Blaine Street (Sherman Street to Newberg Chehalem Skate Park)
- College Street (Foothills Drive to 6th Street)
- Dayton Avenue (5th Street to Urban Growth Boundary)
- Elliott Road (Newberg High School to OR99W)

- Illinois Street/College Street/Vermillion Street/Meridian Street/Fulton Street/Villa Road/Haworth Avenue (Main Street to Springbrook Road)
- Main Street (Mountainview Drive to 5th Street)
- Meridian Street/Crestview Drive/Center Street (Mountainview Drive to 1st Street)
- Mountainview Drive (Chehalem Drive to Aspen Way)
- River Street (Sheridan Street to 14th Street)
- Springbrook Road (Wilsonville Road to Crestview Drive)
- Villa Road (1st Street to Mountainview Drive)
- 4th Street / Wynooksi Street (College Street to Highway 219)

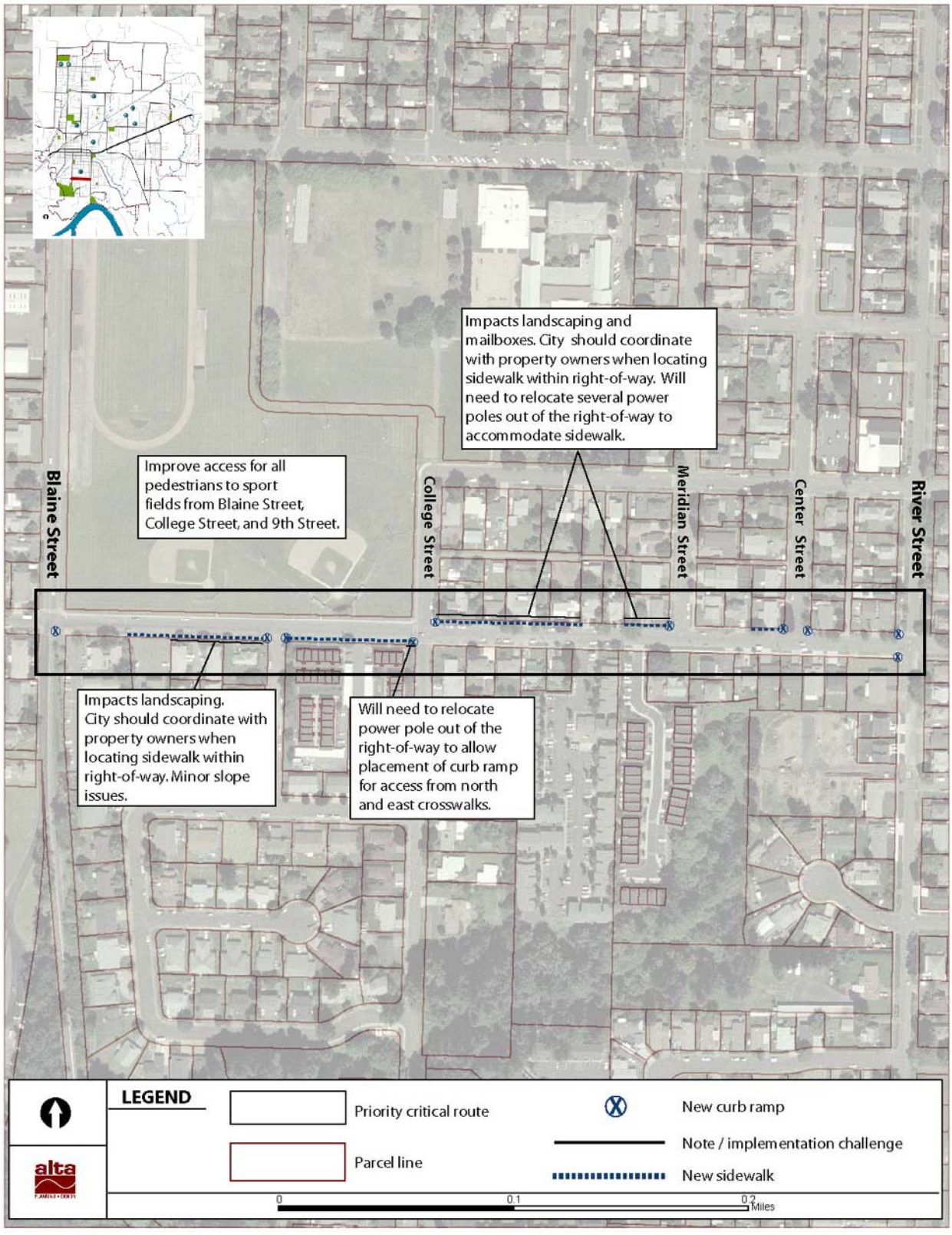
Primary Critical Routes Project Sheets

Project sheets were developed for the primary critical routes identified above. Each project was approached individually as a stand-alone project; therefore there is an overlap of improvements (i.e. same curb ramp, same sidewalk, etc) where projects overlap, and consequently some improvements are counted as costs in multiple projects as well.

Map III-1. Primary Critical Routes



9th Street (Blaine Street to River Street)



9th Street (Blaine Street to River Street)

Description

Connects two other primary critical routes in River Street and Blaine Street that connect the Riverfront to the downtown core and city parks, while connecting the residential areas of southern Newberg with Edwards Elementary School.

9th Street is classified as a minor collector in the Newberg TSP. The road is owned and maintained by the City.

9th Street has a completed 5' wide sidewalk in good condition along the north side of the road between Blaine St and College St. At College Street, the sidewalk becomes intermittent along the north side while it is continuous on the south side from College to River. This sidewalk is also 5' wide and generally in good condition. There are accessible curb ramps where sidewalks exist at College and Blaine, however there are none at River and Blaine, making usage difficult for many users.

9th Street has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and sharing the lane should not be too difficult or uncomfortable for most bicyclists. On-street parking is allowed along 9th Street.

The lack of a sidewalk and curb cuts at 9th and Center make travel difficult for many pedestrians.

Proposed Improvements

New sidewalks:

315 feet on south side between Blaine and School.

310 feet on south side between School and College.

331 feet on north side between College and Meridian.

115 feet on north side between College and Meridian.

100 feet on north side between Meridian and Center.

Curb ramps:

10 new curb ramps

The city will have to work with residents where private landscaping encroaches into the public right-of-way.

Potential Funding Sources

ODOT (TE, SR2S, New Freedom Initiative, Bike/Ped Program Grants), Community Development Block Grants, LID's, Sidewalk/ADA line item

Next Steps

Identify any improvements that will be made through the Sidewalk Intersections/ADA line item in the city budget.

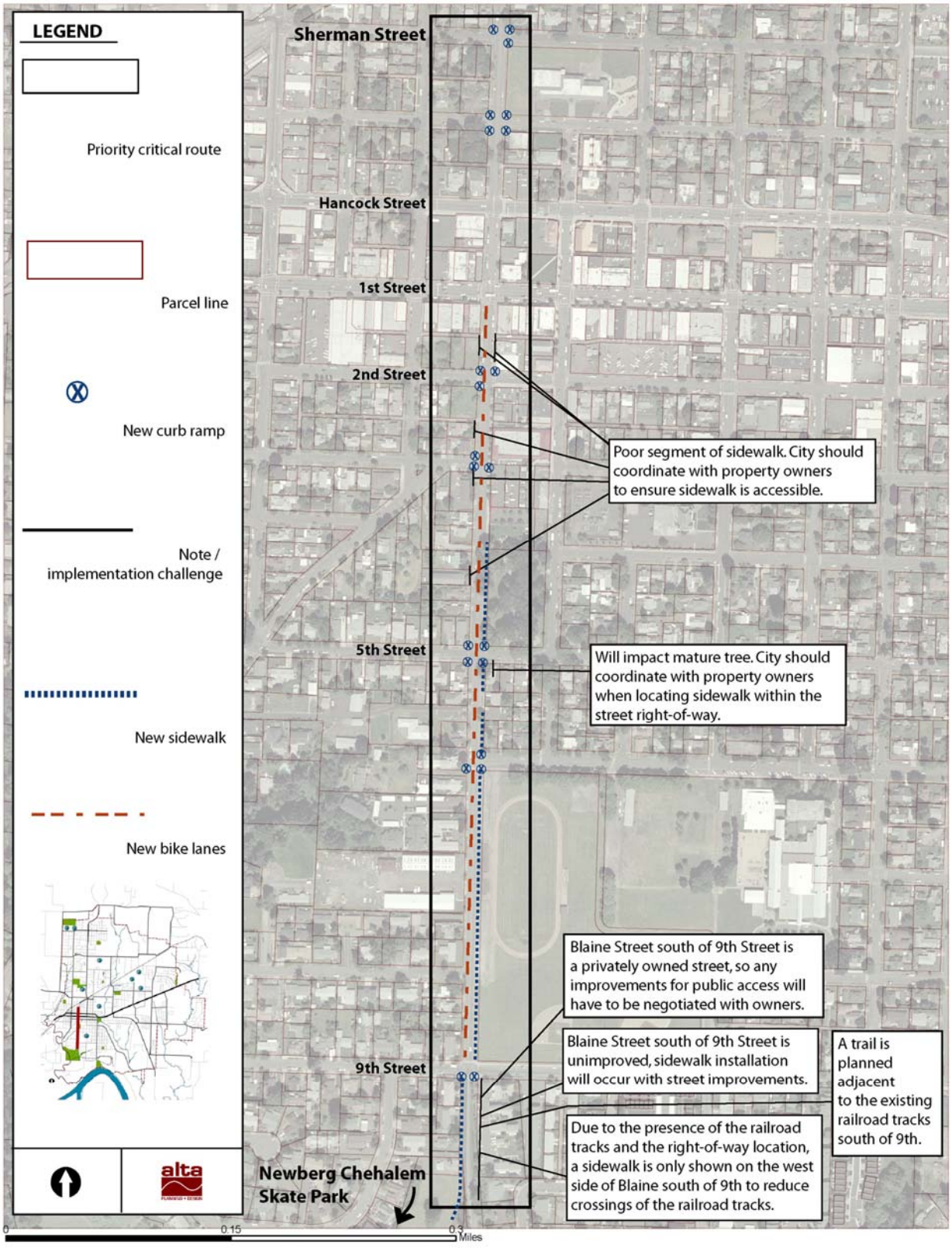
Responsible Implementing Agency

City of Newberg

Planning-Level Cost Estimate

$242,000

Blaine Street (Sherman Street to Newberg Chehalem Skate Park)



Blaine Street (Sherman Street to Newberg Chehalem Skate Park)

Description

Provides a connection to the Newberg Chehalem BMX and skate park, a desirable destination for younger residents of Newberg. Also connects to Edwards Elementary School and through the downtown core to future Culture and Arts Center at the site of the former Central Elementary School.

Blaine Street is classified as a major collector in the Newberg TSP. Blaine Street has railroad tracks that run down it which are used 2-3 times a week by SP Newsprint. The road is owned and maintained by the City.

Blaine Street has a completed 4' wide sidewalk along the west side of the street from 9th to Sherman. This sidewalk is in generally fair condition, although there are several small segments of sidewalk near downtown that need repair to make the sidewalk more accessible. In addition, there are almost no curb ramps north or south of the downtown core area along either side of the road.

Blaine Street has no existing bicycle network provisions, but traffic speeds and volumes are such that riding in the roadway and taking the lane should not be too difficult or uncomfortable for most bicyclists. According to the street classification, bike lanes should be striped on Blaine. On-street parking is allowed along portions of Blaine Street.

Proposed Improvements

New sidewalks:

900 feet on west side south of 9th Street

1020 feet on east side between 9th and 6th Street.

300 feet on east side between 6th and 5th Street.

400 feet on east side next to city park.

Intermittent segments of sidewalk north of 5th Street

Curb ramps:

22 new curb ramps

Bike lanes:

2700 feet both sides of Blaine from 1st – 9th

Potential Funding Sources

ODOT (TE, SR2S, New Freedom Initiative, Bike/Ped Program Grants), Community Development Block Grants, LID's, Sidewalk/ADA line item

Next Steps / Outstanding Questions

Outstanding questions: Are bike lanes desired on Blaine Street?

Responsible Implementing Agency

City of Newberg

Planning-Level Cost Estimate

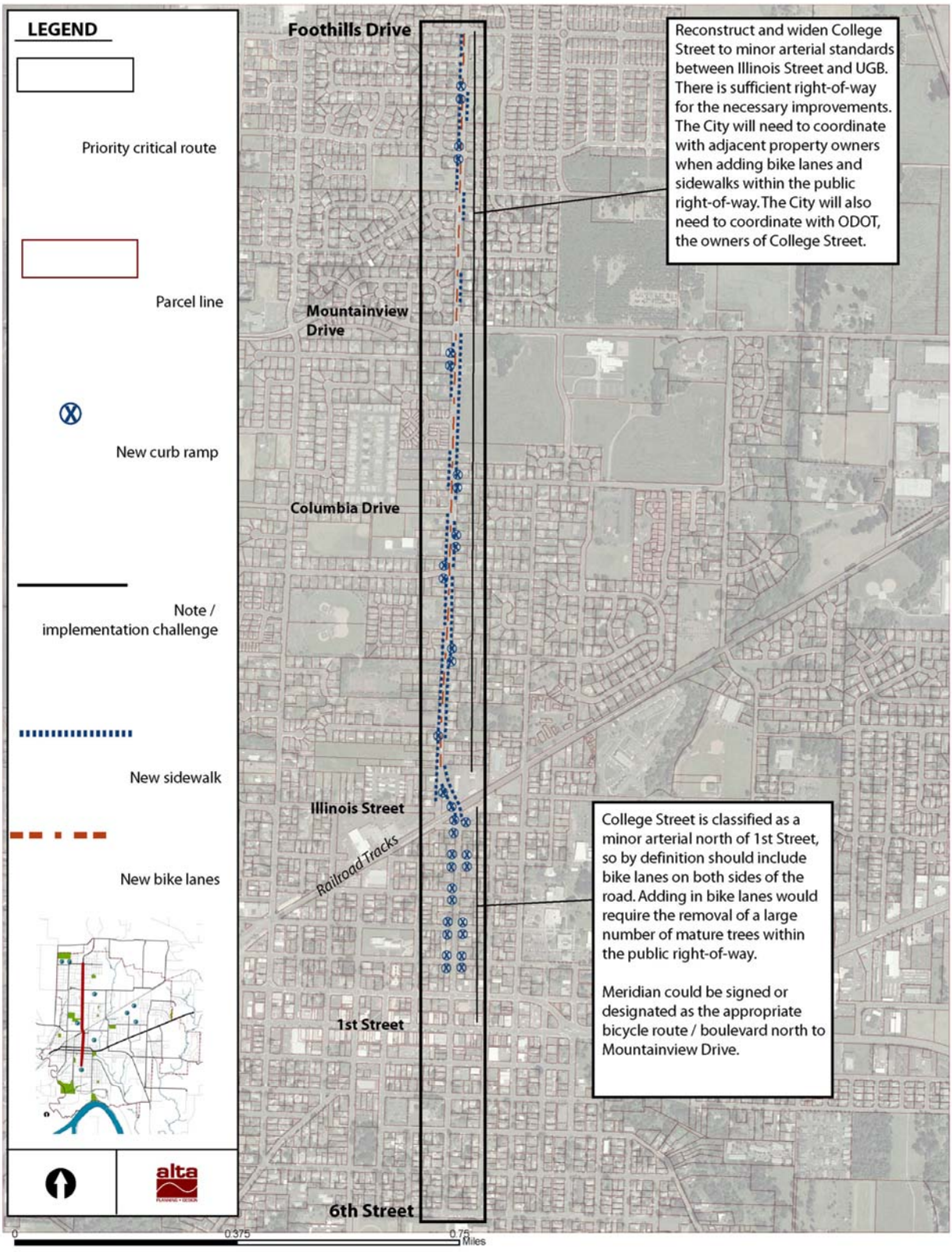
$351,000

The lack of curb cuts and sidewalk make it difficult to access the school grounds from Blaine Street.

Blaine Street has sufficient roadway width to stripe bike lanes with the removal of on-street parking.

The skate park is a major destination for many bicyclists and pedestrians.

College Street (Foothills Drive to 6th Street)



College Street (Foothills Drive to 6th Street)

Description

Provides excellent north-south connectivity through Newberg, connecting to Edwards Elementary School, Jaquith Park, existing residential areas, and the downtown core.

College Street is classified as a minor arterial north of 1st Street (also identified as OR219) and a minor collector south of 1st Street, according to the functional classification design standards in the Newberg TSP. The road is owned by ODOT north of 1st Street, and the city south of 1st Street.

College Street, particularly north of Illinois, has a number of large gaps in the sidewalk network on both sides of the street. Where the sidewalk is present north of Illinois it is generally in good to fair condition and 5' wide. South of Illinois the sidewalk is typically only 4' wide, and generally in poor to fair condition. Few curb ramps are provided north of the downtown area.

College Street has a striped shoulder that varies in width from 4'-6' along the entire corridor for bicyclists.

The drainage ditch will have to be piped to accommodate any roadway widening project designed to add sidewalks and bike lanes to College Street.

Proposed Improvements

Improve to minor arterial standard with bike lanes and sidewalks

New sidewalks:

5776 feet of new sidewalk along the east side

6078 feet of new sidewalk along the west side

Curb ramps:

34 new curb ramps

Bike lanes:

7000 feet both sides of College from Foothills to Illinois

Sidewalks that end abruptly make travel difficult for all pedestrians.

Potential Funding Sources

ODOT STIP, Spot Improvement Program

Next Steps

Work with ODOT to get College Street added to the state's Transportation Improvement Program so that it will be eligible for funding.

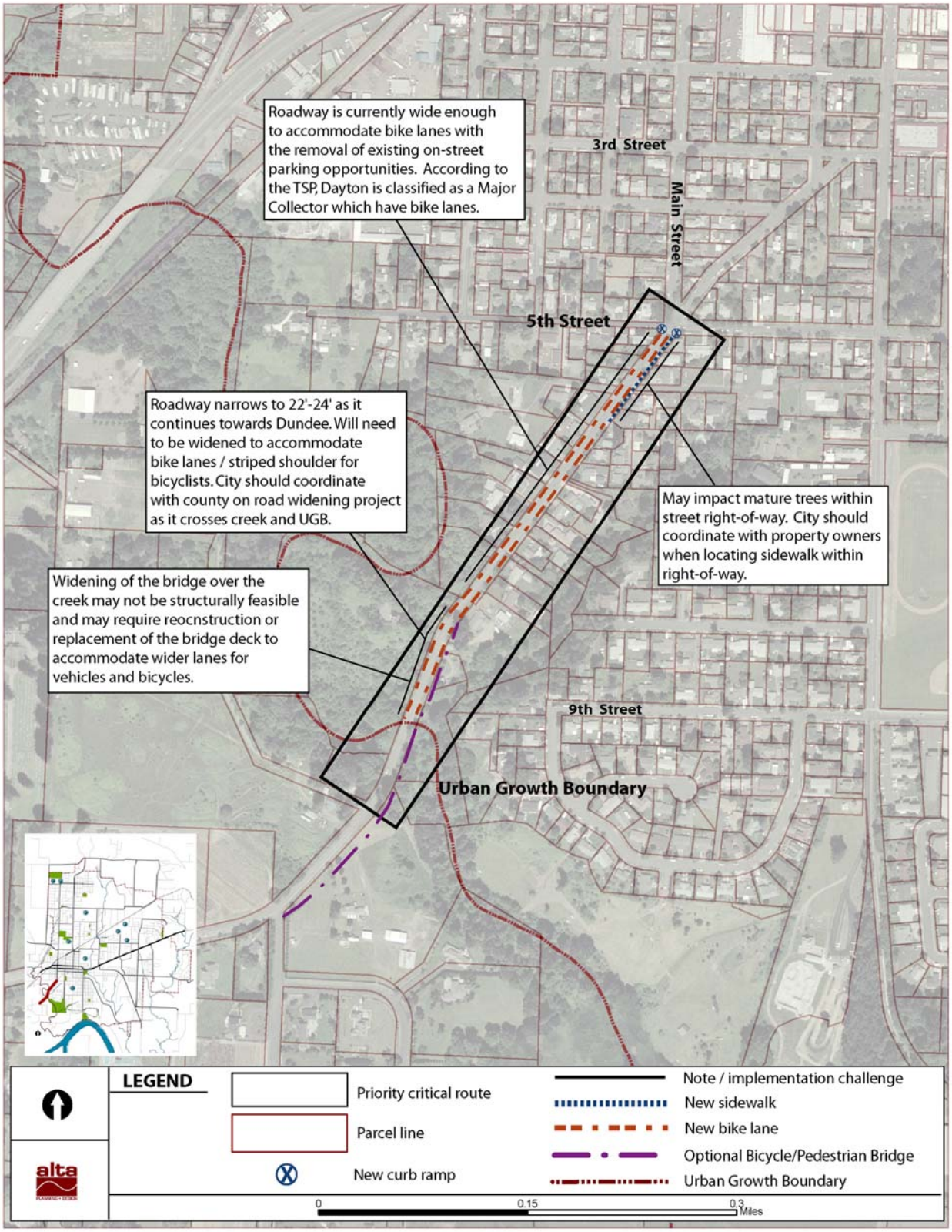
Responsible Implementing Agency

ODOT / City of Newberg

Planning-Level Cost Estimate

$9.3 million

Dayton Avenue (5th Street to UGB)



Dayton Avenue (5th Street to UGB)

Description

Dayton Avenue is one of the few identified bicycle routes within the Yamhill County Transportation System Plan. Dayton Avenue provides an alternate route to Dundee for bicyclists who prefer to not use OR99W while providing a connection to downtown Newberg.

Dayton Avenue is classified as a major collector in the Newberg TSP. The road is owned and maintained by the City within the UGB, and by the county outside of the UGB.

Directly south of 5thStreet, the roadway is ~ 34' wide with on-street parking. This is sufficient width for bicyclists to share the road. Further southwest, the road narrows to ~ 22' wide as it crosses over the creek and continues towards Dundee. There is no existing signage, which would increase driver awareness to the possible presence of bicyclists along this route.

Proposed Improvements

New sidewalks:

380 feet on southeast side between 5th and Johanna.

Curb ramps:

2 new curb ramps

Bike lanes:

1800 feet of bike lanes south of 5th Street to UGB

In addition, the roadway and bridge over the creek will most likely need to be widened to accommodate the bike lanes / shoulders as the bike route continues towards Dundee.

Bicycle / Pedestrian Bridge:

As an alternative to widening the existing bridge, a separated bicycle / pedestrian bridge could be installed. Great care would need to be taken to ensure user safety, particularly when entering/leaving the bridge from the roadway.

Potential Funding Sources

ODOT Bike/Ped Program Grants, TE grants, Highway Safety Improvement Program, Surface Transportation Program

Next Steps

Coordinate with Yamhill County on improvements to Dayton Avenue, particularly the bridge over the creek.

Responsible Implementing Agency

City of Newberg, Yamhill County

Planning-Level Cost Estimate

$304,000 (without significant work required on bridge)

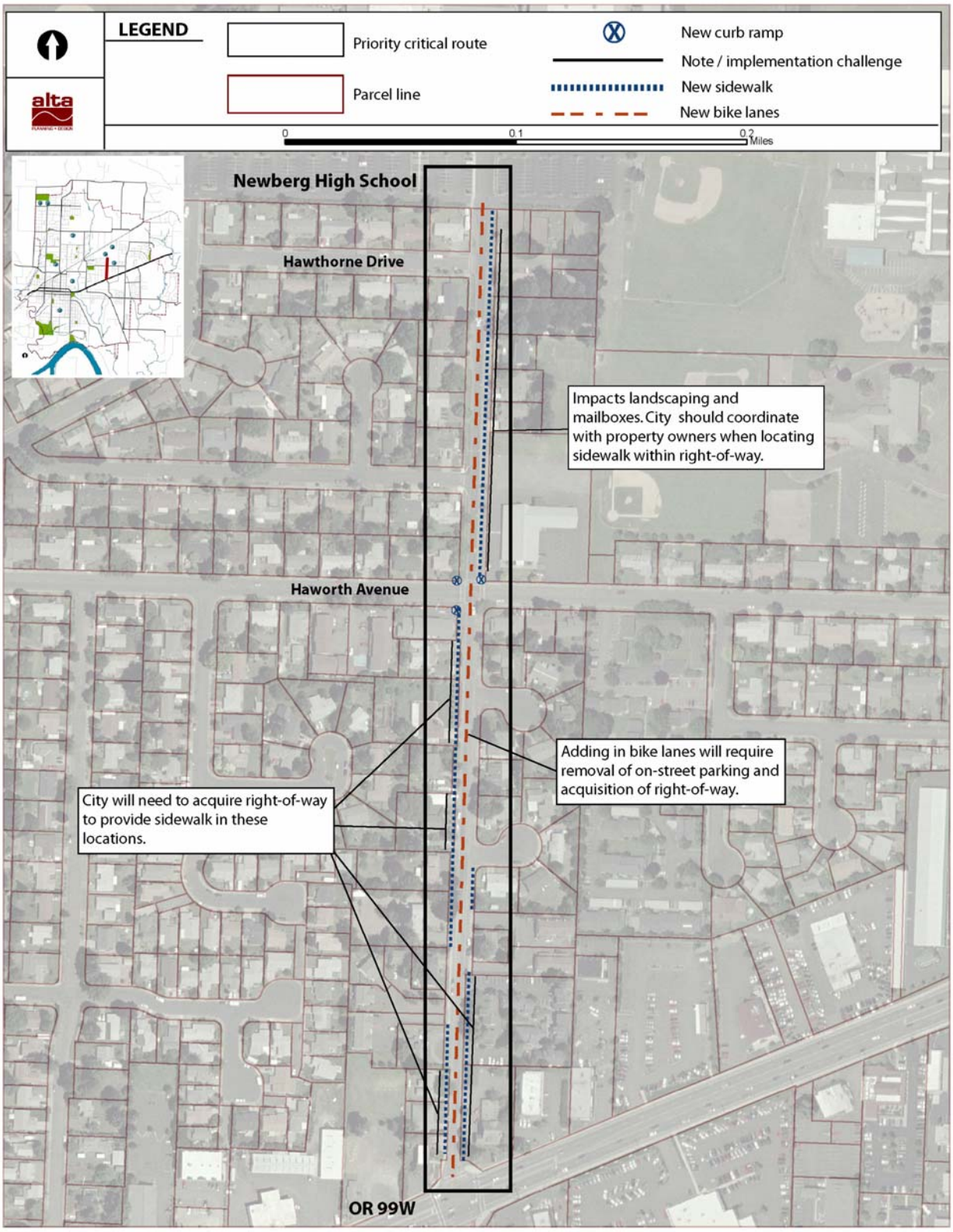
$8 million (with significant work to bridge)

$9.1 million (separated bicycle/pedestrian bridge)

Leaving trash cans in more appropriate locations can improve accessibility for all pedestrians.

The wide shoulder can easily be striped with a bike lane stencil with the appropriate signage to prevent on-street parking.

Elliott Road (Newberg High School to OR 99W)



Elliott Road (Newberg High School to OR 99W)

Description

Provides a north-south connection across OR99W east of downtown. Also provides a connection from the residential areas south of OR99W directly to Newberg High School.

Elliott Road is classified as a major collector in the Newberg TSP. The road is owned and maintained by the City.

North of OR99W, the pedestrian network has large gaps on both sides of the street with the existing sidewalk varying between 4'-5' wide and from poor to fair condition. This remains true all the way to the high school. Curb ramps are located at many of the intersections, however important curb ramps are missing from the intersection of Haworth and Elliott.

Sidewalk with new curb ramp near high school.

Proposed Improvements

New sidewalks:

830 feet on east side between Hawthorne and Haworth.

1236 feet on west side between Haworth and OR99W

670 feet on east side between Norwood and OR99W.

Curb ramps:

3 new curb ramps

Elliott Road will need to be widened to accommodate sidewalks and bike lanes to meet the functional classification standards.

Potential Funding Sources

ODOT (TE, SR2S, New Freedom Initiative, Bike/Ped Program Grants), Community Development Block Grants, LID's, Sidewalk/ADA line item

Next Steps / Outstanding Questions

Add curb ramps at Haworth Ave through Spot Improvement program.

Explore acquiring right-of-way along Elliott south of Haworth to add sidewalks and bike lanes.

Responsible Implementing Agency

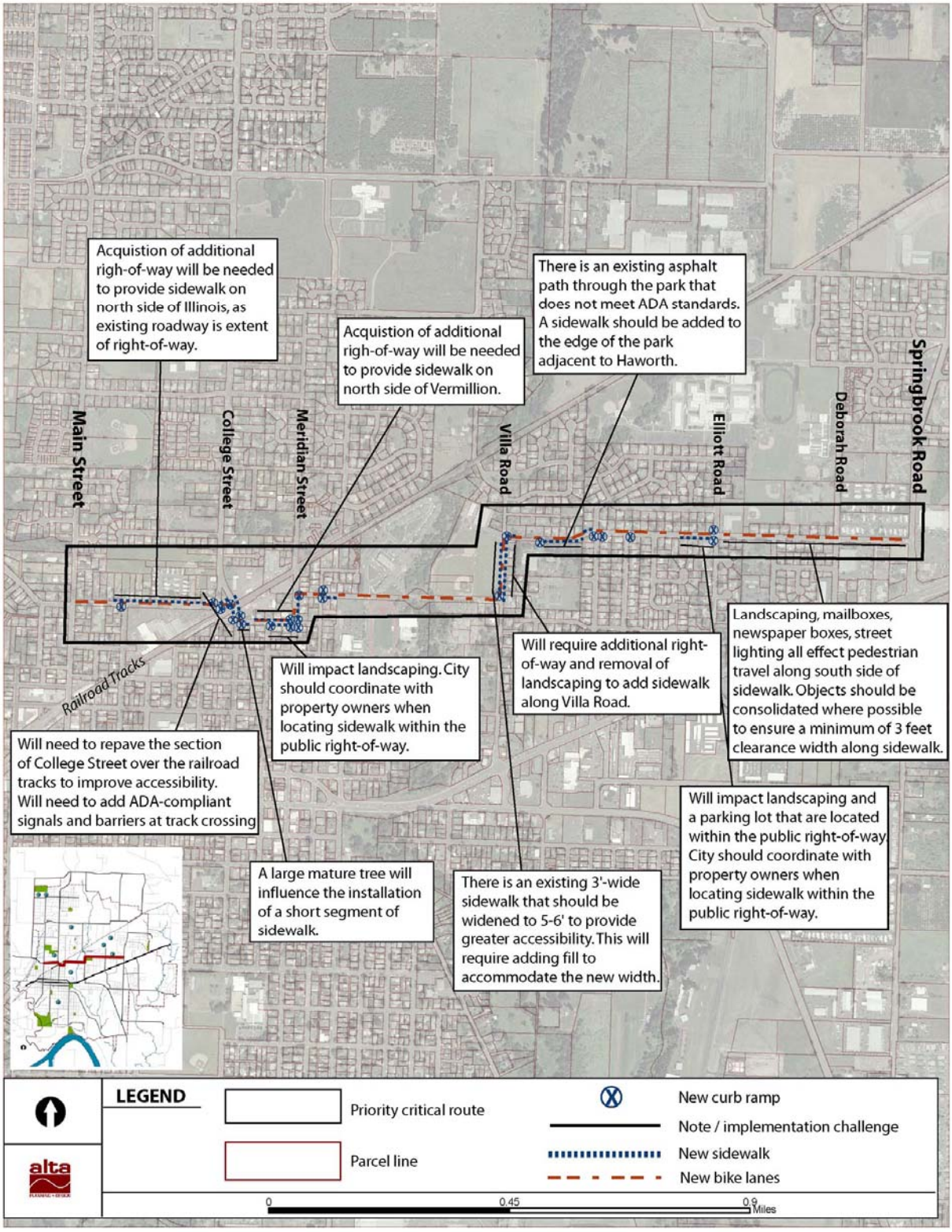
City of Newberg

Planning-Level Cost Estimate

Curb ramps = $8000

Widening to major collector status = $1.1 million

Illinois Street/College Street/Vermillion Street/Meridian Street/Fulton Street/Villa Road/Haworth Avenue (Main Street to Springbrook Road)



Illinois Street/College Street/Vermillion Street/Meridian Street/Fulton Street/Villa Road/Haworth Avenue (Main Street to Springbrook Road)

Description

This east-west connector route generally provides good connectivity and sidewalk conditions, at least on one side of the road. From Main Street, Illinois has an existing sidewalk on the south side that varies from 4' wide to 7' wide until Illinois intersects with College Street. There is no sidewalk on the north side, and locating one there would require negotiating with private property owners. The most difficult segment of this route is between College Street and Meridian Street. There is no good connection or crossing of the railroad tracks making it extremely difficult to reach Vermillion Street. And once users reach Vermillion, there is very little sidewalk provided. Users are forced to use the road until reaching Fulton Street. At Fulton, with the exception of a small gap on the south side, the sidewalks are complete and in good condition on both sides of the road. Another difficult crossing is of Villa Street, and reaching Haworth Avenue. Once at Haworth, the sidewalk on the south side disappears at the park and users are routed onto an asphalt path that winds through the park before rejoining the sidewalk. There are also small missing segments of sidewalk along the north of Haworth, and a larger gap on the south side at the intersection of Haworth and Elliott. Curb ramps are intermittent along this entire route.

These roads are classified as major collectors according to the functional classification design standards in the Newberg TSP. The roads are owned and maintained by the City.

Proposed improvements

New sidewalks:

980 feet on north side Illinois between Main and Deskins

90 feet on north and south side between Deskins and College

200 feet on east and west side between Illinois and Vermillion

360 feet north side of Vermillion between College and Meridian

260 feet south side of Vermillion between College and Meridian

260 feet east side Meridian between Vermillion and Fulton

135 feet south side Fulton just east of Center

600 feet on west side of Villa between Fulton and Haworth

380 feet on south side Haworth adjacent to park

100 feet north side Haworth just west of Sitka

325 feet south side Haworth just west of Elliott

Curb ramps:

10 new curb ramps

Bike lanes:

10,389 feet of bike lanes on both sides of the route

Potential funding sources

ODOT (TE, SR2S, New Freedom Initiative, Bike/Ped Program Grants), Community Development Block Grants, LID's, Sidewalk/ADA line item

Next steps

Explore desire to stripe bike lanes along this route at the expense of on-street parking.

Explore opportunities to acquire additional right-of-way along Illinois, Vermillion, and Villa

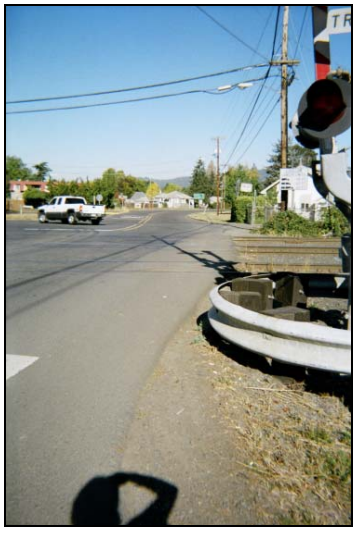
Responsible implementing agency

City of Newberg

Planning level cost estimate

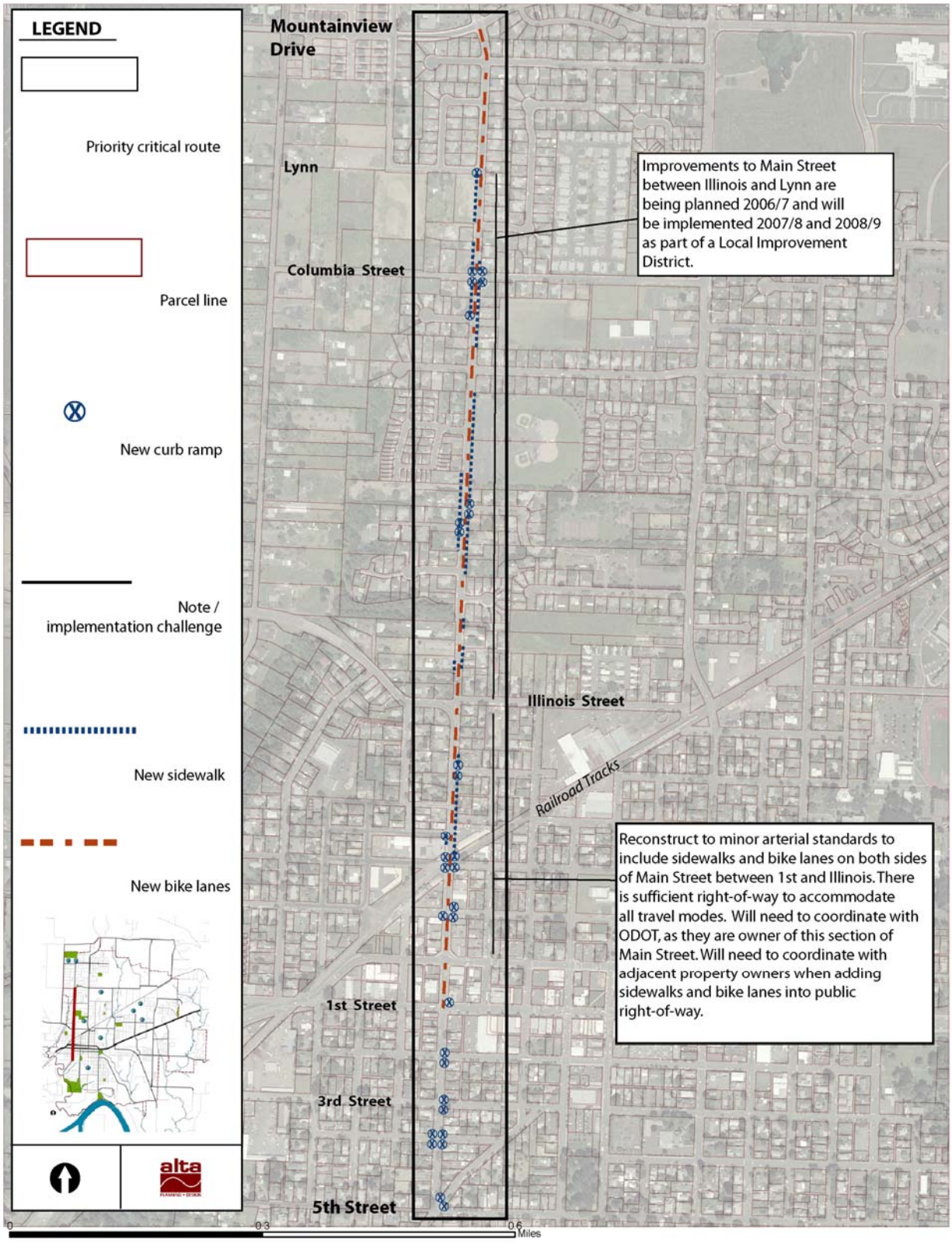
$1.7 million

Right-of-way will need to be acquired to install sidewalks along the north side of Illinois Street



Railroad crossing on College Street

Main Street (Mountainview Drive to 5th Street)



Main Street (Mountainview Drive to 5th Street)

Description

Provides excellent north-south connectivity through Newberg, connecting to Chehalem Valley Middle School, Crater Elementary School, Jaquith Park, the Senior Center, existing residential areas, and the downtown core.

Main Street is classified as a major collector north of Illinois and south of 1st and a minor arterial between 1st and Illinois, according to the functional classification design standards in the Newberg TSP. The road is owned and maintained by the City where it is designated a collector, ODOT is responsible for the road segment where it is classified as an arterial.

Main Street, particularly north of Columbia, is a very good pedestrian route. There are a few small segments of missing sidewalk, and then only on one side of the street. The sidewalk is 5' wide and in good condition up to Foothills Drive. South of Columbia the pedestrian network is less friendly, with large gaps on both sides of the street and the existing sidewalk varying between 4'-5' wide and from poor to fair condition. This remains true until Main Street enters the downtown area. South of downtown, Main Street has a consistent sidewalk on both sides of the street, however the lack of curb ramps makes accessibility difficult.

Missing curb cuts south of downtown make pedestrian travel difficult.

Proposed Improvements

Many improvements will occur as a result of the LID between Lynn and Illinois.

Add 11 curb ramps south of 1st Street

Missing sidewalks force pedestrians into the roadway where safety becomes a greater issue.

Potential Funding Sources

ODOT (TE, SR2S, New Freedom Initiative, Bike/Ped Program Grants), Community Development Block Grants, LID's, Sidewalk/ADA line item

Next Steps

Coordinate with ODOT to make improvements to Main between 1st Street and Illinois.

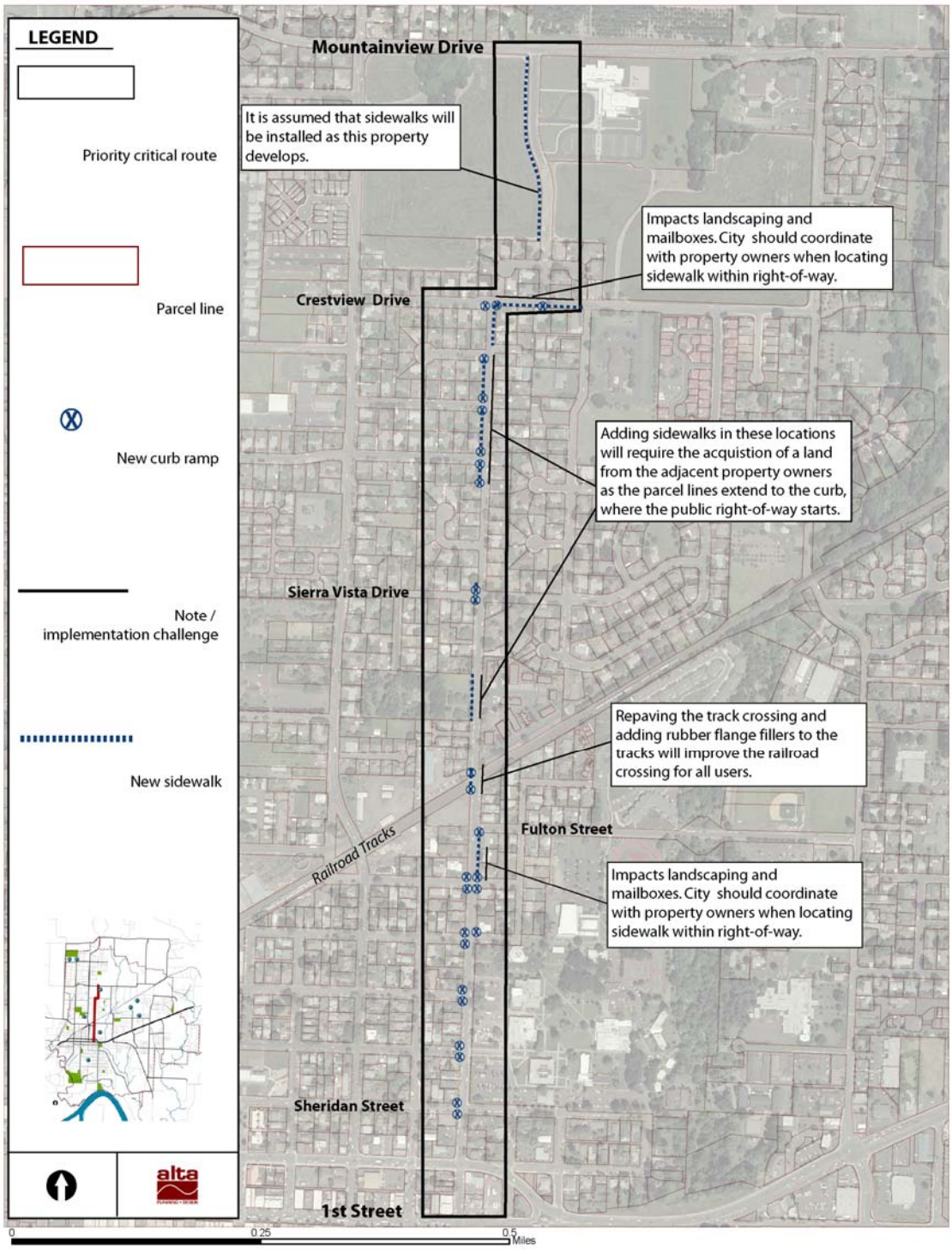
Responsible Implementing Agency

ODOT / City of Newberg

Planning-Level Cost Estimate

$2.3 million

Meridian Street/Crestview Drive/Center Street (Mountainview Drive to 1st Street)



Meridian Street/Crestview Drive/Center Street (Mountainview Drive to 1st Street)

Description

Provides an alternate north-south route to College Street and Main Street while connecting downtown Newberg, George Fox University, Joan Austin Elementary School and residential areas

This route is classified as a minor collector from 1st to Crestview, with a one-block segment (Vermillion to Fulton) identified as a major collector, according to the functional classification design standards in the Newberg TSP. The road is owned and maintained by the City.

This route is generally a decent pedestrian route. South of Vermillion there are no gaps in the sidewalk network on either side of the road, and the sidewalks are 4'-5' wide in good condition. Between Vermillion and the railroad tracks is the most difficult section. The sidewalk exists primarily on the west side and is in fairly poor condition, including the crossing of the railroad tracks. North of the railroad tracks there are intermittent gaps in the sidewalk network that increase on the west side approaching Crestview. The sidewalks are typically in fair to good condition along this segment, although curb ramps are inconsistent north of the railroad tracks.

The lack of sidewalks forces pedestrians into the street and competing with vehicle traffic.

Proposed Improvements

New sidewalks:

450 feet south side Crestview between Meridian and Hoskins

200 feet on east side Meridian south of Crestview Drive

850 feet on west side Meridian between Crestview and Vermillion

276 feet east side on Meridian between Fulton and Vermillion

Curb ramps:

27 new curb ramps

Adding smoother transitions and warning devices will improve pedestrian safety at railroad crossings.

Potential Funding Sources

ODOT (TE, SR2S, New Freedom Initiative, Bike/Ped Program Grants), Community Development Block Grants, LID's, Sidewalk/ADA line item

Next Steps

Explore opportunities to acquire right-of-way along Meridian for installing a sidewalk

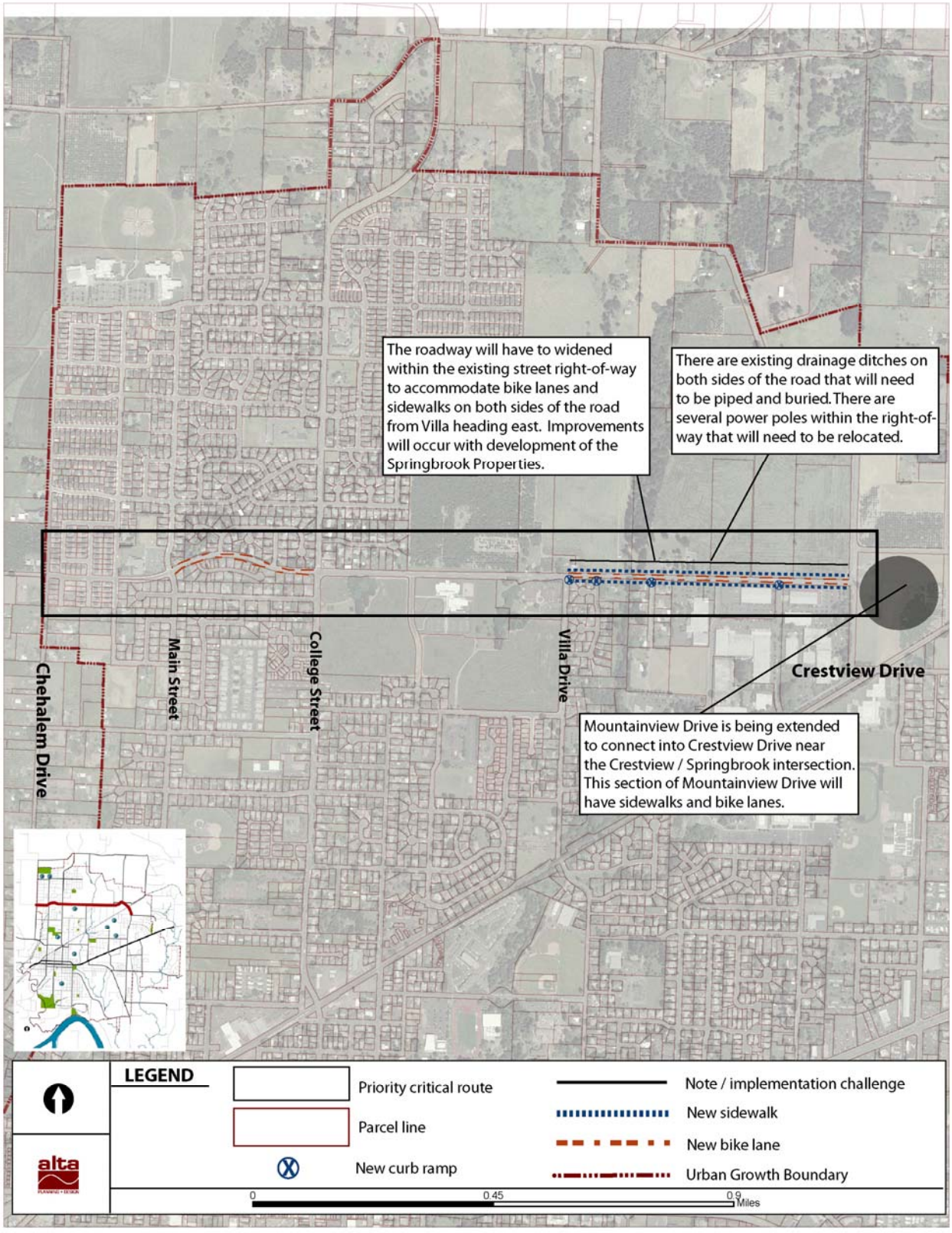
Responsible Implementing Agency

City of Newberg

Planning-Level Cost Estimate

$335,000

Mountainview Drive (Chehalem Drive to Aspen Way)



Mountainview Drive (Chehalem Drive to Aspen Way)

Description

Provides a vital east-west connection in northern Newberg. Connects older residential areas with the growing northeast section of Newberg, as well as providing a connection to Joan Austin Elementary School, Newberg High School, Mabel Rush Elementary School and Mountain View Middle School. Mountainview Drive also provides connections to several other north-south critical routes.

Mountainview Drive is classified as a major collector according to the Newberg TSP. The road is owned and maintained by the City.

Mountainview Drive has a completed 5' wide sidewalk in good condition along both sides of the road between Chehalem Drive and Villa Road. Curb ramps are fairly new and located at nearly all intersections. There are no pedestrian facilities provided east of Villa Road. However, this will most certainly change with the development of the Austin property north of Mountainview Drive.

The portion of Mountainview between Villa and Aspen Way should be fully improved in the next 2-3 years as the Springbrook Properties development occurs.

Proposed Improvements

New sidewalks:

2660 feet on north and south sides of Mountainview between Villa and Aspen

Curb ramps:

4 new curb ramps

Bike lanes:

2660 feet on north and south sides of Mountainview between Villa and Aspen

Potential Funding Sources

ODOT (TE, SR2S, New Freedom Initiative, Bike/Ped Program Grants), Community Development Block Grants, LID's, Sidewalk/ADA line item

Next Steps

Explore communities desire for bike lanes between Main and College.

Responsible Implementing Agency

City of Newberg, private developers

Planning-Level Cost Estimate

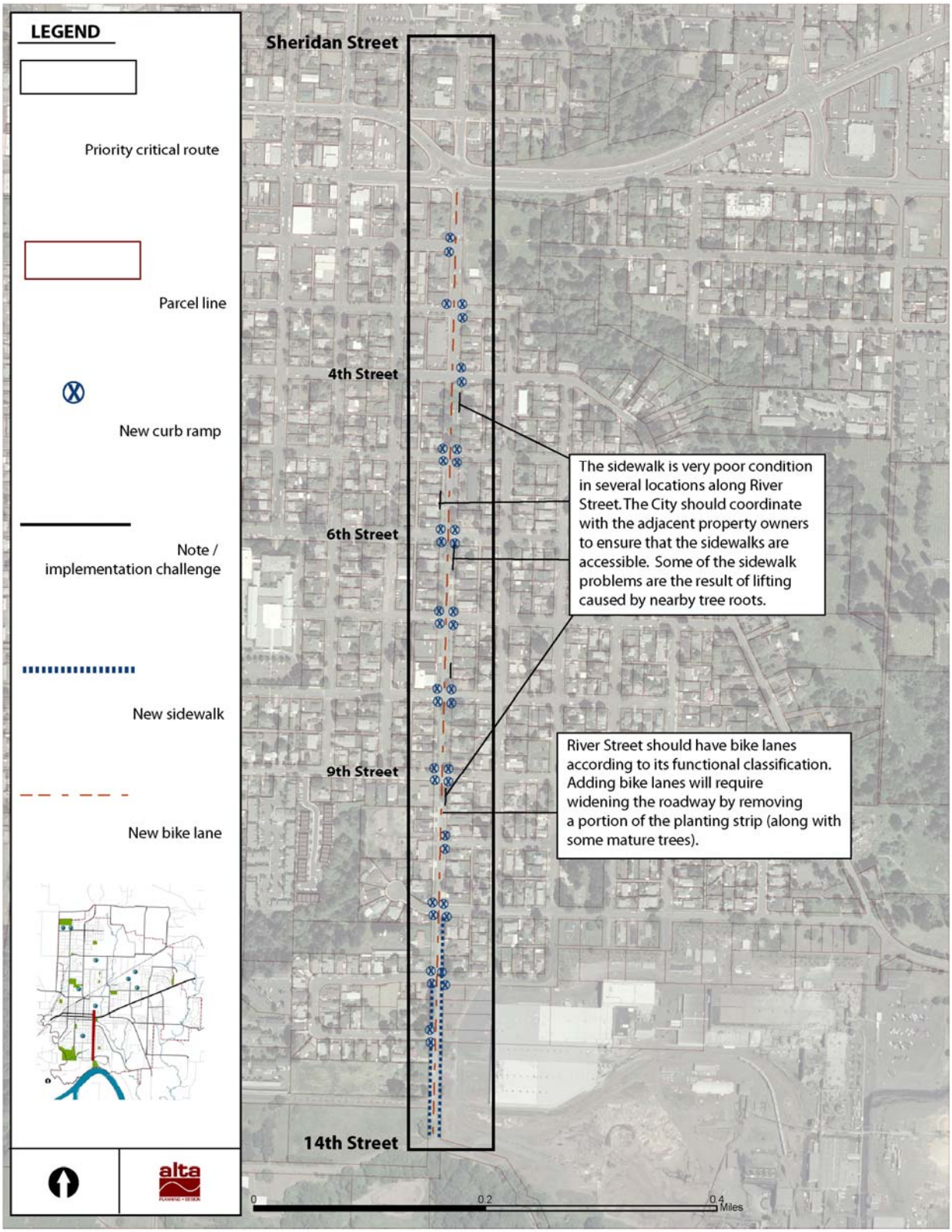
$2.5 million

Mountainview will require widening to accommodate bicycles, pedestrians, and motor vehicles safely.

Mountainview near the Elementary school has excellent pedestrian and bicyclist facilities.

Maintaining existing facilities improves accessibility for all users

River Street (Sheridan – 14th Street)



River Street (Sheridan – 14th Street)

Description

River Street provides connections to Hoover Park, George Fox University, the neighborhoods to the south and east of downtown, as well as the Rogers Landing park and boat launch and Willamette River.

River Street is classified as a major collector in the Newberg TSP. The road is owned and maintained by the City.

River Street has a complete sidewalk network on both sides of the street between Sheridan Street and 11th Street. The sidewalks are predominantly 4' wide, with a few exceptions, such as near the church on 4th Street where the west side sidewalk becomes nearly 10' wide for a block. However, the condition of the sidewalks makes it very difficult for many people to use comfortably. There are many older, large trees along River Street that have lifted a number of sidewalk panels with their roots, some as much as 3" or more. In addition, there are almost no curb ramps south of the downtown area along either side of the road, even where crosswalks are marked

Proposed Improvements

New sidewalks:

964 feet on east side south of 11th Street.

650 feet on west side south of 12th Street.

Curb ramps:

37 new curb ramps

Potential Funding Sources

ODOT (TE, SR2S, New Freedom Initiative, Bike/Ped Program Grants), Community Development Block Grants, LID's, Sidewalk/ADA line item

Next Steps

Identifying key curb ramps to be prioritized through ADA Spot Improvement Program.

Addressing question of whether bike lanes are desired along River Street.

Responsible Implementing Agency

City of Newberg

Planning-Level Cost Estimate

Short-Term (installing curb ramps): $350,000

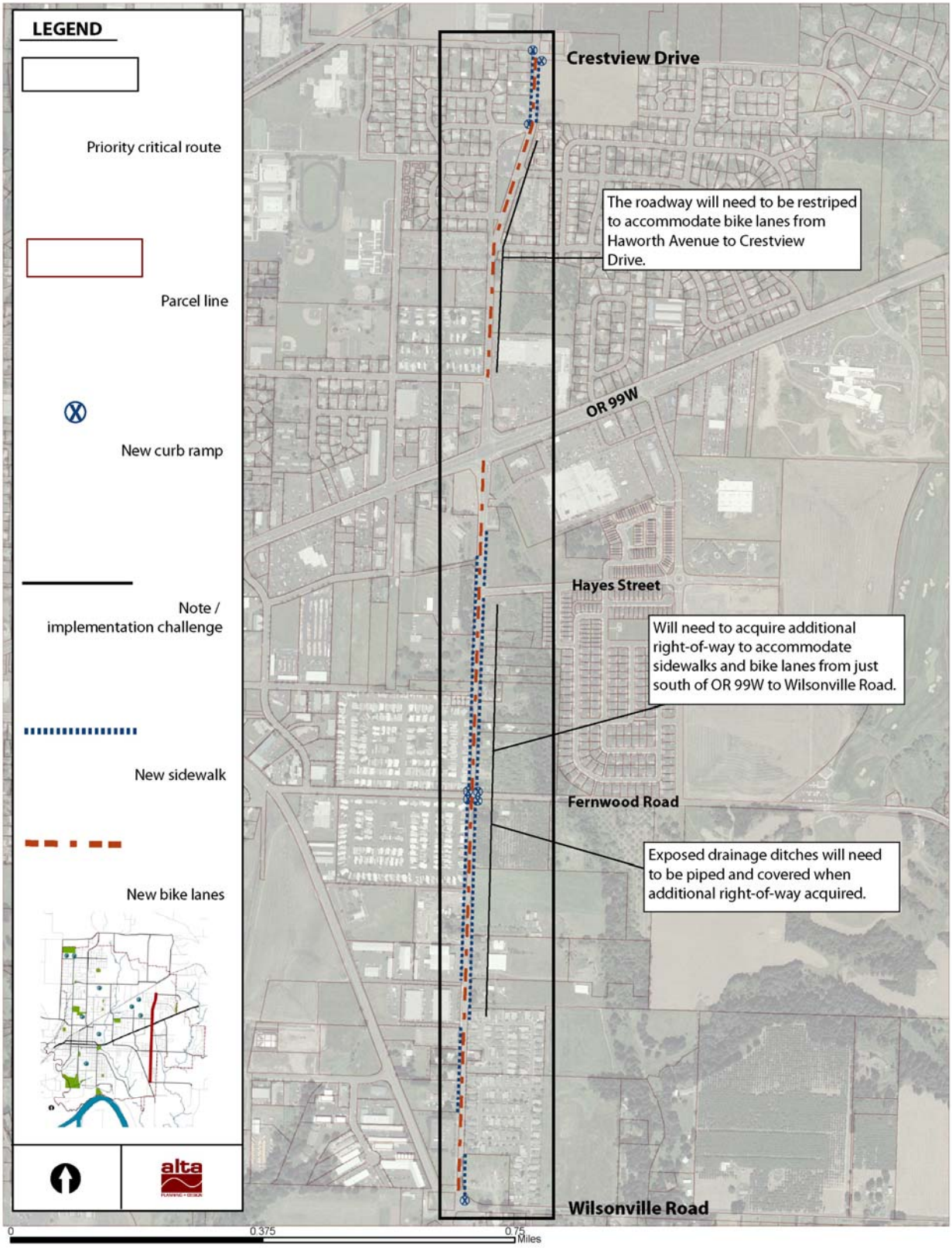
Long-Term (widening roadway to accommodate bike lanes): $2.7 million

Existing mature trees have uprooted sidewalk segments in multiple locations along River Street.

Most of the intersections along River Street are lacking curb cuts, making pedestrian travel difficult for all users.

South of 12th Street, River Street lacks sidewalks on both sides of the street

Springbrook Road (Wilsonville Road to Crestview Drive)



Springbrook Road (Wilsonville Road to Crestview Drive)

Description

Provides north-south connections in the eastern area of the city. Provides access to Mabel Rush Elementary School, Mountain View Middle School, and Newberg High School. Provides access to shopping on OR99W, including the Fred Meyer, Crossroads Plaza, and Springbrook Plaza, as well as to major employers such as A-dec.

Springbrook Road is classified as a major collector north of OR99W and a minor arterial south of OR99W in the Newberg TSP. The road is owned and maintained by the City.

Springbrook Road has good sidewalk conditions with 5' wide sidewalks directly north and south of OR 99W. This continues in the northern direction until Middlebrook, where the sidewalk then ends on both sides of the road. Heading south, the sidewalks disappear on both sides of the road before reaching Hayes Street. South of Hayes, a narrow asphalt path appears on the west side of the road across from the ditch next to the fence line and continues to Fernwood. South of Fernwood, sidewalks appear, hopping back forth from the west side to the east and back to the west before reaching Wilsonville Road.

Proposed Improvements

New sidewalks:

490 feet on east/west side between south of Crestview

500 feet on east side between OR99W and Hayes

1500 feet on east/west side between Hayes and Fernwood

1800 feet on east side south of Fernwood

2000 feet on west side south of Fernwood

Curb ramps:

8 new curb ramps

Bike lanes:

8625 feet of bike lane on both sides

Potential Funding Sources

ODOT (TE, SR2S, New Freedom Initiative, Bike/Ped Program Grants), Community Development Block Grants, LID's, Sidewalk/ADA line item

Next Steps

Restripe Springbrook Road north of OR99W with bike lanes

Complete sidewalks from OR99W to Hayes

Explore opportunities for acquiring additional right-of-way south of Hayes

Responsible Implementing Agency

City of Newberg

Planning-Level Cost Estimate

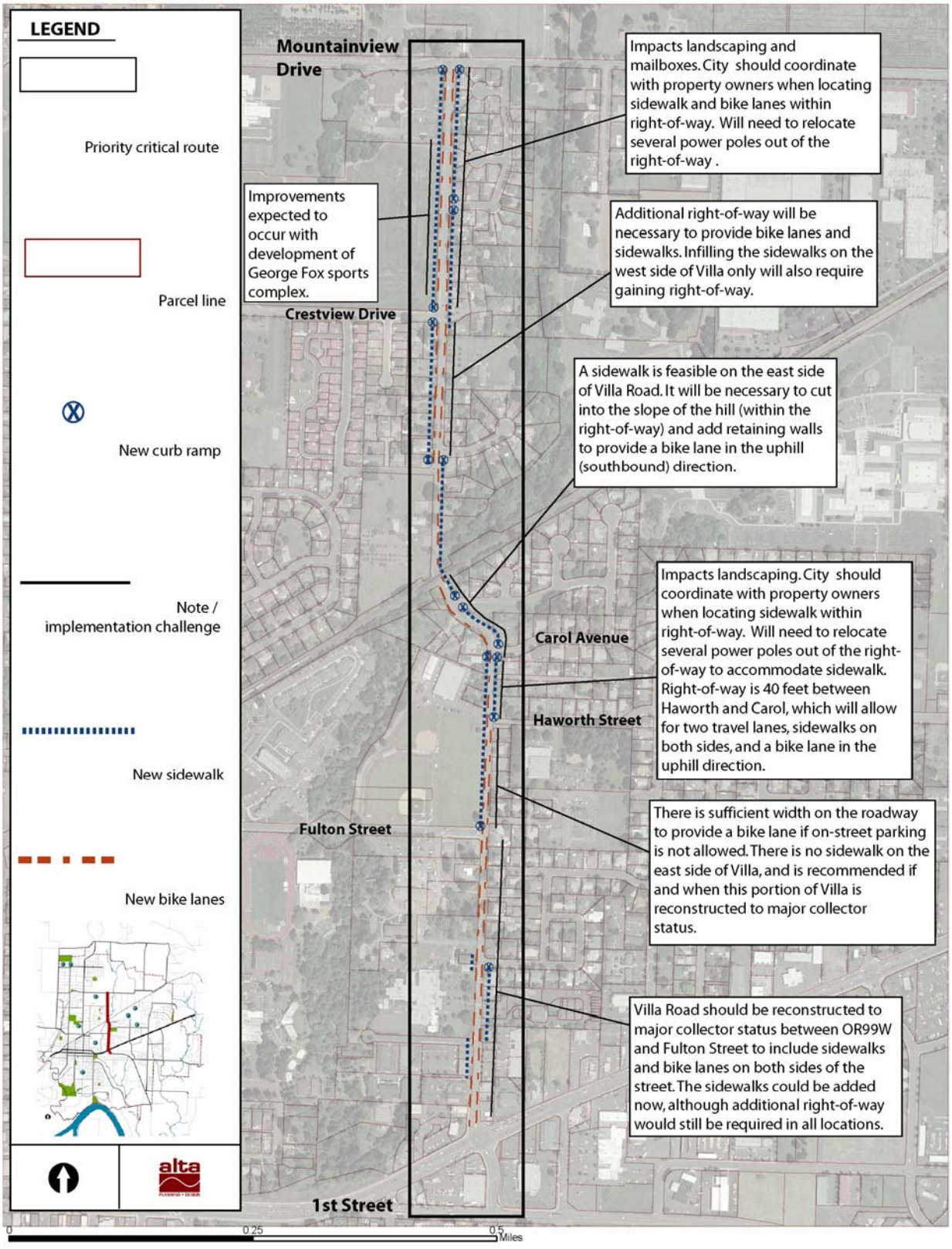
$4 million

Springbrook south of 2nd Street will need to be widened to accommodate sufficient bicycle and pedestrian facilities.

North of OR99W, Springbrook has good sidewalks with sufficient room for bicycle facilities.

South of Fernwood Road there are intermittent sidewalk segments associated with newer development, as shown above

Villa Road (1st Street to Mountainview Drive)



Villa Road (1st Street to Mountainview Drive)

Description

Villa provides a critical north-south route in a portion of the city where very few choices exist. Provides connections to the swimming pool park, Joan Austin Elementary School, George Fox University, the future George Fox Sports Complex, residential areas, and OR99W.

Villa Road is classified as a major collector north of OR99W, and a minor arterial south of OR99W in the Newberg TSP. The road is owned and maintained by the City.

Villa Road has a highly inconsistent sidewalk network with very few completed portions. The majority of the existing sidewalk can be found on the west side, although gaps exist between OR99W and Haworth Avenue. Furthermore, some of the existing segments are less than 3' wide, making them inaccessible for people with mobility difficulties. The remaining portions of sidewalk vary in length between 4' and 5' feet, depending on the age of the adjacent development. North of Haworth Avenue there is only a short portion of existing sidewalk on the east side just south of Crestview.

Proposed Improvements

New sidewalks:

1300 feet west / east side between Mountainview and Crestview

800 feet west side south of Crestview

1500 feet east side between Haworth and Hess Creek

580 feet west side between Fulton and Haworth

430 feet east side south of Fulton

270 feet west side south of Fulton

Curb ramps:

16 new curb ramps

Bike lanes:

2150 feet of bike lanes on both sides between Mountainview and Park

750 feet of bike lane on east side between Park and Carol Ann

700 feet of bike lane on west side between Carol Ann and Haworth

2250 feet of bike lane between Haworth and OR99W

Potential Funding Sources

ODOT (TE, SR2S, New Freedom Initiative, Bike/Ped Program Grants), Community Development Block Grants, LID's, Sidewalk/ADA line item

Next Steps

Explore opportunities for acquiring right-of-way south of Haworth

Explore opportunities for partnering with University in implementing improvements

Responsible Implementing Agency

City of Newberg

Planning-Level Cost Estimate

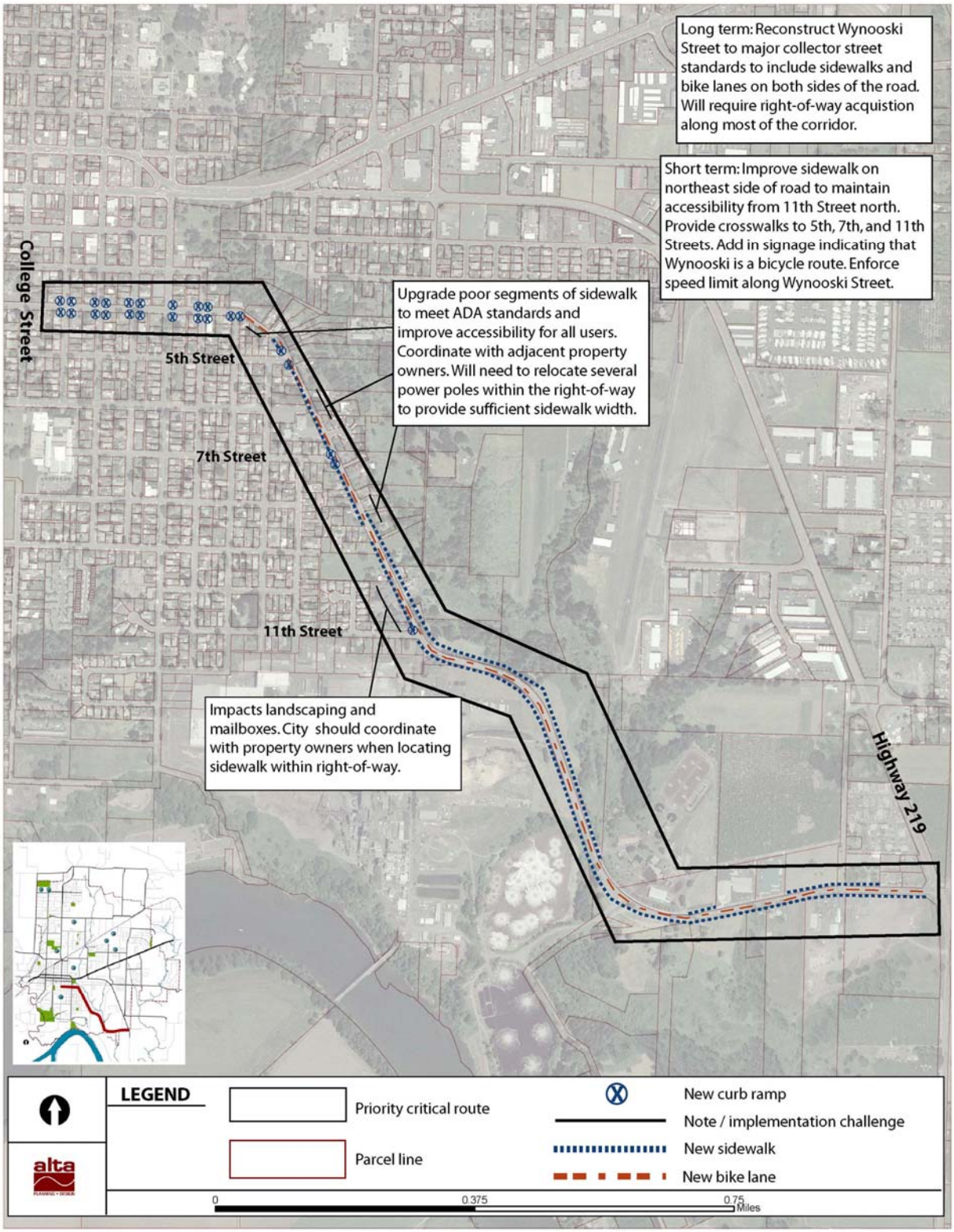
$5.1 million

The city will have to work with private landowners or the university to install sidewalks in many locations along Villa Road.

Villa Road will have to be widened to accommodate all modes in locations.

Pedestrians must currently use the wide shoulder along the east side of Villa Road as it heads north under the railroad tracks.

4th Street/Wynooski Street (College Street to Highway 219)



4th Street/Wynooski Street (College Street to Highway 219)

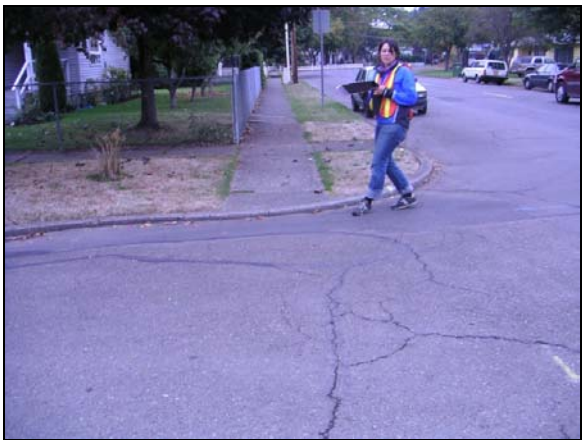
Description

Wynooski Street provides an alternate route to Hwy 219 for bicyclists. It also provides more direct access into downtown Newberg without having to utilize OR99W and Hwy 219.

4th Street is classified as a minor collector, while Wynooski Street is classified as a major collector in the Newberg TSP. The road is owned and maintained by the City.

There is an intermittent sidewalk that varies in width from 3'5' on the east side of the road between River Street and 11th Street. The condition of this sidewalk also varies from poor to good, with short segments being practically inaccessible for some users.

For bicyclists, South of 11th Street the roadway is wide enough to be a comfortable shared use road. North of 11th Street the roadway narrows considerably. However the posted speed limit drops to 25 mph, which should be a comfortable riding environment for most bicyclists. There is no existing signage, which would increase driver awareness to the possible presence of bicyclists along this route.



Wynooski has sidewalks close to downtown, however the lack of curb cuts reduces accessibility for all users.

Overgrown shrubs greatly reduce the usable walking surface of many sidewalks, making them inaccessible to many users.

Wynooski is lacking pedestrian facilities west of 11th Street.

Proposed Improvements

Short term:

New sidewalks:

2750 feet of sidewalk on northeast side

Upgrade intermittent segments of sidewalk on east side

Curb ramps:

25 new curb ramps

Potential Funding Sources

ODOT (TE, New Freedom Initiative, Bike/Ped Program Grants), Community Development Block Grants, LID's, Sidewalk/ADA line item

Next Steps

Implement short-term improvements through grants and ADA Spot Improvement Program, including bicycle signage and speed enforcement.

Responsible Implementing Agency

City of Newberg

Planning-Level Cost Estimate

Short term: $310,000

Long-term: $3.1 million

Network Improvements

As noted earlier, the projects on the primary critical route list will receive the highest priority when pursuing funding while the projects and corridors on the secondary list, though obviously important, will be viewed as longer-term projects for Newberg. The remaining projects have been prioritized into medium- and long-term projects (Table III-5 and Table III-6 below) with associated planning-level cost estimates for each project (see Appendix C). The planning-level cost estimates have been provided for both full route improvements (both sides of the street), and single-side improvements as a way for the City to make a good faith effort in providing accessible routes while securing additional funding. The project timetable may change according to available funds, changing priorities, new roadway projects that coincide, new development and redevelopment opportunities, or other factors.

Table III-5. Medium-Term Projects

Project (Street / Trail)	Planning-Level Cost Estimate for Full Route Improvements	Planning-Level Cost Estimate for Single-Side Improvements *(route side)*
2nd Street	$25,000	$9,900 *(north)*
6th Street	$28,000	$9,900 *(north)*
11th Street	$240,000	$78,000 *(north)*
Chehalem Drive	$2,000,000	$650,000 *(east)*
Columbia Drive / Crestview Drive	$2,100,000	$322,000 *(north side of route, crossing to south side at Hoskins)*
Crater Lane / Lynn Drive	$310,000	$99,000 *(west side between Foothills and Mountainview, cross to east side)*
Foothills Drive	$20,000	$0 *(south side is accessible)*
Highway 219	$25,000	$25,000 *(bicycle route signage)*
Howard Street	$70,000	$40,000 *(west side of route)*

Table III-6. Long-Term Projects

Project (Street / Trail)	Planning-Level Cost Estimate for Full Route Improvements	Planning-Level Cost Estimate for Single-Side Improvements *(route side)*
14th Street / Waterfront Street	$500,000	$215,000 *(south)*
Aspen Way	$2,100,000	$1,005,000 *(east)*
Brutscher Street	$90,000	$0 *(west side is accessible)*
Crestview Drive	$850,000	$277,000 *(south)*
Fernwood Road	$700,000	$315,000 *(north)*
Emery Drive / Douglas Avenue / Vittoria Way	$35,000	$15,000 *(west/south)*
Hayes Street / Providence Drive	$105,000	$45,000 *(north/west)*
Hoskins Street	$115,000	$23,000 *(east)*
Rogers Landing Road	$850,000	$600,000 *(east)*
Sitka Avenue / Hancock Street	$160,000	$62,000 *(north)*
Morton Street	$325,000	$122,000 *(east)*
Zimri Drive	$630,000	$322,000 *(east)*
Hess Creek Trail (off-street)	$375,000	n/a
Chehalem Creek Trail (off-street)	$2,100,000	n/a

ADA Spot Improvement Program

Pedestrian improvements range from small, incremental changes such as a new curb ramp, to a major new project such as a dedicated pedestrian/bicycle bridge over the Willamette River. Larger projects are easily identified and earmarked for funding through grants and stand-alone Capital Improvement Projects, leaving many of the smaller, yet necessary, pedestrian improvements with little or no funding.

One solution is to establish an ADA Spot Improvement/Infill Program that identifies the smaller pedestrian improvements that would significantly improve the accessibility of identified critical routes. To fully maximize the funding for this program, improvements may be identified on one side of the street only, until funding for full route improvements becomes available.

The projects likely to be funded through the ADA Spot Improvement Program are smaller, more flexible, and will be funded through its own dedicated line item in the City of Newberg's budget and/or secured grant funds.

The two major eligible types of improvements are:

- Installing or repairing key curb ramps – Many of Newberg's older streets have sidewalks without curb ramps (i.e. River Street) that make travel difficult for the mobility impaired. Replacing or repairing these curb ramps will greatly improve access for all residents.
- Installing or repairing key sidewalk sections – In many instances, a short segment of sidewalk is in need of repair or installation to make an entire length of a route accessible. By definition, these projects need to be smaller and more flexible, so some locations that had extensive need for sidewalks on both sides of the street (i.e. sections of College Street) were not included in the project list.

The ADA Spot Improvement Program would become a primary method by which neighborhoods would seek localized improvements. The preliminary ranking of intersections and other locations that were identified as having pedestrian needs were determined through a combination of field review, input from City staff, and input from Task Force members. Using a ranking methodology that evaluates proximity to schools, parks, and other key destinations; safety needs; missing sidewalks and other infrastructure; and public support, the ranked individual intersection locations are identified in Table III-7 below.

ADA Spot Improvement Program Project List

Based on the ranking process described above, the ADA Spot Improvement projects were divided into three tiers of projects (Tier I – III) (Map III-2). Tier I projects ranked the highest and are considered to have the highest importance for the City of Newberg. The locations for improvements within each tier are considered to be roughly equal in terms of priority, giving the City some flexibility to select improvement projects based on opportunities such as planned roadway re-construction (see Appendix D).

As projects are completed and conditions change over time, pedestrian needs will also change. The City should maintain a citizens advisory committee that meets quarterly to help in identifying and selecting projects for and from the ADA Spot Improvement Program project list.

Table III-7. ADA Spot Improvement Table

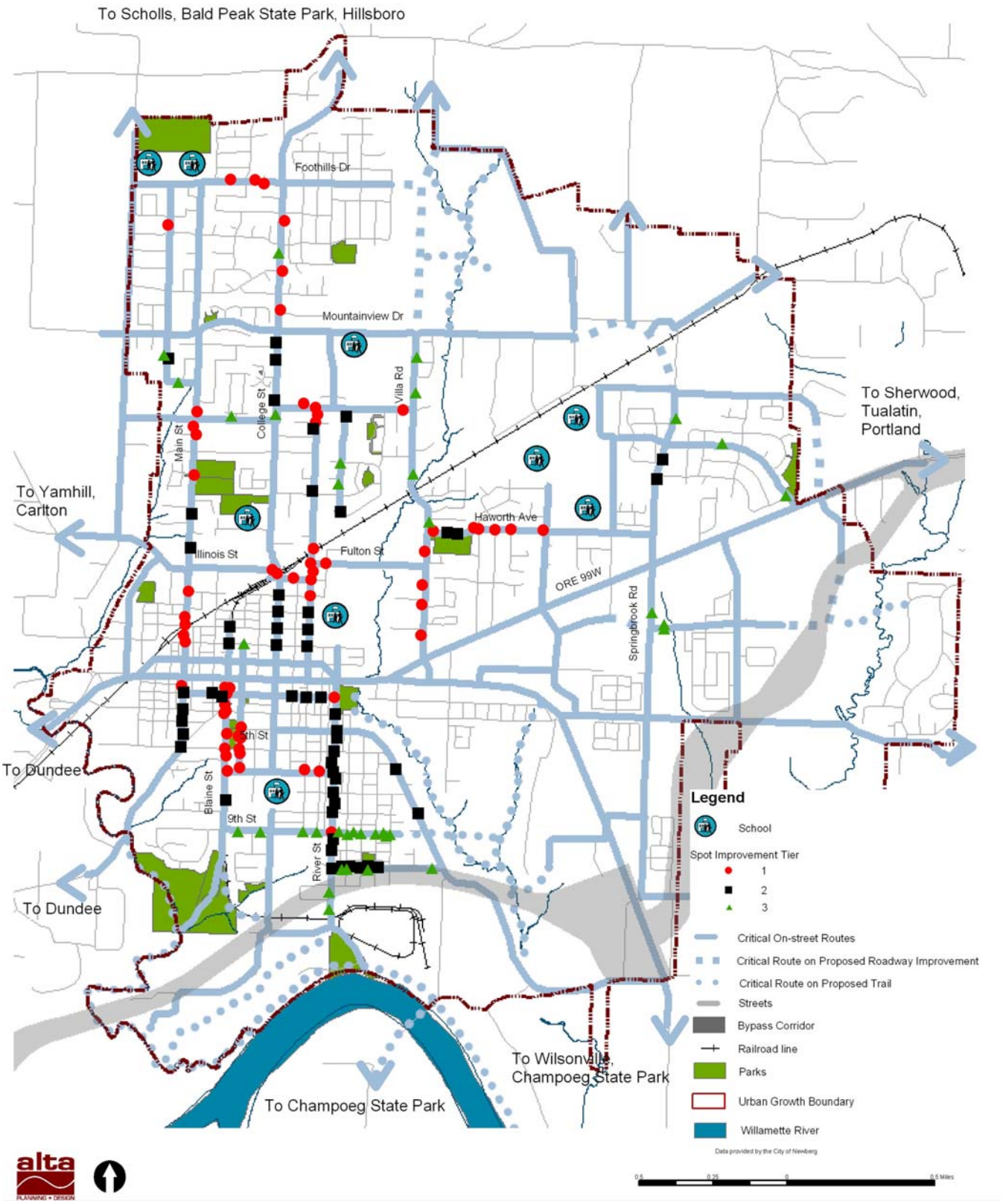
Route	Location	Side	Improvement	Tier
6th Street	6th & Blaine	north/south	new sidewalk, curb ramps	1
6th Street	6th & Meridian	north	new curb ramps	1
6th Street	6th & Center	all corners	new curb ramps	1
Blaine Street	1st to 2nd	west	new segment sidewalk	1
Blaine Street	1st to 2nd	east	new segment sidewalk	1
Blaine Street	Blaine & 2nd	3 corners	curb ramps	1
Blaine Street	2nd to 3rd	west	new segment sidewalk	1
Blaine Street	Blaine & 3rd	all 3 corners	curb ramps	1
Blaine Street	3rd to 5th	west	new segments of sidewalk	1
Blaine Street	park to 5th	east	new sidewalk	1
Blaine Street	Blaine & 5th	all corners	curb ramps	1
Blaine Street	5th to 6th	east	new segments of sidewalk, curb ramps	1
Blaine Street	6th to 9th	east	new sidewalk	1
College Street	Quail to Edgewood	east	new segment of sidewalk	1
College Street	Henry Rd path to Dartmouth	east	new segment of sidewalk, need to cover drainage ditch	1
College Street	Dartmouth to Mountainview	east	new segment of sidewalk, need to cover drainage ditch	1
Columbia/ Crestview	College to Center	north	new sidewalk, curb ramps	1
Columbia/ Crestview	Mary Lou to Villa	south	new sidewalk, curb ramps	1
Crater Lane	Hazelnut to Edgewood	west	new segment of sidewalk	1
Foothills Drive	Jones to Morris	north	new segment of sidewalk	1
Foothills Drive	Morris to Holveck	north	new segment of sidewalk	1
Foothills Drive	Morris to College	south	new segment of sidewalk	1
Howard Street	Howard & 4th	all corners	curb ramps	1
Howard Street	4th to 5th	west	sidewalk along park	1
Howard Street	Howard & 5th	3 corners	curb ramps	1
Howard Street	5th to 6th	east	new sidewalk	1
Howard Street	Howard & 6th	northeast	new curb ramp	1
Illinois - Haworth	Deskins to College	south	new sidewalk	1
Illinois - Haworth	Illinois to Vermillion (along College)	west	new sidewalk, repave across RR tracks, fill flanges	1
Illinois - Haworth	College to Meridian (along Vermillion)	north	new sidewalk, curb ramp	1
Illinois - Haworth	Meridian & Fulton	west T, northeast	curb ramps	1
Illinois - Haworth	Fulton & Center	north	curb ramps	1
Illinois - Haworth	Villa to Sitka	north	new segments of sidewalk	1
Illinois - Haworth	driveway entrance to swim center	south	curb ramps	1
Illinois - Haworth	Pool Park	south	new sidewalk or widen and smooth park path	1
Illinois - Haworth	Haworth & Sitka	east	curb ramps	1
Illinois - Haworth	Haworth & Hulet	2 corners	curb ramps	1
Illinois - Haworth	Haworth & Marie	T-side	curb ramps	1
Illinois - Haworth	Haworth & Elliot	northwest	curb ramps	1
Main Street	Crestview to Columbia	east	new sidewalk, curb ramps	1
Main Street	Columbia to Ashley	west	new sidewalk, curb ramps	1
Main Street	Columbia to Pinehurst	east	new sidewalk, curb ramps	1

Route	Location	Side	Improvement	Tier
Main Street	Main & North	east	curb ramps	1
Main Street	Franklin to Sherman	west	new sidewalk segment, curb ramps	1
Main Street	Main & Railroad tracks	west	repave path across tracks, fill flanges, curb ramps	1
Main Street	Railroad tracks to Sheridan	west	new sidewalk segment	1
Meridian/Crestview/Center	Meridian & Crestview	southwest	curb ramps	1
Meridian/Crestview/Center	Crestview to Fircrest	east	new sidewalk, 3 trees will need removal/replanting	1
Meridian/Crestview/Center	Meridian & Railroad tracks	east	repave and smooth, fill flanges	1
Meridian/Crestview/Center	Fulton to Vermillion	east	new sidewalk	1
Meridian/Crestview/Center	Meridian & Vermillion	all corners	curb ramps	1
Meridian/Crestview/Center	Meridian & North	all corners	curb ramps	1
River Street	2nd & River	west	curb ramps	1
Villa Road	Haworth to Fulton	west	new sidewalk with curb ramps, will need fill for widening	1
Villa Road	Fulton to North	west	existing sidewalk will need widening	1
Villa Road	Villa @ Laurel	west	will need to acquire land from single parcel (college may acquire)	1
Villa Road	Sherman to OR99W	west	will need to acquire land from single parcel (college may acquire)	1
11th Street	River to Chehalem	north	new sidewalk, curb ramp	2
11th Street	Chehalem to Willamette	north	new sidewalk, curb ramp	2
11th Street	11th & Willamette	all corners	curb ramp	2
11th Street	Willamette to Columbia	north	new sidewalk, curb ramp	2
11th Street	Columbia to Pacific	north	new sidewalk, curb ramp	2
11th Street	Mill to Wynookski	north	new sidewalk, curb ramp	2
2nd Street	2nd & Washington	all corners	curb ramps	2
2nd Street	Washington to Blaine	south	new segment of sidewalk	2
2nd Street	2nd & Edwards	3 corners	curb ramps	2
2nd Street	2nd & Meridian	all corners	curb ramps	2
2nd Street	2nd & Center	southwest	curb ramps	2
Blaine Street	Blaine & Sherman	3 corners	curb ramps	2
Blaine Street	Blaine & Sheridan	all corners	curb ramps	2
College Street	Mountainview to Melody	west	new segment of sidewalk, need to cover drainage ditch	2
College Street	Melody to Arlington	west	new segment of sidewalk, need to cover drainage ditch	2
College Street	Arlington to Columbia (will require buying property based on aerial and parcelwithadd on map)	west	new segment of sidewalk, need to cover drainage ditch	2
College Street	College & North	east/west	curb ramps	2
College Street	College & Franklin	west	curb ramps	2
College Street	College & Sherman	east/west	curb ramps	2
College Street	College & Sheridan	east/west	curb ramps	2
Crater Lane	Mountainview to Lynn	east	new segment of sidewalk	2
Hoskins Street	Crestview to church entrance	east	new sidewalk, curb ramp, trim back tree well	2

Route	Location	Side	Improvement	Tier
Hoskins Street	Palomino to Sierra Vista	west	new sidewalk, curb ramp	2
Hoskins Street	Hoskins & Pennington	northeast	new curb ramp	2
Main Street	Pinehurst to Markris	east	new sidewalk, curb ramps	2
Main Street	Markris to Clifford	east	new sidewalk, curb ramps	2
Main Street	Clifford to Illinois	east	new sidewalk, curb ramps	2
Main Street	Main & Sheridan	south	curb ramps	2
Main Street	1st to 2nd	west	new sidewalk segment	2
Main Street	Main & 2nd	east	curb ramps	2
Main Street	Main & 3rd	east	curb ramps	2
Main Street	Main & 4th	all corners	curb ramps	2
Main Street	4th to 5th	east	new sidewalk segments, landscaping	2
Main Street	Main & 5th	all corners	curb ramps	2
Meridian/Crestview/Center	Meridian & Fircrest	all 3 corners	curb ramps	2
Meridian/Crestview/Center	Fircrest to Aldercrest	west	new sidewalk, 2 trees will need removal/replanting, curb ramps	2
Meridian/Crestview/Center	Hemlock to Sierra Vista	west	new segment of sidewalk, curb ramps	2
Meridian/Crestview/Center	Meridian & Franklin	west 2 corners	curb ramps	2
Meridian/Crestview/Center	Meridian & Sherman	west 2 corners	curb ramps	2
Meridian/Crestview/Center	Meridian & Sheridan	west 2 corners	curb ramps	2
River Street	3rd & River	3 corners	curb ramps	2
River Street	4th & River	east	curb ramps	2
River Street	4th to 5th	east	new sidewalk	2
River Street	5th & River	all corners	curb ramps	2
River Street	5th to 6th	west	new sidewalk	2
River Street	6th & River	all corners	curb ramps	2
River Street	6th to 7th	east	new sidewalk	2
River Street	7th & River	all corners	curb ramps	2
River Street	7th to 8th	east	new sidewalk	2
River Street	8th & River	all corners	curb ramps	2
River Street	9th & River	all corners	curb ramps	2
River Street	9th to 10th	east	new sidewalk	2
River Street	10th & River	east	curb ramps	2
River Street	11th & River	southeast	curb ramps	2
Springbrook Road	Vittoria to Aquarius	east	new sidewalk	2
Springbrook Road	Aquarius to Haworth	east	new short segment of sidewalk	2
Wynooski Street	5th to Lilly	east	new sidewalk segments, relocate a power pole	2
Wynooski Street	7th to Merlin	east	new sidewalk segments, trim back landscaping	2
11th Street	River to Chehalem	south	new sidewalk, curb ramp	3
11th Street	11th & Chehalem	southeast	curb ramp	3
11th Street	Willamette to Columbia	south	new sidewalk, curb ramp	3
9th Street	Blaine to School	south	new sidewalk, curb ramps	3
9th Street	School to College	south	new sidewalk, curb ramps	3
9th Street	9th & Meridian	northeast, T	curb ramps	3
9th Street	9th & Center	northwest, T	curb ramps	3
9th Street	9th & Chehalem	southeast	curb ramps	3
9th Street	9th & Willamette	all corners	curb ramps	3

Route	Location	Side	Improvement	Tier
9th Street	9th & Columbia	south corners	curb ramps	3
9th Street	Columbia to Pacific	south	new sidewalk	3
9th Street	9th & Pacific	south corners	curb ramps	3
9th Street	River to Chehalem	north	new sidewalk	3
9th Street	Chehalem to Willamette	north	new sidewalk	3
9th Street	Columbia to Pacific	north	new sidewalk, curb ramps	3
College Street	Edgewood to Oxford	west	new segment of sidewalk, need to cover drainage ditch	3
College Street	crossing Columbia/Crestview		mid-block crossing	3
Columbia/ Crestview	Main to College	north	new sidewalk, curb ramps	3
Crater Lane	Mountainview to Lynn	west	new segment of sidewalk	3
Crater Lane	Crater to Main (along Lynn)	south	new segment of sidewalk, need to cover drainage ditch	3
Hayes Street	Springbrook to Oak Leaf	south	new sidewalk	3
Hayes Street	Springbrook to Oak Grove	north	2 new segments of sidewalk	3
Hoskins Street	Hoskins & Pennington	south	2 new curb ramps	3
Howard Street	Sheridan	north	new curb ramp	3
River Street	12th to 13th	west	new sidewalk, curb ramp south side	3
River Street	13th to 14th	west	new sidewalk, curb ramps	3
Springbrook Road	Crestview to Vittoria	east	new sidewalk, curb ramp	3
Springbrook Road	Fred Meyer entrance to Hayes	west	new sidewalk	3
Villa Road	Mountainview to Thorne	east	new sidewalk with curb ramps	3
Villa Road	Thorne to Crestview (may req. acquiring some pvt property)	east	new sidewalk with curb ramps	3
Villa Road	Hess Creek to Carol	east	new sidewalk with curb ramps	3
Villa Road	Carol to Haworth	east	new sidewalk with curb ramps	3
Vittoria	Gemini to Libra	north	curb ramp	3
Vittoria	Vittoria & Aquarius	northwest	curb ramp	3

Map III-2. Newberg Spot Improvements



Funding and Implementation

Federal, State, and Regional Funding Sources

Federal Funding Sources

Federal funding is primarily distributed through a number of different programs established by the Federal Transportation Act. The latest federal transportation act, The Safe, Accountable, Flexible, Efficient Transportation Equity Act – a Legacy for Users (SAFETEA-LU) was enacted August 2005, as Public Law 109-59. SAFETEA-LU authorizes the Federal surface transportation programs for highways, highway safety, and transit for the 5-year period 2005-2009.

Federal funding is administered through the state (Oregon Department of Transportation, or ODOT) and regional planning agencies. Most, but not all, of these funding programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections. Federal funding is intended for capital improvements and safety and education programs and projects must relate to the surface transportation system.

SAFETEA-LU

There are a number of programs identified within SAFETEA-LU that provide for the funding of bicycle and pedestrian projects. The specific types of eligible projects and required funding match by the local jurisdiction are discussed further below.

National Highway System (NHS)

This program funds improvements to rural and urban roads that are part of the National Highway System (NHS), including the interstate system. Bicycle and pedestrian facilities within NHS corridors are eligible activities for NHS funds. This includes OR99W through Newberg. ODOT estimates that it will receive $418.4 million for this program over the lifetime of SAFETEA-LU.

Surface Transportation Program (STP)

The Surface Transportation Program (STP) provides States with flexible funds which may be used for a wide variety of projects on any Federal-aid Highway including the NHS, bridges on any public road, and transit facilities.

Bicycle and pedestrian improvements are eligible activities under the STP. This covers a wide variety of projects such as on-road facilities, off-road trails, sidewalks, crosswalks, bicycle and pedestrian signals, parking, and other ancillary facilities. SAFETEA-LU also specifically clarifies that the modification of sidewalks to comply with the requirements of the Americans with Disabilities Act is an eligible activity.

As an exception to the general rule described above, STP-funded bicycle and pedestrian facilities may be located on local and collector roads which are not part of the Federal-aid Highway System. In addition, bicycle-related non-construction projects, such as maps, coordinator positions, and encouragement programs, are eligible for STP funds. ODOT estimates that it will receive $419.3 million for this program through the lifetime of SAFETEA-LU.

Highway Safety Improvement Program

Funds projects designed to achieve significant reduction in traffic fatalities and serious injuries on all public roads and pedestrian/bike pathways. Included within this program are the Railway-Highway Crossings program and the High Risk Rural Roads program. ODOT estimates that they will receive

$79.1 million for this program through the lifetime of SAFETEA-LU. (This program replaces the Hazard Elimination Program from TEA-21.)

Railway-Highway Crossing Program (RHC)
Administered by Oregon Department of Transportation (ODOT), this program is funded by a set-aside of STP funds and is designated for improvements to highway-rail grade crossings to eliminate safety hazards. Funding for this program comes out of Highway Safety Improvement Program funds. ODOT estimates that they will receive an average of $3.1 million annually for this program through the lifetime of SAFETEA -LU.

Transportation Enhancements (TE)
Administered by Oregon Department of Transportation (ODOT), this program is funded by a set-aside of STP funds. Projects must serve a transportation need. These funds can be used to build a variety of pedestrian, bicycle, streetscape and other improvements that enhance the cultural, aesthetic, or environmental value of transportation systems. The statewide grant process is competitive.

Recreational Trails Program (RTP)
The Recreational Trails Program of the Federal Transportation Bill provides funds to states to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. Examples of trail uses include hiking, bicycling, in-line skating, equestrian use, and other non-motorized as well as motorized uses. These funds are available for both paved and unpaved trails, but may not be used to improve roads for general passenger vehicle use or to provide shoulders or sidewalks along roads.

Recreational Trails Program funds may be used for:

- Maintenance and restoration of existing trails;
- Purchase and lease of trail construction and maintenance equipment;
- Construction of new trails; including unpaved trails
- Acquisition of easements or property for trails;
- State administrative costs related to this program (limited to seven percent of a State's funds); and
- Operation of educational programs to promote safety and environmental protection related to trails (limited to five percent of a State's funds).

Safer Routes to School (SR2S)
Federal funds administered by the Oregon Department of Transportation (ODOT). Under the Oregon Safer Routes to School Program, approximately $3.7 million will be available for grants between 2006 and 2010. The grants can be used to identify and reduce barriers and hazards to children walking or biking to school. ODOT estimates that they will receive an average of $1.4 million annually for this program through the lifetime of SAFETEA -LU.

New Freedom Initiative
SAFETEA-LU creates a new formula grant program that provides capital and operating costs to provide transportation services and facility improvements that exceed those required by the Americans with Disabilities Act.

Rivers, Trails and Conservation Assistance program
The Rivers, Trails and Conservation Assistance Program is a National Parks Service program which provides technical assistance via direct staff involvement, to establish and restore greenways, rivers, trails, watersheds and open space. The RTCA program provides only for planning assistance—there are no implementation monies available. Projects are prioritized for assistance based upon criteria that include conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation and focusing on lasting accomplishments.

Land and Water Conservation Fund (LWCF)
Land and Water Conservation Fund is a federally funded program that provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. Funds can be used for ROW acquisition and construction. These funds are administered by the Oregon Parks and Recreation Department.

Transportation, Community and System Preservation Program
The Transportation, Community and System Preservation Program provides federal funding for transit oriented development, traffic calming and other projects that improve the efficiency of the transportation system, reduce the impact on the environment, and provide efficient access to jobs, services and trade centers. The program is intended to provide communities with the resources to explore the integration of their transportation system with community preservation and environmental activities. The Transportation, Community and System Preservation Program funds require a 20 % match.

Bridges
The Highway Bridge program requires that 15% of funding be shared with local governments for work on bridges not on the state highway system. ODOT will distribute an average of nearly $18 million each year for these bridge projects.

State Funding Sources

Bicycle and Pedestrian Program Grants
The Pedestrian and Bicycle Grant Program is a competitive grant program that provides approximately $5 million every two years to Oregon cities, counties and ODOT regional and district offices for design and construction of pedestrian and bicycle facilities. Proposed facilities must be within public rights-of-way. Grants are awarded by the Oregon Bicycle and Pedestrian Advisory Committee. Additional information related to the Bicycle and Pedestrian Program is located in the Appendix.

Measure 66 Funds – Oregon State Lottery
Measure 66 Funds are coordinated by Oregon State Parks. These funds can be used for trail right-of-way acquisition and construction. "15% of the net proceeds from the State Lottery shall be deposited in a parks and natural resources fund created by the Legislative Assembly. Of the moneys in the parks and natural resources fund, 50% shall be distributed for the public purpose of financing the protection, repair, operation, and creation of state parks, ocean shore and public beach access areas, historic sites and recreation areas," with recreation areas including trails.

Highway Revenue Apportionment
The City of Newberg received $981,591.98 in Highway Revenue Apportionment from the state in the 2005/2006 fiscal year. The majority of this revenue is generated by the state gasoline tax. Last

year, the City of Newberg dedicated approximately $10,000 from their portion to bicycle and pedestrian projects.

State Administered CDBG
The Federal program also provides each state the opportunity to administer CDBG funds for non-entitlement areas. Non-entitlement areas include those units of general local government which do not receive CDBG funds directly from HUD as part of the entitlement program (Entitlement Cities and Urban Counties). Non-entitlement areas are cities with populations of less than 50,000 (except cities that are designated principal cities of Metropolitan Statistical Areas), and counties with populations of less than 200,000. Block Grant Grantees may "use Community Development Block Grants funds for activities that include (but are not limited to): acquiring real property; reconstructing or rehabilitating housing and other property; building public facilities and improvements, such as streets, sidewalks, community and senior citizen centers and recreational facilities, paying for planning and administrative expenses, such as costs related to developing a consolidated plan and managing Community Development Block Grants funds; provide public services for youths, seniors, or the disabled; and initiatives such as neighborhood watch programs."

State Law Requiring Funding

1971: ORS 366.514: Use of highway fund for footpaths and bicycle trails
Often referred to as the "Oregon Bike Bill," this law applies equally to bicycle and pedestrian facilities. The law, the first of its type in the nation, requires the development of bikeways and walkways. The intent was to ensure that future roads be built to accommodate bicycle and pedestrian travel, where warranted. It also enables road funds to be used for constructing bikeways and walkways along existing roads. The relevant provisions of this statute are:

1. It requires ODOT and the cities and counties of Oregon to expend reasonable amounts of the highway fund to provide bikeways and walkways.
2. It requires the inclusion of bikeways and walkways whenever highways, roads and streets are constructed, reconstructed or relocated, with three exemptions (where there is no need or probable use, where safety would be jeopardized, or where the cost is excessively disproportionate to the need or probable use).

ORS 366.514 drives most of ODOT's bicycle and pedestrian activities.

Regional and non-traditional funding sources

American Greenways Program
Administered by The Conservation Fund, the American Greenways Program provides funding for the planning and design of greenways. Applications for funds can be made by local regional or state-wide non-profit organizations and public agencies. The maximum award is $2,500, but most range from $500 to $1,500. American Greenways Program monies may be used to fund unpaved trail development.

City of Newberg Funding Sources

Sidewalk Intersections/ADA

This is already planned with identified funding as part of the Newberg 2006-2007 budget. These funds are used to repair or reconstruct sidewalks at intersections and alleyways to meet ADA

standards. Sidewalk repair is typically the property owner's responsibility; however, the intersection walks, wheelchair ramps, and alley access crossings are funded by the City. $25,000/year has been set aside out of gas tax revenue for this project for the next five years.

Local Improvement Districts (LID)

Through a LID, a street or other transportation improvement is built and adjacent properties that benefit are assessed a fee to pay for the improvement. LID's may be a good choice for funding new sidewalk projects on collector streets. The City of Newberg has a planned LID on Main Street from Illinois to Lynn to pay for street improvements. In addition, the city is creating a Columbia Drive LID from College Street to Main Street.

Transportation User Fees

Transportation user fees are any group of additional fees that could be used to fund maintenance and improvement projects for non-motorized uses. Properties would be assessed fees based on the traffic generation by land use or business activity as published in the Institute of Transportation Engineers (ITE) Trip Generation Manual.

The fee could be a Street Maintenance Fee, to fund maintenance of the existing roadway system to free up dollars from the state gasoline tax for capital projects. In the TSP, it was estimated that a $10 monthly fee would generate approximately $1 million in revenue, which would grow to $1.6 million annually by 2025.

Another type of fee previously considered by the city is a Sidewalk Fee, which could be included monthly with resident's water bills. A small fee (a $1 or $2 per month) would generate between $100,000 -$200,000 annually that could be spent on building and upgrading the highest priority sidewalks in the city.

Local Bond Measures

The city could issue bonds to fund sidewalk/ADA improvements. This would spread the cost of the improvements over the life of the bonds. Certain types of bonds would require voter approval. The debt would have to be retired, so funding for repayment on the bond and the interest would be required.

Developer Impact Fees

Another potential local source of funding are developer impact fees, typically ties to trip generation rates and traffic impacts produced by a proposed project. A developer may reduce the number of trips (and hence impacts and cost) by paying for on- or off-site pedestrian improvements that will encourage residents to walk or use transit rather than drive. In-lieu parking fees may be used to help construct new or improved pedestrian facilities. Establishing a clear nexus or connection between the impact fee and the project's impacts is critical in avoiding a potential lawsuit.

System Development Charges (SDC)

The City of Newberg established an SDC for transportation in 1995. The amount collected entirely dependent upon the level of new development. In the year 2006/2007 the City collected just over $3.5 million, however, $3.2 million was related to development of the Springbrook Oaks/Werth family property. The City could reevaluate the SDC rate to determine if it should be increased.

Business Improvement Districts

Pedestrian improvements can often be included as part of larger efforts at business improvement and retail district beautification. Business Improvement Districts collect levies on businesses in order to fund area-wide improvements that benefit businesses and improve access for customers. These districts may include provisions for pedestrian and bicycle improvements, such as wider sidewalks, landscaping, and ADA compliance.

Local Gas Tax

Newberg could use revenues from a local gasoline tax to provide for ADA and sidewalk improvements. Such a tax would likely require voter approval, which is an uncertainty, especially with the ever increasing costs of gas. However, once established the tax would be a relatively stable funding source for improvements.

Other

Local taxes, fees, and permits may be implemented, requiring a local election. A challenge grant program with local businesses may be a good source of local funding, where corporations 'adopt' a pedestrian way and help maintain the facility. Foundation grants, volunteer work, and donations of in-kind services, equipment, labor or materials are

Implementation Options

Option 1: Low funding scenario

In the low funding scenario, it is assumed that the City will have only current sources of funds to dedicate towards ADA and sidewalk improvements. Under this scenario, Newberg will have approximately $35,000/year to spend on specific non-motorized projects. This allows for funding of the Spot Improvement Program and little else. Additional improvements would occur as a normal course of development, such as sidewalks along Villa and Crestview when the George Fox Sports Complex develops. The corridor projects would remain unfunded unless rolled into other projects and funding sources, such as the Main Street and Columbia Drive LIDs.

Option 2: Medium funding scenario

In a medium funding scenario, it is assumed that along with the current funding sources, the City receives a small amount of grant funding as well as additional revenue from a new funding source, such as a tax or a fee. The fee funds could be used as a match to leverage possible grant funds. If Newberg created a $1/month sidewalk fee, this would raise approximately $100,000/year that could be dedicated towards ADA and sidewalk improvements, in addition to the existing $35,000/year plus $25,000-$50,000 in grant funds. In addition, the City could do a direct assessment of properties along critical routes and charge the property owner the cost of installing the necessary improvements, although this may not be politically feasible.

Option 3: High Funding scenario

In a high funding scenario, it is assumed that along with the current funding sources, the City receives a moderate amount of grant funding as well as additional revenue from a new funding source, such as a tax or a fee. The fee funds could be used as a match to leverage possible grant funds. A $10/month street maintenance fee would raise approximately $1 million/year, plus an increase in the SDC rate could raise another $100,000 - $200,000 annually. These sources, addition

to the existing $35,000/year plus $50,000-$150,000 in grant funds for some of the smaller corridor projects, brings total funds to over $1.2 million/year . Furthermore, getting some of the larger corridor projects onto ODOT's Statewide Transportation Improvement Plan (STIP) project list is vital for securing all the necessary funding. In addition, the City could do a direct assessment of properties along critical routes and charge the property owner the cost of installing the necessary improvements.

The following tables show possible funding scenarios that the City of Newberg might choose to pursue in funding the highest priority projects. Table III-8 highlights the current funding gap between the city's existing resources and funding all of the high priority projects, while Tables III-8 through III-11 show possible options for filling the funding gap.

Table III-8. Funding Gap

Total Cost	Property Owner Sources	Estimated Street Frontage w/ Non-remonstrance	New Development	SDC	County	State	City Funds needed
$ 242,000	$ 181,500	0%					$ 60,500
$ 351,000	$ 263,250	0%					$ 87,750
$ 9,300,000	$ 930,000	13%				$ 8,370,000	$ -
$ 8,000,000		0%			$ 2,000,000	$ 4,000,000	$ 2,000,000
$ 1,100,000	$ 450,000	3%		$ 500,000			$ 150,000
$ 1,700,000	$ 1,275,000	6%					$ 425,000
$ 2,300,000	$ 1,725,000	17%					$ 575,000
$ 335,000	$ 251,250	0%					$ 83,750
$ 2,500,000	$ 300,000	20%	$ 1,200,000	$ 900,000			$ 100,000
$ 1,800,000	$ 675,000	0%		$ 900,000			$ 225,000
$ 900,000		0%				$ 900,000	$ -
$ 4,000,000	$ 1,575,000	8%	$ 1,400,000	$ 500,000			$ 525,000
$ 5,100,000	$ 3,825,000	24%		$ 500,000			$ 775,000
$ 3,100,000	$ 1,950,000	7%		$ 500,000			$ 650,000
$ 4,000,000	$ 3,000,000	n/a					$ 1,000,000
$ 35,828,000	**$ 16,401,000**		**$ 2,600,000**	**$ 3,800,000**	**$ -**	**$ 8,370,000**	**$ 4,657,000**
$ 44,728,000	$ 16,401,000		$ 2,600,000	$ 3,800,000	$ 2,000,000	$ 13,270,000	$ 6,432,000

	5-year amount
75%	$ 16,401,000

Current City sources	Rate	Units	Annual Amount	5-year amount
State Gas Tax	1%	$ 1,000,000	$ 10,000	$ 50,000
Federal Exchange	10%	$ 100,000	$ 10,000	$ 50,000
Potential Fees / Taxes				
Local Gas Tax	$ -	per gallon	$ -	$ -
Sidewalk / Bike Route / ADA Fee	$ -	per month	$ -	$ -
Street Maintenance Fee	$ -	per month	$ -	$ -
Property Tax	$ -	$ 1,000	$ -	$ -
Total City Sources				***$ 100,000***
Funding Gap				***$ (4,557,000)***

Table III-9. Property Tax

Total Cost	Property Owner Sources	Estimated Street Frontage w/ Non-remonstrance	New Development	SDC	County	State	City Funds needed
$ 242,000	$ 181,500	0%					$ 60,500
$ 351,000	$ 263,250	0%					$ 87,750
$ 9,300,000	$ 930,000	13%				$ 8,370,000	$ -
$ 8,000,000		0%			$ 2,000,000	$ 4,000,000	$ 2,000,000
$ 1,100,000	$ 450,000	3%		$ 500,000			$ 150,000
$ 1,700,000	$ 1,275,000	6%					$ 425,000
$ 2,300,000	$ 1,725,000	17%					$ 575,000
$ 335,000	$ 251,250	0%					$ 83,750
$ 2,500,000	$ 300,000	20%	$ 1,200,000	$ 900,000			$ 100,000
$ 1,800,000	$ 675,000	0%		$ 900,000			$ 225,000
$ 900,000		0%				$ 900,000	$ -
$ 4,000,000	$ 1,575,000	8%	$ 1,400,000	$ 500,000			$ 525,000
$ 5,100,000	$ 3,825,000	24%		$ 500,000			$ 775,000
$ 3,100,000	$ 1,950,000	7%		$ 500,000			$ 650,000
$ 4,000,000	$ 3,000,000	n/a					$ 1,000,000
$ 35,828,000	**$ 16,401,000**		**$ 2,600,000**	**$ 3,800,000**	**$ -**	**$ 8,370,000**	**$ 4,657,000**
$ 44,728,000	$ 16,401,000		$ 2,600,000	$ 3,800,000	$ 2,000,000	$ 13,270,000	$ 6,432,000

	5-year amount
75%	$ 16,401,000

Current City sources	Rate	Units	Annual Amount	5-year amount
State Gas Tax	1%	$ 1,000,000	$ 10,000	$ 50,000
Federal Exchange	10%	$ 100,000	$ 10,000	$ 50,000
Potential Fees / Taxes				
Local Gas Tax	$ -	per gallon	$ -	$ -
Sidewalk / Bike Route / ADA Fee	$ -	per month	$ -	$ -
Street Maintenance Fee	$ -	per month	$ -	$ -
Property Tax	$ 1.00	$ 1,000	$ 1,000,000	$ 5,000,000
Total City Sources				***$ 5,100,000***
Funding Gap				***$ 443,000***

Table III-10. Owner Funded

Total Cost	Property Owner Sources	Estimated Street Frontage w/ Non-remonstrance	New Development	SDC	County	State	City Funds needed
$ 242,000	$ 242,000	0%					$ -
$ 351,000	$ 351,000	0%					$ -
$ 9,300,000	$ 930,000	13%				$ 8,370,000	$ -
$ 8,000,000		0%			$ 2,000,000	$ 4,000,000	$ 2,000,000
$ 1,100,000	$ 600,000	3%		$ 500,000			$ -
$ 1,700,000	$ 1,700,000	6%					$ -
$ 2,300,000	$ 2,300,000	17%					$ -
$ 335,000	$ 335,000	0%					$ -
$ 2,500,000	$ 400,000	20%	$ 1,200,000	$ 900,000			$ -
$ 1,800,000	$ 900,000	0%		$ 900,000			$ -
$ 900,000		0%				$ 900,000	$ -
$ 4,000,000	$ 2,100,000	8%	$ 1,400,000	$ 500,000			$ -
$ 5,100,000	$ 5,100,000	24%					$ -
$ 3,100,000	$ 2,600,000	7%		$ 500,000			$ -
$ 4,000,000	$ 4,000,000	n/a					$ -
$ 35,828,000	**$ 21,558,000**		**$ 2,600,000**	**$ 3,300,000**	**$ -**	**$ 8,370,000**	**$ -**
$ 44,728,000	$ 21,558,000		$ 2,600,000	$ 3,300,000	$ 2,000,000	$ 13,270,000	$ 2,000,000

	5-year amount
100%	$ 21,558,000

Current City sources	Rate	Units	Annual Amount	5-year amount
State Gas Tax	1%	$ 1,000,000	$ 10,000	$ 50,000
Federal Exchange	10%	$ 100,000	$ 10,000	$ 50,000
Potential Fees / Taxes				
Local Gas Tax	$ -	per gallon	$ -	$ -
Sidewalk / Bike Route / ADA Fee	$ -	per month	$ -	$ -
Street Maintenance Fee	$ -	per month	$ -	$ -
Property Tax	$ -	$ 1,000	$ -	$ -
Total City Sources				***$ 100,000***
Funding Surplus				***$ 100,000***

Table III-11. Sidewalk ADA Bike Route Fee

Total Cost	Property Owner Sources	Estimated Street Frontage w/ Non-remonstrance	New Development	SDC	County	State	City Funds needed
$ 242,000	$ 181,500	0%					$ 60,500
$ 351,000	$ 263,250	0%					$ 87,750
$ 9,300,000	$ 930,000	13%				$ 8,370,000	$ -
$ 8,000,000		0%			$ 2,000,000	$ 4,000,000	$ 2,000,000
$ 1,100,000	$ 450,000	3%		$ 500,000			$ 150,000
$ 1,700,000	$ 1,275,000	6%					$ 425,000
$ 2,300,000	$ 1,725,000	17%					$ 575,000
$ 335,000	$ 251,250	0%					$ 83,750
$ 2,500,000	$ 300,000	20%	$ 1,200,000	$ 900,000			$ 100,000
$ 1,800,000	$ 675,000	0%		$ 900,000			$ 225,000
$ 900,000		0%				$ 900,000	$ -
$ 4,000,000	$ 1,575,000	8%	$ 1,400,000	$ 500,000			$ 525,000
$ 5,100,000	$ 3,825,000	24%		$ 500,000			$ 775,000
$ 3,100,000	$ 1,950,000	7%		$ 500,000			$ 650,000
$ 4,000,000	$ 3,000,000	n/a					$ 1,000,000
$ 35,828,000	**$ 16,401,000**		**$ 2,600,000**	**$ 3,800,000**	**$ -**	**$ 8,370,000**	**$ 4,657,000**
$ 44,728,000	$ 16,401,000		$ 2,600,000	$ 3,800,000	$ 2,000,000	$ 13,270,000	$ 6,432,000

	5-year amount
75%	$ 16,401,000

Current City sources	Rate	Units	Annual Amount	5-year amount
State Gas Tax	1%	$ 1,000,000	$ 10,000	$ 50,000
Federal Exchange	10%	$ 100,000	$ 10,000	$ 50,000
Potential Fees / Taxes				
Local Gas Tax	$ -	per gallon	$ -	$ -
Sidewalk / Bike Route / ADA Fee	$ 10.00	per month	$ 960,000	$ 4,800,000
Street Maintenance Fee	$ -	per month	$ -	$ -
Property Tax	$ -	$ 1,000	$ -	$ -
Total City Sources				***$ 4,900,000***
Funding Gap				***$ 243,000***

IV. Design Guidelines

Introduction

This chapter discusses recommended design guidelines for Newberg's pedestrian and bicycle system. Design recommendations are proposed for each of the non-motorized facility types proposed in this plan including bikeways and walkways. This chapter also discusses other important issues that should be considered as the City improves existing facilities and expands the pedestrian and bicycle network.

Principles for Pedestrian Design

The following design principles represent a set of ideals that should be incorporated, to some degree, into every pedestrian improvement.

- The pedestrian environment should be safe. Sidewalks, walkways, and crossings should be designed and built to be free of hazards and to minimize conflicts with external factors such as noise, vehicular traffic, and protruding architectural elements.
- The pedestrian network should be accessible to all. Sidewalks, walkways, and crosswalks should ensure the mobility of all users by accommodating the needs of people regardless of age or ability.
- The pedestrian network should connect to places people want to go. The pedestrian network should provide continuous direct routes and convenient connections between destinations, including homes, schools, shopping areas, public services, recreational opportunities, and transit.
- The pedestrian environment should be easy to use. Sidewalks, walkways, and crossings should be designed so people can easily find a direct route to a destination and delays are minimized.
- The pedestrian environment should provide good places. Good design should enhance the look and feel of the pedestrian environment. The pedestrian environment includes open spaces such as plazas, courtyards, and squares, as well as the building facades that give shape to the space of the street. Amenities such as seating, street furniture, banners, art, plantings, shading, and special paving, along with historical elements and cultural references, should promote a sense of place.
- The pedestrian environment should be used for many things. The pedestrian environment should be a place where public activities are encouraged. Commercial activities such as dining, vending, and advertising may be permitted when they do not interfere with safety and accessibility.
- Pedestrian improvements should be economical. Pedestrian improvements should be designed to achieve the maximum benefit for their cost, including initial cost and maintenance cost as well as reduced reliance on more expensive modes of transportation. Where possible, improvements in the right-of-way should stimulate, reinforce, and connect with adjacent private improvements.

Sidewalks

A variety of considerations are important in sidewalk design. Providing adequate and accessible facilities should lead to increased numbers of people walking, improved safety, and the creation of social space. Attributes of well-designed sidewalks include the following:

- Accessibility: A network of sidewalks should be accessible to all users and meet ADA requirements.
- Adequate width: Two people should be able to walk side-by-side and pass a third person comfortably and different walking speeds should be possible. In areas of intense pedestrian use, sidewalks should be wider to accommodate the greater volume of walkers.
- Safety: Design features of the sidewalk should allow pedestrians to have a sense of security and predictability. Sidewalk users should not feel they are at risk due to the presence of adjacent traffic.
- Continuity: Walking routes should be obvious and should not require pedestrians to travel out of their way unnecessarily.
- Landscaping: Plantings and street trees within the roadside area should contribute to the overall psychological and visual comfort of sidewalk users, without providing hiding places for attackers.
- Social space: Sidewalks should be more than areas to travel; they should provide places for people to interact. There should be places for standing, visiting, and sitting. The sidewalk area should be a place where adults and children can safely participate in public life.
- Quality of place: Sidewalks should contribute to the character of neighborhoods and business districts and strengthen their identity.

Width

The City of Newberg and the Oregon Department of Transportation (ODOT) requires five-foot sidewalks on all streets.

Preferably, sidewalks would be at least six feet wide, exclusive of the curb and other obstructions. This width enables two pedestrians (including wheelchair users) to walk side by side, or to pass each other comfortably. It also allows two pedestrians to pass a third pedestrian without leaving the sidewalk. This Plan recommends that the City of Newberg increase its current minimum sidewalk width standard to six feet to address these issues.

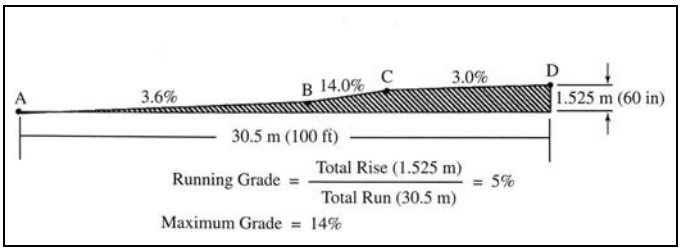
Surface

Sidewalk surfaces should be smooth and continuous. It is also desirable that the sidewalk surface be stable, firm and slip resistant. Preferred materials include Portland Cement Concrete (PCC) and Asphalt Concrete (AC). PCC provides a smooth, long-lasting and durable finish that is easy to grade and repair. AC has a shorter life expectancy but may be more appropriate in less urbanized areas and in park settings. Crushed aggregate may also be used as an all-weather walkway surface in park areas, but this material generally requires a higher level of maintenance to maintain accessibility.

Brick pavers (or other decorative treatments) may be used on some sidewalks and crosswalks if they are constructed to avoid settling or removal of bricks, which can create tripping hazards. This treatment should also be constructed to provide a high level of smoothness to accommodate wheelchairs and other mobility devices. Alternatives to brick pavers include "stamping" molds to create the visual appearance of bricks.

Grade

The grade of a sidewalk is important because of the issues of control, stability, and endurance. Gentle grades are preferred to steep grades so as to make it possible for people to go up hill, so that they don't lose control on the downhill, and so that they don't lose their footing.

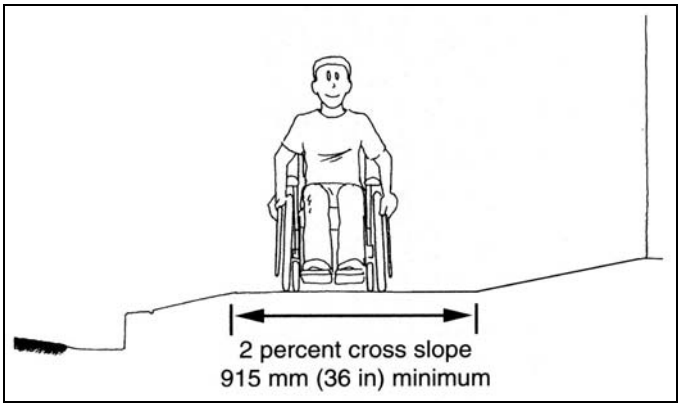


The recommended grade for a sidewalk.

- Grade is the slope parallel to the direction of travel.
- Running grade is the average grade along a continuous path.
- Maximum grade covers a limited section of sidewalk that exceeds the running grade. It is measured over 24 in (0.610 m). The above figure illustrates running grade and maximum grade.
- Rate of change of grade is the change of grade over a distance of 24 in (0.610 m) intervals.
- Counter slope is the grade running opposite to the running grade.
- New sidewalks must be built to comply with these grade requirements. However, in a steep area with existing roadways, exceptions are allowed. Staircases and/or elevators can provide an alternative.

Cross Slope

Cross-slope affects the stability of wheelchairs, walking aids, and people who have difficulty walking but do not use aids. All sidewalks require some cross-slope for drainage, but a cross-slope that is too great presents problems for disabled users. The recommended cross-slope for sidewalks is 2%. The preferred cross slope for the entire paved sidewalk corridor is 1:50. If a greater slope is anticipated because of unusual topographic or existing conditions, the designer should maintain the preferred slope of 1:50 for as long as possible.

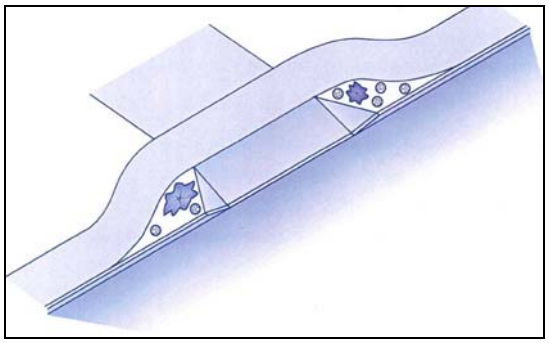


A 2% slope should be maintained for a minimum of three feet width.

If the above measures are not sufficient and additional slope is required to match grades, the cross slope may be as much as 1:25, provided that a 3 ft (900 mm) wide portion within the walking area remains at 1:50 cross slope. The approach will only be acceptable when staff determines that no other approach or design is feasible.

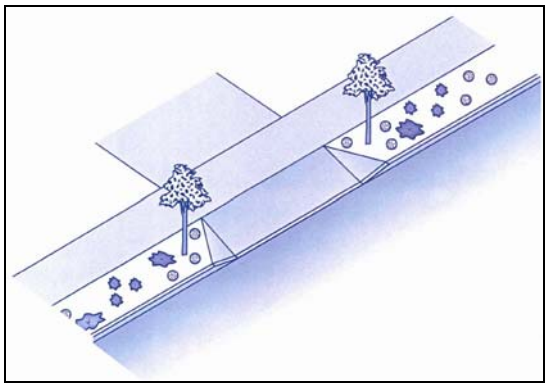
Addressing Obstructions

Obstructions to pedestrian travel in the sidewalk corridor typically include sign posts, utility and signal poles, mailboxes, fire hydrants and street furniture. Obstructions should be placed between the sidewalk and the roadway to create a buffer for increased pedestrian comfort while maintaining six feet of lateral clearance. When sidewalks abut perpendicular or angle on-street parking, wheelstops should be placed in the parking area to prevent parked vehicles from overhanging in the sidewalk. When sidewalks abut hedges, fences, or buildings, an additional two feet of lateral clearance should be added to provide appropriate shy distance.



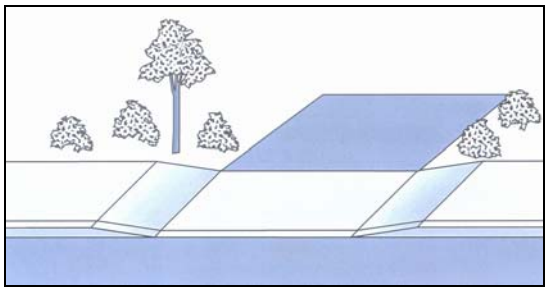
Sidewalk wrapped around driveway

Driveways represent another sidewalk obstruction, especially for wheelchair users. The following techniques can be used to accommodate wheelchair users at driveway crossings:



Driveway apron utilizing a planter strip

- Reducing the number of accesses reduces the need for special provisions. This strategy should be pursued first.
- Constructing wide sidewalks avoids excessively steep driveway slopes. The overall width must be sufficient to avoid an abrupt driveway slope.
- Planter strips allow sidewalks to remain level, with the driveway grade change occurring within the planter strip.
- Where constraints preclude a planter strip, wrapping the sidewalk around the driveway has a similar effect. However, this method may have disadvantages for visually-impaired pedestrians who follow the curb line for guidance.



Entire sidewalk dips at driveway

- When constraints only allow curb-tight sidewalks, dipping the entire sidewalk at the driveway approaches keeps the cross-slope at a constant grade. However, this may be uncomfortable for pedestrians and could create drainage problems behind the sidewalk.

Alternatives to Sidewalks

Although the City of Newberg has a goal of providing sidewalks on both sides of all streets, physical and other constraints (especially in older neighborhoods) could preclude sidewalks in some parts of the city. Alternative sidewalk treatments could be used to accommodate foot traffic in these areas.

Soft Paths

In areas where paved sidewalks are not feasible or appropriate due to site conditions such as existing trees, walls, or other obstacles, a soft path alternative should be explored. A soft path is a pedestrian path constructed of a pervious material such as decomposed granite or other universally accessible material. Another option is rubberized sidewalks, which use one recycled automobile tire per square foot of sidewalk. Rubberized sidewalks cost approximately one-third more than the cost of typical concrete sidewalks, but require significantly less maintenance than concrete sidewalks that are located near trees, since they can be lifted out of the ground for periodic tree root trimming. Rubberized sidewalks are less likely than concrete to be broken up by tree roots, further reducing long-term costs. Soft paths should be at least five feet wide. Constricted areas may have a reduced width consistent with the ADA guidelines.

Colored Shoulders

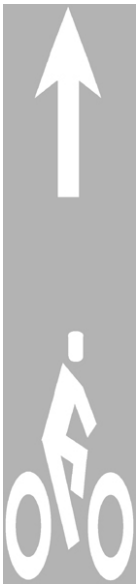
Colored shoulders visually narrow the roadway and slow traffic, making it more pedestrian friendly. They are optional treatments for neighborhoods with no room for traditional sidewalks. Drivers see only travel lanes as available road space, so the roadway appears narrower than it is when the shoulders are a different color. Painting the road surface requires frequent maintenance; lower-maintenance methods include:

- Paving travel lanes with concrete, and bicycle/pedestrian facilities with asphalt, or the reverse
- Slurry sealing or chip-sealing the roadway, and not the pedestrian path
- Incorporating dyes into concrete or asphalt
- Colored unit pavers that resemble brick

Bicycle Lanes

This Plan proposes bicycle lanes on several existing streets in Newberg. The City currently requires 5-foot bicycle lanes on minor arterials and major collectors, and 6-foot bicycle lanes on major arterials. Cyclists need at least four feet of lateral clearance while operating in a bicycle lane. A lane's usable width is normally measured from the curb face to the center of the lane stripe, although adjustments should be made for drainage grates and longitudinal joints between the street pavement and the curb gutter pan. If parking is ever permitted on a street with bicycle lanes, bicycle lanes should be placed between the parking lane and the travel lane. Oregon Administrative Rules require bicycle lanes to be striped with an eight-inch solid white line to increase the visual separation between the vehicle lane and bicycle lane. A four-inch solid white line may also be striped between the bicycle lane and adjacent on-street parking to encourage parking closer to the curb and to provide additional separation from motor vehicles. Bicycle lanes should also be marked with stencils and directional arrows. The Oregon Bicycle and Pedestrian Plan recommends placing

stencils after most intersections to alert motorists and cyclists of the exclusive nature of bicycle lanes. For long street segments with few intersections, the appropriate frequency of stencils is calculated by multiplying the street's design speed by 40. For instance, stencils should be placed every 1,400 feet on streets with a 35 MPH designated speed.



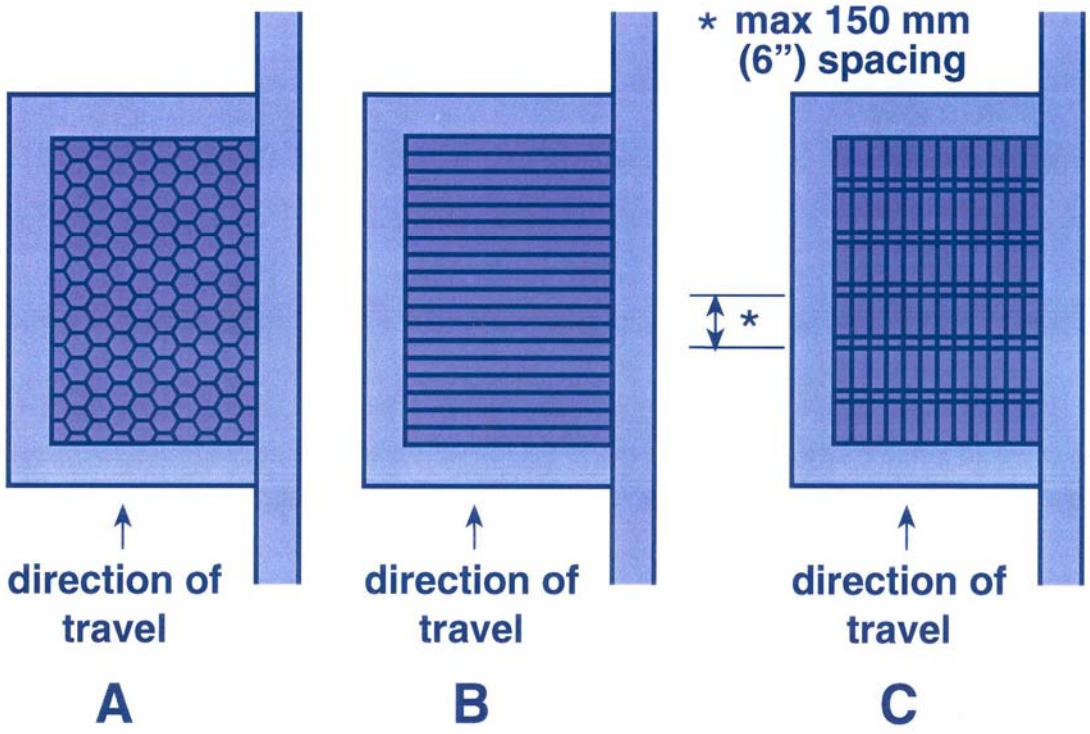
Bicycle lane pavement stencil and arrow

Other Bicycle Lane Treatments

Addressing Drainage Grates and Other Obstacles

Bicycle lanes should be provided with adequate drainage to prevent ponding, washouts, debris accumulation and other potentially hazardous situations for cyclists. Drainage grates should be bicycle-safe (see Figure IV-1). When an immediate replacement of an incompatible grate is not possible, a temporary correction of welding thin metal straps across the grates perpendicular to the drainage slots (four to six inches apart, center-to-center spacing) should be considered. Bicycle lanes should also include a smooth riding surface, and utility covers should be adjusted flush with the street surface. Furthermore, raised pavement markings (e.g., reflectors and truncated domes) can cause steering difficulties for bicyclists, and should not be used to delineate bicycle lanes.

Figure IV-1. Bicycle-Safe Drainage Grates



Shared Roadways/Bicycle Boulevards

Typically the most common type of bikeway, shared roadways are streets with relatively low traffic volumes and posted speeds that enable cyclists and motorists to share the same travel lanes. These streets usually have two travel lanes with or without adjacent on-street parking.

Shared roadways that incorporate treatments to accommodate cyclists are often called "bicycle boulevards." Bicycle boulevards are developed through a combination of traffic calming measures and other streetscape treatments, and are intended to slow vehicle traffic while facilitating safe and convenient bicycle travel. Appropriate treatments depend on several factors including traffic volumes, vehicle and bicycle circulation patterns, street connectivity, street width, physical constraints, and other parameters. Most streets could be provided relatively inexpensive treatments like new signage, pavement markings, striping and signal improvements to facilitate bicyclists' mobility and safety. Other potential treatments include curb extensions, medians, on-street parking delineation and other features that can be implemented at reasonable cost and are compatible with snow plowing and emergency vehicle accessibility. It should be noted that many bicycle boulevard treatments can also benefit pedestrians. Curb extensions, for instance, can reduce vehicle speeds on a street by creating a visual "pinch point" for motorists. They also improve the pedestrian environment by shortening the pedestrian crossing distance.

Bicycle Boulevard Applications

The following section describes recommended applications for Newberg's proposed shared roadway/bicycle boulevard system. The treatments have been divided into five main categories based on their level of "intensity", with Level 1 representing the least intensive treatments that could be implemented at relatively low cost. It should be noted that each successive application "level" would also include (where necessary) treatments identified for the previous levels. Furthermore, several treatments could fall within multiple categories as they achieve multiple goals.

Level 1: Signage

Bikeway signage is relatively cost-effective treatment the can improve the bicycling environment along Newberg's bicycle boulevard system. Described below, signage can serve both wayfinding and safety purposes.

Wayfinding Signs

Bicycle wayfinding signs should be installed along Newberg's bicycle boulevards and other cycling routes. Placing signs throughout the city indicating to bicyclists their direction of travel, location of destinations, and the time/distance to those destinations will increase users' comfort and accessibility to the bicycle system. Wayfinding signs also visually cue motorists that they are driving along a bicycle route and should correspondingly use caution. Signs are typically placed at key locations leading to and along bicycle routes, including where multiple routes intersect. Note that too many road signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level most visible to bicyclists and pedestrians, rather than per vehicle signage standards. Care also needs to be taken that any signs are posted at the proper location and orientation to be visible to bicyclists.

Signage concept

Warning Signs

On bicycle boulevards with higher vehicle and bicycle volumes, the City should also consider installing additional warning signs advising motorists to "share the road" with cyclists. This signage would also be effective in areas with higher numbers of bicycle trips, such as Highway 219 and Dayton Avenue.

Warning sign

Level 2: Pavement Markings

A variety of pavement marking techniques can effectively improve bicycling conditions along bicycle boulevards.

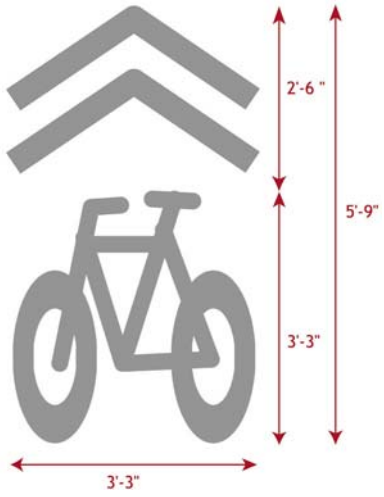
Directional Pavement Markings

Directional pavement markings effectively lead cyclists along a bicycle boulevard (and reinforce cyclists that they are on a designated route). The markings take the form of small bicycle symbols (about one foot in diameter) placed every 600-800 feet along a linear corridor. When a bicycle boulevard travels along several streets (with multiple turns at intersections), additional markings accompanied by directional arrows are provided to guide cyclists through turns and other complex routing areas. Directional pavement markings also visually cue motorists that they are traveling along a bicycle route and should exercise caution.

Directional pavement marking

Sharrows

Some communities use high-visibility pavement markings to delineate specifically where bicyclists should operate within the travel lane. These markings, known as "sharrows," are often used on streets where dedicated bicycle lanes are desirable but are not possible due to physical or other constraints. Sharrows are placed strategically in the travel lane to alert motorists of bicycle traffic, while also encouraging cyclists to ride at an appropriate distance from the "door zone" of adjacent parked cars. Placed in a linear pattern along a corridor (typically every 100-200 feet), sharrows also encourage cyclists to ride in a straight line so their movements are predictable to motorists. Although these pavement markings are not yet a nationally adopted standard, they are successfully used in many small and large communities throughout the U.S. Sharrow markings made of thermoplastic tend to last longer than traditional paint.



Sharrow marking

On-Street Parking Delineation

Delineating on-street parking spaces represents another effective pavement marking treatment. Delineation through paint or other materials clearly indicates where a vehicle should be parked, and can discourage motorists from parking their vehicles too far into the adjacent travel lane. This could help cyclists by maintaining a wide enough space to safety share a travel lane with moving vehicles while minimizing the need to swerve farther into the

travel lane to maneuver around parked cars. In addition to benefiting cyclists, delineated parking spaces also promote the efficient use of on-street parking by maximizing the number of spaces in high-demand areas, such as in the Bay Front.

Level 3: Intersection Treatments

Described below, a variety of intersection treatments can be used to safely and conveniently facilitate bicycle travel on bicycle boulevards.

Stop Sign Placement

Placing stop signs on cross-streets approaching a bicycle boulevard can facilitate convenient through bicycle travel. A reduced number of stop signs on a designated bicycle route enables riders to maintain their momentum and exert less energy with fewer "stops and starts". This treatment should be used judiciously to minimize the potential for increasing vehicle speeds on the bicycle boulevard. Additionally, appropriate traffic control measures should be used where bicycle boulevards intersect major streets.

Bicycle Detection at Signalized Intersections

Several treatments can be used to streamline bicycle travel where bicycle boulevards approach intersections with actuated signals. In-pavement bicycle loop detectors can sense a bicyclist's presence (in the way that vehicle loop detectors sense automobiles) and trigger the signal to provide a "green" phase for the cyclist. Bicycle loop detectors should be placed within the bicyclist's expected path, (including left turn lanes and shoulders), and should be accompanied with a pavement marking indicating the optimal location for detection. Vehicle loop detectors can also be used for bicycle detection, provided they are located within the bicycle travel path and their "sensitivity" levels are adjusted for cyclists.

Loop detector marking

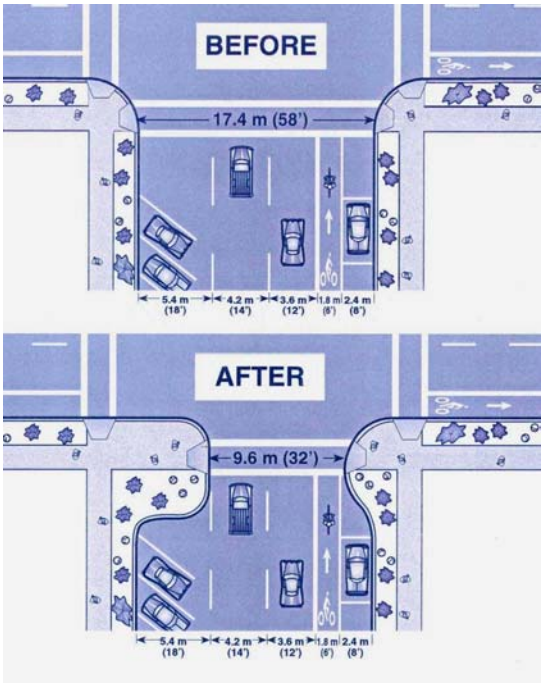
Similar to pedestrian activation buttons, bicyclist activation buttons can also be used at signalized intersections as long as they do not require cyclists to dismount or make unsafe leaning movements. These devices should be placed as close to the street as possible in a location that is unobstructed by parked vehicles or motorists making right-hand turns.

Half Signals

Because bicycle boulevards generally travel along lower-volume minor streets, they typically have minimal treatments to accommodate bicycle/pedestrian crossings when they approach major streets. In situations where there are few "crossable" gaps and where vehicles on the major street do not stop for pedestrians and cyclists waiting to cross, "half signals" could be installed to improve the crossing environment. Half signals include pedestrian and bicycle activation buttons and may also include bicycle loop detectors on the bicycle boulevard. Many of these models have been used successfully for years overseas, and their use in the United States has increased dramatically over the last decade. Discussed in the "Signals and Signal Warrants" section (later in this chapter), a variety of half signal applications could be used on Newberg's bicycle boulevard network.

Curb Extensions

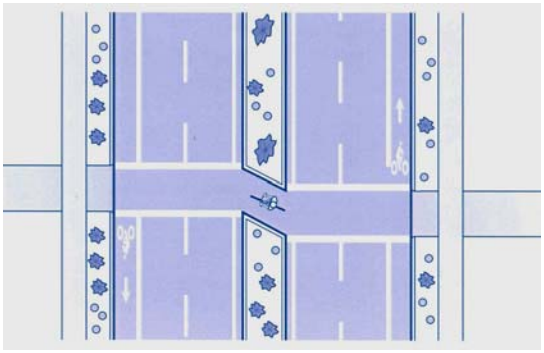
Curb extensions slow vehicle traffic by creating a visual "pinch point" for approaching motorists. Typically constructed within the on-street parking lane, these devices can calm vehicle traffic passing through or turning at an intersection. Curb extensions also benefit cyclists and pedestrians on cross-streets by reducing the crossing distance within the roadway. Curb extensions should be designed with sufficient radii to accommodate the turning movements of snowplows, school buses and emergency vehicles.



Intersection with curb extensions installed.

Medians/Refuge Islands

Medians are elevated or delineated islands that break up non-motorized street crossings into multiple segments. Where shared roadways intersect major streets at unsignalized intersections, medians can be used to simplify bicyclist and pedestrian crossings on the major street. Appropriate signage should be installed on the major street to warn motorists of bicyclist/pedestrian crossings. Additionally, vegetation within the median should be low to maintain adequate sight distances for both motorists and bicyclists/pedestrians. Medians can also be used along the bicycle boulevard to create a visual pinch point for motorists as well as to accommodate mid-block bicycle/pedestrian crossings.



Crossing with a median/refuge island.

Level 4: Traffic Calming

Traffic calming treatments on bicycle boulevards improve the bicycling environment by reducing vehicle speeds to the point where they generally match cyclists' operating speeds, enabling motorists and cyclists to safely co-exist on the same facility. Specific traffic calming treatments are described below.

Chicanes

Chicanes are a series of raised or delineated curb extensions on alternating sides of a street forming an S-shaped curb, which reduce vehicle speeds through narrowed travel lanes. Chicanes can also be achieved by establishing on-street parking on alternate sides of the street. These treatments are most effective on streets with narrower cross-sections.

Chicane

Mini Traffic Circles

Mini traffic circles are raised or delineated islands placed at intersections, reducing vehicle speeds through tighter turning radii and narrowed vehicle travel lanes. These devices can effectively slow vehicle traffic while facilitating all turning movements at an intersection.

Mini traffic circles can also include a paved apron to accommodate the turning radii of larger vehicles like fire trucks or school buses.

Speed Humps

Speed humps are rounded raised areas of the pavement requiring approaching motor vehicles to reduce speed. These devices also discourage through vehicle travel on a street when a parallel through route exists.

Level 5: Traffic Diversion

Traffic diversion treatments maintain through bicycle travel on a street while physically restricting through vehicle traffic. These treatments direct through vehicle traffic onto parallel higher-order streets while accommodating bicyclists and local vehicle traffic on the bicycle boulevard. Traffic diversion is most effective when the higher-order streets can sufficiently accommodate the diverted traffic associated with these treatments.

Choker Entrances

Choker entrances are intersection curb extensions or raised islands allowing full bicycle passage while restricting vehicle access to and from a bicycle boulevard. When they approach a choker entrance at a cross-street, motorists on the bicycle boulevard must turn onto the cross-street while cyclists may continue forward. These devices can be designed to permit some vehicle turning movements from a cross-street onto the bicycle boulevard while restricting other movements.

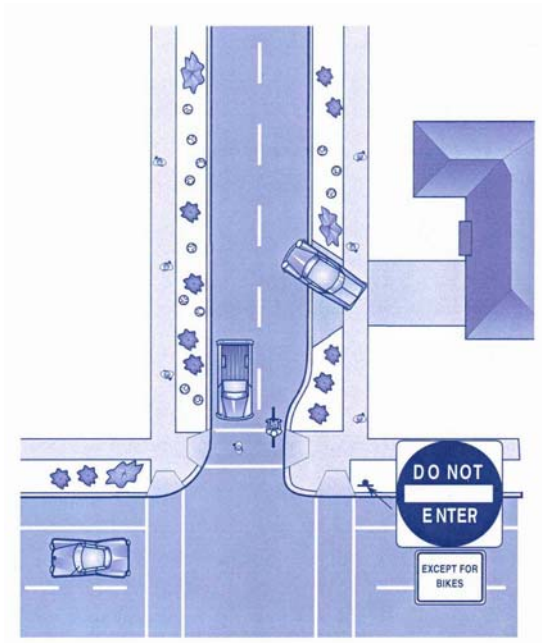
Traffic Diverters

Similar to choker entrances, traffic diverters are raised features directing vehicle traffic off the bicycle boulevard while permitting through bicycle travel.

Figure IV-2 on the following page illustrates an example of bicycle boulevard applications on a hypothetical street.

Traffic circle

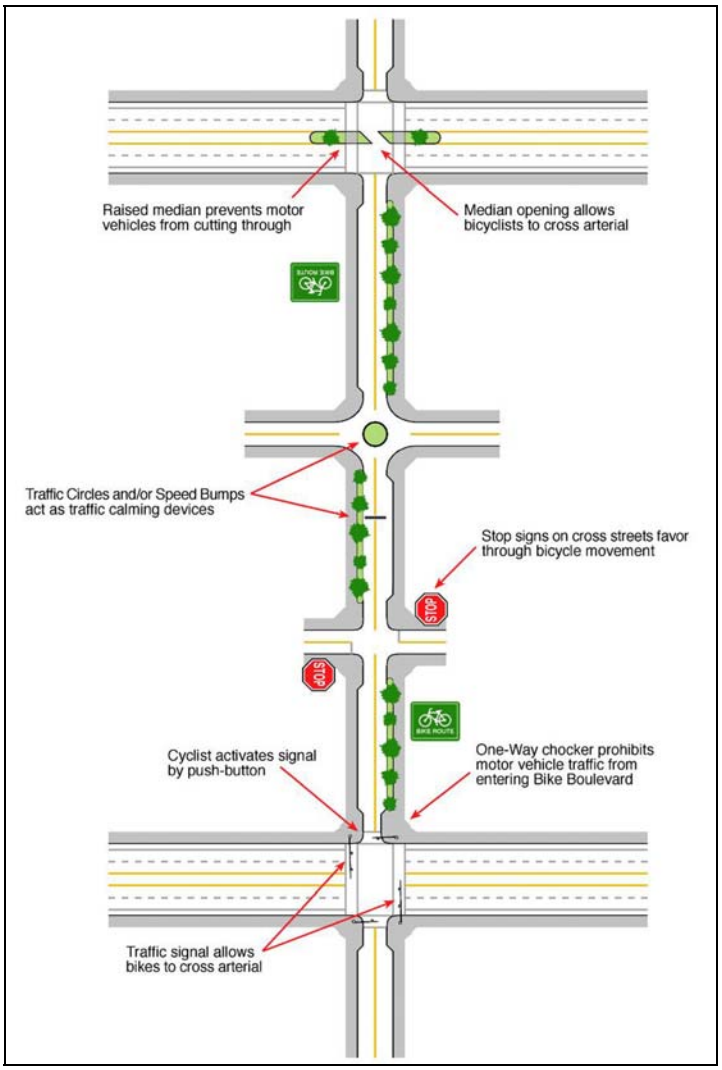
Speed hump



Choker at entrance of two-way local street

Traffic Diverters: Median island (left) and bike/ped only refuge on NE 16th and Tillamook in Portland, Oregon.

Figure IV-2. Bicycle Boulevard Treatments



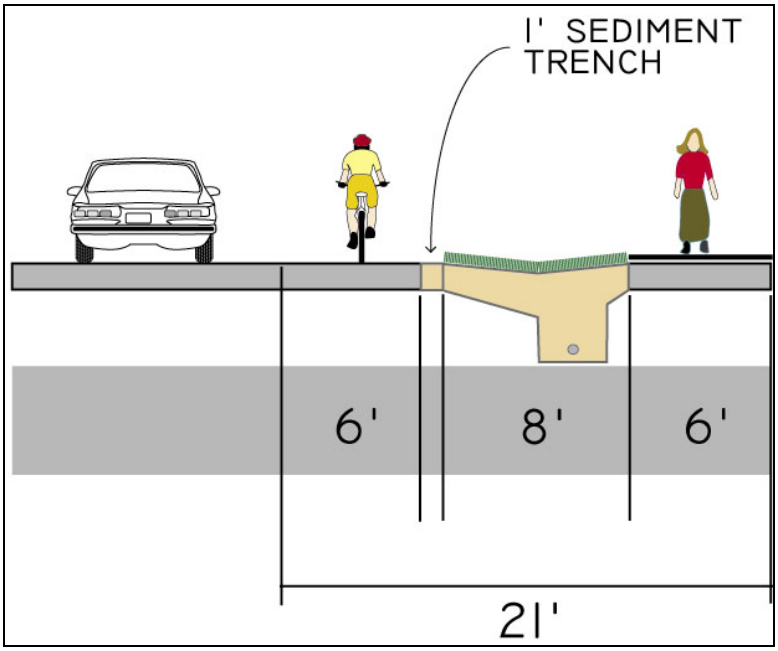
Innovative Roadside Treatments

Filter strips and bio-swales are innovative ways to retain and treat stormwater from impervious surfaces and work well with roadside bicyclist and pedestrian facilities. The design guidelines for filter strips and swales are similar; both methods use grassy vegetation or aggregate to remove sediment from stormwater runoff. Use of filter strips and swales can be limited in retrofit situations due to slope, soil, and right-of-way conditions. Existing underground utility conflicts may increase cost and complexity.

Filter Strips

Filter strips (Figure IV-3) are gently sloped grassy and aggregate areas that are used to treat small quantities of sheet flow runoff. They are often used to pre-treat stormwater flow of minimal depth (.5 inches) as it passes from an impervious area, like a parking lot or roadway, into a swale or infiltration area. Sidewalk width illustrated is a minimum.

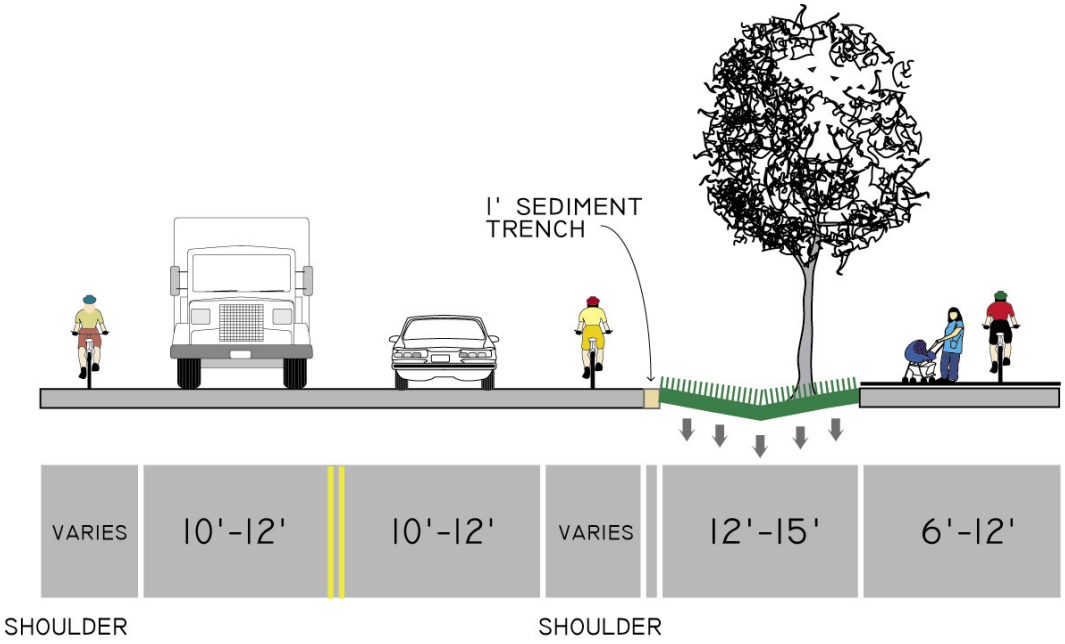
Figure IV-3. Grass Filter Strip



Swales

Swales (Figure IV-4) are shallow, wide depressions adjacent to roadways and trails that collect stormwater runoff over vegetation to slowly settle sediments and particulate matter. The pollutants are filtered out, settled, or removed by plants, causing fewer pollutants to enter ecologically sensitive water bodies. For more information and further design guidelines for swales and other Green Street concepts, a good reference is Metro's "Green Streets" guidebook.

Figure IV-4. Bio-Swale

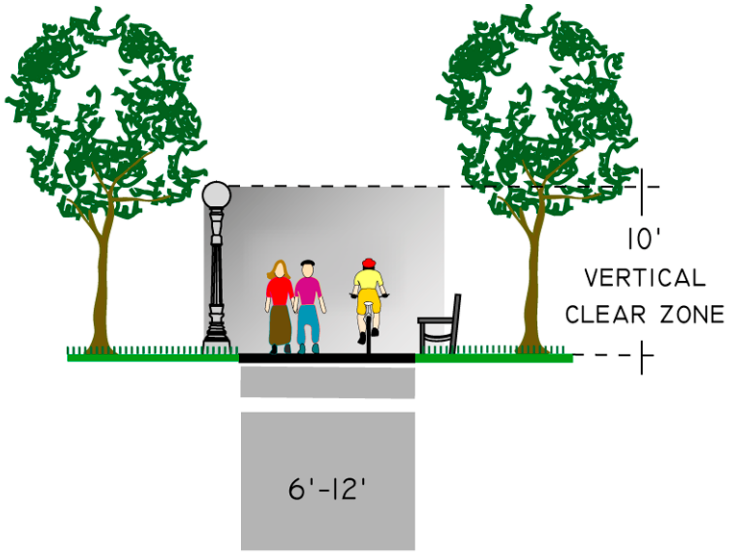


Trails

City Trail

City trails provide access for most, if not all, trail users within neighborhoods, parks, greenspaces, and other recreational areas. They are similar to regional trails in that they typically have their own right-of-way and serve only non-motorized users. These trails should be at least six feet wide and at least 12 feet wide if extensive bicycle use is anticipated.

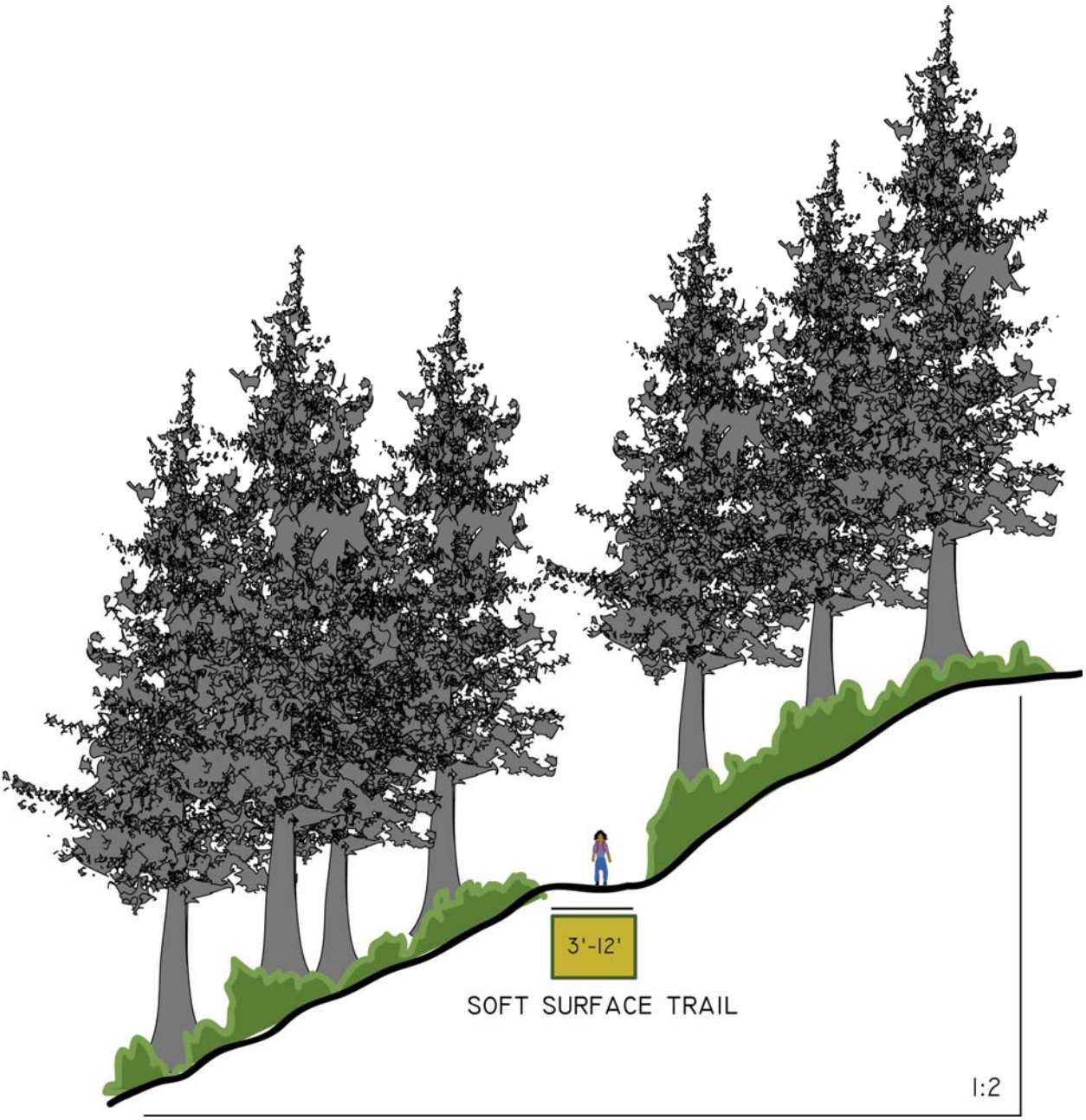
Figure IV-5. Accessible Shared-Use Path



Natural Trail

Natural trails are usually considered when a trail is desired next to a pristine natural resource. Trail width will vary depending on the existing topographic and environmental conditions. Natural trails should take into account issues like drainage, erosion, compaction/impaction from anticipated use, presence of waterways and sensitive riparian areas, habitat areas, environmental guidelines, such as "Green Trails" Guidelines for Environmentally Friendly Trails" by Metro.

Figure IV-6. Natural Trail

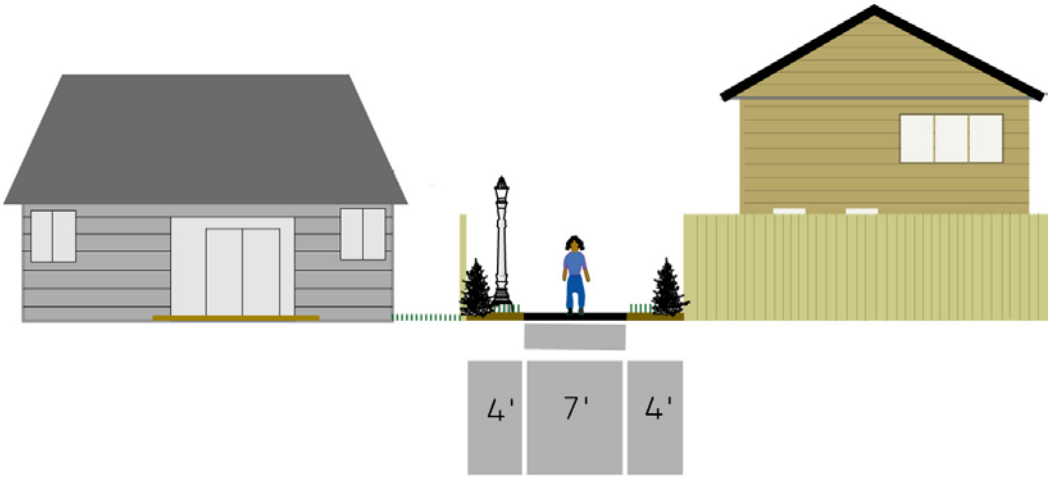


Trail width will depend on intended users. For example, narrower widths should be used in environmentally constrained areas with only hiking uses intended. Wider widths are desirable for shared bicycle and/or equestrian use.

Local Trail: Accessway

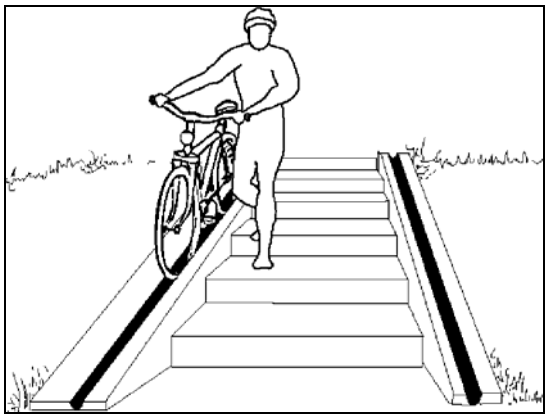
Accessways provide direct connections for trail users to schools, parks, community centers, retail areas, neighborhoods, and other trails. They are intended to be short, direct connections to reduce unnecessary out-of-direction travel for bicyclists and pedestrians. Accessways in parks, greenways, or other natural resource areas may have a 5' wide gravel path with wooden, brick or concrete edgings.

Figure IV-7. Local Accessway



Innovative Accessways

There are also other innovative ways to provide direct access, particularly in topographically constrained areas (i.e., on steep hills, over waterways, etc.) Stairs, alleyways, bridges, and elevators can provide quick and direct connections throughout the city and can be designed so they are safe, inviting, and accessible to most trail users. For example, stairways can have wheel gutters so that bicyclists can easily roll their bicycles up and down the incline and boardwalks can provide access through sensitive wet areas and across small waterways.



Bicycle gutters

Intersection Treatments

Several design and operational treatments could be implemented to improve the pedestrian environment at intersections. Attributes associated with good intersection design include the following:

- Clarity: It should be obvious to motorists that there will be pedestrians present; it should be obvious to pedestrians where to cross.
- Predictability: The placement of crosswalks should be predictable. Additionally, the frequency of crossings should increase where pedestrian volumes are greater.

- Visibility: The location and illumination of the crosswalk allows pedestrians to see and be seen by approaching traffic while crossing.
- Short wait: The pedestrian does not have to wait unreasonably long for an opportunity to cross.
- Limited exposure: Conflict points with traffic are few, and the distance to cross is short or is divided into shorter segments with crossing islands.
- Clear crossing: The crosswalk is free of barriers, obstacles, and hazards and is accessible to all users. Pedestrian crossing information is available in accessible locations.

Signal Timing Evaluation and Modification

Providing adequate pedestrian crossing time is a critical element of the walking environment at signalized intersections. The Manual on Uniform Traffic Control Devices (MUTCD) recommends traffic signal timing to assume a pedestrian walking speed of four feet per second, meaning that the length of a signal phase with parallel pedestrian movements should provide sufficient time for a pedestrian to safely cross the adjacent street. It should be noted however that the four feet per second walking speed does not reflect the walking rates of many users. At crossings where older pedestrians or pedestrians with disabilities are expected, crossing speeds as low as three feet per second may be assumed.

Innovative Pedestrian Signal Features

Pedestrian Countdown Signals

According to the MUTCD, "Pedestrian Signal Heads provide special types of traffic signal indications exclusively intended for controlling pedestrian traffic. These signal indications consist of the illuminated symbols of a WALKING PERSON (symbolizing WALK) and an UPRAISED HAND (symbolizing DONT WALK)." An advanced type of pedestrian signal head contains a countdown signal, in addition to the WALK/DON'T WALK symbol. The countdown signal displays the number of seconds remaining for the individual to complete their crossing..

Pedestrian crossing countdown signal

Leading Pedestrian Interval (LPI)

Including LPIs at signalized crossings provides pedestrians with a three- to four-second head start into the intersection before parallel traffic is released by the green light. LPIs ensure that pedestrians are well into the intersection and visible to turning vehicles prior to vehicles entering the crosswalk. Installing LPIs at selected intersections along OR99W would benefit pedestrians greatly.

Curb Ramps

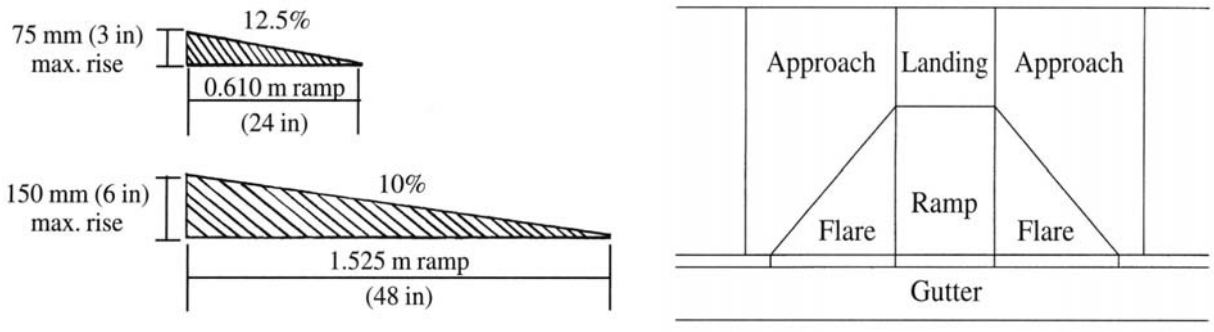
Curb ramps are a fundamental element of an accessible public realm. A sidewalk without a curb ramp can be useless to someone in a wheelchair, forcing them back to a driveway and out into the street for access. Likewise, street crossings must be aligned and properly designed to accommodate the needs and desires of all people. Many of the single access ramps built in previous decades direct users diagonally into the street intersection (rather than straight into the crosswalk area). This can be problematic for visually impaired pedestrians as they could experience difficulty orienting themselves toward the crosswalk. Where possible, all intersection corners should provide dual curb ramps oriented directly across the street. Curb ramps should also have detectable warning strips to accommodate the visually impaired. AASHTO's Guide for the Planning, Design, and Operation of Pedestrian Facilities and the Oregon Bicycle and Pedestrian Plan, provide further guidance on curb ramp design.

Curb ramps help people with other mobility impairments transition easily between sidewalks and crosswalks. Curb ramps also help people with strollers or rolling carts. ADA requires installation of curb ramps in new sidewalks, as well as retrofitting of existing sidewalks.

Curb ramp components include:

- Landing – the level area at the top of a curb ramp facing the ramp path. Landings allow wheelchairs to enter and exit a curb ramp, as well as travel along the sidewalk without tipping or tilting.
- Approach – portion of the sidewalk on either side of the landing. Approaches provide space for wheelchairs to prepare to enter landings.
- Flare – the sloped transition between the curb and sidewalk. Flares provide a sloped transition between the sidewalk and curb ramp to help to prevent pedestrians from tripping over an abrupt change in level.
- Ramp – sloped transition between the sidewalk and street where the grade is constant and cross slope is at a minimum. Ramps are the main pathway between the sidewalk and street.
- Gutter – the trough that runs between the curb or curb ramp and the street.

A number of different types of curb ramps exist. The type selected should correspond to the design requirements of a given location.

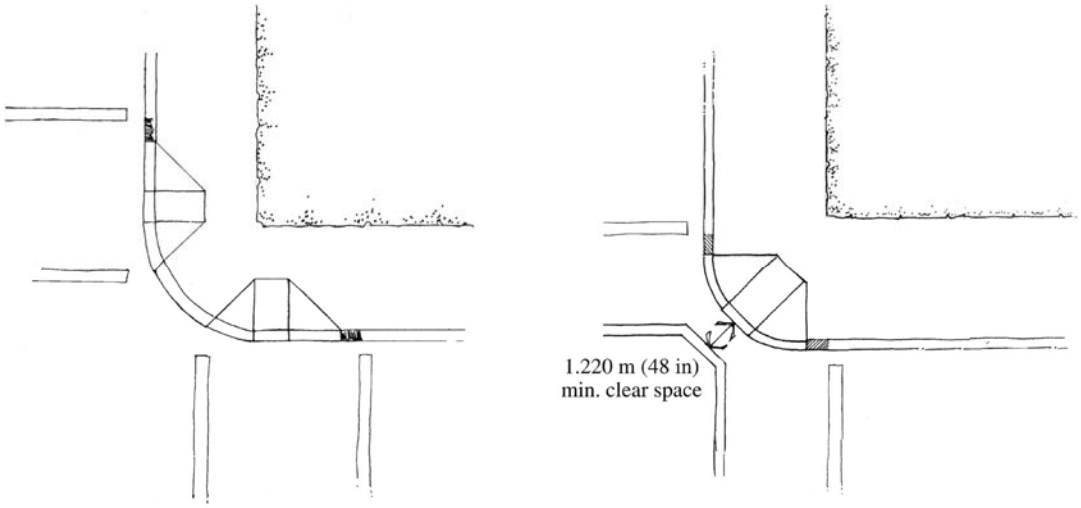


Alternate ramp slope and curb ramp components

Perpendicular curb ramps

Perpendicular curb ramps allow for a convenient, direct path of travel with a 90-degree angle to the curb. Perpendicular curb ramps maximize access for pedestrians at intersections. They reduce the distance required to cross the street as compared with diagonal ramps. They often require two ramps, one for each direction of travel across the street. Perpendicular curb ramps without level landings are difficult for wheelchairs to negotiate. They require more space than single diagonal ramps (see Figure IV-8). Where sidewalks are narrow, there may not be space for two perpendicular curb ramps and their landings. Adding curb extensions can create additional space to accommodate two perpendicular ramps. Newly constructed sidewalks should include two perpendicular ramps. Retrofitted ramps in multi-family neighborhoods and commercial areas should include perpendicular ramps, except where space is inadequate.

Figure IV-8. Perpendicular and Diagonal Curb Ramps



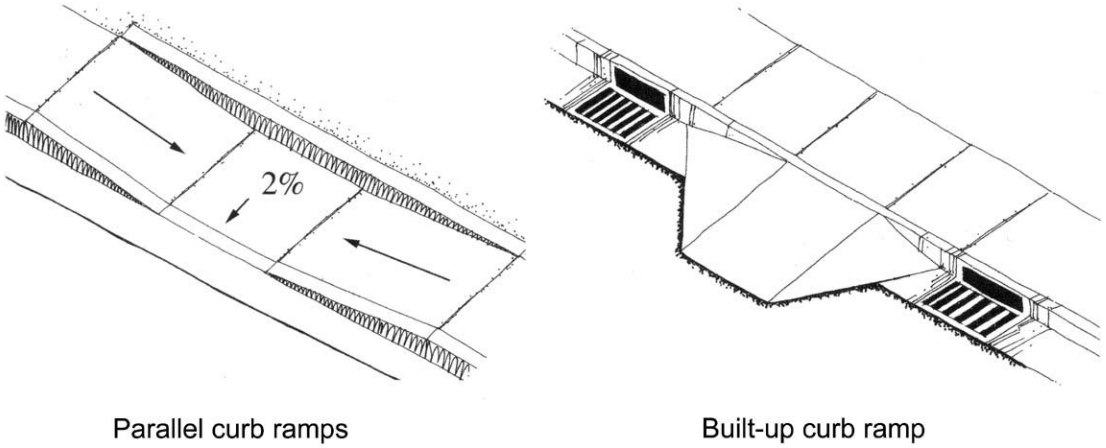
Diagonal curb ramps

Diagonal curb ramps (see Figure IV-8) are single curb ramps at the apex of the corner. They cause the user to travel towards the center of the intersection where they may fall into danger of being hit by turning cars. They also require the user to take a longer, circuitous travel path to the other side than a perpendicular ramp. Being in the intersection longer exposes the user to greater risk of being hit by vehicles. Diagonal curb ramps cost less than perpendicular ramps since they are single ramps. Diagonal curb ramps are generally desirable only on streets with little motor vehicle traffic where the advantage of installing more curb ramps compensates for the drawbacks of its design.

Parallel curb ramps

Parallel curb ramps are oriented parallel to the street. They are generally used on narrow sidewalks where inadequate space exists to install other ramps. The sidewalk itself ramps down, as shown in Figure IV-9. Parallel curb ramps require pedestrians who are continuing along the sidewalk to ramp down and up. Where space exists in a planting strip, parallel curb ramps can be designed in combination with perpendicular ramps to reduce the ramping for through pedestrians.

Figure IV-9. Parallel and Built-up Curb Ramps



Built-up curb ramps and curb ramps with curb extensions

Built-up curb ramps project from the curb into the gutter and street. They aren't often used on streets, but may be used where the sidewalk is narrow and other options for ramps are not available. They are oriented in the same direction as perpendicular ramps at 90 degrees to the streets. Some built-up curb ramps are partial, and begin their slope at the sidewalk and end it at the end of the gutter. Built-up curb ramps must be designed with provisions for drainage. Perpendicular ramps on curb extensions are preferable to built-up curb ramps and have the same design guidelines.

Depressed corners

Depressed corners gradually lower the level of the sidewalk through a slope that meets the grade of the street. Depressed corners offer the same advantages of perpendicular curb ramps. However, they are generally not recommended since they make it difficult for people who are visually and cognitively impaired to distinguish the transition from the sidewalk and street. They can confuse guide dogs as well. Motor vehicles also intrude onto depressed corners. For these reasons, where depressed corners exist, they should be retrofitted with bollards or other intermittent barriers to prevent cars from traveling on the sidewalk. Detectable warnings should also be placed at the edge of the sidewalk.

Table IV-1. Design Standards and Guidelines for Curb Ramps

Curb Ramp Type	Characteristic	US Access Board Guidelines[24]	Other
Perpendicular	Maximum slope of ramps	ramp not steeper than 8.35% (1:12)	
	Maximum cross-slope of ramps	2%	
	Maximum slope of flared sides	10%	
	Minimum ramp width	48 in (1.22 m)	
	Minimum landing length	36 in (0.915 m); if landing is less than 48 in (1.22 m)	
	Minimum landing width		
	Maximum gutter slope	5%	Gutter should be designed to not retain water
	Changes in level	flush	
	Truncated domes	24 in (610 mm)	
Diagonal	Maximum slope of ramps	not steeper than 1:12 (8.33%)	
	Maximum cross-slope of ramps	2%	
	Maximum slope of flared sides	10%	
	Minimum ramp width	48 in (1.22 m)	
	Minimum landing length	36 in (0.915 m); if landing is less than 48 in (1.22 m)	
	Minimum landing width	48 in (1.22 m)	
	Maximum gutter slope	2%	Gutter should be designed to not retain water
	Changes in level	none	
	Minimum clear space	48 in (1.22 m)	
Parallel and Combination	Maximum slope of ramps	not steeper than 8.33% (1:12)	
	Maximum cross-slope of ramps	2%	
	Maximum slope of flared sides	10%	
	Minimum ramp width	48 in (1.22 m)	
	Minimum landing length	36 in (0.915 m); if landing is less than 48 in (1.22 m)	
	Minimum landing width	48 in (1.22 m)	
	Maximum landing slope	2%	
	Maximum gutter slope	5%	Gutter should be designed to not retain water
	Changes in level	none	
	Truncated domes (parallel); detectable warnings (combination)	24 in (610 mm)	

[24] US Access Board Guidelines as of July 23, 2004.

Curb Ramp Type	Characteristic	US Access Board Guidelines[24]	Other
Curb Extensions and Built-up	Maximum slope of ramps	not steeper than 8.33% (1:12)	
	Maximum cross-slope of ramps	2%	
	Maximum slope of flared sides	10%	
	Minimum ramp width	48 in (1.22 m)	
	Minimum landing length	36 in (0.915 m); if landing is less than 48 in (1.22 m)	
	Minimum landing width	48 in (1.22 m)	
	Maximum gutter slope	5%	Gutter should be designed to not retain water
	Changes in level	flush (curb ext.); none (built-up)	
	Detectable warnings	24 in (610 mm)	

Accommodating People with Visual Impairments

People with visual impairments must gather information about their traveling environment in different ways from fully sighted people. While people with full vision primarily use their sight to find their way, people with vision impairments use other cues, such as the sound of traffic and its direction, changes in slope such as are found on curb ramps, textures, and color contrast. Good design provides these cues for them. Moreover, predictability in the walking environment makes navigation easier. Intersections that are at 90-degree angles with simple crossing patterns are easily discerned, as compared with irregularly shaped intersections or complex intersections. If devices are used to help the visually impaired, such as audible pedestrian signals or truncated domes, consistency is important. The same devices should be used uniformly. The following section identifies and provides guidance for the use of accessibility information added to the pedestrian environment.

Raised Tactile Devices (Truncated Domes)

Raised tactile devices can be very effective in alerting people with visual impairments of changes in the pedestrian environment, such as the transition between a curb ramp and the street. These devices are most effective when adjacent to smooth pavement so the difference is easily detected. Similarly, they must also provide color contrast so partially sighted people can see them.

The ADAAG standards for detectable warnings are:

- Bottom diameter: 0.9 in (23 mm)
- Top diameter: 0.4 in (10 mm)
- Height: 0.2 in (5 mm)
- Center-to-center spacing: 2.35 in (60 mm)
- Visual contrast: Shall contrast visually with adjoining surfaces, light-on-dark, or dark-on-light. The material needs to provide contrast and shall be an integral part of the walking surface.

U.S. Access Board recommendations include:

- Visual contrast: at least 70%
- Width: 24 in (610 mm)
- Location: 6 in to 8 in (152 mm to 200 mm) from the bottom of the ramp

Used at:

- The edge of depressed corners
- The border of raised crosswalks and intersections
- The base of curb ramps
- The border of medians
- The edge of transit platforms and where railroad tracks cross the sidewalk

Grooves

Grooves are indentations at the top of curb ramps. Sometimes they are not detectable by canes, unless the pedestrian's cane has constant contact with the sidewalk. For pedestrian facilities along Caltrans highways, Caltrans sets a standard requiring grooves to form a border at the level surface of the sidewalk of 12 in (300 mm).

Accessible Pedestrian Signals (ASPs)

ASP's supplement pedestrian signal indications with audible and/or vibrotactile information. These treatments include directly audible or transmitted tones, speech messages, Talking Signs, and vibrating surfaces. They are intended to make real-time pedestrian signal information accessible to pedestrians who are visual-impaired. Pedestrians who know when the crossing interval begins will be able to start a crossing before turning cars enter the intersection and can complete a crossing with less delay. Audible signals can also provide directional guidance, which is particularly useful at non-perpendicular intersections and at wide multi-lane crossings. Many different technologies exist. Newer signal types have a quiet, slowly repeating locator tone that indicates to approaching pedestrians that they must push a button to get a WALK signal and indicates the location of the push button. Directly audible or transmitted speech messages can identify the location of the intersection and the specific crosswalk controlled by that push button. A vibrating arrow at the push button can also be used to supplement the audible signals.

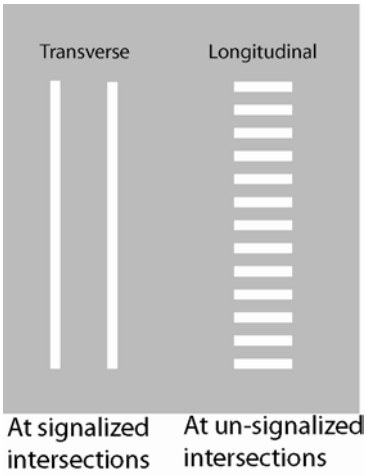
To be considered for audible signals, the location must first meet the following basic criteria:

- The intersection must already be signalized.
- The location must be suitable to the installation of audible signals, in terms of safety, noise level, and neighborhood acceptance.
- There must be a demonstrated need for an audible signal device. The need is demonstrated through a user request.

Audible crossing indicators have been available for over 25 years, however they have not been well received in the United States. This is probably attributable to two factors: one is noise pollution and consequent community opposition; the other is disagreement among blind people on the need for and effectiveness of audible pedestrian signals. Therefore, most communities look to install ASP's only after a specific request.

Crosswalks

Newberg currently uses a variety of crosswalk treatments, including "transverse" (also called "parallel bar") markings consisting of two bars crossing an intersection; "longitudinal" (also called "ladder style") markings; and combinations of these marking styles. Crosswalks with pavement texturing and color also exist along Fernwood Road by the golf course. The MUTCD indicates that transverse crosswalks should include solid white lines six to 24 inches wide (extending across the full pavement width), with a minimum of six feet between the lines. Longitudinal crosswalk bars should be 12 to 24 inches wide, at least six feet long, with 1- to 5-foot spacing between each bar (the space between bars should not exceed 2.5 times the bar width). To minimize maintenance costs, the bars should not be placed directly within vehicle wheel paths (where possible).



Crosswalk types in Newberg

Signals and Signal Warrants

Full Signalized Crossings

The Federal government has provided guidance to determine where traffic control signals should be considered for installation. The Pedestrian Volume signal warrant is intended for the application where traffic volumes on a major street are high enough that pedestrians on an approaching side street or path experience excessive delay in crossing the major street. Section 4C.05 of the MUTCD details Warrant 4, Pedestrian Volume. For signal warrant analysis, a location with a wide median, even if the median width is greater than nine meters (30 feet), should be considered as one intersection.

Warrant 5, School Crossing, is another signal warrant that could have applications in Newberg. Several Collector streets in Newberg connect schools and surrounding neighborhoods, with some of these streets serving primary commuter routes for students. Furthermore, cities like Sacramento have modified their usage projections by upwardly accounting for youth, disabled, and elderly populations through the "Equivalent Adult Units" factors (see the chart at right) at intersections that are deemed to present special circumstances:

Equivalent Adult Units

Type	Factor
Child	2
Senior	1.5
Disabled	2

- Forty pedestrians cross during a one-hour period, or 25 cross per hour for four consecutive hours using the Equivalent Adult Units system.
- Fewer than five gaps in traffic during the peak five-minute period.

Warrant 4, Pedestrian Volume

Support:

The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

Standard:

The need for a traffic control signal at an intersection or mid-block crossing shall be considered if an engineering study finds that both of the following criteria are met:

A. The pedestrian volume crossing the major street at an intersection or mid-block location during an average day is 100 or more for each of any 4 hours or 190 or more during any 1 hour;

B. There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular travel.

At non-intersection crossings, the traffic control signal should be pedestrian-actuated, parking and other sight obstructions should be prohibited for at least 30 m (100 ft) in advance of and at least 6.1 m (20 ft) beyond the crosswalk, and the installation should include suitable standard signs and pavement markings if a traffic control signal is justified by both this signal warrant and a traffic engineering study.

The criterion for the pedestrian volume crossing the major roadway may be reduced as much as 50 percent if the average crossing speed of pedestrians is less than 1.2 m/sec (4 ft/sec).

Warrant 5, School Crossing

Support:

The School Crossing signal warrant is intended for the application where the fact that schoolchildren cross the major street is the principal reason to consider installing a traffic control signal.

Standard:

The need for a traffic control signal shall be considered when an engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of school children at an established crossing across the major street shows that the number of adequate gaps in the traffic stream during the period when the children are using the crossing is less than the number of minutes in the same period (see Section 7A.03[25]) and there are a minimum of 20 students during the highest crossing hour.

Before a decision is made to install a traffic control signal, consideration shall be given to the implementation of other remedial measures, such as warning signs and flashers, school speed zones, school crossing guards, or a grade-separated crossing.

The School Crossing signal shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 90 m (300 ft), unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Guidance:

If this warrant is met and a traffic control signal is justified by an engineering study, then:

A. If at an intersection, the traffic control signal should be traffic-actuated and should include pedestrian detectors.

B. If at a nonintersection crossing, the traffic control signal should be pedestrian-actuated, parking and other sight obstructions should be prohibited for at least 30 m (110 ft) in advance of and at least 6.1 m (20 ft) beyond the crosswalk, and the installation should include suitable standard signs and pavement markings.

C. Furthermore, if installed within a signal system, the traffic control signal should be coordinated.

Half Signalized Crossings

In situations where there are few "crossable" gaps and where vehicles do not stop for pedestrians waiting to cross (or because of multiple lanes, it is unsafe to cross in front of a stopped vehicle), there are a number of innovative pedestrian traffic signals that do not operate as full signals that could be installed. Many of these models have been used successfully for years overseas, and their use in the United States has increased dramatically over the last decade.

Pelican Signals

A **Pelican** (**Pe**destrian **Li**ght **C**ontrol **A**ctivated crossi**n**g) signal incorporates a standard red-yellow-green signal light that rests in green for vehicular traffic until a pedestrian wishes to cross and presses the button. The signal then changes to yellow, then red, while WALK is shown to the pedestrian. The signal can be installed as either a one-stage or two-stage signal, depending on the street's characteristics. In a two-stage crossing, the pedestrian crosses first to a median island and is then channelized along the median to a second signalized crossing point. At that point, the pedestrian then activates a second crossing button and another crossing signal changes to red for the

[25] "Alternate gaps and blockades are inherent in the traffic stream and are different at each crossing location. For safety, students need to wait for a gap in traffic that is of sufficient duration to permit reasonably safe crossing. When the delay between the occurrence of adequate gaps becomes excessive, students might become impatient and endanger themselves by attempting to cross the street during an inadequate gap."

traffic while the pedestrian is given a WALK signal. The two crossings only delay the pedestrian minimally and allow the signal operation to fit into the arterial synchronization, thus reducing the potential for stops, delays, accidents, and air quality issues. A Pelican crossing is quite effective in providing a pedestrian crossing at mid-block locations when the technique can be integrated into the roadway design.

Pelican signal

Puffin Signals

A **Puffin** (**P**edestrian **U**ser **F**riendly **In**telligent) crossing signal is an updated version of a Pelican crossing. The signal consists of traffic and pedestrian signals with push-button signals and infrared or pressure mat detectors. After a pedestrian pushes the button, a detector verifies the presence of the pedestrian at the curbside. This helps eliminate false signal calls associated with people who push the button and then decide not to cross. When the pedestrian is given the WALK signal, a separate motion detector extends the WALK interval (if needed) to ensure that slower pedestrians have time to cross safely. Conversely, the signal can also detect when the intersection is clear of pedestrians and return the green signal to vehicles, reducing vehicle delay at the light. Puffin signals are designed to be crossed in a single movement by the pedestrian, unlike the Pelican signal, which can be designed to cross in either one or two stages.

Puffin signal

Hawk Signals

A **Hawk** (**H**igh-Intensity **A**ctivated Cross**w**al**k**) signal is a combination of a beacon flasher and traffic control signaling technique for marked crossings. The beacon signal consists of a traffic signal head with a red-yellow-red lens. The unit is normally off until activated by a pedestrian. When pedestrians wish to cross the street, they press a button and the signal begins with a flashing yellow indication to warn approaching drivers. A solid yellow, advising the drivers to prepare to stop, then follows the flashing yellow. The signal is then changed to a solid red, at which time the pedestrian is shown a WALK indicator. The beacon signal then converts to an alternating flashing red, allowing the drivers to proceed after stopping at the crosswalk, while the pedestrian is shown the flashing DON'T WALK signal.

Hawk signal

Crossing Treatments

Like most bicycle and pedestrian systems in built urban areas, non-motorized users in Newberg must cross roadways at certain points. While at-grade crossings create a potentially high level of conflict between bicyclists and pedestrians and motorists, well-designed crossings have not historically posed a safety problem. In most cases, intersection crossings can be properly designed at-grade to a reasonable degree of safety and meet existing traffic and safety standards.

Evaluation of intersections involves analysis of vehicular and anticipated path user traffic patterns, including vehicle speeds, traffic volumes (average daily traffic and peak hour traffic), street width, sight distance and user profile (age distribution, destinations served). Crossing features for all roadways include warning signs both for vehicles and path users. The type, location, and other criteria are identified in AASHTO's *Guide for the Development of Bicycle Facilities* and the MUTCD. Consideration must be given for adequate warning distance based on vehicle speeds and line of sight, with visibility of any signing absolutely critical. Catching the attention of motorists jaded to roadway signs may require additional alerting devices such as a flashing light, roadway striping or changes in pavement texture. Care must be taken not to place too many signs at crossings lest they begin to lose their impact.

The following section identifies several roadway crossing treatments that should be considered for Newberg's bicycle and pedestrian system.

Roadway Crossing Prototypes

The proposed intersection approach that follows is based on established standards, published technical reports, and experiences from cities around the country. Intersection crossings generally will fit into one of four basic categories:

- Type 1: Marked/Unsignalized; Type 1+: Marked/Enhanced
- Type 2: Route Users to Existing Signalized Intersection
- Type 3: Signalized/Controlled
- Type 4: Grade-separated crossings

Type 1: Marked/Unsignalized Crossings

A marked/unsignalized crossing (Type 1) consists of a crosswalk, signage, and often no other devices to slow or stop traffic. The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, route traffic, use patterns, vehicle speed, road type and width, and other safety issues such as proximity to schools. The following thresholds recommend where unsignalized crossings may be acceptable:

Type 1 Crossing

Maximum traffic volumes:

- ≤9,000-12,000 Average Daily Traffic (ADT) volumes
- Up to 15,000 ADT on two-lane roads, preferably with a median.
- Up to 12,000 ADT on four-lane roads with median.

Maximum travel speed:

- 35 MPH

Minimum line of sight:

- 25 MPH zone: 155 feet
- 35 MPH zone: 250 feet
- 45 MPH zone: 360 feet

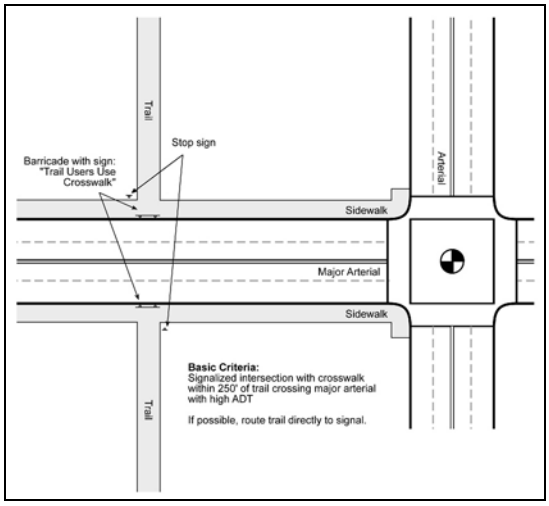
If well-designed, crossings of multi-lane higher-volume arterials over 15,000 ADT may be unsignalized with features such as a combination of some or all of the following: excellent sight distance, sufficient crossing gaps (more than 60 per hour), median refuges, and/or active warning devices like flashing beacons or in-pavement flashers. These are referred to as "Type 1 Enhanced" (Type 1+). Such crossings would not be appropriate; however, if a significant number of school children used the identified route. Furthermore, both existing and potential future non-motorized traffic volume should be taken into consideration.

On two-lane residential and collector roads below 15,000 ADT with average vehicle speeds of 35 MPH or less, crosswalks and warning signs ("Path Xing") should be provided to warn motorists, with engineering judgment used to determine the appropriate level of traffic control and design.

On roadways with low to moderate traffic volumes (<12,000 ADT) and a need to control traffic speeds, a raised crosswalk may be the most appropriate crossing design to improve pedestrian visibility and safety. These crosswalks are raised 75 millimeters above the roadway pavement (similar to speed humps) to an elevation that matches the adjacent sidewalk. The top of the crosswalk is flat and typically made of asphalt, patterned concrete, or brick pavers. Brick or unit pavers should be discouraged because of potential problems related to pedestrians, bicycles, and ADA requirements for a continuous, smooth, vibration-free surface. Detectable warning strips are needed at the sidewalk/street boundary so that visually impaired pedestrians can identify the edge of the street.

Type 2: Route Users to Existing Signalized Intersection

Crossings within 250 feet of an existing signalized intersection with pedestrian crosswalks are typically diverted to the signalized intersection for safety purposes. For this option to be effective, barriers and signing may be needed to direct trail users to the signalized crossings. In most cases, signal modifications would be made to add pedestrian detection and to comply with the Americans with Disabilities Act.



Type 2 Crossing

Type 3: Signalized/Controlled Crossings

New signalized crossings may be recommended for crossings that meet pedestrian, school, or modified warrants, are located more than 250 feet from an existing signalized intersection and where 85th percentile travel speeds are 40 MPH and above and/or ADT exceeds 15,000 vehicles. Each crossing, regardless of traffic speed or volume, requires additional review by a

registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity, and safety.

The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street. The signals may rest on flashing yellow or green for motorists when not activated, and should be supplemented by standard advanced warning signs. As described in the "Half Signalized Crossings" section earlier in this chapter, various types of pedestrian signals exist and can be used at Type 3 crossings.

Type 3 Crossing

Type 4: Grade-separated Crossings

Grade-separated crossings may be needed where existing bicycle/pedestrian crossings do not exist, where ADT exceeds 25,000 vehicles, and 85th percentile speeds exceed 45 MPH. Safety is a major concern with both overcrossings and undercrossings. In both cases, users may be temporarily out of sight from public view and may have poor visibility themselves. Undercrossings, like parking garages, have the reputation of being places where crimes occur. Most crime on trails, however, appears to have more in common with the general crime rate of the community and the overall usage of the trail than any specific design feature.

Type 4 Grade-separated Undercrossing

Design and operation measures are available which can address trail user concerns. For example, an undercrossing can be designed to be spacious, well-lit, equipped with emergency cell phones at each end and completely visible for its entire length prior to entering. Other potential problems with undercrossings include conflicts with utilities, drainage, flood control, and maintenance requirements. Overcrossings pose potential concerns about visual impact and functional appeal, as well as space requirements necessary to meet ADA guidelines for slope.

Type 4 Grade-separated Overcrossing

Summary of At-Grade Crossing Recommendations

Table IV-2. provides guidance on how to implement at-grade path/roadway crossings in Newberg.

Table IV-2. Summary of At-Grade Crossing Recommendations

Roadway Type (Number of Travel Lanes and Median Type)	Vehicle ADT ≤ 9,000			Vehicle ADT > 9,000 to 12,000			Vehicle ADT > 12,000 to 15,000			Vehicle ADT > 15,000		
	Speed Limit **											
	30 mi/h	35 mi/h	40 mi/h	30 mi/h	35 mi/h	40 mi/h	30 mi/h	35 mi/h	40 mi/h	30 mi/h	35 mi/h	40 mi/h
2 Lanes	1	1	1/1+	1	1	1/1+	1	1	1+/3	1	1/1+	1+/3
3 Lanes	1	1	1/1+	1	1/1+	1/1+	1/1+	1/1+	1+/3	1/1+	1+/3	1+/3
Multi-Lane (4 or more lanes) with raised median ***	1	1	1/1+	1	1/1+	1+/3	1/1+	1/1+	1+/3	1+/3	1+/3	1+/3
Multi-Lane (4 or more lanes) without raised median	1	1/1+	1+/3	1/1+	1/1+	1+/3	1+/3	1+/3	1+/3	1+/3	1+/3	1+/3

*__General Notes:__ Crosswalks should not be installed at locations that could present an increased risk to pedestrians, such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices. Adding crosswalks alone **will not** make crossings safer, nor will they necessarily result in more vehicles stopping for pedestrians. Whether or not marked crosswalks are installed, it is important to consider other pedestrian facility enhancements (e.g., raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions), as needed, to improve the safety of the crossing. **These are general recommendations; good engineering judgment should be used in individual cases for deciding which treatment to use.**

For each pathway-roadway crossing, an engineering study is needed to determine the proper location. For each engineering study, a site review may be sufficient at some locations, while a more in-depth study of pedestrian volume, vehicle speed, sight distance, vehicle mix, etc. may be needed at other sites.

** Where the speed limit exceeds 40 mi/h (64.4 km/h), marked crosswalks alone should not be used at unsignalized locations.

*** The raised median or crossing island must be at least four ft (1.2 m) wide and six ft (1.8 m) long to adequately serve as a refuge area for pedestrians in accordance with MUTCD and AASHTO guidelines. A two-way center turn lane is not considered a median.

1= Type 1 Crossings. Ladder-style crosswalks with appropriate signage should be used.

1/1+ = With the higher volumes and speeds, enhanced treatments should be used, including marked ladder style crosswalks, median refuge, flashing beacons, and/or in-pavement flashers. Ensure there are sufficient gaps through signal timing, as well as sight distance.

1+/3 = Carefully analyze signal warrants using a combination of Warrant 2 or 5 (depending on school presence) and EAU factoring. Make sure to project pathway usage based on future potential demand. Consider Pelican, Puffin, or Hawk signals in lieu of full signals. For those intersections not meeting warrants or where engineering judgment or cost recommends against signalization, implement Type 1 enhanced crosswalk markings with marked ladder style crosswalks, median refuge, flashing beacons, and/or in-pavement flashers. Ensure there are sufficient gaps through signal timing, as well as sight distance.

V. Programmatic Opportunities

Introduction

Bicycle and pedestrian programs enhance the biking and walking experience in ways other than the provision of traditional walkways and bikeways.

Safer Routes to School

Safer Routes to School (SR2S) refers to a variety of multi-disciplinary programs aimed at promoting walking and bicycling to school, and improving traffic safety around school areas through education, incentives, increased law enforcement, and engineering measures. Safer Routes to School programs typically involve partnerships among municipalities, school districts, community and parent volunteers, and law enforcement agencies. Newberg's SR2S efforts are a complementary component of the Plan, as they will facilitate the implementation and funding for specific improvements that will help increase bicyclist and pedestrian safety and encourage fewer auto trips.

Student escorting fellow students across the street.

The City has a vested interest in encouraging schoolchildren to lead active lifestyles. Safer Routes to School programs offer ancillary benefits to neighborhoods by helping to slow traffic and provide reasonable facilities for walking by all age groups. The City benefits from a generally well-connected street system near most schools, a critical element in encouraging children to bike and walk to school.

Why Do We Need SR2S?

The purpose of a SR2S program is to identify and improve school commute routes, to increase the number of students who walk and/or bicycle to school in Newberg, to lessen traffic congestion, and to improve health. Although most children walked or biked to school before and during the 1980s, the number of children walking or bicycling to school has sharply declined since, due to urban growth patterns and design, which have made it less safe to do so, in addition to other factors such as higher obesity rates and changes in lifestyle emphasizing more driving. Walking and bicycling to school are healthy alternatives to being driven and can provide a sense of independence for children who may otherwise be restricted by school bus or parents' schedules.

What are the Benefits of a SR2S Program?

The primary benefit of implementing a SR2S program is the resulting increase in safety for children walking and riding bicycles to school. A comprehensive strategy based on a cooperative effort between school officials, parents, residents and city planning staff will ensure that specific school-

related traffic calming projects and pedestrian and bicycle improvements will become priority projects eligible for State, Federal or other grant funding. The involvement of various stakeholders throughout the Safer Routes process increases the likelihood for implementation of needed safety improvements. While the primary focus of a SR2S program is improving safety for children walking and biking to school, these safety benefits often extend to all age and activity groups. In addition to safety enhancements, a SR2S program helps integrate physical activity into the everyday routine of schoolchildren. Health concerns related to sedentary lifestyles have become the focus of efforts both statewide and nationally to reduce health risks associated with being overweight. Identifying and improving routes for children to safely walk and bicycle to school is one of the most cost-effective means of reducing weekday morning traffic congestion (especially at school drop-off and pick-up sites) and can help reduce auto-related pollution.

Children walking to school

Local Coordination and Involvement

In order to be successful, a SR2S program in Newberg will need buy-in from individuals and organizations throughout the community. While each individual school will have unique concerns and goals for developing a SR2S program, an organizational strategy that promotes the sharing of ideas between schools can be more effective than several isolated school groups. The key components of an effective SR2S program include champions (individuals at each school who spearhead their school's organizing effort), stakeholders (a team of people from an individual school), and a task force made up of all the stakeholder teams in the community.

The basic components of the proposed SR2S program include bicycle/pedestrian safety education, encouragement, engineering improvements, and enforcement of traffic laws.

Education

Curriculum programs implemented in schools can teach children the basics regarding pedestrian and bicycle safety. Classroom educational materials should be presented in a variety of formats (safety videos, printed materials, and classroom activities), and should continually be updated to make use of the most recent educational tools available. Classroom education programs should also be expanded to promote the health and environmental benefits of bicycling and walking. Outside schools, educational materials should be developed for different audiences, including elected officials (describing the benefits of and need for a SR2S program), and parents (proper school drop-off procedures and safety for their children).

Educational programs should be linked with events and incentive programs when appropriate, and students should be included in task force activities, such as mapping locations for improvements. Involving students can serve as an educational tool and can also provide the task force with meaningful data that is useful for prioritizing improvement locations.

In-class training and on-bike training

Encouragement

School commute events and frequent commuter contests are used to encourage participation. Programs that may be implemented include a "Walking School Bus Program," which involves parents taking turns walking (or bicycling) with groups of children to school. A good opportunity to kick-off a SR2S program is during International Walk to School Day, held annually in early October. Good resources and start-up material can be found at the City of Portland's new Safer Routes to School website, http://www.trans.ci.portland.or.us/saferoutes/program/. Organized Bike and Walk to School Days should be held monthly or weekly to keep the momentum going and encourage more children and their parents to walk or bike to school. Prizes or drawings for prizes offered to participants have been used in some schools as an incentive. Events related to bicycling and walking should be incorporated into existing curricula when practical. Involving local celebrities or publishing the names of student participants in events can be effective means of encouraging student involvement. Another key to successful events is promotion. Ensuring that parents are aware of events (whether classroom-specific or district-wide) is crucial to gaining maximum student participation.

Other contests and event ideas to encourage bicycling and walking to school include: competitions in which classrooms compete for the highest proportion of students walking or biking to school, themed or seasonal events, and keeping classroom logs of the number of miles biked and walked by children and plotting these distances on a map of Oregon or the U.S. A wealth of information and ideas for promoting SR2S programs can be found at: www.nhtsa.dot.gov/people/injury/pedbimot/ped/saferouteshtml/index.html.

Enforcement

Various techniques are employed to ensure traffic laws are obeyed. The SR2S task force and stakeholder teams should develop priority areas in need of enforcement by the Newberg Police Department. One option to avoid the cost of providing physical police presence is to use innovative signage, such as in-roadway crosswalk signs or in-roadway warning lights, to alert motorists that children may be crossing, or speed feedback signs that indicate to motorists their current speed. Neighborhood speed watch programs, in which community members borrow a radar device and use it to record the license plate numbers of speeding vehicles, can also be effective.

Engineering

To provide safe access for children, school sites should have designated pedestrian access points that do not require students to cross in front of drop-off and pickup traffic. Locations identified through the SR2S process should be considered for SR2S grant funding.

Streetscape improvements should ensure adequate sight distance on all access routes, crossings, and intersections. School zone designations for speed limits should be an element of a comprehensive circulation plan that also includes school-based student as well as Police Department crossing guard programs and identification of safe routes for bicycling and walking to school.

Funding

While much of the initial work involved in starting a SR2S program can be conducted by stakeholder team volunteers, eventually funding will be needed to plan and implement physical improvements, hold events, and develop and implement educational programs and materials.

Capital Funding

Capital funding for infrastructure improvements is available from a variety of sources. The SR2S task force should work with City staff to identify all potential funding sources and to provide support on funding requests. Newberg may be able to pursue federal funds recently made available with the new Safer Routes to School Program established in the Safe, Accountable, Flexible, Efficient Transportation Equity Act - A Legacy for Users (SAFTEA-LU). This section of the bill provides $612 million in funding over the next five years with no state receiving less than $1 million per fiscal year. Other portions of SAFETEA-LU, such as the Transportation Enhancements (TE) and the Congestion Mitigation and Air Quality (CMAQ) funds may also provide funding opportunities for bicycle and pedestrian projects.

Program Funding

As Newberg's SR2S program develops, funding will be needed to support the overall program, including coordination assistance, purchasing incentives, printing newsletters, staffing events, and developing educational materials. Both school-based and program-based funding will be essential for success. When program funding is pursued, it should be emphasized that a SR2S program improves the entire community by relieving traffic congestion, contributing to cleaner air, creating alternative transportation routes, and improving the health and safety of children and the entire community. In order to maintain and expand the program, new sources of funding need to be obtained. Other possible funding sources include:

- **Corporations and Businesses:** Local corporations and businesses may be able to provide cash, prizes, and/or donations, such as printing services, through community giving or other programs. Parents or other members of stakeholder teams may be a good source for contacting companies.
- **Foundations**: There are institutions throughout the country that provide funding to non-profit organizations. The Foundation Center is a national organization dedicated to collecting and communicating information about philanthropy in the U.S., and is an excellent source for researching potential foundation funding sources. Potential foundation funding sources can be searched by geographic region and by category. Some categories that may be applicable include transportation, health, environment, and community building.

- **Individuals:** Statistically, individuals give more money than corporations and foundations combined. A local fund drive can quickly reach a large number of people if outreach is conducted by stakeholder team members.
- **Events:** Many SR2S programs have raised funds by holding special events, often using a related themed event such as a walkathon or a bicycling event. More traditional fundraising efforts, such as bake sales, concerts, talent shows, etc., can also help raise funds.
- **Parent Teacher Associations (PTAs) and School Districts**: Many PTAs have funds to distribute to school programs, and often schools have their own safety funding sources. Stakeholder teams should work with local PTAs and school districts to see if there is a method for applying for a grant.
- **City and County Funds:** Some cities and counties allocate funds to support SR2S programs. Some also allocate a portion of their local Transportation Enhancement funds to SR2S educational programs.
- **State Funds:** Each state receives Federal Highway Safety Funds, also called 402 Funds. Although each state handles this program differently, most funding is available on a competitive basis for projects that increase road safety.

Additional Educational Opportunities

Safety Handbook

Safety handbooks are generally developed as part of a school-based bicycle and pedestrian safety program. Handbooks may include a circulation map of the campus and immediate neighborhood showing the preferred circulation and parking patterns, suggested routes to school, locations of crosswalks, crossing guards and signalized intersections, instructions for bicycle maintenance and use, instructions for fitting and wearing a helmet, instructions for crossing the street, and lists of emergency and school numbers. A general handbook can be published by the City and used by each school in conjunction with the school-specific map.

Educate Motorists, City Staff, Maintenance, and Construction Crews

Motorist education on the rights of bicyclists and pedestrians is limited. Many motorists mistakenly believe, for example, that bicyclists do not have a right to ride in travel lanes and that they should be riding on sidewalks. Education about the rights and responsibilities of pedestrians and cyclists can include:

- Incorporating bicycle and pedestrian safety into traffic school curriculum.
- Producing a brochure on bicycle and pedestrian safety and laws for public distribution.
- Enforcing traffic laws for cyclists.

Ensure that clear directions are provided when detours are necessary.

- Providing bicycle and pedestrian planning training for all City planners.
- Working with contractors, subcontractors and city maintenance and utility crews to ensure they understand the needs of bicyclists and pedestrians and follow standard procedures when working on or adjacent to roadways and walkways.

Bicycle Patrol Unit

The City of Newberg may want to work with the Police Department, local business and neighborhood groups to establish local Bicycle Patrol Units. A Bicycle Patrol Unit may be an official law enforcement unit, a private security guard patrol, or a volunteer network. Bicycles are an excellent community policing tool, as officers on bikes are often viewed as more approachable, thus improving trust and relations between the citizens and police. Bicycle patrol units can work closely with citizens to address concerns before they become problems. Bicycle patrol units can have a direct impact on bicycle safety by enforcing bicycle traffic laws (e.g., wrong-way riding, sidewalk riding, obeying traffic controls, children wearing helmets), and providing bicycle safety education.

Encouragement Programs

Strategies for community involvement in bicycle and pedestrian improvements will be important to ensure broad-based support – which translates into political support – to help secure financial resources. Involvement by the private sector in raising awareness of the benefits of bicycling can range from small incremental activities by non-profit groups, to efforts by the largest employers in the City. Specific programs are described below.

Facilitate the Development of Employer Incentive Programs

Employer incentive programs to encourage employees to walk and bike to work include strategies like providing bicycle lockers and shower facilities, offering more flexible arrival and departure times, and fun incentives such as entry into monthly raffle contests. The City may offer incentives to employers to institute these improvements through air quality credits, lowered parking requirements, reduced traffic mitigation fees, or other means.

Community Bikeway/Walkway Adoption

Community Bikeway/Walkway Adoption programs are similar to the widely-instituted Adopt-a-Highway programs throughout the country. These programs identify local individuals, organizations, or businesses that would be interested in "adopting" a bikeway or walkway. Adopting a facility would mean that person or group would be responsible for the facility's maintenance either through direct action or as the source of funding for the City's maintenance of that facility. For example, members of a local recreation group may volunteer every other weekend to sweep a bikeway and identify and address larger maintenance needs. Or, a local bike shop may adopt a bikeway by providing funding for the maintenance costs. The managers of an adopted bikeway may be allowed to post their name on bikeway signs throughout the bikeway in order to display their commitment to bicycling in Newberg.

Create a Multi-Modal Access Guide

A multi-modal access guide provides concise customized information on how to access specific destinations with emphasis on bicycling, walking and transit. Access guides can be as simple as a map printed on the back as a business card or as complex as a multi-page packet distributed to employees. Some items commonly included in access guides are:

- A map of the area depicting bus stops, recommended walking and bicycling routes, landmarks, facilities such as restrooms and drinking fountains, locations of bicycle and vehicle parking, and major roads
- Information on transit service, including frequency, fares, accepted methods of payment, first and last runs, schedules, phone numbers and websites of transit service providers and taxis
- Information on how long it takes to walk or bike from a transit center to a destination
- Accessibility information for people with disabilities

Best practices include using graphics, providing specific step-by-step travel directions, providing parking location and pricing information, and providing information about the benefits of walking and bicycling. High quality access guides should be concise and accurate and should incorporate input from key stakeholders, including public transportation operators, public officials, employees, staff who will be distributing the access guide, and those with disabilities.

Work with Businesses to Develop Incentives for Bicycling and Walking

Incentive programs to encourage bicycling and walking to local businesses can be developed in coordination with individual businesses, the Chamber of Commerce, and the Bicycle Transportation Alliance. Such efforts may include:

- Creating promotional events such as "Bicycle to the Grocery Store" days, when cyclists get vouchers for, or discounts on items in the store, or "bicycle to the video store" days, when cyclists receive free popcorn or a discount on a movie rental.
- Holding an annual community event to encourage residents to replace one car trip a week with a bicycle trip. This type of event could be integrated with current special events.
- Developing, promoting and publicizing bicycle commuter services, such as bike shops selling commute gear, bikes-on-transit policies, and regular escorted commute rides.
- Creating an annual commuter challenge for area businesses.

Walk- and Bike-to-School Days

The City and School District should encourage residents to participate in the annual international Walk-to-School Day held each October. The City and School District could also create a Bike-to-School day. These events raise the profile of bicycling and walking among children. Local Bike- and Walk-to-Work days can be held annually in conjunction with the school-related events.

Bike Fairs, Organized Rides, and Races

Hosting bike fairs, organized rides (such as Cycle Oregon), and races in Newberg can raise the profile of bicycling in the area and provide entertainment for all ages at the same time. Bike fairs and races provide an opportunity to educate and encourage current and potential bicyclists. These events can also bring visitors to Newberg that may also contribute to the local economy. These events could be sponsored and implemented through collaboration between the City and local employers.

TravelSmart Programs

TravelSmart is an innovative way to encourage environmentally friendly ways to travel. The concept, used in more than 300 projects around the world, identifies individuals who want to change the way they travel and uses personal, individualized contact to motivate them to think about their travel options. TravelSmart provides customized information and training to help people take transit, bike, walk, or carpool for some of their trips. TravelSmart projects provide many benefits including individual health and financial improvements, and community-wide benefits such as reduced air pollution and enhanced community safety.

TravelSmart gives participants just the information they ask for to help them get started, or to keep on walking, biking, taking transit or carpooling. Those who do not want information are left alone. Materials are delivered by a "Travel Ambassador" in the most efficient and cost effective way – by bicycle. Travel Ambassadors are cross-trained to answer participants' questions concerning all alternative travel modes. Depending on the information requested by an individual participant, marketing materials could include maps identifying safe, convenient and direct walking and bicycling routes in Newberg, public bicycle parking locations, transit maps and schedules, and free bus passes. Travel Ambassadors would contact program participants periodically to answer questions about alternative transportation. The City could also periodically survey participants about their travel habits to gauge the program's success.

Enforcement Programs

The best protection for pedestrians and bicyclists traveling along and across streets are motorists who are aware of and follow laws regarding bicycle/pedestrian right-of-way. Many people however are unaware of these laws.

Targeted enforcement action should be focused in those areas with high bicycle and pedestrian volumes or where non-motorized travelers are especially vulnerable. Law enforcement efforts

should be targeted during periods and at locations where motorists and the general public will become aware of bicycle/pedestrian laws and their penalties. It is recommended that such targeted enforcement occur at least four times per year and last one week. Focused enforcement should also take place at the start of the school year at selected schools near their primary access points by children walking and cycling. An effective form of targeted enforcement is the use of a Police Officer posing as a pedestrian crossing the street. Motorists who do not yield to the officer are ticketed by other Police Officers further down the street. Another example of effective enforcement of the bicycle and pedestrian right-of-way is ticketing cars parked across the sidewalk or within striped bicycle lanes.

All targeted enforcement actions should be coordinated with the Public Works Department. The Newberg Police Department should also be surveyed for input on appropriate educational material, advisory and warning signs, and other tools to help them accomplish their mission. Finally, it is recommended that the Police Department vigorously pursue legal action against motorists who cause a bicycle/pedestrian injury or fatality.

Pedestrians and bicyclists are protected in the public right-of-way by the Oregon Vehicle Code, as enforced by the Newberg Police Department. Some of the key provisions of the Oregon Vehicle Code pertaining to pedestrians and bicyclists are shown below.

811.015 Failure to obey traffic patrol member; penalty.

(1) The driver of a vehicle commits the offense of failure to obey a traffic patrol member if:

(a) A traffic patrol member makes a cautionary sign or signal to indicate that students have entered or are about to enter the crosswalk under the traffic patrol member's direction; and

(b) The driver does not stop and remain stopped for students who are in or entering the crosswalk from either direction on the street on which the driver is operating.

(2) Traffic patrol members described in this section are those provided under ORS 339.650 to 339.665.

(3) The offense described in this section, failure to obey a traffic patrol member, is a Class A traffic violation. [1983 c.338 §545; 1995 c.383 §12; 2003 c.278 §2]

811.020 Passing stopped vehicle at crosswalk; penalty.

(1) The driver of a vehicle commits the offense of passing a stopped vehicle at a crosswalk if the driver:

(a) Approaches from the rear another vehicle that is stopped at a marked or an unmarked crosswalk at an intersection to permit a pedestrian to cross the roadway; and

(b) Overtakes and passes the stopped vehicle.

(2) The offense described in this section, passing a stopped vehicle at a crosswalk, is a Class B traffic violation. [1983 c.338 §546]

811.025 Failure to yield to pedestrian on sidewalk; penalty.

(1) The driver of a vehicle commits the offense of failure to yield to a pedestrian on a sidewalk if the driver does not yield the right of way to any pedestrian on a sidewalk.

(2) The offense described in this section, failure to yield to a pedestrian on a sidewalk, is a Class B traffic violation. [1983 c.338 §547; 1995 c.383 §42]

811.028 Failure to stop and remain stopped for pedestrian; penalty.

(1) The driver of a vehicle commits the offense of failure to stop and remain stopped for a pedestrian if the driver does not stop and remain stopped for a pedestrian when the pedestrian is:

(a) Proceeding in accordance with a traffic control device as provided under ORS 814.010 or crossing the roadway in a crosswalk, as defined in ORS 801.220; and

(b) In any of the following locations:

(A) In the lane in which the driver's vehicle is traveling;

(B) In a lane adjacent to the lane in which the driver's vehicle is traveling;

(C) In the lane into which the driver's vehicle is turning;

(D) In a lane adjacent to the lane into which the driver's vehicle is turning, if the driver is making a turn at an intersection that does not have a traffic control device under which a pedestrian may proceed as provided under ORS 814.010; or

(E) Less than six feet from the lane into which the driver's vehicle is turning, if the driver is making a turn at an intersection that has a traffic control device under which a pedestrian may proceed as provided under ORS 814.010.

(2) For the purpose of this section, a bicycle lane or the part of a roadway where a vehicle stops, stands or parks that is adjacent to a lane of travel is considered to be part of that adjacent lane of travel.

(3) This section does not require a driver to stop and remain stopped for a pedestrian under any of the following circumstances:

(a) Upon a roadway with a safety island, if the driver is proceeding along the half of the roadway on the far side of the safety island from the pedestrian; or

(b) Where a pedestrian tunnel or overhead crossing has been provided at or near a crosswalk.

(4) The offense described in this section, failure to stop and remain stopped for a pedestrian, is a Class B traffic violation. [2005 c.746 §2]

811.035 Failure to stop and remain stopped for blind pedestrian; penalty.

(1) The driver of a vehicle commits the offense of failure to stop and remain stopped for a blind pedestrian if the driver violates any of the following:

(a) A driver approaching a blind or blind and deaf pedestrian carrying a white cane or accompanied by a dog guide, who is crossing or about to cross a roadway, shall stop and remain stopped until the pedestrian has crossed the roadway.

(b) Where the movement of vehicular traffic is regulated by traffic control devices, a driver approaching a blind or blind and deaf pedestrian shall stop and remain stopped until the pedestrian has vacated the roadway if the blind or blind and deaf pedestrian has entered the roadway and is carrying a white cane or is accompanied by a dog guide. This paragraph applies notwithstanding any other provisions of the vehicle code relating to traffic control devices.

(2) This section is subject to the provisions and definitions relating to the rights of pedestrians who are blind or blind and deaf under ORS 814.110.

(3) The offense described in this section, failure to stop and remain stopped for a blind pedestrian, is a Class B traffic violation. [1983 c.338 §549; 1985 c.16 §280; 2003 c.278 §3]

811.050 Failure to yield to rider on bicycle lane; penalty.

(1) A person commits the offense of failure of a motor vehicle operator to yield to a rider on a bicycle lane if the person is operating a motor vehicle and the person does not yield the right of way to a person operating a bicycle, electric assisted bicycle, electric personal assistive mobility device, moped, motor assisted scooter or motorized wheelchair upon a bicycle lane.

(2) This section does not require a person operating a moped to yield the right of way to a bicycle or a motor assisted scooter if the moped is operated on a bicycle lane in the manner permitted under ORS 811.440.

(3) The offense described in this section, failure of a motor vehicle operator to yield to a rider on a bicycle lane, is a Class B traffic violation. [1983 c.338 §698; 1985 c.16 §336; 1991 c.417 §4; 1997 c.400 §8; 2001 c.749 §23; 2003 c.341 §7]

811.060 Vehicular assault of bicyclist or pedestrian; penalty.

(1) For the purposes of this section, "recklessly" has the meaning given that term in ORS 161.085.

(2) A person commits the offense of vehicular assault of a bicyclist or pedestrian if:

(a) The person recklessly operates a vehicle upon a highway in a manner that results in contact between the person's vehicle and a bicycle operated by a person, a person operating a bicycle or a pedestrian; and

(b) The contact causes physical injury to the person operating a bicycle or the pedestrian.

(3) The offense described in this section, vehicular assault of a bicyclist or pedestrian, is a Class A misdemeanor. [2001 c.635 §5]

811.435 Operation of motor vehicle on bicycle trail; exemptions; penalty.

(1) A person commits the offense of operation of a motor vehicle on a bicycle trail if the person operates a motor vehicle upon a bicycle lane or a bicycle path.

(2) Exemptions to this section are provided under ORS 811.440.

(3) This section is not applicable to mopeds. ORS 811.440 and 814.210 control the operation and use of mopeds on bicycle lanes and paths.

(4) The offense described in this section, operation of a motor vehicle on a bicycle trail, is a Class B traffic violation. [1983 c.338 §643]

814.400 Application of vehicle laws to bicycles.

(1) Every person riding a bicycle upon a public way is subject to the provisions applicable to and has the same rights and duties as the driver of any other vehicle concerning operating on highways, vehicle equipment and abandoned vehicles, except:

(a) Those provisions which by their very nature can have no application.

(b) When otherwise specifically provided under the vehicle code.

(2) Subject to the provisions of subsection (1) of this section:

(a) A bicycle is a vehicle for purposes of the vehicle code; and

(b) When the term "vehicle" is used the term shall be deemed to be applicable to bicycles.

(3) The provisions of the vehicle code relating to the operation of bicycles do not relieve a bicyclist or motorist from the duty to exercise due care. [1983 c.338 §697; 1985 c.16 §335]

811.440 When motor vehicles may operate on bicycle lane.

This section provides exemptions from the prohibitions under ORS 811.435 and 814.210 against operating motor vehicles on bicycle lanes and paths. The following vehicles are not subject to ORS 811.435 and 814.210 under the circumstances described:

(1) A person may operate a moped on a bicycle lane that is immediately adjacent to the roadway only while the moped is being exclusively powered by human power.

(2) A person may operate a motor vehicle upon a bicycle lane when:

(a) Making a turn;

(b) Entering or leaving an alley, private road or driveway; or

(c) Required in the course of official duty.

(3) An implement of husbandry may momentarily cross into a bicycle lane to permit other vehicles to overtake and pass the implement of husbandry.

(4) A person may operate a motorized wheelchair on a bicycle lane or path.

(5) A person may operate a motor assisted scooter on a bicycle lane or path.

(6) A person may operate an electric personal assistive mobility device on a bicycle lane or path.
[1983 c.338 §645; 1991 c.417 §1; 2001 c.749 §24; 2003 c.341 §8]

VI. Appendices

Appendix A. Critical Route Criteria Matrix

		CRITICAL ROUTES																																
		College Street	Main Street	River Street	Springbrook Road	Blaine Street	9th Street	Villa Road	Illinois Street	Haworth Avenue	5th Street	Brutscher Street	Mountainview Drive	Fulton Street	Highway 219 (bikes	Chehalem Drive	Foothills Drive	Wynooski Street	Sitka Avenue	Elliott Road	Hayes Street	Providence Road	Deborah Road	Emery Drive	Crestview Drive	Meridian Street	Crater Lane	Aspen Way	Columbia Drive	Rogers Landing	Zimri Drive	Hess Creek	Chehalem Creek
NETWORK CONNECTIVITY	Extend the local bicycle and pedestrian network	+	+	+	+	+	+	+	+	+	+	+	+	+	O	+	+	O	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Provide safe, direct and convenient connections	+	+	+	O	+	+	O	O	+	+	O	+	+	O	O	+	O	+	+	+	+	+	+	+	+	+	O	+	+	O	+	+
	Reduce out-of-direction travel	+	+	O	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	+	+	+	+	+	+	+	+	O	+	+	O	+	+
	Connect to a regional bicycle and pedestrian system	+	-	O	+	-	-	-	+	-	-	+	+	-	+	+	-	+	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
LAND USE	Connect to schools	+	+	+	O	+	+	+	O	+	O	-	+	-	-	+	+	-	-	+	-	-	+	+	+	+	+	-	+	-	-	-	-
	Connect to parks/natural areas	+	+	+	O	+	O	O	-	+	+	-	+	+	-	+	+	-	-	+	-	-	+	+	+	+	+	-	+	+	-	+	+
	Connect to shopping areas	+	+	O	+	+	-	O	-	-	-	+	-	-	+	-	-	+	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-
	Connect to existing and planned residential neighborhoods	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	O	O	O	O	+	+	+	+	+	+	+	O	+	+	+
	Connect to transit stops	+	+	-	+	+	+	+	+	+	+	+	-	+	+	-	+	-	+	+	+	+	+	-	-	+	+	-	-	-	-	-	-
	Connect to major employment centers	+	+	+	+	+	-	+	O	+	-	O	+	O	O	O	O	O	O	O	+	+	O	O	+	O	O	+	-	-	+	+	-
	Connect to civic and cultural institutions	+	+	O	O	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-
	Connect to senior and affordable housing	+	O	-	O	O	-	+	-	+	-	+	-	+	-	+	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-
ACCESS	Improved north-south connections	+	+	+	+	+	+	+	n/a	n/a	n/a	+	n/a	n/a	+	+	n/a	n/a	n/a	+	n/a	n/a	+	n/a	n/a	+	+	+	n/a	n/a	+	+	+
	Improved east-west connections	n/a	n/a	n/a	n/a	n/a	n/a	n/a	+	+	+	n/a	+	+	n/a	n/a	+	+	+	n/a	+	+	n/a	+	+	n/a	n/a	n/a	+	+	n/a	n/a	n/a
	Reduce out-of-direction travel	+	+	O	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	+	+	O	+	+
	Provide accessibility at railroad crossings	+	+	n/a	+	n/a	+	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	+	+	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Appendix B. Bicycle Potential Index

Critical Route	Bicycle Potential Criteria: Land Uses			Lack of alternative routes			Aesthetics/ Comfort			Ease of Implementation			Overcomes Major Barriers			TOTAL
possible scores	*15*	*8*	*3*	*10*	*5*	*1*	*10*	*5*	*1*	*5*	*3*	*1*	*5*	*3*	*0*	
Main Street		15			5			5			3			5		33
College Street		15			5			5			3			5		33
Springbrook Road		8			10			5			5			5		33
River Street		15			5			5			5			0		30
Blaine Street		15			5			5			5			0		30
9th Street		15			10			5			3			0		33
Villa Road		15			10			5			1			3		34
Illinois Street / Vermillion Street / Fulton Street / Haworth Avenue		15			10			5			3			3		36
6th Street		8			5			5			5			0		23
Brutscher Street		8			5			10			5			0		28
Mountainview Drive		8			10			10			5			5		38
Highway 219		15			10			1			5			3		34
Chehalem Drive		3			5			5			1			0		14
Foothills Drive		15			10			5			5			3		38
Dayton Avenue		15			10			5			1			3		34
Wynooski Street		15			5			5			3			5		33
Sitka Avenue / Hancock Street		8			10			5			5			0		28
Elliott Road		8			10			1			5			3		27
Hayes Street / Providence Drive		3			10			10			5			0		28
Emery Drive / Douglas Avenue / Vittoria Way		15			5			5			5			0		30
Crestview Drive		8			5			1			5			3		22
11th Street		8			5			1			3			0		17
Meridian Street / Center Street		15			5			5			3			5		33
Crater Lane / Lynn Drive		15			5			10			5			3		38
Deborah Road		15			5			5			5			0		30
Wilsonville Road		8			5			5			3			5		26
2nd Street		15			1			5			3			0		24
Howard Street		15			5			5			5			0		30
Morton Street		8			10			5			5			3		31
Hoskins Street		15			5			5			5			0		30
4th Street		8			5			5			3			0		21
14th Street / Waterfront Street		8			10			5			3			5		31
OR 99W		15			10			5			5			0		35
Zimri Drive		8			10			5			3			5		31
Aspen Way		8			10			5			3			5		31
Fernwood Road / 2nd Street		8			10			5			3			3		29
Hancock Street		15			5			5			5			0		30
1st Street		15			5			5			5			0		30
Columbia Drive / Crestview Drive		8			5			5			3			3		24
Rogers Landing Road		8			10			5			3			3		29

Appendix C. Critical Route Cost Breakdown

	Item	Missing Sidewalk	Curb & Gutter	Sidewalk	Curb Ramp	Ditch	Drain Line	Catch Basin & Grates	SubTotal	Contingency	Design	Construction Management	Mobilization	TOTAL*
	Unit	l.f	l.f	s.f	each	l.f	l.f	each						
	Unit Cost		$35.00	$4.50	$1,500.00		$55.00	$1,500.00		40%	10%	10%	5%	
	side			5				200						
2nd Street	north				$6,000.00				$6,000.00	$2,400.00	$600.00	$600.00	$300.00	$9,900.00
	south		$1,050.00	$675.00	$6,000.00				$7,725.00	$3,090.00	$772.50	$772.50	$386.25	$12,746.25
4th Street	north				$10,500.00				$10,500.00	$4,200.00	$1,050.00	$1,050.00	$525.00	$17,325.00
	south				$7,500.00				$7,500.00	$3,000.00	$750.00	$750.00	$375.00	$12,375.00
6th Street	north	0	$0.00	$0.00	$6,000.00				$6,000.00	$2,400.00	$600.00	$600.00	$300.00	$9,900.00
	south	77	$2,695.00	$1,732.50	$6,000.00				$10,427.50	$4,171.00	$1,042.75	$1,042.75	$521.38	$17,205.38
9th Street	north	1488	$52,080.00	$33,480.00	$7,500.00				$93,060.00	$37,224.00	$9,306.00	$9,306.00	$4,653.00	$153,549.00
	south	641	$22,435.00	$14,422.50	$10,500.00				$47,357.50	$18,943.00	$4,735.75	$4,735.75	$2,367.88	$78,139.88
11th Street	north	583	$20,405.00	$13,117.50	$13,500.00				$47,022.50	$18,809.00	$4,702.25	$4,702.25	$2,351.13	$77,587.13
	south	1303	$45,605.00	$29,317.50	$13,500.00				$88,422.50	$35,369.00	$8,842.25	$8,842.25	$4,421.13	$145,897.13
14th Street	north	1004	$35,140.00	$22,590.00	$6,000.00	1004	$55,220.00	$7,530.00	$126,480.00	$50,592.00	$12,648.00	$12,648.00	$6,324.00	$208,692.00
	south	1004	$35,140.00	$22,590.00	$6,000.00	1004	$55,220.00	$7,530.00	$126,480.00	$50,592.00	$12,648.00	$12,648.00	$6,324.00	$208,692.00
Aspen Way	north	5226	$182,910.00	$117,585.00	$6,000.00	5226	$287,430.00	$39,195.00	$633,120.00	$253,248.00	$63,312.00	$63,312.00	$31,656.00	$1,044,648.00
	south	5023	$175,805.00	$113,017.50	$6,000.00	5023	$276,265.00	$37,672.50	$608,760.00	$243,504.00	$60,876.00	$60,876.00	$30,438.00	$1,004,454.00
Blaine Street	east	2245	$78,575.00	$50,512.50	$13,500.00				$142,587.50	$57,035.00	$14,258.75	$14,258.75	$7,129.38	$235,269.38
	west	946	$33,110.00	$21,285.00	$13,500.00				$67,895.00	$27,158.00	$6,789.50	$6,789.50	$3,394.75	$112,026.75
Brutscher Street	east	821	$28,735.00	$18,472.50	$1,500.00				$48,707.50	$19,483.00	$4,870.75	$4,870.75	$2,435.38	$80,367.38
	west	0	$0.00	$0.00	0				$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Chehalem Drive	east	3257	$113,995.00	$73,282.50	$13,500.00	3085	$169,675.00	$23,137.50	$393,590.00	$157,436.00	$39,359.00	$39,359.00	$19,679.50	$649,423.50
	west	6092	$213,220.00	$137,070.00	$6,000.00	6092	$335,060.00	$45,690.00	$737,040.00	$294,816.00	$73,704.00	$73,704.00	$36,852.00	$1,216,116.00
College Street	east	5776	$202,160.00	$129,960.00	$25,500.00	3347	$184,085.00	$25,102.50	$566,807.50	$226,723.00	$56,680.75	$56,680.75	$28,340.38	$935,232.38
	west	6078	$212,730.00	$136,755.00	$34,500.00	4519	$248,545.00	$33,892.50	$666,422.50	$266,569.00	$66,642.25	$66,642.25	$33,321.13	$1,099,597.13
Columbia	north	1583	$55,405.00	$35,617.50	$4,500.00	1417	$77,935.00	$10,627.50	$184,085.00	$73,634.00	$18,408.50	$18,408.50	$9,204.25	$303,740.25
	south	2596	$90,860.00	$58,410.00	$6,000.00	1683	$92,565.00	$12,622.50	$260,457.50	$104,183.00	$26,045.75	$26,045.75	$13,022.88	$429,754.88
Crestview Drive	north	5350	$187,250.00	$120,375.00	$6,000.00	1612	$88,660.00	$12,090.00	$414,375.00	$165,750.00	$41,437.50	$41,437.50	$20,718.75	$683,718.75
	south	3922	$137,270.00	$88,245.00	$6,000.00	1201	$66,055.00	$9,007.50	$306,577.50	$122,631.00	$30,657.75	$30,657.75	$15,328.88	$505,852.88
Crater Lane / Lynn Drive	east	623	$21,805.00	$14,017.50	$1,500.00	306	$16,830.00	$2,295.00	$56,447.50	$22,579.00	$5,644.75	$5,644.75	$2,822.38	$93,138.38
	west / south	1876	$65,660.00	$42,210.00	$1,500.00	134	$7,370.00	$1,005.00	$117,745.00	$47,098.00	$11,774.50	$11,774.50	$5,887.25	$194,279.25
Dayton Avenue	east	942	$32,970.00	$21,195.00	$4,500.00				$58,665.00	$23,466.00	$5,866.50	$5,866.50	$2,933.25	$96,797.25
	west	1260	$44,100.00	$28,350.00	$4,500.00				$76,950.00	$30,780.00	$7,695.00	$7,695.00	$3,847.50	$126,967.50
Elliott Road	east	1358	$47,530.00	$30,555.00	$6,000.00				$84,085.00	$33,634.00	$8,408.50	$8,408.50	$4,204.25	$138,740.25
	west	2118	$74,130.00	$47,655.00	$10,500.00				$132,285.00	$52,914.00	$13,228.50	$13,228.50	$6,614.25	$218,270.25
Emery Drive / Douglas Avenue / Vittoria Way	east	155	$5,425.00	$3,487.50	$1,500.00				$10,412.50	$4,165.00	$1,041.25	$1,041.25	$520.63	$17,180.63
	west	124	$4,340.00	$2,790.00	$1,500.00				$8,630.00	$3,452.00	$863.00	$863.00	$431.50	$14,239.50
Fernwood Road	north	1918	$67,130.00	$43,155.00	$6,000.00	1190	$65,450.00	$8,925.00	$190,660.00	$76,264.00	$19,066.00	$19,066.00	$9,533.00	$314,589.00
	south	3943	$138,005.00	$88,717.50	$6,000.00				$232,722.50	$93,089.00	$23,272.25	$23,272.25	$11,636.13	$383,992.13
Foothills Drive	north	100	$3,500.00	$2,250.00	$6,000.00				$11,750.00	$4,700.00	$1,175.00	$1,175.00	$587.50	$19,387.50
	south	0	$0.00	$0.00	0				$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Hayes Street	north	674	$23,590.00	$15,165.00	0				$38,755.00	$15,502.00	$3,875.50	$3,875.50	$1,937.75	$63,945.75
	south	299	$10,465.00	$6,727.50	0				$17,192.50	$6,877.00	$1,719.25	$1,719.25	$859.63	$28,367.63
Highway 219	east	4890	$171,150.00	$110,025.00	$9,000.00				$290,175.00	$116,070.00	$29,017.50	$29,017.50	$14,508.75	$478,788.75
	west	4660	$163,100.00	$104,850.00	$12,000.00				$279,950.00	$111,980.00	$27,995.00	$27,995.00	$13,997.50	$461,917.50
Highway 240	north	262	$9,170.00	$5,895.00	$1,500.00				$16,565.00	6626	1656.5	1656.5	828.25	$27,332.25
	south	227	$7,945.00	$5,107.50	$3,000.00				$16,052.50	$6,421.00	$1,605.25	$1,605.25	$802.63	$26,486.63
Hoskins Street	east	160	$5,600.00	$3,600.00	$4,500.00				$13,700.00	$5,480.00	$1,370.00	$1,370.00	$685.00	$22,605.00
	west	736	$25,760.00	$16,560.00	$4,500.00				$46,820.00	$18,728.00	$4,682.00	$4,682.00	$2,341.00	$77,253.00
Howard Street	east		$875.00	$562.50	$9,000.00				$10,437.50	$4,175.00	$1,043.75	$1,043.75	$521.88	$17,221.88
	west	340	$11,900.00	$7,650.00	$4,500.00				$24,050.00	$9,620.00	$2,405.00	$2,405.00	$1,202.50	$39,682.50
Illinois Street / Haworth Avenue / Fulton Street	north	1529	$53,515.00	$34,402.50	$15,000.00				$102,917.50	$41,167.00	$10,291.75	$10,291.75	$5,145.88	$169,813.88
	south	1314	$45,990.00	$29,565.00	$15,000.00				$90,555.00	$36,222.00	$9,055.50	$9,055.50	$4,527.75	$149,415.75
Main Street	east	2546	$89,110.00	$57,285.00	$34,500.00	666	$36,630.00	$4,995.00	$222,520.00	$89,008.00	$22,252.00	$22,252.00	$11,126.00	$367,158.00
	west	1490	$52,150.00	$33,525.00	$25,500.00	0			$111,175.00	$44,470.00	$11,117.50	$11,117.50	$5,558.75	$183,438.75
Meridian Street / Center Street	east	455	$15,925.00	$10,237.50	$12,000.00				$38,162.50	$15,265.00	$3,816.25	$3,816.25	$1,908.13	$62,968.13
	west	861	$30,135.00	$19,372.50	$21,000.00				$70,507.50	$28,203.00	$7,050.75	$7,050.75	$3,525.38	$116,337.38
Morton Street	east	1257	$43,995.00	$28,282.50	$1,500.00				$73,777.50	$29,511.00	$7,377.75	$7,377.75	$3,688.88	$121,732.88
	west	1540	$53,900.00	$34,650.00	$4,500.00				$93,050.00	$37,220.00	$9,305.00	$9,305.00	$4,652.50	$153,532.50
Mountainview Drive	north	2644	$92,540.00	$59,490.00	$1,500.00	2625	$144,375.00	$19,687.50	$317,592.50	$127,037.00	$31,759.25	$31,759.25	$15,879.63	$524,027.63
	south	2603	$91,105.00	$58,567.50	$9,000.00	2603	$143,165.00	$19,522.50	$321,360.00	$128,544.00	$32,136.00	$32,136.00	$16,068.00	$530,244.00
River Street	east	977	$34,195.00	$21,982.50	$30,000.00				$86,177.50	$34,471.00	$8,617.75	$8,617.75	$4,308.88	$142,192.88
	west	787	$27,545.00	$17,707.50	$30,000.00				$75,252.50	$30,101.00	$7,525.25	$7,525.25	$3,762.63	$124,166.63
Rogers Landing Road	north	1040	$36,400.00	$23,400.00	$3,000.00				$62,800.00	$25,120.00	$6,280.00	$6,280.00	$3,140.00	$103,620.00
	sputh	945	$33,075.00	$21,262.50	$3,000.00				$57,337.50	$22,935.00	$5,733.75	$5,733.75	$2,866.88	$94,606.88
Sitka Avenue / Hancock Street	north	600	$21,000.00	$13,500.00	$3,000.00				$37,500.00	$15,000.00	$3,750.00	$3,750.00	$1,875.00	$61,875.00
	south	815	$28,525.00	$18,337.50	$3,000.00				$49,862.50	$19,945.00	$4,986.25	$4,986.25	$2,493.13	$82,273.13
Springbrook Road	east	4156	$145,460.00	$93,510.00	$6,000.00	3077	$169,235.00	$23,077.50	$437,282.50	$174,913.00	$43,728.25	$43,728.25	$21,864.13	$721,516.13
	west	4373	$153,055.00	$98,392.50	$6,000.00	1306	$71,830.00	$9,795.00	$339,072.50	$135,629.00	$33,907.25	$33,907.25	$16,953.63	$559,469.63
Villa Road	east	4323	$151,305.00	$97,267.50	$15,000.00	1201	$66,055.00	$9,007.50	$338,635.00	$135,454.00	$33,863.50	$33,863.50	$16,931.75	$558,747.75
	west	3625	$126,875.00	$81,562.50	$15,000.00	702	$38,610.00	$5,265.00	$267,312.50	$106,925.00	$26,731.25	$26,731.25	$13,365.63	$441,065.63
Wynooski Street	north	1524	$53,340.00	$34,290.00	$12,000.00	781	$42,955.00	$5,857.50	$148,442.50	$59,377.00	$14,844.25	$14,844.25	$7,422.13	$244,930.13
	south	2736	$95,760.00	$61,560.00	$19,500.00	2179	$119,845.00	$16,342.50	$313,007.50	$125,203.00	$31,300.75	$31,300.75	$15,650.38	$516,462.38
Zimri Drive	east	1622	$56,770.00	$36,495.00		1622	$89,210.00	$12,165.00	$194,640.00	$77,856.00	$19,464.00	$19,464.00	$9,732.00	$321,156.00
	west	1687	$59,045.00	$37,957.50		1687	$92,785.00	$12,652.50	$202,440.00	$80,976.00	$20,244.00	$20,244.00	$10,122.00	$334,026.00

Appendix D. ADA Criteria Matrix

		Schools	Parks	Cmmty	Missing SW / Curb / Gap	Total
Factor		2.5	1.5	2	2	
Location	Side					
Route: Foothills Drive						
Jones to Morris	north	2	2	1	0.5	11
Morris to Holveck	north	2	2	1	0.5	11
Morris to College	south	2	2	1	0.5	11
Route: Crater Lane						0
Hazelnut to Edgewood	west	2	1	0	0.5	7.5
Mountainview to Lynn	east	2	1	0	0.5	7.5
Mountainview to Lynn	west	2	1	0	0.5	7.5
Crater to Main (along Lynn)	south	2	2	0	1	10
Route: College Street						0
Quail to Edgewood	east	2	2	0	0.3	8.6
Edgewood to Oxford	west	2	2	0	0.3	8.6
Henry Rd path to Dartmouth	east	2	2	0	0.3	8.6
Dartmouth to Mountainview	east	2	2	0	0.3	8.6
Mountainview to Melody	west	2	2	0	0.5	9
Melody to Arlington	west	2	2	0	0.25	8.5
Arlington to Columbia (will require buying property based on aerial and parcelwithadd on map)	west	2	2	0	0.3	8.6
crossing Columbia/Crestview		2	2	0	0.2	8.4
College & North	east/west	2	2	0	0.5	9
College & Franklin	west	2	2	0	0.5	9
College & Sherman	east/west	2	2	0	0.5	9
College & Sheridan	east/west	2	2	0	0.5	9
Route: Columbia/ Crestview						
Main to College	north	1	0	0	1	4.5
College to Center	north	1	0	0	1	4.5
Mary Lou to Villa	south	1	0	0	1	4.5
Route: Main Street						
Crestview to Columbia	east	2	1	2	0.25	11
Columbia to Ashley	west	2	1	2	0.25	11
Columbia to Pinehurst	east	2	1	2	0.25	11
Pinehurst to Markris	east	2	1	2	0.25	11
Markris to Clifford	east	2	1	2	0.25	11
Clifford to Illinois	east	2	1	2	0.25	11
Main & North	east	2	1	2	0.25	11
Franklin to Sherman	west	2	1	2	0.25	11
Main & Railroad tracks	west	2	1	2	0.25	11
Railroad tracks to Sheridan	west	2	1	2	0.25	11
Main & Sheridan	south	2	1	2	0.25	11
1st to 2nd	west	2	1	2	0.25	11
Main & 2nd	east	2	1	2	0.25	11
Main & 3rd	east	2	1	2	0.25	11
Main & 4th	all corners	2	1	2	1	12.5
4th to 5th	east	2	1	2	0.25	11
Main & 5th	all corners	2	1	2	1	12.5
Route: Howard Street						
Sheridan	north	0	0	1	0.5	3
Howard & 4th	all corners	1	1	2	1	10

		Schools	Parks	Cmmty	Missing SW / Curb / Gap	Total
	Factor	2.5	1.5	2	2	
Location	Side					
4th to 5th	west	1	1	2	1	10
Howard & 5th	3 corners	1	1	2	1	10
5th to 6th	east	1	1	2	1	10
Howard & 6th	northeast	1	1	2	1	10
Route: 6th Street						
6th & Blaine	north/south	1	3	1	0.5	10
6th & Meridian	north	1	3	1	0.5	10
6th & Center	all corners	1	3	1	0.5	10
Route: River Street						
2nd & River	west	1	1	1	0.5	7
3rd & River	3 corners	1	1	1	0.75	7.5
4th & River	east	1	1	1	0.25	6.5
4th to 5th	east	1	1	1	0.25	6.5
5th & River	all corners	1	1	1	1	8
5th to 6th	west	1	1	1	0.25	6.5
6th & River	all corners	1	1	1	1	8
6th to 7th	east	1	1	1	0.25	6.5
7th & River	all corners	1	1	1	1	8
7th to 8th	east	1	1	1	0.25	6.5
8th & River	all corners	1	1	1	1	8
9th & River	all corners	1	1	1	1	8
9th to 10th	east	1	1	1	0.25	6.5
10th & River	east	1	1	1	0.25	6.5
11th & River	southeast	1	1	1	0.25	6.5
12th to 13th	west	1	1	1	1	8
13th to 14th	west	1	1	1	1	8
Route: 9th Street						
Blaine to School	south	1	1	0	0.25	4.5
School to College	south	1	1	0	0.25	4.5
9th & Meridian	northeast, T	1	1	0	0.25	4.5
9th & Center	northwest, T	1	1	0	0.25	4.5
9th & Chehalem	southeast	1	1	0	0.25	4.5
9th & Willamette	all corners	1	1	0	0.25	4.5
9th & Columbia	south corners	1	1	0	0.25	4.5
Columbia to Pacific	south	1	1	0	0.25	4.5
9th & Pacific	south corners	1	1	0	0.25	4.5
River to Chehalem	north	1	1	0	0.25	4.5
Chehalem to Willamette	north	1	1	0	0.25	4.5
Columbia to Pacific	north	1	1	0	0.25	4.5
Route: 11th Street						
River to Chehalem	north	1	1	0	1	6
River to Chehalem	south	1	1	0	0.25	4.5
Chehalem to Willamette	north	1	1	0	1	6
11th & Chehalem	southeast	1	1	0	0.25	4.5
11th & Willamette	all corners	1	1	0	1	6
Willamette to Columbia	north	1	1	0	1	6
Willamette to Columbia	south	1	1	0	0.25	4.5
Columbia to Pacific	north	1	1	0	1	6
Mill to Wynookski	north	1	1	0	1	6
Route: Blaine Street						
Blaine & Sherman	3 corners	1	4	2	0.5	13.5
Blaine & Sheridan	all corners	1	4	2	0.5	13.5

		Schools	Parks	Cmmty	Missing SW / Curb / Gap	Total
	Factor	2.5	1.5	2	2	
Location	Side					
1st to 2nd	west	1	4	2	0.5	13.5
1st to 2nd	east	1	4	2	0.5	13.5
Blaine & 2nd	3 corners	1	4	2	0.5	13.5
2nd to 3rd	west	1	4	2	0.5	13.5
Blaine & 3rd	all 3 corners	1	4	2	0.5	13.5
3rd to 5th	west	1	4	2	0.5	13.5
park to 5th	east	1	4	2	0.5	13.5
Blaine & 5th	all corners	1	4	2	0.5	13.5
5th to 6th	east	1	4	2	0.5	13.5
6th to 9th	east	1	4	2	0.5	13.5
Route: 2nd Street						
2nd & Washington	all corners	1	1	1	0.25	6.5
Washington to Blaine	south	1	1	1	0.25	6.5
2nd & Edwards	3 corners	1	1	1	0.25	6.5
2nd & Meridian	all corners	1	1	1	0.25	6.5
2nd & Center	southwest	1	1	1	0.25	6.5
Route: Illinois - Haworth						
Deskins to College	south	2	1	0	0.5	7.5
Illinois to Vermillion (along College)	west	2	1	0	0.5	7.5
College to Meridian (along Vermillion)	north	2	1	0	0.5	7.5
Meridian & Fulton	west T, northeast	2	1	0	0.5	7.5
Fulton & Center	north	2	1	0	0.5	7.5
Villa to Sitka	north	2	1	0	0.5	7.5
driveway entrance to swim center	south	0	1	1	0.5	4.5
Pool Park	south	3	2	1	0.5	13.5
Haworth & Sitka	east	3	2	1	0.5	13.5
Haworth & Hulet	2 corners	3	2	1	0.5	13.5
Haworth & Marie	T-side	3	2	1	0.5	13.5
Haworth & Elliot	northwest	3	2	1	0.5	13.5
Route: Meridian/Crestview/Center						
Meridian & Crestview	southwest	2	3	0	0.25	10
Crestview to Fircrest	east	2	3	0	0.25	10
Meridian & Fircrest	all 3 corners	2	3	0	0.25	10
Fircrest to Aldercrest	west	2	3	0	0.25	10
Hemlock to Sierra Vista	west	2	3	0	0.25	10
Meridian & Railroad tracks	east	2	3	0	0.25	10
Fulton to Vermillion	east	2	3	0	0.25	10
Meridian & Vermillion	all corners	2	3	0	0.25	10
Meridian & North	all corners	2	3	0	0.25	10
Meridian & Franklin	west 2 corners	2	3	0	0.25	10
Meridian & Sherman	west 2 corners	2	3	0	0.25	10
Meridian & Sheridan	west 2 corners	2	3	0	0.25	10
Route: Hoskins Street						
Crestview to church entrance	east	1	1	1	1	8
Hoskins & Pennington	south	0	0	0	0.2	0.4
Palomino to Sierra Vista	west	0	0	0	0.2	0.4
Hoskins & Pennington	northeast	0	0	0	1	2
Route: Villa Road						
Mountainview to Thorne	east	1	0	0	0.2	2.9
Thorne to Crestview (may req. acquiring some pvt property)	east	1	0	0	0.2	2.9
Hess Creek to Carol	east	0	1	0	0.5	2.5

		Schools	Parks	Cmmty	Missing SW / Curb / Gap	Total
	Factor	2.5	1.5	2	2	
Location	Side					
Carol to Haworth	east	0	1	0	0.5	2.5
Haworth to Fulton	west	2	1	1	0.2	8.9
Fulton to North	west	1	1	1	0.75	7.5
Villa @ Laurel	west	1	1	1	1	8
Sherman to OR99W	west	1	1	1	0.5	7
Route: Springbrook Road						
Crestview to Vittoria	east	0	0	0	0.2	0.4
Vittoria to Aquarius	east	3	1	0	0.2	9.4
Aquarius to Haworth	east	3	1	0	0.2	9.4
Fred Meyer entrance to Hayes	west	0	0	1	0.2	2.4
Route: Hayes Street						
Springbrook to Oak Leaf	south	0	0	0	0.5	1
Springbrook to Oak Grove	north	0	0	0	0.5	1
Route: Vittoria						
Gemini to Libra	north	1	1	0	0.2	4.4
Vittoria & Aquarius	northwest	1	1	0	0.2	4.4
Route: Wynooski Street						
5th to Lilly	east	1	3	0	0.5	8
7th to Merlin	east	1	3	0	0.5	8