Transportation Options Program

Strategic Implementation Plan for Walking and Biking Infrastructure

2013 & 2014

Final Report

Documentation of Process and Outcomes

Growth Management Department

This memorandum documents the Strategic Implementation Plan and its development to deliver walking and biking projects through the city's Capital Improvement Program and reflects the goals of the Transportation System Plan.

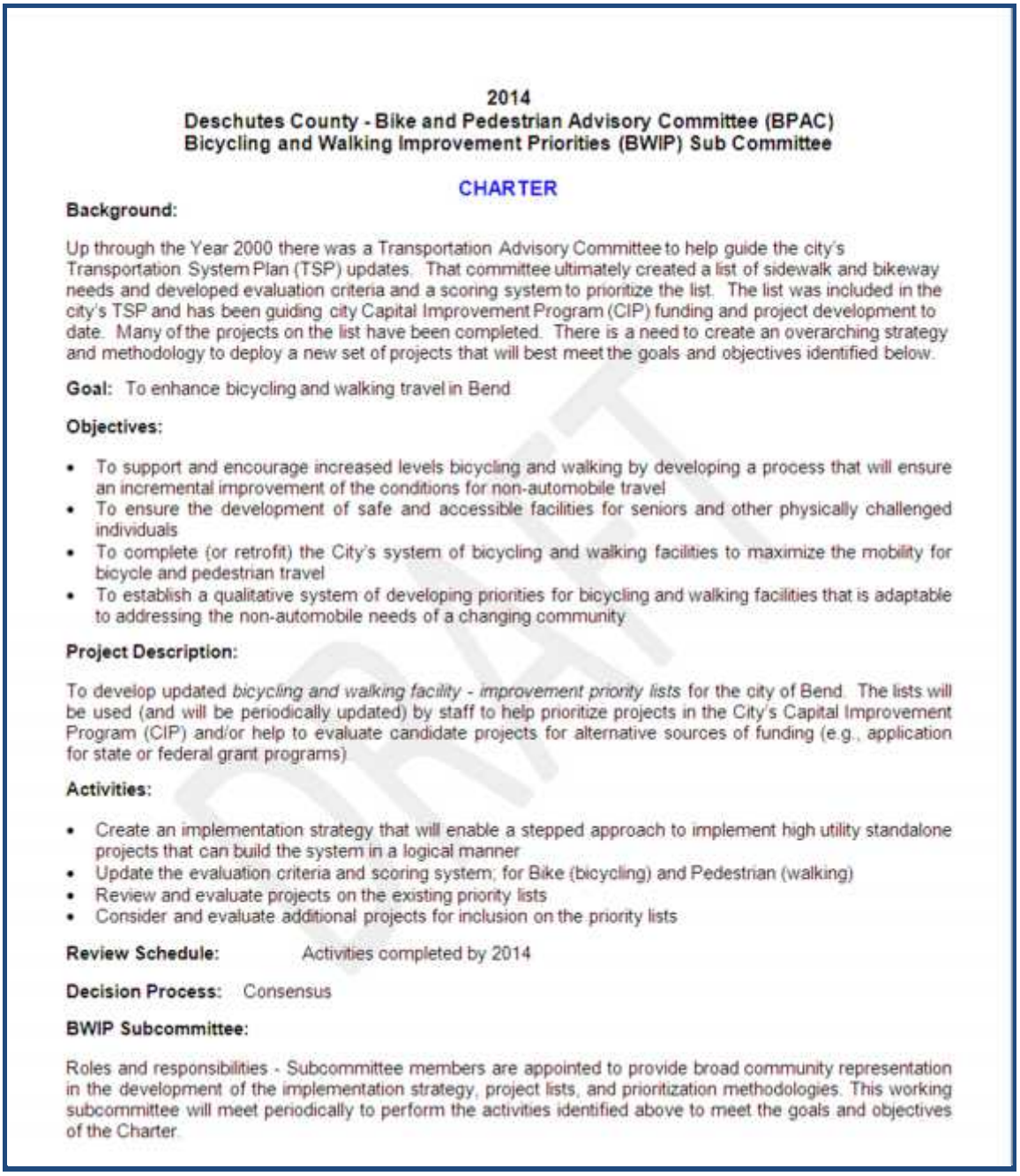
The projects anticipated to be readied for implementation during the CIP project years 2014-2015 through 2017-2018 are identified.

The strategy documented here achieves a unified walking and biking transportation system through the incremental but systematic deployment of safe and accessible facilities. The strategy places high importance on the use of state of the art design techniques to increase user comfort and perception of safety in order to support and encourage increased levels of walking and biking in targeted areas of the community.

The approach provides a priority assessment for capital projects and facilitates multiple deployment mechanisms including the use of alternative funding sources and maintenance activities.

Public Input and Outreach

A citizens' advisory committee was created to guide the development of this implementation plan. Named the Bicycling and Walking Improvement Priorities (BWIP) sub-committee, members represented appointed committees of Deschutes County Commissioners and Bend City Councilors, as well as bicycling and accessibility advocacy groups in the community. The committee met frequently throughout 2013 and 2014. The group went through a chartering process to document their goals, objectives, and roles in the development of this strategic implementation plan.



2014
Deschutes County - Bike and Pedestrian Advisory Committee (BPAC)
Bicycling and Walking Improvement Priorities (BWIP) Sub Committee

CHARTER

Background:

Up through the Year 2000 there was a Transportation Advisory Committee to help guide the city's Transportation System Plan (TSP) updates. That committee ultimately created a list of sidewalk and bikeway needs and developed evaluation criteria and a scoring system to prioritize the list. The list was included in the city's TSP and has been guiding city Capital Improvement Program (CIP) funding and project development to date. Many of the projects on the list have been completed. There is a need to create an overarching strategy and methodology to deploy a new set of projects that will best meet the goals and objectives identified below.

Goal: To enhance bicycling and walking travel in Bend

Objectives:

- To support and encourage increased levels bicycling and walking by developing a process that will ensure an incremental improvement of the conditions for non-automobile travel
- To ensure the development of safe and accessible facilities for seniors and other physically challenged individuals
- To complete (or retrofit) the City's system of bicycling and walking facilities to maximize the mobility for bicycle and pedestrian travel
- To establish a qualitative system of developing priorities for bicycling and walking facilities that is adaptable to addressing the non-automobile needs of a changing community

Project Description:

To develop updated *bicycling and walking facility - improvement priority lists* for the city of Bend. The lists will be used (and will be periodically updated) by staff to help prioritize projects in the City's Capital Improvement Program (CIP) and/or help to evaluate candidate projects for alternative sources of funding (e.g., application for state or federal grant programs)

Activities:

- Create an implementation strategy that will enable a stepped approach to implement high utility standalone projects that can build the system in a logical manner
- Update the evaluation criteria and scoring system; for Bike (bicycling) and Pedestrian (walking)
- Review and evaluate projects on the existing priority lists
- Consider and evaluate additional projects for inclusion on the priority lists

Review Schedule: Activities completed by 2014

Decision Process: Consensus

BWIP Subcommittee:

Roles and responsibilities - Subcommittee members are appointed to provide broad community representation in the development of the implementation strategy, project lists, and prioritization methodologies. This working subcommittee will meet periodically to perform the activities identified above to meet the goals and objectives of the Charter.

2014 BWIP Charter (continued)

Subcommittee Member	Representing
Bobby Fox	COBAAC
Pam Hardy	BPAC
Brian Potwin	Commute Options
Scott Beaird	COBAAC
Karin Morris	City of Bend Accessibility Program Manager
Nick Stevenson	Bend Bikes
Lucas Freeman	Bike Around Bend
Wendy Robinson	City of Bend Long Range Planning

Subcommittee Technical Support & Staff	
Jovi Anderson	Bend MPO Program Technician
Kevin Black-Tanski	GIS Support Volunteer
Robin Lewis	City of Bend Project Manager

BWIP Technical Advisory Group:

Roles and responsibilities - Technical Advisory Group members will meet periodically to review progress of the subcommittee and provide feedback on project direction. This group will meet after key project milestones are achieved to review and recommend approval to the city.

TAG Member	Representing
Steve Jorgensen	Bend Park & Recreation District
Jeff Monson	Commute Options for Central Oregon
Scott Ferguson	BPAC
Tyler Deke	Bend MPO
Christopher Blake	City of Bend – Streets Maintenance
Scott Aycock	COIC – Transit
Brian Rankin	City of Bend Long Range Planning
Dan Serpico	Oregon Department of Transportation

City of Bend:

Roles and responsibilities – The city acts and performs the duties of the road authority for roadways under their jurisdiction and is responsible for funding, implementing, managing and maintaining the multimodal transportation system for the community. The city will meet the goals and objectives of the General Plan and TSP by implementing the project lists developed through this effort through the CIP program and through land use exactions on private and public developments. The City Council has review authority for project budgets and system implementation timelines.

Oregon Department of Transportation:

Roles and responsibilities – ODOT acts and performs the duties of the road authority for roadways under their jurisdiction and is responsible for funding, implementing, managing and maintaining the multimodal transportation for the community on those roadways. As part of the technical advisory group for the BWIP subcommittee, ODOT will advise on the technical feasibility of bicycle and pedestrian facilities on their roadways, particularly bike lanes on 3rd Street and pedestrian crossings of 3rd Street and of Greenwood Avenue.

Figure 1 BWIP Charter & Membership

Existing Facilities

Existing bike facilities in Bend include bikeways on arterial and collector roadways, separated trails, and public and private bike parking. Existing walking facilities include sidewalks, trails and roadway crossing elements such as curb extensions, medians, refuge islands, signing and striping, signals and roundabouts.

Trip Potential

While the year 2012 American Community Survey shows that approximately 1.7-percent of workers in the Bend Metropolitan Planning Organization (MPO) area commuted to work by bicycle and about 2.6-percent walked to work, this only reports home based work trips. Additional trips are made to and from other origins and destinations (e.g. recreation, entertainment, dining, and school) which were not reported. Travel by bicycle and foot has tremendous potential in the Bend urban area. Bend's relatively small size is an enabling characteristic. Depending on the type of trip, studies indicate a willingness of people to walk between a quarter and a half mile, and bicycle upwards of 2 or 3 miles. In 2006, the Oregon Department of Transportation (ODOT) funded the *Individual Transportation Options Pilot Project.* The project evaluated the transportation behavior of a random sample of persons in Bend. The results of the project showed that 16 percent of all automobile trips are one mile or less and 56 percent are three miles or less. These data suggest that many trips could possibly be made on bicycle or on foot.

Throughout the MPO area, travel time to work by all modes was less than fifteen minutes for about 47-percent of all workers, less than ten minutes for 23-percent, and less than five minutes for 5-percent.

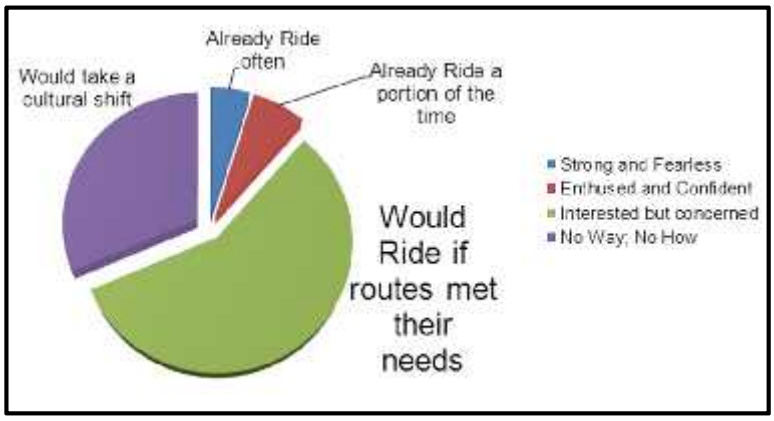


Figure 2 Ridership Potential

Short trip lengths and travel times are part of the equation for encouraging non-auto trips. A complete, safe, and well-maintained network of trails, sidewalks and bicycle facilities will further encourage these trips. The City of Bend and Bend MPO have recently developed a strategy for upgrading the existing walking and biking systems to deliver such a network. Additionally, as noted in Figure 2, there is a large percentage of the community that would ride their bikes more if routes met their needs in terms of safety, security, and comfort.

Strategic Implementation Plan for Biking and Walking Infrastructure

After the subcommittee identified a draft strategy, outreach to the sponsoring advisory committees and additional citizen advisory committees occurred through presentations and discussions as noted here:

- Bend Bikes Community Forum
- City of Bend Accessibility Advisory Committee
- Central Oregon Coalition for Access
- Deschutes County Bike and Pedestrian Advisory Committee
- Bend Metropolitan Planning Organization Citizens Advisory Committee
- Bend Metropolitan Planning Organization Policy Board
- Neighborhood Association Roundtable
- Traffic Safety Advisory Committee
- City of Bend Planning Commission.

BICYCLING SYSTEM

Guiding Principles

Stakeholders and BWIP sub-committee members agreed to several key guiding principles.

1) Continuous routes
2) Comfortable and safe
3) Coordinated

Figure 3 NACTO Bikeway Design Guide Cover

Biking routes must be continuous. It was determined that adding projects to eliminate gaps in the system were crucial, and that completing any single route prior to skipping to another route would be most helpful to boost bicycle ridership in the community.

Facilities should address user comfort and safety. There was strong agreement in the concept that additional riders would only be gained through changing not just the system coverage, but by providing facilities that are inherently more comfortable to a broader range of users. The concept of neighborhood bikeways was discussed at great length.

It was recommended that the city incorporate bike system design techniques from the National Association of City Transportation Officials (NACTO) Bikeway Design Guidelines.

Preferred System Elements
for Bend's Bicycling System

- Separated trails,
- wider bike lanes,
- lower volume streets,
- green bike boxes,
- buffered bike lanes and
- cycle tracks.

Figure 4 Enhanced Bicycle System Elements

An appendix to this memorandum details each of these preferred bike facilities for Bend and quantifies the added benefits of each facility including statistics on increased safety, ridership or positive change in lane positioning experienced through the use of each facility design.

Coordinating on-road and off-road systems. Enhanced coordination with the Bend Parks and Recreation District's Trail System is necessary to ensure ease of movement between on-road and off-road facilities and thereby increase the reach and coverage of each system.

Delivery Strategy

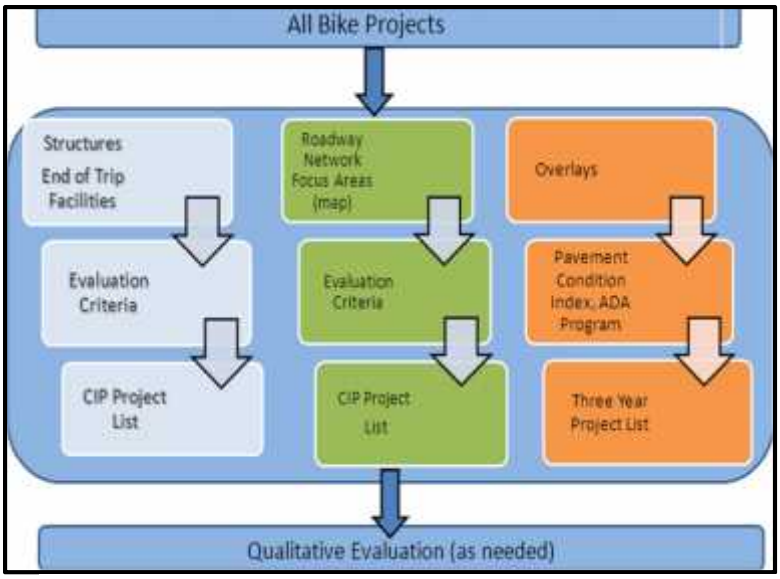


Figure 5 Delivering Bike Projects – Multi-Pronged Approach

The Biking System Implementation Strategy developed a three prong approach to deliver bike projects. These were Structures; Roadway Network; and Overlays. Some structures in Bend such as bridges or tunnels do not provide walking and/or biking facilities.

Structures

There were several structures seen as key gaps in the system which, if closed, would open up long biking corridors that typically already have at least a base bike lane. The Structures identified in the delivery strategy were geographically diverse and represented gaps in the biking system on routes that have increased ridership potential because of a nearby school, shopping center, park or a combination of these land uses.

Prioritized Structures

- Drake Park (footbridge)
- 3rd Street (near Fred Meyer Shopping)
- Brosterhous Road (canal crossing near 3rd)
- Purcell Boulevard (near Pine Nursery Park and Ponderosa Elementary School)
- RR Structures (Franklin, Greenwood, 3rd)

Prioritized Trip Facilities

- Bike Parking Downtown
- Way Finding Signage

Figure 6 Prioritized Structures & Trip Facilities

Prioritized Group Bike Parking

- Deschutes Public Library
- Environmental Center

Figure 7 Prioritized Group Bike Parking

Trip Facilities

Trip Facilities such as bike parking and way-finding signage create value added components to the system and could help educate community members and visitors as to the location and ease of using the system.

Figure 8 Wayfinding Sign Example

Bike Parking Corral opportunities were identified in front of the Deschutes Public Library, and the Environmental Center.

A bike parking inventory has been completed in the downtown Central Business District and work would need to continue on this to identify demand/capacity issues. Group parking and bike corrals were identified to be the largest need in the downtown area to accommodate trips by families and tourist groups.

Roadway Network

The roadway network focus area is divided into near-term, mid-term and long-term phases of implementation. The central core of the community would be completed first before the outer portions of the community. There was strong belief that increased ridership could be gained from deploying this phasing strategy. Twenty-four separate bikeway corridors on arterial and collector roadways within the central core of the community were identified. Realizing that it would be difficult to deliver that many projects, the strategy prioritizes just five corridors and identified those as *Key Bikeway Corridors*.

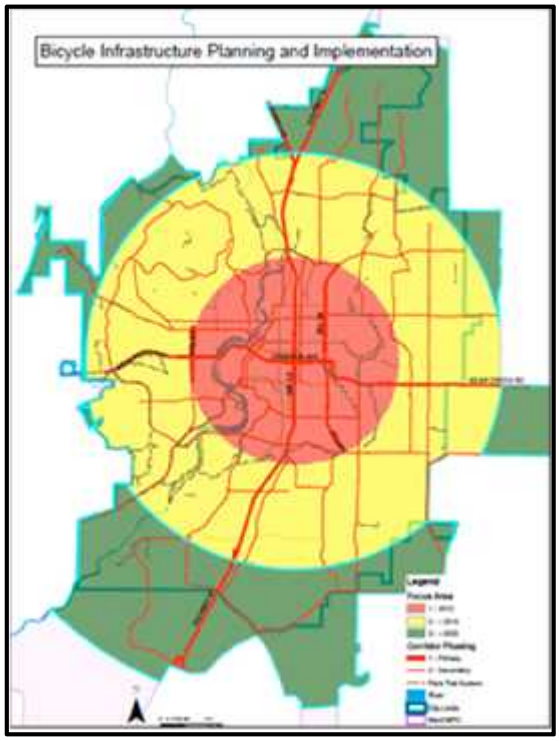


Figure 9 Roadway Network Focus Area

Prioritized Key Bikeway Corridors

- Franklin Avenue
- NE/SE 8th & 9th Street
- NW/SW 14th Street
- 3rd Street
- Greenwood Avenue

Figure 10 Key Bikeway Corridors in the Community

Additionally, stormwater inlet grate condition on several central core corridors has been identified as an issue. The issue is generally understood to be caused by overlays which over time have left the stormwater inlet grate low with an abrupt elevation drop that is hazardous particularly at night.

Stormwater Inlet Priority Correction Corridors

- Wilson Avenue
- Bond Street
- 8th/9th Street
- Franklin Avenue

Figure 11 Stormwater Grate Elevation Issues

One issue is that the person on the bike could be required to merge into the traffic lane for a short distance multiple times along the corridor as they cannot traverse directly

over the sunken stormwater grate. Another might be that the elevation change catches riders off-guard and causes unexpected loss of control or ejection off their bike.

Storm grate issues have been identified on Wilson Avenue, Bond Street in the Old Mill, and 8th/9th Streets on the east side, and Franklin Avenue near the Railroad Underpass.

The Neighborhood Greenway

In addition to the arterial and collector system, a new facility type was discussed.

The subcommittee and the various advisory committees as well as the public at large, have a strong desire to develop biking routes that were not on the heavily trafficked arterial system, but would utilize a system of local streets with key crossings of the arterials to provide facilities attractive to a whole new audience of potential bike riders. These low stress routes would connect to key community assets such as parks and schools, attracting a new riding demographic. There were reservations about creating a new facility type when the city struggles to construct and maintain the existing facilities. Questions in regards to funding mechanisms and maintenance priorities still exist and will need to be worked out. The subcommittee developed a series of initial routes which can be further vetted. While the BWIP subcommittee did not ultimately prioritize the creation of Neighborhood Greenways, staff has recommended their inclusion in the Transportation Options Program Strategic Implementation Plan for Walking and Biking Infrastructure. The initial focus of these facilities is crossings of busy roads. Over time it is desirable to create complete streets.

Overlays

Overlays have been identified as the quickest and easiest construction strategy.The city overlays or chip seals many miles of roadway annually.

City Streets Division has expressed concern that adding Preferred System Elements such as those identified in Figure 3 to an overlay (e.g. buffered bike lanes, green conflict zone identification, etc.) would shift maintenance funds from structural integrity to surface striping which would add to an already increasingly deferred structural maintenance backlog. Additionally, the division notes that these Preferred System Elements would add another set of facilities that would need to be re-striped and maintained over time. Inadequate funding already exists for pavement striping so the result would be an increase in the mean time between restriping for all facilities in the community or some other maintenance element trade off.

The city has identified up-front added budget that can be applied to initially create Preferred System Elements such as buffered bike lanes, bike boxes, or colored bike lanes by using Transportation System Development Funds and other flexible funding

sources. However, on-going maintenance resources for bike lane striping or color have been more elusive to identify.

The Transportation Division is working with both the Streets Division and the regional Metropolitan Planning Organization to set aside a portion of the more flexible state gas tax or STP funding for maintenance of bike lane facilities on an on-going basis. The Streets Division would prefer that pure pavement preservation dollars are not diverted for this effort. More discussions and a final funding package will need to be created.

Biking System Summary

The recommended biking system construction strategy:

- Focus on central core (Century Drive to Purcell; Butler Market to Reed Market) where densities and land use intensity are greatest;
- Capitalize on private development & overlays to create complete streets;
- Provide the next level of bike facility (not just a bike lane) (e.g. buffered, cycle track, separated, bike box, bike boulevard, etc.).

Next Steps for the Biking System Design & Construction:

1. Develop design RFP which will provide concept designs for the projects identified in Table 1 and Table 2. It is anticipated that this RFP will be published in late 2014.
2. Create a revolving fund and budget system that creates concept plans, provides project designs, and constructs projects.
3. Identify funding for on-going bicycle system maintenance.

The MPO Policy Board has discussed providing a separate budgetary line item for bike facility maintenance which would include signing and striping of system enhancements.

Biking Facilities Construction Prioritization

The following two tables provide the prioritized project list for biking facilities to be included in the city's CIP program in the next 5 years.

Table 1 Future Bike Facility Concept Development & Prioritization Process	
Structures	• Drake Park Footbridge • 3rd Street canal (just south of Brosterhous) • Brosterhous canal (just east of 3rd) • Purcell Boulevard canal (north of Empire) • RR Undercrossings (Franklin, Greenwood, 3rd) • Parkway Crossings (corridor concept)
Road Network Facilities	• 3rd Street • 8th-9th Street • Galveston-Riverside-Franklin-Bear Creek • 14th-Century Drive • Newport-Greenwood • College Way-Portland-Olney-Neff
Overlays	TBD –opportunity to enhance bike lane connectivity and buffering with the annual overlay program.
Stormwater Grate Inlet Elevation Changes	• Wilson Avenue • Bond Street • 8th/9th Street • Franklin Avenue • Mt. Washington • Additional corridors as needed
Trip Facilities	• Bike Parking downtown • Way Finding Signage

Table 2 Neighborhood Greenways (potential initial system routes)	
Neighborhood Greenways	COCC to St. Charles Hosp (4 mi) via 1st Street Rapids
	COCC to Larkspur Trail (3.2 mi) via Hawthorne
	OSU-OMD-Coyner Trail via Aune (4 miles)
	Juniper Swim Center + Bend High + Marshall High (2.3 miles) via 5th or 6th St
	Harmon-Columbia route (2 miles) Kenwood to OMD
	12th Street (2 miles) Bend High to Butler Mkt

WALKING SYSTEM

The city of Bend has established good mechanisms and policies to allow the creation of a successful walking system as the community grows. The existing as-built system however has significant gaps and safety issues which is a strong disincentive to attracting people to walking as a transportation mode of travel. Some of the system needs are very simple such as sidewalk and ADA ramp infill. Others are more complex such as multi-lane roadway crossings. Many discussions were held with the BWIP subcommittee and the city's long range planning division to develop the following strategy.

Walking System Guiding Principles

Discussion participants strongly agreed that getting more people to walk would take more than just filling in the holes in the transportation system. It was clear that the urban fabric, land uses, densities, street layout, and facilities design all play a role in making neighborhoods walkable. There is considerable research being published that shows the physical makeup of a neighborhood can affect people's health.

Walking Zones

The city used GIS mapping to identify Walking Zones – these are areas of the community that already have many of the characteristics which can be capitalized upon to create Walkable Neighborhoods:

Figure 12 Walkable Neighborhood Characteristics

- A center such as a main street or a public space;
- People to allow businesses to flourish and public transit to run frequently;
- Mixed Income and Mixed Use to allow affordable housing to be located near jobs, parks, shopping;
- Pedestrian scale design such as short, interconnected blocks, comfortable and pleasing walkways, and buildings readily accessible on foot;
- Schools, Jobs and Shopping close enough that people can walk from their homes;
- Parks and public spaces for people to meet and play.

The BWIP subcommittee identified six different Pedestrian Zones. These zones have some geographic diversity, but as can be seen in Figure 13, mostly represent areas more centrally located in the community.

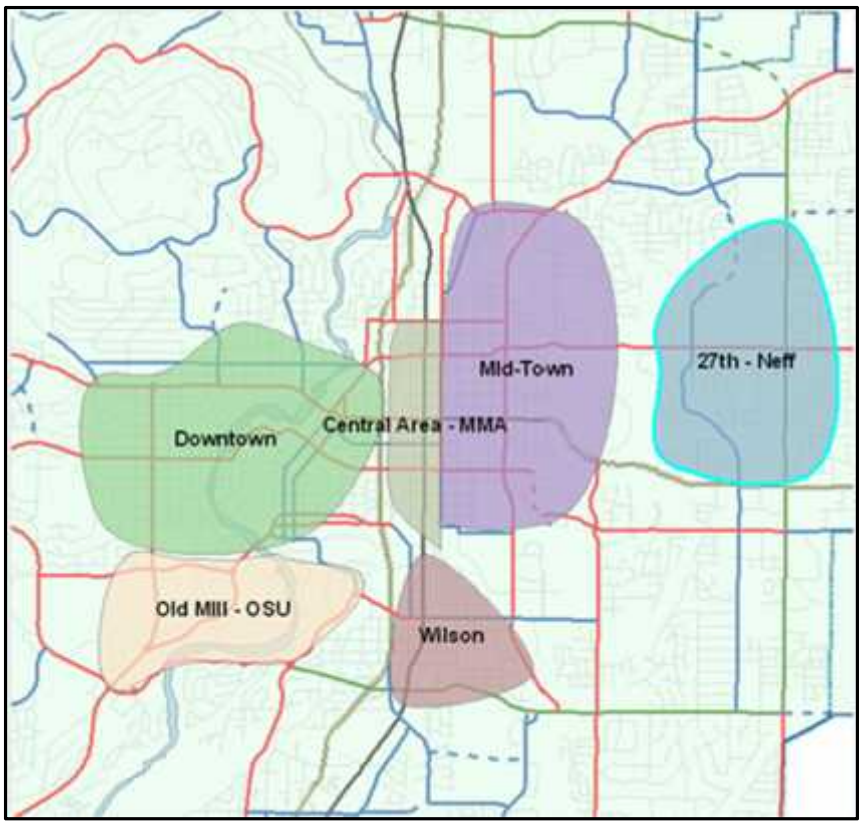


Figure 13 Map of Identified Pedestrian Zones

Ranking and Prioritizing

It was recognized that in order to attract people to use walking as a mode of transportation, the transportation system would need to provide connected routes and would need to be deployed with enough design details that the Zone would be able to fulfill its destiny and be "walkable." Julie Campoli, in her book, *"Made for Walking"* sums up what the BWIP committee were looking for in a Walking Zone neighborhood:

> *"The structural elements illustrated throughout "Made for Walking" – streets, blocks, sidewalks, and connected open spaces together with the intricate mixing of uses – make walking and biking convenient and enable mobility with a vastly reduced carbon impact. These qualities, combined with a comfortable streetscape, create the type of pedestrian-oriented environment that lures people out of their cars. A few other physical qualities may not contribute directing to lowering a place's carbon footprint but are also essential ingredients in a successful urban neighborhood. These elements, which can be designed in a place to add value, include the things all of us need in varying degrees – greenery, privacy, variety, and a sense of spaciousness."*

The subcommittee determined that it would be necessary to deploy CIP projects in a strategic and focused manner. The team created a three-step process to project deployment.

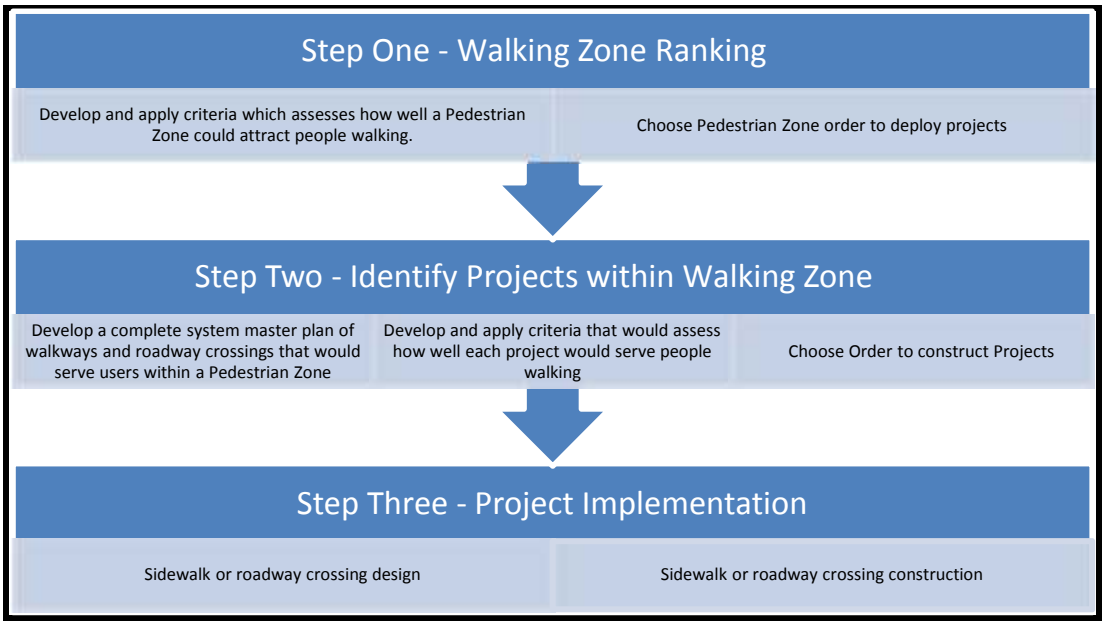


Figure 14 Walking System Development Prioritization

It was also clear that there are a handful of significant infrastructure projects that would enhance the overall community's walkability to complement this Walking Zone deployment process. To this end, the BWIP group identified the following Key Walkability Projects that would be prioritized and deployed independent of the Walking Zone projects. These Key Walkability projects provide strategic high visibility walkability.

Key Walkability Projects
Drake Park Footbridge
Hawthorne Over Parkway (US 97)
Old Mill-via Aune-to 2nd Street (RR overpass)

Figure 15 Key Walkability Projects

It is recognized that walking is often cultural as well as habit-based. The more walkable the overall community, the easier it is to attract and retain people walking. The city has several implementation mechanisms in place that will continue to enhance walkability throughout the community.

These mechanisms include:

- sidewalk construction,
- multi-lane roadway crossing safety enhancements, and
- in-fill development/redevelopment.

Sidewalk construction. The city constructs approximately ½ mile of new sidewalk each year as part of the city's accessibility program. This is a very small amount of funding, but can close gaps in the system. Sidewalk segments are chosen based upon input by the community, the transit district, and the City of Bend Accessible Advisory Committee. The city is also in the early discussion stages of developing a sidewalk maintenance program to bring deteriorating existing sidewalks back into an accessible standard.

Multi-lane roadway crossings. The city has identified multi-lane roadway crossings as a safety issue for people trying to cross busier arterial roadways. These wide roadways create real as well as psychological barriers to people crossing the street to access jobs, schools, services, and transit. The city is in the process of funding concept development plans. These concept plans would identify potential crossing locations and design features for several corridors including 3rd Street, Greenwood Avenue, and Colorado Avenue.

Development. As noted earlier, the city has clear policies and standards for properties that are developing or re-developing to construct adequate walking facilities. Some restrictions apply, but all development and most re-development should be required to construct sidewalk and ADA ramps abutting their property. These developments also contribute to a more walkable community by utilizing the latest required design features that contribute to walkability, such as buildings closer to the sidewalk (rather than located at the far side of a paved parking lot), interconnected walkways on site, and walkways connecting to the public sidewalk system.

All of these implementation mechanisms will be deployed throughout the community.

Walking Zone Ranking Criteria

The city's timing to develop ranking criteria coincided with the testing and deployment phase of *NCHRP 07-17 Pedestrian and Bicycle Transportation Along Existing Roads Draft Prioritization Methodology* project. This project aims to create a flexible automation tool to setting deployment priorities. The tool is easy to use and can be customized to reflect community values and resources.

Kittelson and Associates, a transportation consulting firm, helped guide city staff in its use. The city chose to apply the prioritization methodology to the Pedestrian Zones to help choose an order for which zone will be worked on first. Appendix D of this report provides greater detail on the city's methodology. The ranking outcome was:

1. Mid-town
2. Downtown – Near West Side
3. Wilson Avenue
4. Old Mill District

5. Central Area MMA
6. 27th - Neff.

PROJECT LISTS

After a Walking Zone was chosen, the city worked with BWIP to identify projects that would enhance walking in the zone. To this end, the city has created an interactive electronic map for citizen's to use to help identify project lists.

www.bendoregon.gov/bikewalk

The website tracked projects and was used to develop a project list.

The BWIP committee started with the website projects recommended by the community, looked to provide corridor continuity, and identified walking routes that would connect transit, parks, schools, shopping and employment.

It was interesting to note that the types of projects needed within each zone were different from one zone to another, reflecting the needs and specific structural deficiencies of each area.

Mid-town. This zone was dominated by a need for upgrades to roadway crossings of busier streets. Many comments were received on the website that these crossings were significant barriers to walking because there was simply no safe way across, or the feeling of insecurity was so great that these roadways often felt like a moat around their neighborhood with the only way to bridge the moat being to walk long distances to a controlled crossing or choose not to walk at all.

The BWIP committee noted that it might be possible to group these crossings together into logical bundles of crossing projects. Crossing projects would aim to make the crossing more comfortable, ADA accessible, and safer for all abilities and ages of users walking across these busy roadways.

The Mid-town zone primarily provides good local street connectivity, however, there are a couple of locations where the gridded street system is not as comprehensive and connectivity parallel to the arterials is not readily available to use for a low stress route. In these cases, the BWIP committee identified the need for sidewalk construction along the arterial roadways.

There were 5 roadways identified by BWIP that fit this category:

- 4th and Studio (Burnside to Butler Market);
- College Way-Portland-Olney-Neff (COCC to St. Charles)
- Wilson (2nd to 15th)

- Franklin (Lava to Purcell)
- 14th (Colorado to Newport)
- 8th Street (Reed Market to Butler Market).

There were 3 key roadway crossings identified by BWIP:

- 3rd at Hawthorne
- Greenwood at 5th and/or 6th
- Neff at Purcell (all legs)

As previously noted there were 3 key community walkability projects identified by BWIP:

- Drake Park Footbridge
- Old Mill-via Aune-to 2nd Street (RR overpass)
- Hawthorne Over Parkway (US 97)

Downtown Bend Bike & Walking Enhancements

While the BWIP subcommittee did not ultimately prioritize projects downtown, staff has recommended their inclusion in the Transportation Options Program Strategic Implementation Plan for Walking and Biking Infrastructure.

Downtown has an attractive walking and biking system but missing biking infrastructure, and the city's recent review of crashes in the community showed a greater amount of crashes with pedestrians and bicyclists downtown which indicates a need for a thorough review of bicycling and walking facilities within the area. Traffic Signal equipment as well as phasing and timing reviews for the 6 downtown traffic signals are important to enhance safety. There is a potential to remove the Bond-Wall-Oregon traffic signals downtown in order to increase safety, operational efficiency and reduce wait times for pedestrians. This currently has the support of the downtown business association. There are also several small biking and walking enhancement projects downtown that could occur such as the crossing between the Deschutes Public Library and its parking lot; increasing driver yielding to pedestrians at crossings (including traffic signals); curb extensions where missing; bike parking; illumination; signal timing and efficiency along Greenwood Avenue; the one-way couplet tie-in at Bond-Wall; bikeway facilities throughout downtown including sharrows and bike lane drops.

Construction

In addition to the work being done on the Walking Zones and their subsequent project lists and deployment, the city is also working with the Accessible Advisory Committee to reduce barriers to accessibility throughout the community. The Accessible Advisory Committee has identified 6 key sidewalk corridors that represent

significant barriers to their constituents. These corridors are mapped on Figure 13 to provide a sense of the relationship between these ADA Prioritized Corridors and the Walking Zones. Most of these are contained within the Walking Zones or create an important arterial link between two Walking Zones. These ADA Prioritized Corridors are:

- Wilson Avenue between 2nd Street and 9th Street
- Newport Road between College Way and 12th Street
- Neff Road between Eastview Drive and Purcell Boulevard.
- Sidewalks surrounding the Bend Community Center (5th/6th/Greenwood)
- 8th Street between Franklin and Greenwood Avenues
- 27th Street between Neff and Butler Market Road (sidewalk completed summer 2013).

The Accessibility Advisory Committee also identified roadway crossings that are difficult for people with disabilities to use including:

- Greenwood Avenue near the Community Center
- 27th Street at Conners Road
- Neff Road at Williamson Boulevard.

Table 3 2014 BWIP Walk Facility Priorities – Construction Strategy	
Walking Facility Corridors	• 4th and Studio (Burnside to Butler Market); • College Way-Portland-Olney-Neff (COCC to St. Charles) • Wilson (2nd to 9th) • Franklin (Lava to Purcell) • 14th (Colorado to Newport) • 8th Street (Reed Market to Butler Market) Additional ADA Prioritized Corridors • Newport Road (College Way to 12th Street) • Bend Community Center (5th/6th/Greenwood/Kearney)
Roadway Crossings	• 3rd at Hawthorne • Greenwood at 5th and/or 6th • Neff at Purcell (all legs) Additional ADA Prioritized Crossings • Neff at Williamson • 27th at Conners
Key Community Walkability	• Drake Park Footbridge • Old Mill-via Aune-to 2nd Street (RR overpass) • Hawthorne Over Parkway (US 97)

Walking System Summary

The recommended walking system deployment strategy includes three delivery techniques:

- Focus on Walking Zones that already have many of the elements that make neighborhoods walkable;
- Continue to require complete streets with private development;
- Provide comfortable, safe & secure walking facilities (not only ADA compliant but also include street crossings, buffered sidewalk, street trees, illumination, etc.).

Table 3 presents the complete 2014 Walk Facility Construction Strategy and Project Priorities.

Next Steps for the Walking System Construction

1. Develop design RFP which will provide concept designs for many of the projects identified in this construction strategy. It is anticipated that this RFP will be published in late 2014.
2. Create a revolving funding and budgeting system that creates concept plans, designs projects, and constructs projects.
3. Develop a program and identify funding for on-going walking system maintenance.

Project Overlap

When reviewing the Project Priorities lists for both walking and biking facilities staff has noted that there is overlap between the projects for the two modes of travel. For example, the Portland-Olney-Neff corridor is a priority for both walking and biking facilities upgrades. In order to improve the corridor for both modes with an integrated approach, staff has combined the biking and walking projects into a single corridor streetscape project. With a streetscape project, the designer will be able to more fully meet the desire to create an enhanced walking and biking environment through the use of landscaped parkstrips, illumination, enhanced roadway crossings, buffered bike lanes, protected bike lanes, etc. These streetscape projects are labeled as Multimodal Corridorson the following map.

Figure 16 Map of Walking & Biking Facility Priority Projects

Appendix A

Goals and Objectives

The background work that set the stage for the Development of a Strategic Implementation Plan for Walking and Biking include:

- State Law
- SDC Revisions
- CIP Funding Strategy Changes.

There are Oregon Administrative Rules which apply to the City. Some of those pertain to increasing the number of people walking and biking, decreasing the number of people driving, and reducing parking spaces provided per capita.

- OAR 660-012-0045(5)(c) Implements a parking plan which:
  (A)Achieves a 10% reduction in the number of parking spaces per capita in the MPO area over the planning period.

- OAR 660-012-0035 Evaluation and Selection of Transportation System Alternatives

  (4)TSPs shall identify ways to reduce reliance on the automobile; increase transportation choices; change land use patterns and transportation systems so that walking, transit and cycling are highly convenient.

  (5)MPOs shall demonstrate progress towards reducing reliance on the automobile and accomplish a significant increase in the availability or convenience of alternative modes of transportation; Vehicle Miles Traveled is monitored and reported per capita.

To comply with these laws, objectives and policies have been incorporated into the Bend Urban Area General Plan and the Bend Urban Area Transportation System Plan. These policies and objectives meet the city's livability goals, and align with the goals of the Bend 2030 Vision.

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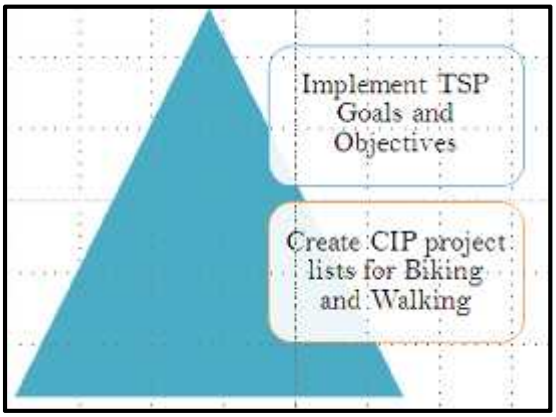
Appendix B

Background

The city revised its SDC methodology in 2011 the greatest impact was that the new methodology allowed standalone walking and biking projects as a means to increase the capacity of the transportation system.

The city also has allowed standalone walking and biking projects to be funded separately in the CIP. Prior years project ranking criteria rated a walk or bike project side by side with a large road works project. This pitted a sidewalk segment against new arterial roadway corridors and the criteria were geared to projects that served a greater number of the community, higher traffic volumes, and connectivity. So it was difficult for the standalone sidewalk or bikeway project to rank higher than a roadway project.

By using separate funding silos for walking and biking projects than roadway or intersection projects, a prioritization/ranking methodology just for walking and biking projects could be used and those smaller projects would only compete against other walking and biking projects.



In order to implement this new funding strategy –the city needed to create a Walking and Biking Implementation Priority and Strategic Implementation Plan – thus the efforts outlined in this memorandum were initiated.

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Appendix C

Preferred Bicycling System Elements

Tool Box and Benefits

Appendix D

Pedestrian Zone

Ranking Methodology

As shown in the following figure, the prioritization methodology consists of 10 steps. These steps have been laid out in an easy to follow and customize spreadsheet.

The city has completed each of these steps as noted herein.

Step 1. Define Purpose. The purpose of the prioritization methodology is to rank Pedestrian Zones by their built environment's potential to create and sustain walking as a mode of transportation.

Step 2. Select Factors. Factors are elements within the built environment that are measureable and can be used to differentiate the zones.

Step 3. Select Variables. Within each factor, different variables can be measured. The factors and their variables chosen are:

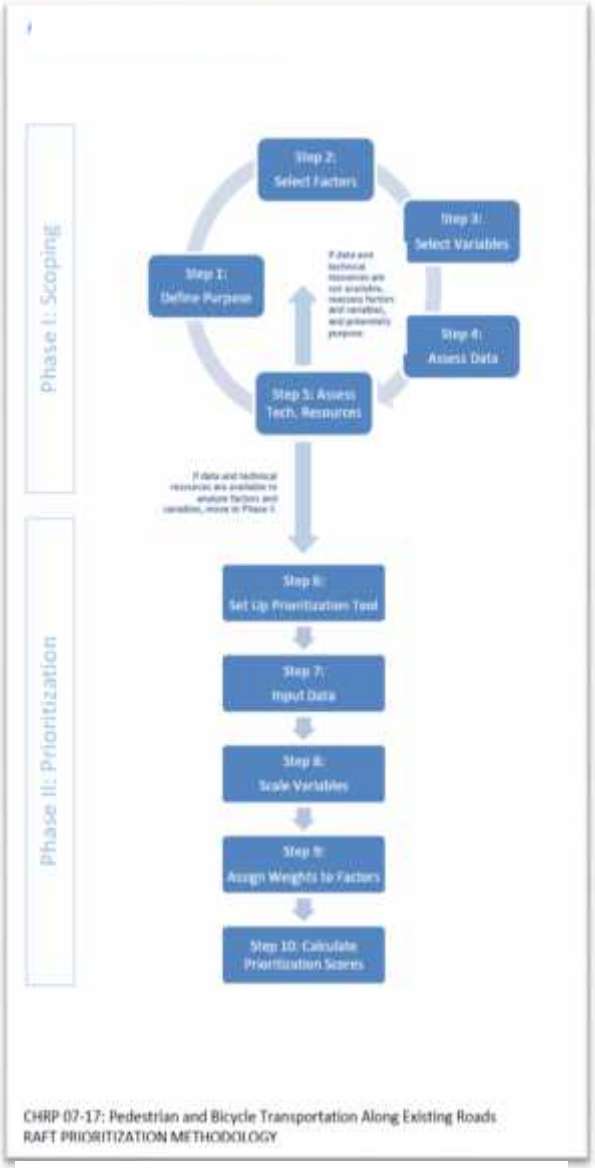

Figure 17 Pedestrian System Prioritization Methodology

- Stakeholder input
- Constraints (Costs and Legal)
- Opportunities (Upcoming Projects)
  - This variable was not utilized because the purpose at this time is to rank Pedestrian Zones, not individual projects.
- Safety
  - Total Pedestrian Crashes in the Zone
  - Fatal & Severe Pedestrian Crashes in the Zone
  - Pedestrian Crash Rate
- Existing Conditions
  - Proportion of Roads with 5 lanes
  - Sidewalk Coverage
  - Percentage of bus stops with shelters
  - # of Luminaires per square mile
- Demand
  - Population Density
  - Employment Density
  - Retail Property Density
  - Number of Bus Stops
  - Number of Trailheads
  - Number of Hotels
  - Number of Schools
  - Park to total district acreage ratio
  - Quantity of off-street parking stalls

- Connectivity
  - Intersection Density
  - Roadway Segment Density
- Equity
  - % population with Disabilities
  - % population older than Age 64
  - % population younger than Age 18
  - % population with no Auto
  - % Households in Poverty
- Compliance
  - % Non-ADA Curb Ramps/Total Curb Ramps.

Step 4. Assess Data. This step allowed the group to identify whether there was sufficient data to populate the criteria identified in Steps 2 and 3. If there was insufficient data the group discussed whether to use a proxy or drop the variable. One issue that came up was that the city did not have access to census tract data at a very small scale, so it has been difficult to answer the Equity variable questions for each Zone. Often the census tract is much larger than the Pedestrian Zone we were working with.

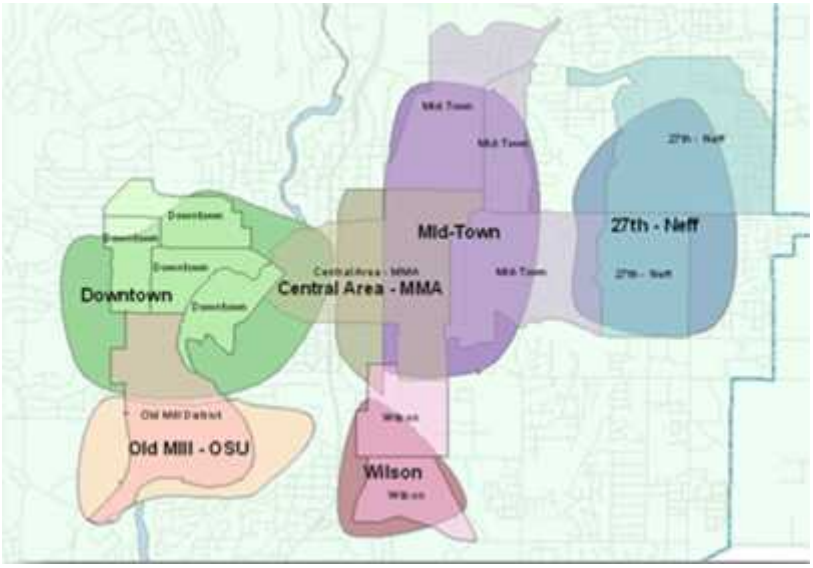

Figure 18 Census Block Group and Pedestrian Zones Combined

Steps 5, 6, and 7 are just setting up the spreadsheet and inputting the data for each variable for each Pedestrian Zone.

Step 8. Scale Variables. The overarching goal of this step is to figure out whether a variable is considered beneficial or not and therefore whether it should contribute to a ranking or detract from a ranking. For example, one variable that had much discussion focused on Safety Criteria. The group wrestled with the concept of whether having crashes or five-lane roadways should contribute points that would bolster a Pedestrian Zone's ranking or not. If the criteria were looked at positively, then zones with higher crashes and a greater percentage of multi-lane roadways to cross would be ranked higher. On the one hand, everyone was clear that these zones would have a higher need for pedestrian facilities to counteract these safety conditions. Not everyone was certain that these zones should be the first chosen due to the added complexity and ultimately added cost of achieving a walkable district. Some people thought it might be beneficial to choose zones that were easily and readily convertible to complete walkable districts with easier to implement sidewalk and ADA ramp infill projects. In this case, Pedestrian Zones with few existing safety issues, and few 5-lane roadways to cross would be prioritized for sidewalk infill.

The BWIP committee's ranking identified Mid-town, Central & Near West, and Wilson Avenue as Pedestrian Zones to work on first. There is a Transportation Growth management Grant that will begin in mid-2014. This process will look at the transportation and land use systems in the central and western portions of the community and it would be helpful to allow this process to move forward and then utilize the findings to enter into this Pedestrian Zone and Project Identification Phase of the Strategic Implementation Plan.

Step 9. Weight Factors. This step allowed the BWIP committee the opportunity to weight some factors and variables higher than others based upon their perceived importance.

Step 10. Results – this step documents the Pedestrian Zone's scores and ultimate Rank. Based on the factors chosen, the variables's scaling, and ultimately the data, the city has ranked each of the 6 Pedestrian Zones as follows:

1. Mid-town
2. Downtown – Near West Side
3. Wilson Avenue
4. Old Mill District
5. Central Area MMA
6. 27th - Neff.

Appendix E

www.bendoregon.gov/bikewalk

Citizen Input