



Bicycle Transportation

Spring 2011 • Planning, Public Policy and Management

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About SCI

The Sustainable Cities Initiative (SCI) is a cross-disciplinary organization at the University of Oregon that seeks to promote education, service, public outreach, and research on the design and development of sustainable cities. We are redefining higher education for the public good and catalyzing community change toward sustainability. Our work addresses sustainability at multiple scales and emerges from the conviction that creating the sustainable city cannot happen within any single discipline. SCI is grounded in cross-disciplinary engagement as the key strategy for solving community sustainability issues. We serve as a catalyst for expanded research and teaching, and market this expertise to scholars, policymakers, community leaders, and project partners. Our work connects student energy, faculty experience, and community needs to produce innovative, tangible solutions for the creation of a sustainable society.

About SCY

The Sustainable City Year (SCY) program is a year-long partnership between SCI and one city in Oregon, in which students and faculty in courses from across the university collaborate with the partner city on sustainability and livability projects. SCY faculty and students work in collaboration with staff from the partner city through a variety of studio projects and service-learning courses to provide students with real-world projects to investigate. Students bring energy, enthusiasm, and innovative approaches to difficult, persistent problems. SCY's primary value derives from collaborations resulting in on-the-ground impact and forward movement for a community ready to transition to a more sustainable and livable future. SCY 2010-11 includes courses in Architecture; Arts and Administration; Business Management; Interior Architecture; Journalism; Landscape Architecture; Law; Planning, Public Policy, and Management; Product Design; and Civil Engineering (at Portland State University).

About Salem, Oregon

Salem, the capital city of Oregon and its third largest city (population 157,000, with 383,000 residents in the metropolitan area), lies in the center of the lush Willamette River valley, 47 miles from Portland. Salem is located an hour from the Cascade mountains to the east and ocean beaches to the west. Thriving businesses abound in Salem and benefit from economic diversity. The downtown has been recognized as one of the region's most vital retail centers for a community of its size. Salem has retained its vital core and continues to be supported by strong and vibrant historic neighborhoods, the campus-like Capitol Mall, Salem Regional Hospital, and Willamette University. Salem offers a wide array of restaurants, hotels, and tourist attractions, ranging from historic sites and museums to events that appeal to a wide variety of interests. 1,869 acres of park land invite residents and visitors alike to enjoy the outdoors.

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This report represents original student work and recommendations prepared by students in the University of Oregon's Sustainable City Year program for the City of Salem, the Urban Renewal Agency of the City of Salem, or the Salem Housing Authority. Text and images contained in this report may not be used without permission from the University of Oregon.

Executive Summary

The proposals reviewed in this document were generated as a result of collaboration between the City of Salem and the University of Oregon Sustainable Cities Initiative. Fifty-one students in a Planning, Public Policy, and Management course entitled “Bicycle Transportation”, taught by Professor Marc Schlossberg, reviewed and examined critical elements of an urban bikeway system and proposed projects that would encourage increased bicycle ridership. This course was offered to upper level undergraduates and graduate students.

The City of Salem provided the “Downtown Parks Connectivity” scope of work document to facilitate collaboration and yield work products that contributed to one of the city’s goals. This particular goal is aimed at developing a well-connected system of bicycling and walking trails, thus increasing accessibility to downtown, its parks, and other key destinations, as well as enabling the park patrons to enjoy the park system.

This course’s content laid a solid groundwork for approaching issues outlined in the downtown parks connectivity document. Categories of actions recommended by student proposals fell into three general categories: Bicycle Infrastructure, Social and Cultural Issues, and Enriching Bicycle Culture.

Several proposals address current and future connections from West Salem, via parks and the Union Street Pedestrian and Bicycle Bridge (Union Street Railroad Bridge), to the core downtown area. Also considered were the many existing trails within the complex of centrally located parks (Wallace Marine, Riverfront, Minto-Brown Island, and Bush’s Pasture Parks). Two new bicycle and pedestrian bridges were proposed to connect a larger area of the Salem core in the hope of decreasing congestion while providing more cycling options across town. North/south corridor connections to the downtown core were addressed in at least four projects.

Other proposals address attitudes and behaviors related to bicycling in Salem. Creative ideas and resources for the city are suggested as ways to encourage and educate all potential cyclists. Issues confronted by women as bicyclists are primarily about safety, requiring thoughtful consideration when planning infrastructure. A fun, educational event held three times a year for all age levels is suggested to promote cultural change.

Two proposals focus on enriching bicycling culture through enjoyment of the activity of cycling. They present ideas for enhancing the experience of the Willamette Valley Scenic Bikeway and providing a signature city event. Each of these activities would offer fun, educational opportunities for Salem residents and visiting cyclists.

The conclusion offers some suggestions for ways that the City of Salem may use this document. The proposals are not intended to be used as a comprehensive plan. Instead, individual elements from or extraction of a complete proposal could be implemented to increase bicycle connectivity in the Salem core and enhance enjoyment of the city parks.

Introduction

The City of Salem is redefining itself as a city of the twenty-first century. Every aspect of the city's development trajectory is being analyzed for changes that will make it more livable and sustainable. Salem's Transportation System Plan (TSP) is undergoing major reworking, including an effort to facilitate development of an active transportation system through the plan's "Bike and Walk" element. An updated TSP will integrate the Salem Vision 2020 goals of downtown connectivity, enabling downtown to be a "revitalized, welcoming and vibrant community gathering place."

The City of Salem, in partnership with the University of Oregon Sustainable Cities Initiative (SCI), created a scope of work document for a project based on downtown and parks connectivity. The project goals expressed a desire to fix missing or inadequate links in the bicycle and pedestrian routes through and around downtown Salem and its parks. It acknowledges that efficient and attractive transportation routes and connections to key destinations for work, play, and business are needed to facilitate increased use by bicyclists and pedestrians. The city collaborated with students in SCI's Sustainable City Year program, providing city documents, contact people, technical assistance, and other resources to make the objectives and desired outcomes obtainable for student projects.

The course provided a rich contextual exploration of bicycle transportation issues. It included examining and understanding the physical engineering changes necessary to provide excellent bicycle infrastructure, as well as planning, policies, and funding that support infrastructure and bicyclists. But beyond that, it also examined the social underpinnings of attitudes and cultural connotations of transportation by bicycle. The complexity of the issue requires more than just a built environment that makes cycling physically possible, but also a comprehension of the issues of bicycling on a larger social scale. Attitudes about safety, appearance, fashion, distance and time perceptions, comfort, and convenience affect peoples' decisions, or even consideration, to bike in the first place. All of the infrastructure in the world will not make bicycle transportation an attractive alternative if people do not want to bike or do not think of it as a viable option.

Students used many resources and activities to compile suggestions from City of Salem staff, local bloggers, and residents. All student groups pored over comprehensive on-line city data to understand the scope and issues of the bicycle transportation challenge. Some ideas for projects came from issues addressed by a bicycle advocacy group, the Mid-Willamette Valley Bicycle Transportation Alliance (MWVBTA). Many students made at least one trip to Salem to ride, take photos and notes, and experience the bicycle infrastructure on the ground. Students conducted interviews with and surveys of Salem residents, city staff, and police officers. Varying approaches provided a rich array of proposals; some are concrete, structured designs, while others used

creative recommendations for policies, planning, actions, and events that may help Salem meet the bicycle transportation challenge.

Background Information

During the process of updating Salem's TSP, the plan's Bicycle Element is undergoing a comprehensive restructuring, funded by a grant from the Transportation Growth Management (TGM) program, a joint program of the Oregon Department of Transportation (ODOT) and the Oregon Department of Land Conservation and Development (DLCD). The objective is that the resulting plan will reflect the city's desire to increase the mode share of active transportation.

Salem transportation behaviors reflect many opportunities for improvement through thoughtful active transportation planning. Information from the Journey to Work 2000 Census data showed that 77% of West Salem residents cross the Willamette River to commute to work. In addition, according to the 2009 American Community Survey from the U.S. Census Bureau, 74.2% of Salem Residents drive alone, and a mere 1.1% bicycle and 3.7% walk to work.

Various organizations are studying ways to address these issues and are making recommendations. One of the efforts looking at reducing single occupant vehicle travel across the Willamette River is the Salem Willamette River Crossing Alternate Modes Study (Salem Alternate Modes Study). Representatives from the City of Salem, ODOT, Mid-Willamette Valley Council of Governments (MWVCOG), and Salem-Keizer Transit (Cherriots) lead this group. The consultant groups of CH2MHILL, Alta, and PTV also provided plans and recommendations. The Salem Alternate Modes Study group has a future-planning horizon of 2031 and provides multiple Transportation System Management (TSM) and Transportation Demand Management (TDM) recommendations. These include physical as well as educational and policy elements to encourage Salem residents to change their transportation behavior and to use alternative modes. An overview of their recommended physical changes to bike infrastructure can be seen in Figure 1. Many more recommendations relate to educational programs, incentives for alternative travel, and other policies and actions the city may use to advance the use of alternative transportation. The study is completed and the full document may be viewed on-line at http://www.salemrivercrossing.org/ProjectLibrary/AltModesPlan_VI_Final.pdf.

Salem Vision 2020 is a community-wide process, operating as a group represented by local, regional, and state government as well as community organizations, businesses, and residents. The group is focusing on revitalizing the city core, transforming it into a community gathering place by increasing its appeal and accessibility as a destination. Vision 2020 has a shorter planning time horizon—the year 2020—than that of the Salem Alternate Modes Study group. The elements of the plan are integral to increasing alternative

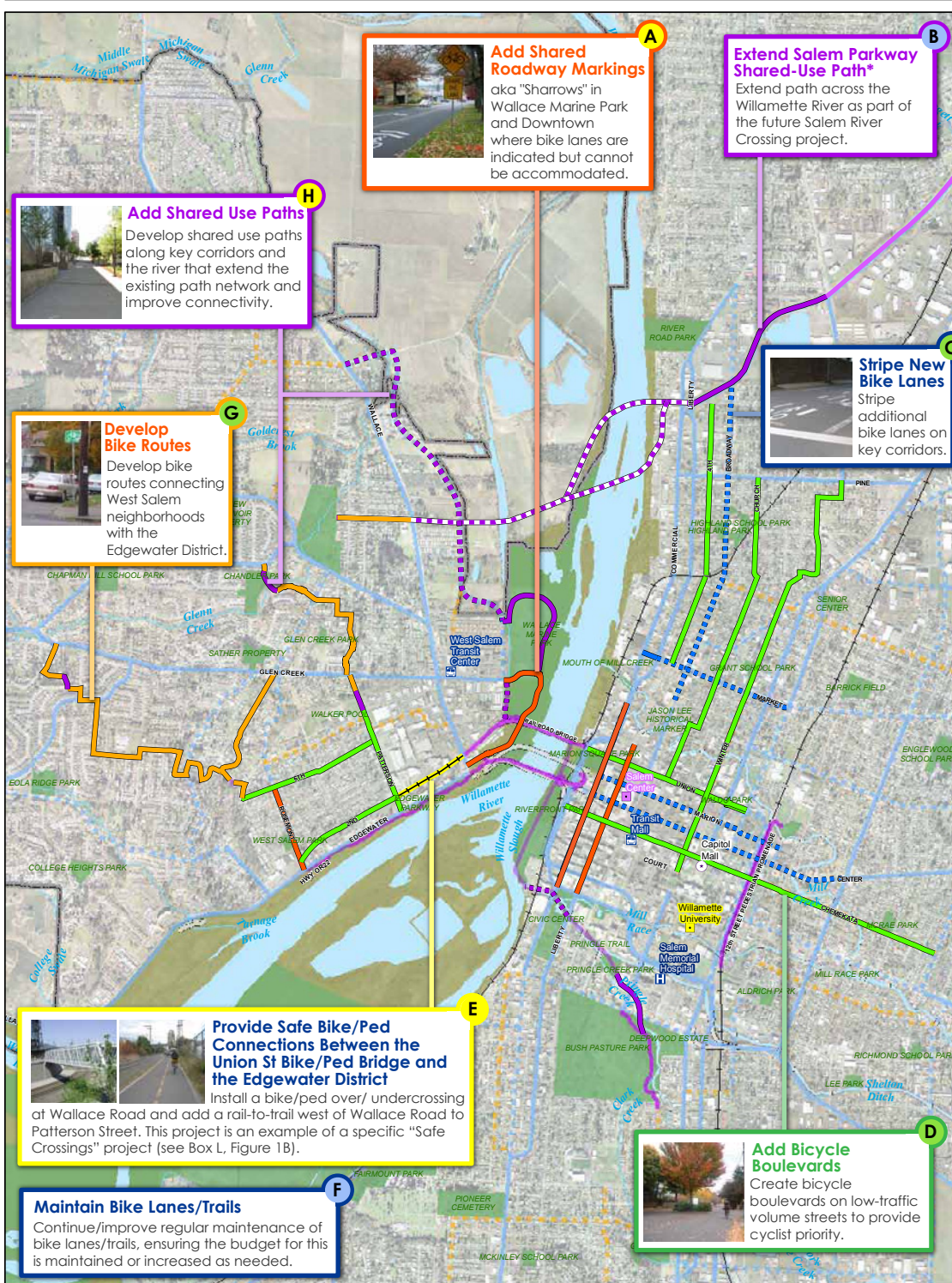


Figure 1: Salem Alternate Modes Study Proposed Bicycle/Pedestrian Network Improvements.

transportation options, and also address the need to improve and increase accessibility for bikes and pedestrians from West Salem to Downtown.

Vision 2020 bicycle and pedestrian ideas are viewable at the Vision 2020 website: <http://www.cityofsalem.net/CityCouncil/CityProjects/Vision2020/Projects/Pages/BikePedestrianAccess.aspx>. Salem Vision 2020's map of existing and proposed bike lanes is shown in Figure 2.

Current bicycle maps on the City of Salem website show routes, lanes, and paths that appear to be fairly well distributed. However, the problems with everyday use are well documented in reflections from the city's many groups looking at alternative transportation connectivity. Problems include bicycle lanes disappearing into traffic, poor paving, dangerous intersections, and missing links. Additional documentation about local bicycle issues is available on a bicycle advocacy blog sponsored by the Mid-Willamette Valley Bicycle Transportation Alliance (MWVBTA) entitled "Salem Breakfast on Bikes" (<http://breakfastonbikes.blogspot.com/>).

The proposals set forth in this report will focus specifically on the goal of increasing use of bicycles as transportation. Many of the previously discussed items in this background overview will be addressed. These student proposals do not recommend specific standards, design criteria, or combine in any way to present a comprehensive bikeway system. They do, however, recommend many treatment alternatives, bike routes and boulevards, socio-cultural considerations, and bicycle culture enrichment ideas to promote the efficacy, safety, and appeal of the city's bicycle network.

"Salem Vision 2020 participants sought connections for bicycles to and through the City Center: more dedicated on street lanes leading to and through the City Center, off-street multi-use paths, use of alleyways for bike travel, and additional striping and visible barriers at key intersections to ensure adequate space for cyclists." - Salem Vision 2020 Action Plan (2007)

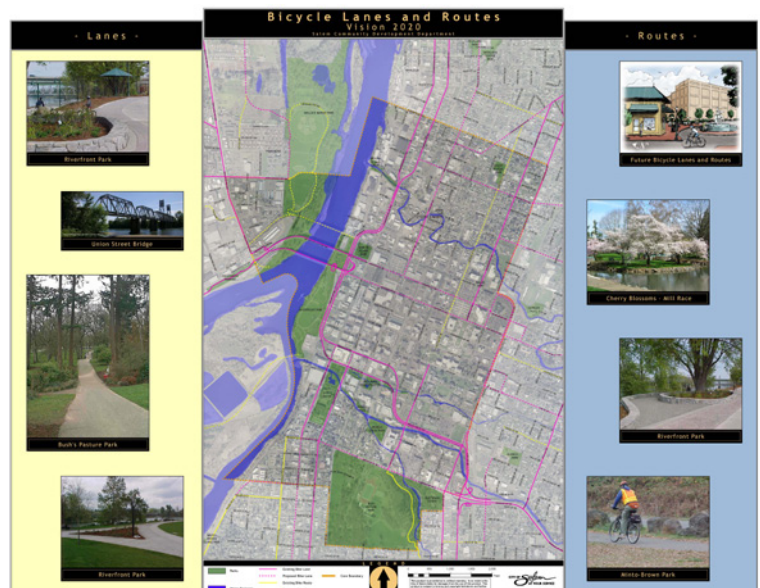


Figure 2: Salem Vision 2020 Bike Lanes and Routes Map: Existing and proposed bicycle lanes and dedicated routes are highlighted" from Salem Vision 2020 website.

A Context for Action: Bicycle Infrastructure

This section of the report includes all proposals that suggest physical changes to the Salem bikeway network in order to improve its connectivity, safety, and appeal. These infrastructure changes are reflections of the bicycle and pedestrian issues currently being considered by the City of Salem advisory groups. Recommendations include:

- Adding bicycle and pedestrian bridges across the Willamette River.
- Improving or adding shared use paths.
- Fixing missing and/or poorly surfaced connections.
- Engineering solutions to problematic intersections.
- Implementing various types of safe bikeways on city streets.
- Improving and adding to existing wayfinding signage.
- Improving connectivity between parks, neighborhoods, and schools.
- Developing bicycle boulevards.
- Enhancement of the aesthetic appeal of bike routes.

Bicycle Infrastructure: Cross-city Connections

Brandon Caudle, Sophie Luthin, Ross E. Sherbak, Daiva Trudeau

Connectivity over and along the Willamette River through the core of Salem is the focus of this proposal, emphasizing a unifying theme of connectivity for the entire city. The structuring of an efficient bikeway system is enhanced by the aesthetic appeal of the route. Not only would it increase the connections between downtown and the parks, but it would also enable multiple bike route options for bicycle commuters or recreational riders from West Salem and the core. If the Union Street Railroad Pedestrian and Bicycle Bridge (hereafter referred to as the Union Street Railroad Bridge) is included, bicyclists and pedestrians would be able to cross the river at three spatially distributed locations along the river. Better access to Minto-Brown Island Park and Wallace Marine Park would enable more enjoyment of these parks for recreation. Transportation through and between them for commuting and other purposes would also be improved.

The proposed Edgewater Bicycle/Pedestrian Bridge would connect West Salem via the Edgewater trail to Minto-Brown Island, south of the downtown core. This bridge would cross to improved, widened shared use paths that traverse the island. The trails here may be extended to the bridge currently under consideration by the City of Salem connecting Riverfront Park to Minto-Brown Island.

Crossing the river north of the core area, the proposed Pine Street Bicycle/Pedestrian Bridge would connect to a route along the west side of the Willamette River, running south through Wallace Marine Park, and eventually

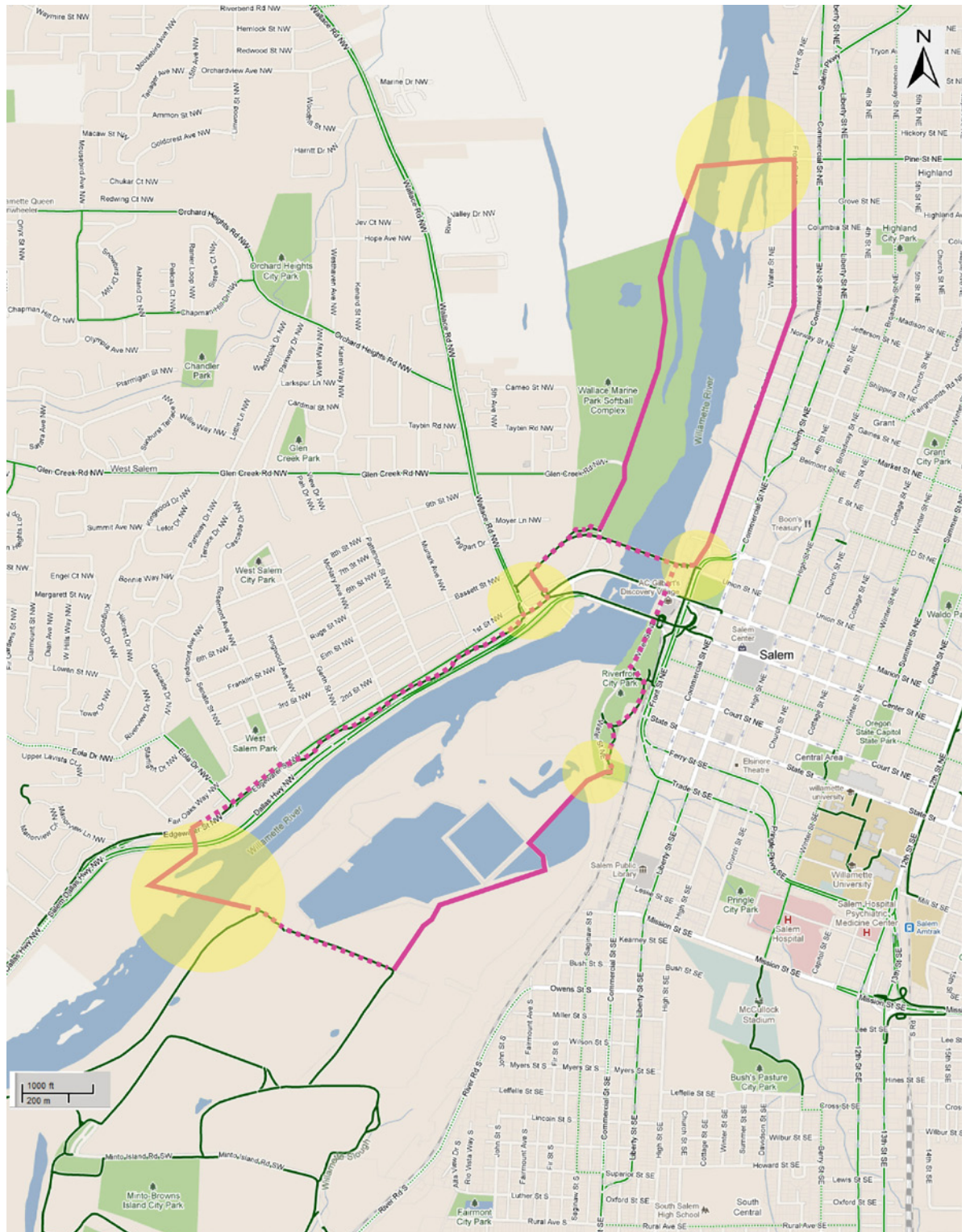


Figure 3: Cross-city connections shows large loop running along both sides of Willamette River with a bicycle/ pedestrian crossing at both north and south ends of loop.

connecting to the Union Street Railroad Bridge and other trails to the south. On the east end of the bridge, the route would run along the river's east side, connecting back to the downtown area.

Only the bravest of riders would cross the Center Street bridge (one way east) in its current incarnation, and there is no bike lane over the Marion Street Bridge— just a narrow sidewalk that is daunting to most cyclists. That leaves Union Street Railroad Bridge as the lone safe bicycle and pedestrian crossing over the river. Improved meshing of infrastructure to close missing links of current bike paths on either side of the river are needed. Furthermore, exiting from the bridges to either the Edgewater Trail or the Union Street Railroad Bridge trails is currently difficult and dangerous. Enhanced connectivity between all trails on either side of the river, with widening, good lighting, and signage would make the loop route more bicycle friendly. Extensive traffic calming and bicycle infrastructure would be needed on the east side of the Union Street Railroad Bridge to move cyclists safely through this heavily industrialized area. Wide bicycle trails in and around bridges and overpasses with clear wayfinding signage would make cycling across the river safer, more convenient, and more appealing to a broad range of cyclists (see Wayfinding sidebar).



Figure 4: Wayfinding signage assists cyclists with directions in areas where converging bike paths occur and good sight distance is not available.

Wayfinding Signs

Effective wayfinding signs facilitate safe travel of bicycles and motorists through areas shared by bicycles and all types of other traffic. Signage for cyclists should share the same format, such as distinctive colors and symbols, so they are easily recognizable. Information about distance, time and direction of key destinations may be noted. The signs should be posted as far in advance as possible to allow cyclists to prepare to turn in an appropriate direction. Signage for motorists alerts them to the presence of cyclists on the street.

From the “Fundamentals of Bicycle Boulevard Planning and Design”, p 20. Initiative for Bicycle and Pedestrian Innovation, Center for Transportation Studies, Center for Urban Studies, Portland State University, Portland, Oregon, July 2009. <http://ibpi.usp.pdx.edu/media/BicycleBoulevardGuidebook.pdf>

Bicycle Infrastructure: North-South Corridors; South of Downtown to Core

The need for north-south bicycle connections was noted and addressed by several proposals. These recommendations may help the city meet the goals set forth in Salem Vision 2020, and could also increase accessibility from residential neighborhoods, schools, and parks to key destinations in the neighborhoods as well as to downtown. These proposals consider the fact that cyclists of all riding abilities may use these routes, including children on their way to schools or parks and other cyclists who may be deterred from riding in areas that they perceive as unsafe. Other factors addressed are convenience and aesthetic appeal, both of which may be responsible for increasing usage of a particular route or path.

Two student groups focused on increasing safety and connectivity along High Street from Mission Street to downtown, a route that sometimes experiences considerable motor vehicle traffic. This is already a designated bicycle route. Each proposal suggests alternative ways to increase the safety and efficacy of bicycle routes on High Street through the downtown area, and two proposals consider traffic calming measures via a bicycle boulevard on High Street south of Mission Street.

Bike Through the Park

Jason DeHaan, Amber Swanson, Monica Welch, Colin Wiest

This proposal suggests a bike route that offers:

- A quiet, bicycle-friendly connection between south Salem and downtown, in contrast to current bicycle facilities, which exist only on high-volume arterials.
- Enhanced connections to Bush's Pasture Park, promoting it both as a safe space for bicycle commuters and as a recreational area for the community.
- A safe, low-volume traffic route for children who attend any of the three schools along the route. This route would serve McKinley Elementary School, South Salem High School, and Howard Street Charter School.

Focus Area

The focus area of this report is on the South Central Association of Neighbors (SCAN) neighborhood. Implementation could increase connectivity within the schools and parks in the neighborhood, provide recreational riding within Bush's Pasture Park, and facilitate north-south travel for commuting to Salem Hospital, the State Capitol, and other downtown destinations.

Route

The bike route flows along a low-traffic volume street, Church Street SE, from McGilchrist Street on the southern end, through Bush's Pasture Park, to just north of Mission Street (see Figure 6). The placement of sharrows on Church Street may enhance the safety of cycling through this neighborhood. Wayfinding signage for cyclists is recommended, in order to keep cyclists informed of their routes and distances to destinations. Warning signs for motorists would increase awareness of cyclists sharing the streets.

The centerpiece of the route is the shared use path through Bush's Pasture Park. Utilizing paths that are already in place, it is proposed that some paths be widened for safe and efficient use by multiple modes (walking, bicycling, wheelchairs, families). Providing a recreational loop would meet the requirements by park trustees that changes to the park be made for recreational purposes.

Intersection Treatments

Intersection treatments are recommended for the two places where cyclists may exit from Bush's Pasture Park on their way to destinations north. Both Church Street and Winter Street intersect with Mission Street at the north end of the Park. Crossing this busy street is a challenge for cyclists and pedestrians alike. Suggestions include:

- Widen and raise crossings.
- Add street marking to bicycle crossing areas.
- Add priority signals for cyclists and pedestrians, which would stop all motorized traffic through the intersections while cyclists and pedestrians cross.

See Figure 7 for proposed changes to the Winter and Mission Street intersection.



Figure 5: Sharrow designs include a bike with a double chevron in varying arrangements.

Sharrows

Sharrows are street markings that indicate bicycles are sharing the traffic lane with vehicular traffic. This is a traffic-calming method that works well on low-traffic residential streets, letting motorists know that bicycles may be present. A bike route with sharrows provides a more appealing transportation option for less confident cyclists, who may hesitate to cycle in bike lanes on high-traffic streets. These markings are applied near the center of the lane, indicating where the cyclists should ride, away from the danger of parked cars, where doors may open in the path of a rider (AASHTO 2010).

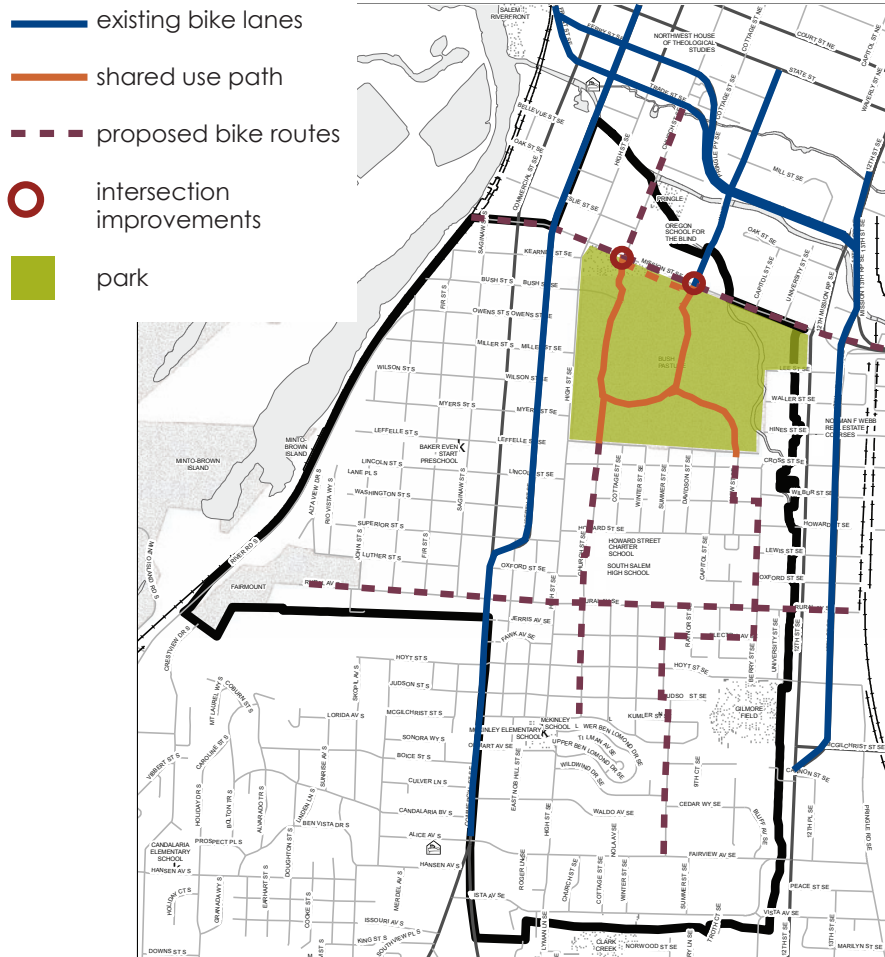


Figure 6: Overall route proposed by 'Bike in the Park', with a north-south connector route, as well as a recreational loop through Bush's Pasture Park.



Figure 7: Before and after plans of the intersection of Winter and Mission Streets. Note widened shared use path entry to/ exit from Bush's Pasture Park, and street markings connecting cyclists to bike lanes already in place.

Shared Use Path

Shared use paths are good for areas that need to support multiple types of path users, including bicyclists, pedestrians, runners, skaters, families with strollers, wheelchair users, and others. These paths offer both recreational opportunities and aids to routes for commuters. They should be used to serve corridors that are not accessible by streets, and as such are frequently used to serve parks. Shared use paths are a complement to other parts of the bikeway, and help to minimize conflict between different users (ODOT, p 113-115). A shared use path would serve to move bicycle and pedestrian traffic pleasantly and efficiently through Bush's Pasture Park.

A shared use path should be wide enough to accommodate two-way bicycle traffic in addition to another person approaching from either direction. The American Association of State Highway Transportation Officials (AASHTO) and the Oregon Department of Transportation (ODOT) both require a minimum of 10 feet, but the acceptable range goes up to 14 feet. The width depends on the number of path users, sight distance, and types of path users. A width of at least 11 feet is necessary for two bikes passing each other, moving in opposite directions, with another person on the path (three abreast). For heavily used paths, a center stripe may organize traffic and increase safety.

Safety for shared use paths can be a concern. Signage encourages path users to stay to the right unless they are passing. Most cycling recommendations require cyclists to give an audible warning when they are passing other path users, since they are usually travelling at a higher rate of speed. Lighting is necessary at night for safety and visibility.



Figure 8: Shared use paths provide rooms for cyclists and multiple other path users.

High Street Bicycle Corridor

Chase Dearman, Chelsea Johnson, Naria Kiani, Arnold Koo

This proposal addresses High Street between Chemeketa Street and Mission Street (see Figure 9). The safety and ease of riding in the downtown core would be improved by several engineering treatments. Since High Street is one-way southbound from Chemeketa Street to Trade Street, motorized traffic may turn from the right or left side of the road. The danger to a cyclist in intersections such as these may be seen in Figure 10. The recommendation suggests placing bike box turn lanes at the intersections (see Figure 11).

At a red light, the bike box puts the cyclists in front of motorists, in clear view. An advance bicycle signal would allow cyclists to turn safely or to proceed straight ahead. Bike boxes allow cyclists to clear the intersection before motorized traffic proceeds.

For increased safety, the proposal recommends bicycle lanes along each side of High Street, with a hard separation between motor vehicles and the bike lane. Bollards (removable metal poles) as separators are recommended in the downtown area.



Figure 9: High Street Improvements are recommended from Chemeketa Street to Mission Street.



Figure 10: Danger to cyclist while turning across in front of cars.

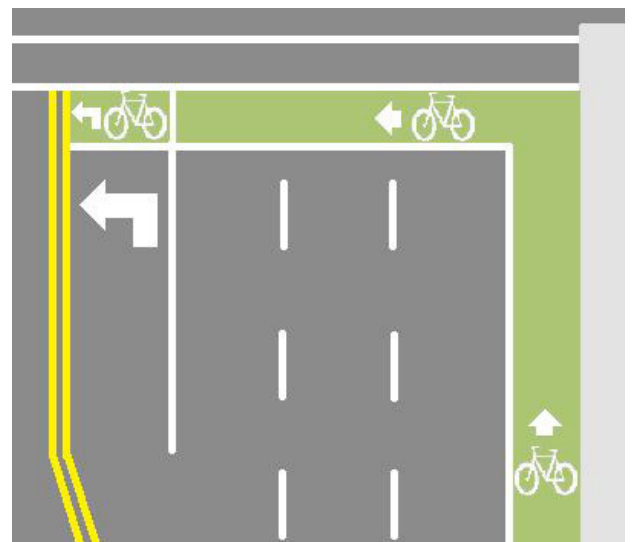


Figure 11: Bike box turn lane.



Figure 12: Bike boxes allow full visibility of the bicycles in front of the car traffic, priority signals allow cyclists to proceed before vehicular traffic.

Bike Boxes

Bike boxes are an engineering solution to facilitating safe, efficient bicycle travel through a highly trafficked intersection. Bicycles are particularly vulnerable in these intersections, and bike boxes reduce the likelihood of a right-turn conflict known as a “right-hook.” In this situation, a cyclist in a bike lane is in danger of being hit by a car from behind as the car turns right. In addition, without a bike box, the cyclist wanting to turn left must maneuver across

vehicular traffic to turn left. The bike box is a solution that allows all cyclists an enhanced level of safety through the intersection for any direction of travel they may be pursuing. Bike boxes are sometimes referred to as advanced stop lines.

A bike box is a designated area at an intersection that spans the entire width of an automobile lane, and extends all the way to the side of the street, encompassing the bike lane as well (see Figure X). The bike box is generally painted green, with bicycle icons placed on the green paint, drawing visual attention to the fact that bicycles will be present in front of all lanes of traffic. Cyclists advance to a bike box in front of cars at a red light, and motorists stop behind the bike box. This puts the cyclists in full visibility of the motorists behind them, as well as the motorists across the intersection from them.

An important element of the functionality of the bike box is a bicycle priority signal that turns green for cyclists first. This allows the bicycle traffic to clear the intersection before allowing other vehicular traffic to proceed. In addition, the right-turn on red must be prohibited in these intersections for bike boxes to be successful. Intersections with a high volume of right turning motorists may not be candidates for this treatment (Portland State University 2009).

High Street Bicycle Boulevard

Andrew Gordon, Emma Newman, Jacob Rahn, Jack Thomas

This proposal also focuses on High Street. The full route would enhance connections between south central Salem, downtown, and West Salem via High Street to Union Street (from the Union Street Railroad Bridge, along Union Street, turning south onto High Street and ending on High Street just south of Mission Street). The objectives are to calm traffic along the route and to divert automobile traffic from High Street to Commercial Street and Liberty Street. Recommendations in this proposal include:

- Traffic calming, signage, and bicycle priority signals to facilitate bicycle traffic from the Union Street Railroad Bridge to High Street downtown.
- Cyclist-activated bicycle priority signals throughout the downtown core at all intersections.
- Segments of raised bicycle lanes outside the motorized traffic lanes, next to the sidewalks, to separate them from motorists.
- Center lane two-way cycle tracks where High Street is one-way southbound for motorized traffic (see Figure 13).
- Redesign of the intersection of High Street and Mission Street, creating a roundabout for traffic flow.
- Diversion of traffic from High Street to Liberty and Commercial to decrease vehicular traffic traveling north or south on High Street.
- A bicycle boulevard designation for High Street, south of Mission Street, limiting traffic access from the north onto High Street, and using traffic calming measures to increase safety.



Figure 13: Appearance of center lane cycle track on High Street. Cycle tracks separate bicycle traffic from automobile traffic with a hard separation.

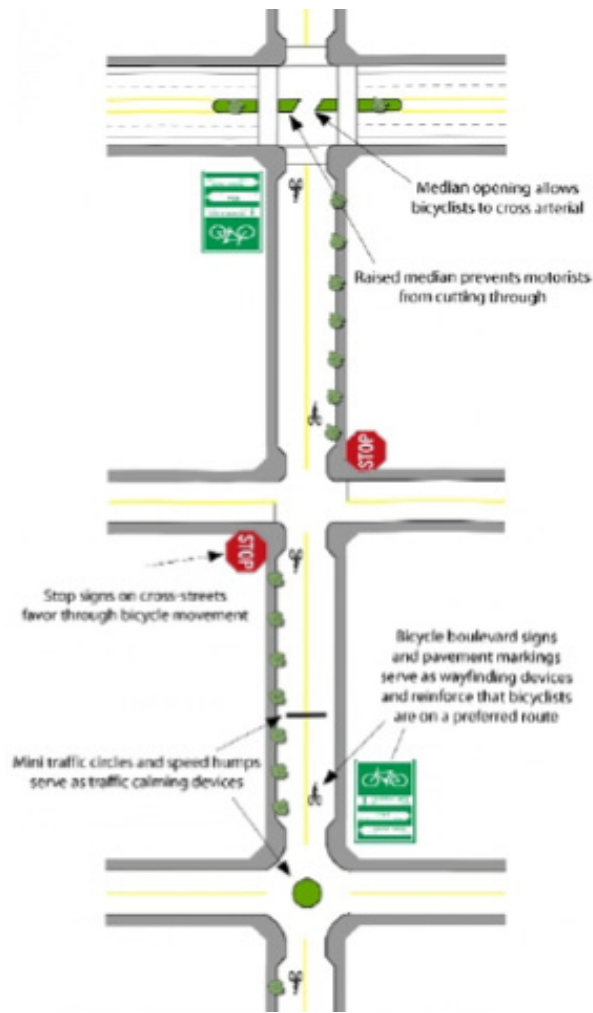


Figure 14: Design elements that may be used to develop a bicycle boulevard.

Bicycle Boulevards

Bicycle boulevards are quiet, low-traffic streets in residential areas, modified with physical structures to increase bicycle access and safety while discouraging automobile access and use. Sharrows, curb bump-outs, and barriers to automobile access may be used to provide a safe, bicycle friendly route. Bicycle boulevards offer a relatively inexpensive way to improve the comfort, appeal, and safety of cycling without the cost of major bicycle facilities. Intersections along bicycle boulevards enable cyclists to travel through without frequent stopping. They may employ the use of a bicycle priority signal at busy intersections, with bicycle-sensitive loop detectors. Wayfinding signage may also make use of the bicycle boulevard easier and more efficient (Portland State University 2009).

Liberty Park Connector

Pip Allen, Kerry Erwin, Chase McVeigh-Walker

The Liberty Park Connector addresses a route that had been discussed by the “Bike and Walk Salem” Stakeholder Advisory Committee in March 2011. This proposal addresses a one-way south-to-north route from Fairmount Park to Riverfront Park, suggesting several design alternatives that may enhance bicycle travel between these two parks. Since there is currently no bicycle route between these areas that does not encounter heavily trafficked streets, consideration of this proposal may help implement a broader plan to provide two-way routes that will be safe and attractive to cyclists of all abilities. Figure 15 shows a map of the final proposed route.

Key design elements include:

- Implement a bicycle boulevard on Saginaw Street to provide a traffic-calmed route on residential streets from Luther Street to Bush Street, where the route turns east to connect to Liberty Street.
- Eliminate parking on the west side of northbound Liberty Street and move the bicycle lane to the west side of the street, or add this as an additional lane, keeping the lane on the east side of the street (see Figure 16). This would allow safer access for cyclists to turn onto Liberty Street from Bush Street.
- Separate the northbound bicycle lane on Liberty Street with a landscaped buffer.
- Provide a buffered contra-flow bike lane on State Street where motorized traffic is one-way east.



Figure 15: Route from Fairmount Park to Riverfront Park, south to north, via Saginaw and Liberty Streets.

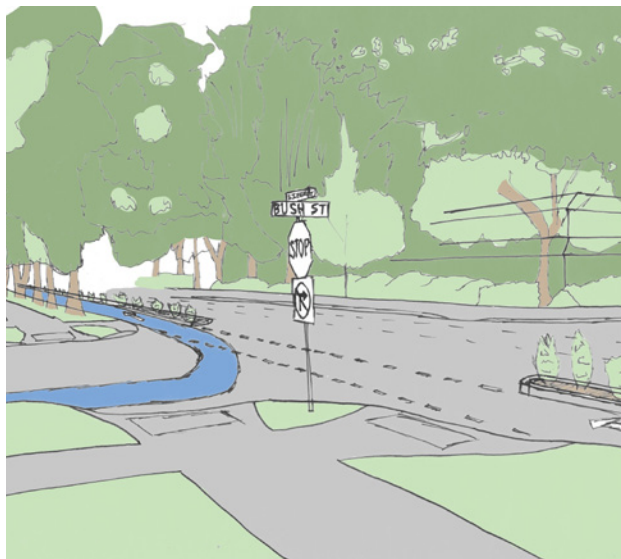


Figure 16: Image of intersection treatment at Bush Street and Liberty Street, with a painted, buffered bicycle lane merging onto the west side of Liberty Street.

Bicycle Infrastructure: Engineering Solutions for the Intersection of Wallace Road and Glen Creek Road

A large percentage of Salem residents live in West Salem and must travel across the Willamette River to the city core for work or other purposes every day. Funneling of traffic from many areas of West Salem through the intersection of Wallace Road and Glen Creek Road has created problematic traffic congestion. As a result, the intersection has been targeted for redesign; proposals will

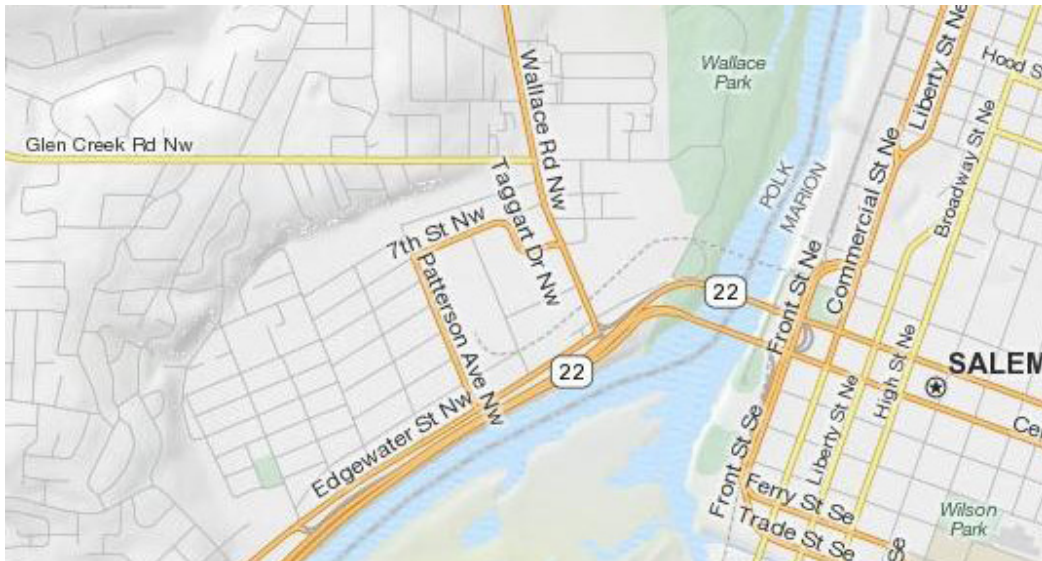


Figure 17: Map of intersection of Wallace Road and Glen Creek Road.



Figure 18: City of Salem's proposed redesign of intersection adds multiple lanes.

increase the total number of car lanes to five. According to the “Salem Breakfast on Bikes” bicycle advocacy blog, this will “make the moat much deeper and wider” for cyclists and pedestrians encountering this intersection. It is noted to be the most hazardous intersection in Salem, with nine crashes involving bicycles between 2005-2009 (Salem Breakfast on Bikes 2011).

Due to the controversy over the final redesign of this intersection, two separate student proposals address ways to overcome the congestion through bicycle infrastructure and engineering treatments. Ease of travel through this area is critical to cyclists, because Glen Creek Road connects to Wallace Marine Park and provides direct access for cyclists to the Union Street Railroad Bridge and downtown Salem. See Figures 17 and 18 for the location of the intersection and for the city’s proposed redesign.

Wallace Road and Glen Creek Road Roundabout

Shaheen Axtle, Sander Cole, Brian Miller, Courtney Moore

This proposal is fairly straightforward. Instead of adding lanes, this redesign would engineer a large roundabout for traffic control. The efficiency of vehicular movement would be facilitated by continuous flow without adding lanes. Bicycle lanes would be added to all sides of the intersection, separated from the vehicular flow. Slower vehicular speeds and shorter crossings for bicyclists and pedestrians would increase safety. Bicycle and pedestrian crossings would be widened and clearly marked, and priority signals would be placed at each crossing area. Priority signals do not stop traffic unless activated by cyclists or pedestrians. Figure 19 compares the present design, the design under consideration by Salem, and the proposed traffic roundabout.

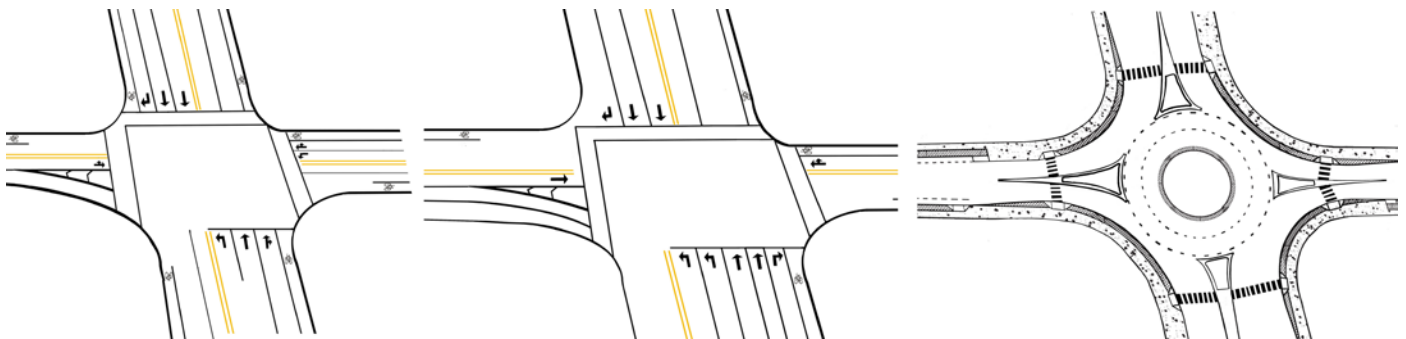


Figure 19: Image showing intersection current design, design under consideration by Salem and the proposed traffic roundabout.

Wallace Road and Glen Creek Road Bike Boxes

Sean Dunn, Maddison Foster, Mary Heberling, Jeffrey Nunnemaker, Lindsey Russell

Another approach to redesigning the Wallace Road/Glen Creek Road intersection embraces the use of bike boxes, again without adding lanes to either road. As an argument against adding lanes, the proposal refers to the Triple Convergence Theory formulated by Anthony Downs in 1992. Anthony Downs, a senior fellow at the Brookings Institute, focuses his work on smart growth, traffic congestion, and metropolitan policy. The theory states that increasing roadway capacity compounds traffic congestion; it attracts additional motorists who would otherwise take a different route, travel at a different time, or use another mode of travel. This would suggest that increasing the number



Figure 20: Two-stage bike queues place bike boxes in the east and west bound lanes of Glen Creek Road. Cyclists southbound on Wallace would cross to the Glen Creek bike box on the west side of the intersection and wait there for the signal on Glen Creek. It would take two phases of the traffic light for them to cross the intersection safely.

of lanes on Wallace Road and Glen Creek Road might, in the long run, make congestion worse. Encouraging alternative modes of transportation may actually be more effective at decreasing congestion.

This group proposes bicycle infrastructure that increases the efficiency and safety of bicycle routing through the intersection. The preferred bicycle route would encourage cyclists to travel through the intersection from either Glen Creek Road or Wallace Road toward the Union Street Railroad Bridge on Glen Creek Road, discouraging bicycle traffic traveling south on Wallace Road.

The safety of cyclists in heavily trafficked intersections is increased by the use of bike boxes, which are proposed for Glen Creek Road on either side of the intersection. This treatment would put the cyclists clearly in front of motorists at a red light, with a priority signal for bicycles to cross the intersection. The bike boxes would be clearly marked with green paint. Instead of adding another turn lane, this proposal suggests moving the vehicular turn lane outward one lane, allowing bicycles to advance forward to the bike box. This change would assist cyclists riding east and west on Glen Creek Road.

This proposal also enables cyclists traveling south on Wallace Road to turn left onto Glen Creek Road in order to travel east toward the Union Street Railroad Bridge. This potentially hazardous maneuver would be made safer by using what the proposal calls a two-stage bicycle queue. Cyclists traveling south on Wallace Road would cross the intersection to the bike box on Glen Creek Road, where they would wait for the Glen Creek Road signal to turn green. This means they would cross the intersection in two stages, always traveling straight across the intersection, and never turning across traffic (see diagram in Figure 20).

To educate the public about the new traffic control strategies, the proposal suggests a “grand opening,” with a car-free day in and around the intersection. This would allow riders of all confidence and ability levels to experience the new design in a safe environment. A mass ride could be led from the intersection to the Union Street Railroad Bridge, assisting cyclists in planning their routes from West Salem to the core and back again. Support by local businesses would be a key element in the success of this innovative treatment for active transportation.

Sociocultural Considerations: Promote and Educate

Heidi Beierle, Stella Day, Kaitlin Kernan, Mark McCaffery, Elle Natchke

As discussed earlier in the introduction, attracting more people to bicycling for transportation depends on a complement of actions. Supporting the development of infrastructure provides a base, but fostering development of bicycle culture is needed to complete the equation. Social issues based on people's attitudes toward cycling are powerful players in changing behaviors. How the City of Salem incorporates plans, policies, and actions affecting the bicycle culture may amplify the effects of improved infrastructure.

This team's proposal provides a survey of strategies used in communities across the country to increase the number of people bicycling. The team uses this precedent research as a springboard to discuss how mechanisms currently in place in Salem may take fuller advantage of these strategies. Additional recommendations describe how a richer context of actions may develop a bicycle culture that will sustain itself and grow over time. This proposal recommends ways in which Salem can integrate bicycle-related programming into city functions, organizations, and services to increase ridership numbers and frequency.

In addition to researching best practices in growing a bicycle culture, the team interviewed and surveyed city officials, bicycle advocates, Salem residents, and City of Salem employees. Through this process, they identified barriers and opportunities related to increasing bicycling in Salem.

A review of educational opportunities led to a recommendation for Salem to institute programs to increase public awareness about bicycling issues. Safety on the streets for all riders may be addressed through targeted ad campaigns. The city may conduct public relations campaigns to educate the public about services and resources available to cyclists, such as rides, activities, and events. Safe Routes to Schools is a program already in place in Salem, but expanding its presence in all areas and promoting it through organized activities may increase both safety and participation in the program.

The City of Salem's support for recreational and commuter cycling has the potential to improve the city's bicycling culture on a large scale. The seeds of the culture are already evident in the number of cyclists, bike shops, and range of activities for cyclists. This proposal suggests that enriching the local bike culture may lead to a unique sense of place. The students' proposal contains many recommendations for the city:

- Survey the community about cycling issues and perceived barriers to cycling.
- Promote bicycling clubs and incentives to first-time riders at cycling events.
- Raise awareness of local bicycle routes through neighborhoods.

- Provide opportunities to host public announcements for cycling events, either on paper or on-line.
- Encourage parents to cycle with youth to ensure the future of bicycle culture.
- Orient community service projects to embrace bicycle culture. For example, empower city staff to use cargo bikes to haul items for community events.
- Host car-free days or events.
- Collaborate with local bike shops to provide incentives to the public to pursue cycling for any purpose.

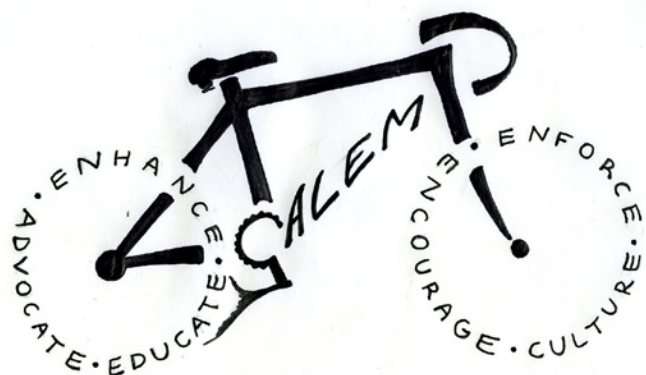


Figure 21: Salem embraces the League of American Bicyclists 5 E's of bicycle advocacy: Engineering, Education, Encouragement, Enforcement, Evaluation and Planning.

Advocacy provides an additional component to supporting and sustaining a bicycle culture. Expanding support for and public awareness of the following organizations may enrich empowerment, communication, and partnerships among all levels of the cycling community.

- 'Bike and Walk' Salem Bicycle and Pedestrian Stakeholders Advisory committee
- Mid-Willamette Valley Bicycle Transportation Alliance (MWVBTA)

Commuter programs may strengthen a broad base of support for transportation by bicycle. Encouraging city employees (who may serve as role models) to

Fort Collins "Coexist" Campaign

In 2008, Fort Collins, Colorado instituted the 'Coexist' Ad campaign. This outreach program encouraged responsible transportation behavior through simple rules for motorist and cyclist interactions. It emphasized basic rules of the road for cyclists and encouraged motorists to share the road and to be cautious when backing up or making right hand turns. Posters highlighting messages to cyclists to follow safe riding rules augmented the campaign.

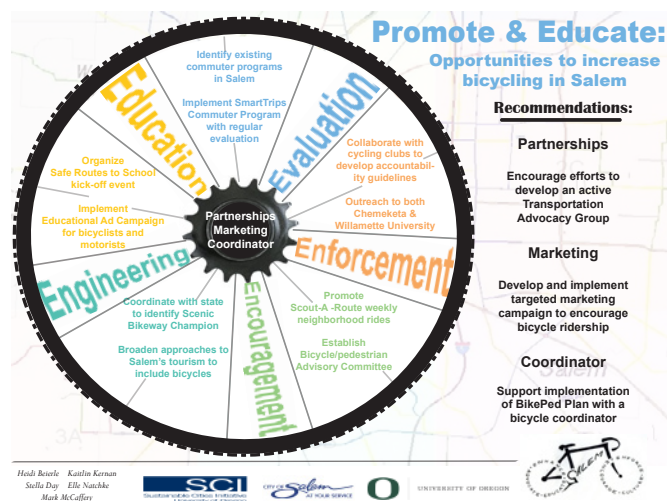


Figure 22: Poster from 'Coexist' campaign encouraging cyclists to use front and rear lights at night.

bicycle to work may enhance these effort, and programs offering incentives for cycling to work may positively impact the number of people bicycle commuting. The Bicycle Transportation Alliance (BTA) supports the Bicycle Commute Challenge, which is a friendly competition between groups of employees working for different businesses, offices or organizations. Recommendations from this proposal relate to measures the City of Salem may want to implement to increase the percentage of bicycle commuters. Specific actions related to commuting may include:

- Measure and evaluate the effectiveness of any commuter program instituted.
- Implement a public outreach program in the form of posters, print ads, videos, and on-line sources.
- Set a positive example by fostering bicycle culture and commuting among city employees.

Enforcement is the final element addressed by this proposal. This relates to behavior of and interaction among cyclists and motorists. Compliance with traffic laws affects rates of crashes and injuries. Effective enforcement is needed to reduce those in non-compliance and make transportation safer for all.

Palo Alto Safe Routes to School Program

Palo Alto, California is an example of a successful Safe Routes to Schools program. Since 1994, there has been an active effort to improve safety for children walking and bicycling to school. A major contributor to its success is the fact that Palo Alto citizens have organized a Safe Routes Task Force, composed of members from the school district, police department, city staff, and Parent Teacher Association. Input encompasses a broad range of issues from all quarters, making the program as comprehensive as possible. There is also a webpage that provides a place to report potential or real issues, as well as information for families about how to safely walk or bike to school.

New York City “Look” Campaign

In 2006, New York City instituted the “Look” Campaign, hoping to positively impact the safety and numbers of cyclists on the street. It was supported by a street code, Biking Rules, from the NYC Bicycle Safety Coalition, which sought to teach responsible behavior for cyclists interacting with motorists and pedestrians. The tagline was simply “The best protection a cyclist has is our attention,” and advertisements read “There is one thing everyone can do: look.” (NYC Bicycle Safety Coalition Website 2011). Through this campaign and bicycle infrastructure changes, their goal of increasing cycling commuters as well as decreasing cyclist death rates was realized.

Both cyclists and motorists must be treated equitably by the law. There are many cultural elements that impact equity, including cyclist and motorist education, how they behave in traffic, and how the police treat infractions. Police officers generally do not receive any particular training on handling enforcement of bicycle traffic laws, and less experienced riders (such as children) provide an additional challenge. Two recommendations are mentioned that may be helpful in improving the level of enforcement.

- A partnership between the MWVBTA and the Salem police may allow development of a plan to better educate the public on bicycle traffic laws and safe riding practices.
- An open dialogue between Salem Police and the local colleges, including Willamette University and Chemeketa Community College, may improve safety skills of students who may not be familiar with bicycle traffic laws.

The elements outlined and recommendations provided by this proposal may be used as a guide for the City of Salem to embrace, enrich and develop a strong, viable bicycle culture. This may, in turn, greatly affect the number of Salem residents who choose to bicycle instead of getting in their cars.

Whatcom Smart Trips

Smart Trips was instituted in Whatcom County, Washington, whose largest city is Bellingham. This online program offers participants the opportunity to track their number of trips through a daily trip diary. It enables participants to calculate how many driving miles they avoid, how their carbon footprint decreases, and how much gasoline they save. Participants receive incentives in the form of coupons and discounts, and are also entered to win cash prize drawings. Employees are assisted in transitioning from car to bicycle or other non-motorized forms of transportation by a transportation coordinator at their workplace.

Sociocultural Considerations: Women on Wheels

Nicole Gautier, Ariella Hubbard, Tyler Pell, Trevor Probert, Cameron Rico

“Women on Wheels” examines women’s relationship to the bicycle. Historically, the bicycle in the 1800s provided women with freedom and independence, making them no longer dependent on a man for transportation.

I think [bicycling] has done more to emancipate women than anything else in the world. It gives women a feeling of freedom and self-reliance. I stand and rejoice every time I see a woman ride by on a wheel...the picture of free, untrammled womanhood.” – Susan B. Anthony (Harper 1899)

With the passage of time, the technology of motorized transportation evolved, and new modes of transportation and urbanization transformed people’s lifestyles. The development of car culture changed the way people moved about, and the bicycle fell from favor as a mode of transportation.

Examining women’s attitudes about and behaviors in bicycling as a transportation mode may help to discern the issues women face in choosing to bike. A study in Sydney, Australia in 2004 found that safety concerns were the major issue that prevented women from cycling. Safety concerns were also cited as a primary reason that parents prevented their children from cycling to school. In New

York City, though outnumbered 3 to 1 by male riders, women are 44% of cyclists on off-street bicycle paths. European countries with high female cyclist numbers, such as the Netherlands and Denmark, have bicycle infrastructure that commonly includes cycle tracks, where cyclists have a physical separation from motorized traffic. Countries where cycle tracks are used have experienced a drastic increase in female ridership.

Safer bicycle infrastructure in Salem may include cycle tracks (see Figure 23) to assuage women’s concerns about safety in cycling. Improved safety may be achieved by the recommendations suggested in this proposal:

- Lighting of off-street bicycle paths
- Security call boxes along bike routes and paths
- Community watch groups
- Fostering development of women cyclists’ social networks
- Better connectivity with adequate bicycle facilities
- Law enforcement against criminal activities

This group looked at the notion of “en-gendering” bicycle infrastructure, an idea that recognizes the fact that, in general, women and men have different social roles. Women’s more diverse set of responsibilities, such as work and family obligations, is more likely to include transporting children as well as various items needed by the family. For safe and convenient bicycle transportation by women, transportation connections previously designed for car travel must be matched or surpassed in terms of bicycle infrastructure. This proposal gives an example of the difficulties a woman may encounter in attempting to make connections to schools and markets by bicycle that in a car may be simple and straightforward. It is difficult to make a case for transportation by bicycle when connectivity and safety of bike routes is compromised.

Available clothing options and bicycle styles are other issues that disproportionately affect women riders. Women riding to work have considerations about appearance that may be problematic when they desire to appear professional and appropriately dressed. For instance, bicycle facilities that may include showers and dressing rooms at the destination become more important. This report discusses the difficulty in obtaining not only fashionable appointments for bicycles, but easy-to-ride, step-through bicycles available in many European countries. Though these considerations may seem frivolous, they carry weight with female cyclists who are not simply going out for a recreational or fitness ride, but are using bicycles as a way to travel to their destinations.

When trying to inspire creative and comprehensive alternative transportation design for infrastructure, we must take into account the “concrete differences between women’s and men’s travel differences, [and] gendered attitudes and valuations of transportation facilities” (Emond, 2009).



Figure 23: Well-lit cycle track with colored pavement enhances safety in more ways than one.

Monica Adkins

Monica Adkins, of Eugene, Oregon, is the mother of four children between the ages of 5 and 10. Her family is completely car-free, and her experience is unlike anything many of us ever undertake. The decision to be car-free has changed many things in their lives, but they still travel to most of the same destinations—just in a different manner. Their home, located next to a bike path, has made the existing, well-connected bicycle infrastructure more easily accessible, but there are still times when dealing with street traffic is necessary. Accepting this challenge has made a difference in their lives, and also, by example, has touched many others' lives as well. Getting more women to take this challenge will depend on a constellation of support services that are needed in order to make cycling a palatable choice. In an interview with students from this course, Monica had this to say:

“Going car-free I realized, I was jumping in with two feet, I wasn’t trying to change the world. But I was changing my world. I was changing my children’s world. I thought my children would see me doing things other children might [not] see their parents [doing], so I thought I could give them that.”

About entering car traffic lanes by bicycle: “It’s pretty empowering taking the lane. I feel like it makes you stronger, it has for me. Just the feeling of not being closed in. You feel the wind; you feel that texture on your face. That rain, that damp air, you feel it. There’s something bigger about that. ... All of a sudden there’s more of a connection to place, and I think our kids feel that too. I just think they’re more aware.”



Figure 24: Monica Adkins cycling with her family in the rain.

Sociocultural Considerations: Cycle Salem!

Lucile de Boisson, Ashlie Laydon, Brian Maxson, Andrew Roll

This proposal builds on the idea that increasing bicycle ridership in Salem will depend on increasing awareness and education. Providing a city-sponsored event three times a year would serve multiple purposes, including:

- Building a respectful relationship between motorists and bicyclists.
- Educating the cycling public about available resources, routes, and activities.
- Teaching riding skills and safe riding in traffic for children through a fun event.

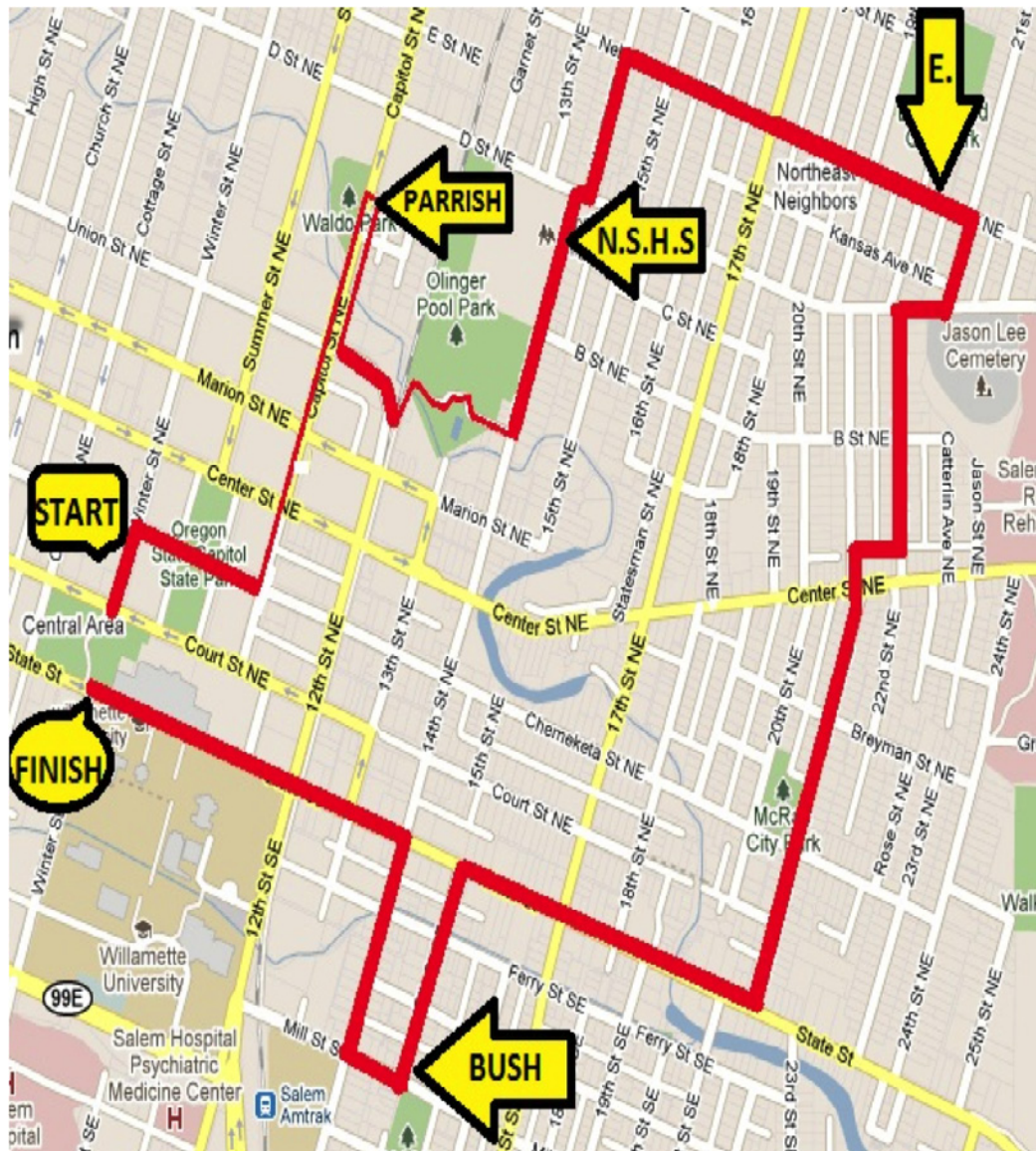


Figure 25: Cycling from school to school with various events makes an educational experience fun and rewarding, while increasing the riding skills of children biking to school, parks, or friends' homes.

Timing for the event would occur at key times during the year. Not only would regular scheduling lead residents to expect and look forward to the activities, the timing of the event would serve to encourage riders through the next season of cycling. A suggested annual calendar is as follows:

- Late summer—before school begins, in order to promote children riding to school.
- Late fall—when weather is becoming gloomy, in order to encourage residents to continue biking.
- Early spring—to promote and celebrate summer bicycle commuting.

The proposal suggests siting the event in Wilson Park, which is located at the intersection of Winter Street and Court Street. This location is advantageous since it is in a park near the core, and adjacent to Winter Street, which is under consideration for development of a bicycle boulevard. Activities here would be geared toward the needs of the cyclist. Bicycle mechanics providing free tune-ups, educational workshops for bike maintenance, bicycle and helmet fitting, and booths staffed by bicycle vendors would provide complementary services. Other information directed at motorists may provide increased awareness about how to interact with cyclists on the streets.

The centerpiece of the event would be the children’s activities. A pre-planned bike route would link four different schools that would each sponsor cycling skills events in the form of games and competitions. These schools are Parrish Middle School, Bush Elementary School, Englewood Elementary School,

Organization	Website (for more information)	Contact Email
Alliance for Community Traffic Safety Oregon: Building Safer Communities Mini-Grant Program	http://www.childsafetyseat.org/grants.html	charitys@actsoregon.org
Cycle Oregon Fund	http://www.cycleoregon.com/cycle-oregon-fund/	jerry@cycleoregon.com
Alliance for Biking & Walking	http://www.peoplepoweredmovement.org/site/index.php/site/memberservices/C528	Brigid@PeoplePoweredMovement.org
Bikes Belong	http://www.bikesbelong.org/grants/apply-for-a-grant/grant-seekers-guide/	grants@bikesbelong.org
Metro Regional Travel Options	http://www.oregonmetro.gov/index.cfm/go/by.web/id=24924	rto@oregonmetro.gov
Willamette University Sustainability Grants	http://www.willamette.edu/councils/sustainability/grant_proposals/	jvarga@willamette.edu

Figure 26: Potential funding sources for the Cycle Salem! bicycle education event.

and North Salem High School. This 'bike rodeo' would include games such as 'Paper Boy', Zigzag Course, Stop on a Dime, and many others. Bicycle-related prizes, such as lights and stickers, could be given out or discovered by children participating in a related scavenger hunt. Children's riding skills and street-riding confidence could be encouraged in a safe environment, such as parks, school campuses, and low-traffic city streets. Appendix A contains a full explanation of events and games for children, with photos and game rules.

Results of a survey distributed by city organizers during the event could provide a fair assessment of what attendees gained from the event, as well as descriptions of their transportation behavior. Repeating the survey at times in the future may also be useful to judge the effectiveness of the event and changes in residents' proclivity for cycling. The full survey is included as Appendix B.

Potential local, regional, and national funding sources for the event are shown in Figure 26.

Bicycle Culture Enrichment: The Fun of Rides and Events

Bicycle infrastructure with good connectivity and bicycle facilities provides a foundation for encouraging bicycle use as transportation and recreation. Social and cultural considerations contribute additional elements necessary for good public planning, policy, and action. Enriching the bicycle culture through events and rides goes one step further in providing enjoyment and entertainment for those who choose to cycle, and, in addition, may attract the attention of non-cyclists. Two proposals examine ways in which the City of Salem may grow a flourishing bicycle culture by supporting events and rides with fun as a centerpiece.

Bicycle Culture Enrichment: Willamette Valley Scenic Bikeway

Courtney Ferris, Cody Franz, Lauren Houston, Bryant Rombaoa

This proposal addresses improvements needed to the Willamette Valley Scenic Bikeway (WVSB), a 132-mile long route that runs directly through the center of Salem. This beautiful route attracts cyclists from the region and beyond, and offers tourism benefits to Salem as cyclists travel through town. However, there are problems with the route, as noted by members of the student group that rode the path through Salem, and as documented by Terry Richards, outdoor and recreation reporter for the Oregonian newspaper. This proposal addresses infrastructure problems with poor paving, connectivity, signage, and conflicts with traffic. In addition, they outline several ideas for enriching the Bikeway with improvements to the aesthetics, experiences, and tourism opportunities afforded by the route.

The proposal suggests overall improvement ideas, including the following:

- Reroute some areas of the WVSB path. Redirecting the ride from high-traffic areas to calmer streets, parks, and areas of interest would provide a safer, more pleasant experience, impacting the cyclists' general impression of Salem in a positive manner. More specific details are addressed in the section below, entitled "Infrastructure Issues."
- Re-pave areas where there are potholes, crumbling pavement and other undesirable riding surfaces. This would increase safety and may prevent bicycle crashes and potential injuries to cyclists.
- Improve signage and wayfinding, which would facilitate seamless travel through the city and provide a more enjoyable ride. The route may be more efficient and allow cyclists to focus on what they would like to explore, as opposed to spending their time losing their way and attempting to rediscover the route. Large-scale route maps and improved route markers may provide



Figure 27: Large-scale route maps are easily read and provide a context for the entire route through Salem.



Figure 28: Example of signage indicating cycling time and direction to areas of interest, lodging, retail, restaurants.

useful visual cues for following the route (see Figure 27).

- Locate a bicycle information kiosk at the edge of the downtown core to provide valuable information about the route, Salem, tourist services, and cycling events in and around the area. Signage here may indicate directions to areas of interest, such as lodging, retail, or restaurants (see example in Figure 28).
- Collaborate on planning and actions with the City of Keizer, which could facilitate an efficient, safe and enjoyable ride all the way through the metropolitan area.
- Use imaginative, creative architecture and art, from local or other artists, Willamette University students, and other contributors, in order to enhance the aesthetics and enjoyment of the route through the city. The proposal suggests public outreach to procure works of art, develop nature displays of native plantings, and other creative ideas that would encourage community participation.

Infrastructure Issues

A major portion of this proposal is geared toward problematic intersections and infrastructure issues at several locations along the route through the core of Salem. Some of these are discussed below. Full intersection redesign images, including improved bike lane additions and markings, may be seen in Appendix C for Division-Commercial-Front Streets, Liberty Street, and Owens Street.

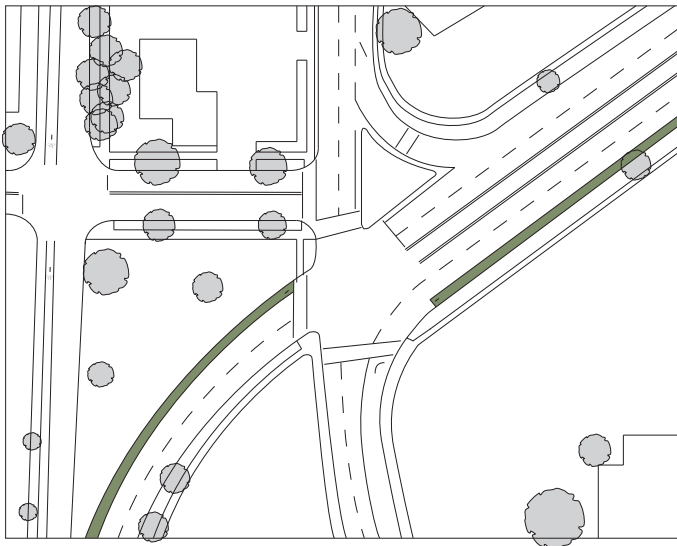


Figure 29: Current bike lanes at Salem Parkway and Liberty Street. (Gray circles represent existing trees.)



Figure 30: Proposed redesign with added bike lanes, and lanes extending across intersection, painted green to attract motorists attention. The median area between Salem Parkway, Tryon Street and Commercial could be used as a rest stop for cyclists, with a posted route map and bike rack.

Salem Parkway and Liberty Street Redesign

The intersections of Salem Parkway and Liberty Street and the Division Street/Commercial Street/Front Street intersection are two major intersections with poor connectivity for bicycles on the WWSB route. Adding clearly marked bicycle lanes extending across the intersections would greatly increase rider safety. It may be also be advisable to consider use of a bicycle priority signal for added safety. The proposal also recommends diverting the WWSB route off of Commercial Street onto Front Street, which is a lower-volume traffic area (see example of the Salem Parkway and Liberty Street intersection treatment in Figures 29 and 30).

River Road and Miller Street

Another problematic section of the WWSB is located along River Road and its connection to Miller Street. The WWSB's route along the high-speed, high-traffic River Road is a hazardous, narrow walkway. The turn onto Miller Street is a poorly paved surface that is not obviously a bike route, and is visually unattractive (see Figures 31-33 for current conditions). The proposal suggests widening and repaving the shared use path along River Road as well as adding a traffic barrier between vehicular traffic and bicycles and pedestrians. Clear exit signs from River Road to Miller Street would prevent confusion for the cyclists. It would enhance the appeal of the route down Miller Street by closing the street and creating a shared use path through a pocket park (see Figure 34). Installing a water station, bench, and posted route map would provide a needed rest area for cyclists on the route (see Figure 35).



Figures 31 - 33: Photo showing current appearance at end of Miller Street at entrance to River Road; Hazardous riding conditions along River Road, where there is high-volume, high-speed traffic next to a narrow walkway used by cyclists and pedestrians; Current road and path layout.

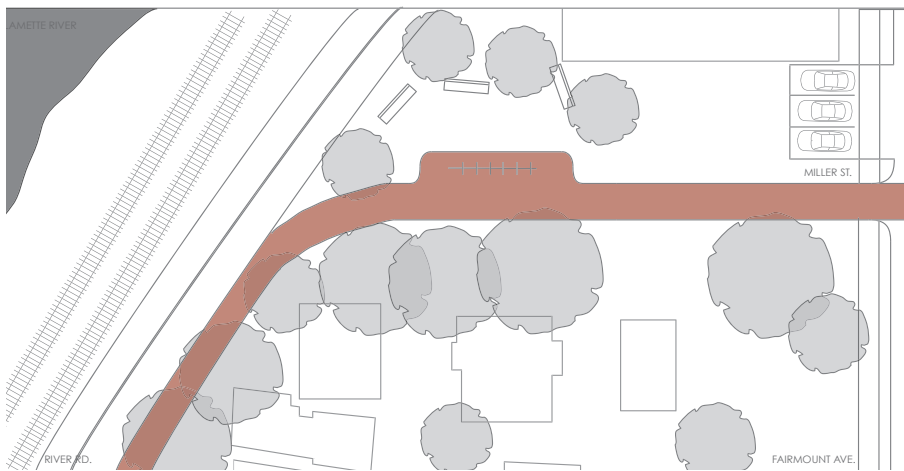


Figure 34: Proposed shared use path running through Miller Street Pocket Park and along River Road.



Figure 35: Artist's rendering of proposed pocket park at entrance to River Road.

This comprehensive plan may not only increase usage of the Willamette Valley Scenic Bikeway, but also enhance the experience of all cyclists who choose to ride it. The City of Salem may choose to implement one or all of these changes, but the more changes it embraces, the more benefits the city may reap from its usage.

Bicycle Culture Enrichment: Bike Salem: Proposal for a Car-Free Event

Olga Sivka, Molly Simas, Alex Bellew, Ryan Shimizu

This proposal suggests that the festivities of a car-free event will help residents of Salem understand the reality of using bicycles for transportation. Barriers to bicycle transportation may include misconceptions about the practicality of cycling; envisioning routes to key destinations, forecasting times needed for transit, and putting the whole picture together are necessary to help change transportation behavior. Seeing a working example may be enough to promote change for many people.

A fun, festive event would help to raise awareness and appreciation for the validity of bicycle transportation. For residents of Salem who may hesitate to bike on city streets under normal circumstances, this event would provide that opportunity in a safe environment. A car-free event would completely eliminate automobile traffic for a designated area and time frame, opening the streets to bicyclists and pedestrians. People attending the event are exposed to a safe,



Figure 36: Portland cyclists queue up for the start of the Providence Bridge Pedal.

Providence Bridge Pedal, Portland, Oregon

This annual event closes all ten of the downtown bridges over the Willamette River to car traffic and opens them to cyclists and walkers for a community celebration of active transportation. Since 1996, participation has grown, and now every year, thousands of Portland residents enrich their sense of place, enjoyed from the bridges and streets throughout the downtown area. Many festivities line the route. (Providence Bridge Pedal 2011)

enjoyable, urban environment, enhanced by bicycle rides, activities, music, and community bonding.

The proposed event route connects neighborhoods, schools, parks, and downtown to help people visualize bicycling routes and develop a new appreciation for the ease and efficiency of cycling to all these places. The route goes through a diverse set of neighborhoods, as well as to North and South Salem High Schools, the central shopping district, the Capitol, and Bush's



Figure 37: Planned route for Bike Salem Car-Free Event, with red dots indicating special event locations along the route.

Pasture Park. Starting at South Salem High School, specified activities will be coordinated at locations along the route (see Figure 37).

The event would be promoted through email, on-line announcements, flyers and posters. Some car-free events require entrance fees, but this proposal suggests that a free, volunteer-based event would encourage greater participation by a more diverse set of residents.

Other ideas for activities and services along the route include the following:

- Starting point activities at South Salem High School would include giveaways of t-shirts and other promotional items. Water and coffee would be available. Vendors' kiosks would be open for purchase of bicycle accessories.
- Rest stops along the route would provide bathroom facilities and water.
- A raffle could be entered by participants at the North Salem High School stop, with the drawing to be held for various bicycle-related gear.
- Educational and support tents would be set up at North Salem High School stop to provide information and technical assistance to participants.

Educational games could appeal to families with children.

- Food and refreshments would also be available at North Salem High School.
- Richmond School City Park and Lee City Park would be locations for musical stages, encouraging the riders with a festive atmosphere as they near the finish at South Salem High School.
- A call for bicycle art (photographs, drawings, sculptures) by Salem residents would go out before the event, so the art would be available for display outside the Hallie Ford Museum of Art the day of the event.

Additional community involvement could enhance the event in numerous ways. Local bicycle shops would be able to promote their businesses by providing kiosks for the event. The schools located along the route would be in a unique position to disseminate information to school-aged children and their families in advance, and could also provide volunteer opportunities for them during the event. Saturday Market vendors could be enticed to enrich the event by setting up along the route, offering food or crafts for purchase.

This proposal provides a complete plan for a fun, festive, signature event, which would enrich the community experience, while advancing alternative transportation by bicycle.

Cicloviás in Bogotá, Colombia; Pioneering Car-Free Events

Beginning in the 1980s, car-free Sundays were instituted to help people appreciate and enjoy the safety of cycling, walking, skating, and otherwise enjoying their urban environment without the presence of automobiles. The streets in the central core are closed to vehicles for a major portion of the day and people are free to bike and stroll anywhere throughout the area. Stages are set up where music, yoga, and other activities are provided for the residents' enjoyment and participation. According to Gil Peñalosa, former Commissioner of Parks, his idea was to make the '8/80 rule' a reality during these events, believing the streets should be safe for anyone from age 8 to age 80. (Atlanta Streets Alive 2011)

Conclusion

This report includes a comprehensive review of all work products from the course 'Bicycle Transportation'. Three general categories of actions are suggested from the resultant proposals: Bicycle Infrastructure, Social and Cultural Issues, and Enriching Bicycle Culture. Core elements from each category may be considered for implementation.

Many of the proposals in this report provide suggestions for funding sources for a wide range of projects, from infrastructure to social programs. Case studies provide examples to help envision the kinds of actions that may be taken to encourage transportation by bicycle.

This report compiles a variety of suggestions and plans that emerged from a University of Oregon / Sustainable City Year course on Bicycle Transportation. Though not a comprehensive plan for implementation, many aspects may be useful in part or in full to enhance the bicycle and pedestrian connectivity in the core of Salem. Increasing the ease and appeal of active transportation to Salem residents may help make the city a more enjoyable, attractive and sustainable place to live and to visit, now and in the future.

Bicycle Infrastructure Actions

Many of the students' proposals note that critical elements of a complete, efficient, and attractive bikeway system are missing from Salem's bicycle infrastructure.

- Only one bridge that connects West Salem to the downtown core (Union Street Railroad Bridge) currently has a safe, dedicated route for cyclists to cross the Willamette River. Better connectivity over the river is addressed by suggesting the addition of at least two bridges farther from the core, connecting parks and trails on either side of the river.
- Another element of infrastructure to complement connectivity would include north-south corridors that safely and efficiently connect neighborhoods, schools, parks, and people to downtown.
- Completing vital missing links between bicycle routes and trails with safe, well-paved connecting paths and effective, informative signage would enable safe, efficient routes for cycling through neighborhoods, to parks and schools, or across town.
- Wider shared use paths through parks would enable equitable recreational use by bicyclists, pedestrians, wheelchair-users, skaters, and families with strollers.
- Recreational loops through and between parks would facilitate parks patrons' enjoyment of their parks.

- The infrastructure redesign of the Wallace Road and Glen Creek Road intersection would benefit either from additions of bike boxes or complete re-engineering into a roundabout with bicycle/pedestrian priority signals, making bicycle connectivity to downtown safer and more efficient.

Social and Cultural Issues

Changing peoples' attitudes and behaviors about cycling for transportation requires consideration of different elements of planning and policy. Promotion of bicycle commuting by the City of Salem may be implemented through ad campaigns, educational outreach, and advocacy programs. Public input into these programs enables community involvement and increases likelihood of the programs' success. The city may choose to support employee cycling incentive programs, bicycle shops, and events to promote the education and participation of the public. City planners may want to thoughtfully consider elements of safety, aesthetics, and connectivity to engage the ridership of women, children, and families as a whole.

Enriching Bicycle Culture

The Willamette Valley Scenic Bikeway route provides an opportunity for Salem to enrich residents' and visitors' experience of recreational riding through Salem. Tourism dollars may be realized by polishing the route and its environs to connect riders to parks, lodging, restaurants, and other key destinations. Innovative ideas for enriching this experience on many levels will contribute to a comprehensive plan for improvement.

The City of Salem could also encourage cycling through the fun of a signature car-free community event. Details for the event incorporate a number of ways to engage all-ages participation while helping residents to learn how to include cycling among their everyday transportation options. Different ways of engaging the city's bicycle shops, Saturday Market vendors, and schools with the event are identified to increase participation and augment local businesses' income and exposure.

Appendix A

Cycle Salem: Children's Activities and Bicycle Rodeo



BICYCLE AWARENESS FAIR



PARRISH Middle School

ZIG ZAG COURSE

- 30-50ft long; 3ft wide
- 4-5 90 degree turns
- Deduct points for touching boundaries or hitting cones

FIGURE EIGHT

- 30ft circles (barely touching); 2ft wide
- Ride 3 times at any speed
- Points deducted for touching boundaries



BUSH Elementary School

SLOW RACE

- Develops balance and bike handling ability
- Long loop
- Slowest wins



STOP ON A DIME

- 25ft straight line
- Ride to end and stop with tire touching finish line
- Deduct one point for each line before or after finish

ENGLEWOOD Elementary School

LONG ROLL

- Pedal as fast as you can
- Coast at certain point
- Points for distance marks



PAPER BOY

- Hit 5-10 targets with newspaper
- Points for accuracy, successful delivery, and maintaining control of bike

Appendix B

CYCLE SALEM! Bicycle Awareness Fair Initial Questionnaire

Please answer the following questions as a tool for the City of Salem to better meet bicyclists' needs. Your information will be kept confidential and used solely for the purpose of improving bicycle awareness programs in Salem.

General Information

- 1) Name: _____
- 2) Address: _____

- 3) Age: _____ Sex: Male _____ Female _____
- 4) Number of adults in your household: Male _____ Female _____
- 5) Number of children in your household: _____
- 6) Approximate distance from home to work _____ (miles)
- 7) Approximate distance from home to school _____ (miles)
- 8) Do you own a bike: Yes _____ No _____
- 9) How many days per week do you ride your bike to work or school _____ /7
- 10) How many others in your home own a bike _____
- 11) How many days per week do they ride to work or school _____ /7
- 12) Do you ride your bike when: it's rainy: Yes _____ No _____ when it's dark: Yes _____ No _____
- 13) Which of the following best describes your view of bicycling:
 - a. Bikes are for kids
 - b. Bikes are a practical mode of transportation
 - c. Bikes are good for exercising, but that's all
 - d. Bikes are dangerous
- 14) How many trips do you make per day: (one-way)
by car _____ by bike _____ on foot _____ by bus _____ other _____
- 15) What do you use your bike for: (check all that apply)
leisure _____ exercise _____ transportation/commuting _____ racing _____
- 16) Why do you ride a bike?

or, why not?

Bicycle Safety

- 1) Do you wear a helmet when you ride: Yes _____ No _____
- 2) Does your bike have lights: Front: Yes _____ No _____ Rear: Yes _____ No _____
- 3) Do you signal when turning: Yes _____ No _____
- 4) Where do you ride:
Street (with traffic) _____ Bike Lane _____ Sidewalk _____ Off-street Path _____
- 5) Have you ever sustained a serious injury while bicycling (ie-collision/accident): Yes _____ No _____

CYCLE SALEM! Bicycle Awareness Fair Follow-up Questionnaire

Please answer the following questions as a tool for the City of Salem to better meet bicyclists' needs. Your information will be kept confidential and used solely for the purpose of improving bicycle awareness programs in Salem.

General Information

- 17) Name: _____
- 18) Address: _____

- 19) Age: _____ Sex: Male _____ Female _____
- 20) Number of adults in your household: Male _____ Female _____
- 21) Number of children in your household: _____
- 22) Approximate distance from home to work _____ (miles)
- 23) Approximate distance from home to school _____ (miles)
- 24) Do you own a bike: Yes _____ No _____
- 25) How many days per week do you ride your bike to work or school _____ /7
- 26) How many others in your home own a bike _____
- 27) How many days per week do they ride to work or school _____ /7
- 28) Do you ride your bike when: it's rainy: Yes _____ No _____ when it's dark: Yes _____ No _____
- 29) Which of the following best describes your view of bicycling:
- a. Bikes are for kids
 - b. Bikes are a practical mode of transportation
 - c. Bikes are good for exercising, but that's all
 - d. Bikes are dangerous
- 30) How many trips do you make per day: (one-way)
- by car _____ by bike _____ on foot _____ by bus _____ other _____
- 31) What do you use your bike for: (check all that apply)
- leisure _____ exercise _____ transportation/commuting _____ racing _____
- 32) Why do you ride a bike?
- _____
- _____
- or, why not?
- _____
- _____

Bicycle Safety

- 6) Do you wear a helmet when you ride: Yes _____ No _____
- 7) Does your bike have lights: Front: Yes _____ No _____ Rear: Yes _____ No _____
- 8) Do you signal when turning: Yes _____ No _____
- 9) Where do you ride:
- Street (with traffic) _____ Bike Lane _____ Sidewalk _____ Off-street Path _____
- Have you ever sustained a serious injury while bicycling (ie-collision/accident): Yes _____ No _____

Appendix C

Willamette Valley Scenic Bikeway: Intersection Improvements

Two intersections along the WWSB route through Salem are in need of improved and additional bike lanes for safe transit of bicyclists through town. The two intersections with current and proposed changes are shown in Figures 38 - 41. Safety would be enhanced by connecting well-marked bike lanes through the intersections and along the streets, including green painted bike lanes through the intersections, and by the addition of bicycle priority signals.

Division-Commercial-Front Street Intersection

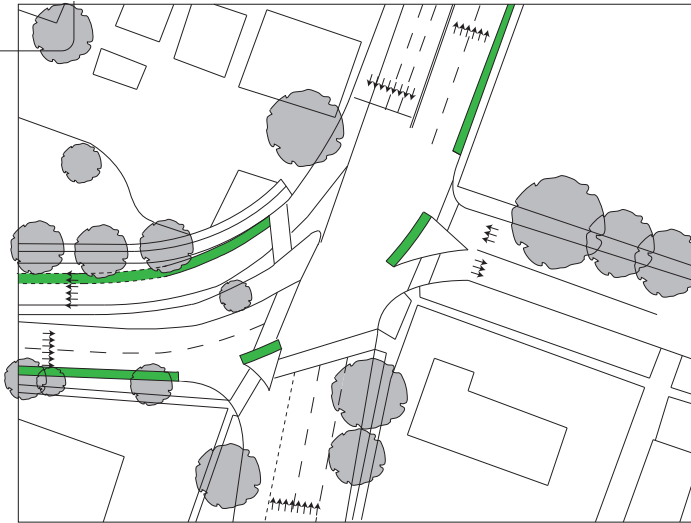


Figure 38: Current conditions with disconnected bike lanes through the intersection.



Figure 39: Proposed changes show connected bike lanes and bike lanes painted through the intersection.

Liberty Street and Owens Street Intersection

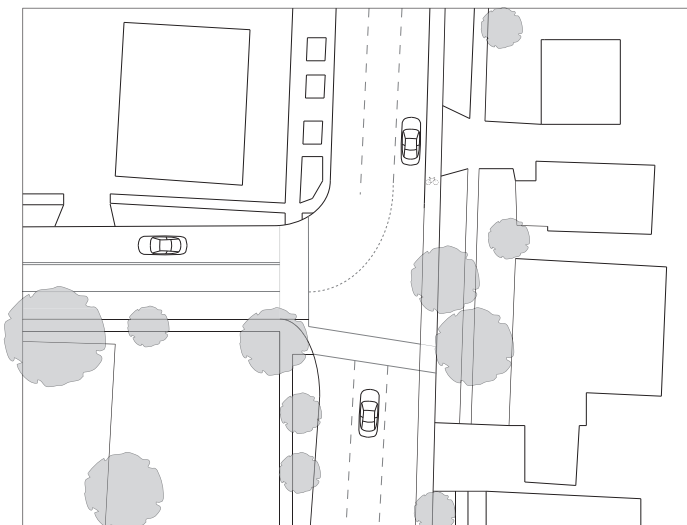


Figure 40: Current conditions show bike lanes present on Liberty Street but none on Owens Street.

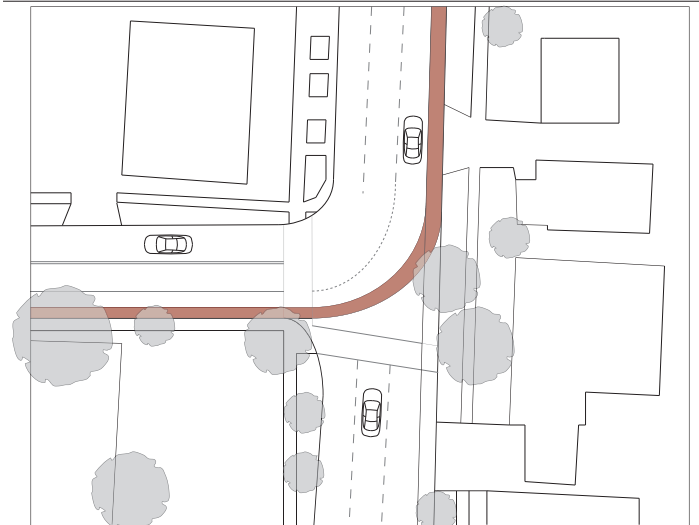


Figure 41: Improvements include a painted green bike lane connecting bike lanes across the intersection and adding bike lanes along Owens Street.

Resources

Bicycle Transportation Alliance (BTA) is an Oregon/Washington, non-profit organization that works to promote healthy, sustainable communities by making bicycling safe, convenient and accessible for all persons. Their work is promoted by members and volunteers through advocacy and education. Their website is at: http://www.bta4bikes.org/at_work/index.php

Blueprint for Better Biking: Salem/Keizer Top 12 List is a publication by the MWVBTA that shows their survey of current bicycling conditions in the area and twelve recommendations for change, including engineering, education, evaluation, and planning projects. The publication may be viewed at: <http://www.scribd.com/doc/47156476/Salem-Blueprint-for-Better-Biking-v3>

Initiative for Bicycle and Pedestrian Innovation Center is a center for research about how best to incorporate bicycle and pedestrian transportation into Oregon's communities. They are housed at the University of Portland's Center for Transportation Studies, and focus on research, education, and information sharing. Their website is at: <http://www.ibpi.usp.pdx.edu/>

Manual on Uniform Traffic Control Devices, or MUTCD "defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic." Current nationally accepted control devices for bicycling are shown in its manual, and new standards are considered carefully before being added. Some states may use control devices that have not yet been accepted into "The Manual". It is published by the Federal Highway Administration (FHWA) and their website may be accessed at: <http://mutcd.fhwa.dot.gov/>

Mid Willamette Valley Bicycle Transportation Alliance (MWVBTA) is the Salem-Keizer chapter of the BTA. They are actively involved in bicycle transportation issues in the area, and sponsor a bicycle advocacy blog named "Salem Breakfast on Bikes". The blog is at: <http://breakfastonbikes.blogspot.com/>

New York City Bicycle Safety Coalition was formed in 2006 in response to a large number of cyclist crashes. The coalition was formed with members from NYCDOT, NYC police, and bicycle and automobile clubs to develop a plan to dramatically increase safety. Their "Look" campaign is only one example of their educational and media campaign efforts to affect cyclist and motorist behavior. Their website is at: http://www.nyc.gov/html/look/html/about/about_us_text.shtml

Oregon Transportation Research and Education Consortium (OTREC) is a national University Transportation Center that supports research for innovative active and alternative (such as electric vehicles) transportation solutions. <http://www.otrec.us/>

Safe Routes to Schools is a national program that offers assistance to communities nationwide, with the goal of increasing children's safety while walking and/or biking to school. Attainment of this goal will also have positive impact on their health and fitness levels while also bringing communities together. They offer tools and resources that are available for use for all communities. <http://www.saferoutesinfo.org/>

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