

# **Title VI Evaluation of August 2010 Service Reductions Plan July 2010**

## **Submitted by**

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## I. INTRODUCTION

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In March 2010, AC Transit implemented a District-wide comprehensive service restructuring that was estimated to provide annualized savings of \$10.34 Million. At that time, service was reduced by approximately 162,000 annual platform hours, which represented a 7.7% reduction in service from prior levels. Unfortunately, the District's financial situation has not yet improved, which required staff to assess of an additional round of service reductions. As a part of other cost-reductions measures currently underway, the District Finance Department estimates a \$56 Million shortfall, of which, \$11.44 Million must come from service reductions. As a result, staff proposed to reduce the annualized service reductions to approximately 137,000 hours, representing a 7.2% service reduction.

On June 2, 2010, the Board passed Resolution 10-030, approving the August 2010 Service Reductions Plan for Special Transit Service Districts One and Two, effective August 2010, pending receipt of a Title VI Disparate Impacts Study. Part of the decision making process includes a Title VI analysis to assess how the August 2010 Service Reductions Plan will affect minority and/or low income rider populations, as well as to determine if any of the service changes result in disproportionately high and adverse effects on minority and/or low income populations within the District.

## II. TITLE VI BACKGROUND

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Title VI of the Civil Rights Act of 1964, Section 601 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.”

It is AC Transit’s responsibility to ensure that all transit service and access to its facilities is equitably distributed and provided without regard to race, color, or national origin. It is also the goal of AC Transit to ensure equal opportunities to all persons without regard to race, color, or national origin to participate in all local, subregional and regional transit planning and decision-making processes under the District’s control.

According to the Federal Department of Transportation, equity in the provision of transit service is described as "providing equal levels of service to minority and non-minority residents of the urbanized area. Levels of service, in turn, are defined in terms of capital allocation and accessibility."<sup>1</sup> The indices of discrimination that could be monitored for disparate treatment include fare structure or service design that could consistently cause minority-group riders to bear a higher average fare than non-minority group riders.

To codify the Title VI requirements relative to AC Transit, the Board adopted Policy 551 in order to ensure that service decisions would not discriminate against any one community by establishing steps to assess the impacts that service or fare changes may have on minority communities. Consequently, whenever service changes are being planned, Environmental Justice issues are analyzed and considered.

Policy 551 states that a Title VI analysis must occur whenever there is a major service adjustment representing an aggregate change of 25% or more in daily route miles or hours. This analysis should be conducted that uses data and other information to:

- Determine benefits to and potential negative impacts on minority populations from proposed investments or actions.
- Quantify expected effects (total, positive and negative) and disproportionately high and adverse effects on minority populations.
- Determine the appropriate course of action, whether avoidance, minimization, or mitigation.

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<sup>1</sup> Transit Cooperative Research Program, Legal Research Digest: “The Impact of Civil Rights Litigation Under Title VI and Related Laws on Transit Decision Making”, TCRP Project J-5, Washington, D.C. June 1997

### III. METHODOLOGY AND DATA SOURCES

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District staff utilized three (3) main sources of data and analysis for the Title VI analysis, which will be described further in this document:

- U.S. Bureau of the Census, Census 2000, Summary Files.
- Spring/Fall 2010 ***Transit Service Intensity Analysis*** representing frequencies, daily trips and routes for all census tracts within the District.
- Spring/Fall 2010 ***Transit Service Quality Analysis***, which indicates travel distance, time and cost averages derived from a Select Link Analysis that compares a variety of metrics between minority and non-minority census tracts, and low and non-low income categories. (Attachment B)

Results of these analyses were then forwarded to the District Statistician to determine the thresholds of significance and explain the findings. The Statistician then performed an *independent-samples t-test* on a variety of the data points in the data set. This statistical procedure tests the significance of the difference between sample means. Attachment A presents the Statistician's review of the data.

- **U.S. Bureau of the Census, Census 2000, Summary Files).**

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The 2000 Census represents the most accurate data the District has regarding AC Transit passengers at the census tract level. However, it is important to note that the data is ten years old and will not be updated until the decennial census this year. Despite these limitations, the District utilizes data resulting from the 2000 Census because it provides the most comprehensive demographic data on a micro-level.

Staff established the District's majority minority and non-minority census tracts utilizing Census 2000, Summary File 1 (SF-1). SF-1 contains detailed demographic data for all U.S. households down to the block group level, while P3 represents race and P53 represents income. According to the 2000 Census, the District service area contains 331 census tracts. One hundred fifty-nine census tracts (48%) contain populations with a majority of minority residents, representing just under half of the entire AC Transit service area. Based on this information, the population residing within the AC Transit service district is approximately 56% minority.

Income data is derived from Census 2000, Summary File 3 (SF-3), which presents detailed population and housing data from a one in six sample of households weighted to represent the total population. For income, the Title VI analysis uses the definition of low income that was used in the development of the Revised Service Adjustments Plan, effective March 2010 (RevSAP); that is, less than 80% of the median income of the San Francisco-Oakland-San Jose Consolidated Metropolitan Statistical Area. Of the minority tracts within the service area, about 2/3 are low income and 1/3 are not low income. Of the non-minority tracts about 26% are low income, while 73% of the tracts are not low income.

- **Service Intensity Analysis**

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Staff developed the *Service Intensity Analysis* as a means to capture the changes at a census tract level to determine if the August 2010 Final Service Reductions Plan would result in disparate impacts on minority and/or low income populations within the District.

The Fall/Spring 2010 *Service Intensity Analysis* presents peak/off-peak frequencies, number of daily trips and number of routes for all census tracts within the District. For comparison, staff examined each variable under current and proposed service hours. The average peak/off-peak headways, daily trips and routes were then calculated under current and proposed conditions to determine if any of the service changes result in disproportionately high and adverse effects on minority and/or low income populations within the District.

### **Methodology**

Staff initiated the exercise by setting up templates in Microsoft Excel for the purpose of analyzing two sets of files: route trips originating in minority/non-minority census tracts and low income/non-low income census tracts. As previously noted, the analysis uses the definition of low income that was used in the development of the RevSAP; that is, less than 80% of the median household income of the San Francisco-Oakland-San Jose Consolidated Metropolitan Statistical Area. For identifying minority census tracts, the analysis uses the definition of census tracts with a minority population greater than 56%; that is, greater than the minority population within the AC Transit service area as a whole.

Route data for the Spring/Fall 2010 schedules were obtained from the Title VI Analysis Associated with the 2010 Revised Service Adjustments Plan (GM Memo No. 10-017) and HASTUS scheduling software, respectively. Additionally, staff identified changes in route shape and/or frequency from Spring 2010 service, using the Final Service Reductions Plan for August 2010, as of July 14, 2010. Where a number of variations existed for a route, staff considered these trip patterns separately.

Data were sorted and analyzed by weekday and weekend hours, by service type (local, Owl, and Transbay) and by peak and off-peak service hours. For weekend service, only off-peak service was analyzed as only off-peak service is offered on Saturdays and Sundays. The frequency, number of daily trips, and total routes by census tract sorted into minority and non-minority census tracts, and separately into low/non-low income census tracts. The average peak/off-peak headways, daily trips, and routes were then calculated and compared to Spring 2010 figures to determine if upcoming service changes resulted in disparate impacts on minority and low income populations within the District.

In general, this analysis followed the same process as for the Spring 2010 RevSAP, with the exception that weekend analyses were not conducted in Spring 2010, but were conducted for Fall 2010. Finally, any small errors identified in the Spring 2010 process were noted, assessed and corrected for impact on the analysis

### **Results of Service Intensity Analysis:**

As shown in Tables 1a, 1b, and 1c, the number of average weekday and weekend daily trips on local, Owl and Transbay lines decreases within all census tracts. There appears to be a negative impact on minority riders during the peak and off-peak period for local and Transbay

service. From Spring 2010 to Fall 2010, minority census tracts experience a 7.4% change during the peak period for local weekday service and a 7.7% for weekday Transbay service. During the same period, non-minority census tracts experience a 6.1% change for local service, and no change for Transbay service. By contrast, there appears to be a negative impact for non-minority riders during weekend service. While minority riders experience no change during the off-peak period from Spring 2010 to Fall 2010, non-minority riders experience a change of 2.2%. However, in absolute terms, these disparities amount to a matter of minutes only. As a result, the following factors were highlighted for statistical analysis: average peak/non peak frequency (in minutes) and average daily trips.

### Statistical Results:

Results from the Service Intensity Analysis were forwarded to the District's Statistician, who performed an *independent-samples t-test* to determine the significance of the average peak/non peak frequency and average daily trips for both weekday and weekend periods as well as local and Transbay service. As a result, there were no findings of disparate impacts on minority populations compared with non-minority populations. Additionally, the Statistician reviewed the income data to determine if there were disparities between the low income group and the non-low income group. There were also no findings of disparity within the income category. (See attachment A for Statistical Results)

**Table 1a – Spring/Fall 2010 Service Intensity Comparative Analysis for Weekday Local and Owl Routes**

Weekday Local and Owl						
	Spring 2010 Minority	Fall 2010 Minority	% Change	Spring 2010 Non-Minority	Fall 2010 Non-Minority	% Change
Average Peak (frequency)	27	29	7.4%*	33	35	6.1%*
Average Off-Peak (frequency)	33	35	6.1%*	37	40	8.1%*
Average Daily Trips	408.1	372.3	-8.8%	261.0	234.8	-10.0%
Total Routes	876	883	0.8%	641	679	5.9%
Average Routes	5.6	5.6	-0.5%	3.8	3.9	4.7%

\*While these numbers represent a positive percent change, the value change from Spring to Fall 2010 represents a negative impact on riders.

**Table 1b – Spring/Fall 2010 Service Intensity Comparative Analysis for Weekday Transbay Routes**

Weekday Transbay						
	Spring 2010 Minority	Fall 2010 Minority	% Change	Spring 2010 Non-Minority	Fall 2010 Non-Minority	% Change
Average Peak (frequency)	26	24	-7.7%	24	24	0.0%
Average Off-Peak (frequency)	44	47	6.8%*	50	47	-6.0%
Average Daily Trips	50.6	25.0	-50.5%	39.2	25.9	-33.9%
Total Routes	146	151	3.4%	217	215	-0.9%
Average Routes	1.9	0.9	-49.2%	1.8	1.3	-28.6%

\*While these numbers represent a positive percent change, the value change from Spring to Fall 2010 represents a negative impact on riders.

**Table 1c – Spring/Fall 2010 Service Intensity Comparative Analysis for Weekend All Routes**

<b>Weekend All Routes</b>						
	<b>Spring 2010 Minority</b>	<b>Fall 2010 Minority</b>	<b>% Change</b>	<b>Spring 2010 Non- Minority</b>	<b>Fall 2010 Non- Minority</b>	<b>% Change</b>
<b>Average Off-Peak (frequency)</b>	38	38	0.0%	46	45	-2.2%
<b>Average Daily Trips</b>	288.4	259.8	-9.9%	171.7	155.5	-9.4%
<b>Total Routes</b>	753	796	5.7%	564	556	-1.4%
<b>Average Routes</b>	4.8	5.0	3.6%	3.5	3.2	-6.6%

• **Service Quality Analysis**

Board Policy 551 requires an analysis of accessibility and quality to key destinations within the transit district service area. To determine whether the quality of service is consistent among different user groups and the degree to which transit is responsive to minority needs, the following methodology was used, based on input from the District’s Statistician:

- Five of the most popular destinations were selected for the analysis—Kaiser Hospital (Richmond), University of California Berkeley (Berkeley), Downtown Oakland (Oakland), Chabot College (Hayward), and New Park Mall (Newark)
- 15 minority and 15 non-minority census tracts were randomly generated within the following concentrations: 3 from West County; 6 from Oakland/Berkeley Area; 3 from Alameda/Hayward Area; and, 3 from Fremont/Newark Area. Of those census tracts, the low income percentages were relatively the same between minority and non-minority. These census tracts were then matched to the reasonable destinations.
- An 8:00 a.m. peak arrival time was established for each weekday trip, while a 9:00 a.m. arrival time was established for each weekend trip.
- The most efficient local routes were selected for each trip.

**Methodology:**

In order to conduct the *Service Quality Analysis* provided in Table 2 and Table 3, staff created a trip origin location using the centroid point of the fifteen (15) randomly selected census tracts within the District. Route and walk distance were calculated using GIS software, while walk time was calculated at three miles per hour. While wait time for Spring 2010 daily trips was based on the frequencies presented in the 2009/10 Transit Service Intensity Analysis, the data for Fall 2010 trips were obtained from the Final Service Reductions Plan for August 2010 – As of July 14, 2010. Current vehicle time was based on the regional 511 Trip Planner provided by the Bay Area Metropolitan Transportation Commission (MTC), while proposed vehicle times are based on times using HASTUS scheduling software. The total cost per trip mile is a function of Microsoft Excel. Additionally, the percentages of low income tracts were relatively the same between the minority and non-minority groups. Consequently, the analysis only reviewed the disparity between minority and non-minority status. Detailed analyses of all trips are presented as Attachment B.

### Results of Planning Analysis:

While there were apparent disparities noted in areas such as “Walking Distance” and associated “Walk Time”, as well as “Total Cost per Trip Mile” and “Total Travel Time”, the most prominent disparity is related to average weekday wait time--which is directly related to service frequencies that were adjusted as part of the Final Service Reductions Plan for August 2010. From Spring 2010 to Fall 2010, there was a 1.5%% decrease (15 seconds) in average weekday wait time within minority census tracts, compared to a decrease of 48.8% (15 minutes, 4 seconds) for non-minority riders. By contrast, there was a 2.8% decrease in average weekend wait time within minority census tracts, compared to a 13.6% for non-minority riders. However, in absolute terms, these disparities only amount to a matter of minutes.

Based on the planner’s analysis provided in Table 2 and Table 3, several factors were highlighted and forwarded to the Statistician for an *independent-samples t-test*, to determine if the disparities were significant. These included:

- Total travel time (which is a combination of walk time, wait time and in-vehicle time)
- Wait time (which is calculated at ½ of a headway)
- Cost per trip mile (which is based on Total Cost per Trip and Total Distance)

**Table 2 – Spring/Fall 2010 Weekday Service Quality Analysis Comparison Table**

	Spring 2010 Minority Census Tracts	Fall 2010 Minority Census Tracts	Percent Change (Spring '10 to Fall '10)	Spring 2010 Non-Minority Census Tracts	Fall 2010 Non-Minority Census Tracts	Percent Change (Spring '10 to Fall '10)
Walking Distance (Miles)	0.98	0.87	-11.2%	0.75	0.73	-2.6%
Route Distance (Miles)	6.58	6.61	0.4%	5.60	5.53	-1.2%
Total Distance (Miles)	7.57	7.49	-1.1%	6.35	6.26	-1.4%
Walk Time (Minutes:Seconds)	19:39	17:26	-11.2%	14:56	0:14:33	-2.6%
Wait Time (Minutes:Seconds)	17:44	17:29	-1.5%	30:51	0:15:47	-48.8%
Vehicle Time (Minutes:Seconds)	25:37	26:17	2.6%	22:57	0:21:49	-5.0%
Total Travel Time (Hours:Minutes:Seconds)	1:03:00	1:01:12	-2.9%	1:08:45	0:52:09	-24.1%
Number of Transfers	0.52	0.52	0.0%	0.43	0.38	-11.1%
Total Cost per Trip \$	\$2.13	\$2.13	0.0%	\$2.10	\$2.08	-0.6%
Total Cost per Trip Mile \$	\$0.74	\$0.74	0.5%	\$0.55	\$0.55	0.2%

**Table 3 – Spring/Fall 2010 Weekend Service Quality Analysis Comparison Table**

	Spring 2010 Minority Census Tracts	Fall 2010 Minority Census Tracts	Percent Change (Spring '10 to Fall '10)	Spring 2010 Non-Minority Census Tracts	Fall 2010 Non-Minority Census Tracts	Percent Change (Spring '10 to Fall '10)
Walking Distance (Miles)	1.13	1.15	1.4%	0.80	0.79	-1.0%
Route Distance (Miles)	5.97	6.19	3.6%	4.73	4.76	0.5%
Total Distance (Miles)	7.10	7.33	3.3%	5.53	5.55	0.3%
Walk Time (Minutes:Seconds)	22:40	22:59	1.4%	0:16:00	0:15:50	-1.0%
Wait Time (Minutes:Seconds)	25:36	24:53	-2.8%	0:21:04	0:23:56	13.6%
Vehicle Time (Minutes:Seconds)	26:51	27:20	1.8%	0:21:54	0:22:14	1.5%
Total Travel Time (Hours:Minutes:Seconds)	1:15:08	1:15:12	0.1%	0:58:59	1:02:00	5.1%
Number of Transfers	0.67	0.62	-7.1%	0.48	0.48	0.0%
Total Cost per Trip \$	\$2.33	\$2.24	-4.1%	\$2.20	\$2.20	0.0%
Total Cost per Trip Mile \$	\$0.76	\$0.74	-2.2%	\$0.69	\$0.68	-0.1%

**Result of Statistical Analysis:**

It appears that even though the planner’s analysis suggests that disparate impacts occur in several categories as a result of the August 2010 Service Reductions Plan, the thresholds of significance indicate that the August 2010 Service Reductions Plan does **not** result in disparate impacts. For the minority group (weekday), the average *total travel time* decreased 1.80 minutes, *wait time* increased 0.26 minutes, and *cost per trip mile* stayed the same. For weekend service, changes from Spring 2010 to Fall 2010 remained relatively similar for both minority and non-minority groups. A standard statistical t-test was conducted and showed that the changes in mean differences for both minority and non-minority groups from the 2009 to 2010 data were not significant (see Attachment A).

• **Summary and Mitigation:**

It is a testament to careful planning that the August 2010 Service Reductions Plan did not generate any disparate impacts between minority and non-minority areas, nor between low income and non-low income groups. As such, no changes or mitigations to the August 2010 Service Reductions Plan are required.

## Attachment A:

### Title VI Statistical Analysis – Spring/Fall 2010

#### Summary of Analysis:

The following analysis compares minority/non-minority tract data on the following factors: travel time, wait time, cost per trip mile, average peak/non-peak (frequency in minutes), and average daily trips. Significance testing was also conducted to compare low-income/non-low income groups. An *independent-samples t-test* was the selected method to conduct this analysis. This statistical procedure tests the significance of the difference between sample means. Each of the analyses consists of descriptive statistics, significance test results, followed by a brief summary of results. The analyses are detailed in the following order:

#### ~Transit Service Quality Analysis

*Total Travel Time, Wait Time, Cost Per Trip Mile*

- Minority Group (Fall 2010/Spring 2010)
- Non-Minority Group (Fall 2010/Spring 2010)
- Minority/Non-Minority group (Fall 2010)

#### ~Transit Service Intensity

*Average Peak, Off-Peak, Daily Trips*

- Weekday (Local & Owl)
- Weekday (Transbay)
- Weekend (All routes)
- Low-income/Non-low income (Weekday: Local & Owl, Transbay; Weekend: all routes)

A significant difference suggests a disparity may exist, while no significant differences suggests that actual differences are likely due to chance. A disparate impact exists when the mean differences are significant and also negatively impacts the affected group (minority/low-income group). Overall, there were no disparate impacts on the minority or low-income group when assessed on the above criteria.

## Minority Group (Fall 2010/Spring 2010)

### Group Statistics

Minority Group		N	Mean	Std. Deviation	Std. Error Mean
Total Travel Time (min)	Spring 2010	21	63.0012	35.80458	7.81320
	Fall 2010	21	61.1967	32.09506	7.00372
Wait Time (min)	Spring 2010	21	17.7381	9.50081	2.07325
	Fall 2010	21	17.4762	8.91835	1.94614
Cost Per Trip Mile (\$)	Spring 2010	21	.7343	.7343	1.15164
	Fall 2010	21	.7376	1.15863	.25283

### Independent Samples Test

Assumptions=Equal variances assumed

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Total Travel Time	.377	.543	.172	40	.864	1.80456	10.49277	19.40211	23.01123
Wait Time	.513	.478	.092	40	.927	.26190	2.84356	-5.48514	6.00895
Cost Per Trip Mile	-	-	-.009	39.99	.993	-.00333	.35648	-.72381	.71715

For the minority group (changes from Spring 2010 to Fall 2010), the average total travel time decreased by 1.8 minutes, while wait time (increase of .26 minutes) and cost per trip mile remained relatively the same. The statistical test showed that mean differences when comparing the change in values from Spring 2010 to Fall 2010 were not significant.

## Non-Minority Group (Fall 2010/Spring 2010)

### Group Statistics

Non-Minority Group		N	Mean	Std. Deviation	Std. Error Mean
Total Travel Time (min)	Spring 2010	21	68.7471	90.26630	19.69772
	Fall 2010	21	52.1476	30.09772	6.56786
Wait Time (min)	Spring 2010	20	32.4000	81.06732	18.12720
	Fall 2010	21	15.7857	10.94597	2.38861
Cost Per Trip Mile (\$)	Spring 2010	21	.5471	.56683	.12369
	Fall 2010	21	.5486	.56788	.12392

**Independent Samples Test**

Assumptions=Equal variances assumed

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Total Travel Time	1.689	.201	.799	40	.429	16.59952	20.76384	-25.36576	58.56481
Wait Time	2.771	.104	.931	39	.358	16.61429	17.84783	-19.48635	52.71492
Cost Per Trip Mile	.001	.971	-.008	40	.994	-.00143	.17509	-.35530	.35244

For the non-minority group (changes from Spring 2010 to Fall 2010), the average total travel time decreased by 16.60 minutes, wait time decreased by 16.61 minutes, and cost per trip mile remained relatively the same. While mean differences for total travel time and wait time showed changes of over 16 minutes, the mean value changes were not statistically significant.

**Fall 2010 (Minority/Non-Minority)**

**Group Statistics**

	Minority/Non-Minority	N	Mean	Std. Deviation	Std. Error Mean
Total Travel Time (min)	Minority (Fall 2010)	21	61.1967	32.09506	7.00372
	Non-Minority (Fall 2010)	21	52.1476	30.09772	6.56786
Wait Time (min)	Minority (Fall 2010)	21	17.4762	8.91835	1.94614
	Non-Minority (Fall 2010)	21	15.7857	10.94597	2.38861
Cost Per Trip Mile (\$)	Minority (Fall 2010)	21	.7376	1.15863	.25283
	Non-Minority (Fall 2010)	21	.5486	.56788	.12392

**Independent Samples Test**

Assumptions=Equal variances assumed

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Total Travel Time	.192	.664	.942	40	.352	9.04905	9.60150	-10.35631	28.45441
Wait Time	.544	.465	.549	40	.586	1.69048	3.08106	-4.53657	7.91753
Cost Per Trip Mile	2.003	.165	.671	40	.506	.18905	.28157	-.38002	.75812

Results for Fall 2010 indicated no significant differences in mean values for the minority group compared to the non-minority group.

Total travel time: Minority (M=61.20, SD=32.10)  
 Non-minority (M=52.15, SD=30.10); t(40)=.942, p=.352  
 Wait time: Minority (M=17.48, SD=8.92)  
 Non-minority (M=15.79, SD=10.95); t(40)=.549, p=.586  
 Cost per trip mile: Minority (M=.74, SD=1.16)  
 Non-minority (M=.55, SD=.57); t(40)= .671, p=.506

While there were no significant differences identified, it should be noted that for the non-minority group, the mean travel time and wait time were each reduced by over 16 minutes. This decrease is attributed to the large reduction in the variation of sampled values relative to the small sample (N). In particular, census tract 4412 showed a decrease in the total travel time from 444 minutes (Spring 2010) to 84 minutes (Fall 2010), and wait time decreased from 375 minutes to 30 minutes, thus greatly reducing the overall mean.

### Analysis of Average Peak Minutes, Non-peak Minutes, and Daily Trips

#### Weekday – Local & Owl (Fall 2010)

Group Statistics

Group	N	Mean	Std. Deviation	Std. Error Mean
Average Peak (min) Minority (Weekday - Local & Owl)	156	28.702	10.7401	.8599
Non-Minority (Weekday - Local & Owl)	166	35.249	14.0132	1.0876
Average Off-Peak (min) Minority (Weekday - Local & Owl)	156	34.912	8.8131	.7056
Non-Minority (Weekday - Local & Owl)	166	39.495	11.6717	.9059
Average Daily Trips Minority (Weekday - Local & Owl)	156	379.47	291.031	23.301
Non-Minority (Weekday - Local & Owl)	166	243.34	190.631	14.796

Independent Samples Test

Assumptions=Equal variances not assumed

	t-test for Equality of Means						
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Avg Peak	-4.722	307.744	.000	-6.5476	1.3865	-9.2758	-3.8194
Avg Off-Peak	-3.991	306.032	.000	-4.5824	1.1483	-6.8419	-2.3228
Avg Daily Trips	4.932	264.758	.000	136.131	27.602	81.784	190.478

For **weekday (local & owl)**, mean differences for average peak/off-peak frequency in minutes, and average daily trips were significant. The average peak frequency in minutes was 6.5 minutes greater for non-minority over the minority group, and average off-peak minutes were 4.6 minutes greater for non-minority over the minority group. In addition, on average, there were 136 more daily trips for minority tracts than for non-minority tracts. The significantly greater number of daily trips for the minority tracts helps explain why the mean

differences for peak/non-peak minutes are statistically significant. The greater number of trips for the minority tracts results in more frequent peak and off-peak trips for the minority group. The minority group is not negatively impacted, thus, there is no disparate impact.

**Weekday – Transbay (Fall 2010)**

**Group Statistics**

	Group	N	Mean	Std. Deviation	Std. Error Mean
Average Peak (min)	Minority (Weekday - Transbay)	78	24.420	7.3165	.8284
	Non-Minority (Weekday - Transbay)	121	23.800	6.9614	.6329
Average Off-Peak (min)	Minority (Weekday - Transbay)	37	46.757	34.4040	5.6560
	Non-Minority (Weekday - Transbay)	27	46.667	26.1652	5.0355
Average Daily Trips	Minority (Weekday - Transbay)	78	50.99	31.713	3.591
	Non-Minority (Weekday - Transbay)	121	36.88	33.847	3.077

**Independent Samples Test**

Assumptions=Equal variances assumed\*; equal variances not assumed\*\*

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Avg Peak*	.001	.982	.601	197	.549	.6196	1.0313	-1.4142	2.6534
Avg Off-Peak**	2.183	.145	.012	61.868	.991	.0901	7.5727	-15.0482	15.2284
Avg Daily Trips*	1.307	.254	2.942	197	.004	14.111	4.796	4.653	23.569

For **weekday – Transbay**, no significant differences were identified for average peak or non-peak minutes when comparing minority and non-minority groups. Mean values were relatively similar, showing a difference of 0.62 minutes for average peak minutes, and 0.09 minutes for off-peak minutes. A significant difference was identified for average daily trips. On average, there are 14 more daily trips for the minority group compared to the non-minority group.

## Weekend – All routes (Fall 2010)

### Group Statistics

Group	N	Mean	Std. Deviation	Std. Error Mean
Average Off-Peak (min) Minority (Weekend - all routes)	155	38.102	8.6727	.6966
Non-Minority (Weekend - all routes)	156	44.568	11.6352	.9316
Average Daily Trips Minority (Weekend - all routes)	155	266.54	223.876	17.982
Non-Minority (Weekend - all routes)	156	171.42	136.642	10.940

\*Average Peak (min) N/A

### Independent Samples Test

Assumptions=Equal variances not assumed; Avg Peak data N/A

	t-test for Equality of Means						
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Avg Off-Peak	-5.559	286.612	.000	-6.4664	1.1632	-8.7559	-4.1768
Avg Daily Trips	4.519	254.463	.000	95.119	21.049	53.667	136.571

For **weekend routes**, significant differences were identified for off-peak minutes and for daily total trips. Off-peak minutes were 6.5 minutes greater for non-minority tracts than for minority tracts. There were 95 more daily trips for minority tracts than for non-minority tracts. There is no disparate impact.

## Low-income/Non Low-income analysis

### Weekday - Local & Owl Routes (Fall 2010)

#### Group Statistics

Income Group	N	Mean	Std. Deviation	Std. Error Mean
Peak Average (min) Weekday – Local & Owl (Low Income)	151	26.87	11.274	.917
Weekday – Local & Owl (Non-Low Income)	171	36.67	12.595	.963
Off-Peak Average (min) Weekday – Local & Owl (Low Income)	151	34.13	8.572	.698
Weekday – Local & Owl (Non-Low Income)	171	40.06	11.470	.877
Daily Trips Weekday – Local & Owl (Low Income)	151	427.66	293.508	23.885
Weekday – Local & Owl (Non-Low Income)	173	203.69	149.639	11.377

**Independent Samples Test**

Assumptions=Equal variances not assumed

	t-test for Equality of Means						
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Peak Average	-7.365	319.937	.000	-9.797	1.330	-12.414	-7.180
Off-Peak Average	-5.290	311.723	.000	-5.929	1.121	-8.134	-3.724
Daily Trips	8.466	216.083	.000	223.974	26.456	171.829	276.120

For **weekday – local and owl routes**, significant differences were identified when comparing low-income/non-low income groups on average peak/off-peak minutes, and average daily trips. On average, the low-income group boarded 9.8 minutes more frequently during peak time, and 5.9 minutes more frequently during off-peak time, compared to the non-low income group. There is an average of 223 more daily trips for the low-income group compared to the non-low income group.

The changes in mean differences from Spring 2010 to Fall 2010 are shown below:

Peak Average:	Low income	Fall 2010 (M=26.87, SD=11.27) Spring 2010 (M=25.31, SD=10.17); t(300)=1.27, p=.206
	Non-low income	Fall 2010 (M=36.67, SD=12.60) Spring 2010 (M=33.85, SD=11.48); t(339)=2.16, p=.032*
Off-Peak Average:	Low income	Fall 2010 (M=34.13, SD=8.57) Spring 2010 (M=33.16, SD=7.33); t(300)=1.05, p=.294
	Non-low income	Fall 2010 (M=40.06, SD=11.47) Spring 2010 (M=37.46, SD=10.60), t(341)=2.17, p=.031*
Daily Trips:	Low income	Fall 2010 (M=427.66, SD=293.51) Spring 2010 (M=460.07, SD=307.27); t(300)=1.05, p=.349
	Non-low income	Fall 2010 (M=203.69, SD=149.64) Spring 2010 (M=225.35, SD=160.63); t(343)=-1.30, p=.196

**Weekday – Transbay (Fall 2010)**

**Group Statistics**

Weekday	Income Group	N	Mean	Std. Deviation	Std. Error Mean
Peak Average (min)	Low Income (Transbay)	82	21.81	6.608	.730
	Non-Low Income (Transbay)	117	25.61	7.022	.649
Off-Peak Average (min)	Low Income (Transbay)	42	40.00	22.524	3.475
	Non-Low Income (Transbay)	22	59.55	40.294	8.591
Daily Trips	Low Income (Transbay)	82	53.12	32.912	3.635
	Non-Low income (Transbay)	117	34.90	32.244	2.981

**Independent Samples Test**

Assumptions=Equal variances assumed\*; equal variances not assumed\*\*

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Avg Peak*	1.239	.267	-3.854	197	.000	-3.805	.987	-5.752	-1.858
Avg Off-Peak**	-	-	-2.109	28.052	.044	-19.545	9.267	-38.527	-.564
Avg Daily Trips**	-	-	3.877	172.212	.000	18.225	4.701	8.946	27.503

For **weekday – Transbay**, results indicate there is a significant difference between low-income and non low-income groups for average peak minutes, average non-peak minutes, and average daily trips. Average peak minutes are 3.8 minutes lower for low income group; average off-peak minutes are 19.5 minutes lower for low-income group; there is an average of 18.2 more daily trips for low income groups over non-low-income groups. The low-income group is not negatively impacted given the mean differences, thus, there is no disparate impact.

The change in mean differences from Spring 2010 to Fall 2010 are shown below:

Peak Average:	Low income	Fall 2010 (M=21.81, SD=6.61) Spring 2010 (M=23.17, SD=6.98); t(162)=-1.28, p=.201
	Non-low income	Fall 2010 (M=25.61, SD=7.02) Spring 2010 (M=25.96, SD=6.78); t(233)=-.39, p=.696
Off-Peak Average:	Low income	Fall 2010 (M=40.00, SD=22.52) Spring 2010 (M=40.00, SD=22.52); t(82)=.00, p=1.00
	Non-low income	Fall 2010 (M=59.55, SD=40.294) Spring 2010 (M=59.55, SD=40.294), t(42)=.00,p=1.00
Daily Trips:	Low income	Fall 2010 (M=53.12, SD=32.91) Spring 2010 (M=55.02, SD=31.295); t(162)=-.379, p=..705
	Non-low income	Fall 2010 (M=34.90, SD=32.34) Spring 2010 (M=35.65, SD=29.55); t(234)=-.186, p=.852

## Weekend (all routes) Fall 2010

### Group Statistics

Income Group		N	Mean	Std. Deviation	Std. Error Mean
Off-Peak Average (min)	Weekend - all routes (Low Income)	151	38.38	8.436	.686
	Weekend - all routes (Non-Low Income)	160	44.15	11.910	.942
Daily Trips	Weekend - all routes (Low Income)	151	309.97	215.867	17.567
	Weekend - all routes (Non-Low Income)	160	132.81	108.969	8.615

\*Peak Average N/A for weekend

### Independent Samples Test

Assumptions=Equal variances not assumed

	t-test for Equality of Means						
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Off-Peak Average (min)	-4.955	287.004	.000	-5.774	1.165	-8.067	-3.480
Daily Trips	9.055	218.879	.000	177.161	19.566	138.599	215.722

For **Fall 2010 weekend routes**, results indicate significant differences in mean values when comparing low-income with non-low income groups for average off-peak minutes and number of daily trips. The average off-peak frequency is 5.77 minutes longer for non-low income group than for the low-income group. The low-income group also received 177 more daily trips on average. The change in mean differences from Spring 2010 to Fall 2010 are shown below:

Off-Peak Average:	Low income	Fall 2010 (M=38.38, SD=8.44) Spring 2010 (M=38.40, SD=10.37); t(295)=-.027, p=.979
	Non-low income	Fall 2010 (M=44.15, SD=11.91) Spring 2010 (M=45.55, SD=11.87); t(318)=-1.05, p=.294
Daily Trips:	Low income	Fall 2010 (M=310, SD=215.88) Spring 2010 (M=290, SD=236.43); t(304)=.765, p=.445
	Non-low income	Fall 2010 (M=132.81, SD=108.97) Spring 2010 (M=174.09, SD=136.93); t(303)=-2.98, p=.003*

While the mean differences are significant (Fall 2010 low income/non-low income), the low-income group benefits from more frequent off-peak service and greater number of daily trips compared to the non-low income group, thus no disparate impact exists.

**Attachment B**

**Spring 2010 Weekday Service Quality Analysis - Minority**

Origin Destination Analysis Minority Census Tracts	Kaiser Permanente, Richmond, CA			Downtown Oakland, Oakland, CA						University California Berkeley, Berkeley, CA						Chabot College, Hayward, CA			Newpark Mall, Newark, CA			Average
	Tract ID	3690.01	3671.00	3790.00	4018	4031.00	4065	4090.00	4100.00	4240.02	4018.00	4031.00	4065.00	4090.00	4100.00	4240.02	4325.00	4340.00	4373.00	4403.08	4413.01	
Spring 2010 Weekday Route ID	70	72, 71	76	26*	51A	14*	73, 1R	46, 1R	72	26*, 1R	1R	40, 1R	73, 1R	46, 1R	88, 51B	85, 97	99, 97	97	232	232	217, 242	
Walking Distance (Miles)	0.65	0.38	0.68	0.13	0.25	0.42	0.97	2.64	0.34	0.65	0.74	0.99	1.41	3.09	0.38	1.17	0.51	0.72	0.75	2.39	1.36	0.98
Route Distance (Miles)	2.32	5.50	0.43	1.82	0.13	3.71	8.74	8.82	3.56	12.21	4.76	8.01	19.77	20.36	2.90	7.36	5.90	0.37	8.32	7.42	5.85	6.58
Total Distance (Miles)	2.98	5.87	1.12	1.95	0.38	4.13	9.71	11.47	3.90	12.86	5.49	9.00	21.18	23.45	3.28	8.53	6.40	1.09	9.07	9.80	7.21	7.57
Walk Time (Minutes)	0:13:04	0:07:31	0:13:41	0:02:35	0:04:55	0:08:28	0:19:22	0:52:54	0:06:49	0:12:57	0:14:42	0:19:49	0:28:17	1:01:49	0:07:37	0:23:29	0:10:06	0:14:25	0:15:02	0:47:44	0:27:17	0:19:39
Wait Time (Minutes)*	0:15:00	0:30:00	0:15:00	0:07:30	0:04:00	0:07:30	0:13:30	0:21:00	0:15:00	0:13:30	0:06:00	0:11:00	0:21:00	0:21:00	0:14:00	0:37:30	0:22:30	0:07:30	0:30:00	0:30:00	0:30:00	0:17:44
Vehicle Time (Minutes)	0:13:00	0:21:00	0:02:00	0:09:00	0:01:00	0:21:00	0:43:00	0:43:00	0:20:00	0:29:00	0:21:00	0:37:00	1:05:00	1:01:00	0:15:00	0:29:00	0:23:00	0:01:00	0:31:00	0:28:00	0:25:00	0:25:37
Total Travel Time (Minutes)*	0:41:04	0:58:31	0:30:41	0:19:05	0:09:55	0:36:58	1:15:52	1:56:54	0:41:49	0:55:27	0:41:42	1:07:49	1:54:17	2:23:49	0:36:37	1:29:59	0:55:36	0:22:55	1:16:02	1:45:44	1:22:17	1:03:00
Walk Time (Minutes)	13.06	7.51	13.68	2.58	4.92	8.46	19.36	52.90	6.82	12.94	14.70	19.83	28.29	61.82	7.61	23.49	10.11	14.42	15.03	47.73	27.28	19.64
Wait Time (Minutes)*	15.00	30.00	15.00	7.50	4.00	7.50	13.50	21.00	15.00	13.50	6.00	11.00	21.00	21.00	14.00	37.50	22.50	7.50	30.00	30.00	30.00	17.74
Vehicle Time (Minutes)	13	21	2	9	1	21	43	43	20	29	21	37	65	61	15	29	23	1	31	28	25	25.62
Total Travel Time (Minutes)*	41.06	58.51	30.68	19.08	9.92	36.96	75.86	116.90	41.82	55.44	41.70	67.83	114.29	143.82	36.61	89.99	55.61	22.92	76.03	105.73	82.28	63.00
Number of Transfers	0	1	0	0	0	0	1	1	0	1	0	1	1	1	1	1	1	0	0	0	1	0.52
Total Cost per Trip \$	\$2.00	\$2.25	\$2.00	\$2.00	\$2.00	\$2.00	\$2.25	\$2.25	\$2.00	\$2.25	\$2.00	\$2.25	\$2.25	\$2.25	\$2.25	\$2.25	\$2.25	\$2.00	\$2.00	\$2.00	\$2.25	\$2.13
Total Cost per Trip Mile \$	\$0.67	\$0.38	\$1.79	\$1.02	\$5.29	\$0.48	\$0.23	\$0.20	\$0.51	\$0.17	\$0.36	\$0.25	\$0.11	\$0.10	\$0.69	\$0.26	\$0.35	\$1.83	\$0.22	\$0.20	\$0.31	\$0.74

\*Source: Title VI Spring 2010 (RevSAP)

**Attachment B**

**Spring 2010 Weekday Service Quality Analysis – Non-Minority**

Origin Destination Analysis Non-Minority Census Tracts	Kaiser Permanente, Richmond, CA				Downtown Oakland, Oakland, CA					University California Berkeley, Berkeley, CA					Chabot College, Hayward, CA			Newpark Mall, Newark, CA			Average	
Tract ID	3902.00	3830.00	3690.02	4032.00	4038.00	4040.00	4217.00	4227.00	4239.01	4032.00	4038.00	4040.00	4217.00	4227.00	4239.01	4272.00	4324.00	4337.00	4412.00	4426.00	4441.00	ALL
Spring 2010 Weekday Route ID	72M	72M	70	72R	58L	51A	18	51B, 51A	18	72R, 1R	57, 1R	51A, 51B	7	None**	18	51A, 1R, 97	89*, 97	93, 97	625***, 212	242	232	
Walking Distance (Miles)	0.58	0.49	4.00	0.12	0.66	0.45	0.06	0.72	0.13	0.40	1.26	0.96	0.90	0.68	1.08	0.74	0.54	0.30	1.10	0.52	0.08	0.75
Route Distance (Miles)	4.82	3.76	3.41	0.63	1.97	1.57	5.99	5.69	3.95	10.63	4.88	3.45	0.81	0.00	4.94	21.75	13.40	7.16	13.51	1.86	3.38	5.60
Total Distance (Miles)	5.40	4.25	7.41	0.75	2.62	2.02	5.98	6.41	4.08	11.03	6.15	4.41	1.71	0.68	6.02	22.49	13.94	7.46	14.62	2.38	3.45	6.35
Walk Time (Minutes)	0:11:40	0:09:42	1:20:00	0:02:22	0:13:08	0:08:57	0:01:12	0:14:19	0:02:40	0:07:55	0:25:18	0:19:07	0:17:59	0:13:30	0:21:39	0:14:46	0:10:48	0:06:04	0:22:06	0:10:27	0:00:02	0:14:56
Wait Time (Minutes)	0:15:00	0:15:00	0:15:00	0:06:00	0:15:00	0:04:00	0:07:30	0:08:00	0:07:30	0:12:00	0:10:00	0:08:00	0:20:00	0:00:00	0:07:30	0:17:30	0:22:30	0:37:30	6:15:00	0:15:00	0:30:00	0:30:51
Vehicle Time (Minutes)	0:22:00	0:17:00	0:17:00	0:03:00	0:10:00	0:10:00	0:31:00	0:34:00	0:20:00	0:23:00	0:24:00	0:37:00	0:11:00	0:00:00	0:06:00	1:27:00	0:44:00	0:24:00	0:47:00	0:06:00	0:09:00	0:22:57
Total Travel Time (Minutes)	0:48:40	0:41:42	1:52:00	0:11:22	0:38:08	0:22:57	0:39:42	0:56:19	0:30:10	0:42:55	0:59:18	1:04:07	0:48:59	0:13:30	0:35:09	1:59:16	1:17:18	1:07:34	7:24:06	0:31:27	0:39:02	1:08:45
Walk Time (Minutes)	11.67	9.70	80.01	2.37	13.13	8.96	1.20	14.31	2.66	7.92	25.29	19.11	17.99	13.50	21.65	14.77	10.80	6.07	22.10	10.45	0.03	14.94
Wait Time (Minutes)	15.00	15.00	15.00	6.00	15.00	4.00	7.50	8.00	7.50	12.00	10.00	8.00	20.00	0.00	7.50	17.50	22.5	37.50	375.00	15.00	30.00	30.86
Vehicle Time (Minutes)	22	17	17	3	10	10	31	34	20	23	24	37	11	0	6	87	44	24	47	6	9	22.95
Total Travel Time (Minutes)	48.67	41.70	112.01	11.37	38.13	22.96	39.70	56.31	30.16	42.92	59.29	64.11	48.99	13.50	35.15	119.27	77.30	67.57	444.10	31.45	39.03	68.75
Number of Transfers	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	2	1	1	1	0	0	0.43
Total Cost per Trip \$	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.25	\$2.00	\$2.25	\$2.25	\$2.25	\$2.00	0	\$2.00	\$4.25	\$2.25	\$2.25	\$2.25	\$2.00	\$2.00	\$2.10
Total Cost per Trip Mile \$	\$0.37	\$0.47	\$0.27	\$2.67	\$0.76	\$0.99	\$0.33	\$0.35	\$0.49	\$0.20	\$0.36	\$0.51	\$1.17	0	\$0.33	\$0.19	\$0.16	\$0.30	\$0.15	\$0.84	\$0.58	\$0.55

\*Source: Title VI Analysis for Spring 2010 (RevSAP)

**Attachment B**

**Spring 2010 Weekend Service Quality Analysis - Minority**

Origin Destination Analysis Minority Census Tracts	Kaiser Permanente, Richmond, CA			Downtown Oakland, Oakland, CA						University California Berkeley, Berkeley, CA						Chabot College, Hayward, CA			Newpark Mall, Newark, CA			Average
Tract ID	3690.01 72, 72M	3671.00 76	3790.00 72M	4018 26	4031.00 51A	4065 40	4090.00 73, 1R	4100.00 57, 18	4240.02 72	4018.00 31, 26, 1	4031.00 1	4065.00 40, 1	4090.00 73, 1	4100.00 57, 1	4240.02 72, 51B	4325.00 89, 97	4340.00 99, 97	4373.00 22	4403.08 332	4413.01 251, 251	4420.00 217, 251	ALL
Route ID																						
Walking Distance (Miles)	0.49	0.21	0.82	0.13	0.25	0.71	2.20	2.29	0.38	1.20	1.11	1.54	2.97	3.08	1.18	0.55	0.30	0.67	0.87	1.20	1.65	1.13
Route Distance (Miles)	4.62	6.26	0.16	1.82	0.13	3.30	10.41	9.51	3.54	5.42	4.67	7.92	14.94	12.57	3.54	10.06	6.11	0.37	8.45	3.62	7.92	5.97
Total Distance (Miles)	5.11	6.47	0.98	1.95	0.39	4.01	12.62	11.80	3.92	6.62	5.78	9.46	17.91	15.65	4.72	10.61	6.41	1.04	9.32	4.82	9.57	7.10
Walk Time (Minutes)	09:47	04:16	16:27	02:35	05:06	14:12	44:03	45:48	07:32	23:57	22:09	30:48	59:28	01:41	23:34	11:01	06:01	13:19	17:26	24:03	32:57	22:40
Wait Time (Minutes)	30:00	15:00	15:00	15:00	10:00	05:00	15:00	17:30	15:00	40:00	10:00	15:00	17:30	17:30	25:00	45:00	45:00	30:00	30:00	00:00	05:00	25:36
Vehicle Time (Minutes)	23:00	28:00	01:00	10:00	01:00	17:00	46:00	43:00	19:00	27:00	01:00	41:00	1:11:00	0:54:00	17:00	45:00	34:00	02:00	29:00	18:00	37:00	26:51
Total Travel Time (Minutes)	02:47	47:16	32:27	27:35	16:06	36:12	1:45:03	1:46:18	41:32	1:30:57	0:33:09	1:26:48	2:27:58	2:13:11	1:05:34	1:41:01	1:25:01	0:45:19	1:16:26	1:42:03	2:14:57	1:15:08
Walk Time (Minutes)	9.78	4.27	16.45	2.58	5.09	14.20	44.05	45.81	7.53	23.96	22.15	30.79	59.46	61.68	23.57	11.02	6.02	13.31	17.43	24.05	32.95	22.67
Wait Time (Minutes)	30.00	15.00	15.00	15.00	10.00	5.00	15.00	17.50	15.00	40.00	10.00	15.00	17.50	17.50	25.00	45.00	45.00	30.00	30.00	60.00	65.00	25.60
Vehicle Time (Minutes)	23	28	1	10	1	17	46	43	19	27	1	41	71	54	17	45	34	2	29	18	37	26.86
Total Travel Time (Minutes)	62.78	47.27	32.45	27.58	16.09	36.20	105.05	106.31	41.53	90.96	33.15	86.79	147.96	133.18	65.57	101.02	85.02	45.31	76.43	102.05	134.95	75.13
Number of Transfers	1	0	0	0	0	0	1	1	0	2	0	1	1	1	1	1	1	0	0	1	2	0.67
Total Cost per Trip \$	\$2.25	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.25	\$2.25	\$2.00	\$4.25	\$2.00	\$2.25	\$2.25	\$2.25	\$2.25	\$2.25	\$2.25	\$2.00	\$2.00	\$2.25	\$4.25	\$2.33
Total Cost per Trip Mile \$	\$0.44	\$0.31	\$2.04	\$1.02	\$5.15	\$0.50	\$0.18	\$0.19	\$0.51	\$0.64	\$0.35	\$0.24	\$0.13	\$0.14	\$0.48	\$0.21	\$0.35	\$1.93	\$0.21	\$0.47	\$0.44	\$0.76

Attachment B

Spring 2010 Weekend Service Quality Analysis – Non-Minority

Origin Destination Analysis Non-Minority Census Tracts	Kaiser Permanente, Richmond, CA			Downtown Oakland, Oakland, CA						University California Berkeley, Berkeley, CA						Chabot College, Hayward, CA			Newpark Mall, Newark, CA			Average
Tract ID	3902.00	3830.00	3690.02	4032.00	4038.00	4040.00	4217.00	4227.00	4239.01	4032.00	4038.00	4040.00	4217.00	4227.00	4239.01	4272.00	4324.00	4337.00	4412.00	4426.00	4441.00	ALL
Spring 2010 Weekend Route ID	72M	72M	72, 72M	51A	57, 18	51A	18	51B, 51A	18	72M, 1	57, 1	57, 1	7, 51B	F	18	20, 40, 97	89, 97	32, 97	332	251	332	
Walking Distance (Miles)	0.68	0.56	1.22	0.42	0.81	0.46	0.08	0.69	0.66	1.19	1.32	1.03	1.20	0.84	1.15	1.04	0.75	0.69	0.62	0.91	0.50	0.80
Route Distance (Miles)	4.76	3.90	4.49	0.30	4.15	1.58	5.96	4.42	3.96	5.11	4.80	0.99	1.41	0.26	0.99	17.76	13.46	6.72	10.23	1.40	2.74	4.73
Total Distance (Miles)	5.44	4.46	5.71	0.72	4.95	2.04	6.03	5.11	4.62	6.30	6.12	2.01	2.61	1.11	2.14	18.80	14.21	7.40	10.85	2.31	3.24	5.53
Walk Time (Minutes)	0:13:32	0:11:15	0:24:29	0:08:20	0:16:07	0:09:14	0:01:32	0:13:51	0:13:13	0:23:44	0:26:24	0:20:30	0:24:03	0:16:52	0:22:57	0:20:50	0:14:59	0:13:45	0:12:20	0:18:14	0:09:57	0:16:00
Wait Time (Minutes)	0:15:00	0:15:00	0:50:00	0:10:00	0:17:30	0:10:00	0:10:00	0:20:00	0:10:00	0:25:00	0:17:30	0:17:30	0:40:00	0:15:00	0:10:00	0:40:00	0:15:00	0:15:00	0:30:00	0:30:00	0:30:00	0:21:04
Vehicle Time (Minutes)	0:24:00	0:20:00	0:23:00	0:02:00	0:18:00	0:10:00	0:28:00	0:26:00	0:17:00	0:27:00	0:22:00	0:17:00	0:10:00	0:01:00	0:05:00	1:17:00	0:50:00	0:30:00	0:35:00	0:09:00	0:09:00	0:21:54
Total Travel Time (Minutes)	0:52:32	0:46:15	1:37:29	0:20:20	0:51:37	0:29:14	0:39:32	0:59:51	0:40:13	1:15:44	1:05:54	0:55:00	1:14:03	0:32:52	0:37:57	2:17:50	1:19:59	0:58:45	1:17:20	0:57:14	0:48:57	0:58:59
Walk Time (Minutes)	13.53	11.24	24.49	8.33	16.12	9.23	1.53	13.85	13.21	23.73	26.40	20.51	24.04	16.86	22.95	20.84	14.99	13.74	12.33	18.23	9.96	16.00
Wait Time (Minutes)	15.00	15.00	50.00	10.00	17.50	10.00	10.00	20.00	10.00	25.00	17.50	17.50	40.00	15.00	10.00	40.00	15	15.00	30.00	30.00	30.00	21.07
Vehicle Time (Minutes)	24	20	23	2	18	10	28	26	17	27	22	17	10	1	5	77	50	30	35	9	9	21.90
Total Travel Time (Minutes)	52.53	46.24	97.49	20.33	51.62	29.23	39.53	59.85	40.21	75.73	65.90	55.01	74.04	32.86	37.95	137.84	79.99	58.74	77.33	57.23	48.96	58.98
Number of Transfers	0	0	0	0	1	0	0	1	0	1	1	1	1	0	0	2	1	1	0	0	0	0.48
Total Cost per Trip \$	\$2.00	\$2.00	\$2.00	\$2.00	\$2.25	\$2.00	\$2.00	\$2.25	\$2.00	\$2.25	\$2.25	\$2.25	\$2.25	2	\$2.00	\$4.25	\$2.25	\$2.25	\$2.00	\$2.00	\$2.00	\$2.20
Total Cost per Trip Mile \$	\$0.37	\$0.45	\$0.35	\$2.79	\$0.45	\$0.98	\$0.33	\$0.44	\$0.43	\$0.36	\$0.37	\$1.12	\$0.86	\$1.81	\$0.93	\$0.23	\$0.16	\$0.30	\$0.18	\$0.87	\$0.62	\$0.69

Attachment B

Fall 2010 Weekday Service Quality Analysis - Minority

Origin Destination Analysis Minority Census Tracts	Kaiser Permanente, Richmond, CA			Downtown Oakland, Oakland, CA					University California Berkeley, Berkeley, CA					Chabot College, Hayward, CA			Newpark Mall, Newark, CA			Average		
Tract ID	3690.01	3671.00	3790.00	4018	4031.00	4065	4090.00	4100.00	4240.02	4018.00	4031.00	4065.00	4090.00	4100.00	4240.02	4325.00	4340.00	4373.00	4403.08	4413.01	4420.00	ALL
Fall 2010 Weekday Route ID	70	72, 71	76	26	51A	14	73, 1R	45, 1R	72	26, 1R	1R	40, 1R	73, 1R	45, 1R	88, 51B	89, 97	99, 97	22	232	251	217, 251	
Walking Distance (Miles)	0.65	0.38	0.68	0.13	0.25	0.42	0.97	2.40	0.34	0.65	0.74	0.99	1.41	2.81	0.38	0.55	0.51	0.65	0.75	1.12	1.53	0.87
Route Distance (Miles)	2.32	5.50	0.43	1.82	0.13	3.71	8.74	8.52	3.56	12.21	4.76	8.01	19.77	13.11	2.90	15.32	5.90	0.37	8.32	7.62	5.85	6.61
Total Distance (Miles)	2.98	5.87	1.12	1.95	0.38	4.13	9.71	10.92	3.90	12.86	5.49	9.00	21.18	15.92	3.28	15.87	6.40	1.02	9.07	8.74	7.39	7.49
Walk Time (Minutes)	13:04	07:31	13:41	02:35	04:55	08:28	19:22	48:01	06:49	12:57	14:42	19:49	28:17	56:09	07:37	11:01	10:06	13:03	15:02	22:22	30:39	17:26
Wait Time (Minutes)	15:00	30:00	15:00	10:00	05:00	07:30	13:30	16:00	15:00	16:00	06:00	11:00	21:00	16:00	15:00	40:00	25:00	15:00	30:00	15:00	30:00	17:29
Vehicle Time (Minutes)	13:00	21:00	02:00	09:00	01:00	21:00	43:00	40:00	20:00	29:00	21:00	37:00	1:05:00	1:00:00	15:00	49:00	23:00	02:00	31:00	25:00	25:00	26:17
Total Travel Time (Minutes)	41:04	58:31	30:41	21:35	10:55	36:58	1:15:52	1:44:01	41:49	0:57:57	0:41:42	1:07:49	1:54:17	2:12:09	0:37:37	1:40:01	0:58:06	0:30:03	1:16:02	1:02:22	1:25:39	1:01:12
Walk Time (Minutes)	13.06	7.51	13.68	2.58	4.92	8.46	19.36	48.01	6.82	12.94	14.70	19.83	28.29	56.15	7.61	11.01	10.11	13.05	15.03	22.36	30.65	17.43
Wait Time (Minutes)	15.00	30.00	15.00	10	5	7.50	13.50	16.00	15.00	16.00	6.00	11.00	21.00	16.00	15.00	40	25.00	15.00	30.00	15.00	30.00	17.48
Vehicle Time (Minutes)	13	21	2	9	1	21	43	40	20	29	21	37	65	60	15	49	23	2	31	25	25	26.29
Total Travel Time (Minutes)	41.06	58.51	30.68	21.58	10.92	36.96	75.86	104.01	41.82	57.94	41.70	67.83	114.29	132.15	37.61	100.01	58.11	30.05	76.03	62.36	85.65	61.20
Number of Transfers	0	1	0	0	0	0	1	1	0	1	0	1	1	1	1	1	1	0	0	0	1	0.52
Total Cost per Trip \$	\$2.00	\$2.25	\$2.00	\$2.00	\$2.00	\$2.00	\$2.25	\$2.25	\$2.00	\$2.25	\$2.00	\$2.25	\$2.25	\$2.25	\$2.25	\$2.25	\$2.25	\$2.00	\$2.00	\$2.00	\$2.25	\$2.13
Total Cost per Trip Mile \$	\$0.67	\$0.38	\$1.79	\$1.02	\$5.29	\$0.48	\$0.23	\$0.21	\$0.51	\$0.17	\$0.36	\$0.25	\$0.11	\$0.14	\$0.69	\$0.14	\$0.35	\$1.95	\$0.22	\$0.23	\$0.30	\$0.74

**Attachment B**

**Fall 2010 Weekday Service Quality Analysis – Non-Minority**

Origin Destination Analysis Non-Minority Census Tracts	Kaiser Permanente, Richmond, CA			Downtown Oakland, Oakland, CA						University California Berkeley, Berkeley, CA						Chabot College, Hayward, CA			Newpark Mall, Newark, CA			Average
Tract ID	3902.00	3830.00	3690.02	4032.00	4038.00	4040.00	4217.00	4227.00	4239.01	4032.00	4038.00	4040.00	4217.00	4227.00	4239.01	4272.00	4324.00	4337.00	4412.00	4426.00	4441.00	ALL
Fall 2010 Weekday Route ID	72M	72M	70	72R	12	51A	18	51B, 51A	18	72R, 1R	57, 1R	57, 1R	7	F	18	51A, 1R, 97	89, 97	93, 97	232	242	232	
Walking Distance (Miles)	0.58	0.49	4.00	0.12	0.32	0.45	0.06	0.72	0.13	0.40	1.26	1.07	0.90	0.68	1.08	0.74	0.60	0.30	0.85	0.52	0.08	0.73
Route Distance (Miles)	4.82	3.76	3.41	0.63	2.13	1.57	5.99	5.69	3.95	10.63	4.88	3.79	0.81	0.00	4.94	21.75	13.44	7.16	11.51	1.86	3.38	5.53
Total Distance (Miles)	5.40	4.25	7.41	0.75	2.45	2.02	5.98	6.41	4.08	11.03	6.15	4.86	1.71	0.68	6.02	22.49	14.04	7.46	12.36	2.38	3.45	6.26
Walk Time (Minutes)	0:11:40	0:09:42	1:20:00	0:02:22	0:06:30	0:08:57	0:01:12	0:14:19	0:02:40	0:07:55	0:25:18	0:21:27	0:17:59	0:13:30	0:21:39	0:14:46	0:12:02	0:06:04	0:17:04	0:10:27	0:00:02	0:14:33
Wait Time (Minutes)	0:15:00	0:15:00	0:15:00	0:06:00	0:10:00	0:05:00	0:07:30	0:10:00	0:07:30	0:12:00	0:11:30	0:13:30	0:20:00	0:00:00	0:07:30	0:21:00	0:40:00	0:40:00	0:30:00	0:15:00	0:30:00	0:15:47
Vehicle Time (Minutes)	0:22:00	0:17:00	0:17:00	0:03:00	0:14:00	0:10:00	0:31:00	0:34:00	0:20:00	0:23:00	0:24:00	0:19:00	0:11:00	0:00:00	0:06:00	1:27:00	0:44:00	0:24:00	0:37:00	0:06:00	0:09:00	0:21:49
Total Travel Time (Minutes)	0:48:40	0:41:42	1:52:00	0:11:22	0:30:30	0:23:57	0:39:42	0:58:19	0:30:10	0:42:55	1:00:48	0:53:57	0:48:59	0:13:30	0:35:09	2:02:46	1:36:02	1:10:04	1:24:04	0:31:27	0:39:02	0:52:09
Walk Time (Minutes)	11.67	9.70	80.01	2.37	6.50	8.96	1.20	14.31	2.66	7.92	25.29	21.44	17.99	13.50	21.65	14.77	12.04	6.07	17.07	10.45	0.03	14.55
Wait Time (Minutes)	15.00	15.00	15.00	6.00	10.00	5.00	7.50	10.00	7.50	12.00	11.50	13.50	20.00	0.00	7.50	21.00	40	40.00	30.00	15.00	30.00	15.79
Vehicle Time (Minutes)	22	17	17	3	14	10	31	34	20	23	24	19	11	0	6	87	44	24	37	6	9	21.81
Total Travel Time (Minutes)	48.67	41.70	112.01	11.37	30.50	23.96	39.70	58.31	30.16	42.92	60.79	53.94	48.99	13.50	35.15	122.77	96.04	70.07	84.07	31.45	39.03	52.15
Number of Transfers	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	2	1	1	0	0	0	0.38
Total Cost per Trip \$	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.25	\$2.00	\$2.25	\$2.25	\$2.25	\$2.00	0	\$2.00	\$4.25	\$2.25	\$2.25	\$2.00	\$2.00	\$2.00	\$2.08
Total Cost per Trip Mile \$	\$0.37	\$0.47	\$0.27	\$2.67	\$0.82	\$0.99	\$0.33	\$0.35	\$0.49	\$0.20	\$0.37	\$0.46	\$1.17	\$0.00	\$0.33	\$0.19	\$0.16	\$0.30	\$0.16	\$0.84	\$0.58	\$0.55

Attachment B

Fall 2010 Weekend Service Quality Analysis - Minority

Origin Destination Analysis Minority Census Tracts	Kaiser Permanente, Richmond, CA			Downtown Oakland, Oakland, CA						University California Berkeley, Berkeley, CA						Chabot College, Hayward, CA			Newpark Mall, Newark, CA			Average
Tract ID	3690.01 72, 72M	3671.00 76	3790.00 72M	4018 26	4031.00 51A	4065 40	4090.00 73, 1R	4100.00 57, 18	4240.02 72	4018.00 26, 1	4031.00 1	4065.00 40, 1	4090.00 73, 1	4100.00 57, 1	4240.02 72, 51B	4325.00 89, 97	4340.00 99, 97	4373.00 22	4403.08 332	4413.01 251, 251	4420.00 217, 251	ALL
Walking Distance (Miles)	0.49	0.21	0.82	0.13	0.25	0.71	2.20	2.29	0.38	1.52	1.11	1.54	2.97	3.08	1.18	0.55	0.30	0.67	0.87	1.20	1.65	1.15
Route Distance (Miles)	4.62	6.26	0.16	1.82	0.13	3.30	10.41	9.51	3.54	4.72	4.67	7.92	14.94	12.57	3.54	15.32	6.11	0.37	8.45	3.62	7.92	6.19
Total Distance (Miles)	5.11	6.47	0.98	1.95	0.39	4.01	12.62	11.80	3.92	6.24	5.78	9.46	17.91	15.65	4.72	15.87	6.41	1.04	9.32	4.82	9.57	7.33
Walk Time (Minutes)	09:47	04:16	16:27	02:35	05:06	14:12	44:03	45:48	07:32	30:27	22:09	30:48	59:28	01:41	23:34	11:01	06:01	13:19	17:26	24:03	32:57	22:59
Wait Time (Minutes)	30:00	15:00	15:00	15:00	10:00	05:00	15:00	17:30	15:00	25:00	10:00	15:00	17:30	17:30	25:00	45:00	45:00	30:00	30:00	00:00	05:00	24:53
Vehicle Time (Minutes)	23:00	28:00	01:00	10:00	01:00	17:00	46:00	43:00	19:00	33:00	01:00	41:00	1:11:00	0:54:00	17:00	49:00	34:00	02:00	29:00	18:00	37:00	27:20
Total Travel Time (Minutes)	02:47	47:16	32:27	27:35	16:06	36:12	1:45:03	1:46:18	41:32	1:28:27	0:33:09	1:26:48	2:27:58	2:13:11	1:05:34	1:45:01	1:25:01	0:45:19	1:16:26	1:42:03	2:14:57	1:15:12
Walk Time (Minutes)	9.78	4.27	16.45	2.58	5.09	14.20	44.05	45.81	7.53	30.45	22.15	30.79	59.46	61.68	23.57	11.01	6.02	13.31	17.43	24.05	32.95	22.98
Wait Time (Minutes)	30.00	15.00	15.00	15.00	10.00	5.00	15.00	17.50	15.00	25.00	10.00	15.00	17.50	17.50	25.00	45	45.00	30.00	30.00	60.00	65.00	24.88
Vehicle Time (Minutes)	23	28	1	10	1	17	46	43	19	33	1	41	71	54	17	49	34	2	29	18	37	27.33
Total Travel Time (Minutes)	62.78	47.27	32.45	27.58	16.09	36.20	105.05	106.31	41.53	88.45	33.15	86.79	147.96	133.18	65.57	105.01	85.02	45.31	76.43	102.05	134.95	75.20
Number of Transfers	1	0	0	0	0	0	1	1	0	1	0	1	1	1	1	1	1	0	0	1	2	0.62
Total Cost per Trip \$	\$2.25	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.25	\$2.25	\$2.00	\$2.25	\$2.00	\$2.25	\$2.25	\$2.25	\$2.25	\$2.25	\$2.25	\$2.00	\$2.00	\$2.25	\$4.25	\$2.24
Total Cost per Trip Mile \$	\$0.44	\$0.31	\$2.04	\$1.02	\$5.15	\$0.50	\$0.18	\$0.19	\$0.51	\$0.36	\$0.35	\$0.24	\$0.13	\$0.14	\$0.48	\$0.14	\$0.35	\$1.93	\$0.21	\$0.47	\$0.44	\$0.74

**Attachment B**

**Fall 2010 Weekend Service Quality Analysis – Non-Minority**

Origin Destination Analysis Non-Minority Census Tracts	Kaiser Permanente, Richmond, CA				Downtown Oakland, Oakland, CA				University California Berkeley, Berkeley, CA				Chabot College, Hayward, CA			Newpark Mall, Newark, CA			Average			
Tract ID	3902.00	3830.00	3690.02	4032.00	4038.00	4040.00	4217.00	4227.00	4239.01	4032.00	4038.00	4040.00	4217.00	4227.00	4239.01	4272.00	4324.00	4337.00	4412.00	4426.00	4441.00	ALL
Fall 2010 Weekend Route ID	72M	72M	72, 72M	51A	57, 18	51A	18	51B, 51A	18	72M, 1	57, 1	57, 1	7, 51B	F	18	20, 40, 97	89, 97	32, 97	332	251	332	
Walking Distance (Miles)	0.68	0.56	1.22	0.42	0.81	0.46	0.08	0.69	0.66	1.19	1.32	1.03	1.20	0.84	1.15	1.04	0.601921	0.662094	0.62	0.91	0.50	0.79
Route Distance (Miles)	4.76	3.90	4.49	0.30	4.15	1.58	5.96	4.42	3.96	5.11	4.80	0.99	1.41	0.26	0.99	17.76	13.44	7.22	10.23	1.40	2.74	4.76
Total Distance (Miles)	5.44	4.46	5.71	0.72	4.95	2.04	6.03	5.11	4.62	6.30	6.12	2.01	2.61	1.11	2.14	18.80	14.04	7.88	10.85	2.31	3.24	5.55
Walk Time (Minutes)	0:13:32	0:11:15	0:24:29	0:08:20	0:16:07	0:09:14	0:01:32	0:13:51	0:13:13	0:23:44	0:26:24	0:20:30	0:24:03	0:16:52	0:22:57	0:20:50	0:12:02	0:13:15	0:12:20	0:18:14	0:09:57	0:15:50
Wait Time (Minutes)	0:15:00	0:15:00	0:50:00	0:10:00	0:17:30	0:10:00	0:10:00	0:20:00	0:10:00	0:25:00	0:17:30	0:17:30	0:40:00	0:15:00	0:10:00	0:40:00	0:45:00	0:45:00	0:30:00	0:30:00	0:30:00	0:23:56
Vehicle Time (Minutes)	0:24:00	0:20:00	0:23:00	0:02:00	0:18:00	0:10:00	0:28:00	0:26:00	0:17:00	0:27:00	0:22:00	0:17:00	0:10:00	0:01:00	0:05:00	1:17:00	0:54:00	0:33:00	0:35:00	0:09:00	0:09:00	0:22:14
Total Travel Time (Minutes)	0:52:32	0:46:15	1:37:29	0:20:20	0:51:37	0:29:14	0:39:32	0:59:51	0:40:13	1:15:44	1:05:54	0:55:00	1:14:03	0:32:52	0:37:57	2:17:50	1:51:02	1:31:15	1:17:20	0:57:14	0:48:57	1:02:00
Walk Time (Minutes)	13.53	11.24	24.49	8.33	16.12	9.23	1.53	13.85	13.21	23.73	26.40	20.51	24.04	16.86	22.95	20.84	12.04	13.24	12.33	18.23	9.96	15.84
Wait Time (Minutes)	15.00	15.00	50.00	10.00	17.50	10.00	10.00	20.00	10.00	25.00	17.50	17.50	40.00	15.00	10.00	40.00	45	45.00	30.00	30.00	30.00	23.93
Vehicle Time (Minutes)	24	20	23	2	18	10	28	26	17	27	22	17	10	1	5	77	54	33	35	9	9	22.24
Total Travel Time (Minutes)	52.53	46.24	97.49	20.33	51.62	29.23	39.53	59.85	40.21	75.73	65.90	55.01	74.04	32.86	37.95	137.84	111.04	91.24	77.33	57.23	48.96	62.01
Number of Transfers	0	0	0	0	1	0	0	1	0	1	1	1	1	0	0	2	1	1	0	0	0	0.48
Total Cost per Trip \$	\$2.00	\$2.00	\$2.00	\$2.00	\$2.25	\$2.00	\$2.00	\$2.25	\$2.00	\$2.25	\$2.25	\$2.25	\$2.25	2	\$2.00	\$4.25	\$2.25	\$2.25	\$2.00	\$2.00	\$2.00	\$2.20
Total Cost per Trip Mile \$	\$0.37	\$0.45	\$0.35	\$2.79	\$0.45	\$0.98	\$0.33	\$0.44	\$0.43	\$0.36	\$0.37	\$1.12	\$0.86	\$1.81	\$0.93	\$0.23	\$0.16	\$0.29	\$0.18	\$0.87	\$0.62	\$0.68