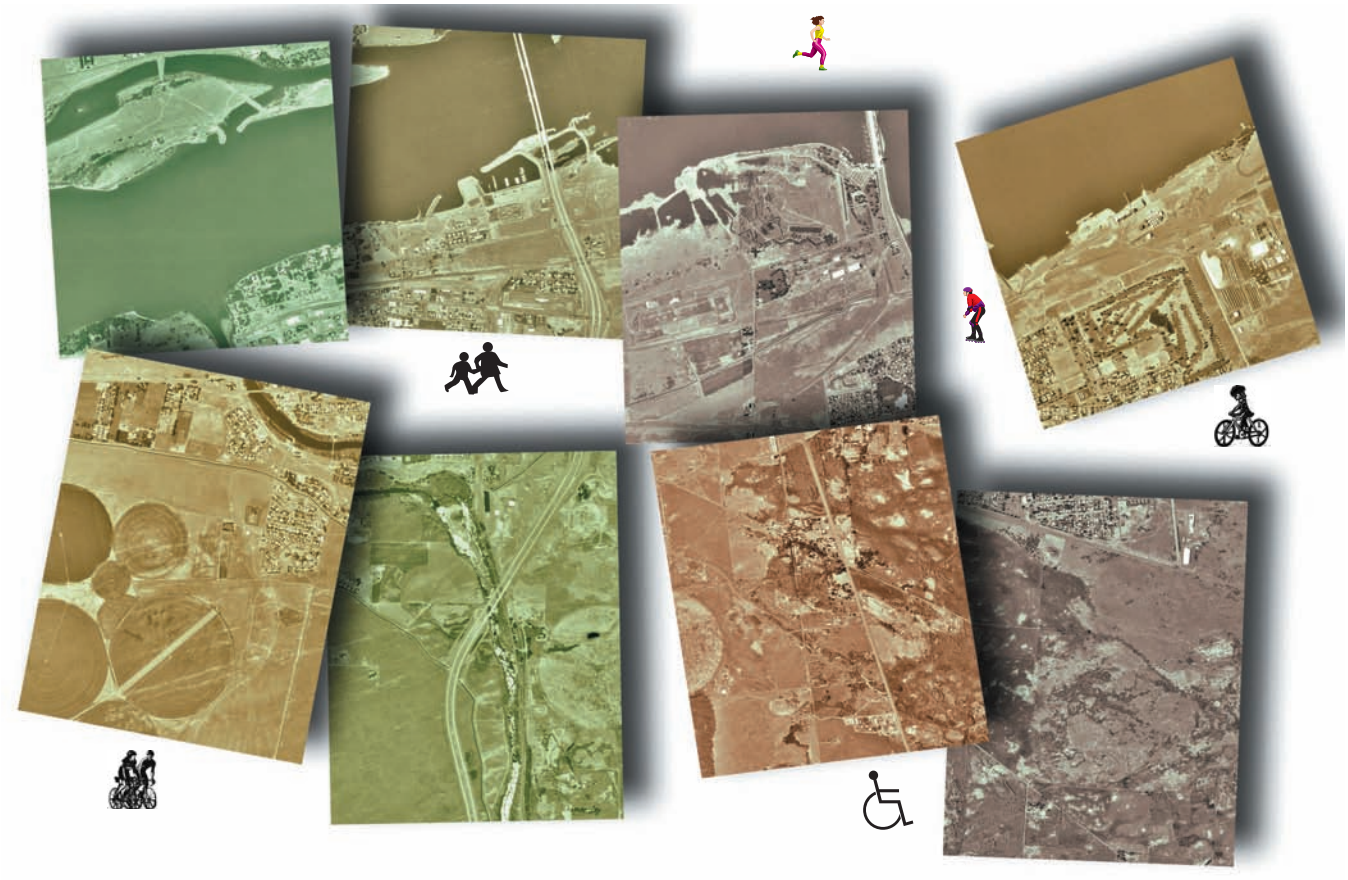


Umatilla

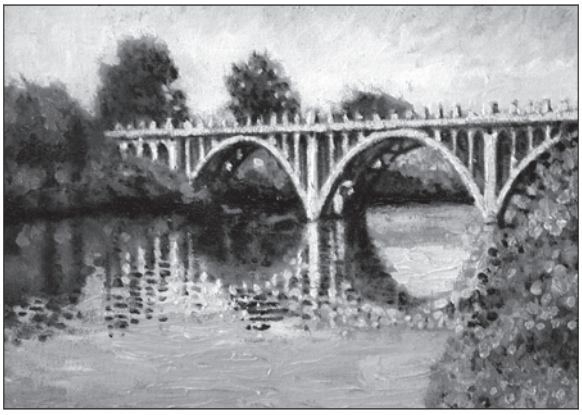
Pedestrian & Bicycle

MASTER PLAN

June 3, 2003

This project is partially funded by the Transportation and Growth Management Program (TGM), a joint program of the Oregon Department of Transportation and the Oregon Department of Land Development and Conservation. This TGM grant is financed, in part, by federal Transportation Equity Act for the 21st Century (TEA-21), local government, and the State of Oregon Funds.

Neither the City of Umatilla nor ODOT guarantee funding to complete any project described in this document.



Historic Umatilla River bridge

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McNary Dam

1 Scope

The Umatilla Pedestrian & Bicycle Master Plan refines the pedestrian and bicycle elements of the City's adopted Transportation System Plan and furthers the work of the completed Downtown Study. It combines on-street bikeways and sidewalks with off-street paths to:

- Connect the community.
- Improve access to local destinations.
- Provide opportunities for healthy exercise.
- Reduce dependence on cars for short trips.
- Reduce conflicts between travel modes.
- Meet the needs of the those not using a car.
- Support local land uses.
- Help implement the Lewis & Clark Commemorative Trail.

The process included:

- Scoping tour with the technical advisory committee.
- Periodic meetings with the advisory committee.
- Review of existing plans and materials.
- Stakeholder interviews.
- Children's workshop.
- Two community workshops.
- Task-oriented draft documents:
  - Base map and inventory.
  - Opportunities and constraints.
  - Project feasibility analysis.
  - Code revisions.
  - System development charge example.
  - Updated highway traffic counts.
  - Preliminary engineering design standards.
  - Capital improvement program.

The results are presented in the following sections:

Section 2, Background Research, presents the information gathered during the scoping tour, kick-off meeting and review.

Section 3, Inventory, summarizes the existing and planned bikeway and walkway facilities.

Section 4, Systemwide Factors, looks at factors which affect overall system design and effectiveness.

Section 5, Neighborhood Analysis, evaluates a refined list of projects developed from the workshops. They are divided into four geographical areas.

Section 6, Capital Improvement Program, lists recommended projects for the near (10 years) and long-term (20 years).

Seven appendices provide supporting material including a glossary of terms and system maps.

2 Background Research

2.1 Sources

The inventory consisted of identifying, researching, field-checking, and analyzing opportunities and constraints within the Umatilla Urban Growth Boundary. Initial sources used included:

- 1999 City of Umatilla Transportation System Plan (TSP)
- 2001 City of Umatilla Downtown Revitalization and Circulation Study (Downtown Study)
- 2002 Lewis and Clark Pathway Land Memorandum of Understanding (MOU)
- 1999 City of Umatilla Comprehensive Plan and Zoning Map
- 2000 U.S. Census data
- 1991 USGS topographical map
- 1996 USGS satellite photos

Using a base map provided by ODOT, the identified opportunities and constraints were mapped in layers to reveal the location of possible bikeway and walkway alignments.

2.2 Area Description

From the 2002 Census update, Umatilla had a population of 5990, similar to other cities such as Eagle Point, Scappose, Madras and Sandy, but with less density within its 3.72 square miles. The elevation is about 300 feet and is relatively flat with a few short hills. The region gets only 9 inches of rain per year. Average temperatures range from 26 in January to 88 in July. Overall, the area has an excellent environment for walking and bicycling.

According to the 2000 Census, the population includes 1830 workers over age 15 (37% of population) and 1325 students (27%). Among the workers, 93% reported that their usual mode of transportation was a car. About 2.3% usually commuted by walking or bicycling, and 2.5% worked at home, both about half the state average. There is no public transit available. The average travel time to work for those who did not work at home was 19 minutes, below the state average of 21 minutes. (Note that work trips comprise only one in five trips nationally, and do not include trips to school, shopping or recreation.)

2.3 Jurisdictions

Land and transportation facilities in or adjacent to the City are under full or partial control of many agencies:

- City of Umatilla (local streets)
  - 5th Street
  - 7th Street
  - Switzler Avenue (shown as a County road on TSP Figure 2)
  - Willamette Avenue
  - Columbia Street

Note: There are no sidewalks or bicycle facilities on County roads except for a section of sidewalk on the west side of Powerline Road at the south end.

Note: There are no sidewalks or bicycle facilities on Highway 395. Interstate 82 has an unmarked access path from 3rd Street to a multi-use path on the Columbia River Bridge. Highway 730 has some sidewalks west of I-82, primarily in the downtown area, and paved shoulders elsewhere.

- Umatilla County (regional roads within the City)
  - Powerline Road
  - Umatilla River Road
  - Brownell Boulevard
  - 3rd Street (east of I-82)
  - Bud Draper Drive
  - McNary Beach Access Road
  - Power City Road
  - Roxbury Road (shown on TSP Figure 2)
- Oregon Department of Transportation, District 12 (highways)
  - Interstate 82
  - Highway 730
  - Highway 395
- Umatilla School District (3 schools)
- Port of Umatilla
- Union Pacific Railroad
- U.S. Army Corps of Engineers, Portland and Walla Walla Districts
  - Devore Road
  - Riverside Avenue (not mentioned in TSP but important street)
- Bonneville Power Administration (power line corridor)
- West Extension Irrigation District, Irrigon, OR (irrigation canal)

2.4 *Nonmotorized Traffic Generators*

The following important nonmotorized traffic generators and trip destinations exist in Umatilla.

Schools

- McNary Heights Elementary School
- Clara Brownell Middle School
- Umatilla High School
- Elementary school on Powerline Road (planned)

Parks/Sport Fields/Recreation

- Lewis & Clark Commemorative Trail
- High School-Middle School track and ball fields
- Umatilla River
- McNary Wildlife Nature Area
- West Park
- Port of Umatilla Marina and RV Park
- McNary Golf Course
- Recreational routes (see list at right)
- Future ballfield on Bud Draper Road
- Old Umatilla townsite (potential)

Commercial/Work Destinations

- Downtown core (Highway 730 west of "J" Street)
- Highway 730 at I-82
- Columbia Red Apple Market (Highway 730 near Yerxa Avenue)
- McNary Market (Highway 730 at Willamette Avenue)

- Highway 730 & 395 (potential)
- South Powerline Road (potential)

Industrial/Work Destinations

- Port of Umatilla
- McNary Dam and Locks
- Two Rivers Correctional Institution

Other Traffic Generators

- Post Office (1900 6th Street)
- Public Library (911 7th Street)
- Welcome Center (100 Cline Avenue)
- Umatilla Museum & Historical Foundation (911 6th Street)
- Senior Center (7th & "B" Street)
- "I" Street (future pedestrian-oriented street per Downtown Study)

In addition to identifying major traffic generators and trip destinations, the areas of higher residential densities are considered to have higher potential to generate trips; namely, South Hill, McNary and Downtown.

Trip generators are important because every trip, even those counted as an automobile trip, involves a walking component. Furthermore, efficient walkway and bikeway systems can substitute pedestrian or bicycle trips for auto trips, especially for shorter distances (one-half to five miles).

In addition to reducing auto trips, nonmotorized trips have other benefits:

- They provide healthy exercise.
- They tie the community together in ways that motorized travel cannot.
- They reduce the amount of hydrocarbons released into the atmosphere by motor vehicle emissions. About 60% of hydrocar-

Recreational Routes

from www.umatilla.org

Route #1 - 2.0 miles **Easy** **45 Minutes**
3rd St. at Marina, east to Brownell Ave., south on Brownell, west on 6th St. (Main St.) to Switzler, north to 3rd to start.

Route #2 - 2.0 miles **Easy** **45 Minutes**
Start at fountain below McNary Dam and follow trail signs around wildlife area. Many shorter trails also.

Route #3 - 3.0 miles **Strenuous** **75 Minutes**
McNary Market to Columbia Street, west to Hwy 730, north to McNary Dam, uphill east to golf course and Willamette Ave., south to McNary Market.

Route #4 - 1.5 miles **Easy** **30 Minutes**
McNary Market to Columbia Street, west to Chenowith St., north to Rio Senda leading east back to Willamette and south to McNary Market.

Route #5 - School Track **Moderate**
Access from South Hill area across Stevens Ave. to Footbridge Trail leading to school, or walk from south end of I Street to the track.

Route #6 - 0.7 miles **Moderate** **30 Minutes**
Start at basketball court (W. Columbia/Van Buren) on South Hill, east on Van Buren St. to Pierce St., north on Powerline to Jefferson St. and west to West Columbia St.

bon emissions occur within a mile of the motor vehicle trip origin, nearly 85% of the emissions occur within the first five miles after the starting an automobile.

Because many trips are of short distance, a system for nonmotorized transportation could have a significant impact on the air quality of the community. According to the 1990 Nationwide Personal Transportation Survey (NPTS), 27% of travel trips are one mile or less, 40% are two miles or less, and 63% are five miles or less.

While the NPTS data cover all trips in the nation, the 2000 Census data provide a look at how Umatilla residents commute (the survey was taken in March 2000). Travel time to work was less than 5 minutes for 4% of workers, less than 10 minutes for 14%, and less than 15 minutes for 30%. Many of these trips would be suitable for walking or bicycling if a comprehensive network of pathways, sidewalks, and bicycle facilities existed.

2.5 *Implementation Plan*

The 20-year Transportation Improvement Program outlined in the TSP lists 54 projects estimated to cost nearly $15 million as shown in Table 1. By far the greatest need identified was sidewalks with 37 projects totaling $9.35 million. There are another 8 multi-use path projects totaling $1.33 million.

Over half of the roadway project cost is for replacing the Umatilla River bridge. The remainder of the roadway system needs relatively minor improvements according to the TSP. However, many county roads were not included, most of which have less than 24 ft of pavement width — far below the standard for arterial and collector streets. The additional width is particularly important to bicyclists and pedestrians.

The TSP notes that the City's annual Street Fund of $250,000 is dedicated entirely to the operation and maintenance of the existing facilities. The few capitol improvement projects realized were funded primarily by the developer or by a Local Improvement District. The TSP recommended a transportation system development charge.

Table 1. TSP Implementation Plan

Project Category	Short-Term (1998-2007)		Long-Term (2008-2017)		Total	
	Projects	Cost, $M	Projects	Cost, $M	Projects	Cost, $M
Roadway	2	$0.29	7	$3.40	9	$3.69
Sidewalk	13	$1.16	24	$8.19	37	$9.35
Multi-Use Path	0	0	8	$1.33	8	$1.33
Total	15	$1.45	39	$12.92	54	$14.37

3 Inventory

3.1 Street System

A priority of the Pedestrian & Bicycle Master Plan is to extend the off-street pathways and connect them to on-street bicycle and pedestrian facilities. Successful pathway networks connect with good on-street facilities; this connectivity provides the kind of access and mobility needed to make nonmotorized modes attractive.

The existing city street system excluding I-82 is summarized in Table 2. There are roughly 7.7 mi of arterial streets and 12.7 mi of collector streets. There are about 5.1 mi of sidewalks on the 20.4 mi of arterial and collector streets, so 12% have sidewalks (counting both sides of the street).

There is about 1.0 mi of bike lane, or about 3% of the arterial and collector streets have bike lanes (counting both sides of the street).

There are at least 25 intersections with crosswalks, most of these downtown.

Looked at from one perspective, there are over 20 ft of major roadway from 2 to 5 lanes for every resident, but there are only 5 feet of sidewalk.

Table 2. Existing Street System

Street	Length,	Walkways	Bikeways
Major Arterials — 26,250 ft (5.0 mi)			
Highway 730 (6th Street)	16250	Partial (25%)	Wide lane or shoulder
Highway 395	3300	No	Shoulder
Bud Draper Drive	4000	No	Shared
Roxbury Road	2700	No	Shared
Minor Arterials — 14,000 ft (2.7 mi)			
Powerline Road	8900	Partial (5%)	Shared
Umatilla River Road	3200	No	Shared
Brownell Blvd. (3rd to 6th St.)	1900	No	Shared
Collectors — 55,650 ft (10.5 mi)			
3rd Street ("I" Street to east)	11800	No	Shared
"I" Street	1050	No	Shared
Switzler Avenue	1200	No	Partial bike lane (20%)
Quincy Avenue	1300	No	Shared
7th Street	5100	Partial (20%)	Shared
Scapelhorn Road	4400	No	Shared
Power City Road	6100	No	Shared
Devore Road	3600	No	Shared
Rio Senda Drive	2250	Yes	Shared
Willamette Avenue	3000	Partial (40%)	Shared
Riverside Avenue	4900	No	Shared
McNary Beach Access Road	7700	No	Shared
Margaret Avenue	3350	No	Shared
Neighborhood Collectors — 11,700 ft (2.2 mi)			
Madison Avenue & Grant Street	2400	Partial (10%)	Shared
Monroe Street	1000	Yes	Shared
Stephens Avenue	1550	No	Shared
Columbia Avenue	2900	Partial (15%)	Partial bike lane (85%)
Chenoweth Avenue	1050	No	Shared
Walla Walla Street	2800	Partial (45%)	Shared

3.2 *Pedestrian Facilities*

3.2.1 *Existing Walkways*

Existing pedestrian facilities consist primarily of sidewalks, crosswalks, multi-use paths, trails, and bridges. The walkways are described in the TSP under Pedestrian System in Section 2, Existing Conditions; see Figure 5 in the TSP for sidewalks and paths. Some new facilities were constructed since the TSP was written.

Existing sidewalks and crosswalks are summarized in Section 3.1, Street System, and shown on the maps in Appendix B. In addition, there are three multi-use paths:

1) A path on the east side of the I-82 bridge over the Columbia River; accessed at 3rd Street.
2) A 10-ft wide asphalt path along the north side of the Umatilla River for roughly 2100 ft; accessed from the park parking lot at the south end of "B" Street and from the high school track.
3) A 10-ft wide asphalt path along the south side of 3rd Street between Switzler Avenue and Brownell Boulevard; roughly 3200 ft long; accessed from end points and from several points along 3rd Street.

Downtown core sidewalks should be 10 to 12 feet wide.

A pedestrian bridge across the Umatilla River connects the multi-use path on the north side to Stephens Avenue on the south side (south approach unpaved).

Numerous user trails (beaten paths created by people walking) exist. A prominent user trail connects the pedestrian bridge to Powerline Road. Another connects the north end of Willamette Avenue to the base of the hill on Riverside Avenue.

An extensive developed and maintained trail system exists at the McNary Wildlife Nature Area. The system has trailheads on Brownell Boulevard, Scapelhorn Road and Devore Road.

3.2.2 *Planned Walkways*

As noted in Section 2.5, Implementation Plan, the City's TSP lists 37 sidewalk and 8 multi-use path projects. Also, the Lewis & Clark Commemorative Trail is being planned to connect new and existing walkways in a signed trail that spans the entire City.

3.2.3 *Pedestrian Access Routes*

The Americans with Disabilities Act (ADA) requires that access for persons with disabilities is provided wherever a pedestrian way is newly built or altered, and that the same degree of convenience, connection, and safety afforded the public generally is available to pedestrians with disabilities. The basic requirement is for a continuous, unobstructed route. Guidelines cover pedestrian access to sidewalks and streets, including crosswalks, curb ramps, street furnishings, parking, and other

components of public rights-of-way. The guidelines can be found at the U.S. Access Board website <www.access-board.gov>.

Within the City, very few public walkways are accessible for more than a few feet.

Umatilla River path; park on left, encroaching vegetation on right.

3.3 *Bicycle Facilities*

3.3.1 *Existing Bikeways*

Existing bicycle facilities consist of striped lanes, shoulder bikeways and multi-use paths. Most bicycle travel within the city occurs on the roadways as built with no special provisions for bicyclists. The bikeways are described in the TSP under Bicycle System in Section 2, Existing Conditions; see Figure 5 in the TSP for bikeways. The 3rd Street path was constructed since the TSP was written.

Existing bicycle facilities are summarized in Section 3.1, Street System, of this report and shown on the maps in Appendix B. The vast majority of streets in the City are ridden as built with no special bicycle accommodation. Multi-use paths are described in Section 3.2, Pedestrian Facilities.

3.3.2 *Planned Bikeways*

Figure 15 in the TSP shows a recommended bikeway system that includes bike lanes on:

- Columbia Street — existing
- 3rd Street
- Highway 730 (6th Street)
- 7th Street
- "A" Street (south of Highway 730)

- "F" Street
- "L" Street (south of 7th Street)
- Sections of Devore Road and Riverside Avenue near 3rd Street
- Beach Access Road
- Powerline Road
- Lind Road (Power City Road to Union Street)
- Bonney Lane
- 2 future streets in South Hill

Eight planned multi-use paths could also be used by cyclists. This leaves several major streets without appropriate bikeways as required by the TPR:

- Roxbury Road (major arterial)
- Umatilla River Road (minor arterial)
- Brownell Boulevard (minor arterial)
- "I" Street (collector)
- Switzler Avenue (collector)
- Quincy Avenue (collector)
- Scapelhorn Road (collector)
- Power City Road (collector)
- Devore Road (collector)
- Rio Senda Drive (collector)
- Willamette Avenue (collector)
- Riverside Avenue (collector)
- Margaret Avenue (collector)

Some of the collectors may have traffic volumes below 2000 ADT at the end of the 20-year planning period of the TSP, so that it could be argued that a shared roadway is sufficient. However, volumes on these streets were not provided in the TSP.

3.3.3 *Regional Connections*

While the focus of this Plan is to identify and rank walkways and bikeways within the UGB, the importance of regional bikeway connections should not be overlooked. Many Umatilla residents travel to work, shopping or other purposes in the nearby cities of Irrigon, Hermiston and the Tri-Cities in Washington. Facility segments which provide an opportunity for the community to access areas outside of the UGB should be preserved and improved.

The major regional links for bicyclists include I-82, Highway 395, Highway 730, and Umatilla River Road. Only Umatilla River Road lacks adequate shoulders.

Bike lane on Columbia Street is dropped a block before the school.

4 Systemwide Factors

Many community characteristics and policies affect the ability of people to walk and bicycle. Some are physical barriers, whereas others are political or institutional. These factors affect all projects to some degree and are influenced by local policies and priorities.

4.1 Natural and Manmade Barriers

Physical barriers to bicycling and walking can force people to make longer trips or to resort to taking a car. People without access to a car may have to forgo the trip entirely.

Angled tracks with a rough, irregular flange opening can easily cause a cyclist to fall.

Some barriers, such as waterways, require bridges for convenient travel. The pedestrian bridge over the Umatilla River is a good example. The bridge on Washington Street over an irrigation canal is another important connection for pedestrians and bicyclists.

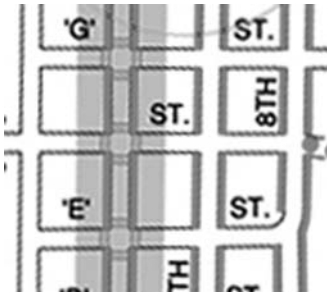
Highways including I-82, 395 and 730 are usually thought of as connecting areas but they can be a significant barrier to non-motorized traffic. Where there are no sidewalks, as on Highway 395 and the east half of Highway 730, pedestrians lack mobility. Where safe crossings are few or poorly designed, such as on these same highways, pedestrians and bicyclists lose access.

Railroad tracks, whether active or inactive, are further barriers. There are several at-grade rail crossings in the City that have angled tracks, damaged pavement and no sidewalks.

Both irrigation canals and rail corridors can potentially provide excellent trail facilities. Each has its own challenges in terms of convincing property owners and agencies that risks can be managed.

4.2 Development Pattern

The City of Umatilla has a unique development pattern, consisting of three somewhat separated nodes: McNary, Downtown, and South Hill. Each of these areas forms a distinct neighborhood. The most significant constraints to walking and bicycling created by this land use pattern are not within each of these three distinct areas, but between them.



A dense grid of streets maximizes access and route choices, both critical to walking.

Most new residential development is occurring in South Hill which has no commercial services or employers and limited access via a single major road. The City has recognized that the current land use pattern in South Hill has drawbacks to pedestrian and bicycle traffic, among other things. Long-term, some of the problems in South Hill will be solved by the inclusion of small commercial areas and a school, reducing the need for trips into the Downtown area. However, it appears that housing is being created at a faster rate than other types of development. The City may wish to consider incentives for developing the neighborhood commercial area.

The City is also supporting mixed use zoning in the Downtown, which should eventually lead to more people living and shopping in the downtown core.

4.3 *Street Standards and Development Codes*

4.3.1 *Transportation System Plan*

Transportation Planning Rule (TPR)

660-012-0045 (3)(b)(B) Implementation of the Transportation System Plan

Bikeways shall be required along arterials and major collectors. Sidewalks shall be required along arterials, collectors and most local streets in urban areas, except that sidewalks are not required along controlled access roadways, such as freeways.

The City of Umatilla adopted its Transportation System Plan (TSP) in 1999. This document includes pedestrian and bicycle system plans, which are discussed elsewhere in this report. The TSP also includes street functional classifications and cross-sections, which are addressed here. There are several opportunities for revision to these classifications as discussed below.

4.3.1.1 *Major Arterials*

This roadway cross-section shows a five-lane arterial with an 86-foot wide optional continuous center turn lane and optional outer lanes. Five-lane arterials are the most hazardous street configuration for pedestrians because of the distance and the complex intersections required. In addition, this lane configuration tends to result in a greater number of vehicle crashes, mainly due to the continuous center turn lane. Based on the TSP's 20-year capacity analysis, concerns center around the Highway 730/I-82 interchange and truck weigh station. Therefore, it is unlikely that a five-lane configuration would actually be needed within the Umatilla urban boundaries within the 20-year planning period.

It is recommended that the City reconsider the likelihood and desirability of a five-lane major arterial within the urban boundaries. Some modifications to the adopted cross-section might include the optional or required provision of a center median to restrict turns and provide a pedestrian crossing refuge, or limiting the lane configuration to three lanes.

The Major Arterial cross-section also makes the planting strip an optional component, with a six-foot sidewalk required. Given the volumes and speeds of traffic on a typical major arterial and the safety and comfort impacts of that traffic on pedestrians, it is recommended that either the planting strip be made a required component or the minimum sidewalk width increased to at least 10 feet.

4.3.1.2 *Minor Arterials*

There appear to be two major differences between the Major and Minor Arterial: the required right-of-way is 12 feet lesser, and bike lanes are optional. In the TSP, planned minor arterials along with collectors provide the most connectivity within the urban area. The Transportation Planning Rule requires bikeways along all arterials and major collectors (OAR 660-0120945(b)(B)). It is not evident from the TSP that planned separated pathways can provide the same level of connectivity (although pathways are also important). It is recommended that the Minor Arterial cross-section be revised to require bike lanes.

In addition, the comments on five-lane sections and planter strips for Major Arterials also apply to Minor Arterials.

4.3.1.3 *Collectors*

Comments on bike lanes for Minor Arterials also apply to Collectors. The City's Collector and Neighborhood Collector classifications are equivalent to Major Collector and Minor Collector.

4.3.2 *Land Division Code (Title 11)*

Umatilla's Land Division Code (Title 11) includes minimum street standards for new streets. These standards largely reflect the City's recently adopted Transportation System Plan (1999). Major arterials and some minor arterials and collectors (as designated in the City's TSP) must include six-foot bike lanes. As discussed above, it is recommended that bike lanes be required on all arterials (major and minor) and collectors, in order to provide connectivity.

Title 11, as recommended in the 1999 TSP, also states that, "Bikeways shall be designed and constructed consistent with the design standards in the Oregon Bicycle Plan, 1992, and AASHTO's "Guide for the Development of Bicycle Facilities, 1991." The correct reference is the current edition of the Oregon Bicycle and Pedestrian Plan; the most recent edition was published in 1995 and a revision is due out next year. It is not necessary to reference AASHTO because the Oregon Plan incorporates relevant parts of it and supersedes the rest.

All street types identify sidewalks as a required element. Sidewalk width ranges from six feet on major arterials to five feet on other public streets.

However, although the TSP allows the option of a "planting strip" on arterials and collectors, the code specifies that sidewalks should be curb-tight rather than setback at the property line. For pedestrian safety and comfort, it is optimal to place sidewalks further back from the road edge on streets. This is particularly true where vehicle speeds exceed 25 mph, where there are no parked cars or bicycle lanes to buffer pedestrians from the noise and proximity of vehicles, and where sidewalk widths are narrower than 10 feet.

Some jurisdictions have been concerned that the setback area or "landscape strip" will not be maintained and may become an eyesore. The benefits to pedestrians largely outweigh these concerns, even where the buffer strip is not maintained. Outside of the downtown area, where landscaping is more desirable and likely to be maintained, many

eastern Oregon cities have found that gravel base and a regular weed maintenance program is sufficient.

4.3.3 *Downtown Study*

A Downtown Revitalization and Circulation Study was completed in 2001, which modified the street standards for the area between "A" Street and Umatilla River Road. In this area, sidewalks are recommended to be from eight to ten feet wide, on-street parking is required, traffic lane width is limited to 11 feet, crosswalks are high-visibility ladder stripes, bike lanes are added, and a center median is included on some blocks. These features will improve walking and bicycling conditions.

4.3.4 *Zoning Code (Title 10)*

The City of Umatilla's Zoning Code (Title 10) was revised in 1999 and 2002 to update aspects of the code that relate to the Transportation Planning Rule and the TSP. Many of these changes support the City's desire to promote a more attractive pedestrian and bicycling environment. For example, the Code allows mixed uses in the downtown, requires that primary entrances be street-oriented, limits drive-through uses, and provides the Planning Commission with the option to exact pedestrian accessways or easements.

The parking section of the Code includes standards for bicycle parking as well as such often-overlooked details as requiring bumper-rails in parking lots that abut walkways to prevent vehicle overhang from obstructing pedestrians. Site Plan Review is thorough, addressing pedestrian enhancing design issues such as building orientation and setbacks, location of off-street parking, orientation of drive-through windows, and internal circulation.

Several minor changes could be made to clarify or strengthen the Zoning Code:

- Add definitions for bicycle, bicycle facilities (i.e., lane, path, shared, etc.), pedestrian, pedestrian facilities (i.e., walkway, sidewalk, path, accessway, easement). Note: Most of these are defined in Title 11.)
- Prohibit drive-through windows in the downtown core entirely (rather than making them conditionally allowed uses).
- Set a maximum percentage of allowed parking spaces (i.e., 150% of the minimum).
- Clarify the conditions under which a pedestrian easement or accessway might be required.

4.4 *Funding*

This section discusses a number of funding sources potentially available to Umatilla to fund portions of the Bicycle & Pedestrian Plan. These funding sources most likely will need to combined over a length of time to fully implement the Plan.

Projects occurring on the highway may be financed by ODOT, the City, or a combination of the two. Any project funded by ODOT must be included on the State Transportation Improvement Program (STIP), which is updated biannually, unless other, short-term or one-time funds

are available through ODOT, such as the recently offered one-time pedestrian safety improvement fund.

4.4.1 *Local Revenue Sources*

4.4.1.1 *Capital Improvement Program*

Many jurisdictions use some form of Capital Improvement Program (CIP) to schedule and budget resources for improvement projects, such as road, sewer, or waterline construction. A CIP usually extends out at least five years, although only one year's worth of projects may be actually funded. CIPs are typically updated on an annual or biannual basis. The City of Umatilla does not have a written Capital Improvement Program. Implementing a CIP would allow Umatilla to identify and prioritize projects over the long term.

4.4.1.2 *Gas Tax Revenues*

The state collects gas taxes, vehicle registration fees, and overweight and overheight taxes, and returns a portion of the revenues to cities and counties. This funding is typically used for roadway construction and maintenance, but it can be used to make other transportation-related improvements as long as they are located within the public right of way. This may include sidewalks, intersection enhancement for pedestrians, and bike lanes.

4.4.1.3 *System Development Charges*

System development charges (SDCs) are used by some communities to fund public works infrastructure needed for new developments. SDCs allocate portions of the costs associated with capital improvements to the development that increases demand on transportation, sewer, water, and parks.

Sidewalks and trails can be considered as reimbursable expenses under a transportation SDC. (Reimbursable means that the new user has to pay a proportionate share of what existing users already have for infrastructure already in place). SDCs can only be applied to new development based on the increase in traffic that they will create, and cannot include addressing existing deficiencies.

Umatilla's current SDC ordinance applies to sewer and water only. The City may consider adopting a new ordinance for a transportation SDC or a parks SDC (potentially used for paths), which would apply to new development just as the current sewer and water SDCs do.

4.4.1.4 *Local Improvement Districts*

Typically, the type of public realm projects identified in this plan are funded by one of several different types of local funding districts: Local Improvement Districts (LID), Economic Improvement Districts (EID), Business Improvement Districts (BID), or an Urban Renewal District (URD), which provides tax increment financing and tax exempt bonding.

LIDs provide funds for local types of capital improvements, such as sidewalks or other street improvements. Individual property owners usually have the option of playing the LID assessment in cash or apply-

ing fore financing through the city. The assessment formula is typically based on criteria such as property frontage or trip generation.

EIDs typically base assessments on property values. EIDs cannot be used to fund capital improvements, but can be used to fund smaller project that complement or support larger downtown improvements. EIDs are often managed by a downtown development board or group, and are limited to a five-year duration.

BIDs are similar to EIDs; however, assessments are paid by business owners rather than property owners. BIDs cannot be used to pay for capital improvements, but can fund smaller projects. BIDs can be time limited or perpetual.

4.4.1.5 *Bonds*

Bonds provide a means for obtaining immediate capital financing of infrastructure project. A bond is a formalized agreement by which the bond issuer promises to repay the bond issuers a certain amount of money at a stated interest rate on a certain date. Government debt can be incurred at lower interest rates than commercial, because the interest is generally exempt from state and federal income taxes.

Measure 50 placed additional limits on bonded debt over those that were established by Measure 5. For debt that had been exempt under Measure 5, capital construction now excludes reasonably anticipated maintenance and repairs, supplies and equipment not intrinsic to the structure, and furnishings. The bond levy may be imposed for no more than the expected useful life of the project.

Several different bond types are available to municipalities and special districts: general obligation, revenue, assessment, refunding, and certificates of participation.

General obligation bonds are typically secured by the issuer's promise to levy a property tax to pay the bonded debt principal and interest. They can typically sold at a lower rate of interest than other bonds. General obligation bonds require voter approval, and proceeds may be only used for capital construction and improvements.
Revenue bonds generally secure a higher interest rate than general obligation bonds. Revenue bonds are secured by a commitment of system user fees for facility revenues, and fees can be increased if needed to pay debt.

With assessment bonds, also known as Bancroft bonds, benefited properties are assessed to pay for a portion of the cost of local improvements. Once the assessment procedure has been completed, owners of assessed properties have the right to apply to pay their assessment over a period as determined by the municipality (with a minimum of 10 years).

Refunding bonds may be sold at a lower interest rate than the bonds outstanding, and the proceeds may be used to redeem the outstanding bonds. This allows the issuer to continue to pay the original debt at a lower interest rate. Alternatively, it may allow the debt service on the original bonds to be spread out over a longer period of time. Advance refunding bonds may be issued in advance of maturity or date of redemption. Proceeds from the sale of the advance refunding bonds are

placed in an escrow account and invested so there is sufficient money to pay bondholders at the earliest possible redemption date.

Certificates of participation, also call lease purchase revenue bonds, are a financing technique for facilities, property, or equipment that uses the leasing power of local governments. Unlike general obligation bonds, no new tax levy is authorized. Therefore, no voter approval is necessary. Generally, certificates of participation represent participation in a tax-exempt lease, which is an agreement between a municipal government and a bank trust department or governmental agencies. Revenues to pay the certificate of participation can come from a number of sources, depending on the type of project financed. For example, a certificate of participation issued to finance a community facility may be paid back from special taxes such as room taxes or business license fees. When the certificate is retired, the local government owns the project.

4.4.1.6 *Short-Term Debt*

There are three types of short-term debt: tax and revenue anticipation notes, bond anticipation notes and warrants (Bancroft), and public improvement notes. In all cases, short-term debt is incurred upon and secured by anticipated future revenues and a line of credit. Issuing short-term notes allows the issuer to delay long-term financing until the market is more stable.

4.4.2 *State and Federal Sources*

There are a number of state and federal grant and loan programs available for economic development or specific transportation projects. Most programs require a match from the local jurisdiction. Most of the programs available for transportation projects are administered through Oregon Department of Transportation (ODOT) or the Oregon Economic and Community Development Department (OECDD). Several of these are described below. It should be noted that funding sources are continuously changing and this list will need to be updated every several years to remain relevant.

4.4.2.1 *ODOT-Administered Programs*

State Pedestrian and Bicycle Grants, administered by ODOT, are grants for pedestrian or bicycle improvements on state highways or local streets. Grant amounts are up to $200,000, with a local match encouraged. The grants require the applicant to administer the project, and projects must be situated in road or highway rights-of-way. Projects include sidewalk infill, handicap access, street crossings, intersection improvements, and minor widening for bike lanes. The grant cycle is every two years, coinciding with State Transportation Improvement Program (STIP) update cycle. Cities and counties may apply.

The ***Special Small City Allotment Program*** is restricted to cities with populations under 5,000. No locally funded match is required for participation. Grant amounts are limited to $25,000 and must be earmarked for surface projects such as drainage, curbs, and sidewalks.

The program allows cities to leverage local funds on non-surface projects if the grant is used specifically to repair the affected area.

The ***Federal Surface Transportation Program*** is used to construct, re-construct, and restore roads and complete operational improvements on federal aid highways. In particular, ***Transportation Enhancement*** activities consist of projects that improve the cultural, aesthetic and environmental value of the state's transportation system. Twelve eligible activities, including bicycle and pedestrian projects, historic preservation, landscaping and scenic beautification, mitigation of pollution due to highway runoff, and preservation of abandoned railway corridors. A 10.27% minimum match is required. The funding cycle is every two years in conjunction with the STIP update process. Local governments, other public agencies (state, federal, tribal) and the five ODOT regions can apply.

The ***Oregon Transportation Infrastructure Bank*** provides loans and other financial assistance to local jurisdictions for federal-aid eligible highway and transit capital projects. Loans can cover all or a portion of an eligible project. Cities, counties, special districts, transit districts, tribal governments, ports, state agencies, and private for-profit and non-profit organizations can apply.

The ***Highway Bridge Rehabilitation or Replacement*** provides funding for local bridge rehabilitation or replacement, administered by ODOT, with a two-year funding cycle coinciding with the STIP update cycle. Any city or county with a structurally deficient or functionally obsolete bridge meeting criteria established by federal regulations or Federal Highway Administration policies may apply.

The ***Hazard Elimination Program*** carries out safety improvement projects to reduce the risk, number, or severity of accidents at highway locations, sections, and elements on any public road or public transportation facility. Applications are accepted at any time. Once the agency identifies a safety problem they should contact the appropriate Region staff and forward accident records, justification documents, and other pertinent project information. Region staff will then prepare a draft prospectus and send it to the Traffic Management Section to determine program eligibility. State and local agencies may apply.

The mission of the ***Transportation and Growth Management Program*** is to enhance Oregon's livability, foster integrated transportation and land use planning and development that result in compact, pedestrian, bicycle, and transit friendly communities. The program offers grants to local governments for transportation system planning and development assistance through the Quick Response and Community Outreach programs. The funding cycle is every two years.

The ***Public Lands Highways Discretionary Program*** is for projects that improve access to or within federal lands of the nation. The program can fund engineering or construction of highways and roads, transportation planning and research, and other facilities related to public travel on roads to or through federal lands. This program provides reimbursement rather than grants. This is a nationwide program with no guaranteed minimum for Oregon. The funding cycle is annual, with applications due in May. Selections in the following December are

candidate projects to enter in the nationwide competition for funds. Any public agency may apply.

4.4.2.2 *OECDD-Administered Programs*

The ***Immediate Opportunity Fund*** provides street and road improvements to influence location or retention of firms providing primary employment or revitalize business or industrial centers where the investment is not speculative.

The ***Special Public Works Fund*** has money targeted from lottery bond proceeds for loan and grant assistance to eligible public entities for the construction of infrastructure that leads to business location or expansion and the creation or retention of jobs. These are defined as providing "educational, commercial, recreational, cultural, social, or similar services to the public. This is program for which cities and counties may apply. The infrastructure must be needed primarily to support economic development, and 30% of jobs created or retained must be family wage jobs.

The ***Oregon Bond Bank*** pools municipal loans made under the Special Public Works Fund and Water/Wastewater Financing programs into state revenue bonds. The purpose of the bond bank is to provide small communities access to financial markets to finance infrastructure projects at lower rates.

Oregon Tourism Commission provides matching grants up to $100,000, coordinated with OECDD's Needs and Issues process in order to give applicants more exposure to a greater number of potential funders. The focus is on tourism-related projects within a larger economic development strategy, with funds are for tourism projects such as marketing materials, market analyses, signage, visitor center development planning, etc., but not for construction of infrastructure. Nonprofit agencies, municipalities, tribes, and ports may apply.

OECDD administers the state's annual federal allocation of ***Community Development Block Grants*** (CDBG) for non-metropolitan cities. The notational objective of the program is "the development of viable urban communities, by providing decent housing and a suitable living environment and expanding the economic opportunities, principally for persons of low and moderate income." Eligible projects include downtown revitalization projects such as clearance of abandoned buildings or improvement to publicly owned facilities or infrastructure such as curbs, gutters, storm drainage, sidewalks, streetlights, landscaping, water and sewer, and permanent benches. Matching funds are required.

5 Neighborhood Analysis

Potential projects in the three distinct neighborhoods — South Hill, Downtown and McNary — as well as the central area between Downtown and McNary are discussed in this section. For each project, the opportunities and constraints are examined, and the major objectives are listed.

5.1 Project Evaluation Criteria

The projects from the O&C report were looked at in terms of 7 criteria:

❶ **Relevance to plan goals — *High is best***

Projects that strongly support multiple transportation and community goals are preferable.

- Is the project part of the city's transportation plan?
- Is there a bicycle or pedestrian transportation problem that the project will solve or alleviate?
- Will the project support business, health or other community goals?

❷ **Level of service (LOS) need — *Low is best***

Areas or corridors that serve pedestrians and bicyclists poorly are better candidates for projects than those that already have facilities.

- Is the existing road a deterrent to bicycling or walking? Roads with narrow lanes and heavy traffic, or that are difficult to cross, receive priority treatment. Other factors include high truck volumes, poor sight distance, dangerous intersections or other obstacles to direct travel by bicyclists and walkers.
- Does the project upgrade a major roadway (arterial or major collector street), bridge an obstacle, provide a more direct route (reducing significant out-of-direction travel), or provide access to important destinations such as schools?
- Will the facility link, complete or extend the system? Are there clear origin and destination points along the corridor served?

❸ **Realistic cost — *Low is best***

Projects that provide a good return on investment are preferable.

- Are the estimated engineering and construction costs typical for this type of project?
- Are expected maintenance costs reasonable?
- Are there secondary benefits that help mitigate the cost such as economic vitality, lower crime or improved safety?

❹ **Available funding — *All is best***

Projects that have identified funding sources are preferable.

- Can the project be funded from existing transportation sources?
- Are special grants or loans available?
- Are private or community interests willing to invest in the project?
- Can the project be timed to take advantage of other road work being performed?

❺ **Technical implementation — *Simple is best***

Straightforward projects with standard designs are preferable.

- Is the project the appropriate treatment for the problem?
- Does the project meet current design standards?
- Are highway design exceptions needed?
- Are there any unusual engineering problems such as a steep slope, poor drainage, or constrained right-of-way?
- Does the project involve many elements or complex phasing?

❻ **Political implementation — *Easy is best***

Non-controversial projects with strong support are preferable.

- Is a substantial amount of public involvement necessary?
- Does the project require additional right-of-way?
- Is removal of on-street parking necessary?
- Has the public shown support for the project?
- Do affected or adjacent property owners agree to the project?
- Does the business community support the project?
- Do government officials support the project?
- Does the responsible agency agree to maintain the facility?
- Is there a willing party to see the project through to completion?

❼ **Potential use — *High is best***

Projects that attract large numbers of pedestrians and bicyclists are preferable.

- Is the potential use high compared to similar facilities? Factors to consider include proximity to residential areas, schools, parks, shopping centers, business, and industrial districts.
- Does the project consider the needs of both bicyclists and pedestrians? In most cases, bicyclists and pedestrians require separate facilities. If the project provides for only one mode, the design should not preclude use by the other mode, where appropriate.
- Does the project help meet the needs of the young, the elderly, the low-income, and the disabled?
- Does the project provide connectivity to other modes? Facilities that provide bicycle and pedestrian access to existing or future bus stops and park-and-ride sites enhance intermodal transportation.

There is no particular weighting to these criteria. In general, if the majority of criteria rate well above average, then the project is a good candidate. However, one extremely negative criterion tends to offset several positive ones.

A given project may have alternative designs with different trade-offs. In particular, it may be tempting to accept a design with low standards to avoid confrontation with affected property owners, to avert perceived inconvenience to motorists, or to simply keep construction costs down. Except in special circumstances, minimum standards in the Oregon Bicycle and Pedestrian Plan should be used, and attention should always be paid to long-term goals. The liability and waste of investment in inadequate facilities outweigh any temporary gains.

Table 3 shows a qualitative rating of these criteria. The last column shows the overall feasibility of the project. The following text examines each project in more detail and establishes the period of completion (near-term, long-term), the cost, the funding authority, and potential funding. Complicated projects such as the Powerline Road Improvements are broken down into elements.

Because these projects span a wide range of needs and level of development, it is difficult to compare them directly. Some are specific facility projects (such as the various path segments), others cover an area or corridor (such as downtown walkway infill or 3rd Street corridor), while yet others are planning initiatives (such as the Umatilla River Bridge). Together, they represent system needs over the next 20 years.

Table 3
Project Rating Matrix

	❶	❷	❸	❹	❺	❻	❼	
Project (♦ = Poor, ♦♦ = Fair, ♦♦♦ = Good)	**Relevance**	**LOS**	**Cost**	**Funding**	**Technical**	**Political**	**Use**	**Feasibility**
South Hill								
❦ **Ped. Bridge to Powerline Rd Path**	♦♦♦	♦♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	**High**
❦ **Lower South Hill Extension Path**	♦♦♦	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦	♦♦♦	**High**
❦ **Umatilla Bridge Undercrossing Path**	♦♦	♦♦♦	♦♦♦	♦♦	♦♦	♦♦♦	♦♦	**High**
❦ **Powerline Road Improvements**	♦♦♦	♦♦♦	♦	♦	♦♦	♦♦	♦♦♦	**Medium**
❦ **Future Elementary School and Park**	♦♦♦	♦♦	♦♦	♦	♦♦	♦	♦♦♦	**Medium**
❦ **Umatilla River Bridge**	♦♦	♦♦	♦♦♦	♦	♦♦	♦♦	♦♦	**Meduim**
Downtown Umatilla								
❦ **3rd Street Path to River Path**	♦♦♦	♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦	**High**
❦ **Walkway Infill**	♦♦♦	♦♦	♦♦	♦♦	♦♦	♦♦	♦♦♦	**Medium**
❦ **Old Umatilla Connectors**	♦♦	♦♦♦	♦♦	♦	♦	♦	♦♦	**Low**
Central Area								
❦ **3rd Street Corridor**	♦♦	♦♦	♦♦	♦	♦♦♦	♦♦	♦	**Medium**
❦ **Crossroads Intersection**	♦♦	♦♦♦	♦♦♦	♦♦	♦♦	♦	♦	**Medium**
McNary								
❦ **Devore Road Connection**	♦♦	♦	♦♦♦	♦	♦♦	♦	♦	**Low**
❦ **Dam Overlook Improvements**	♦♦	♦♦	♦♦♦	♦	♦♦	♦♦	♦♦	**Medium**
❦ **Future Park Connectors**	♦♦	♦♦♦	♦♦	♦	♦♦	♦♦♦	♦♦♦	**Medium**

5.2 *South Hill Projects*

The South Hill area is the newest residential area of Umatilla. Located roughly along the top of the plateau above Umatilla, its development pattern is typical of more recent subdivisions, with large lots and long blocks that feed onto one major street, Powerline Road. Newer streets have sidewalks. There are no commercial services or schools currently available within the South Hill area, although an elementary school and park are planned for the near future and some areas are zoned for neighborhood commercial.

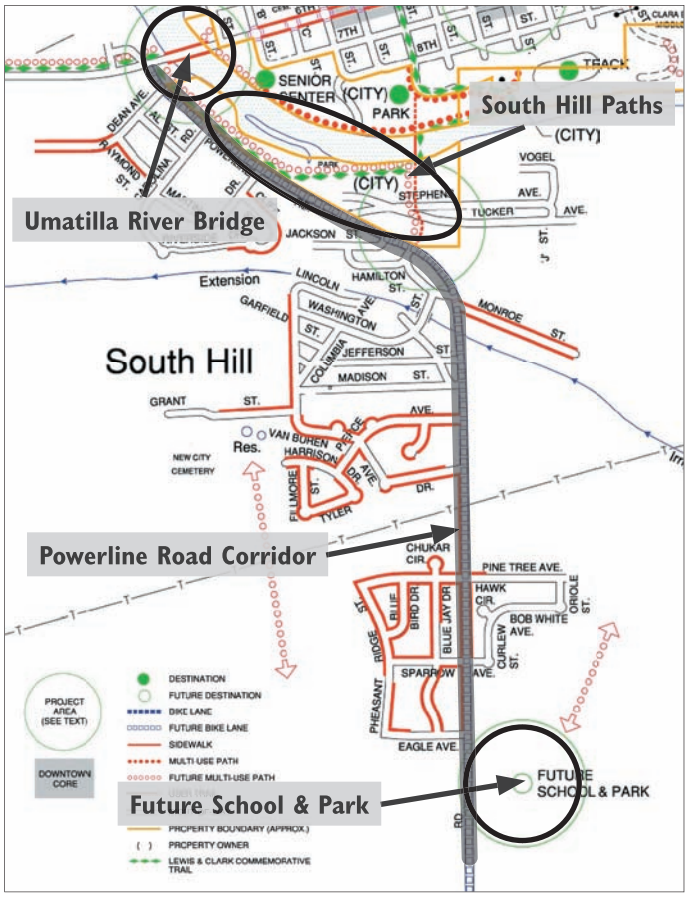


Figure 1
South Hill

The maps in this section are for orientation. See Appendix B for map detail.

Downtown and South Hill are separated by the Umatilla River. Two bridges connect the neighborhoods, an aging structure to the north on Highway 730 and a conveniently located pedestrian bridge. Neither bridge is well connected by sidewalks, although the pedestrian bridge has a multi-use path on the Downtown (north) side.

Major opportunities in South Hill include improving access to the pedestrian bridge, constructing sidewalks and bike lanes on Powerline Road, developing a bicycle-friendly and walkable school/park site, and eventually acquiring the historic highway bridge for pedestrian and bicycle use.

The four primary projects described below are related but can be pursued independently. These four projects received the highest interest of any projects at the public workshop.

5.2.1 *Lower South Hill Paths*

The pedestrian bridge over the Umatilla River below "F" Street provides a key shortcut between South Hill and the downtown and schools. Its utility has been limited by a poor connection to Powerline Road. Three path segments provide an opportunity to greatly improve access to the bridge.

Connector Path from Pedestrian Bridge to Powerline Road

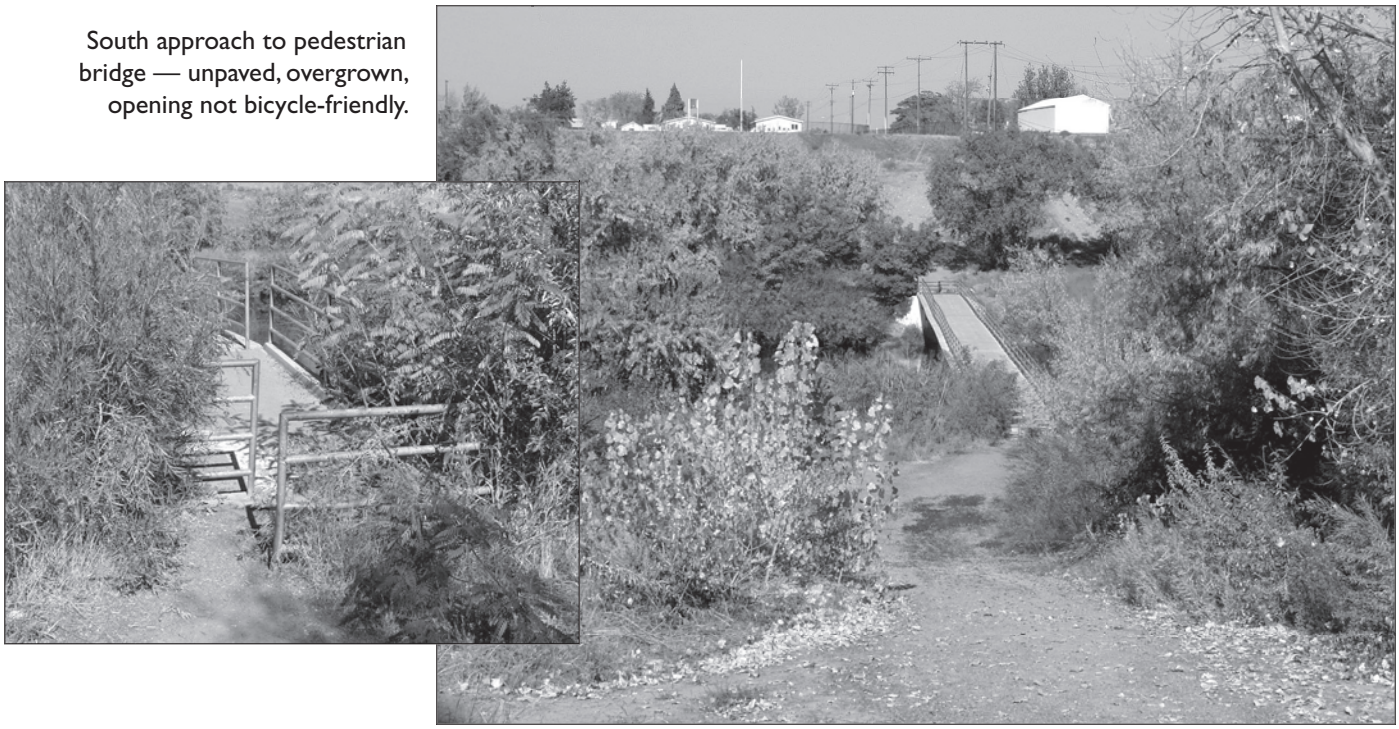
- ***Description:*** construct a paved path between the existing pedestrian bridge over the Umatilla River and Powerline Road at Hamilton Street.
- ***Period of completion:*** near-term.
- ***Cost: 1560 ft 10-ft wide*** path, $105k including excavation.
- ***Ownership:*** City.
- ***Funding authority:*** City.
- ***Funding sources:*** general funds, grants, school transportation fund.
- ***Feasibility:*** high.

Currently, many users reach the bridge from Powerline Road via a steep, unimproved trail which trespasses over a corner of private

property. The remainder of the trail is on City property and crosses two paved easements used by residents of a small development.

A paved path connecting to a marked crosswalk on Powerline would greatly improve access and steer users away from private property. The technical challenge is to find a suitable route that maintains a moderate slope. Such a path would probably not meet ADA maximum slope nor AASHTO bike path recommendations; however, there is alternate paved access via Stephens Avenue to the west that is less steep although not as direct, and the Lower South Hill Extension Trial (see following text) will provide another access.

South approach to pedestrian bridge — unpaved, overgrown, opening not bicycle-friendly.



Trail down from Powerline Road down to pedestrian bridge, looking northwest.

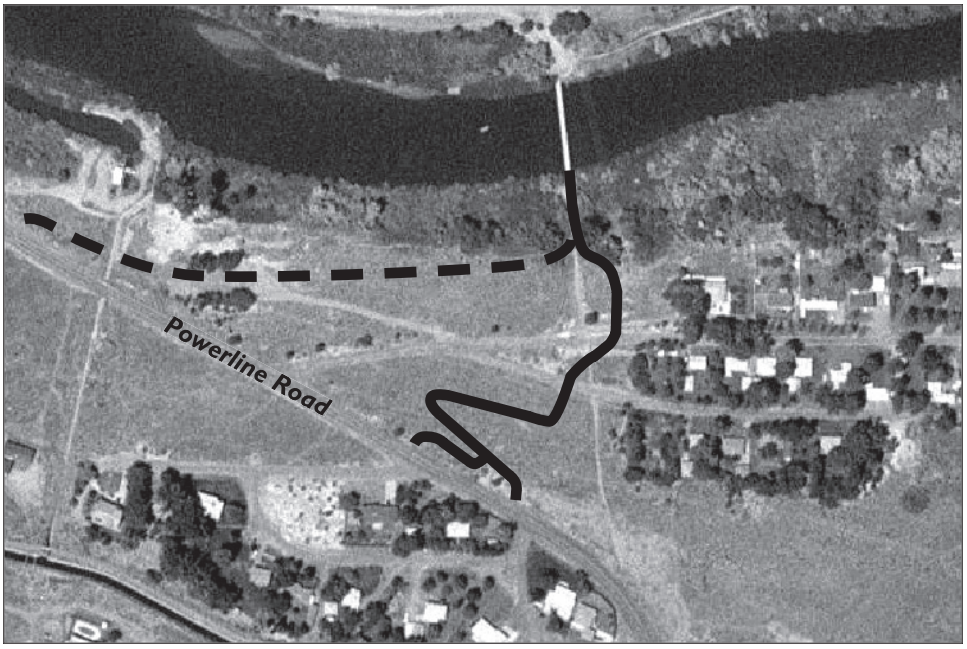


Figure 2
Proposed Connector (solid) & Extension (dashed) Paths — Aerial Photo

A possible path design is shown in Figure 2. It switchbacks down the hill at less than 8% slope and is entirely on City property. Figure 3 shows a preliminary engineering design and typical section.

Lower South Hill Extension Path

- ***Description:*** construct a path (unpaved initially but paving planned) between the existing pedestrian bridge over the Umatilla River and Powerline Road at Martin Drive.
- ***Period of completion:*** near-term.
- ***Cost: paved*** path, 1200 ft at $22/ft,$26k.
- ***Ownership:*** City, Army Corps of Engineers/Bureau of Land Management.
- ***Funding authority:*** City.
- ***Funding sources:*** general funds, grants.
- ***Feasibility:*** high.

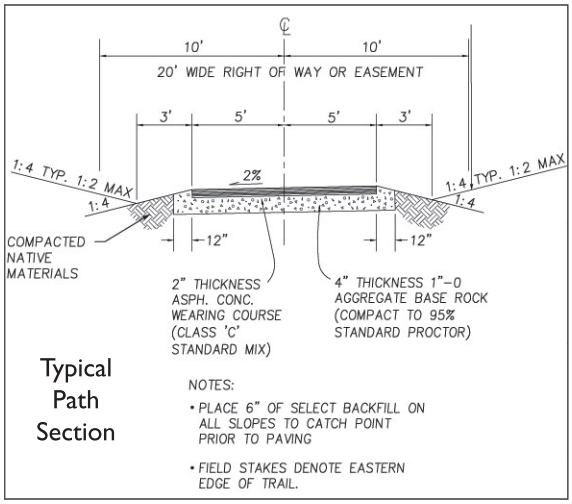
This short path segment would follow a sewer easement. The western end of the path would connect to the north side of Powerline Road at Martin Drive. The eastern end would join the connector path described above and would serve residents at the north end of South Hill. The Lewis and Clark Trail would be routed along this path.

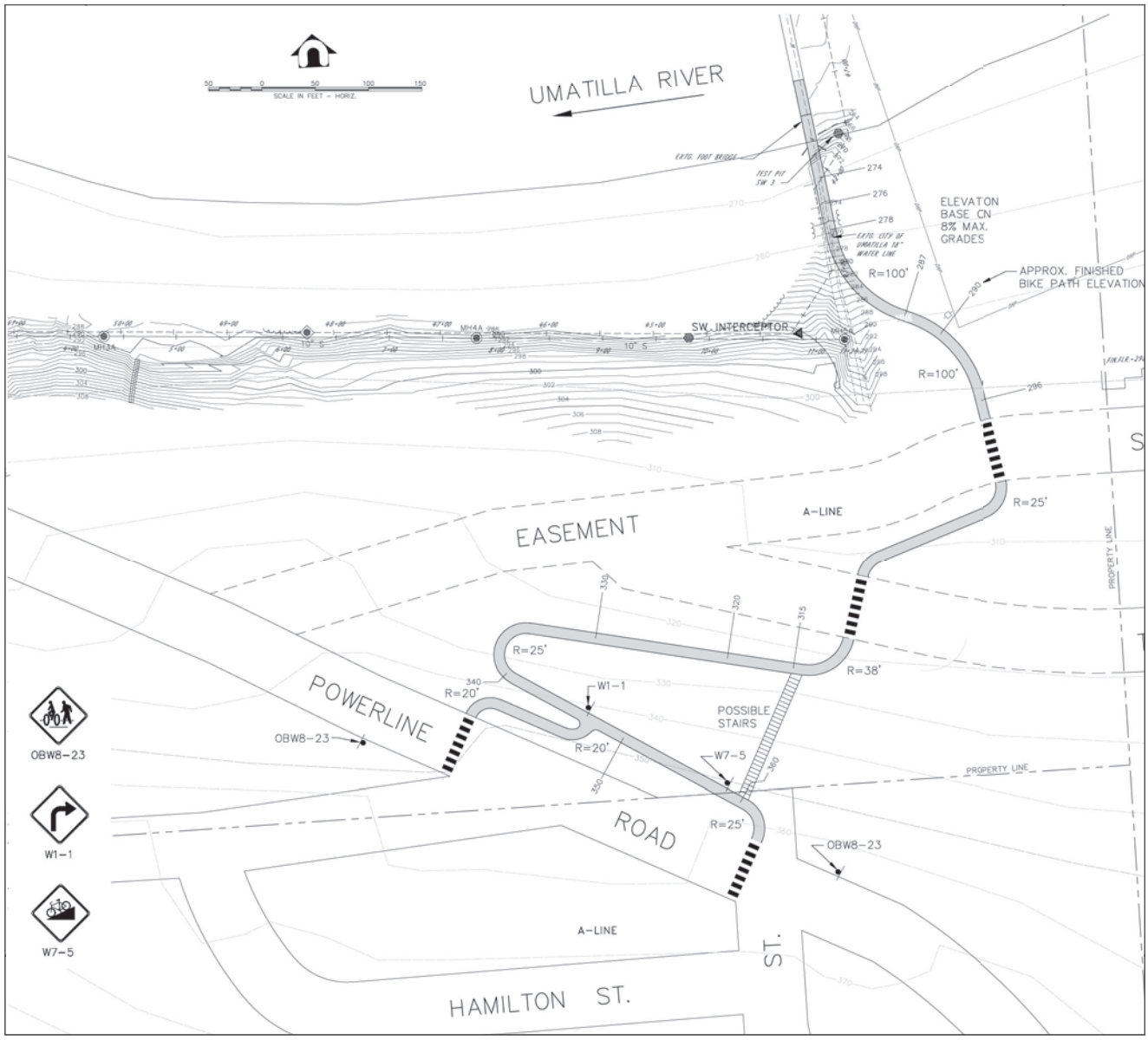
Umatilla Bridge Undercrossing Path

- ***Description:*** construct an unpaved path north from the Lower South Hill Extension Trail under the Umatilla River Bridge.
- ***Period of completion:*** long-term.
- ***Cost:*** unpaved path, 1500 ft at $12/ft, $18k.
- ***Ownership:*** Army Corps of Engineers/Bureau of Land Management, ODOT.
- ***Funding authority:*** City.
- ***Funding sources:*** general funds, grants.
- ***Feasibility:*** high.

A path under the Umatilla River Bridge would allow the Lewis and Clark Trail to avoid the intersection of Highway 730 and Powerline Road.

Figure 3
Proposed Path — Design Details





5.2.2 *Powerline Road Improvements*

This minor arterial received the highest interest at the public workshop with concerns about safety, comfort, speeding, crossing, and the lack of alternate routes. The road covers about 1.7 miles within the City and provides the only motorized vehicle access to South Hill. (A secondary access to Highway 730 may be developed in the future but will not change the corridor needs.)

The existing pavement is 20 to 22 feet wide without curbs and sidewalks, except for the south end which has a curb-tight sidewalk adjacent to new development. The posted speed is 35 mph. Traffic volume from the TSP was estimated to be 1,950 vehicles/day in 1997, increasing to 4,650 vehicles/day in 2017. Improving this single street will have a large influence on travel choices and safety.

The overall objective is to develop a bicycle-friendly and walkable design consistent with the residential neighborhood. Potential improvements include:

- Redesign of the intersection with Highway 730.
- Adding sidewalks and bike lanes throughout.
- Calming the traffic to reduce speeds.
- Providing comfortable crossings at key intersections and where the path from the river joins Powerline.

Overall, the feasibility of improving this corridor is medium as discussed for each of the individual elements below.

Intersection of Powerline Road and Highway 730

- ***Description:*** improve intersection for pedestrians and bicyclists.
- ***Period of completion:*** phased over near- and long-term.
- ***Cost:*** small part of intersection improvement for motor vehicles — signal, $150k (TSP); bridge and intersection, $2M (TSP).
- ***Ownership:*** ODOT, City.
- ***Funding authority:*** ODOT.
- ***Funding sources:*** ODOT.
- ***Feasibility:*** medium.

Powerline Road intersection with Highway 730 functions poorly for pedestrians and other users.

Five options for this intersection were analyzed in the TSP to mitigate motor vehicle delay. Because of the proximity of the Umatilla River Bridge there is insufficient room for adding turn lanes. The preferred approach was a series of staged improvements starting with an interim signal; the signal is listed in the TSP as one of only two roadway projects during the near-term (first 10-year period, 1999-2008).

The intersection's motor vehicle capacity was reassessed based on traffic counts taken by ODOT in January 2003. The capacity has diminished considerably since the 1997 counts on which the TSP was based but remains acceptable for the time being.

An interim signal might be followed by an at-grade jughandle (a type of intersection that redirects left turns) and eventually by a grade-separated crossing in conjunction with a new bridge; the bridge replacement is a focus of the long-term projects (second 10-year period, 2009-2018) in the TSP. The major concern for pedestrians and bicyclists is ensuring that any intersection improvements include standard sidewalks, marked crosswalks and integration with bike lanes.

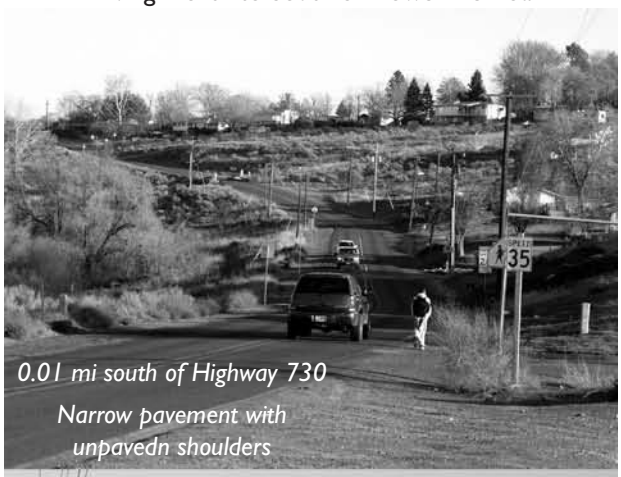
Powerline Road Sidewalks and Bike Lanes

- ***Description:*** construct sidewalks and bike lanes from Highway 730 to Eagle Avenue.
- ***Period of completion:*** phased over near- and long-term.
- ***Cost:*** sidewalk and curbs on 4400 ft of roadway, $310k; widening 4400 ft of roadway from 20 to 36 ft at $48/ft, $215k plus $200k contingency; total $725k+. Note that the northern 2500 feet of road could make do with a sidewalk on one side because of the one-sided development, reducing total cost by about $90k.
- ***Funding authority:*** County.
- ***Funding sources:*** City, County, developers.
- ***Feasibility:*** medium.

The TSP lists installing a sidewalk on Powerline Road during the long-term at a cost of $823k to the southern UGB, about 2.2 mi; there is no mention of bike lanes. The majority of the road is substandard at 20 to 22 feet wide without curbs, sidewalks or paved shoulders. A segment of the road in the south has been widened with curbs and sidewalks where there is new development, and future development may eventu-

Powerline Road (north section) — primary access to South Hill has narrow, unpaved shoulders.

Driving North to South on Powerline Road



0.01 mi south of Highway 730

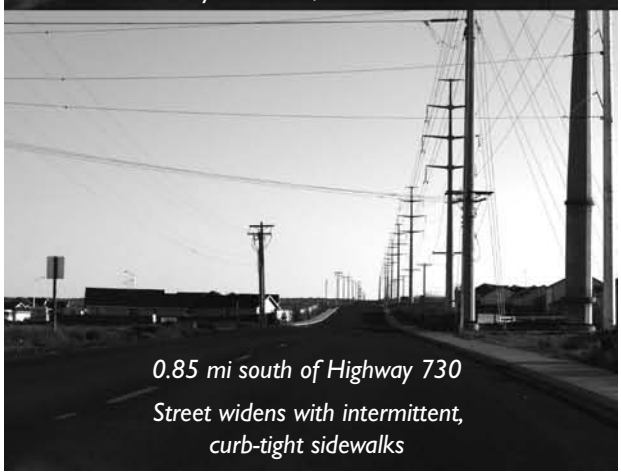
Narrow pavement with unpavedn shoulders

0.25 mi south of Highway 730

No shoulders at constricted drainage culvert

0.70 mi south of Highway 730

Low visibility crosswalk, no sidewalks



0.85 mi south of Highway 730

Street widens with intermittent, curb-tight sidewalks

ally result in most of the southern half of the road being improved. However, the northern 0.6 mi is largely built up so that new development cannot be depended on for improvements.

Other considerations in the north end that will complicate the engineering are the cross-slope, road alignment to the side of the right-of-way, a narrow bridge over a culvert, and the fact that there are no alternate routes during construction. The road is under County jurisdiction (Road 1225) although it functions primarily as a City street. The City evidently has an agreement with developers to fund some local projects.

Traffic Calming and Crossings

- ***Description:*** manage traffic speed and driver attention on Powerline Road.
- ***Period of completion:*** phased over near- and long-term.
- ***Cost:*** 6 crosswalks, $1800; 6 refuge islands, $12k; roundabout, $150K; about $165k total.
- ***Funding authority:*** County.
- ***Funding sources:*** City, County, developers, safety or bike-ped grants.
- ***Feasibility:*** medium.

There is an existing crosswalk on the north leg of Powerline Road at Carolina Road and at Monroe Street. Other potential locations are:

- Umatilla River Path connection near Washington Street and Hamilton Street.
- Pine Tree Avenue.
- Sparrow Avenue.
- Eagle Avenue.

Traffic calming can be incorporated into arterial street design to reduce speed, increase safety, eliminate barriers that impede walking and bicycling, and improve the roadway environment. Some typical measures suitable for Powerline Road are shown in Figure 9.

For example, one approach is a combination of measures including narrowing travel lanes from 12 ft to 10 ft (this would also reduce project cost), striping high-visibility crosswalks with lighting for night, installing refuge islands at crosswalks (perhaps two of them near the Umatilla River Path connection), and converting the future school intersection (probably Eagle Avenue) to a modern roundabout. If these measures prove insufficient, more aggressive traffic calming such as neckdowns, speed tables and mini-roundabouts at other intersections could be considered.

Figure 9
Typical Traffic Calming Measures

Horizontal alignment:

- Raised median
- Roundabout

Vertical alignment:

- Raised intersection or crosswalk
- Speed hump
- Speed table

Narrow (real or perceived):

- Neck down
- Curb extension (if on-street parking)
- Curb radius reduction
- Gateway
- Landscaping
- Lane width reduction
- Raised median
- On-street parking
- Pavement texture
- Roadway striping and delineation

Regulate and enforce:

- 4-way stop (if warrants met)
- High-visibility crosswalk
- Pedestrian signal
- Truck restriction
- Speed reader

Refuge island with speed hump.

Refuge island with speed table and high-visibility crosswalk.

Modern roundabout is superior to a signal or stop signs for many intersections.

5.2.3 *Future Elementary School and Park Planning*

- ***Description:*** design an accessible neighborhood school and park that are integrated into future development.
- ***Period of completion:*** near-term.
- ***Cost:*** design team, $50k.
- ***Ownership:*** City.
- ***Funding authority:*** City.
- ***Funding sources:*** City, School District, developers, grants.
- ***Feasibility:*** low.

This is a planning initiative rather than a specific project. For example, a design team involving city representatives, school officials, developers, urban planners, and the interested public could develop a specific neighborhood design that would be more walkable than what would occur otherwise. Figure 5 shows a result of two such initiatives.

Powerline Road (south section) — new residential development with curb-tight sidewalks; planned elementary school and park will be to the right (east).

An elementary school and park are planned for South Hill, east of Powerline Road about a mile south of Downtown — within walking distance of most students. The site design is not determined but the TSP shows several new streets and a short connector path in the area. If the school is designed as an integral part of the neighborhood with a local street grid including well-connected walkways and bikeways, it has the potential for greatly enhancing access for children from South Hill and Downtown. If coordinated with shared park facilities, the school could be a neighborhood center, accessible to South Hill residents by walking or biking.

Many other communities have allowed "big box" schools on large, fenced grounds with buildings set well back from the street and accessible primarily by car and bus. The schools may even be purposely located on arterial streets to aid access by car, even though these streets are difficult for children to cross.

Figure 5
School Access Using a Roundabout

Because a lack of planning in these communities has often resulted in inadequate pedestrian and bicycle facilities, some school districts discourage walking and bicycling for safety reasons. In addition, they may close the grounds to the public at all times. These policies result in public facilities that are not integrated into neighborhoods and create a significant barrier to walking and bicycling. This has proven to have negative consequences, especially for children who tend to develop a lifetime habit of inadequate physical activity.

5.2.4 *Convert Historic Umatilla River Bridge*

- ***Description:*** convert bridge to nonmotorized use when new bridge is constructed.
- ***Period of completion:*** long-term.
- ***Cost:*** depends on future connections but negligible.
- ***Ownership:*** City.
- ***Funding authority:*** ODOT.
- ***Funding sources:*** State and Federal.
- ***Feasibility: unknown,*** depends on new bridge construction.

The Umatilla River Bridge on Highway 730 was analyzed in the TSP with several options ranging from reconstruction to building a new bridge to the north where a railroad bridge used to be. The existing structure is not adequate to support a wider deck, so a new bridge is the most promising alternative. If a new bridge is built, the existing bridge could be converted to nonmotorized use and easily tied into the sidewalk and trail system. This would provide a scenic amenity and preserve an historic structure.

The need for a new bridge is well established but Highway 730 is a secondary route with less priority than many others. Limited state funding for bridge work means that this project may not occur for many years. Nevertheless, the potential for reuse of the existing bridge should be kept in mind.

Umatilla Bridge from fishing platform on River Trail.

5.3 *Downtown Projects*

The downtown consists of the older part of Umatilla along Highway 730 from the Umatilla River Bridge to Umatilla River Road. The core reflects the traditional grid of blocks typical of older downtowns, with some residential development and a more highway-oriented pattern at the edges. The downtown area also includes Old Umatilla to the north, an abandoned town section owned by the Army Corps of Engineers and inaccessible due to fencing.

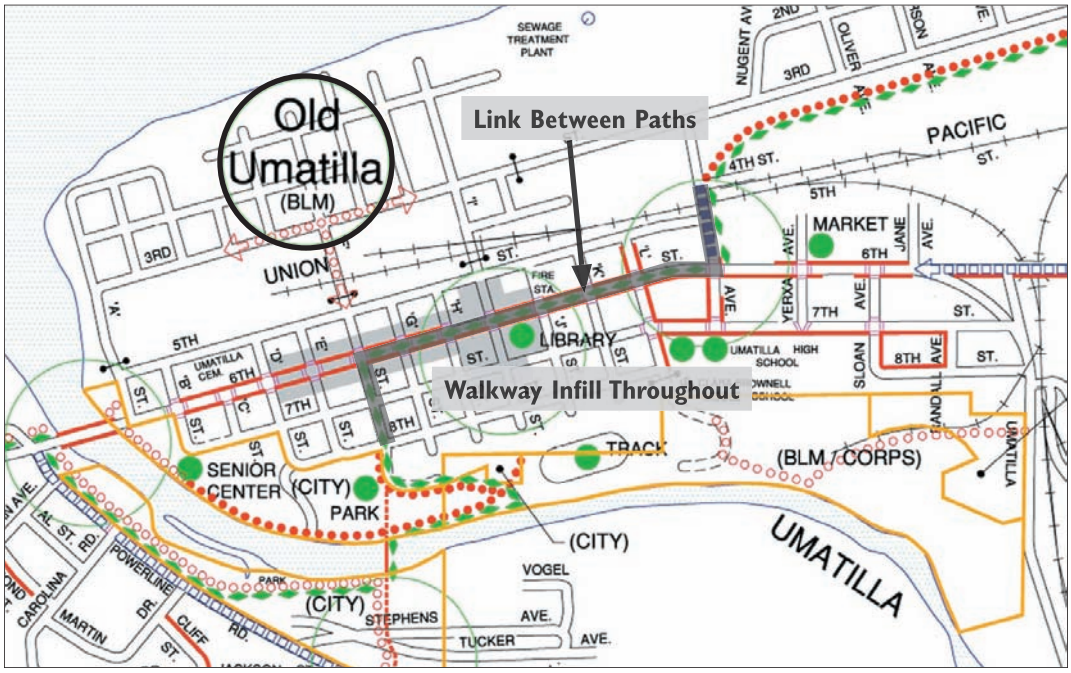


Figure 6
Downtown

Many downtown enhancements are covered in the 2001 Downtown Study. The Study designated the intersection of 7th and "I" Streets for a future civic center with "I" Street receiving special pedestrian-oriented features. This fundamental change in the development pattern will take many years to develop but should be supported by other opportunities such as completing missing links in the Downtown pathway network, improving walkways and bikeways, and potential development of Old Umatilla into a park.

The TSP recommended $422,000 in near-term sidewalk projects in the downtown on Highway 730 (Switzler to Brownell) and on "D," "F," "I," "L," and 7th Streets.

5.3.1 *Link the 3rd Street and Umatilla River Paths*

- ***Description:*** develop route between existing paths.
- ***Period of completion:*** near-term.
- ***Cost:*** 400 ft of 6-ft wide sidewalks (both sides) and bike lanes (one side) on Switzler Avenue, $37k; 5000 ft bike lanes on Highway 730 in downtown at $0.80/ft, $10k; 500 ft of 5-ft sidewalks on "F" Street, $25k; zebra crosswalks with median islands at Switzler, $6k; signage, $1k; $79k total.
- ***Ownership:*** City.
- ***Funding authority:*** City, ODOT.
- ***Funding sources:*** City, grants, ODOT, developers.
- ***Feasibility:*** high.

Two existing paths, the 3rd Street Path and the Umatilla River Path, are separated by a 0.5-mile gap in the downtown. (Note that this is also the route of the Lewis and Clark Trail.) Although creating a separated path is not feasible in the downtown core, several things can be done to make it easier for people to continue from one path to the other:

- Construct sidewalks and bike lanes on Switzler Avenue to connect the 3rd Street Path to 6th Street (Highway 730). At present there is a bike lane on only the east side of Switzler and the sidewalks extend only a short distance north of 6th Street.
- Develop a connection of the Umatilla River Path to the intersection of Switzler Avenue with 6th Street, such as on "F" Street to 6th Street and then on 6th Street to Switzler. There would be sidewalks and a signed, on-street, shared bikeway on "F" Street, and sidewalks and bike lanes on 6th Street.
- Improve the crossing of 6th Street at Switzler in a similar manner as to what is planned for the east end of downtown from the Downtown Study: curb extensions, a median refuge, high-visibility zebra crosswalk, and pedestrian-oriented lighting. The intersection is two-way stop controlled with a 60-ft crossing distance. If enough pedestrian and bicycle traffic can be generated, the intersection might eventially meet signal warrants.

Although the Lewis & Clark Trail would be on 6th Street where the facilities and services are located, users could choose to use any of several other parallel routes in the downtown street grid.

Another potential connection of the Umatilla River Path with downtown is "L" Street up from the high school track where the path currently ends. However, this option was dropped at the school's request because they have other plans for the area.

Also, "F" Street could be a way to connect downtown and the Umatilla River Trail to Old Umatilla if that area were developed.

Unsignalized crossing of Highway 730 at Switzler Avenue, looking north.

One-way bike lane on Switzler Avenue with no facility going opposite direction.

5.3.2 *Walkway Infill*

- ***Description:*** upgrade existing sidewalks and fill in gaps within the downtown core.
- ***Period of completion: phased*** near- and long-term.
- ***Cost:*** TSP lists about $400k of sidewalks in the downtown area (not including the walkways and bikeways in 3.3.1 above); 700 ft of path at $22/ft, $15k; $415k total.
- ***Ownership:*** City, ODOT.
- ***Funding authority:*** City, ODOT.
- ***Funding sources:*** City, ODOT, grants, developers.
- ***Feasibility:*** medium.

Downtown walkways have many obstacles, few curb ramps, and long crossings. Curb extensions would address all these problems.

The Downtown Study discussed the core area in detail. The TSP listed many sidewalk projects, including all major streets downtown as well as many minor streets. Other potential improvements on Highway 730 (6th Street) downtown include:

- The City is planning a median on Highway 730 at east end of downtown.
- The City plans to install curb ramps at 36 corners from a grant plus City contribution.
- Stripe bike lanes when the street is resurfaced or restriped (included as part of path connection project described in Section 5.3.1).
- Install curb extensions when the street is repaved (no repave scheduled as the surface is relatively new).

Most streets in the downtown area have sidewalks, but they are inconsistent and handicapped accessibility is low. There are few bicycle racks and Highway 730 lacks bike lanes although there is ample width. Many potential improvements to the downtown for bicyclists and pedestrians are described in the Downtown Study and should be pursued as opportunities present themselves. In particular, missing sidewalk segments should be constructed and unused driveways consolidated during building construction or refurbishment. Installation

Missing or inadequate sidewalk segments, such as this at-grade corner behind an extruded curb, should be fixed.

of curb extensions, curb ramps, parking bays, and medians should be coordinated with ODOT in conjunction with highway resurfacing or reconstruction.

There is much to do and it may be difficult to focus on where to start. The many underdeveloped lots do not support an active pedestrian environment. Promoting changes on the highway will require a long-term commitment to get the project on the State Transportation Improvement Program (STIP) and to coordinate with new development.

Off the highway, many other needs have been identified to support the downtown. Besides sidewalks, two multi-use paths are shown on the map:

- Extend the Umatilla River Path 700 ft to the northwest under the Umatilla River Bridge and to a small park north of the bridge.
- Construct a multi-use path along the old railroad grade west of Umatilla River Road to south end of "L" Street. This would be roughly 2400 ft long with the eastern 500 ft through private land.

5.3.3 *Old Umatilla Townsite and Connectors*

- ***Description:*** develop site as park with trails, paths and interpretive center.
- ***Period of completion:*** long-term.
- ***Cost: initial*** planning, $25k.
- ***Ownership:*** City, Army Corps of Engineers (Portland)/Bureau of Land Management.
- ***Funding authority:*** Corps of Engineers.
- ***Funding sources:*** Federal, City.
- ***Feasibility:*** low.

The original Umatilla townsite is next to the Columbia River (what is now called Lake Umatilla) just north of the present downtown. There are roughly 16 square blocks of streets and vacant, overgrown land — the buildings were removed when the downstream dam was built — under control of the U.S. Army Corps of Engineers, Portland District.

The area would make an excellent park and would reconnect the downtown with the Columbia River. Both "F" and "I" Streets are logical corridors, and there is also the potential for a trail along the Umatilla River.

The Old Umatilla townsite is closed to public access by the Army Corps of Engineers.

The area is fenced off to protect a Umatilla Indian burial site. It was listed on the National Register of Historic Places in 1981, one of only 22 such listings in Umatilla County and the only one in the City of Umatilla. This puts significant restrictions on how the land can be developed. Any proposals would have to consider the important archaeological features of the site and coordinate with the Corps' Real Estate Branch and the Confederated Tribes of the Umatilla Indian Reservation. Funding development would be a major undertaking.

The original listing notes the functions of the site as landscape, recreation, culture, and park, so a return to this status would seem reasonable.

The potential of developing this area is recognized but there have been limited discussions with the Army Corps of Engineers. The Umatilla Tribes are concerned about protection of cultural resources on this site. A full master plan of the area, including details on the protection of these resources, would be necessary before the Tribes would be willing to provide public access.

The controlling land owner, the Army Corps of Engineers, would seek concurrence from the Tribes. It is recommended that a steering committee including representatives of the Tribes and Corps be formed to move forward with planning for the Old Umatilla area. This plan includes some general suggestions for plausible trail connections.

Conceptual drawing of how Old Umatilla might be developed into a public park.

5.4 *Central Area Projects (Between Downtown and McNary)*

McNary and Downtown are separated by approximately two miles. A portion of this area is zoned Public Facilities and is associated with the dam and Army Corps of Engineers land, including a large wetland reserve. It is unlikely that this area will see significant infill development over the next 20 years to expand the urban area. Therefore, connection between McNary and Downtown will remain an important transportation consideration.

The area is bisected by I-82 which can be crossed in only two places: the 3rd Street underpass and the Highway 730 interchange.

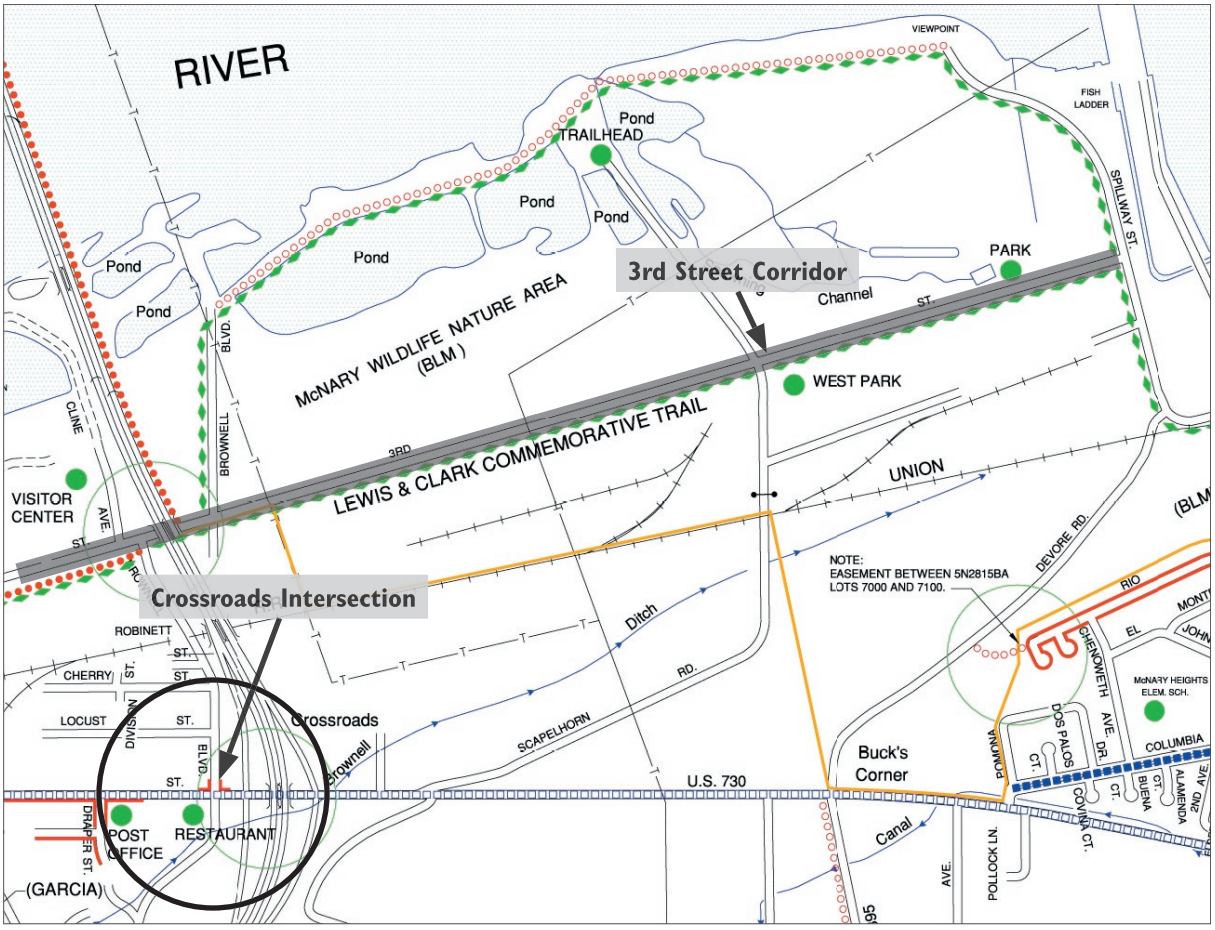


Figure 7 Central Area

Although most of Highway 730 includes shoulders, there is little lighting, especially for nonmotorists, and intersections are all difficult to traverse. Opportunities for improvements to Highway 730 and its intersections are described in the Downtown Study and in the TSP.

Parallel to Highway 30 runs 3rd Street which is a 2-lane County road without paved shoulders. It is part of the future Lewis & Clark Trail and connects to numerous destinations.

There are three north-south connectors between 3rd Street and Highway 730: Brownell Boulevard, Scapelhorn Road and Devore Road. The TSP recommended a near-term sidewalk project on Brownell Boulevard. Devore Road could provide another connection to the McNary neighborhood (refer to Section 5.5.1).

5.4.1 *3rd Street Corridor*

❖ ***Description:*** provide walkway along 3rd Street and path through McNary Wildlife Nature Area.

❖ **Period of completion:** long-term.

❖ ***Cost:*** 7000 ft of hard-pack, unpaved surface one side of 3rd Street at $10/ft, $70k; 6000 ft through Nature Area, $60k; $130k total.

❖ ***Ownership:*** Corps of Engineers (Walla Walla)/Bureau of Land Management, Bonneville Power Admin.

❖ ***Funding authority:*** Corps of Engineers.

❖ ***Funding sources:*** Corps of Engineers, City, grants.

❖ ***Feasibility:*** medium.

As part of the Lewis & Clark Trail, some type of improvements are desired on 3rd Street. Objectives include:

- Establish safe connections to multi-use paths.
- Provide a walkway along 3rd Street east of the multi-use path.
- Develop signing and pavement markings for Lewis & Clark Trail.

Path access on Switzler Ave.

This is a key street for bicycling and walking because it accesses many destinations and provides an alternative to Highway 730. East of Switzler Avenue, 3rd Street is part of the future Lewis & Clark Trail. Destinations on or near 3rd Street include: residences, the McNary Wildlife Nature Area and its trails, the dam's fish viewing station, two parks, the Visitor Center, the Marina, and potentially Old Umatilla if that area is opened up.

The pavement is about 20 feet wide without curbs and sidewalks and is in fair condition; traffic appears to be light (no volume data in TSP). A multi-use path was recently constructed parallel to the south side of 3rd Street between Switzler Avenue and Brownell Boulevard, about 3200 feet long. On the east side of the underpass of I-82, an unmarked path leads to a multi-use path on the I-82 bridge across the Columbia River.

Path access on Brownell Blvd.

The adjacent 3rd Street path west of Brownell provides an alternate to the street for walkers but has little advantage for cyclists, especially considering that the entry and exit points are at conflict points near intersections. The marina and RV campground generate large-vehicle traffic which can make the narrow road unpleasant. Since most RV traffic probably uses the street segment between Quincy Avenue and Brownell Boulevard, this should be widened first.

The remainder of the street will probably have to wait some time to be improved as there are many other priorities on more heavily traveled streets. It may be possible to create a hard surface side path parallel to the street for

3rd Street east of I-82.

pedestrians. The Army Corps of Engineers has shown support; the Bonneville Power Administration (BPA) which has facilities along 3rd Street and influences road access, has not. However, if the BPA chose to close the road to public motorized traffic, that would make pedestrian and bicycle use easier to accommodate.

An improved trail through the Nature Area that connects to the northern segment of Brownell Blvd. is a likely improvement although this is not a substitute for a facility on 3rd Street. Feasibility rates medium because potential use is relatively low for the size of the project.

5.4.2 *Crossroads Intersection (Highway 730 at I-82)*

- ***Description:*** improve intersection for pedestrians and bicyclists.
- ***Period of completion:*** near-term.
- ***Cost:*** 400 ft curb & 6-ft wide sidewalk south side at $40/ft, $16k; 2 driveways at $2k,/each, $4k; 1800 ft of 5-ft wide sidewalk on west side of Brownell Blvd., $54k; $74k total.
- ***Ownership:*** ODOT, County (Brownell Blvd.).
- ***Funding authority:*** ODOT.
- ***Funding sources:*** ODOT, adjacent landowners.
- **Feasibility:** medium.

This major intersection is the most direct east-west route between the downtown and McNary, and is close to the Post Office and a popular restaurant. There are signalized crosswalks on the west and south legs of the Brownell-Highway 730 intersection although they are not easily reached. Sidewalks are missing or intermittent and lighting east

Inaccessible crosswalk on Highway 730 west of I-82.

of the interchange is poor. There is much that can be done to improve the area.

The interchange has a high number of vehicle turning movements and trucks because of the ODOT truck weigh station on the northwest corner. The TSP discusses some improvements that could be made to expedite truck movements. The nearby restaurant, gas station and post office have wide driveways with many conflict points that add to the gauntlet a pedestrian or bicyclist must negotiate. Concrete barriers have been installed at some driveways to control vehicle movement but create an extremely unpleasant pedestrian environment.

This intersection is below basic standards for pedestrian accessibility. It should be improved to at least ODOT's basic pedestrian standards (curbs, sidewalks, accessible crosswalks) at the first available opportunity such as during repaving or a change in adjacent land use.

Other desirable improvements include:

- Install bike lanes.
- Add pedestrian lighting.
- Clean up and consolidate property access points.
- Provide connecting sidewalks on Brownell Blvd.
- Move Post Office downtown.

Highway 730 has a paved shoulder but no crosswalk west of I-82 (left photo) and east of I-82 (right photo).

5.5 *McNary*

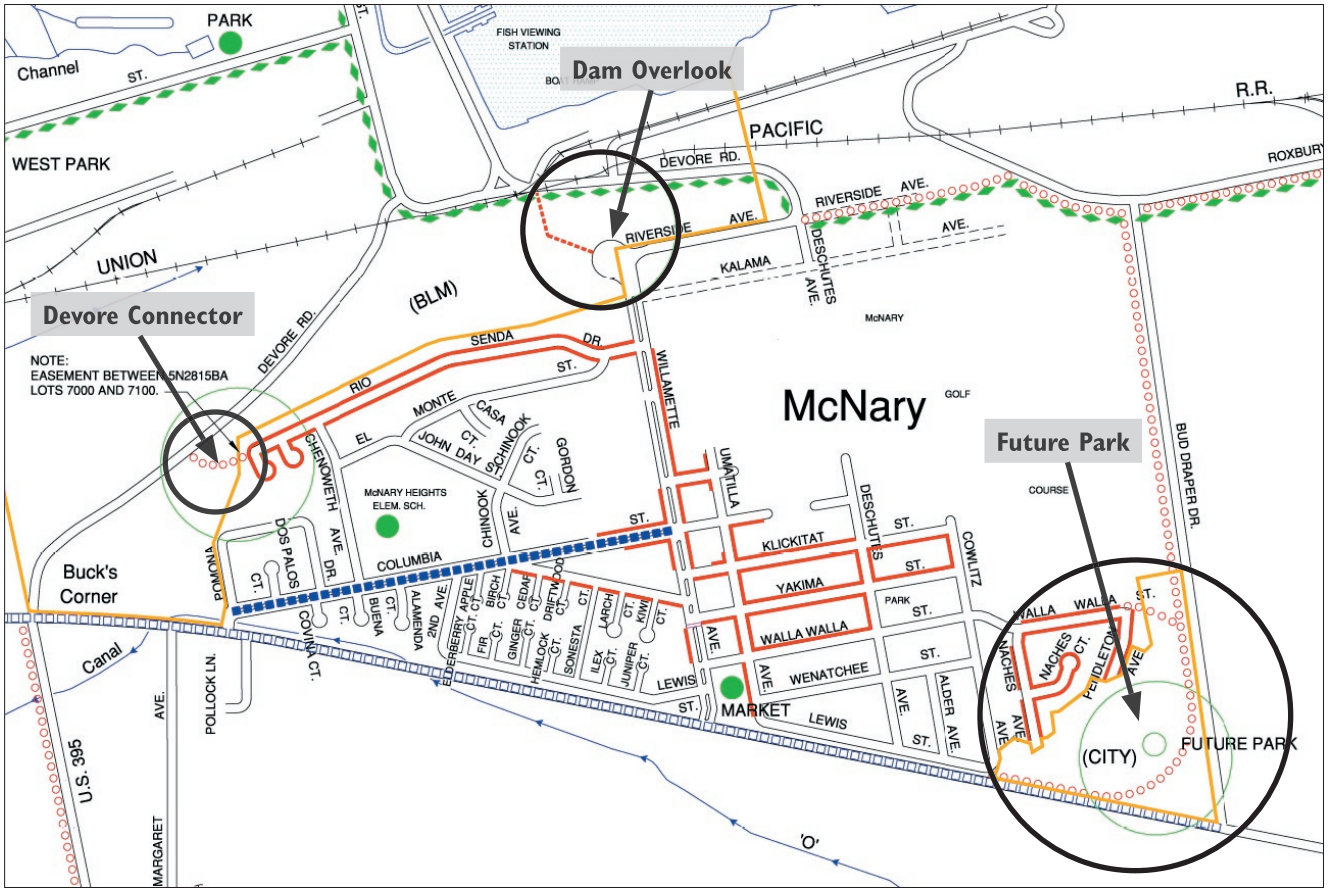
"We must plan towns in the name of our great nation, for the United States of America, and we must do the very best that we can within the limitations imposed by the yard-sticks of economics and human values — placing all possible emphasis upon the latter. Anyway, if we can afford it, if we can come reasonably near to monitoring its cost, what is wrong with Utopia?" – John M. Allison, McNary Town Manager, 1946

The McNary Townsite was area platted and developed by the Army Corps of Engineers in conjunction with the dam construction from 1947-53. Streets were named for tributaries of the Columbia River. McNary constitutes a somewhat self-sufficient neighborhood with a school, golf course and small commercial area including a market.

There are two broad "boulevards" and a grid of local streets characteristic of traditional towns. Although there are few sidewalks or bicycle lanes, residents of McNary are reportedly comfortable walking and bicycling on the local streets. The difficulty comes in traveling outside the town.

The TSP recommended $600,000 in near-term sidewalk projects in McNary for Willamette Avenue, Columbia Street, John Day Street, Chinook Avenue, Lake Gordon Avenue, and Chenoweth Avenue. These are mostly around the elementary school.

Figure 8
McNary



5.5.1 *Devore Road Connector*

- ***Description:*** develop short link (hard-surface path) from McNary to Devore Road.
- ***Period of completion:*** long-term.
- ***Cost:*** trail, 400 ft at $15/ft, $6k; plus 150 ft right-of-way, unknown cost.
- ***Ownership:*** private, Army Corps of Engineers (Walla Walla)/Bureau of Land Management, City.
- ***Funding authority:*** Army Corps of Engineers, City.
- ***Funding sources:*** Army Corps of Engineers, City.
- ***Feasibility:*** low.

This project is listed in the TSP as a street connection to help divert traffic from the Highway 730 intersections (Willamette and Columbia Avenues). It could benefit bicyclists and pedestrians, too, although there has been no support for it from either the technical advisory committee nor the public workshop. Instead, a trail is suggested as a way to benefit pedestrians and bicyclists without causing additional motorized traffic in the neighborhood.

Rio senda means river footpath.

A lot at the west end of Rio Senda Drive is undeveloped. It may be possible to obtain a narrow strip (at least 14 ft wide) of land for 150 ft between two existing subdivision lots for the trail, either through purchase or negotiation.

User trail down from subdivision lot

Devore Road west of McNary

5.5.2 *Dam Overlook Improvements*

❖ ***Description:*** improve overlook at north end of Willamette Avenue and access to the dam area below.

❖ ***Period of completion:*** long-term.

❖ **Cost:** trail, 600 ft at $15/ft, $9k; overlook, unknown but small improvements (picnic table, shelter, interpretive sign, outhouse, etc.) could be made incrementally as interest is developed; railroad crossings repair, $100k; $114k total.

❖ ***Ownership:*** City, Army Corps of Engineers (Walla Walla)/Bureau of Land Management.

❖ ***Funding authority:*** City, Army Corps of Engineers, Port of Umatilla (rail crossing).

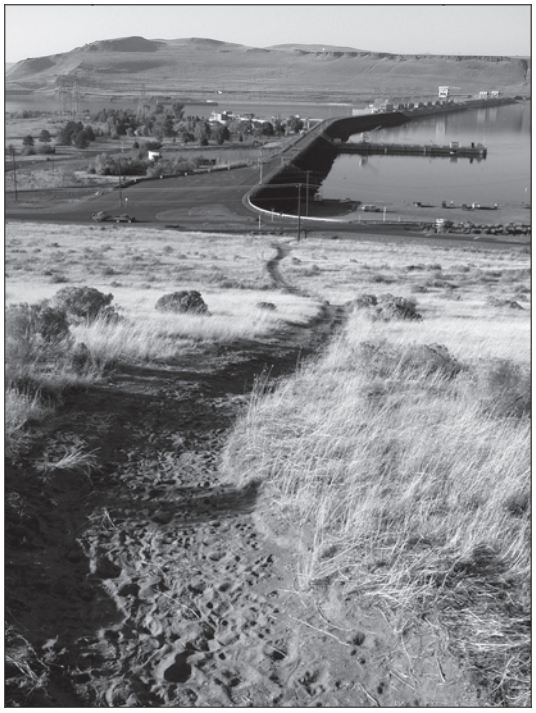
❖ ***Funding sources:*** City, Army Corps of Engineers, grants.

❖ ***Feasibility:*** medium.

The City controls part of the overlook while the Corps controls the slope and Devore Road to the north. The location has potential as an excellent waypoint on the Lewis & Clark Trail. It would also serve local residents. Objectives are to:

- Improve trail down slope for pedestrians.
- Route Lewis & Clark Trail on Riverside Avenue and Devore Road.
- Improve railroad crossings on Devore Road.
- Improve overlook for users.

Northern access to the McNary neighborhood is via Willamette Avenue above the McNary Dam. From a paved overlook at the north end of Willamette Avenue, the dam is reached by traveling east on Riverside Avenue and then turning left (north) down the hill at an intersection where the Lewis & Clark Trail will join from the east.



User trail down from overlook.

The hill section is moderately steep with a 140-foot elevation change, and is narrow (22 feet pavement width) without curbs and sidewalks; the posted speed is 25 mph. At the base of the hill, two angled railroad tracks with pavement heaving present an additional obstacle to bicyclists. The crossing should be made smooth, the flange openings minimized, and signs and pavement markings installed to warn cyclists.

Large paved overlook could be made into an attractive stop near the Lewis & Clark Trail.

Pedestrians have created a user trail straight up the hill to the overlook which not only avoids the narrow road but saves nearly a half-mile in distance. This trail could be improved to primitive standards for low cost. An opening in the guard rail at the top should be provided. Better

still, the large expanse of pavement at the viewpoint could be converted into a picnic and interpretive area.

The road near the dam eventually intersects the east end of 3rd Street where the Lewis & Clark Trail continues west. Traffic throughout appears to be light (the TSP has no traffic volume data for these roads).

Any road widening would be expensive because of the slope. There do not appear to be any other logical alignments for a path expect for the railroad right-of-way which would be unacceptable to the Port.

Angled railroad crossing with damaged flangeways on Devore Road at base of hill.

Devore Road hill below overlook.

5.5.3 *Future Park Connectors*

- ***Description:*** develop paths to future park.
- ***Period of completion:*** long-term.
- ***Cost:*** path, 5300 ft at $22/ft, $117k.
- ***Ownership:*** City, private, Port of Umatilla.
- ***Funding authority:*** City.
- ***Funding sources:*** City, grants.
- ***Feasibility:*** medium.

Site of future park and paths at corner of Highway 730 and Bud Draper Drive.

A park with ballfields is planned for the intersection of Highway 730 and Bud Draper Drive in the southeast corner of the McNary neighborhood. It would presumably be reached by short paths from Walla Walla Street and Lewis Street, and by a multi-use path parallel to Bud Draper Drive as shown on the map. The park design has not been determined. The TSP listed a street connection from Walla Walla Street to Bud Draper Drive, although the City indicated that this is no longer viable.

6 Capital Improvement Program

The TSP implementation plan, summarized in Table 4 (repeat of Table 1 for convenience), is a starting point for a specific pedestrian and bicycle Capital Improvement Plan (CIP). The 20-year plan outlined in the TSP lists 54 projects estimated to cost nearly $15 million. By far the greatest need identified was sidewalks with 37 projects totaling $9.35 million. There are another 8 multi-use path projects totaling $1.33 million.

Over half of the roadway project cost is for replacing the Umatilla River bridge. The remainder of the roadway system needs relatively minor improvements according to the TSP. However, many county roads, such as Powerline Road, were not included, most of which have less than 24 ft of pavement width — far below the standard for arterial and collector streets. The additional width is particularly important to bicyclists and pedestrians.

The TSP did not provide a fiscally-constrained plan from which to work. It notes that the City's annual Street Fund of $250,000 is dedicated entirely to the operation and maintenance of existing facilities. The few capitol improvement projects realized in the past were funded primarily by the developer or by a Local Improvement District. The TSP recommended a transportation system development charge supplemented by a combination of other sources such as street bonding, local improvement districts, a local gas tax, hotel/motel tax, and a street utility fee.

The TSP showed funding responsibilities of roughly $5.3M for ODOT (including most roadway projects), $5.6M for the County, $3.0M for the City, and $0.5M for the Army Corps of Engineers. This demonstrates the large number of roads in the urban area that are under County jurisdiction. The County has no plans and very limited funding to improve these facilities, so any projects must be undertaken by the City.

Table 4. TSP Implementation Plan

Project Category	Short-Term (1998-2007)		Long-Term (2008-2017)		Total	
	Projects	Cost, $M	Projects	Cost, $M	Projects	Cost, $M
Roadway	2	$0.29	7	$3.40	9	$3.69
Sidewalk	13	$1.16	24	$8.19	37	$9.35
Multi-Use Path	0	0	8	$1.33	8	$1.33
Total	15	$1.45	39	$12.92	54	$14.37

Because the City has no Capital Improvement Program, the list of projects in Table 5 is derived from the discussion in Section 5. These are considered the most promising pedestrian and bicycle projects for the City to undertake. Although the projects focus on specific facilities such as sidewalks and multi-use paths, they also include the key Powerline Road and 3rd Street corridors. Many of the projects support the Lewis & Clark Trail.

The estimated cost of these capital improvement projects is $2140k, assuming a signal installation at the Powerline Road-Highway 730 intersection. The cost is evenly split between near- and long-term projects. About $1600k would be City funded or about $80k per year over 20 years.

Left out of the list are potential projects that did not make the cut but were included on the system map for planning purposes and future consideration. Some of these may become practical sooner than anticipated if unexpected development occurs or a project advocate appears.

Finally, several multi-jurisdictional planning initiatives should be included in the City's efforts:

- South Hill school and park.
- Umatilla River Bridge replacement.
- Old Umatilla park and trail development.

Table 5. Proposed Pedestrian-Bicycle CIP

Project	Description	Period	Cost, $k	Authority
Umatilla River Paths				
Ped. Bridge to Powerline Rd. Path	1560 ft multi-use path 10-ft wide	Near	105	City
Lower South Hill Extension	1200 ft multi-use path 10-ft wide	Near	26	City
Umatilla Bridge Undercrossing	1500 ft multi-use path 10-ft wide	Long	18	City
Umatilla River Path Extension	700 ft multi-use path 10-ft wide	Near	15	City
Powerline Road Improvements				
Intersection with Highway 730	Signal near-term; bridge long-term	Near-Long	150–2000	ODOT
Sidewalks & Bike Lanes	4400 ft sidewalks & curbs both sides; 16-ft roadway widening	Near-Long	725	County
Traffic Calming & Crossings	6 crosswalks & islands; 1 roundabout	Near-Long	165	County
Downtown				
Link 3rd St. & Umatilla River Paths	900 ft sidewalks & curbs; 5000 ft bike lanes; crossing treatments	Near	79	City, ODOT
Walkway Infill	Various sidewalk segments; 700 ft multi-use path	Near-Long	415	City, ODOT
Central Area				
3rd St. Corridor	13,000 ft unpaved path	Long	130	USACE
Crossroads Intersection	2200 ft sidewalk & curb one side	Near	74	ODOT
McNary				
Devore Rd. Connector	400 ft unpaved path	Long	6	City, USACE
Dam Overlook	600 ft trail; RR Xing repair	Long	114	City, USACE, Port (RR)
Future Park Connectors	5300 ft multi-use path	Long	117	City

A

Appendix A

Glossary

AASHTO – American Association of State Highway and Transportation Officials. They publish national road and bicycle facility design guidelines which have been used by the State with modifications.

ADA – The Americans with Disabilities Act. Civil rights legislation passed in 1990, became effective July 1992.

ADAAG – Americans with Disabilities Act Accessibility Guide.

ADT – Average daily traffic. The average traffic volume in both directions of travel at a given point on a road.

Arterial street – A higher classification of street designated to carry traffic, mostly uninterrupted, through an urban area, or to different neighborhoods within an urban area. Arterial streets may be further broken down into major and minor categories, major often referring to State highways.

Bicycle – A vehicle having two tandem wheels, a minimum of 14 inches in diameter, propelled solely by human power, upon which any person or persons may ride. Three-wheeled adult tricycles and four-wheeled quadracycles are considered bicycles; tricycles for children are not.

Bicycle facilities – A general term denoting improvements and provisions made to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically designated for bicycle use.

Bicycle lane (or bike lane) – A portion of the roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists.

Bikeway – A generic term for a facility that is created when a road has the appropriate design treatment for bicyclists, based on motor vehicle traffic volumes and speeds; shared roadway, shoulder bikeway and bike are the most common. Another type of facility is separated from the roadway: multi-use path.

BPAC – Bicycle and Pedestrian Advisory Committee.

BID – Business Improvement District.

CBD – Central business district. A traditional downtown area usually characterized by established businesses fronting the street, sidewalks, slow traffic speeds on-street parking and a compact grid system.

CDBG – Community Development Block Grant

CENWP – Corps of Engineers, Portland District

CENWW – Corps of Engineers, Walla Walla District

CIP – Capital Improvement Program

Collector street – A street designated to carry traffic between local streets and arterials, or from local street to local street.

CPTED – Crime Prevention Through Environmental Design.

Cross-slope – Lateral slope across a road or path, typically designed for drainage.

Crosswalk – Portion of a roadway designated for pedestrian crossing, marked or unmarked. Unmarked crosswalks are the natural extension of the shoulder, curb line or sidewalk.

EID – Economic Improvement District

Enhancement funds – Set aside funds for certain transportation projects including bicycle and pedestrian facilities and paths.

DLCD – Department of Land Conservation and Development.

Grade – A measure of the steepness of a roadway, bikeway or walkway, expressed as a ratio of vertical rise per horizontal distance, usually in%. For example, a 5% grade equals a 5 unit rise over a 100 unit horizontal distance.

Grade separation – The vertical separation of conflicting travelways with a structure. Overpasses and tunnels are examples of common grade separations used to avoid conflicts.

IGA – Intergovernmental Agreement.

Interchange – A system of interconnecting roadways providing for traffic movement between two or more highways that are grade separated.

LID – Local Improvement District.

Local street – A street designated to provide access to and from residences and businesses.

MOA – Memorandum of Agreement.

MOU – Memorandum of Understanding.

Multi-use path – A path physically separated from motor vehicle traffic by an open space or barrier and either within a highway right-of-way or within an independent right-of-way, used by bicyclists, pedestrians, joggers, skaters and other non-motorized travelers. Sometimes called a shared-use path.

MUTCD – Manual on Uniform Traffic Control Devices. The national standard, approved by the Federal Highway Administration, for selection and placement of all traffic control devices on or adjacent to all highways open to public travel.

O&C – Opportunities and constraints.

ODOT – Oregon Department of Transportation.

OECDD – Oregon Economic and Community Development Department

ORS – Oregon Revised Statute, the laws that govern the state of Oregon, as proposed by the legislature and signed by the Governor.

OTC – Oregon Transportation Commission, a five-member, Governor-appointed commission, whose primary duty is to develop and maintain a state transportation policy and a comprehensive, long-term plan for a multimodal transportation system.

OTIB – Oregon Transportation Infrastructure Bank

OTP – Oregon Transportation Plan.

Path (or pathway) – a sidewalk, trail or shared-use path.

Paved shoulder – The portion of a shoulder which is paved.

Pavement markings – Painted or applied lines or legends placed on a roadway surface for regulating, guiding or warning traffic.

Pedestrian – A person on foot, in a wheelchair, or walking a bicycle.

Pedestrian facilities – A general term denoting improvements and provisions made by public agencies to accommodate or encourage walking, including walkways, crosswalks, signs, signals, illumination and benches. -

Rail trail – A shared use path, either paved or unpaved, built within the right-of-way of an existing or former railroad.

Rail with trail – A shared-use path, either paved or unpaved, built within the right-of-way of an active railroad.

Right-of-way – A general term denoting land, property, or interest therein, usually in a strip, acquired for or devoted to transportation purposes.

Roadway – The paved portion of the road.

Shared roadway – A type of bikeway where bicyclists and motor vehicles share a travel lane.

SDC – System Development Charge.

SHPO – State Historic Preservation Office.

Shoulder – The portion of a road that is contiguous to the travel lanes and provided for pedestrians, bicyclists, emergency use by vehicles and for lateral support of base and surface courses.

Shoulder bikeway – A type of bikeway where bicyclists travel on a paved shoulder.

Sidewalk – A walkway separated from the roadway with a curb, constructed of a durable, hard and smooth surface, designed for preferential or exclusive use by pedestrians.

STIP – State Transportation Improvement Program

TEA-21 – Transportation Efficiency Act for the 21st Century. Federal legislation that guides the expenditure of federal highway funds from 1998 through 2002, replaced ISTEA.

TPR – Transportation Planning Rule 12 (OAR 660-12).

Traffic – Pedestrians, ridden or herded animals, vehicles, streetcars and other conveyances either singly or together while using any highway for purposes of travel.

Traffic volume (see ADT) – The given number of vehicles that pass a given point for a given amount of time (hour, day, year).

Trail – a path of travel within a park, natural environment or designated corridor.

Travelway (also traveled way) – The portion of a roadway provided for the movement of vehicles, exclusive of shoulders.

TSP – Transportation System Plan, the overall plan for all transportation modes for the City

UGB – Urban Growth Boundary, the area surrounding an incorporated city in which the city may legally expand its city limits.

URD – Urban Renewal District.

USACE – US Army Corps of Engineers.

USGS – United States Geological Survey.

Vehicle – Every device in, upon or by which any person or property is or may be transported or drawn upon a highway, including vehicles that are self-propelled or powered by any means.

Walkway – A transportation facility built for use by pedestrians, including persons in wheelchairs. Walkways include sidewalks, paths and paved shoulders.

Wide curb lane (also wide outside lane) – A wide travel lane adjacent to a curb, parking lane or shoulder provided for ease of bicycle operation where there is insufficient room for a bike lane or shoulder bikeway.

B

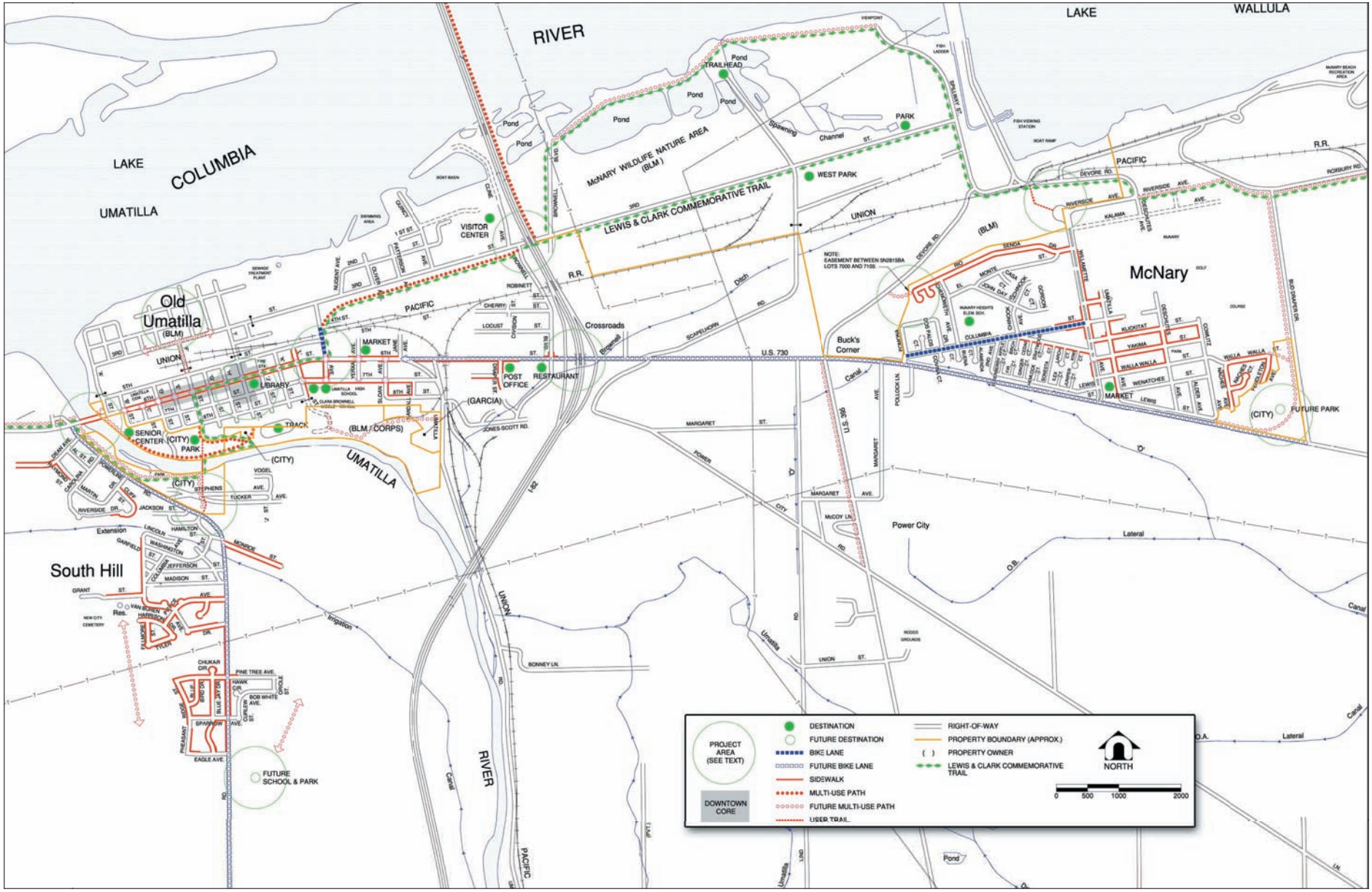
Appendix B

Pedestrian & Bicycle System Maps

Figure B-1 is the full map of the city showing existing and planned facilities. Projects areas are noted. Future sidewalks are not shown because they are largely dependent on development and on street construction or reconstruction. This figure has also been provided in color as a separate foldout for readability.

Figures B-2 through B-5 zoom in on four neighborhood areas. Property lines and ownerships relevant to projects are shown. Roads are shown at right-of-way width.

Figure B-1
City Map



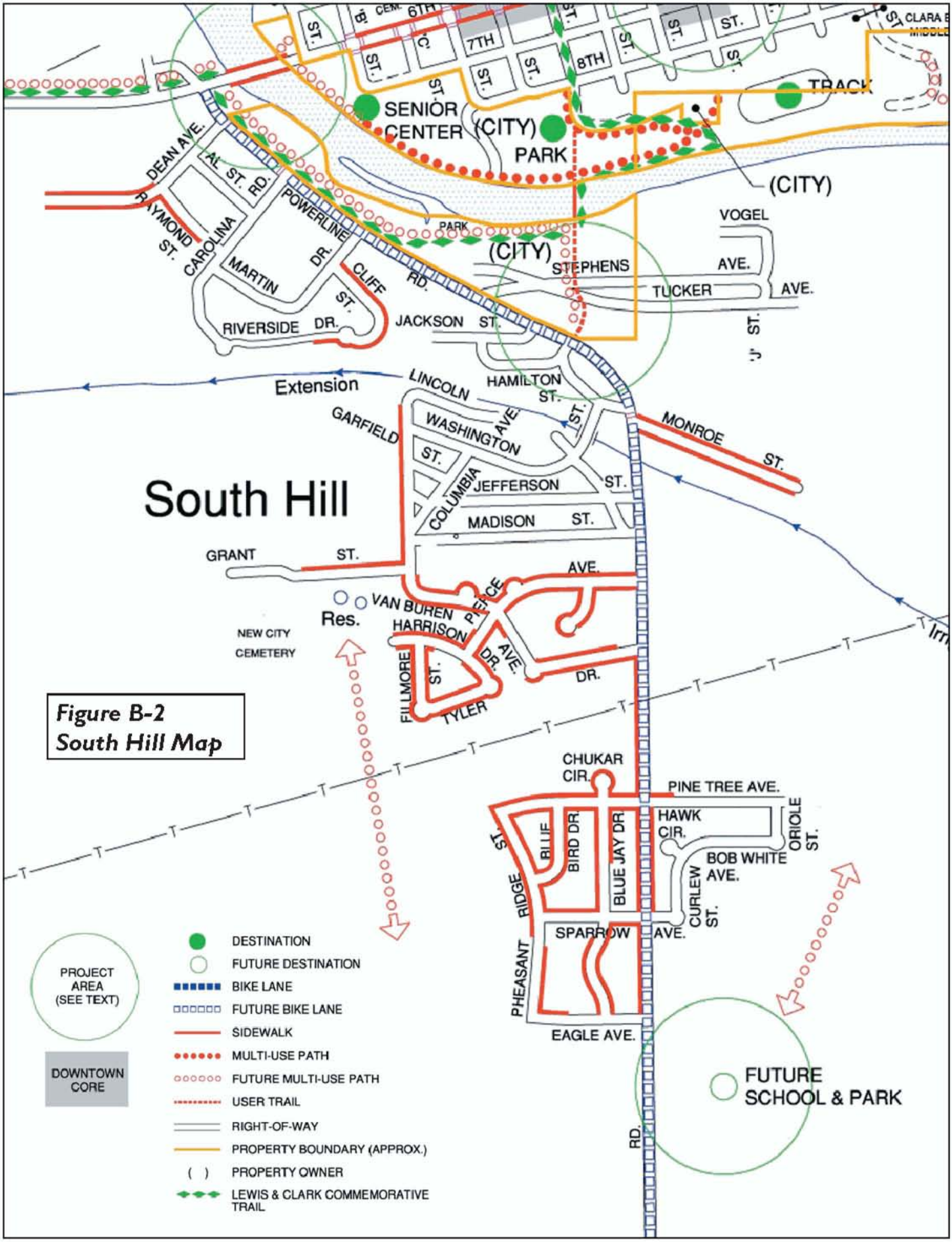
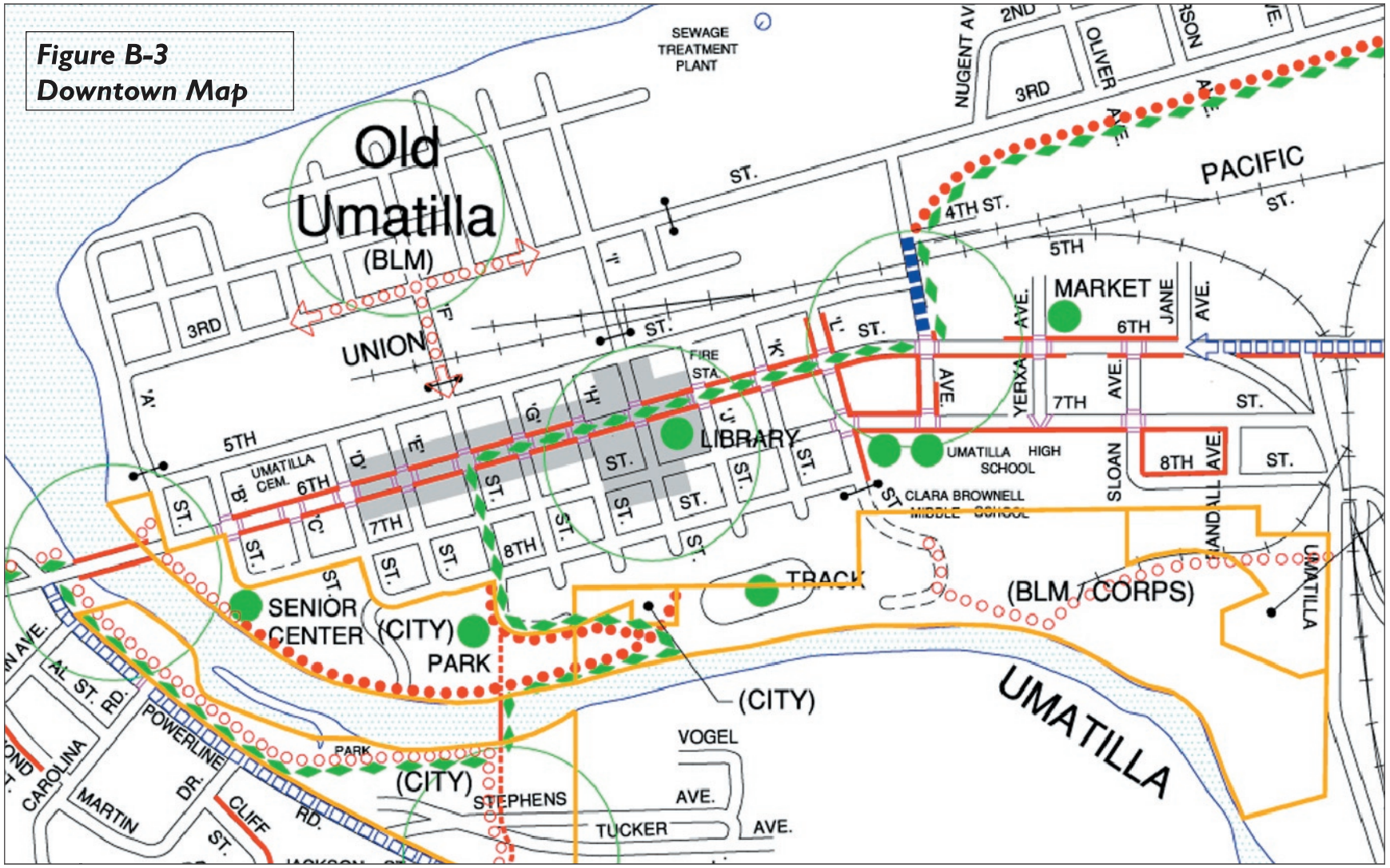


Figure B-2
South Hill Map

Figure B-3
Downtown Map



PROJECT AREA (SEE TEXT)

- DESTINATION
- FUTURE DESTINATION
- BIKE LANE
- FUTURE BIKE LANE
- SIDEWALK
- MULTI-USE PATH
- FUTURE MULTI-USE PATH
- USER TRAIL
- RIGHT-OF-WAY
- PROPERTY BOUNDARY (APPROX.)
- ( ) PROPERTY OWNER
- LEWIS & CLARK COMMEMORATIVE TRAIL

DOWNTOWN CORE

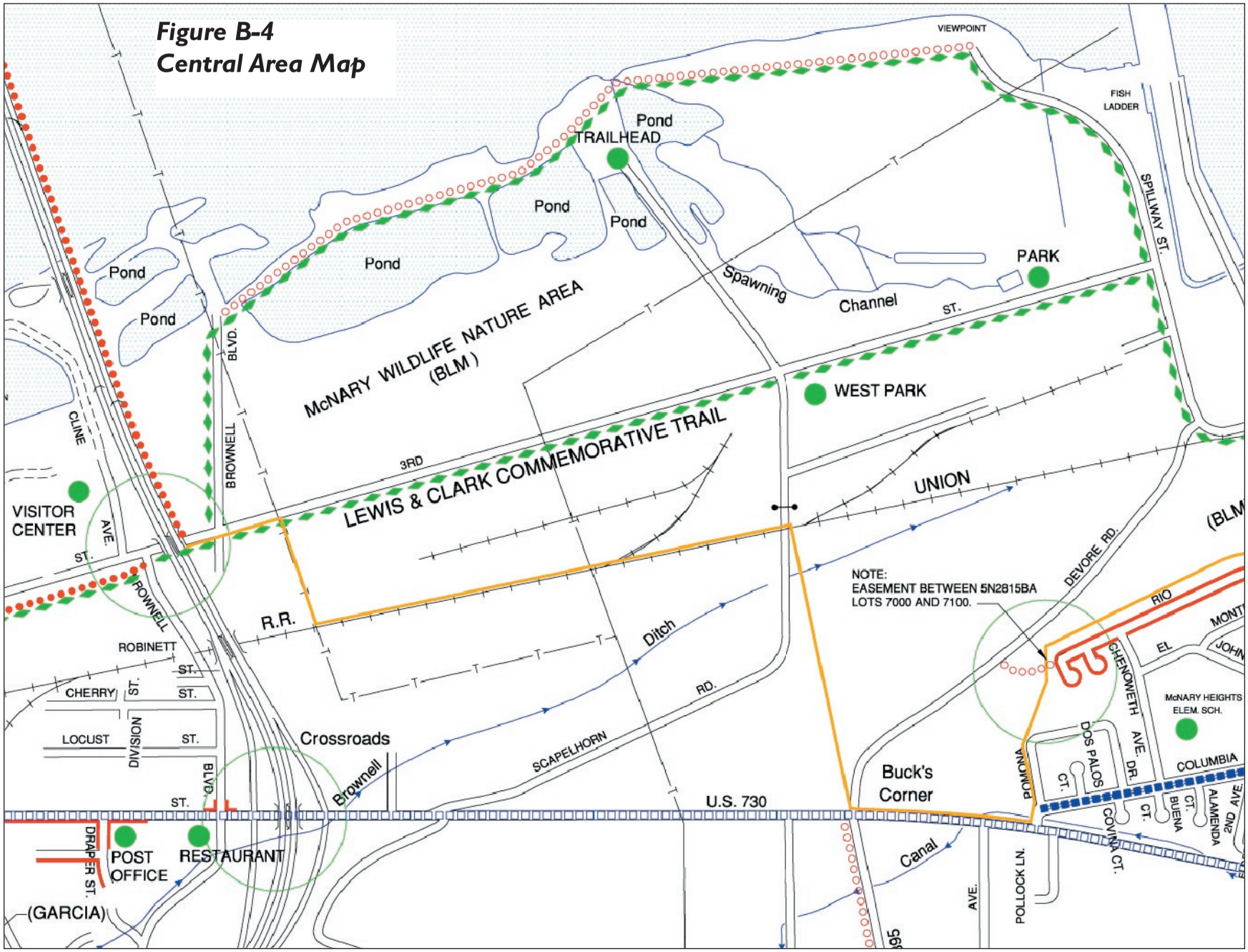
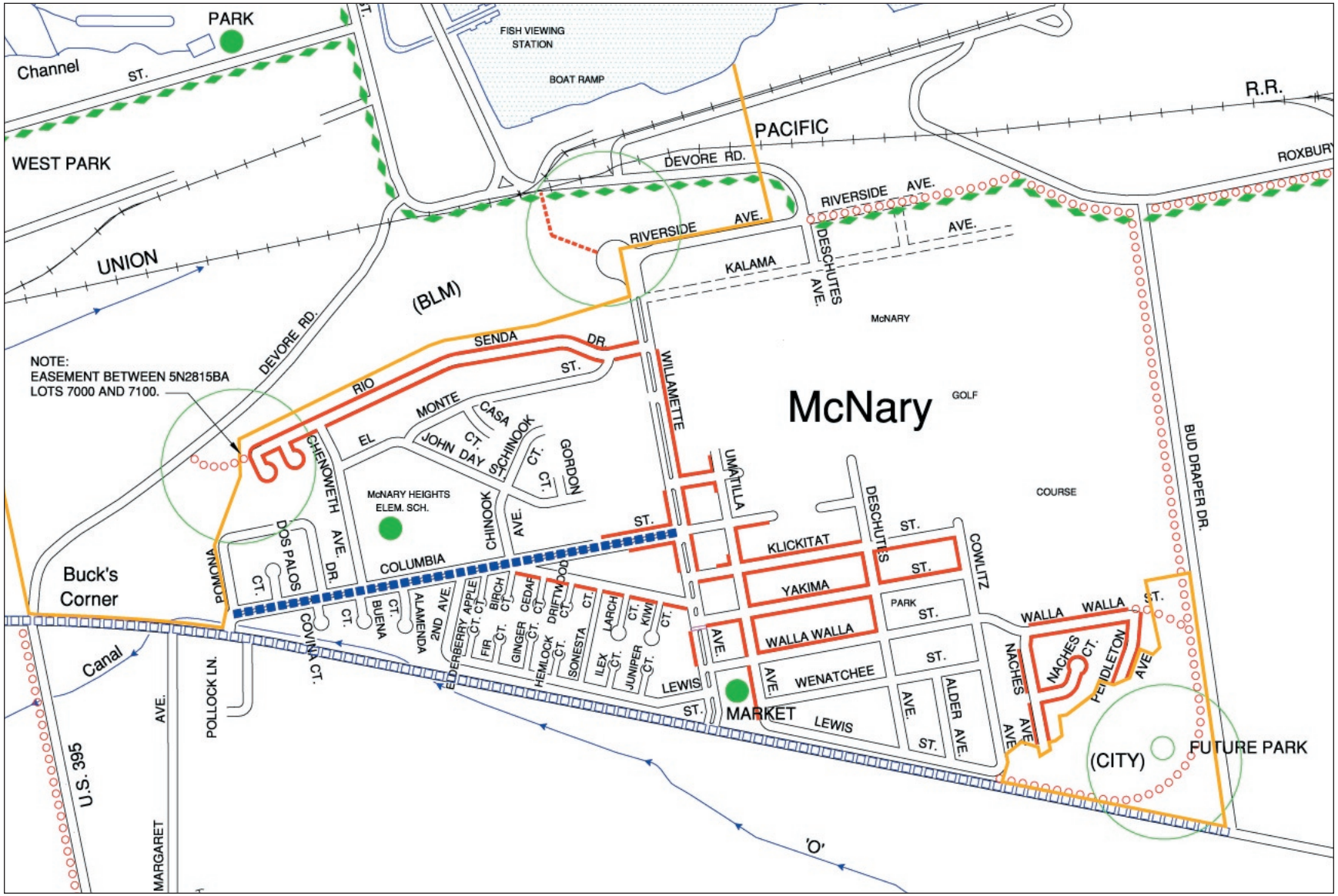


Figure B-4
Central Area Map
VIEWPOINT
FISH LADDER
Pond
TRAILHEAD
Pond
Pond
Pond
Pond
Pond
PARK
SPILLWAY ST.
Spawning
Channel
ST.
McNARY WILDLIFE NATURE AREA (BLM)
BLVD.
BROWNELL
CLINE
WEST PARK
3RD
LEWIS & CLARK COMMEMORATIVE TRAIL
UNION
VISITOR CENTER
AVE.
ST.
BROWNELL
NOTE:
EASEMENT BETWEEN 5N2815BA
LOTS 7000 AND 7100.
DEVORE RD.
R.R.
Ditch
ROBINETT
ST.
CHERRY
ST.
ST.
LOCUST
DIVISION
ST.
RD.
SCAPELHORN
Crossroads
Brownell
BLVD.
ST.
U.S. 730
Buck's Corner
DRAPER ST.
POST OFFICE
RESTAURANT
(GARCIA)
Canal
AVE.
POLLOCK LN.
McNARY HEIGHTS ELEM. SCH.
CHENOWETH AVE.
DOS PALOS CT.
DR.
COLUMBIA
POMONA
COVINA CT.
CT.
BUENA
ALAMENDA
2ND AVE.

Figure B-5
McNary Map



C

Appendix C

Transportation SDC Example

(See hard copy.)

D

Appendix D

Code Amendments

Recommended Revisions to Title 10, Umatilla Zoning Code

Recommended Revisions to Title 11, Umatilla Land Development Code

All suggested new text is shown in **bold, underline**. Deleted text is shown in ~~**bold, strikethrough**~~.

10-1-6: DEFINITIONS:

Insert language at appropriate alphabetical placement.

ACCESSORY STRUCTURE OR USE: A structure or use incidental and subordinate to the primary use of the property and that is located on the same lot with the main use, e.g., a home occupation is an accessory use.

ACCESSWAY or ACCESS CORRIDOR: A defined right-of-way or easement provided for pedestrians, vehicles, or both, for safe, usable and convenient access to or between properties or uses. "Access corridor" means a separate travel way for pedestrians and bicyclists to minimize travel distances within and between subdivisions, planned unit developments, residential areas and commercial centers, major employment areas, transit stops, or within and between nearby neighborhood activity centers such as schools, parks and convenience shopping.

BICYCLE. A vehicle designed to operate on the ground on wheels, propelled solely by human power, upon which any person or persons may ride, and with every wheel more that 14 inches in diameter or two tandem wheels either of which is more than 14 inches in diameter or having three wheels in contact with the ground, any of which is more than 14 inches in diameter.

BICYCLE FACILITIES. A general term denoting improvements and provisions made to accommodate or encourage bicycling, including parking facilities, all bikeways, and shared roadways not specifically designated for bicycle use.

BIKEWAY. Any road, path or way which in some manner is specifically designated as being open to bicycle travel, regardless of whether such facility is designated for the exclusive use of bicycles or is shared with other transportation modes.

PEDESTRIAN. A person who is traveling without the use of a vehicle; i.e., walking or using a wheelchair.

PEDESTRIAN FACILITIES. Improvements which provide for pedestrian traffic including sidewalks, walkways, crosswalks and other improvements, such as lighting and benches which make it safe or convenient to walk.

SIDEWALK. A pedestrian walkway separated from a road, with or without a curb, constructed of a durable, hard surface, usually concrete.

WALKWAY. A facility provided specifically for the benefit and use of pedestrians.

ARTICLE B. DOWNTOWN COMMERCIAL (DC)

10-4B-1: PURPOSE:

The downtown commercial district is intended to provide a concentrated central business district centered on 6th Street (State Highway 730). Uses include a mix of civic, retail, service, ~~and~~ office and residential uses, designed to be pedestrian friendly and encouraged to be close to and oriented toward fronting streets and sidewalks. Parking may be provided on a districtwide basis and may include public street parking, rather than having each individual building or use provide parking. (Ord. 710, 5-7-2002)

10-4B-2: USES PERMITTED:

The following uses and their accessory uses are permitted in the DC district. Site review is required.

Commercial uses which are conducted wholly within an enclosed building. Outside displays, furniture, and promotional activities directly related and subordinate to the primary business such as sidewalk cafes and outdoor seating are permitted; however, use of a sidewalk or public right of way is subject to a permit issued by the city.

Residential uses provided the ground floor street frontage is occupied by commercial use.

Temporary commercial uses including the sale of arts and crafts, produce, collectibles and other small retail sales may occur outside a wholly enclosed structure. This temporary use is intended to create a "farmer's market" atmosphere in the city on weekends. (Ord. 710, 5-7-2002)

10-4B-3: CONDITIONAL USES PERMITTED:

Community services uses. (See standards and limitations on community services uses of this title.)

~~**Drive through windows for any use. (Ord. 710, 5-7-2002)**~~

10-4B-4: DEVELOPMENT STANDARDS:

A. Landscaping: Landscaping shall be provided as follows:

REQUIRED LANDSCAPING

Site Size	Required Landscaped Area
10,000 square feet or smaller	None
Greater than 10,000 square feet	5 percent of site area

B. Pedestrian Amenities: Pedestrian amenities, such as benches, plazas, fountains, and sculptures, may replace required landscaped area.

DIMENSIONAL STANDARDS

Minimum lot area:

Commercial uses	None
Residential uses	None; density shall comply with R3 district requirements

Minimum lot width	None
Maximum front or side street yard setback	10 feet
Minimum yard setbacks:	
Front and rear yards	0 feet or 10 feet if adjacent to a residential district
Side yard	0 feet or 10 feet if adjacent to a residential district
Side street yard	0 feet or 10 feet if adjacent to a residential district
Parking spaces or parking area	10 feet
Maximum building height	35 feet
Maximum site coverage (building and impervious surface)	100 percent

C. Building Orientation: Buildings shall have their primary entrances oriented toward the street. On corner lots, building entrances shall face the primary fronting street or the corner. New buildings located on the corner of 6th and "I" Streets shall be designed with building fronts, which include display windows, facing both 6th Street and "I" Street.

D. Building Materials: No special standards for building materials apply.

E. Parking: No off street parking is required.

F. Parking Or Loading Areas Which Abut A Residential Zone: Parking or loading areas which abut a residential zone along a rear or side property line shall be separated from the property line by a twenty foot (20') wide landscaped area. Alternatively, a ten foot (10') wide landscaped area and a fence or wall at least four feet (4') in height may be used to buffer the residential property.

G. Design Features: Awnings are permitted on commercial buildings fronting on 6th or "I" Street. Awnings shall not bisect transom windows. (Ord. 710, 5-7-2002)

10-4B-5: LIMITATIONS ON USE:

A. All uses are subject to site review.

B. No drive-through windows shall be permitted in this District for any use.

~~**B.**~~**C.** No single use shall have a gross floor area greater than twelve thousand (12,000) square feet, except for a grocery store.

~~**C.**~~**D.** The maximum front yard setback may be increased by ten feet (10') if the setback is occupied by an outdoor feature relating to the business or public amenity such as seating or artwork.

~~**D.**~~**E.** Parking is not allowed in the front yard setback or in a side yard setback closer to the street than the adjacent building facade or a minimum of ten feet (10'). Parking shall not be located between a building and the public street. (Ord. 710, 5-7-2002)

10-9-1: OFF-STREET PARKING AND LOADING:

A. Scope: At the time a structure is erected or floor area is enlarged by ten percent (10%), or the use of a structure or parcel of land is changed within any district, off-street parking spaces for motor vehicles and bicycles shall be provided in accordance with the requirements of this Chapter unless greater requirements are otherwise established.

B. Compliance: Occupancy of a building or use will not be permitted without complying with this Chapter. If parking space has been provided in connection with an existing use, the parking space shall not be eliminated if it would result in less than is required by this Chapter. A permit for the use of property is contingent upon the unqualified continuance and availability of the amount of parking space required by this Title. Reduction of the amount of required off-street parking shall be considered a violation of this Title.

C. General Requirements:

1. Where square feet are specified, the area measured shall be the gross floor area primary to the functioning of the particular use of property.

2. Where employees are specified, persons counted shall be those working on the premises, including proprietors, during the largest shift at peak season.

3. Required vehicle parking shall be available for the parking of operable automobiles and bicycles of residents, customers and employees and shall not be used for the storage of vehicles, materials or for the parking of trucks used in conducting business or use. A required loading space shall not be used for any other purpose than the immediate loading or unloading of goods.

4. For purposes of calculating the required number of vehicle or bicycle parking spaces, a fractional space shall be counted as a whole space.

5. Joint Use of Facilities. The off-street requirements of two or more uses, structures, or parcels of land may be satisfied by the same parking or loading spaces used jointly to the extent that it can be shown by the owners or operators of the uses, structures or parcels that their operations and parking needs do not overlap in point of time. If the uses, structures, or parcels are under separate ownership, the right to joint use of the parking space must be evidenced by a deed, lease, contract, or other appropriately written documents to establish the joint use.

6. The maximum number of parking spaces for a commercial development shall not exceed 150% of the required parking.

CHAPTER 4

DESIGN AND IMPROVEMENT REQUIREMENTS

11-4-2: STREETS:

MINIMUM STREET STANDARDS

Type Of Street[1]	Minimum Right Of Way	Minimum Widths For Sidewalks [2]	Minimum Pavement Width	Bicycle Lane
Major arterial street	State or county standards or 60'	6' both sides	40'	6' both sides
Minor arterial street	State or county standards or 60'	5' both sides	40'	~~**See bikeway plan**~~[4] **6' both sides**
Collector street	60' or county standard	5' both sides	40'	~~**See bikeway plan**~~[4] **5' both sides**
Neighborhood collector street	60' or county standard	5' both sides	40'	~~**See bikeway plan**~~[4] **5' both sides**
Local streets: commercial or industrial	60' minimum	5' both sides	36'	n/a
Cul-de-sacs: commercial or industrial	55' radius	5' around	45' radius	n/a
Local streets: residential [~~2~~,3,~~ 4~~]	34'	5' both sides	24'	n/a
Cul-de-sacs: residential	50' radius	5' around	40' radius	n/a
Pedestrian connections	20' minimum	6' walkway	n/a	6' wide in addition to walkway
Alleys	24' commercial or industrial; 20' residential	n/a	20' minimum	n/a

1. Except in the Downtown Commercial Zone, all sidewalks shall be located at the property line.

~~**1.**~~**2.** Standards for streets within the downtown plan area shall conform to design standards of the "Downtown Revitalization and Circulation Study, June 29, 2001", figures 5-9 and 5-13, or other applicable street standards of the downtown plan.

~~2.~~**3.** The typical local residential street is expected to have a 60 foot right of way with 36 feet of pavement. Local residential streets may have reduced rights of way and pavement widths when anticipated traffic volume is less than 500 vehicle trips per day for low density developments in the R-1 and R-2 zones.

~~3.~~**4.** A local residential "minor street" may be approved with a minimum right of way of 34 feet and pavement width of 24 feet when the proposed street serves 5 or fewer dwellings; is not a through street and does not exceed 150 feet in length. A minor street may be terminated with a hammerhead type turnaround. A minor street may be public or privately owned. If private, "right of way" shall become required easement width and provisions for maintenance shall be recorded with the deeds of properties served by the street.

~~**4. The bikeway plan is on file under the transportation system plan in the office of the city clerk.**~~

E

Appendix E

Inter-Jurisdictional Agreements

Background Information

Recommendations for the Umatilla Pedestrian and Bicycle Plan

Background Information

One of the most common methods for neighboring jurisdictions use to cooperate is entering into agreements. These agreements may take a variety of forms, ranging from the informal understood contract, most commonly called a Memorandum of Understanding (MOU), to more formal Memorandum of Agreement (MOA), to the most formal intergovernmental agreement (IGA). The three basic types of agreements are be described as follows:

- Understood Contract: Its most common use occurs between two smaller neighboring towns or an town and the county or special district. This usually takes the form of a MOU. Typically, a MOU has no definite contract but is a statement of an informal understanding. For example, an informal arrangement might be set up between a city and county under which the city agrees to remove snow or sweep county roads that are within the city. An example of a MOU (Lewis and Clark Commemorative Trail) is attached to this memorandum.

- Service Contract: Under this arrangement, one jurisdiction contracts with another to provide one or more services for a stated amount. The terms of the contract are negotiated and formalized in a written agreement. One city or other entity is the supplier of the service and the other pays for the service. This is the most common method of intergovernmental contracting. Using the previous example, the county would pay the city an agreed-upon fee for sweeping its streets. An example of a MOA (City of Bend & COCAAN) is attached to this memorandum.

- Joint Agreement: This method is distinguished from the service contract in that responsibility for the performance of a particular function or the operation and construction of a facility would be shared through the creation of an administrative vehicle to handle service responsibilities; e.g., a board consisting of representatives of each participating governmental unit (this can be the existing City Council or similar body). An example IGA (City of Bend & Bend Metro Park and Recreation) is attached to this memorandum.

  The joint agreement may be spelled out through a contract, generally authorized by ordinance, following procedures established in the Oregon Administrative Rules, which spell out the details of local discretion. This approach leaves a good deal of flexibility so that local officials can tailor the program to reflect their own needs and sensitivities. IGAs are most often used for real construction projects or provision of long-term services. In Oregon, cities and counties may have an IGA to determine which jurisdiction governs the Urban Growth Boundary area. Projects shared by ODOT and a city will also typically have a formal IGA,

Projects to improve conditions for pedestrians and bicyclists often cross jurisdictional boundaries and have one of the types of agreements outlined above. Coordination between jurisdictions is a key component for successful projects. The issue of intergovernmental coordination takes on greater significance in areas, such as Umatilla, that have one or more agencies that could potentially participate in projects, each with its own policies and budgets. In Umatilla, the major affected agencies include the City, Umatilla County, and the Army Corps of Engineers. Other jurisdictions include the Port of Umatilla, Umatilla Tribes, Bonneville Power Administration, Umatilla School District, and West Extension Irrigation District.

Recommendations for the Umatilla Pedestrian and Bicycle Plan

The Umatilla Pedestrian and Bicycle Plan includes several projects that have multi-jurisdictional ownership. The following are recommendations for formalizing the relationships between these agencies as pertains to projects identified in the Umatilla Pedestrian and Bicycle Plan.

- The City and County should consider formalizing the existing verbal agreement to participate in improving the 1.2 miles at the north end of Powerline Road with curbs, sidewalks and bikelanes.

- Also related to Powerline Road improvements, the City should consider formalizing the agreement between the private land developers and the City for contributions to improvements along the southern portion of Powerline Road. It may be beneficial to connect the timing of improvements or contributions to improvements to the number of units developed in each phase of development or similar method. Because of the effect of the planned development on South Hill on Powerline Road, it may be appropriate to involve the County in this process.

- The City should maintain its existing MOU to establish the Lewis and Clark Commemorative Trail.

- The City should develop an IGA with ODOT to bring the pedestrian crossing facilities at the Crossroads Intersection to ODOT's basic standards. The City may contribute such items as removal of concrete barriers in exchange for ODOT providing correct access (curbs, sidewalk, ADA ramp) to the pedestrian push buttons.

- The City should establish an IGA with the Army Corps of Engineers to provide and maintain an unpaved hard surface path between Brownell Blvd. and Spillway St. along Third St.

- The City and the Army Corps of Engineers should establish a MOU to provide right-of-way or easement, development of a surface, and maintenance for the two trails in the McNary area (Devore extension and Riverside trail).

- The City should set up a Stakeholder Committee to develop plans and, eventually, an IGA between the City, Army Corps of Engineers, and the Umatilla Tribes to provide public access to the Old Town area. The stake holder committee should include a representative of the Umatilla Tribes, Army Corps of Engineers, City of Umatilla, and Chamber of Commerce.

F

Appendix F

Traffic Analysis

Traffic Count Update (Preliminary)

TRAFFIC COUNT UPDATE

During the course of the Umatilla Pedestrian and Bicycle Plan development, ODOT requested that traffic counts be updated at several intersections along Highway 730 to determine if changes in traffic could potentially affect the outcome of the Plan. ODOT conducted the counts at US 730 and Umatilla River Road, US 730 and Brownell Blvd., and US 730 and Powerline Road in the Spring of 2003. This data was provided to David Evans and Associates, Inc. (DEA), where it was analyzed. The results are shown in Table 1.

Table 1 - Intersection Performance Summary

Intersection	Traffic Control	Critical Approach	LOS	V/C
US 730 and Umatilla River Road	Unsignalized	Northbound Left	F	1.42
US 730 and Brownell Blvd.	Signalized	Westbound Left	E	0.58
US 730 and Powerline Road	Unsignalized	Northbound	E	0.74

Abbreviations: LOS = Level-of-Service, V/C = Volume-to-Capacity Ratio

The results of this survey show a significant increase in traffic over previous traffic counts done in 1998 by Kittelson and Associates, Inc. (KAI), as shown in Table 2. It is unclear whether these increases reflect an actual increase in traffic or are an artifact of different analysis techniques, or some combination of these.

Table 2 - Comparison of 1997 and 2003 Traffic Counts

Intersection	Traffic Control	Critical Approach	1997[1]		2003[2]	
			LOS	V/C	LOS	V/C
US 730 & Umatilla River Rd	Unsignalized	Northbound	C	0.35	F	1.62
US 730 & Brownell Blvd.	Signalized	Westbound Left	C	0.3	E	0.58
US 730 & Powerline Rd	Unsignalized	Northbound	B	0.12	E	0.74

1. Kittelson Assoc., Umatilla
2.. Counts taken by ODOT in February 2003, analyzed by David Evans and Associates, Inc.

Abbreviations: LOS = Level-of-Service, V/C = Volume-to-Capacity Ratio

There are several reasons why the analyses conducted by DEA and KAI result in significantly different volume-to-capacity (V/C) ratios and levels of service (LOS) for the three intersections in the City of Umatilla. These are explained below:

1. Traffic Volumes

The traffic volumes used by DEA for the capacity analysis are significantly higher than those used by KAI. The traffic volumes on US 730 that were used by DEA are roughly 20% to 100% higher than those that were used by KAI. The traffic volumes on the

sidestreets that were used by DEA are roughly 35% to 300% higher than those that were used by KAI.

The most likely reason for the discrepancy in the traffic volumes is that DEA used a 30th highest hour analysis and KAI did not. ODOT now requires that capacity analysis on state highways be performed for the 30th highest hour (also known as the Design Hour Volume).

For this analysis, ODOT provided 24-hour manual turning movement counts that were conducted in January 2003. DEA converted the 24-hour January count to a 30th highest hour count using data from ODOT's permanent Automatic Traffic Recorder (ATR) number 30-002, which is located on US 730, 0.2 miles east of US 395.

First, the 24-hour January count was converted to a 2003 Average Daily Traffic (ADT) volume by applying a seasonal adjustment factor. According to the ATR data, January traffic volumes represent 76 percent of ADT volumes. Therefore, the 24-hour January traffic volumes were divided by 0.76 to convert them to 2003 ADT volumes.

Then, the 2003 ADT volumes were converted to 2003 30th highest hour volumes. According to the ATR data, the 30th highest hour volumes represent 10.3 percent of ADT volumes. Therefore, the 2003 ADT volumes were multiplied by 0.103 to convert them to 2003 30th highest hour volumes. KAI used PM peak hour traffic counts from May 1997, which were not seasonally adjusted and were not converted to 30th highest hour volumes in their analysis.

A second reason for the discrepancy in the traffic volumes is the different analysis years. DEA analyzed conditions for the year 2003. KAI analyzed conditions for the year 1997. According to the City of Umatilla TSP (Table 6 on page 37), traffic volumes in the study area were predicted to increase at 5% per year between the years 1997 and 2002, and at 3% per year between the years 2002 and 2007. Applying those growth rates to year 1997 traffic volumes would result in year 2003 traffic volumes that would be roughly 30% higher than those in the year 1997.

A third reason for the discrepancy in the traffic volumes is the truck factor. According to the ATR data, roughly 40% of the traffic on US 730 is comprised of trucks. Therefore, DEA used a truck factor of 40% in the capacity analysis. KAI provided no explanation of what (if any) truck factor was applied in the capacity analysis.

2. Lane Configurations

The lane configurations used by DEA at two of the intersections are slightly different than those used by KAI.

At the intersection of US 730 and Umatilla River Road, DEA used a one-lane approach (shared left/right turn lane) on the northbound approach (the critical approach). KAI used a two-lane approach (separate left and right turn lanes) on the northbound approach. Substituting a two-lane approach into DEA's analysis returns a slightly better V/C ratio and LOS; however, the intersection still operates with a V/C ratio over 1.00 and LOS F.

At the intersection of US 730 and Brownell Road, DEA used a one-lane approach (shared left/through/right lane) on the northbound approach. KAI used a two-lane approach (separate left and through/right lanes) on the northbound approach. Substituting a two-lane approach into DEA's analysis has no effect on the V/C ratio and LOS because the critical turn movement at this intersection is the westbound left turn.

3. Signal Phasing

KAI provided no explanation of what traffic signal phasing at the intersection of US 730 and Brownell Road was used in the TSP. DEA assumed that the signal phasing consisted of a 90-second, three phase cycle consisting of: protected east-west left turns, east-west through and right, and north-south left, through, and right. DEA optimized the signal timing based on the existing traffic volumes.

CONCLUSIONS

ODOT is currently evaluating the data and analyses for this study. If the DEA analysis is accurate, this means that traffic has significantly increased along Highway 730 and its side streets since the Umatilla TSP was completed. However, the TSP identified improvement projects for all three of these intersections. No additional projects are proposed in the Umatilla Pedestrian and Bicycle Plan that would alter the recommendations of the TSP.

G

Appendix G

Engineering Design Standards

G.1 *Pedestrian Facilities*

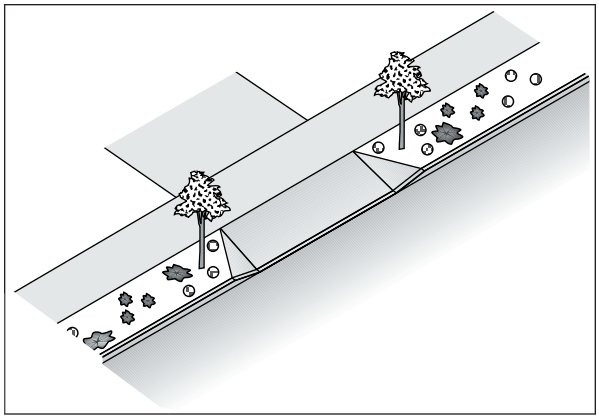
G.1.1 *Sidewalks*

Location

Commercial centers and downtowns: both sides of all streets.
Major residential streets: both sides.
Local residential streets: preferably both sides, but at least one side.
Low-density residential (1-4 units/ac): preferably both sides, but at least one side with shoulder on other side.
Rural residential (less than 1 unit/ac): preferably one side with shoulder on other side, but at least a shoulder on both sides.

Width

Local streets outside central business district:
1.8 to 2.4 m (6 to 8 ft) [1.5 m (5 ft) minimum].
Commercial areas outside central business district:
2.4 to 3.0 m (8 to 10 ft) [1.5 m (6 ft) minimum].
Central business areas including downtowns and commercial centers:
3.0 m (10 ft) [2.4 m (8 ft) minimum];
More width in areas of high pedestrian activity; sidewalk cafes and transit stops.
Buffer zone (aka landscape strip) between sidewalk and roadway:
0.6 to 1.2 m (2 to 4 ft) on local and collector streets;
1.5 to 1.8 m (5 to 6 ft) on arterial and major streets;
1.5 to 2.4 m (5 to 8 ft) with street trees, high speeds, high truck use, or where space exists;
1.5 m (5 ft) minimum for uncurbed sidewalk including 0.9 m (3 ft) minimum green strip.



Buffer zone enhances the walking environment and allows the sidewalk to remain level at driveways.

Standard Sidewalk Dimensions

Width (varies by type of street, larger number preferred):

- Local = 5 to 6 ft
- Commercial area outside downtown = 8 to 10 ft
- Downtown = 10 to 12 ft

Horizontal Clear Space = 3 to 5 ft

Vertical Clear Space = 7 to 8 ft

Planting Strip (buffer zone) Between sidewalk and street = 4 to 8 ft

Surface vertical change (abrupt, such as sidewalk cracks) = 1/4 in. maximum

Surface gap = 1/2 in. maximum

Slope in direction of travel = 5 percent maximum (1:20)

Cross-slope across direction of travel = 2 percent maximum (1:50)

Standard Bikeway Width

(One-way travel; recommended width depends on motor vehicle speed and volume.)

Bike Lane = 4 to 6 ft

Paved Shoulder = 4 to 6 ft

Wide Curb Lane (shared by cars and bikes) ≥ 14 to 16 ft

Horizontal Clearance

Accessibility:

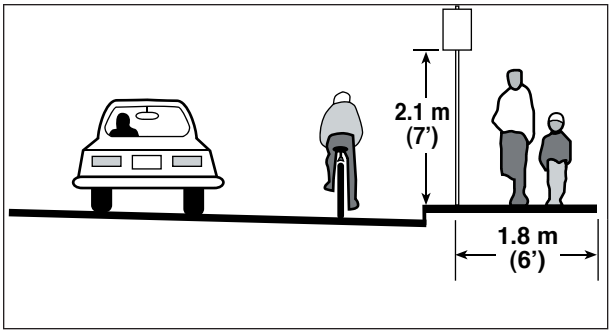
1.5 m (5 ft) [0.9 m (3 ft) minimum] unobstructed width.
Additional 0.6 to 0.9 m (2 to 3 ft) for shoulder-high barriers such as walls, railings and fences.

On-street parking:

0.6 m (2 ft) for parallel parking stalls;
0.9 m (3 ft) for angled or perpendicular parking stalls.

Ditch or swale:

0.6 m (2 ft) minimum.
Ditch side slope should not exceed a 3:1.



Sidewalk clearances. Add an additional 2' horizontal clearance to shoulder-high barriers such as walls and fences.

Vertical Clearance

2.4 m (8 ft) to continuous structures such as undercrossings and permanent canopies.
2.1 m (7 ft) to spot items such as traffic signs and tree branches.

Surface

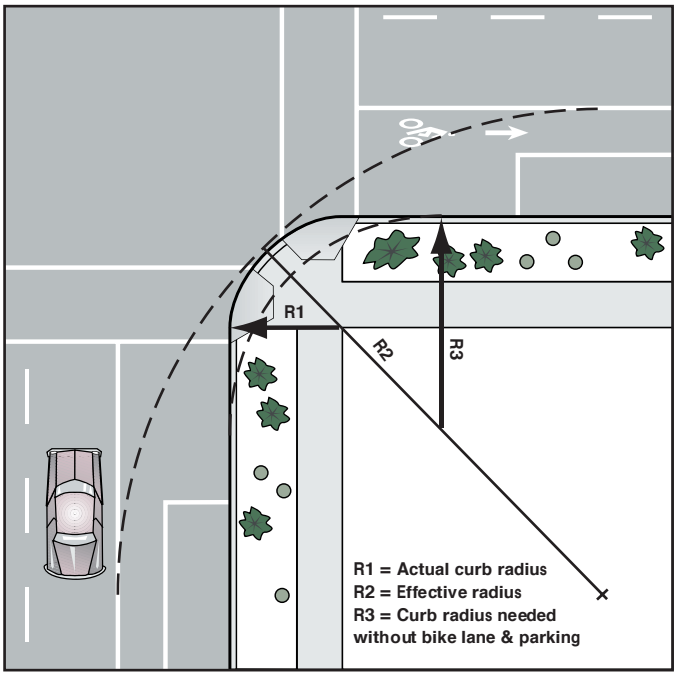
Minimum slope consistent with roadway.
5% (1:20) running slope.
2% maximum cross-slope including driveways.
Stable, firm, and slip-resistant.
6 mm (0.25 in.) maximum vertical change in level; 13 mm (0.5 in.) if beveled.
13 mm (0.5 in.) maximum gratings/gaps in direction of travel.
65 mm (2.5 in.) maximum gap at rail flangeway.
Continuity across driveways.

Sidewalk Buffer

Local or collector streets: 0.6 to 1.2 m (2 to 4 ft).
Arterial or major streets: 1.5 to 1.8 m (5 to 6 ft).
Street trees or high speeds: 1.5 to 2.4 m (5 to 8 ft).

G.1.2 *Corner Radius*

No turning movements: 1.2 m (4 ft).
On-street parking or bike lanes: 1.5 m (5 ft).
Minor street with minimal truck and bus turning: 4.5 to 7.5 m (15 to 25 ft).
Major street with occasional trucks: 9.0 m (30 ft).

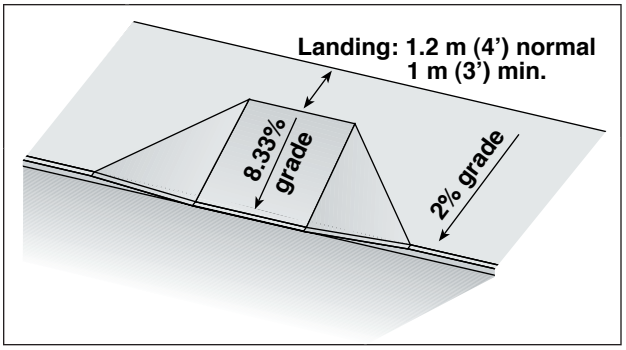


Sharp corners shorten and align crosswalks, improve pedestrian visibility, and reduce vehicle turning speed.

On-street parking and bike lanes permit a tighter corner, often as little as a 25 ft radius.

G.1.3 *Curb Ramps*

One at each crossing perpendicular to curb line.
Within crosswalk at foot of ramp.
No exposure to moving traffic lane.
Maximum running slope:
1:12 (8.33%) in new construction.
1:10 (10%) for 15 cm (6 in.) rise in existing retrofit.
1:8 (16.67%) for 75 mm (3 in.) rise in historic retrofit.
1:48 (2%) maximum cross-slope.
1:20 (5%) maximum counter-slope at gutter.
1:10 (10%) side flare slope.
0.9 m (3 ft) minimum width.



Curb ramp clearance, grade and crossslope.

Length:

0.9 m (3 ft) long if toe room available.

1.2 m (4 ft) long if constrained.

1.5 m (5 ft) long if between ranges.

Level landing at top and bottom:

1.5 m (5 ft) [1.2 m (4 ft) minimum] landing length at perpendicular curb ramp.

1.5 m (5 ft) minimum landing length at parallel curb ramp.

1:48 (2%) maximum slope in the two perpendicular directions of travel.

Flush (no lip) connection at street.

0.6 m (2 ft) detectable warning full width of the curb ramp.

G.1.4 *Crosswalks*

Location (Marked)

All open legs of a signalized intersection.

Across a roadway approach controlled by a STOP or a YIELD sign if there is a sidewalk or a shoulder on both sides of the approach.

At intersections on roadway approaches not regulated by signals, STOP signs or YIELD signs if the speed limit is 60 km/h (40 mph) or less, and there are sidewalks or shoulders on both sides of the approach.

Mid-block as needed.

Unmarked crosswalks at other intersections.

Striping

2.4 m (8 ft) [1.8 m (6 ft) minimum] width.

Extra width for high pedestrian volumes or to increase conspicuity of crossing.

Zebra-type patterns:

300 to 600 mm (12 to 24 in.) wide stripes.

300 to 600 mm (12 to 24 in.) stripe spacing.

Stop lines (when used) 3.0 m (10 ft) [1.2 m (4 ft) minimum] in advance.

Use curb extensions with on-street parking.

No parking within 6 m (20 ft) from crosswalk without curb extension.

Zebra crosswalks are more visible to drivers than standard double lines.

G.2 *On-Road Bicycle Facilities*

G.2.1 *Bicycle Lanes*

Location

General: one-way facilities not physically separated from travel lanes.

Urban areas: both sides of most highways, arterial streets and collector streets (generically referred to as "streets" below).

Rural areas: typically not used (paved shoulders or shared lanes preferred).

Width

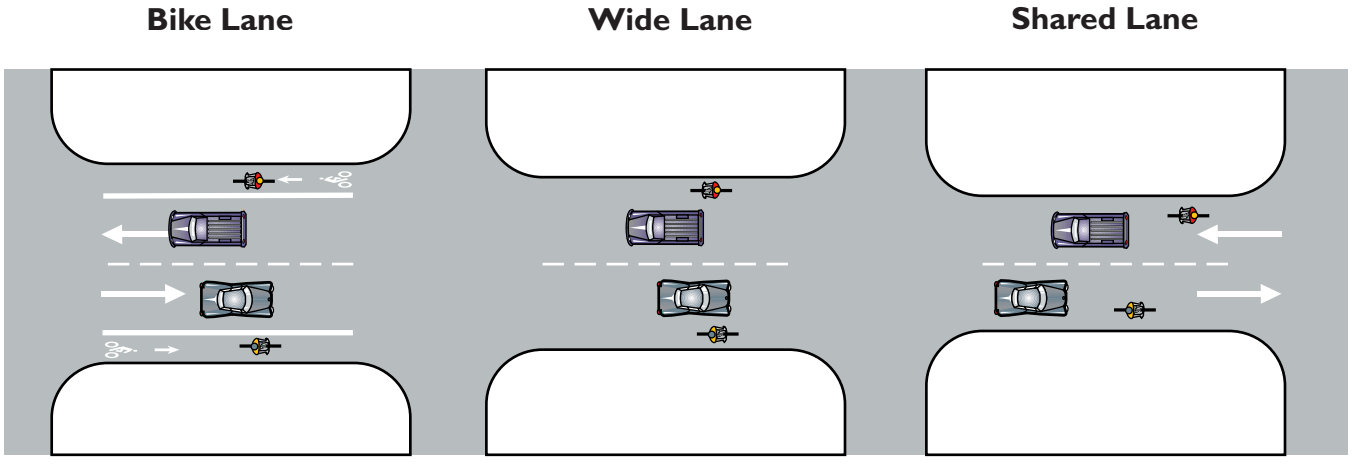
Curbed street without on-street parking:
1.8 m (6 ft) [1.2 m (4 ft) minimum];
1.8 m (6 ft) where use is high, in-line skaters are expected, or grades exceed 5%.

Curbed street with on-street parking:
1.8 m (6 ft) [1.5 m (5 ft) minimum];
1.8 m (6 ft) where use is high, in-line skaters are expected, or grades exceed 5%.

Uncurbed street without parking:
1.8 m (6 ft) where use is high, in-line skaters are expected, or grades exceed 5%.
1.8 m (6 ft) where speeds exceed 55 km/h (35 mph).
1.5 m (5 ft) where speeds are 55 km/h (35 mph) or less.
1.2 m (4 ft) minimum.

Uncurbed street with parking:
2.1 m (7 ft) where use is high, in-line skaters are expected, or grades exceed 5%.
2.1 m (7 ft) where speeds exceed 55 km/h (35 mph).
1.8 m (6 ft) where speeds are 55 km/h (35 mph) or less.
1.5 m (5 ft) minimum.

Add 0.3 m (1 ft):
on bridges, or
where there are 30 or more heavy vehicles per hour in the outside lane.



Striping

150 mm (6 in.) solid white stripe standard; or (optional) 200 mm (8 in.) solid white stripe.

On-street parking (right side of lane) marked with 100 mm (4 in.) solid white stripe or tick marks.

Do not extend striping through intersections (except across from T-intersection) and crosswalks.

Dotted guidelines [0.6 m (2 ft) dots and 1.8 m (6 ft) spaces] may be extended through complex intersections.

At intersections controlled by signals or stop signs and where right-turn lanes exist, use a dotted line with 0.6 m (2 ft) dots and 1.8 m (6 ft) spaces for the approach in lieu of solid striping for 15 to 60 m (50 to 200 ft).

Where sufficient width exists, place a separate through bicycle lane between the right-turn lane and the through travel lane.

At ramps and dedicated right-turn slip lanes, use a minimal turning radius or a compound curve to reduce entry speed.

Marking

Bicycle symbol with directional arrow on pavement; or (optional) word legend "BIKE ONLY" with directional arrow.

Symbol with arrow on far side of each intersection no closer than 20 m (65 ft) from intersection; additional symbols placed periodically along uninterrupted sections.

Signing

MUTCD signs R3-16 and R3-17 designate the presence of a bike lane.

Many other signs are available for special situations; refer to MUTCD Part 9 and the Oregon Bicycle and Pedestrian Plan.

G.2.2 *Wide Curb Lanes*

Urban streets with insufficient width for bike lanes.

4.0 m (13 ft) wide without on-street parking and 4.3 m (14 ft) wide with on-street parking.

Where 4.6 m (15 ft) or more width is available, consider striping bicycle lanes or shoulders.

G.2.3 *Paved Shoulders*

Location

Rural: most roads and highways.

Urban areas: both sides of lower volume major streets where bike lanes are not appropriate.

Width

1.5 m (5 ft):

on steep up-grades where bicyclists require maneuvering room or where downgrades exceed 5% for 1 km (0.6 mi);

where there are 30 or more heavy vehicles per hour in the outside lane; or

where motor vehicle posted speeds exceed 80 km/h (50 mph).
1.2 m (4 ft) against guardrail, curb or other roadside barrier.
1.0 m (3 ft) minimum.

Striping

100 mm (4 in.) solid white edge line.

G.2.4 *Shared Lanes*

Roads are as they exist with no special provisions for bicyclists.
Common on neighborhood streets, low-volume (< 500 ADT) rural roads and highways, and commercial and downtown centers with constrained right-of-way.

G.2.5 *Marginal Improvements*

Add usable riding surface to right of roadway edge stripe by:
paving extra width—as little as 0.6 m (2 ft) extra width is beneficial,
reducing travel lane width,
eliminating unneeded travel lanes, or
eliminating parking on one or both sides.
Bicycle-safe drainage grates.
Bicycle-friendly railroad crossings.
Pavement surfaces free of irregularities.
Bicycle-oriented signs and bicycle-sensitive traffic detection devices.
Roadway maintenance including removal of accumulated dirt, broken glass and other debris.
Reducing and enforcing posted speed limits.

G.3 *Multi-Use Paths*

G.3.1 *Location*

Within highway right-of-way or within an independent right-of-way.

Physically separated from motorized traffic by open space or barrier.

Shortcuts between neighborhoods, parks, schools, and business areas.

Access to areas served only by controlled-access highways where pedestrians and bicycles are prohibited; otherwise, not a substitute for on-road facilities.

Access to areas not well served by roads such as streams, lakes, rivers, greenways, abandoned or active railroad and utility rights of way, school campuses, and planned unit developments and community trail systems.

G.3.2 *Path Design*

Width

Paved shared use:

3.0 to 4.3 m (10 to 14 ft) [2.4 m (8 ft) minimum (rare)];
4.3 m (14 ft) or more with separated bicycle, horse or running lanes.

Unpaved shared use: 2.4 to 3.0 m (8 to 10 ft) [2.4 m (8 ft) minimum].

One-way shared use (rare): 1.8 m (6 ft) [1.5 m (5 ft) minimum].

Paved pedestrian only: 1.8 m (6 ft) [1.5 m (5 ft) minimum].

Shoulders

Width on both sides: 0.6 m (2 ft).

Side slope: 4%.

Recovery Area

If side slope greater than 1:4:

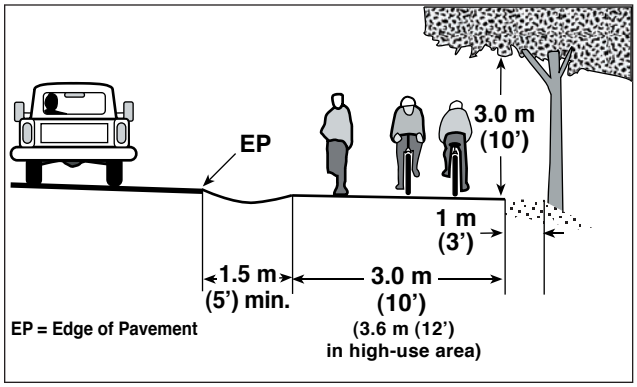
1.5 m (5 ft) recovery area at maximum 1:6 slope from edge of path; or barrier.

Clearance

Lateral: 1.8 m (6 ft) [1.5 m (5 ft) minimum].

Vertical 3.0 m (10 ft) [2.5 m (8 ft) minimum, 3.6 m (12 ft) minimum for equestrians].

Standard multi-use path dimensions.



Separation from Roadway

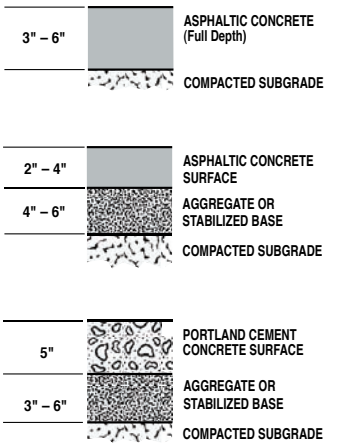
Curbed section: 1.2 m (4 ft) minimum.

Uncurbed section: 1.5 m (5 ft) minimum, at least 0.9 m (3 ft) of which is a buffer zone or landscape strip.

Surface

Stable, firm, and slip-resistant.

Multi-Use Path Pavement Alternatives



Source: Oregon Bicycle and Pedestrian Plan

At unpaved roadway or driveway crossings of paved paths, pave the roadway or driveway at least 3.0 m (10 ft) on each side of crossing.

Unpaved surface: 10 cm (4 in.) layer of granular stone no larger than 8 mm (3/8 in.) in diameter over prepared subgrade of at least 15 cm (6 in.) of crushed gravel (top layer) and 20 cm (8 in.) of gravel (bottom layer), roller compacted.

Grade

5% for up to 240 m (800 ft).
8% for up to 90 m (300 ft).
11% or more for up to 15 m (50 ft).
Running grade over 8.33% less than 30% of the total path length.

Cross Slope

Slopping in one direction instead of crowning preferred.
Paved: 2% maximum.
Unpaved: 5% maximum.
Superelevation: 2% maximum.

Summary of Surface Materials for Multi-Use Paths

Surface Material	Firmness	Stability	Slip Resistance (dry)
Asphalt	firm	stable	slip resistant
Concrete	firm	stable	slip resistant*
Soil with Stabilizer	firm	stable	Slip resistant
Soil with High Organic Content	soft	unstable	Not slip resistant
Crushed rock (3/4" minus) with Stabilizer	firm	Stable	Slip resistant
Crushed Rock w/o Stabilizer	firm	stable	Not slip resistant
Wood Planks	firm	stable	Slip resistant
Engineered Wood Fibers – that comply with ASTM F1951	Moderately firm	Moderately stable	Not slip resistant
Grass or Vegetative Ground Cover	Moderately firm	Moderately stable	Not slip resistant
Engineered Wood Fibers that do not comply with ASTM F1951	soft	unstable	Not slip resistant
Wood Chips (bark, cedar, generic)	Moderately firm to soft	Moderately stable to unstable	Not slip resistant
Pea Stone or 1-1/2" minus Aggregate	soft	unstable	Not slip resistant
Sand	soft	unstable	Not slip resistant

Source: Adapted from Federal Highway Administration Designing Sidewalks and Trails for Access, Part II, Best Practices Design Guide.

Design Speed

Paved: 30 km/h (20 mph); 50 km/h (30 mph) for downgrades over 4% for 245 m (800 ft).
Unpaved: 25 km/h (15 mph).

G.3.3 *Barriers*

Purpose: Safety and security, protection from falls, screening of adjacent uses, separation from adjacent roadway or other uses, vertical or grade separation, or enhanced aesthetics.
Need: Protective barrier use based on clear area, side slope steepness and material, and type of hazard.
Types: Fences, walls, vegetation, guardrails, jersey barrier, and railing.
Retaining walls no closer than 0.6 m (2 ft) from path edge.
Railings should be at least 1.1 m (3.5 ft) high.

G.3.4 *Crossings*

Marking: Either none, crosswalk stripes, or dotted guidelines.
At-grade:
Mid-block: Not near intersection, angled 75 degrees maximum.
Parallel path: Near intersection
Complex intersection: highly skewed or multiple-leg, often with two-step crossing.
Refuge island:
Necessary with marked crossing of more than 2 lanes.
3.7 m (12 ft) [2.4 m (8 ft) minimum] wide.
Cut-through angled 30 degrees towards oncoming traffic.

G.3.5 *Bridges*

Width: approach width plus 0.6 m (2 ft) on each side.
Vertical clearance: same as for path.
Loading: H10 or a 10-ton load for a two-axle vehicle.
Approach railing: Extend 4.5 m (15 ft) from end of bridge and flared.
Decking: Transverse (90 degrees to the direction of travel).

G.4 *Signs, Pavement Markings And Signals*

G.4.1 *General Application*

Warranted by use and need per latest Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD).

All signs and markings retroreflective or illuminated.

G.4.2 *Pedestrian Facilities*

Signs

Intended for motorists: warning signs for pedestrian crossings.

Intended for pedestrians: regulatory signs for pedestrian signals; special wayfinding signs.

Intended for all users: most guide signs.

Markings

Crosswalks, detectable warnings and vertical markers per Oregon Bicycle and Pedestrian Plan.

Signals

Timing:

Adult pedestrian clearance interval of 1.2 m/s (4 fps) measured from the curb-to-curb or edge-of-roadway to edge-of-roadway distance.

Child or elderly pedestrian clearance interval of 0.9 m/s (3 fps) measured from the curb-to-curb or edge-of-roadway to edge-of-roadway distance.

Options to address slower walking speeds include:

increase crossing time,

decrease crossing distance,

subdivide crossing distance (medians or refuge islands, with separate pedestrian controls), or

provide a pedestrian-actuated control that permits extended-time crossing on demand.

Midblock Pedestrian Activated:

Based on MUTCD Warrants 4 (Pedestrian Volume), 5 (School Crossing), or 7 (Crash Experience).

Note if any potential users not reflected in the data because the lack of a signal discourages them from crossing.

Accessibility:

Refer to Section 4G.06 of the MUTCD and U.S. Access Board guidelines.

G.4.3 *On-Road Bicycle Facilities*

Most signs, pavement markings, signals, and delineators for motorists apply to bicycles.

Part 9 of the MUTCD covers specific traffic controls for bicycles.

Signs

Bike lanes: MUTCD signs R3-16 and R3-17 designate the presence of a bike lane.

Warning: signs denoting unexpected or changed conditions.

Bicycle Route: used to guide cyclists to destinations or to mark regional, interstate and international facilities.

Markings

Bike lane:

150 mm (6 in.) wide retroreflectorized white stripe; and symbol of cyclist with directional arrow in lane.

Object markings:

Delineate presence of potentially hazardous objects and obstructions.

Signals

Timing:

1.5 m (5 ft) [0.9 m (3 ft) minimum] unobstructed width.

0.6 to 0.9 m (2 to 3 ft) for shoulder-high barriers such as walls, railings and fences.

Demand actuated signal:

Adjust detector sensitivity for bikes and mark most sensitive location.

Mark pavement where sensitivity is highest.

Consider alternatives to pavement loops (video, microwave, infrared).

Programmable signal heads:

Ensure that cyclist can see signals.

Signal synchronization:

Add 2 to 3 sec. to automobile green time.

Yellow interval of 3 sec.

All-red clearance interval greater than 2 sec.

G.4.4 *Shared Use Paths*

Requires its own signing because separate alignment from roadway.

Signs reduced size per MUTCG.

Special markings for railroad crossings.

Supplemental markings may be used (center line, stop bar, etc.).

G.4.5 *School Areas*

Part 7 of the MUTCD discusses school routes, crossings, signs, markings, signals, and other considerations.