New Look
The Regional Transportation Plan

2035 Regional Transportation Plan Update

Background Paper:

A Profile of the Regional Bicycle System in the Portland Metropolitan Region

Prepared by:

METRO
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February 14, 2007

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People places • open spaces

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and good transportation choices for people and businesses in our region. Voters have asked Metro to help with the challenges that cross those lines and affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to protecting open space, caring for parks, planning for the best use of land, managing garbage disposal and increasing recycling. Metro oversees world-class facilities such as the Oregon Zoo, which contributes to conservation and education, and the Oregon Convention Center, which benefits the region's economy.

Your Metro representatives

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Auditor – Suzanne Flynn

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List of RTP Background Research Papers

- **Environmental Justice** in Metro's Transportation Planning Process
- A Profile of **Security** in the Portland Metropolitan Region
- A Profile of the **Regional Trends and Travel Characteristics** in the Portland Metropolitan Region
- A Profile of the **Regional Bicycle System** in the Portland Metropolitan Region
- A Profile of the **Regional Transit System** in the Portland Metropolitan Region
- A Profile of the **Regional Pedestrian System** in the Portland Metropolitan Region
- A Profile of **Regional Travel Options and Parking Management Systems** in the Portland Metropolitan Region
- A Profile of the **Regional Freight Transportation System** in the Portland-Vancouver Metropolitan Region
- **Preliminary Financial Analysis** for the 2035 Regional Transportation Plan Update
- A Profile of **Safety** in the Portland Metropolitan Region
- A Profile of the **Regional Roadway System** in the Portland Metropolitan Region
- A Profile of **Key Environmental Issues and Metro's Mitigation-Related Activities** in the Portland Metropolitan Region

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2035 Regional Transportation Plan Update

A Profile of the Regional Bicycle System

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I. Introduction

This paper is one of a series of papers that provide background research and analysis to guide Regional Transportation Plan (RTP) update policy discussions. The papers describe trends and research affecting the regional transportation system, current regional transportation planning policies and regulatory requirements, a profile of the existing transportation system and policy implications to be addressed in the RTP to respond to identified policy gaps and key findings of the background research. Collectively, the background papers will inform future policy discussions by Metro Policy Advisory Committee (MPAC), Joint Policy Advisory Committee on Transportation (JPACT) and the Metro Council and lead to an updated RTP.

This paper provides a profile of the regional bicycle system in the Portland metropolitan region. It identifies trends and research on bicycling and reports on the existing regional bicycle system. The trends shaping future bicycle travel and performance of the current regional bicycle system are essential considerations for the development of effective goals and strategies to address bicycle travel needs in the Portland metropolitan region. The paper concludes with a list of key findings and policy recommendations to be considered during the RTP update process.

II. Background

The benefits of bicycling to society are extensive and well documented. The bicycle is considered the most energy efficient transportation device ever invented, and its use benefits the environment, public health, the economy and other users of the transportation system. Motorists and freight carriers benefit from reduced congestion and wear and tear on roads; pedestrians and transit users benefit from the separation from vehicles provided by a multi-use trail or bicycle lane, and the reduced noise and air pollution along a traffic-calmed bicycle boulevard. Bicycling is a key part of the 2040 Growth Concept, and supports the 2040 Fundamentals adopted by the region in 1997:

1. *Healthy Economy*
2. *Vibrant Communities*
3. *Environment Health*
4. *Transportation Choices*
5. *Equity*
6. *Fiscal Stewardship*

Recent studies, described in Section III demonstrate considerable *economic* value created by bicycling. The bicycling industry includes manufacturers, distributors, retailers, repairers, race/event/tour providers, and other bicycling-focused professionals such as advocacy groups, planners and messenger companies. This diverse industry creates jobs, spurs commercial development (increasing local tax revenues) and other related economic activity. Furthermore, public investments in bicycling facilities have seen significant economic return through increased property values and tourism dollars.

Streets that are busy with bicyclists (and pedestrians) are considered to be *vibrant*, human-scaled environments that foster a sense of neighborhood and community. They create more “eyes on the street,” improving perceptions of safety and vitality. They create easy opportunities for residents to live a more active lifestyle by walking and biking to do their errands. Many of the region’s most popular commercial and civic districts are places where bicycling (and walking) is common.

Bicycling produces no pollution and consumes no fossil fuels. The most frequent trips for bicyclists – those less than five miles – produce the greatest *environmental* benefit since auto trips under five miles in length are the least fuel efficient and produce the highest emissions per mile.[1]

The bicycle is an important component in the region's strategy to provide a multi-modal system and maintain quality of life, as it is key to serving shorter trip lengths within and between mixed-use centers. Short trips are often more time efficient and less costly by bicycle. Making bicycling safe and convenient provides a legitimate travel choice to all people in the region, regardless of whether they have access to a car or transit.

Bicycling is a relatively affordable mode of transportation that increases the accessibility and mobility of those who are too young or too old to drive, or who cannot afford to own and maintain a car. Investments in the bicycle system increase *equity* in addressing mobility needs across the region, and improve access to jobs, recreation, and services for people of all income levels. Geographic equity should be considered when developing projects for the regional bicycle system.

Finally, the bicycle system helps ensure *fiscal stewardship*, due to its relatively inexpensive capital and maintenance costs.

III. Trends and Recent Research

Growing awareness and understanding of economic value of bicycling

Several recent studies, both locally and nationally, have explored the economic value of bicycling, both in terms of the benefits of bicycle facility investments and an extensive bicycle industry.

The Economic Benefits of Trails and Greenways

This Rails to Trails Conservancy study demonstrates the economic benefits of investments in trails and greenways. Such benefits include downtown revitalization, tourism-related opportunities, expansion of businesses related to trail use (equipment, clothes, food, maps, etc.), increased property values and improved quality of life – making an area more attractive to new residents and businesses.

Bikeways to Prosperity

This North Carolina Department of Transportation study is focused on the economic benefits of bicycle tourism in the northern outer banks of coastal North Carolina. It found that bicycle focused tourism and activity has contributed $60 million annually and over 1400 jobs to the local economy. The public has seen a significant return (9:1) on its $6.7 million investment in bicycle facilities over the past ten years.[2]

Bicycle-related Industry Growth in Portland

This Alta Planning study points to the growing importance of the bicycle-related industry as a vibrant economic sector. The industry, currently estimated with an annual value of 63 million dollars, is increasing rapidly in both gross numbers of jobs and dollar value.[3] Activity is grouped into four categories ranging from retail (61 percent of industry), to tours, races rides and events (11 percent), to distribution and manufacturing (18 percent), and professional services (10 percent). An important factor to increasing bike industry revenues is Portland's reputation as a bicycle-friendly city.

[1] Wisconsin Department of Transportation, Wisconsin Bicycling Transportation Plan 2020. December 1998.
[2] Lawrie, Norman, et al. Bikeways to Prosperity – Assessing the Economic Impact of Bicycle Facilities, Institute for Transportation Research and Education, North Carolina State University, 2006.
[3] Alta Planning, Bicycling-Related Industry Growth in Portland, 2006.

Comprehensive Economic Development Strategy
This ECONorthwest analysis found that livability (which bicycle friendliness contributes to) is one of the region's defining characteristics. It states that most local economic development plans refer to livability as a key component to economic development. Furthermore, most CEOs interviewed for the study cited livability as a key advantage of doing business in the region.

Livability is particularly consequential for attracting highly educated 25-34 year olds to the region. Research by local economist Joe Cortright has found that educated 25-34 year olds are key for growing a region's economy, due to their familiarity with computers, up-to-date training and entrepreneurial tendencies. In recent years, Portland has successfully attracted more of this demographic than most other U.S cities. Between 1990 and 2000 Portland ranked 8th out of the top 50 U.S metropolitan regions with its 12 percent increase in 25-34 year olds.[4]

Economic Impact of Bicycling in Wisconsin
This Governor's Council and Wisconsin Department of Transportation study provides information about the economic impact of bicycling in Wisconsin both in terms of industry and tourism. The state accounts for nearly 20 percent of the entire US bicycling industry, and is home to a large number of manufacturers of bicycles, parts and accessories. The total estimated economic impact of bicycling on Wisconsin's economy ranges from $765 to $835 million.[5]

Getting Western Australians More Active – A Strategic Direction
This Premier's Physical Activity Taskforce report is focused on the benefits of a more active society including the economic costs to organizations with physically inactive employees. It found that increasing the physical activity of the workforce can have substantial benefits, including improved productivity and reduced sick leave. It estimated that if an extra 10 percent of the Western Australian population became physically active, productivity gains of approximately $60 million would accrue each year"[6]. Cycling to work was found to boost employee morale and loyalty and was more acceptable and cost-effective than formal work-site exercise classes.

Increasing Local Awareness and Advocacy for Bicycling
In recent years, the local awareness of bicycling as a transportation option has grown considerably in the media and general public. Likewise, local advocacy has expanded as established groups have matured and new groups have formed.

Blueprint for Better Bicycling
The goal of this Bicycle Transportation Alliance study is to "identify a consistent set of bicycling facilities, policies and programs that will drastically increase bicycling among a wide range of users including adults, elderly and youth."[7] The study identifies four major themes representing regional bicycling challenges: cycling around cars, complete routes, motorist behavior, and quality of facilities (especially poor street conditions and signage).

[4] Cortright, Joe, Impresa Consulting. The Young and the Restless – How Portland Competes for Talent. Accessed on 11/17/06 at: http://www.restlessyoung.com/public/pdf/Portland.pdf
[5] Bicycle Federation of Wisconsin (in conjunction with the Wisconsin Department of Transportation), The Economic Impact of Bicycling in Wisconsin, Prepared for the Governor's Bicycle Coordinating Council, 2005, http://www.dot.wisconsin.gov/business/econdev/docs/impact-bicycling.pdf
[6] Government of WA (2001) *Getting Western Australians More Active – A Strategic Direction Report from the Premier's Physical Activity Taskforce*.
[7] Blueprint for Better Bicycling – 40 Ways to Get There, 2005, www.bta4bikes.org/at_work/blueprint.php

The report identifies four items to increase cycling in the region.

- Increased User Base -The region's population can be divided into four groups regarding their bicycle behavior: fearless riders (1 percent) who will ride any road, confident riders (7 percent) who ride regularly on most roads, interested and concerned (60 percent) who feel that low-traffic and car-free routes will increase their biking significantly. A final group, non-cyclists (33 percent) is currently not interested in riding.
- Comprehensive Bikeway Network - Low traffic streets will receive bike boulevard treatments while bike lanes will be reserved for high traffic streets. Routes should be designed to meet the needs for each type of rider
- Solutions for Suburbs - Due to the lack of connecting low traffic streets, suburbs are often connected with higher traffic streets. Low traffic bike networks should be expanded to the suburbs.
- Cultural Shift - Use marketing and promotions to capture first time riders and reengage experienced cyclists.

The report identifies 40 projects and programs throughout the region that fit into these various themes and strategies. The list was developed though an extensive two-year process that included a survey of more than 900 bicyclists, meetings with technical experts, and meetings with bicycle advisory committees. The top ten projects range from infrastructure projects, such as improving the Sellwood Bridge, to retooling Portland's downtown bike plan to increase ease of biking downtown. Also included are trail projects, bikeways and low traffic routes across the region. Rounding out the top ten is increased enforcement, and the Safe Routes to School program.

Bicycle Transportation Alliance Bike Boulevard Campaign

The Bicycle Transportation Alliance established a goal to increase the number of bicyclists and improve bicycle safety throughout the region by advocating for a comprehensive network of low-traffic bicycle streets, known as "bicycle boulevards." Among the campaign's priorities are the creation of a design toolbox and the integration of bicycle boulevards into city, regional and state plans.

As part of the campaign, the BTA administered an online survey during the summer of 2006. Preliminary results show that a large majority of respondents (especially novice cyclists) prefer a lower traffic environment than typically found on streets with bicycle lanes.

Bike cultural events

In recent years the region has seen a noticeable increase in size and public awareness of bicycle culture. Groups, such as SHIFT focus on the celebration of biking with various activities, rides and festivals. A prominent blog, (bikeportland.org), is another venue for bikers to discuss bicycle related topics. Calendars that track bike events in the city show at least one planned event most days of the month.

Bicycle Friendliness Ratings (League of American Bicyclists)

The League of American Bicyclists has recognized the City of Portland and the City of Beaverton as "Gold" and "Bronze" level, respectively, for bicycle friendliness. Awards are based on the League's analysis of bicycle friendliness in five areas: education, enforcement, encouragement, engineering, and evaluation. Communities are rated platinum, gold, silver or bronze. The Bicycle Transportation Alliance and City of Portland Commissioner Adams are leading a "Go Platinum" campaign to improve the City of Portland's rating to platinum, which would make it the only large U.S. city to achieve this distinction. The nine part strategy includes enhancement and expansion of the existing bike network, updating the Bicycle Master Plan, education and encouragement activities, expanded law enforcement, development of tourism

and other economic opportunities, increased funding for bicycle projects and a city council resolution on the campaign and a review of City policy changes.

Local citizen bike advisory committees
In September and October 2006, staff met with several local citizen bicycle advisory committees (Portland, Beaverton, Clackamas County, Multnomah County, Washington County[8]) to seek input on existing conditions for bicycling in the region. Each group was asked what changes have occurred since the last RTP update that affect bicycling conditions, what are the barriers to biking in their communities, what types of solutions would be most helpful, and what locations feel unsafe for biking. Some of the common themes heard are described below:

Changes since last RTP update in bicycling conditions
- There are many more cyclists (and drivers) on the road.
- High growth areas in the region are playing catch up such that new bicycle facilities have helped, but have not been built as fast as the growth in population.
- Problems of success - choke points have emerged in inner Portland areas with high bike traffic.
- There is a growing awareness that high speed/volume streets with bike lanes are not attractive cycling options for children and elderly.

Barriers to bicycling
- Large, high traffic volume intersections with no bike facilities.
- Difficulties crossing arterial streets when using low-traffic streets (no gaps in traffic).
- Poor street connectivity outside of downtowns and eastside Portland neighborhoods
- Lack of education amongst drivers and bicyclists regarding traffic laws and sharing the road safely.
- Perceptions that bicycling is not safe.
- Lack of end-of-trip facilities such as bicycle parking and lockers.

Recommended solutions to improve bicycling conditions
- Identify corridors in the region appropriate to apply a low-traffic bicycle route design treatments, i.e. "bicycle boulevards" with good signage and improved crossings of higher traffic arterial streets.
- Retrofit bicycle/pedestrian accessways to better connect existing neighborhoods and subdivisions.
- Increase education for drivers and bicyclists:
    - Start a regional "Share the Road" campaign
    - Increase bicycling-related content on Oregon driver's exam
- Expand areas supported by regional funding beyond the major streets in regional centers.
    - Fund bike facilities along parallel lower classification streets that serve the same corridor.
    - Fund bike facilities that connect to centers as well as being completely within a center.

Areas that feel unsafe to bicycle
- High-speed and high-traffic arterials, with or without bicycle lanes

Regional trails working group
The Regional Trails Working Group is a group of local and state trail planners, professionals and advocates that meets quarterly to discuss and coordinate trail planning efforts in the region. Staff attended their September 2006 meeting seeking input for the RTP update. Suggestions from the work group included:

[8] Washington County does not have a bicycle advisory committee, so staff met with the Washington County bicycle coordinator.

- Prioritize the regional trails system to identify the most critical gaps in the system.
- Consider the difficulties of trail projects competing for regional funding with lower-cost and longer distance bicycle boulevard projects.
- Consider the value of trail projects that connect 2040 centers, rather than being located within a center's boundary.

Increasing Emphasis on the Link Between Public Health, Transportation and Land Use in the Active Living Movement

The active living movement has grown out of the national health crisis that obesity has become in the United States and elsewhere. Much research is being done on the subject of urban form and physical activity levels. According to the organization *Active Living by Design* "the chief aim of Active Living Research is to increase knowledge about active living by supporting research to identify environmental factors and policies with potential to substantially increase levels of physical activity among Americans of all ages, incomes and ethnic backgrounds."[9] Bicycling has become a key focus in the discussion of active living and the improvements to public health that occur when people bike more. It is an easy and relatively safe way to improve health for people of all ages and the active living community has realized that the transportation system, particularly on-street bicycle facilities and trails are essential for providing opportunities for people to bike. The body of work in this area is growing rapidly as are people's awareness of the benefits of living more actively. Locally, research funded by the Active Living program is being conducted at Portland State University.

Of particular concern is the lack of active lifestyles amongst children. The national decline in bicycling (and walking) to school has received much attention in recent years. In 1969, 42 percent of children 5 to 18 years of age walked or biked to school, whereas only 16 percent did so in 2001.[10]

Increasing Emphasis on Managing the Existing System and Intelligent Transportation Systems (ITS)

In recent years there has been an increased focus at the federal, state, regional and local level on how to best manage existing infrastructure. In the bicycling context this involves:

- Maintenance of facilities so that they are safe and usable, including clearing debris, restriping and repaving.
- Providing information to the public about how to travel via bicycle, including:
    - Individualized marketing increases awareness off non-SOV transportation options, i.e. Travelsmart, regional Drive Less Save More campaign
    - Local and regional bicycle maps help new cyclists find safe and convenient routes.
    - An online regional bicycle trip planner (similar to MapQuest) is currently under development under a partnership between Metro and Bycycle.org.
    - Increased bicyclist and driver education through local campaigns to "Share the road"
- ITS technology to make traffic signals more bicycle friendly.

[9] Active Living by Design Website (Research Page, viewed on Oct. 5, 2006) www.activelingbydesign.org.
[10] National Center for Safe Routes to School, website: viewed on November 15, 2006: http://www.saferoutesinfo.org/ask_a_question/answer.cfm?id=124

IV. Policy and Regulatory Framework

Federal

Congress enacted the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991. ISTEA gave Metropolitan Planning Organizations (MPOs) increased funding, expanded authority to select projects and mandates for new planning initiatives in their regions. ISTEA requires MPOs to consider bicycles in developing regional transportation plans and restructured federal transportation funding into several new programs with increased flexibility for funding bicycle projects. The legislation also focused on improving transportation not as end in itself but as the means to achieve important national goals including economic progress, cleaner air, energy conservation and social equity. ISTEA promoted a transportation system in which all modes and facilities were integrated to allow a "seamless" movement of both goods and people. New funding programs provided greater flexibility in the use of funds, supported improved "intermodal" connections and emphasized upgrades to existing facilities over building new capacity – particularly roadway capacity.

To accomplish these goals, ISTEA doubled funding for MPO operations and required the agencies to evaluate a variety of multimodal solutions to roadway congestion and other transportation problems. MPOs were also required to broaden public participation in the planning process and see that investment decisions contributed to meeting the air quality standards of the federal Clean Air Act Amendments.

The next two reauthorizations of Federal Transportation legislation, TEA-21 and SAFETEA-LU continued the multi-modal emphasis of ISTEA. Congress passed the Transportation Equity Act for the 21st Century (TEA-21) in 1998. It reduced the 15 planning factors from ISTEA to seven and continued the majority of its predecessor's programs. TEA-21 recognized that transportation investments impact the economy, environment, and community quality of life.

In 2005, Congress built on both ISTEA and TEA-21 with the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). SAFETEA-LU addresses the many challenges facing our transportation system today, such as improving safety, reducing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment. SAFETEA-LU promotes more efficient and effective Federal surface transportation programs by focusing on transportation issues of national significance, while giving State and local transportation decision makers more flexibility for solving transportation problems in their communities.

All provisions for Metropolitan Planning are consolidated in a new section 5303. The requirement for separate transportation plans and transportation improvement programs is maintained. The Long Range Transportation Plan and the Transportation Improvement Program are to be updated every four years. Provisions regarding Transportation Management Areas (TMAs) are included in the metropolitan transportation planning section. Metropolitan Planning Organizations (MPOs) are encouraged to consult or coordinate with planning officials responsible for other types of planning activities affected by transportation. Safety and security are factors to be included in metropolitan planning.

State

Executive Order (EO) on Sustainability

Governors Kitzhaber and Kulongoski both issued EO's on sustainability that support increasing sustainable modes of transportation in Oregon, such as bicycling. The legislature codified much of Governor Kitzhaber's EO into statue in 2001 known as the Sustainability Act. Under the EO, ODOT has developed a Sustainability Plan, renewing the agency's vision of a balanced, multimodal transportation system.

Oregon Transportation Plan (OTP)
Amended in September 2006 by the Oregon Transportation Commission, the OTP includes several policies that address bicycling:

- Policy 1.1 – Development of an Integrated Multimodal System
- Policy 1.2 – Equity, Efficiency, and Travel Choices
- Policy 1.3 – Relationship of Interurban and Urban Mobility
- Policy 3.2 – Moving People to Support Economic Vitality
- Policy 3.4 – Development of the Transportation Industry
- Policy 4.3 – Creating Communities
- Policy 5.1 – Safety
- Policy 5.2 – Security

Most requirements will be included in specific modal plans. Oregon Bicycle & Pedestrian Plan update is underway. Future RTP updates will be developed to be consistent with the updated state plan.

Oregon Transportation Planning Rule (TPR)
In 1991, the Land Conservation and Development Commission adopted the Oregon Transportation Planning Rule (TPR). The TPR implements State Land Use Planning Goal 12, Transportation[11], which was adopted by the Oregon Legislature in 1974. The TPR requires most cities and counties and the state's Metropolitan Planning Organizations, such as Metro, to adopt transportation system plans that consider all modes of transportation, energy conservation and avoid principal reliance on any one mode to meet transportation needs. By state law, local plans in MPO areas must be consistent with the regional transportation system plan (TSP). In the Portland metropolitan region, the Regional Transportation Plan serves as the regional TSP. Likewise, the regional TSP must be consistent with the OTP.

The state TPR also requires that transportation system plans provide an adequate system of improvements that meet adopted performance measures. TPR requirements for bicycle planning include:

- Mandates that transportation planning in Oregon reduce reliance on any one mode of transportation.
- Requires vehicle miles traveled (VMT) per capita reduction targets for local jurisdictions. The RTP identifies 2040 Non-SOV modal targets in place of and consistent with the requirement to reduce VMT per capita. As required by the TPR, jurisdictions within the Metro region must adopt policies and actions that support an increase in the share of trips by walking, bicycling, transit and shared ride.
- Requires a region wide network of bicycle facilities.

Recent updates to the TPR do not affect the requirements for bicycle planning.

[11] Goal 12 states, "To provide and encourage a safe, convenient, and economic transportation system."

Regional

Metro Charter
In 1979, the voters in this region created Metro, the only directly elected regional government in the nation. In 1991, Metro adopted Regional Urban Growth Goals and Objectives (RUGGOs) in response to state planning requirements. In 1992, the voters of the Portland metropolitan area approved a home-rule charter for Metro. The charter identifies specific responsibilities of Metro and gives the agency broad powers to regulate land-use planning throughout the three-county region and to address what the charter identifies as "issues of regional concern." Among these responsibilities, the charter directs Metro to provide transportation and land-use planning services. The charter also directed Metro to develop the 1997 Regional Framework Plan that integrates land-use, transportation and other regional planning mandates.

Regional Framework Plan
Updated in 1995 and acknowledged by the Land Conservation Development Commission in 1996, the RUGGOs establish a process for coordinating planning in the metropolitan region in an effort to preserve regional livability. The 1995 RUGGOs, including the 2040 Growth Concept, were incorporated into the 1997 Regional Framework Plan to provide the policy framework for guiding Metro's regional planning program, including development of functional plans and management of the region's urban growth boundary. The Regional Framework Plan is a comprehensive set of policies that integrate land-use, transportation, water, parks and open spaces and other important regional issues consistent with the 2040 Growth Concept. The Framework Plan is the regional policy basis for Metro's planning to accommodate future population and employment growth and achieve the 2040 Growth Concept.

2040 Growth Concept
The 2040 Growth Concept text and map identify the desired outcome for the compact urban form to be achieved in 2040. It envisions more efficient land use and a diverse and balanced transportation system closely coordinate with land use plans. Bicycling is an important element of the transportation concept envisioned in Region 2040. The 2040 Growth Concept has been acknowledged to comply with statewide land use goals by the Land Conservation and Development Commission (LCDC). It is the foundation of Metro's 1997 Regional Framework Plan.

2004 Regional Transportation Plan
The RTP implements the goals and policies in 1995 RUGGOs and the 1997 Regional Framework Plan, including the 2040 Growth Concept. The region's planning and investment in the regional bicycle system are directed by current RTP policies and objectives for the regional bicycle system as shown in Table 1.

Table 1. 2004 Regional Transportation Plan – Regional Bicycle System Policies

Policy 16.0 Regional Bicycle System Connectivity Provide a continuous regional network of safe and convenient bikeways connected to other transportation modes and local bikeway systems, consistent with regional street design guidelines. a. Integrate the efforts of the state, counties and cities in the region to develop a convenient, safe, accessible and appealing regional system of bikeways. b. Design the regional bikeway system to function as part of the overall transportation system and include appropriate bicycle facilities in all transportation projects. c. Integrate multi-use paths with on-street bikeways, consistent with established design standards. d. Work with local jurisdictions, ODOT and other public agencies to identify high-frequency bicycle-related crash locations and improvements to address safety concerns in these locations Policy 16.1 Regional Bicycle System Mode Share and Accessibility Increase the bicycle mode share throughout the region and improve bicycle access to the region's public transportation system. a. Promote increased bicycle use for all travel purposes b. Coordinate with TriMet to improve bicycle access and parking facilities at existing and future light rail stations, transit centers and park-and-ride locations c. Work with local jurisdictions, ODOT and other public agencies to provide appropriate short and long-term bicycle parking and other end-of-trip facilities at regional activity centers through the use of established design standards. d. Develop travel-demand forecasting for bicycle use and integrate with regional transportation planning efforts.

A major goal of the RTP is to provide a regional network of safe and convenient bikeways, including bike lanes, multi-use paths and bicycle boulevards. The 2004 RTP regional bikeway system (see Figure 1.19) identifies a network of bikeways throughout the region that provide for bicyclist mobility between the central city, regional centers and town centers. A complementary system of on-street and off-street regional bikeway corridors, regional multi-use trails and local bikeways is proposed to provide a continuous network. The following are the regional bicycle system functional classification categories. These are on-street bikeways that would be designed using a flexible toolbox of designs. The appropriateness of each design is based on adjacent motor vehicle speeds and volumes.

Regional access bikeway – focus on accessibility to and within the central city, regional centers, and some of the larger town centers. They generally have higher volumes as they serve areas with higher population and employment density.

Regional corridor bikeway –the longer routes that provide connectivity between the central city, regional centers and larger town centers. They generally have higher automobile speeds and volumes than regional accessways and community connectors.

Community connector – These longer routes connect smaller town centers, main streets, station areas, industrial areas and other regional attractions to the regional bikeway system.

Multi-use trail - These are physically separated from motor vehicle traffic by open space or a barrier, and are used by pedestrians, joggers, skaters and other non-motorized travelers. Trails that support both utilitarian and recreational bicycle functions are included as part of the regional bicycle system.

Non-SOV Modal Targets Project

In 2005, Metro studied the region's Non-SOV modal targets to support efforts by Metro and local jurisdictions to reduce drive-alone trips in the region to comply with the TPR. The study made the following recommendations to Metro to improve the regional bicycle policy framework:

- Construct bicycle improvements as required by state and federal regulations, and consistent with local TSPs and regional guidelines. Local governments and Metro should prioritize improvements that enhance connectivity of the bicycle and pedestrian system and access to transit.
- Support and coordinate Safe Routes to School programs and projects. Local jurisdictions and Metro should support and help coordinate these efforts by seeking and procuring project funding from federal, state and local sources, and providing technical assistance.
- Keep a region-wide database tracking total mileage of bikeway facilities in the region.
- Develop a region-wide database of bicycle user counts, provide guidance on the methodologies, help organize or provide PSU students or interns to carry out these counts, and track the progress over time.

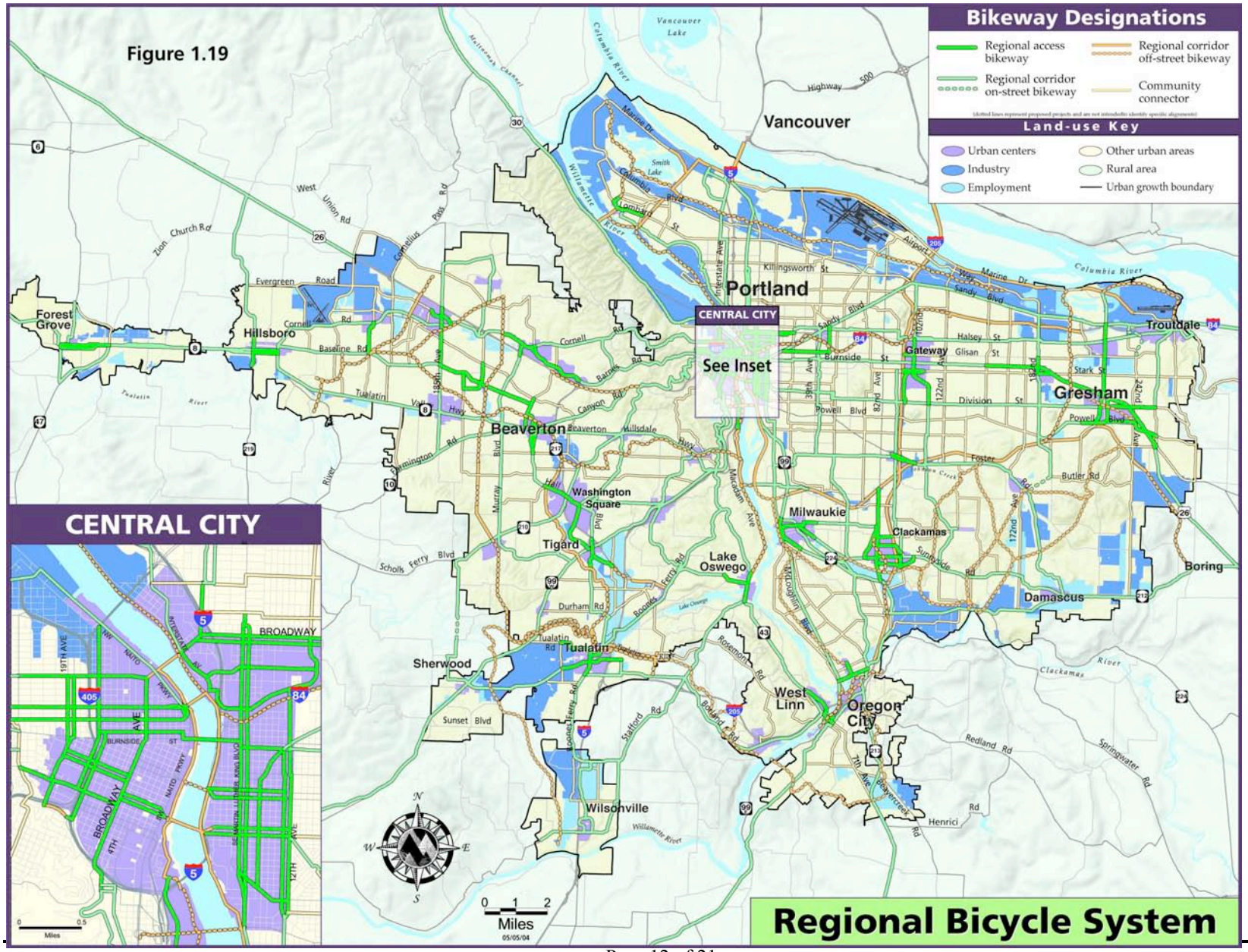


Figure 1.19
Bikeway Designations
Regional access bikeway
Regional corridor off-street bikeway
Regional corridor on-street bikeway
Community connector
Land-use Key
Urban centers
Other urban areas
Industry
Rural area
Employment
Urban growth boundary
Vancouver
Portland
CENTRAL CITY
See Inset
Forest Grove
Hillsboro
Beaverton
Tigard
Tualatin
Sherwood
Wilsonville
Lake Oswego
Milwaukie
Clackamas
Gresham
Troutdale
Damascus
Boring
West Linn
Oregon City
Gateway
Washington Square
CENTRAL CITY
BROADWAY
Miles
Regional Bicycle System

V. Bicycle System Profile

Regional Bicycle System Gap Analysis

It is important to evaluate how well the regional bicycle system is currently meeting regional bicycle policies. Figure 2 shows the regional bicycle routes that currently have a bicycle facility (i.e. bicycle lane or multi-use trail, or low-traffic bike boulevard) and the areas where gaps exist.

As table 2 shows, a higher percentage of Regional Accessway and Corridor routes have been completed compared to Community connector routes. This demonstrates that the region has been effectively implementing the current vision for the regional bikeways system, by prioritizing off-street trails and on-street facilities that serve (or are located within) the larger centers.

Table 2. Progress in completion of Regional Bicycle System

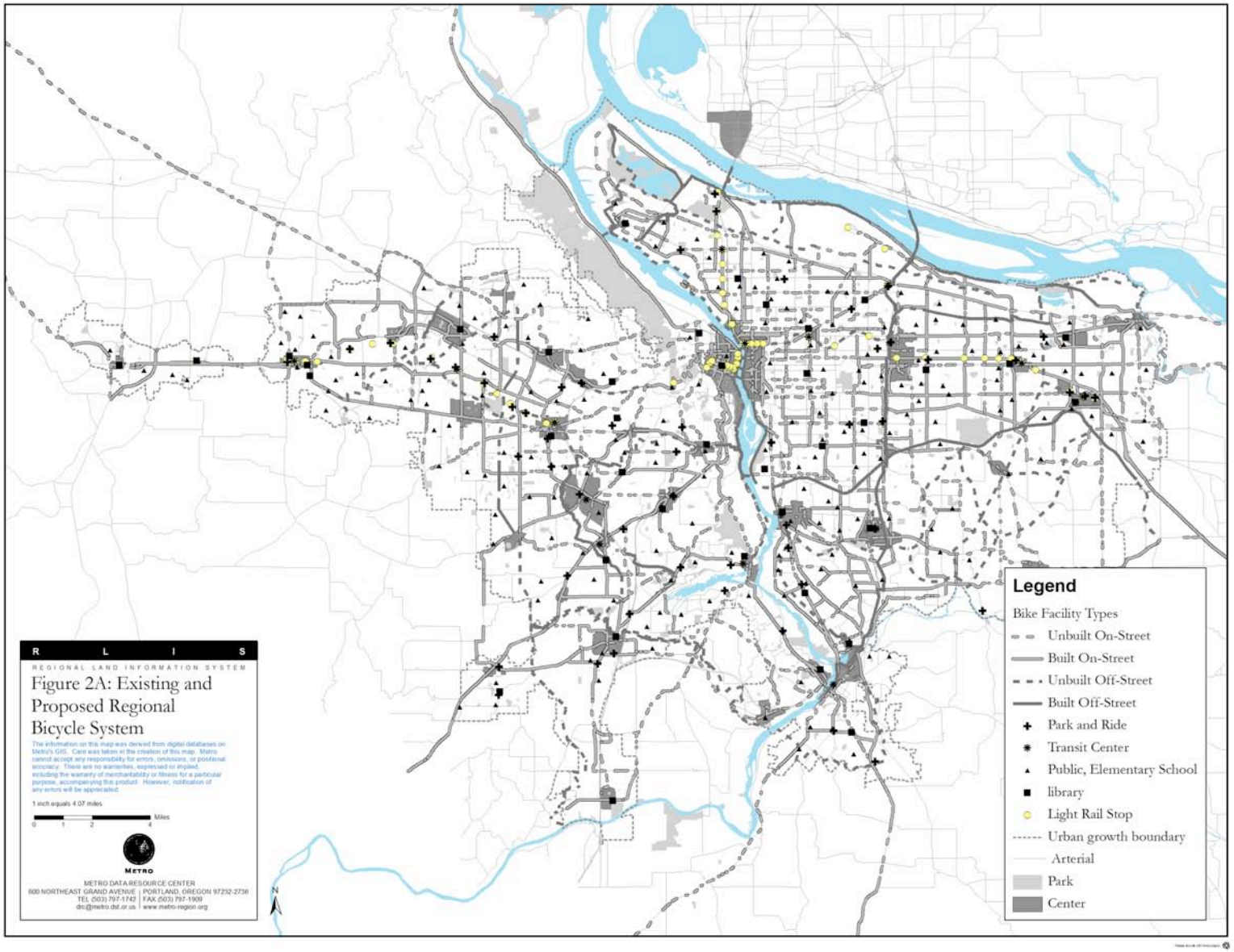
	Total	Regional Access	Regional Corridor	Community Connector	Multi-Use trails
Proposed regional bikeway system (miles)	773	103	344	326	238
Existing regional bikeway system (miles)	380	54	199	127	153
Percent complete	**49%**	**52%**	**57%**	**39%**	**64%**

Table 3 and Figures 2a and 2b show how the regional bicycle system serves schools, libraries, transit centers and park and rides. The data shows that access from regional bicycle routes is not as great for public schools as for regional parks, libraries, transit centers, and park and rides.

Table 3. Trip generators served by existing regional bicycle routes

	Public Schools[12] within ¼ mile	Regional Parks [13]within ¼ mile	Libraries within ¼ mile	Transit Centers within ¼ mile	Park and Rides within ¼ mile
Existing regional on-street bikeways	162 of 328	30 of 45	25 of 39	12 of 18	37 of 54
Existing regional off-street trails	25 of 328	15 of 45	4 of 39	6 of 18	4 of 54
Either on-street or off-street	176 of 328	32 of 45	26 of 39	15 of 18	39 of 54

[12] Data includes public elementary, secondary, high school, and colleges/universities. It does not include private schools, technical schools, and non-traditional schools.
[13] Regional Parks include those used in Metro's Top 50 Parks map from 2004, factoring in size and usage.


Legend
Bike Facility Types
Unbuilt On-Street
Built On-Street
Unbuilt Off-Street
Built Off-Street
Park and Ride
Transit Center
Public, Elementary School
library
Light Rail Stop
Urban growth boundary
Arterial
Park
Center
R L I S
REGIONAL LAND INFORMATION SYSTEM
Figure 2A: Existing and Proposed Regional Bicycle System
The information on this map was derived from digital databases on Metro's GIS. Care was taken in the creation of this map. Metro cannot accept any responsibility for errors, omissions, or positional accuracy. There are no warranties, expressed or implied, including the warranty of merchantability or fitness for a particular purpose, accompanying this product. However, notification of any errors will be appreciated.
1 inch equals 4.07 miles
Miles
0 1 2 4
METRO
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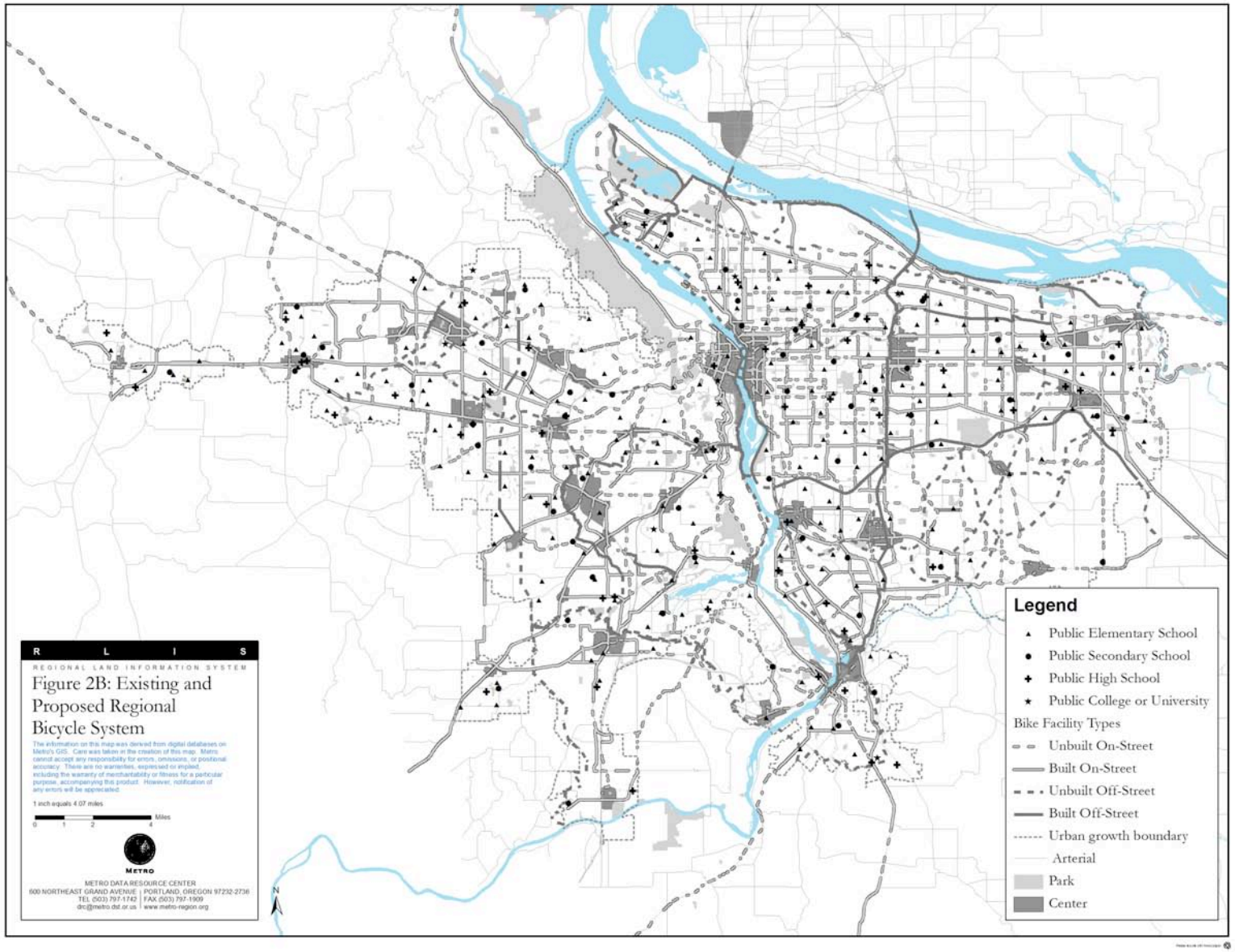
Legend
Public Elementary School
Public Secondary School
Public High School
Public College or University
Bike Facility Types
Unbuilt On-Street
Built On-Street
Unbuilt Off-Street
Built Off-Street
Urban growth boundary
Arterial
Park
Center
R L I S
REGIONAL LAND INFORMATION SYSTEM
Figure 2B: Existing and Proposed Regional Bicycle System
1 inch equals 4.07 miles
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Increasing supply of local bicycle routes

As an educational and navigational aid to bikers, Metro publishes the *Bike There* map. The map contains information about existing and planned striped bike facilities, off street paths, bike shops, light rail and shared roadways. Its data for bike lanes and multi-use trails can be used to track progress in building bike facilities across the region. As Table 4 shows, local jurisdictions have added bike facilities at a slower rate between 2002 and 2005 compared with 1999 to 2002. For bicycle lanes, this may be partially explained due to having added them in the most easily retrofitted locations during the 1990s. Adding bike lanes to areas with constrained right-of-way areas may prove more difficult.

At the same time, low-traffic bicycle boulevards have gained popularity with local jurisdictions and bicycle advocacy organizations, due to their perceived attractiveness to a larger demographic of users. The City of Portland currently has 30 miles of bike boulevards. Tracking the completion of these facilities will be needed in the future, as it provides a broader perspective on the supply of bicycle facilities for all users of the system and their benefits.

Table 4. Miles of bike lanes and multi-use trails in the region

	1999	2002	2005
Bicycle lanes	430	512	547
Multi-Use trails	41	110	127

Source: Metro Data Resource Center, Bike There map

Increasing bicycle ridership

In addition to tracking the inventory (supply) of bicycle facilities in the region, it is also important to track their usage (demand). Anecdotal reports have shown that bicycle ridership has increased throughout the region over the past fifteen years. Quantitative bicycle count data is limited mostly to the City of Portland. A recent study, *Bridging the Gaps: How the Quality and Quantity of a Connected Bikeway Network Correlates with Increasing Bicycle Use*, looked at the success of Portland's "build it and they will come" philosophy toward bicycle facility construction.

During the last ten years, the City of Portland invested $12 million dollars and increased the city's developed bikeway network from 83 to 260 miles.[14] Coincident with this mileage increase was a doubling of citywide bicycle commute trips from the 1990 to 2000 census. A large share of this money was invested on and around bridge crossings near the downtown core. Improvements ranged from widening bridge facilities, to striping and signing, bike boulevard implementation, minimizing areas that create safety conflicts, and ramp redesign to meet ADA compliance.

During the 1990s, annual counts conducted by the city across the four major bridges showed a greater increase in bike traffic (78 percent) than in motor vehicle traffic (8 percent). The authors state their belief that two key factors: quantity of facilities (completeness of network) and quality of facilities have led to these increases. Of particular interest are figures for the Hawthorne and Broadway bridges. In both cases, completion of the network feeding the bridge increases in tandem with number of bicycle trips using the bridge. In specific years, increases in the number of bike trips across a given bridge appear to be linked to system improvements. For example, the number of bike trips across the Broadway bridge increased by about 50 percent between 1998 and 1999 when the lift span was replaced with a non-slippery surface.

[14] Birk, Mia and Geller, Roger. Bridging the Gaps: How the Quality and Quantity of a Connected Bikeway Network Correlates with Increasing Bicycle Use, 2005.

The findings from the Portland study were affirmed at the national level in a study that evaluated data from 35 large cities across the U.S, and found that cities with higher levels of bicycle infrastructure saw higher levels of bicycle commuting.[15]

Portland's ridership gains during the 1990s reported in the Bridging the Gap study have continued during the 2000s. Bicycle counts released for 2006 shows significant increases across the city. Dramatic increases occurred in areas such as the four central city bike friendly bridges, which captured 12,000 daily trips, an 18 percent increase since last year and 10 percent of the total trips across the bridge.[16] Also worthy of note is the increasing presence of female bikers. Overall, women represented 32 percent of all riders counted this year, up from 25 percent in 2000. Nationally, women represent about 25 percent of bikers.

Local Outreach on the Regional Bicycle System

In October 2006, staff held a bicycle and pedestrian workshop with local bicycle and pedestrian planners from local and state governments, advocacy groups and the private sector. The discussion focused on trends/research, barriers to developing the bicycle system and a review of current regional bicycle policy.

Key workshop recommendations identified for consideration during the RTP update include:

- Improve data collection at regional level.
    - Coordinate bicycle counts region-wide through the purchase of infrared counter to share with local jurisdictions to conduct bicycle and pedestrian counts.
    - Conduct annual regional user satisfaction surveys.
- Expand consideration of low-traffic bicycle boulevards in the regional bicycle system.
    - Current RTP bicycle map classifications favor bike lanes on arterial and collector streets, however, additional attention is needed to adequately serve potential riders that may favor lower-traffic routes to increase the bicycle mode share in the region.
    - More research is needed on the return on investment of bicycle facility improvements, including a comparison of bike lane retrofits on major arterial streets with parallel low-traffic bicycle boulevard design treatments.
    - Suburban areas face difficulties in implementing bicycle boulevards due to limited local and regional street connectivity, and road capacity projects that create limited opportunities for safe bicycle crossings.
- Update MTIP criteria to prioritize bicycle projects with greatest benefits to safety and ridership:
    - Current criteria favor projects within center boundaries (regional accessways).
    - Current criteria favor bicycle facilities along designated bicycle corridors, however, crossings of arterial streets have been identified as the biggest barrier to bicycle travel. Consider funding packages of arterial crossings improvements that benefit bicyclists.
- Explore role/responsibility for funding bicycle infrastructure:
    - Federal, state, regional, local – who's responsible for what?
    - Transportation impact fees, System Development Charges

Safety

Outreach

Staff asked local Citizen Bike Advisory Committees which locations were unsafe for bicyclists. The responses were primarily high traffic / high speed arterials and intersections. Local bicycle planners also

[15] Dill, Jennifer and Carr, Theresa. Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them, Commuters Will Use Them. Transportation Research Board, 2003, accessed at http://www.ce.umn.edu/~levinson/pa8202/Dill.pdf.

[16] Portland Office of transportation, Bicycle Count Report, 2006.

gave feedback that bike crash data did not tend to cluster at specific locations, thus they focus on unsafe bicycling "conditions" rather than "locations".

Existing regional policies/programs impact on safety
It is important to recognize that existing RTP projects, programs and policies have a positive impact on bicycle (and pedestrian) safety. These include regional street connectivity requirements, parking maximums, transit service planning requirements, 2040 growth concept (mixed-use centers, compact urban form, UGB), regional street design guidelines and the Bike There map. Recent studies have examined the link between sprawling regions and traffic fatalities and found that the more compact / less sprawled a region, the fewer the rates of traffic fatalities of all modes.[17]

Crash Data
There are serious limitations with the crash data available for bicycling, particularly due to underreporting. First, bicycle crash data from Oregon DMV are required to be reported to ODOT only if the incident involves a motor vehicle. Bicycle-only crashes are not reported, even though a recent FHWA study of 8 emergency rooms (in urban, suburban and rural areas) found that 70 percent of bicycle injuries did not involve a motor vehicle.[18]

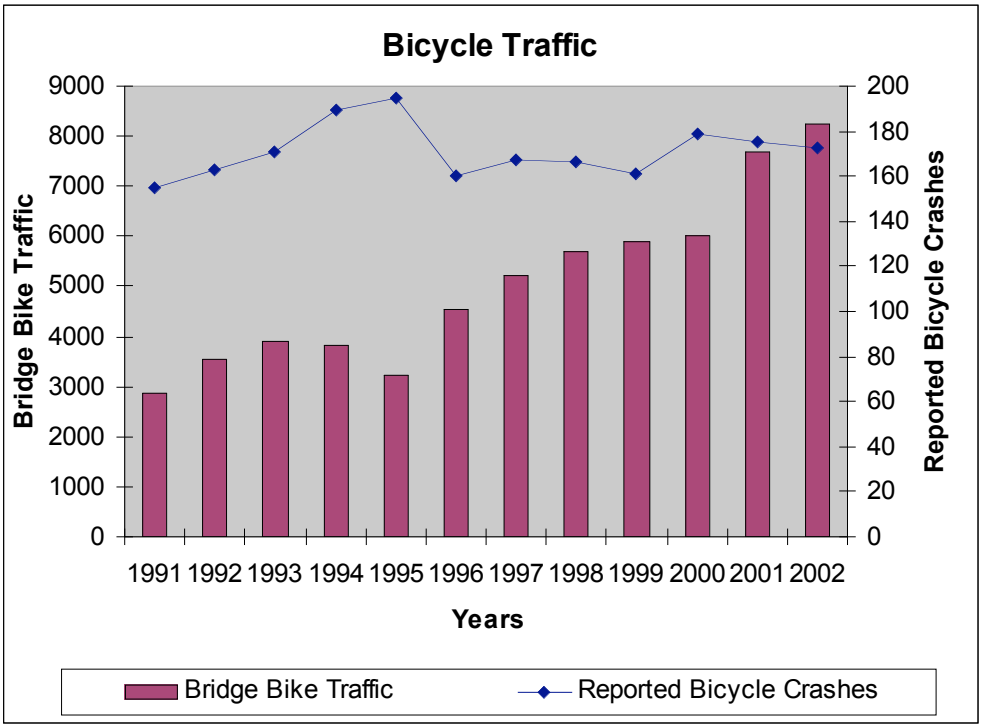
Second, Oregon relies heavily on driver self-reporting, which inherently leads to some accidents not being reported. An Oregon study showed as many as 50 percent of all crashes are not reported.[19] Furthermore, the causes of bicycle crashes are difficult to determine from the DMV data.

Despite the limitations in bicycle crash data, the City of Portland has done extensive localized bicycle crash analyses. They compared analyzed crashes in the Hawthorne corridor of SE Portland between 1991 and 2000. During this period far more crashes occurred on Hawthorne (80 percent) than on either of the two parallel low-traffic bike routes – Salmon/Taylor or Lincoln/Harrison (20 percent). Anecdotal evidence suggests that the low-traffic bike routes received higher bicycle volumes than Hawthorne, with the conclusion being that they are much safer bike routes.

<u>Declining bicycle crash rate</u>
As Figure 4 shows, despite increasing numbers of people biking in the City of Portland, the number of bicycle crashes is holding constant. This continues the trend of the decreasing bicycle crash rate within the City. Helmet usage has also grown in the City from 59 percent in 1992 to 73 percent in 2006.[20]

[17] Ewing, R, Schieber, R, and Vegeer, C. "Urban Sprawl as a risk factor in Motor Vehicle Occupant and Pedestrian Fatalities." American Journal of Public Health. 2003.
[18] FHWA, Injuries to Pedestrians and Bicyclists: An Analysis of Hospital Emergency Room data, FHWA-RD-99-078, accessed 11/20/06 at http://www.tfhrc.gov/safety/pedbike/research/99078/99-078.htm
[19] S. Malik, R.L. Bertini, C. Monsere, "Crash Data Reporting and Analysis—An Oregon Case Study," Presented at the Annual Meeting of ITE, Seattle, WA.
[20] 2006 City of Portland Bicycle Count Report – Significant Findings & Analysis.

Figure 4. Bicycle Traffic vs Bicycle Crashes in City of Portland 1991-2002



Safety in numbers: more walkers and bicyclists, safer walking and bicycling
This study analyzed the relationship between the number of people walking or bicycling and the frequency of collisions between motorists and walkers and bicyclists. The research focused on California roadways for the year 2000. The results demonstrated that a motorist is less likely to collide with a person walking and bicycling in areas with more pedestrians and bicyclists. The implication is that when drivers expect to see walkers or cyclists, they alter their behavior and drive more slowly/cautiously.

VI. Policy Assessment

Key finding	RTP Implication
1. Investing in bicycle facilities and encouraging growth of the bicycling industry benefits the economy.	• Acknowledge economic benefit of bicycle facilities in RTP.
2. The current regional bicycle system favors bike lanes on high-traffic streets. Local survey work asserts that many potential cyclists prefer low-traffic routes (i.e. bicycle boulevards).	• Conduct empirical research as part of upcoming travel behavior survey to better define the user preferences and behavioral responses on bikeways on low and high traffic streets. In future research, study the impact on ridership and safety of implementing retrofitting bike lanes on a major arterial streets versus a parallel low traffic bicycle boulevard. • Consider bicycle boulevards part of the regional system if: o The regional street system does not meet arterial spacing standards. o Due to a constrained right-of-way, bicycle lanes are not feasible on an adjacent regional route. • Consider adopting stricter requirements and/or greater incentives for more street connectivity and/or bicycle and pedestrian accessways which could improve ability to develop low-traffic bicycle routes in suburban areas
3. Current technical criteria for regional funding decision favors projects within centers, but many key gaps are located outside centers.	• Consider increasing priority for bicycle projects along corridors that directly connect to 2040 centers.
4. Current technical criteria for regional funding decision favors long-distance projects, but crossings of arterials are considered biggest barrier to bicycling.	• Consider funding packages of bicycling focused arterial improvements.
5. Lack of regional bicycle count data.	• Consider providing funding to local jurisdictions to collect regular bicycle count data, particularly "before and after" counts when a new facility is constructed. Facilitate this effort with purchase of infrared counter to be shared with local jurisdictions. Provide guidance on count methodology.
6. Lack of bicycle crash data and analysis of conditions attributing to crashes. Local jurisdictions have not found much clustering of bicycle crashes during their safety analyses.	• Consider requiring local jurisdictions to submit bicycle crash data biennially. • Change language of Policy 16.0 D to reference "high crash *conditions*" rather than "high crash locations."

7. Active Living movement is gaining momentum.	• Develop a regional policy that supports the active living / public health /transportation/land use connection.
8. Bicycle ridership has increased as the bicycle network has expanded.	• Continue to prioritize and fund bicycle infrastructure projects and include appropriate bicycle facilities in all transportation projects.
9. Lack of awareness of how to ride a bicycle (and drive near a bicycle) safely.	• Explore potential for regional safety/education campaign that could be administered through the Regional Travel Options program if more funding became available.
10. Declining revenues available for transportation projects, particularly at federal and state levels.	• Research potential for using local funding mechanisms such as traffic impact fees or system development charges for bicycle projects (beyond bike lanes on suburban arterial). • Consider ways to ensure that future major road projects funded through public-private partnerships include bicycle-friendly design treatments.
11. Increasing competition between trail projects and bicycle boulevards for regional funding.	• Prioritize the most important regional trails (with transportation function) on RTP bicycle system map. • Consider making trails its own category for technical evaluation in the Transportation Priorities process.

VII. Conclusion

The role of bicycling in the regional transportation system has grown greatly since the last RTP update. The region has experienced many successes in the realm of bicycling. Greater levels of bicycle infrastructure have led to increased ridership. Despite these successes, challenges remain. New infrastructure has not been built as fast as growth in bicycle riders. Many suburban areas face obstacles due to a lack of connecting streets, and large auto-focused intersections.

All across the region, there may be a large group of potential cyclists being left out, since they do not feel safe using bicycle lanes on high-traffic arterials. More research is needed to determine whether low-traffic bicycle boulevards would compel these individuals to bicycle for short trips. If so, the regional bicycle policies/classifications should be updated to reflect the needs of the next wave of potential cyclists. It will also be important to continue to integrate the efforts of the state, counties and cities in the region to develop a convenient, safe, accessible and attractive regional system of bikeways that are complemented by more locally-oriented bikeway routes.

Finally, in order to better plan for the future, better data is needed. Much available data is either anecdotal or limited to the City of Portland. More bicycle count and crash data from throughout the region would be useful to track the progress of the regional bicycle system and forecast future use.