600 NE Grand Ave.
Portland, OR 97232-2736

Metro | *Agenda*

Meeting:	ATP Stakeholder Advisory Committee meeting
Date:	February 21, 2013
Time:	3-5 p.m.
Place:	Room 501, Metro, 600 NE Grand Ave., Portland, 97232
Purpose:	Bicycle and Pedestrian Network Evaluation

3:00	Meeting overview, project updates/timeline, approve Jan. 10 meeting minutes
3:15	Discussion on Regional Bicycle and Pedestrian Network Concepts – functional class and "layers" of the networks *Refer to document titled "Regional Bicycle and Pedestrian Network Concepts and Functional Classes" and Bicycle and Pedestrian Concept maps. Objective is for the SAC to provide feedback on the direction of the network concepts, functional classifications, and proposed approaches to organizing design types by functional class and organizing priorities into implementation tiers*
4:00	Regional Pedestrian Network Analysis –preliminary evaluation results of access criterion (materials will be distributed at meeting) *Alta will present the preliminary results of the analysis for the access criterion and measures*
4:45	Benefits and Trade-Offs report outline *CH2MHill is developing a benefits and trade-offs report that will synthesize the bicycle and pedestrian evaluation analysis results with supporting literature. Objective is for the SAC to comment on the organization of the report.*
5:00	Adjourn

*If time allows, update from SAC members on STIP and RFF projects

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

Meeting materials

Discussion items

1. Regional Bicycle and Pedestrian Network Concepts and Functional Classes
2. Bicycle and Pedestrian Network Concept maps
3. Benefits and Trade-Offs report outline
4. (Alta regional pedestrian analysis materials will be provided at the meeting)

Other materials

5. ATP meeting schedule
6. Regional Barriers map *(identifies barriers to active travel; barriers used in the pedestrian network analysis)*
7. Final revisions to "Principles and Criteria" and clean copy
8. Revised Alta memo "Regional Pedestrian Network Flow Analysis Methodology", track changes and clean copy
9. Revised memo "Proposed improvements for evaluating pedestrian network" track changes
10. Revised memo "Proposed approach – measuring improved access to destinations" track changes
11. Revised "Proposed Evaluation Methodology for Regional Bicycle Parkway Network Concepts" memo, track changes
12. Notes from 1/10/13 meeting

Upcoming SAC meeting dates

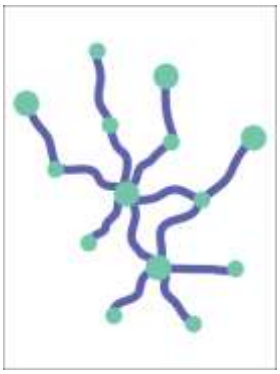
Thursday, March 21, 3-5 p.m.
Thursday, May 2, 3-5 p.m.
Thursday, June 6, 3-5 p.m.

Regional Active Transportation Plan

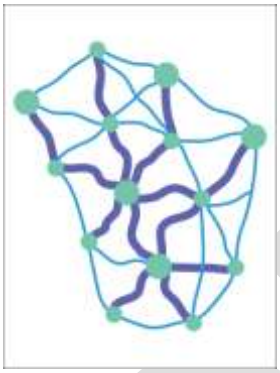
Regional Bicycle and Pedestrian Network Concepts & Functional Classes

REGIONAL BICYCLE NETWORK CONCEPT

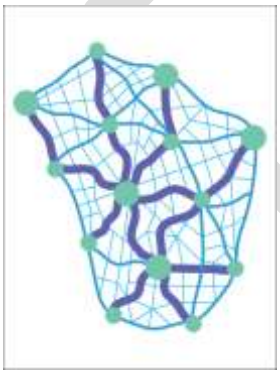
A dense network of off-street trails, in-street separated bikeways, bicycle boulevards and other bicycle facilities make up the regional bicycle network. The regional bicycle network has a functional hierarchy similar to that of the regional street and throughway network.



Regional Bicycle Parkways are a new functional class for bicycles and are the highest functional class for bicycle facilities, providing the highways of bicycle travel. Bicycle Parkways make up the spine of the bicycle network and allow for long distance intra-regional trips, connecting centers and 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. Implementation requires cross-jurisdictional coordination and strong stakeholder support. Bicycle parkways are the highest priority for the regional bicycle network.



Regional Bikeways combine and replace the 2035 RTP functional classes of regional and community bikeways. Regional bikeways can be any type of facility, including off-street trails, separated in-street bikeways and bicycle boulevards. On-street regional bikeways located on arterial and collector streets are designed to provide separation from traffic on streets with higher auto speeds and volumes. Regional bikeways provide connections to regional bicycle parkways and provide to destinations that parkways do not reach– they are the arterials of bicycle travel. Implementation requires some cross-jurisdictional coordination and strong stakeholder support. Regional bikeways are the second highest priority for the regional bicycle network.



Local Bikeways are a new functional classification and include trails, streets and connections not identified as regional bicycle parkway or regional bikeway. Local bikeways are the local collectors of bicycle travel. They are typically shorter routes with less bicycle demand and use. Implementation carried out primarily by local jurisdiction and requires no cross-jurisdictional coordination. Not all local bikeways are eligible for federal funding.

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 and the highest priority for the regional pedestrian network. A connected network of on and off-street corridors anchored by pedestrian districts that 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. The principal pedestrian network provides the spine for regional pedestrian corridors and local pedestrian corridors to make a complete regional pedestrian network. Implementation requires cross-jurisdictional coordination and strong stakeholder support.

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. Implementation of the corridors can require cross-jurisdictional coordination.

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. Implementation carried out primarily by local jurisdictions and requires no cross-jurisdictional coordination. Not all local connectors are eligible for federal funding.

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** (Insert Description)			**Functional Class 2 (FC-2)** **Regional Bikeway** (Insert Description)			**Functional Class 3 (FC-3)** **Local Bikeway** (Insert Description)	
Design Type 1 Off-street Insert Design Principles	Design Type 2 Low traffic street Insert Design Principles	Design Type 3 High traffic street Insert Design Principles	Design Type 1 Off-street Insert Design Principles	Design Type 2 Low traffic street Insert Design Principles	Design Type 3 High traffic street Insert Design Principles	Design Type 1 Off-street Insert Design Principles	Design Type 2 Low traffic street Insert Design Principles

Table 2: Regional Pedestrian Network Functional Classification Design Types

Functional Class 1 (FC-1) **Principal Regional Pedestrian Corridors and Districts** (Insert Description)		**Functional Class 2 (FC-2)** **Regional Pedestrian Corridors** (Insert Description)		**Functional Class 3 (FC-3)** **Local Pedestrian Connectors** (Insert Description)	
Design Type 1 Off-street path Insert Design Principles	Design Type 2 On-street corridor Insert Design Principles	Design Type 1 Off-street path Insert Design Principles	Design Type 2 On-street corridor Insert Design Principles	Design Type 1 Off-street path Insert Design Principles	Design Type 2 On-street corridor Insert Design Principles

Regional Active Transportation Plan

Regional Bicycle and Pedestrian Network Concepts & Functional Classes

PRIORITIZATION TIERS FOR BICYCLE AND PEDESTRIAN NETWORK IMPLEMENTATION

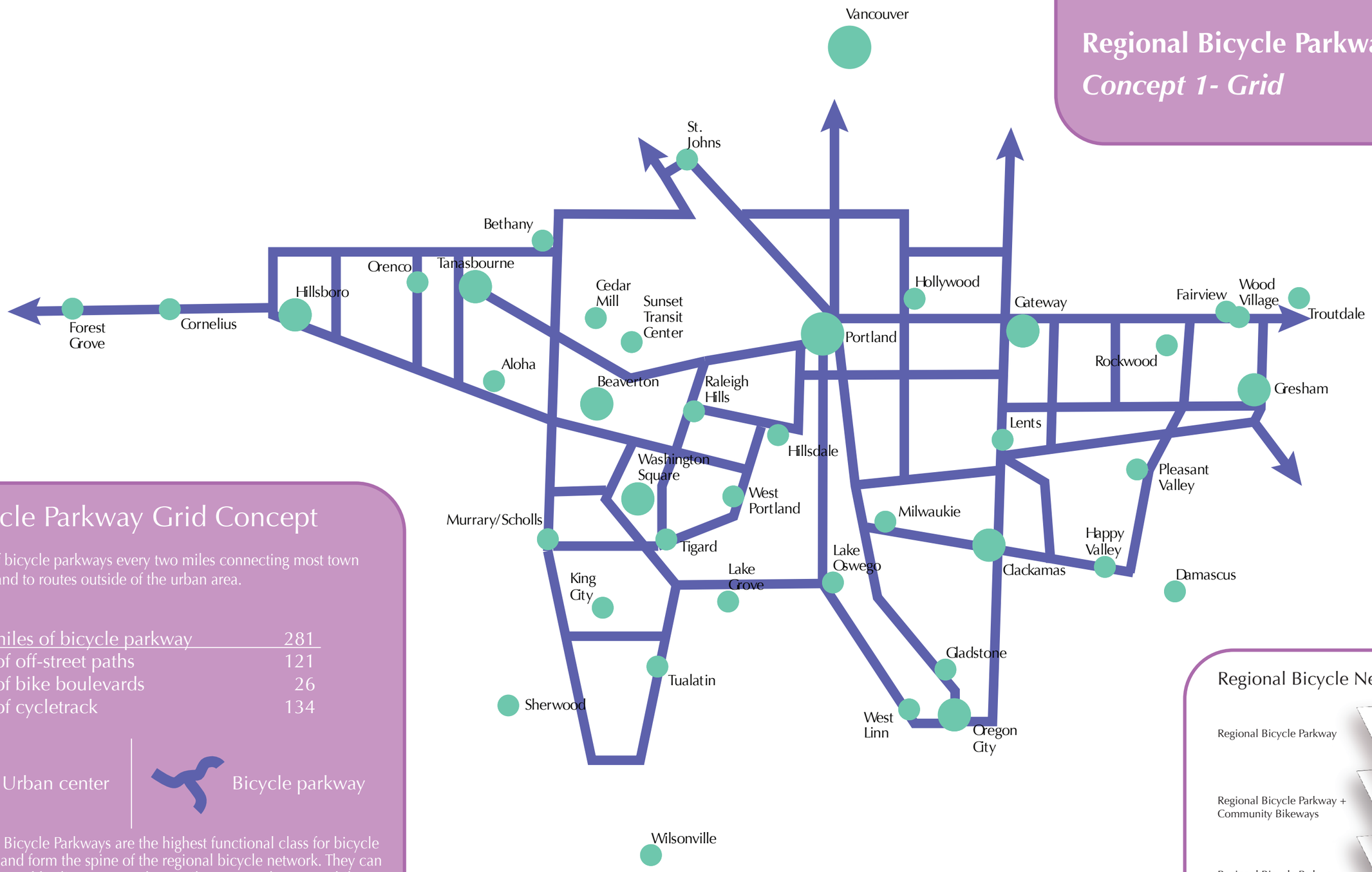
Table below is provided for discussion purposes and illustrates an approach to prioritizing projects from the regional bicycle and pedestrian networks. This approach proposes three tiers of projects. Tier 1 includes projects that have recently been funded or are seeking MTIP and STIP funding. Tier two 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.

Tier 1- Short Term (0-5 years; funded and seeking funding)	
Bicycle Parkways	**Principal Pedestrian Corridors (on and off street)**
Project 1	Project 1
Project 2	Project 2
Project 3	Project 3
Community Bikeways	**Community Pedestrian Corridors**
Project 1	Project 1
Project 2	Project 2
Project 3	Project 3
Tier 2- Near Term (5-15 years; next rounds of federal and state funding)	
Bicycle Parkways	**Principal Pedestrian Corridors (on and off street)**
Project 1	Project 1
Project 2	Project 2
Project 3	Project 3
Project 4	Project 4
Community Bikeways	**Community Pedestrian Corridors**
Project 1	Project 1
Project 2	Project 2
Tier 3- Long Term (15+ years)	
Bicycle Parkways	**Principal Pedestrian Corridors (on and off street)**
Project 1	Project 1
Project 2	Project 2
Project 3	Project 3
Community Bikeways	**Community Pedestrian Corridors**
Project 1	Project 1
Project 2	Project 2

Active Transportation Plan

Regional Bicycle Parkways

Concept 1- Grid



Bicycle Parkway Grid Concept

A grid of bicycle parkways every two miles connecting most town centers and to routes outside of the urban area.

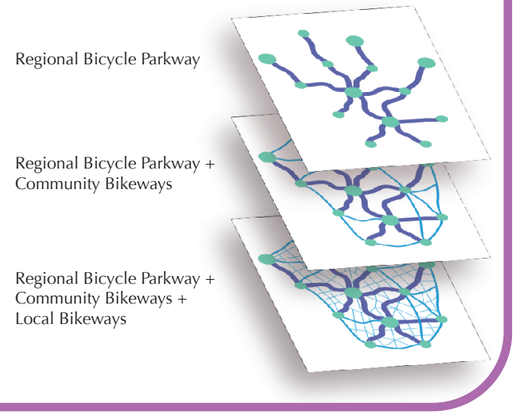
Total miles of bicycle parkway	281
miles of off-street paths	121
miles of bike boulevards	26
miles of cycletrack	134

Urban center

Bicycle parkway

Regional Bicycle Parkways are the highest functional class for bicycle facilities and form the spine of the regional bicycle network. They can be a variety of facility types, such as trails, separated on-street bikeways or bicycle boulevards and are designed to provide a higher degree of capacity and comfort/protection from motorized traffic compared to an average bicycle lane, trail or boulevard.

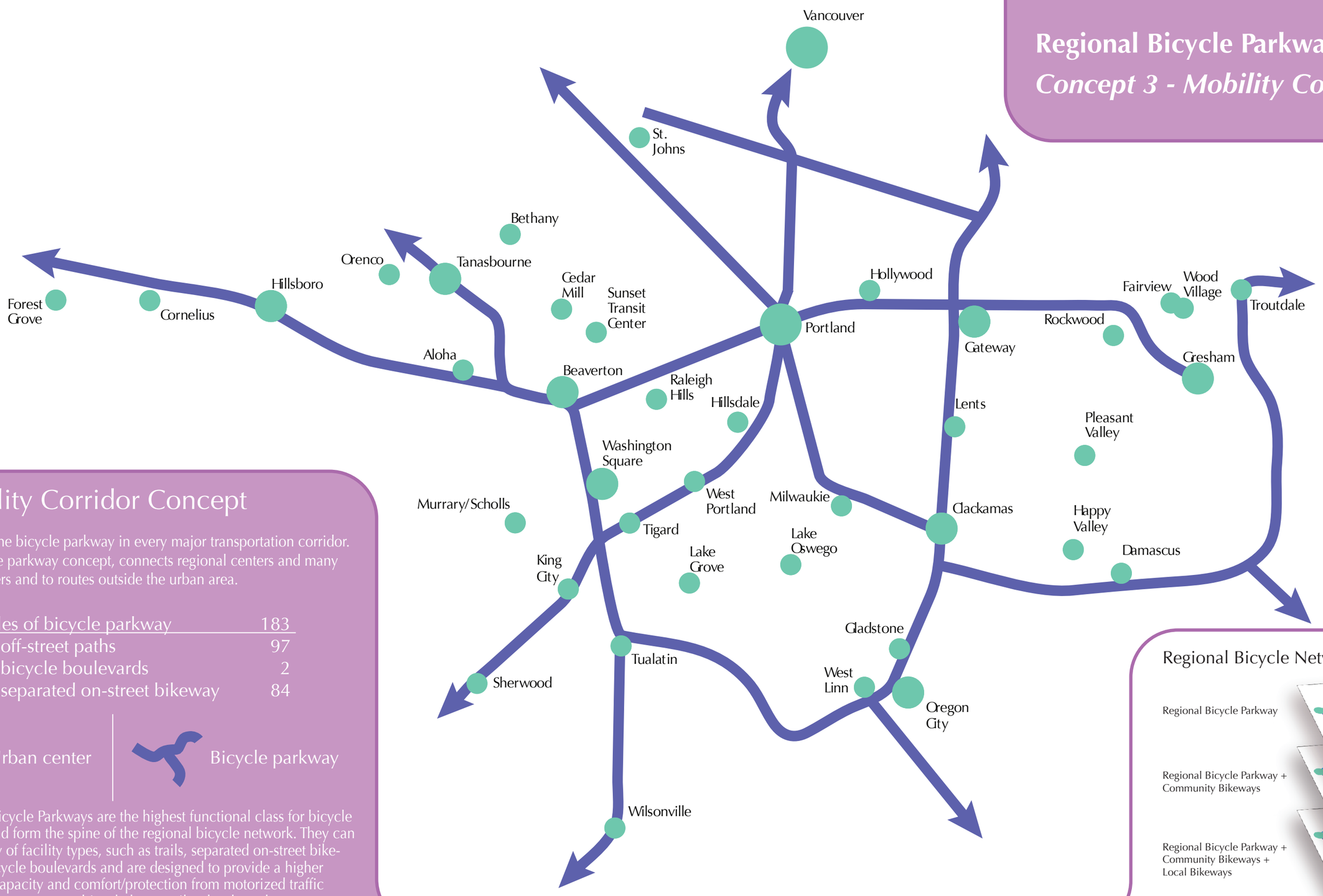
Regional Bicycle Network Concept



Active Transportation Plan

Regional Bicycle Parkways

Concept 3 - Mobility Corridors



Mobility Corridor Concept

Provides one bicycle parkway in every major transportation corridor. Least dense parkway concept, connects regional centers and many town centers and to routes outside the urban area.

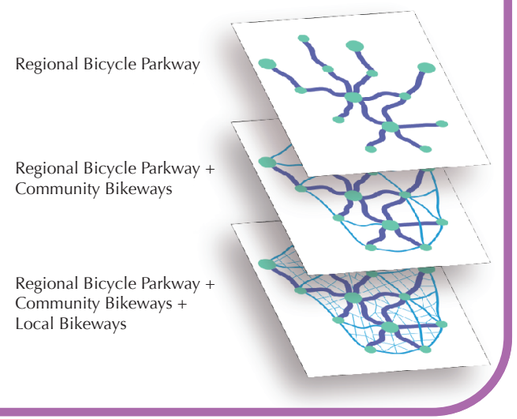
Total miles of bicycle parkway	183
miles of off-street paths	97
miles of bicycle boulevards	2
miles of separated on-street bikeway	84

Urban center

Bicycle parkway

Regional Bicycle Parkways are the highest functional class for bicycle facilities and form the spine of the regional bicycle network. They can be a variety of facility types, such as trails, separated on-street bikeways or bicycle boulevards and are designed to provide a higher degree of capacity and comfort/protection from motorized traffic compared to an average bicycle lane, trail or boulevard.

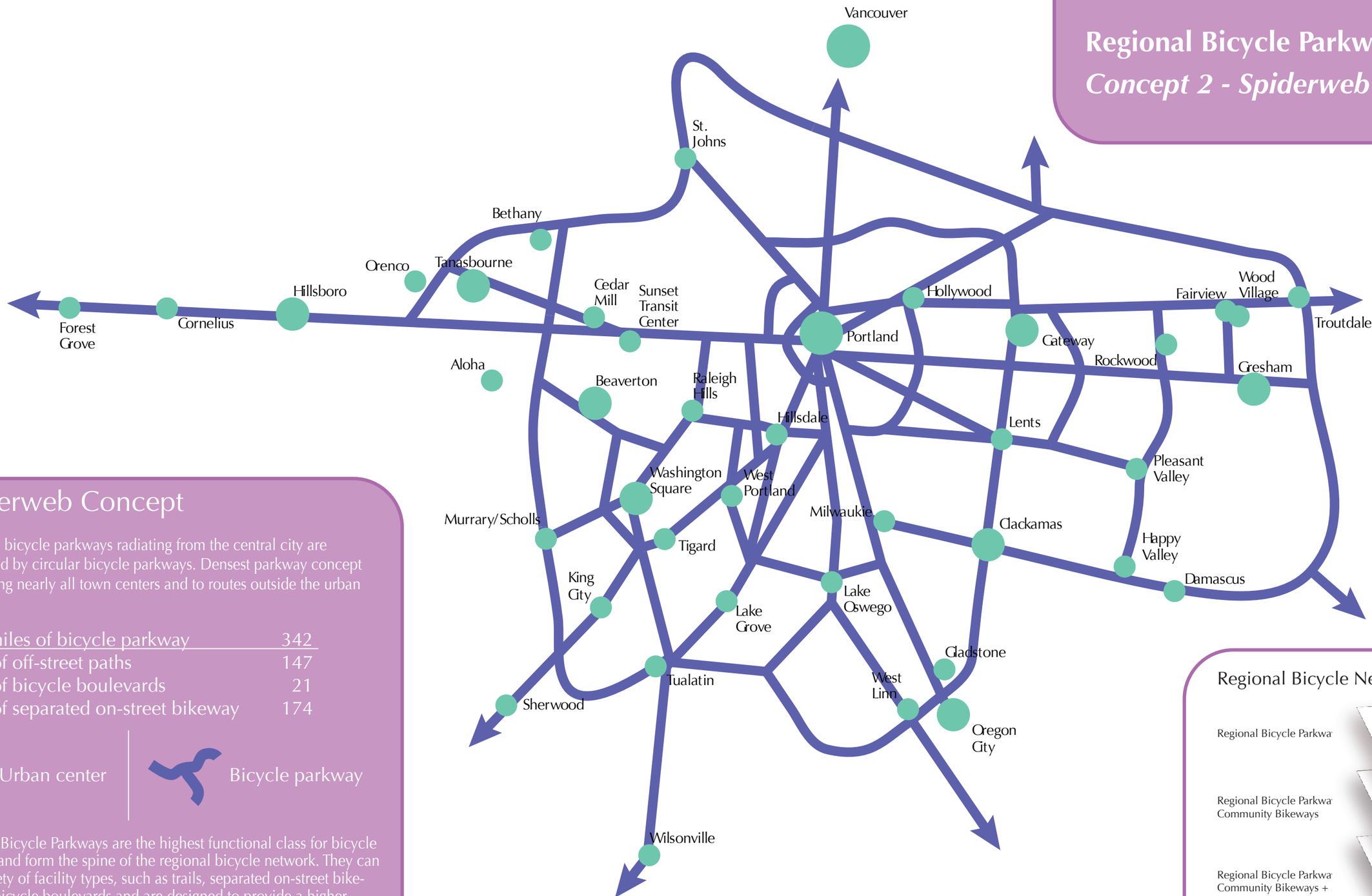
Regional Bicycle Network Concept



Active Transportation Plan

Regional Bicycle Parkways

Concept 2 - Spiderweb



Spiderweb Concept

Diagonal bicycle parkways radiating from the central city are connected by circular bicycle parkways. Densest parkway concept connecting nearly all town centers and to routes outside the urban area.

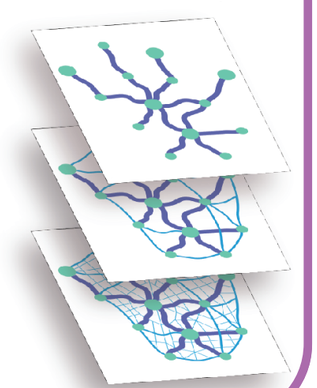
Total miles of bicycle parkway	342
miles of off-street paths	147
miles of bicycle boulevards	21
miles of separated on-street bikeway	174

Urban center

Bicycle parkway

Regional Bicycle Parkways are the highest functional class for bicycle facilities and form the spine of the regional bicycle network. They can be a variety of facility types, such as trails, separated on-street bikeways or bicycle boulevards and are designed to provide a higher degree of capacity and comfort/protection from motorized traffic compared to an average bicycle lane, trail or boulevard.

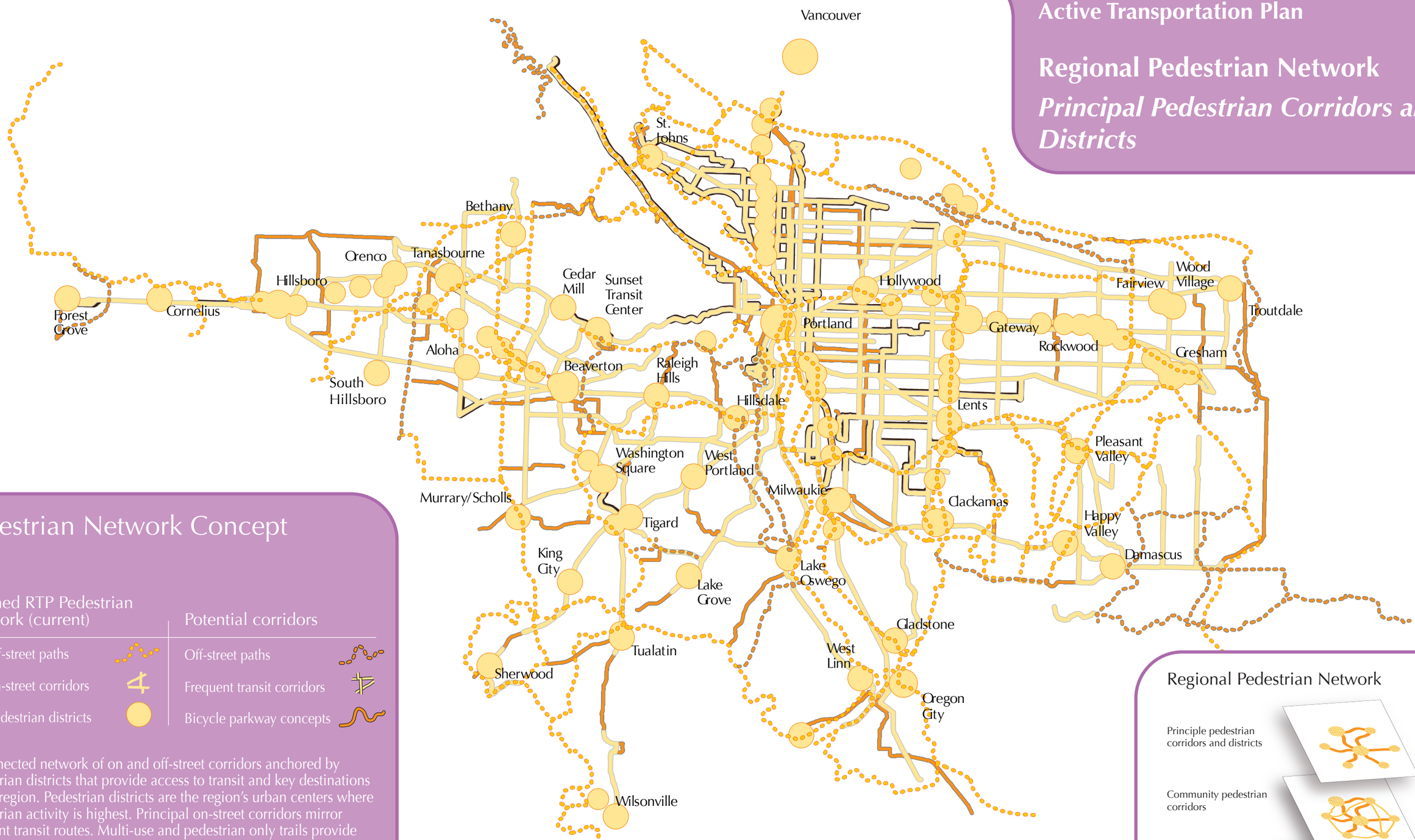
Regional Bicycle Network Concept



Active Transportation Plan

Regional Pedestrian Network

Principal Pedestrian Corridors and Districts

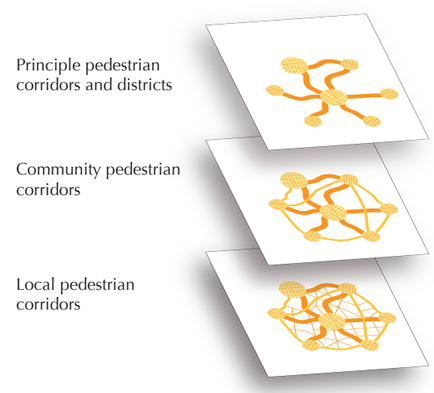


Pedestrian Network Concept

Planned RTP Pedestrian Network (current)	Potential corridors
RTP off-street paths	Off-street paths
RTP on-street corridors	Frequent transit corridors
RTP pedestrian districts	Bicycle parkway concepts

A connected network of on and off-street corridors anchored by pedestrian districts that 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. The principal pedestrian network provides the spine for regional pedestrian corridors and local pedestrian corridors to make a complete regional pedestrian network.

Regional Pedestrian Network



Regional Active Transportation Plan
Network Evaluation Benefits and Trade-offs Report

PREPARED FOR: Lake McTighe, Metro
Lidwien Rahman, ODOT

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PREPARED BY: Sumi Malik, AICP, CH2M HILL
Sharon Daleo, PE, CH2M HILL
Reza Farhoodi, CH2M HILL

DATE: February 15, 2013

Intro

The Purpose of this report is to articulate benefits, trade-offs, and costs related to each of the bicycle network concepts and pedestrian network concept for the purpose of selecting a preferred network and making a case, generally, for active transportation within the region. The assessment of benefits will draw from evaluation criteria established for the planning process. Trade-offs will articulate potential drawbacks to other modes, such as automobiles and freight, and any policy inconsistencies. Costs will be assessed by network and facility type. These combined provide a basis for decision-making and selection of a preferred alternative.

Evaluation Criteria and Benefits

- Access – Does the network improve access to destinations?
- Safety – Does the network make it safer to walk and ride a bike for all users, regardless of age and ability?
- Equity—Does the network increase access for low-income, minority, disabled, non-English speaking, youth and elderly populations.
- Increased Activity—Does the network increase the number of trips made by walking and bicycling?

Connection between this report and other efforts within planning process

- Benefits are derived from evaluation results that measure increased access, safety, equity and activity.
- Results will be used to inform prioritizing network implementation.

Brief description of the bicycle network concepts and pedestrian network concept and their functions

- Bicycle
    - 2010 and 2035 State RTP networks
    - Mobility Concept
    - Grid Concept
    - Spiderweb Concept

- Pedestrian: Made up of districts, pedestrian corridors, and trails; existing 2010 network, planned network and improvements added to the network—fill sidewalk gaps, fill trail gaps, add new trail connections, add new crossings.

Methodology

This report will use interpretation and/or analysis of results from pedestrian and bicycle network evaluations, augmented by any other additional data sources to draw conclusions about derived, or secondary benefits as well. Conclusions will be supported by and tied to literature citations of research and locally produced studies.

Caveats

This outline represents current thinking; however, data limitations (such as absence of right-of-way data for cost estimates and forecasts of pedestrian use), limitations in peer reviewed literature, locally developed studies, quantitative, and qualitative data may alter the final report. Generally, quantitative findings and conclusions drawn from peer reviewed academic articles or studies conducted in the Portland region will be highlighted more heavily than qualitative or advocacy oriented literature.

Benefits Related to Active Transportation Networks

The purpose of this section is to illustrate and differentiate the potential benefits of each bicycle concept and improvements to the pedestrian network, derived from data results of the network evaluations. Analysis of results from the regional pedestrian and bicycle network evaluations are supported by and tied to literature citations of research, locally produced studies, and supporting data from surveys. Benefits are organized by the four main criteria - access, safety, equity and increased activity.

Benefits are numbered. Supporting data sources and preliminary literature citations follow the numbered benefits in *italics.*

Evaluation Criteria and Related Benefits

Access - benefits experienced from increase in and improved access to destinations

1) **Increased access to destinations by biking and walking.** Primary destination types served, access to transit, differentiating high capacity or high frequency transit, access to jobs, basic services, hospitals, school, civic institutions, town centers, retail, and grocery stores (healthier food). Transportation is a derived demand, meaning people travel to get to places, so access is a direct benefit.
   - *The increase/decrease in the ease of access for bicycle trips by way of the bicycle network and roadway network using Metro's bicycle modeling tool that will measure the utility from Transportation Analysis Zones (TAZs) and Cycle Analysis Zones (CAZs).*
   - *Increase in bikeway density. Measures the number of new miles (compared to 2010 network) of bike lanes, bike boulevards, and trails in each network concept.*
   - *Bikeway connectivity—the ratio of three-way or more intersections for the bikeway network concepts.*
   - *Within each pedestrian district and corridor, the average walking distance to destinations for populations within each district or corridor and those populations within a half-mile of district or corridor.*
   - *Miles of sidewalk gaps filled*
   - *Miles of trails and percentage of regional trails complete*
   - *Hoehner, 2008, Perceived and Objective Environmental Measures and Physical Activity Among Urban Adults*

2) **Increased travel choices.** Bicycling and walking become more viable for daily travel with implementation of the networks. Accommodate latent demand for bicycling and walking.
   - *The increase/decrease in the ease of access for bicycle trips by way of the bicycle network and roadway network using Metro's bicycle modeling tool that will measure the utility from Transportation Analysis Zones (TAZs) and Cycle Analysis Zones (CAZs).*
   - *Within each pedestrian district and corridor, the average walking distance to destinations for populations within each district or corridor and those populations within a half-mile of district or corridor.*
   - *Miles of sidewalks and % of sidewalks complete*
   - *Miles of trails and percentage of regional trails complete*

- *Support with regional survey data that states whether or not people want to bike or walk more than they do currently, to make the point that viable travel choices, biking and walking, have been expanded and this is what people want.*
- *(Volpe 2012)*

3) **Time savings for shorter trips** (short trips made by car can actually cost more time, especially if the time for parking is included)
   - *Number of short trips made by bicycle and foot for all types of trips.*

4) **Decreased transportation costs** (maintenance, insurance, gas, parking) should this be moved under increased activity

5) **Ability to accommodate regional trips by linking transit, biking and walking.**
   - *Access to high capacity or higher frequency transit*

6) Economic - Tourism denser more connected bicycling and walking facilties create destinations for tourism walking and bicycling**.**
   - *Increase in bikeway density. Measures the number of new miles (compared to 2010 network) of bike lanes, bike boulevards, and trails in each network concept.*
   - *Bikeway connectivity—the ratio of three-way or more intersections for the bikeway network concepts.*
   - **Economic** increase support of local businesses. *Increase in bikeway density. Measures the number of new miles (compared to 2010 network) of bike lanes, bike boulevards, and trails in each network concept. I could see this measure being included in the intro paragraph of the access benefit. Describing the increase in number of miles.*
   - *Bikeway connectivity—the ratio of three-way or more intersections for the bikeway network concepts.*
   - *Kelly Clifton survey showing that in region people spend more at restaurants and grocery stores when arrive by foot and bike.*
   - *Less money on transportation keeps money circulating in local economy – Joe Cortright.*

7) Economic- business retention and recruitment. Many businesses locate where there are transportation options for employees. Employees consider transportation when looking for work.
   - *Increase in bikeway density. Measures the number of new miles (compared to 2010 network) of bike lanes, bike boulevards, and trails in each network concept.*
   - *Within each pedestrian district and corridor, the average walking distance to destinations for populations within each district or corridor and those populations within a half-mile of district or corridor.*

8) **Increase development potential of properties**.
   - *Increase in bikeway density. Measures the number of new miles (compared to 2010 network) of bike lanes, bike boulevards, and trails in each network concept. I could see this measure being included in the intro paragraph of the access benefit. Describing the increase in number of miles.*
   - *Bikeway connectivity—the ratio of three-way or more intersections for the bikeway network concepts.*
   - *Metro/Fregonese study.*

Safety – Safety benefits experienced for all users, regardless of age and ability, when walking and biking

1) Increase in actual and perceived safety.
   - *Increased safety is a benefit in and of itself*
   - *Number of high crash locations/corridors that intersect with improvements to the bicycle network*

- *Use Bicycle Comfort Index (BCI) that will compare 2035 conditions for each of the networks to 2010, existing conditions. BIC accounts for adjacent auto speeds, auto volumes, and the number of lanes for on-street bicycle facilities. Note: cycle tracks will be treated as separated facilities*
- *The number (and length) of facilities (see above) on high risk roads identified in the Metro's analysis of the existing built regional pedestrian network and the increase in the number (and length) with all improvements added.*
- *The number of people the safety issues/barriers addressed will benefit.*

2) **Reduced crashes**
   - *Number of high crash locations/corridors that intersect with improvements to the bicycle network*
   - *Use Bicycle Comfort Index (BCI) that will compare 2035 conditions for each of the networks to 2010, existing conditions. BIC accounts for adjacent auto speeds, auto volumes, and the number of lanes for on-street bicycle facilities. Note: cycle tracks will be treated as separated facilities.*
   - *The number of people the safety issues/barriers addressed will benefit.*
   - *Crash rates (per-rider/walker) may decline even if the total number of crashes increases. As more people bike and walk, driver awareness increases and safety in numbers benefits are realized.* City of Portland data.
   - *(Nonmotorized Transportation Pilot Program, 2012)*

3) **Reduced cost of crashes** (currently over $900 million annually) related to increase in bicycling and walking activity (this is the data that supports the benefit: made on separated facilities, improved crossing locations, low-traffic bicycle boulevards, and gaps addressed in bicycle and pedestrian network. Differentiated shared versus separated facilities. Include inferences related to crash severity, with a focus on severe and fatal crashes.
   - *Number of high crash locations/corridors that intersect with improvements to the bicycle network*
   - *Use Bicycle Comfort Index (BCI) that will compare 2035 conditions for each of the networks to 2010, existing conditions. BIC accounts for adjacent auto speeds, auto volumes, and the number of lanes for on-street bicycle facilities. Note: cycle tracks will be treated as separated facilities*
   - *The number (and length) of facilities (see above) on high risk roads identified in the Metro's analysis of the existing built regional pedestrian network and the increase in the number (and length) with all improvements added.*
   - *The number of people the safety issues/barriers addressed will benefit.*

4) Personal security due to "eyes on the street."
   - *Increase in bikeway density. Measures the number of new miles (compared to 2010 network) of bike lanes, bike boulevards, and trails in each network concept. I could see this measure being included in the intro paragraph of the access benefit. Describing the increase in number of miles.*
   - *Increase bicycle volumes on new parkway bridges that cross barriers such as rivers, freeways, or railroads.*
   - *Within each pedestrian district and corridor, the average walking distance to destinations for populations within each district or corridor and those populations within a half-mile of district or corridor.*
   - *Miles of trails and percentage of regional trails complete*
   - *Miles of gaps filled*
   - *Health Impact Assessment for East Bay Greenway, 2008*
   - *Evenson, et al, 2008: Associations of adult physical activity with perceived safety and police-recorded crime*

5) **Increase in safety for other modes of travel**—separated bicycle and pedestrian facilities can reduce potential conflict points and make it safer to operate vehicles and freight trucks. Roadway diets can benefit certain vehicle crash types, such as rear-end crashes.
   - *Use Bicycle Comfort Index (BCI) that will compare 2035 conditions for each of the networks to 2010, existing conditions. BIC accounts for adjacent auto speeds, auto volumes, and the number of lanes for on-street bicycle facilities. Note: cycle tracks will be treated as separated facilities*
   - *Miles of trails and percentage of regional trails complete*

Equity - Benefits Experienced to low-income, minority, disabled, non-English speaking, youth, and elderly populations from increased access. Providing access (see access criterion) to serve low income, minority, non-white, non-English speaking, youth (under 18), disabled, and elderly populations

1) **Improve access to destinations for the Active Transportation Dependant**—no access to a vehicle households, youth under 18 and elderly populations. Equity hotspots in the region will be used to assess benefits.
   - *Increase in the miles of all new bicycle facilities and new bicycle parkways in the U.S. Census block groups that have a higher than average percentage (compared to the Portland region) of low-income, minority, non-English speaking, youth (under age 18) or elderly (over age 65) populations. Use the demographic calculations developed in the Transportation Equity Analysis for the 2014-15 Regional Flexible Fund Allocation (RFFA).*
   - *Improved access to destinations (see access criterion) for each social equity population sub-group identified in the RFFA analysis. This will allow for an assessment of the number of Census block groups within higher proportions of equity populations that will benefit (i.e. access or access improvements above a certain threshold) from improvements to the network.*

2) **Better air quality in low-income areas** (Environmental Justice neighborhoods) from greater access to bicycling and walking.
   - *Mode shift data by area, if available, compared to US Census block groups that have higher than average percentage of low-income, minority, non-English speaking, youth (under age 18) or elderly (over age 65) populations.*
   - *Increase or decrease in the percentage of all trips made by bicycling and walking for the overall network concept and for some individual bicycle parkways. The bicycle modeling tool will be used to measure the change (decrease/increase) in mode share for all modes region wide by trip length for all types of trips under 12 miles.*

3) Lower transportation costs for low-income households
   - *Increase in the miles of all new bicycle facilities and new bicycle parkways in the U.S. Census block groups that have a higher than average percentage of low-income, minority, non-English speaking, youth (under age 18) or elderly (over age 65) populations. Use the demographic calculations developed in the Transportation Equity Analysis for the 2014-15 Regional Flexible Fund Allocation (RFFA).*
   - *Improved access to destinations (see access criterion) for each social equity population sub-group identified in the RFFA analysis. This will allow for an assessment of the number of Census block groups within higher proportions of equity populations that will benefit (i.e. access or access improvements above a certain threshold) from improvements to the network.*

Increased activity - benefits experienced from increased bicycling and walking activity

1) Reduced mortality rates

- *Increase or decrease in the percentage of all trips made by bicycling and walking for the overall network concept and for some individual bicycle parkways. The bicycle modeling tool will be used to measure the change (decrease/increase) in mode share for all modes region wide by trip length for all types of trips under 12 miles.(Nonmotorized Transportation Pilot Program, 2012)*
- *(Genter, et al, 2008: Valuing Health Benefits of Active Transport Modes)*
- *Samitz, et al , 2011: Domains of physical activity and all-cause mortality: systematic review and dose–response meta-analysis of cohort studies*

2) **Reduced morbidity rate and occurrence of diseases and reduced healthcare costs**: cardiovascular disease, cancer, diabetes, depression
   - *Increase or decrease in the percentage of all trips made by bicycling and walking for the overall network concept and for some individual bicycle parkways. The bicycle modeling tool will be used to measure the change (decrease/increase) in mode share for all modes region wide by trip length for all types of trips under 12 miles.*
   - *(Genter, et al, 2008: Valuing Health Benefits of Active Transport Modes)*
   - *Boarnet, et al, 2008: Walking, Urban Design, and Health: Toward a Cost-Benefit Analysis Framework*

3) Reduce congestion
   - *Increase or decrease in the percentage of all trips made by bicycling and walking for the overall network concept and for some individual bicycle parkways. The bicycle modeling tool will be used to measure the change (decrease/increase) in mode share for all modes region wide by trip length for all types of trips under 12 miles.*

4) **Improved air quality and reduced GHG emissions, cleaner air and water** (derived from reduced Vehicle Miles Traveled or mode shift)
   - *Increase or decrease in the percentage of all trips made by bicycling and walking for the overall network concept and for some individual bicycle parkways. The bicycle modeling tool will be used to measure the change (decrease/increase) in mode share for all modes region wide by trip length for all types of trips under 12 miles. (Nonmotorized Transportation Pilot Program, Volpe, 2012)*

5) **Economic – fosters active transportation related industries and jobs: bike building, sports equipment and clothing, bicycle repair shops, tourism, sustainability related (those industries relying on a sustainable region)**
   - *Increase or decrease in the percentage of all trips made by bicycling and walking for the overall network concept and for some individual bicycle parkways. The bicycle modeling tool will be used to measure the change (decrease/increase) in mode share for all modes region wide by trip length for all types of trips under 12 miles.*

6) Improve personal sense of well-being
   - *Increase or decrease in the percentage of all trips made by bicycling and walking for the overall network concept and for some individual bicycle parkways. The bicycle modeling tool will be used to measure the change (decrease/increase) in mode share for all modes region wide by trip length for all types of trips under 12 miles.*
   - *Increase or decrease in the number of miles traveled by bicycle and foot for all types of trips.*
   - *Change in mode share by geographic areas used in 2011 Oregon Household Activity Survey (e.g. CBD, city center minus CBD, inner east side, counties, other cities).*
   - *Dunn, et al, 2001: Physical activity dose-response effects on outcomes of depression and anxiety*

7) Saves tax payers money – high return on investment for bike/ped projects. they cost less

- *Increase or decrease in the percentage of all trips made by bicycling and walking for the overall network concept and for some individual bicycle parkways. The bicycle modeling tool will be used to measure the change (decrease/increase) in mode share for all modes region wide by trip length for all types of trips under 12 miles.*
- *Increase or decrease in the number of miles traveled by bicycle and foot for all types of trips.*
- *Change in mode share by geographic areas used in 2011 Oregon Household Activity Survey (e.g. CBD, city center minus CBD, inner east side, counties, other cities).*

8) **Improve sense of community and social capital** through increased interaction
   - *Increase or decrease in the percentage of all trips made by bicycling and walking for the overall network concept and for some individual bicycle parkways. The bicycle modeling tool will be used to measure the change (decrease/increase) in mode share for all modes region wide by trip length for all types of trips under 12 miles.*
   - *Increase or decrease in the number of miles traveled by bicycle and foot for all types of trips.*
   - *Change in mode share by geographic areas used in 2011 Oregon Household Activity Survey (e.g. CBD, city center minus CBD, inner east side, counties, other cities).*
   - *Health Impact Assessment for East Bay Greenway, 2008*
9) **Reaching a tipping point in bicycling and walking and moving towards a cultural shift**—more children biking and walking leads to changed behavior (everyone is doing it). Increased perceived safety attracts the interested but concerned. Addresses latent demand for bicycling and walking.
   - *Increase or decrease in the percentage of all trips made by bicycling and walking for the overall network concept and for some individual bicycle parkways. The bicycle modeling tool will be used to measure the change (decrease/increase) in mode share for all modes region wide by trip length for all types of trips under 12 miles*

Trade-Offs and Costs

While many benefits could be realized by implementing a bicycle network concept and the pedestrian network concept, implementation of a network could pose trade-offs. This section describes potential impacts to auto and freight movement, and potential travel time delays or volume shifts to different routes. It also describes how feasible implementation is, both physically, noting constrained right-of-way or topographic constraints; and institutional or political feasibility, primarily how supportive a community would be of implementation. This section describes the networks consistency with policies, standards, and functional classifications. In sum, these describe the trade-offs associated with the benefits of implementing the active transportation networks.

Impacts to Auto, Freight, and Transit Movement

The benefits section, primarily the safety section, captures benefits to other modes when better bicycling and walking networks are implemented. Implementation of a better bicycling and walking network can also pose impacts with auto and freight movement. This section details impacts to auto and freight movement that are associated with implementation of the bicycle and pedestrian networks.

1) **Reduced roadway capacity for autos** (road diet- which can also have benefits in reducing certain crash types, particularly rear-end crashes and can also shift traffic volumes to parallel streets)
2) **Shift in auto volumes to different routes** (may or may not have data from bike model to support conclusions) however we should also note this as a benefit above when bike trips in particular are shifted from roadways to off-street paths
3) **Vehicle delay** (may be difficult to obtain data that would allow us to pin-point bicycling and walking improvements as a cause)
4) **Transit conflict** (is the corridor or network a transit route or planned transit route, and could a bicycle facility be in conflict or compete for space in that corridor?)

Feasibility

1) This section addresses both physical feasibility, political, and institutional feasibility. **Political and institutional feasibility is a qualitative assessment that generally reflects the community's receptiveness to a particular network. Physical feasibility reflects physical constraints such as constrained right-of-way or topographic constraints, such as steep slopes.** Is the corridor or district political or institutionally feasible? The Stakeholder Advisory Committee can help rank the political or institutional feasibility. Are there physical constraints? Is right-of-way needed? Will travel lanes or parking need to be removed? Does the corridor have steep slopes, serve high traffic volumes, are they planned for high-capacity transit, such that bicycle facilities could be a conflict?

Consistency with Policies, Standards, and Functional Classifications

The regional bicycle and pedestrian networks may or may not be consistent with State and Regional functional classifications, policies, and design standards. For example, a bicycle network may call for a bicycle lane on a facility that also is also designated as a State freight route, which may pose conflicts. Likewise bicycle or pedestrian networks may not be consistent with existing standards. Because local policies are to be consistent with State and Regional policies, State and Regional policies will be examined, and this section will primarily highlight facilities that do not meet current policies, functional classification designations, and design standards.

- National Highway System route, State highways, and Freight Routes
- Arterials and collectors based on regional policies and classifications Feasibility of improvements based on daily traffic volumes and right-of-way if it is available.

Costs

Costs are being developed to compare to benefits and trade-offs to provide a more complete understanding of implications with implementation of any one network. Planning level cost estimates will be based on unit costs per mile for facility types, by network. For each network, a planning level cost estimate will be provided for each facility type, for example new trails or new bicycle boulevards, for the entire network. Cost estimates will not include right-of-way acquisition costs, Appendix A contains information about costs per mile assumed by facility type and what each cost per mile calculation includes, such as stormwater management, signalization, and other infrastructure requirements. In cases where more precise cost estimates are available from the Regional Transportation Plan (RTP), they will be used.

Bicycle Parkway Concepts

For each Bicycle Parkway Concept, (Grid, Spiderweb, and Mobility Corridors), a table of costs by facility type will be provided. Below is an example cost table. Can you provide the table for each of the concepts? It will help the SAC understand. Need to include trails for the bike concepts. Overlaps between bike and ped will be reconciled in the prioritization phase

Bicycle Network: Grid

New bicycle boulevard (no project in RTP)	$
Upgrade existing bicycle boulevard	$
New separated 8-10' in-roadway bikeway	$
Upgrade existing in-roadway bikeway to separated	$
New trail 12' (no project in RTP)	$
Upgrade existing trail in 2035 network to 12-14'	$

Bicycle Network: Spiderweb

New bicycle boulevard (no project in RTP)	$
Upgrade existing bicycle boulevard	$
New separated 8-10’ in-roadway bikeway	$
Upgrade existing in-roadway bikeway to separated	$
New trail 12’ (no project in RTP)	$
Upgrade existing trail in 2035 network to 12-14’	$

Bicycle Network: Mobility Corridors

New bicycle boulevard (no project in RTP)	$
Upgrade existing bicycle boulevard	$
New separated 8-10’ in-roadway bikeway	$
Upgrade existing in-roadway bikeway to separated	$
New trail 12’ (no project in RTP)	$
Upgrade existing trail in 2035 network to 12-14’	$

Regional Pedestrian Network

Cost estimates will be given by facility type.

New 17’ sidewalk and buffer	$
Upgrade existing sidewalk to 17’ including buffer	$
New trail 12’ (no project in RTP)	$
Upgrade existing trail in 2035 network to 12-14’	$
Improved or new crossings	$

Appendix A: Unit Costs per Mile Assumptions

Table of Construction Cost Assumptions

Bicycle or Pedestrian Facility Type	Cost Per Mile	Costs Include
New 17’ sidewalk and buffer	$2 million/side	Sidewalk, buffer, grading, a few sections with walls. Drainage/stormwater management system is assumed to already be in place.
Upgrade existing sidewalk to 17’ including buffer	$1 million/side	Sidewalk, buffer, grading, a few sections with walls. Drainage/stormwater management system already in place
New trail 12’ (no project in RTP)	$4 million	Costs are federalized and include acquisition of right of way, intersection crossings, signalization, crosswalks, mitigation, access points, bridge crossings, trailheads.
Upgrade existing trail in 2035 network to 12-14’	$1.5 million	Widen 4’ from 8’ to12’ or 10’ to 14’, repave, lighting, signage, signalized crossings of barrier roadways, improved access to street network.
New bicycle boulevard (no project in RTP)	$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 separated 8-10’ in-roadway bikeway	$1 million	Costs include signal timing, lane reconfigurations, stripping, raised curbs, no drainage needed.
Upgrade existing in-roadway bikeway to separated	$1 million	Costs include signal timing, lane reconfigurations, stripping, raised curbs, no drainage needed.
Improved or new crossings	$10,000 - $150,000/crossing	Lower costs are for 2-3 lane roadways with markings and rapid flash beacon. Medium costs are for a typical 4-5 lane arterial, includes treatments such as rapid flash beacons, curb ramps, median island, signage, stripping. Improvements will be identified on the pedestrian network. Highest cost is for a fully signalized intersection.

Memorandum

To: Lake McTighe, Metro

CC: Lidwien Rahman, ODOT and Sumi Malik, CH2M HILL

From: Matt Berkow and Kim Voros, Alta Planning + Design

Date: November 29, 2012

Re: Metro Active Transportation Plan – Regional Pedestrian Network Flow Analysis Methodology

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This memorandum outlines a revised technical approach to conducting Task 6.2 of the Regional Active Transportation Plan based on feedback from Metro. The analysis will measure for the impact of potential improvements made to the regional pedestrian network to address identified deficiencies and gaps. Locations and types of improvements will be provided to the consultant team by Metro. The objective of the analysis is to help Metro and the Stakeholder Advisory Committee match up the places that people want to get to with gaps and deficiencies in the network to help determine which gaps and deficiencies will provide the most benefit in increasing access, safety and equity.

Potential Criteria for Assessing the Pedestrian Network Concepts

Below are the criteria identified by the Stakeholder Advisory Committee: for evaluating the proposed Regional Pedestrian Network Concept: Access, Equity, Safety, and Increased Activity.

Criteria
Access: ~~Improved access to destinations, including transit, schools, jobs, parks, social services, town centers, etc.~~Does the network improve access to destinations?
Equity: ~~Providing access (see criterion above) to serve low income, minority, non-white, non-English speaking, youth (under 18), and elderly populations (over 65)~~Does the network provide access to low income, minority, disabled, non-white, non-english speaking, youth and elderly populations?
Safety: ~~Solves a safety problem, provides safe crossings, safety on high volume/speed roads.~~Does the network make it safer to walk for all users, regardless of age or ability? Safety problems and areas are identified in Metro's state of safety report and in Portland's list of high crash corridors.
Increases Activity: Measures the increase or decrease in the number of trips made by walking and bicycling. (Metro will evaluate this criterion using the Metro bicycle modeling tool.)

Evaluation Methodology

Access

- What will be measured?
    - Access to destinations within the existing and proposed regional pedestrian network by way of sidewalks, trails, bridges, stairs, overcrossings, and ~~signalized~~ improved crossings. The planned network is identified in the 2035 RTP Pedestrian Network map (5/18/10). For purposes of this project, routes not designated as a 2040 corridor but serving as a high frequency bus route have been added to the planned network. For consistency with recent regional transportation planning efforts, we propose defining destinations in the same way as was done for the Transportation Equity Analysis for the 2014-15 Regional Flexible Fund Allocation (RFFA). This effort utilized an essential services indicator derived from selected North American Industry Classification System (NAICS) codes and categorized into five individual categories: civic, financial/legal, healthcare, food and essential retail services. This analysis will add high frequency TriMet transit stop locations (light rail stations are captured in station communities) and regional parks (those identified on the 2040 map). Access will be measured separately for each of the NAICS categories, potentially for specific location types (e.g. education or colleges and universities), for high frequency transit, regional parks and as a whole (for access for all destinations). The measure will calculate the average distance for residential and employment populations (trip generators) to travel along the pedestrian network to the closest destination type (trip attractors - see the destination types identified above). Pending confirmation from the SAC, there will be designation of 'priority destination types' to receive a higher weighting.
- Methodology
    - GIS will be used to create a network destinations dataset, with destinations snapped to the network. Residential and employment populations will be snapped to the network at the census block level. Employment data (i.e., number of jobs) will be apportioned evenly across the census blocks rather than tied to specific employment centers within the TAZ.
    - Closest facility analysis will be used to identify an average walking distance to destinations within each Pedestrian District and Pedestrian Corridor (the analysis will include people accessing destinations from beyond the district or corridor within a ½ mile. The total population in each pedestrian area (district or corridor) will be incorporated into the analysis to identify the relative number of people that will benefit from improvements to each area.
    - Pedestrian travel assumptions:
        - Sidewalks are required for pedestrian travel on collectors and above.
        - Trails must be complete for travel.
        - ~~The~~ For the purpose of the analysis, the existence of a local street, regardless of whether it has a sidewalk, will be assumed to be sufficient for pedestrian travel.

        - Pedestrian access is prohibited across 'barrier' streets (those streets identified as having high volumes and/or speeds and/or widths in the 2013-15 RFFA analysis[1]) without a signal protected crossing. This includes trails crossing barrier streets. Data is not available at the regional level for mid-block marked crossings or locations with flashing beacons.
    - The following information identifying the amount of pedestrian facilities included in the Network Concept will be provided for informational purposes:
        - Miles of sidewalks and % of sidewalks complete
        - Miles of trails and percentage of regional trails complete
        - Number of signalized crossings
        - Miles of gaps filled

- Key Assumptions
    - The analysis will use 2035 population data available at the Transportation Analysis Zone (TAZ) level, which is much larger than the parcel or census block level. Data from each TAZ can be apportioned to smaller study areas by calculating the percentage of each TAZ that falls within a given area and apportioning that amount of the population to the geography in question. The apportionment will be informed by a 2010 household density layer (available at the TAZ level).
    - A ½ mile will be used to constitute a walkable distance for this analysis, which is consistent with the methodology used in the TriMet Pedestrian Network Analysis report and the results of the 2011 Oregon Household Activity Survey.
    - The analysis will consider a ½ mile network buffer ("ground truthed")to around each LRT station, and a ½ mile buffer around each pedestrian corridor (including trails) and pedestrian district thereby including people living within a walkable distance of the regional pedestrian areas.
- Data Requested from Metro
    - Essential services indicator point data derived from North American Industry Classification System (NAICS) codes used to complete the Transportation Equity Analysis for the 2014-15 Regional Flexible Fund Allocation.
    - TriMet high frequency bus stop location data 2035 population data
    - 2010 household density by TAZ
    - Regional parks identified on the 2040 map

[1] The methodology for identifying these roadways and maps of the roadways can be found on Metro's website: http://library.oregonmetro.gov/files//appendix_24_rffa_equity.pdf

- Shapefiles of existing pedestrian network: ~~(~~regional trails, pedestrian corridors, LRT stations (Alta will add ½ mile network buffer to define station ~~community~~communities), and pedestrian districts~~)~~
- Employment and industrial areas
- Regional bike network data (from RLIS, for overcrossings and stairs)
- Location and/or list of pedestrian network enhancements: ~~.~~sidewalks, crossings (different design treatments, e.g. signal, marked crosswalk with flashing beacons, etc will not be differentiated in the analysis; it will just be assumed that some sort of improvement has been added) , trails, and pedestrian bridges, trail access points.
- Metro's approach to automating crossing improvements and filling sidewalk gaps.
- Corridor segmentation, if corridors are shortened.

Equity

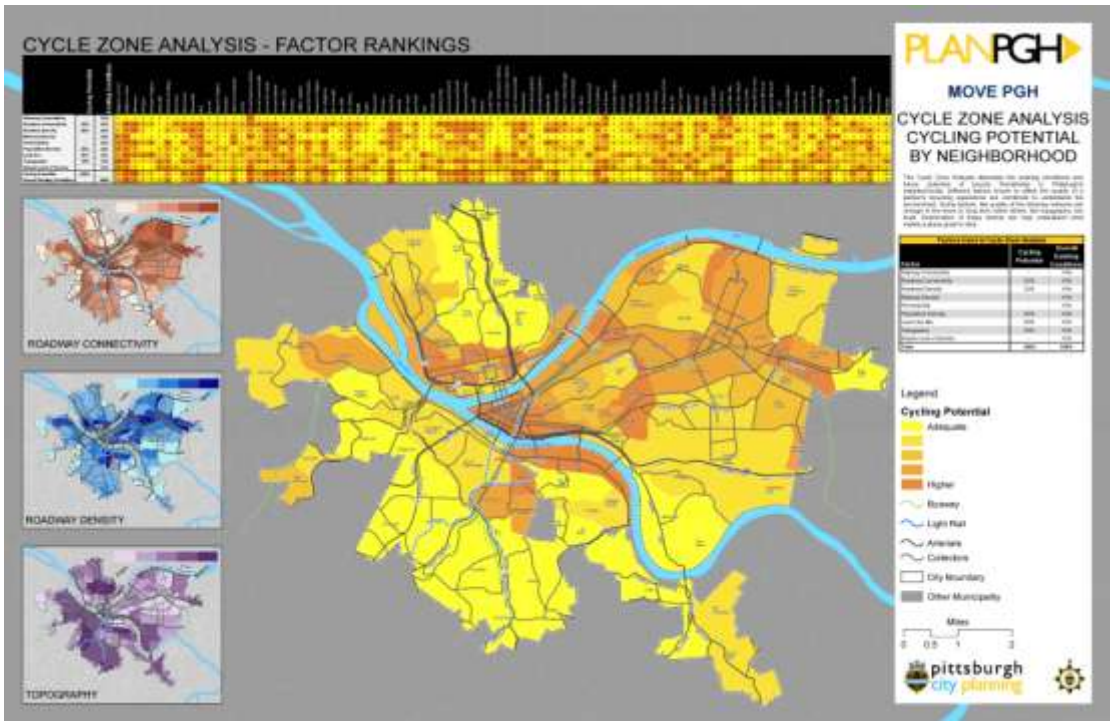
- What will be measured?
  - Improved access to destinations (see access criterion) for each social equity population sub-group identified in the RFFA analysis.
- Methodology
  - For consistency with recent regional transportation planning efforts, we propose utilizing the analysis used in the Transportation Equity Analysis for the 2014-15 Regional Flexible Fund Allocation (RFFA), which included low-income population, non-white populations, non-English speaking populations, youth populations (under 18), and elderly populations (over 65).
  - The RFFA methodology was completed at the census block group level, while we propose to conduct the Access analysis at the census block level. Thus, this metric will be achieved by aggregating the Access scores to a census block group average and then linking these to the RFFA equity results. This will allow for an assessment of the number of block groups with higher proportions of equity populations that will benefit (i.e. access or access improvements above a certain threshold) from improvements to the network.
- Key Assumptions
  - Since we cannot forecast the distribution of future populations by sub-group, the analysis will assume a distribution of population sub-groups similar to 2010 in the 2035 population scenario.
- Data Requested from Metro
  - GIS shapefiles from the RFFA Transportation Equity Analysis.

Safety

- What will be measured?
    - The number of miles of separated paths, sidewalks and crossings (including signalized and grade separated) added to roads within the regional pedestrian network with high volumes, speeds, and auto lanes – i.e. those identified as 'barriers' in Metro's analysis of the existing regional pedestrian network and those identified by Metro as barriers.
- Methodology
    - Calculate the number (and length) of facilities (see above) on high risk roads identified in the Metro's analysis of the existing built regional pedestrian network and the increase in the number (and length) with all improvements added. For longer corridors, Metro may break the corridor into shorter segments, taking into consideration local analyses of high risk corridors.
    - Overlay with location of pedestrian crashes.
    - Crossings opportunities will be normalized for roads of different lengths by calculating an average crossing distance. Average crossing distances should make general considerations for the crossing need, which can be estimated per the bullet below.
    - Metro has identified a crossing rule. Alta will use the rule to automate adding in crossings. Alta will develop an algorithm or 'rule' based on the location of destinations and populations to ensure that crossings are not proposed in areas where they are clearly not appropriate or needed. Alta will send the proposed crossings layer to Metro for confirmation and revision of particular crossing locations prior to performing the analysis.
    - Calculate the number of "mid-block crossings" of trails on the network that do not have a signal. A mid-block crossing is defined as a trail crossing a barrier street.
    - The safety benefit relates to the number of people the facility improvements will serve. In other words, there will be a greater safety benefit for facilities provided on streets likely to have more pedestrian activity. Thus, the analysis will interact the safety/barriers calculation with the access criteria for each particular pedestrian area to weight improvements to areas with higher likely use.
- Data Requested from Metro
    - Metro crossing rule.
    - Location of pedestrian network enhancements on Barrier roads (this data is already requested under the Access criteria).
    - Existing sidewalks 'gaps' layer
    - 2007-2010 pedestrian and bicycle crash location data.

Presentation

- Methodology
    - Given the large number of criteria, we propose presenting the results in a matrix format with accompanying maps illustrating the results for each criterion for each corridor and district. The example map below illustrates a potential format for including multiple pieces of information on a single map.
    - To the extent possible the analysis will maintain consistency with Metro's analysis of the existing regional pedestrian network, so that improvements to the regional pedestrian network can be compared to the existing conditions analysis.



    - The analysis will be presented graphically as follows:
        - A set of four maps, with one map per criteria to illustrate the score for each Pedestrian District and Pedestrian Corridor. A fourth map will illustrate a composite score of the three criteria.
        - Each map will include the existing conditions as a smaller map for easy comparison.
        - Per the example above, each map can include:
            - Large map illustrating the criteria evaluation score in the center
            - Smaller maps to identify existing conditions and the net change between existing conditions and the score based on improvements
            - A matrix of the individual criteria scores for each Pedestrian District/ Corridor

        - The number of facilities in each scenario, provided as a table
    - Results will be reported on a five point scale, as was done in Metro's analysis of the existing regional pedestrian network. Each of the numbers in the scale will be represented in a different color.
    - The consultant team will develop maps using an agreed upon color scheme and Metro template.
  - Developing a single pedestrian score for the region
    - If there is more than one network concept, the composite scores for each Pedestrian Corridor/District will be weighted by population to create a regional score.
    - The analysis will identify the number of Pedestrian Corridors/Districts that benefit (i.e., that have a composite score above a certain threshold) under each Pedestrian Network Concept. As a hypothetical example, one concept may benefit 25 of the 30 pedestrian areas while another may only benefit 15 of 30. This metric will provide a useful complement to the population based regional score to illustrate how benefits would be distributed across the region.

- <u>Key Questions</u>
  - The consultant team and Metro will need to agree on a calculation for a composite score of the three evaluation criteria (Access, Equity, and Safety).

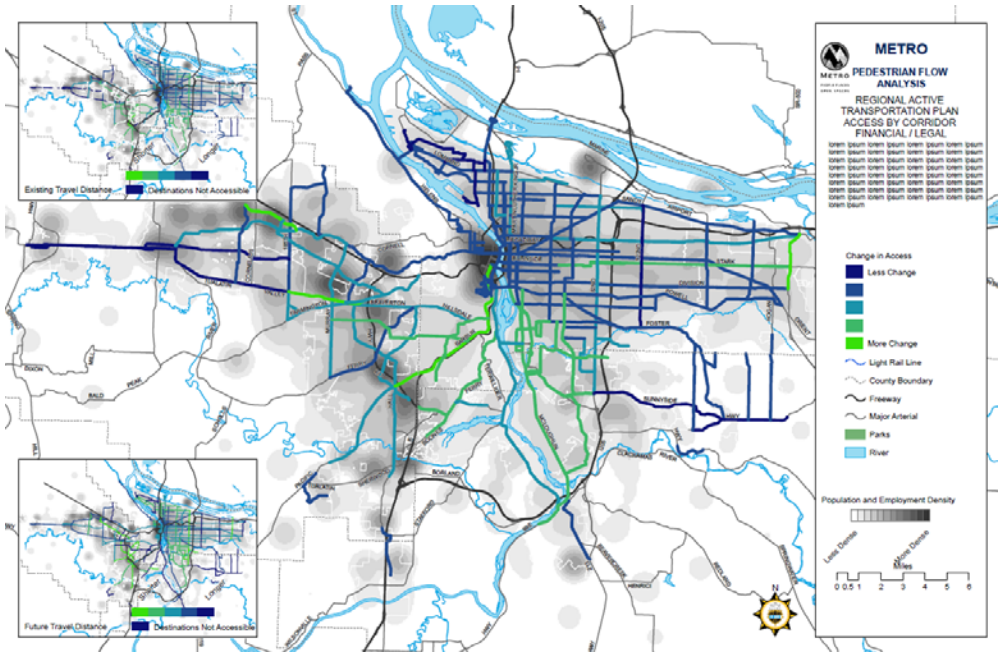
Pedestrian Flow Analysis

alta
PLANNING + DESIGN

SAC Meeting
February 21, 2013

Pedestrian Flow Analysis

- Measuring the potential to make a walking trip via the regional pedestrian network
- Analysis being completed for pedestrian corridors and pedestrian districts (separate maps)
- Access, Equity and Safety



Access Criteria

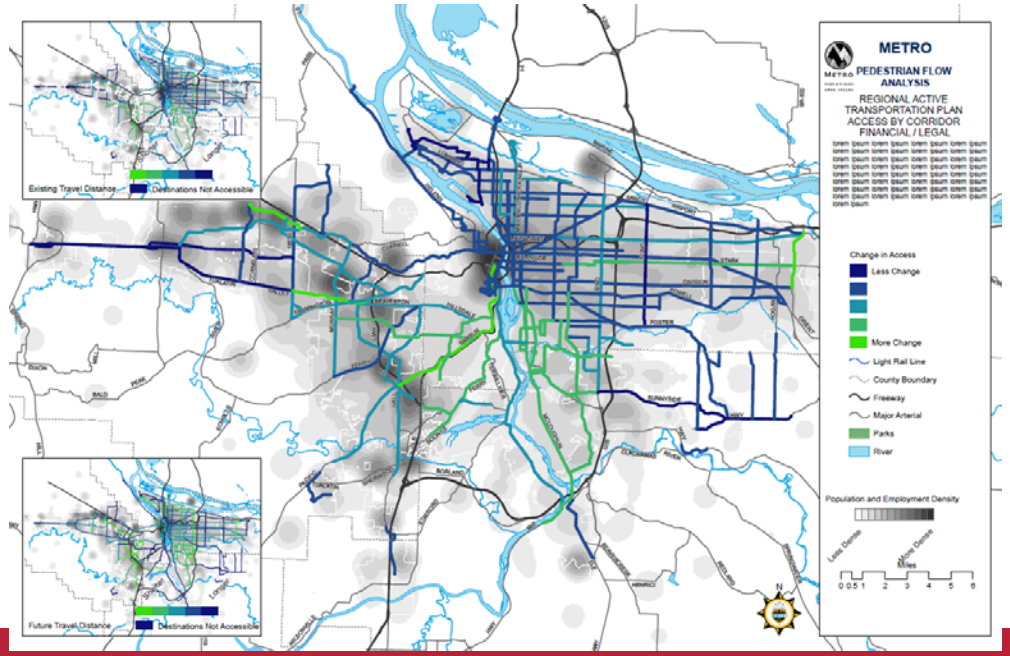
- People
  - 2035 population / employment data
- Destinations
  - Civic, financial/legal, healthcare, food, & essential retail services (NAICS)
  - High frequency bus stops (LRT stations captured in station communities)
  - Regional parks (those identified on the 2040 map)
- Pedestrian network
  - Sidewalks, crossings and trails
  - Existing and future (complete)

Access Criteria

- For each corridor and district
  - Analysis includes pop and destinations w/in ½ mile buffer
  - Measuring the # of people that can reach each destination via the pedestrian network (i.e. walkable distance)
- Walkable Distance
  - ½ mile or 1 mile

Access Criteria – Corridor Example

- Output map includes
  - People with access in existing conditions
  - People with access in future conditions (completed network)
  - Change between the existing and future conditions



Access Criteria – Corridor Example

- Essentially a model: Extremely resource intensive
- Measuring walking distance for people via the network
  - to reach each of 7 destination types
    - On 80+ corridors
      - Existing and future conditions
- Each iteration takes several hours
  - i.e. One destination type for existing conditions (>80 corridors)
  - Then have to repeat for future conditions
  - Then have to repeat entire process for other 6 destination types

Questions?

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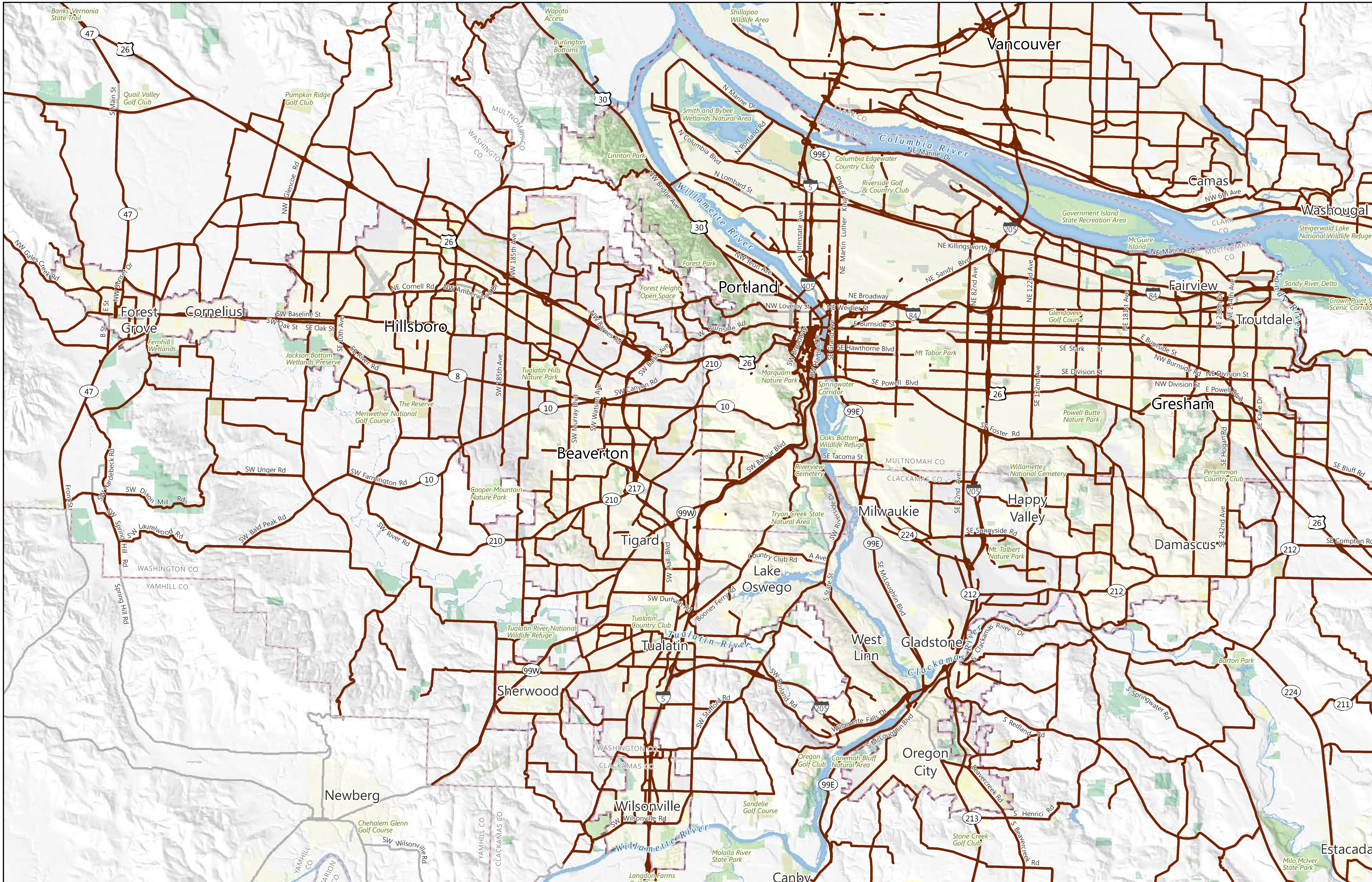
mattberkow@altaplanning.com

Alta Planning + Design
503.230.9862


Vancouver
Camas
Washougal
Portland
Fairview
Troutdale
Gresham
Forest Grove
Cornelius
Hillsboro
Beaverton
Tigard
Lake Oswego
Milwaukie
Happy Valley
Damascus
Tualatin
Sherwood
West Linn
Gladstone
Oregon City
Wilsonville
Newberg
Canby
Estacada
Columbia River
Willamette River
Tualatin River
Clackamas River
Sandy River
Banks-Vernonia State Trail
Quail Valley Golf Club
Pumpkin Ridge Golf Club
Wapato Access
Burlington Bottoms
Shillapoo Wildlife Area
Smith and Bybee Wetlands Natural Area
Linnton Park
Forest Park
Forest Heights Open Space
Columbia Edgewater Country Club
Riverside Golf & Country Club
Government Island State Recreation Area
McGuire Island
Steigerwald Lake National Wildlife Refuge
Sandy River Delta
Crown Point State Scenic Corridor
Glendoveer Golf Course
Mt Tabor Park
Powell Butte Nature Park
Fernhill Wetlands
Jackson Bottom Wetlands Preserve
Tualatin Hills Nature Park
The Reserve
Meriwether National Golf Course
Marquam Nature Park
Springwater Corridor
Oaks Bottom Wildlife Refuge
Riverview Cemetery
Willamette National Cemetery
Persimmon Country Club
Cooper Mountain Nature Park
Tryon Creek State Natural Area
Mt. Talbert Nature Park
Tualatin River National Wildlife Refuge
Tualatin Country Club
Barton Park
Oregon Golf Club
Canemah Bluff Natural Area
Sandelie Golf Course
Molalla River State Park
Langdon Farms Golf Course
Chehalem Glenn Golf Course
Stone Creek Golf Club
Milo McIver State Park
CLARK CO.
MULTNOMAH CO.
WASHINGTON CO.
CLACKAMAS CO.
YAMHILL CO.
MARION CO.
N Marine Dr
N Columbia Blvd
N Portland Rd
N Lombard St
NW Bridge Ave
NW Yeon Ave
N Interstate Ave
NE Martin Luther King Jr Blvd
NE Marine Dr
NE Killingsworth St
NE Sandy Blvd
NE Broadway
NW Lovejoy St
NE Weidler St
E Burnside St
W Burnside Rd
SE Hawthorne Blvd
SE Powell Blvd
SE Grand Ave
SW Harbor Dr
SW Broadway
NE 82nd Ave
NE 122nd Ave
NE 181st Ave
NE 238th Dr
NE 244th Ave
NW 6th Ave
SE Stark St
SE Division St
NW Burnside Rd
NE Division St
NW Division St
E Powell Blvd
SE Kane Dr
SE 122nd Ave
SE Foster Rd
SE Hogan Rd
SE 242nd Ave
SE Bluff Rd
SE Compton Rd
SE 82nd Ave
SE Sunnyside Rd
SE Tacoma St
NW Gales Creek Rd
S Main St
NW Sunset Dr
E St
B St
NW Glencoe Rd
SW Baseline St
SW Oak St
SE Oak St
SE 10th Ave
SE River Rd
NE Cornell Rd
NW Amberwood Dr
NW 185th Ave
NW Barnes Rd
SW Baltic Ave
SW Canyon Rd
SW 185th Ave
SW Murray Blvd
SW Watson Ave
SW Barbur Blvd
SW Unger Rd
SW Farmington Rd
SW Hardebeck Rd
SW Dixon Mill Rd
Front St
SW Spring Hill Rd
Spring Hill Rd
SW Laurelwood Rd
SW Bald Peak Rd
SW River Rd
SW Hall Blvd
SW Durham Rd
Boones Ferry Rd
Country Club Rd
A Ave
S State St
SW Riverside Dr
SE McLoughlin Blvd
SW Stafford Rd
SW Borland Rd
Willamette Falls Dr
S McLoughlin Blvd
SW Wilsonville Rd
SW Wilsonville Rd
S Clackamas River Dr
S Springwater Rd
S Redland Rd
Beavercreek Rd
S Henrici Rd
S Beavercreek Rd
5
205
405
84
26
30
47
8
10
210
217
99W
99E
224
212
211
213

Regional Active Transportation Plan

DRAFT - Principles for the Regional Active Transportation Network

The following principles are used to **guide policies and development** of the regional active transportation network.

1. Cycling, walking, and transit routes are integrated and connections to regional centers and regional destinations are seamless.
2. Routes are direct, form a complete network, are intuitive and easy-to-use and are accessible at all times.
3. Routes are safe and comfortable for people of all ages and abilities.
4. Routes are attractive and travel is enjoyable.
5. Routes are integrated with nature and facility designs are context sensitive.
6. Relieves strain on other transportation systems.
7. Increases access to regional destinations for low income, minority, disabled, non-English speaking, youth and elderly populations..
8. Measurable data and analysis inform the development of the network and active transportation policies.
9. Implements regional and local land use and transportation goals and plans to achieve regional active transportation modal targets.

DRAFT - Regional Active Transportation Network Evaluation and Prioritization Criteria

Access. Does the network improve access to destinations?

Safety. Does the network make it safer to walk and ride a bike for all users, regardless of age and ability?

Equity. Does the network increase access low income, minority, disabled, non-English speaking, youth and elderly populations?

Increased activity. Does the network increase the number of trips made by walking and bicycling?

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Metro | *Memo*

Date: January 18, 2013
To: ATP Stakeholder Advisory Committee (SAC)
From: Lake McTighe, Metro
Subject: **DRAFT Revised** 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 network~~s~~ 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.

Potential 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. Employment sites with ~~500~~ 300 or more employees (Data source: NAICS code data, filtered by number of employees.)
2. High frequency bus stop locations (Data source: RLIS. Light rail stations are already captured within station communities in the pedestrian network.)
3. Regional shopping centers (Data source: Points created from Internet search. See list below)
~~3.~~4. Major hospitals and medical centers (Data source: RLIS)
~~4.~~5. Colleges and universities (Data source: RLIS)
~~5.~~6. High schools (Data source: RLIS)
~~6.~~7. Regional parks (Data source: RLIS~~, those identified on Metro's 2040 map~~, Metro will work with partners to compile a list)
~~7.~~8. Major government sites (Data source: RLIS)
~~8.~~9. Sports and attraction sites (Data source: NAICS) (e.g. zoo, OMSI, Jen Weld, Rose Quarter)
~~9.~~10. Social services 200 ~~daily~~ monthly LIFT pickups (Data source: NAICS)

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

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Metro | *Memo*

Date: ~~January 10, 2013~~February 14, 2013
To: ATP Stakeholder Advisory Committee (SAC)
From: Lake McTighe, Metro
Subject: UPDATED Draft 2- Proposed improvements for evaluating the regional pedestrian network

A set of improvements to the regional pedestrian network will be identified for prioritization. The Pedestrian Network Analysis will provide direction to the Stakeholder Advisory Committee to determine where and how to focus investments. ~~evaluated to demonstrate the potential of increasing access to destinations within and near the network, increasing the safety of the network and increasing access and safety for identified equity populations. Metro is proposing that the type and location of improvements will be identified using a variety of methods and sources.~~

Sources for regional pedestrian network ~~improvements~~improvement projects

1. Gaps in sidewalks, trails and crossings identified in existing conditions analysis
2. TriMet Pedestrian Network Analysis priority transit stop locations
3. 2035 RTP project list, Mobility Corridor Atlas, local TSPs, SW Corridor project list and East Metro Connections Plan priorities for major crossings and improvements
~~3.~~4. 2016-18 STIP Enhance Applications, 2016-18 RFF applications

Proposed improvements for evaluating the regional pedestrian network

1. Fill in every sidewalk gap in regional pedestrian corridors and districts identified in the 2012 sidewalk inventory.

2. Complete trail gaps in pedestrian network trails identified in the Regional Trails data set.

3. Add the following regional trails to the regional pedestrian network (identify non-paved trails~~:~~). These trails were identified by Metro staff and most are currently identified on the regional trail map. Trails that provided a unique pedestrian connection or are a newly identified trail were included.
    1. *Sandy River to Springwater Multimodal Corridor (includes the Beaver Creek Trail from Glenn Otto Park, Troutdale, to Springwater Corridor via Mt Hood Community College)(conceptual; not on regional trail map, identified in EMCP)*
    2. *Wildwood Trail from US Hwy 26 to NW Cornelius Pass Road (pedestrian only; currently identified as a trail not meeting transportation criteria from April 2007 screening)*
    3. *Marquam Trail from US Hwy 26 to SW Terwilliger Blvd*
    4. *SW Terwilliger Blvd from SW 6th Ave to OR Hwy 43*
    5. *BN Powerline Corridor Trail from the Rock Creek Trail to the Cooper Mt. Trail*
    6. ~~*Hillsdale to Lake Oswego Trail*~~ *(pedestrian trail only, not paved; currently identified as a trail not meeting transportation criteria from April 2007 screening)*
    6.

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7. *River to River Trail, a.k.a., Wilson Creek Trail, from the Willamette River in Lake Oswego to the Tualatin River in Stafford~~.~~*
8. *Columbia Slough Trail from NE 47th to NE 82nd (ped only; fills gap in planned trail previously on RTP pedestrian system map)*
9. *Columbia Slough Trail from NE 166th to NE Fairview Lake Way*
10. *Sunrise Multi-Use Path (not on regional trail map) (RTP 11347)*
11. *Hwy 47 Trail, Forest Grove (constructed, bike/ped)*
12. *Hwy 217 Trail (conceptual, bike/ped)*
13. *Segment of Hwy 26 Trail (planned, bike/ped)*
14. *Kruse Way Path (constructed, bike/ped)*
15. *Tualatin River Greenway Trail segment*
16. *Damascus Trails (not on identified on Regional Trails Map)*

4. Add ~~the following~~ potential regional bicycle parkways (which are not current pedestrian corridors) or appropriate parallel route and fill any sidewalk gaps~~:~~.
   - ~~229th/231st from Evergreen to Lois, Lois from 231st to Century Blvd, Century Blvd from Lois to TV Hwy~~
   - ~~Schools Ferry Rd. from Sunset Hwy to TV Hwy~~
   - ~~On street Crescent Connection Trail through Beaverton TC~~
   - ~~Connection from Sunset Hwy to Hwy 26 Trail~~
   - ~~Milwaukie LRT connection from Willamette River Bridge into downtown Portland~~
   - ~~NE Vancouver and Williams couplet in Portland~~
   - ~~Sunnyside Rd. from Damascus TC to 242nd.~~
   - ~~NW 205th, 206th, NW John Olson Road from *TV Hwy* to EvergreenMilwaukie LRT Clinton St. Multi-use path~~
   - ~~McLoughlin Trail (Tacoma to 17th Ave)~~

5. Improved pedestrian crossings:
   - For corridors with posted speeds over 35 MPH, over 10,000 daily auto trips and/or those with 3 or more lanes of traffic provide for an improved pedestrian crossing at least every 530 feet or at a trail crossing.[1]

[1] Examples of crossing improvements:

A. A median refuge (or equal/better treatment) is provided where any of the following conditions is satisfied:
   - Road is 4 lanes or more
   - Daily traffic volume is 12,000 or greater
   - Posted speed is 45 mph or greater

B. A signal or rapid-flash beacon and yield lines and marked continental crossing (or equal/better treatment) are provided where any of the following conditions is satisfied:
   - Road is 4 lanes of more and posted speed is 45 mph or greater
   - Daily traffic volume is 15,000 or greater and posted speed is 35 mph or greater
   - Daily traffic volume is 25,000 or greater and posted speed is 25-30 mph

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- For pedestrian districts with a high proportion of roadways with speeds over 35 MPH, over 10,000 daily auto trips and/or those with 3 or more lanes of traffic provide for an improved pedestrian crossing at least every 530 feet.[2]
- Provide for an improved crossing when a regional trail intersects with a roadway.
- Provide for an overcrossing or similar type of separated crossing where corridors or roadways within districts intersect with a limited access freeway or highway, a railroad or river. (RTP projects for these type of crossings are listed in #6. If no project exists but a barrier is identified a crossing will be added for the evaluation.)

6. ~~Add pedestrian bridges at the following locations, providing crossings of limited access freeways or highways, rivers and railroads, or on constricted roadways~~Bridge and crossing projects in the RTP. [NOTE: DRAFT LIST OF BRIDGES AND CROSSINGS WILL BE USED TO IDENTIFY PRIORITY PROJECTS. FOR ANALYSIS OF THE PEDESTRIAN ENVIRONMENT, BRIDGE AND CROSSING WILL BE AUTOMATED] :
   - *Causey Ave Overcrossing of I-205 at Bob Schumaker Road and I-205 path (RTP 10007)*
   - *Hwy 26 at 173rd/174th Ave.*
   - *Boeckman Rd. I-5 overcrossing in Wilsonville, connect to regional trails (RTP 10132)*
   - *I-5 at Gibbs Overcrossing, Portland (completed; confirm on map)*
   - *N. Lombard at Columbia Slough Overcrossing, Portland (RTP 10217)*
   - *Grover pedestrian Bridge, Naito to Barbur (RTP 10235)*
   - *205th Ave Bridge over Beavercreek (RTP 10592)*
   - *Bridge at 231st/Century Blvd. Hillsboro (10818)*
   - *Separated grade crossing of TV Hwy by Westside Trail (RTP 11210)*
   - *Bridge crossing of Hwy. 26 by Westside Trail (RTP 11211)*
   - *Bridge crossing of Scholls Ferry Road by the Westside Trail (RTP 11213)*
   - *Grade separated crossings of major roads in Aloha connecting to the Westside Trail (RTP 11239)*
   - *French Prairie Bike/Ped Bridge (RTP 10133)*
   - *Trolley Trail Bridge (RTP 10151)*
   - *Wildwood Bridge at West Burnside (RTP 10351)*
   - *162nd RR Bridge at I-84, Gresham Fairview Trail (RTP 10492)*
   - *Kellogg Creek ped/Bike bridge (RTP 10109)*
   - *SE 122nd at SE Morrison Ped Overcrossing (RTP 10223)*
   - *Ross Island Bridge Improvements (RTP 10259)*
   - *Pedestrian Overpass near Markham School, over SW Barbur and I-5 (RTP 10286)*
   - *Ped/bike bridges over 99 W, Sherwood (RTP 10707)*

[2] *ITE- Context Sensitive Solutions, Designing Walkable Urban Thoroughfares -Urban Chapter 10, Intersection Design Guidelines*" states: The preferred location for pedestrian crossings is at intersections. However, if the block length exceeds 400 feet, consider adding a midblock crossing. The target spacing for pedestrian crossings in more intensive urban areas (C-4 to C-6) is every 200 to 300 feet." http://www.ite.org/css/online/index.html

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- *Pedestrian Bridge over the Tualatin River at SW 108th Ave (RTP 10742 – not on regional ped system)*
- *Bike/ped undercrossing of I-5 R ~~sw~~ SW Sheridan, Portland (RTP 10247)*
- *Killingsworth Bridge at I-5 (RTP 10296)*
- *SE Tacoma Overcrossing, Portland (RTP 10297)*
- *SW Barbur Bridge improvements (RTP 11324)*
- *East Portland I-205 Crossing (RTP?)*
- *NE Halsey 1-205 Overcrossing (RTP?)*
- *7th Ave Bike-Ped Bridge (RTP?)*

7. Assume trail access at the intersection of two trails or roadway.

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Metro | *Memo*

Date: ~~November 29, 2012~~January 18, 2013
To: ATP Stakeholder Advisory Committee (SAC)
From: John Mermin and Lake McTighe, Metro
Subject: **Revised Draft -**Proposed Evaluation Methodology for Regional Bicycle Network Concepts

This memorandum outlines the criteria methodology for evaluating alternative regional bicycle network concepts. For the Regional Active Transportation Plan a total of five regional bicycle networks will be evaluated using Metro's regional bicycle modeling tool and geographic information system (GIS). The intention of the evaluation is to understand the potential benefits and trade-offs of each alternative bicycle network concept. From the five alternative network concepts a preferred Principal Regional Bicycle Parkway Network will be identified. The Principal regional Bicycle Network will be comprised of Regional Bicycle Parkways, the highest functional classification of regional bikeways and will serve as the primary spine of the entire regional and local bicycle network. Other regional bikeways and local bikeways will connect into the spine.

Proposed Regional Bicycle Network Concepts to be Evaluated

Base concepts

1. **2010 Regional Bicycle Network.** This is the existing network of existing local and regional bicycle facilities.
2. **2035 RTP Bicycle Network Projects.** Includes the 2010 network plus future planned bike projects that are included on the RTP project list, including bike improvements that are part of roadway projects. (*Note: Not all gaps in the 2035 RTP bicycle network vision have projects identified in the RTP project list and some of the future projects improve areas outside the RTP bicycle network vision.)*

Regional Bicycle Parkway Concepts

3. **Concept 1- Grid Network of Regional Bicycle Parkways.** Comprised of a grid of regional bicycle parkways spaced approximately every 2 miles north/south and east/west. Connecting to regional centers and areas of higher density employment and households is emphasized. The concept includes the 2035 network. This is the medium density concept.
4. **Concept 2 – Spiderweb Network of Regional Bicycle Parkways.** Comprised of a spiderweb of regional bicycle parkways with connections to regional centers and areas of higher density employment and households emphasized. The concept includes the 2035 network. This is the densest bicycle parkway concepts. The spiderweb is comprised of long radials with circular connectors.
5. **Concept 3 – Mobility Corridors.** Identifies ~~at least~~ one Regional Bicycle Parkway per regional mobility corridor. Mobility corridors that extend outside the urban growth boundary are not included. The concept includes the 2035 network. This is the sparsest of the bicycle parkway network concepts.

Description of Proposed Regional Bicycle Parkway
The 2035 Regional Transportation Plan (RTP) included a new policy concept for the regional bicycle network, the "Regional Bicycle Parkway." These routes are intended to form the spine of the regional bicycle network, providing for direct and efficient travel with minimal delays in different urban environments and to destinations outside the region. The RTP introduced the concept but did not designate specific routes. It deferred to a future Active Transportation Plan to further develop the concept, including desired spacing, designation of routes and prioritization for implementation. Key experiential aspects that the bicycle parkways should embody:

- Comfort and safety provided by protection from motorized traffic
- Large volumes of cyclists traveling efficiently with minimal delays
- A green environment (some will already be green, while others will be made greener as part of bicycle parkway development, e.g. adding street trees, plantings or bioswales along the route)

The experience of the cyclist will be optimized to such a high level that people will clearly know when they are riding on a Regional Bicycle Parkway. The specific design of a bicycle parkway will vary depending on the land use context within which it passes through. The facility could be designed as an off-street trail along a stream or rail corridor, a cycle track along a main street or town center, or a bicycle boulevard through a residential neighborhood. Priority treatments will be given to cyclists (e.g. signal timing/priority) using the bicycle parkway when they intersect other transportation facilities, and connections to/from other types of bicycle routes will be intuitive.

Criteria to Evaluate the Bicycle Network Concepts

The following criteria were identified by the ATP Stakeholder Advisory Committee to evaluate the bicycle network concepts to aid in determining the best concept or combination of concepts for the principal regional bicycle network.

Criteria
Access: Improved access to destinations, including transit, schools, jobs, parks, social services, town centers, etc.
Equity: Providing access (see criterion above) to serve low income, minority, non-white, non-English speaking, youth (under 18~~),~~), disabled and elderly populations (65 and over)
Safety: Solves a safety problem, provides safe crossings, safety on high volume/speed roads.
Increased Activity: Measures the increase or decrease in the number of trips made by walking and bicycling. (Metro will evaluate this criterion using the Metro bicycle modeling tool.)

Process

Potential Regional Bicycle Parkways (e.g. the I-205 Trail, SW Barbur Blvd, etc) identified by Metro staff and the Stakeholder Advisory Committee are coded into Metro's bicycle modeling tool. Actual facilities and/or right-of-way are identified in order to use the modeling tool. While the ATP will propose a set of Regional Bicycle Parkways, for the purposes of the evaluation the identified facilities and/or rights-of-way are proxies for the corridors where it is assumed a regional bicycle parkway is needed.

To test a "what-if" scenario of the impact of narrowing a roadway (i.e. a road diet) to accommodate ~~an~~ in-roadway bikeways, such as a cycle track, staff identified a set of roadways in the Spiderweb and Mobility Corridor concepts. Roadways were chosen to reflect different areas of the region and are merely to test the "what-if" scenario~~a lane was removed for some of the corridors on the Spiderweb and Mobility Corridor Concepts.~~ No lanes were removed from ~~the~~ any bike parkways in the Grid concept to provide a comparison. The lane removed ~~al~~ is ~~based~~from the planned 2035 cross-sections. ~~on the 2035 transportation network~~Note – in the 2035 RTP, some of these roads are widened from their existing cross-sections, e.g. 172nd, TV Hwy, . ~~and includes projects to widen roadways by 2035.~~

~~Decisions such as lane removal are generally made during the design phase of a project, and identifying a comprehensive and accurate list of roadways where lane removal is beyond the scope of the ATP project. Our approach is to identify a limited set of roadway corridors where we could reasonably assume that some lane removal or parking removal might be needed and/or feasible and compare the modeled results to roadways that did not have a lane removed. Some of the roadway corridors are present on at least two bicycle network concepts for comparison purposes.~~

Corridors with one auto travel lane replaced with bikeway

1. SW Barbur Blvd. I-405 to future Tonquin trail (just South of Sherwood Blvd) (Remove lane from Mobility Corridor and Spiderweb, not on Grid)
2. SE Halsey, ~~east of I-205~~ I-205 Trail to Gresham-Fairview Trail ~~to 186th~~ (Remove lane from Mobility Corridor and Spiderweb, not on Grid)
3. ~~Troutdale Road/282nd. (Remove lane from Mobility Corridor and Spiderweb)~~
4. SE Foster Powell Blvd. -to SE 172nd and Powerline Trail(Remove lane from Spiderweb)
5. SE Sandy, Burnside Couch couplet to I-205 Trail (Remove lane from Spiderweb)
6. SE Tualatin Valley Hwy, Westside trail to 10th Ave in Hillsboro (Remove lane from Mobility Corridor and Spiderweb, not on Grid)
7. Hillsboro to Forest Grove (Baseline/Adair/Pacific) (Remove lane from Spiderweb, not Grid)
8. SE 172nd, Sunnyside Rd. to Powerline Trail (Remove lane from Spiderweb, not Grid)

Comment [LSM1]: Removed. Only two lanes today and no RTP project to widen.

Evaluation Methodology

Access

1. The increase/decrease in the ease of access for bicycle trips by way of the bicycle network and roadway network. The Metro bicycle modeling tool will be used to measure the utility from Transportation Analysis Zones (TAZs) and Cycle Analysis Zones (CAZs) to regional destinations such as the CBD, Regional Centers such as Gateway, Gresham, and Hillsboro, large employers, e.g. OHSU, Intel. Higher utility, identified by a number, indicates better access from the identified TAZ or CAZ to the regional destinations. Metro will identify set of "origin-destination" trips, attached, that will be reviewed by the Stakeholder Advisory Committee.

2. Increase in bikeway density. Measures the number of new miles (compared to 2010 network) of bike lanes, bike boulevards and trails in each network concept. Metro will utilize the bicycle modeling tools and GIS to calculate the miles of new bicycle lanes, bicycle boulevards, trails and cycletracks. The density the bicycle network in each concept will be calculated for each cycle analysis zone. A map will depict whether the facilities are improved existing or are new. Facilities such as buffered bike lanes and cycle tracks were not in existence in the region when

the bicycle modeling tool was developed. These facilities will be identified (in the bicycle modeling tools) as having a similar comfort level as "bicycle boulevards". If possible, report out the mileage of mileage traveled on buffered bike lanes and cycle tracks separately from bicycle boulevards.

3. Bikeway connectivity for each of the network concepts will be calculated using GIS. The ratio of three-way or more intersections for the bikeway network concepts will be calculated. Bikeway connectivity for the existing bicycle network has already been calculated in Metro's Cycle Zone Analysis.

4. Increase in bicycle volumes on new parkway bridges that cross barriers such as rivers, freeways or railroads. Metro will utilize the bicycle modeling tool to calculate the bicycle volumes. The level of attractiveness for the new crossings to "attract" new bicycle trips will also be calculated.

5. Measure change in directness of trips and/or travel time savings

Safety

1. Measures increased separation from roadway traffic. Using the bicycle modeling tools, the percentage of miles of bicycle (and pedestrian) traveled made on trails and cycle tracks will be calculated and compared with the percentage of miles of each facility type.

2. Number of high crash locations/corridors that intersect with improvements to the bicycle network.

~~2.~~3. Develop a Bicycle Comfort Index (BCI) for the 2035 network and each of the three concepts for comparison to the 2010 BCI developed in the existing conditions. This measure looks at auto speeds, auto volumes and the number of lanes for on-street bicycle facilities. It is proposed that Cycle tracks will be identified as completely separated and treated like trails; 0 lanes, 0 auto volumes, and 0 auto speeds.

Equity

1. Increase in the miles of all new bicycle facilities and new bicycle parkways in U.S. Census block groups that have a higher than average percentage of low income, minority, non-English speaking, youth (under age 18) or elderly (over age 65) populations. Metro will use the demographic calculations developed in the Transportation Equity Analysis for the 2014-15 Regional Flexible Fund Allocation (RFFA). Using GIS, the miles of new facilities in each block group will be determined for each bicycle network concept. Since we cannot forecast the distribution of future populations by sub-group, the analysis will assume a distribution of population sub-groups similar to 2010 in the 2035 bicycle network concepts. Metro will assign an equity score to each of the network concepts based on the calculations.

Increased activity

1. Increase or decrease in the percentage of all trips made by bicycling and walking for the overall network concept and for some individual bicycle parkways. The bicycle modeling tool will be used to measure the change (decrease/increase) in mode share for all modes region wide by trip length for all types of trips under 12 miles. The calculations can be aggregated by CAZ.

2. Increase or decrease in the number of miles traveled by bicycle and foot for all types of trips. Using the bicycle modeling tool the change in VMT, BMT (bicycle miles traveled) and PMT (pedestrian miles traveled), total and per person will be calculated. The calculations can be aggregated by CAZ.

3. Number of short trips made by bicycle and foot for all types of trips. Using the bicycle modeling tool, the percentage of trips under three miles and change in VMT, BMT, PMT under 3 miles will be calculated. The data can be aggregated by CAZ.

4. Average trip length on new bicycle parkways for all types of trips. Using the bicycle modeling tool, Metro will identify a few illustrative examples and compare to the overall average bike trip length. Helps answer the question, "do longer trails/seamless corridors allow longer trips to be made by bicycle?"

5. Calculate change in mode share by geographic areas used in the 2011 Oregon Household Activity Survey (e.g. CBD, city center minus CBD, inner east side, counties, other cities)

Potential Presentation of Evaluation Outcomes

1. Schematic representation of each bicycle network concept overlaid on 2035 bicycle network. Each map will include a matrix of the criteria with evaluation measure outcomes (e.g. increase in bicycle miles traveled, equity score, etc.).

2. Metro will explore the possibility of calculating the evaluation measures by cycle analysis zone (CAZ) and displaying the changes graphically by CAZ.

3. Map depicting whether the Regional Bicycle Parkways consist of improved existing facilities or are new.

4. Network flow maps. These maps provide a graphic representation of the modeled volume of bicycle trips on the bicycle network.

5. Maps of each regional center showing level of access (utility) from TAZs and CAZs

MEETING SUMMARY
Active Transportation Plan | Stakeholder Advisory Committee Meeting
3:00-5:00 p.m., January 10, 2012

SAC Members present: Brad Choi, Hillsboro
Aaron Brown, The Intertwine
Kelly Clark (for Katherine Kelly) Gresham
Lidwien Rahman, ODOT
Todd Borkowitz, Citizen Rep.
Lori Mastrantonio-Meuser, Clackamas County
Hal Bergsma, Tualatin Hills Parks and Recreation
Suzanne Hansche, Elders in Action
Kate McQuillen, Multnomah County
Jeff Owen, TriMet
Shelley Oylear, Washington County
Roger Geller, PBOT
Stephanie Routh, Willamette Pedestrian Coalition

SAC Members absent: Allen Berry, Fairview
Rob Sadowsky, Bicycle Transportation Alliance
Derek Robbins, Forest Grove
Jose Orozco, Cornelius
Allen Schmidt, Portland Parks and Recreation

Metro staff and guests present: Lake McTighe, John Mermin, Matt Berkow (Alta Planning)

Meeting overview
Lake McTighe gave a brief overview of the agenda and the desired outcomes of the meeting:

- Hear any further comments on the Active Transportation Network Principles and Criteria, and potentially finalize.
- Receive feedback on the revised methodology for evaluating the pedestrian network improvements.
- Discuss and agree on which destinations to include in the pedestrian network improvement evaluation.
- Receive feedback on the revised methodology for evaluating the bicycle network concepts.
- Review origin-destination trip pairs for bicycle model and ask for suggestions on additional trip pairs.
- Look at initial bicycle modeling results for the 2010 existing network and 2035 network to give an idea of what the evaluation will be providing us.

Lake announced that Heidi Guenin had resigned from the committee due to a change in her position and that the committee would need to bring in the health perspective.

Lake pointed to the project timeline and list of upcoming meetings. She noted that all of the SAC meetings had been scheduled through the end of the project. She also noted that she was starting to schedule presentations

on the plan in April with stakeholder groups **and asked SAC members to contact her with any groups that should get a presentation.**

Principles and Criteria, final revisions

SAC members reviewed the updated principles and criteria (changes made from the November meeting) and provided feedback. Lake noted that the process was pointing to continued fine tuning of the principles as the ATP was developed. She noted that the Metro Council would have an opportunity to provide input on the principles at their upcoming worksession in February. ***Suggested changes are attached.***

- Hal and Lidwien - Principle #1 –connections to all destinations or regional destinations? Add word regional before destinations in Principle #1 and Principle #7.
- Lori and other SAC members noted that still need to determine what falls under regional destinations.
- Hal – Principle #2, what does connected mean? Does it mean complete?
- Hal – what does data driven mean in #8?
- Roger – think this is trying to say that what you prioritize is based on measureable data
- Matt Berkow – suggest adding the word analysis?
- Kelly Clark- add "routes" to #1
- Kelly - #2 – intuitive for users? What is intuitive and for who? It is not clear
- Kelly – possibility to combine #3 and #5?
- Roger, Lidwien and Aaron – think that they should be separate.
- Kelly - #9 add word plans – implementing projects as well
- There was a discussion about including the word local in principle #9 – are regional and local goals and targets the same? If you include local and there are different goals or targets will it be confusing or lead to a less implementable regional plan? SAC seemed to land on leaving local in.

Updated pedestrian evaluation methodology

SAC responded to revised Alta memo on the methodology for analyzing improvements to the regional pedestrian network. ***Revisions based on feedback are attached.***

- Kelly – under criteria (first page) how are safety problems defined? Lake responded that Metro's Safety Action Plan helps identify problem areas, locations of crashes; deficiencies and gaps on high traffic volume/speed roadways also indicate a less safe environment.
- Members reported difficulty in interpreting the equity/barriers map. This map shows roads that have one of the following conditions: 4+ lanes, 35+mph, 2,500+ vehicles during peak period. Lake will email out a link to a larger version of this map (Attached)
- Lidwien – page 5, need to clarify the difference between existing network and existing planned network. Also include map and description of the barrier network.
- Kelly – page 2 pedestrian travel assumptions – it is a big assumption to assume that all local streets are adequate for pedestrian travel. Lake responded that this was for the purpose of the analysis. This does not imply a policy. It is a technical approach – the GIS programming makes this assumption.

Destinations for evaluation and prioritization

SAC reviewed the memo describing Metro's suggested approach to analyzing destinations. The SAC agreed to the approach overall. ***Revisions based on feedback are attached.***

- Question about which destinations are included in #8. Lake responded sites such as zoo, Rose Quarter, Jen Weld. A list will be included with the map that will be available at the next meeting.
- #9 – typo – it should say "200 monthly" not "daily" LIFT pickups. SAC agreed this made more sense.
- Confirm if hospitals and major health care providers are included in "social services". Hospitals will be added using RLIS data.

- There was a discussion about how to capture office complexes and industrial areas that have clusters of employment. These will not be captured in #1, employers with more than 300 employees. Lake suggested reviewing the first draft of the "regional destinations map" and then deciding on next steps. Lidwien suggested (and Hal agreed) that it made more sense to focus on serving employment in 2040 centers, rather than office parks.
- Shelley – will there be enough difference in where employment is located in the future that the NAICS codes (which only captures the present and the plan is for the future) will not provide enough information. *Lake suggested overlaying the pedestrian network (and possibly the bike network) with the 2035 employment densities.*
- Lidwien suggested keeping destinations limited and noted that the regional destinations would help prioritize.
- Roger wondered if using a broader list of destinations was fine for the pedestrian analysis, since we're not comparing alternative networks like in the bike analysis.
- Hal – need to make a difference between destinations for pedestrians and bicyclists. The travel distances are different. Lake noted that the average regional trip for pedestrians is ½ mile in the region.
- Roger – it makes sense for the bike system to use destinations such as centers.
- Hal – how do you define regional parks? Some Metro-owned parks don't generate as much usage as some locally owned parks. Lori and Hal suggested providing a list of what were considered regional. Lake will follow up with them and others.
- Jeff Owen – a proof of concept from Alta would be helpful in trying to determine which destinations make sense to use.
- Matt asked the committee if all destinations are created equal in the analysis (should some be weighted differently?)
- Aaron asked to clarify the purpose of the ped analysis.
- Hal – are trails included? Lake, yes and a map showing them will be available at the next meeting.
- Matt noted once we have initial results it will be easier to discuss.

Updated bicycle network concept evaluation memo and preliminary bicycle modeling evaluation results for 2010 and 2035 bicycle networks

SAC provided feedback on revised

- Roger – stated that his understanding was that while the bicycle modeling tool was still being refined (only one study used to develop it) it was helpful for comparative evaluations at the network level. John noted that this was correct.
- John noted that we would learn a lot from the tool through this process.
- Aaron asked if the evaluation would tell us how to prioritize. Lake stated no, but the evaluation would provide information to inform the decision.
- Hal – what is a parkway? First time he has seen it on the maps. Lake – yes added it to the maps (network concepts) because the evaluation is focused on the regional bicycle parkways – first identified in the 2035 RTP, concept needs to be refined as part of ATP. Highest level classification for a bike facility.
- Roger asked if we can look at mode-split results by organized by the geographic sub-areas people live in.
- Roger asked if our modeling staff if can produce the 2035 trip pairs chart for trips < 5 miles. It currently includes CAZ pairs with the most trips between them (2035 Total daily person trips < 10 miles),
- *Note: revisions based on feedback on lane removal section of memo are based on feedback provided after the meeting.*

Origin-destination trip pairs (for bicycle network modeling and evaluation)

John Mermin went over the suggested origin and destination pairs. Lake asked for feedback if SAC members wanted to see additional O-D pairs included.

- Jeff - is it center to center or edge to edge that is modeled? John – It's all trips that begin (anywhere in the first zone and end anywhere in the 2nd zone)
- Brad – is it origin to destination and back to origin (round trip)? John – no, just origin to destination. Brad – why aren't the trips from zone X to Zone Y the same as the trips from zone Y to X? John – people make many different trips throughout the day, e.g. they may go from zone Y to zone Z before they return to zone X.
- Jeff - asked about the "reason" given for the O-D pair. Do we need to provide? John, no just helps explain why the pairs were chosen.

Network Concepts and Evaluation

Stakeholder Advisory Committee
Feb. 21, 2013

Lake McTighe
Senior Transportation Planner
Regional Transportation Planning

Metro | *Making a great place*

the final stretch….

Feb- March: complete evaluation, benefits/trade-offs report

March 21 SAC meeting: discuss evaluation and priority setting, policy changes

April: write draft ATP, stakeholder engagement

May 2 SAC meeting: discuss draft plan, prioritization

May: finalize plan, project list, policies

June 6 SAC meeting: implementation, next steps, celebrate!

Stakeholder engagement to date

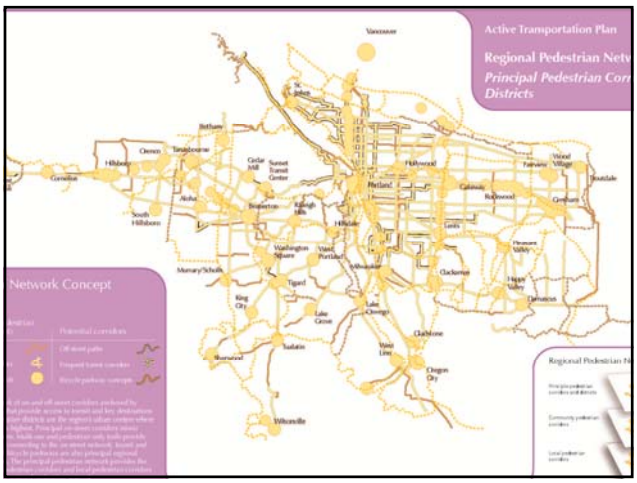
- Metro Council
- ECAT
- TPAC, MTAC MPAC
- TAC's: WCCC, EMCTC, CCCC
- Portland Freight Committee
- Gresahm Transportation Sub--committee
- Elders in Action Commission

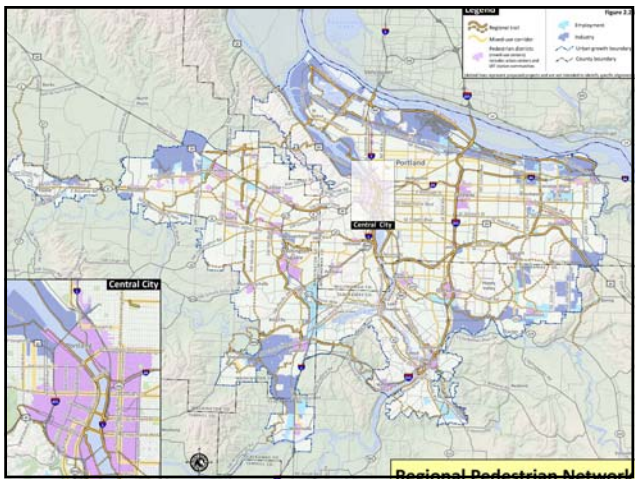
Scheduled – stakeholder engagement

- Open House – May 9
- Clack. Co Bike and Ped Committee
- Portland Bike and Ped Committees
- Mult. Co Bike and Ped Committee
- Oregon Active Transportation Summit
- Washington Coordinating Committee
- JPACT, TPAC, MTAC, MPAC
- Metro Council and ECAT

Regional pedestrian network concept

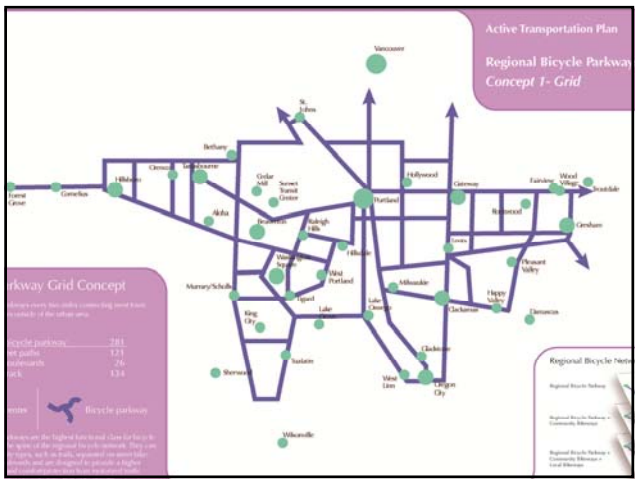
- Principal Regional Pedestrian Network
- Community Pedestrian Corridors
- Local Pedestrian Corridors

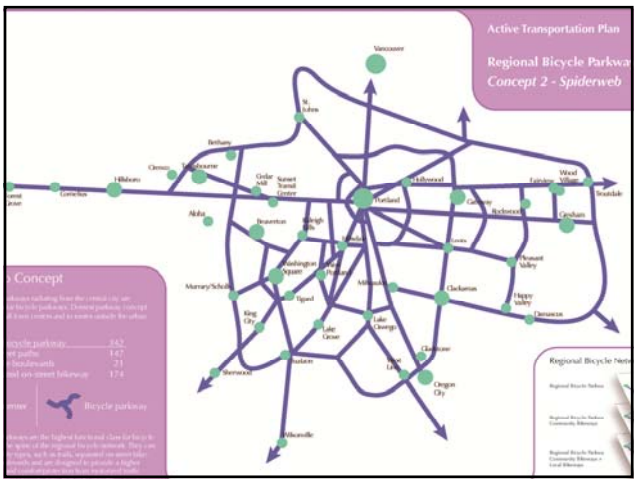


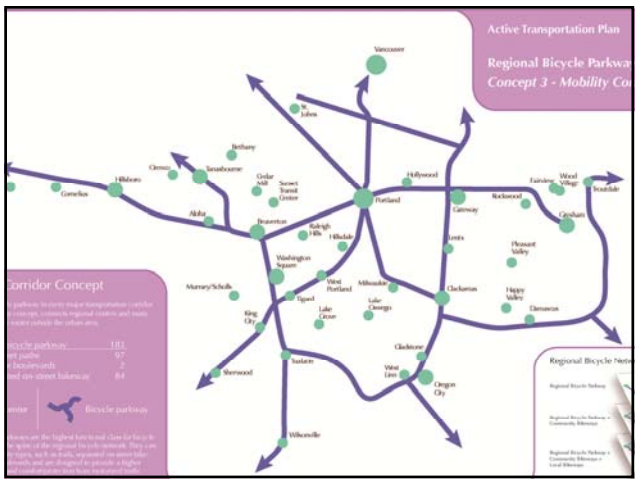


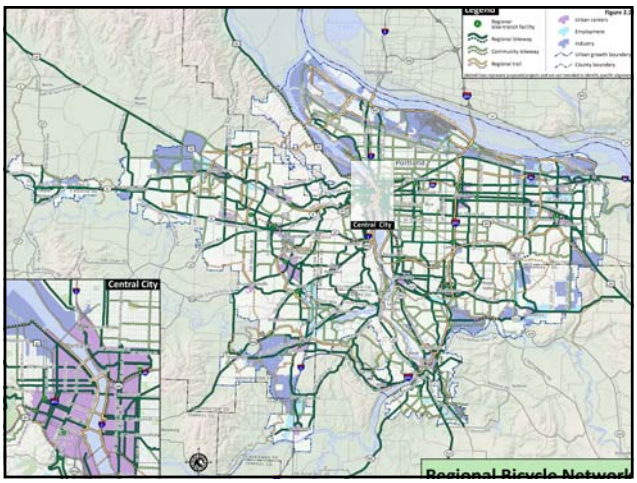
Regional bicycle network concept

- Regional Bicycle Parkways
- Community Bikeways
- Local Bikeways


Active Transportation Plan
Regional Bicycle Parkway
Concept 1- Grid
Bicycle parkway


Active Transportation Plan
Regional Bicycle Parkway
Concept 2 - Spiderweb
Bicycle parkway


Active Transportation Plan
Regional Bicycle Parkway
Concept 3 - Mobility Co
Corridor Concept
Bicycle parkway


Central City
Central City

Metro Council feedback on concepts

1. Liked denser bike parkway concepts, but think it is good to evaluate different levels of investments/broad range of choices
2. Important to show lots of options
3. Should focus on local trips, not long regional trips (bike/ped hwys)- target short trips

Metro Council feedback on principles & criteria

Keep **principles** simple and short..but consider calling out:

- Importance of ROI (under data driven?)
- Expand networks where you will see highest volume of use
- Economic benefits
- A parkway leading to each city center

Criteria: add 'how well does or by how much'

Initial bike facts

1. 1/4 -1/3 of all BMT are on bike network concept facilities.
2. The concept network facilities have about 2.5 times more bike traffic than the average bike facility.
3. BMT more than doubles between 2010 and 2035.
4. Bike trips increase about 65%.