

Powell-Division Transit and
Development Project—
Supplemental for initial screening of
equity measures

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Supplemental: Powell-Division Transit Alternatives Screening – Approach for Initial Screening of Equity Measures

The following background document is intended to provide information on the methodology for assessing the benefits and burdens of several potential high capacity transit alternatives on three environmental justice communities for the Powell-Division Transit and Development project. The benefits and burdens are intended to provide a quick glance at the potential benefits and burdens each transit alternative poses. Further specific analysis of benefits and burdens will be conducted starting in Fall 2014 and Winter/Spring 2015 as the high capacity alternatives are narrowed and more detail of the route and mode are determined.

Draft Findings

- Overall worst performing for Environmental Justice Communities: Dedicated bus along Division only
- Overall best performing for Environmental Justice Communities: Frequent service plus along Powell-Division
- Overall, the light rail option on a combined “Powell-Division” route would provide more promising benefits to environmental justice communities, but less promising (but not the worst) on the burdens to be experienced by environmental justice communities.
- The route/alignment to perform best is combined Powell-Division route. Regardless of mode, the Powell-Division alignment tended to provide the greatest benefits, but was variable in regards to burdens.
- The mode to perform best is the frequent service plus. While dedicated bus also provided the same level of benefit as a mode, the frequent service plus caused less burden on environmental justice communities.
- Regardless of mode, performance on an “all Division” alignment/route really does not bode very well in regards to benefits and burdens for environmental justice communities. This may be because despite the corridor having an overall higher than the regional average presence of environmental justice communities, the “Division only” corridor did not capture as many environmental justice communities and also experienced more burdens as compared to a “Powell only” or combined “Powell to Division” corridor.

Definitions of transit alternatives explored

The project considered a range of high capacity transit alternatives based on policy, technical assessment, and public feedback.

Rail options include:

- **Light rail**, similar to the existing TriMet light rail network.
- **Rapid streetcar**, which would be similar to the existing streetcar network, but would utilize dedicated transit lanes where possible, with station spacing farther apart. This screen assumes that at least fifty percent of the route would be in dedicated transit lanes.

Bus options were screened to provide a range of bus rapid transit characteristics. Both bus types would include new, larger, and more significant station area amenities compared to existing bus stops. Bus options screened included:

- **Dedicated busway** would include significant portions running in transit-only lanes, enhanced stops and stations, and new vehicles. For analytical purposes, this screen assessed at least fifty percent of the route would be in dedicated transit lanes. Concept design during the next phase could consider dedicated lanes for less than fifty percent, where right-of-way and traffic conditions allow.
- **Frequent service plus bus** would operate primarily in mixed traffic, with transit priority treatments, enhanced stops and stations, and new vehicles. Transit priority treatments could include queue bypass lanes, business access transit lanes, and dedicated right-of-way in locations where right-of-way and traffic conditions allow.

The project is also considering a range of **transit routes** within the corridor between downtown Portland and Gresham. The initial routes include portions of Powell Boulevard and Division Street in Gresham and Portland. The project is also exploring a range of Willamette River Crossings, potential north/south street connections in Portland, and north/south connections in Gresham.

- From downtown Portland, **Division Street**
- From downtown Portland, **Powell Boulevard**
- From downtown Portland, **inner Division Street and transitioning to Powell Boulevard** with options for the north-south crossing
- From downtown Portland, **inner Powell Boulevard and transitioning to Division Street**, with options for the north-south crossing

More detail about the routes are found in the Draft Transit Screening Report. For analytical purposes, a range of potential transit alternatives were assessed based on the equity criteria, based on a range of project vehicle modes and routes. These included:

- Light rail on SE Powell Blvd transitioning to Division (“LR3”)
- Frequent Service Plus Bus on SE Powell Blvd (“FS1”)
- Frequent Service Plus on Bus SE Division St (“FS2”)
- Frequent Service Plus on SE Powell transitioning to Division (“FS3”)
- Dedicated Busway on SE Powell Blvd (“DB1”)
- Dedicated Busway on SE Division St (“DB2”)
- Dedicated Busway on SE Powell Blvd transitioning to Division (“DB3”)

Evaluation of equity in the context of transit alternatives

On June 23, 2014 the Project Steering Committee adopted the following **outcomes** for this project:

The Powell-Division Transit and Development Project will result in an actionable plan for key places (future station areas) and improved mobility to address long-standing infrastructure and investment issues along Powell-Division. This action plan will strive to:

- 1) Create a vision and development strategy for key places that promotes community-driven and supported economic development and identifies tools and strategies that mitigate the impacts of market pressures that cause involuntary displacement.
- 2) Identify a preferred near-term high capacity transit solution for the corridor that safely and efficiently serves high ridership demand, improves access to transit, is coordinated with related transportation investments, and recognizes limited capital and operational funding. The solution will include mode, alignment and station locations.

The Steering Committee also adopted the following **goals** for the project:

- **Transportation:** People have safe and convenient transportation options – including efficient and frequent high capacity transit service that enhances current local transit service – that get them where they want to go and improves the existing system.
- **Well-being:** Future development and transit improvements create safe, healthy neighborhoods and improve access to social, educational, environmental and economic opportunities.
- **Equity:** Future development and transit improvements reduce existing disparities, benefit current residents and businesses and enhance our diverse neighborhoods. There is a commitment to prevent market-driven displacement of residents and businesses and to equitably distribute the benefits and burdens of change.
- **Efficiency:** A high capacity transit project is efficiently implemented and operated.

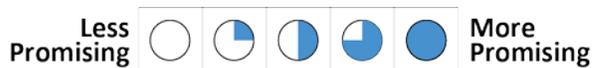
This report documents the screening of the equity goal based on three objectives:

- Improves transit Access, for populations of concern (“EQ1”)
- Distributes negative impacts equitably (“EQ2”)
- Distributes benefits equitably (“EQ3”)

This report defines the technical methods for these objectives when screened against the alternatives.

Summary evaluation of equity in the context of transit alternatives

Powell - Division Screening		Improves transit access for populations of concern	Distributes negative impacts equitably	Distributes benefits equitably
		EQ1	EQ2	EQ3
LR3	Light rail on SE Powell Blvd transitioning to Division			
FS1	Frequent Service Plus on SE Powell Blvd			
FS2	Frequent Service Plus on SE Division St			
FS3	Frequent Service Plus on SE Powell transitioning to Division			
DB1	Dedicated Busway on SE Powell Blvd			
DB2	Dedicated Busway on SE Division St			
DB3	Dedicated Busway on SE Powell Blvd transitioning to Division			



Definitions of Environmental Justice Communities

As the first step in taking an environmental justice lens or perspective to the

Community: People of Color

Proposed Definition: Persons who identify as any of the following races: Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, some other race or multiple races AND persons who identify ethnically as Hispanic or Latino in the 2010 U.S. decennial census.

Reason for Selection of this Community and Definition: Identified as specified population to evaluate under Title VI of the Civil Rights Act of 1964 and the Executive Order 12898 on Environmental Justice.

See Attachment 1 for a map of where people of color exceed the regional threshold.

Community: Limited English Proficiency

Proposed Definition: Persons who identify in the U.S. Census Bureau's American Community Survey as speaking English "less than very well."

Reason for Selection of this Community and Definition: Recently used in Metro's factor one analysis for identifying LEP populations and developing strategies to reduce barriers to participation. For the purposes of the high capacity transit screening alternatives, the LEP populations are being analyzed in aggregate. In the draft demographic baseline report for the Powell-Division Transit and Development project, LEP populations disaggregated by language to inform meaningful public involvement. Because the Powell-Division project is likely to use federal funds, project staff wants to ensure both Executive Order 12898 and Title VI requirements are addressed in all areas.

See Attachment 2 for a map of where persons with limited English proficiency populations exceed the study area threshold.

Community: Low-Income

Proposed Definition(s): Persons living at or below 185% of the federal poverty guidelines

Reason for Section of this Community and Definition(s): Identified as a specified population to evaluate under the Executive Order 12898 on Environmental Justice. In absence of an agreed upon regionally-specific definition (which may emerge out of other work including Metro's equity strategy) federal poverty guidelines definition is being proposed for the interim. Of several commonly used federal poverty guidelines thresholds (150%, 185%, and 200%), the 185% at or below the federal poverty guideline is being proposed. In other recent analyses conducted by Metro, 185% definition has been employed technical feedback and input. For reference, the federal poverty guidelines are listed in Table 1.

Table 1. 2014 Federal Poverty Guidelines

Persons in Family/Household	Federal Poverty Guideline	185% Poverty Guideline
1	\$21,590	\$11,670
2	\$29,101	\$15,730
3	\$36,612	\$19,790
4	\$44,123	\$23,850
5	\$51,634	\$27,910
6	\$59,145	\$31,970
7	\$66,656	\$36,030
8	\$74,167	\$40,090

See Attachment 3 for a map where persons with low-income exceed the study area threshold.

Objectives to Comprise the EQ2 and EQ3 for Screening Evaluation

The Powell-Division Transit and Development project uses a two step screening to narrow the number of high capacity transit alternatives to evaluate in the next phase of the project. The objectives EQ2 and EQ3 are part of the second step screening process. Objectives EQ2 and EQ3 take a high level look at the benefits and burdens posed by each high capacity transit alternative based on a composite of six of objectives (see Table 2 below) evaluated under an environmental justice lens. The Powell-Division Transit and Development project step two screening analysis takes the approach of using the existing methodology already being employed with the other screening measures (i.e. T2, WB3, etc.), but applying an environmental justice lens. Staff reviewed the methodology for each screening measure to see if there are opportunities to employ a simplified environmental justice lens. Based on the methodology review of each screening measure and feedback from the Powell-Division project team as well as select stakeholders, Table 2 identifies the six objectives included in the EQ2 and EQ3 composites. Again, the second step of the screening process is intended to provide a high level look at the potential benefits and burdens of each high capacity transit alternative to the three identified environmental justice communities in the Powell-Division study area. Further analysis will be conducted ...

Table 2. Measures assessed for benefits and burdens on environmental justice communities

Measure	Description
T2	Connects to areas with currently high ridership demand
WB3	Provides transit service to the greatest number of jobs
WB4	Serves major land uses and transit connections
WB5	Serves important community resources and commercial destinations (include recreational resources, parks, but not 4F designated sites)
WB6	Minimizes property impacts (homes and businesses)
WB7	Supports economic development
WB8*	Protects or improves the natural environment

**At the time the methodology for the benefits and burdens objectives (EQ2 and EQ3) were developed, WB8 was identified as one of several objectives to look at under an environmental justice lens. Since conducting the initial analysis, it was determined only a nominal number of regional conservation strategy resources were affected by the high capacity transit alternatives being assessed. Therefore, the WB8 measure has been removed from the composite analysis for objectives EQ2 and EQ3.*

Overall EQ2 and EQ3 Methodology

The overall result shown for each alternative in the Powell-Division Transit and Development project step two screening matrix illustrates a composite of several inputs and considerations. The input

Each environmental justice community (e.g. people of color, people with low-income, limited English proficiency population) was evaluated separately instead of as an aggregate or through a composite. This is because of the limited ability to distinguish in the U.S. Census Bureau's Decennial Census or American Community Survey datasets whether an individual may identify in one or more of the communities of concern. Therefore, with each objective evaluated as part of EQ2 and EQ3 there were three scores for each individual environmental justice community. To gather a single score for the alternative for the measure, the three scores were then combined to create a single aggregated total.

With a single total created for each alternative, the average was taken for each environmental justice community and also summed to create an average. The average served as the benchmark of comparing the total scores (comprised of the scores for each individual environmental justice community) of the alternatives. Alternatives were assigned a value ranging from +2 to -2. Alternatives which had aggregate totals well above the average were provided a break score of +2. Those with totals significant less than were assigned a score of -2. Those scores very close to the average were assigned a score of 0. Table 4 provides an example of how the individual environmental justice communities were combined to create the total aggregated score for each objective.

Once each alternative had a score assigned for each objective to comprise the composite, the scores for each objective that pertained specifically for EQ2 and subsequently EQ3 were aggregated to create the single composite. Table 3 below illustrates which objectives comprised of EQ2 and EQ3. Some of the scores resulted in values as high as 4 and others as low as -4. In reporting out the scoring, any alternative with a composite score greater than 2 was given a 2 value in the reporting matrix. Any alternative with a score less than -2 was given a -2 value in the reporting matrix. The single composite score is reported in the Powell-Division Transit and Development project second step screening matrix.

Table 3.

Powell-Division Step Two Screening Objective	EQ2	EQ3
T2 - Connects to areas with currently high ridership demand		X
WB3 - Provides transit service to the greatest number of jobs		X
WB4 - Serves major land uses and transit connections		X
WB5 - Serves important community resources and commercial destinations		X
WB6 - Minimizes property impacts (homes and businesses)	X	
WB7 - Supports economic development	X	

Table 4. Sample Table

	T2: Connects to areas with currently high transit ridership demand (POC)	T2: Connects to areas with currently high transit ridership demand (Low Income)	T2: Connects to areas with currently high transit ridership demand (LEP)	Total	Score
LR3: Light rail on SE Powell Blvd transitioning to Division	27790	43405	43596	114791	1
FS1: Frequent Service Plus on SE Powell Blvd	21887	47669	39480	109036	0
FS2: Frequent Service Plus on SE Division St	22671	42851	37629	103151	-1
FS3: Frequent Service Plus on SE Powell transitioning to Division	27790	43405	43596	114791	1
DB1: Dedicated Busway on SE Powell Blvd	21887	47669	39480	109036	0
DB2: Dedicated Busway on SE Division St	22671	42851	37629	103151	-1

Note: Average for the three communities is 109,821.

Because each objective was measured slightly differently based on the context of what the objective was to convey, Table 4 outlines the methodology for each objective and how an environmental justice perspective was applied.

Table 4. Proposed methodology each objective to compose the EQ2 and EQ3 composite for screening

Screen Matrix Objective	Measure/Indicator	Methodology
T2 – Connects to areas with current high ridership	Comparison of alternative aggregate boardings and alightings to the boarding and alightings in the corridor which overlap with areas of high concentrations of environmental justice communities	Using a ½ mile radius around each alternative route, determine which existing bus stops are within each alternative. Overlay demographic information and identify the bus stop in each alternative which overlap areas where the high concentrations of environmental justice communities are present in the alternative. Summarize weekday 2013 boardings and alightings of the existing bus stops serving high concentrated areas of environmental justice communities along alternative. Calculate an average of daily boardings plus alightings for all alternative alignments and score individual alignments based on comparison to the average. Alternatives which yield higher ridership where overlapping concentrated environmental justice communities yield greater benefit.
WB3 – Serves the greatest number of jobs	Current employment of environmental justice communities within ½ mile of stops.	Using a ½ mile radius around each alternative route, calculate the employment (using 2010 employment numbers) within each alternative. The ½ mile buffer of each alternative will be used to intersect the 2162 transportation analysis zones (TAZ), which has the attributed 2010 employment information. For each TAZ to overlap the ½ mile buffer, a ratio will be derived to estimate the employment value within the ½ mile buffer. Following, demographic information will be overlaid and identify the areas in the ½ mile buffer which overlaps areas where there is a high concentrated presence of environmental justice communities in each alternative. The employment values will be totaled for each TAZ overlapping the ½ mile buffer and environmental justice community to gather the total employment for the alternative. More employment overlapping areas with high concentration of environmental justice communities yields greater benefit.
WB4 – Serves major land uses and transit connections	The acres of 2040 centers which overlap areas with environmental justice communities.	Using a ½ mile radius around each alternative route, the number of 2040 destinations (e.g. 2040 centers, campuses, etc.) to intersect the alternative buffer will be counted. The same intersection count will be applied looking specifically at the 2040 destinations which overlap environmental justice communities. The number of centers overlapping environmental justice communities will be totaled. The greater number of 2040 centers which overlap environmental justice communities yields greater benefit.
WB5 – Serves community and commercial	Community resources including: schools, health care, public and human services, and	Using a ½ mile radius around each alternative route, the number of community amenities and services (data provided from the Regional Equity Atlas) which intersect the ½ mile alternative buffer will be counted and totaled.

Screen Matrix Objective	Measure/Indicator	Methodology
destinations	food within ½ mile of stop, particularly which overlap areas of high concentration of environmental justice communities.	The same count will occur with the services located within environmental justice communities located within the alternative buffer. Greater number of amenities overlaid in areas of high concentrations of environmental justice communities yield greater benefit.
WB6 – Minimizes property impacts	Potential right-of-way impact to community resources, homes and businesses which overlap areas with high concentration of environmental justice communities.	A coarsely estimated cross section will be determined per mode/segment for each alternative. A segment specific polygon buffer will be created to roughly reflect the total right-of-way needed for that mode/segment. The combined polygons will create the buffer for each alternative. The polygon buffer will be intersected with existing tax lots and building foot prints to roughly assess which mode/segment will have the most or least amount of relative impacts to homes and businesses. The aggregate area of impacted property (home and businesses) will look at the overlap of areas with high concentrations of environmental justice populations to come up with the total area of property impacts which are in environmental justice areas within the alternative. The higher the area, the less benefit to environmental justice communities.
WB7 – Supports economic development	Development potential in areas which overlap areas with high concentration of environmental justice communities.	Using a ½ mile radius around each alternative route, the acres of privately owned land with commercial, multifamily, or industrial zoning designations AND with an assessed “Real Market” improvement to land value ratio of less than 1:1 will be totaled for each alternative. Demographic information will be overlaid to assess where the acres of “Real Market” improvement to land value ratio of less than 1:1 are relative to the presence of concentration environmental justice communities. The acres of the land at a value ratio of less than 1:1 that is within environmental justice communities will be totaled. The greater number of acres yields less and greater benefit to environmental justice communities.
WB8 – Protects and improves the environment*	Number of regional conservation strategy identified high value habitat area within the alternative corridor which overlap areas with high concentration of environmental justice communities.	A coarsely estimated cross section will be determined per mode/segment for each alternative. A segment specific polygon buffer will be created to roughly reflect the total right-of-way needed for that mode/segment. The combined polygons will create the buffer for each alternative. The polygon buffer will be intersected with areas identified as high value habitat as determined in the Regional Conservation Strategy. Regional Conservation Strategy high value habitat areas affected by the polygon buffer in the alternative will also be overlaid with demographic information to illustrate locations where high concentrations of environmental justice communities

Screen Matrix Objective	Measure/Indicator	Methodology
		are located. The acres of high value habitat areas overlapping environmental justice communities will be totaled for each alternative. The greater the total of high value habitat affected, the less benefit to environmental justice communities.

**See note regarding WB8 under Table 2.*

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Major Assumptions and Limitations in the Methodology

As with any technical analysis there were a number of assumptions and limitations to highlight and address. The following section provides a summary of the assumptions and limitations.

Assumptions

- Access to employment is assumed as a benefit for environmental justice populations. Staff recognizes types of employment generally serves as a better measurement for determining benefits to different populations/demographic groups.
- For measure WB3 only current/existing population was evaluated for EQ2 and EQ3 because Metro's existing modeling tools do not forecast race/ethnicity. While the remaining step two screening with look at both existing and future employment growth in the corridor, the environmental justice lens was only applied to existing because only existing demographic information is know at this time.
- Measure WB2 is not being evaluated in the composite EQ2 and EQ3 because very closely resembles and would use similar datasets for evaluating objective EQ1.
- New modeling analysis was not conducted, but outputs from previous forecasting work were utilized.
- Because of the Powell-Division study area is composed of higher than regional average of persons with low-income and limited English proficiency populations, the study area average for low-income and limited English proficiency populations was used for purposes of analysis for developing the composite results the EQ2 and EQ3.

Limitations

- The high capacity transit alternatives evaluated in the step two screening for the Powell-Division Transit and Development project are not fully detailed designs and therefore the evaluation is only capable of providing a high level initial assessment of the benefits and burdens on environmental justice communities for each alternative.
- Similar to other analyses which utilize U.S. Census data, the exact location of environmental justice communities cannot be pinpointed within the analysis geographies, such as census tracts or census blocks. Therefore, census geographies with a higher than regional average presence of an environmental justice community was deemed as a concentrated environmental justice area.
- The analyses for the Powell-Division Transit and Development project step two screening is limited to geospatial analysis tools at this time. Additional analysis tools, including use of the travel demand model are anticipated for the next phase of the project where a smaller number of high capacity transit alternatives will be fleshed out in more detail and evaluated more in depth.

Technical Feedback Heard to be Integrated in Environmental Review

As part of the process, the project staff solicited feedback from select stakeholders within the interagency project team (e.g. City of Portland, City of Gresham, Multnomah County) as well as Metro staff, to gather technical feedback regarding the methodology and approach for applying an environmental justice lens on the Powell-Division Transit and Development project step two high capacity transit alternative screening. Metro staff received comments back from the project team and in areas where possible, feedback was incorporated. Some of the feedback received was more appropriate to apply in the next phase of the high capacity transit alternatives analysis where more

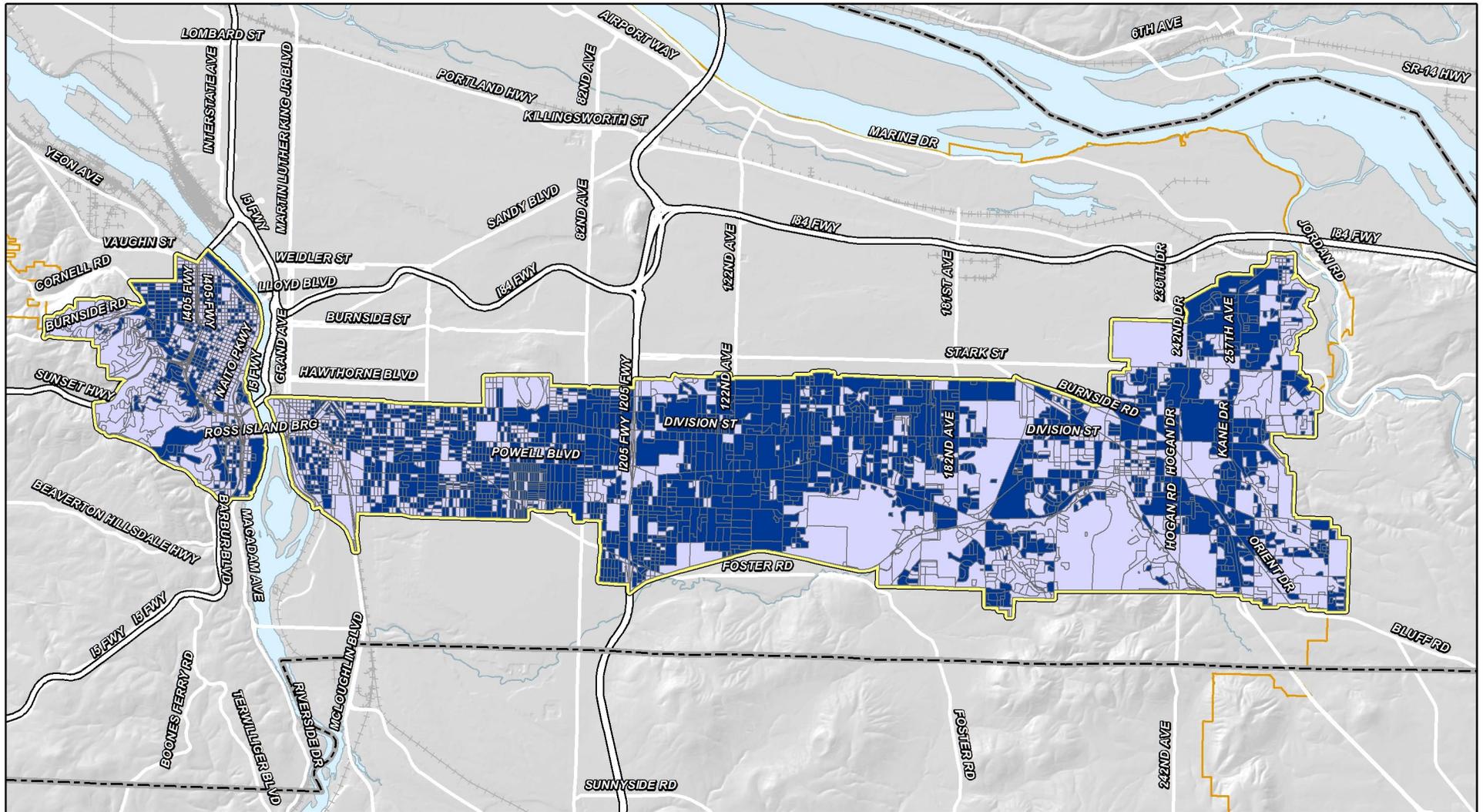
detailed analysis with expanded toolsets will be used. The feedback received will be taken into consideration for the next phase of analysis.

- More localized definitions for environmental justice communities (people of color, low-income specifically) to capture and address hidden communities.
- Understanding and disaggregating ridership data is critical to evaluating and understanding the equity implications for analysis purposes.
- Any documentation, even technical needs to be written in a more communicable matter for a broader audience.
- The controls and strategies need to be discussed in tandem with the analysis results (as well as informing the base data and indicators for analysis).
- A displacement indicator will be necessary for the environmental review phase of the project.
- Demographic trending for the corridor is important to understand.
- The factors not being considered in this analysis: pedestrian safety/personal safety (crime), transit service factors (travel time, frequency of service, overcrowding, operating hours), complimentary infrastructure (pedestrian facilities to potential stations areas for the alternatives, driving speeds), Detailed access to destinations (N/S destinations, last mile connections, station spacing)

Powell-Division Transit and Development Project Step Two Screening and Coordination with Metro's Equity Strategy

Metro's own agency values embed equity as a desired outcome for all agency activities. In 2011, the Metro Council directed staff to develop an overarching framework which would guide how equity is incorporated into the work programs (e.g. sustainability and solid waste, transportation and land use planning, Oregon Zoo, etc.) across this agency. As part of the agency equity strategy work, indicators and metrics are being proposed for baseline and monitoring work. From an early preview of Metro's Equity Strategy baseline datasets, there are three datasets and indicators which are overlapping the objectives used in the transit screening. Because these indicators are not finalized, the additional datasets not already included in the step two high capacity transit screening work were not incorporated into the step two screening. However, the proposed equity strategy baseline indicators and datasets are up for consideration for the environmental review phase of the Powell-Division Transit and Development project.

Powell-Division Transit and Development Project: Nonwhite Population Density



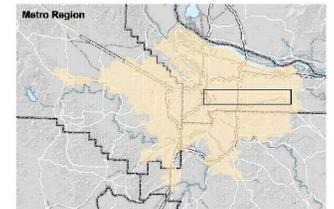
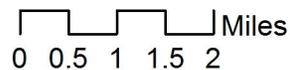
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Non-White Population in Aggregate

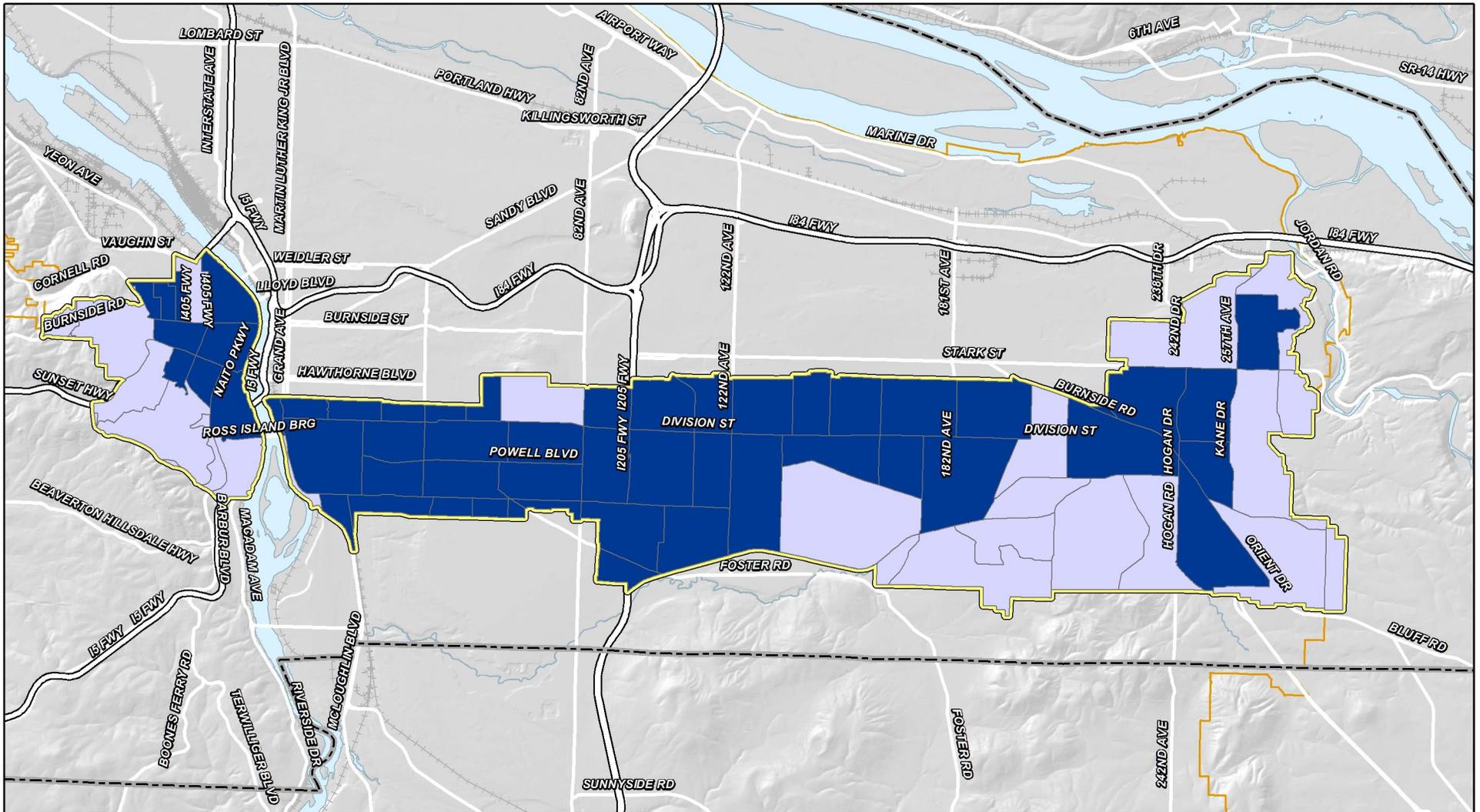
- People of Color Below Regional Density Threshold
- People of Color Above Regional Density Threshold
- Powell-Division Study Area

Note: The regional average density of the Nonwhite population is 1.657 persons per acre (26.96 percent of the region's population) in blocks intersecting the urban growth boundary. Areas with a density greater than 1.657 persons are highlighted in the map.

Source: 2010 U.S. Decennial Census



Powell-Division Transit and Development Project: Poverty Density



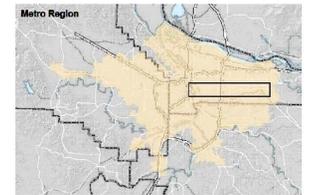
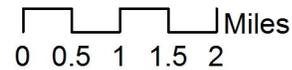
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Persons in Poverty Density

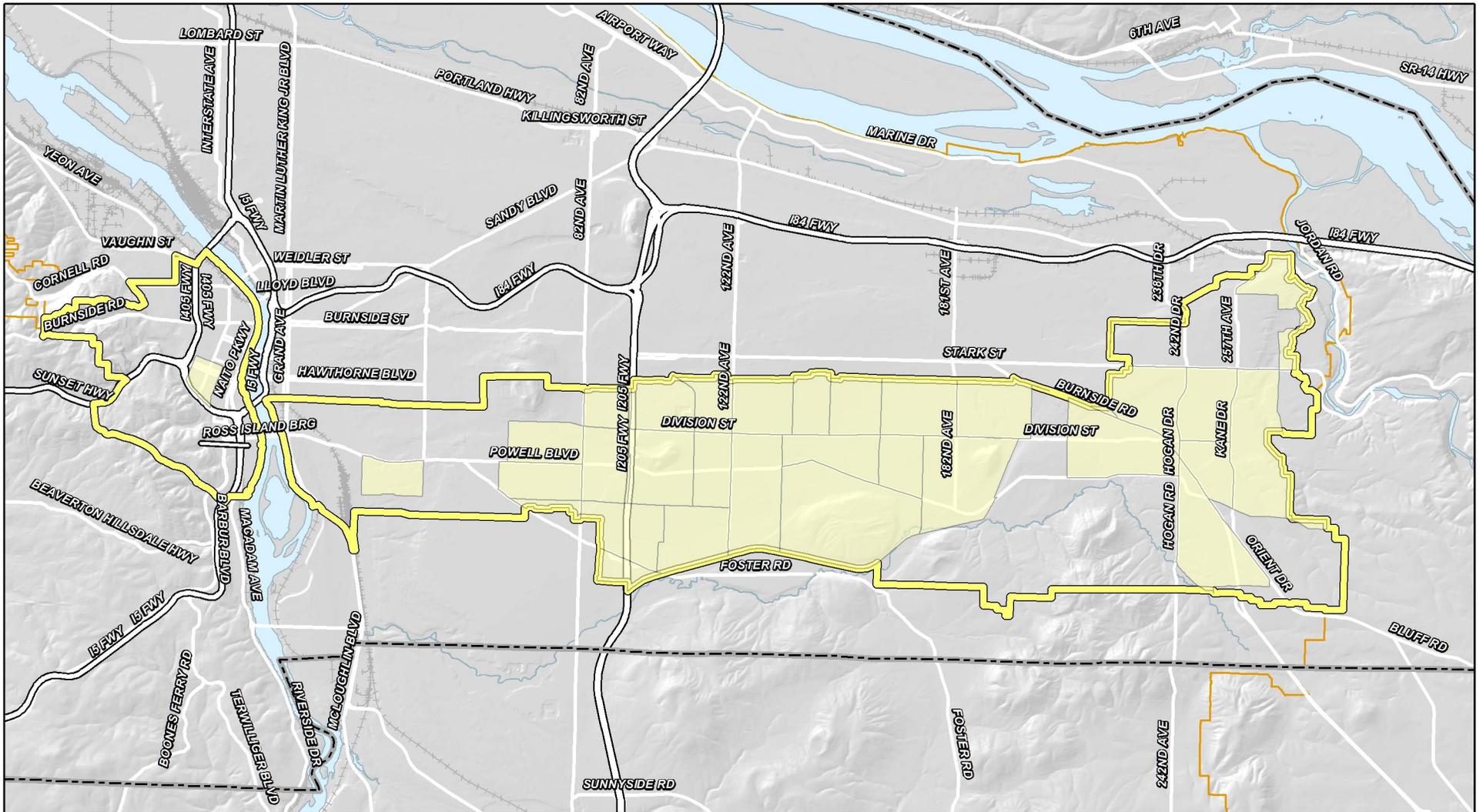
- Poverty Below Study Area Density Threshold
- Poverty Above Study Area Density Threshold
- Powell-Division Study Area

Note: The study area average density of population in poverty is 2.03 persons per acre in blocks intersecting the urban growth boundary. Areas with a density greater than 2.03 persons are highlighted in the map.

Source: American Community Survey, 2006-2010



Powell-Division Transit and Development Project: All Languages - Limited English Proficiency



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- Populations Where Another Language is Spoken at Home and Speaks English Less Than "Very Well"
- Powell-Division Study Area

Source: American Community Survey, 2006-2010

