

Pierce Transit

# Title VI Service Equity Analysis

Pursuant to FTA Circular 4702.1B

March 2017 Restructure

December 2016

# PIERCE TRANSIT TITLE VI SERVICE EQUITY ANALYSIS

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# PIERCE TRANSIT TITLE VI SERVICE EQUITY ANALYSIS

## 1 INTRODUCTION

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin in programs and activities receiving Federal financial assistance. This analysis was conducted in compliance with Federal Transit Administration (FTA) Circular 4702.1B, which requires any FTA recipient serving a population of 200,000 or greater to evaluate any fare change and any major service change at the planning and programming stages to determine whether those changes have a discriminatory impact. This document is an analysis of the route restructure planned for the March 2017 service change.

## 2 BACKGROUND

After substantial cuts to service in 2011 and 2012, Pierce Transit is in the process of restoring approximately 59,000 fixed-route service hours to be added to the September 2016, March 2017 and September 2017 service changes. The most substantial of these additions will be the 35,000 service hours to be added for the March 2017 service change. Pierce Transit recognized that such a major service addition called for a comprehensive review of how current service was performing and where improvements could be made to maximize the long-term benefits of changes. Like many transit agencies across the country, a confluence of external factors has caused a steady decline in Pierce Transit fixed route ridership while changing land-patterns and increased congestion have in some cases altered the functionality of the route network as originally designed. Therefore in January of 2016 Pierce Transit began collaborating with the consulting firm Nelson/Nygaard on a comprehensive fixed route analysis. Subsequent months were spent analyzing performance data and soliciting input from the Pierce Transit Board of Commissioners and public on the desired outcomes of this route analysis.

The public input, stakeholder discussions, and board outreach had a common theme of desired improvements. Improved route frequency and expanded span of service were the two most desired improvements. The Pierce Transit board also strongly indicated a desire to improve ridership levels. Improved frequencies generally lead to bigger ridership gains than expanded span of service. As a result, four different investment priorities were developed, which were applied to two alternative expansion scenarios. They are as follows:

1. Upgrade urban routes to 30-minute peak frequency
2. Upgrade urban routes to 30-minute mid-day frequency
3. Extend urban route spans to 10 p.m.
4. Extend urban route Saturday span to 10 p.m.

The results of the analysis concluded that the top three priorities could be achieved for the March 2017 service change by shifting, consolidating, and in some cases eliminating certain routes that had unproductive or duplicative service.

## 2.1 Service Characteristics

Guided by public and staff input, detailed ridership/on-time performance data, and Pierce Transit’s recently adopted long range plan, two alternative scenarios were developed. Alternative 1 proposed increased frequencies on most existing urban routes and would have no adverse effects on service delivery, however it would also not deliver significant positive benefits. Alternative 2 proposed substantial improvements in span and frequency for all urban routes but would require some routing changes and eliminations. Following a presentation of these alternatives by Nelson/Nygaard at the October 10<sup>th</sup>, 2016, Pierce Transit board meeting, staff were directed by the board to further develop Alternative 2 as the preferred alternative due to its superior ability to achieve the goals set at the outset of the route analysis.

The following tables outline the Alternative 2 alterations to existing service proposed for the March 2017 Service Change.

**Table 1: Routes Experiencing a Change in Weekday Span**

Route	Current Span	Description of Changes
4 112th St	Service until 9:00 PM	Span extended to 10:00pm
10 Pearl Street	Service until 7:00 PM	Span extended to 10:00pm
11 Pt. Defiance	Service until 6:30 PM	Span extended to 10:00pm
13 N. 30th Street	Service until 7:20 PM	Eliminated due to low productivity; hours move to nearby Routes 11, 16
14 N. Proctor District	Service until 7:00 PM	Absorbed by Route 11; interlined with Route 41 for on-seat ride to Tacoma Dome Station
16 UPS / TCC	Service until 8:30 PM	Span extended to 10:00pm
28 S 12th St	Service until 8:30 PM	Span extended to 10:00pm
41 Portland Ave	Service until 8:30 PM	Span extended to 10:00pm
42 McKinley Ave	Service until 7:30 PM	Span extended to 10:00pm
45 Yakima	Service until 7:15 PM	Span extended to 10:00pm
48 Sheridan M St	Service until 9:30 PM	Span extended to 10:00pm
51 Union Ave	Service until 7:45 PM	Eliminated due to low productivity and high overlap; hours move to nearby routes
52 TCC Tac Mall	Service until 8:45 PM	Span extended to 10:00pm
53 University Place	Service until 8:00 PM	Span extended to 10:00pm
54 38th St	Service until 8:30 PM	Span extended to 10:00pm
55 Parkland Tac Mall	Service until 9:00 PM	Absorbed by Route 52
56 56th St	Service until 7:00 PM	Absorbed by Routes 41, 54
57 Tacoma Mall	Service until 8:30 PM	Span extended to 10:00pm
202 72nd Street	Service until 9:00 PM	Span extended to 10:00pm

206 Pacific Hwy / Tillicum / Ft. Lewis	Service until 9:00 PM	Span extended to 10:00pm
212 Steilacoom	Service until 9:00 PM	Span extended to 10:00pm
214 Washington	Service until 8:30 PM	Span extended to 10:00pm
300 S Tacoma Way	Service until 9:00 PM	Mostly absorbed by Routes 3 and 206
500 Federal Way	Service until 10:30 PM	Span extended to 11:00pm

**Table 2: Routes Experiencing a Change in Weekday Frequency**

Route	Current Frequencies			Description of Changes
	Peak	Midday	Evening	
10 Pearl Street	30	30	60	Mid-day frequency improved to 30 minutes
11 Pt. Defiance	30	60	-	Peak and mid-day frequency improved to 30 minutes
13 N. 30th Street	30	60	-	Eliminated due to low productivity; hours move to nearby Routes 11, 16
14 N. Proctor District	30	60	60	Absorbed by Route 11; interlined with Route 41 for one-seat ride to Tacoma Dome Stn.
16 UPS / TCC	30	30	60	Peak and mid-day frequency improved to 30 minutes
28 S 12th St	30	30	60	Mid-day frequency improved to 30 minutes
41 Portland Ave	30	30	60	Mid-day frequency improved to 30 minutes
42 McKinley Ave	30	30	60	Mid-day frequency improved to 30 minutes
45 Yakima	30	30	60	Peak and mid-day frequency improved to 30 minutes
48 Sheridan M St	30	30	60	Mid-day frequency improved to 30 minutes
51 Union Ave	30	60	60	Eliminated due to low productivity and high overlap; hours move to nearby routes
53 University Place	30	30	30-60	Peak and mid-day frequency improved to 30 minutes
54 38th St	30	60	60	Peak and mid-day frequency improved to 30 minutes
56 56th St	30	30	60	Absorbed by Routes 41, 54
206 Pacific Hwy / Tillicum / Ft. Lewis	30	40	40-60	Mid-day frequency improved to 30 minutes
300 S Tacoma Way	30	30	30-60	Mostly absorbed by Routes 3 and 206
400 Puyallup / Downtown Tacoma	20AM/30PM	60	60	PM peak frequency improved to 20 minutes
402 Meridian / Federal Way	30	60	60	Mid-day frequency improved to 30 minutes
500 Federal Way	30	30	60	Mid-day frequency improved to 30 minutes

**Table 3: Routes Experiencing a Change in Alignment or Elimination**

<b>Route</b>	<b>Description of Changes</b>
3 Lakewood / Tacoma	Shifted to serve S Tacoma Way corridor from Tacoma Mall Transit Center (TMTC) to SR-512 P&R
4 112th St	Shifted to 100th St SW in coordination with Route 3 re-route
10 Pearl Street	Mid-day frequency improved to 30 minutes; Service extended to 10:00pm
11 Pt. Defiance	Peak and mid-day frequency improved to 30 minutes; Service extended to 10:00pm
13 N. 30th Street	Eliminated due to low productivity
14 N. Proctor District	Absorbed by Route 11 between Proctor and Commerce
16 UPS / TCC	Peak and mid-day frequency improved to 30 minutes; Service extended to 10:00pm
41 Portland Ave	New terminus of Tacoma Mall Transit Center; Weekday frequency improved to 30 minutes mid-day; Service extended to 10:00pm
48 Sheridan M St	Weekday frequency improved to 30 minutes mid-day; Service extended to 10:00pm
51 Union Ave	Route eliminated due to low productivity
52 TCC Tac Mall	Appended with Route 55
53 University Place	East of S Tacoma Way, new routing to TMTC between S 66th St and S 48th St via S Oakes St; No service east of TMTC
54 38th St	Routing adjusted to serve more S 38th St, Portland Ave corridors, 72nd St TC
55 Parkland Tac Mall	Absorbed by Route 52
56 56th St	Absorbed by Routes 41, 54
206 Pacific Hwy / Tillicum / Ft. Lewis	Adjusted to serve Springbrook neighborhood
300 S Tacoma Way	Route eliminated due to overlap with Route 3, low productivity

### Outreach and Decision-making

The addition or deletion of more than 20% of a route’s service hours or miles is considered a major service change under Pierce Transit’s Major Service Change Policy (see 3.1) and requires a Title VI Service Equity Analysis and public outreach.

Public outreach included six public open houses and seven stakeholder outreach meetings. The locations and groups are provided in Tables 4 and 5. The first three public open houses were designed to solicit public input to help develop the alternative vision of a major addition in service. Following the unveiling of Alternatives 1 and 2 on October 10, 2016, at a study session prior to Pierce Transit’s regular Board of Commissioner’s meeting, an additional three open-houses were held in order to simultaneously inform the public of proposed changes as well as garner more targeted feedback. The open-houses were advertised online, in print, and via Automated Vehicle Announcements (AVA) on-board Pierce Transit buses.

Pierce Transit’s Board of Commissioners held a Public Hearing on the proposed restructure on November 14, 2016. Legal notices were published on November 2, 2016, 12 days in advance of the public hearing scheduled to take place at the Board of Commissioners’ meeting. The legal notice and rider alert was also published on Pierce Transit’s web site in advance of the public hearing.

**Table 4: Public Outreach Open-Houses**

City	Place	Date
Lakewood	Pierce Transit	7/28/2016
Puyallup	Puyallup Library	8/9/2016
Tacoma	Hilltop Community Health Clinic	8/11/2016
Tacoma	Wheelock Library	10/18/2016
Tacoma	Salishan Family Investment Center	10/19/2016
Lakewood	Pierce Transit	10/25/2016

Written comments and attendance were recorded for each public meeting.

At least 6 meetings regarding proposed changes were held with stakeholders.

**Table 5: Stakeholder Outreach Meetings**

<b>Organization</b>	<b>Date</b>
Pierce County Chief Appointed Officials Meeting	10/27/2016
City of Tacoma Planning Commission	11/2/2016
RAMP - Chamber of Commerce meeting	11/2/2016
North Tacoma Neighborhood Council	11/7/2016
New Tacoma Neighborhood Council	11/9/2016
South Tacoma Neighborhood Council	11/16/2016
Partner Café	11/18/2016

Additionally, a project website (<http://www.piercetransit.org/route-analysis-moving-forward/>) was created in order to communicate proposed changes to the public. The website included a “Build Your Own System” survey tool, which granted respondents a hypothetical budget and asked them to make tradeoffs regarding which improvements to Pierce Transit service were most valued. A feedback tool provided an avenue for direct comments on proposed changes or suggestions. A separate tab on the project website informed the public of potential Title VI-related impacts.

All comments were saved and categorized. As of November 26, 2016, 366 comments have been submitted regarding the route analysis. As of August 16, 2016, 861 Build Your Own System surveys were completed.

### 3 TITLE VI POLICIES & DEFINITIONS

Pierce Transit's Board of Commissioners adopted three policies in February 2013 related to Title VI that guide this analysis: Major Service Change Policy; Disparate Impact Policy; and Disproportionate Burden Policy. The requirement for these policies comes from Federal Transit Administration (FTA) Circular 4702.1B, "Title VI Requirements and Guidelines for Federal Transit Administration Recipients" which became effective October 1, 2012. The Circular requires any FTA recipient that operates 50 or more fixed route vehicles in peak service and serving a population of 200,000 persons or greater to evaluate any fare change and any major service change at the planning and programming stages to determine whether those changes have a discriminatory impact.

#### 3.1 PIERCE TRANSIT MAJOR SERVICE CHANGE POLICY

The purpose of this policy is to establish a threshold that defines a major service change and to define an adverse effect caused by a major service change.

A major service change is defined as any change in service on any individual route that would add or eliminate more than twenty percent of the route revenue miles or twenty percent of the route revenue hours. All major service changes will be subject to an equity analysis which includes an analysis of adverse effects on minority and low income populations.

An adverse effect is defined as a geographical or time-based reduction in service which includes but is not limited to: Span of service changes, frequency changes, route segment elimination, re-routing, or route elimination.

#### 3.2 PIERCE TRANSIT DISPROPORTIONATE BURDEN POLICY

The purpose of this policy is to establish a threshold which identifies when the adverse effects of a major service change or any fare change are borne disproportionately by low income<sup>1</sup> populations.

A disproportionate burden occurs when the low income population adversely affected by a fare or service change is five percent more than the average low income population of Pierce Transit's service area.

Disproportionate burden on routes with either Span of service changes and/or frequency changes will be determined by analyzing all routes with such changes together. Disproportionate burden on routes with segment elimination, re-routing, or route elimination will be determined on a route by route basis.

If Pierce Transit finds a potential disproportionate burden, the agency will take steps to avoid, minimize or mitigate impacts and then reanalyze the modified service plan to determine whether the impacts were removed. If Pierce Transit chooses not to alter the proposed changes, the agency may implement the service or fare change if there is substantial legitimate justification for the change AND the agency can show that there are no alternatives that would have less of an impact on low income population and would still accomplish the agency's legitimate program goals.

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<sup>1</sup> **Low Income Population** – Persons reporting as being under the federal household poverty limit as defined by the U.S. Department of Health and Human Services. In 2015 the poverty level for a family of four was \$24,250.

### 3.3 **PIERCE TRANSIT DISPARATE IMPACT POLICY**

The purpose of this policy is to establish a threshold which identifies when adverse effects of a major service change or any fare change are borne disproportionately by minority populations.

A disparate impact occurs when the minority population<sup>2</sup> adversely affected by a fare or service change is ten percent more than the average minority population of Pierce Transit's service area.

Disparate impacts on routes with either Span of service changes and/or frequency changes will be determined by analyzing all routes with such changes together. Disparate impacts on routes with segment elimination, re-routing, or route elimination will be determined on a route by route basis.

If Pierce Transit finds a potential disparate impact, the agency will take steps to avoid, minimize or mitigate impacts and then reanalyze the modified service plan to determine whether the impacts were removed. If Pierce Transit chooses not to alter the proposed changes, the agency may implement the service or fare change if there is substantial legitimate justification for the change AND the agency can show that there are no alternatives that would have less of an impact on the minority population and would still accomplish the agency's legitimate program goals.

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<sup>2</sup> **Minority Population** – Persons identifying themselves as a race other than white or of Hispanic origin, self-reported in the U.S. Census.

## 4 METHODOLOGY

Pierce Transit is required to evaluate changes to span and frequency as separate categories in order to determine whether disparate impacts or disproportionate burdens exist at a systematic level under each category. Conversely, changes to routing which meet major service change thresholds are required to be analyzed on a route-by-route basis to determine disparate impacts/disproportionate burdens and additionally require documentation of mitigation efforts.

Pierce Transit staff used Remix ([www.remix.com](http://www.remix.com)) to aid in the quantitative aspects of the Title VI analysis for this project. Remix allows you to automatically generate a Title VI report (based on Census data) by comparing existing service to a set of proposed changes. The methodology used by Remix to achieve this includes the following steps:

1. Obtain population demographics information near a route, including its low income and minority percentage.
  - For each route, build a shape file that represents the area within a quarter mile of any of its stops.
  - Intersect the catchment area with 2009-2013 ACS Census data. Obtain a list of block groups and the percentage that overlap with each.
  - For each block group, take the percentage of overlap and multiply it by the block group's statistics.
  - Obtain the population, minority population, and low income population for each group and sum them together. This is the total population a route could serve.
2. Compare the number of people-trips, before and after.
  - Multiply the population near a route by the number of trips it makes (per year) to derive "people-trips".
  - Repeat for low income and minority populations to derive "low income people-trips" and "minority people trips".
  - Compare these numbers between the before and after versions of the route, to obtain a set of people-trip differences. Routes that have identical names in the before and after scenarios are placed in the same row of the analysis table.
3. Calculate the total difference in people-trips across the transit system.
  - Repeat the process above for every route in the transit system.
  - Sum together the difference in people trips. This will return three numbers: total difference in people-trips, total difference in low income people-trips, and total difference in minority people trips.
4. Calculate the change borne by low income and minority populations.
  - Divide the total difference in low income people trips by the total difference in people-trips to get the percentage of change borne by those with low incomes.
  - Repeat for minority people-trips.
5. Compare the percentage change to the average in the service area.
  - Calculate the average percentage of low income and minority populations across the entire service area.
  - Subtract from the change borne by those populations.

- Obtain the two final numbers: the difference between the impact this set of transit changes had on low income and minority populations compared to the percentage population of low income and minority populations that live in the service area.

The equity analysis is provided in Section 5.

## 5 EFFECTS OF PROPOSED SERVICE CHANGE ON MINORITY AND LOW INCOME POPULATIONS

### 5.1 Impact of Service Change on Minority and Low Income Populations

Table 5-1 summarizes the characteristics of routes experiencing a change in span. For a detailed breakdown of the before and after service level characteristics of each route see Appendix 1.

**Table 5-1: Analysis of Span Changes on Low Income and Minority Populations**

	Low Income	Minority
<b>Change Borne By</b>	17.4%	32.4%
<b>Area Average</b>	14.3%	35.3%
<b>Delta</b>	3.1%	-2.9%

Low Income populations on routes with span changes experience a greater fraction of people-trips than previous levels of service. Thus at the system level there are no adverse impacts to low income populations.

Minority populations do experience a decrease in total fraction of people-trips relative to the system average; however, this difference is below the 10% threshold of adverse impacts which would trigger a disparate impact.

Table 5-2 summarizes the characteristics of routes experiencing a change in frequency. For a detailed breakdown of the before and after service level characteristics of each route see Appendix 2.

**Table 5-2: Analysis of Frequency Changes on Low Income and Minority Populations**

	Low Income	Minority
<b>Change Borne By</b>	16.9%	30.2%
<b>Area Average</b>	14.3%	35.3%
<b>Delta</b>	2.6%	-5.1%

Low Income populations on routes with frequency changes experience a greater fraction of people-trips than previous levels of service. Thus at the system level there are no adverse impacts to low income populations.

Minority populations do experience a decrease in fraction of people-trips relative to the system average; however, this difference is below the 10% threshold of adverse impacts which would trigger a disparate impact.

Table 5-3 outlines which routes experience changes to their alignment, how these changes would be distributed among low income and minority populations, whether these changes meet the thresholds of a disproportionate burden or disparate impact, and what mitigation steps are being undertaken.

**Table 5-3: Analysis of Route Changes or Elimination on Low Income and Minority Populations**

Route	Change Borne By Low Income	Change Borne by Minorities	Existing Route Miles Changed %	Disparate Impact OR Disproportionate Burden	Mitigation
3 Lakewood / Tacoma	24.7%	7.5%	64%	Yes	Stops previously served by Route 3 will in most cases continue to be served by restructured Routes 48 and 53
4 112th St	176.1% <sup>3</sup>	263.0% <sup>3</sup>	15%	No	Stops no longer served by Route 4 would be served by restructured Route 3
10 Pearl Street	17.4%	30.3%	10%	No	Mid-day frequency improved to 30 minutes on weekdays; Weekday span extended to 10:00pm
11 Pt. Defiance	17.9%	19.5%	43%	Yes	East of N Proctor St, shifted to cover absorb nearby Route 14; restructured route will mostly remain within 1/4 mile of existing Route 11
13 N. 30th Street	19.5%	27.5%	100%	Yes	Eliminated; Hours move to nearby Routes 11, 16
14 N. Proctor District	23.1%	23.7%	100%	Yes	Eliminated; Most stops would be served by Route 11; Interlined with Route 41 for on-seat ride to Tacoma Dome Station
16 UPS / TCC	17.1%	26.5%	24%	No	Shifted to serve gaps in service along N Pearl St and N 26h St
41 Portland Ave	19.4%	35.8%	17%	Yes	Segment eliminated from Portland Ave between E 56th St and E 72nd St to be served by Route 54
48 Sheridan M St	29.7%	56.0%	42%	Yes	Stops along Jefferson Ave will be served by Route 3
51 Union Ave	22.3%	43.3%	100%	Yes	Eliminated; Most stops currently served by Route 51 will continue to be served by Routes 206, 2, 53, 52, 57, 11, and 16, which will see improvements in span and/or frequency.
52 TCC Tac Mall	25.3%	55.8%	0%	No	Appended to Route 55; Will create one-seat ride from TCC to Parkland TC
53 University Place	4.6%	30.9%	36%	Yes	Peak and mid-day frequency improved to 30 minutes; Service extended to 10:00pm; Routes 1, 54 fill coverage gap
54 38th St	-31.0%	-71.3%	47%	Yes	Peak and mid-day frequency improved to 30 minutes; Service extended to 10:00pm
55 Parkland Tac Mall	25.5%	55.8%	100%	No	Appended to Route 55; Service extended to 10:00pm; Will allow for one seat ride from Parkland TC to TCC
56 56th St	22.2%	51.9%	100%	Yes	Eliminated; Service nearby routes extended to 10:00pm
206 Pacific Hwy / Tillicum / Ft. Lewis	38.2%	65.8%	8%	No	Peak and mid-day weekday frequency improved to 30 minutes; Service extended to 10:00pm
300 S Tacoma Way	28.9%	57.9%	100%	Yes	Eliminated; Gaps filled by shifting Routes 48, 53; GO transit will provide access to JBLM via SR-512, Lakewood Transit Center

<sup>3</sup> Value exceeds 100% since the numerator is greater than the denominator.

Note that only changes triggering disproportionate burden or disparate impact require mitigation. It is possible that changes to the overall number of people-trips by a re-route are small, while the changes to low income or minority people trips can be high. For example, moving Route 4 away from a pocket of residential areas reduced the total number of people living within a quarter mile of stops, but there are more trips, so the total change in people trips is relatively small. The difference in number of people-trips would be calculated as (people-trips after change) minus (people-trips before change), or (16,689 people x 9,920 trips) - (17,224 people x 9,965): = -915,080 people-trips. The low income people-trip count in the before scenario is (16,689 people x 9,920 trips x 18.5%) - (17,224 people x 9,965 x 19.4%) = -1,611,685. In this case the “% Change borne by...” value exceeds 100% since the numerator (-1,611,685) is greater than the denominator (-915,080).

There are **eleven** routes with changes large enough to warrant a major service change threshold of 20% AND create a disproportionate burden **and/or** disparate impact.

## 5.2 Disproportionate Burden Analysis

Pierce Transit’s policy states that a disproportionate burden occurs when the low income population adversely affected by a fare or service change is 5% more than the average low income population of Pierce Transit’s service area. An adverse effect is defined in the Major Service Change Policy as a geographical or time-based reduction in service which includes but is not limited to: Span of service changes, frequency changes, route segment elimination, re-routing, or route elimination.

Appendix 6.1, 6.2 and 6.3 highlights the full list of variables (route change %, adverse effect, change borne by %) which established the determinations of disproportionate burdens. There are total of **ten** routes which meet the threshold of disproportionate burden; these are Routes 3, 13, 14, 41, 48, 51, 53, 54, 56, and 300. The proposed mitigation addressing these disparate impacts can be found in Table 5-3, above. Mitigation includes adding span and or frequency to nearby stops, adding new routing to or near impacted stops, and partnering with other transit agencies to bridge gaps and/or enhance service.

## 5.3 Disparate Impact Analysis

Pierce Transit’s policy states that a disparate impact occurs when the minority population adversely affected by a fare or service change is 10% more than the average minority population of Pierce Transit’s service area. An adverse effect is defined in the Major Service Change Policy as a geographical or time-based reduction in service which includes but is not limited to: Span of service changes, frequency changes, route segment elimination, re-routing, or route elimination.

Appendix 6.1, 6.2 and 6.3 highlights the full list of variables (route change %, adverse effect, change borne by %) which established a determination of disparate impact. There are total of **seven** routes which meet the threshold of disparate impact; these are Routes 3, 11, 14, 48, 54, 56, and 300. The proposed mitigation addressing these disparate impacts can be found in Table 5-3. Mitigation includes adding span and or frequency to nearby stops, adding new routing to or near impacted stops, and partnering with other transit agencies to bridge gaps and/or enhance service.

For more details on proposed routing changes, please see maps for each route on the following pages. Where current and proposed routings differ, a dashed line indicates the corridor of service which would be lost. The blue lines indicate proposed service. The violet, orange, and red shading indicates where the average percentage of low income, minorities, or both categories is above the PTBA average.

Figure 5-1 Restructured Route 3

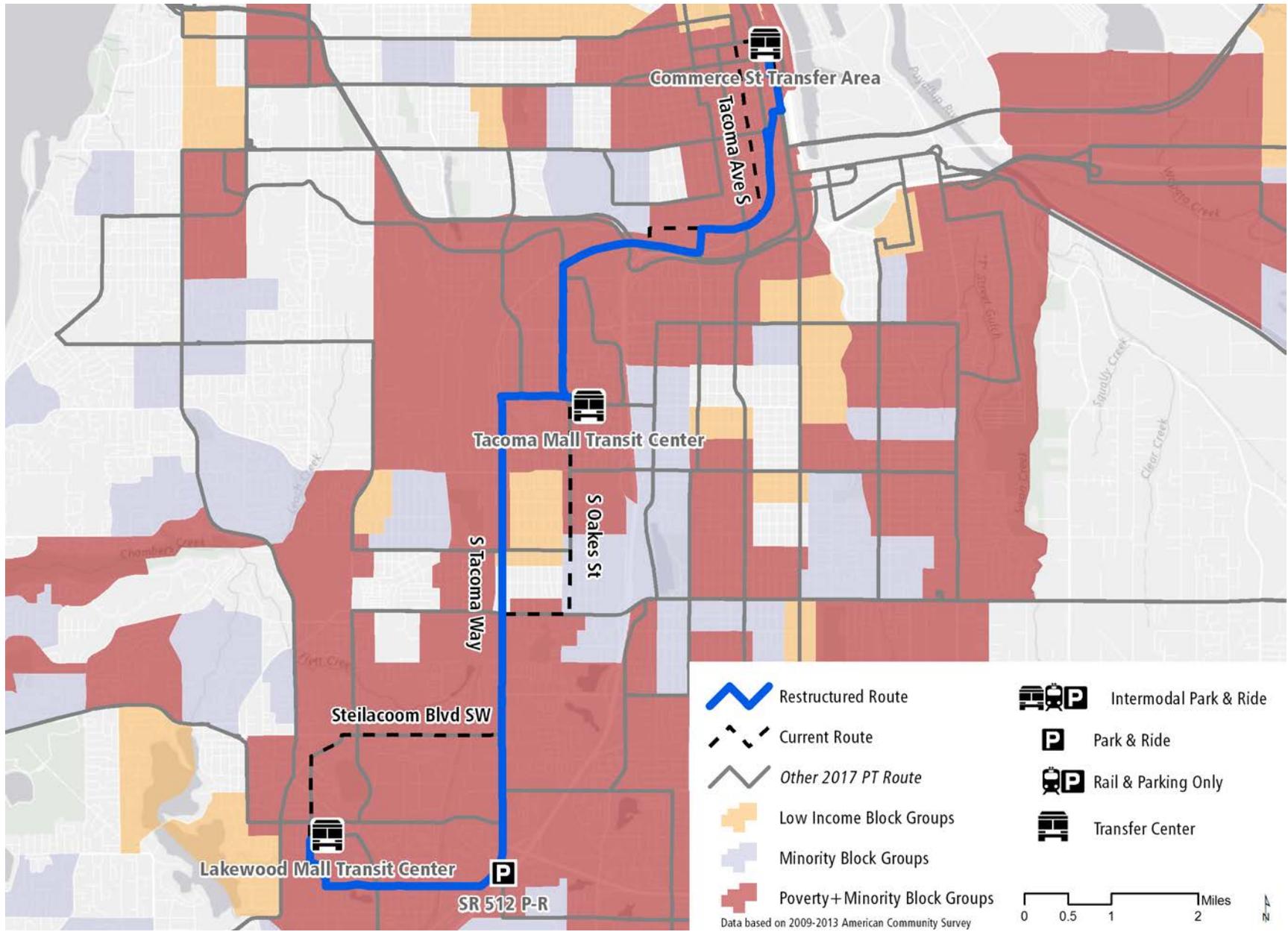


Figure 5-2 Restructured Route 4

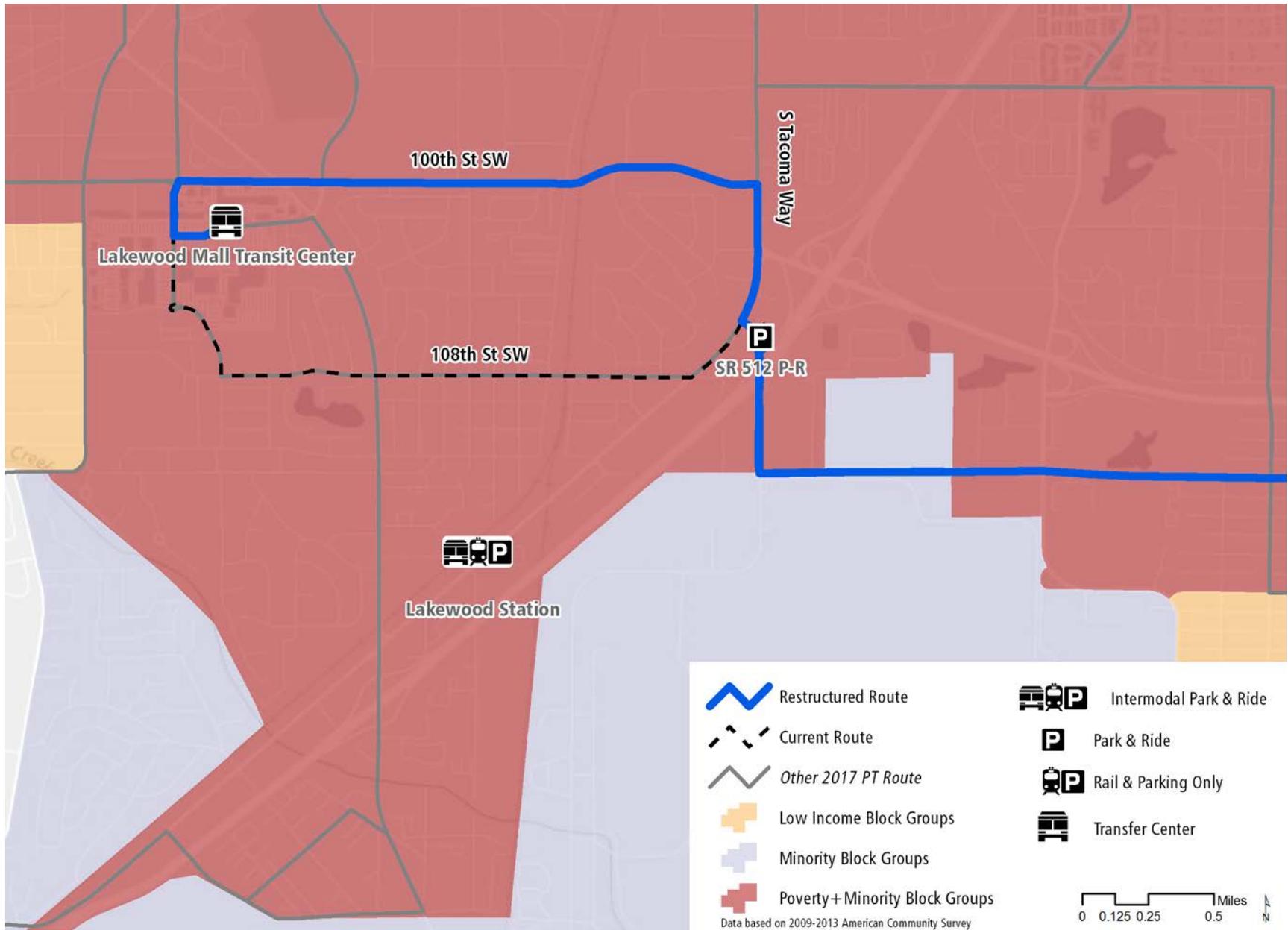


Figure 5-3 Restructured Route 10

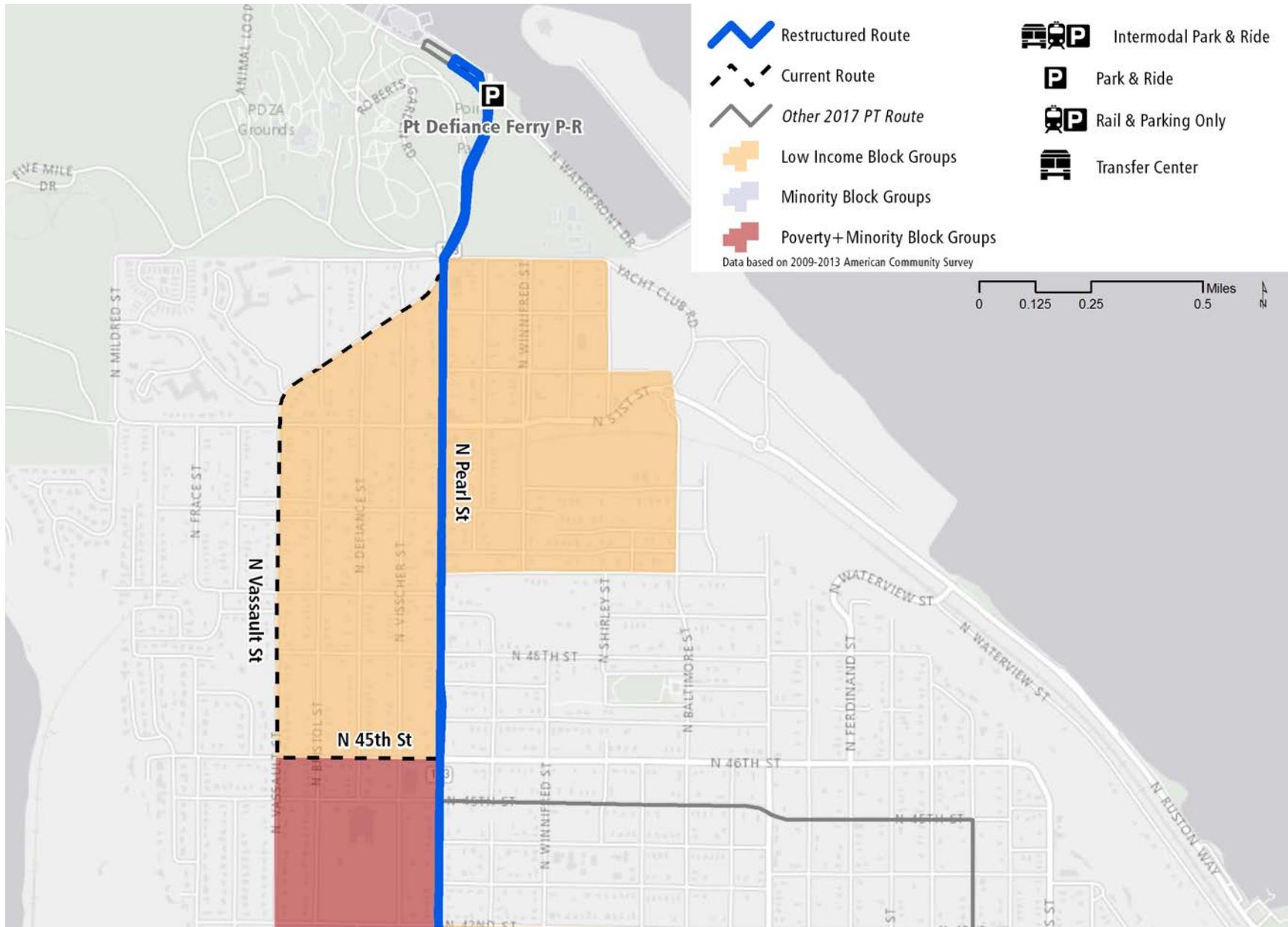


Figure 5-4 Restructured Route 11

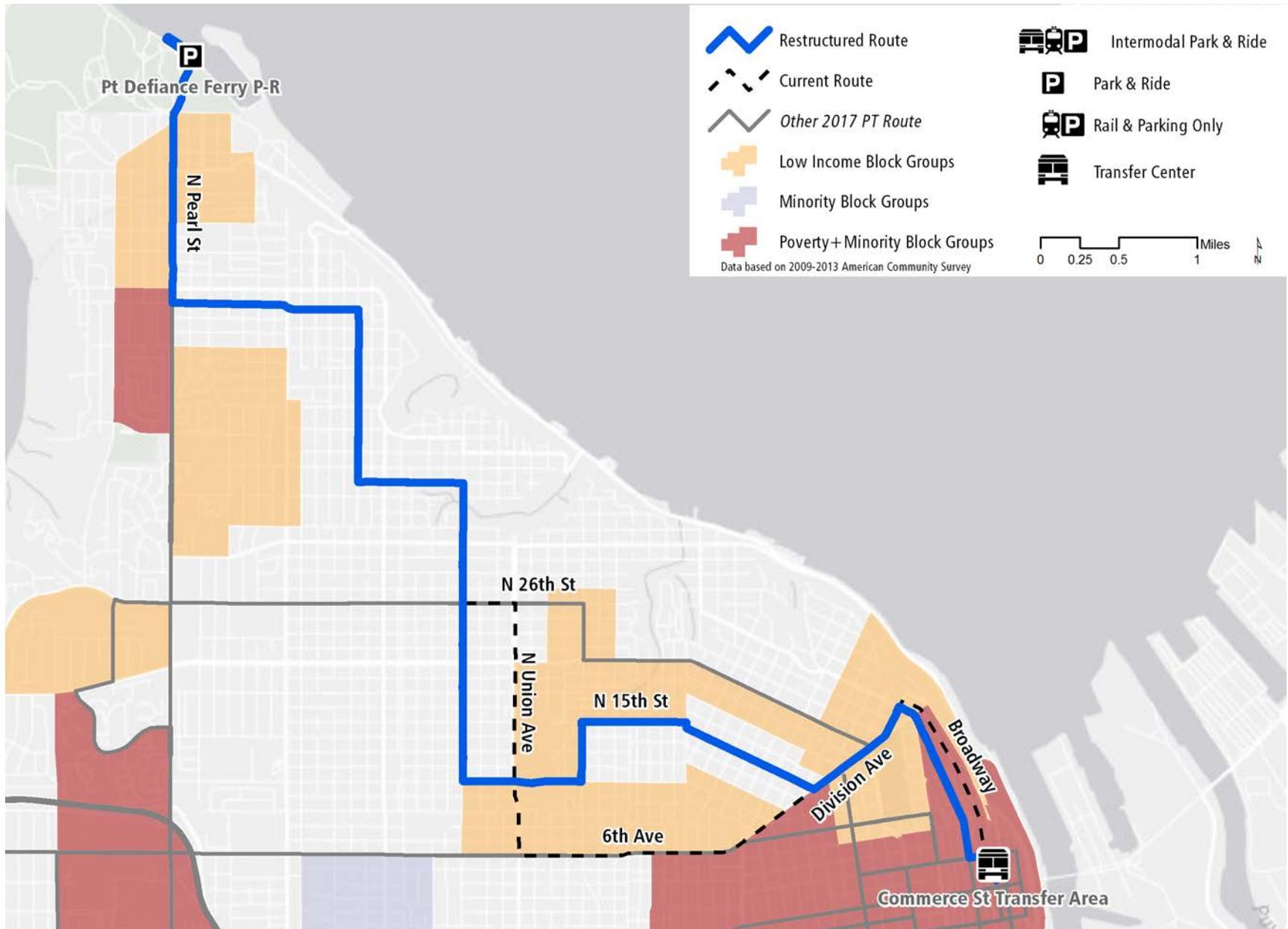


Figure 5-5 Eliminated Route 13

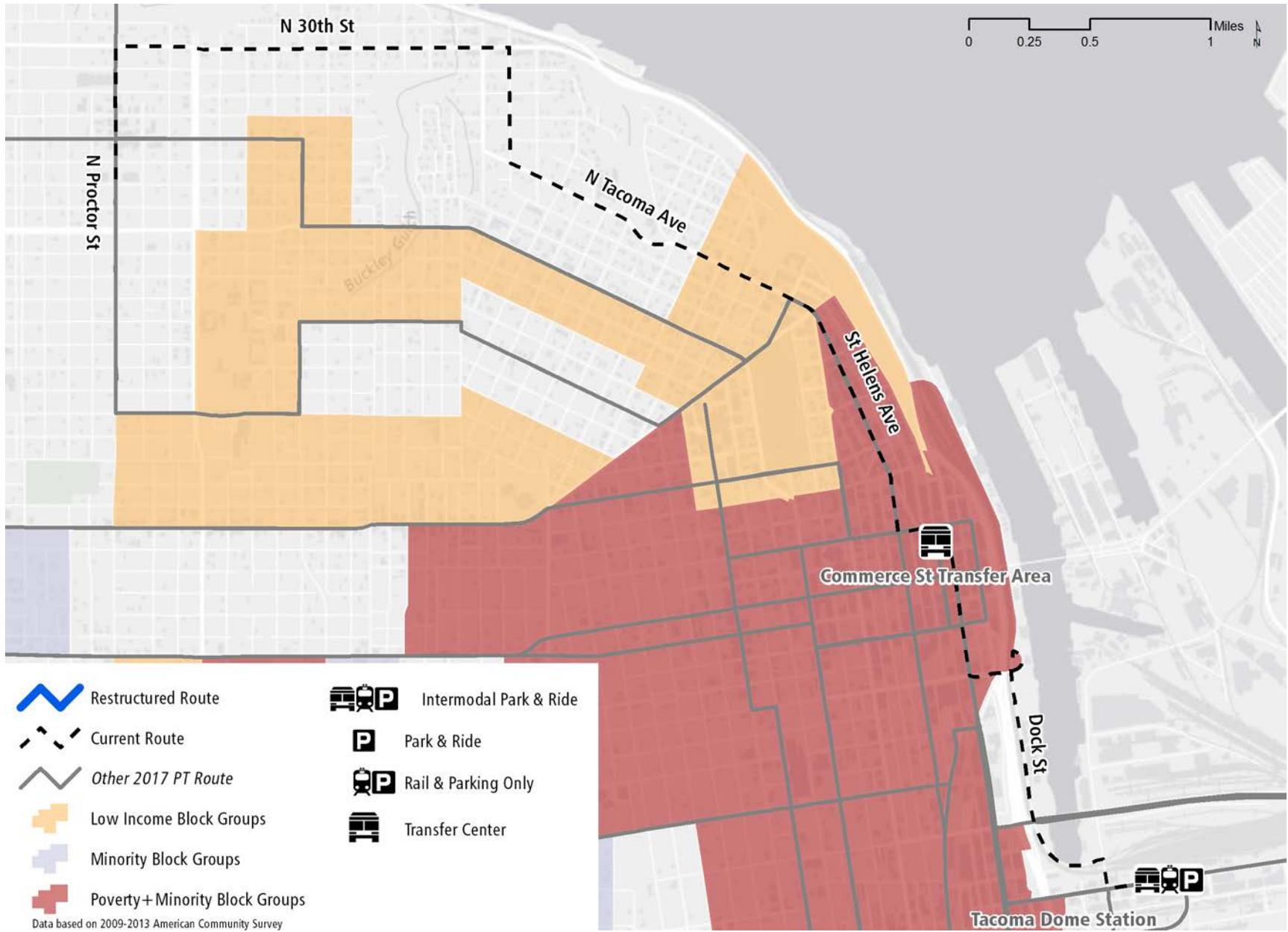


Figure 5-6 Eliminated Route 14

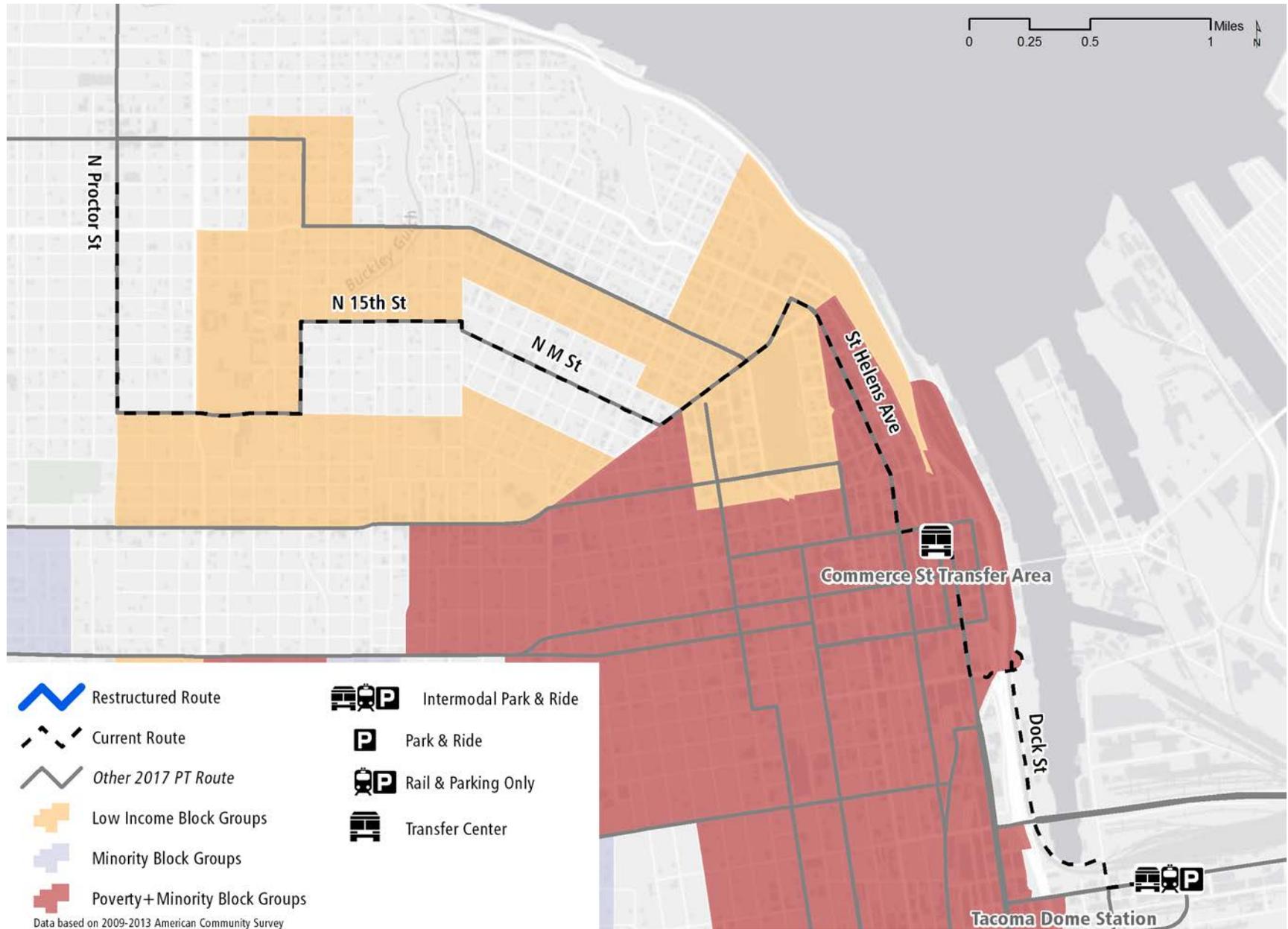


Figure 5-5 Restructured Route 16

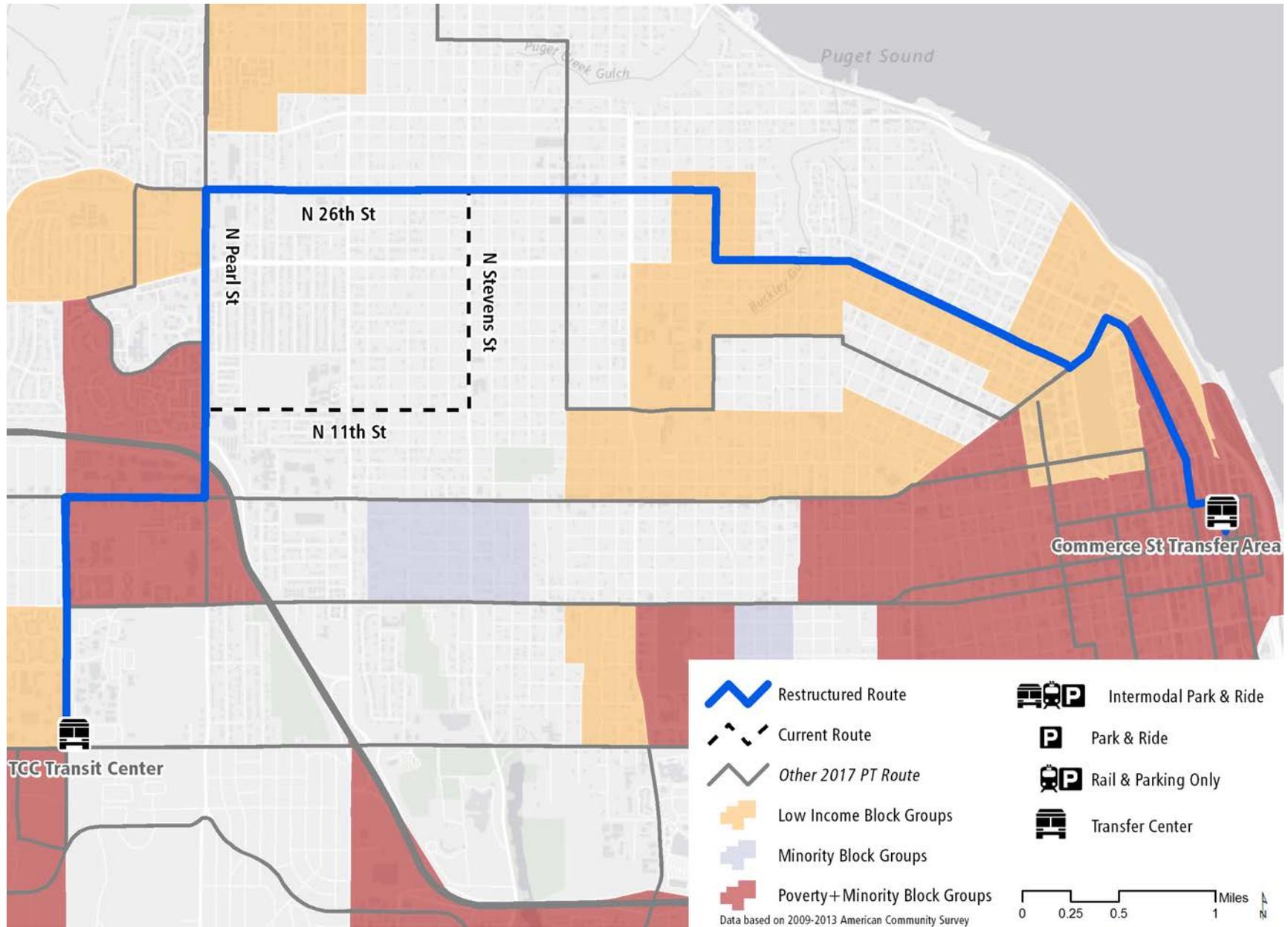


Figure 5-6 Restructured Route 41

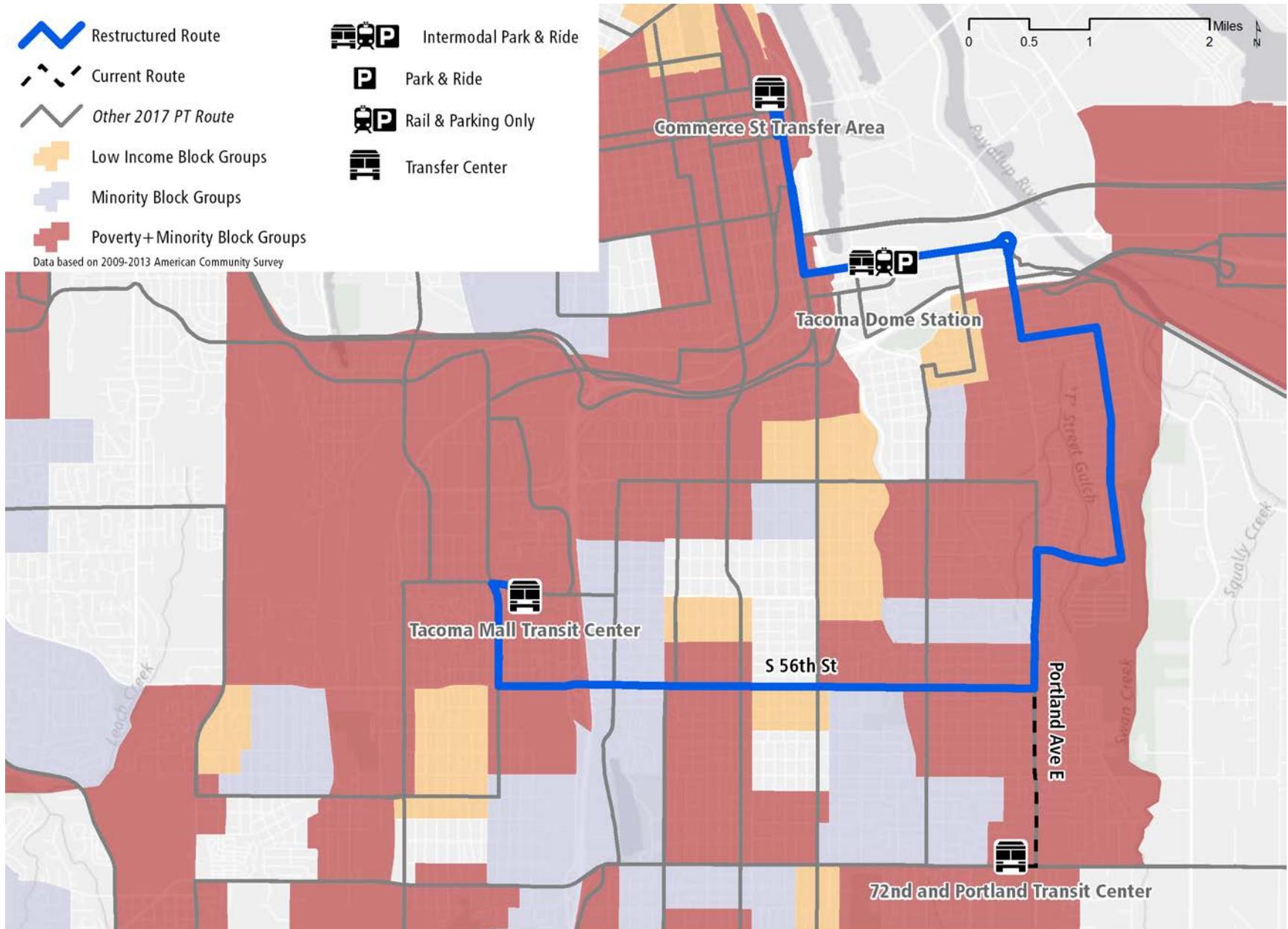


Figure 5-7 Restructured Route 48

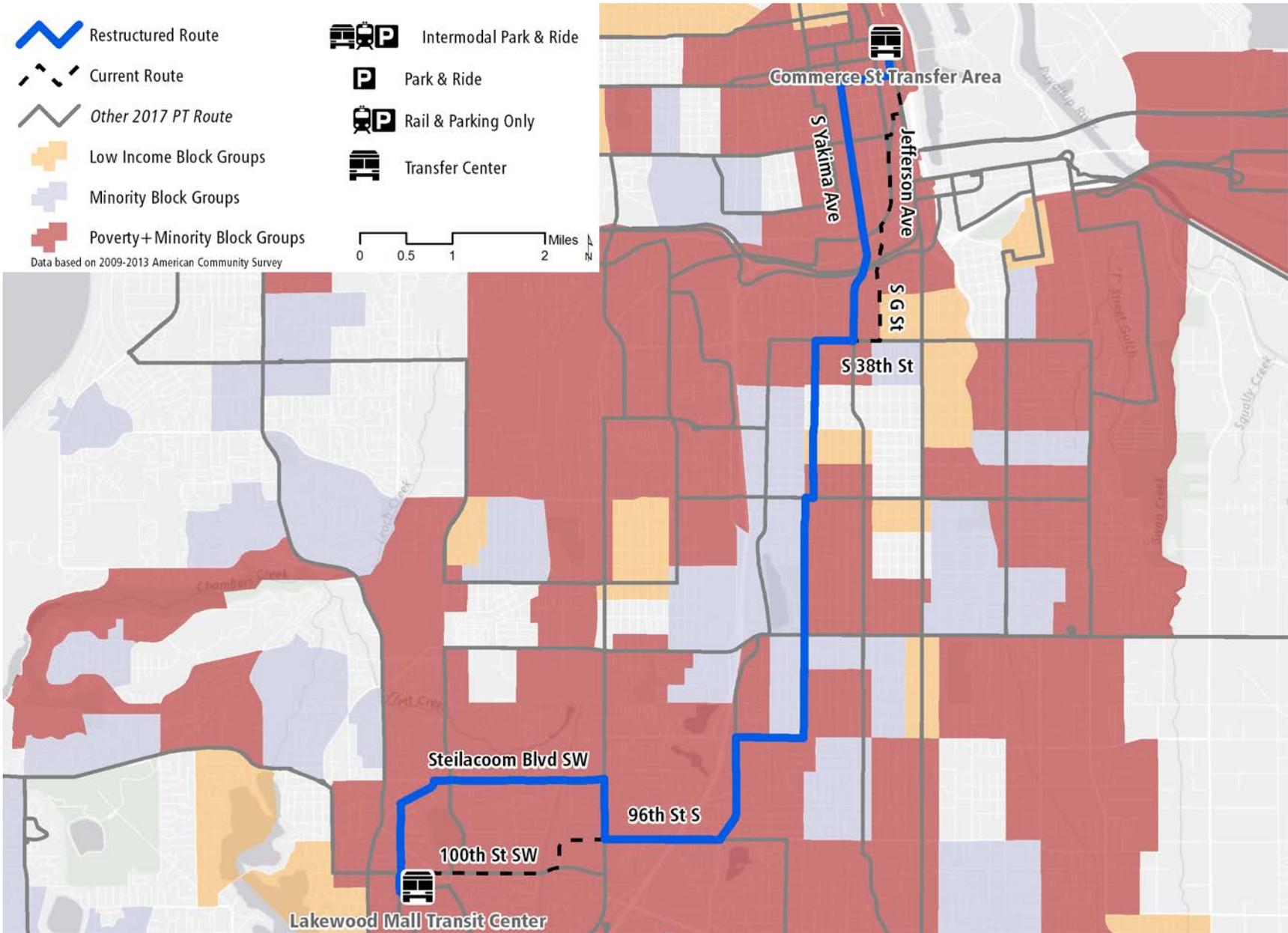


Figure 5-8 Eliminated Route 51

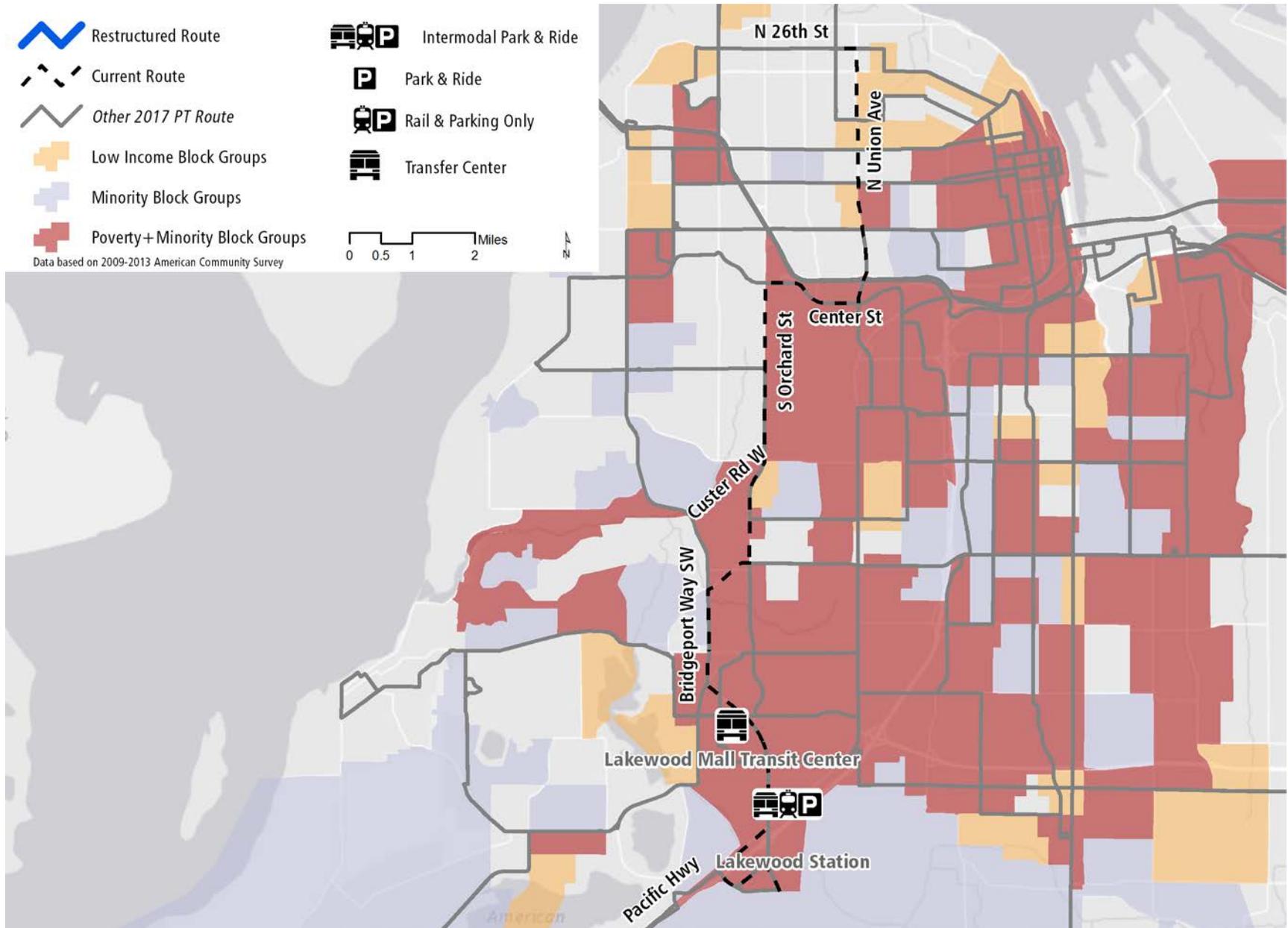


Figure 5-9 Restructured Route 52+55 (named Route 52)

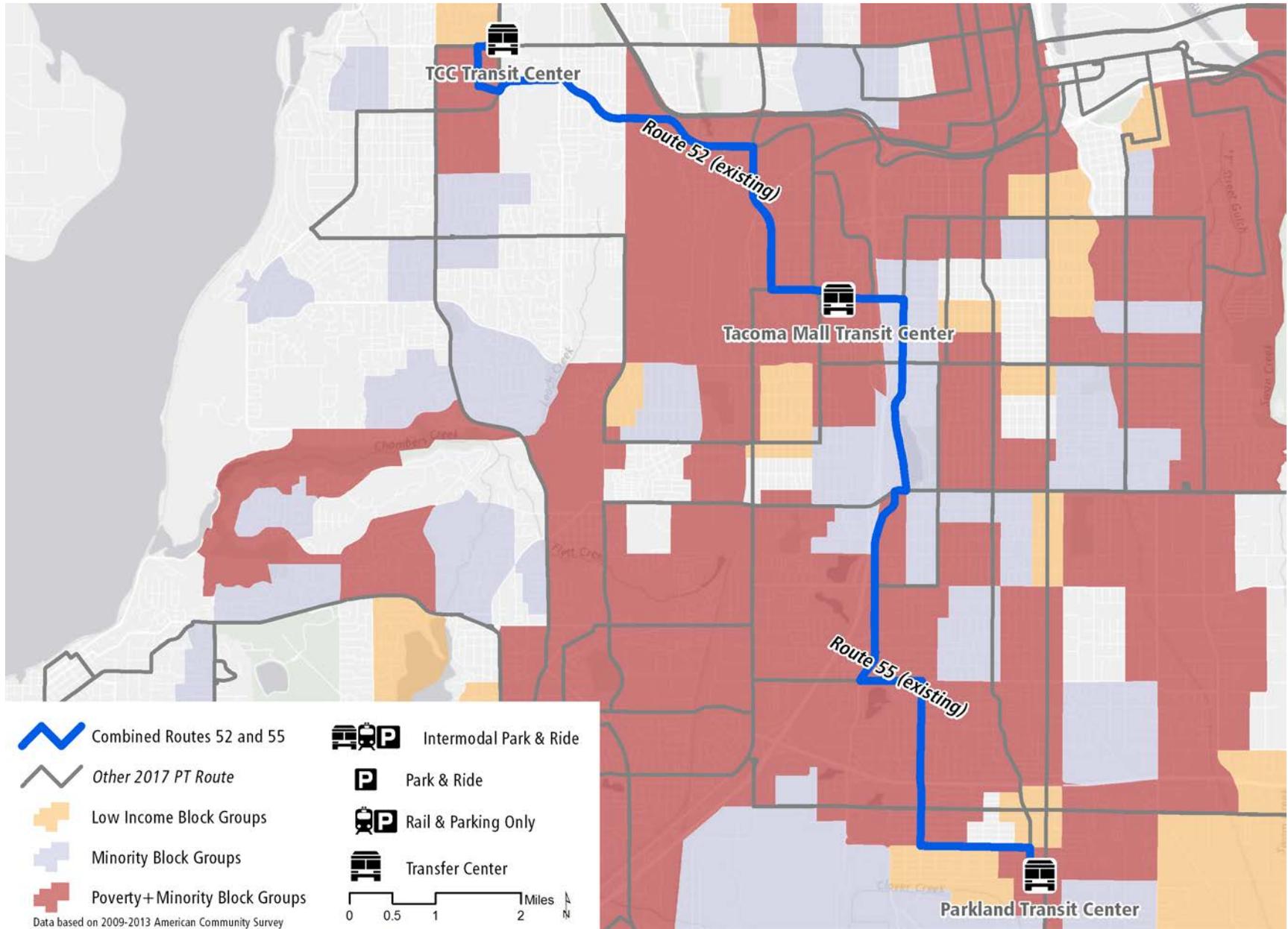


Figure 5-10 Restructured Route 53

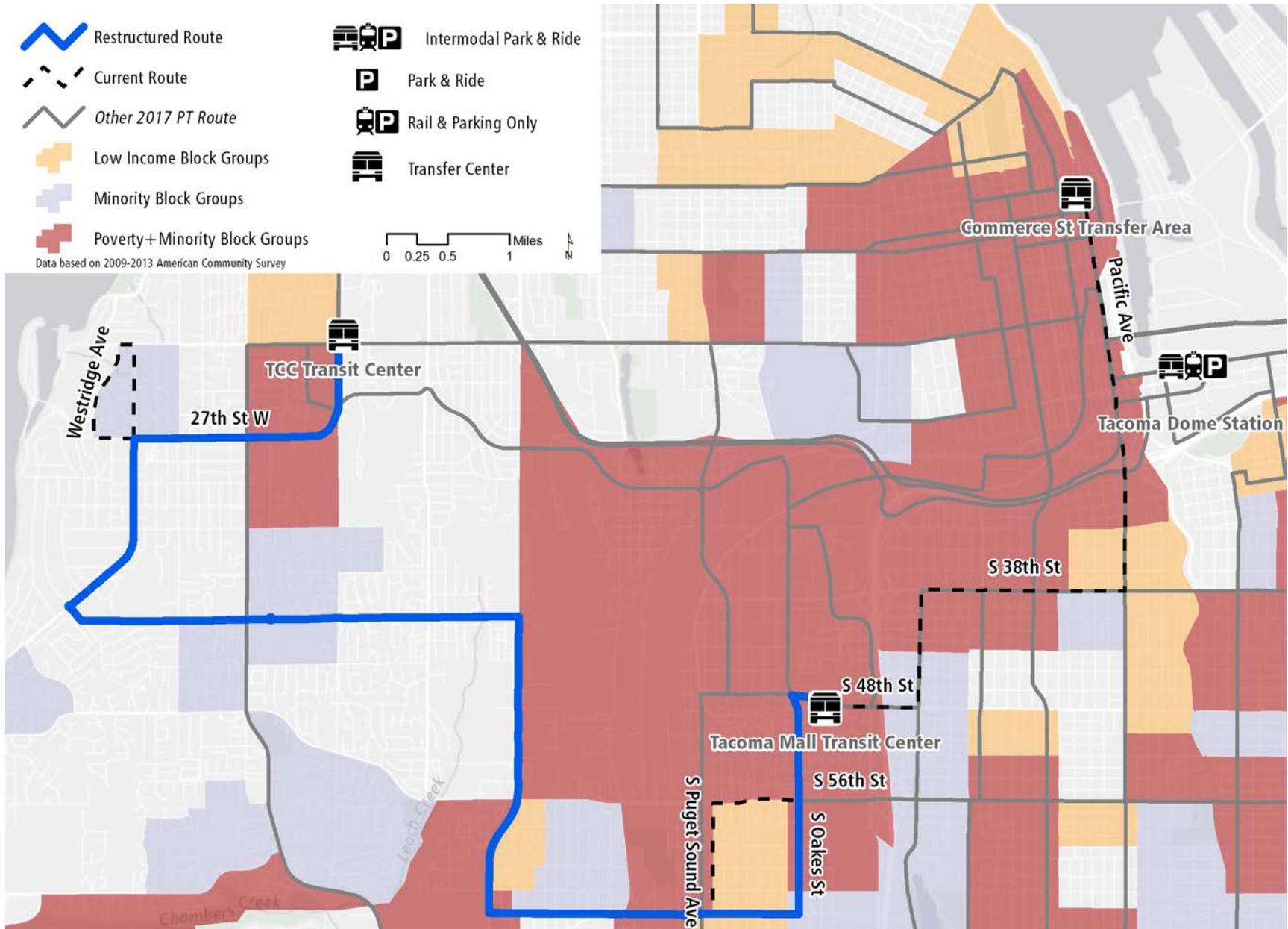


Figure 5-11 Restructured Route 54

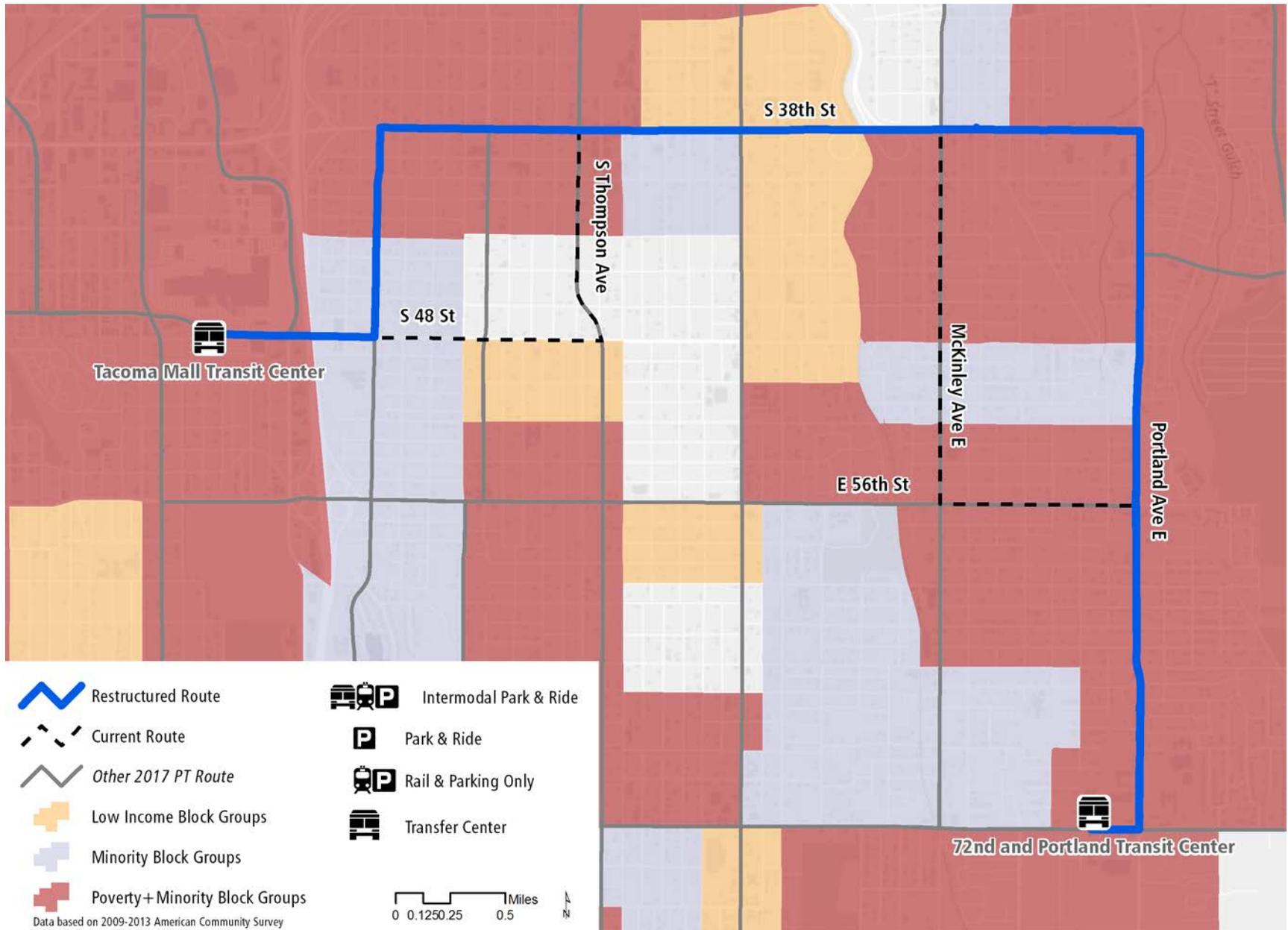


Figure 5-12 Restructured Route 56

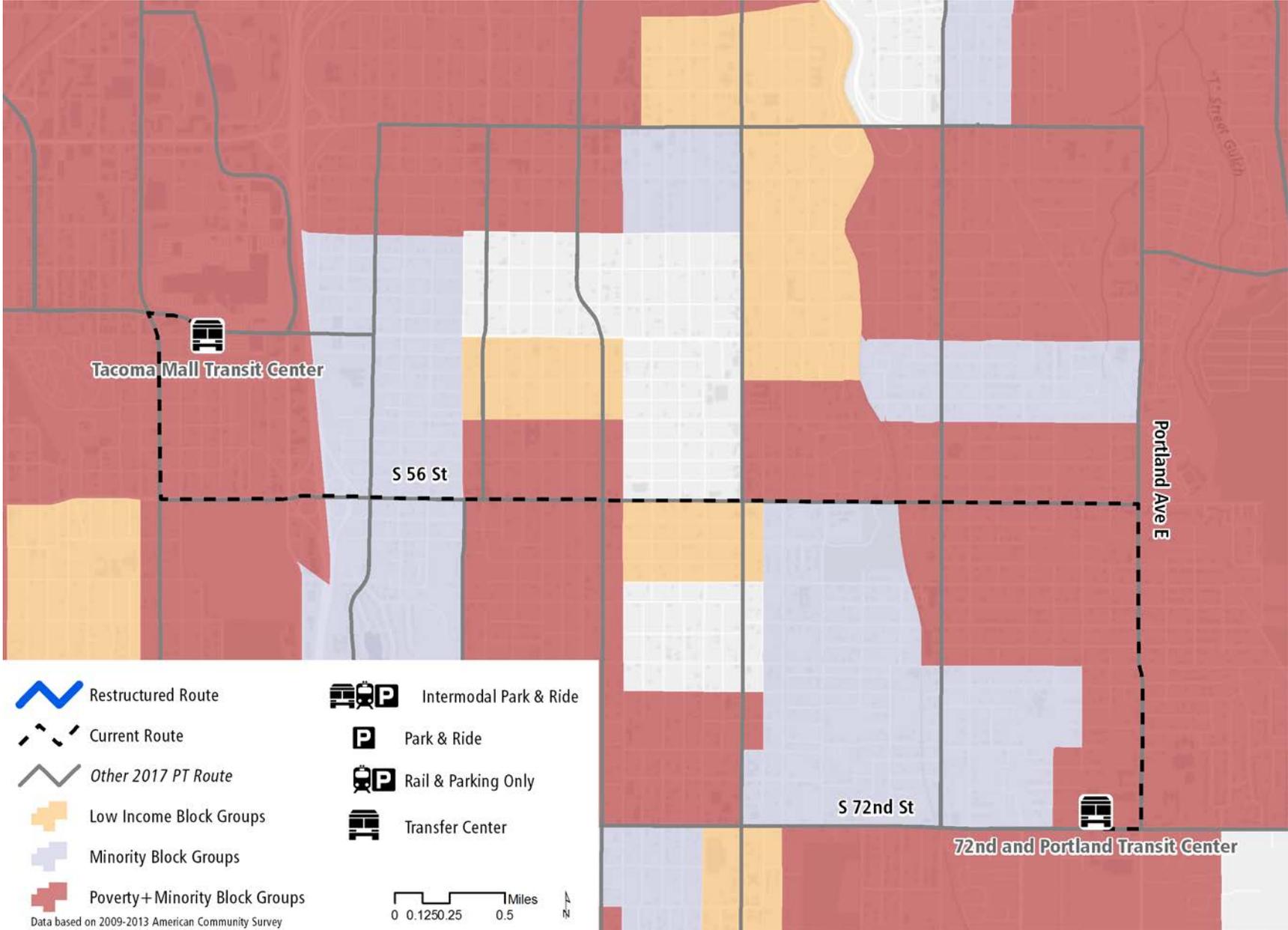


Figure 5-13 Restructured Route 206

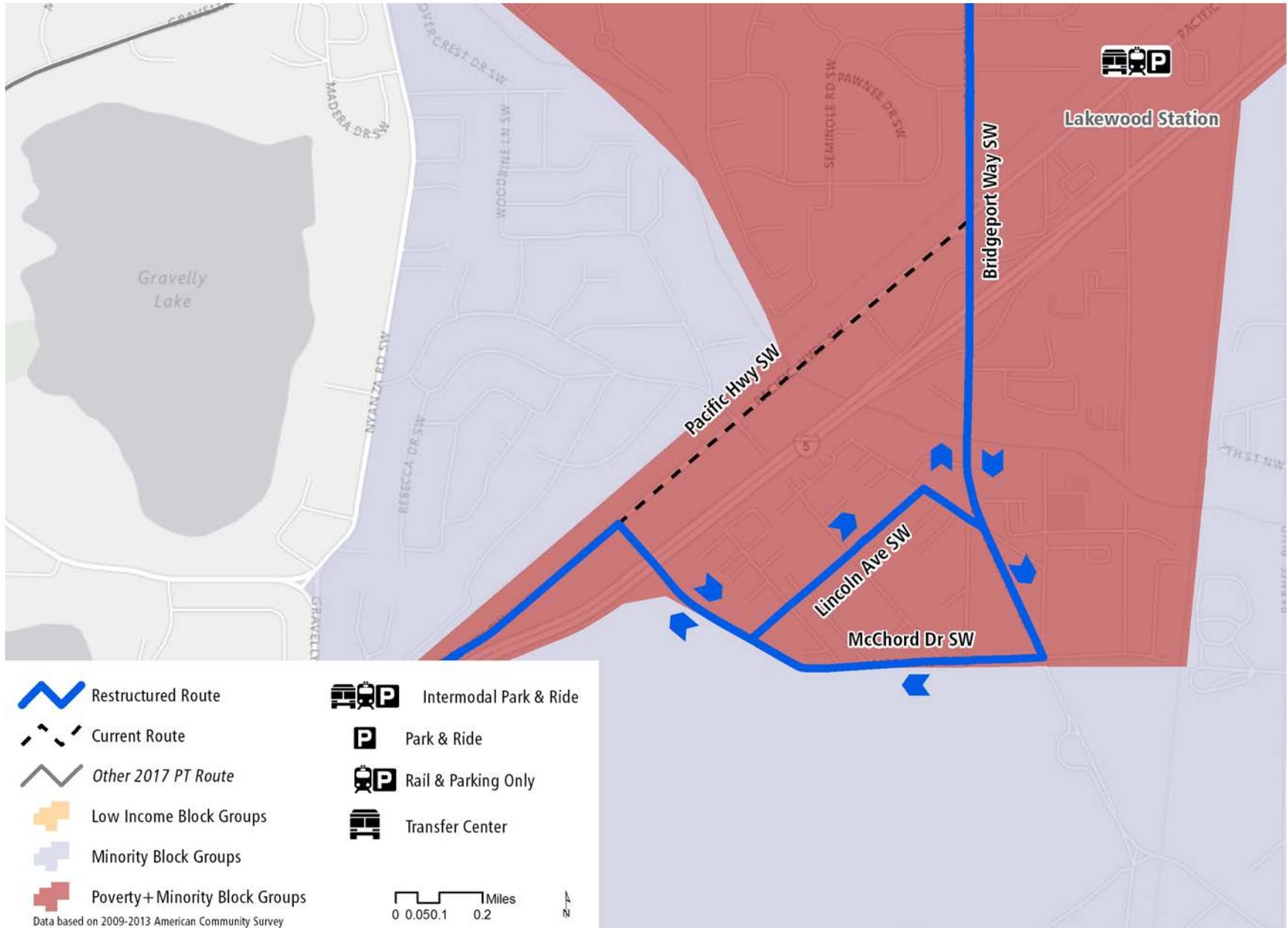
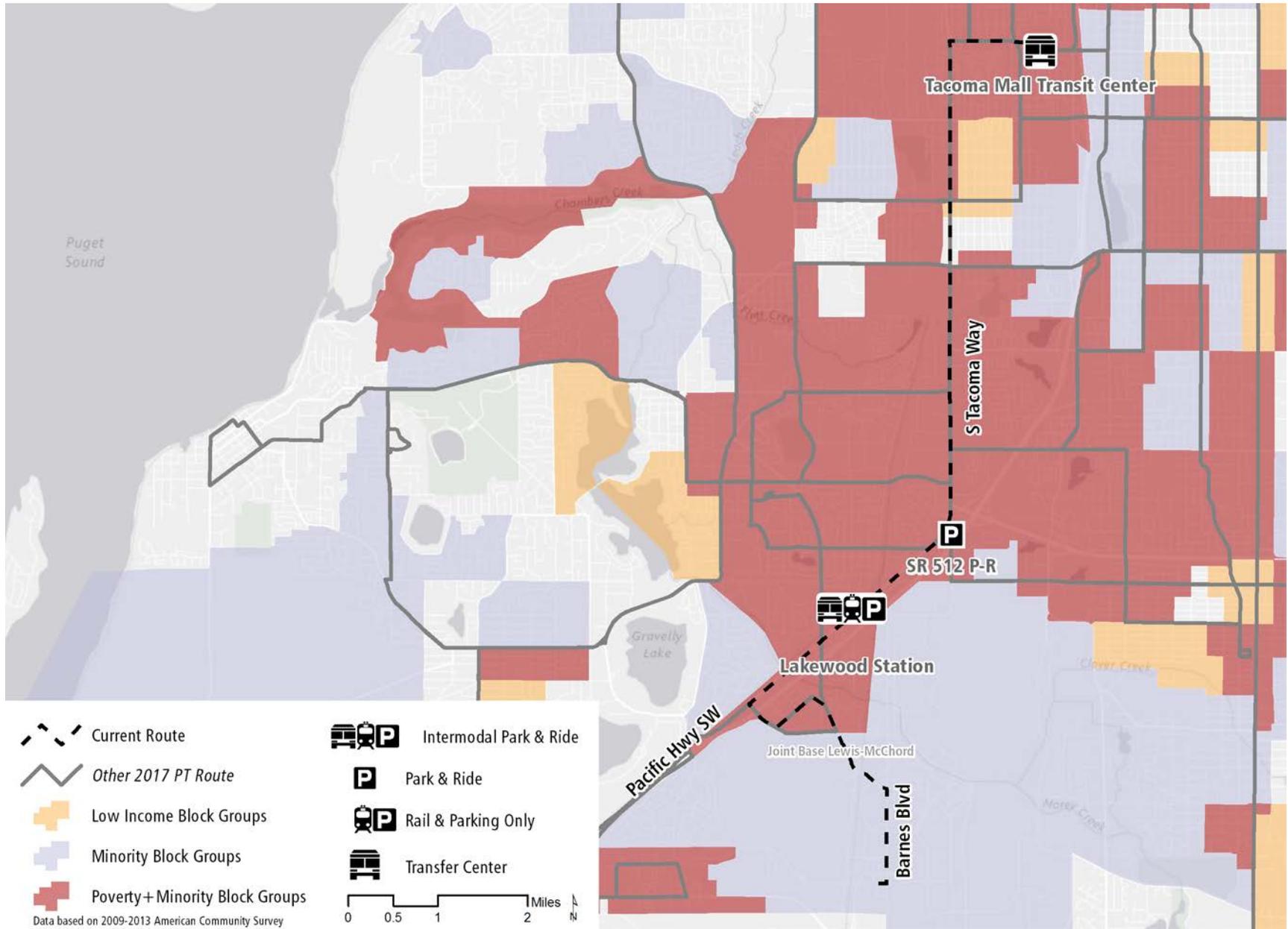


Figure 5-14 Eliminated Route 300



## 6 Appendix

### 6.1 Routes Experiencing a Change in Weekday Span

Route	Before				After				Difference						
	Population (within 1/4 mi)	Low Income	Minority	Trips (Annually)	Population (within 1/4 mi)	Low Income	Minority	Trips (Annually)	People-Trips (Population * Trips)	Low Income People-Trips	Minority People-Trips	Change Borne by Low Income	Change Borne by Minorities	Change in Annual Trips	Trip Count Change from Original
4 112th St	17,224	19.4%	39.4%	9,665	16,689	18.5%	38.2%	9,920	-915,080	-1,611,685	-2,406,465	176.1%	263.0%	255	3%
10 Pearl Street	14,689	16.9%	29.6%	7,220	14,564	17.0%	29.7%	8,750	21,380,420	3,723,956	6,481,600	17.4%	30.3%	1,530	21%
11 Pt. Defiance	23,638	18.3%	25.9%	3,940	23,743	18.1%	22.8%	7,765	91,230,675	16,331,088	17,798,155	17.9%	19.5%	3,825	97%
13 N. 30th Street	11,159	19.5%	27.5%	3,790	0			0	-42,292,610	-8,227,134	-11,623,930	19.5%	27.5%	-3,790	-100%
14 N. Proctor District	16,944	23.1%	23.7%	3,790	0			0	-64,217,760	-14,805,503	-15,228,220	23.1%	23.7%	-3,790	-100%
16 UPS / TCC	22,263	17.6%	25.4%	4,980	22,313	17.3%	25.9%	9,315	96,975,855	16,545,108	25,708,500	17.1%	26.5%	4,335	87%
28 S 12th St	17,055	21.4%	41.3%	6,710	17,055	21.4%	41.3%	8,240	26,094,150	5,590,987	10,789,560	21.4%	41.3%	1,530	23%
41 Portland Ave	12,011	33.7%	60.9%	7,385	18,007	27.0%	49.3%	9,170	76,422,955	14,787,946	27,395,340	19.4%	35.8%	1,785	24%
42 McKinley Ave	12,422	21.5%	53.4%	4,415	12,287	21.5%	53.1%	8,495	49,534,935	10,681,019	26,128,525	21.6%	52.7%	4,080	92%
45 Yakima	25,668	25.7%	45.6%	4,560	25,668	25.7%	45.6%	8,640	104,725,440	26,955,969	47,793,120	25.7%	45.6%	4,080	89%
48 Sheridan M St	24,169	25.3%	53.6%	7,640	26,874	26.5%	54.3%	9,425	68,636,290	20,390,716	38,413,310	29.7%	56.0%	1,785	23%
51 Union Ave	26,923	22.3%	43.3%	4,615	0			0	-124,249,645	-27,747,704	-53,838,590	22.3%	43.3%	-4,615	-100%
52 TCC Tac Mall	9,800	21.4%	42.6%	8,680	28,807	24.1%	51.6%	9,190	179,672,330	45,478,895	100,287,640	25.3%	55.8%	510	6%
53 University Place	31,410	18.3%	37.6%	4,670	21,601	15.2%	36.1%	8,750	42,324,050	1,941,770	13,069,870	4.6%	30.9%	4,080	87%
54 38th St	16,300	22.4%	48.3%	8,240	15,699	25.8%	56.0%	8,040	-8,092,040	2,507,555	5,772,960	-31.0%	-71.3%	-200	-2%
55 Parkland Tac Mall	19,486	25.5%	55.8%	8,790	0			0	-171,281,940	-43,729,800	-95,600,040	25.5%	55.8%	-8,790	-100%
56 56th St	13,981	22.2%	51.9%	4,215	0			0	-58,929,915	-13,096,009	-30,571,395	22.2%	51.9%	-4,215	-100%
57 Tacoma Mall	15,454	28.6%	47.2%	7,985	15,382	28.6%	47.2%	8,495	7,269,900	1,960,630	3,463,560	27.0%	47.6%	510	6%
202 72nd Street	12,848	20.0%	53.2%	9,465	12,985	20.2%	53.2%	9,720	4,607,880	1,144,493	2,424,600	24.8%	52.6%	255	3%
206 Pacific Hwy / Tillicum / Ft. Lewis	10,383	33.7%	57.7%	7,770	11,471	35.0%	60.0%	9,830	32,084,020	12,258,964	21,111,880	38.2%	65.8%	2,060	27%
212 Steilacoom	8,643	15.7%	37.6%	8,535	8,643	15.7%	37.6%	8,790	2,203,965	346,895	827,985	15.7%	37.6%	255	3%
214 Washington	9,649	13.0%	40.2%	8,040	9,649	13.0%	40.2%	8,550	4,920,990	640,590	1,980,330	13.0%	40.2%	510	6%
300 S Tacoma Way	14,900	28.9%	57.9%	8,150	0			0	-121,435,000	-35,142,703	-70,293,750	28.9%	57.9%	-8,150	-100%
500 Federal Way	4,113	27.1%	36.6%	8,245	4,113	27.1%	36.6%	10,030	7,341,705	1,990,571	2,684,640	27.1%	36.6%	1,785	22%
<b>Total</b>									<b>224,011,570</b>	<b>38,916,614</b>	<b>72,569,185</b>				

## 6.2 Routes Experiencing a Change in Weekday Frequency

Route	Before				After				Difference						
	Population (within 1/4 mi)	Low Income	Minority	Trips (Annually)	Population (within 1/4 mi)	Low Income	Minority	Trips (Annually)	People-Trips (Population * Trips)	Low Income People-Trips	Minority People-Trips	Change Borne by Low Income	Change Borne by Minorities	Change in Annual Trips	Trip Count Change from Original
10 Pearl Street	14,689	16.9%	29.6%	7,220	14,564	17.0%	29.7%	8,750	21,380,420	3,723,956	6,481,600	17.4%	30.3%	1,530	21%
11 Pt. Defiance	23,638	18.3%	25.9%	3,940	23,743	18.1%	22.8%	7,765	91,230,675	16,331,088	17,798,155	17.9%	19.5%	3,825	97%
13 N. 30th Street	11,159	19.5%	27.5%	3,790	0			0	-42,292,610	-8,227,134	-11,623,930	19.5%	27.5%	-3,790	-100%
14 N. Proctor District	16,944	23.1%	23.7%	3,790	0			0	-64,217,760	-14,805,503	-15,228,220	23.1%	23.7%	-3,790	-100%
16 UPS / TCC	22,263	17.6%	25.4%	4,980	22,313	17.3%	25.9%	9,315	96,975,855	16,545,108	25,708,500	17.1%	26.5%	4,335	87%
28 S 12th St	17,055	21.4%	41.3%	6,710	17,055	21.4%	41.3%	8,240	26,094,150	5,590,987	10,789,560	21.4%	41.3%	1,530	23%
41 Portland Ave	12,011	33.7%	60.9%	7,385	18,007	27.0%	49.3%	9,170	76,422,955	14,787,946	27,395,340	19.4%	35.8%	1,785	24%
42 McKinley Ave	12,422	21.5%	53.4%	4,415	12,287	21.5%	53.1%	8,495	49,534,935	10,681,019	26,128,525	21.6%	52.7%	4,080	92%
45 Yakima	25,668	25.7%	45.6%	4,560	25,668	25.7%	45.6%	8,640	104,725,440	26,955,969	47,793,120	25.7%	45.6%	4,080	89%
48 Sheridan M St	24,169	25.3%	53.6%	7,640	26,874	26.5%	54.3%	9,425	68,636,290	20,390,716	38,413,310	29.7%	56.0%	1,785	23%
51 Union Ave	26,923	22.3%	43.3%	4,615	0			0	-124,249,645	-27,747,704	-53,838,590	22.3%	43.3%	-4,615	-100%
53 University Place	31,410	18.3%	37.6%	4,670	21,601	15.2%	36.1%	8,750	42,324,050	1,941,770	13,069,870	4.6%	30.9%	4,080	87%
54 38th St	16,300	22.4%	48.3%	8,240	15,699	25.8%	56.0%	8,040	-8,092,040	2,507,555	5,772,960	-31.0%	-71.3%	-200	-2%
56 56th St	13,981	22.2%	51.9%	4,215	0			0	-58,929,915	-13,096,009	-30,571,395	22.2%	51.9%	-4,215	-100%
206 Pacific Hwy / Tillicum / Ft. Lewis	10,383	33.7%	57.7%	7,770	11,471	35.0%	60.0%	9,830	32,084,020	12,258,964	21,111,880	38.2%	65.8%	2,060	27%
300 S Tacoma Way	14,900	28.9%	57.9%	8,150	0			0	-121,435,000	-35,142,703	-70,293,750	28.9%	57.9%	-8,150	-100%
400 Puyallup / Downtown Tacoma	9,236	17.8%	23.8%	6,375	9,236	17.8%	23.8%	7,140	7,065,540	1,256,339	1,678,410	17.8%	23.8%	765	12%
402 Meridian / Federal Way	15,317	12.0%	24.9%	7,075	15,317	12.0%	24.9%	8,860	27,340,845	3,270,158	6,815,130	12.0%	24.9%	1,785	25%
500 Federal Way	4,113	27.1%	36.6%	8,245	4,113	27.1%	36.6%	10,030	7,341,705	1,990,571	2,684,640	27.1%	36.6%	1,785	22%
<b>Total</b>									<b>231,939,910</b>	<b>39,213,094</b>	<b>70,085,115</b>				

### 6.3 Routes Experiencing Elimination or Change in Alignment

Route	Before				After				Difference					Existing Route Miles Changed %	Existing Route Miles Changed >20%	Adverse Effects	Disproportionate Burden	Disparate Impact
	Population (within 1/4 mi)	Low Income	Minority	Trips (Annually)	Population (within 1/4 mi)	Low Income	Minority	Trips (Annually)	People-Trips (Population * Trips)	Low Income People-Trips	Minority People-Trips	Change Borne by Low Income	Change Borne by Minorities					
3 Lakewood / Tacoma	17,961	27.9%	49.1%	10,780	17,279	28.1%	50.7%	10,780	-7,351,960	-1,818,825	-549,780	24.7%	7.5%	64%	Yes	Yes	Yes	Yes
4 112th St	17,224	19.4%	39.4%	9,665	16,689	18.5%	38.2%	9,920	-915,080	-1,611,685	-2,406,465	176.1%	263.0%	15%	No	Yes	No	No
10 Pearl Street	14,689	16.9%	29.6%	7,220	14,564	17.0%	29.7%	8,750	21,380,420	3,723,956	6,481,600	17.4%	30.3%	10%	No	Yes	No	No
11 Pt. Defiance	23,638	18.3%	25.9%	3,940	23,743	18.1%	22.8%	7,765	91,230,675	16,331,088	17,798,155	17.9%	19.5%	43%	Yes	Yes	No	Yes
13 N. 30th Street	11,159	19.5%	27.5%	3,790	0			0	-42,292,610	-8,227,134	-11,623,930	19.5%	27.5%	100%	Yes	Yes	Yes	No
14 N. Proctor District	16,944	23.1%	23.7%	3,790	0			0	-64,217,760	-14,805,503	-15,228,220	23.1%	23.7%	100%	Yes	Yes	Yes	Yes
16 UPS / TCC	22,263	17.6%	25.4%	4,980	22,313	17.3%	25.9%	9,315	96,975,855	16,545,108	25,708,500	17.1%	26.5%	24%	Yes	Yes	No	No
41 Portland Ave	12,011	33.7%	60.9%	7,385	18,007	27.0%	49.3%	9,170	76,422,955	14,787,946	27,395,340	19.4%	35.8%	17%	Yes	Yes	Yes	No
48 Sheridan M St	24,169	25.3%	53.6%	7,640	26,874	26.5%	54.3%	9,425	68,636,290	20,390,716	38,413,310	29.7%	56.0%	42%	Yes	Yes	Yes	Yes
51 Union Ave	26,923	22.3%	43.3%	4,615	0			0	-124,249,645	-27,747,704	-53,838,590	22.3%	43.3%	100%	Yes	Yes	Yes	No
52 TCC Tac Mall	9,800	21.4%	42.6%	8,680	28,807	24.1%	51.6%	9,190	179,672,330	45,478,895	100,287,640	25.3%	55.8%	0%	Yes	No	No	No
53 University Place	31,410	18.3%	37.6%	4,670	21,601	15.2%	36.1%	8,750	42,324,050	1,941,770	13,069,870	4.6%	30.9%	36%	Yes	Yes	Yes	No
54 38th St	16,300	22.4%	48.3%	8,240	15,699	25.8%	56.0%	8,040	-8,092,040	2,507,555	5,772,960	-31.0%	-71.3%	47%	Yes	Yes	Yes	Yes
55 Parkland Tac Mall	19,486	25.5%	55.8%	8,790	0			0	-171,281,940	-43,729,800	-95,600,040	25.5%	55.8%	100%	Yes	No	No	No
56 56th St	13,981	22.2%	51.9%	4,215	0			0	-58,929,915	-13,096,009	-30,571,395	22.2%	51.9%	100%	Yes	Yes	Yes	Yes
206 Pacific Hwy / Tillicum / Ft. Lewis	10,383	33.7%	57.7%	7,770	11,471	35.0%	60.0%	9,830	32,084,020	12,258,964	21,111,880	38.2%	65.8%	8%	No	Yes	No	No
300 S Tacoma Way	14,900	28.9%	57.9%	8,150	0			0	-121,435,000	-35,142,703	-70,293,750	28.9%	57.9%	100%	Yes	Yes	Yes	Yes