600 NE Grand Ave.
Portland, OR 97232-2736

Metro | *Agenda*

Meeting:	ATP Stakeholder Advisory Committee meeting
Date:	April 4, 2013
Time:	3-5 p.m.
Place:	Room 401, Metro, 600 NE Grand Ave., Portland, 97232
Purpose:	SAC provide feedback to complete the evaluation of the pedestrian and bicycle networks and prepare for recommendations and prioritization

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3:00	Meeting overview, project updates/timeline
3:10	Response and revisions from Feb. 19 meeting • Developing planning level cost estimates for the principal ATP Network memo • Regional Bicycle and Pedestrian Network Concepts and Functional Classes
3:30	Bicycle Model Volume Plots and Difference Plots – Discussion and feedback *SAC members provide comments and feedback based on review of the volume plots and the difference plots. Staff are finalizing the Bicycle Network Evaluation Report that summarizes and analyzes the outputs from the modeling of the bicycle networks and will incorporate feedback from the SAC into the report.*
4:00	Regional Destinations Map – Discussion and feedback *SAC members provide comments and feedback on the use of the regional destinations to help identify the principal active transportation network and prioritize projects.*
4:15	Pedestrian Network Analysis – Initial maps and analysis *Staff from Alta will present on evaluation results for the access to essential destinations and equity criteria for the pedestrian network. Alta and staff will use feedback from the SAC to finalize the Pedestrian Network Flow Analysis Report.*
5:00	Next steps and adjourn

See other side for list of meeting materials and upcoming meeting dates

Meeting materials

Discussion Materials (copies will be provided at the meeting)

1. Revised - Developing planning level cost estimates for the principal ATP Network Memo
2. Revised - Regional Bicycle and Pedestrian Network Concepts and Functional Classes
3. Bicycle model network volumes ftp://ftp.oregonmetro.gov/pub/tran/ATP/
   Make sure to view FTP site in Windows Explorer: press Alt, click View, and then click Open FTP Site in Windows Explorer. Volume plot maps are in the "Vol plots" folder.
4. Bicycle model Difference Plots ftp://ftp.oregonmetro.gov/pub/tran/ATP/
   Make sure to view FTP site in Windows Explorer: press Alt, click View, and then click Open FTP Site in Windows Explorer. Volume plot maps are in the "DIFF plots" folder.
5. Regional Destinations - Map and Memo
6. Pedestrian Network Analysis – Access and Equity maps and analysis
7. Feb. 19 meeting notes

Upcoming SAC meeting dates

Thursday, May 2, 3-5 p.m.
Thursday, June 6, 3-5 p.m.

Network Concepts and Evaluation

Stakeholder Advisory Committee
April 4, 2013

Lake McTighe
Senior Transportation Planner
Regional Transportation Planning

Planning level cost estimates

Improvement	Cost per mile, 2012$
New 8-10’ sidewalk and 7’ buffer (parking or planter strip)	$2 million/side
Upgrade existing sidewalk to 8-10’ sidewalk and 7’ buffer (parking or planter strip)	$1 million/side
New 12’ regional trail	$3 million
Upgrade existing trail in 2035 network to 12-14’,	$1.5 million
New bicycle boulevard	$250,000
Upgrade existing bicycle boulevard	$100,000
New or upgraded separated 8-10’ in-roadway bikeway	$1 million/side
Improved or new crossings	$80,000/crossing of five lane arterial

Regional Bicycle and Pedestrian Network Functional Classification Design Types

Functional Class 1 (FC-1) Regional Bicycle Parkway

Design Type A Off-street

- Minimum width of 12’; additional width or bifurcation where demand warrants.
- Marked high-visibility crosswalks at all crossings of collector and arterial roads, additional crossing features where appropriate.
- Lighting is desirable.
- Bike signals and detection at signals are desirable.

Functional Class 1 (FC-1) Regional Bicycle Parkway

Design Type B, Low traffic street

(ADT <6,000 and posted speed is 30 or less)

- Where ADT <3,000, bike boulevard treatments including traffic calming and diversion measures may be appropriate.
- Where bike boulevard treatments are not used, 6’ bike lanes are minimum treatment (preferred 7’).
- Crossing treatments at all crossings of collector and arterial roads.
- Context-based traffic calming is desirable..

Functional Class 1 (FC-1) Regional Bicycle Parkway

Design Type C, High traffic street

- (ADT >6,000 or posted speed is 35 or more)
- Separation from vehicle traffic is critical. Use cycle tracks, buffered bike lanes (minimum 6’ lane, 4’ buffer), parallel trail, or parallel low-traffic street.
- Attention to treatment of intersections and driveways is critical. Preferential treatments such as green coloring, bike boxes, bike signals, turn queue boxes, and advance stop lines should be used as appropriate.
- Arterial-type traffic calming is desirable.

Functional Class 2 (FC-2) Community Bikeway

- Design Type A Off-street

- Minimum width of 10’.
- Marked crosswalks at all crossings of collector and arterial roads, additional crossing features where appropriate.
- Lighting may be desirable.

Functional Class 2 (FC-2) Community Bikeway

Design Type B Low traffic street

- Where ADT <3,000, bicycle boulevard treatments including traffic calming and diversion measures may be appropriate.
- Where bike boulevard treatments are not used, 5’ bike lanes are minimum treatment (preferred 7’).

Functional Class 2 (FC-2) Community Bikeway

Design Type C High traffic street

- 5’ bike lanes are minimum treatment (preferred 7’).
- Separation/buffer from vehicle traffic is desirable.
- Attention to treatment of intersections and driveways is desirable. Preferential treatments such as green coloring, bike boxes, bike signals, turn queue boxes, and advance stop lines may be used as appropriate.

Functional Class 3 (FC-3)

Local Bikeway

Local standards apply

Functional Class 1 (FC-1) Principal Regional Pedestrian Corridors and Districts

- Design Type A Off-street **(for regional trails that are not also Bicycle Parkways)**
- Minimum width of 10’; additional width or bifurcation where demand warrants.
- Marked crosswalks at all crossings of collector and arterial roads, additional crossing features where appropriate.
- Crosswalk lighting is critical.
- Pedestrian countdown heads at all signals.
- Short signal cycle lengths (90s or less), pedestrian-friendly timing, and lead pedestrian intervals at signals are desirable.

Functional Class 1 (FC-1) Principal Regional Pedestrian Corridors and Districts

Design Type B On-street corridor

- Minimum sidewalk plus buffer width of 17’ where ADT >12,000 or posted speed is 40 or more, and 10’ where ADT <12,000 and posted speed is 35 or less.
- Buffer width includes width of on-street parking, landscape buffer, furnishing zone.
- Pedestrian clear zone of 6’ or more.
- Street trees between roadway and pedestrian clear zone.

Functional Class 1 (FC-1) Principal Regional Pedestrian Corridors and Districts

Design Type B On-street corridor **CONT.**

- Marked crosswalks provided ≤530’ spacing along corridor where feasible
- Crossing features such as refuge islands, curb extensions, raised crosswalks, raised intersections, and beacons or signals where appropriate.
- Lighting at all crosswalks.
- Pedestrian-scale lighting along corridor.
- Pedestrian countdown heads at all signals.
- Short signal cycle lengths (90-s or less), pedestrian-friendly timing, and lead pedestrian intervals at signals are desirable.

Functional Class 2 (FC-2)
Community Pedestrian Corridors

Design Type A Off-street

- Minimum width of ~~8~~’ 10’.
- Marked crosswalks at all crossings of collector and arterial roads, additional crossing features where appropriate.
- Lighting may be desirable.

Functional Class 2 (FC-2)
Community Pedestrian Corridors

Design Type B On-street corridor

- Minimum sidewalk plus buffer width of 14’ where ADT >12,000 or posted speed is 40 or more, and 10’ where ADT <12,000 and posted speed is 35 or less.
- Buffer width includes width of on-street parking, landscape buffer, furnishing zone.
- Pedestrian clear zone of 5’ or more.
- Street trees between roadway and pedestrian clear zone.
- Marked crosswalks provided every 530 feet along corridor where feasible

Functional Class 2 (FC-2)
Community Pedestrian Corridors

Design Type B On-street corridor

- Crossing features such as refuge islands, curb extensions, and beacons or signals where appropriate.
- Lighting at all crosswalks.
- Pedestrian-scale lighting along corridor.
- Pedestrian countdown heads at all signals.
- Short signal cycle lengths (90-s or less), pedestrian-friendly timing, and lead pedestrian intervals at signals are desirable.
- Street or sidewalk connectivity ≤530’ spacing along corridor.

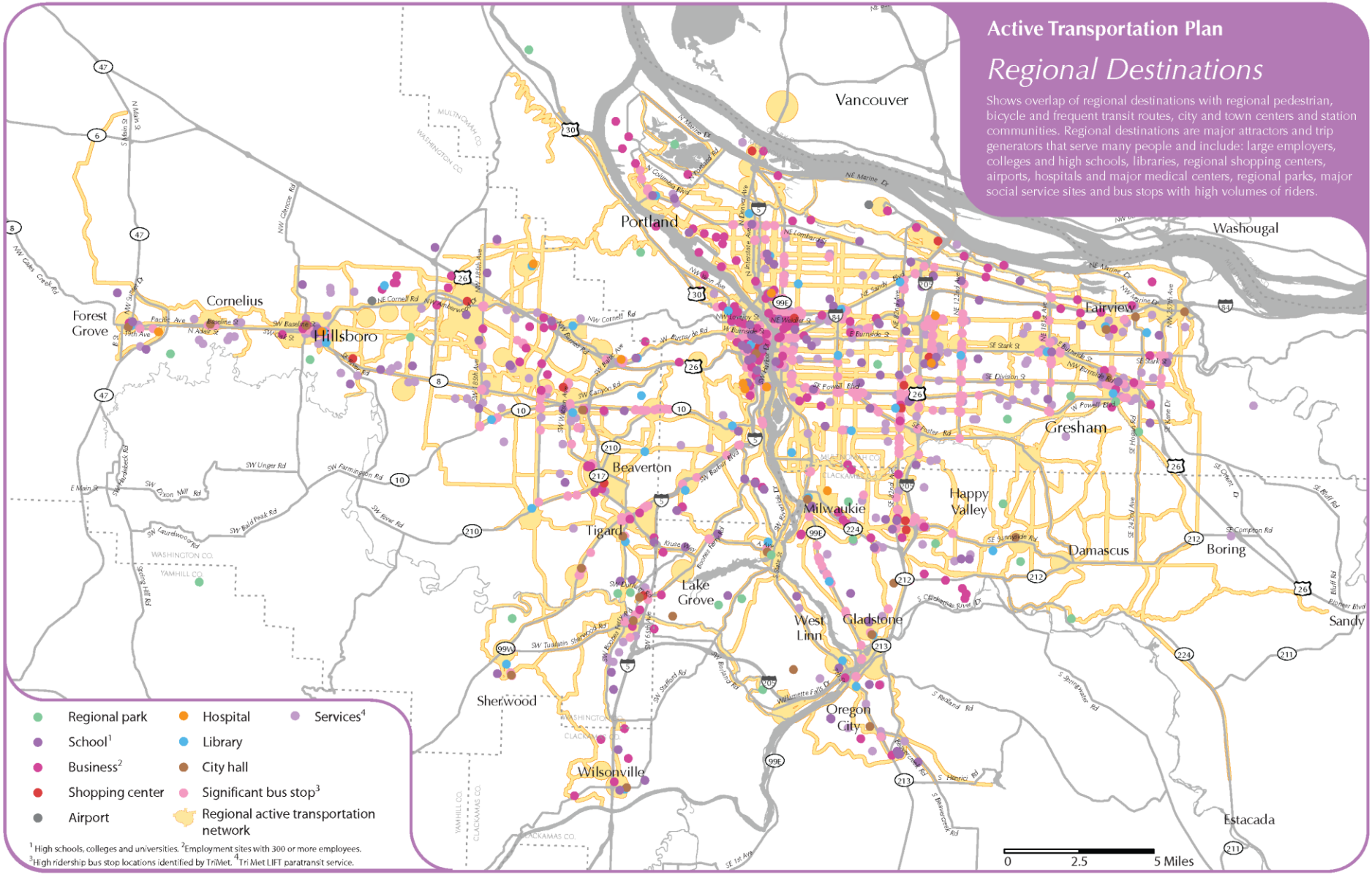
Functional Class 3 (FC-3)
Local Pedestrian Connectors

Local standards apply

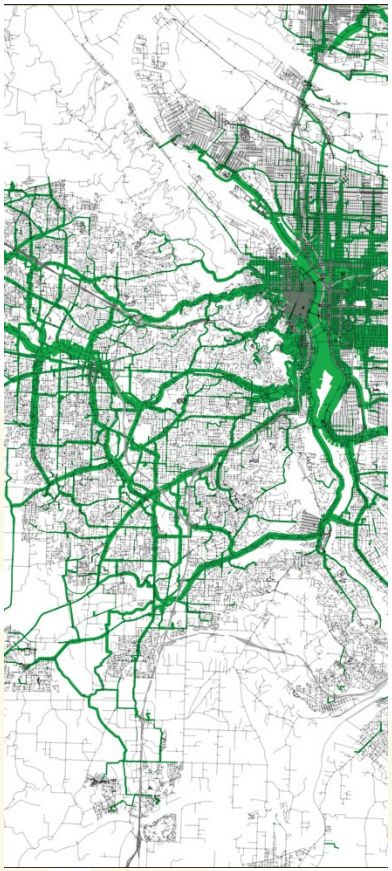
Active Transportation Plan

Regional Destinations

Shows overlap of regional destinations with regional pedestrian, bicycle and frequent transit routes, city and town centers and station communities. Regional destinations are major attractors and trip generators that serve many people and include: large employers, colleges and high schools, libraries, regional shopping centers, airports, hospitals and major medical centers, regional parks, major social service sites and bus stops with high volumes of riders.



[1] High schools, colleges and universities. [2]Employment sites with 300 or more employees.
[3]High ridership bus stop locations identified by TriMet. [4]Tri Met LIFT paratransit service.



Bicycle Network Evaluation

Bicycle Model Outputs, Volume Plots & Difference Plots

Measure	Network Concept		
	Spiderweb	**Mobility Corridor**	**Grid**
% increase bike trips over 2035 state network	1.5%	0.09%	1.1%
% increase in bicycle miles traveled (BMT) over 2035 state network	4%	2%	3%
Miles of new bicycle parkways	51	30	49
% BMT on separated bike facilities	45%	38%	43%
Bike mode share in 2035 for trips within the urban growth boundary	3.7%	3.6%	3.6%
New bike trips/day over 2035 state network	4,383	2,525	3,223
Cost of new bikeways over cost of 2035 state network	$147 million or $3.30/capita/year	$87 million or $1.90/capita/year	$123 million or $2.80/capita/year

Initial findings

- Of the three concepts, the Spiderweb concept shows the most growth in bicycle mode share/trips compared to the 2035 state scenario, for all areas.
- Mobility Corridor concept shows more growth in traditional biking areas of Portland, while the scenarios with more investments (Grid and Spiderweb) show more growth in the suburban areas, along with growth in Portland.

Initial findings, cont

- The mobility corridor concept has the largest amount of trips per mile of bike parkway, suggesting that it provides the most bang per buck.
- Portland's central city area and parts of SW, inner SE, NE and North Portland have the highest bicycle mode share and number of bicycle trips in all of the scenarios.
- In all scenarios, bicycle mode share increases the most for commute trips.

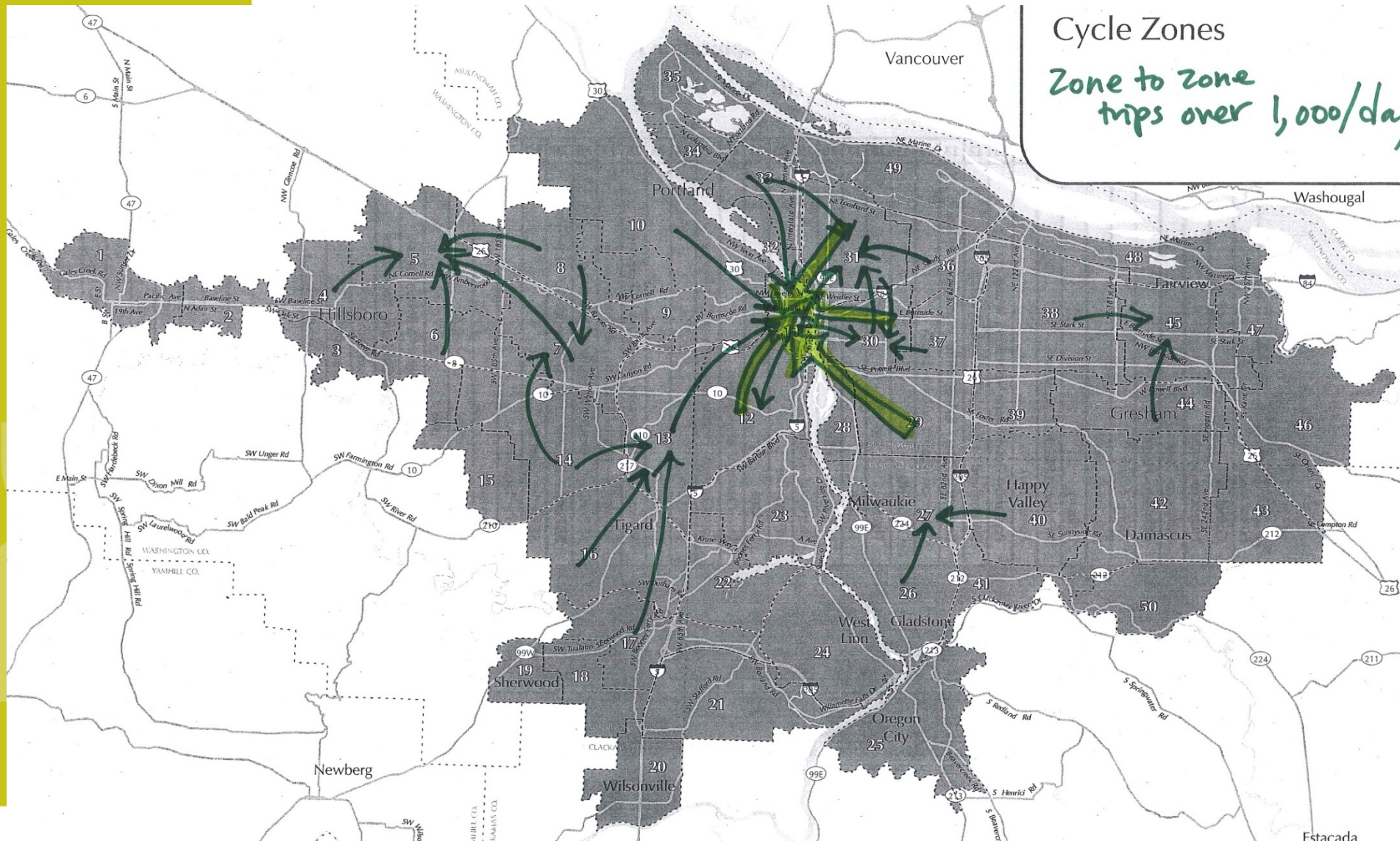
Initial findings, cont

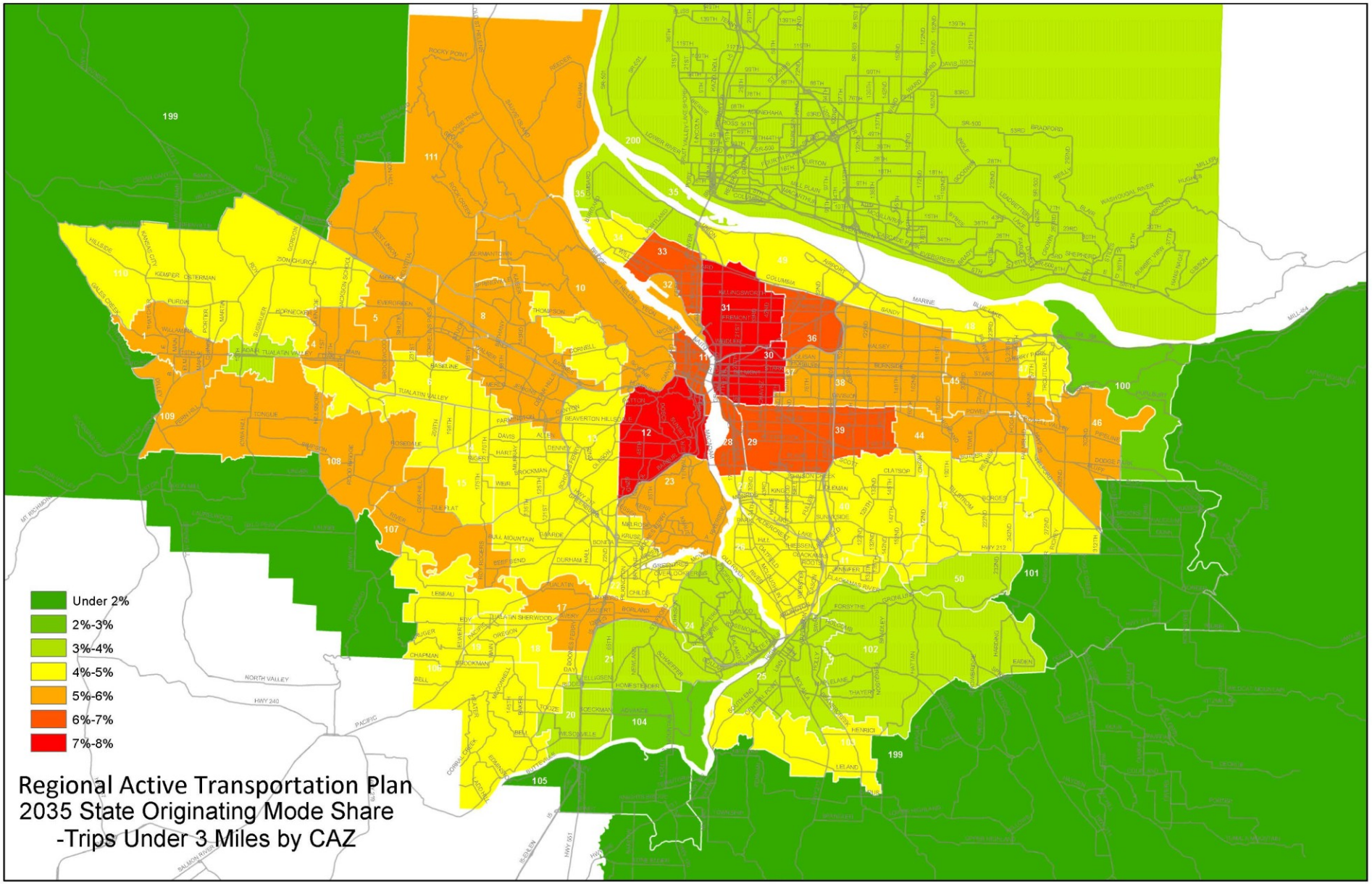
- Diagonal routes show high demand for bicycle travel in all of the scenarios, even with no facilities or only bike lanes.
- Routes on the perimeter of the UGB have substantially lower volumes of bike travel.
- Overall, trails attract trips from other facilities, especially parallel routes.

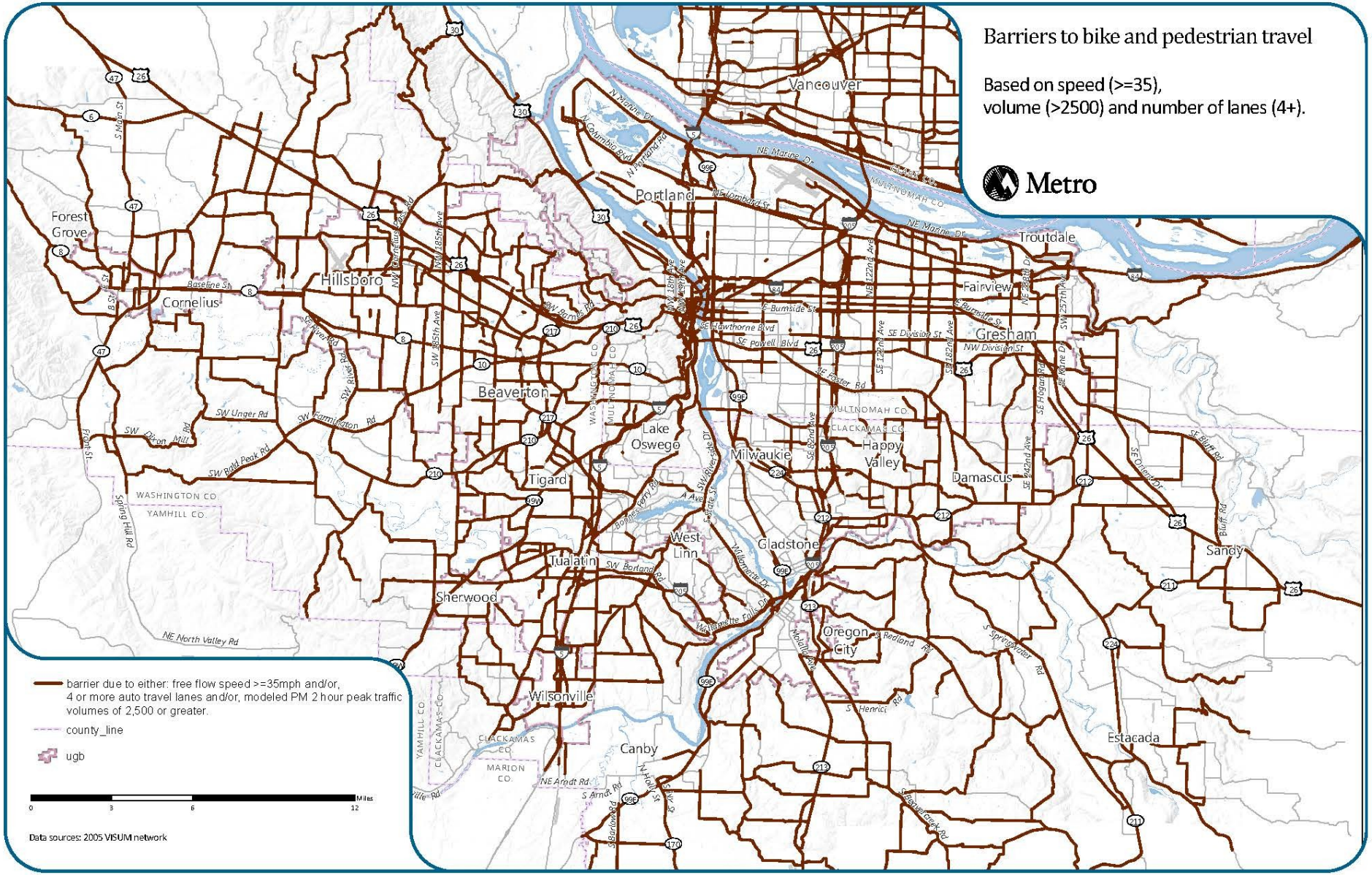
Initial findings, cont

- Land use is important. Bike routes in dense areas with a lot of destinations show higher volumes of trips even without the addition of improvements other than bike lanes.
- Bicycle miles traveled on bike lanes decreases up to 39% from the 2035 network to the network concepts.
- The network concept facilities have about 2.5 times more bike traffic than the average bike facility.

Zone to zone trips over 1,000/day




Under 2%
2%-3%
3%-4%
4%-5%
5%-6%
6%-7%
7%-8%
Regional Active Transportation Plan
2035 State Originating Mode Share
-Trips Under 3 Miles by CAZ


Barriers to bike and pedestrian travel
Based on speed (>=35),
volume (>2500) and number of lanes (4+).
Metro
Vancouver
Portland
Troutdale
Fairview
Gresham
Forest Grove
Hillsboro
Cornelius
Beaverton
Lake Oswego
Tigard
Tualatin
Sherwood
Wilsonville
Canby
Milwaukie
Happy Valley
Damascus
Gladstone
West Linn
Oregon City
Sandy
Estacada
WASHINGTON CO.
YAMHILL CO.
CLACKAMAS CO.
MULTNOMAH CO.
MARION CO.
barrier due to either: free flow speed >=35mph and/or,
4 or more auto travel lanes and/or, modeled PM 2 hour peak traffic volumes of 2,500 or greater.
county_line
ugb
Miles
0
3
6
12
Data sources: 2005 VISUM network

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Date: March 8, 2013
To: Sumi Malek, CH2MHill
CC: ATP Stakeholder Advisory Committee, Lidwien Rahman, ODOT
From: Lake McTighe, ATP Project Manager
Subject: Developing planning level cost estimates for the principal ATP Network

Purpose

Planning level cost estimates for developing the principal regional pedestrian and bicycle networks are needed for the development of the Regional Active Transportation Plan (ATP). This memo provides direction from Metro to CH2MHill for developing an approach for calculating the estimates. CH2MHill will develop the planning level cost estimates for Metro to complete Task 6.4 of the ATP project scope of work.

The ATP will identify the principal regional active transportation network. This network is integrated with public transit and is comprised of regional bicycle parkways, regional pedestrian corridors and regional pedestrian districts. The planning level cost estimates will be used to help identify and prioritize the preferred pedestrian and bicycle network In addition to cost, benefits such as increased access to destinations, increased safety and health, more pedestrian and bicycle activity will also be considered in the prioritization. The results of the cost estimates will be included in the Benefits and Considerations report to be developed by CH2MHill.

What are costs being estimated for?

1. **Three alternative bicycle parkway network concepts –Grid, Spiderweb and Mobility Corridors.** Cost estimates will be provided for each of the bicycle parkway network concepts. Base costs for each of the bicycle concepts are cost of completing the 2035 state RTP bicycle, pedestrian and trail projects.[1] Cost estimates will be provided for new projects not already identified in the 2035 state RTP project list and for bike lane projects in the RTP upgraded to a cycletrack

2. **Proposed principal regional pedestrian network of on and off-street corridors and pedestrian districts.** Cost estimates will be provided by pedestrian corridor, district and trail sidewalk gaps, trail gaps and street crossing improvements of barrier roadways.[2]

3. A project list with planning level cost estimates will be refined for the **Preferred Principal Active Transportation Network** and will incorporate existing projects identified in the

[1] The 2035 RTP state project list does not separate out all bicycle and pedestrian projects, making it difficult determine the cost of only bicycle projects or only pedestrian projects.
[2] Barrier roadways were identified by Metro as part of the 2014-15 RFFA equity analysis from data on the Metro VISUM 2005 network, and are roadways with at least one of the following: free flow speed of 35mph and/or, 4 or more auto travel lanes and/or, modeled PM 2 hour peak traffic volumes of 2500 or greater.

2035 state RTP project list and new projects needed to complete the principal active transportation network. Cost estimates will be provided for the overlapping pedestrian and bicycle preferred network and organized by corridor and/or district. The project list will integrate:

- Planning level cost estimates for improvements that do not have identified existing projects in the RTP.
- Existing projects in the Regional Transportation Plan or other local ped/bike/transportation plans.
- Current funded projects that are under construction or about to be constructed.
- Projects that have applied for 2016-18 state and federal funds project descriptions.[3]

Considerations

1. Costs should be in 2012 dollars for consistency with the update of the RTP. Existing projects incorporated into the final project list for the Preferred Principal Active Transportation Network will be updated to 2012 costs.

2. Cost estimates include a fully built and functioning bicycle and pedestrian parkway including construction, design, engineering and contingency. Costs do not include acquisition of right of way, drainage/stormwater management, landscaping, maintenance, bicycle parking, education or programs. These types of costs should be addressed in the ATP's final recommendations and implementation strategy.

3. Caveats and limitations to the approach and recommendations for future data needs or next steps should be included along with the cost estimates.

Table 1. Planning Level Federalized Capital Costs *

Improvement[4]	Cost per mile, 2012$	Costs include
New 8-10' sidewalk and 7' buffer (parking or planter strip)	$2 million/side	Sidewalk and parking or planter strip buffer, grading, a few sections with walls. Drainage/stormwater management system already in place.
Upgrade existing sidewalk to 8-10' sidewalk and 7' buffer (parking or planter strip)	$1 million/side	Sidewalk upgrade and addition of parking or planter strip buffer if needed, grading, a few sections with walls. Drainage/stormwater management system already in place.
New 12' regional trail	$3 million	Trail, intersection crossings, mitigation, access points, bridge crossings, trailheads, signage and lighting. Assumes some ROW may be needed.
Upgrade existing trail in 2035 network to 12-14',	$1.5 million	Widen existing trails 4' from 8' to12' or 10' to 14', repave if needed, lighting, signage, intersection crossings, improved access points.
New bicycle boulevard	$250,000	Signage, markings, speed humps, traffic diversion, crossing elements and any other elements to develop a complete bicycle boulevard.
Upgrade existing bicycle boulevard	$100,000	Improve crossings, add signage, fix identified, deficiencies, etc.
New or upgraded separated 8-10' in-roadway bikeway	$1 million/side	Costs include signal timing, lane reconfigurations, striping, raised curbs, no drainage needed.

[3] Overlaps in projects of the pedestrian and bicycle network will be accounted for.
[4] Upgrades costs applied to existing substandard infrastructure or to projects indentified in the 2035 RTP.

Improvement[4]	Cost per mile, 2012$	Costs include
Improved or new crossings	$80,000/crossing of five lane arterial	Costs are for a typical 4-5 lane arterial, includes treatments such as rapid flash beacons, curb ramps, median island, signage, striping.

*Cost opinions do not include acquisition of right-of-way

Additional cost estimate details

Included in Sidewalk Cost Opinion
Proposed sidewalk widths are consistent with guidelines for regional and community boulevards and streets described in Metro's "Creating Livable Streets – Street Design Guidelines" (2002). The per mile unit cost was developed by Metro based on the costs included in the table below to provide a general federalized capital cost that assumes no acquisition of right-of-way and no drainage required.

Table 2: Sidewalk Costs

New 8-10' sidewalk, no curb	10.00/SF 60.00/LF
New curb	16.00/LF
Grading	17.50/CY
Retaining Wall	250.00/LF
Surveying, Design	30%
Construction Engineering	20%
Administration	35%
Contingency	20%

Included in Trail Cost Opinion
Planning level per mile unit costs for trails are an average per mile cost of twenty trails in the Portland region developed by Alta Planning and Design and described in the 2009 report "Connecting Green Trails, Cost Estimates, Benefits and State of Development for Twenty Regional Trails". The report estimated 229 miles of trail gaps for the twenty trails. The cost opinion for capital was estimated at $518,140,636. The federalized cost opinion estimate was $673,585, 827. The cost opinion for acquisition was $507,414,959. The cost opinion for administrative costs was $7,535,000. Using the federalized cost opinion plus the administrative cost opinion divided by the 229 miles of trail gaps Metro developed a per mile cost opinion of $3,000,000 for federalized capital costs. The following table provides the costs Alta Planning and Design used to determine the cost estimates for the twenty trails.

Table 3. Regional Trail Costs

12' Trail common condition	39.75/LF
Add for difficult soils	23.00/LF
Add for 4' fill	20.71/LF
Add for 4' cut	37.68/LF
Add for parallel to stream	99.90/LF
Add for wetland mitigation	262.50/LF
12'wide boardwalk	600.00/LF
14" wide bridge	3,500.00/LF
Intersection	8,760.00 EA
Signalized intersection	131,760.00 EA
Trailhead	78,267.60 EA
High visibility crosswalk	3,000.00 EA
Contingency: concept alignment	40%
Contingency: master planned	35%

Alta Planning and Design, 2009

Table 4. Cost Opinion Summary, Twenty Regional Trails

Total gap length	229
Capital cost opinion	$518,140,636
Federalized cost opinion	$673,582,827
Cost opinion for acquisition	$507,414,959
Cost opinion for administrative costs	$7,535,000

Alta Planning and Design, 2009

Included in bikeway costs

Costs for bicycle boulevards and separated in-roadway bikeways are based on per mile project cost estimates used in the *Portland Bicycle Plan for 2030*, costs (Chapter 5 and Appendix A) and a report developed by the Initiative for Bicycle and Pedestrian Innovation (IBPI) *Draft Report - Cost Analysis of Bicycle Facilities*, (November 2011). The table below provides examples of the range of costs for bicycle boulevards and cycle tracks. Portland has developed the most bicycle boulevards in the region. Costs range from $70,000/ mile to 200,000/mile. In planning for new cycle track facilities the City or Portland is using an estimate of $275/FT or $1.5M/mile.

Table 5. Cost examples, Bicycle Boulevards and Cycle tracks in Portland

Bicycle Boulevard - include signage, street markings, speed humps, traffic circles, bike boxes, intersection crossings	North Concord Neighborhood Greenway, Portland - Total cost approx $184,000 total cost, $73,600/mile	North 80s Greenway, Portland. Total cost approx $520,000, $200,000/mile.	SE Center-Gladstone Neighborhood Greenway, Portland. Total cost $300,000, $168,000/mile.
Cycle tracks	Street level cycle track $132,000/mile. Broadway cycle track 1,800 feet, $44,623 or $25/ft.	Raised concrete two way cycle track $698/foot, $3.6M/mile (Portland)	Raised cycle track, $275/foot, $1.5M/mile (Portland) Cully Cycle Track, ($360,000/mile)Portland

Information found in the IBPI *Draft Report - Cost Analysis of Bicycle Facilities*, (November 2011)

Table 6. Raised Concrete Cycle Track Costs

2-way raised concrete cycle track, construction	93.00/LF
Project management	23.00/LF
Engineering	23.00/LF
Administration/overhead	78.00/LF
Contingency	58.00/LF

Why are Right-of-Way costs not included?

- Comprehensive regional data for existing right-of-way does not exist. Metro has developed a polygon shapefile showing all right-of-way in the region (approximately 16% of all land), but that data is not yet available by street or trail segment. Local right-of-way data is in varying formats and is not easily combined into a regional data set.
- Metro has some data providing a unit cost for ROW acquisition for trail corridors, developed for 20 trail projects in the region. However recent experience with acquisition has shown those unit cost estimates are probably too high and should not be used.
- Metro investigated developing a unit cost per mile for right-of-way acquisition for on-street bikeways. However, right-of-way acquisition costs vary widely depending on the value of the land and seller willingness. Developing a standard cost for ROW acquisition for the region is therefore unrealistic.
- There are very few instances, if any, in the U.S. where a DOT has acquired ROW solely for a bikeway project, such as a cycletrack. Acquiring ROW for sidewalk expansion is also rare. In instances where bicycle and pedestrian projects are developed on new ROW, the ROW was acquired to expand capacity for autos. It is safe to assume that this trend will continue and that the addition of separated on-street bikeways and sidewalk expansions will, in most circumstances, need to be accommodated in existing ROW through roadway reconfigurations or as part of larger roadway projects.

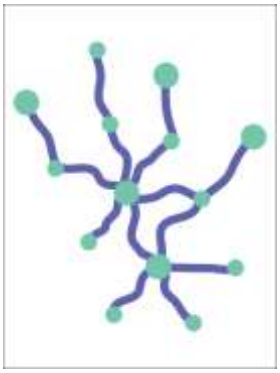
Regional Active Transportation Plan

Regional Bicycle and Pedestrian Network Concepts & Functional Classes

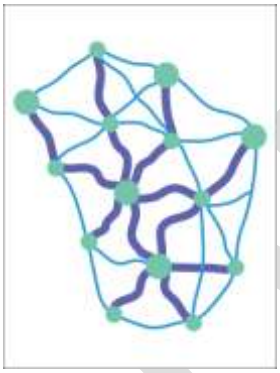
REGIONAL BICYCLE NETWORK CONCEPT

A dense network of off-street trails, in-street separated bikeways, bicycle boulevards and other bicycle facilities make up the regional bicycle network. The regional bicycle network has a functional hierarchy similar to that of a street network.

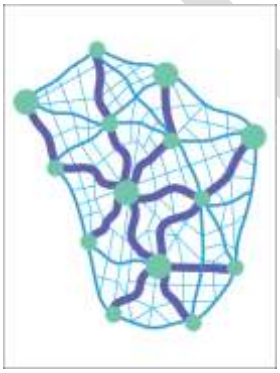
Regional Bicycle Districts are areas, such as the region's urban centers, where bicycle activity is highest or has the potential to be high.



Regional Bicycle Parkways are a new functional class for bicycles and are the highest functional class for bicycle facilities. Bicycle Parkways are high quality and high priority routes and make up the spine of the bicycle network – the highways of bicycle travel. They provide safe, comfortable and efficient bicycle travel within and between centers. They provide connections to key destinations and routes outside of the region. Parkways can be any type of facility designed to parkway standards. Facility types can include off-street trails, separated in-street bikeways and bicycle boulevards. When pedestrian share the facility, such as on trails, adequate width and separation are provided.



Community Bikeways combine and replace the 2035 RTP functional classes of regional and community bikeways. Community bikeways can be any type of facility, including off-street trails, separated in-street bikeways and bicycle boulevards. On-street community bikeways located on arterial and collector streets are designed to provide separation from traffic on streets with higher auto speeds and volumes. Community bikeways provide connections to regional bicycle parkways and to destinations that parkways do not reach– they are the arterials of bicycle travel.



Local Bikeways are a new functional classification and include trails, streets and connections not identified as regional bicycle parkway or community bikeway. Local bikeways are the local collectors of bicycle travel. They are typically shorter routes with less bicycle demand and use. These routes are not identified on the regional bicycle map, but are an important part of the system allowing for door to door bicycle travel.

Regional Active Transportation Plan

Regional Bicycle and Pedestrian Network Concepts & Functional Classes

REGIONAL PEDESTRIAN NETWORK CONCEPT
All streets (except limited access highways) and off-street trails are part of the regional pedestrian network. The regional pedestrian network is organized into functional classes.

Principal Regional Pedestrian Network – Corridors and Districts is the highest functional class of pedestrian facilities. They are high quality and high priority routes and areas. A connected network of on and off-street corridors anchored by pedestrian districts provide access to transit and key destinations in the region. Pedestrian districts are the region's urban centers where pedestrian activity is highest. Principal on-street corridors mirror frequent transit routes. Multi-use and pedestrian only trails provide off-street corridors, connecting to the on-street network, transit and nature. All regional bicycle parkways are also principal regional pedestrian corridors. When bicycles share the facility, such as on trails, adequate width and separation are provided. The principal pedestrian network provides the spine for regional pedestrian corridors and local pedestrian corridors to make a complete regional pedestrian network.

Community Pedestrian Corridors is the second highest functional class of the regional pedestrian network and the second highest priority. On-street community pedestrian corridors are any major or minor arterial on the regional arterial network that is not part of the principal regional pedestrian network. Off-street community pedestrian corridors are community trails not included in the principal regional pedestrian network. Community pedestrian corridors experience less transit access and/or pedestrian activity.

Local Pedestrian Connectors are all streets and trails not included in the principal regional or regional corridor networks. Local connectors experience lower volumes of pedestrian activity and on-street connectors are typically on residential and low-volume/speed roadways. Connectors, however, are an important element of the regional pedestrian network because they allow for door-to-door pedestrian travel.

Regional Active Transportation Plan

Regional Bicycle and Pedestrian Network Concepts & Functional Classes

FUNCTIONAL CLASS AND DESIGN TYPES – ORGANIZATION STRUCTURE

Tables below are provided for discussion purposes. The templates illustrate how design types for different facilities in each of the functional classifications for the regional bicycle and pedestrian network could be organized. High level design principles would be provided for each design type of each functional classification.

Table 1: Regional Bicycle Network Functional Classification Design Types

Functional Class 1 (FC-1) **Regional Bicycle Parkway** The highest functional class for bicycle facilities. High quality and high priority routes, the highways for bicycle travel, connecting to and through regional centers. Parkways can be any type of facility designed to parkway standards, including off-street trails, separated in-street bikeways and bicycle boulevards.	**Functional Class 2 (FC-2)** **Community Bikeway** High-quality routes with seamless connections to bicycle parkways. Community bikeways can be any type of facility, including off-street trails, bike lanes and bicycle boulevards. On-street community bikeways located on arterial and collector streets are designed to provide separation from traffic on streets with higher auto speeds and volumes.	**Functional Class 3 (FC-3)** **Local Bikeway** Primarily local streets and trails providing the door to door connections for bicycle travel. They are typically shorter routes with less bicycle demand and use. Includes all streets and trails not identified as a bicycle parkway or community bikeway.
Design Type A Off-street • Minimum width of 12'; additional width or bifurcation where demand warrants. • Marked high-visibility crosswalks at all crossings of collector and arterial roads, additional crossing features where appropriate. • Lighting is desirable. • Bike signals and detection at signals are desirable.	Design Type A Off-street • Minimum width of 10'. • Marked crosswalks at all crossings of collector and arterial roads, additional crossing features where appropriate. • Lighting may be desirable.	Design Type A Off-street • Local standards apply.
Design Type B Low traffic street (ADT <6,000 and posted speed is 30 or less) • Where ADT <3,000, bike boulevard treatments including traffic calming and diversion measures may be appropriate. • Where bike boulevard treatments are not used, 6' bike lanes are minimum treatment (preferred 7'). • Crossing treatments at all crossings of collector and arterial roads. • Context-based traffic calming is desirable.	Design Type B Low traffic street • Where ADT <3,000, bicycle boulevard treatments including traffic calming and diversion measures may be appropriate. • Where bike boulevard treatments are not used, 5' bike lanes are minimum treatment (preferred 7').	Design Type B Low traffic street • Local standards apply.

Design Type C High traffic street (ADT >6,000 or posted speed is 35 or more) • Separation from vehicle traffic is critical. Use cycle tracks, buffered bike lanes (minimum 6' lane, 4' buffer), parallel trail, or parallel low-traffic street. • Attention to treatment of intersections and driveways is critical. Preferential treatments such as green coloring, bike boxes, bike signals, turn queue boxes, and advance stop lines should be used as appropriate. • Arterial-type traffic calming is desirable.	Design Type C High traffic street • 5' bike lanes are minimum treatment (preferred 7'). • Separation/buffer from vehicle traffic is desirable. • Attention to treatment of intersections and driveways is desirable. Preferential treatments such as green coloring, bike boxes, bike signals, turn queue boxes, and advance stop lines may be used as appropriate.	

Table 2: Regional Pedestrian Network Functional Classification Design Types

Functional Class 1 (FC-1) **Principal Regional Pedestrian Corridors and Districts** Highest functional class of pedestrian facilities for the regional network. Includes off-street corridors, on-street corridors and pedestrian districts. Pedestrian districts are the region's urban centers where pedestrian activity is highest. Principal on-street corridors mirror frequent transit routes. Off-street corridors are also bicycle parkways.	**Functional Class 2 (FC-2)** **Community Pedestrian Corridors** Second highest functional class of the regional pedestrian network. On-street community pedestrian corridors are any major or minor arterial on the regional arterial network that is not part of the principal regional pedestrian network. Off-street community pedestrian corridors are regional trails not included in the principal regional pedestrian network. Community pedestrian corridors experience less transit access and/or pedestrian activity than the principal network.	**Functional Class 3 (FC-3)** **Local Pedestrian Connectors** All streets and trails not included in the principal regional or regional corridor networks. Local connectors experience lower volumes of pedestrian activity and on-street connectors are typically on residential and low-volume/speed roadways. Allow for door-to-door pedestrian travel.
Design Type A Off-street • Minimum width of 10'; additional width or bifurcation where demand warrants. • Marked crosswalks at all crossings of collector and arterial roads, additional crossing features where appropriate. • Crosswalk lighting is critical. • Pedestrian countdown heads at all signals. • Short signal cycle lengths (90s or less), pedestrian-friendly timing, and lead pedestrian intervals at signals are desirable.	Design Type A Off-street • Minimum width of 8'. • Marked crosswalks at all crossings of collector and arterial roads, additional crossing features where appropriate. • Lighting may be desirable.	Design Type A Off-street • Local standards apply.

Design Type B On-street corridor • Minimum sidewalk plus buffer width of 17' where ADT >12,000 or posted speed is 40 or more, and 10' where ADT <12,000 and posted speed is 35 or less. • Buffer width includes width of on-street parking, landscape buffer, furnishing zone. • Pedestrian clear zone of 6' or more. • Street trees between roadway and pedestrian clear zone. • Marked crosswalks provided ≤530' spacing along corridor where feasible • Crossing features such as refuge islands, curb extensions, raised crosswalks, raised intersections, and beacons or signals where appropriate. • Lighting at all crosswalks. • Pedestrian-scale lighting along corridor. • Pedestrian countdown heads at all signals. • Short signal cycle lengths (90-s or less), pedestrian-friendly timing, and lead pedestrian intervals at signals are desirable. • Walkable street-fronting retail uses and on-street parking is desirable in centers and along Main Streets. • Medians desirable along corridors with 4+ lanes. • Street or sidewalk connectivity ≤530' spacing along corridor. • Minimize driveway count and width. • Context-based traffic calming is desirable.	Design Type B On-street corridor • Minimum sidewalk plus buffer width of 14' where ADT >12,000 or posted speed is 40 or more, and 10' where ADT <12,000 and posted speed is 35 or less. • Buffer width includes width of on-street parking, landscape buffer, furnishing zone. • Pedestrian clear zone of 5' or more. • Street trees between roadway and pedestrian clear zone. • Marked crosswalks provided every 530 feet along corridor where feasible • Crossing features such as refuge islands, curb extensions, and beacons or signals where appropriate. • Lighting at all crosswalks. • Pedestrian-scale lighting along corridor. • Pedestrian countdown heads at all signals. • Short signal cycle lengths (90-s or less), pedestrian-friendly timing, and lead pedestrian intervals at signals are desirable. • Street or sidewalk connectivity ≤530' spacing along corridor.	Design Type B On-street corridor • Local standards apply.

Regional Active Transportation Plan

Regional Bicycle and Pedestrian Network Concepts & Functional Classes

PRIORITIZATION TIERS FOR BICYCLE AND PEDESTRIAN NETWORK IMPLEMENTATION

The table below is provided for discussion purposes and illustrates an approach to prioritizing projects from the regional bicycle and pedestrian networks. This approach proposes three tiers of projects. Tier 1 includes projects that have recently been funded or are seeking MTIP and STIP funding. Tier two includes projects that are high priority and would be prepared to seek funding in the next round of state and federal funding. Tier 2 consists primarily of regional bicycle parkways and principal regional pedestrian corridors. The Tier 2project list would be used to develop and seek potential new funding sources, demonstrating regional coordination and prioritization. Tier 3 includes projects to be completed in the long term. Tier 3 may include high priority projects that require extensive coordination and stakeholder support. Projects are organized by types:

- Major Projects (e.g. Sullivan's Gulch Trail)
- Pedestrian & Bicycle Districts/Centers (e.g. Rockwood pedestrian improvements, Hollywood bike district)
- Programmatic Bucket of smaller projects (under $1 M) by jurisdiction, area, corridor, theme, etc

Tier 1- Short Term (0-5 years; funded and seeking funding)
Major Projects – Bicycle Parkways and Principal Pedestrian Corridors
Project 1
Project 2
Pedestrian and Bicycle Districts – Centers
Project 1
Project 2
Program Buckets
Project 1
Project 2
Tier 2- Near Term (5-15 years; next rounds of federal and state funding, new funding source)
Major Projects – Bicycle Parkways and Principal Pedestrian Corridors
Project 1
Project 2
Pedestrian and Bicycle Districts – Centers
Project 1
Project 2
Program Buckets
Project 1
Project 2
Tier 3- Long Term (15+ years)
Major Projects – Bicycle Parkways and Principal Pedestrian Corridors
Project 1
Project 2
Pedestrian and Bicycle Districts – Centers
Project 1
Project 2
Program Buckets
Project 1
Project 2

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Metro | *Memo*

Date: March 7, 2013 (Updated)
To: ATP Stakeholder Advisory Committee (SAC)
From: Lake McTighe, Metro
Subject: Proposed approach - Measuring improved access to destinations

Purpose
Analysis of the regional pedestrian network for the Active Transportation Plan (ATP) includes evaluating access to destinations within the network. This memo outlines Metro's proposed approach to determining which destinations should be included in the evaluation. This memo also responds to the SAC pedestrian workgroup's question as to whether a comprehensive set of destinations or a limited set of destinations defined as regional should be used.

Background
As part of the ATP the regional pedestrian network will be evaluated using the criteria of access, safety, equity and increased (pedestrian) activity. The regional pedestrian network includes pedestrian districts (regional and town centers and station communities) and pedestrian corridors (mixed-use and high frequency transit and trails). The pedestrian corridors and districts are highlighted as regional focus areas for pedestrian investments in the Regional Transportation Plan.

The Stakeholder Advisory Committee for the ATP needs to determine which destinations are used in the analysis for evaluating the access criteria. At the Oct. 18 meeting the SAC discussed using destinations identified as regional, such as those used in Metro's High Capacity Transit analysis with the addition of regional parks and high frequency transit stops. At that meeting the SAC agreed that using destinations identified as regional would be appropriate but that the types of destinations still needed to be determined. Subsequently, Metro and Alta Planning and Design developed a proposed methodology for evaluating the regional pedestrian network, and proposed using a more detailed set of data for destinations, using the US Census North American Industry Classification System (NAICS) codes data. The NAICS codes provide data, including location, of a wide range of businesses and services. Metro utilized this data in the 2014-15 RFFA Equity Analysis and identified a set of essential services and destinations.

Proposed Approach
Metro staff proposes the following approach to address the question of which destinations to evaluate for the access criterion.

1. **Use the NAICS data for the evaluation of improvements to the regional pedestrian network.** [1]Discussions with Alta Planning have led staff to understand that the evaluation will be less revealing with a more limited set of regional destinations. That is, it will be more difficult to determine how much access has improved on the network. Alta had proposed the option of running a "proof of concept analysis" in order to compare what the

[1] A list of the proposed destinations that would be included are attached. More detail on each destination type can be found by searching: http://www.census.gov/cgi-bin/sssd/naics/naicsrch

two types of analysis would look like, but Metro staff determined that this extra step will delay the project.

2. **Develop a list of regional destinations, see below.**

3. **Identify if there are regional destinations that do not fall within with a regional pedestrian district or corridor.** Regional destinations will be overlaid with the regional pedestrian network in order to identify any regional destinations that are not located on or near the regional pedestrian network. The SAC can then determine if some sort of regional connection to the destination should be explored.

4. **Use the "regional destinations" to help prioritize investments within the regional pedestrian and bicycle networks in Phase 3 of the ATP.** The set of agreed upon regional destinations can be used as one piece of information to help determine a phased investment strategy for the regional pedestrian network.

Key Regional Destinations
This set of destinations is similar to the "regional attractors" defined in Metro's High Capacity Transit Analysis (see attached) and to regional destinations identified in Metro's SW Corridor project which are being used to help prioritize investments; the SW Corridor includes town centers.

1. **Business.** Employment sites with 300 or more employees (Data source: ESRIO Business Analyst) (includes regional sports and attraction sites such as Oregon Zoo, OMSI, Jen Weld, Rose Stadium).
2. **Significant bust stops.** High ridership bus stop locations identified in TriMet Pedestrian Network Analysis (Data source: RLIS. Light rail stations are already captured within station communities in the pedestrian network.)
3. **Regional shopping centers.** See list below (Data source: Points created from Internet search)
4. **Hospitals.** Major hospitals and medical centers (Data source: RLIS)
5. **Education.** Colleges, universities and high schools (Data source: RLIS)
6. **Regional parks.** See list below, compiled by Metro based on interviews with jurisdictions and park providers. (Data source: RLIS)
7. **City Halls.** (Data source: RLIS)
8. **Social services.** 200 monthly LIFT pickups (Data source: TriMet paralift service data)
9. **Airports.** (Data source: RLIS)
10. **Libraries.** (Data source: RLIS)

Regional Parks Identified on Regional Destinations Map
Regional parks list was developed based on Metro interviews with park providers in the summer of 2010.
Cook Park and Community Park
Forest Park
Mt. Tabor
Washington Park
Powell Butte
Tualatin Wildlife refuge
Fern Hill Wetlands
Scouter Mountain
Tualatin River and Upper Dairy Creek
Bald Peak
Wapato Lake

Carver Park
Durham City Park (next to Cook Park)
Oaks Bottom
Main City Park (Gresham)
Hogan Butte
Gresham Fairview Sports Park
Jackson Bottom
Noble Wood
Millenium Plaza
Luscher Farm
Homewood Park
Hood View, North Clack Park, Aquatic Park, Mt. Talbert, Eagle Fern, Meltzer, Madrone Wall
Smith and Bybee Wetlands
Sauvie Island

Regional Shopping Centers

Name	City	Year opened	Stores
Bridgeport Village	Tigard Tualatin	2005	90
Cascade Station	NE Portland	2007	25
Cedar Hills Crossing	Beaverton	1969	68
Clackamas Promenade	Clackamas	1989	30
Clackamas Town Center	Clackamas	1981	185
Eastport Plaza	SE Portland	1960	
Fubonn Shopping Center	SE Portland	2006	29
Jantzen Beach SuperCenter	N Portland	1972	39
Lloyd Center	NE Portland	1960	200
Mall 205	SE Portland	1970	40
Pioneer Place	Downtown Portland	1990	100
Sunset Esplanade	Hillsboro	1989	35
The Streets of Tanasbourne	Hillsboro	2004	55
Washington Square	Tigard	1973	170

Active Transportation Plan

Regional Destinations

Shows overlap of regional destinations with regional pedestrian, bicycle and frequent transit routes, city and town centers and station communities. Regional destinations are major attractors and trip generators that serve many people and include: large employers, colleges and high schools, libraries, regional shopping centers, airports, hospitals and major medical centers, regional parks, major social service sites and bus stops with high volumes of riders.

Vancouver
Portland
Washougal
Forest Grove
Cornelius
Hillsboro
Beaverton
Tigard
Lake Grove
Sherwood
Wilsonville
Milwaukie
Gresham
Fairview
Happy Valley
Damascus
Boring
Sandy
West Linn
Gladstone
Oregon City
Estacada
MULTNOMAH CO.
WASHINGTON CO.
CLACKAMAS CO.
YAMHILL CO.
N Marine Dr
NE Marine Dr
N Columbia Blvd
N Portland Rd
N Denver Ave
N Interstate Ave
NE Lombard St
NW Yeon Ave
NW Cornell Rd
NE Cornell Rd
NW Amberwood Dr
NW 185th Ave
NW Glencoe Rd
NW Gales Creek Rd
NW Scoggins Valley Rd
Pacific Ave
19th Ave
B St
N Adair St
Baseline St
SW Baseline St
SW Oak St
SE River Rd
NW Barnes Rd
SW Ballou Rd
W Burnside Rd
NW Lovejoy St
NE Weidler St
W Burnside St
E Burnside St
SW Harbor Dr
SW 185th Ave
SW Watson Ave
SW Canyon Rd
SE Powell Blvd
NE Sandy Blvd
NE 82nd Ave
NE 122nd Ave
NE 181st Ave
NW 257th Ave
SE Stark St
SE Division St
NW Burnside Rd
W Powell Blvd
SE Foster Rd
SE Hogan Rd
SE Kane Dr
SE Orient Dr
SE Bluff Rd
SE Compton Rd
SE Sunnyside Rd
SE 242nd Ave
SW Barbur Blvd
SW Capitol Hwy
SW Multnomah Blvd
SW Taylors Ferry Rd
SW Dosch Rd
SW Kruse Way
Boones Ferry Rd
A Ave
S State St
SW Dunkan Rd
SW Tualatin Sherwood Rd
SW Boones Ferry Rd
SW 65th Ave
SW Bonard Rd
SW Stafford Rd
Willamette Falls Dr
S Clackamas River Dr
S Redland Rd
S Springwater Rd
Beavercreek Rd
S Henrici Rd
S Beavercreek Rd
SE 1st Ave
Pioneer Blvd
Bluff Rd
SW Unger Rd
SW Farmington Rd
SW Dixon Mill Rd
SW Laurelwood Rd
SW Bald Peak Rd
SW River Rd
SW Hardebeck Rd
E Main St
Spring Hill Rd
N Main St
S Main St

Regional park	Hospital	Services[4]
School[1]	Library	
Business[2]	City hall	
Shopping center	Significant bus stop[3]	
Airport	Regional active transportation network	

[1] High schools, colleges and universities. [2]Employment sites with 300 or more employees.
[3]High ridership bus stop locations identified by TriMet. [4]Tri Met LIFT paratransit service.

0 2.5 5 Miles