2024 AC Transit Realign Update Title VI Service Equity Analysis

September 2024

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Introduction

AC Transit is California's most extensive public bus-only transit system, serving 13 cities and 8 unincorporated communities. As part of its mission to deliver safe, reliable, and sustainable transit service that responds to the needs of its customers and community, AC Transit serves 39.2 million riders annually.

AC Transit's Realign Project kicked-off in January 2023 with a comprehensive review of the systems' routes and schedules. Based on that review the project recommendations prioritize where and when transit service is offered and aligns service with customer needs and equity goals. The goal is to create a more attractive network for riders and better meet their needs.

Initially, two near-term scenarios were developed: one focused on maximum coverage and the other on frequency. Both scenarios were cost-neutral to assure that AC Transit had the resources, vehicle operators, and revenue to support the final recommendations. The guiding principles for this project are to provide a network that prioritizes services for communities who need it the most, reliable and predictable bus service, and frequent service to the most people. These principles led the development of the initial recommended plan that combined the best elements for both scenarios in a cost-neutral manner.

Through engaging with the community, the feedback received emphasized reliability above all. This feedback also resulted in revisions to the recommended plan leading to the current plan (Proposed Final Plan, or PF Plan) that is subject to this Title VI analysis. As a result, the current plan included:

1. Broadening the frequent network, adding back some frequent lines into the proposal, including lines 1T, 6, 10, 18, 20/21, 40, 51A/B, 52, 57, 72/72M, 97, and NL to operate every 15 minutes or less on weekdays.
    a. Focus frequency improvements on lines that serve Equity Priority Communities.
2. Improve reliability in a customer-focused, operator-supportive way (focusing extra buffer time in schedules that have the worst reliability)
    a. Identify the lines below the key performance indicators for "on-time" performance and add reliable resources to them.
3. Tune frequency for efficiency (Minor changes (e.g., 15 -> 17 min.) where savings are possible.
    a. Reduce frequency on low ridership lines.

Before implementing the recommendations, the Federal Transit Administration (FTA) regulations and the District's Title VI policies require the Board of Directors to review and adopt the service equity analysis.

This report analyzes the effects of the recommended service changes. **The analysis finds no disparate impact of the proposals on people of color and no disproportionate burden on low-income populations.**

This report contains a statistical analysis of the process and the final findings. The report also describes how the public, particularly communities protected by Title VI, was engaged in the

planning process; it explains how comments were solicited and obtained and provides details about comments received through different means.

In compliance with FTA requirements, the AC Transit Board of Directors will review and adopt this service equity analysis in October 2024 before approving the plan's implementation.

Title VI Background

Title VI of the Civil Rights Act of 1964 states:

> "No persons in the United States shall, on the grounds 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 issued a circular in 2012 (Title VI Circular 4702.1B) to help transit agencies meet the mandate of Title VI. The FTA issued an Environmental Justice circular in 2012 to help FTA funding recipients avoid, minimize, and mitigate disproportionately high and adverse health and environmental effects – including social and economic impact – on people of color and low-income populations. These two circulars guide AC Transit's compliance with federal requirements because it is a designated recipient of FTA funding.

Commitment to Title VI compliance is essential to AC Transit's strategic plan and the District's operation. AC Transit aims to ensure that all transit services are equitably distributed and provided regardless of race, color, national origin, or low-income status. AC Transit's goal is to ensure equal opportunities for all persons to participate in transit planning and decision-making processes related to providing that service without regard to race, color, national origin, or low-income status. Several board policies guide the implementation of these goals.

Service Equity Analysis

Service Equity Analysis Board Policy 518 (Title VI and Environmental Justice Service Review and Compliance Report Policy) requires the team to conduct a Title VI service equity analysis whenever a major service change occurs. Per Board Policy 518, a major service change is defined as:

a. A new transit route; or
b. Any aggregate change of ten (10) percent or more of the number of transit revenue miles or hours system-wide; or
c. Any aggregate change of twenty (20) percent or more of the number of transit revenue miles or hours in one of the four planning areas of the District (West Contra Costa County, North Alameda County, Central Alameda County, South Alameda County); or
d. Any aggregate change of twenty-five (25) percent or more of the number of transit revenue vehicle miles or hours of a route computed on a daily basis for the day of the week for which the change is proposed.

Under these policies, the Realign Project constitutes a major service change. Line 27, 239 and 299 are new routes, which satisfies criteria A. At the system-wide level, the aggregate annual

change is 1.0% for revenue hours and 0.1% for revenue miles, as seen in Figure 1. Although this does not meet criteria B, several of the individual route changes meet the threshold for criteria D. Appendix A: Service Change at Route Level – Comparison of Performance Metrics includes tables for more individual route details.

Figure 1: Comparison of Performance Metrics (Annualized)

	Revenue Hours				Revenue Miles			
	Current Service	**Proposed Final Plan**	**Difference**	**% Difference**	**Current Service**	**Proposed Final Plan**	**Difference**	**% Difference**
System-wide	1,357,551	1,370,483	12,932	1.0%	18,233,790	18,251,670	17,881	0.1%

For such major service changes, the Board policies require the team to assess the quantity and quality of service provided and the populations affected. Board Policy 518 states that for a major service equity analysis, “the Title VI service equity analysis will assess the quantity and quality of service provided and populations affected; the analysis will measure service in terms of current AC Transit standards for frequency, span of service, and/or distance to bus routes.” The service equity analysis aims to identify if, in implementing proposed changes, people of color or low-income populations or riders would experience any more major adverse effect than non-people of color or non-low-income populations or riders.

If the District finds that the service proposals have disparate impacts on people of color, the District must identify alternatives to the proposal to serve the same legitimate objective with less disparate impact. If a less discriminatory alternative does not exist and AC Transit has a substantial legitimate justification that cannot otherwise be accomplished, AC Transit must identify measures to mitigate the negative impacts of the changes. Additionally, if the District finds that the service proposals impose disproportionate burdens on low-income communities, the District must identify alternatives available to affected low-income riders and take steps to avoid, minimize, or mitigate impacts where practicable.

Public Engagement

In addition to the requirement to conduct a service equity analysis, the District’s Title VI program contains requirements to ensure equal opportunities for all persons to participate in planning decision-making and to provide input about major service changes, regardless of race, color, national origin, or low-income status. The program guides how best to reach people protected by civil rights legislation and regulations.

Outreach to the community recognizes the importance of the diversity inherent within the AC Transit service area from a racial and economic perspective. The Public Participation Plan (PPP) in the program was created to identify ways of communicating with and engaging communities that may have been traditionally underserved and determine the most effective

strategies to encourage the participation of these communities in decision-making processes. The Language Assistance Plan (LAP) contains recommendations for communicating with people who speak less than proficient English.

The team followed the PPP and LAP recommendations to conduct outreach activities and solicit feedback and opinions in multiple ways. The team received over thousands of comments regarding the changes, ranging from specific service lines to issues with service areas. See Appendix B: Public Engagement for more details.

List of Print Promotion Materials

- At stop signage
- Ad cards on all buses
- Rail hangers on all buses
- Postcards
- Posters
- Printed Surveys in English/Spanish/Chinese/Vietnamese
- Exhibit Boards

List of Digital Promotion Materials

- Website project page (actransit.org/realign)
- Website carousel for Phase 1 (actransit.org)
- AC Transit eNews
- Social media images and promotions

List of Physical Engagement Activities

- Bus stop outreach
- Community Events
- Pop Up Events
- City council meetings
- Workshops
- Lived Experience Advisory Meetings

To ensure the diverse populations within AC Transit's service area were reached, targeted outreach was conducted to various CBO's and advertisements were placed on relevant media platforms with a focus on Chinese, South Asian and Vietnamese communities.

Service Equity Analysis

For this study, there were several methods to determine if there were any adverse effects on the protected population.

Methods

The team conducted two separate analyses, which will be described further in this document:

- The service intensity analysis asks how the recommended service changes affected the amount of service available to protected populations compared to non-protected populations.
- The service quality analysis, which asks how the recommended service changes affected the amount of time for protected populations to complete transit trips as compared to non-protected populations.

Data Sources

A variety of data sources were used for these analyses.

For the service intensity analysis, the team combined HASTUS schedule outputs with the most up to date data available from the American Community Survey 5-year dataset (2018-2022) using ArcGIS Pro spatial analysis tools and in-built spatial queries to count the number of people who lived within 1/4 mile of bus stops before and after the changes and to count the number of trips available to those people in the existing and proposed service. The process aligned with past AC Transit methodology using different software tools. This analysis was conducted at the system-wide and planning area levels.

For the service quality analysis, the team used the Rapid Realistic Routing on Real-world and Reimagined networks (R^5) routing engine and r5py python library to access the interface of R^5, which are open-source and primarily developed by Conveyal and the Brazilian Institute for Applied Economic Research. These software packages were used to calculate the number of jobs accessible from areas across the District; the pedestrian networks were derived from OpenStreetMap exports, and the transit networks were derived from static AC Transit GTFS feeds. In this case, average job accessibility was calculated by the Census Block Group for people of color, non-people of color, low-income and non-low-income communities, within 30, 60, and 90 minutes using the schedules for each service change. The analysis also calculated the average travel time from an expansive grid to all Census Block Groups within walking distance of the AC Transit bus network.

Summary of Findings

The Disparate Impact policy in Board Policy 518 states:

> "When the proportion of people of color populations or riders adversely affected by the proposals is 15% (or more) than the proportions of non-people of color populations or riders adversely affected, such changes will be considered to have a disparate impact."

The Disproportionate Burden policy states:

> "When the proportion of low-income populations or riders adversely affected by the proposals is 15% (or more) than the proportion of non-low-income populations or riders adversely affected, such changes will be considered to have a disproportionate burden."

The analyses described in this report found **no disparate impact** of the service changes on people of color populations and **no disproportionate burden** of the service changes on low-income populations.

From the outset, the plans aimed to minimize impacts on the entire District, with special care to prioritize protected populations' access to service. The analysis found some differences between the effects of the changes on populations protected and those not protected by Title VI.

Due to the reduction in the span of service in terms of trips, there is a small average decrease in the number of people serviced for the protected populations. See Appendix C: Service Equity Analysis's Service Intensity Analysis for more information.

In terms of job accessibility, which accounts for travel times based on scheduling, headways, and service availability, people who are low-income have access to more jobs within 60-minute and 90-minute. Moreover, none of the differences between impacts on different communities met the thresholds contained in AC Transit policies for finding discriminatory effects. Appendix C: Service Equity Analysis' second part, the Service Quality Analysis, focuses on job accessibility.

Appendix A: Service Change at Route Level – Comparison of Performance Metrics

Table 1: Comparison of Performance Metrics (Weekday Revenue Miles)

Line	Revenue Miles (Weekday)			
	Current Service	Proposed Final Plan	Difference	% Difference
1T	2,101.60	2,101.60	-	0%
6	994.90	994.90	-	0%
7	888.80	420.60	(468.20)	-53%
10	953.40	2,380.80	1,427.40	150%
12	1,003.10	1,168.20	165.10	16%
14	1,312.60	1,243.60	(69.00)	-5%
18	1,347.40	1,966.90	619.50	46%
19	256.00	373.49	117.49	46%
20	631.80	806.06	174.26	28%
21	631.20	700.60	69.40	11%
27	-	661.40	661.40	
28	461.60	678.80	217.20	47%
29	623.70	827.50	203.80	33%
33	973.80	-	(973.80)	
34	441.80	649.70	207.90	47%
35	429.20	637.60	208.40	49%
36	620.30	828.80	208.50	34%
39	252.50	-	(252.50)	
40	1,853.50	1,862.60	9.10	0%
41	330.10	330.10	-	0%
45	786.40	786.40	-	0%
46L	173.80	173.80	-	0%
51A	1,587.40	1,587.40	-	0%
51B	909.90	911.30	1.40	0%
52	547.60	583.30	35.70	7%
54	507.80	481.60	(26.20)	-5%
56	367.00	539.80	172.80	47%
57	2,040.30	2,040.30	-	0%
60	553.90	512.90	(41.00)	-7%
62	843.90	814.30	(29.60)	-4%
65	201.50	211.80	10.30	5%
67	162.80	95.00	(67.80)	-42%
70	260.90	660.20	399.30	153%
71	811.30	811.30	-	0%
72	1,249.60	1,249.60	-	0%
72M	1,084.30	1,084.30	-	0%
72R	1,816.70	743.20	(1,073.50)	-59%
73	814.00	633.10	(180.90)	-22%
74	814.50	789.70	(24.80)	-3%
76	826.30	910.90	84.60	10%
79	458.90	-	(458.90)	
86	815.70	970.00	154.30	19%

Line	Revenue Miles (Weekday)			
	Current Service	Proposed Final Plan	Difference	% Difference
88	739.20	1,018.00	278.80	38%
90	405.20	405.20	-	0%
93	618.40	618.40	-	0%
95	153.30	153.10	(0.20)	0%
96	639.40	680.70	41.30	6%
97	1,591.70	1,591.70	-	0%
98	757.10	757.10	-	0%
99	1,629.30	-	(1,629.30)	
200	1,200.50	1,118.60	(81.90)	-7%
210	803.60	803.60	-	0%
212	368.60	588.50	219.90	60%
215	314.50	-	(314.50)	
216	312.60	360.60	48.00	15%
217	1,039.60	588.90	(450.70)	-43%
232	407.20	281.60	(125.60)	-31%
239	792.80	889.10	96.30	12%
251	183.00	204.20	21.20	12%
299	-	475.10	475.10	
376	239.30	-	(239.30)	
800	660.90	661.10	0.20	0%
801	558.20	300.60	(257.60)	-46%
802	60.70	60.70	-	0%
805	147.70	147.70	-	0%
840	78.90	78.90	-	0%
851	118.60	117.90	(0.70)	-1%
E	104.60	104.60	-	0%
F	1,188.20	1,173.80	(14.40)	-1%
FS	53.70	53.70	-	0%
G	117.80	117.80	-	0%
J	117.50	117.50	-	0%
L	152.50	161.50	9.00	6%
LA	114.50	-	(114.50)	
NL	1,799.90	1,799.90	-	0%
NX	131.90	117.30	(14.60)	-11%
NX3	131.00	131.00	-	0%
O	1,148.40	1,148.40	-	0%
OX	148.50	-	(148.50)	
P	154.20	154.20	-	0%
U	233.10	233.10	-	0%
V	164.30	164.30	-	0%
W	153.20	171.40	18.20	12%
System	**53,475.00**	**52,773.00**	**(702.00)**	**-1.3%**

Table 2: Comparison of Performance Metrics (Weekday Revenue Hours)

Line	Revenue Hours (Weekday)			
	Current Service	Proposed Final Plan	Difference	% Difference
1T	193.35	190.22	(3.13)	-2%
6	99.93	99.93	-	0%
7	71.13	34.86	(36.27)	-51%
10	72.03	172.90	100.87	140%
12	93.12	107.70	14.58	16%
14	109.72	100.08	(9.64)	-9%
18	122.13	163.43	41.30	34%
19	18.62	27.77	9.15	49%
20	60.27	81.27	21.00	35%
21	47.27	59.27	12.00	25%
27	-	71.25	71.25	
28	33.92	50.25	16.33	48%
29	54.20	74.27	20.07	37%
33	75.17	-	(75.17)	
34	31.15	46.13	14.98	48%
35	28.62	43.08	14.46	51%
36	56.28	79.87	23.59	42%
39	18.38	-	(18.38)	
40	155.50	152.92	(2.58)	-2%
41	22.97	22.97	-	0%
45	60.85	60.85	-	0%
46L	10.02	10.02	-	0%
51A	144.93	144.83	(0.10)	0%
51B	92.47	94.70	2.23	2%
52	60.82	68.55	7.73	13%
54	32.15	30.67	(1.48)	-5%
56	26.73	39.63	12.90	48%
57	167.78	164.62	(3.16)	-2%
60	41.08	37.88	(3.20)	-8%
62	72.27	68.77	(3.50)	-5%
65	16.35	17.05	0.70	4%
67	13.18	7.62	(5.56)	-42%
70	16.92	47.43	30.51	180%
71	57.62	57.62	-	0%
72	107.58	107.25	(0.33)	0%
72M	99.15	99.15	-	0%
72R	151.85	61.98	(89.87)	-59%
73	52.62	41.23	(11.39)	-22%
74	53.85	56.55	2.70	5%
76	65.00	65.07	0.07	0%
79	44.25	-	(44.25)	
86	53.85	57.35	3.50	6%
88	61.07	87.47	26.40	43%
90	30.37	30.37	-	0%
93	47.97	47.97	-	0%
95	10.13	10.13	-	0%

Line	Revenue Hours (Weekday)			
	Current Service	Proposed Final Plan	Difference	% Difference
96	48.48	51.63	3.15	6%
97	115.73	115.73	-	0%
98	51.70	51.80	0.10	0%
99	116.30	-	(116.30)	
200	77.30	69.35	(7.95)	-10%
210	51.28	51.38	0.10	0%
212	26.12	39.77	13.65	52%
215	20.35	-	(20.35)	
216	20.38	21.90	1.52	7%
217	59.35	37.45	(21.90)	-37%
232	22.95	16.73	(6.22)	-27%
239	46.38	60.03	13.65	29%
251	11.42	12.63	1.21	11%
299	-	33.23	33.23	
376	14.50	-	(14.50)	
800	31.75	31.75	-	0%
801	30.12	16.22	(13.90)	-46%
802	3.10	3.10	-	0%
805	9.10	9.10	-	0%
840	4.09	4.50	0.41	10%
851	7.50	7.50	-	0%
E	4.57	4.57	-	0%
F	65.84	64.95	(0.89)	-1%
FS	3.28	3.28	-	0%
G	7.73	7.73	-	0%
J	6.68	6.68	-	0%
L	8.52	8.17	(0.35)	-4%
LA	5.32	-	(5.32)	
NL	96.55	96.28	(0.27)	0%
NX	6.27	5.47	(0.80)	-13%
NX3	6.42	6.42	-	0%
O	53.20	51.95	(1.25)	-2%
OX	7.42	-	(7.42)	
P	8.25	8.25	-	0%
U	14.62	14.62	-	0%
V	8.42	8.42	-	0%
W	8.15	8.44	0.29	4%
System	**4,034.00**	**4,022.00**	**(12.00)**	**-0.3%**

Table 3: Comparison of Performance Metrics (Saturday Revenue Miles)

Line	Revenue Miles (Saturday)			
	Current Service	Proposed Final Plan	Difference	% Difference
1T	2,092.20	2,092.20	-	0%

Line	Revenue Miles (Saturday)			
	Current Service	Proposed Final Plan	Difference	% Difference
6	868.40	868.40	-	0%
7	888.80	420.60	(468.20)	-53%
10	797.80	2,257.40	1,459.60	183%
12	771.40	815.50	44.10	6%
14	696.80	1,168.50	471.70	68%
18	1,037.10	1,481.90	444.80	43%
19	263.80	373.49	109.69	42%
20	631.80	796.23	164.43	26%
21	581.00	685.00	104.00	18%
27	-	627.40	627.40	
28	461.60	678.80	217.20	47%
29	556.40	825.90	269.50	48%
33	846.00	-	(846.00)	
34	441.80	441.80	-	0%
35	493.50	493.50	-	0%
36	620.30	786.30	166.00	27%
39	-	-	-	0%
40	1,224.60	1,224.60	-	0%
41	330.10	330.10	-	0%
45	485.40	485.40	-	0%
46L	-	-	-	0%
51A	1,242.70	1,242.70	-	0%
51B	731.60	696.00	(35.60)	-5%
52	306.20	475.30	169.10	55%
54	288.90	324.00	35.10	12%
56	367.00	367.00	-	0%
57	2,060.70	2,060.70	-	0%
60	553.90	512.90	(41.00)	-7%
62	540.50	807.00	266.50	49%
65	-	-	-	0%
67	-	-	-	0%
70	260.90	366.80	105.90	41%
71	412.50	412.50	-	0%
72	1,242.40	1,242.40	-	0%
72M	1,138.10	1,138.10	-	0%
72R	1,348.80	743.20	(605.60)	-45%
73	814.00	633.10	(180.90)	-22%
74	514.30	600.30	86.00	17%
76	680.90	752.20	71.30	10%
79	353.10	-	(353.10)	
86	687.60	982.80	295.20	43%
88	732.60	1,018.00	285.40	39%
90	260.80	260.80	-	0%
93	384.10	384.10	-	0%
95	144.30	144.00	(0.30)	0%
96	639.40	680.70	41.30	6%
97	917.50	917.50	-	0%
98	480.40	480.40	-	0%

Line	Revenue Miles (Saturday)			
	Current Service	Proposed Final Plan	Difference	% Difference
99	1,151.80	-	(1,151.80)	
200	1,213.90	1,133.90	(80.00)	-7%
210	605.00	722.50	117.50	19%
212	316.30	561.80	245.50	78%
215	-	-	-	0%
216	312.60	360.60	48.00	15%
217	1,006.10	552.10	(454.00)	-45%
232	407.20	253.60	(153.60)	-38%
239	-	438.50	438.50	
251	178.90	223.60	44.70	25%
299	-	426.30	426.30	
376	239.30	-	(239.30)	
800	660.90	661.10	0.20	0%
801	558.20	300.60	(257.60)	-46%
802	60.70	60.70	-	0%
805	147.70	147.70	-	0%
840	78.90	78.90	-	0%
851	118.60	117.90	(0.70)	-1%
E	-	-	-	0%
F	1,119.40	1,119.40	-	0%
FS	-	-	-	0%
G	-	-	-	0%
J	-	-	-	0%
L	-	-	-	0%
LA	-	-	-	0%
NL	1,194.50	1,194.50	-	0%
NX	-	-	-	0%
NX3	-	-	-	0%
O	1,131.50	1,131.50	-	0%
OX	-	-	-	0%
P	-	-	-	0%
U	-	-	-	0%
V	-	-	-	0%
W	-	-	-	0%
System	**41,694.00**	**43,581.00**	**1,887.00**	**4.5%**

Table 4: Comparison of Performance Metrics (Saturday Revenue Hours)

Line	Revenue Hours (Saturday)			
	Current Service	Proposed Final Plan	Difference	% Difference
1T	181.12	180.95	(0.17)	0%
6	73.17	73.17	-	0%
7	64.77	33.47	(31.30)	-48%
10	58.10	164.52	106.42	183%
12	70.33	73.62	3.29	5%
14	54.92	87.27	32.35	59%

Line	Revenue Hours (Saturday)			
	Current Service	Proposed Final Plan	Difference	% Difference
18	86.83	112.32	25.49	29%
19	18.88	27.77	8.89	47%
20	58.45	75.53	17.08	29%
21	42.87	51.20	8.33	19%
27	-	55.10	55.10	
28	29.92	44.87	14.95	50%
29	48.55	69.60	21.05	43%
33	61.07	-	(61.07)	
34	28.53	28.53	-	0%
35	32.08	32.08	-	0%
36	53.73	68.02	14.29	27%
39	-	-	-	0%
40	92.93	92.10	(0.83)	-1%
41	21.73	21.73	-	0%
45	34.93	34.93	-	0%
46L	-	-	-	0%
51A	105.27	105.00	(0.27)	0%
51B	74.23	70.55	(3.68)	-5%
52	31.92	48.02	16.10	50%
54	17.55	19.65	2.10	12%
56	23.12	23.12	-	0%
57	159.62	159.93	0.31	0%
60	40.00	36.90	(3.10)	-8%
62	43.73	65.02	21.29	49%
65	-	-	-	0%
67	-	-	-	0%
70	16.53	25.55	9.02	55%
71	26.93	26.93	-	0%
72	98.67	98.67	-	0%
72M	92.10	92.10	-	0%
72R	95.80	52.00	(43.80)	-46%
73	46.67	36.93	(9.74)	-21%
74	38.43	45.52	7.09	18%
76	53.83	53.83	-	0%
79	31.95	-	(31.95)	
86	42.13	55.60	13.47	32%
88	59.22	79.13	19.91	34%
90	16.83	16.83	-	0%
93	24.93	24.93	-	0%
95	9.67	9.67	-	0%
96	46.78	49.80	3.02	6%
97	61.95	61.95	-	0%
98	30.15	30.15	-	0%
99	80.92	-	(80.92)	
200	67.63	61.90	(5.73)	-8%
210	36.86	43.73	6.87	19%
212	22.20	35.83	13.63	61%
215	-	-	-	0%

Line	Revenue Hours (Saturday)			
	Current Service	Proposed Final Plan	Difference	% Difference
216	19.35	20.98	1.63	8%
217	53.97	28.62	(25.35)	-47%
232	22.35	14.83	(7.52)	-34%
239	-	27.92	27.92	
251	10.38	13.68	3.30	32%
299	-	29.98	29.98	
376	15.07	-	(15.07)	
800	31.75	31.75	-	0%
801	30.12	16.22	(13.90)	-46%
802	3.10	3.10	-	0%
805	9.10	9.10	-	0%
840	4.09	4.09	-	0%
851	7.50	7.50	-	0%
E	-	-	-	0%
F	58.80	58.80	-	0%
FS	-	-	-	0%
G	-	-	-	0%
J	-	-	-	0%
L	-	-	-	0%
LA	-	-	-	0%
NL	59.95	58.93	(1.02)	-2%
NX	-	-	-	0%
NX3	-	-	-	0%
O	49.25	48.58	(0.67)	-1%
OX	-	-	-	0%
P	-	-	-	0%
U	-	-	-	0%
V	-	-	-	0%
W	-	-	-	0%
System	**2,983.00**	**3,130.00**	**147.00**	**4.9%**

Table 5: Comparison of Performance Metrics (Sunday Revenue Miles)

Line	Revenue Miles (Sunday)			
	Current Service	Proposed Final Plan	Difference	% Difference
1T	2,092.20	2,092.20	-	0%
6	868.40	868.40	-	0%
7	888.80	420.60	(468.20)	-53%
10	797.80	2,257.40	1,459.60	183%
12	771.40	815.50	44.10	6%
14	696.80	1,168.50	471.70	68%
18	1,037.10	1,481.90	444.80	43%
19	263.80	373.49	109.69	42%
20	602.30	786.40	184.10	31%
21	581.00	697.50	116.50	20%
27	-	627.40	627.40	

Line	Revenue Miles (Sunday)			
	Current Service	Proposed Final Plan	Difference	% Difference
28	461.60	692.60	231.00	50%
29	556.40	825.90	269.50	48%
33	846.00	-	(846.00)	
34	441.80	441.80	-	0%
35	493.50	493.50	-	0%
36	620.30	786.30	166.00	27%
39	-	-	-	0%
40	1,224.60	1,224.60	-	0%
41	330.10	330.10	-	0%
45	485.40	485.40	-	0%
46L	-	-	-	0%
51A	1,179.20	1,179.20	-	0%
51B	711.70	696.00	(15.70)	-2%
52	306.20	475.30	169.10	55%
54	288.90	324.00	35.10	12%
56	367.00	367.00	-	0%
57	2,060.70	2,060.70	-	0%
60	553.90	512.90	(41.00)	-7%
62	540.50	807.00	266.50	49%
65	-	-	-	0%
67	-	-	-	0%
70	260.90	366.80	105.90	41%
71	412.50	412.50	-	0%
72	1,242.40	1,242.40	-	0%
72M	1,138.10	1,138.10	-	0%
72R	1,348.80	743.20	(605.60)	-45%
73	814.00	633.10	(180.90)	-22%
74	514.30	600.30	86.00	17%
76	680.90	752.20	71.30	10%
79	353.10	-	(353.10)	
86	686.30	982.80	296.50	43%
88	732.60	1,018.00	285.40	39%
90	260.80	260.80	-	0%
93	384.10	384.10	-	0%
95	144.30	144.00	(0.30)	0%
96	639.40	680.70	41.30	6%
97	917.50	917.50	-	0%
98	480.40	480.40	-	0%
99	1,151.80	-	(1,151.80)	
200	1,213.90	1,133.90	(80.00)	-7%
210	605.00	722.50	117.50	19%
212	316.30	561.80	245.50	78%
215	-	-	-	0%
216	312.60	373.60	61.00	20%
217	1,006.10	552.10	(454.00)	-45%
232	407.20	253.60	(153.60)	-38%
239	-	438.50	438.50	
251	178.90	223.60	44.70	25%

Line	Revenue Miles (Sunday)			
	Current Service	Proposed Final Plan	Difference	% Difference
299	-	426.30	426.30	
376	239.30	-	(239.30)	
800	660.90	661.10	0.20	0%
801	558.20	300.60	(257.60)	-46%
802	60.70	60.70	-	0%
805	147.70	147.70	-	0%
840	78.90	78.90	-	0%
851	118.60	117.90	(0.70)	-1%
E	-	-	-	0%
F	1,119.40	1,119.40	-	0%
FS	-	-	-	0%
G	-	-	-	0%
J	-	-	-	0%
L	-	-	-	0%
LA	-	-	-	0%
NL	1,194.50	1,194.50	-	0%
NX	-	-	-	0%
NX3	-	-	-	0%
O	1,131.50	1,131.50	-	0%
OX	-	-	-	0%
P	-	-	-	0%
U	-	-	-	0%
V	-	-	-	0%
W	-	-	-	0%
System	**41,579.00**	**43,547.00**	**1,967.00**	**4.7%**

Table 6: Comparison of Performance Metrics (Sunday Revenue Hours)

Line	Revenue Hours (Sunday)			
	Current Service	Proposed Final Plan	Difference	% Difference
1T	178.12	179.15	1.03	1%
6	73.97	73.97	-	0%
7	67.75	33.47	(34.28)	-51%
10	58.10	164.52	106.42	183%
12	70.25	73.33	3.08	4%
14	53.93	84.82	30.89	57%
18	87.15	113.77	26.62	31%
19	18.88	27.77	8.89	47%
20	53.25	72.57	19.32	36%
21	41.07	54.25	13.18	32%
27	-	55.10	55.10	
28	30.02	45.78	15.76	52%
29	48.55	69.60	21.05	43%
33	61.12	-	(61.12)	
34	28.53	28.53	-	0%
35	32.08	32.08	-	0%

Line	Revenue Hours (Sunday)			
	Current Service	Proposed Final Plan	Difference	% Difference
36	53.73	69.70	15.97	30%
39	-	-	-	0%
40	90.82	90.38	(0.44)	0%
41	21.73	21.73	-	0%
45	34.93	34.93	-	0%
46L	-	-	-	0%
51A	96.30	96.48	0.18	0%
51B	70.58	69.35	(1.23)	-2%
52	31.92	48.02	16.10	50%
54	17.55	19.38	1.83	10%
56	23.12	23.12	-	0%
57	157.32	159.93	2.61	2%
60	40.00	36.90	(3.10)	-8%
62	44.20	66.95	22.75	51%
65	-	-	-	0%
67	-	-	-	0%
70	16.53	25.55	9.02	55%
71	26.93	26.93	-	0%
72	98.67	98.67	-	0%
72M	92.10	92.10	-	0%
72R	95.80	52.00	(43.80)	-46%
73	45.75	36.00	(9.75)	-21%
74	38.43	45.52	7.09	18%
76	53.83	53.83	-	0%
79	31.95	-	(31.95)	
86	42.13	55.60	13.47	32%
88	59.22	79.13	19.91	34%
90	18.23	16.83	(1.40)	-8%
93	24.93	24.93	-	0%
95	9.67	9.67	-	0%
96	46.78	49.80	3.02	6%
97	61.95	61.95	-	0%
98	30.98	30.15	(0.83)	-3%
99	80.92	-	(80.92)	
200	67.63	61.90	(5.73)	-8%
210	36.86	43.73	6.87	19%
212	22.20	35.83	13.63	61%
215	-	-	-	0%
216	19.35	21.67	2.32	12%
217	53.97	28.62	(25.35)	-47%
232	22.35	14.83	(7.52)	-34%
239	-	27.92	27.92	
251	10.38	13.22	2.84	27%
299	-	29.98	29.98	
376	15.07	-	(15.07)	
800	31.75	31.75	-	0%
801	30.12	16.22	(13.90)	-46%
802	3.10	3.10	-	0%

Line	Revenue Hours (Sunday)			
	Current Service	Proposed Final Plan	Difference	% Difference
805	9.10	9.10	-	0%
840	4.09	4.09	-	0%
851	7.50	7.50	-	0%
E	-	-	-	0%
F	57.68	57.68	-	0%
FS	-	-	-	0%
G	-	-	-	0%
J	-	-	-	0%
L	-	-	-	0%
LA	-	-	-	0%
NL	58.52	59.13	0.61	1%
NX	-	-	-	0%
NX3	-	-	-	0%
O	45.20	45.03	(0.17)	0%
OX	-	-	-	0%
P	-	-	-	0%
U	-	-	-	0%
V	-	-	-	0%
W	-	-	-	0%
System	**2,955.00**	**3,116.00**	**161.00**	**5.4%**

Appendix B: Public Engagement

There were five phases for the Realign Project, and public engagement was prominent in each one. Phase 1 focused on collecting rider and community preferences from surveys and engagement activities to help shape the guiding principles, which was finalized and shared with the community in Phase 2. Phases 3 to 5 collected community input on the network alternatives and the draft plan. The number of events and comments collected for each phase is summarized below.

Phase 1

The first phase of outreach for AC Transit Realign was conducted from April to June 2023 with the goal of obtaining community feedback and rider preferences that would inform the guiding principles of the project and the development of a new AC Transit network.

Digital Engagement

- Survey: 14,583 online responses
- Comments and suggestions: 128
- Digital Ads/Banners
    - Total Impressions: 31,564
- 3,601 visits to the Realign webpage recorded from the Transit app
- 11,702 users opted and received push notifications regarding AC Transit Realign
- 20,898 Realign page views
- Social Media Performance (numbers note impressions / engagement)

    Impressions: number of times a post is seen

    Engagement: number of interactions (likes, shares, comments, reactions, clicks, etc.) with a post

    - Twitter: 20,861/395
    - Facebook: 7,481/538
    - Instagram: 1,471/35

In-Person Engagement

- Total events: 152
    - Outreach at more than 17 bus stop locations through 125 shifts, totaling 635 hours worked across the service area
- Survey: 1,135 paper surveys collected
- One community presentation/workshop held
- Eight community-based organization (CBO) collaborations
- 54 attendees at one public meeting
- Approximately 10,000 in-person interactions with the community
- Community-Based Organizations (CBOs)

  - Reached out to 15 CBOs
  - Eight formal partnerships
  - 17 CBO staff recruited and trained for survey administration
  - Four CBO helped administer surveys
  - One CBO held a pop-in event
- Attendance and participation at Board meetings on 4/26/23, 5/24/23, and 6/28/23

Phase 2

Phase 2 refined and gathered feedback on the guiding principles established, and it took place between July and August 2023. It refined and gathered feedback on the guiding principles established to direct the forthcoming stages of the AC Transit Realign project.

Digital Engagement

- Website Page views: 2,116 total
  - AC Transit Realign: 1,740
  - Realign: What We've Learned: 376
- Social Media Performance (impressions/engagements)
  - Twitter: 7,007/137
  - Facebook: 4,565/167
  - Instagram: 510/22
- One trilingual digital workshop and telephone conference with 55 attendees

In-Person Engagement

- 47 events
  - 19 community events
  - 13 school sites outreach totaling to 20 events
- Two focus groups with two CBO partners
  - Community Resources for Independent Living on 7/17/23
  - Black Cultural Zone on 7/29/23
- One Lived Experience Advisory Group meeting on 8/12/23
  - Consists of 5 (one per ward) AC Transit District residents with experience of AC Transit or deep understanding of communities that depend on its services
- Board of Directors Workshop attendance on 7/26/23
- Seven presentations at existing meeting forums

Phase 3

Phase 3 outreach was conducted from November to December 2023. Draft service scenarios that propose different configurations of AC Transit's routes and schedules will be presented for community feedback.

Digital Engagement

- AC Transit Website
  - Realign: 38,442 page views, 27,255 users
  - Balanced Coverage Scenario: 3,714 page views, 1,920 users

    - Frequent Service Scenario: 2,903 page views, 1,611 users
    - Unconstrained Vision Scenario: 1,632 page views, 1,097 users
- AC Transit eNews:
    - Newsletter sent to 34,045 recipients
    - Unique Opens: 7,324 (21.5%)
    - Total Opens: 11,741 (34.4%)
    - Total Clicks: 608 (1.7%)
- Social Media Performance (Impressions/Engagements): 123,723
    - Engagements: 3,608
    - Clicks: 4,023
- Online survey tool: 804 responses
- Phone line comments: 14 total voicemails, 13 English and 1 Spanish
- Email comments: 310 emails received via the project email
- Digital Ads/Banners
    - Total Impressions: 1,430,721
    - Total Clicks: 10,574
- Print Ads in Local Newspapers
    - Total Impressions: 51,934
- TV/Radio
    - Total Impressions: 1,694,400
- One district-wide online workshop with 29 attendees and 27 questions

In-Person Engagement

- Six CBOs engaged
    - Seven events/pop-ins/focus groups
        - *The Latina Center Focus Group, 11/28/23*
        - *Cherryland Community Association Pop-In Presentation, 11/30/23*
        - *Community Resources for Independent Living (CRIL) Focus Groups, 11/28/23 and 12/13/23*
        - *Trybe Focus Group, 12/1/23*
        - *La Familia CBO Event, 12/5/23*
        - *United Seniors of Alameda County (USOAC) CBO Event, 12/6/23*
- 68 events
    - 11 pop-up events
- Two AC Transit General Office Open Houses
- One LEAG meeting on 11/4/23 with make-up session on 12/13/24

Phase 4

Phase 4 recently wrapped up and its first outreach component spanned from May to June 2024. The data and community input received centered around a Draft Plan that was created by the Realign project team.

Digital Engagement

- AC Transit Website
    - Realign: 23,116 page views, 11,315 users
- AC Transit eNews:
    - Newsletters sent to 20,834 recipients
    - Unique Opens: 4,792 (27%) | 4,444 (25%)

    - Total Opens: 7,754/7,406
    - Total Clicks: 570/1,260
- Social Media Performance (Impressions/Engagements): 45,836
    - Engagements: 1,774
    - Clicks: 232
- Online mapping tool: 461
    - ArcGIS comments: 65
- Phone line comments: 6
- Email comments: 49
- Digital Ads/Banners
    - Total Impressions: 645,893
    - Total Clicks: 614
- Print Ads in Local Newspapers
    - Total Impressions: 161,511

In-Person Engagement

- Total Events: 180
    - 11 community pop-ups
- Bus Stop and Onboard Outreach: 106
    - Total card surveys distributed: 1,899
    - Total scanned QR Codes: 762
- CBO Events: 9
    - 5/9/24 Cherryland Community Association
    - 5/13/24 Community Resources for Independent Living (CRIL)
    - 5/15/24 Trybe
    - 5/19/24 Black Cultural Zone
    - 5/19/24 Glad Tidings Community Church
    - 5/20/24 United Seniors of Oakland Alameda County (USOAC)
    - 5/28/24 Oakland Chinatown Chamber of Commerce
    - 5/29/24 La Familia
    - 6/3/24 The Latina Center
- Community Event Pop-Ups: 11
- Library Pop-Ups: 21
- Comment cards received: 9
- Open Houses at AC Transit General Office: 1
- LEAG Meeting: 1 on 5/18/23
    - Participants: 3
- Attendance and participation at district-wide online workshop: 38
    - Comments received: 61
- Realign Board Workshop 6/5/24
- District-wide online workshop on 5/23/24

AC Transit also facilitated a public comment period and held public hearings on a Draft Final plan shaped by the outreach and engagement heard as part of Draft Plan outreach. This public comment period spanned from September 2nd to October 11, 2024. Attachments 4 and 9 in Staff Report 23-250k detail public engagement efforts and all comments received during the public comment period and public hearings associated with the Draft Final plan. This feedback informed the development of the proposed final plan that is the focus of this service equity analysis.

Phase 5

Phase 5 will take place upon final approval of the plan and once and implementation date is set. At that time, AC Transit will actively publicize the forthcoming network changes in line with its Public Participation Plan. In addition, forthcoming (as of October 2024) updates to AC Transit’s service standards as part of Board Policy 545 will guide future planning and monitoring of AC Transit's routes, including of the proposed Realign Final Network plan.

Appendix C: Service Equity Analysis

As stated in the report, District team used two service equity analysis methods: Service Intensity and Service Quality.

Throughout the Service Equity Analysis, the following parameters were used:

- Data related to all lines in the AC Transit service area were included in the analysis.
- For lines with varying schedules by day of the week, excluding many 600-series (School Service Lines) and 700-series (Early Bird Lines) limited-service lines, a typical Wednesday schedule was chosen to represent weekday service and Saturday/Sunday for the weekends.
- “People of color” include all persons who self-identify as not white in the US Census, including those who identify as Latino/a or Hispanic.
- Low-income populations include all persons living in households with income less than 200% of the federal poverty level.

For background information, the AC Transit service area population of over 1.6 million people is approximately 73.5% of people of color and 21.7% of people in low-income households (Figure 2).

Figure 2 - Population in AC Transit Service Area

Total	**1,633,236**
People of Color	73.5%
Low-Income	21.7%

Source: ACS 5-Year Estimates 2018-2022

Service Intensity Analysis

The Service Intensity Analysis asks, "how does the service change affect the amount of service available to populations protected by Title VI of the Civil Rights Act compared to non-protected populations?” The team analyzed access to service and the amount of service to protected and non-protected groups system-wide; the amount of service was also analyzed on a smaller area-wide basis.

Methodology

The team utilized exported trip and stop data from its HASTUS scheduling software and combined it with data from the American Community Survey 5-year Estimates dataset (2018-2022). All the data is analyzed except for the 600 series (school tripper) and 700 series (Early Bird) routes. This analysis was conducted within ArcGIS. Spatial database functions were used to count the number of people who lived within 1/4 mile of bus stops under the Proposed Final (PF) plan and after the potential major service change from the Fall 2024 schedule and to count the number of trips available to those people on current service and the PF plan. The process

aligns with the past AC Transit methodology but uses different software tools. This analysis was conducted system-wide and within more fine-grained planning sub-areas.

ArcGIS generated 1/4-mile buffers around bus stops and estimated the population within the buffers. The queries also automatically counted the amount of bus service (i.e., trips) available in each buffer based on the service data on the two maps.

Census data from the American Community Survey 2018-2022 5-year sample was extracted for analysis. In this dataset, people of color status are coded by subtracting the white, non-Latino/a population from the total population (table B03002), and low-income status is coded at 200% of the US federal poverty rate (table C17002).

Access to Service

The team first analyzed how many people of color and low-income people lived within 1/4 mile of a bus stop under the existing service and compared it to how many people of color and low-income people would live within a 1/4 mile of a bus stop with the proposed service (Figure 3).

Figure 3 - Overall Population within 1/4 mile of Service-by-Service Change

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
Overall	1,578,597	1,576,145	-2,452	**-0.16%**

This analysis found that the overall population within 1/4 mile of service decreases by 0.16% based on the current service plan.

This analysis was repeated for people of color, non-people of color, low-income, and non-low-income people, and the results were compared (Figure 4 and 5).

Figure 4 - People of Color and Non-People of Color Population within 1/4 mile of Service-by-Service Change

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
People of Color	1,163,532	1,161,454	-2,078	-0.18%
Non-People of Color	415,065	414,691	-374	-0.09%
% Difference				**-0.09%**

Figure 5 - Low-Income and Non-Low-Income Population within 1/4 mile of Service-by-Service Change

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change

Low-Income	348,940	348,802	-138	-0.04%
Non-Low-Income	1,203,744	1,201,430	-2,314	-0.01%
% Difference				**-0.03%**

The differences between the change in coverage for people of color / non-people of color and low-income / non-low-income populations all fall below the district's threshold of 15% for disparate impacts and disproportionate burdens. There is a difference of less than 0.1% for the change in coverage. **As a result, there is no discriminatory effect on the protected populations.**

Amount of Service

The team counted the number of people who lived near the transit service and the amount of service available to the different population groups. This involved counting the number of trips passing through Census Block Groups within 1/4 mile of bus stops and multiplying that by the total population in those Census Block Groups, resulting in annual person trips near bus stops. This analysis was conducted for non-people of color, low-income, and non-low-income groups using existing and proposed services.

Figure 6 - People of Color and Non-People of Color Person Trips by Census Block Group

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
People of Color	128,190,870,496	126,809,736,144	-1,381,134,352	-1.08%
Non-People of Color	47,551,767,276	47,602,492,392	50,725,116	0.11%
% Difference				**-1.18%**

Figure 7 - Low-Income and Non-Low-Income Person Trips by Census Block Group

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
Low-Income	47,777,738,996	47,236,822,672	-540,916,324	-1.13%
Non-Low-Income	123,643,518,232	122,718,166,012	-925,352,220	-0.44%
% Difference				**-0.69%**

This analysis found that people of color received less service (1.18% less) based on the current service (Figure 6). The low-income population received 0.69% less service than the non-low-

income population (Figure 7). **Neither of these findings represents a discriminatory effect on people of color or low-income persons.**

The team then looked closer at the service intensity analysis by smaller areas. The following five geographic sub-areas as follows were used (Figure 8 and 9):

- Area A: San Pablo, Richmond, El Cerrito
- Area B: Albany, Berkeley, Emeryville
- Area C: Piedmont, Oakland, Alameda
- Area D: San Leandro. Castro Valley, Hayward
- Area E: Union City, Fremont, Newark

The amount of service assigned to each analysis area was then calculated using the same spatial queries and grouped by the geography areas denoted. Figure 10 and Figure 11 reflect percentage change in annual person-trips by protected population.

Figure 8 – Analysis areas in Service Plan

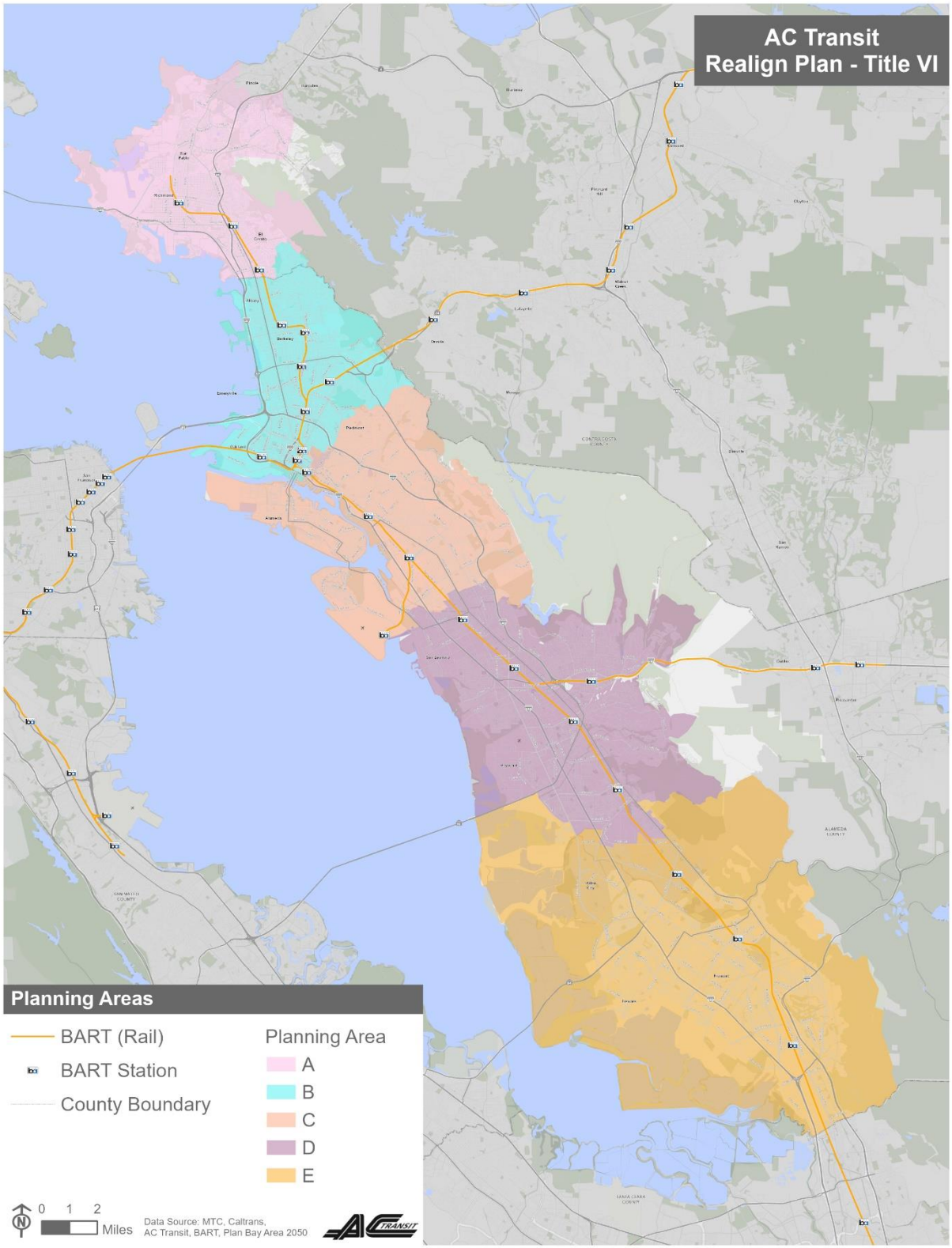


Figure 9 - Proposed Routes and Planning Areas

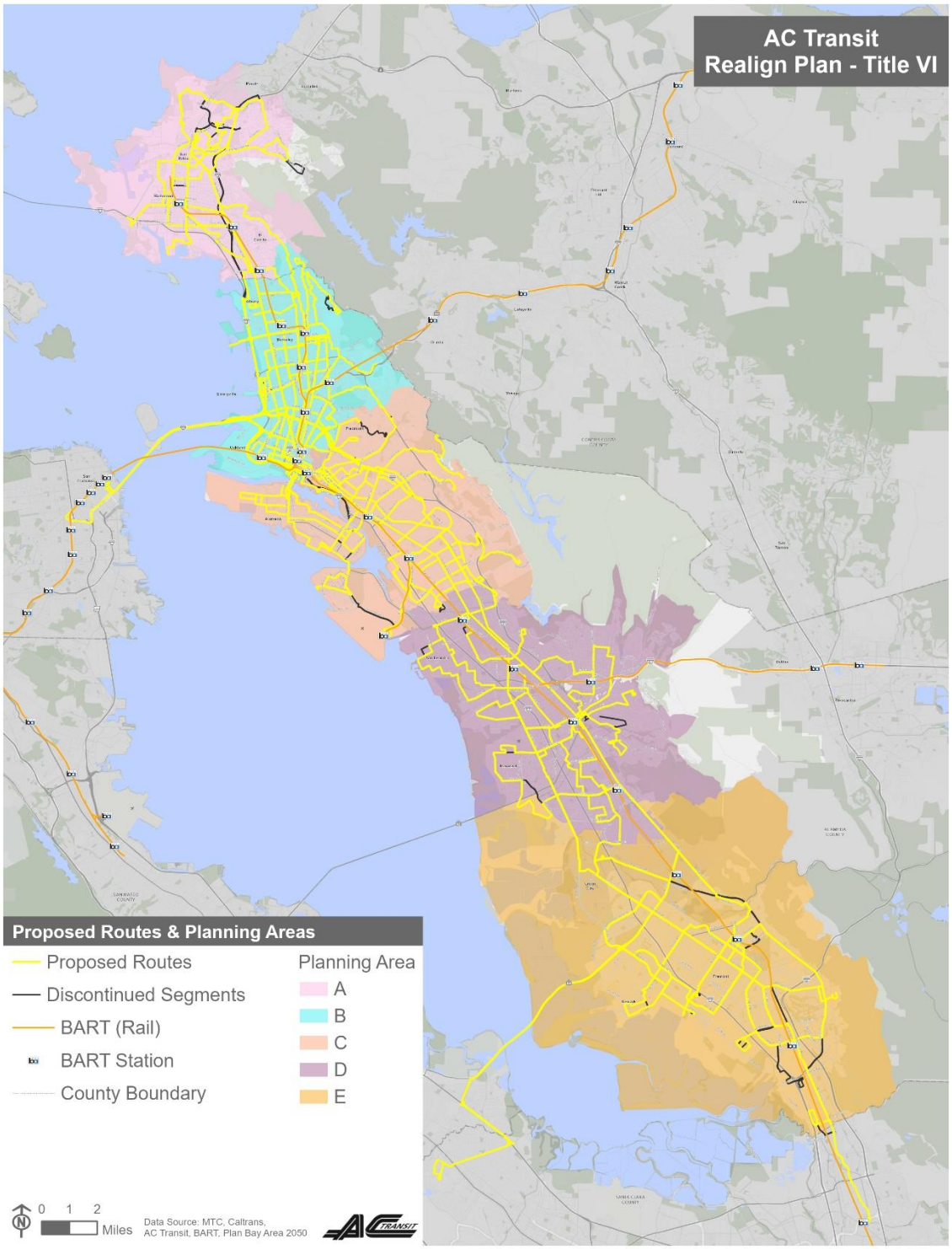


Figure 10 - Annual Person Trips Percent Change - Low-Income

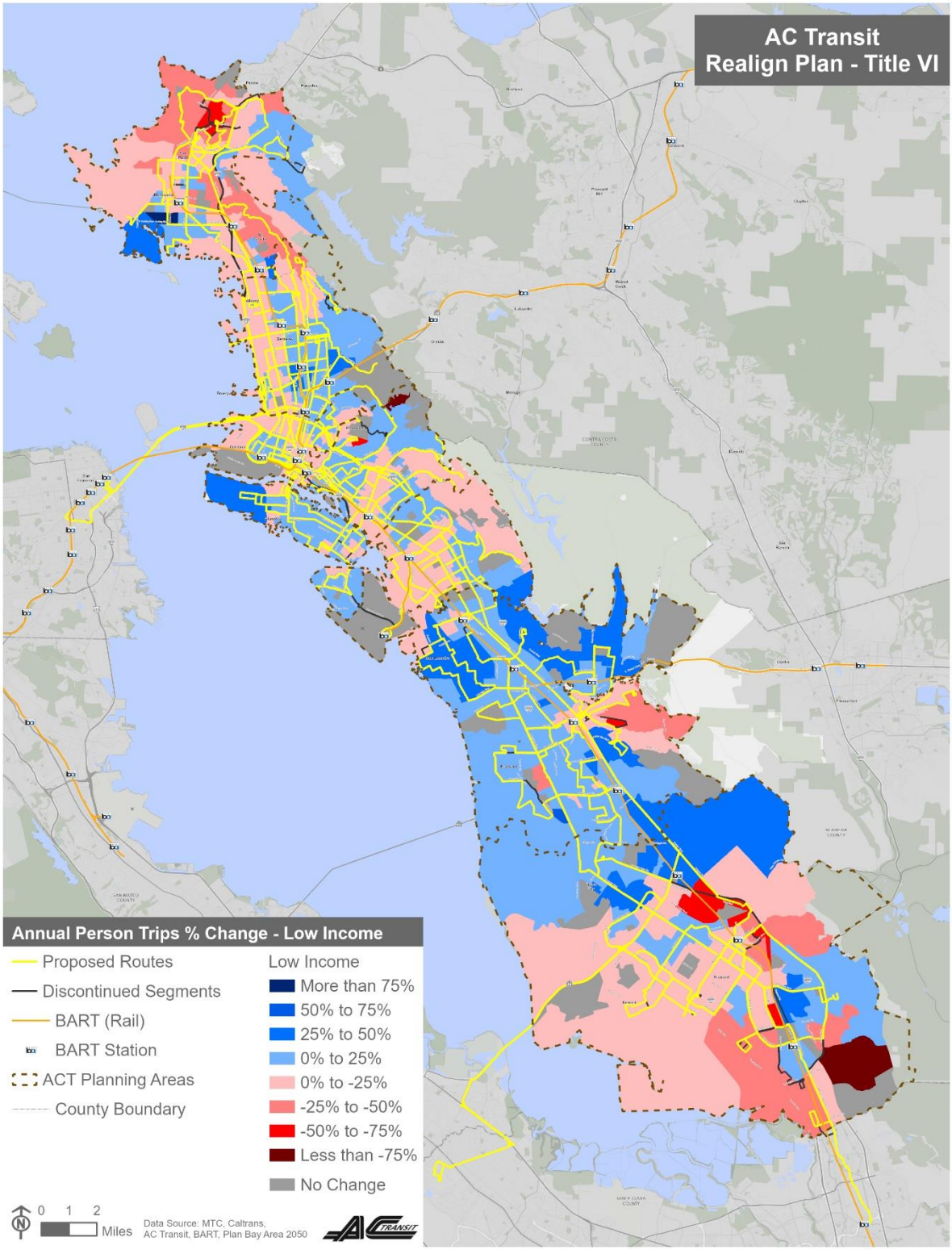
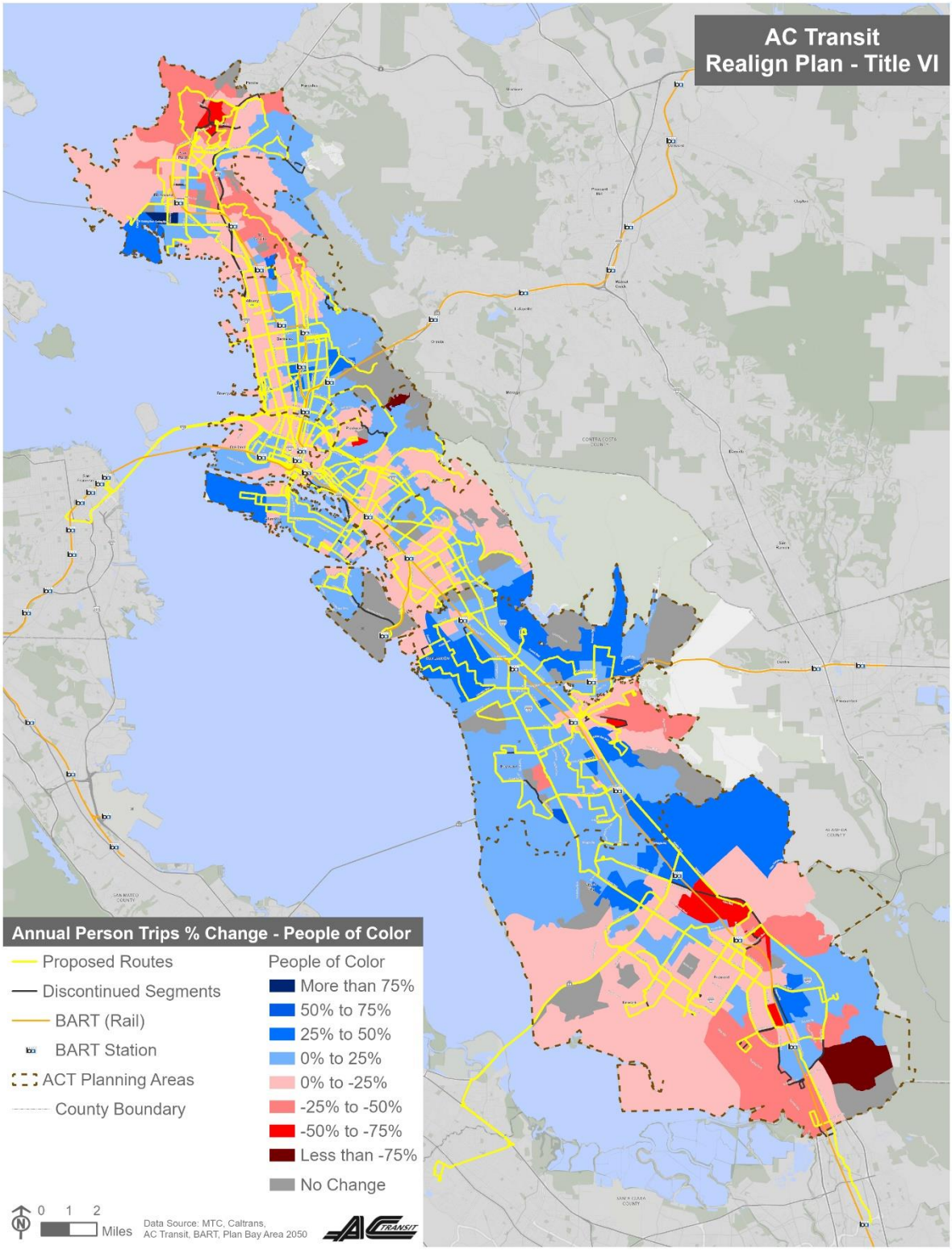


Figure 11 - Annual Person Trips Percent Change - People of Color



Findings:

There is a decrease in most areas, except for Area D. Figure 12 through 21 for each geographic area are depicted below.

Figure 22 is a summary of all the areas for both people of color and low income.

Figure 12 - People of Color and Non-People of Color Person Trips (Area A: San Pablo, Richmond, El Cerrito)

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
People of Color	14,349,846,888	11,934,828,360	-2,415,018,528	-16.83%
Non-People of Color	3,328,590,564	2,756,162,864	-572,427,700	-17.20%
% Difference				**0.37%**

Figure 13 - Low-Income and Non-Low-Income Person Trips (Area A: San Pablo, Richmond, El Cerrito)

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
Low Income	5,346,533,556	4,538,191,632	-808,341,924	-15.12%
Non-Low- Income	12,169,280,604	10,017,098,260	-2,152,182,344	-17.69%
% Difference				**2.57%**

Figure 14 - People of Color and Non-People of Color Person Trips (Area B: Albany, Berkeley, Emeryville)

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
People of Color	35,404,988,164	35,155,205,384	-249,782,780	-0.71%
Non-People of Color	24,604,626,644	24,973,105,144	368,478,500	1.50%
% Difference				**-2.20%**

Figure 15 - Low-Income and Non-Low-Income Person Trips (Area B: Albany, Berkeley, Emeryville)

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
Low Income	16,754,480,184	16,730,802,764	-23,677,420	-0.14%
Non-Low- Income	40,141,370,984	40,158,045,980	16,674,996	0.04%
% Difference				**-0.18%**

Figure 16 - People of Color and Non-People of Color Person Trips (Area C: Piedmont, Oakland, Alameda)

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
People of Color	43,151,351,256	42,844,591,868	-306,759,388	-0.71%
Non-People of Color	12,240,559,344	12,211,175,028	-29,384,316	-0.24%
% Difference				**-0.47%**

Figure 17 - Low-Income and Non-Low-Income Person Trips (Area C: Piedmont, Oakland, Alameda)

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
Low Income	17,833,842,676	17,647,416,280	-186,426,396	-1.05%
Non-Low- Income	36,936,273,036	36,792,038,972	-144,234,064	-0.39%
% Difference				**-0.65%**

Figure 18 - People of Color and Non-People of Color Person Trips (Area D: San Leandro. Castro Valley, Hayward)

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
People of Color	21,146,970,208	22,998,974,648	1,852,004,440	8.76%
Non-People of Color	4,492,826,676	4,889,543,204	396,716,528	8.83%
% Difference				**-0.07%**

Figure 19 - Low-Income and Non-Low-Income Person Trips (Area D: San Leandro. Castro Valley, Hayward)

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
Low Income	5,676,201,700	6,200,086,724	523,885,024	9.23%
Non-Low- Income	19,616,883,728	21,301,468,084	1,684,584,356	8.59%
% Difference				**0.64%**

Figure 20 - People of Color and Non-People of Color Person Trips (Area E: Union City, Fremont, Newark)

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
People of Color	14,137,713,980	13,876,135,884	-261,578,096	-1.85%
Non-People of Color	2,885,164,048	2,772,506,152	-112,657,896	-3.90%
% Difference				**2.05%**

Figure 21 - Low-Income and Non-Low-Income Person Trips (Area E: Union City, Fremont, Newark)

People within ¼ Mile of AC Transit Stops	Current Service	PF Plan	Change	% Change
Low Income	2,166,680,880	2,120,325,272	-46,355,608	-2.14%

Non-Low- Income	14,779,709,880	14,449,514,716	-330,195,164	-2.23%
% Difference				**0.09%**

Figure 22- Summary Annual Person Trips changes at System and Planning Areas level

Population Group	**Annual Person Trips**					
% Change	**System**	**Area A**	**Area B**	**Area C**	**Area D**	**Area E**
People of Color	-1.08%	-16.83%	-0.71%	-0.71%	8.76%	-1.85%
Non-People of Color	0.11%	-17.20%	1.50%	-0.24%	8.83%	-3.90%
Relative Difference	**-1.18%**	**0.37%**	**-2.20%**	**-0.47%**	**-0.07%**	**2.05%**
Low-Income	-1.13%	-15.12%	-0.14%	-1.05%	9.23%	-2.14%
Non-Low-Income	-0.44%	-17.69%	0.04%	-0.39%	8.59%	-2.23%
Relative Difference	**-0.69%**	**2.57%**	**-0.18%**	**-0.65%**	**0.64%**	**0.09%**

AC Transit Board Policy 518 indicates:

> "When people of color populations or riders as a whole will experience a 15% (or more) greater adverse effect than that borne by the non-people of color populations or riders, such changes will be considered to have a disparate impact. An adverse effect is defined as a geographical or time-based reduction in service which includes but is not limited to elimination of a route, short turning a route, rerouting an existing route, or an increase in headways."

There was no analysis where service levels for non-people of color were prioritized over those for people of color, as they all had less than a 3% difference. Areas A, C, and D have percent differences less than 1%. Area B has the largest difference between people of color and non-people of color with -2.20%. The difference between the change of person-trips for people of color and non-people of color is less than the threshold, with no adverse effects. So, this analysis finds **no disparate impacts** on people of color.

AC Transit Board Policy 518 also says:

> "When the proportion of low-income populations or riders as a whole adversely affected by the proposals is 15% (or more) than the proportion of non-low-income populations or riders adversely affected, such changes will be considered to have a disproportionate burden."

In all planning areas, low-income person trips decreased by a greater percentage than non-low-income person trips, except for Area A, where there was a relative increase of 2.57% in the low–income population group more than the non-low-income population group. Area C has the

largest difference with -0.65%. Overall, there are **no disproportionate burdens** on low-income populations.

Service Quality Analysis

The Service Quality Analysis asks the question: how did the service change affect access to economic opportunity for protected populations compared to non-protected populations? In this case, the team used the number of jobs accessible by walking and transit as a proxy for economic opportunity.

To accomplish this, the team conducted an Origin-Destination (or O-D) exercise using employment data from the U.S. Census Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics (LEHD LODES, or LODES) 2021dataset. The LODES dataset summarizes employment numbers at the block level for this analysis.

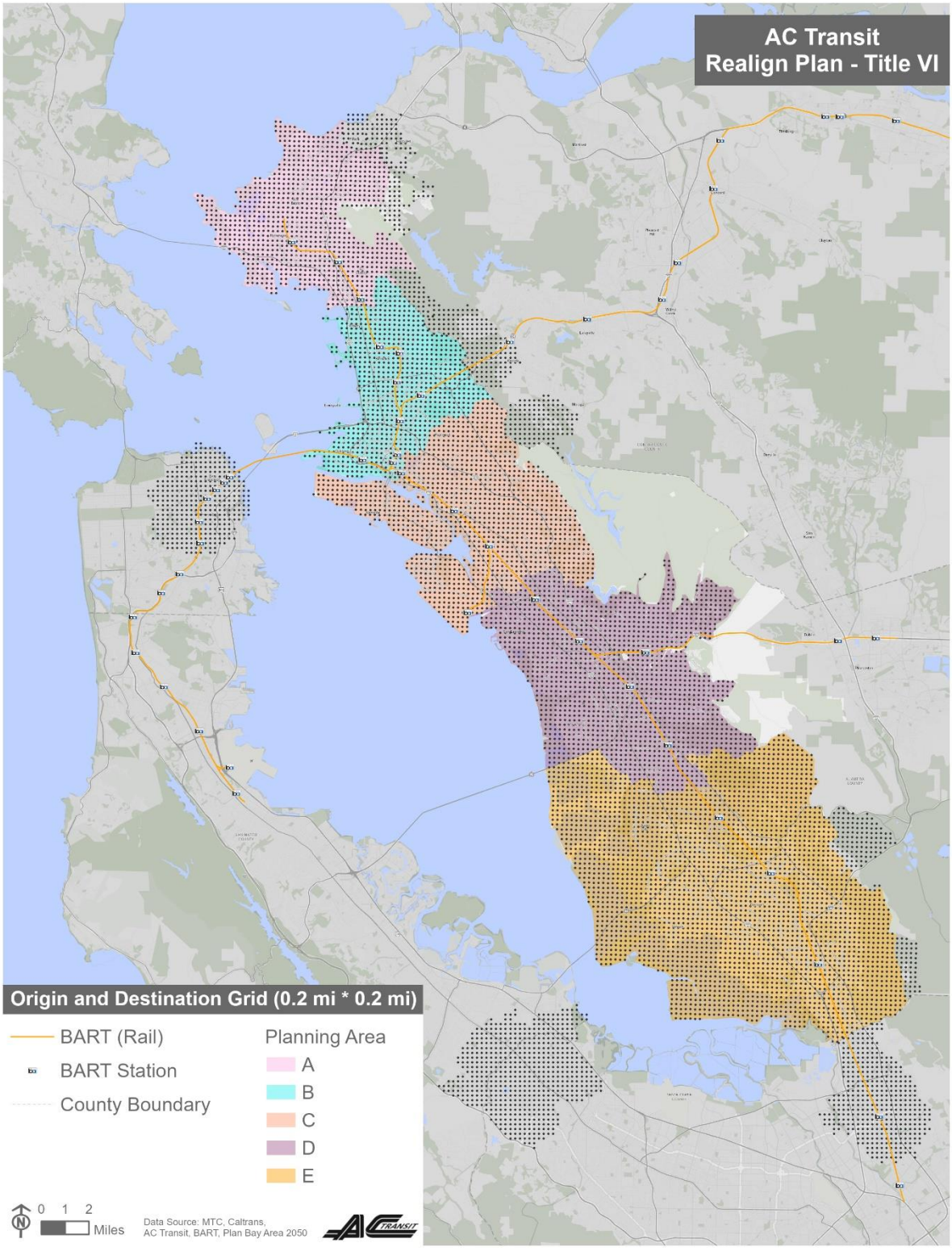
Methodology

The team used the open source *r5* multimodal routing engine package and its companion Python programming language package *r5py* to generate combined pedestrian and AC Transit network analysis datasets reflective of the entire AC Transit service area. The *r5* package is primarily developed by Conveyal and is partly derived from the OpenTripPlanner project. The *r5py* package was created mainly by IPEA, Brazil's National Institute for Applied Economic Research. The pedestrian network was derived from OpenStreetMap street centerline data and transit networks from AC Transit's static GTFS feeds for each service change, i.e., the Fall Service change and the Draft Proposed Plan. The *r5* network parameters assume standard walking speeds of 1.5 meters per second (or just under three miles per hour) for pedestrian links and aggregated transit travel times during these periods based on GTFS transit schedules.

The r5py package calculated travel time estimates for departures at 30-minute intervals during the weekday AM peak period (6:00 a.m. to 10:00 a.m.); within the window of 30 minutes, the median travel times spaced every minute of departures were calculated. The analysis used 8,007 origin points based on a 1/5-mile grid within the AC Transit Planning area (Figure 23). For destinations, the study considered 1,646 ACS Block Groups within a two-mile radius of AC Transit bus network stops, along with 9,858 grid points. 1.094 billion one-way travel times were calculated, with 574 million trips analyzed for each service change scenario.

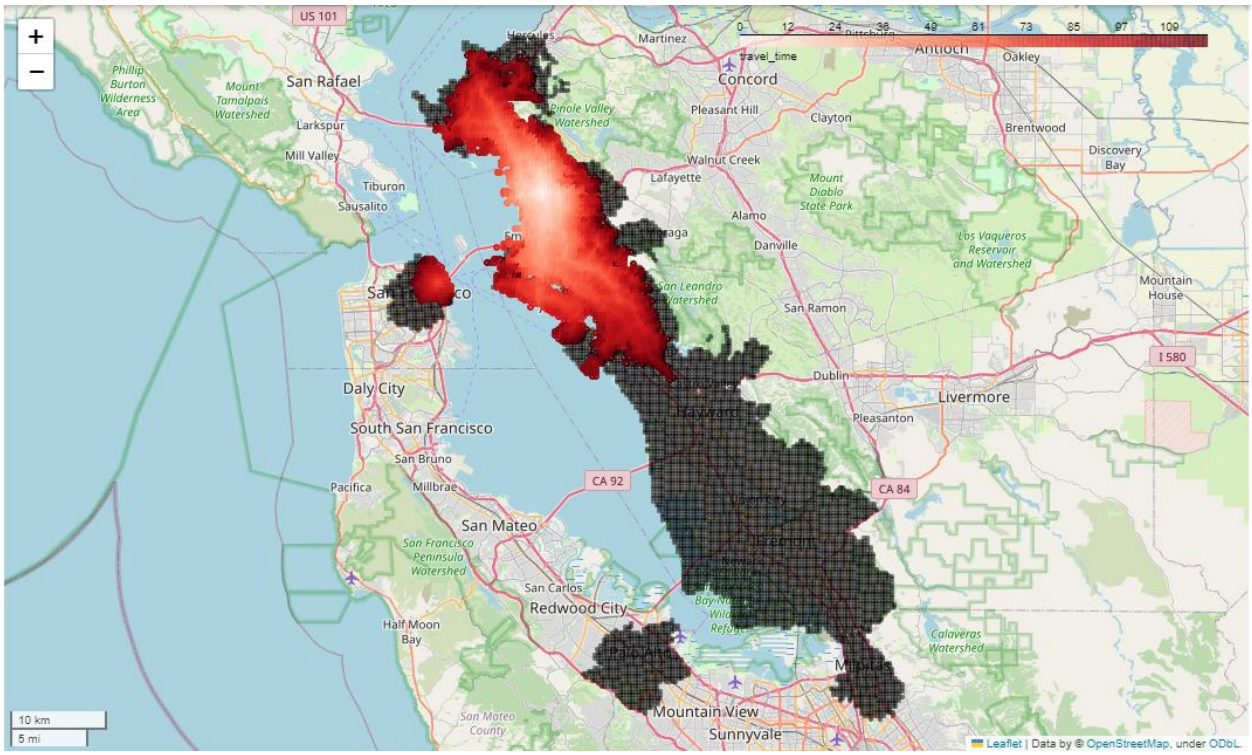
For more details, see Appendix D: Service Quality Analysis Methodology.

Figure 23 – Origin and Destination Grid



Starting with the origin points, each was buffered by 200 feet and grouped by origin and destination Census Block Groups to ensure comprehensive coverage of the population in the origin and jobs in the destination Census Block Groups. Average travel times were calculated between these groups, accounting for walk times, out-of-vehicle wait times, and in-vehicle travel times. The average number of jobs accessible within 30-, 60-, and 90-minute travel time thresholds was then determined. These job accessibility figures were multiplied by population data to compare job access for various demographic groups, including people of color, non-people of color, and low-income and non-low-income populations. Figure 24 presents a sample output of travel times using public transit, with walking as the mode of access and egress.

Figure 24 – Average Travel time of up to 2 hrs. from the origin point in Berkeley



Findings

There are **no disparate impacts or disproportionate burdens** due to the service changes between the PF Plan and the current service plan.

Analysis of Job Access within 30 Minutes

Figure 25 and Figure 26 below show the differences in job accessibility at a 30-minute travel time threshold.

Figure 25 - People of Color and Non-People of Color Job Accessibility within 30 minutes by Service Change

Plans	Current Service	PF Plan	Change	% Change
People of Color	1,157,168,596	1,117,108,778	-40,059,818	-3.5%
Non-People of Color	412,447,821	404,848,189	-7,599,632	-1.8%
% Difference				**-1.6%**

People of color experienced a 1.6 % decrease in job access than non-people of color with the proposed service changes (-3.5% and -1.8%, respectively). The difference between them is less than 15%, below the Disproportionate Burden threshold in Board Policy 518.

Figure 26 - Low-Income and Non-Low-Income Job Accessibility within 30 minutes by Service Change

Plans	Current Service	PF Plan	Change	% Change
Low-Income	392,337,851	370,959,532	-21,378,319	-5.4%
Non-Low-Income	1,156,218,696	1,130,167,238	-26,051,458	-2.3%
% Difference				**-3.2%**

Low-income populations experienced a decrease in job accessibility at a 30-minute travel time threshold with the service changes, and the difference between low-income and non-low-income was -3.2%, below the Disproportionate Burden threshold in Board Policy 518.

Analysis of Job Access within 60 Minutes

Figure 27 and Figure 28 below show the differences in job accessibility at a 60-minute travel time threshold.

Figure 27 - People of Color and Non-People of Color Job Accessibility within 60 minutes by Service Change

Plans	Current Service	PF Plan	Change	% Change
People of Color	3,571,581,441	4,152,419,186	580,837,745	16.3%
Non-People of Color	1,133,779,685	1,230,061,452	96,281,767	8.5%
% Difference				**7.8%**

For this travel time threshold, people of color retained access to more jobs than non-people of color (by +16.3% and +8.5%, respectively).

Figure 28 - Low-Income and Non-Low-Income Job Accessibility within 60 minutes by Service Change

Plans	Current Service	PF Plan	Change	% Change
Low-Income	1,157,508,442	1,480,594,806	323,086,364	27.9%
Non-Low-Income	3,500,227,954	3,846,177,911	345,949,957	9.9%
% Difference				**18.0%**

Within a 60-minute travel time threshold, low-income populations retained access to more jobs than non-low-income populations, with a differential of 18.0%. The low-income populations saw marked gains in job accessibility.

Analysis of Job Access within 90 Minutes

Figure 29 and Figure 30 below show the differences in job accessibility at a 90-minute travel time threshold.

Figure 29 - People of Color and Non-People of Color Job Accessibility within 90 minutes by Service Change

Plans	Current Service	PF Plan	Change	% Change
People of Color	6,196,674,045	7,320,465,598	1,123,791,553	18.1%
Non-People of Color	1,731,236,478	1,978,141,192	246,904,714	14.3%
% Difference				**3.9%**

The people of color populations have a slightly bigger increase in access to jobs than the non-people of color populations, with the service charge for the travel time threshold of 90 minutes by 3.9%.

Figure 30 - Low-Income and Non-Low-Income Job Accessibility within 90 minutes by Service Change

Plans	Current Service	PF Plan	Change	% Change
Low-Income	1,586,181,505	2,032,802,656	446,621,151	28.2%
Non-Low-Income	6,288,416,641	7,156,970,050	868,553,409	13.8%
% Difference				**14.3%**

In this travel time distance, the low-income populations have double the increase in access to jobs than non-low-income populations i.e., 14.3%.

Figure 31 - Summary of Job Accessibility summarizes the differences in job accessibility at the 30, 60, and 90-minute travel threshold.

Figure 31 - Summary of Job Accessibility

Accessible Person-Jobs	% Change					
	People of Color	Non-People of Color	% Difference	Low-Income	Non-Low-Income	% Difference
30 Minutes	-3.5%	-1.8%	-1.6%	-5.4%	-2.3%	-3.2%
60 Minutes	16.3%	8.5%	7.8%	27.9%	9.9%	18.0%
90 Minutes	18.1%	14.3%	3.9%	28.2%	13.8%	14.3%

The AC Transit Board Policy 518 indicates if the protected population experiences a 15% (or more) adverse effect than the non-protected population, it is considered a disparate and disproportionate impact on the community. Overall, the difference between the protected and non-protected **populations is not above the disparate impact or disproportionate burden threshold**.

Appendix D: Service Quality Analysis Methodology

1. Data Overview

Average Travel Time Matrix:

- Contains travel time data between unique pairs of origin and destination grid points (from_id, to_id).
- The travel time between each origin-destination pair is minutes (average_travel_time).

Census Block Group Population Data:

- Each id corresponds to a unique point and is associated with a Census Block Group (GEOIDFQ), which is a geographic identifier.
- The dataset includes the total population (Total Population) for each Census Block Group.

Census Block Group Job Data:

- Similar to the population data, each id corresponds to a unique point and is associated with a Census Block Group (GEOIDFQ).
- The dataset includes the total number of jobs (Jobs) within each Census Block Group.

2. Assumptions

Unique Origin-Destination (O-D) Pairs:

- It is assumed that each pair of from_id and to_id in the travel time matrix is unique, ensuring that each origin-destination pair is represented only once.

Many-to-Many Relationships:

- The from_id and to_id points may be associated with multiple Census Block Groups (GEOIDFQ). The analysis accounts for these many-to-many relationships by aggregating travel times and job accessibility metrics at the Census Block Group level.

Aggregation of Travel Times:

- For each pair of origin and destination Census Block Group (GEOIDFQ_from, GEOIDFQ_to), the travel times from multiple origin-destination points are averaged. This provides a single representative travel time between Census Block Groups, which is used in further calculations.

Constant Population within Each Census Block Group:

- The population associated with an origin Census Block Group (GEOIDFQ_from) remains constant when calculating job accessibility for different time windows. This means the same population is used when multiplying by the sum or average of jobs accessible within each time window.

3. Calculation Logic

Travel Time Aggregation:

- The analysis steps first calculate the average travel time between each origin and destination Census Block Group by aggregating travel times from all associated from_id and to_id pairs.
- This average travel time determines whether a destination Census Block Group can be reached within a specific time window.

Job Accessibility Calculation:

- For each origin Census Block Group (GEOIDFQ_from), the script calculates the following for each time window:

Average Job Accessibility:

- This is calculated by multiplying the total population of the Origin Census Block Group by the average number of jobs accessible within the destination Census Block Group that can be reached within the specified time window.

Summarization:

- The results are summarized across all origin Census Block Groups to provide an average job accessibility value for each time window (0-30 minutes, 0-60 minutes, and 0-90 minutes).