



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

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
<u>Access</u> : Does the network improve access to destinations?
<u>Equity</u> : Does the network provide access to low income, minority, disabled, non-white, non-English speaking, youth and elderly populations?
<u>Safety</u> : 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.
<u>Increases Activity</u> : 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 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.
 - 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 analysis¹) 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 (more accurate than a radial buffer) 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

Metro Active Transportation Plan

- Shapefiles of existing pedestrian network: regional trails, pedestrian corridors, LRT stations (Alta will add ½ mile network buffer to define station 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

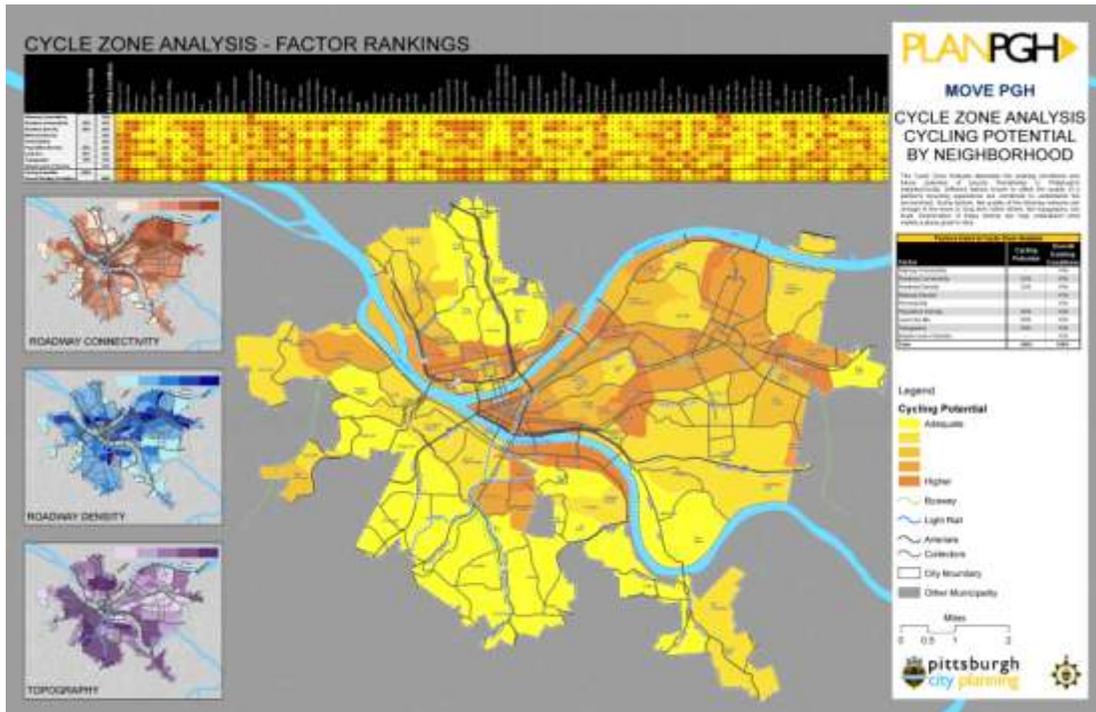
- What will be measured?
 - Improved access to destinations (see access criterion) for each social equity population sub-group identified in the RFFA analysis.
- Methodology
 - For consistency with recent regional transportation planning efforts, we propose utilizing the analysis used in the Transportation 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.
- Key Questions
 - 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).