Equity Analysis: Orange Line MAX Startup & Bus Service Plan

Department of Diversity & Transit Equity

April 17, 2015

Executive Summary: PMLR Startup & Bus Service Plan Equity Analysis

In accordance with Title VI of the Civil Rights Act of 1964 and FTA Circular 4702.1B, TriMet conducts an equity analysis any time major service changes are proposed in order to ensure that changes do not unfairly impact people of color and low-income populations. This analysis follows up on the already-conducted Environmental Impact Statement, which includes an Environmental Justice Analysis of impacts to minority and low-income populations in the corridor, by examining the detailed service proposal for any potential disproportionate impacts on the basis of race, color, national origin, or income level. The launch of the new MAX Orange Line and the proposed realignment of bus service in the Orange Line corridor call for such an analysis prior to the Board taking action on service decisions.

Methodology

TriMet's Title VI Program outlines the agency's Disparate Impact and Disproportionate Burden policies, as well as the way in which TriMet conducts equity analyses. In the case of the service changes proposed with the launch of the Orange Line, staff aimed to answer the following two questions:

1. Given the projected improved travel times and increased bus service in the corridor, do minority and low-income populations stand to benefit equitably as compared to non-minority and higher income populations?
2. Do any service changes with potential adverse effects occur in areas of high concentrations of minority and/or low-income populations?

Data from the US Census Bureau's American Community Survey was used to conduct the analysis.

Findings

Disparate Impact Analysis (Minority Population)

The Orange Line corridor has a below-average minority population relative to the TriMet district. Areas where duplicative service is proposed to be removed are also below-average minority population, therefore leading to a finding of *no Disparate Impact* related to service reductions.

At the same time, the demographics of the corridor also mean that proposed service improvements stand to benefit an above-average non-minority population. Given considerations like the prior Environmental Justice Analysis, the agency's commitment to retain the bus service hours currently provided in the corridor, and project goals relating to supporting Orange Line operation, this does not prompt TriMet to modify the proposal.

Disproportionate Burden Analysis (Low-income Population)

The Orange Line corridor has an above-average low-income population relative to the TriMet district. This implies that the travel time improvements and bus service increases have the potential to benefit low-income populations at least as much as (or even more than) higher income populations.

However, some bus stops where otherwise duplicative service is proposed to be removed are in areas with above-average low income populations, leading to a finding of *potential Disproportionate Burden*. Many of these

stops have nearby alternative service or very little ridership, but the stop pair located at Harold & McLoughlin in the Westmoreland neighborhood, which currently has frequent service from the Line 33-McLoughlin, does not have equivalent alternative service within an acceptable distance per TriMet's adopted Title VI policies.

Alternatives to Address Findings

Per FTA, identification of a Disproportionate Burden calls for TriMet to "avoid, minimize, or mitigate impacts where practicable." TriMet leadership has considered the following three options as potential alternatives in response to the findings of the equity analysis:

Option 1: Minimize
Provide bus service connecting Harold & McLoughlin to the MAX Orange Line. While this could not feasibly be the level of service currently provided to the identified stops, it would avoid discontinuing service to the stops altogether.

Option2 : Mitigate
Review the Line 19-Woodstock/Glisan (which stops 1/3 mi from Harold & McLoughlin) for increased service. The Line 19 travels to downtown Portland and boosting its frequency could help address the loss of frequent service to Harold & McLoughlin.

Option 3: Take no additional action
Move forward as planned, providing a justification for why avoiding, minimizing, or mitigating for the Disproportionate Burden is not practicable, per FTA guidelines.

Agency Decision

TriMet has selected Option 3 above as the most feasible option. This decision is based on the following reasons:

- The balance of benefits to populations with low incomes across many MAX stations and bus stop compared to the negative impacts to the populations near one bus stop is overall positive.
- Other options carry large on-going operations costs, taking operating resources away from other services that could serve larger populations.
- The bus stop pair of most concern has comparatively low ridership.

Thus, the service plan as provided is proposed to be adopted by the TriMet Board.

I. Background

TriMet will be opening its fifth MAX light rail line, the Orange Line, on September 12, 2015. Associated with the opening of the Orange Line are proposed service changes to most bus routes in the corridor, which have previously been discussed with the public through a series of National Environmental Policy Act documents and public conversations over the last 17 years. Specifically, in 1998 the Portland region examined transit service alternatives in *the South/North Draft Environmental Impact Statement* and selected light rail as the locally preferred alternative. In 2002, the region again examined light rail, busway and bus rapid transit alternatives from Portland to Milwaukie through a *South Corridor Draft Environmental Impact Statement (SDEIS)* and subsequently chose light rail to be the preferred alternative between Portland and Milwaukie.

In 2008, the region examined service options that explored how far south light rail would extend in Milwaukie and the exact Willamette River crossing through the *South Corridor Supplemental Draft Environmental Impact Statement* (SDEIS). This document described potential adjustments to the transit service for light rail and bus service including transit lines 4, 9, 17, 19, 31, 32, 33, 34, 41, 70, 75 and 99. These changes presented in 2008 are very similar to the service changes proposed in 2015.

The *PMLRT Final Environmental Impact Statement* (FEIS) was published in October 2010 after significant public review and discussion. The transit service (alignments and potential bus service changes) were subject to an Environmental Justice analysis. Further, the service frequency and span of service for light rail was included in the Full Funding Grant Agreement with the Federal Transit Administration and therefore becomes a requirement that TriMet provides this level of service. A map of the proposed service changes from the FEIS is included in appendix A.

In addition to the Environmental Justice analysis already conducted, TriMet must ensure that all service changes – both increases and reductions – comply with Title VI of the Civil Rights Act of 1964, which states:

> *"No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."*

The FTA has provided specific implementing guidelines and regulations for complying with Title VI in Circular 4702.1B ("Circular"). Due to the interrelated nature of race/ethnicity and income, the Circular instructs transit agencies to consider impacts on low-income populations as well as minority populations; the assessment of potential Title VI issues related to Major Service Changes is completed through a service equity analysis. Figure 1 below shows the sequence of steps and considerations in the equity analysis process.

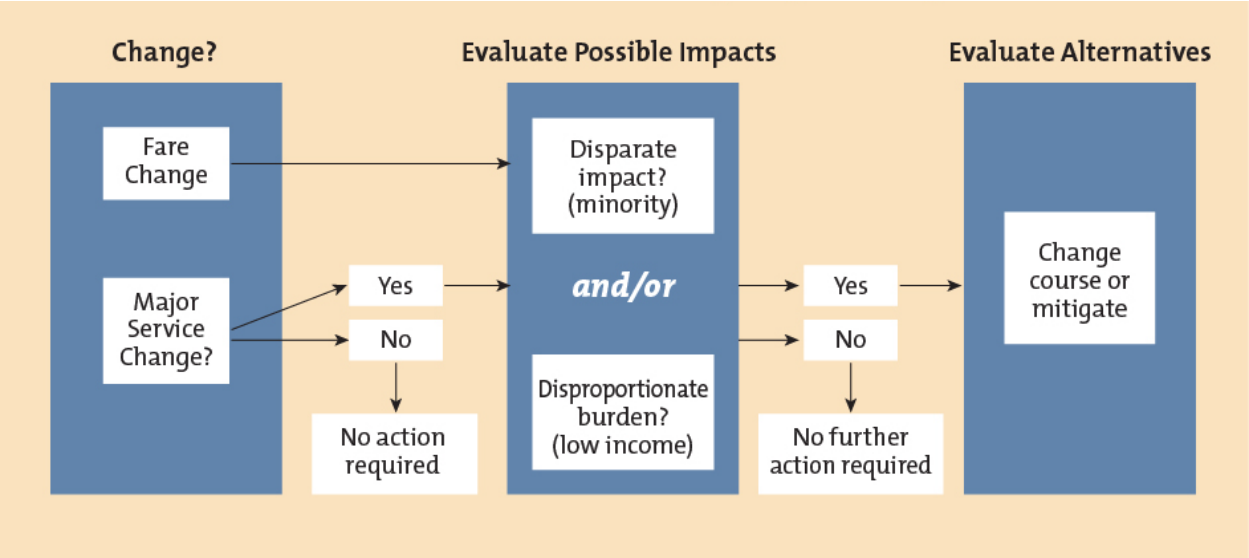


Figure 1: Overview of Title VI Equity Analysis

II. TriMet Title VI Compliance

In the fall of 2013, TriMet updated its Title VI Program, which received concurrence by the FTA in January 2014. The program outlines agency policies, definitions and procedures for complying with Title VI and performing equity analyses. This includes the agency's Major Service Change, Disparate Impact, and Disproportionate Burden policies.

A. Major Service Change Policy

All changes in service meeting the definition of "Major Service Change" are subject to a Title VI Equity Analysis prior to Board approval of the service change. A Title VI Equity Analysis will be completed for all Major Service Changes and will be presented to the TriMet Board of Directors for its consideration and included in the subsequent TriMet Title VI Program report with a record of action taken by the Board.

A Major Service Change is defined as:

1. A change in service of:
   a. 25 percent or more of the number of route miles, or;
   b. 25 percent or more of the number of revenue vehicle hours of service on a daily basis for the day of the week for which a change is made, or;

2. A new transit route is established as defined in the Introduction of TriMet's Title VI Program.

3. If changes in service on a route to be effective at more than one date within any fiscal year would equal or exceed 1(a) and/or 1(b) above, the changes in total will be considered a Major Service Change, and an equity analysis will be completed in advance of action on the proposed change.

The following service changes are exempted:

1. Standard seasonal variations in service are not considered Major Service Changes.

2. In an emergency situation, a service change may be implemented immediately without an equity analysis being completed. An equity analysis will be completed if the emergency change is to be in effect for more than 180 days and if the change(s) meet the definition of a Major Service Change. Examples of emergency service changes include but are not limited to those made because of a power failure for a fixed guideway system, the collapse of a bridge over which bus or rail lines pass, major road or rail construction, or inadequate supplies of fuel.

3. Experimental service changes may be instituted for 180 days or less without an equity analysis being completed. An equity analysis will be completed prior to continuation of service beyond the experimental period if the change(s) meet the definition of a Major Service Change.

B. Disparate Impact Policy

Testing for "Disparate Impact" evaluates effects on minority riders or populations as compared to non-minority riders or populations. "Minority" is defined as all persons who identify as being part of racial/ethnic groups besides white, non-Hispanic.

Major Service Changes – One Line

A Major Service Change to a line will be considered to have a Disparate Impact if condition 1 and either condition 2(a) or 2(b) below is found to be true:

1. The percentage of impacted minority population in the service area of the line exceeds the percentage of minority population of the TriMet District as a whole, and;

2.(a) In the event of service reductions, the service change has an adverse effect on the minority population in the service area of the line.

2.(b) In the event of service additions, the addition is linked to other service changes that have adverse effects on the minority population in the service area of the line, or; the service addition on the subject line is linked with a service change(s) on other line(s) that have adverse effects on the minority population in the service area of that line or lines.

For lines with Major Service Changes, if the percentage of minority population in block groups[1] served by the impacted portion of the line (sum of minority population in all impacted block groups divided by the

[1] TriMet's 2013 Title VI Program states that the geographic unit of measurement will be tracts, but FTA C 4702.1B instructs transit agencies to evaluate impacts at the block or block group level.

total population in all impacted block groups) exceeds the percentage of minority population in the TriMet District as a whole, the impacts of changes to the line will be considered disparate.

Major Service Changes – System Level

To determine the system-wide impacts of service changes on more than one line, the percentage of impacted minority population (sum of minority population in all impacted block groups divided by the minority population of the TriMet District as a whole) is compared to the percentage of impacted non-minority population (sum of non-minority population in all impacted block groups divided by the non-minority population of the TriMet District as a whole). Comparisons of impacts between minority and non-minority populations will be made for all changes for each respective day of service — weekday, Saturday, and Sunday.

If the percentage of impacted minority population differs from the percentage of impacted non-minority population by more than 20 percent, the overall impact of changes will be considered disparate.

C. Disproportionate Burden Policy

Testing for "Disproportionate Burden" evaluates potential effects on low-income riders or populations, defined as at or below 150% of the federal poverty level. The line and system level evaluations are identical to those used to determine potential Disparate Impacts, but comparing low-income and higher income populations rather than minority and non-minority populations.

III. Proposed Service Changes for September 2015

A. Overview of Changes and Corridor Demographics

TriMet's newest addition to the MAX light rail network, the Orange Line, will improve transportation options in the corridor between downtown Portland and Milwaukie. Proposed changes would also affect service south of Milwaukie, as the proposal includes modifying bus service between Oregon City and Milwaukie.

Currently 22 bus lines serve the corridor along the Orange Line and south to Oregon City, most of which are not proposed for any changes in routing or service. Nine others, however, are proposed to be reconfigured in order to align with the new light rail service. Proposed changes include re-routing lines, shortening routes that previously traveled to downtown Portland, increasing frequency and hours of service, and adding new service where none previously existed. Table 1 provides a summary of the types of service changes proposed by line and maps depicting service before and after the changes are shown in Figure 2.

Table 1: Summary of proposed September 2015 service changes

Line	Routing Changes	Frequency Improvements	Span (Hours of Service) Improvments	New Service or Service Pattern
9-Powell Blvd	✓			
17-Holgate/Broadway	✓			
19-Woodstock/Glisan			✓*	
28-Linwood	✓	✓	✓	
31-King Rd	✓	✓	✓	
32-Oatfield	✓			
33-McLoughlin	✓			
34-River Rd	✓	✓		
99-McLoughlin Express	✓			✓
MAX Orange Line				✓

**Saturday & Sunday only*

Figures 3 and 4 show the proposed changes overlaid on above-average concentrations of minority and low-income populations, respectively. Demographically, the corridor is less diverse in terms of race/ethnicity than the TriMet district as a whole: the population includes 16% people of color, compared to 27% for the district. The low-income population is slightly above that of the TriMet district, at 23% of the population at or below 150% federal poverty; the TriMet district has a 22% low-income population.

Consistent with a promise made to riders, the proposal does not remove bus service hours from the corridor. Instead, all savings due to route changes are reinvested in the area under the proposal package.

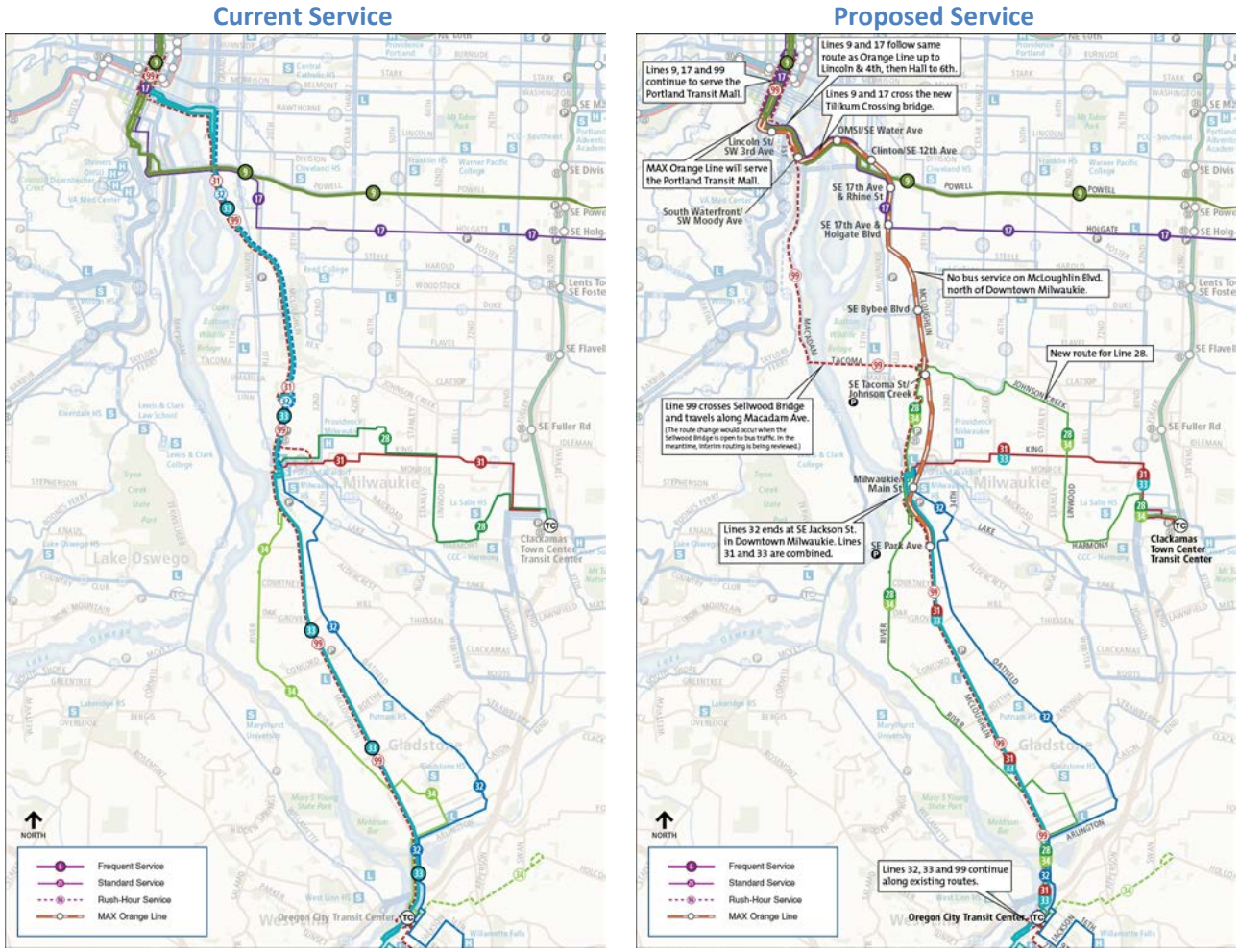


Figure 2: Maps of current and proposed transit service in the MAX Orange Line corridor

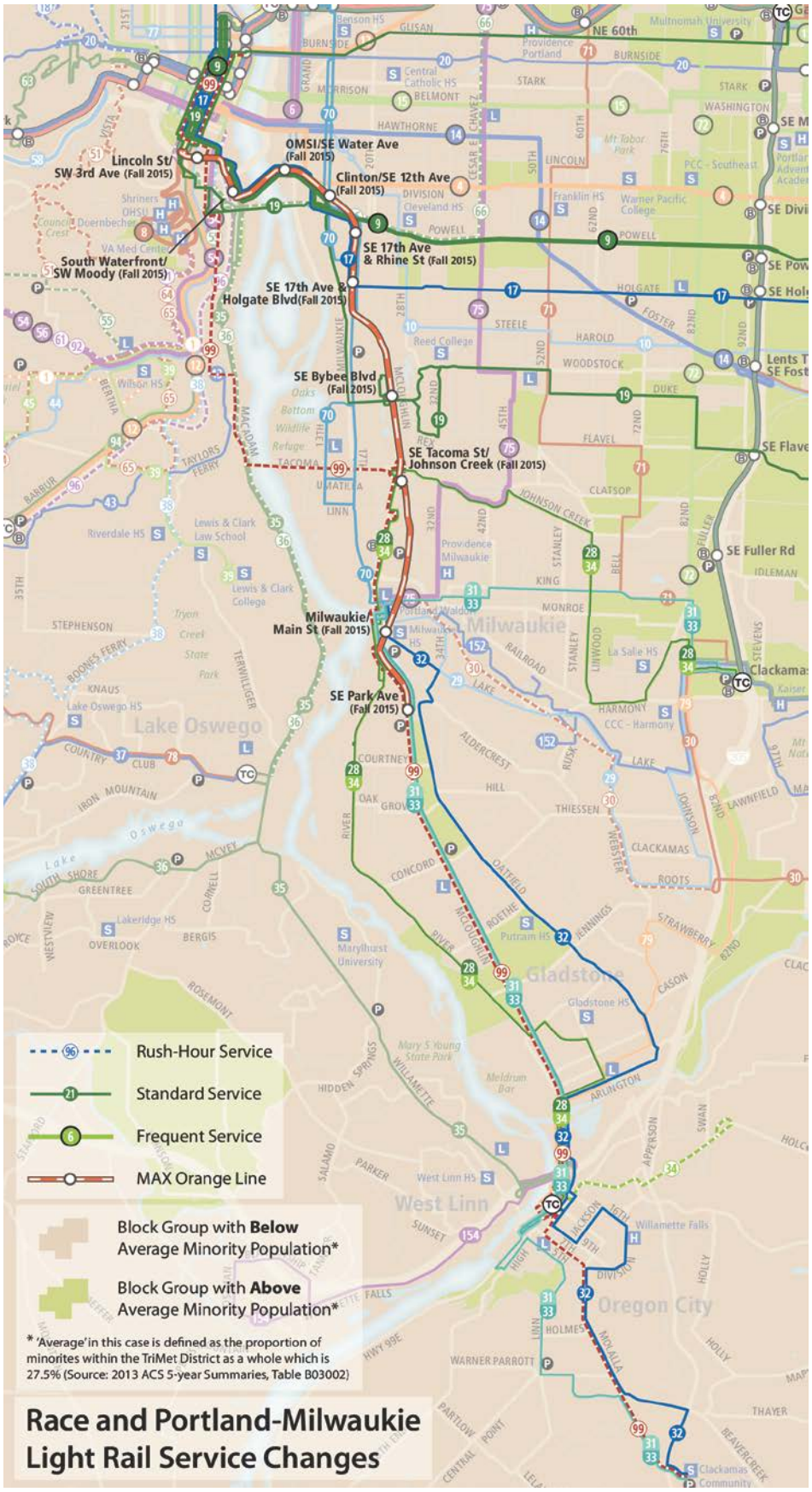


Figure 3: Proposed Service Changes and Minority Population

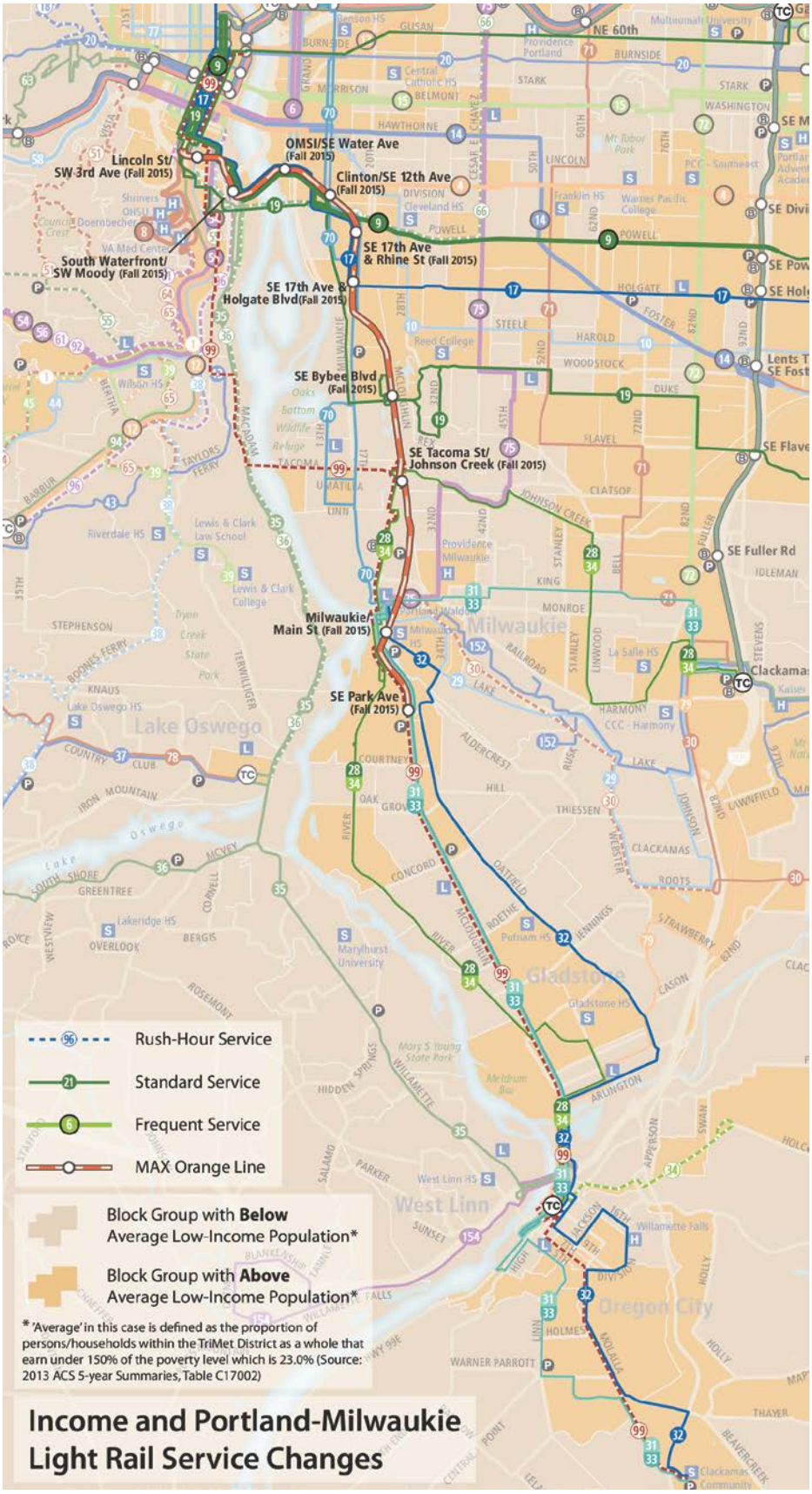


Figure 4: Proposed Service Changes and Low-income Population

B. Service Change Details

Because the package of service changes are associated with a new fixed guideway project, the FTA Circular requires TriMet to evaluate all changes for potential disproportionate impacts, and not just those meeting the agency's Major Service Change threshold. The Circular further instructs that the analysis compare service levels before and after implementation of changes.

Number of daily trips[2] is used to measure the change in revenue hours of service; results are shown in Table 2, with estimated percentage change and nature of that change by line (whether frequency, span, new service pattern, or new line). All changes shown indicate an increase in service compared to the present.

Table 2: Estimated change in service hours by line

Line	Current Daily Trips	Est. Daily Trips under Proposal	Est. Change in Daily Revenue Hours (%)	Type of Change
19-Woodstock/Glisan SATURDAY	54	54*	+13%	Span
19-Woodstock/Glisan SUNDAY	36	36*	+14%	Span
28-Linwood	54	88	+63%	Frequency, Span
31-King Rd WEEKDAY	71	131	+85%	Frequency
31-King Rd SATURDAY	42	108	+157%	Frequency
31-King Rd SUNDAY	22	108	+391%	Frequency
34-River Rd	32	88	+175%	Frequency
99-McLoughlin Express	19	38	+100%	New Service Pattern
MAX Orange Line WEEKDAY	0	146	New line	New Line
MAX Orange Line SATURDAY	0	119	New line	New Line
MAX Orange Line SUNDAY	0	111	New line	New Line

**Although the number of trips will remain the same on the Line 19, five trips will serve a segment of the route beginning two hours earlier than it currently serves.*

Table 3 shows proposed routing changes. The Line 9-Powell Blvd and Line 17-Holgate/Broadway have minor changes due to being re-routed across the new Tilikum Crossing bridge. The Line 32-Oatfield is proposed to be reduced in length so that it no longer travels between Milwaukie and downtown Portland. The Line 31-King Rd and Line 33-McLoughlin are proposed to no longer operate between Milwaukie and downtown Portland, and will be operated as a single line with connections to Orange Line in Milwaukie, and the Line 28 and Line 34 are also proposed to be combined, thereby increasing both route lengths.

[2] A trip is defined as a complete journey by the vehicle from one end of the route to the other.

Table 3: Change in Route Length by Line

Line	Est. Change in Route Miles (Number)	Est. Change in Route Miles (%)
9-Powell Blvd	-0.1	-1%
17-Holgate/Broadway	+0.1	+1%
19-Woodstock/Glisan	0.0	0%
28-Linwood	+11.5	+180%
31-King Rd*	-7.6 +3.9	-61% +31%
32-Oatfield	-7.3	-35%
33-McLoughlin*	-8.3 +4.5	-42% +23%
34-River Rd	+6.7	+60%
99-McLoughlin Express	+1.2	+7% New Service Pattern
MAX Orange Line	+7.3	New Line

IV. Equity Analysis

A. Line-level Analysis

Following the Title VI policies described previously, the line-level analysis examines how proposed changes might impact minority and low-income populations, for each line proposed for service changes. This considers both positive impacts (i.e. benefits including increases in frequency and service hours) and negative impacts (i.e. adverse effects including service reductions and/or removal of stops).

MAX Orange Line

Service Change Description

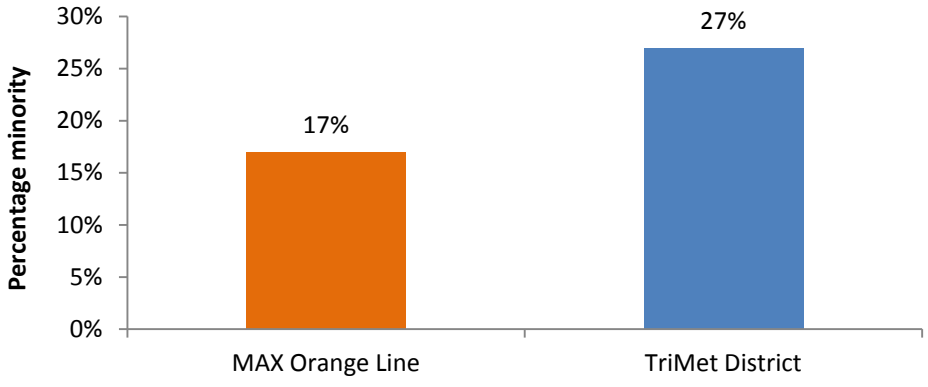
The most substantial service change occurring in September 2015 is the opening of the MAX Orange Line between Downtown Portland and Downtown Milwaukie. Service on the Orange Line will operate between approximately 4:30am and 1:30am daily[3]. Trains will arrive every 15 minutes most of the day, and every 10 minutes on average during weekday rush hours.

[3] Due to the rail maintenance-of-way window of opportunity, trains will operate until 11:30pm, followed by bus service that will replicate the Orange Line.

Disparate Impact Analysis

As a new service, this analysis examines the change through the lens of distribution of benefits. Figure 5 compares the minority population along the Orange Line with the minority population of the TriMet service district as a whole. As shown, the minority is lower in the block groups located around Orange Line stops (17%) than the district average (27%). On its own, this could indicate a potential disparate impact since the benefits of the new service accrue to a disproportionately high non-minority population, but should be considered along with the rest of the analysis, including associated service changes occurring along with the opening of the Orange Line.

Figure 5: Minority Population Comparison
MAX Orange Line & TriMet District

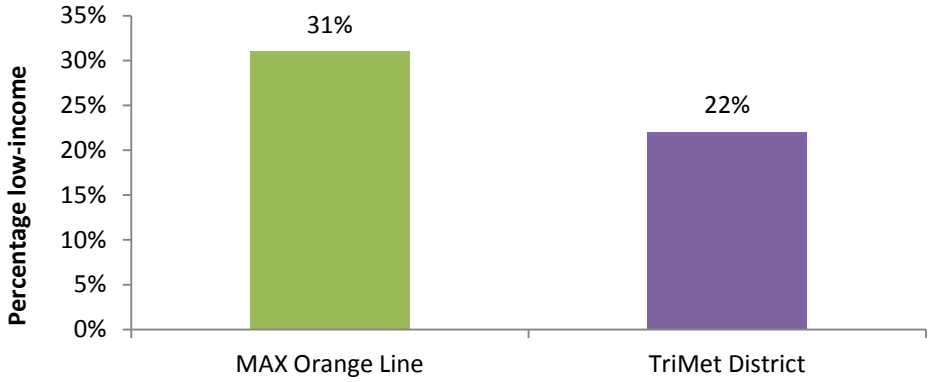


Source: 2008-2012 American Community Survey, block group level.

Disproportionate Burden Analysis

Figure 6 compares the low-income population along the Orange Line with the low-income population of the TriMet service district as a whole. As shown, the low-income population is higher in block groups surrounding Orange Line stops (31%) than the district average (22%). On its own, this could indicate no potential disproportionate burden, but should be considered along with the rest of the analysis, including associated changes occurring along with the opening of the Orange Line.

Figure 6: Low-Income Population Comparison
MAX Orange Line & TriMet District



Source: 2008-2012 American Community Survey, block group level.
Low-income defined as at or below 150% federal poverty.

Line 19-Woodstock/Glisan

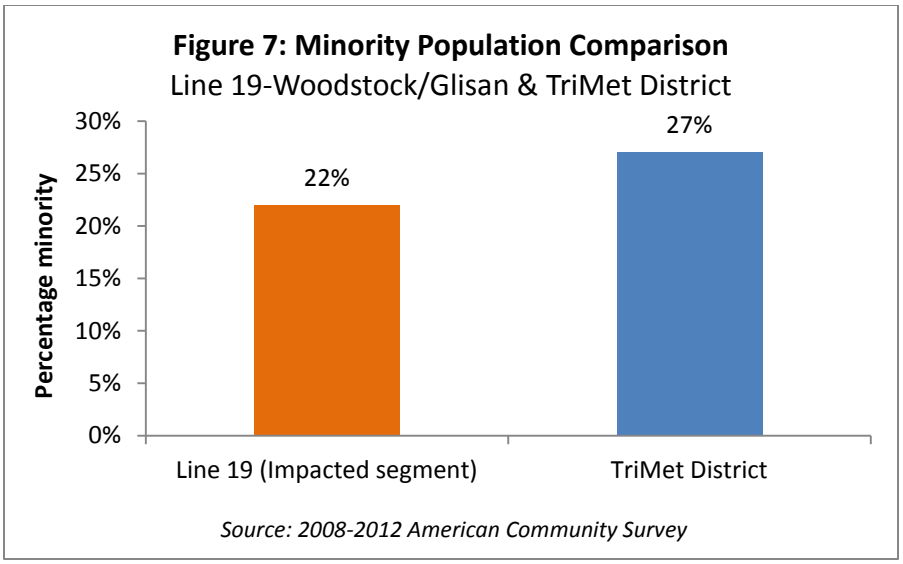
Service Change Description

It is proposed that the Line 19 begin running the full length of the route approximately two hours earlier on Saturdays and Sundays. Currently trips between downtown Portland and SE 112th & Mt. Scott Blvd begin around 10:00am; the proposal would begin these trips in both directions around 8:00am.

As an increase in service, the line-level analysis examines the change through the lens of distribution of benefits.

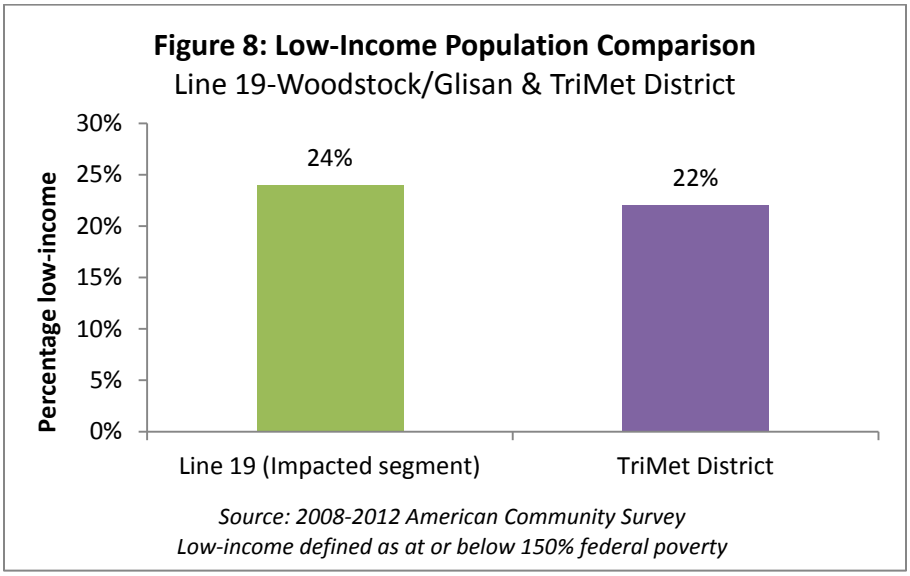
Disparate Impact Analysis

Figure 7 compares the minority population along the impacted segment of the Line 19 with the minority population of the TriMet service district as a whole. As shown, the minority population is lower along the Line 19 than the district average. On its own this could indicate a potential disparate impact, but should be considered along with the rest of the analysis.



Disproportionate Burden Analysis

Figure 8 compares the low-income population along the impacted segment of the Line 19 with the low-income population of the TriMet service district as a whole. As shown, the low-income population is higher along the Line 19 than the district average. On its own this could indicate no potential disproportionate burden, but should be considered along with the rest of the analysis.



Line 28-Linwood

Service Change Description

It is proposed that the Line 28:

- Be re-routed into Downtown Milwaukie;
- Be combined with Line 34-River Rd;
- Double in frequency (from service every 70 min to every 35 min); and

- Operate 1 ½ hours later in the evenings.

While most changes increase the level of service provided, the re-routing does eliminate service to several stops. Thus, both adverse effects and potential benefits are evaluated in the analysis.

The proposed route changes to the Line 28 would remove Line 28 service from a total of 39 stops (including stops in both directions). As Table 4 shows, 27 of these stops have alternative service with similar frequency and span within ¼ mile, which means their service removal does not qualify as an adverse effect under TriMet's Title VI policies. The remaining 12 stops have alternative service between ¼ and ½ mile away, thereby meeting the adverse effect definition. These 12 stops see little activity, with 14 total ons/offs on a typical weekday at all 12 stops combined.

Disparate Impact Analysis

Table 4 indicates that the Line 28 stops being removed and meeting the adverse effect criteria are in block groups with minority populations that are lower than average for the TriMet district (16% vs. 27%). Thus, the adverse effects associated with the Line 28 route changes are both minimal impact (few ons/offs) and do not result in Disparate Impacts on minority populations.

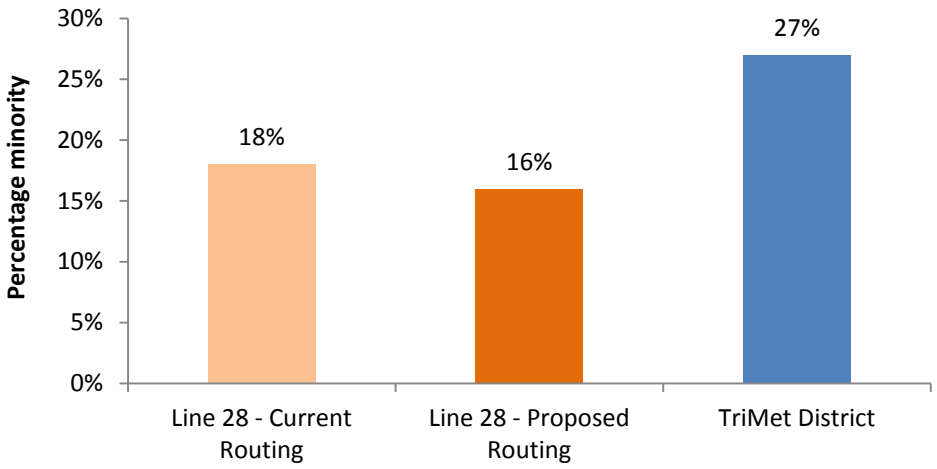
Table 4: Stops and populations impacted by routing changes to Line 28-Linwood

	No. of Stops	Total daily ons/offs (weekdays)	Pct. Population Minority	Pct. Population Low-Income
Service Removed	39	44	14%	24%
Nearest alternative service w/ similar span & frequency				
Less than ¼ mile to bus or less than ½ mile to rail	27	30	14%	24%
Over ¼ mile to bus or over ½ mile to rail*	12	14	16%	24%

**Adverse effect applies*

To analyze the beneficiaries of increased service, Figure 9 compares the minority population along the Line 28 (entire route, current and proposed) with the minority population of the TriMet service district as a whole. As shown, the minority population along the current Line 28 (18%) and the proposed new route (16%) are both lower than the district average (27%). While the minority *percentage* is lower along the proposed as compared to the current routing, the actual *number* of minority persons served would increase by nearly 500.

Figure 9: Minority Population Comparison
Line 28-Linwood & TriMet District



Source: 2008-2012 American Community Survey, block group level.

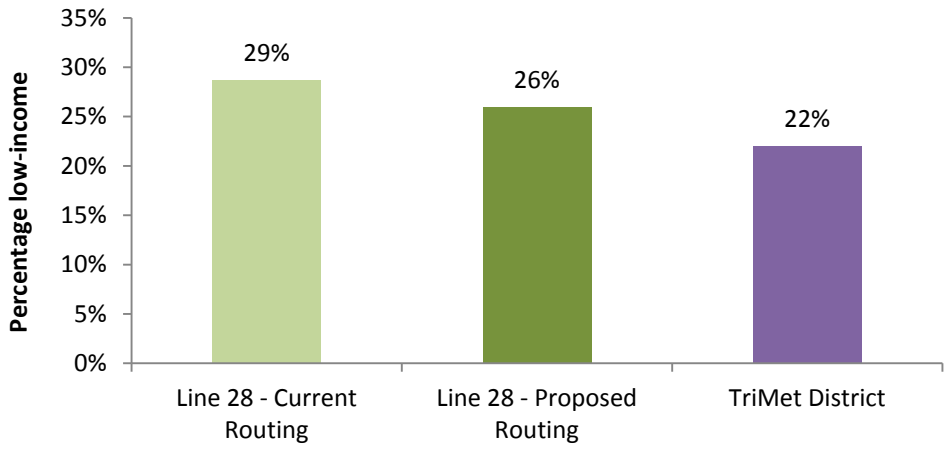
- Taken together, proposed changes to the Line 28-Linwood do not result in disproportionate adverse effects on minority populations, but the service increase benefits an above-average non-minority population.

Disproportionate Burden Analysis

Table 4 shows that the Line 28 stops being removed and meeting the adverse effect criteria are in block groups with low-income populations that are higher than average for the TriMet district (24% vs. 22%). This indicates that the adverse effects associated with the Line 28 route changes, while small, may result in a Disproportionate Burden on low-income populations.

To analyze the beneficiaries of increased service, Figure 10 compares the low-income population along the Line 28 with the low-income population of the TriMet service district as a whole. As shown, the low-income population is higher along the Line 28 than the district average, for both the current and proposed routings. And, while the *percentage* of low-income persons served is lower for the proposed as compared to the current routing, the actual *number* of low-income persons served would increase by over 700.

Figure 10: Low-Income Population Comparison
Line 28-Linwood & TriMet District



Source: 2008-2012 American Community Survey, block group level.
Low-income defined as at or below 150% federal poverty.

- Taken together, proposed changes to the Line 28-Linwood could result in and disproportionate adverse effects on low-income populations, but the service increase benefits an above-average low-income population.

Line 31-King Rd.

Service Change Description
It is proposed that the Line 31:

- Maintain its existing route between Clackamas Town Center and Downtown Milwaukie, then combine with Line 33 along McLoughlin Boulevard between Milwaukie and Oregon City;
- Increase frequency to match most Line 33 service; and
- Increase hours of service to match most Line 33 service.

Line 33 is part of the frequent service bus network. Currently the Line 31 provides service between Downtown Milwaukie and Downtown Portland during peak hours – this service would be discontinued, with the MAX Orange Line providing frequent service in its place. While most changes increase the level of service provided, the eliminated segment calls for evaluation of both adverse effects and potential benefits.

The proposed route changes to the Line 31 would remove Line 31 service from a total of 32 stops (including stops in both directions). As Table 5 shows, 30 of these stops have alternative bus service within ¼ mile or rail service within ½ mile, which means their service removal does not qualify as an adverse effect under TriMet's Title VI policies. The remaining 2 stops are over ¼ mile from similar bus service and over ½ mile from the nearest Orange Line station, thereby meeting the adverse effect definition. These 2 stops see little activity, with 5 total ons/offs on a typical weekday at both stops together.

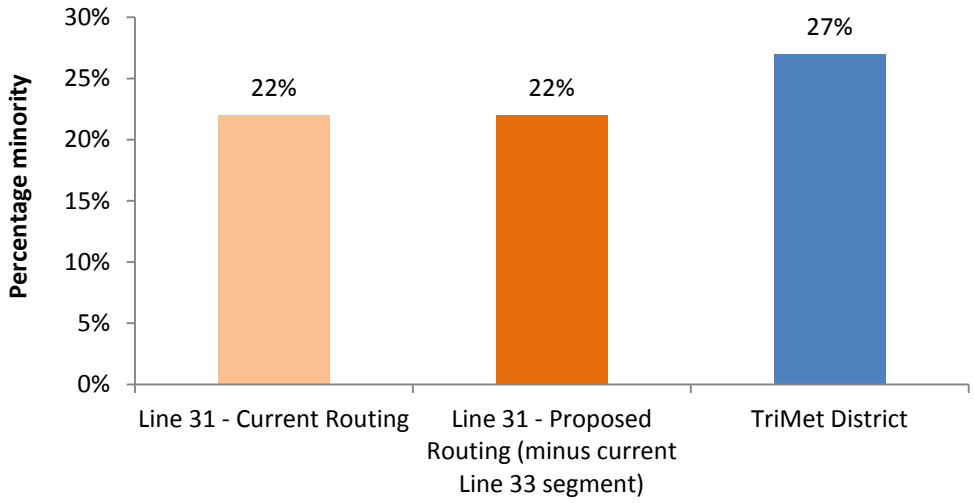
Table 5: Stops and populations impacted by routing changes to Line 31-King Rd.				
	No. of Stops	Total daily ons/offs (weekdays)	Pct. Population Minority	Pct. Population Low-Income
Impacted	32	680	21%	42%
Nearest alternative service w/ similar span & frequency				
Less than ¼ mile to bus or less than ½ mile to rail	30	675	22%	43%
Over ¼ mile to bus and over ½ mile to rail*	2	5	22%	32%
**Adverse effect applies*				

Disparate Impact Analysis

Table 5 indicates that the Line 31 stops being removed and meeting the adverse effect criteria are in block groups with minority populations that are lower than average for the TriMet district (22% vs. 27%). Thus, the adverse effects associated with the Line 31 route changes are both minimal impact (few ons/offs) and do not result in Disparate Impacts on minority populations.

To analyze the beneficiaries of increased service, Figure 11 compares the minority population along the Line 31 (entire current route and proposed route before combining with Line 33) with the minority population of the TriMet service district as a whole. As shown, the minority population along the current Line 31 and the proposed new route (both 22%) is lower than the district average (27%). The number of minority persons served also decreases significantly (by nearly 1,700), primarily due to the fact that the route will no longer serve Downtown Portland.

Figure 11: Minority Population Comparison
Line 31-King Rd & TriMet District



Source: 2008-2012 American Community Survey, block group level.

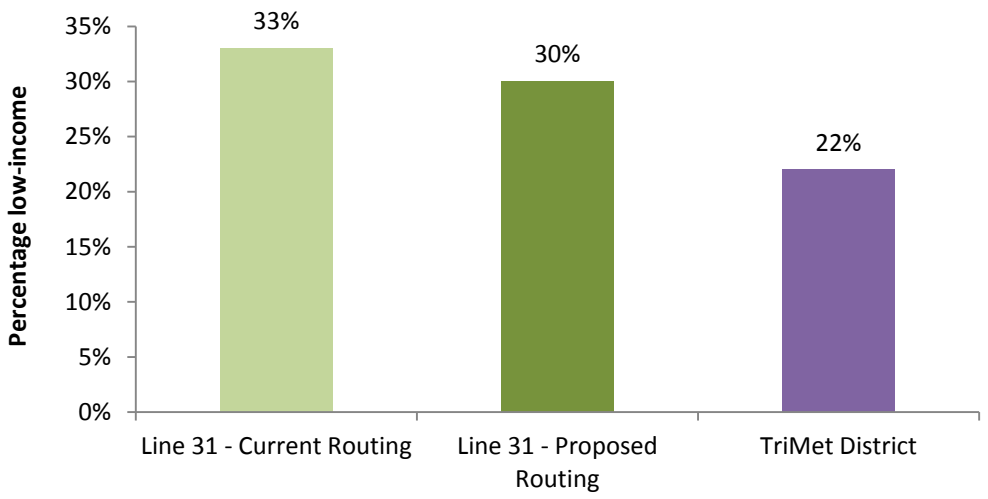
- Taken together, proposed changes to the Line 31-King Rd do not result in disproportionate adverse effects on minority populations, but the service increase benefits an above-average non-minority population.

Disproportionate Burden Analysis

Table 5 shows that the Line 31 stops being removed and meeting the adverse effect criteria are in block groups with low-income populations that are higher than average for the TriMet district (32% vs. 22%). This indicates that the adverse effects associated with the Line 31 route changes, while small because of the small number of boardings the stops see, may result in a Disproportionate Burden on low-income populations.

To analyze the beneficiaries of increased service, Figure 12 compares the low-income population along the Line 31 (entire current route and proposed route before combining with Line 33) with the low-income population of the TriMet service district as a whole. As shown, the low-income population is higher along the Line 31 than the district average (22%), both currently (33%) and as proposed (30%). The drop in low-income population percentage coincides with a drop in low-income persons served (by about 3,000), which is mostly due to the route no longer serving Downtown Portland.

Figure 12: Low-Income Population Comparison
Line 31-King Rd & TriMet District



Source: 2008-2012 American Community Survey, block group level.
Low-income defined as at or below 150% federal poverty.

- Taken together, proposed changes to the Line 31-King Rd could result in disproportionate adverse effects on low-income populations, but the service increase benefits an above-average low-income population.

Line 32-Oatfield

Service Change Description
It is proposed that the Line 32:

- Maintain its existing route, frequency, and hours of service between Clackamas Community College and Downtown Milwaukie; and
- Discontinue peak hour service between Downtown Milwaukie and Downtown Portland.

The eliminated segment calls for evaluation of adverse effects.

The eliminated segment of the Line 32 is identical to that of the Line 31. As such, the proposed route changes to the Line 32 would remove Line 32 service from a total of 32 stops (including stops in both directions). As Table 6 shows, 30 of these stops have alternative bus service within ¼ mile or rail service within ½ mile, which means their service removal does not qualify as an adverse effect under TriMet's Title VI policies. The remaining 2 stops are over ¼ mile from similar bus service and over ½ mile from the nearest Orange Line station, thereby meeting the adverse effect definition. These 2 stops see little activity, with 4 total ons/offs on a typical weekday at both stops together.

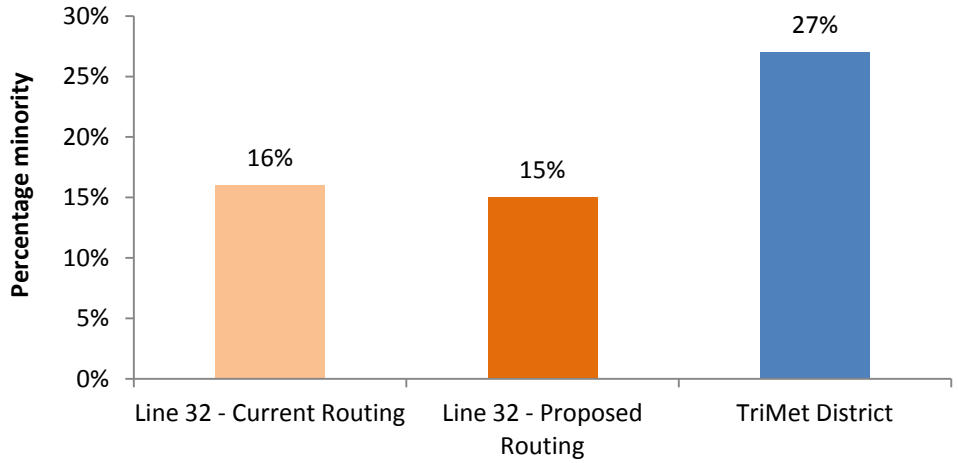
Table 6: Stops and populations impacted by routing changes to Line 32-Oatfield.				
	No. of Stops	Total daily ons/offs (weekdays)	Pct. Population Minority	Pct. Population Low-Income
Impacted	32	440	21%	42%
Nearest alternative service w/ similar span & frequency				
Less than ¼ mile to bus or less than ½ mile to rail	30	436	22%	43%
Over ¼ mile to bus or over ½ mile to rail*	2	4	22%	32%
**Adverse effect applies*				

Disparate Impact Analysis

Table 6 indicates that the Line 32 stops being removed and meeting the adverse effect criteria are in block groups with minority populations that are lower than average for the TriMet district (22% vs. 27%). Thus, the adverse effects associated with the Line 32 route changes are both minimal impact (few ons/offs) and do not result in Disparate Impacts on minority populations.

Comparing the current and proposed routing for the Line 32 reveals a drop in the minority population percentage, from 16% to 15% (Figure 13). This is compared to the TriMet District average of 27%. The number of minority persons served would also decrease by approximately 2,000 due to the route no longer serving Downtown Portland.

Figure 13: Minority Population Comparison
Line 32-Oatfield & TriMet District



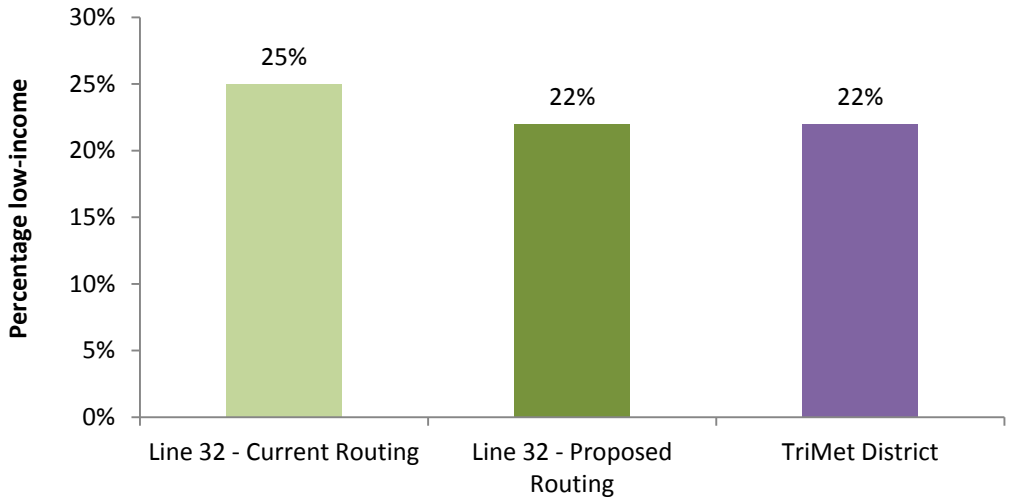
Source: 2008-2012 American Community Survey, block group level.

Disproportionate Burden Analysis

Table 6 shows that the Line 32 stops being removed and meeting the adverse effect criteria are in block groups with low-income populations that are higher than average for the TriMet district (32% vs. 22%). This indicates that the adverse effects associated with the Line 32 route changes, while small, may result in a Disproportionate Burden on low-income populations.

Figure 14 compares the low-income population along the Line 32 (current and proposed routes) with the low-income population of the TriMet service district as a whole. As shown, the low-income population is currently higher along the Line 32 than the district average (25% vs. 22%), and as proposed would make the low-income population even with the district average. The drop in low-income population percentage coincides with a drop in low-income persons served (by about 3,300), which is mostly due to the route no longer serving Downtown Portland.

Figure 14: Low-Income Population Comparison
Line 32-Oatfield & TriMet District



Source: 2008-2012 American Community Survey, block group level.
Low-income defined as at or below 150% federal poverty.

Line 33-McLoughlin

Service Change Description

It is proposed that the Line 33:

- Maintain its existing route between Clackamas Community College and Downtown Milwaukie;
- Combine with the current Line 31 between Downtown Milwaukie and Clackamas Town Center; and
- Discontinue service between Downtown Milwaukie and Downtown Portland.

Frequency and hours of service would remain the same on the current Line 33 route, but the combination with the Line 31 would increase service between Downtown Milwaukie and Clackamas Town Center. The eliminated segment of the Line 33 calls for evaluation of adverse effects. The service increases along the current Line 31 route were evaluated under the Line 31 section.

The eliminated segment of the Line 33 is mostly identical to that of the Lines 31 and 32. However, Line 33 service is much more substantial than that of the Lines 31 or 32 because it is a Frequent Service line. Therefore, its equivalent service alternatives differ from the Lines 31 and 32.

The proposed route changes to the Line 33 would remove Line 33 service from a total of 36 stops (including stops in both directions). As Tables 7-9 show, 31 of these stops have alternative bus service with similar span & frequency within ¼ mile and/or alternative rail service with similar span & frequency within ½ mile, which means their service removal does not qualify as an adverse effect under TriMet's Title VI policies. These stops serve 3,864 out of 4,157, or 93%, of all impacted rides on weekdays; 2,525 out of 2,578, or 98%, of all impacted rides on Saturdays; and 1,961 out of 2,000, or 98% of all impacted rides on Sundays.

Removal of service from the remaining 5 stops qualifies as an adverse effect because they do not have similar bus service within ¼ mile, or similar rail service within ½ mile. On a typical weekday these 5 stops see 293 total ons/offs at all 5 stops combined. On Saturdays there are an average of 53 ons/offs, and on Sundays there are an average of 39 ons/offs.

The vast majority of this ridership is from the pair of stops serving the Milwaukie Park & Ride at Main & Milport (253 weekday ons/offs). Although this pair of stops is located within a block group with an above-average low-income population, they are in an industrial area that is not within walking distance of residences; their high ridership is generated by Park & Ride customers. A third stop at Main & Mailwell is nearby in the same industrial district, and is also not within walking distance of low-income residences in its block group; the stop averages 8 ons/offs per weekday. The pair of stops at McLoughlin & Harold are near residences on one side of McLoughlin Boulevard, and average 32 ons/offs per weekday. (See discussion about this pair of stops in Section IV below.)

Table 7: Stops and populations impacted by routing changes to Line 33-McLoughlin (Weekdays Only)

	No. of Stops	Total daily ons/offs	Pct. Population Minority	Pct. Population Low-Income
Impacted	36	4,157	21%	46%
Nearest alternative service w/ similar span & frequency				
Less than ¼ mile to bus or less than ½ mile to rail	31	3,864	21%	46%
Over ¼ mile to bus or over ½ mile to rail*	5	293	16%	28%

**Adverse effect applies*

Table 8: Stops and populations impacted by routing changes to Line 33-McLoughlin (Saturdays Only)				
	No. of Stops	Total daily ons/offs	Pct. Population Minority	Pct. Population Low-Income
Impacted	36	2,578	21%	46%
Nearest alternative service w/ similar span & frequency				
Less than ¼ mile bus or ½ mile rail	31	2,525	21%	46%
Between ¼ and ½ mile bus, or over ½ mile rail*	5	53	16%	28%
**Adverse effect applies*				

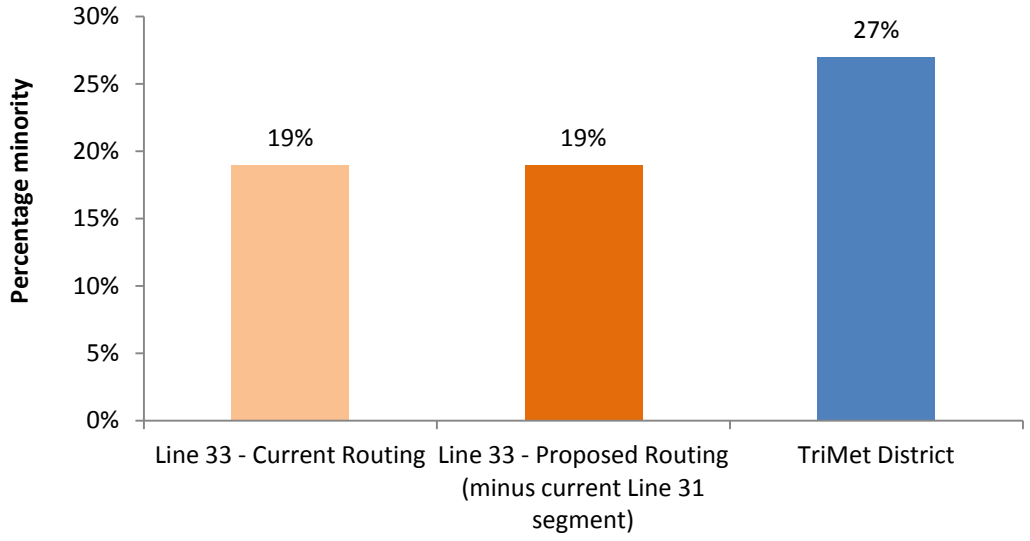
Table 9: Stops and populations impacted by routing changes to Line 33-McLoughlin (Sundays Only)				
	No. of Stops	Total daily ons/offs	Pct. Population Minority	Pct. Population Low-Income
Impacted	36	2,000	21%	46%
Nearest alternative service w/ similar span & frequency				
Less than ¼ mile bus or ½ mile rail	31	1,961	21%	46%
Between ¼ and ½ mile bus, or over ½ mile rail*	5	39	16%	28%
**Adverse effect applies*				

Disparate Impact Analysis

Tables 7-9 indicate that the Line 33 stops being removed and meeting the adverse effect criteria are in block groups with minority populations that are lower than average for the TriMet district. The population surrounding these stops is about 16% minority, which is lower than the TriMet district average minority population of 27%. Thus, while the removal of service will have an impact on several hundred riders per day, the change does not result in a Disparate Impact on minority populations.

As shown in Figure 15, the minority population percentage would not change under the proposed routing, but the number of minority persons served would drop by about 2,600. This is mostly due to the route no longer serving Downtown Portland. As with the current route, the proposed route would serve an area with a below-average minority population for the TriMet District.

Figure 15: Minority Population Comparison
Line 33-McLoughlin & TriMet District



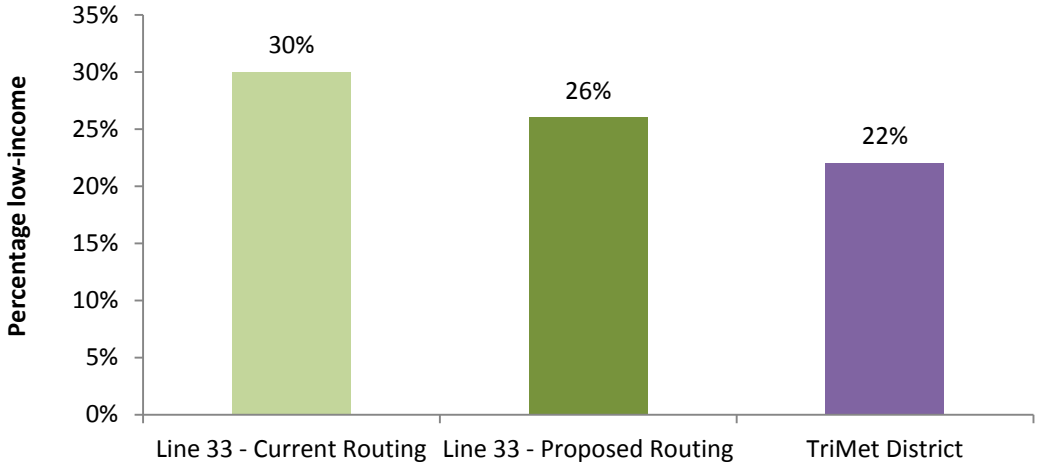
Source: 2008-2012 American Community Survey, block group level.

Disproportionate Burden Analysis

Tables 7-9 indicate that the Line 33 stops being removed and meeting the adverse effect criteria are in block groups with low-income populations that are higher than average for the TriMet district. The population surrounding these stops is about 28% low-income, which is higher than the TriMet district average minority population of 22%. Thus, the removal of service has the potential to impact on several hundred riders per day in disproportionately high low-income areas. The change could therefore result in a Disproportionate Burden on low-income populations.

As shown in Figure 16, the low-income population percentage would drop from 30% to 26% under the proposed routing, and the number of low-income persons served would drop by about 5,300. This is mostly due to the route no longer serving Downtown Portland. As with the current route, the proposed route would have an above-average low-income population for the TriMet District.

Figure 16: Low-Income Population Comparison
Line 33-McLoughlin & TriMet District



Source: 2008-2012 American Community Survey, block group level.
Low-income defined as at or below 150% federal poverty.

Line 34-River Rd.

Service Change Description

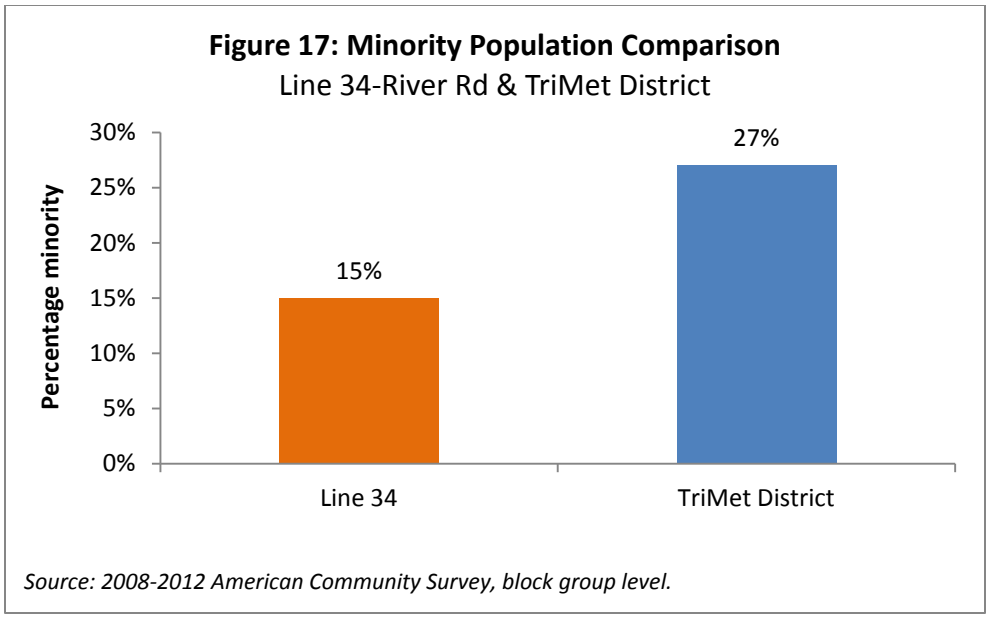
It is proposed that the Line 34:

- Maintain its current route and hours of service between Oregon City and Downtown Milwaukie;
- Double in frequency (from about every 70 minutes to about every 35 minutes); and
- Be combined with the new Line 28.

No Line 34 stops are proposed to be eliminated. As an increase in service, the line-level analysis thusly examines the change through the lens of distribution of benefits.

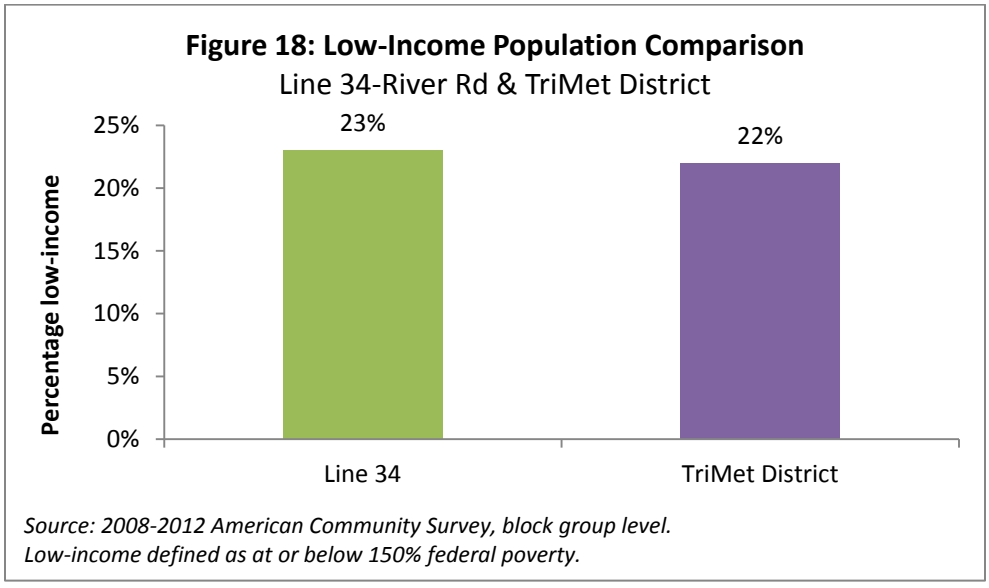
Disparate Impact Analysis

Figure 17 compares the minority population along the current Line 34 with the minority population of the TriMet service district as a whole. As shown, the minority population is lower along the Line 34 than the district average. On its own, this could indicate a potential disparate impact, but should be considered along with the rest of the analysis.



Disproportionate Burden Analysis

Figure 18 compares the low-income population along the current Line 34 with the low-income population of the TriMet service district as a whole. As shown, the low-income population is higher along the Line 34 than the district average. On its own, this could indicate no potential disproportionate burden, but should be considered along with the rest of the analysis.



Line 99

Service Change Description

It is proposed that the Line 99:

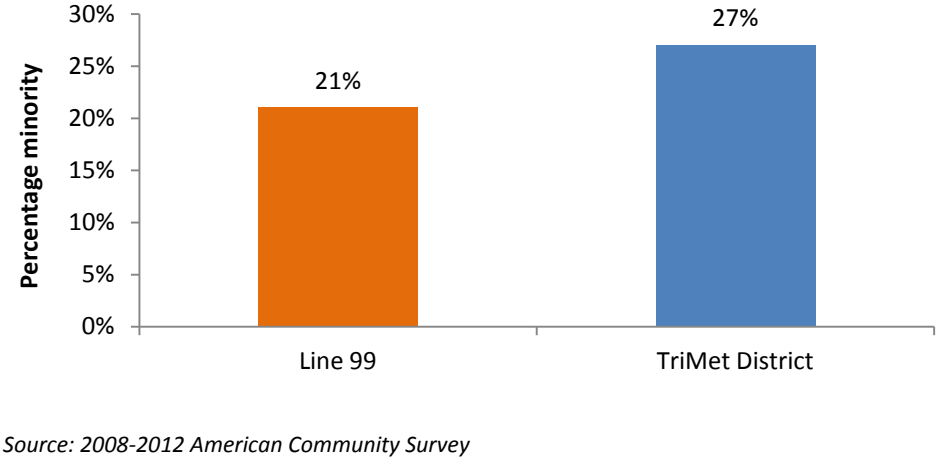
- Maintain existing frequency and hours of service;
- Add a new service pattern from Downtown Portland to Oregon City in the mornings and the opposite in the evenings; and
- Re-route to cross the Sellwood Bridge, adding limited stops between Sellwood and Downtown Portland[4].

The line-level analysis examines the new service pattern and additional stops through the lens of the distribution of benefits.

Disparate Impact Analysis

Figure 19 compares the minority population along the current Line 99 with the minority population of the TriMet service district as a whole. As shown, the minority population is lower along the Line 34 than the district average. On its own, this could indicate a potential disparate impact, but should be considered along with the rest of the analysis.

Figure 19: Minority Population Comparison
Line 99-McLoughlin Express & TriMet District



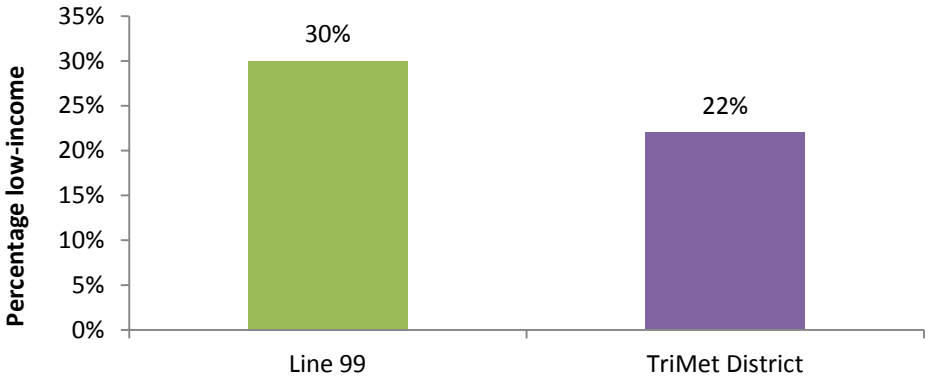
Source: 2008-2012 American Community Survey

Disproportionate Burden Analysis

Figure 20 compares the low-income population along the current Line 99 with the low-income population of the TriMet service district as a whole. As shown, the low-income population is higher along the Line 99 than the district average. On its own, this could indicate no potential disproportionate burden, but should be considered along with the rest of the analysis.

[4] Once construction of the new Sellwood Bridge is complete. Projected for 2016.

Figure 20: Low-Income Population Comparison
Line 99-McLoughlin Express & TriMet District



Source: 2008-2012 American Community Survey, block group level.
Low-income defined as at or below 150% federal poverty.

B. System-level Analysis

Beyond looking at each line individually, TriMet analyzes the impact all service changes together have on the minority and low-income populations in the service district, according to the Title VI policies described previously.

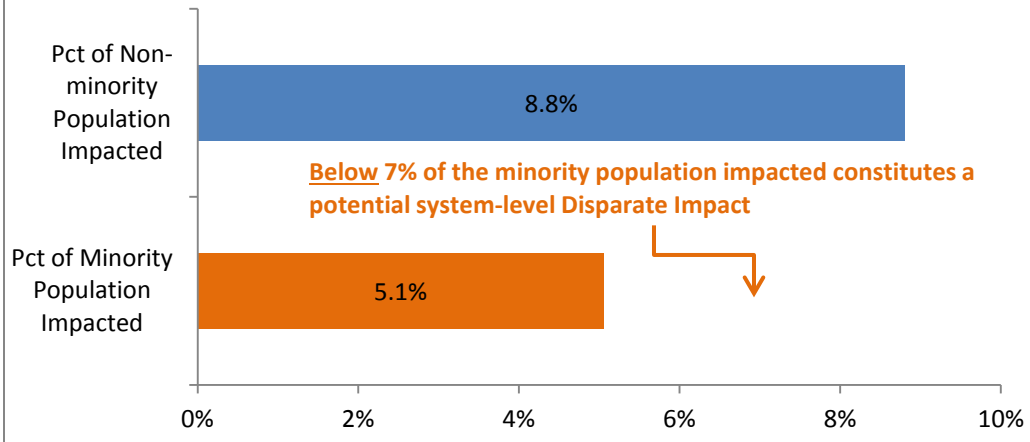
Disparate Impact Analysis

This analysis compares the proportion of the TriMet district's minority and non-minority populations that would be impacted by the proposed service changes, both positively and negatively. Table 10 and Figures 21-22 presents the results of this comparison, indicating that no Disparate Impact exists in terms of the negative impacts, i.e. service removals. Additionally, while less than 1% of the district's minority population stands to be negatively impacted by adverse effects related to access to bus stops, over 5% stand to benefit from service improvements. However, the overall service package does appear to benefit non-minorities disproportionately; over 20% more of the TriMet district's non-minority population lives in the area where service additions/increases are planned as compared to the minority population.

Taken together, these results show that in terms of benefits and burdens associated with planned service changes, minority populations stand to be impacted positively more than negatively, would not experience as much of the burden as non-minority populations, but would also not see as much of the benefit.

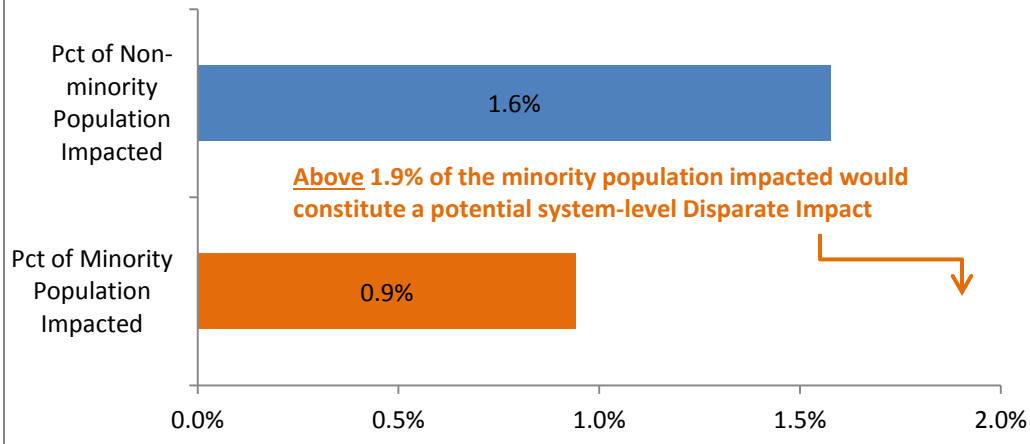
Table 10: System-level Disparate Impact Analysis				
	Pct. of TriMet District Non-Minority Pop Impacted	Minority Pop Disparate Impact Threshold	Pct. of TriMet District Minority Pop Impacted	Potential Disparate Impact?
Service Removals	1.6%	Greater than 1.9%	0.9%	No
Service Additions/Increases	8.8%	Less than 7.0%	5.1%	Yes

Figure 21: System-level impacts of service additions/increases
Minority and Non-minority Populations



Source: 2008-2012 American Community Survey, block group level

Figure 22: System-level impacts of service removals
Minority and Non-minority Populations



Source: 2008-2012 American Community Survey, block group level

Disproportionate Burden Analysis

This analysis compares the proportion of the TriMet district's low-income and higher income populations that would be impacted by the proposed service changes, both positively and negatively. Table 11 and Figures 23-24 present the results of this comparison, indicating that a disproportionate burden exists in terms of negative impacts, i.e. service removals; over 20% more of the TriMet district's low-income population lives in the areas where service removals are planned as compared to the higher income population. At the same time, the overall service package does appear to benefit a greater portion of the low-income than higher income population, and while about 2% of the district's low-income population live in areas of service removals, 9% live in areas of service improvements.

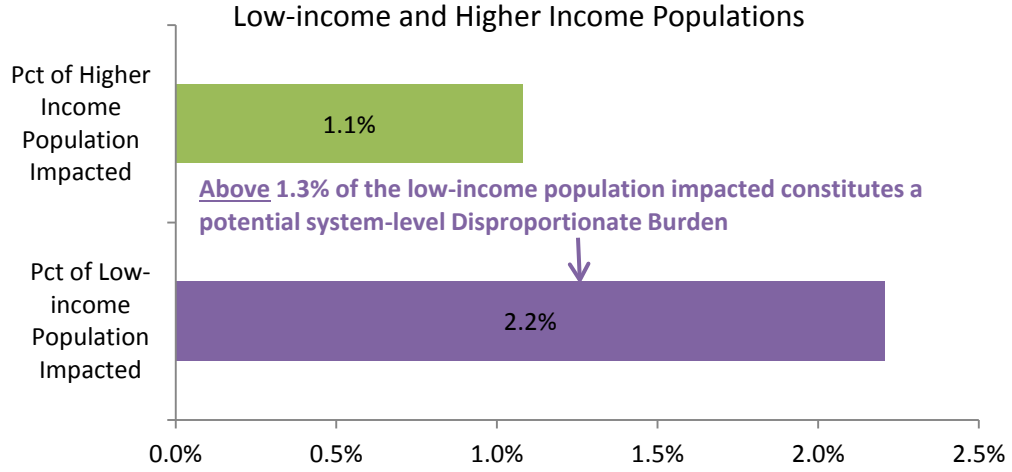
Taken together, these results show that in terms of benefits and burdens associated with planned service changes, low-income populations stand to be impacted positively more than negatively, would see more of the benefit than higher income populations, but would also experience more of the burden of service removals than higher-income populations.

Table 11: System-level Disproportionate Burden Analysis

	Pct. of TriMet District Non-Low-Income Pop Impacted	Low-Income Pop Disproportionate Burden Threshold	Pct. of TriMet District Low-Income Pop Impacted	Potential Disproportionate Burden?
Service Removals	1.1%	Greater than 1.3%	2.2%	Yes
Service Additions/Increases	7.3%	Less than 5.8%	9.0%	No

Figure 23: System-level impacts of service removals

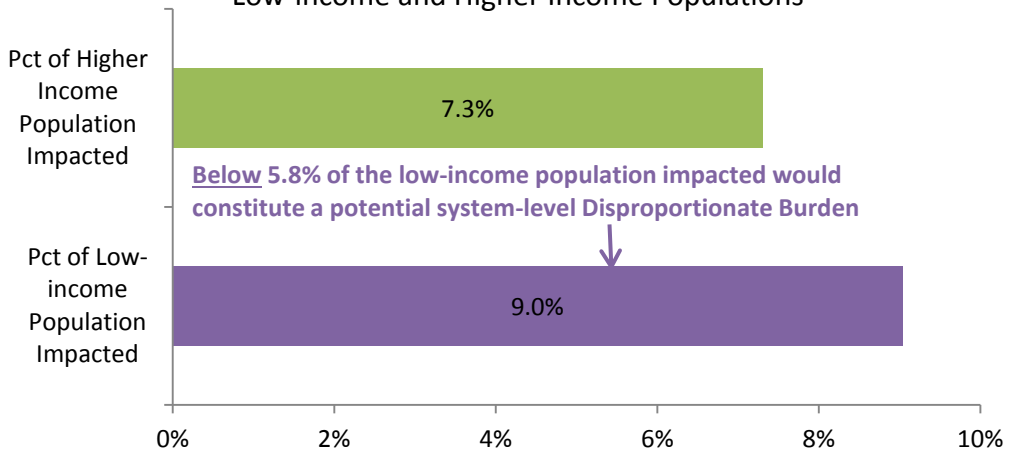
Low-income and Higher Income Populations



Source: 2008-2012 American Community Survey, block group level.
Low-income defined as at or below 150% federal poverty. Higher income includes all others.

Figure 24: System-level impacts of service additions/increases

Low-income and Higher Income Populations



Source: 2008-2012 American Community Survey, block group level.
Low-income defined as at or below 150% federal poverty. Higher income includes all others.

C. Summary of Findings

Disparate Impact

As Table 12 summarizes, no Disparate Impact was identified related to the adverse effects of service removal at stops that would have otherwise duplicative service. That is, minority populations would not be negatively impacted to a greater extent than non-minority populations as a result of service removals.

In terms of benefits, a potential Disparate Impact was identified related to proposed changes. This area of the TriMet service district has a lower-than-average minority population, and the service increases proposed potentially benefit non-minority populations to a greater extent than minority populations. However, these increases exist because of TriMet's commitment to reinvest bus service hours currently provided within the Orange Line corridor, but would be duplicative with the Orange Line. Because of this, *TriMet concludes that this does not constitute a Disparate Impact.*

Disproportionate Burden

Also shown in Table 12, *a Disproportionate Burden was identified* related to the adverse effects of service removal. That is, low-income populations may be negatively impacted as a result of service removals to a greater extent than those above 150% federal poverty.

On the other hand, no Disproportionate Burden was found for proposed service improvements, including service provided by the new MAX Orange Line. Increases in service look to potentially benefit low-income populations to a greater degree than higher income populations, based on the population of the service areas.

Table 12: Summary of Disparate Impact and Disproportionate Burden Analyses

Line	Change in Service Hours (Frequency and/or Span)	Change in Route Length	Service Reductions (Adverse Effects/Burdens)		Service Improvements (Benefits)	
			Potential Disparate Impact?	Potential Dis-proportionate Burden?	Potential Disparate Impact?	Potential Dis-proportionate Burden?
MAX Orange Line	New Route	New Route	N/A*	N/A	Yes	No
Line 19-Woodstock/Glisan (Saturday)	+13%	N/A	N/A	N/A	Yes	No
Line 19-Woodstock/Glisan (Sunday)	+14%	N/A	N/A	N/A	Yes	No
Line 28-Linwood	+63%	+180%	No	Yes	Yes	No
Line 31-King Rd (Weekdays)	+85%	+31% -61%	No	Yes	Yes	No
Line 31-King Rd (Saturday)	+157%	+31% -61%	No	Yes	Yes	No
Line 31-King Rd (Sunday)	+391%	+31% -61%	No	Yes	Yes	No
Line 32-Oatfield	0%	-35%	No	Yes	N/A	N/A
Line 33-McLoughlin	0%	+23% -42%	No	Yes	N/A	N/A
Line 34-River Rd	+175%	+60%	N/A	N/A	Yes	No
Line 99-McLoughlin Express	+100%	+7%	N/A	N/A	Yes	No
All Combined (System-level)	+42% Bus; New Rail Route	+22%	No	Yes	Yes	No

**N/A indicates that the corresponding line did not have service reductions (center two columns) or service improvements (right two columns), so Disparate Impact and Disproportionate Burden analyses do not apply.*

IV. Further Analysis and Alternatives

Having identified a Disproportionate Burden associated with the proposed service changes, TriMet is required by the Circular to avoid, minimize, or mitigate impacts where practicable.

In order to better understand the extent of the issues identified and how to address them, staff conducted further analysis in response to the findings. Through an examination of stop characteristics including boardings, surrounding environment, and alternative service, staff identified the stop pair at SE Harold & McLoughlin as having a notable negative impact and also an above-average low-income population. Staff thusly conducted an ad-hoc rider survey at this stop, as well as two others to get a better idea at the ground level of what impacts might be (survey instrument attached in Appendix B). The survey was administered on two weekdays during peak hours and one Saturday during the midday at three stops where service is proposed to be removed. It received little response, largely due to the low ridership at the surveyed stops. Results did indicate the following:

- Most respondents plan to use the MAX Orange Line, Line 19, and/or Line 70 after the service changes.
- Some respondents were unsure of what they would do after the service changes.
- A few respondents surveyed were transit dependent.

Informed by this survey as well as internal discussions, staff provided the following options for leadership consideration.

Option 1: Provide bus service directly connecting primary stops of concern to MAX Orange Line (Avoid/Minimize)

This option would most directly address the results of the Title VI equity analysis by removing concerns about a potential Disproportionate Burden due to service removal. It would serve to avoid, or at least minimize, the potential negative impacts identified. However, it would require an estimated $250,000 per year or more to provide with limited returns in terms of ridership. It would also still require a transfer to other services to reach downtown Portland or most other employment, medical or other destinations. It may also reduce ridership on the MAX Orange Line where the two routes parallel one another.

Option 2: Review Line 19 for further increased service (Mitigate)

The frequency of the Line 19 could be increased to help mitigate for removal of the Line 33 connection from the Orange Line corridor to downtown Portland. Similarly to Option 1, this is estimated to cost at least $250,000 per year.

Option 3: Take no additional action

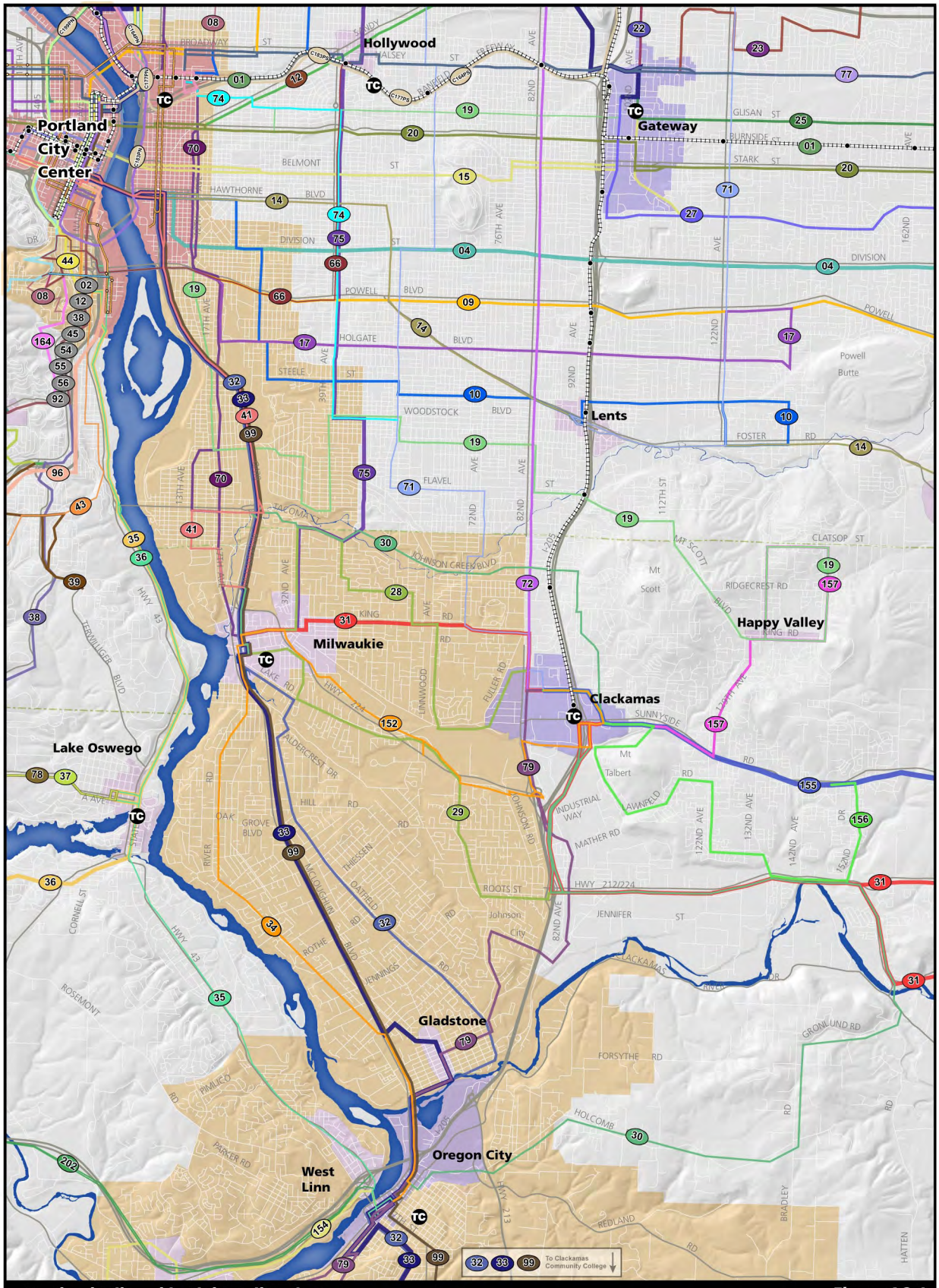
TriMet could keep the service plan as proposed, as long as the agency can demonstrate why avoiding, minimizing, or mitigating for the Disproportionate Burden identified is not practicable.

V. Agency Decision

The overall potential benefits of the proposed service plan to residents and riders in the Orange Line corridor are significant. Such benefits include improved travel times, increased frequency and span of bus service, and better schedule reliability due to the Orange Line's separated right-of-way. TriMet wants to ensure that all residents of the corridor have fair access to these benefits, regardless of race, ethnicity, or income.

Having reviewed and considered the options described in Section IV of this report, TriMet leadership is proposing moving forward with Option 3, thereby adopting the Orange Line MAX service plan as proposed. The justification for doing so centers around return on investment. The cost of pursuing Option 1 or Option 2 is not justified by the potential ridership generated. Either option may require reducing service elsewhere in the corridor, or elsewhere in the TriMet system. Or, if invested without any reductions, this amount of funding could be better used to improve service elsewhere in the system, providing a greater benefit to a greater number of riders (including minority and low-income riders).

APPENDIX A: Proposed service changes from Portland-Milwaukie Light Rail Final Environmental Impact Statement, October 2010



Portland-Milwaukie Light Rail Project **Figure 4.2-1**

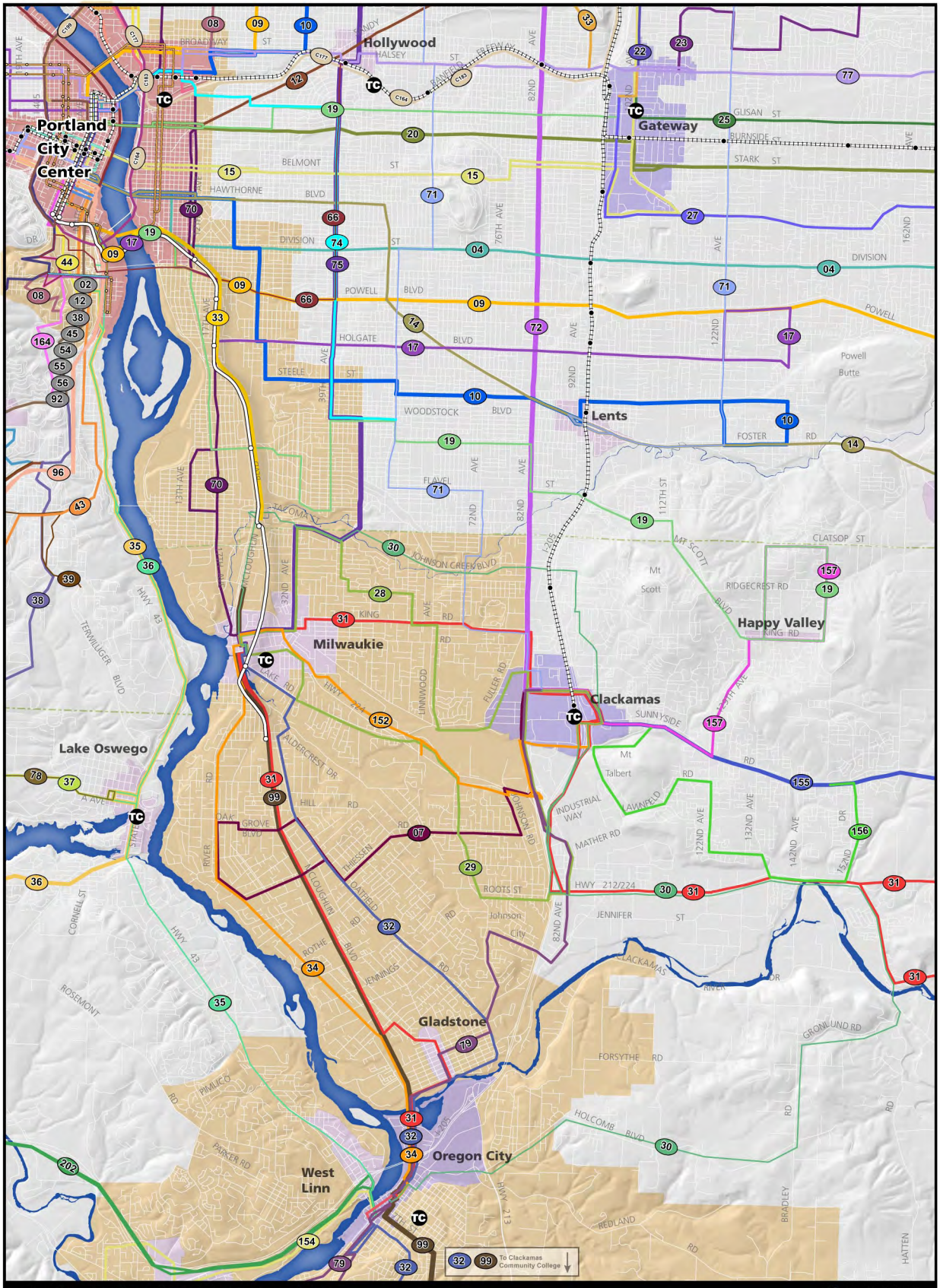
2030 No-Build Transit Network

- Bus Route
- Light Rail and Station
- Streetcar and Station
- Portland Aerial Tram
- Transit Center
- City Center
- Regional Center
- Town Center
- Portland-Milwaukie Corridor

TRIMET
Metro

0 0.5 1 1.5 Miles

December 2009



Portland-Milwaukie Light Rail Project **Figure 4.2-2**

2030 Light Rail Alternative Transit Network

- Bus Route
- Light Rail Alternative and Station
- Light Rail and Station
- Streetcar and Station
- Portland Aerial Tram
- Transit Center
- City Center
- Regional Center
- Town Center
- Portland-Milwaukie Corridor

TRIMET

Metro

0 0.5 1 1.5 Miles

December 2009

APPENDIX B: Bus Stop Intercept Survey

TRIMET

Bus Stop Intercept Survey **Location: Harold**

Surveyor initials: _____ Date: _____ Time: _____ Stop ID#: _____

Tally: Refusal_____ Q1 terminate: _____ Incentive: ____

Hello, I work for TriMet and I'm asking a few questions about your use of this stop.

1. First, did you come to this stop from your home?

☐ 1 Yes ☐ 2 No → Thank, terminate and tally

2. Please tell me the street and cross street closest to your home. Or if you prefer, what is your home address?

_____

3. How many people live in your home? _____

4. ***(Hand card*****) What was your household income before taxes in 2014? Please read me the letter that indicates your income.** *(Take card back)*

Record letter: _____

5a. Is it closer to your home to take the line 70 that travels on SE 17th ? *(show map if needed)*

☐ 1 Yes ☐ 2 No ☐ 3 Don't know

5b. Is it closer to your home to take the line 19 that travels on Milwaukie Ave? *(show map if needed)*

☐ 1 Yes ☐ 2 No ☐ 3 Don't know

If yes in 5a or 5b

5c. Since the other route is closer, why are you taking a bus from this stop? *(check all that apply)*

☐ 1 More frequency

☐ 2 Runs more hours in the day (span of service)

☐ 3 Other: _____

6. Do you have a vehicle you could use for this bus trip either as a driver or passenger?

☐ 1 Yes ☐ 2 No ☐ 3 Don't know

7. Where is the destination location of the trip you are about to take? You can tell me the street and cross street or a landmark such as Pioneer Courthouse Square.

_____

8. In September this stop will be removed due to the Orange Line travelling along McLoughlin. How will you make this trip when that happens? *(check all that apply)*

☐ 1 Take line 70

☐ 2 Take line 19

☐ 3 Take Orange Line

☐ 4 Will not make this trip on transit

☐ 5 Don't know

☐ 6 Other: _____

Thank you, those are all the questions I have.