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DRAFT TECHNICAL MEMORANDUM

DATE:	November 17, 2022
TO:	Ally Holmqvist, Metro Metro HCT Strategy Update PMT
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SUBJECT:	HCT Corridor Analysis Approach to Identify "Big Moves"
CC:	Project file
PROJECT NAME:	Metro High Capacity Transit (HCT) Strategy Update

1 INTRODUCTION

This memo describes an approach to identify "Big Moves" as part of the corridor identification and screening process for the High Capacity Transit (HCT) System Strategy Update (HCT Update) project. This analysis would complement the Level 1 screening to identify candidate HCT corridors (HCT Screening) for inclusion in the regional HCT system vision, as described in previous memos. The HCT "Level 1" Screening process analyzed existing and planned frequent service corridors as well as corridors identified through the original HCT Plan in 2009 to help identify the universe of corridors to consider in the HCT Evaluation. However, since the screening is primarily based on corridors aligned with the existing TriMet service network, it may not identify travel "desire lines" where the existing transit network does not provide a convenient connection that people would choose for their trip. The project team is proposing an approach to help confirm needs identified through the screening process and assess additional connections that may not have been identified through the screening process:

1. Where current and future travel demand are strong
2. Where the current transit system does not provide a connection or a high quality connection

Connections with strong demand and lower-quality transit may be high priorities to evaluate for HCT, or other types of transit service (HCT may not be the most suitable mode for all areas). This analysis could confirm the need for corridors already identified through the screening process as well as suggest additional connections that should be evaluated as part of the HCT Strategy Update. Connections with strong demand and a low-quality transit connection could suggest additional corridors to evaluate for HCT. HCT projects could also be identified to strengthen existing parts of the HCT system that are only of moderate quality.

2 "BIG MOVES" CORRIDOR IDENTIFICATION APPROACH

2.1 Travel Demand Analysis Zones

Analysis zones were developed based on the following approach:

- Start with Metro Concept Analysis Center (2040) geographies
- Include City of Portland Town Center designations, based on the City of Portland Centers GIS layer and/or the map in Chapter 3 of the Comprehensive Plan (page 30): Belmont-Hawthorne-Division, Interstate/Killingsworth, Midway, and Northwest District
- Select Transportation Analysis Zones (TAZs) overlapping with the above geographies
- Identify additional TAZs as either additions to the above geographies or as additional geographies, including:
  - Major institutions (major hospitals, universities, etc.), such as OHSU.
  - Major employment areas, based on Longitudinal Household Employment Dynamics (LEHD) data and Metro model 2040 projections, using a threshold of 4,000 jobs in a TAZ and grouping adjacent TAZs with employment at or close to the threshold.
- Portland Central City Zones were disaggregated as follows for initial analysis, given the high concentration of trips, but could be reaggregated at a later stage of the process or for representation purposes.
  - Downtown – South, Central, and North
  - West of Downtown (west of I-405, north of Burnside)
  - Northwest Portland – Northwest District (corresponding to the City of Portland Town Center), Outer Northwest, and Northwest Industrial area
  - South Waterfront (with the OHSU Marquam Hill Campus as a separate geography)
  - Central Eastside – South and North
  - Rose Quarter/Albina West
  - Lloyd District
  - Albina East

Figure 1 shows the analysis zones.

2.2 Travel Demand

Travel demand data was aggregated to the above centers-based travel demand zone structure. The data was normalized using the area of the zones to account for the varying geographic size (and density of travel demand) of each area.

The primary travel demand measure used was future travel demand from the Metro model:

- Future (2040) Person Trips, both directions, Total and Normalized for area of the zone (per square mile)

Secondary travel demand measures were used to provide an understanding of more recent changes to travel demand, including effects of the pandemic:

- Fall 2021 person trips from Replica data,[1] both directions, Total and Normalized for area of the zone (per square mile), including trips by people earning less than 200% of the federal poverty level and estimate transit person trips
- Fall 2019 person trips for comparison with current (baseline) person trips from the Metro model

Travel demand measures were classified into five categories.

2.3 Service Quality

For purposes of this analysis, travel time was used as a proxy for service quality. Transit travel time was compared to auto travel times to understand the relative convenience of making a particular trip by transit versus driving.

- A representative point was selected for each analysis zone. If existing high capacity transit service was present, a HCT station was selected so that access time to/from destinations was not considered in evaluating how well a geography is generally served by the HCT system.
- Google Maps was used (via an automated query) to determine: 1. Auto travel time and 2. Transit travel time for each zone-to-zone connection. A trip time of 3 pm on a weekday (Wednesday) was specified. Analysis was run in both directions and the highest ratio used.
- A ratio of the transit travel time to the auto travel time was calculated. A ratio of 2.0 would mean that a transit trip takes twice as long as a trip made by driving.

The transit to auto travel time ratio was classified into five categories using the following breakpoints:

- Up to 1.1 (Transit competitive with auto)
- > 1.1 to 1.5
- > 1.5 to 2.4
- 2.5 to 3.9
- 4.0 or more (Transit takes significantly longer than driving)

[1] Replica is an activity-based transportation model in which travel demand is derived from people's daily activity patterns, including de-identified mobile location and demographic data sources.

Figure 1 Map of Analysis Zones

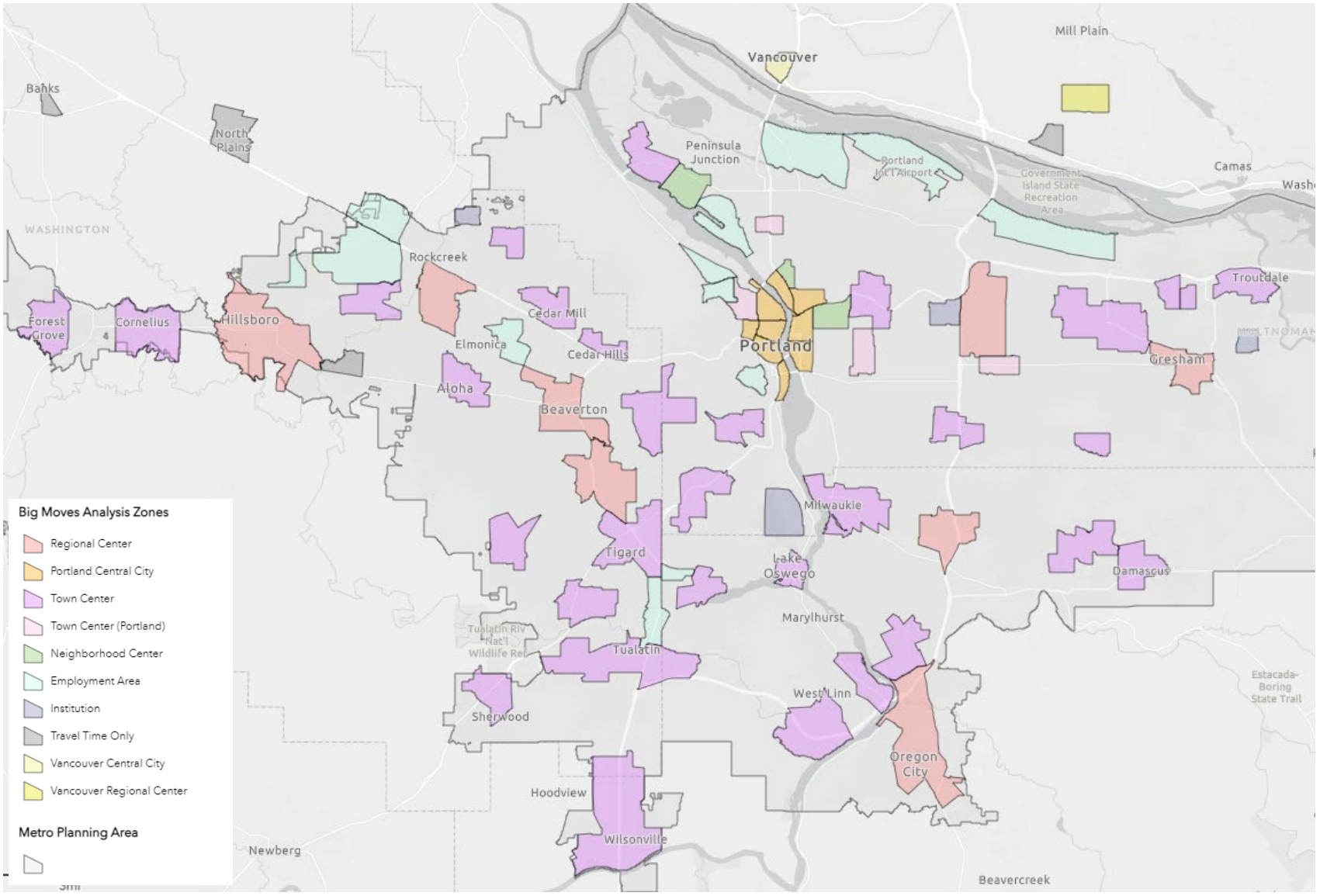
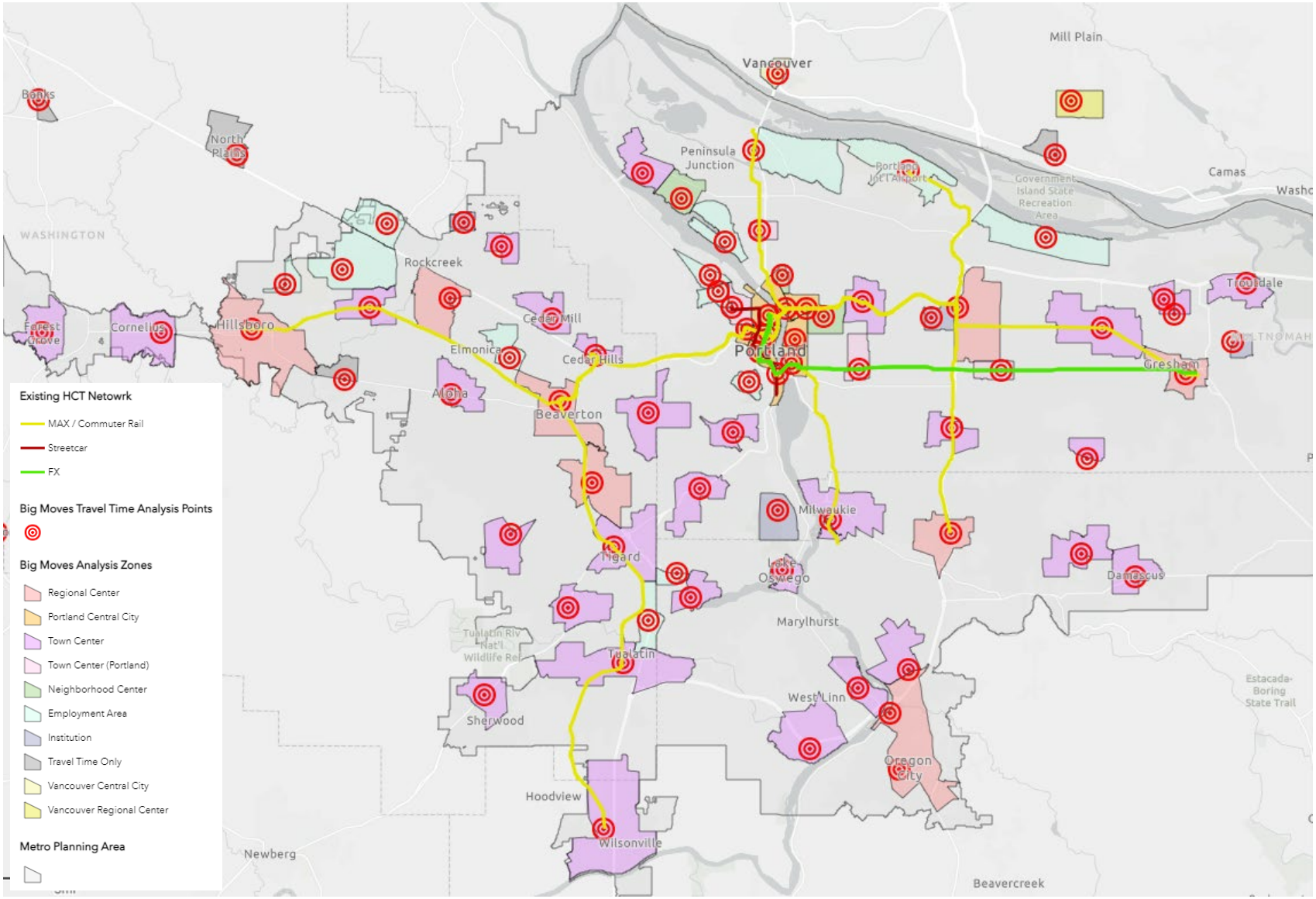


Figure 2 Map of Analysis Zones, Travel Time Analysis Points, and Existing HCT Network



3 ANALYSIS RESULTS

3.1 Analysis Results

The analysis was utilized as a tool to further explore and understand possible additional connections identified through the Level 1 Screening analysis and identify additional connections to consider in the next phases of the evaluation (e.g., Level 2 and Readiness Evaluation). **Figure 3** illustrates travel demand and the transit to auto travel time ratios for a representative set of connections between regional and town centers, including the additional employment and major activity centers included in the analysis. Line color illustrates the travel time ratio. Line weight illustrates travel demand. Travel demand in this schematic representation reflects only the demand between the specific centers connected, not the total travel demand between multiple centers that might utilize a particular connection (aggregating that demand was beyond the scope of this analysis). This analysis also did not consider demand outside of these centers.

- Connections shown in dark or lighter blue have a transit travel time that is competitive with driving. These include many parts of the existing light rail network, such as:
  - Between Gresham, Gateway, Hollywood, and Lloyd District
  - Between Clackamas and Gateway
  - Between Downtown Portland, Beaverton, and Hillsboro

  They also include some centers connected by bus links today.
- Connections shown in yellow, orange, and red range from moderately less competitive by transit to significantly longer.

The regional high capacity transit system is intended to be the backbone of the transit system. As such, this analysis focuses on longer-distance connections between regional centers, major town centers, and central cities with the highest travel demand and person capacity needs, that have gaps in service quality identified through this analysis. Focusing on these types of connections, this analysis identified the potential to improve transit travel times for corridors such as the following:

- Between multiple town and regional centers in a generally southeast to northwest arc through the Hwy 217 corridor between south and north/northwest Washington County, including connections from southwest Clackamas County. Since WES commuter rail operates between Wilsonville, Tualatin, Tigard, and Beaverton, but only during AM and PM peak hours, there is a gap in HCT service quality.
- The Tualatin Valley (TV) Highway corridor, between Beaverton, Hillsboro, Cornelius, and Forest Grove. There is an active planning project in this corridor (TV Hwy BRT).
- The Beaverton-Hillsdale (BH) Highway corridor, between Beaverton, Raleigh Hills and Hillsdale
- The Hwy 99W corridor, including Tigard, Tualatin, and Southwest Portland
- In South Clackamas County, between Oregon City and Clackamas Town Center (CTC) as well as along the Hwy 99E and Hwy 43 corridors, and between CTC and both Milwaukie and Happy Valley
- Town centers in East Multnomah County, including Troutdale, Fairview, and Wood Village, both east-west and north-south
- Across the Columbia River to/from Clark County

- Between St. Johns and various parts of Multnomah County

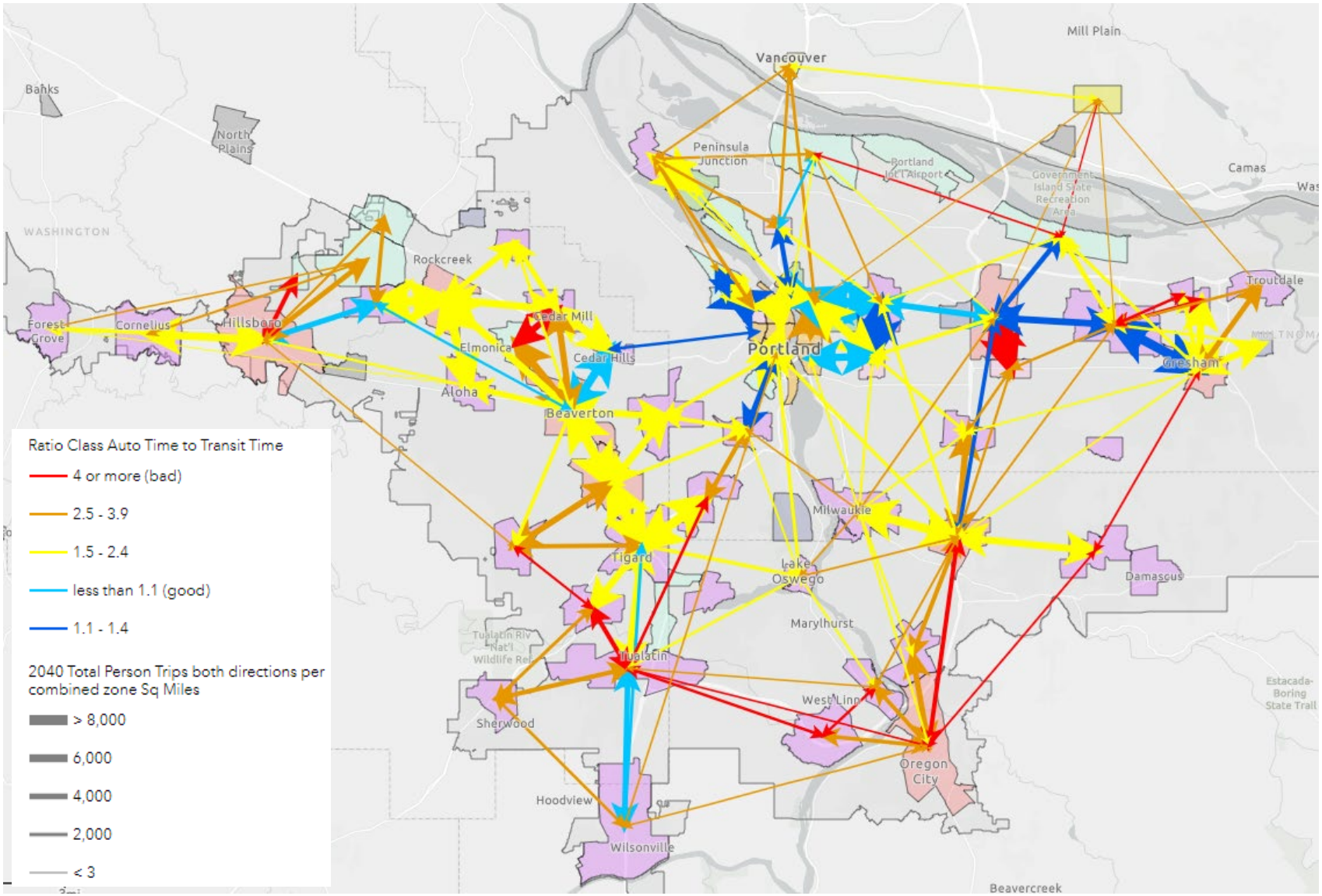
Figure 4 summarizes the connections identified above, along with existing HCT in these corridors, existing HCT priorities that were identified (in the 2009 HCT Plan/RTP or 2018 RTP), and active HCT planning efforts.

The analysis also highlights additional connections that are shorter in length or affect smaller or more isolated town centers. Examples of these types of gaps include:

- Employment areas north of Hillsboro, including along Evergreen Pkwy and Cornelius Pass Road.
- Town Centers in Washington County that are not along major travel corridors, such as Bethany, Murray/Scholls, and Sherwood.
- Columbia Corridor Employment Area in Multnomah County
- Between Midway and Gateway

However, these connections may be better addressed through other transit investments, such as frequent service fixed route, Better Bus enhancements, or enhanced connections to existing HCT service, and/or first and last mile improvements. These connections are likely outside the primary focus of the HCT system in connecting regional and major town centers and creating the backbone of the transit network.

Figure 3 Illustration of Travel Demand and Travel Time Ratio for Regional Zone-to-Zone Connections



3.2 Summary of Potential System Gaps and Previous/Active HCT Planning

Figure 4 Summary of Identified Major HCT Service Quality Gaps and Previous/Active HCT Planning

Major Travel Corridor / Connections	Counties	Existing HCT	Previously Identified HCT Priorities	Active HCT Planning
OR 217 Corridor (SW Clackamas Cty and SE Washington County – N/NW Washington County)	Washington, Clackamas	WES Commuter Rail (Peak Hours Only)	• Upgrades to WES, Wilsonville-Beaverton • Clackamas Town Center to Washington Square • Oregon City to Washington Square	-
TV Hwy Corridor	Washington	-	• TV Hwy BRT	TV Hwy BRT Study
US 26 Corridor (Sunset TC – Hillsboro)	Washington	-	• US 26 Corridor, Sunset TC – Hillsboro	-
BH Hwy Corridor	Washington, Multnomah	-	• 2010 Mobility Corridors Atlas	-
Hwy 99W / I-5 Corridor	Washington, Clackamas, Multnomah		• Southwest Corridor LRT • Sherwood – King City – Tigard	Southwest Corridor LRT Project
Hwy 43 Corridor	Clackamas, Multnomah		• Lake Owego – Portland (Rapid Streetcar)	-
Hwy 99E Corridor	Clackamas	MAX Orange Line (north of Park Ave)	• Milwaukie – Oregon City (Extension)	-
I-205 Corridor	Clackamas		• CTC – Oregon City – Washington Square	-
Hwy 224/Sunnyside Road Corridor	Clackamas	-	• CTC- Milwaukie – Washington Square • CTC – Happy Valley	-
East Multnomah County (Troutdale / Fairview / Wood Village)	Multnomah	MAX Blue Line (south of identified communities)	• LRT Extension, Gresham – Troutdale	-
St. Johns	Multnomah	-	• 2010 Mobility Corridors Atlas	-
I-5 (Interstate Bridge)	Multnomah, Clark	-	• Interstate Bridge	Interstate Bridge Replacement Project
I-205 Corridor	Multnomah, Clark	-	• 2010 Mobility Corridors Atlas	-

3.3 Portland Central City Analysis Results

Although the focus of this analysis is trips around the region, regional transit trips are affected by service quality through downtown Portland. Figure 5 illustrates travel demand and the transit to auto travel time ratios for a representative set of connections within the Portland Central City. Although the transit is relatively time competitive for some trips, HCT system speed into and through the Central City is slow, which affects travel time competitiveness both for transit trips into downtown and for transit trips that cross the region through downtown Portland. Figure 6 summarizes these connections along with existing HCT lines, existing HCT priorities that have been identified (in the 2009 HCT Plan/RTP or 2018 RTP), and active HCT planning efforts.

Figure 5 Illustration of Travel Demand and Travel Time Ratio for Portland Central City

Figure 6 Summary of Identified Major HCT Service Quality Gaps and Previous/Active HCT Planning – Portland Central City

Major Travel Corridor / Connections	Counties	Existing HCT	Previously Identified HCT Priorities	Active HCT Planning
MAX into downtown and through Portland Central City	Multnomah	MAX	• Central City Tunnel Study	
Central Eastside (north-south and between Downtown)	Multnomah	Streetcar	• 2010 Mobility Corridors Atlas	-
Northwest Portland and parts of Downtown	Multnomah	Streetcar	• 2010 Mobility Corridors Atlas	-

3.4 Next Steps

This analysis provides additional information about the potential HCT connections identified in the Level 1 HCT Screening and helps identify additional gaps in regional transit connections and/or service quality (travel time). This analysis was used to shape the set of HCT corridors that will be considered in the Readiness step of the HCT Evaluation.