

# Chapter 7: Pedestrian and Bicycle System

## Introduction

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Pedestrian and bicycle facilities are integral elements of the transportation system and valuable components in the strategy to reduce reliance on automobiles. The community benefits in many ways from adequate pedestrian and bicycle facilities including reducing traffic congestion, supporting tourism, improving public health, and providing accessibility to all parts of the community. Further, there is a segment of the population who do not drive or who do not have access to an automobile.

### Trip Potential

Travel by bicycle and foot has tremendous potential in the Bend urban area. A large part of this is attributable to the region's predominantly sunny weather and relatively flat terrain. In addition, the outdoor spirit of the citizenry, the desire to engage in healthy exercise, and the interest in active modes of travel provide a strong population base for generating non-automobile trips. The visibility of pedestrian and bicycle traffic throughout the year confirms the importance of these travel options.

Bend's relatively small size is amenable to travel by bicycle or foot. Depending on the type of trip, studies indicate a willingness of people to walk between a quarter and a half mile, and bicycle upwards of 2 or 3 miles. In 2006, the Oregon Department of Transportation (ODOT) funded the *Individual Transportation Options Pilot Project*. The project evaluated the transportation behavior of a random sample of persons in Bend. The results of the project showed that 16 percent of all automobile trips are one mile or less and 56 percent are three miles or less. These data suggest that many trips could possibly be made on bicycle or on foot.

Year 2012 ACS 5-year estimates data shows that approximately 1.7-percent of workers in the MPO area commuted to work by bicycle, while about 2.6-percent walked to work. Throughout the MPO area, travel time to work by all modes was less than fifteen minutes for about 47-percent of all workers, less than ten minutes for 23-percent, and less than five minutes for 5-percent. Short trip lengths and travel times are part of the equation for encouraging non-auto trips. A complete and safe network of trails, sidewalks and bicycle facilities will further encourage these trips.

The year 2012 US Census American Community Survey (ACS) data show that approximately 4.4-percent of households in the Bend metropolitan area do not have access to an automobile.

### Benefits

In addition to reducing traffic, non-motorized trips conserve fossil fuels, reduce noise, protect air and water quality, reduce the demand for parking spaces, and improve personal health. The air quality issue is particularly important to Central Oregonians, as the pristine mountain views and clean air are cherished resources of the community. A

concerted effort to reduce automobile trips and the resultant exhaust emissions will be valuable in diminishing the impact on air quality. Non-motorized trips can also directly address the obesity crisis facing the United States. Getting people to walk or bicycle directly benefits personal health.

### **Community and Site Design**

An adequate bike and pedestrian system requires a complete network of walkways and bikeways that connect parks, schools, and activity centers. Orienting buildings to the street and providing safe and easy connections from stores to the sidewalk, and providing convenient bike parking all help make bicycling and walking more desirable trip choices. The city has a strong development code that requires quality walking and biking systems and requires lot designs to encourage walking and biking through walkways, building orientation, and on-site bike parking.

### **Facility Performance Analysis**

The quality of walk and bike facilities should be considered in evaluating the adequacy of the system. The current draft of Version 2 of the Oregon Department of Transportation's (ODOT's) Analysis Procedures Manual (APM) notes that there are multiple analyses procedures that can be used for this purpose, depending on the scale of the analysis being conducted (i.e. network level vs. individual segment). These methods attempt to capture how bicyclists and pedestrians will perceive the quality of the biking or walking facility. At the regional level, the APM recommends using its Qualitative Assessment method, which is a simplification of the *Highway Capacity Manual* (HCM) 2010's multimodal level-of-service (MMLOS) procedures into subjective categories (i.e. Excellent, Good, Fair, Poor) for planning purposes. This procedure can be applied for both pedestrian and bicyclist networks. Level of Traffic Stress (LTS) can also be used for analyzing bike networks at a regional level, but is not applicable to pedestrian facilities. LTS divides routes into four different stress categories, which are defined as being suitable for different user groups (e.g. children to advanced riders) based on the opinions of the method's authors. For more detailed analysis at the project level, the APM recommends using the full MMLOS procedures from the HCM 2010. The full version of MMLOS requires more detailed inputs than the other methods, providing the opportunity to assess the impacts of detailed changes. The final version of the APM will also include an intermediate analysis procedure, currently expected to be a simplified version of MMLOS that is more detailed than the Qualitative Assessment methodology.

### **Maintenance and Repair**

Maintenance and repair of the bicycle and pedestrian system are critical to the use of these transportation modes. Timely snow removal, sweeping, gravel removal, patching, surface repair and striping are all necessary to maximize the use of bike lanes and sidewalks. Property-tight sidewalks may require less maintenance than curb-tight sidewalks because the landscape strip provides a place to pile snow and separates the sidewalk from road debris accumulation.

In general, responsibility for sidewalk maintenance and repair is assigned to the adjacent property owners. This system may not adequately assure timely maintenance and repair of the sidewalk network. Furthermore, there is no program in place to require the property owners to perform their duties.

The use of gravel during winter months can negatively impact the bicycle lane and pedestrian system. The city of Bend has implemented a street sweeping system that helps remove the gravel as soon as weather conditions allow. Chip sealing can also have a negative impact on bicycle safety. The city of Bend and Deschutes County have worked with the Deschutes County Bicycle and Pedestrian Advisory Committee in recent years to minimize the impacts of chip sealing on the bicycle system.

## **The Pedestrian System**

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Walking is the most basic form of transportation, undertaken by almost every citizen. Sidewalks and other pedestrian facilities are an essential element of the transportation system since every trip involves at least one walking segment. The City of Bend has been designated a silver-level Walk Friendly Community by the national Walk Friendly Communities Program administered by the Pedestrian and Bicycle Information Center at the University of North Carolina. The City was lauded in particular for the overall existing connectivity of the pedestrian system, for having a development code that encourages short block lengths and connected pedestrian facilities, and for its parking management strategies.

### **Existing and Proposed Pedestrian System**

The existing sidewalk system is delineated in Figure 7-1. This figure is based on an inventory of sidewalks maintained by the City of Bend. The figure reflects the latest inventory data as of 2014, which includes completion of many sidewalk projects that occurred after the *Bend Urban Area Transportation System Plan* was developed. Therefore, Figure 7-1 shows a more extensive complete sidewalk network than the *Bend Urban Area TSP*.

The City has been working on an update of the sidewalk gap prioritization process, which is summarized below in the Ongoing Plans and Programs section, as part of the *Strategic Implementation Plan for Walking and Biking Infrastructure*. Phase II of the MTP Update will incorporate these projects into the 2040 MTP. Chapter 6 of this MTP identifies the committed and build projects for the City. Although some of the identified projects are new roadways or roadway upgrades, which will include a sidewalk component, the majority of pedestrian facility projects will be covered under the funding allocated for the City of Bend local transportation projects.

## **Pedestrian System Components**

### *Sidewalks*

Because the primary function of sidewalks is to provide a safe place for pedestrians, facilities need to be designed accordingly. Sidewalks also need to be constructed to Americans with Disabilities Act (ADA) requirements. The requirements are meant to insure that everyone, regardless of mobility issues, can safely travel on sidewalks.

In the city of Bend, sidewalk construction has been required in all new residential and commercial developments since the late 1980s. Sidewalks are normally located on both sides of the street and separated from the street by a curb and a landscape strip. In steep topography or unusual topography, sidewalks may be allowed on only one side of the street and may be curb-tight. Sidewalks are normally constructed with a concrete material although special paver blocks may be utilized in high-use pedestrian areas, such as downtown Bend, to enhance surface aesthetics. Sidewalks vary in width depending on anticipated pedestrian volumes but have certain minimum widths established to meet ADA requirements. Minimum sidewalk widths are established in the implementing ordinances of the city and county.

### *Landscape Strip*

The area located between a sidewalk and the curb serves many important functions and is commonly referred to as the planting or landscape strip. The landscape strip creates space for a variety of underground utilities, such as telephone, cable television, fiber optic cables, etc. The landscape strip is also beneficial for locating utility poles, fire hydrants, benches, bus shelters, and other features that might otherwise block or obstruct pedestrian travel along sidewalks.

Landscaping helps to soften the hard edge created by pavement and curbs. Large trees can also provide cooling summer shade for parked cars and pedestrians. A canopy of street trees can help to slow traffic and enhance the beauty of the community. The physical separation from the street also improves the design of sidewalks by maintaining a constant grade without dipping at driveways and makes Americans with Disabilities Act compliance easier. During winter months, snow can be plowed into these areas from the street and gravel can accumulate in the parkstrip and not block sidewalks. The landscape strip provides a physical separation from the adjacent roadway, providing enhanced pedestrian comfort and an improved walking experience.

### *Street Crossings*

Crossing local street intersections is normally not difficult because of lower traffic volumes and because the distances are relatively short. Crossing arterial streets can be more challenging based on street width, traffic volume, and speed. Minimizing crossing distances required for pedestrians is important to reduce the actual and psychological barrier created by wide streets and the amount of exposure to conflicting motor vehicle traffic. Increasing driver yielding rates to pedestrians is important and can be done through various design techniques as well as enforcement and education.

Construction of curb extensions is one method to improve the visibility of pedestrians and reduce the crossing distance of the street. These extended “bulb-outs” add valuable pedestrian space, increase driver yielding and reduce the size of the gap needed in traffic. The additional space can also provide a location for bike parking or other sidewalk amenities. Downtown Bend is an excellent example of where this type of design has been used very successfully.

Another solution to addressing conditions where traffic volume is high, or roadways are wide, is the construction of raised medians, islands or refuges. Medians can significantly improve pedestrian visibility, increase driver yielding, reduce the size of the gap needed in traffic, and provide a place to wait for safe gaps in the traffic stream while crossing busy roadways. Medians can also improve the aesthetics of a community with added landscaping opportunities. Islands and refuges are especially important at large intersections to reduce the crossing distance and improve pedestrian comfort by minimizing exposure to motor vehicles.

One important function of traffic signals is providing for the movement of pedestrians across busy intersections. Signal timing and intersection design play a critical role in safety. The city’s recent crash review did find that people crossing at traffic signals were hit by automobiles during the walk phase when permitted turns were allowed. Injuries are more likely when speeds of the turning traffic are higher. Slowing turning traffic can help reduce crashes and injuries. Where truck movements occur and need to be accommodated some techniques to keep the radii tight while still accommodating trucks include: allowing trucks to use both lanes; adding bike lanes to increase the usable radius; or adding truck aprons on the outside. Other techniques to accommodate trucks and pedestrians can include building a dedicated turn lane with a raised island for pedestrians. This significantly improves the comfort of pedestrians by reducing the amount of uninterrupted pavement to cross.

Roundabouts can play a similar role in providing for the movement of pedestrians across busy intersections. Pedestrian safety at roundabouts is well documented. Roundabout design is critical to pedestrian safety by keeping speeds low at the crosswalk, providing pedestrian refuges, and ensuring lighting and visibility are maintained.

### *Rural Walkways*

In sparsely populated areas, the shoulders of rural roads can be designed to also accommodate pedestrians. Pedestrian demand can change in rural areas over time as development occurs. Pedestrian demand can also exist in rural areas near commercial strips or in residential clusters along county roads or state highways.

### *Neighborhood Accessways*

An August 2006, report provided an assessment of the city of Bend’s neighborhood accessways. The neighborhood accessway system is comprised of a wide range of facilities that include a variety of trail types and on-street facilities that are collectively referred to as “accessways.”

The purpose of these facilities is to minimize travel distances within and between residential areas and commercial centers, major employment areas, transit stops, or within and between nearby neighborhood activity centers such as schools and parks. The greater system of proposed accessways will provide transportation and recreation mobility opportunities for non-automobile travel through out the community. This accessway plan for the City generally uses a geographic spacing for accessways on an interval of approximately every *quarter-mile*.

### *Multi-Use Trails*

Trails provide important transportation connections and shortcuts to destination points that make travel by foot or bicycle comfortable, pleasant, and convenient. Recreational activity is also a common use of the trail system, with scores of residents and tourists using these areas for walking, jogging, bicycling, and other activities.

Trails also provide citizens and visitors with links to the natural environment. One special quality of a trail is the opportunity they provide to escape the bustle of the city - while remaining within the city. This is particularly evident along the Deschutes River trail system. Public opinion supports this sentiment, as people cite the ability to depart from traffic congestion, noise, and exhaust as a prime factor in their enjoyment of trails.

The first trail plan in the area was established in the Bend Area General Plan in 1981. This has been the policy tool that has provided some protection of trail corridors and has promoted the construction of the current limited system. Several additions were adopted by the City and County and incorporated into the General Plan in 1998. The current "primary" trail plan is illustrated in the City of Bend Transportation System Plan (Bicycle and Trail System Map). The city of Bend and the Bend Metro Park and Recreation District continue working together to plan and develop a trail system to meet the recreational and transportation needs of the community.

The trail plan for the City of Bend is delineated on figures 7-1 and 7-2. The alignments depicted as proposed were based on the City's TSP should be considered general in nature. Flexibility should be permitted during the development and design of private lands to locate these planned primary trails to fit the context of the natural terrain, to minimize trail grade, to consider street crossings and other safety issues, to account for the pattern and design of the development, or consider any other topographic or geographic barriers or issues, etc. Also, while it may be suitable to locate a trail next to a street due to existing difficult to resolve issues, it is the intent of the plan to locate trails - as much as possible - away from streets to minimize conflicts with other types of conflicting traffic. It is also the intent of the trail system (both connector and primary) to provide direct and convenient walking and bicycling connections to parks, schools, open spaces, employment areas, shopping destinations, and the like. Balancing these trail design criteria may require a concerted coordination effort between the City, the Park District, and new development to satisfactorily locate these trails to ensure that the intent of the plan will be fulfilled.

### *Railroad Right-of-way Trails*

Both “abandoned” and “active” railroad right-of-ways can be developed as part of local trail systems. The Springwater Trail in the Portland area and the bikepath in Ashland along the Central Oregon and Pacific rail line are excellent examples of this type of trail development that is located along an active railroad right-of-way within the State of Oregon. The report *Rails-with-Trails - Lessons Learned 2002*, prepared for the U.S. Department of Transportation, provides a comprehensive analysis and evaluation of rails with trails (RWT) development practices. The Rails-to-Trails Conservancy also maintains a number of resources on its website ([www.railstotrails.org](http://www.railstotrails.org)).

A trail within/parallel to the Burlington Northern-Santa Fe Railroad corridor in the Bend area could provide a substantial enhancement of the Primary Trail system. The *Bend Urban Area - Bicycle and Pedestrian System Plan* illustrates the alignment of this “Rails-with-Trails” concept. It should be acknowledged that, due to site specific railroad operational requirements, alternative parallel accessway/roadway corridors may be more suitable for avoiding problematic sections of this rail-trail corridor. Also, grade-separated rail-roadway crossings may be difficult to retrofit or may be operationally unsuitable for joint trail and rail operation and parallel alternative routes should be considered. Typically, these alternative routes, if used, should not deviate physically too far from the intended corridor alignment (i.e., follow the nearest parallel alternative corridor). Further planning and discussion with the railroad representatives, adjacent property owners and field investigations are required to determine the feasibility of this concept.

### *Unpaved Paths*

In general, the standard width of an unpaved path is the same as for sidewalks. An unpaved path should not be constructed where a sidewalk is more appropriate. The surface material must comply with the ADA.

## **Ongoing Plans and Programs**

The following is a summary of pedestrian specific plans and programs that are ongoing in the Bend MPO area.

### *Strategic Implementation Plan for Walking and Biking Infrastructure*

The City of Bend and Bend MPO are in the process of developing this plan. When completed, it will outline a strategy for incorporating bicycle and pedestrian focused projects into the City’s Capital Improvements Plan (CIP). To date, the effort has identified five “Pedestrian Zones” where walkable areas have the most potential. The zones were prioritized against each other and specific projects identified for the top three zones. The City has received project ideas from the public related to upgrading/completing existing facilities, improving crossings of multi-lane roads, and creating new connections within these zones. The plan is also identifying important corridors where accessibility improvements are needed.

### *ADA Transition Plan for Curb Ramps in Public Rights-of-Way*

Completed in February 2014, this plan outlines how the City will improve curb ramps to meet accessibility standards.

### *ADA Improvement Construction Program*

The City of Bend maintains an ongoing program to upgrade curb ramps and construct sidewalks to improve accessibility. This program is currently focused on areas serving medical and government facilities. It is guided by the nine-member City of Bend Accessibility Advisory Committee.

### *Bicycle and Pedestrian Documentation Project*

In 2013, the Bend MPO and the City of Bend began an annual bicycle and pedestrian counting program. This program is modeled after the National Bicycle and Pedestrian Documentation Project. The program involves volunteers counting two-hour periods at about 30 designated locations on a quarterly basis on both weekdays and Saturdays.

### *Road User Safety Task Force*

Initially formed to improve road safety for people on bicycles, the road user safety task force now focuses on reducing crashes between motor vehicles and bicycles and pedestrians. Many of the task force's efforts are aimed at educating road users. Notable projects the group has taken on include media campaigns, obtaining a proclamation from the Bend City Council of a road safety week in each year starting in 2010, and the previously described bicycle and pedestrian documentation project.

### *Deschutes County Bicycle and Pedestrian Advisory Committee*

A group of local residents makes up the Deschutes County Bicycle and Pedestrian Advisory Committee. Its members are appointed by the Deschutes County Board of Commissioners, but the committee also serves the City of Bend and ODOT. The committee is involved in a number of promotional and educational activities and serves as an advisory group to specific projects. It maintains its own website that it uses to disseminate information about upcoming projects and general bicycling and walking educational materials.

### *Pedestrian Injury Prevention Action Team Program*

Commute Options was recently selected to participate in the *Pedestrian Injury Prevention Action Team Program* run by the Safe States Alliance. As a part of this program, Commute Options staff will receive guidance in preparing training materials for local and State agencies and conduct these trainings and have the access to grant funds that can be awarded to local agencies.



## **The Bicycle System**

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Residents and tourists of all ages enjoy bicycling for both transportation and recreation. Bend's relatively small size and short distances encourage travel by bicycle. The MPO area has been designated as a silver-level Bicycle Friendly Community by the League of American Bicyclists. In awarding this designation to the City and the adjacent urbanized area of Deschutes County, the League noted strong points of the community's application as being the culture of the region, promotional and educational efforts (e.g. Bike Month, Bicycle Diversion Program), Commute Options' services, and improvements being made to the on and off-street networks.

### **Existing and Proposed Bicycle System**

The majority of the current bike system is found on arterial and collector streets as bike lanes. The network of multi-use trails also serves as an important part of the bike system. Based on need and road characteristics, all roads open for public use should be considered for the potential to improve travel opportunities by bicycle. Facilities should safely accommodate users.

The existing and proposed bicycle system is delineated in Figure 7-2. These facilities are based on an inventory from the *Bend Urban Area TSP* and also reflect projects that have been completed after the TSP. The system as proposed should be considered general in nature. Flexibility should be permitted during the development and design of roadways and private lands to locate these planned bicycle facilities to fit the context of the natural terrain, to minimize grade, to minimize safety issues, and consider any other topographic or geographic barriers or issues. It is the intent of the bicycle system to provide direct and convenient bicycling connections to parks, schools, open spaces, employment areas, shopping destinations, and the like.

The City's *Strategic Implementation Plan for Walking and Biking Infrastructure* described above includes the development of priority bicycle improvement projects for the City. Phase II of the MTP Update will incorporate these projects into the 2040 MTP. Chapter 6 of this MTP identifies the committed and build projects for the City. Although some of the identified projects are new roadways or roadway upgrades, which will include a bicycle facility component, the majority of bicycle facility projects will be covered under the funding allocated for the City of Bend local transportation projects.

During the city's Strategic Implementation Planning efforts, there was a strong desire to enhance bike system elements above and beyond the basic provision of a bike lane. The following section identifies bike system components that will help the city fulfill that desire.

### **Components of the Bicycle System**

The following is a description of the components of the existing and planned bicycle networks. More detailed information on these and other bicycle facilities can be found in the City of Bend's 2014 publication *A Complete and Attractive System of Bikeways Tool Box*.

### *Bike Lanes*

A bike lane is a space on the road shoulder that is delineated from the adjacent vehicle travel lane by a solid white striped line. Bike lanes are provided on both sides of the street and promote travel in the same direction as the adjacent lane of traffic. This practice provides an exclusive place for bicycles and requires a cyclist to conform to the laws of motor vehicle travel.

Bike lanes are intended to provide a convenient and exclusive location for bicycles on collectors and arterials. Bike lanes provide a clear and distinctive location on the road for bikes to travel at their own speed. They improve driver expectation of bike movements and they reduce bike and auto conflicts. Bike lanes provide a benefit to all modes of travel. For pedestrians, they help separate bike movements from the sidewalk and they increase walking comfort due to the increased sidewalk separation from adjacent auto traffic. For motor vehicle traffic, the lanes add buffer space from roadside obstacles and they improve driveway and intersection sight distances.

It is preferable not to permit on-street parking next to a bike lane due to the hazard of opening car doors and the conflict of cars moving in and out of the parking stalls. However, there may be locations where it is necessary to provide both parking and bike lanes. Where space is limited, one design solution is the construction of recessed parking bays to better accommodate the space requirements for both needs. Another solution is to provide a buffer space between the bike lane and the parking lane that moves cyclists out of the “door zone.” In other cases, such as the commercial downtown core area where a large inventory of on-street parking is essential, the need to provide vehicle parking may take priority over the delineation of bike lanes. In that case, where lower traffic speeds can be maintained, bikes can be accommodated through a mixed traffic flow such as with Shared Markings.

### *Buffered Bike Lanes*

A buffered bike lane is similar to a conventional bike lane, but it is separated from the adjacent motor vehicle travel lane and/or parking lane by a painted buffer. The painted buffer space increases comfort by providing further separation between bicycle and motor vehicle traffic (or the doors and mirrors of parked cars).

### *Protected Bike Lanes/Cycle Tracks*

Protected bike lanes, also called cycle tracks or separated bike lanes, separate bicycle traffic from motor vehicle traffic using a physical barrier. Common barrier types include plastic bollards, parked cars, and curbing (including a raised bike lane). The physical barrier further increases comfort for bicyclists. It also introduces additional considerations that need to be accounted for depending on the barrier type (e.g. maintenance). There are two examples of protected bike lanes within the Bend MPO Area. In 2003 the city constructed a raised bike lane on Reed Market Road as part of the Southern River Crossing project. A recently completed project on Riverside Boulevard provides a nice example of a protected bike lane application within the Bend MPO area.

### *Rural Bikeways*

On most rural roadways, shoulder bikeways are appropriate, accommodating cyclists with few conflicts with motor vehicles. In general, the minimum shoulder widths recommended by ODOT's Bicycle and Pedestrian Design Guide for rural highways are adequate for bicycle travel. These standards take into account traffic volumes and other considerations. Shared roadways are adequate on low-volume rural roads, where motor vehicle drivers can pass bicyclists due to the low likelihood of encountering on-coming traffic. Shoulder bikeways can be added to roads with high bicycle use, such as in semi-rural residential areas or close to urban areas. It may be appropriate to stripe and mark shoulders as bike lanes near schools or other areas of high use. Even adding minimal-width shoulders can improve conditions for bicyclists on roads with moderate traffic volumes. On roads with high use, it may be necessary to add full-width shoulders in areas of poor visibility due to topography.

### *Shared Roadways*

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. The majority of rural roads in the region are shared roadways. Shared roadways are suitable in urban areas on streets with low speeds (25 MPH or less) or low traffic volumes (3,000 ADT or less, depending on speed and land use). In rural areas, the suitability of a shared roadway decreases as traffic speeds and volumes increase, especially on roads with poor sight distance. The city is considering creating a network of shared urban roadways called Bikeways, which would provide a comfortable road to travel on away from the busier traffic of the arterial roadways. Arterial crossings would be an important design elements of the Bikeways.

### *Wide Curb Lanes*

A wide curb lane may be provided where there is inadequate width to provide the required bike lanes or shoulder bikeways. This may occur on retrofit projects where there are severe physical constraints, and all other options have been pursued, such as removing parking or narrowing travel lanes. Wide curb lanes are not particularly attractive to most people on bikes; they simply allow a motor vehicle to pass the slower vehicle within a travel lane.

To be effective, a wide lane must be at least 14 feet wide, but less than 16 feet. Usable width is normally measured from curb face to the center of the lane stripe, but adjustments need to be made for drainage grates, parking and the ridge between the pavement and gutter. Widths greater than 16 feet encourage the undesirable operation of two motor vehicles in one lane. In this situation, a bike lane or shoulder bikeway should be striped.

### *Shoulder Bikeways*

Paved shoulders are provided on rural highways for a variety of safety, operational and maintenance reasons:

- Space is provided for motorists to stop out of traffic in case of mechanical difficulty, a flat tire, or other emergency;
- Space is provided to escape potential crashes;
- Sight distance is improved in cut sections;
- Highway capacity is improved;
- Space is provided for maintenance operations, such as snow removal and storage;
- Lateral clearance is provided for signs and guardrail;
- Storm water can be discharged farther from the travel lanes; and
- Structural support is given to the pavement.

### *Bike Parking Facilities*

For a bikeway network to be used to its full potential, secure bicycle parking should be provided at likely destination points. Lack of secure parking is often cited as a reason people hesitate to ride a bicycle to certain destinations. Bicycle parking should also be convenient, easy to access, and provide suitable protection from the weather. Bike parking needs to be designed for both short- and long-term use, depending on site conditions and demands. The city of Bend has provided a number of short-term bike racks throughout the central business area. These racks have helped reduce some of the automobile parking demand in this activity center. To support public transportation service, bike-parking facilities should be provided at all park and ride lots, major transit stops and transit center facilities. Adequate bike parking facilities need to be provided where other public facilities, such as libraries, parks, recreation centers and schools, are constructed and wherever automobile traffic is provided.

### **Ongoing Plans and Programs**

The following is a summary of bicycle-specific plans and programs that are ongoing in the Bend MPO area.

#### *Strategic Implementation Plan for Walking and Biking Infrastructure*

The City of Bend and Bend MPO are in the process of developing this plan. When completed, it will outline a strategy for incorporating bicycle and pedestrian focused projects into the City's Capital Improvements Plan (CIP). To date, in regards to bicycle infrastructure, the effort has identified guiding principles, project delivery strategies, a phasing approach, and a series of priority corridors and critical gap closure projects.

#### *Bicycle Diversion Program*

The mission of the bicycle diversion program is "education through enforcement." Under this program, people who are cited for bicycle-related traffic infractions are given the option to have their fine reduced by taking an educational course that is offered monthly. The program is a collaborative effort of local enforcement agencies, the City of Bend, and Commute Options.

#### *Bicycle and Pedestrian Documentation Project*

##### *Road User Safety Task Force*

##### *Deschutes County Bicycle and Pedestrian Advisory Committee*

See the Pedestrian section for descriptions of this project and these groups.

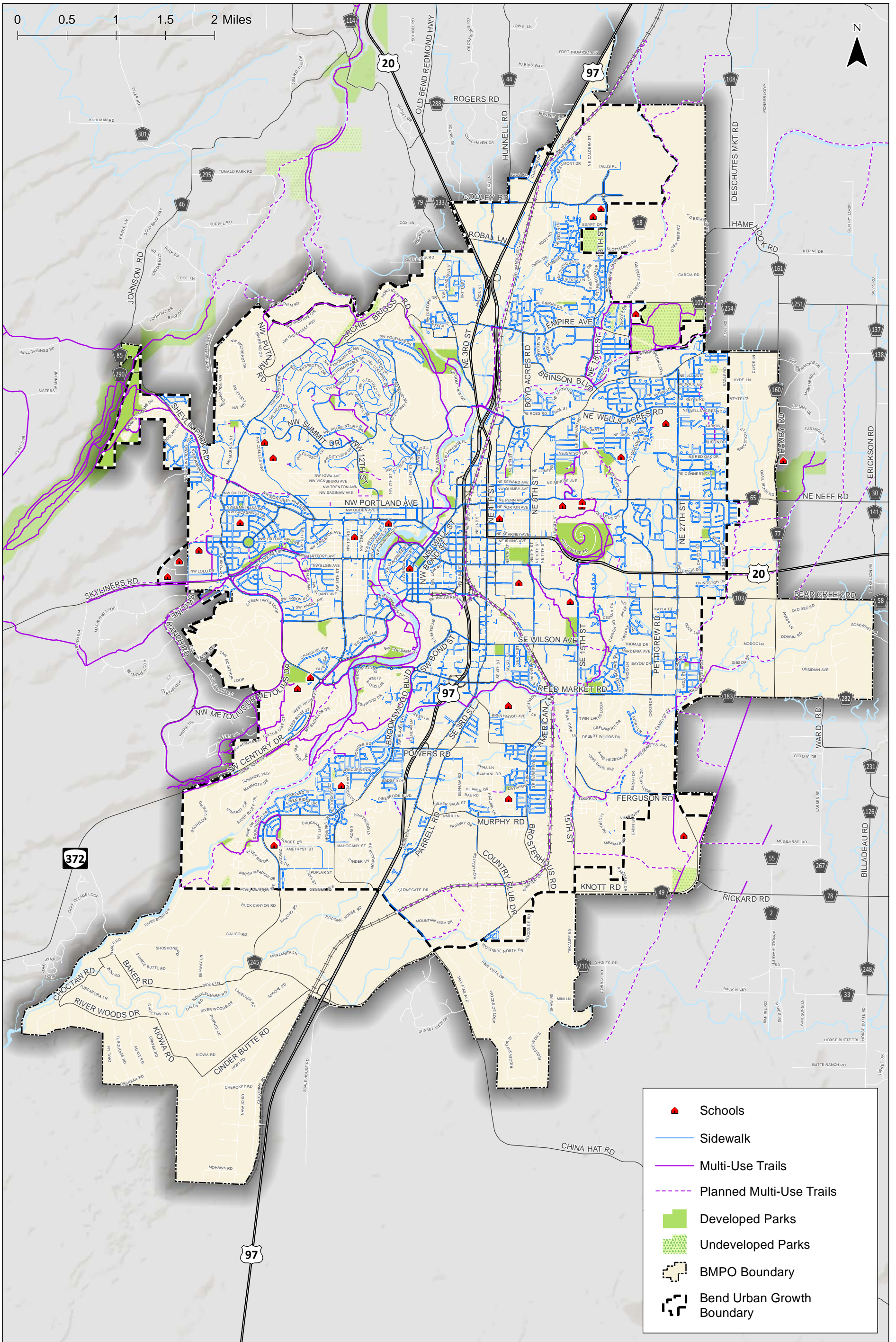
## **Bicycle and Pedestrian Policies**

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1. Assist the City, County, State, Forest Service, Park District and other agencies, including irrigation districts, to acquire, develop and maintain a series of trails along the Deschutes River, Tumalo Creek, and the irrigation district canal system so that these features can be retained as a community asset. Work with these same agencies to identify and develop connections between the Bend Urban Area Bicycle and Trails System and the USFS trail system.
2. Assist the City and Park District to acquire, develop and maintain the primary trails designated on Figure 7-2.
3. Assist the City with developing safe and convenient bicycle and pedestrian circulation to major activity centers, including the downtown, schools, shopping areas, and parks. Particular emphasis should be given to east-west access barriers to the downtown area (e.g. the Bend Parkway, the railroad, etc.).
4. Work with the City to facilitate easy and safe bicycle and pedestrian crossings of major collector and arterial streets. Work with the City to identify intersection designs that include pedestrian refuges or islands, curb extensions and other elements where needed for pedestrian safety and extend bike lanes to meet intersection crosswalks.
5. Work with the city and county to ensure that bike lanes or bikeways are included on all new and reconstructed arterials and collectors. Add bike lanes to existing arterial and collector streets with particular emphasis to fill the gaps in the on-street bikeway system. Provide an appropriate means of pedestrian and bicyclist signal actuation at all new or upgraded traffic signal installations.
6. Work with the city to ensure that property-tight sidewalks are included on both sides of all new or reconstructed arterial and collector streets except where extreme slopes, severe topographical constraints, or special circumstances exist. Add sidewalks to all existing arterial and collector streets to fill the gaps in the pedestrian system.
7. Work with the City and County to develop a program to ensure timely maintenance and repair of all sidewalks, including, but not limited, to assigning responsibility for maintenance and repair.
8. Work with the City and County to ensure that bicycle and pedestrian facilities are maintained in a manner that promotes use and safety. Perform street repair and maintenance in a manner that does not negatively impact bicycle and pedestrian facilities and their use.

9. Work with the City to ensure that bicycle parking facilities are provided at all new multifamily residential, commercial, industrial, recreational, and institutional facilities, major transit stops, transit stations, and park-and-ride lots.
10. Encourage the City to establish or maintain accessways, paths, or trails prior to vacating any public easement or right-of-way.
11. Work with the City, County, and State to support bicycle and pedestrian education and safety programs.
12. Work with the City and the Burlington Northern – Santa Fe (BNSF) Railroad to determine where, if possible, railroad right-of-ways could be used also as trail corridors. Provided a joint-use agreement can be reached with BNSF, work with the City to evaluate the entire Rails with Trails Corridor in light of opportunities to augment the local primary trail system.
13. Work with the City, County, and Park and Recreation District, to identify funding options for right-of-way acquisition, design, construction and maintenance of priority trails.
14. Work with the City, County, and Park and Recreation District to update sidewalk, trail and bike lane systems inventories and identify gaps and missing system segments and prioritize these for completion.
15. Work with the City to identify specific annual targets for sidewalk in-fill projects.
16. Work with the City and County to identify specific annual targets for bikeway in-fill projects.
17. Work with the City and Park and Recreation District to identify specific annual targets for securing public right-of-ways or easements for trails and constructing trails.





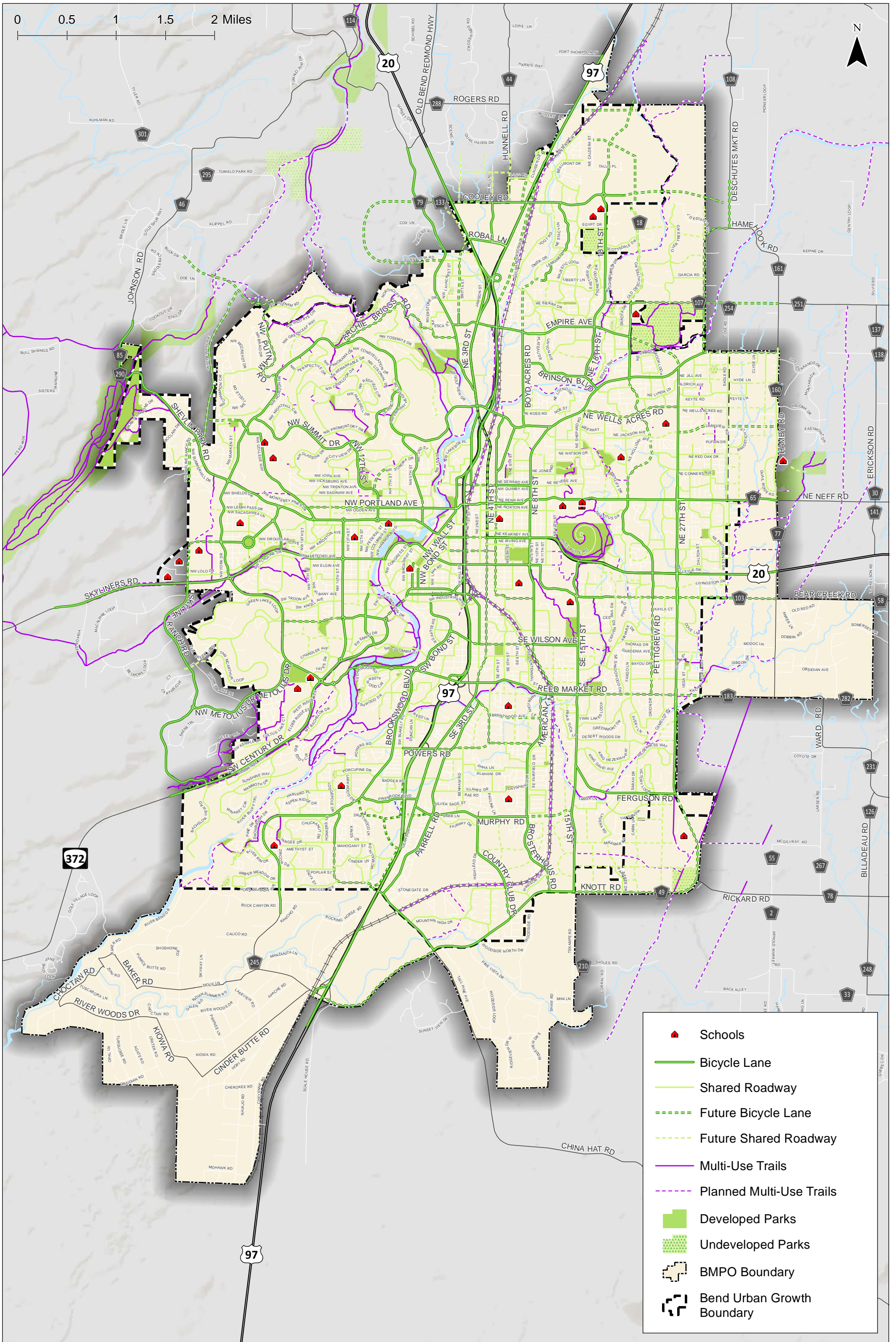
**Pedestrian Facilities  
Bend, Oregon**

**Figure  
7-1**

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**Bicycle Facilities  
Bend, Oregon**

**Figure  
7-2**

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