

Title VI Evaluation of Revised Service Adjustments Plan February 2010

Submitted by

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I. INTRODUCTION

In January 2009, the AC Transit Board of Directors received a report outlining an 18 month financial projection that indicated a \$57 Million deficit by the end of June 2010. Subsequently, the Board adopted Resolution No. 09-037 declaring a Fiscal Emergency for the 2009-2010 fiscal year.

In response to this fiscal crisis, Service Development staff developed the 2009 Draft Service Adjustments Plan (SAP) presented before the Board on June 24, 2009 (GM Memo 09-161). The SAP proposed service reductions, adjustments and re-alignments resulting in the elimination of 15% of the District's Platform hours. A final set of proposals was presented to the Board on August 26, 2009, that included three (3) minor revisions to the original SAP (GM Memo 09-161a). During the development of the SAP, planning staff took great care to consider social equity issues when proposing service elimination, route consolidation or frequency adjustments.

In September 2009, while conducting the public comments process of the SAP, District management began the process to divert funds from a capital project to assist with minimizing the service cut impacts of the SAP (GM Memo 09-228). The Board affirmed its support for the diversion of \$35 Million of Congestion Mitigation/Air Quality (CMAQ) funding from the District's Bus Rapid Transit (BRT) capital project to operating expenses (GM Memo 09-247) on October 28, 2009.

On November 18, 2009, a Revised Service Adjustments Plan (RevSAP) was presented before the Board. The RevSAP is based on the assumption of receipt of these revenues, resulting in only a net 8% service reduction. Generally, the RevSAP calls for the implementation of a new service design, along with all trunk-line service levels at original frequencies and span. Additionally, the span for several lines has been restored, and service to a key regional destination previously proposed for discontinuation has been restored.

Adopted by the Board on December 16 2009, Resolution No. 09-053 approves the Revised Service Adjustments Plan, effective March 2010, pending the receipt of a Title VI Disparate Impacts Study. Part of the decision making process includes a Title VI analysis to assess how the RevSAP will affect minority rider populations, as well as to determine if any of the service changes result in disproportionately high and adverse effects on minority populations within the District.

II. TITLE VI BACKGROUND

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."¹ 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.

¹ 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

Because the RevSAP was a system-wide service restructuring, it is not possible to analyze every frequency or route change by segment within the timeframe allowed. As a result, staff developed several methods to determine disparate impacts.

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.
- The 2009/10 ***Transit Service Intensity Analysis*** representing frequencies, daily trips and routes for all census tracts within the District.
- Transit Service Quality Analysis, which indicates travel distance, time and cost averages derived from the 2009/10 Select Link Analysis. (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).**

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 AC Transit service district is approximately 56% minority.

Income data is derived from Census 2000, Summary file 3. For income, the Title VI analysis used the definition of Low Income that was used in the development of the 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**

Because the RevSap was a system-wide service restructuring, it was not possible to analyze the impacts of every route segment that was proposed for change. As a result, staff developed the *Service Intensity Analysis* as a means to capture the changes at a census tract level to determine if the RevSAP resulted in disparate impacts.

The 2009/10 *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 populations within the District.

Methodology

Staff initiated the exercise by utilizing GIS software to export data into Microsoft Excel for purposes of analyzing two files--minority and non-minority. Staff also completed the analysis for low income and non-low income groups. As previously noted, the analysis used the definition of low income that was used in the development of the RevSAP; that is, less than 80% of the median income of the San Francisco-Oakland-San Jose Consolidated Metropolitan Statistical Area. After the data was divided into minority and non-minority census tracts, data was then further separated by weekday and weekend hours, then into three service type categories (local, Owl and Transbay), two frequency categories (peak and off-peak), number of daily trips, and total routes. For weekend hours, the data was presented collectively, as there is only off-peak service offered on Saturdays and Sundays.

Using GIS software, staff identified each route intersecting with each census tract. Peak and off-peak frequencies for each line were then determined using one of three documents: the District Adopted SAP Workbook, presented and adopted by the Board on December 16, 2009; current timetables for all District routes; and the Maps and Schedules link to the District website. For variations in trip patterns, staff added another column representing separate trip patterns for each line. To determine the number of daily trips for each route, staff then generated a report using HASTUS scheduling software. The average peak/off-peak headways, daily trips and routes were then calculated to determine disparate impacts among riders living within the District's minority census tracts.

Results of Service Intensity Analysis:

As shown in Tables 1a and 1b, the number of average daily trips on local, Owl and Transbay lines decreases within all census tracts. However, there appeared to be a negative impact on minority riders for some service types. For local service, negative impacts are slightly greater for non-minority tracts than for minority tracts. On local and Owl lines, there is only a -3.5% change in average daily trips within minority census tracts, compared to -5.1% in non-minority census tracts. By contrast, there is a -27.0% change in average daily trips for minority riders on Transbay routes, compared to only -17.2% for non-minority passengers.

Additionally, when viewing the peak and non-peak frequency change in Transbay service, there appeared to be disparate impacts between minority and non-minority tracts that required further scrutiny. In the off-peak period, the disparities were more pronounced: minority tracts experienced a 23% decrease, while non-minority tracts experienced only a

10.7% decrease. However, in absolute terms, these disparities amount to a matter of minutes in either period. 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.

Table 1a – 2009/2010 Service Intensity Comparative Analysis for Local and Owl Routes

| Local and Owl | | | | | | |
|------------------------------|------------------|------------------|-------------|-------------------------|-------------------------|-------------|
| | 2009 Minority | 2010 Minority | % Change | 2009 Non Minority | 2010 Non Minority | % Change |
| Average Peak (frequency) | 24:21 | 26:37 | -9.3% | 29:11 | 32:49 | -12.5% |
| Average Off-Peak (frequency) | 31:21 | 33:13 | -6.0% | 35:27 | 37:23 | -5.5% |
| Average Daily Trips | 422.7 | 408.1 | -3.5% | 275.0 | 261.0 | -5.1% |
| Total Routes | 843.0 | 876.0 | 3.9% | 655.0 | 641.0 | -2.1% |
| Average Routes | 5.4 | 5.6 | 3.9% | 3.8 | 3.8 | NC |

Table 1b – 2009/2010 Service Intensity Comparative Analysis for Transbay Routes

| Transbay | | | | | | |
|------------------------------|------------------|------------------|-------------|-------------------------|-------------------------|-------------|
| | 2009 Minority | 2010 Minority | % Change | 2009 Non Minority | 2010 Non Minority | % Change |
| Average Peak (frequency) | 23:02 | 25:57 | -12.7% | 23:48 | 24:01 | -1.0% |
| Average Off-Peak (frequency) | 36:09 | 44:27 | -23.0% | 45:10 | 50:00 | -10.7% |
| Average Daily Trips | 69.3 | 50.6 | -27.0% | 47.4 | 39.2 | -17.2% |
| Total Routes | 138.0 | 146.0 | 5.8% | 220.0 | 217.0 | -1.4% |
| Average Routes | 1.7 | 1.9 | 7.2% | 1.8 | 1.8 | NC |

• **Service Quality Analysis**

The rich data set derived from the 2009/10 Service Intensity Analysis served as the basis for the 2009/10 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, Downtown Oakland, Chabot College, 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 trip.
- The most efficient local routes were selected for each trip.

Methodology:

In order to conduct the *Service Quality Analysis* provided in Table 2, 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. Walk time was calculated at three miles per hour, while wait time was based on the frequencies presented in the 2009/10 Transit Service Intensity Analysis. 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 wait time--which is directly related to service frequencies that were adjusted as part of the RevSAP. From 2009 to 2010, there was a 9.1% increase in average wait time within minority census tracts, compared to a decrease of 1.7% for non-minority riders.

Based on the planner’s analysis provided in Table 2, 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 – 2009/2010 Service Quality Analysis Comparison Table

| | 2009 Minority Census Tracts | 2010 Minority Census Tracts | Percent Change (‘09 to ‘10) | 2009 Non-Minority Census Tracts | 2010 Non-Minority Census Tracts | Percent Change (‘09 to ‘10) |
|-----------------------------|--------------------------------------|--------------------------------------|-----------------------------------|--|--|-----------------------------------|
| Walking Distance (Miles) | 0.84 | 0.98 | 17.4% | 0.72 | 0.75 | 4.9% |
| Route Distance (Miles) | 6.12 | 6.58 | 7.6% | 5.56 | 5.60 | 0.6% |
| Total Distance (Miles) | 6.95 | 7.57 | 8.8% | 6.28 | 6.35 | 1.1% |
| Walk Time (Minutes) | 16:44 | 19:39 | 17.3% | 14:18 | 14:56 | 4.5% |
| Wait Time (Minutes) | 16:16 | 17:44 | 9.1% | 31:24 | 30:51 | -1.7% |
| Vehicle Time (Minutes) | 25:26 | 25:37 | 0.7% | 22:29 | 22:57 | 2.1% |
| Total Travel Time (Minutes) | 58:26 | 1:03:00 | 7.8% | 1:08:11 | 1:08:45 | 0.8% |
| Number of Transfers | 0.57 | 0.52 | -8.3% | 0.48 | 0.43 | -10.0% |
| Total Cost per Trip \$ | \$2.39 | \$2.13 | -10.9% | \$2.29 | \$2.10 | -8.3% |
| Total Cost per Trip Mile \$ | \$0.75 | \$0.74 | -1.5% | \$0.64 | \$0.55 | -14.1% |

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 RevSAP, the thresholds of significance indicate that the RevSAP does **not** result in disparate impacts. For the minority group, the average *total travel time* increased 4.57 minutes, *wait time* increased 1.48 minutes, and *cost per trip mile* stayed relatively the same (decrease of \$0.01). A standard statistical t-test was conducted and showed that the mean differences from the 2009 to 2010 data were not significant. For the non-minority group, the changes in mean values were also very small and were not significant.

• **Summary and Mitigation:**

It is a testament to careful planning that the RevSAP 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 RevSAP are required.

**Title VI
Statistical Analysis**

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. 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. Overall, there were no disparate impacts on the minority group when comparing minority/non-minority groups.

Minority Group 2009/2010

Group Statistics

| Minority/Non-Minority | | N | Mean | Std. Deviation | Std. Error Mean |
|-----------------------|------------------------|----|---------|----------------|-----------------|
| Total Travel Time | Minority (Spring 2010) | 21 | 63.0012 | 35.80458 | 7.81320 |
| | Minority (Winter 2009) | 21 | 58.4271 | 30.86223 | 6.73469 |
| Wait Time | Minority (Spring 2010) | 21 | 17.7381 | 9.50081 | 2.07325 |
| | Minority (Winter 2009) | 21 | 16.2619 | 8.62644 | 1.88244 |
| Cost Per Trip Mile | Minority (Spring 2010) | 21 | .7343 | 1.15164 | .25131 |
| | Minority (Winter 2009) | 21 | .7467 | 1.12680 | .24589 |

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 | .345 | .560 | .443 | 40 | .660 | 4.57408 | 10.31514 | -16.27360 | 25.42176 |
| Wait Time | .854 | .361 | .527 | 40 | .601 | 1.47619 | 2.80035 | -4.18352 | 7.13591 |
| Cost Per Trip Mile | .020 | .887 | -.035 | 40 | .972 | -.01238 | .35159 | -.72297 | .69821 |

For the minority group, the average *total travel time* increased 4.57 minutes, *wait time* increased 1.48 minutes, and *cost per trip mile* stayed relatively the same (decrease of \$0.01). A standard statistical t-test was conducted and showed that the mean differences from the 2009 to 2010 data were not significant.

Non-Minority Group 2009/2010

Group Statistics

| Minority/Non-Minority | | N | Mean | Std. Deviation | Std. Error Mean |
|-----------------------|----------------------------|----|---------|----------------|-----------------|
| Total Travel Time | Non-Minority (Spring 2010) | 21 | 68.7471 | 90.26630 | 19.69772 |
| | Non-Minority (Winter 2009) | 21 | 68.1819 | 90.38046 | 19.72263 |
| Wait Time | Non-Minority (Spring 2010) | 20 | 32.4000 | 81.06732 | 18.12720 |
| | Non-Minority (Winter 2009) | 21 | 31.4048 | 82.58838 | 18.02226 |
| Cost Per Trip Mile | Non-Minority (Spring 2010) | 21 | .5471 | .56683 | .12369 |
| | Non-Minority (Winter 2009) | 21 | .6376 | .64898 | .14162 |

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 | .002 | .963 | .020 | 40 | .984 | .56524 | 27.87441 | -55.77104 | 56.90152 |
| Wait Time | .000 | .999 | .039 | 39 | .969 | .99524 | 25.57353 | -50.73211 | 52.72258 |
| Cost Per Trip Mile | .245 | .624 | -.481 | 40 | .633 | -.09048 | .18803 | -.47050 | .28955 |

For the non-minority group, the changes in mean values were very small. On average, total travel time decreased by 0.56 minutes, wait time increased by 0.99 minutes, and cost per trip mile decreased by \$0.09. The mean differences between the 2009 and 2010 data were not significant.

Analysis of Average peak minutes, non-peak minutes, and daily trips

Weekday – Local & Owl

Group Statistics

| Group | | N | Mean | Std. Deviation | Std. Error Mean |
|-----------------|--------------------------------------|-----|----------|----------------|-----------------|
| Avg Peak | Minority (Weekday - Local & Owl) | 156 | 26.6186 | 9.80393 | .78494 |
| | Non-Minority (Weekday - Local & Owl) | 168 | 32.8220 | 12.38282 | .95536 |
| Avg Off-Peak | Minority (Weekday - Local & Owl) | 157 | 33.2121 | 8.00450 | .63883 |
| | Non-Minority (Weekday - Local & Owl) | 170 | 37.3941 | 10.16772 | .77983 |
| Avg Daily Trips | Minority (Weekday - Local & Owl) | 157 | 408.0892 | 304.74702 | 24.32146 |
| | Non-Minority (Weekday - Local & Owl) | 170 | 261.0412 | 204.46948 | 15.68209 |

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 | -5.017 | 314.271 | .000 | -6.20343 | 1.23646 | -8.63622 | -3.77064 |
| Avg Off-Peak | -4.148 | 317.186 | .000 | -4.18202 | 1.00808 | -6.16539 | -2.19864 |
| Avg Daily Trips | 5.081 | 269.654 | .000 | 147.04800 | 28.93893 | 90.07303 | 204.02297 |

For *weekday (local & owl)*, average peak frequency in minutes were 6.2 minutes greater for non-minority over minority, and average off-peak minutes were 4.2 minutes greater for non-minority over minority. In addition, on average, there were 147 more daily trips for minority tracts than for non-minority. The significantly greater number of 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.

Weekday – Transbay

Group Statistics

| Group | | N | Mean | Std. Deviation | Std. Error Mean |
|-----------------|-----------------------------------|-----|---------|----------------|-----------------|
| Avg Peak | Minority (Weekday - Transbay) | 78 | 25.9474 | 7.17388 | .81228 |
| | Non-Minority (Weekday - Transbay) | 123 | 24.0211 | 6.81301 | .61431 |
| Avg Off-Peak | Minority (Weekday - Transbay) | 36 | 44.4444 | 31.84287 | 5.30714 |
| | Non-Minority (Weekday - Transbay) | 29 | 50.0000 | 29.64071 | 5.50414 |
| Avg Daily Trips | Minority (Weekday - Transbay) | 78 | 50.5513 | 31.82078 | 3.60299 |
| | Non-Minority (Weekday - Transbay) | 123 | 39.5447 | 30.70303 | 2.76840 |

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* | .175 | .676 | 1.914 | 199 | .057 | 1.92630 | 1.00667 | -.05881 | 3.91141 |
| Avg Off-Peak* | .417 | .521 | -.721 | 63 | .474 | -5.55556 | 7.70608 | -20.95492 | 9.84381 |
| Avg Daily Trips** | 4.284 | .040 | 2.442 | 159.638 | .017 | 11.00657 | 4.54374 | 2.03297 | 19.98017 |

For *weekday – Transbay*, no significant differences were identified for average peak or non-peak minutes. Mean values showed a difference of 1.9 minutes for average peak minutes, and 5.6 minutes for off-peak minutes. A significant difference was identified for average daily trips. There are 11 more daily trips for minority tracts than for non-minority.

Weekend – All routes

Group Statistics

| Group | | N | Mean | Std. Deviation | Std. Error Mean |
|-----------------|-------------------------------------|-----|----------|----------------|-----------------|
| Avg Off-Peak | Minority (Weekend - all routes) | 156 | 38.3500 | 10.35457 | .82903 |
| | Non-Minority (Weekend - all routes) | 163 | 45.7515 | 11.86836 | .92960 |
| Avg Daily Trips | Minority (Weekend - all routes) | 156 | 288.3910 | 236.69326 | 18.95063 |
| | Non-Minority (Weekend - all routes) | 163 | 171.6871 | 136.82789 | 10.71719 |

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 | -5.942 | 314.343 | .000 | -7.40153 | 1.24557 | -9.85225 | -4.95082 |
| Avg Daily Trips | 5.360 | 245.932 | .000 | 116.70391 | 21.77118 | 73.82215 | 159.58567 |

For *weekend routes*, significant differences were identified for off-peak minutes and for daily total trips. Off-peak minutes were 7.4 minutes greater for non-minority tracts than for minority. There were 117 more daily trips for minority tracts than for non-minority.

2009/2010 Statistical Analysis: Total Travel Time; Wait Time and Cost per Trip Mile

A standard t-test was conducted for each of the following three variables – 1) Total travel time, 2) Wait Time, and 3) Cost per Trip Mile. These statistical tests compare the mean values for the minority and non-minority tracts to determine if any significant difference exists between the two groups. A significant difference suggests a disparity may exist, while no significant difference suggests that actual differences are likely due to chance. No significant differences were found for any of the variables tested. Results are provided below.

Results for Winter 2009 Analysis

Total travel time (Table 1a, 1b)

There was no significant difference between the mean values for minority (M =58.43, SD=30.86) and non-minority (M=68.18, SD=90.38.) groups; $t(40)=-.468$, $p=.642$.

Wait time (Table 2a, 2b)

There was no significant difference between the mean values for minority (M=16.26, SD=8.63) and non-minority (M=31.40, SD=82.59) groups; $t(40)=-.836$, $p=.408$.

Cost per trip mile (Table 3a, 3b)

There was no significant difference between the mean values for minority (M=.747, SD=1.13) and non-minority (M=.638, SD=.65) groups; $t(40)=.384$, $p=.703$.

Results for Spring 2010 Analysis

Total travel time (Table 4a, 4b)

There was no significant difference between the mean values for minority (M=63.00, SD=35.80), and non-minority (M=68.75, SD=90.27) groups; $t(40)=-.271$, $p=.788$.

Wait time (Table 5a, 5b)

There was no significant difference between the mean values for minority (M=17.74, SD=9.50) and non-minority (M=32.40, SD=81.07) groups; $t(39)=-.823$, $p=.415$.

Cost per trip mile (Table 6a, 6b)

There was no significant difference between the mean values for minority (M=.734, SD=1.15) and non-minority (M=.547, SD=.57) groups; $t(40)=.668$, $p=.508$.

Results – Tables

Winter 2009

Table 1a

| Group Statistics | | | | | |
|-------------------|----------------------------|----|---------|----------------|-----------------|
| | Minority/Non-Minority | N | Mean | Std. Deviation | Std. Error Mean |
| Total Travel Time | Minority (Winter 2009) | 21 | 58.4271 | 30.86223 | 6.73469 |
| | Non-Minority (Winter 2009) | 21 | 68.1819 | 90.38046 | 19.72263 |

Table 1b

| 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 | 1.472 | .232 | -.468 | 40 | .642 | -9.75476 | 20.84079 | -51.87556 | 32.36604 |

Table 2a

| Group Statistics | | | | | |
|------------------|----------------------------|----|---------|----------------|-----------------|
| | Minority/Non-Minority | N | Mean | Std. Deviation | Std. Error Mean |
| Wait Time | Minority (Winter 2009) | 21 | 16.2619 | 8.62644 | 1.88244 |
| | Non-Minority (Winter 2009) | 21 | 31.4048 | 82.58838 | 18.02226 |

Table 2b**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 |
| Wait Time | 3.009 | .091 | -.836 | 40 | .408 | -15.14286 | 18.12031 | -51.76536 | 21.47965 |

Table 3a**Group Statistics**

| | Minority/Non-Minority | N | Mean | Std. Deviation | Std. Error Mean |
|--------------------|----------------------------|----|-------|----------------|-----------------|
| Cost Per Trip Mile | Minority (Winter 2009) | 21 | .7467 | 1.12680 | .24589 |
| | Non-Minority (Winter 2009) | 21 | .6376 | .64898 | .14162 |

Table 3b**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 |
| Cost Per Trip Mile | .771 | .385 | .384 | 40 | .703 | .10905 | .28376 | -.46444 | .68254 |

Spring 2010

Table 4a

| Group Statistics | | | | | |
|-----------------------|----------------------------|----|---------|----------------|-----------------|
| Minority/Non-Minority | | N | Mean | Std. Deviation | Std. Error Mean |
| Total Travel Time | Minority (Spring 2010) | 21 | 63.0012 | 35.80458 | 7.81320 |
| | Non-Minority (Spring 2010) | 21 | 68.7471 | 90.26630 | 19.69772 |

Table 4b

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 | .885 | .352 | -.271 | 40 | .788 | -5.74592 | 21.19071 | -48.57395 |

Table 5a

| Group Statistics | | | | | |
|-----------------------|--------------|----|---------|----------------|-----------------|
| Minority/Non-Minority | | N | Mean | Std. Deviation | Std. Error Mean |
| Wait Time | Minority | 21 | 17.7381 | 9.50081 | 2.07325 |
| | Non-Minority | 20 | 32.4000 | 81.06732 | 18.12720 |

Table 5b**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 |
| Wait Time | 2.843 | .100 | -.823 | 39 | .415 | -14.66190 | 17.80634 | -50.67862 | 21.35481 |

Table 6a**Group Statistics**

| Minority/Non-Minority | | N | Mean | Std. Deviation | Std. Error Mean |
|-----------------------|--------------|----|-------|----------------|-----------------|
| Cost Per Trip Mile | Minority | 21 | .7343 | 1.15164 | .25131 |
| | Non-Minority | 21 | .5471 | .56683 | .12369 |

Table 6b**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 |
| Cost Per Trip Mile | 1.936 | .172 | .668 | 40 | .508 | .18714 | .28010 | -.37896 | .75324 |

2009/2010 Low-income/Non Low-income analysis

Local & Owl Routes

Group Statistics

| Group | | N | Mean | Std. Deviation | Std. Error Mean |
|-----------------|-------------------------------------|-----|----------|----------------|-----------------|
| Avg Peak | Low Income (Local & Owl Routes) | 151 | 25.3086 | 10.16725 | .82740 |
| | Not Low Income (Local & Owl Routes) | 170 | 33.8529 | 11.48025 | .88050 |
| Avg Off-Peak | Low Income (Local & Owl Routes) | 151 | 33.1623 | 7.33067 | .59656 |
| | Not Low Income (Local & Owl Routes) | 172 | 37.4640 | 10.60401 | .80855 |
| Avg Daily Trips | Low Income (Local & Owl Routes) | 151 | 460.0662 | 307.27008 | 25.00528 |
| | Not Low Income (Local & Owl Routes) | 172 | 225.3547 | 160.62836 | 12.24780 |

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 | 3.024 | .083 | -7.021 | 319 | .000 | -8.54433 | 1.21695 | -10.93859 | -6.15007 |
| Avg Off-Peak** | 17.900 | .000 | -4.281 | 305 | .000 | -4.30170 | 1.00481 | -6.27894 | -2.32447 |
| Avg Daily Trips** | 26.679 | .000 | 8.430 | 219 | .000 | 234.71157 | 27.84372 | 179.83635 | 289.58679 |

Results indicate there is a significant difference between low-income and non low-income groups on local and owl routes for average peak minutes, average non-peak minutes, and average daily trips. Average peak minutes are 8.54 minutes lower for low income group; average off-peak minutes are 4.30 minutes lower for low-income group; there is an average of 234 more daily trips for low income groups over non-low-income groups.

Transbay

Group Statistics

| | Group | N | Mean | Std. Deviation | Std. Error Mean |
|-----------------|---------------------------|-----|---------|----------------|-----------------|
| Avg Peak | Low Income (Transbay) | 82 | 23.1683 | 6.98050 | .77087 |
| | Not Low Income (Transbay) | 118 | 25.9636 | 6.78229 | .62436 |
| Avg Off-Peak | Low Income (Transbay) | 42 | 40.0000 | 22.52370 | 3.47548 |
| | Not Low Income (Transbay) | 22 | 59.5455 | 40.29383 | 8.59067 |
| Avg Daily Trips | Low Income (Transbay) | 82 | 55.0244 | 31.29548 | 3.45601 |
| | Not Low Income (Transbay) | 119 | 35.6471 | 29.54703 | 2.70857 |

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* | .314 | .576 | -2.833 | 198 | .005 | -2.79527 | .98684 | -4.74134 | -.84919 |
| Avg Off-Peak** | 11.939 | .001 | -2.109 | 28 | .044 | -19.54545 | 9.26707 | -38.52661 | -.56430 |
| Avg Daily Trips** | 5.937 | .016 | 4.413 | 168 | .000 | 19.37733 | 4.39094 | 10.70867 | 28.04599 |

Results indicate there is a significant difference between low-income and non low-income groups on Transbay routes for average peak minutes, average non-peak minutes, and average daily trips. Average peak minutes are 2.80 minutes lower for low income group; average off-peak minutes are 19.55 minutes lower for low-income group; there is an average of 19.38 more daily trips for low income groups over non-low-income groups.

Attachment B

2009 Service Quality Analysis – Minority Census Tracts

| 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 | 4018.00 | 4031.00 | 4065.00 | 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 |
| Route ID | 70 | 71 | 76 | 13 | 51 | 14 | 50, 56, 1R | 98, 1R | 72 | 19 | 1R | 40, 1R | 50, 56, 1R | 98, 1R | 88, 51 | 55, 85, 97 | 99, 97 | 97 | 232 | 232 | 217, 214 | |
| Walking Distance (Miles) | 0.65 | 0.21 | 0.58 | 0.19 | 0.25 | 0.42 | 1.06 | 1.52 | 0.33 | 0.90 | 0.74 | 0.99 | 0.84 | 1.81 | 0.38 | 0.63 | 0.51 | 0.69 | 0.67 | 2.95 | 1.25 | 0.84 |
| Route Distance (Miles) | 2.32 | 4.59 | 0.88 | 1.81 | 0.13 | 3.71 | 9.19 | 11.30 | 3.57 | 7.74 | 4.76 | 8.01 | 12.57 | 14.79 | 2.90 | 7.95 | 5.90 | 0.37 | 9.98 | 9.20 | 6.78 | 6.12 |
| Total Distance (Miles) | 2.98 | 4.80 | 1.46 | 2.00 | 0.38 | 4.13 | 10.25 | 12.82 | 3.91 | 8.64 | 5.49 | 9.00 | 13.41 | 16.60 | 3.28 | 8.57 | 6.40 | 1.06 | 10.65 | 12.16 | 8.02 | 6.95 |
| Walk Time (Minutes) | 0:13:04 | 0:04:17 | 0:11:36 | 0:03:52 | 0:04:55 | 0:08:28 | 0:21:10 | 0:30:27 | 0:06:40 | 0:18:03 | 0:14:42 | 0:19:49 | 0:16:42 | 0:36:09 | 0:07:37 | 0:12:36 | 0:10:06 | 0:13:46 | 0:13:27 | 0:59:05 | 0:24:56 | 0:16:44 |
| Wait Time (Minutes) | 0:15:00 | 0:15:00 | 0:15:00 | 0:10:00 | 0:04:00 | 0:07:30 | 0:21:00 | 0:21:00 | 0:15:00 | 0:15:00 | 0:06:00 | 0:06:00 | 0:21:00 | 0:21:00 | 0:14:00 | 0:37:30 | 0:15:00 | 0:07:30 | 0:15:00 | 0:30:00 | 0:30:00 | 0:16:16 |
| Vehicle Time (Minutes) | 0:13:00 | 0:19:00 | 0:03:00 | 0:11:00 | 0:01:00 | 0:21:00 | 0:34:00 | 0:41:00 | 0:20:00 | 0:38:00 | 0:21:00 | 0:37:00 | 0:54:00 | 1:01:00 | 0:15:00 | 0:32:00 | 0:23:00 | 0:01:00 | 0:34:00 | 0:31:00 | 0:24:00 | 0:25:26 |
| Total Travel Time (Minutes) | 0:41:04 | 0:38:17 | 0:29:36 | 0:24:52 | 0:09:55 | 0:36:58 | 1:16:10 | 1:32:27 | 0:41:40 | 1:11:03 | 0:41:42 | 1:02:50 | 1:31:42 | 1:58:09 | 0:36:37 | 1:22:06 | 0:48:06 | 0:22:16 | 1:02:27 | 2:00:05 | 1:18:56 | 0:58:26 |
| Walk Time (Minutes) | 13.06 | 4.29 | 11.61 | 3.87 | 4.92 | 8.46 | 21.17 | 30.45 | 6.67 | 18.05 | 14.70 | 19.83 | 16.70 | 36.14 | 7.61 | 12.59 | 10.11 | 13.77 | 13.45 | 59.08 | 24.94 | 16.74 |
| Wait Time (Minutes) | 15 | 15 | 15 | 10 | 4 | 8 | 21 | 21 | 15 | 15 | 6 | 6 | 21 | 21 | 14 | 38 | 15 | 8 | 15 | 30 | 30 | 16.26 |
| Vehicle Time (Minutes) | 13 | 19 | 3 | 11 | 1 | 21 | 34 | 41 | 20 | 38 | 21 | 37 | 54 | 61 | 15 | 32 | 23 | 1 | 34 | 31 | 24 | 25.43 |
| Total Travel Time (Minutes) | 41.06 | 38.29 | 29.61 | 24.87 | 9.92 | 36.96 | 76.17 | 92.45 | 41.67 | 71.05 | 41.70 | 62.83 | 91.70 | 118.14 | 36.61 | 82.09 | 48.11 | 22.27 | 62.45 | 120.08 | 78.94 | 58.43 |
| Number of Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 0.57 |
| Total Cost per Trip \$ | \$2.00 | \$2.00 | \$2.00 | \$2.00 | \$2.00 | \$2.00 | \$4.25 | \$2.25 | \$2.00 | \$2.00 | \$2.00 | \$2.25 | \$4.25 | \$2.25 | \$2.25 | \$4.25 | \$2.25 | \$2.00 | \$2.00 | \$2.00 | \$2.25 | \$2.39 |
| Total Cost per Trip Mile \$ | \$0.67 | \$0.42 | \$1.37 | \$1.00 | \$5.29 | \$0.48 | \$0.41 | \$0.18 | \$0.51 | \$0.23 | \$0.36 | \$0.25 | \$0.32 | \$0.14 | \$0.69 | \$0.50 | \$0.35 | \$1.89 | \$0.18 | \$0.16 | \$0.28 | \$0.75 |

2009 Service Quality Analysis – Non-Minority Census Tracts

| 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 |
| Route ID | 72M | 72M | 70 | 72R | 13 | 51 | 18 | 51 | 18 | 72R, 1R | 57, 51 | 51 | 7 | 7 | 18, 1 | 51, 1R, 97 | 55, 97 | 93, 97 | 625, 212, 214 | 213, 214 | 232 | |
| Walking Distance (Miles) | 0.58 | 0.49 | 4.00 | 0.12 | 0.24 | 0.45 | 0.06 | 0.41 | 0.13 | 0.40 | 1.26 | 0.92 | 0.43 | 0.34 | 0.62 | 0.74 | 0.37 | 0.30 | 1.10 | 1.40 | 0.65 | 0.72 |
| Route Distance (Miles) | 4.82 | 3.76 | 3.41 | 0.63 | 2.43 | 1.57 | 5.99 | 4.64 | 4.06 | 10.63 | 4.88 | 3.16 | 1.55 | 0.56 | 8.82 | 21.75 | 12.22 | 6.14 | 7.03 | 6.03 | 2.76 | 5.56 |
| Total Distance (Miles) | 5.40 | 4.25 | 7.41 | 0.75 | 2.66 | 2.02 | 6.05 | 5.05 | 4.19 | 11.03 | 6.15 | 4.09 | 1.97 | 0.90 | 9.44 | 22.49 | 12.58 | 6.44 | 8.13 | 7.43 | 3.41 | 6.28 |
| Walk Time (Minutes) | 0:11:40 | 0:09:42 | 1:20:00 | 0:02:22 | 0:04:43 | 0:08:57 | 0:01:12 | 0:08:17 | 0:02:40 | 0:07:55 | 0:25:18 | 0:18:26 | 0:08:32 | 0:06:45 | 0:12:23 | 0:14:46 | 0:07:21 | 0:06:04 | 0:22:06 | 0:28:05 | 0:13:03 | 0:14:18 |
| Wait Time (Minutes) | 0:15:00 | 0:15:00 | 0:15:00 | 0:06:00 | 0:10:00 | 0:04:00 | 0:07:30 | 0:04:00 | 0:07:30 | 0:12:00 | 0:12:00 | 0:04:00 | 0:10:00 | 0:10:00 | 0:15:00 | 0:17:30 | 0:22:30 | 0:37:30 | 6:30:00 | 0:30:00 | 0:15:00 | 0:31:24 |
| Vehicle Time (Minutes) | 0:22:00 | 0:17:00 | 0:17:00 | 0:03:00 | 0:14:00 | 0:11:00 | 0:34:00 | 0:28:00 | 0:21:00 | 0:23:00 | 0:24:00 | 0:16:00 | 0:11:00 | 0:03:00 | 0:09:00 | 1:27:00 | 0:42:00 | 0:24:00 | 0:31:00 | 0:26:00 | 0:09:00 | 0:22:29 |
| Total Travel Time (Minutes) | 0:48:40 | 0:41:42 | 1:52:00 | 0:11:22 | 0:28:43 | 0:23:57 | 0:42:42 | 0:40:17 | 0:31:10 | 0:42:55 | 1:01:18 | 0:38:26 | 0:29:32 | 0:19:45 | 0:36:23 | 1:59:16 | 1:11:51 | 1:07:34 | 7:23:06 | 1:24:05 | 0:37:03 | 1:08:11 |
| Walk Time (Minutes) | 11.67 | 9.70 | 80.01 | 2.37 | 4.72 | 8.96 | 1.20 | 8.28 | 2.66 | 7.92 | 25.29 | 18.43 | 8.54 | 6.75 | 12.38 | 14.77 | 7.36 | 6.07 | 22.10 | 28.09 | 13.05 | 14.30 |
| Wait Time (Minutes) | 15.00 | 15.00 | 15.00 | 6.00 | 10.00 | 4.00 | 7.50 | 4.00 | 7.50 | 12.00 | 12.00 | 4.00 | 10.00 | 10.00 | 15.00 | 17.50 | 22.50 | 37.50 | 390.00 | 30.00 | 15.00 | 31.40 |
| Vehicle Time (Minutes) | 22 | 17 | 17 | 3 | 14 | 11 | 34 | 28 | 21 | 23 | 24 | 16 | 11 | 3 | 9 | 87 | 42 | 24 | 31 | 26 | 9 | 22.48 |
| Total Travel Time (Minutes) | 48.67 | 41.70 | 112.01 | 11.37 | 28.72 | 23.96 | 42.70 | 40.28 | 31.16 | 42.92 | 61.29 | 38.43 | 29.54 | 19.75 | 36.38 | 119.27 | 71.86 | 67.57 | 443.10 | 84.09 | 37.05 | 68.18 |
| Number of Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 2 | 1 | 0 | 0.48 |
| Total Cost per Trip \$ | \$2.00 | \$2.00 | \$2.00 | \$2.00 | \$2.00 | \$2.00 | \$2.00 | \$2.00 | \$2.00 | \$2.25 | \$2.25 | \$2.00 | \$2.00 | \$2.00 | \$2.25 | \$4.25 | \$2.25 | \$2.25 | \$4.25 | \$2.25 | \$2.00 | \$2.29 |
| Total Cost per Trip Mile \$ | \$0.37 | \$0.47 | \$0.27 | \$2.67 | \$0.75 | \$0.99 | \$0.33 | \$0.40 | \$0.48 | \$0.20 | \$0.36 | \$0.49 | \$1.01 | \$2.23 | \$0.24 | \$0.19 | \$0.18 | \$0.35 | \$0.52 | \$0.30 | \$0.59 | \$0.64 |

Attachment B

2010 Service Quality Analysis

| 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 |
| Current Route ID | 70 | 71 | 76 | 13 | 51 | 14 | 50, 56, 1R | 98, 1R | 72 | 19 | 1R | 40, 1R | 50, 56, 1R | 98, 1R | 88, 51 | 55, 85, 97 | 99, 97 | 97 | 232 | 232 | 217, 214 | |
| Spring 2010 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 |

*Peak frequencies for trips utilizing Line 14, Line 26 and Line 89 provided by HASTUS. Waiting times for remaining new and re-routed lines provided by Adopted SAP Workbook. For routes that are not all impacted by the RevSAP, waiting and total travel times are based on the 2009/2010 Service Intensity Analysis.

**Attachment B
2010 Service Quality Analysis**

| 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 | |
| Current Route ID | 72M | 72M | 70 | 72R | 13 | 51 | 18 | 51 | 18 | 72R, 1R | 57, 51 | 51 | 7 | 7 | 18, 1 | 51, 1R, 97 | 55, 97 | 93, 97 | | 213, 214 | 232 | |
| Spring 2010 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 |

*Peak frequencies for trips utilizing Line 14, Line 26 and Line 89 provided by HASTUS. Waiting times for remaining new and re-routed lines provided by Adopted SAP Workbook. For routes that are not all impacted by the RevSAP, waiting and total travel times are based on the 2009/2010 Service Intensity Analysis. **Due to re-routing, this trip is no longer accessible by AC Transit. Trip is from 15 Hillside Ct, Berkeley to UCB. ***Line 625 is a school tripper with one bus operating during peak service.