Agenda Item #:_____

Staff Report
City of Manhattan Beach

TO: Honorable Mayor Powell and Members of the City Council

THROUGH: David N. Carmany, City Manager

FROM: Richard Thompson, Director of Community Development
Nhung Madrid, Management Analyst

DATE: June 19, 2012

SUBJECT: Cost Sharing Agreement in the Amount of $18,297 with City of Redondo Beach to Continue Funding Beach Cities Transit Line 109 for Fiscal Year 2012-2013.

RECOMMENDATION:
Staff recommends that the City Council approve the renewal of a one-year cost sharing agreement in the amount of $18,297 for Beach Cities Transit Line 109 for Fiscal Year 2012-2013 with the Cities of Hermosa Beach, El Segundo, and Redondo Beach, contingent upon all Cities participating.

FISCAL IMPLICATION:
Historically, the participating Cities of Redondo Beach, Hermosa Beach and El Segundo have contributed the following amounts (as shown in Table 1) towards the cost sharing agreement for Beach Cities Transit Line 109.

Table 1: Cost Sharing Allocation by City

City	FY 2006-2008 Investment	FY 2008-2010 Investment	FY 2010-2011 Investment	FY 2011-2012 Investment w/o STA*	FY 2011-2012 Investment w/ STA*	FY 2012-2013 Investment
Manhattan Beach	$173,278	$61,217	$27,918	$25,266	$16,664	$18,297
El Segundo	$366,558	$137,010	$66,288	$60,006	$39,578	$43,445
Hermosa Beach	$149,968	$56,844	$18,940	$17,145	$11,308	$12,415
Redondo Beach	$258,832	$116,606	$55,822	$55,043	$36,305	$39,843

*****State Transit Assistance funds

For FY 2011-2012, the City's proportional share of the cost sharing agreement was $25,266. When this agreement was negotiated, Beach Cities Transit (BCT) was not anticipating receiving State Transit Assistance (STA) funds for 2012. However, Beach Cities Transit was recently notified that the State Transit Assistance funds were released by the state which resulted in a credit for all of the participating Cities. To date, the City has paid $12,633.00 for the first and second quarter. Fortunately, State Transit Assistance funds received will result in a credit which will cover the full amount of the third quarter invoice resulting in a savings of $6,316.50. To further reduce the cost, the City exchanged General Fund monies for discounted Proposition A funds (seventy cents on the dollar) to pay for the 2011-2012 BCT Line 109 agreement.

In addition, the FY 2010-2011 agreement has been re-evaluated by Redondo Beach staff and there is an overall cost savings that will also be applied towards Manhattan Beach's FY 2011-2012 final fourth quarter invoice.

As shown in Table 1, Manhattan Beach's investment in Line 109 has significantly decreased since the first agreement in 2006. For Fiscal Year 2012-2013, Manhattan Beach's contribution is $18,297. The approved FY 2012-2013 budget allocates $28,000 for Beach Cities Transit Line 109, which will cover the entire cost associated with this agreement. Even with the service expansion in 2009 and the addition of the Manhattan Village Mall stop, Manhattan Beach's 2013 share is approximately 21% less than our 2006 share. Manhattan Beach staff has requested information from Redondo Beach staff on when they believe Beach Cities Transit will be a self-funded transit line. In response, Redondo Beach has stated that as the economy improves, Beach Cities Transit will receive more transit funds, thus reducing the need for contributions from the participating Cities, but they do not have a timeframe of when Line 109 will be self-funded.

BACKGROUND:

Since 2006, the Cities of El Segundo, Hermosa Beach, Manhattan Beach, and Redondo Beach have participated in a sharing agreement to mutually fund the operating costs incurred by Beach Cities Transit Line 109. This Line included the portion of Line 439 that was discontinued by Metro, as well as other beach area public transportation. The replacement service for Metro 439, which ran along the coastline from the southern terminus in Redondo Beach Riviera Village to the LAX City Bus center, was added to Line 109. The route was 12.7 miles in length and the Cities agreed to share the costs based on the percentage of route miles within each City.

In October 2008, Beach Cities Transit Line 109 experienced a funding shortfall; the anticipated allocations and farebox revenues were not sufficient to compensate for the remaining financial shortfall and the rise in fuel prices. The City Council approved an extension of the cost sharing agreement through June 30, 2010.

In July 2009, Beach Cities Transit expanded the Line 109 service area, adding discontinued portions of Metro routes 124 and 125. This expansion eliminated the route on Vista Del Mar in El Segundo, and re-routed the line, adding service miles along Rosecrans Avenue east to the Douglas Green Line Station, north on Sepulveda to Plaza El Segundo Shopping Center, west on Grand Avenue through downtown El Segundo, and then east on Imperial Highway to the Aviation Green Line Station before arriving at the LAX City Bus Center. This expansion resulted in realignment of the Line, route and frequency changes, and additional service hours to the route. These route

changes resulted in increased route mileage service hours (18.6 miles northbound and 16.3 miles southbound), which were paid for by Redondo Beach without changes to the 2008-2010 cost sharing agreement.

For FY 2010-2011 and FY 2011-2012 the City Council continued their support for Beach Cities Transit Line 109 by approving one-year agreements for the City's proportional share of the operational costs for The Line. The City Council again requested that Redondo Beach provide additional operational statistics to show the benefit of Line 109 service to the community, ridership statistics specific to Manhattan Beach residents, increased outreach efforts, and re-routing Line 109 to service Manhattan Village Mall.

DISCUSSION:

Staff liaisons from all of the participating Cities have met regularly to exchange transit line service data information, share technical expertise, provide updated information regarding service issues, vehicle acquisition, and service marketing and coordinating public outreach efforts.

To meet the City Council's request, Redondo Beach Staff has participated in public outreach events at The Aerospace Corporations' Annual Fall Commuter Fair, Redondo Beach Unified High School, South Bay Cities Council of Governments Annual General Assembly, Redondo Beach Senior Health Fair, Redondo Beach Earth Day at Sea Lab, ads in The Beach Reporter, and at Bike to Work Day. Beach Cities Transit schedule brochures have been made available at City Libraries for El Segundo, Hermosa Beach, Manhattan Beach, Redondo Beach, Torrance and Covina, and at the Los Angeles World Airports, Senior Family Services and Local Chambers of Commerce for the participating Cities. Additional outreach efforts were performed during the Comprehensive Operational Analysis Study as mentioned below.

Manhattan Beach staff also performed outreach and marketing efforts to promote Line 109 through periodic email blasts and news updates on the City's website, distributing flyers and schedule brochures at the public counter at City Hall, and most notably, an informational utility bill insert that went out in February and March 2012 that reached over 14,000 properties Citywide.

Other accomplishments for Beach Cities Transit throughout the year included:

- Placing eight new transit vehicles in service
- Installing security cameras in transit buses
- Installing and implementing bus stop annunciator systems that announce bus stops and destinations on buses for Line 102 and Line 109

In 2011, Redondo Beach completed a Comprehensive Operational Analysis (Exhibit A) for their Beach Cities Transit Program. This Comprehensive Operational Analysis provided a detailed description of the transit system through a substantial data collection effort, gathered service and patronage data, provided a detailed analysis of current ridership and performance measures to understand the strength and weaknesses of the route, obtained ridership demographics and travel information, and provided an overall assessment of potential improvements to the transit network to enhance mobility and efficiency.

As noted, outreach efforts were performed throughout the Comprehensive Operational Analysis study including press releases to local papers announcing the Comprehensive Operational Analysis Study community meetings and request for input, four public community meetings in Redondo Beach and El Segundo to provide study results and receive public input on proposed transit service changes, a public hearing in November 2011 on proposed transit service changes, and an article in Redondo Beach City Newsletter in Winter 2011.

As part of the analysis, on-board personnel gathered ridership data via ride checks, counts, and written surveys by passengers. Through this process, it showed that El Segundo residents make up 16.2% of riders and are the majority of passengers on Line 109. As for the other participating Cities, Redondo Beach residents comprised of 8.1% of riders, Manhattan Beach residents comprised of 4.5% of riders, and Hermosa Beach residents comprised of 3.6% of riders. These statistics show that approximately one third (32.4%) of the total passengers on Line 109 are South Bay residents from the participating Cities. Although Manhattan Beach residents may only make up 4.5% of total ridership on Line 109, they actually account for nearly 14% of the total ridership for the in the South Bay cities, which is an impressive number considering Beach Cities Transit attracts riders from 123 different zip codes. Of equal importance, Line 109 benefits Manhattan Beach residents because many riders use The Line to get to work here in our City. The analysis also provided the following ridership information specific to Manhattan Beach passengers:

Trip Purpose	**Percentage of Manhattan Beach Residents**
Work	31%
Visiting/Personal	31%
Other	19%
Shopping	6%
Restaurants/Bars	6%
NA	6%

The operational analysis provided boarding and alighting statistics specific to all stops within Manhattan Beach. According to the data, the most utilized stops in Manhattan Beach on weekdays and weekends are at Highland Avenue/14th Street, Rosecrans Avenue/Alma Ave, and Rosecrans Avenue/Village Drive. More detailed information about all stops for Line 109 are shown in Exhibit B.

Through the Comprehensive Operational Analysis, the consultant explored four options to re-route Line 109 to service Manhattan Village Mall. Currently, Line 109 travels eastbound along Rosecrans Avenue near the Manhattan Village Mall as it routes to the Douglas Station. The most feasible and cost effective option to re-route The Line to Manhattan Village Mall would be a re-route from Rosecrans Avenue to southbound Village Drive, eastbound on Parkview Avenue and northbound on Market Place, then resuming the existing route at Rosecrans Avenue. This option is a minor re-route which will bring Line 109 adjacent to the Manhattan Village Mall entrance. This re-route will have negligible impacts on costs yet should gain ridership from the senior housing facility, and the commercial businesses along Parkview Avenue, which are both beneficial to our community.

From an operational perspective, this re-route does not require the removal of any parking spaces along Village Drive and will use existing red curb on Parkview Avenue to accommodate the new bus stop. Also, having the bus stop in the right-of-way should be more convenient during the mall project since service will not need to be re-routed, and the bus will also be able to avoid traffic delays associated with the construction within the mall property, thus maintaining acceptable headways without additional delay.

The re-route to Manhattan Village Mall along with all of the other service changes from the Comprehensive Operational Analysis was approved by Redondo Beach's City Council on November 15, 2011. All participating Cities were very supportive of the proposed improvements outlined in the analysis. Redondo Beach staff is in the process of a final implementation plan that includes public noticing, new maps, brochures, signage, and signage installation/removal for the approved service changes. The tentative schedule for public outreach and implementation is outlined below:

Task	**Date**	**Estimated Completion**
Draft development of time schedule and route changes.	January-March	April
Time schedule and route testing; Revise as necessary	April-May	May-June
Bus stop location review: new and discontinued	January- March	June
Redesign of graphics for maps, time schedules, brochures and webpage information	June-July	August
Design Contract	March	August
Production of maps, brochures, webpage	July	August
New bus stop signs: Design, production, installation	June, July	August
Public Noticing of Service Change information and possible public meetings	July-August	August
New start date	Late August 2012	

CONCLUSION:

As requested, Redondo Beach has met the City's request to provide ridership data specific to Manhattan Beach residents, increased marketing and outreach efforts, and is in the process of providing a bus stop at the Manhattan Village Mall. At this time, staff is requesting that City Council approve the renewal of a one-year cost sharing agreement to participate in Beach Cities Transit Line 109, to continue to improve the service and serve the community's residents, businesses, and employers.

If the City chooses not to renew the cost sharing agreement for 2012-2013, Redondo Beach staff would not recommend expanding Line 109 to include the stop at Manhattan Village Mall, and service would remain on its current route on Rosecrans Avenue to Douglas Station. Any additional long-term decisions for Line 109 service through Manhattan Beach would be made at a later date by the Redondo Beach City Council, with the possible consideration of re-routing

Line 109 away from the Manhattan Beach coastline area. These are possible considerations of potential impacts, but ultimately, Redondo Beach's City Council will make the final decision on service if Manhattan Beach chooses not to renew the agreement.

El Segundo will be presenting the renewal agreement to their City Council on June 19th, and Hermosa Beach will be presenting their renewal agreement on June 26th. Redondo Beach is expected to take the agreement to their City Council in July after all Cities have presented the agreements to their respective City Councils.

If approved, staff will continue to work cooperatively with the participating Cities to identify and implement marketing strategies and service modifications as deemed necessary. Staff will also work with Redondo Beach on revising the Terms of the agreement to be consistent with the 2011-2012 agreement. Joyce Rooney, Transit Operations & Transportation Facilities Manager from the City of Redondo Beach will be in attendance at the Council Meeting to make a presentation and to answer any questions that the Council may have regarding Beach Cities Transit Line 109 and the cost sharing agreement.

Exhibits:

A. Comprehensive Operational Analysis Study
B. Beach Cities Transit Line 109 Boarding and Alighting Statistics
C. Cost Sharing Agreement for Beach Cities Transit Fiscal Year 2012-2013
D. Minutes Excerpt from the June 21, 2011 City Council Meeting
E. Beach Cities Transit Route Map

Beach Cities Transit
Comprehensive Operational Analysis

Dan Boyle & Associates, Inc.

August 2011

EXHIBIT A
CC MTG 6-19-12

Beach Cities Transit
2011 Comprehensive Operational Analysis
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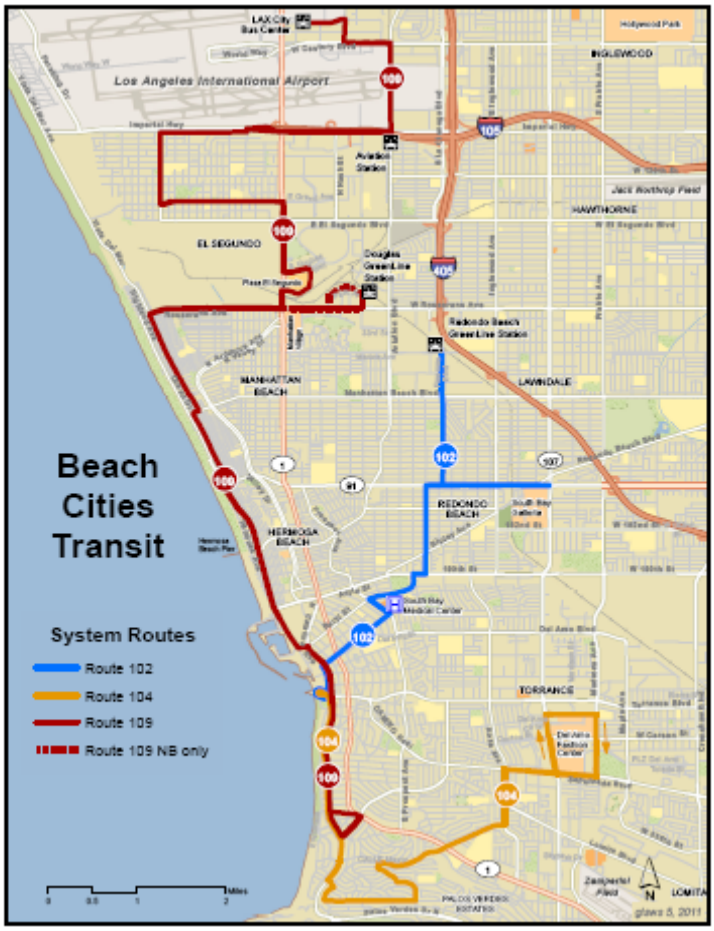
Beach Cities Transit
2011 Comprehensive Operational Analysis
Executive Summary

Beach Cities Transit is the community-based transit system in the South Bay. BCT provides local fixed-route service within the four beach cities: Redondo Beach, Hermosa Beach, Manhattan Beach, and El Segundo. BCT operates three local fixed-route bus lines. BCT's service area extends north to the LAX City Bus Center and south and east to Torrance.

The BCT carries approximately 1,350 riders on a typical weekday when school is in session, 540 riders on Saturday, and 300 riders on Sunday. Figure ES.1 displays a map of the BCT network. The City of Redondo Beach operates the BCT through its service contractor, Transportation Concepts.

Figure ES.1
BCT Network



The beach cities are in a transit-rich environment, served not only by BCT lines but also by services operated by Metro, Torrance Transit, Gardena Municipal Bus Line, Culver City Bus, and Santa Monica Big Blue Bus. Metro is the most important system in terms of regional service coordination because of the sheer volume of Metro service, including three Green Line

stations served by BCT lines. Torrance Transit is also important because BCT connects with five Torrance Transit lines at various locations.

This Comprehensive Operational Analysis of BCT fixed-route transit services has the following objectives:

- Gather current service and patronage data to assist in evaluating current performance and planning future service;
- Assess systemwide operating ridership and performance of BCT fixed routes;
- Conduct a detailed analysis of current ridership and performance measures at the line, line segment, time of day, and day of week levels to understand the strengths and weaknesses of the current system;
- Obtain riders demographics and travel information from an on-board ridership survey to understand who uses the BCT and why;
- Develop a series of recommendations for BCT's transit services.

This executive summary reports findings from the major study tasks and presents the recommended service plan for the BCT transit network.

Findings

Table ES.1 summarizes ridership, service, and performance data by line for weekdays. Productivity is measured as passenger boardings per revenue hour. Cost per passenger is the operating cost divided by the number of passengers.

Table ES.1
Ridership, Service, and Performance Data by Line – Weekday

Line	Ridership	Revenue Hours	Productivity	Cost per Passenger
102	709	34.8	20.4	$2.16
104	46	11.1	4.1	$10.66
109	600	57.3	10.5	$4.21
Total/Average	1,355	103.3	13.1	$3.36

Source: Ridecheck, January 2011; BCT cost per revenue hour for calendar year 2011

Line 102 has the highest weekday ridership and productivity, followed by Line 109. School is a major trip purpose on Line 102, which serves Redondo Union High School. Line 104 has very few riders and extremely low productivity. Total weekday ridership is 1,785 and overall productivity is 13.1.

As a general rule of thumb in assessing service effectiveness by means of passenger boardings per revenue hour, 20 is good for a community route, and anything below 10 is a red flag to examine the line more closely and restructure, reduce span of service or cancel service.

Operating cost per passenger averages $3.36 system-wide. This measure ranges from $2.16 on Line 102 to $10.66 on Line 104. Cost per passenger is inversely correlated with productivity, since the most productive lines require the lowest cost per passenger.

Tables ES.2 and ES.3 provide the same information for Saturday and Sunday service. Ridership is much lower on weekends, with fewer revenue hours of service, lower productivity, and higher cost per passenger. Line 109 has the highest ridership on both Saturday and Sunday, while Line 102 has the highest productivity on both days. Total Saturday ridership is 543, 60 percent lower than weekday ridership. Saturday productivity is 7.1 passenger boardings per revenue hour, 46 percent lower than weekday productivity. Cost per passenger is 85 percent higher on Saturday at $6.22. Line 104 does not operate on Sunday, and Line 102 has a curtailed schedule. Sunday numbers are lower.

Table ES.2
Ridership, Service, and Performance Data by Line – Saturday

Line	Ridership	Revenue Hours	Productivity	Cost per Passenger
102	220	26.3	8.4	$5.27
104	10	7.8	1.3	$34.15
109	313	42.6	7.4	$5.18
Total/Average	543	76.6	7.1	$6.22

Source: Ridecheck, January 2011; BCT cost per revenue hour for calendar year 2011

Table ES.3
Ridership, Service, and Performance Data by Line – Sunday

Line	Ridership	Revenue Hours	Productivity	Cost per Passenger
102	83	10.9	7.6	$5.11
109	220	42.7	5.2	$7.73
Total/Average	303	53.6	5.7	$7.01

Source: Ridecheck, January 2011; BCT cost per revenue hour for calendar year 2011

BCT provides mobility to nearly all transit-oriented neighborhoods within its service area, and others are within an easy walk of Torrance Transit and Metro service. The demographic analysis indicates that there are no major unmet needs.

On-board survey results indicate that expanded routes to new areas are a low priority among riders. Improved frequency is the major improvement sought by existing riders. New, expanded, or changed routes ranked sixth among desired improvements and were cited by only four percent of respondents.

Another way to consider transit system performance is to examine ridership and productivity by line and time of day on weekdays. Table ES.4 presents ridership by line and time of day, and Table ES.5 shows productivity by line and time of day. Morning is defined as 6:00 to 8:59 a.m., midday as 9:00 a.m. to 2:59 p.m., afternoon as 3:00 to 6:59 p.m. and evening as 7:00 p.m. to the end of the service day.

Table ES.4
Weekday Ridership by Line and Time of Day

Line	Morning	Midday	Afternoon	Evening	Total	Percent
102	228	186	292	3	709	52%
104	16	20	10	--	46	3%
109	162	251	155	32	600	44%
Total/Average	406	457	457	35	1,355	100%

Source: Ridecheck, January 2011; percentage totals may not add due to rounding

Ridership is evenly distributed across morning, midday, and afternoon. Line 102 has the highest ridership in the morning and afternoon due to heavy school ridership, while Line 109 leads in the midday and evening. Lines 102 and 109 combined account for 97 percent of all ridership on the BCT system.

Productivity is highest the morning. Line 102 is the most productive line and Line 104 is the least productive at all times of day.

Table ES.5
Weekday Productivity by Line and Time of Day

Line	Morning	Midday	Afternoon	Evening	Total
102	29.6	13.6	24.2	2.1	20.4
104	6.6	3.4	3.5	--	4.1
109	11.9	10.9	9.9	6.3	10.5
Total/Average	17.1	10.7	15.0	5.4	13.1

Source: Ridecheck, January 2011

Table ES.6 shows overall schedule adherence for each line, as measured at each timepoint on each trip. Schedule adherence is defined as no more than one minute early (to allow for minor variations among watches) and no more than five minutes late at a given timepoint along the line. This detailed measure at each timepoint, a more accurate reflection of how riders view on-time performance, usually produces results in the 60 to 70 percent range for most transit agencies.

Table ES.6
BCT Schedule Adherence

Line	Weekday	Saturday	Sunday
102	36.5%	23.9%	79.0%
104	25.0%	63.5%	--
109	65.0%	70.8%	78.5%
Total	**46.3%**	**47.7%**	**78.6%**

Source: Ridecheck Data, January 2011

Weekday schedule adherence is very low, ranging from 25.0 percent on Line 104 Redondo Pier – Torrance to 65.0 percent on Line 109 LAX – Redondo Beach. More crowded and longer lines usually have more difficulty keeping to schedule, so it is surprising that the longest line (Line 109) has the best on-time performance. Weekday schedule adherence is 46.3 percent on all lines.

Schedule adherence is better on weekends, particularly on Sunday. Line 109 has the best schedule adherence on Saturday at 70.8 percent, and Line 102 leads the Sunday lines with 79.0 percent. Overall schedule adherence is 48 percent on Saturday and 79 percent on Sunday.

On-board survey results indicate that BCT riders are using transit primarily for work and school trips: work is the most common trip purpose on weekdays and weekends. Riders are most likely to live in Redondo Beach or El Segundo, although BCT attracts riders from 123 different zip codes. Most riders walk to and from their origin and destination, and many riders transfer to or from other buses or the Metro Green Line.

BCT riders tend to be long-time riders. The number of occasional riders is relatively high. Most riders pay the adult fare, and cash is by far the most common fare payment method. Three-quarters of all respondents report using other transit systems (primarily Metro Bus and Metro Rail) within the past two weeks. Most riders would either walk or take Metro or another bus if BCT were not available, but 11 percent of respondents would not make the trip without BCT.

In terms of demographics, BCT riders are most likely to be female, and to live in households with zero or one car and with incomes under $25,000. Riders are of all ages. The most common ethnicity is Latino, with Latino riders accounting for almost half of all riders.

BCT riders are very pleased with the service. On a scale of one (very poor) to five (excellent), respondents rate BCT service at an average of 4.13, a very high rating. The highest rated items are operator courtesy, personal safety, and cleanliness. Average scores for these three items exceed 4.25. The lowest ratings among all service elements are for frequency (3.41) and reliability (3.51), but even these lowest scores are respectable. Improved frequency and improved on-time performance were the most requested improvements. An analysis of performance versus importance for the eight service attributes indicates that service reliability is the most critical element in terms of needed improvements.

A final task in this study is to provide direction for BCT's future vehicle purchases, with the understanding that BCT is committed to clean-fuel CNG vehicles. Given current and expected future demand on Lines 102 and 109, the recommendation is to purchase 32-foot buses. These provide adequate capacity for peak loads (recognizing that trips at school bell times will always have standees) and preserve the ability to maneuver through the streets within the service area. Larger fuel tanks on new vehicles are recommended. Larger fuel tanks will reduce the need to refuel in the middle of the day. BCT and its contractor are exploring this issue with regard to planned vehicle purchases.

Findings and Recommendations by Line

This section highlights major issues on each line and describes the recommended actions. Schedule adjustments have been proposed for BCT lines to improve on-time performance; the individual segment-level changes are not listed in this executive summary.

The overall goal of the analysis is to provide transit service that will attract additional ridership in a cost-efficient and cost-effective manner. Under this overall goal, objectives include:

1. Establish a clear identity and focus for each line.

2. Provide direct connections to major trip generators and activity centers.

3. Address poorly performing lines segments with low ridership and productivity.

4. Define consistent, realistic schedules for each line. Minimize route deviations by operating via a single route path as much as possible. Where possible, use clockface headways (which result in the bus arriving at a given stop at the same time each hour) to make schedules more understandable for riders and potential riders.

5. Accommodate operational needs such as midday refueling.

6. Identify line segments and potential line segments that are operationally unsound due to terrain, traffic, and/or congestion.

Line 102

The primary function of Line 102 is to serve Redondo Beach residents. Students are a particularly important market for this line, since 88 percent of school-related trips on the BCT system take place on Line 102. School-related travel accounts for 32 percent of all trips on Line 102. Work is the second-ranking trip purpose, with 20 percent of Line 102 trips. Connections to the Redondo Beach Green Line station are especially important in the peak hours. Line 102 serves Redondo Beach and the Galleria at South Bay, as shown in Figure ES.2.

Figure ES.2
Line 102

Options considered for this line include operating in both directions to the Galleria at South Bay on all trips, building an additional bus into the schedule to allow refueling of buses, adding a bus and providing 30-minute service all day on weekdays, and traveling via Inglewood Avenue or Hawthorne Boulevard instead of Vail Avenue north of Artesia Boulevard to speed the trip.

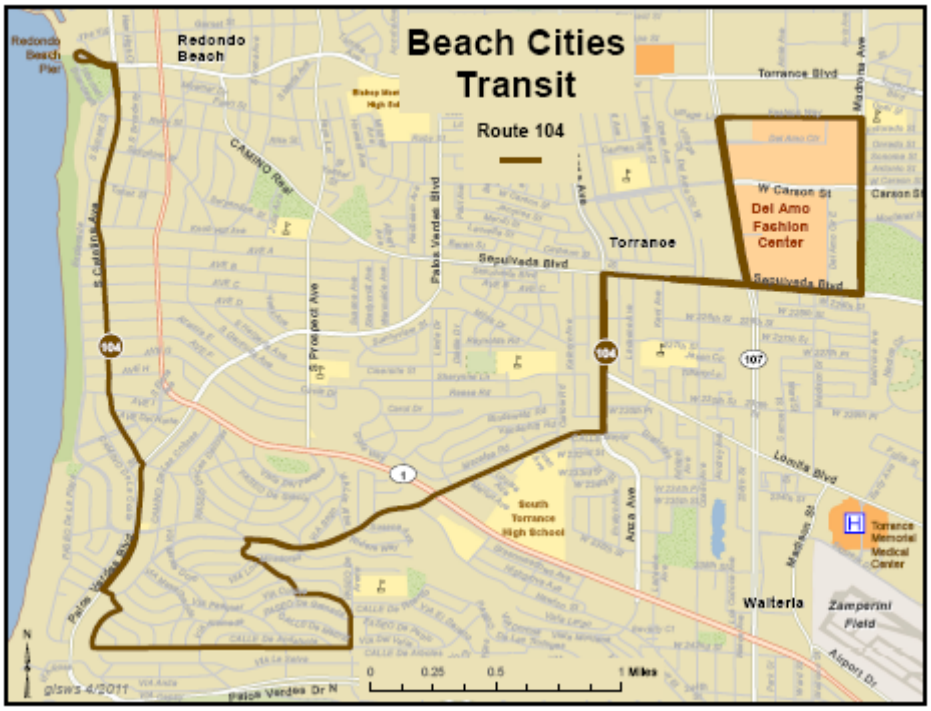
The recommended option for Line 102 is to provide 30-minute service on weekdays, with most trips in both directions serving the South Bay Galleria and a trip added in the midday to allow buses to refuel. This increases annual revenue hours by over 3,600, but the proposed discontinuation of Line 104 reduces annual revenue hours by 3,232. Thus, the resulting net increase is 447 annual revenue hours. No additional vehicles are needed; Line 102 already has five peak vehicles and one of these will operate all day.

Line 104

Line 104 has the lowest ridership of any BCT line on weekdays and Saturday. Productivity is also extremely low. The line averages 4.1 passengers per revenue hour on weekdays and 1.3 passengers per revenue hour on Saturday.

Line 104 connects Redondo Beach Pier with Riviera Village (Line 109 also makes this connection), neighborhoods in Torrance, and Del Amo Fashion Center (see Figure ES.3). A passenger wishing to travel between the Pier and Del Amo Fashion Center would be much more likely to choose Torrance Transit's Line 3 or Line 7, since both lines provide a more direct connection and operate more frequently than Line 104.

Figure ES.3
Line 104



The neighborhoods served by Line 104 explain its low ridership. Figure ES.4 shows two views along Calle de Arboles, in the hills of southwest Torrance bordering Palos Verdes Estates. This neighborhood does not offer fertile ground for transit.

Figure ES.4 Calle de Arboles. Line 104 travels along this street, serving a fairly well-to-do neighborhood with no sidewalks and a low transit orientation.

Options considered for this line include rerouting via Torrance Boulevard, Camino Real/ Sepulveda Boulevard, or PCH to shorten the line and provide a more direct connection to Del Amo Fashion Center. Other options are to discontinue Saturday service and to discontinue the line entirely.

The recommended option is to discontinue Line 104. Ridership and productivity are too low, with no prospect of improvement. These resources can be reallocated to improve Line 102. This option reduces annual revenue hours by over 3,200; these resources can be reallocated elsewhere in the BCT system.

Line 109

Line 109 is the most "regional" line in the BCT network due to its length and its connections (see Figure ES.5). Average trip lengths are relatively short, suggesting that few passengers ride the length of the line. Most riders appear to use the line to reach nearby destinations or regional transit connections. The Aviation Station stop is the busiest stop on the line, with the greatest number of boardings of any BCT non-school stop on weekdays and of any stop on weekends. The Douglas Station stop (served only in the northbound direction) has the highest number of alightings on any non-school stop on weekdays.

Options considered for this line include serving Douglas Station in both directions, providing more direct service to Manhattan Village Mall, adding service to improve headways from 45 to 30 minutes, and truncating the northern end of the line at Aviation Station.

Figure ES.5
Line 109

Several options for Manhattan Village Mall were explored. Bus operation within a shopping center is challenging, owing to difficulty in maneuvering through tight turns in a parking lot with heavy pedestrian activity. A mid-route deviation is especially problematic because of the likelihood of delays affecting passengers on board (the Mall is on the route deviation to Douglas Station) and those waiting at stops past the mall. Figure ES.6 shows the entrance to Manhattan Village Mall and also shows Village Drive to the east of the mall. In the end, none of the options for more direct service to Manhattan Village Mall are recommended for cost (running time would be increased, resulting in the need for an additional bus on this line to maintain the current schedule) and operational reasons.

Figure ES.6 Manhattan Village Mall. The entrance to Manhattan Village Mall from Sepulveda Boulevard is on the left. The Ocean Express Trolley enters the mall with a stop near Tommy Bahamas behind the California Pizza Kitchen. The right photo is looking south on Village Drive, with the mall entrance after the red curb. A rerouting via Village Drive would not bring the line much closer to the mall, and parking meters would need to be removed to establish a bus stop in this location.

The recommended option for Line 109 is to change running times and provide service in both directions at Douglas Station. Reducing the headway to 30 minutes on weekdays would require two extra buses. This remains a future option, but is not within reasonable budget parameters today. Reducing the headway and truncating the line at Aviation Station would require one additional bus and would present refueling issues. This is also an option for the future.

Cost Impacts

Table ES.7 summarizes the annual impacts of proposed short-term changes to the BCT network. The proposed changes result in a minor cost increase of $20,000, with a projected revenue increase of $25,000 for a net savings of $5,000.

Table ES.7
Annual Impacts of Recommendations

Route	Recommendation	Daily Impacts on				
		Ridership	Revenue	Operating Cost	Net Op. Cost	Revenue Hours
102 weekday	30-minute headway	33,807	$25,534	$155,931	$130,397	3,539
102 Sat	Galleria in both directions	294	$222	$2,591	$2,368	59
102 Sun	midday bus for refueling	373	$282	$3,589	$3,307	81
104 weekday	Discontinue	-11,684	-$8,825	-$123,104	-$114,279	-2,794
104 Sat		-560	-$423	-$19,287	-$18,864	-438
109 weekday	Adjust running times	11,821	$8,928	$1,306	-$7,623	30
109 Sat	Serve Douglas Station NB +	-32	-$24	-$329	-$305	-7
109 Sun	SB	-21	-$16	-$305	-$290	-7
Total Weekday		33,944	$25,637	$34,133	$8,496	774.70
Total Sat		-297	-$224	-$17,025	-$16,800	-386.40
Total Sun		353	$266	$3,284	$3,018	74.53
Annual Total		**33,999**	**$25,679**	**$20,392**	**-$5,287**	**462.83**

Beach Cities Transit
2011 Comprehensive Operational Analysis
Chapter 1: Introduction

1.0 Background and Purpose of This Study

Beach Cities Transit is the community-based transit system in the South Bay. BCT provides local fixed-route service within the four beach cities: Redondo Beach, Hermosa Beach, Manhattan Beach, and El Segundo. BCT operates three local fixed-route bus lines. BCT's service area extends north to the LAX City Bus Center and south and east to Torrance.

The BCT carries approximately 1,350 riders on a typical weekday when school is in session, 540 riders on Saturday, and 300 riders on Sunday. Figure 1.1 displays a map of the BCT network. The City of Redondo Beach operates the BCT through its service contractor, Transportation Concepts.

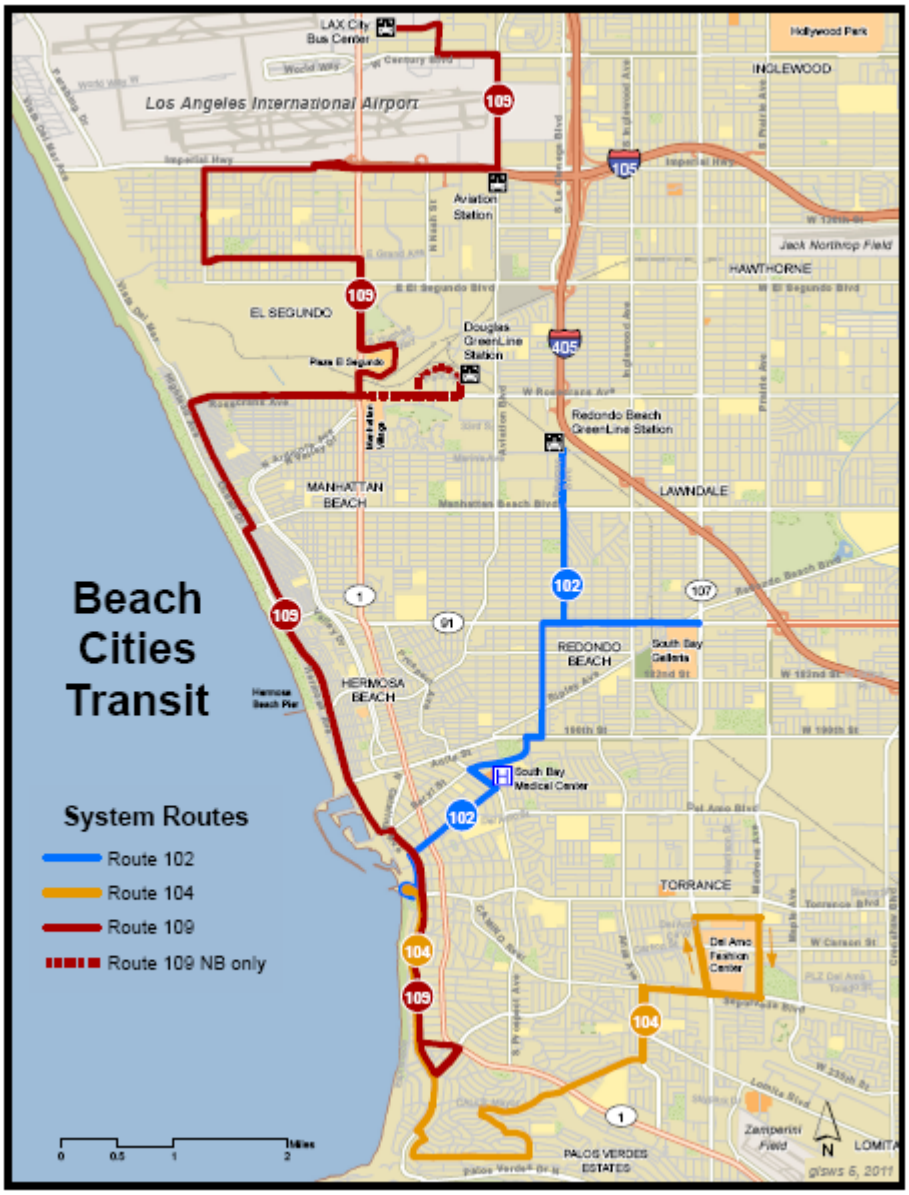
The beach cities are in a transit-rich environment, served not only by BCT lines but also by services operated by Metro, Torrance Transit, Gardena Municipal Bus Line, Culver City Bus, and Santa Monica Big Blue Bus. Metro is the most important system in terms of regional service coordination because of the sheer volume of Metro service, including three Green Line stations served by BCT lines. Torrance Transit is also important because BCT connects with five Torrance Transit lines at various locations.

This comprehensive operational analysis of BCT fixed-route transit services has the following objectives:

- Gather current service and patronage data to assist in evaluating current performance and planning future service;
- Assess systemwide operating ridership and performance of BCT fixed routes;
- Conduct a detailed analysis of current ridership and performance measures at the line, line segment, time of day, and day of week levels to understand the strengths and weaknesses of the current system;
- Obtain riders demographics and travel information from an on-board ridership survey to understand who uses the BCT and why;
- Develop a series of recommendations for BCT's transit services.

A comprehensive operational analysis provides a detailed description of a transit system at a given point in time. It involves a substantial data collection effort, analysis that converts the raw data into useful information, and an assessment of potential improvements to the transit network to enhance mobility and efficiency. The recommendations presented in this report will guide transit-related decisions in Redondo Beach over the next several years.

Figure 1.1
BCT Network



Tables 1.1 and 1.2 provide summaries of service characteristics, including information on span of service and headways by day of the week. Span of service is measured for local service from the start time of the first trip in the morning to the start time of the last trip in the evening. Overall BCT span of service is 6:00 a.m. to 7:38 p.m. weekdays and 9:00 a.m. to 5:13 p.m. Saturday and Sunday. All tables and figures in this chapter reflect service in operation during the ridecheck in January 2011.

Table 1.1
BCT Span of Service by Line and Day

Line	Span of Service		
	Weekday	Saturday	Sunday
102	6:10 a.m. – 7:47 p.m. Last trip 9:05 p.m. Fri	8:05 a.m. – 9:26 p.m.	9:10 a.m. – 12:05 p.m. 3:00 - 5:54 p.m.
104	7:00 a.m. – 5:33 p.m.	10:05 a.m. – 5:27 p.m.	No service
109	6:00 a.m. – 8:45 p.m.	6:05 a.m. – 8:50 p.m.	6:05 a.m. – 8:50 p.m.

Table 1.2 presents headways by time of day and day of week.

Table 1.2
BCT Service Headways by Line, Day, and Time Period

Line	Headway (in minutes)		
	Weekday	Saturday	Sunday
102	35-45	35	35
104	55-70	60-75	--
109	45	60	60

1.1 Ridership Counts and On-Board Survey

On-board personnel gathered ridership data via ride checks in January 2011. Weekday counts were undertaken on Wednesday and Thursday January 19 and 20. Saturday counts were conducted on January 15, and Sunday counts on January 16. Checkers counted boardings, alightings, and passenger loads and noted times at timepoints.

The on-board survey, designed to collect information on travel patterns, passenger demographics, and ratings of various service elements, was conducted in January 2011 in conjunction with the ridecheck. Surveys were distributed starting on January 15 and continuing through January 20.

1.2 Organization of This Report

Following this introductory chapter, Chapter 2 presents detailed route profiles of each BCT line, including an overview, line description, schedule, boardings, alightings, peak load point by time of day, capacity issues (if any), performance measures (broken down by line segment and time of day), schedule adherence, running time, and summary findings. Detailed charts and graphs are included for each line in this chapter and Appendix A.

Chapter 3 summarizes the findings of the on-board survey. Chapter 4 analyzes latent and future demand estimation, using techniques that identify neighborhoods with a high propensity to use transit. Chapter 5 summarizes the roundtable meeting held with the cities to discuss perceived issues and potential solutions.

Chapter 6 identifies options for each line and presents the recommended service plan for Beach Cities Transit. Cost and ridership impacts are included in this chapter. Chapter 6 also addresses the optimum bus size for BCT fixed-route services.

Beach Cities Transit
2011 Comprehensive Operational Analysis
Chapter 2: Route Profiles

2.0 Introduction

Chapter 2 presents the ridership and productivity analysis of the January 2011 ridecheck. This evaluation includes an analysis of ridership by line, direction, time of day, and line segment. Line effectiveness or productivity, measured by boardings per revenue hour, is also considered by direction, line segment, and time of day. Line efficiency is analyzed in terms of subsidy per boarding and farebox recovery ratio (the ratio of operating revenue to operating cost) at the line level. Schedule adherence is also analyzed, along with actual versus scheduled running times by line, direction, time of day, and segment.

Section 2.1 summarizes findings related to ridership, productivity, levels of service, and cost efficiency at the line level. Section 2.2 contains route profiles. These profiles report frequency, span of service, operating and performance data, financial data, and detailed line segment ridership and productivity for each BCT line, including:

- Line description, including major corridors and destinations and trip patterns;
- Schedule, including days of operation, service spans, and frequency;
- Operating and productivity data, including ridership, revenue hours, passengers per revenue hour, and average trip length;
- Financial data, including revenue, operating cost, cost per passenger, subsidy per passenger, and farebox recovery ratio;
- Identification of major stops along the line;
- Capacity issues, measured by trip segments with loads exceeding 125 percent of seated capacity;
- Passenger boardings and productivity (passengers per revenue hour) by line segment;
- Peak and maximum load points along the line;
- Schedule adherence;
- Average versus scheduled running time overall and by line segment;
- Assessment of line performance and trends.

It is worth noting that the Transportation Development Act requires all transit agencies receiving TDA funds to maintain a farebox recovery ratio of 20 percent. We use the most recent available financial data throughout this chapter. Operating cost is based on 2011 rates, while operating revenue is based on FY 2010 average revenue per passenger. This is a reasonable approach at the disaggregate line level, but is not recommended at the system level. Data provided by BCT indicates that the FY 2011 farebox recovery ratio for the system as a whole is 21.4 percent.

Appendix A *Ridecheck Results* (under separate cover) provides all the data collected during the ridecheck in voluminous detail, including ons and offs by stop for each trip and times at each timepoint for each trip. As with any data collection effort, the data can be used in answering all types of questions that will arise regarding BCT service. Appendix B *Stops with Loads over 125 Percent of Capacity* provides a list of all stops/trips experiencing a load in excess of 125 percent of seated capacity. This is a convenient summary of overcrowded trips.

2.1 Overall Findings

Table 2.1 presents ridership by line for weekdays, Saturday, and Sunday. Line 102 Redondo Pier – Green Line has the highest ridership on all days, with over 700 boardings per weekday. It is important to note that the ridecheck took place when schools were open, since school is a major trip purpose for riders on Line 102. Line 109 LAX – Redondo Beach is second in terms of weekday ridership (600 boardings per weekday). Line 104 Redondo Pier – Torrance only has 46 boardings per weekday. Line 109 leads in ridership on Saturday and Sunday.

Table 2.1
BCT Average Daily Ridership by Line and Day of Week

Line	Weekday		Saturday		Sunday	
	Riders	Rank	Riders	Rank	Riders	Rank
102	709	1	220	2	83	2
104	46	3	10	3	--	--
109	600	2	313	1	220	1
Total	**1,355**	--	**543**	--	**303**	--

Source: Ridecheck Data, January 2011

Table 2.2 shows service effectiveness in terms of passenger boardings per revenue hour, a common measure of productivity in the transit industry. Line 102 Redondo Pier – Green Line is the most productive line, with over 20 boardings per revenue hour on weekdays. Line 102 also leads in productivity on weekends, albeit at much lower levels. Productivity is highest on weekdays and lowest on Sunday. Line 104 Redondo Pier – Torrance has the lowest productivity at 4.1 on weekdays and 1.3 on Saturday. On an annualized basis, overall productivity is 9.3 passenger boardings per revenue hour.

As a general rule of thumb in assessing service effectiveness by means of passenger boardings per revenue hour, 20 is good for a community route, and anything below 10 is a red flag to examine the line more closely and restructure, reduce span of service or cancel service.

Table 2.2
BCT Boardings per Revenue Hour by Line and Day of Week

Line	Weekday		Saturday		Sunday	
	B/RH	Rank	B/RH	Rank	B/RH	Rank
102	20.4	1	8.4	1	7.6	1
104	4.1	3	1.3	3	--	--
109	10.5	2	7.4	2	5.2	2
Total	**13.1**	--	**7.1**	--	**5.7**	--

Source: Ridecheck Data, January 2011

Table 2.3 shows overall schedule adherence for each line, as measured at each timepoint on each trip. Schedule adherence is defined as no more than one minute early (to allow for minor variations among watches) and no more than five minutes late at a given timepoint along the line. This detailed measure at each timepoint, a more accurate reflection of how riders view on-time performance, usually produces results in the 60 to 70 percent range for most transit agencies.

Weekday schedule adherence is very low, ranging from 25.0 percent on Line 104 Redondo Pier – Torrance to 65.0 percent on Line 109 LAX – Redondo Beach. More crowded and longer lines usually have more difficulty keeping to schedule, so it is surprising that the longest line (Line 109) has the best on-time performance. Weekday schedule adherence is 46.3 percent on all lines.

Schedule adherence is better on weekends, particularly on Sunday. Line 109 has the best schedule adherence on Saturday at 70.8 percent, and Line 102 leads the Sunday lines with 79.0 percent. Overall schedule adherence is 48 percent on Saturday and 79 percent on Sunday.

Table 2.3
BCT Schedule Adherence

Line	Weekday	Saturday	Sunday
102	36.5%	23.9%	79.0%
104	25.0%	63.5%	--
109	65.0%	70.8%	78.5%
Total	**46.3%**	**47.7%**	**78.6%**

Source: Ridecheck Data, January 2011

2.2 Route Profiles

The following pages contain much greater detail for the individual lines. Each route profile includes a description of the line, headway and span of service, passenger boardings, revenue hours of service, overcrowded segments, stops with major passenger activity, financial data, segment and time of day analysis, schedule adherence, and running time analysis. Overcrowded segments are defined as segments on a given trip with passenger loads over 125 percent of seated capacity. BCT operates different vehicles on different lines, so the definition of overcrowded varies by line.

All operating data are taken from the ridecheck results. Cost calculations are based on a cost per revenue hour of $44.06, the rate paid by Beach Cities Transit in 2011. Revenue calculations are based on the revenue per passenger boarding figures for each line, ranging from $0.67 to $0.93[1] according to the most recent National Transit Database data prepared for the Federal Transit Administration.

The route profiles provide information regarding passengers per revenue hour, a key performance variable used in evaluating transit lines. Ridership and productivity are examined by time of day: each trip was assigned to a time period based on the scheduled start time. Time periods are defined as:

[1] Revenue per passenger boarding is below the base fare of $1.00 because the fare for senior and disabled riders is lower and transfers are either free (internal) or moderately priced.

AM Peak	6:00 to 8:59 a.m.
Midday	9:00 a.m. to 2:59 p.m.
PM Peak	3:00 to 6:59 p.m.
Evening	7:00 p.m. to end of service

Passenger miles per seat mile is a measure of the percentage of seats occupied throughout the course of the day on each line. Financial performance indicators include subsidy per passenger boarding and farebox recovery ratio (operating revenue divided by operating cost).

The final section of each route profile summarizes findings and issues for the line, but does not include line recommendations. Recommendations are developed and presented later in this report.

Line 102 Redondo Pier – Green Line

Overview

Line 102 Redondo Beach Pier – Green Line (Figure 2.1) serves the Redondo Beach Pier and various neighborhoods in the center and north parts of the City. The line travels between the Redondo Beach Pier and the Marine Green Line Station. Primary streets of operation include Catalina Avenue, Diamond Street, Beryl Street, Rindge Lane, Artesia Boulevard, Vail Avenue, and Redondo Beach Avenue. Major destinations include Redondo Union High School, South Bay Galleria, Beach Cities Health District, North Redondo Beach, Redondo Beach Pier, and the Marine Green Line Station.

Line 102 provides circulation within the City of Redondo Beach. For most of the day, each trip serves the South Bay Galleria in one direction only, either northbound or southbound. If a given trip serves the Galleria northbound, then the next trip will serve it in the southbound direction.

Line 102 has the highest weekday ridership and the highest productivity on all days among BCT lines.

Headway and Span of Service

Table 2.4 shows headways for Line 102 by day of the week. Table 2.4 also indicates the span of service on the lines. Span of service is calculated from the start time of the first trip in the morning to the start time of the last trip in the evening.

For most of the service day, headways are 35 minutes. Additional service is provided around school bell times when school is open. A late trip is added to the weekday schedule on Friday, and service operates later on Saturday than on other days. There is a gap in service in the midday on Sunday.

Table 2.4
Line 102 Headway and Span of Service

Day of Week	Headway (minutes)	Span of Service
Weekday	35-45 More frequent at school bell times	6:10 a.m. – 7:47 p.m. Friday last trip at 9:07 p.m.
Saturday	35	8:05 a.m. – 9:26 p.m.
Sunday	35	9:10 a.m. – 12:05 p.m. 3:00 – 5:54 p.m.

Figure 2.1
Line 102

Operating Data

Table 2.5 presents operating data for Line 102. Among the three weekday lines, Line 102 ranks 1st in boardings and in boardings per revenue hour. On Saturday and Sunday, Line 102 ranks 2nd in boardings and 1st in boardings per revenue hour. Note that revenue hours in Table 2.5 are the actual revenue hours operated on the day of the ridecheck, which may be more or less than the scheduled revenue hours. For example, some trips may have been missed due to a bus breakdown, or some buses may have been in service longer than scheduled.

Line 102 ranks 1st on weekdays and Sunday and 2nd on Saturday in average trip length. Average trip lengths fall in the range of 2.81 to 3.44 miles on all days for Line 102. Average trip lengths are longer on weekends, possibly due to the absence of shorter school-related trips. Line 102 ranks 1st on weekdays and Sunday and 2nd on Saturday in seat utilization.

Table 2.5
Line 102 Operating and Productivity Data

Day of Week	Boardings	Revenue Hours	Boardings per Rev Hr	Seat Utilization	Average Trip Length
Weekday	709	34.8	20.4	18.8%	2.81
Saturday	220	26.3	8.4	8.7%	3.44
Sunday	83	10.9	7.6	7.4%	3.31

Source: Ridecheck Data, January 2011

Table 2.6 presents financial data for Line 102. Line 102 ranks 1st in subsidy per boarding and farebox recovery ratio (passenger revenue divided by operating cost) among BCT lines on all days.

Table 2.6
Line 102 Financial Data

Day of Week	Boardings	Passenger Revenue	Operating Cost	Cost per Boarding	Subsidy per Boarding	Farebox Recovery Ratio
Weekday	709	$480	$1,534	$2.16	$1.49	31.3%
Saturday	220	$149	$1,160	$5.27	$4.60	12.8%
Sunday	83	$56	$480	$5.79	$5.11	11.7%

Source: Ridecheck data, January 2011; BCT cost per revenue hour for calendar year 2011; NTD 2010 report for average revenue per passenger by line for FY 2009-2010

Figures 2.2 through 2.4 show boardings by stop and direction for weekdays, Saturday, and Sunday, respectively. The busiest stop (at least 50 boardings per weekday in one direction), in decreasing order of usage, include:

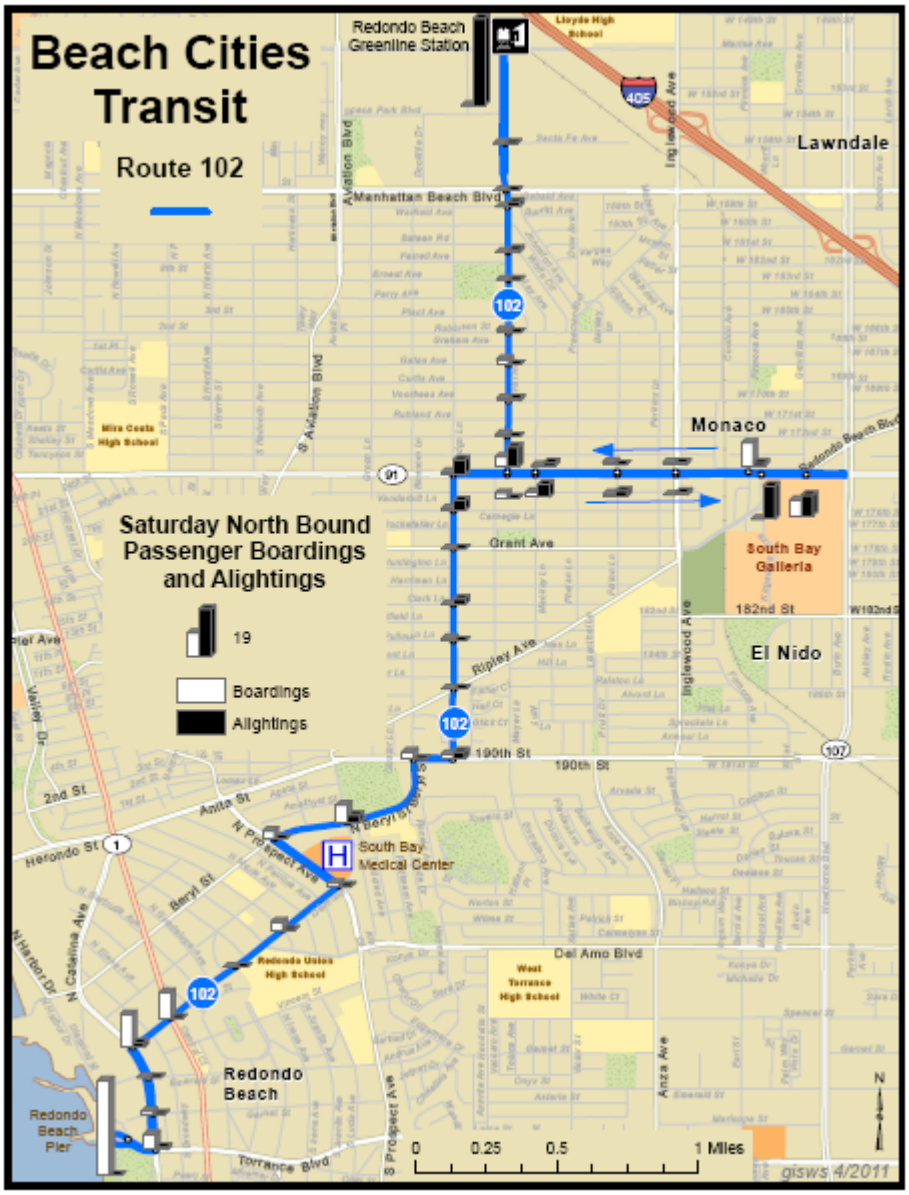
- Diamond Street & PCH NB (Redondo Union High School and City Hall)
- Catalina Avenue & Diamond Street NB (City Hall)

The southbound stop at Diamond Street & Helberta Avenue near Redondo Union High School has 160 daily alightings, 150 of which occur in the morning peak period.

Figure 2.2
Line 102 Weekday Boardings and Alightings by Stop


Beach Cities Transit
Route 102
Weekday South Bound Passenger Boardings and Alightings
80
Boardings
Alightings
Redondo Beach Greenline Station
Lawndale
Manhattan Beach Blvd
Monaco
Grant Ave
South Bay Galleria
182nd St
El Nido
Ripley Ave
190th St
Hermosa Beach
Anita St
2nd St
Herondo St
South Bay Medical Center
Beryl St
Del Amo Blvd
Redondo Beach
Redondo Beach Pier
Torrance Blvd
Aviation Blvd
Inglewood Ave
Anza Ave
S Prospect Ave
N Catalina Ave
Valley Dr
N Harbor Dr
0 0.25 0.5 1 Miles
gisws 4/2011
N

Figure 2.3
Line 102 Saturday Boardings and Alightings by Stop




Beach Cities Transit
Route 102
Saturday South Bound Passenger Boardings and Alightings
22
Boardings
Alightings
Redondo Beach Greenline Station
Manhattan Beach Blvd
Lawndale
Monaco
Grant Ave
South Bay Galleria
182nd St
El Nido
Ripley Ave
190th St
South Bay Medical Center
Del Amo Blvd
Redondo Beach
Redondo Beach Pier
Torrance Blvd
Aviation Blvd
Inglewood Ave
Anza Ave
Prospect Ave
Beryl St
Anita St
Herondo St
2nd St
Valley Dr
N Catalina Ave
N Harbor Dr
Mira Costa High School
Redondo Union High School
West Torrance High School
405
91
107
102
1
0 0.25 0.5 1 Miles
gisws 4/2011

Figure 2.4
Line 102 Sunday Boardings and Alightings by Stop


Beach Cities Transit
Route 102
Redondo Beach Greenline Station
Sunday South Bound Passenger Boardings and Alightings
15
Boardings
Alightings
Lawndale
Manhattan Beach Blvd
Monaco
Grant Ave
South Bay Galleria
182nd St
El Nido
Ripley Ave
190th St
Del Amo Blvd
South Bay Medical Center
Redondo Beach
Redondo Beach Pier
Torrance Blvd
Herondo St
Anita St
2nd St
Beryl St
Aviation Blvd
Inglewood Ave
Anza Ave
Prospect Ave
Catalina Ave
Harbor Dr
Valley Dr
405
91
102
107
0 0.25 0.5 1 Miles
gisws 4/2011

Table 2.7 shows that there are four trips with segments whose loads exceed 125 percent of capacity on Line 102. These trip segments are sorted by direction, time, and day. Three of these occur northbound during the weekday afternoon time period and one occurs southbound during the weekday morning time period. All overcrowded trips are related to high school arrival or dismissal times.

Table 2.7
Line 102 Trip Segments with Loads Exceeding 125 Percent of Capacity

Segment	Day	Direction	Trip Time	Number of Stops	Peak Load	Comments
Diamond Street & PCH – Rindge Lane & Grant Avenue	Weekday	NB	3:00 pm	12	51	High school
Diamond Street & PCH – Rindge Lane & Carnegie Lane	Weekday	NB	3:05 pm	13	53	High school
Diamond Street & PCH – Rindge Lane & Pullman Lane	Weekday	NB	3:55 pm	10	45	High school
Rindge Lane & Grant Avenue – Diamond Street & Helberta Avenue	Weekday	SB	7:00 am	11	56	High school

Source: Ridecheck Data, January 2011

Weekday Segment and Time of Day Analysis

Tables 2.8 and 2.9 show weekday boardings and productivity (boardings per revenue hour) by direction, time of day, and line segment. Each line segment includes boardings at the first stop but not at the last stop of the segment; for example, boardings at Beryl Street & 190th Street are counted in the second segment northbound and in the first segment southbound. The ridership patterns in Table 2.8 indicate a pronounced southbound ridership flow during the morning period and a northbound ridership flow in the midday and afternoon periods. The segment between Redondo Beach Pier & Beryl Street & 190th Street has the greatest passenger activity in the midday and afternoon, while the segment between Vail Avenue & Artesia Boulevard and the Redondo Beach Green Line Station has the greatest morning activity, especially in the southbound direction. Ridership is greater in the afternoon and morning periods.

Table 2.8
Line 102 Weekday Boardings by Direction, Time of Day, and Line Segment

Segment	All Day		Morning		Midday		Afternoon		Evening	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Redondo Beach Pier – Beryl St & 190th St	348	15	2	3	108	4	237	7	1	1
Beryl St & 190th St – Artesia Blvd & Vail Av	26	75	2	54	11	17	13	4	0	0
Artesia Blvd & Vail Av – South Bay Galleria	7	65	0	48	3	13	4	4	0	0
South Bay Galleria – Vail Av & Artesia Blvd	10	28	0	21	5	5	5	2	0	0
Vail Av & Artesia Blvd – Redondo Beach Green Line Station	18	117	6	92	3	17	9	7	0	1
Weekday Total	**409**	**300**	**10**	**218**	**130**	**56**	**268**	**24**	**1**	**2**

Source: Ridecheck data, January 2011

Table 2.9 presents productivity, in terms of boardings per revenue hour, for Line 102 by direction, time of day and line segment. Northbound productivity throughout the day is highest in the segment between Redondo Beach Pier and Beryl Street & 190th Street, due to the high school. Southbound productivity throughout the day is between 20 and 28 in three different segments. Northbound productivity is higher in all time periods except morning (in the evening, productivity is similar in both directions. The most productive time of day segment is northbound between Redondo Beach Pier and Beryl Street & 190th Street in the afternoon (127.0 boardings per revenue hour). Two northbound segments in the morning and several evening segments have 0.0 boardings per revenue hour. Overall productivity is highest northbound in the afternoon (42.8) and lowest northbound in the evening (2.0).

Table 2.9
Line 102 Weekday Boardings per Revenue Hour by Direction, Time of Day, and Line Segment

Segment	All Day		Morning		Midday		Afternoon		Evening	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Redondo Beach Pier – Beryl St & 190th St	65.9	2.4	2.4	1.8	44.7	1.8	127.0	3.7	6.0	4.0
Beryl St & 190th St – Artesia Blvd & Vail Av	7.5	20.5	3.1	41.9	8.8	11.9	9.2	3.5	0.0	0.0
Artesia Blvd & Vail Av – South Bay Galleria	4.6	26.7	0.0	58.8	3.8	20.5	6.3	4.8	0.0	0.0
South Bay Galleria – Vail Av & Artesia Blvd	6.1	12.9	0.0	29.3	8.3	5.7	5.4	4.1	0.0	0.0
Vail Av & Artesia Blvd – Redondo Beach Green Line Station	4.3	27.3	7.3	87.6	1.7	10.7	6.5	5.1	0.0	3.8
Weekday Total	**25.4**	**34.5**	**4.0**	**41.9**	**19.0**	**11.9**	**42.8**	**4.1**	**2.0**	**2.2**

Source: Ridecheck data, January 2011

Appendix A contains detailed information on weekend productivity. Weekend productivity is highest northbound in the afternoon on both days and southbound in the midday on Saturday and in the afternoon on Sunday. The most productive segment on Saturday is on the northbound segment between Redondo Beach Pier and Beryl Street & 190th Street in the afternoon, with 33.2 boardings per revenue hour. This segment is also the most productive segment on Sunday in the afternoon, with 25.7 boardings per revenue hour.

Peak Load and Maximum Load

Table 2.10 shows the peak load points on Line 102 for weekday, Saturday, and Sunday. For peak load point, we use total daily ridership to identify the stop at which the total number of passengers on board is greatest. For maximum load point, we use ridership by trip to identify the trip and stop with the most people on a single bus. Table 2.10 indicates that the peak load point for weekday travel is at Beryl Street & 190th Street, with 332 passengers traveling northbound at this location throughout the day. The maximum load point is southbound on the weekday 7:00 a.m. trip at Rindge Lane & Clark Lane, with 56 passengers on board.

Table 2.10
Line 102 Peak and Maximum Load Points

Measure	Day	Northbound			Southbound		
		Stop	Time	Riders on Board	Stop	Time	Riders on Board
Peak Load Point	Weekday	Beryl St & 190th St	All Day	332	Rindge Ln & 190th St	All Day	262
	Saturday	Rindge Ln & Pullman	All Day	81	Rindge Ln & Clark Ln	All Day	94
	Sunday	Rindge Ln &Carnegie	All Day	32	Rindge Ln &Carnegie	All Day	37
Maximum Load Point	Weekday	Prospect & Diamond	3:05 p.m.	53	Rindge Ln & Clark Ln	7:00 a.m.	56
	Saturday	Artesia & Mackay	3:00 p.m.	14	Rindge Ln & 190th St	1:40 p.m.	20
	Sunday	Diamond & PCH	5:20 p.m.	13	RB Green Line Sta	3:37 p.m.	11

Source: Ridecheck data, January 2011

Schedule Adherence

Tables 2.11 through 2.13 present schedule adherence data, in terms of the percent of all timepoints at which the bus was within one minute before to five minutes after the scheduled time, for Line 102 on weekdays, Saturday, and Sunday.

Weekday on-time performance is 36 percent at all time points, which is very poor schedule adherence although Line 102 is 2nd among the three weekday lines. Southbound schedule adherence is best in the morning and declines throughout the midday and afternoon. Northbound schedule adherence follows the same pattern. Late departures occur more than 12 times as often as early departures. Schedule adherence is slightly better in the southbound direction. Schedule adherence is particularly poor in the afternoon.

Table 2.11
Line 102 Weekday Schedule Adherence

Actual vs. Schedule	All Day			Morning		Midday		Afternoon		Evening	
	NB	SB	Total	NB	SB	NB	SB	NB	SB	NB	SB
On Time	44	57	101	16	23	18	24	7	5	3	5
Early	6	6	12	4	1	2	4	0	0	0	1
Late	79	85	164	2	14	36	26	40	41	1	4
On Time %	34%	39%	36%	73%	61%	32%	44%	15%	11%	75%	50%

Source: Ridecheck Data, January 2011

Saturday on-time performance (Table 2.12) is 24 percent at all time points on Line 102, last among the three Saturday lines. Saturday schedule adherence is slightly better in the northbound direction overall, particularly in the midday. Line 102 was on time at only one of the 66 timepoints observed in the afternoon. Early departures are a significant problem in the morning and evening periods.

Table 2.12
Line 102 Saturday Schedule Adherence

Actual vs. Schedule	All Day			Morning		Midday		Afternoon		Evening	
	NB	SB	Total	NB	NB	NB	SB	NB	SB	NB	SB
On Time	29	26	55	2	1	24	19	1	0	2	6
Early	21	10	31	4	3	7	1	0	0	10	6
Late	66	78	144	4	0	19	36	35	30	8	12
On Time %	25%	23%	24%	20%	25%	48%	34%	3%	0%	10%	25%

Source: Ridecheck Data, January 2011

Sunday on-time performance (Table 2.13) is 79 percent at all time points, best among the two Sunday lines. Schedule adherence is slightly better in the southbound direction, particularly in the midday. In both directions, schedule adherence is best in the midday and worst in the morning. Early departures are three times more likely than late departures on Sunday.

Table 2.13
Line 102 Sunday Schedule Adherence

Actual vs. Schedule	All Day			Midday		Afternoon	
	NB	SB	Total	NB	SB	NB	SB
On Time	40	39	79	17	20	23	19
Early	11	5	16	9	4	2	1
Late	1	4	5	0	0	1	4
On Time %	77%	81%	79%	65%	83%	88%	79%

Source: Ridecheck Data, January 2011

Line 102 schedule adherence is best on Sunday, when there is usually lighter traffic and fewer riders, and worst on Saturday. The number of early departures on Sunday suggests that changes in operating procedures may be in order. Problems with late departures on weekdays and Saturday deserve further investigation.

Another way of considering schedule adherence is to examine actual versus scheduled running times. Tables 2.14 and 2.15 show average running times and scheduled running times by segment and time of day on weekdays for Line 102. Caution is needed in interpreting results, since delays on one or two trips can affect the average for the entire segment or time period, but this level of detail highlights where running time adjustments might be needed. Actual running time is greater than scheduled running time in the northbound direction at all times; the difference ranges from two minutes in the morning to nine minutes on Galleria trips in the afternoon. Actual average running time is four minutes greater than scheduled running time in the morning on short southbound trips and nine minutes greater on Galleria southbound trips. At other times, actual running times are close to scheduled running times.

Table 2.14
Line 102 Average versus Scheduled Northbound Running Times
(in Minutes) by Segment and Time of Day on Weekdays

Segment	Morning		Midday		Afternoon		Evening	
	Act	Schd	Act	Schd	Act	Schd	Act	Schd
Redondo Beach Pier – Beryl St & 190th St	9	10	12	11	11	10	10	10
Beryl St & 190th St – Artesia Blvd & Vail Av	7	6	7	6	7	6	8	5
Artesia Blvd & Vail Av – South Bay Galleria	5	7	7	7	7	7	--	--
South Bay Galleria – Vail Av & Artesia Blvd	5	3	6	3	9	3	--	--
Vail Av & Artesia Blvd – Redondo Beach Green Line Station	9	7	10	7	8	7	12	7
Average Running Time – including the Galleria	35	33	42	34	42	33	--	--
Average Running Time – excluding the Galleria	25	23	29	24	26	23	30	22

Source: Ridecheck data, January 2011

Table 2.15
Line 102 Average versus Scheduled Southbound Running Times
(in Minutes) by Segment and Time of Day on Weekdays

Segment	Morning		Midday		Afternoon		Evening	
	Act	Schd	Act	Schd	Act	Schd	Act	Schd
Redondo Beach Green Line Station – Artesia Blvd & Vail Av	8	7	6	7	7	7	8	7
Artesia Blvd & Vail Av – South Bay Galleria	7	7	8	7	5	8	4	8
South Bay Galleria – Rindge Ln & Artesia Blvd	9	3	6	3	8	3	8	3
Vail Av & Artesia Blvd – Beryl St & 190th St (short)	*8*	*6*	*6*	*6*	*7*	*6*	*7*	*6*
Rindge Ln & Artesia Blvd – Beryl St & 190th St (long)	*7*	*6*	*6*	*6*	*6*	*6*	*4*	*6*
Beryl St & 190th St – Redondo Beach Pier	13	12	10	11	10	11	8	11
Average Running Time – including the Galleria	44	35	36	34	36	35	32	35
Average Running Time – excluding the Galleria	29	25	23	24	24	24	23	24

Source: Ridecheck data, January 2011

Appendix A contains additional information on schedule adherence, including graphs of actual versus scheduled running time for every trip.

Overall Assessment

Line 102 ranks 1st in ridership among the three weekday lines. Ridership is higher in the northbound direction than in the southbound direction except in the morning. Line 102 ranks 2nd in ridership among the three Saturday lines and 2nd among the two Sunday lines. The higher weekday ranking reflects the intensive use of this line by students.

Line 102 is the most productive BCT line on all days, and also leads all lines in subsidy per passenger and farebox recovery ratio.

There are four instances of overcrowding on Line 102, all related to school loads.

Schedule adherence is very poor on weekdays and Saturday. Line 102 has better on-time performance on Sunday, due to lighter ridership and the midday gap in service that avoids the domino effect of delays that propagate further delays. On Sunday, early departures are a bigger problem than late departures. Scheduled running time is not adequate on weekdays and Saturday; revised schedules will be among the recommendations for Line 102.

Line 104 Redondo Pier - Torrance

Overview

Line 104 Redondo Beach Pier – Torrance (Figure 2.5) operates mostly in Torrance. The line travels between the Redondo Beach Pier and Del Amo Fashion Center via Catalina Avenue, Palos Verdes Boulevard, Via Anita, Paseo de los Reyes, Calle de Arboles, Via Colusa, Calle Miramar, Calle Mayor, Anza Avenue, Sepulveda Boulevard, and Hawthorne Boulevard. Major destinations include the Redondo Beach Pier, Riviera Village, South High School in Torrance, and Del Amo Fashion Center.

Line 104 provides connections to a major retail mall and to Metro and Torrance Transit buses. Line 104 has the lowest ridership and productivity on weekdays and Saturday among all BCT lines. This line does not operate on Sunday.

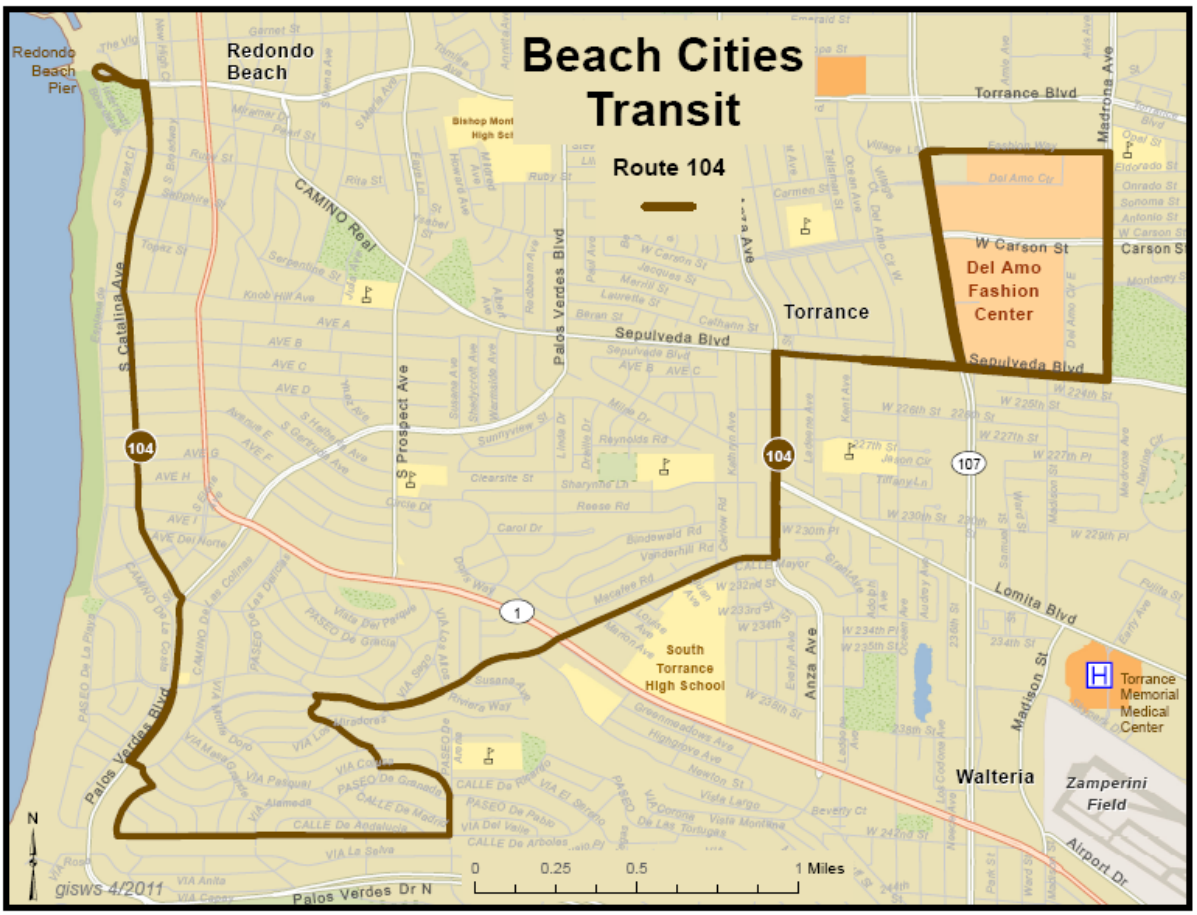
Headway and Span of Service

Table 2.16 shows headway and span of service for Line 104 by day of the week. Span of service is calculated from the start time of the first trip in the morning to the start time of the last trip in the evening. Due to low demand, Line 104 operates fewer hours and less often than other BCT lines.

Table 2.16
Line 104 Headway and Span of Service

Day of Week	Headway (minutes)	Span of Service
Weekday	55 to 70	7:00 a.m. – 5:33 p.m.
Saturday	60 to 75	10:05 a.m. – 5:27 p.m.
Sunday	No service	No service

Figure 2.5
Line 104



Operating Data

Table 2.17 presents operating data for Line 104. Among the three weekday and Saturday lines, Line 104 ranks last in boardings and last in boardings per revenue hour. Note that revenue hours in Table 2.17 are the actual revenue hours operated on the day of the ridecheck, which may be more or less than the scheduled revenue hours. For example, some trips may have been missed due to a bus breakdown, and some buses may have been in service longer than scheduled

Line 104 ranks last in average trip length on weekdays, but ranks first on Saturday. Most Saturday trips appear to be to Del Amo Fashion Center at the end of the line, making average trip lengths longer. Average trip lengths range from 2.69 to 3.49 miles on all days. Line 104 ranks last in seat utilization on weekdays and Saturday.

Table 2.17
Line 104 Operating and Productivity Data

Day of Week	Boardings	Revenue Hours	Boardings per Rev Hr	Seat Utilization	Average Trip Length
Weekday	46	11.1	4.1	8.1%	2.69
Saturday	10	7.8	1.3	3.3%	3.49

Source: Ridecheck Data, January 2011

Table 2.18 presents financial data for Line 104. Line 104 ranks last in both subsidy per boarding and in farebox recovery ratio (passenger revenue divided by operating cost) among three weekday and Saturday lines.

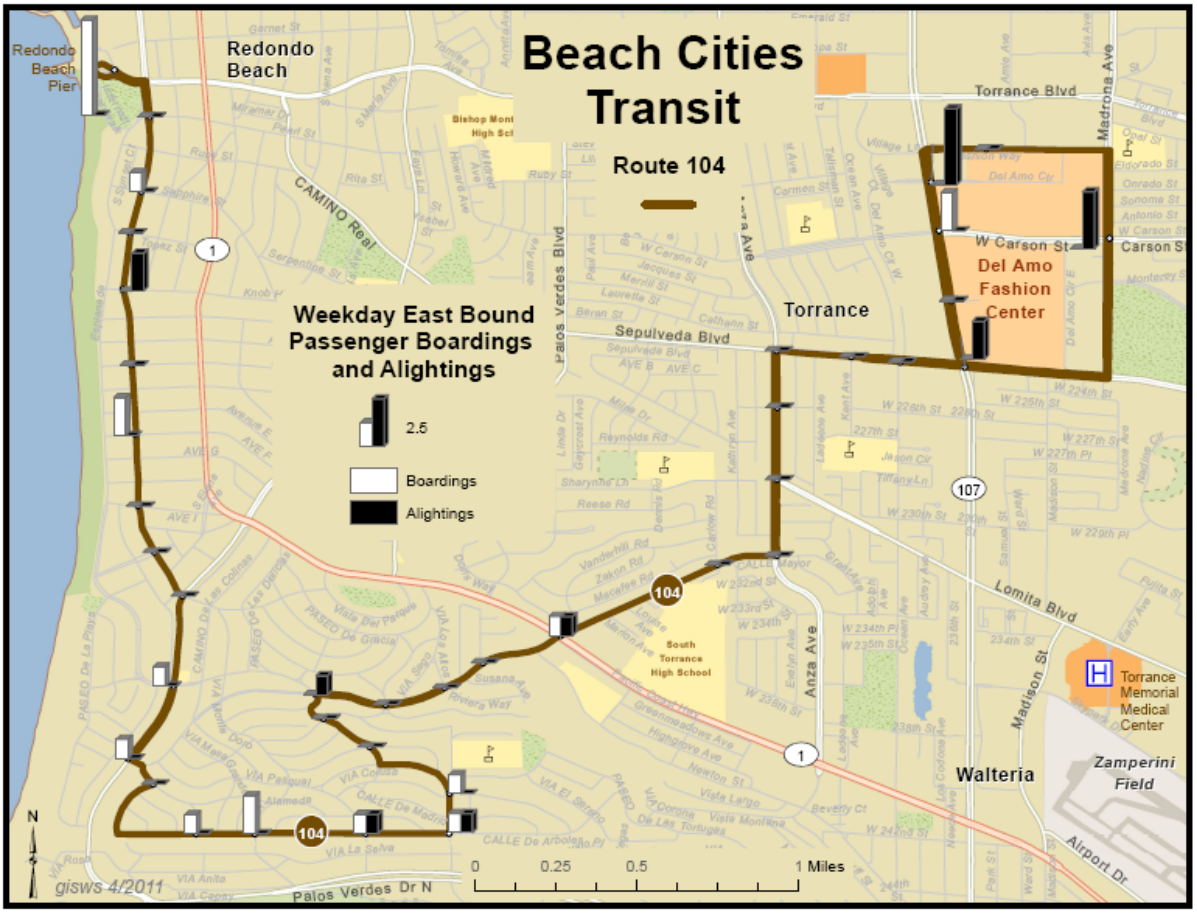
Table 2.18
Line 104 Financial Data

Day of Week	Boardings	Passenger Revenue	Operating Cost	Cost per Boarding	Subsidy per Boarding	Farebox Recovery Ratio
Weekday	46	$43	$491	$10.66	$9.73	8.8%
Saturday	10	$9	$341	$34.15	$33.21	2.7%

Source: Ridecheck data, January 2011; BCT cost per revenue hour for calendar year 2011; NTD 2010 report for average revenue per passenger by line for FY 2009-2010

Figures 2.6 and 2.7 show boardings by stop and direction for weekdays, Saturday, and Sunday, respectively. There are no stops with at least 50 boardings per weekday in one direction, since the entire line carries only 46 weekday passengers. The stops with the most weekday boardings are Redondo Beach Pier EB and Hawthorne & Carson WB, with five boardings at each stop. There are no overcrowded trips on Line 104.

Figure 2.6
Line 104 Weekday Boardings and Alightings by Stop



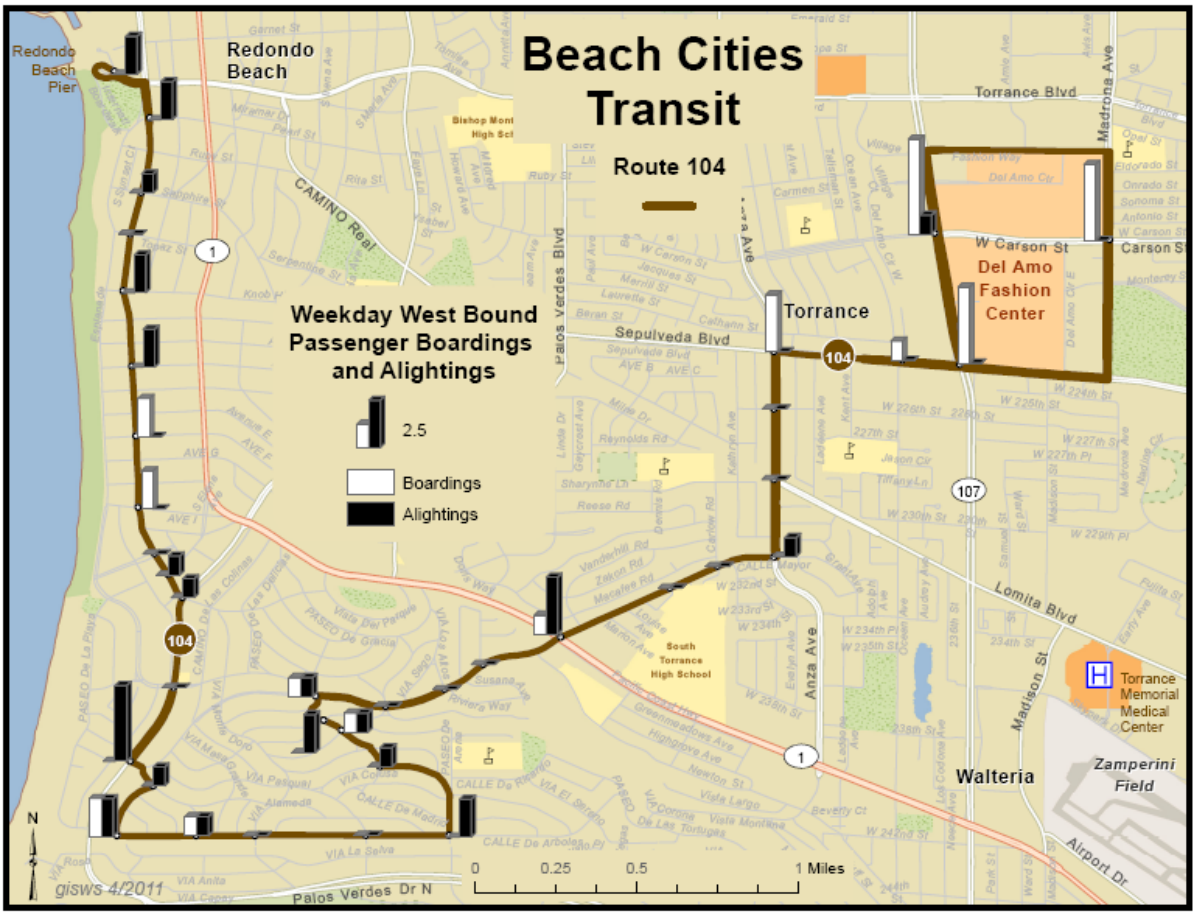

Beach Cities Transit
Route 104
Weekday West Bound Passenger Boardings and Alightings
2.5
Boardings
Alightings
Redondo Beach
Redondo Beach Pier
Torrance
Del Amo Fashion Center
W Carson St
Carson St
Torrance Blvd
Sepulveda Blvd
Palos Verdes Blvd
Anza Ave
Madrona Ave
Lomita Blvd
Madison St
Walteria
Torrance Memorial Medical Center
Zamperini Field
Airport Dr
South Torrance High School
CAMINO Real
Palos Verdes Dr N
104
107
1
0 0.25 0.5 1 Miles
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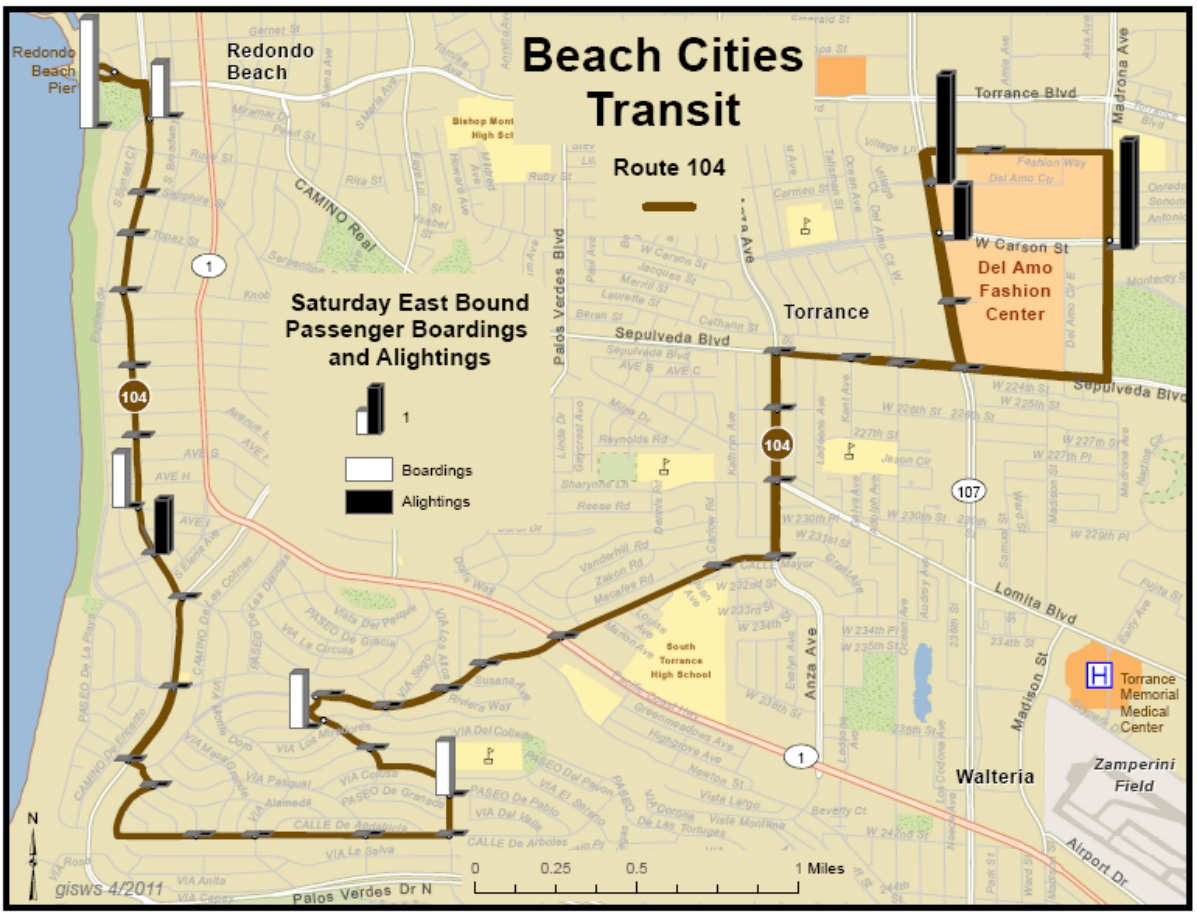
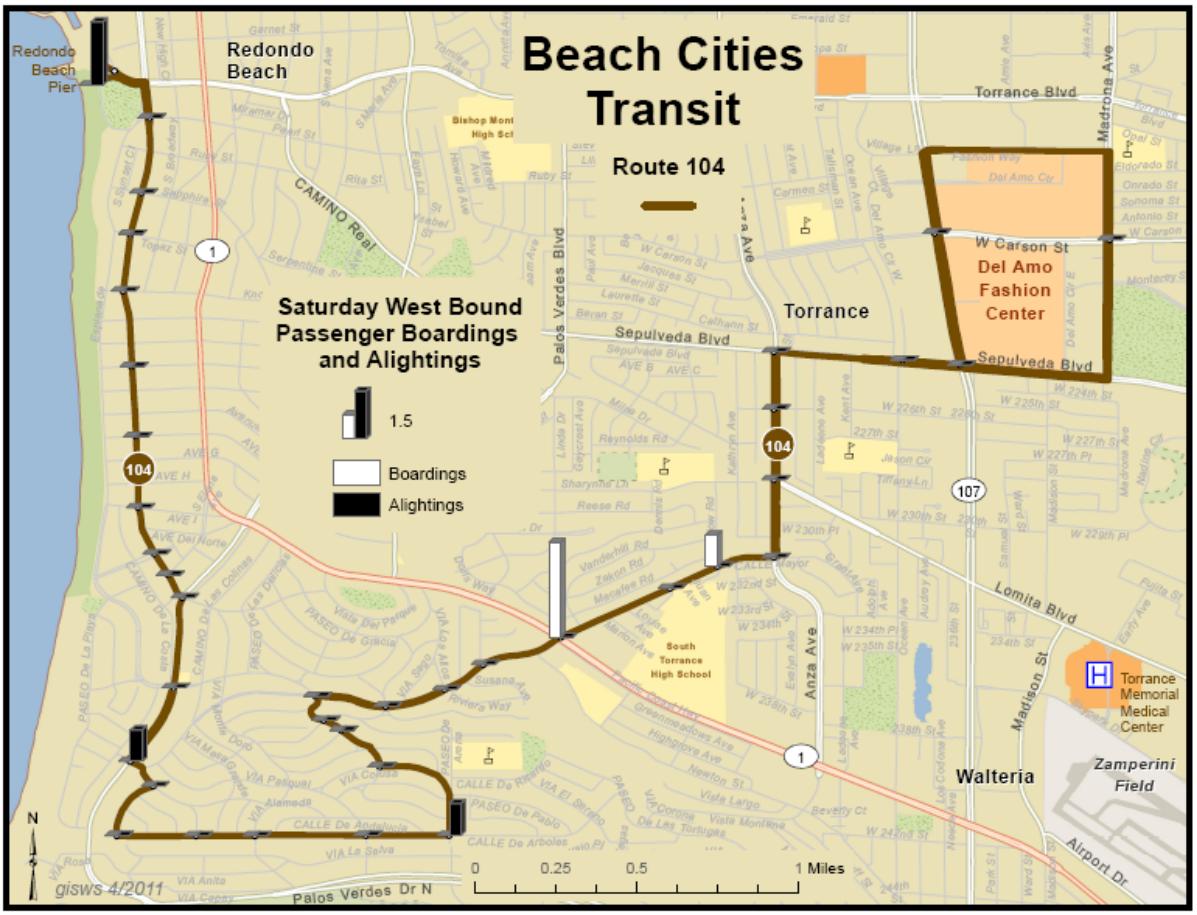
Figure 2.7
Line 104 Saturday Boardings and Alightings by Stop





Weekday Segment and Time of Day Analysis

Tables 2.19 and 2.20 show weekday boardings and productivity (boardings per revenue hour) by direction, time of day, and line segment. Each line segment includes boardings at the first stop but not at the last stop of the segment; for example, boardings at Calle Mayor & PCH are counted in the third segment eastbound but in the second segment westbound. The ridership patterns in Table 2.19 suggest reasonably balanced demand by direction at all times except afternoon, when there are more riders traveling westbound. The last segment between Sepulveda Boulevard & Anza Avenue and Carson Street & Madrona Avenue has the greatest passenger activity. Ridership is highest during the midday.

Table 2.19
Line 104 Weekday Boardings by Direction, Time of Day, and Line Segment

Segment	All Day		Morning		Midday		Afternoon	
	EB	WB	EB	WB	EB	WB	EB	WB
Redondo Beach Pier – Palos Verdes Blvd & Catalina Av	8	4	4	2	4	2	0	0
Palos Verdes Blvd & Catalina Av – Calle Mayor & PCH	8	6	1	2	5	0	2	4
Calle Mayor & PCH – Sepulveda Blvd & Anza Av	1	3	0	0	1	3	0	0
Sepulveda Blvd & Anza Av – Carson St & Madrona Av	2	14	2	5	0	5	0	4
Weekday Total	**19**	**27**	**7**	**9**	**10**	**10**	**2**	**8**

Source: Ridecheck data, January 2011

Table 2.20 presents productivity, in terms of boardings per revenue hour, for Line 104 by time of day and line segment. Morning is defined as start of service to 8:59 AM. Midday is 9:00 AM to 2:59 PM. Afternoon is 3:00 PM to end of service. Overall productivity is greatest on the easternmost segment between Carson Street & Madrona Avenue and Sepulveda Boulevard & Anza Avenue. Westbound service is slightly more productive, and morning is the most productive time period. The most productive direction/time of day segment is westbound between Carson Street & Madrona Avenue and Sepulveda Boulevard & Anza Avenue in the morning (18.8 boardings per revenue hour), and the least productive segments include several segments with no boardings (0.0 boardings per revenue hour).

Table 2.20
Line 104 Weekday Boardings per Revenue Hour by
Direction, Time of Day, and Line Segment

Segment	All Day		Morning		Midday		Afternoon	
	EB	WB	EB	WB	EB	WB	EB	WB
Redondo Beach Pier – Palos Verdes Blvd & Catalina Av	6.6	2.6	15.0	6.7	5.3	2.8	0.0	0.0
Palos Verdes Blvd & Catalina Av – Calle Mayor & PCH	4.4	2.7	2.1	4.1	5.1	0.0	5.7	5.9
Calle Mayor & PCH – Sepulveda Blvd & Anza Av	1.1	3.1	0.0	0.0	1.8	6.9	0.0	0.0
Sepulveda Blvd & Anza Av – Carson St & Madrona Av	1.9	10.1	12.0	18.8	0.0	7.1	0.0	10.0
Weekday Total	**3.8**	**4.4**	**6.5**	**6.8**	**3.4**	**3.4**	**2.1**	**4.2**

Source: Ridecheck data, January 2011

Appendix A contains detailed information on weekend productivity. Saturday productivity is very low overall, and generally highest during the midday. The most productive segment on Saturday is eastbound between Redondo Beach Pier and Palos Verdes Boulevard & Catalina Avenue in the midday, with 5.7 boardings per revenue hour.

Peak Load and Maximum Load

Table 2.21 shows the peak load points on Line 104 for weekday and Saturday. For peak load point, we use total daily ridership to identify the stop at which the total number of passengers on board is greatest. For maximum load point, we use ridership by trip to identify the trip and stop with the most people on a single bus. Table 2.21 indicates that the peak load point for weekday travel is westbound at Anza Avenue & Sepulveda Boulevard, with 20 passengers traveling westbound at this location throughout the day. The maximum load point is five passengers, on the eastbound 8:10 a.m. trip at Palos Verdes Boulevard & Calle Miramar and on the westbound 8:37 and 9:42 a.m. trips at Anza Avenue & Sepulveda Boulevard.

Table 2.21
Line 104 Peak and Maximum Load Points

Measure	Day	Eastbound			Westbound		
		Stop	Time	Riders on Board	Stop	Time	Riders on Board
Peak Load Point	Weekday	Via Colusa & Paseo de Pablo	All Day	12	Anza & Sepulveda	All Day	20
	Saturday	Calle Mayor & Shadycroft	All Day	5	Calle Mayor & PCH	All Day	4
Maximum Load Point	Weekday	Palos Verdes & Calle Miramar	8:10 a.m.	5	Anza & Sepulveda	8:37 a.m. 9:42 a.m.	5
	Saturday	Calle Mayor & Calle Miramar	12:30 p.m. 1:30 p.m.	2	Various	Various	1

Source: Ridecheck data, January 2011

Schedule Adherence

Tables 2.22 and 2.23 present schedule adherence data, in terms of the percent of all timepoints at which the bus was within one minute before to five minutes after the scheduled time, for Line 104 on weekdays and Saturday.

Weekday on-time performance is 25 percent at all time points on Line 104, last among the three weekday lines and surprisingly low given low levels of ridership. Schedule adherence is best in the afternoon and in the eastbound direction. Schedule adherence is 20 percent or below in both directions in the morning and midday periods.

Table 2.22
Line 104 Weekday Schedule Adherence

Actual vs. Schedule	All Day			Morning		Midday		Afternoon	
	EB	WB	Total	EB	WB	EB	WB	EB	WB
On Time	17	8	25	2	0	5	0	10	8
Early	0	0	0	0	0	0	0	0	0
Late	33	42	75	8	10	25	25	0	7
On Time %	34%	16%	25%	20%	0%	17%	0%	100%	53%

Source: Ridecheck Data, January 2011

Saturday on-time performance (Table 2.23) is 63 percent at all time points, 2nd among the three Saturday lines. Schedule adherence is better in the eastbound direction (65 percent). Early trips are the problem in the afternoon.

Table 2.23
Line 104 Saturday Schedule Adherence

Actual vs. Schedule	All Day			Midday		Afternoon	
	EB	WB	Total	EB	WB	EB	WB
On Time	19	21	40	13	16	6	5
Early	2	5	7	0	0	2	5
Late	7	9	16	7	9	0	0
On Time %	68%	60%	63%	65%	64%	75%	50%

Source: Ridecheck Data, January 2011

Line 104 schedule adherence is better on Saturday than on weekdays.

Another way of considering schedule adherence is to examine actual versus scheduled running times. Tables 2.24 and 2.25 show average running times and scheduled running times by segment and time of day on weekdays for Line 104. Caution is needed in interpreting results, since delays on one or two trips can affect the average for the entire segment or time period, but this level of detail highlights where running time adjustments might be needed. Actual running time is greater than scheduled running time on Line 104 in both directions, especially in the morning. Recovery time is fairly generous on this line (16 minutes or 30 percent of running time), suggesting that factors other than running time are contributing to poor schedule adherence in the midday.

Table 2.24
Line 104 Average versus Scheduled Eastbound Running Times (in Minutes) by Segment and Time of Day on Weekdays

Segment	Morning		Midday		Afternoon	
	Act	Schd	Act	Schd	Act	Schd
Redondo Beach Pier – Palos Verdes Blvd & Catalina Av	8	6	7	6	6	6
Palos Verdes Blvd & Catalina Av – Calle Mayor & PCH	14	11	10	11	10	11
Calle Mayor & PCH – Sepulveda Blvd & Anza Av	5	5	6	5	6	5
Sepulveda Blvd & Anza Av – Carson St & Madrona Av	5	5	6	5	6	5
Average Running Time	32	27	29	27	28	27

Source: Ridecheck data, January 2011; totals may not add due to rounding

Table 2.25
Line 104 Average versus Scheduled Westbound Running Times
(in Minutes) by Segment and Time of Day on Weekdays

Segment	Morning		Midday		Afternoon	
	Act	Schd	Act	Schd	Act	Schd
Madrona Av & Carson St – Anza Av & Sepulveda Blvd	7	5	7	5	6	5
Anza Av & Sepulveda Blvd – Calle Mayor & PCH	6	5	5	5	5	5
Calle Mayor & PCH – Palos Verdes Blvd & Catalina Av	11	11	10	11	11	11
Palos Verdes Blvd & Catalina Av – Redondo Beach Pier	7	6	7	6	7	6
Total	31	27	29	27	29	27

Source: Ridecheck data, January 2011; totals may not add due to rounding

Appendix A contains additional information on schedule adherence, including graphs of actual versus scheduled running time for every trip.

Overall Assessment

Line 104 ranks last in ridership among the three weekday and three Saturday lines. Ridership is higher in the westbound direction.

Line 104 ranks last among the three BCT weekday lines and last among the three Saturday lines in productivity, subsidy per passenger, and farebox recovery ratio.

There are no instances of overcrowding on Line 104. Given that the line is operated with smaller vehicles with less capacity, this reinforces the finding of extremely low usage on Line 104.

Schedule adherence is low on Line 104 on weekdays and Saturday. Actual running times are greater than scheduled running times during all weekday periods, particularly in the morning, in both directions. Line 104 ranks last among the three weekday lines and 2nd among the three Saturday lines in terms of schedule adherence.

Line 109 LAX – Redondo Beach

Overview

Line 109 LAX – Redondo Beach (Figure 2.8) is the longest of the three BCT lines. The line serves Redondo Beach, Hermosa Beach, Manhattan Beach, and El Segundo. Line 109 provides regional transit connections at the LAX City Bus Center and the Aviation and Douglas Green Line Stations. Primary streets of operation are Catalina Avenue, Hermosa Avenue, Highland Avenue, Rosecrans Avenue, Sepulveda Boulevard, Grand Avenue, Main Street, Imperial Highway, Aviation Boulevard, Century Boulevard, and 96th Street. Major destinations include the LAX City Bus Center, the Aviation Green Line Station, the Douglas Green Line Station (northbound only), downtown Manhattan Beach, downtown El Segundo, the Hermosa Beach Pier, the Redondo Beach Pier, and Riviera Village.

Line 109 connects the four cities and provides important connections to the regional transit network. Line 109 ranks second on weekdays and first on weekends among BCT lines in terms of ridership.

Headway and Span of Service

Table 2.26 shows headway and span of service for Line 109 by day of the week. Span of service is calculated from the start time of the first trip in the morning to the start time of the last trip in the evening.

Table 2.26
Line 109 Headway and Span of Service

Day of Week	Headway (minutes)	Span of Service
Weekday	45	6:00 a.m. – 8:45 p.m.
Saturday/Sunday	60	6:05 a.m. – 8:50 p.m.

Figure 2.8
Line 109

Operating Data

Table 2.27 presents operating data for Line 109. Among the three weekday lines, Line 109 ranks 2nd in boardings and in boardings per revenue hour. Among the three Saturday and two Sunday lines, Line 109 ranks 1st in boardings and 2nd in boardings per revenue hour on both days. Note that revenue hours in Table 2.27 are the actual revenue hours operated on the day of the ridecheck, which may be more or less than the scheduled revenue hours. For example, some trips may have been missed due to a bus breakdown, and some buses may have been in service longer than scheduled.

Line 109 ranks 2nd among three lines in average trip length on weekdays, 3rd on Saturday, and 2nd on Sunday. This suggests that riders do not ride the length of the line but instead use particular segments. Average trip lengths fall in the range of 2.76 to 3.07 miles on all days. Average trip lengths are longer on Saturday and Sunday. Line 109 ranks 2nd in seat utilization on weekdays and Sunday and first on Saturday.

Table 2.27
Line 109 Operating and Productivity Data

Day of Week	Boardings	Revenue Hours	Boardings per Rev Hr	Seat Utilization	Average Trip Length
Weekday	600	57.3	10.5	11.3%	2.76
Saturday	313	42.6	7.4	10.9%	3.07
Sunday	220	42.7	5.2	5.6%	2.79

Source: Ridecheck Data, January 2011

Table 2.28 presents financial data for Line 109. Line 109 ranks 2nd in subsidy per boarding and in farebox recovery ratio (passenger revenue divided by operating cost) on all days.

Table 2.28
Line 109 Financial Data

Day of Week	Boardings	Passenger Revenue	Operating Cost	Cost per Boarding	Subsidy per Boarding	Farebox Recovery Ratio
Weekday	600	$488	$2,525	$4.21	$3.39	19.3%
Saturday	313	$255	$1,875	$5.99	$5.18	13.6%
Sunday	220	$179	$1,879	$8.54	$7.73	9.5%

Source: Ridecheck data, January 2011; BCT cost per revenue hour for FY 2009; BCT average revenue per passenger for FY 2008

Figures 2.9 through 2.11 show boardings by stop and direction for weekdays, Saturday, and Sunday, respectively. The busiest stop (the only one with at least 50 boardings per weekday in one direction), is:

- Aviation Station SB

This stop also exceeds 50 boardings on Saturday and is slightly below this threshold for Sunday. The Aviation Station southbound stop is the busiest stop in the BCT system on weekends.

There are no overcrowded trips on Line 109.

Figure 2.9
Line 109 Weekday Boardings and Alightings by Stop


Beach Cities Transit
Route 109
North & South Bound
North Bound Only
Weekday South Bound Passenger Boardings and Alightings
59
Boardings
Alightings
0 0.5 1 2 Miles
gisws 4/2011
Los Angeles International Airport
El Segundo
Manhattan Beach
Hermosa Beach
Redondo Beach
Torrance
Hawthorne
Lawndale
Monaco
El Nido
Century Blvd
Imperial Hwy
Rosecrans Ave
Del Amo Blvd
Sepulveda Blvd
Aviation Blvd
Inglewood Ave
Vista Del Mar
Pacific Ocean

Figure 2.10
Line 109 Saturday Boardings and Alightings by Stop


Beach Cities Transit
Route 109
North & South Bound
North Bound Only
Saturday South Bound Passenger Boardings and Alightings
36
Boardings
Alightings
0 0.5 1 2 Miles
gisws 4/2011
Los Angeles International Airport
El Segundo
Manhattan Beach
Hermosa Beach
Redondo Beach
Torrance
Hawthorne
Lawndale
Monaco
El Nido
Del Amo Blvd
Sepulveda Blvd
Imperial Hwy
Rosecrans Ave
Manhattan Beach Blvd
Grant Ave
Ripley Ave
Artesia St
Torrance Blvd
W 120th St
W 190th St
W 182nd St
Aviation Blvd
Inglewood Ave
Vista Del Mar
Pershing Dr
Ocean Dr
Valley Dr
Prospect Ave
Ruhland Ave
Hermosa Beach Pier
Douglas Green Line Station
Aviation Station
South Bay Medical Center
LAX City Bus Center
Jack Northrop Field
Del Amo Fashion Center
105
405
91
107
1

Figure 2.11
Line 109 Sunday Boardings and Alightings by Stop


Beach Cities Transit
Route 109
North & South Bound
North Bound Only
Sunday South Bound Passenger Boardings and Alightings
24
Boardings
Alightings
0 0.5 1 2 Miles
gisws 4/2011
Los Angeles International Airport
El Segundo
Manhattan Beach
Hermosa Beach
Redondo Beach
Torrance
Lawndale
Hawthorne
Monaco
El Nido
Del Amo Blvd
Sepulveda Blvd
Imperial Hwy
Century Blvd
Rosecrans Ave
Grant Ave
Ripley Ave
Aviation Blvd
Inglewood Ave
Vista Del Mar
Pershing Dr
Ocean Dr
Valley Dr
Herondo St
Artesia St
Torrance Blvd
Jack Northrop Field
Hermosa Beach Pier
South Bay Medical Center
105
405
91
107
1

Weekday Segment and Time of Day Analysis

Tables 2.29 and 2.30 show weekday boardings and productivity (boardings per revenue hour) by direction, time of day, and line segment. Each line segment includes boardings at the first stop but not at the last stop of the segment; for example, boardings at Hermosa Avenue & 10th/11th Streets are counted in the second segment northbound and in the first segment southbound. The ridership patterns in Table 2.29 suggest a predominant southbound passenger flow in the morning and a northbound flow in the midday, with balanced flows in the afternoon and evening. The segment between Main Street & Holly/Grand Avenue and Aviation Station has the greatest passenger activity. There is also significant ridership northbound between Hermosa Avenue & 10th Street and Douglas Station, especially in the midday and afternoon. Ridership is highest during the midday.

Table 2.29
Line 109 Weekday Boardings by Direction, Time of Day, and Line Segment

Segment	All Day		Morning		Midday		Afternoon		Evening	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Palos Verdes Blvd & Via Valencia – Hermosa Av & 10th/11th St	67	12	18	3	35	8	13	1	1	0
Hermosa Av & 10th/11th St – Douglas Station	126	45	13	7	63	22	43	11	7	5
Douglas Station – Park Pl & El Segundo Plaza	10		1		7		2		0	
Park Pl & El Segundo Pl – Main St & Holly/Grand Av	17	52	7	27	7	12	2	13	1	0
Main St & Holly/Grand Av – Aviation Station	62	139	17	47	26	57	15	25	4	10
Aviation Station – LAX City Bus Center	15	55	11	11	0	14	2	28	2	2
Weekday Total	**297**	**303**	**67**	**95**	**138**	**113**	**77**	**78**	**15**	**17**

Source: Ridecheck data, January 2011

Table 2.30 presents productivity, in terms of boardings per revenue hour, for Line 109 by time of day and line segment. Morning is defined as start of service to 8:59 AM. Midday is 9:00 AM to 2:59 PM. Afternoon is 3:00 PM to 6:59 PM. Evening is 7:00 PM to end of service. Overall productivity is greatest on the segment between Main Street & Holly/Grand Avenue and Aviation Station. Southbound service is more productive throughout the day, but in the midday this is due to lengthy layovers at the north end of the line being counted as northbound revenue hours. Morning is the most productive time period, especially southbound. The most productive direction/time of day segment is southbound between Aviation Station and Main Street & Grand Avenue in the morning (40.3 boardings per revenue hour), and three direction/time of day segments have no boardings (0.0 boardings per revenue hour).

Table 2.30
Line 109 Weekday Boardings per Revenue Hour by Direction, Time of Day, and Line Segment

Segment	All Day		Morning		Midday		Afternoon		Evening	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Palos Verdes Blvd & Via Valencia – Hermosa Av & 10th/11th St	11.0	2.6	10.9	3.6	13.7	4.4	9.5	0.6	1.9	0.0
Hermosa Av & 10th/11th St – Douglas Station	12.1	6.3	5.1	4.7	14.6	7.5	16.0	5.2	8.6	7.9
Douglas Station – Park Pl & El Segundo Plaza	5.7		6.7		9.3		3.0		0.0	
Park Pl & El Segundo Pl – Main St & Holly/Grand Av	3.9	13.8	5.5	32.4	3.6	7.7	2.4	12.4	3.0	0.0
Main St & Holly/Grand Av – Aviation Station	10.0	25.7	8.8	40.3	11.6	26.9	10.5	15.0	6.7	22.2
Aviation Station – LAX City Bus Center	4.1	15.1	12.5	15.0	0.0	10.1	2.1	23.3	5.2	6.3
Weekday Total	**9.1**	**12.3**	**7.9**	**18.6**	**10.4**	**11.5**	**9.6**	**10.2**	**5.2**	**7.8**

Source: Ridecheck data, January 2011

Appendix A contains detailed information on weekend productivity. The most productive segment on weekends is southbound between Aviation Station and Main Street & Grand Avenue in the evening, with 37.8 boardings per revenue hour on Saturday and 28.0 boardings per revenue hour on Sunday.

Peak Load and Maximum Load

Table 2.31 shows the peak load points on Line 109 for weekday, Saturday, and Sunday. For peak load point, we use total daily ridership to identify the stop at which the total number of passengers on board is greatest. For maximum load point, we use ridership by trip to identify the trip and stop with the most people on a single bus. Table 2.31 indicates that the peak load point for weekday travel is southbound at Imperial Highway & Nash Street, with 153 passengers traveling southbound at this location throughout the day. The maximum load point on Line 109 is southbound on the weekday 8:15 a.m. trip at Imperial Highway & Center Street, with 24 passengers on board.

Table 2.31
Line 109 Peak and Maximum Load Points

Measure	Day	Northbound			Southbound		
		Stop	Time	Riders on Board	Stop	Time	Riders on Board
Peak Load Point	Weekday	Rosecrans & Pacific	All Day	137	Imperial & Nash	All Day	153
	Saturday	Rosecrans & Pacific	All Day	52	Imperial & Aviation	All Day	103
	Sunday	Manhattan & 3 Pl/4 St Highland & 26 St	All Day	35	Aviation Station	All Day	68
Maximum Load Point	Weekday	Rosecrans & Pacific	2:00 p.m.	19	Imperial & Center	8:15 a.m.	24
	Saturday	Rosecrans & Alma	3:05 p.m.	18	Aviation Station	8:50 p.m.	13
	Sunday	Hermosa & 16th	4:05 p.m.	9	Main & Imperial	4:50 p.m.	9

Source: Ridecheck data, January 2011

Schedule Adherence

Tables 2.32 through 2.34 present schedule adherence data, in terms of the percent of all timepoints at which the bus was within one minute before to five minutes after the scheduled time, for Line 109 on weekdays, Saturday, and Sunday.

Weekday on-time performance is 65 percent at all time points on Line 109, best among the three weekday lines. Schedule adherence is best in the morning. Schedule adherence is much better southbound at all time periods except evening. Line 109 has a long layover at its northbound terminus, allowing southbound buses to leave on time even if they had been running late. In the evening, one operator deliberately left the start point late because there was too much scheduled running time and he knew that if he left late, he would arrive on schedule. The southbound schedule adherence of 94 percent in the afternoon is the best of any time period/direction in the BCT system.

Table 2.32
Line 109 Weekday Schedule Adherence

Actual vs. Schedule	All Day			Morning		Midday		Afternoon		Evening	
	NB	SB	Total	NB	SB	NB	SB	NB	SB	NB	SB
On Time	73	96	169	25	21	22	34	16	34	10	7
Early	8	2	10	4	0	1	0	0	1	3	1
Late	59	22	81	6	3	33	14	19	1	1	4
On Time %	52%	80%	65%	71%	88%	39%	71%	46%	94%	71%	58%

Source: Ridecheck Data, January 2011

Saturday on-time performance (Table 2.33) is better at 71 percent at all time points, best among the three Saturday lines. Schedule adherence is better southbound, overall (88 percent) and in each time period.

Table 2.33
Line 109 Saturday Schedule Adherence

Actual vs. Schedule	All Day			Morning		Midday		Afternoon		Evening	
	NB	SB	Total	NB	SB	NB	SB	NB	SB	NB	SB
On Time	59	79	138	16	17	16	30	16	22	11	10
Early	10	7	17	4	1	4	2	2	2	0	2
Late	36	4	40	1	0	22	4	10	0	3	0
On Time %	56%	88%	71%	76%	94%	38%	83%	57%	92%	79%	83%

Source: Ridecheck Data, January 2011

Sunday on-time performance (Table 2.34) is even better at 78 percent at all time points, 2nd by a very small margin among the two Sunday lines. Schedule adherence is better southbound in the midday and afternoon, and is better northbound in the morning and evening.

Table 2.34
Line 109 Sunday Schedule Adherence

Actual vs. Schedule	All Day			Morning		Midday		Afternoon		Evening	
	NB	SB	Total	NB	SB	NB	SB	NB	SB	NB	SB
On Time	79	74	153	17	12	33	33	18	21	11	8
Early	8	9	17	4	3	2	3	1	2	1	1
Late	18	7	25	0	3	7	0	9	1	2	3
On Time %	75%	82%	78%	81%	67%	79%	92%	64%	88%	79%	67%

Source: Ridecheck Data, January 2011

Line 109 schedule adherence is better on weekends than on weekdays.

Another way of considering schedule adherence is to examine actual versus scheduled running times. Tables 2.35 and 2.36 show average running times and scheduled running times by segment and time of day on weekdays for Line 109. Caution is needed in interpreting results, since delays on one or two trips can affect the average for the entire segment or time period, but this level of detail highlights where running time adjustments might be needed. Actual running

time is slightly greater than scheduled running time on Line 109 during the midday and afternoon in the northbound direction and slightly less in the morning and evening. Southbound, actual running time is equal to scheduled running time during the midday and afternoon and is less in the morning and the evening. Minor adjustments can be made to the Line 109 schedule, but a major change is not necessary.

Table 2.35
Line 109 Average versus Scheduled Northbound Running Times
(in Minutes) by Segment and Time of Day on Weekdays

Segment	Morning		Midday		Afternoon		Evening	
	Act	Schd	Act	Schd	Act	Schd	Act	Schd
Palos Verdes Blvd & Via Valencia – Hermosa Av & 10th St	14	12	15	12	13	12	13	12
Hermosa Av & 10th St – Douglas Station	22	21	26	21	26	21	20	21
Douglas Station – Park Pl & El Segundo Plaza	2	7	4	7	7	7	4	7
Park Pl & El Segundo Pl – Main St & Holly Av	11	10	11	10	8	10	9	10
Main St & Holly Av – Aviation Station	16	15	13	15	14	15	15	15
Aviation Station – LAX City Bus Center	8	10	8	10	10	10	10	10
Average Running Time	73	75	77	75	78	75	71	75

Source: Ridecheck data, January 2011; totals may not add due to rounding

Table 2.36
Line 109 Average versus Scheduled Southbound Running Times
(in Minutes) by Segment and Time of Day on Weekdays

Segment	Morning		Midday		Afternoon		Evening	
	Act	Schd	Act	Schd	Act	Schd	Act	Schd
LAX City Bus Center – Aviation Station	10	10	10	10	11	10	9	10
Aviation Station – Main St & Grand Av	17	15	15	15	16	15	14	15
Main St & Grand Av – Park Pl & El Segundo Plaza	11	11	11	11	10	11	9	11
Park Place & El Segundo Plaza – Hermosa Av & 11th St	22	23	21	23	20	23	19	23
Hermosa Av & 11th St – Palos Verdes Blvd & Via Valencia	12	13	13	13	15	13	14	13
Total	72	72	70	72	72	72	65	72

Source: Ridecheck data, January 2011; totals may not add due to rounding

Appendix A contains additional information on schedule adherence, including graphs of actual versus scheduled running time for every trip.

Overall Assessment

Line 109 ranks 2nd in ridership among the three weekday lines. Ridership is heavier in the southbound direction in the morning and in the northbound direction in the midday. Line 109 ranks first in ridership on weekends.

Line 109 ranks 2nd on all days in productivity, subsidy per passenger, and farebox recovery ratio. There are no instances of overcrowding on Line 109.

Schedule adherence is acceptable on Line 109 on weekdays, with slightly more running time needed in the afternoon and less running time in the evening. Line 109 ranks 1st by a wide margin among the three weekday lines in terms of schedule adherence. Schedule adherence is higher on Saturday and Sunday.

Beach Cities Transit
2011 Comprehensive Operational Analysis
Chapter 3: On-board Survey Results

3.0 Introduction

As part of the Comprehensive Operational Analysis, the project team conducted an onboard survey of riders in conjunction with the ridecheck during the period January 15 through 20, 2011. The survey, designed jointly by the project team and Beach Cities Transit staff, solicited input from riders regarding:

- Trip origin, destination, purpose, and other information regarding the passenger's trip
- Extent and history of transit usage
- Ratings of various service elements
- Desired changes and improvements to the bus system
- Rider demographics

Surveyors distributed and collected surveys during the ridecheck. Surveys were printed in English and Spanish. Passengers were asked to fill out the survey only once.

This report summarizes the results of the on-board survey. Copies of the survey may be found in Appendix C.

3.1 Summary of Survey Findings

BCT riders are using transit primarily for work and school trips: work is the most common trip purpose on weekdays and weekends. Riders are most likely to live in Redondo Beach or El Segundo, although BCT attracts riders from 123 different zip codes. Most riders walk to and from their origin and destination, and many riders transfer to or from other buses or the Metro Green Line.

BCT riders tend to be long-time riders. The number of occasional riders is relatively high. Most riders pay the adult fare, and cash is by far the most common fare payment method. Three-quarters of all respondents report using other transit systems (primarily Metro Bus and Metro Rail) within the past two weeks. Most riders would either walk or take Metro or another bus if BCT were not available, but 11 percent of respondents would not make the trip without BCT.

In terms of demographics, BCT riders are most likely to be female, and to live in households with zero or one car and with incomes under $25,000. Riders are of all ages. The most common ethnicity is Latino, with Latino riders accounting for almost half of all riders.

BCT riders are very pleased with the service. On a scale of one (very poor) to five (excellent), respondents rate BCT service at an average of 4.13, a very high rating. The highest rated items are operator courtesy, personal safety, and cleanliness. Average scores for these three items exceed 4.25. The lowest ratings among all service elements are for frequency (3.41) and reliability (3.51), but even these lowest scores are respectable. Improved frequency and improved on-time performance were the most requested improvements. An analysis of performance versus importance for the eight service attributes indicates that service reliability is the most critical element in terms of needed improvements.

3.2 Survey Findings: Survey and Trip Characteristics

Riders completed a total of 715 usable surveys. Figure 3.1 summarizes responses by language. Over 70 percent of all respondents answered the survey in English.

Figure 3.1
Survey Responses by Language

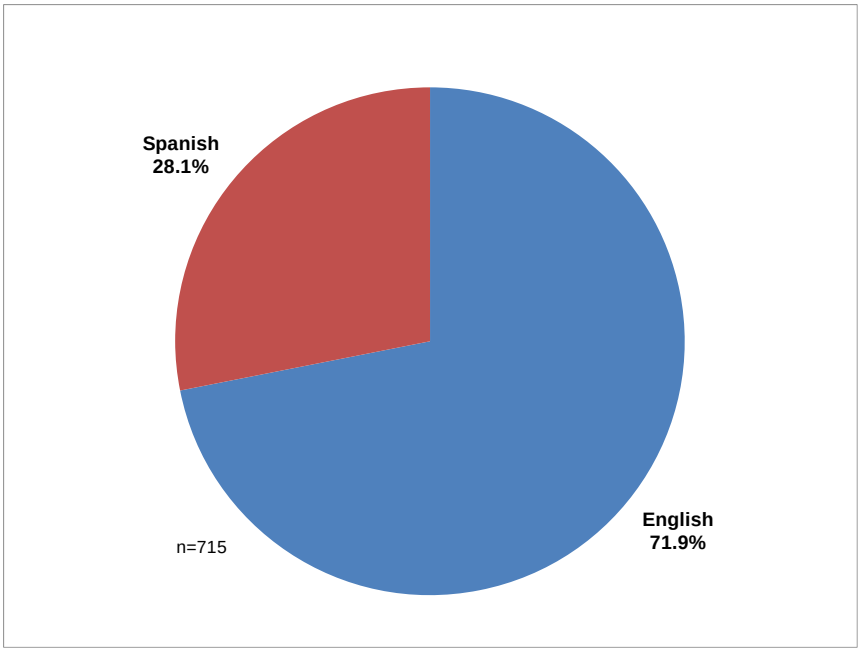


Figure 3.2 shows survey responses by BCT bus line. As expected, Line 109 was the biggest contributor with 55 percent of all responses. The number of responses correlates with the number of riders for each line.

Figure 3.2
Survey Responses by Line

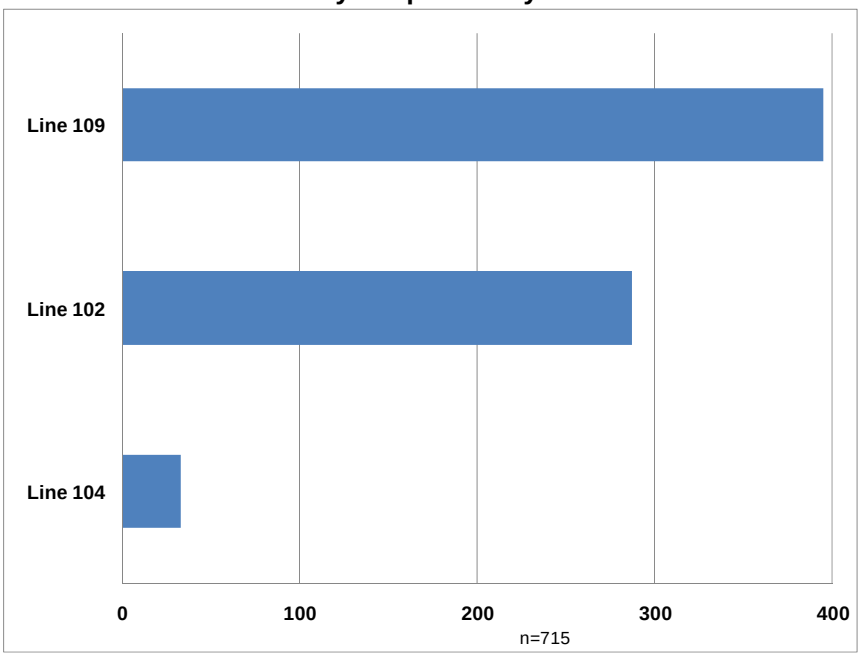


Figure 3.3 shows the home zip code of survey respondents. Only zip codes reported by at least two percent of respondents are shown. The ten zip codes in Figure 3.3 account for 58 percent of all respondents; the remaining 42 percent reported 123 different zip codes, indicated that Beach Cities Transit draws riders from all over.

Figure 3.3
Home Zip Codes of Survey Respondents

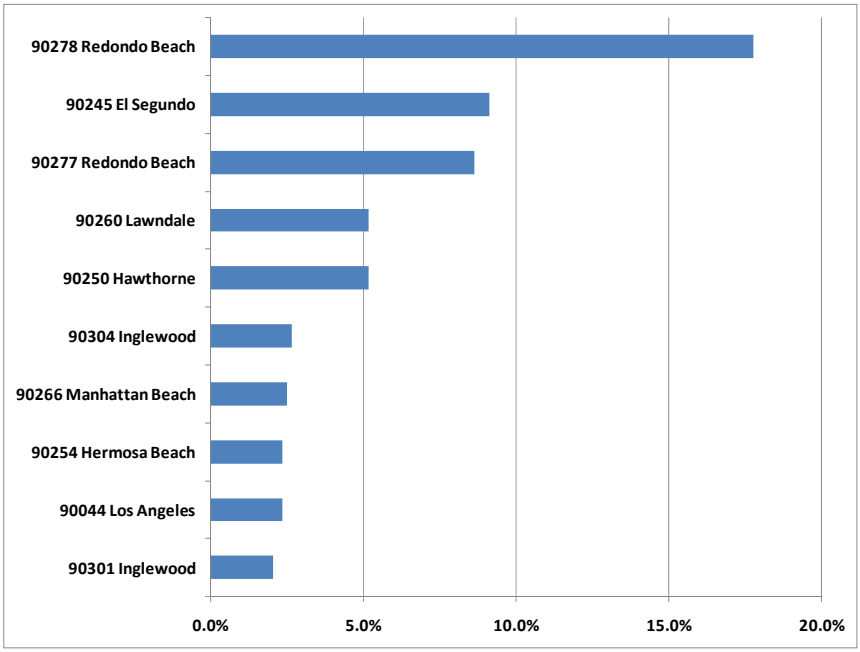
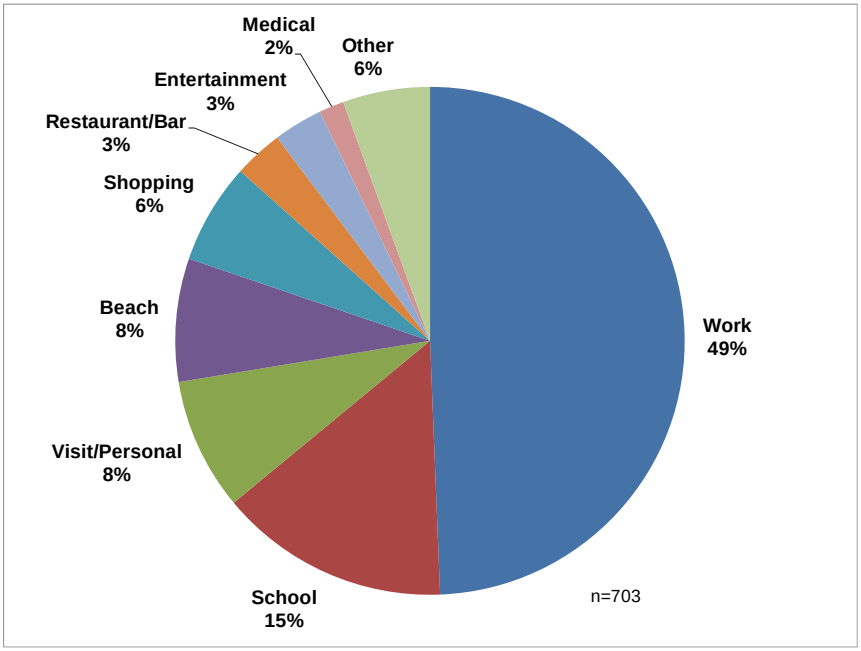


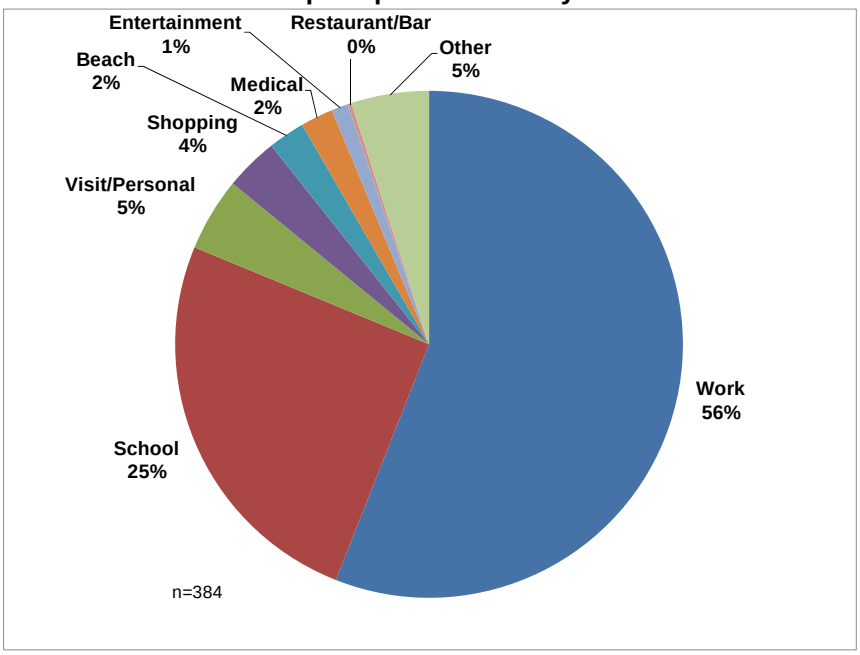
Figure 3.4 presents a breakdown of trip purpose. Work and school together account for almost two-thirds of all trip purposes.

Figure 3.4
Trip Purpose



It is helpful in analyzing trip purpose to examine weekdays and weekends separately. Figures 3.5 and 3.6 show trip purpose on weekdays and weekends, respectively. Work is the single largest trip purpose on weekdays at 56 percent, followed by school at 25 percent. Together, school and work account for over 80 percent of all weekday trips.

Figure 3.5
Trip Purpose - Weekdays



Work is also the largest trip purpose on weekends at 41 percent of all trips, followed by leisure activities such as the beach, visit/personal, and shopping. School-related weekend trips may be for extracurricular activities or for the library. The ranking of trip purposes (i.e., work first, followed by beach, visit personal, and so on) is identical for both Saturday and Sunday, so it is appropriate to combine them into one weekend figure. The percentage of trips for work, the beach, and visit/personal are slightly higher on Sunday, while the percentage of trips for shopping, restaurant/bar, entertainment, and school are slightly higher on Saturday.

Figure 3.6
Trip Purpose – Weekends

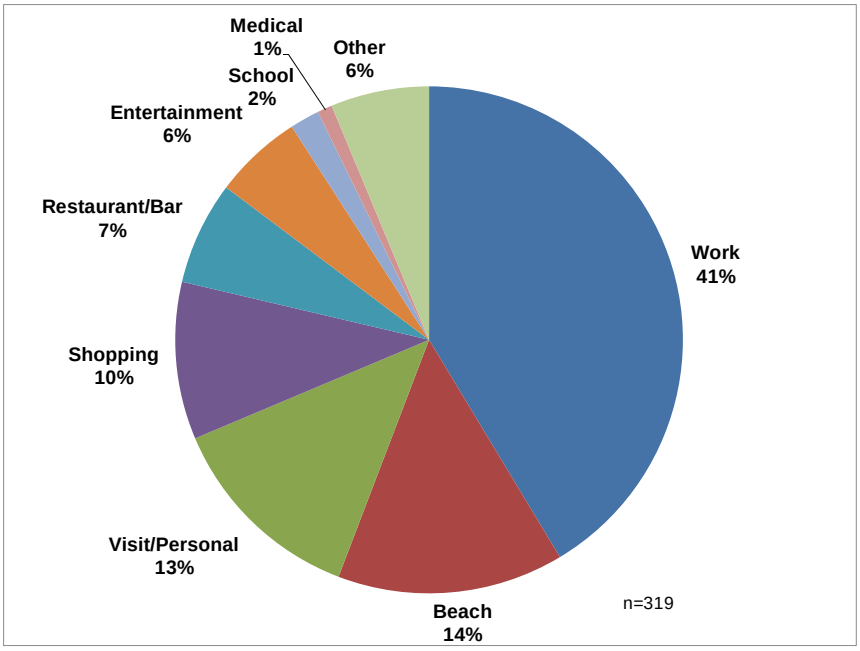
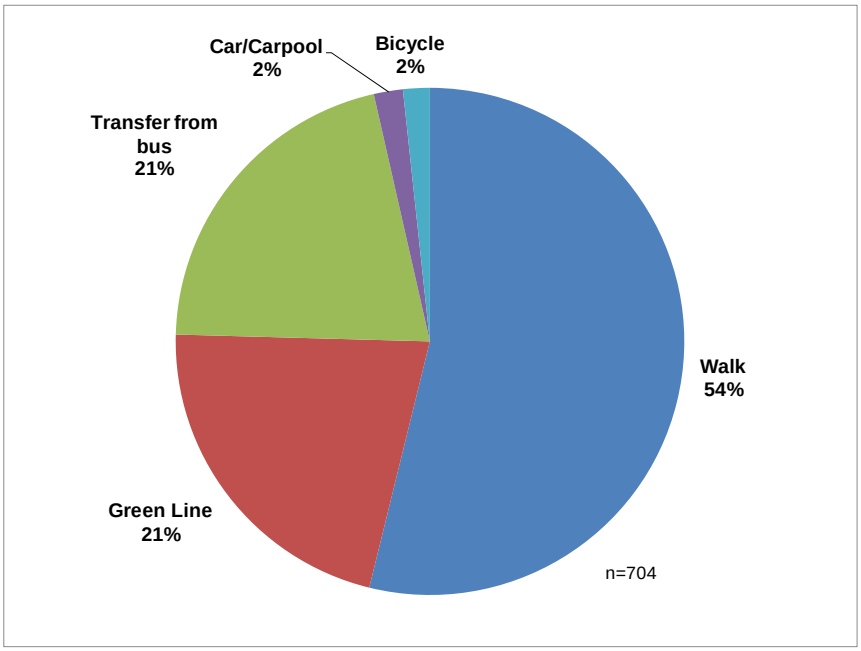


Figure 3.7 shows how riders got to the bus. Over half of all riders report walking to the bus stop, and over 40 percent transfer from another bus or from the Green Line.

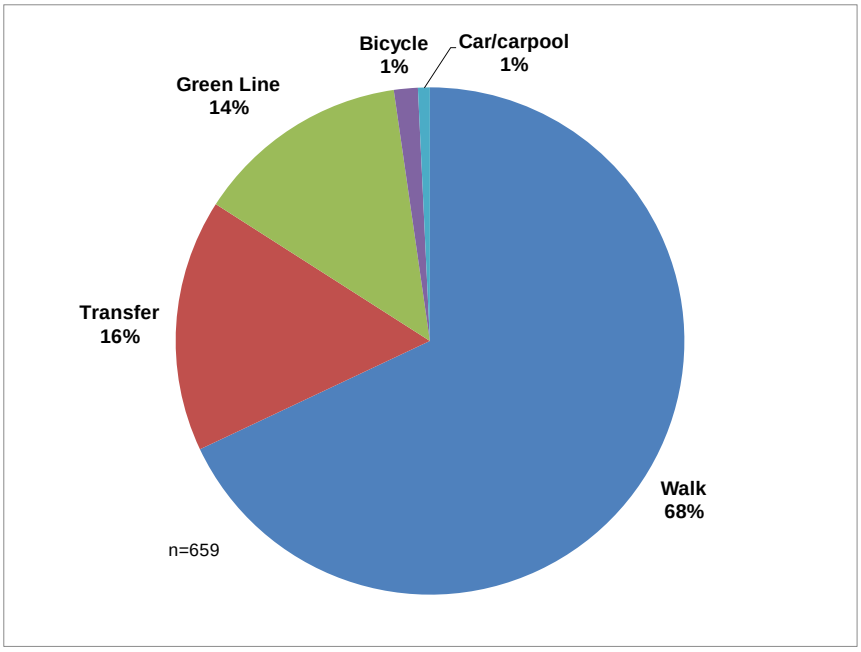
Figure 3.7
Mode of Access to the Bus



Over 60 percent of all transferring bus passengers come from a Metro line. Torrance Transit accounts for 13 percent of reported transfer boardings. BCT and Culver City Bus each accounts for eight percent of transfers. Metro Line 232 (Long Beach to LAX via Pacific Coast Highway and Sepulveda Boulevard) is the leading line to transfer from, with 18 percent of all transfers to a BCT bus coming from this line.

Figure 3.8 shows what passengers did when they got off the bus. Over two-thirds of respondents walk to their final destination, while 16 percent transfer to another line and 14 percent transfer to the Green Line. Mode of egress is similar to mode of access (Figure 3.5), with a greater likelihood to walk upon leaving the bus.

Figure 3.8
Mode of Egress from the Bus



Among transferring passengers, 56 percent transfer to Metro. Torrance Transit accounts for 21 percent of transfers to another bus, while Santa Monica Big Blue Bus accounts for 11 percent. The most frequently reported transfers are to Metro Line 232 and Big Blue Bus Line 3.

3.3 Survey Findings: Ridership Patterns, Fare Payment, and Alternatives

Figure 3.9 indicates ridership history. Almost 45 percent of respondents have been BCT customers for more than two years. At the other end of the spectrum, about one out of every six riders is new to the system within the past six months.

Figure 3.9
Ridership History on BCT

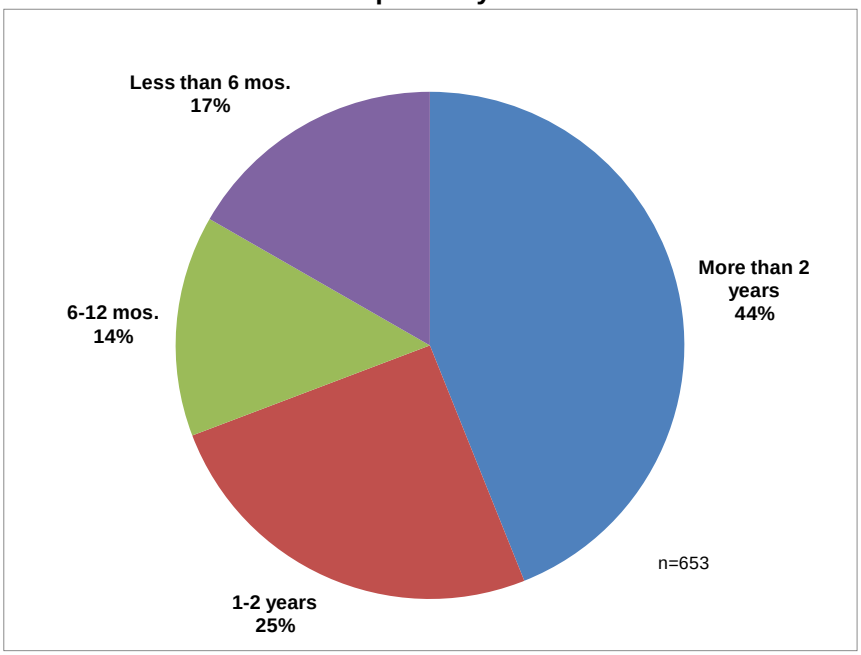


Figure 3.10 shows the reported frequency of transit ridership in a typical week. On-board surveys tend to under-report infrequent ridership, since passengers who ride infrequently have a lesser chance to be surveyed. Less than half of respondents report riding BCT buses at least four days per week, while 21 percent report riding less than once a week.

Figure 3.10
Reported Frequency of Ridership

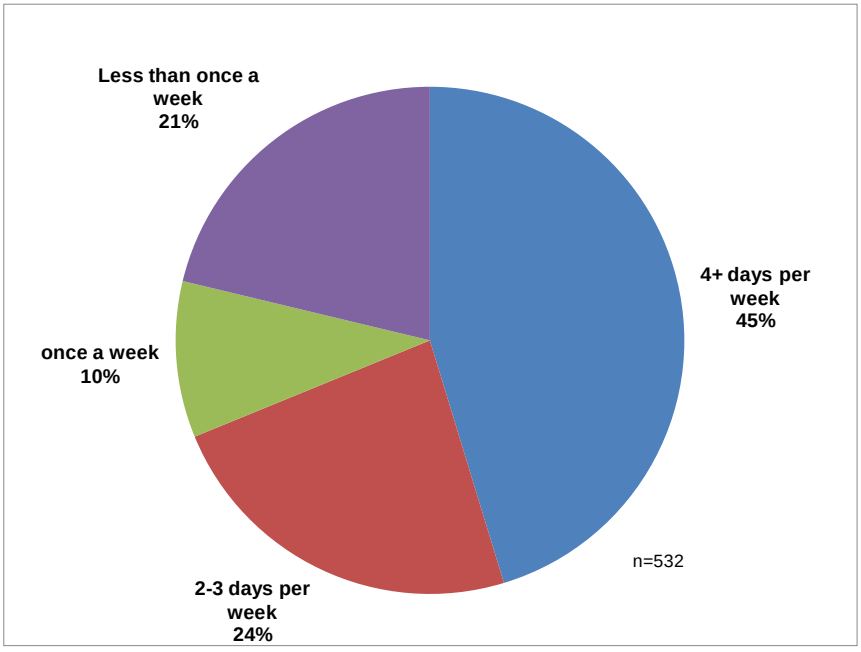


Figure 3.11 indicates the fare category of respondents. Two-thirds of all riders are classified as adult and pay the adult fare. Only 11 percent of riders are senior or disabled.

Figure 3.11
Fare Category of Respondents

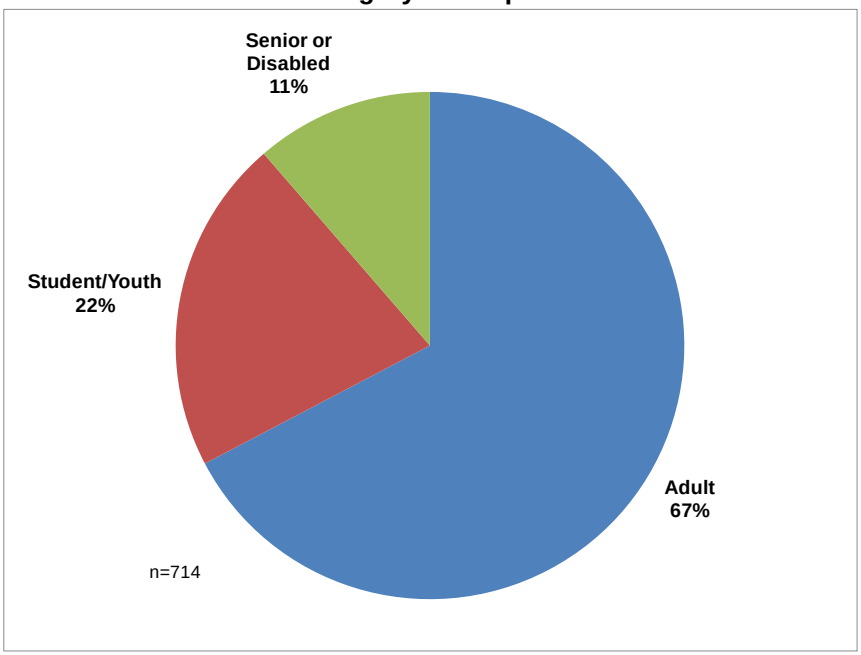


Figure 3.12 presents a breakdown of the method of fare payment as reported by respondents. Cash and the BCT monthly pass are used by 75 percent of all respondents. The BCT monthly pass and transfers make up 18 percent of all respondents. Cash is by far the most common fare payment method.

It is worth noting differences between this and previous figures. The transfer percentage appears low compared to the results in Figure 3.7 (mode of access), but the transfer totals in Figure 3.12 only includes those using transfers, not those who transfer using a monthly pass.

Figure 3.12
Fare Payment Method

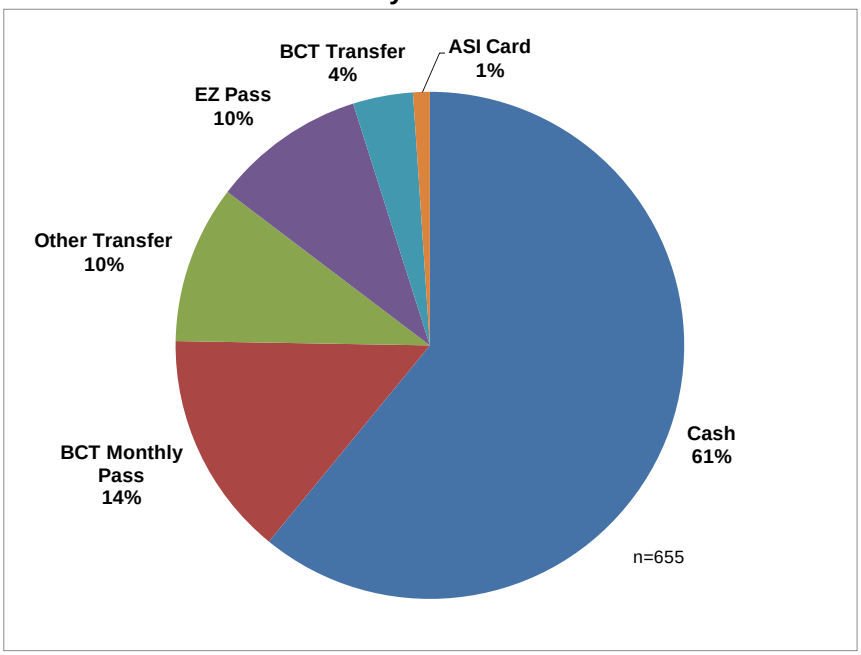


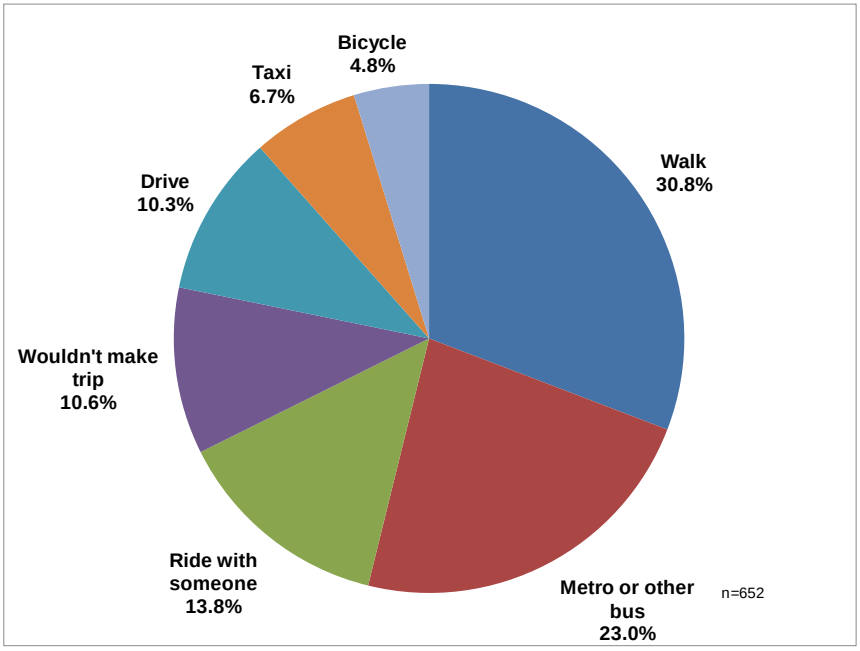
Table 3.1 reports on the recent use of other transit systems by BCT survey respondents. Over 50 percent of respondents also use either Metro Bus or Metro Rail and eight percent use Torrance Transit buses. Other transit services are used less often.

Table 3.1
Other Transit Services Used in the Preceding Two Weeks

Transit System	Respondents	Percentage
Metro Bus	230	32.2%
Metro Rail	141	19.7%
Torrance Transit	57	8.0%
Santa Monica Big Blue Bus	24	3.4%
Metrolink	18	2.5%
Gardena Transit	12	1.7%
Lawndale Transit	12	1.7%
LADOT Commuter Express	11	1.5%
Long Beach Transit	10	1.4%
Culver City Bus	8	1.1%
LADOT DASH	5	0.7%
Access Services	3	0.4%
Total Using Other Systems	531	74.3%
Total Respondents	715	100.0%

Figure 3.13 presents the mode of travel that respondents would use if the BCT bus were not available. Most would either walk or take Metro or another bus. The 11 percent of respondents who would not make the trip are truly dependent on BCT for their mobility.

Figure 3.13
Alternative Mode If the Bus Were Not Available



3.4 Survey Findings: Rider Demographics

This section reports on demographic characteristics of riders, including age, gender, ethnicity, vehicle ownership, and income.

Figure 3.14 shows the age of respondents. The BCT attracts riders of all ages. The single biggest category is between the ages of 35 and 44, 20 percent of all riders, followed by 17 and under (18 percent) and 45 to 54 (17 percent).

Figure 3.14
Age of BCT Riders

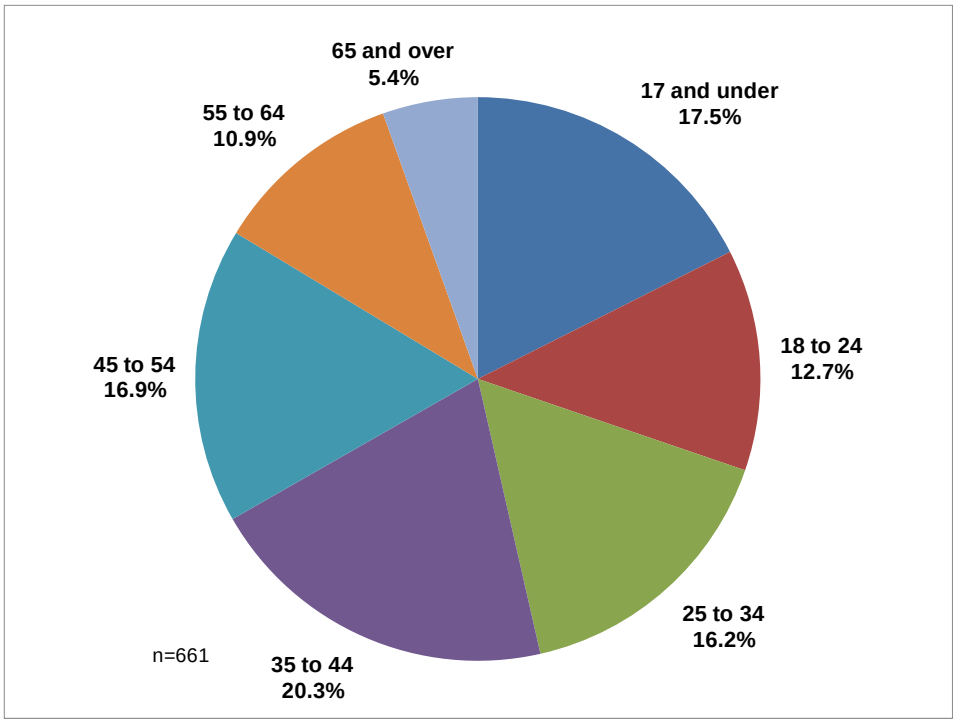


Figure 3.15 shows the gender of respondents. Local transit riders typically include more females than males, and the BCT at 55 percent female is no exception.

Figure 3.15
Gender of BCT Riders

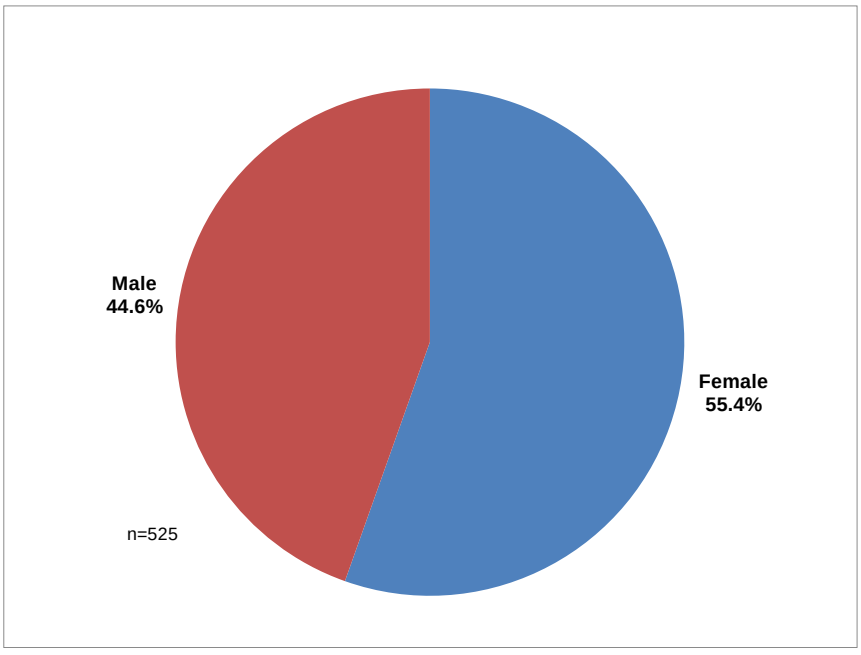


Figure 3.16 shows household vehicle ownership among BCT riders. Almost 40 percent of riders live in households with zero vehicles. One-vehicle households account for 33 percent of all riders, while 29 percent of riders report multiple vehicles in their households.

Figure 3.16
Household Vehicle Ownership among BCT Riders

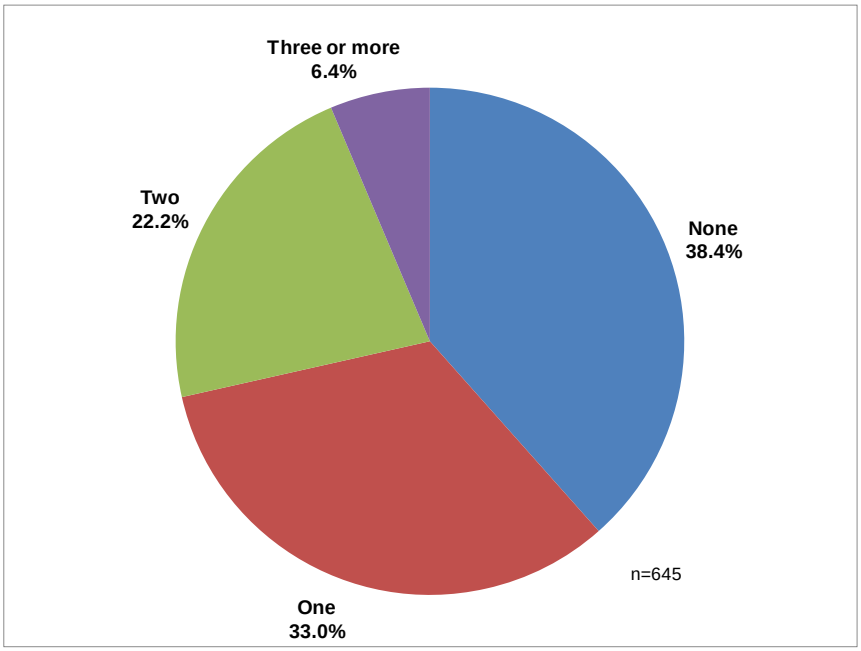


Figure 3.17 shows rider ethnicity. The largest ethnic ridership group is Latino/Hispanic, slightly under 50 percent, followed by white at 31 percent.

Figure 3.17
Ethnicity of BCT Riders

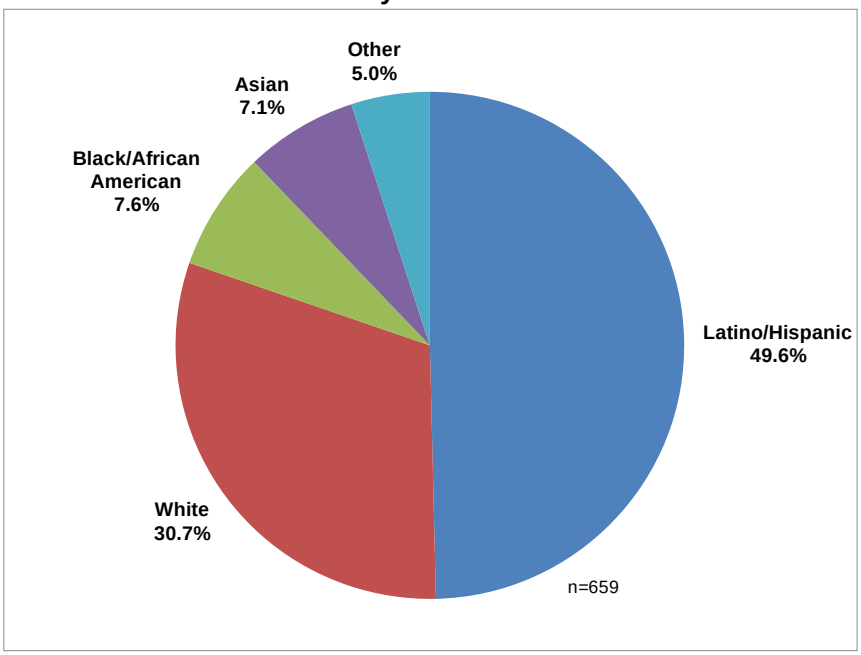
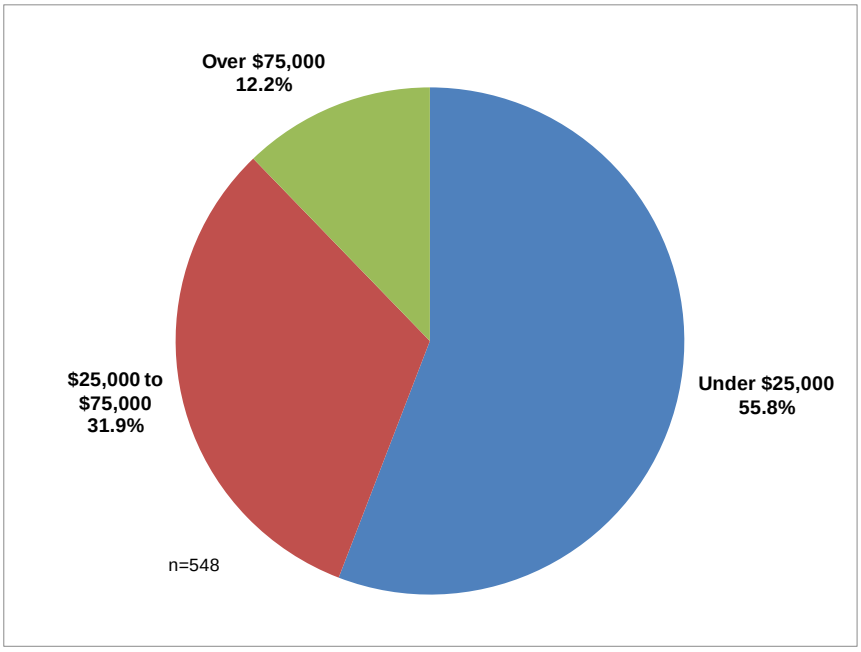


Figure 3.18 shows household income of respondents. Over half of all respondents report household income under $25,000.

Figure 3.18
Household Income of BCT Riders



3.5 Survey Findings: Perceptions of Transit Service Quality

The survey asked riders to rate BCT's performance, on a scale of 1 to 5 with 1 being "very poor" and 5 being "excellent," for eight different service characteristics as well as to provide an overall rating of BCT service. Figure 3.19 shows the results. Table 3.2 presents rider perceptions of service, and includes the weighted average score (used in Figure 3.19) of all ratings for each service element as well as the distribution of actual ratings. The highest rated items are operator courtesy, personal safety, and cleanliness. Average scores for these three items exceed 4.25. The lowest ratings among all service elements are for frequency (3.41) and reliability (3.51), but even these lowest scores are respectable. The average score for overall BCT service is 4.13, indicating a very high level of passenger satisfaction with BCT.

3.6 Survey Findings: Detailed Analysis of Service Attribute Ratings by Riders

In designing service improvements, BCT needs to know not only the customer ratings on individual service attributes but also the importance of each attribute in terms of overall satisfaction. The previous section focused on customer ratings; in this section, we consider the ratings together with the relative importance of each service attribute.

The simplest way to measure importance is to ask the customer to rate each element on a scale of 1 to 5, similar to the performance ratings. The drawback of this method is that it lengthens both the survey instrument and time needed to complete the survey, which in turn could diminish the response rate. An alternate technique to measure the importance of each service attribute is to derive importance by examining the relationship of each attribute to overall satisfaction.

The Bay Area Rapid Transit District in Oakland, CA has developed a practical methodology to derive the importance of individual service attributes.[1] The methodology uses bivariate correlation analysis to estimate the importance of each service attribute. Specifically, Pearson correlation coefficients are calculated between the performance rating of each service attribute and the overall BCT service rating. While there is a degree of intercorrelation among the service attributes, the Pearson correlation coefficients are an effective means to measure the relative importance of each attribute. Importance is derived by calculating the ratio between the correlation coefficient for each attribute and the median correlation coefficient. An index score of 100 is assigned to the median correlation coefficient. Service attributes with a score above 100 are more correlated with overall satisfaction (as measured by the overall BCT rating), while service attributes with a score below 100 are less correlated.

[1] Aaron Weinstein, "Customer Satisfaction Among Transit Riders – How Customers Rank the Relative Importance of Various Service Attributes." **Transportation Research Record 1735**, 2000.

Figure 3.19
Average Ratings of BCT Service Elements

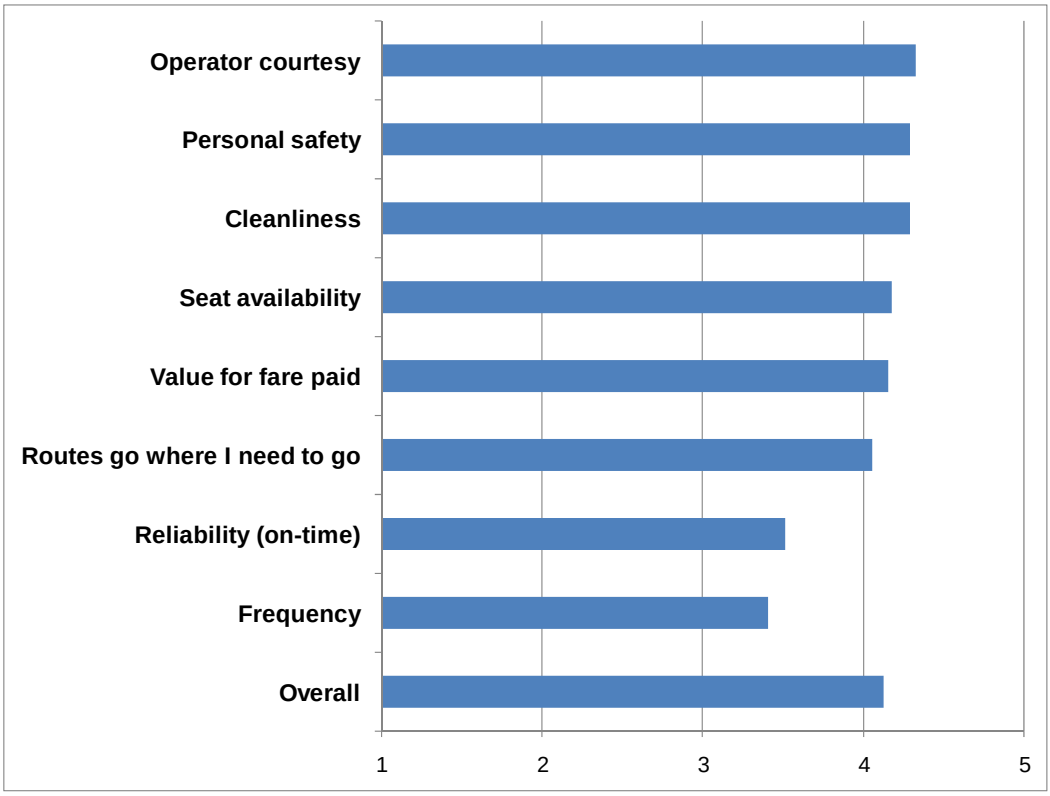


Table 3.2
Detailed Ratings of BCT Service Elements

Service Element	Average Score	Number of Respondents Rating by Score					Total Respondents
		1 Very Poor	2 Poor	3 Fair	4 Good	5 Excellent	
Operator courtesy	4.33	10	17	66	189	333	615
Personal safety	4.29	11	20	52	231	303	617
Cleanliness and comfort	4.29	13	29	61	190	328	617
Seat availability	4.18	21	31	78	178	314	622
Value for fare paid	4.16	22	14	86	215	277	614
Routes go where I need to go	4.06	13	27	106	232	234	612
Reliability (on time)	3.51	57	76	132	204	152	621
Frequency	3.41	58	86	157	203	129	633
Overall Rating	**4.13**	**8**	**19**	**92**	**258**	**230**	**607**

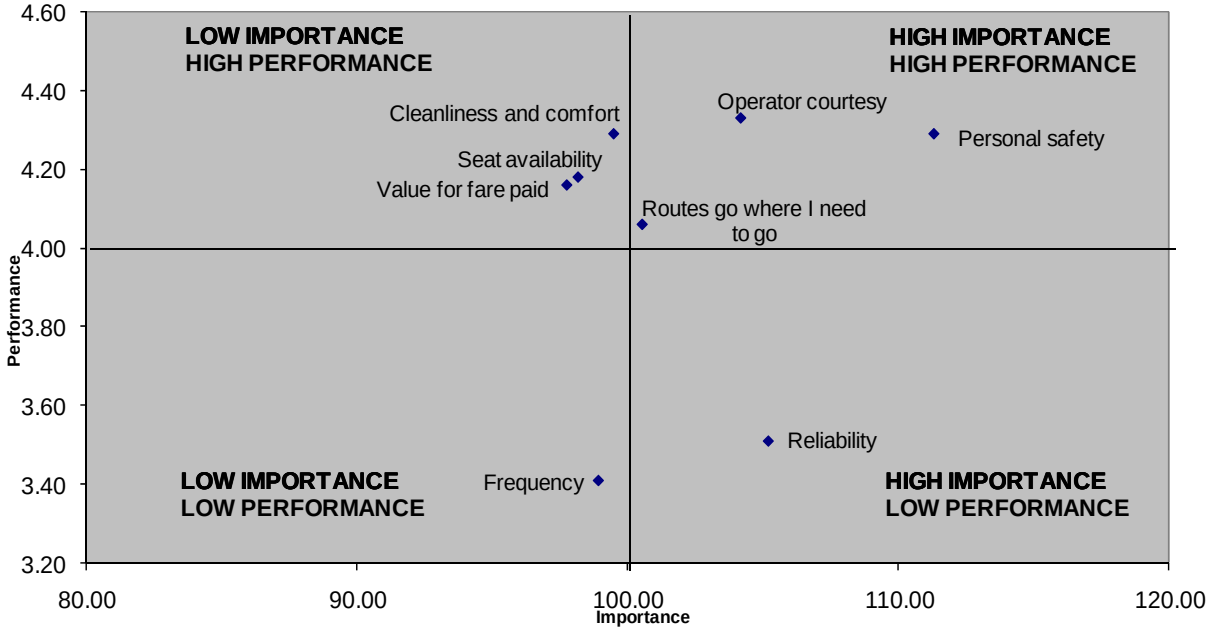
Table 3.3 shows the Pearson correlation coefficient and the importance score for each service attribute. Personal safety, reliability, and operator courtesy rank highly in terms of importance, while value for fare paid and seat availability are relatively less important.

Table 3.3
Importance of Service Elements

Service Attribute	Pearson Correlation Coefficient	Importance Index
Personal safety	0.686	111.33
Reliability (on time)	0.648	105.20
Operator courtesy	0.642	104.18
Routes go where I need to go	0.620	100.53
Cleanliness and comfort	0.613	99.47
Frequency	0.610	98.91
Seat availability	0.605	98.15
Value for fare paid	0.602	97.74

Performance and importance can be related through scatter diagrams, with derived importance on the x-axis and performance ratings on the y-axis. The scatter diagram (Figure 3.20) is divided into quadrants, with an importance score of 100 and a performance rating of 4.00 (a "good" rating) serving as the dividing lines. The 4.00 dividing line for performance is high; a more typical dividing line would be 3.75. Given the high ratings for BCT service, however, a higher dividing line is needed to make this quadrant exercise meaningful.

Figure 3.20
Importance vs. Performance for BCT Service Elements



Items in the upper right hand quadrant represent important attributes with high performance ratings. These are things that BCT does well that are important to riders. BCT should take whatever actions are required to ensure continued high performance ratings on these attributes. Personal safety, operator courtesy, and route coverage are service elements that fall within this quadrant.

Items in the upper left hand quadrant receive high marks in terms of performance but are relatively unimportant to riders. Often, attributes in this quadrant receive lower importance ratings from passengers precisely because the agency does a good job in these areas. Riders, like everyone else, tend to take areas in which their needs are met for granted. This suggests that BCT needs to continue to monitor service delivery in these areas to ensure high performance, but that these elements of service are not top priorities for improvements. Attributes within this quadrant include cleanliness and comfort, seat availability, and value for fare paid.

Items in the lower left hand quadrant are relatively unimportant to riders and relatively low-scoring in terms of performance. While performance levels are relatively low for these attributes, these are not strong candidates for improvement due to their low levels of importance to riders. The only service elements in this quadrant is frequency.

Items in the lower right hand quadrant are key priorities for BCT. Riders consider these attributes important, but current performance ratings are less than desired. Reliability is the only element in this quadrant.

3.7 Survey Findings: Improvements

The survey included a question, "If you could make only ONE improvement to the bus system, what would it be?" Surveyors recorded riders' answers verbatim, and these responses were later coded into 22 categories. Over 34 percent of all riders surveyed proposed an improvement. Table 3.4 presents the results, including all improvements mentioned by at least 2.5 percent of respondents.

Table 3.4
Riders' Suggestions for One Improvement to the BCT Bus System

Improvement	#	%
More frequent buses	85	34.6%
Improved on-time reliability	49	19.9%
Longer span of service	19	7.7%
More weekend service	14	5.7%
New or better buses	13	5.3%
New, expanded or changed routes	10	4.1%
Bigger buses/more seats	8	3.3%
Better information	7	2.8%
Other	41	16.7%
Total	246	100.0%

4.0 Introduction

This chapter examines the BCT service area to identify locations where there are unmet travel needs. Several approaches are used to identify residential travel needs and current system needs. The first involves the Residential Transit Orientation Index (RTOI), a GIS-based analytical tool that utilizes census data to identify neighborhoods with a high orientation toward transit, based on the demographic characteristics of its residents. This information is used as an overlay on GIS maps of BCT transit lines and compared to the existing transit network to identify areas with unmet transit needs.

A second approach identifies transit service needs and markets based on survey results and field observations by the study team. This approach also considers proposed developments expected to be completed within the next three years.

4.1 Travel Needs: Residential Transit Orientation Index

The Residential Transit Orientation Index (RTOI) compares census block groups within a given geographic area to one another with respect to five key variables related to propensity to use transit:

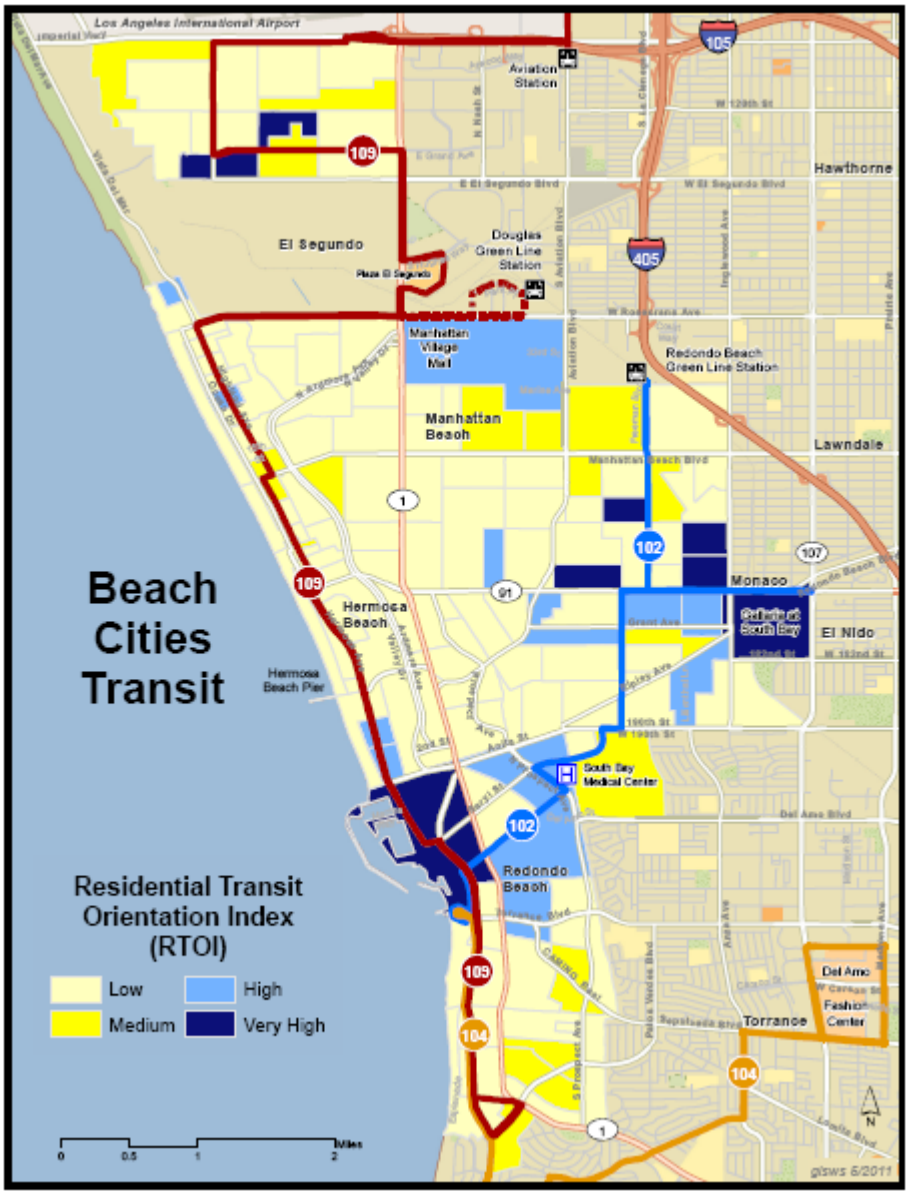
- Population in poverty
- Zero vehicle households
- Elderly population
- Youthful population
- Residential density

For each variable, a score is assigned to each census block group within the Cities of Redondo Beach, Hermosa Beach, Manhattan Beach, and El Segundo based upon how that variable compares to the area-wide average. The score is derived using a comparative probability estimation method. Population in poverty and zero vehicle households scores are weighted by a factor of two, reflecting their importance in terms of transit ridership. A composite score is then obtained for each census block group by summing the scores for each of the five individual variables. These composite scores are then ranked and assigned to one of five transit orientation groups (very high, high, moderate, low, and other) based upon how each compares to the average score for the county as a whole.

The RTOI provides an effective tool to identify residential areas with a high propensity to use transit. When used in conjunction with operating and service-related data, it can assist in evaluating unmet needs within the study area.

Figure 4.1 presents residential transit orientation in the BCT service area. Dark blue areas represent a very high orientation toward transit, while lighter blue areas are those with a high transit orientation.

Figure 4.1
Beach Cities Residential Transit Orientation Index



Most areas with a very high transit orientation are within the City of Redondo Beach: west of PCH in the downtown area north of the Pier; north of Artesia Boulevard on both sides of Vail Avenue, and near the Galleria at South Bay. Line 102 serves the neighborhoods near Artesia Boulevard and Vail Avenue. Line 109 serves the neighborhood west of PCH.

There are three other pockets of very high transit orientation in El Segundo along Grand Avenue near downtown. Line 109 serves this area.

Neighborhoods with high transit orientation (in light blue on Figure 4.1) are generally adjacent to areas with very high transit orientation and are mostly well served by BCT. The area to the southwest of the Galleria at South Bay is served by Torrance Transit's Line 2, and the area east

of PCH along Torrance Avenue is served by Torrance Transit's Line 7. In Manhattan Beach, there are scattered neighborhoods with high transit orientation: east of Manhattan Village Mall (much of this block group is not residential, but there is senior housing along Park Lane Avenue); along Highland Avenue and Vista Del Mar; and north of Artesia Boulevard near Mira Costa High School. The first two locations are served by Line 109, while Metro Line 130 serves Artesia Boulevard.

The results of the RTOI indicate that there are no major unmet needs in the study area in terms of service area coverage for residents. BCT transit service is available directly or within a short walking distance in nearly all transit-oriented neighborhoods within its service area, and Torrance Transit and Metro also serve these neighborhoods.

4.2 Other Unmet Needs

The on-board survey results (Chapter 3) indicate that improved frequency is the major improvement sought by existing riders. New, expanded, or changed routes ranked sixth among desired improvements and were cited by only four percent of respondents. Other improvements such as improved reliability, later or earlier service, more weekend service, and new or better buses all rank ahead of new or expanded routes.

Another important finding from the on-board survey is that 38 percent of all riders have no vehicles in their household. For many existing riders, transit is the primary or only mode choice.

Beach Cities Transit
2011 Comprehensive Operational Analysis
Chapter 5: Public Outreach

5.0 Introduction

There were two primary elements of public outreach in this study. The first, the on-board survey of current riders, was the subject of Chapter 3. This chapter summarizes the second element, a roundtable meeting held with the cities to discuss perceived issues with BCT service and potential solutions.

5.1 Roundtable Meeting

The consulting team convened the roundtable meeting at 3 PM on Monday, March 28, 2011 at the City of Redondo Beach. Representatives from the Cities of Redondo Beach, El Segundo, and Manhattan Beach and from Transportation Concepts, the contractor that operates BCT service, attended. No representative attended the roundtable meeting from the City of Hermosa Beach.

The roundtable began with a summary of findings from the on-board survey of BCT riders, as a starting point for discussion. Representatives from the Cities of El Segundo and Manhattan Beach expressed similar concerns in four primary areas:

1. How well existing routes serve residents of their cities. Concerns included areas of the cities not served by BCT routes (such as east of Sepulveda Boulevard in Manhattan Beach) and the directness of the routes, which affects how quickly riders can get to their destinations. Both City representatives indicated that they do not receive feedback from riders or requests for stops. Manhattan Beach noted that residents east of Sepulveda Boulevard have not expressed a need for BCT service, and El Segundo indicated that their residential areas are centralized within the City and no one is too far from a route.

2. Marketing of the BCT service. The sense of the cities was that there is not enough information available about routes and times. Several ideas arose in the discussion about this issue, including closer collaboration among the cities and greater use of existing low-cost channels to spread the word about BCT. Marketing material can be about the system as a whole or be targeted to individual cities. Cost of added marketing efforts is a concern.

3. Signage at bus stops. As the lead city, Redondo Beach noted that signage is a valid concern and is a high priority in the coming year for BCT. All agreed that the existing signs are very recognizable at bus stops.

4. Recent declines in ridership. Most transit systems experienced a decline in ridership in 2009 as a result of the decline in the economy. One purpose of the study is to identify opportunities to reallocate resources to provide more service in high-ridership areas.

Transportation Concepts noted issues with on-time performance, particularly in the afternoon. Revisiting the current schedules and ensuring that operational needs such as midday refueling of vehicles are considered will improve schedule adherence.

Manhattan Beach also raised the issue of direct service into Manhattan Village Mall. The City Council wants to see this option considered. It is a timely issue, since the mall is being remodeled over the next five to ten years.

Appendix D provides added information on the roundtable discussion.

The roundtable meeting was very helpful in identifying areas of concern for the participating cities. Some areas are not strictly within the scope of this study. However, proposed changes such as clockface headways that help riders remember bus arrival times without consulting a schedule can assist ongoing marketing efforts. The Residential Transit Orientation Index in Chapter 4 is a valuable tool for assessing how well existing routes serve transit-oriented neighborhoods. The Manhattan Village Mall issue is directly addressed in Chapter 6 and Appendix E. Changes to route schedules will improve on-time performance.

Beach Cities Transit
2011 Comprehensive Operational Analysis
Chapter 6: Recommendations

6.0 Introduction

This chapter brings together the findings of the ridecheck and survey analyses, fieldwork by project team members, and discussions with Redondo Beach transit staff and Transportation Concepts staff to identify and analyze alternatives and make recommendations for transit improvements to the BCT transit network.

As noted in previous chapters, the BCT performs very well in terms of customer satisfaction, ridership and productivity. Nevertheless, this chapter identifies options that are intended to enhance productivity, provide more service where it is needed, improve service reliability, and achieve cost savings in light of reduced operating funding.

Section 6.1 summarizes goals and strategies guiding the development of alternatives and recommendations. Section 6.2 addresses alternatives and recommendations by line. Section 6.3 presents a package of recommended improvements, along with ridership and cost or savings estimates for each.

6.1 Transit Goals and Strategies

This section discusses transit goals and strategies that have guided the identification of alternatives and development of recommendations for this comprehensive operational analysis. The overall goal of the analysis is to provide transit service that will attract additional ridership in a cost-efficient and cost-effective manner. Under this overall goal, objectives include:

1. Establish a clear identity and focus for each line.

2. Provide direct connections to major trip generators and activity centers.

3. Address poorly performing line segments with low ridership and productivity.

4. Define consistent, realistic schedules for each line. Minimize route deviations by operating via a single route path as much as possible. Where possible, use clockface headways (which result in the bus arriving at a given stop at the same time each hour) to make schedules more understandable for riders and potential riders.

5. Accommodate operational needs such as midday refueling, operator breaks, and layover or recovery time.

6. Identify line segments and potential line segments that are operationally unsound due to terrain, traffic, and/or congestion.

Strategies to achieve these objectives are discussed in the remainder of this section.

Poor Performance

What actions can be taken to improve the productivity of poorly performing lines? Are there restructuring opportunities? Can headways be adjusted to reflect demand? Are there opportunities to trim lines by discontinuing unproductive early or late trips? At what point is line discontinuation a reasonable option?

Lines 102 and 109 are reasonably productive on weekdays: Line 102 has 20.4 boardings per revenue hour and Line 109 averages 10.5. Line 104 is the weak link in the BCT system, with only 4.1 boardings per revenue hour. This extremely low productivity is rarely seen on transit lines anywhere. Line 104 clearly qualifies as a candidate for discontinuation.

Schedules

Aside from changes to frequency of service, can the schedules be adapted to make it easier for customers to remember departure times? Are there opportunities for enhanced efficiency through scheduling techniques such as interlining?

The recommendations in this report address schedules for BCT lines. Schedule adherence is an issue on several lines, particularly Lines 102 and 104, and the ridecheck provides detailed data that can be used to prepare more appropriate schedules. Recommendations regarding schedules primarily address running time issues and may be thought of as minor adjustments to enhance service reliability rather than wholesale scheduling revisions.

Some lines operate at times that are difficult for the average transit rider to remember without consulting a schedule. Headways of every 15, 20, 30, or 60 minutes are known as “clockface” headways (because a line serves any given stop at the same time each hour) and are usually easier for riders to remember. Line 109 operates clockface headways on weekends (every 60 minutes), but none of the weekday lines has a clockface schedule.

Two broader issues regarding scheduling are to provide adequate break times and meal times for operators in accordance with state Wage Order 9 and to ensure that restroom facilities are available at layover locations. BCT revised its operator schedules shortly after the ridecheck was conducted in January to comply with Wage Order 9. The project team has been mindful of these requirements when drafting new schedules. Restroom facilities are available for operator use at all layover locations.

Consistent Service Patterns

Another factor that helps the average rider understand transit service is a consistent service pattern. A line should follow the same path on every trip unless there are compelling reasons not to do so. This prevents unnecessary confusion and frees the rider from the need to think about whether a particular trip will go to a particular place.

Two examples of inconsistent service patterns in the current BCT system occur at the Galleria at South Bay on Line 102 and at the Douglas Green Line station on Line 109. Most round trips on Line 102 serve the Galleria in one direction only, either northbound or southbound. If a given trip serves the Galleria northbound but not southbound, the next trip will serve the Galleria southbound but not northbound. Line 109 serves the Douglas Green Line station in the

northbound direction only. Section 6.2 identifies options and makes recommendations for consistent service patterns in both directions at these locations.

Overcrowding

All instances of overcrowding are school-related. Are there strategies that can be adopted to reduce or mitigate overcrowding, recognizing that standing loads are acceptable?

Table 6.1 lists overcrowded trips (defined by a load of at least 125 percent of seated capacity) by line and time of day. All of these occur on Line 102 near bell times at Redondo Beach High School.

Table 6.1
BCT Weekday Trip Segments with Loads Exceeding 125 Percent of Capacity

Segment	Line	Direction	Trip Time	Number of Stops	Peak Load	Comments
Diamond Street & PCH – Rindge Lane & Grant Avenue	102	NB	3:00 pm	12	51	High school
Diamond Street & PCH – Rindge Lane & Carnegie Lane	102	NB	3:05 pm	13	53	High school
Diamond Street & PCH – Rindge Lane & Pullman Lane	102	NB	3:55 pm	10	45	High school
Rindge Lane & Grant Avenue – Diamond Street & Helberta Avenue	102	SB	7:00 am	11	56	High school

Source: Ridecheck Data, January 2011

A strategy frequently used to accommodate a major surge in demand is "platooning" buses, or operating two buses over a line within five minutes of each other. BCT already employs this strategy by adding two buses to Line 102 in the afternoon.

More Frequent Service versus New Lines

This dilemma is common to all transit systems: do we provide greater coverage (operate service in all parts of the service area) or do we provide greater frequency (operate more service along high-demand lines)?

This is not a major issue for BCT for two reasons:

- As a municipal as opposed to regional system, BCT has a well defined and reasonably compact service area.

- Coverage is generally good: Metro, Torrance Transit, and other transit operators operate along with BCT on major corridors within the service area.

There is no single "right" answer to the coverage versus frequency question. The recommendations included in this report lean toward frequency rather than coverage, because coverage is adequate while frequency could use improvements. Requests for service to specific locations such as the Manhattan Village Mall are addressed in the development of recommendations.

Requests for New Service

The only request for new service raised by the four cities in the roundtable was for Line 109 to serve Manhattan Village Mall more directly. Criteria for assessing the viability of transit service or transit service concepts include:

- Ridership potential.
- Operational feasibility. Certain streets or areas present significant challenges for bus operation.
- Cost.

This request is analyzed in the discussion of Line 109 in Section 6.2 below.

6.2 Alternatives and Recommendations for Existing BCT Service

This section addresses existing BCT lines. Each line is considered in turn, with an evaluation of potential alternatives and a list of recommended actions.

Line 102

Line 102 ranks first among BCT lines in weekday ridership and productivity. Ridership is over 700 on a typical weekday when school is in session. Line 102 is the most productive weekend line and is second to Line 109 in ridership.

The primary function of Line 102 is to serve Redondo Beach residents. Students are a particularly important market for this line, since 88 percent of school-related trips on the BCT system take place on Line 102. School-related travel accounts for 32 percent of all trips on Line 102. Work is the second-ranking trip purpose, with 20 percent of Line 102 trips. Connections to the Redondo Beach Green Line station are especially important in the peak hours. Line 102 serves the Redondo Beach Pier and the Galleria at South Bay, as shown in Figure 6.1.

Issues related to Line 102 include:

- On-time performance. Schedule adherence is very poor on Line 102, especially in the afternoon. Additional time is needed in the schedule, particularly in the northbound direction during the midday and afternoon time periods. Under the present schedule, each bus gets later and later with each trip.

- Service to the Galleria at South Bay. As noted earlier, most round trips serve the Galleria in one direction only, either northbound or southbound. This is not a critical issue in the morning before the mall opens, but it is confusing at other times. At most stops along the line during the midday, the time between buses is 35 minutes regardless of direction, but at the Galleria the time between northbound buses is 70 minutes, as is the time between southbound buses.

- Non-clockface headways. For most of the day, Line 109 operates every 25 or 35 minutes, depending on location and direction. Service is more frequent between 3 PM and 5 PM, when buses are added to serve the high school.

- Vail Avenue. Line 109 operates on Vail Avenue north of Artesia Boulevard on its way to and from the Green Line station. There are stop signs at almost every intersection along Vail. This results in slow operation.

- Refueling. There is not sufficient time in the current schedule to allow the buses to refuel in the middle of the day. This contributes to poor schedule adherence. Once the buses fall behind schedule, they cannot make up time.

Figure 6.1
Line 102

Six options are identified for Line 102:

1. ***No change – adjust running times only***. Under this and subsequent options, time would be added to the Line 102 schedule to improve the reliability of service. Service would operate slightly less often, with irregular headways ranging from 25 to 45 minutes. This option would increase operating cost slightly.

2. ***Operate in both directions to the Galleria at South Bay***. Each northbound AND southbound trip would serve the Galleria after 9 AM. The early morning trips serve a different market (commuters going to and from the Redondo Beach Green Line station) and do not need to serve a mall that is not yet open. Under this option, Line 102 would operate every 45 minutes throughout most of the day, with more frequent service in the morning and afternoon.

   This option is important for another reason: the new South Bay Regional Intermodal Transit Center (scheduled for opening in calendar year 2012) will be adjacent to the Galleria. Line 102 is the only BCT line planned to serve the new transit center, and it is important to have bidirectional service available on Line 102 at the RITC.

3. ***Build an additional bus into the schedule in the midday to allow for refueling of the all-day buses on Line 102.*** This will enhance schedule reliability by providing the necessary time for refueling. One of the buses used for service at the high school in the afternoon can be used for a single midday round trip on Line 102.

4. ***Add a bus to Line 102 and operate 30-minute headways with service in both directions to the Galleria at South Bay***. This option would keep one of the buses used for school trips on the street all day. In the Line 104 discussion below, discontinuation of that line would allow resources to be reallocated from Line 104 to Line 102. 30-minute service and consistent service to the Galleria on Line 102 would encourage ridership by making the schedule easier to remember. Similar to Option 2, all northbound trips before 8:30 AM would travel directly to the Redondo Beach Green Line station. This option also includes the schedule adjustments under Option 3 to allow for midday refueling.

5. ***Operate via Inglewood Avenue or Aviation Boulevard instead of Vail Avenue north of Artesia Boulevard.*** The stop signs at nearly every intersection along Vail slow the buses down. This option would reroute Line 102 via Inglewood or Aviation between the Galleria and Manhattan Beach Boulevard. This option would improve schedule adherence. Two disadvantages of this routing is (1) Vail Avenue is more centrally located within the City of Redondo Beach than either Inglewood Avenue or Aviation Boulevard and (2) both of these streets are already served by Torrance Transit lines.

All of these options would retain the school-related trips added to the schedule in the morning and afternoon.

Table 6.2 summarizes the options identified for Line 102. Running time changes are included in all options.

Table 6.2
Options and Impacts for Line 102

Option	Weekday Revenue Hours		Sat/Sun Revenue Hours		Annual Revenue Hours			Peak Vehicles	
	Current	Future	Current	Future	Current	Future	Change from Current	Current	Future
1. Running time changes only	33.4	34.0	26.4 Sa 10.9 Su	26.4 Sa 10.7 Su	10,525	10,676	+151	5	5
2. Galleria both directions	33.4	34.9	26.4 Sa 10.9 Su	26.2 Sa 12.4 Su	10,525	10,978	+453	5	5
3. Option 2 + add midday tripper for refueling	33.4	36.2	26.4 Sa 10.9 Su	27.4 Sa 12.4 Su	10,525	11,385	+860	5	5
4. 30' headway + midday refueling	33.4	47.3	26.4 Sa 10.9 Su	27.4 Sa 12.4 Su	10,525	14,205	+3,679	5	5
5. No operation on Vail	33.4	34.0	26.4 Sa 10.9 Su	22.4 Sa 10.7 Su	10,525	10,676	+151	5	5

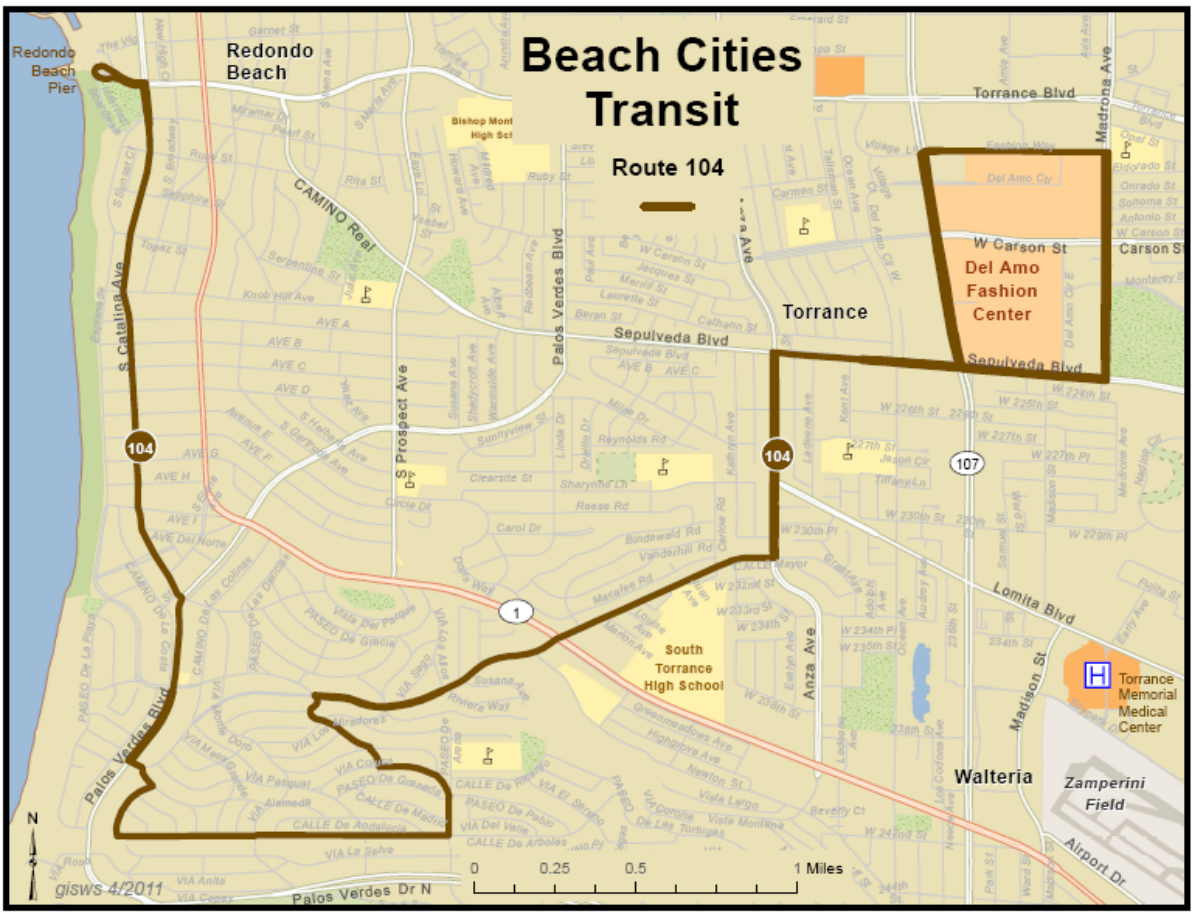
The recommended option for Line 102 is Option 4: 30-minute service, with most trips in both directions serving the South Bay Galleria and a trip added in the midday to allow buses to refuel. This increases annual revenue hours by over 3,600, but the proposed discontinuation of Line 104 reduces annual revenue hours by 3,232. Thus, the resulting net increase is 447 annual revenue hours. No additional vehicles are needed; Line 102 already has five peak vehicles and one of these will operate all day.

Line 104

Line 104 has the lowest ridership of any BCT line on weekdays and Saturday. Productivity is also extremely low. The line averages 4.1 passengers per revenue hour on weekdays and 1.3 passengers per revenue hour on Saturday.

Line 104 connects Redondo Beach Pier with Riviera Village (Line 109 also makes this connection), neighborhoods in Torrance, and Del Amo Fashion Center (see Figure 6.2). A passenger wishing to travel between the Pier and Del Amo Fashion Center would be much more likely to choose Torrance Transit's Line 3 or Line 7, since both lines provide a more direct connection and operate more frequently than Line 104.

Figure 6.2
Line 104



The neighborhoods served by Line 104 explain its low ridership. Figure 6.3 shows two views along Calle de Arboles, in the hills of southwest Torrance bordering Palos Verdes Estates. It is highly unlikely that this neighborhood will ever generate significant transit ridership.

Once out of the hills, the line enters more transit-friendly neighborhoods, especially north of PCH. However, this segment of the line has little ridership except for stops at or near Del Amo Fashion Center.

Figure 6.3 Calle de Arboles. Line 104 travels along this street, serving a fairly well-to-do neighborhood with no sidewalks and a low transit orientation.

The primary issues related to Line 104 are low ridership and productivity. Are there any alternatives that would make Line 104 more productive? Six alternatives have been identified for this line:

1. ***Discontinue Line 104 and reallocate resources to Line 102***. Weekday ridership and productivity are very low, with no prospect of significant improvement. Under this option, Line 104 would be discontinued and the resources used to operate this line would be reallocated to Line 102. As noted in the previous section, the improvements to Line 102 would include running time adjustments, improved headways, and service to South Bay Galleria in both directions.

2. ***Discontinue Line 104 on Saturday***. With only 10 riders and a productivity of 1.3 riders per revenue hour, Line 104 could be discontinued on Saturday with very little impact.

3. ***Reroute via PCH between Riviera Village and Calle Mayor***. This option would maintain current Line 104 service between the Pier and Riviera Village and would shorten the line, allowing for more frequent service. This change would duplicate Metro Line 232 along PCH. Service duplication would require Metro approval. The Line 104 segments that would remain under this option are unproductive and have very little ridership.

4. ***Reroute via Torrance Boulevard for a direct connection between the Pier and Del Amo Fashion Center***. Torrance Boulevard is the fastest way between these two locations but this change would duplicate Torrance Transit Line 3, which operates every 15 minutes. Service duplication would require approval from Torrance Transit.

5. ***Reroute via Camino Real and Sepulveda Boulevard for a slightly less direct connection***. This change would duplicate Torrance Transit Line 7, which serves these streets with 30-minute headways all day. Service duplication would require approval from Torrance Transit.

6. ***Replace Torrance Transit Line 7 between the Pier and Del Amo Fashion Center with a revised Line 104***. Torrance Transit could operate Line 7 with one less bus with its western terminus at Del Amo Fashion Center. Unfortunately, the round-trip running

time via this routing between the Pier and Del Amo is 33 minutes without any recovery time, making it impossible to time connections correctly.

Figure 6.4 presents the routing options identified in Options 3, 4, and 5. Table 6.3 summarizes the options identified for Line 104.

Figure 6.4
Options for Line 104

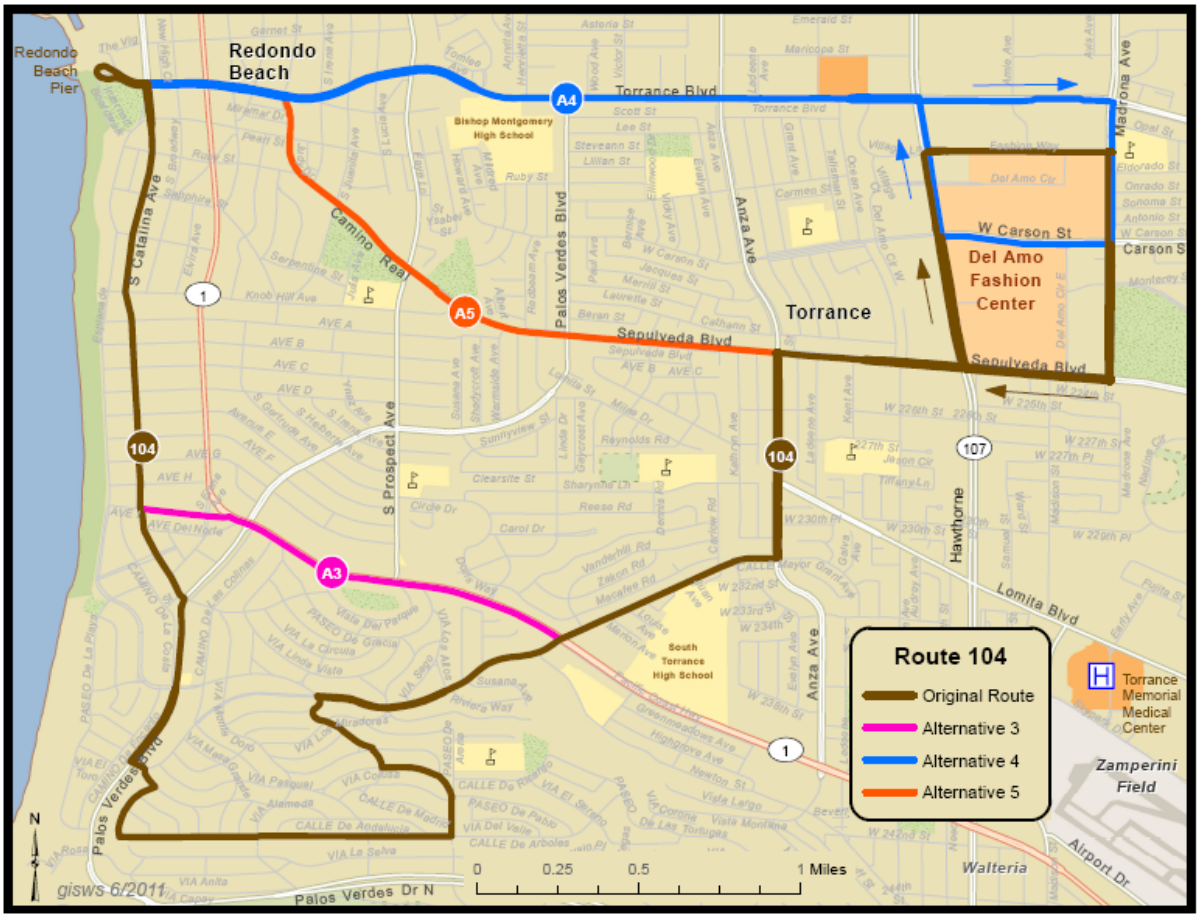


Table 6.3
Options and Impacts for Line 104

Option	Weekday Revenue Hours		Sat/Sun Revenue Hours		Annual Revenue Hours			Peak Vehicles	
	Current	Future	Current	Future	Current	Future	Change from Current	Current	Future
1. Discontinue Line 104	11.00	--	7.82	--	3,232	0	-3,232	1	0
2. Discontinue Saturday	11.00	11.00	7.82	--	3,232	2,816	-416	1	1
3. Reroute via PCH	11.00	11.00	7.82	7.82	3,232	3,232	0	1	1
4. Reroute via Torrance	11.00	11.00	7.82	7.82	3,232	3,232	0	1	1
5. Reroute via Camino Real/ Sepulveda	11.00	11.00	7.82	7.82	3,232	3,232	0	1	1
6. Option 4, but replacing TT Line 7 west of Del Amo	11.00	11.00	7.82	7.82	3,232	3,232	0	1	1

The recommended option for Line 104 is Option 1: discontinue Line 104. Ridership and productivity are too low, with no prospect of improvement. These resources can be reallocated to improve Line 102.

BCT should consult with Torrance Transit prior to making a final decision to implement this option. A major part of this line was formerly operated by Torrance Transit, and the agency should have a chance to discuss this recommendation with BCT.

Line 109

Line 109 is the longest BCT line, connecting Redondo Beach, Hermosa Beach, Manhattan Beach, and El Segundo. Line 109 operates seven days a week at headways of 45 minutes on weekdays and 60 minutes on weekends. This line ranks second to Line 102 in terms of productivity, and has the highest Saturday and Sunday ridership of any BCT line. Regional transit connections are available along this line at the Aviation and Douglas Green Line Stations and at the LAX City Bus Center.

Line 109 is the most "regional" line in the BCT network due to its length and its connections. Average trip lengths are relatively short, suggesting that few passengers ride the length of the line. Most riders appear to use the line to reach nearby destinations or regional transit connections. The Aviation Station stop is the busiest stop on the line, with the greatest number of boardings of any BCT non-school stop on weekdays and of any stop on weekends. The Douglas Station stop (served only in the northbound direction) has the highest number of alightings on any non-school stop on weekdays.

Figure 6.5 shows Line 109.

Figure 6.5
Line 109

Issues related to Line 109 include:

- One-way service at the Douglas Green Line station. Only northbound trips serve this station, and the station stop is heavily used. Green Line passengers bound for Manhattan Beach or Hermosa Beach cannot use the Douglas Station, since there is no southbound service there, but must instead get off at Aviation Station and take a lengthier bus trip through downtown El Segundo.

- Location of the bus stop at Douglas Station. Just before the ridecheck was conducted in January 2011, BCT moved the bus stop from the transit center north of the station to Park Place south of the station. Figure 6.6 shows the previous and current stop

locations. Metro Line 125 uses the Park Place stop, while Line 109 was the only bus using the transit center. An isolated walkway connected the station with the transit center, and several riders reported it as an unsafe location, particularly at night. Moving the bus stop shortened the line while enhancing the safety of passengers.

Figure 6.6 BCT Stop at Douglas Station. The photo on the left was the former location; the photo on the right is a view of the station from the current bus stop on Park Place.

- On-time performance. Schedule adherence on Line 109 is the best in the BCT network (65 percent on weekdays, 71 percent on Saturday and 78 percent on Sunday). Long recovery times at the northern terminus at LAX City Bus Center to accommodate refueling help to keep the line on time. Because of this, southbound schedule adherence is much better than northbound schedule adherence on all days. Additional time is needed in the northbound schedule during the midday and afternoon time periods.

- Non-clockface headways on weekdays. On weekdays, Line 109 operates every 45 minutes. Weekend service is every 60 minutes.

- Service to Manhattan Village Mall. The City of Manhattan Beach has requested that Line 109 serve the mall directly. The closest stop is on Rosecrans just east of Village Drive, and is only served in the northbound direction on the deviation to Douglas Station.

- Long travel times on the line. Line 109 is circuitous north of Rosecrans Avenue, first traveling west on Grand Avenue to downtown El Segundo and then traveling east on Imperial Highway to Aviation Station. The long travel times may be one reason why average trip lengths are relatively short.

Five options are identified for Line 109:

1. ***No change – adjust running times only***. Under this and subsequent options, the Line 109 schedule would be adjusted to improve the reliability of service. Service would continue to operate every 45 minutes. This option would have no cost impact.

2. ***Serve Douglas Station in both directions***. The numerous northbound alightings strongly suggest that there is southbound demand at the station. The stop relocation

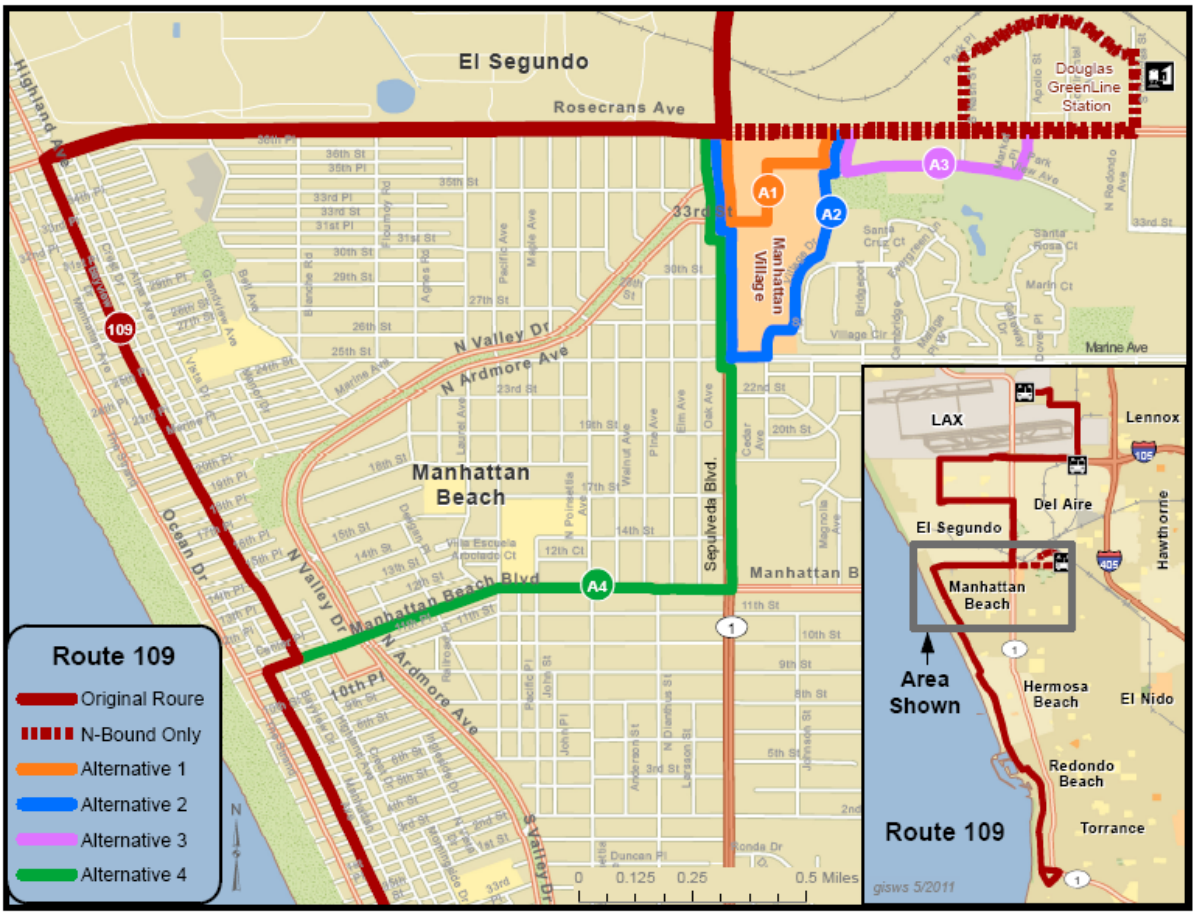
has saved running time; additional running time can come from a slight reduction in recovery time at the north end of the line.

3. ***Reroute Line 109 to provide direct service to Manhattan Village Mall***. This option can either bring the bus into the mall or closer to the mall via a deviation from the main route or a rerouting. Specific options are listed below and shown in Figure 6.7.

4. ***Add service to improve headways to 30 minutes on Line 109***. This option would require two additional buses on the line, due to its length.

5. ***Add one bus on Line 109 and truncate the line at the Aviation Green Line Station***. This option would achieve 30-minute headways on Line 109 with only one additional bus. The only significant stop north of Aviation Station is the LAX City Bus Center, but passenger activity is lower than expected (25 on, 16 off all day on weekdays) and there are other bus lines that connect Aviation Station with the LAX City Bus Center.

Figure 6.7
Options at Manhattan Village Mall for Line 109



Under option 3, four alternatives for providing more direct service to Manhattan Village Mall have been identified, as shown in Figure 6.7:

1) Turn south from Rosecrans Avenue on Sepulveda Boulevard, enter the mall (see Figure 6.8), exit onto Sepulveda north to Rosecrans and resume the existing route.

2) Turn south from Rosecrans on Village Drive (see Figure 6.9) and circle the mall via Village, Marine Avenue, and Sepulveda Boulevard before resuming the existing route.

3) Turn south from Rosecrans on Village Drive, then east on Park View and north on Market Place, resuming the existing route at Rosecrans.

4) Restructure the line entirely, replacing the segments along Highland Avenue and Rosecrans Avenue west of Sepulveda with a new routing east on Manhattan Beach Boulevard and north onto Sepulveda with a stop directly in front of the mall.

Figure 6.8 Entrance to Manhattan Village Mall from Sepulveda Boulevard. The Ocean Express Trolley enters the mall with a stop near Tommy Bahamas behind the California Pizza Kitchen in the photo at the left.

Figure 6.9 Village Drive. The left photo is taken from the MVM parking lot and shows the Village/ Park View intersection. The right photo is looking south on Village Drive, with the mall entrance after the red curb. Parking meters would need to be removed to establish a bus stop in this location.

The first two alternatives under Option 3 would add a minimum of 10 minutes travel time in each direction, requiring an extra bus on Line 109. The third alternative would pass by senior housing and the Manhattan Beach Marriott, but the housing is set well back from Park View Avenue (see Figure 6.10) and there are no sidewalks or safe pedestrian access to Park View Avenue. The fourth alternative under Option 3 would require giving up the existing segments of Line 109 on Highland Avenue and the western portion of Rosecrans Avenue. Line 109 is the only local transit service on these streets.

Figure 6.10 Senior housing on Park View Avenue. The housing cannot be readily seen from the street.

Table 6.4 summarizes the options identified for Line 109.

Table 6.4
Options and Impacts for Line 109

Option	Weekday Revenue Hours		Sat/Sun Revenue Hours		Annual Revenue Hours			Peak Vehicles	
	Current	Future	Current	Future	Current	Future	Change from Current	Current	Future
1. Change running time	58.40	58.15	44.40	44.18	19,629	19,542	-87	4	4
2. Serve Douglas Station NB and SB	58.40	58.52	44.40	44.27	19,629	19,644	+15	4	4
3. Reroute for direct service to Manhattan Village Mall	58.40	74.87	44.40	59.67	19,629	25,460	+5,831	4	5
4. 30-minute headway weekdays	58.40	86.63	44.40	44.27	19,629	26,786	+7,157	4	6
5. 30-minute headway/truncate at Aviation Station	58.40	71.33	44.40	43.72	19,629	22,840	+3,211	4	5

The recommended option for Line 109 is Option 2: change running time and provide service in both directions at Douglas Station.

Providing direct service to Manhattan Village Mall is not recommended because it would require an additional bus, result in an inefficient schedule, and create legitimate operational concerns about bus service within the parking lot of a major mall. The current stop for Manhattan Village Mall is on Rosecrans Avenue just east of Village Drive, a one-block walk from the mall entrance nearest to Macy's. The introduction of two-way service to the Douglas Station means that this stop will be served in both the northbound and the southbound direction, thus enhancing access to the mall while minimizing resource requirements and operational issues.

Reducing the headway to 30 minutes on weekdays would require two extra buses. This remains a future option, but is not within reasonable budget parameters today. Reducing the headway and truncating the line at Aviation Station would require one additional bus and would present refueling issues. This is also an option for the future.

See Appendix E for a more detailed discussion of Manhattan Village Mall options.

6.3 Impacts of Recommendations

Tables 6.5 and 6.6 show daily and annual impacts of proposed short-term changes. The proposed changes result in a minor cost increase of $20,000, with a projected revenue increase of $25,000 for a net savings of $5,000.

Table 6.5
Daily Impacts of Recommendations

Route	Recommendation	Daily Impacts on					Peak Vehicle Requirements
		Ridership	Revenue	Operating Cost	Net Op. Cost	Revenue Hours	
102 weekday	30-minute headway	133	$90	$614	$524	13.93	0
102 Sat	Galleria in both directions	5	$5	$46	$41	1.05	0
102 Sun	midday bus for refueling	7	$6	$69	$63	1.57	0
104 weekday	Discontinue	-46	-$31	-$485	-$454	-11.00	-1
104 Sat		-10	-$9	-$344	-$335	-7.82	-1
109 weekday	Adjust running times	47	$32	$5	-$26	0.12	0
109 Sat	Serve Douglas Station NB +	-1	-$1	-$6	-$5	-0.13	0
109 Sun	SB	0	$0	-$6	-$6	-0.13	0
Total Weekday		134	$90	$134	$44	3.05	-1
Total Sat		-5	-$5	-$304	-$299	-6.90	-1
Total Sun		7	$6	$63	$58	1.43	0

Notes
Ridership change calculated using elasticity of +0.6
102 weekday ridership totals reduced by 25% to account for non-school days
109 weekday totals add in half of alightings at Douglas Station
Revenue per rider of $0.677 weekday; $0.934 Saturday; $0.814 Sunday (source: NTD data)
Operating cost of $44.06 per revenue hour (source: BCT)

Table 6.6
Annual Impacts of Recommendations

Route	Recommendation	Daily Impacts on				
		Ridership	Revenue	Operating Cost	Net Op. Cost	Revenue Hours
102 weekday	30-minute headway	33,807	$25,534	$155,931	$130,397	3,539
102 Sat	Galleria in both directions	294	$222	$2,591	$2,368	59
102 Sun	midday bus for refueling	373	$282	$3,589	$3,307	81
104 weekday	Discontinue	-11,684	-$8,825	-$123,104	-$114,279	-2,794
104 Sat		-560	-$423	-$19,287	-$18,864	-438
109 weekday	Adjust running times	11,821	$8,928	$1,306	-$7,623	30
109 Sat	Serve Douglas Station NB +	-32	-$24	-$329	-$305	-7
109 Sun	SB	-21	-$16	-$305	-$290	-7
Total Weekday		33,944	$25,637	$34,133	$8,496	774.70
Total Sat		-297	-$224	-$17,025	-$16,800	-386.40
Total Sun		353	$266	$3,284	$3,018	74.53
Annual Total		**33,999**	**$25,679**	**$20,392**	**-$5,287**	**462.83**

6.4 Future Bus Size

A final element of this comprehensive operational analysis is to provide direction for BCT's future vehicle purchases, with the understanding that BCT is committed to clean-fuel CNG vehicles. Given current and expected future demand on Lines 102 and 109, the recommendation is to purchase 32-foot buses. These provide adequate capacity for peak loads (recognizing that trips at school bell times will always have standees) and preserve the ability to maneuver through the streets within the service area.

Larger fuel tanks on new vehicles are recommended. Larger fuel tanks will reduce the need to refuel in the middle of the day. BCT and its contractor are exploring this issue with regard to planned vehicle purchases.

Optional vehicle equipment that should be at least considered for inclusion on newly purchased buses includes enunciators and security camera systems. Enunciators ensure that stops are announced, in accordance with ADA requirements. Security cameras provide patrons with a sense of safety and thus encourage ridership. Future buses should be low-floor to make it easier for elderly patrons to board and alight and to speed wheelchair boardings and alightings. Low-floor buses frequently have fewer seats than high-floor buses of the same size. Since overcrowding is not an issue at BCT, the tradeoff of faster and easier boardings and alightings in exchange for fewer seats is advisable.

APPENDIX A
RIDECHECK RESULTS
Provided under separate cover

APPENDIX B
STOPS WITH LOADS OVER 125 PERCENT OF CAPACITY

This appendix lists all stops on all trips where the vehicle load exceeded 125 percent of capacity. Beach Cities Transit uses buses with different seating capacities. Table B.1 presents the average seating capacity and 125 percent of seated capacity by line.

Table B.1
Average Seating Capacity and 125 Percent of Seated Capacity by Line

Line	Average Number of Seats	125% of Seated Capacity
102	34	43
104	13	17
109	31.7	40

Source: City of Redondo Beach Fleet Inventory and Bus Assignment 2011

Four trips, all on Line 102, experienced loads greater than 125 percent of seated capacity.

Line	Day	Direction	Trip Time	Leaving Stop at	Load
102	Weekday	NB	3:00 p.m.	Diamond & PCH	51
102	Weekday	NB	3:00 p.m.	Diamond & Garnsey	51
102	Weekday	NB	3:00 p.m.	Diamond & Lucia	51
102	Weekday	NB	3:00 p.m.	Prospect & Diamond	50
102	Weekday	NB	3:00 p.m.	Beryl & Prospect	50
102	Weekday	NB	3:00 p.m.	Beryl & Flagler	50
102	Weekday	NB	3:00 p.m.	Beryl & 190th St	50
102	Weekday	NB	3:00 p.m.	Rindge & 190th St	50
102	Weekday	NB	3:00 p.m.	Rindge & Ripley	50
102	Weekday	NB	3:00 p.m.	Rindge & Pullman	47
102	Weekday	NB	3:00 p.m.	Rindge & Clark	43
102	Weekday	NB	3:05 p.m.	Diamond & PCH	52
102	Weekday	NB	3:05 p.m.	Diamond & Garnsey	52
102	Weekday	NB	3:05 p.m.	Diamond & Lucia	52
102	Weekday	NB	3:05 p.m.	Prospect & Diamond	53
102	Weekday	NB	3:05 p.m.	Beryl & Prospect	53
102	Weekday	NB	3:05 p.m.	Beryl & Flagler	53
102	Weekday	NB	3:05 p.m.	Beryl & 190th St	53
102	Weekday	NB	3:05 p.m.	Rindge & 190th St	51
102	Weekday	NB	3:05 p.m.	Rindge & Ripley	51
102	Weekday	NB	3:05 p.m.	Rindge & Pullman	50
102	Weekday	NB	3:05 p.m.	Rindge & Clark	50
102	Weekday	NB	3:05 p.m.	Rindge & Grant	46
102	Weekday	NB	3:55 p.m.	Diamond & PCH	45
102	Weekday	NB	3:55 p.m.	Diamond & Garnsey	45
102	Weekday	NB	3:55 p.m.	Diamond & Lucia	45
102	Weekday	NB	3:55 p.m.	Prospect & Diamond	45
102	Weekday	NB	3:55 p.m.	Beryl & Prospect	44
102	Weekday	NB	3:55 p.m.	Beryl & Flagler	44
102	Weekday	NB	3:55 p.m.	Beryl & 190th St	44
102	Weekday	NB	3:55 p.m.	Rindge & 190th St	44
102	Weekday	NB	3:55 p.m.	Rindge & Ripley	43

Line	Day	Direction	Trip Time	Leaving Stop at	Load
102	Weekday	SB	7:00 a.m.	Rindge & Grant	46
102	Weekday	SB	7:00 a.m.	Rindge & Clark	56
102	Weekday	SB	7:00 a.m.	Rindge & Pullman	56
102	Weekday	SB	7:00 a.m.	Rindge & Ripley	56
102	Weekday	SB	7:00 a.m.	Rindge & 190th St	56
102	Weekday	SB	7:00 a.m.	Beryl & 190th St	56
102	Weekday	SB	7:00 a.m.	Beryl & Flagler	56
102	Weekday	SB	7:00 a.m.	Prospect & Beryl	56
102	Weekday	SB	7:00 a.m.	Prospect & Diamond	55
102	Weekday	SB	7:00 a.m.	Diamond & Lucia	54

APPENDIX C
ENGLISH AND SPANISH ON-BOARD SURVEYS

BEACH CITIES TRANSIT ON-BOARD RIDER SURVEY

Please take a minute to fill this out and help us evaluate our service. Hand it to the person who gave it to you. If you have already filled out a survey, you do not need to fill it out a second time.

THANK YOU FOR YOUR PARTICIPATION

1) What route are you riding today (circle below)?
102 104 109

2) What is your home Zip Code? _____

3) What is the main purpose of your trip today?
1 ___ Work 4 ___ School 7 ___ Visit/Personal
2 ___ Medical 5 ___ Shopping 8 ___ Entertainment
3 ___ Restaurant/Bar 6 ___ Beach 9 ___ Other

4) How did you get to the bus stop for this bus?
1 ___ Transferred from Bus Route/Line # _____
2 ___ Walked 4 ___ Car/Carpool
3 ___ Bicycle 5 ___ Green Line

5) Where are you <u>coming from</u> *(or where are you starting your trip)*? Give the city and the nearest street intersection OR address:

6) Where are you <u>going to</u> *(or what is your final destination)*? Give the city and the nearest street intersection OR address:

7) Which fare category are you in?
1 ___ Adult 3 ___ Student/Youth
2 ___ Senior or Disabled

8) What will you do when you get off this bus?
1 ___ Transfer to Bus Route/Line # _____
2 ___ Walk 4 ___ Use a Car/Carpool
3 ___ Bicycle 5 ___ Take the Green Line

9) How did you pay for your fare on this bus?
1 __ Cash 4 __ Other Transfer
2 __ BCT Monthly Pass 5 __ EZ Transit Pass
3 __ BCT Transfer 6 __ ASI Card

10) What other transit services have you used in the past two weeks?
1 ___ Metro Bus 7 ___ LADOT Commuter Express
2 ___ Metro Rail 8 ___ LADOT DASH
3 ___ Metrolink 9 ___ Santa Monica Bus
4 ___ Torrance Transit 10 ___ Culver City Bus
5 ___ Gardena Transit 11 ___ Long Beach Transit
6 ___ Lawndale Transit 12 ___ Access Services

11) How would you make this trip if the bus were not available?
1 ___ Drive 4 ___ Taxi 7 ___ Wouldn't make trip
2 ___ Walk 5 ___ Ride with someone
3 ___ Bicycle 6 ___ Take Metro or other bus

12) How often do you ride Beach Cities Transit?
1 ___ 4+ days per week 3 ___ 1 day per week
2 ___ 2-3 days per week 4 ___ Less than once/week

13) Please rate Beach Cities Transit's performance on the following elements of bus service on a 1-5 scale, with 1 being very poor and 5 being excellent:

	Very Poor	Poor	Fair	Good	Excellent
1 Frequency of buses (how often they run)	1	2	3	4	5
2 Routes go where I need to go	1	2	3	4	5
3 Reliability (buses run on time)	1	2	3	4	5
4 Value for fare paid	1	2	3	4	5
5 Ability to find a seat on the bus	1	2	3	4	5
6 Bus cleanliness and comfort	1	2	3	4	5
7 Operator courtesy	1	2	3	4	5
8 Personal safety on the bus/at bus stops	1	2	3	4	5
9 Overall rating of Beach Cities Transit service	1	2	3	4	5

14) If you could make one change to improve Beach Cities Transit, what would it be?

Finally, for statistical purposes, tell us a little about yourself. All replies are confidential.

15) How long have you been riding Beach Cities Transit?
1 ___ Less than 6 mos. 3 ___ 1 to 2 years
2 ___ 6 mos. to 1 year 4 ___ More than 2 years

16) Your age is...
1 ___ 17 years or under 5 ___ 45 to 54 years
2 ___ 18 to 24 years 6 ___ 55 to 64 years
3 ___ 25 to 34 years 7 ___ 65 years or more
4 ___ 35 to 44 years

17) You are: 1 ___ Female 2 ___ Male

18) How many cars are available at your home?
1 __ None 2 __ One 3 __ Two 4 __ Three or more

19) Your ethnicity is...
1 ___ Latino/Hispanic 3 ___ Asian
2 ___ White 4 ___ Black/African American
5 ___ Other (please specify) _____

20) Your total annual household income is:
1 ___ Less than $25,000 3 ___ $75,000 and over
2 ___ $25,000-$74,999

BEACH CITIES TRANSIT ENCUESTA

Por favor, tómese un minuto para llenar esto y ayudarnos a evaluar nuestro servicio. Llévelo a la persona que te lo dio. Si ya ha completado una encuesta, no es necesario que lo llene por segunda vez.

GRACIAS POR SU PARTICIPACIÓN

1) ¿Qué ruta estás montando hoy (círculo de abajo)?
102 104 109

2) ¿Cuál es su hogar Código Postal? _____

3) ¿Cuál es el propósito principal de su viaje de hoy?
1 __ Un Trabajo 4 __ Escuela 7 ___ Visita/Personal
2 __ Medicos 5 ___ Compras 8 ___ Entretenimiento
3 __ Restaurante/Bar 6___ Playa 9___ Otros

4) ¿Cómo llego a la parada de autobús para este autobús?
1 ___ Transferido de autobús de la ruta / Línea # _____
2 ___ Caminó 4 ___ coches/Carpool
3 ___ Bicicletas 5 ___ Línea Verde

5) ¿Cuando vienes? (o cuando estás de partida del viaje)? Dar a la ciudad y la dirección de la calle o intersección más cercana**:**

6) ¿A dónde vas? (o lo que es su destino final)? Dar a la ciudad y la dirección de la calle o intersección más cercana**:**

7) ¿Qué tarifa de categoría está usted en?
1 ___ Adulto 3 ___ Estudiante/Juventud
2 ___ mayores o de movilidad reducida

8) ¿Qué vas a hacer cuando se baje de este autobús?
1 ___ Transferido de autobús de la ruta / Línea # _____
2 ___ Caminó 4 ___ coches/Carpool
3 ___ Bicicletas 5 ___ Línea Verde

9) ¿Cómo pagó por su pasaje en este autobús?
1 __ Dinero en effectivo 4 __ Otro Transferencia
2 __ Pase mensual BCT 5 __ Pase de Tránsito EZ
3 __ Transferencia BCT 6 __ Tarjetas ASI

10) ¿Qué otros servicios de tránsito ha usado en las últimas dos semanas?
1 ___ Metro Bus 7 ___LADOTCommuter Express
2 ___ Metro Rail 8 ___ LADOT DASH
3 ___ Metrolink 9 ___ Santa Monica Bus
4 ___ Torrance Transit 10 ___ Culver City Bus
5 ___ Gardena Transit 11 ___ Long Beach Transit
6 ___ Lawndale Transit 12 ___ Access Services

11) ¿Cómo haria este viaje si el bus no estaba disponible?
1 ___ Manejar 4 ___ Taxi 7 ___ No haria el viaje
2 ___ Caminar 5___ viajar con alguien
3 ___ Bicicleta 6 ___ Tomar el Metro o otro autobús

12) ¿Con qué frecuencia utiliza la bicicleta Ciudades de Playa de tránsito?
1 ___ 4+ días a la semana 3 ___ Un día a la semana
2 ___ 2-3 días a la semana 4 ___ Menos de una vez a la semana

13) Por favor calificar el desempeño de Beach Cities Transit en los siguientes elementos del servicio de autobuses en una escala de 1-5, siendo 1 muy mala y 5 excelente:

	Very Poor	Poor	Fair	Good	Excellent
1 La frecuencia de los autobuses (con qué frecuencia se ejecutan)	1	2	3	4	5
2 Rutas ir a donde tengo que ir	1	2	3	4	5
3 Fiabilidad (los autobuses salen a tiempo)	1	2	3	4	5
4 Relación calidad precio abonado	1	2	3	4	5
5 Capacidad de encontrar un asiento en el autobús	1	2	3	4	5
6 Bus limpieza y comodidad	1	2	3	4	5
7 Operador de turismo	1	2	3	4	5
8 La seguridad personal en el autobús/en las paradas de autobús	1	2	3	4	5
9 Valoración global de servicios de Beach Cities Transit	1	2	3	4	5

14) Si usted podría hacer un cambio para mejorar Beach Cities Transit, ¿cuál sería?

Por último, a efectos estadísticos, nos dice un poco sobre usted. Todas las respuestas son confidenciales*.*

15) ¿Cuánto tiempo ha estado viajando en Beach Cities Transit?
1 ___ Menos de 6 meses 3 ___ 1 a 2 años
2 ___ 6 meses a un año 4 ___ Más de 2 años

16) Su edad es...
1 ___ 17 años o menos 5___ 45 a 54 años
2 ___ 18 a 24 años 6___ 55 a 64 años
3 ___ 25 a 34 años 7___ 65 años o más
4 ___ 35 a 44 años

17) Usted es: 1 ___ Mujer 2 ___ Hombre

18) ¿Cuántos carros están disponibles en su casa?
1 __ Nada 2 __ Uno 3 __ Dos 4 __ Tres o más

19) Su origen étnico es…
1 ___ Latino/Hispano 3 ___ Asiático
2 ___ Blanco 4 ___ Negro/ Afroamericano
5 ___ Otro (especificar) _____

20) Su ingreso total anual por hogar es…
1 ___ Menos de $25,000 3 ___ $75,000 o más
2 ___ $25,000 - $74,999

APPENDIX D
ROUNDTABLE MEETING DISCUSSION

Beach Cities Transit
2011 Comprehensive Operational Analysis
Appendix D: Roundtable Meeting Discussion

Monday, March 28, 2011 – 3:00 p.m. to 4:00 p.m.

Meeting Attendees

Diane Amaya, City of Redondo Beach
Brett Baum, Transportation Concepts
Dan Boyle, Dan Boyle & Associates, Inc.
Pete Carmichael, City of Redondo Beach
Nhung Madrid, City of Manhattan Beach
Judith Norman, Judith Norman Transportation Consultant
Meredith Petit, City of El Segundo
Joyce Rooney, City of Redondo Beach

Meeting Summary

Joyce Rooney thanked everyone for coming to the meeting and introduced Dan Boyle and Judith Norman.

Dan Boyle welcomed the attendees and stated that the goal of the meeting is to obtain feedback in terms of what is working, possible improvements, next steps for the transit system, and feedback from employees or resident users. He stated that in January, they performed a full check of every route in the system and conducted a survey. He said that they received 700 surveys and the next step is to analyze the ridecheck data in order to determine which route segments work well and which need improvement. He stated that this effort is being coupled with field work to observe actual operation.

Mr. Boyle said that most riders use transportation for work or school, including 81 percent during the week and 41 percent on weekends. He reported that 25 percent of riders live in Redondo Beach, 9 percent in El Segundo, and 3 percent in Manhattan Beach and Hermosa Beach. Survey respondents gave 123 different home zip codes, indicating that Green Line stations and the LAX bus center connect Beach Cities Transit to the regional transit network. Most riders walk from their origin to the bus stop and from the bus stop to their destinations. Many riders transfer to and from other bus lines and the Green Line, and the BCT routes function as a distributor within the BCT service area. Three-quarters of respondents used other transit systems within the past two weeks, primarily Metro Bus and the Green Line. Most riders are long time riders, but there are a high number of occasional riders who use the service once a week or less. Respondents said that without this service, they would walk or take Metro; however, 11 percent said they would not make the trip if BCT service were not available. In terms of demographics, most riders are female, live in households with no car or one car, and report incomes under $25,000. There is a wide range of age groups that use the service. Latino is the most common ethnicity, accounting for just under half of all respondents. The overall rating of the service was 4.13 on a scale of 1 to 5. The highest rated items were

operator courtesy, personal safety at stops and cleanliness of the buses, while the lowest ratings were for frequency and reliability. Service reliability is the most critical element for improvements from an operational standpoint.

Mr. Boyle then turned the meeting over to Judith Norman, who stated that they are looking for opinions from the members, cities, and consumers and they are looking forward to different perspectives on the service. She wants to know what elements are operating to their satisfaction and what changes they would like to see.

Meredith Petit of the City of El Segundo said that she is not a regular rider but she has taken a tour of the routes. She said that her biggest concern is how well they serve the residents. Nhung Madrid of the City of Manhattan Beach agreed, noting a particular concern with commuters on the east side of Sepulveda where BCT does not operate.

Ms. Petit explained that they would like to be able to provide more information to residents. She continued that Line 109 serves residential areas but it is a roundabout route that takes too long. She added that they are concerned with marketing and signage in distributing awareness of this service.

Ms. Norman summarized that route 109 is lengthy and could be more direct for residents.

Ms. Petit agreed that the residents would be more likely to use the route for restaurants and bars in the beach cities than for shopping at the El Segundo Plaza.

Ms. Norman summarized they want more utilization for the residents. She asked Ms. Petit to elaborate on the signage concern.

Ms. Petit answered that there is not enough signage. She added that they can use this as a promotional tool to inform residents. She continued that a map showing the existing three lines would help inform residents of their existence.

Ms. Norman asked for other perspectives on the city service.

Nhung Madrid of the City of Manhattan Beach said that their council is concerned with how the service benefits their specific residents. She continued that Line 109 was rerouted and Vista Del Mar was removed as a stop and they want to know why it was not an option to include the Manhattan Village as a stop. She explained that there are plans to revamp Manhattan Village and this is an opportunity to bring residents directly to this location. She noted that they, like El Segundo, are also concerned with the marketing and signage to inform residents about the service.

Ms. Norman asked if they are suggesting that the lead city perform more marketing or whether the cities would be interested in helping and collaborating.

Ms. Madrid said that the lead city should initiate the marketing but they are happy to help. She continued that their commission meetings are televised on the public channel and including this information would help spread information to residents.

Pete Carmichael of the City of Redondo Beach asked if marketing expenses are included in the funding request to other cities. Joyce Rooney of the City of Redondo Beach answered that marketing expenses are not included.

Ms. Norman stated that the cities have other low-cost avenues to advertise these services and they might want to include these in marketing.

Mr. Carmichael asked if there is willingness to share costs between the cities if they build up the marketing activities in the next couple years. The general sense was that it would be an easier sell if it was included in the overall service operation.

Ms. Madrid suggested that the City of Redondo Beach identify specifics regarding marketing and include anything beyond the standard promotion and standard materials. She stated that a video marketing tool would be an excellent example; there is a vast amount of technology in today's world and this should be easy to create.

Ms. Norman stated that they can produce brochures and/or city specific tools because some cities might not be interested in all of the marketing tools.

Brett Baum of Transportation Concepts said that the biggest challenge is the current schedule and the fact that the drivers must speed through the city in order to stay on track. He said that this increases complaints from riders. He continued that there are operational issues, including fueling, and they must address these to help the service remain on time. He said that they can also discuss altering current routes in order to improve service. He explained that overcrowding is not an issue as they have a good-sized fleet. The schedule remains at the top of their concerns. He explained that they are doing a good job based on the minimal level of complaints they receive and the positive feedback. He said that signage, maps, and time schedules are the biggest negatives.

Ms. Rooney said that the northbound route includes the Douglas Green Line Station stop while southbound does not and she asked for comments on this.

Ms. Petit noted that the McCormick and Schmitt stop at Douglas & Rosecrans might be included now. She said that there is a Metro stop near the Fresh & Easy market which drops riders closer and prevents a lengthy walk. She said that it makes sense to serve the station in both directions.

Mr. Boyle said that having a stop both northbound and southbound provides confidence to the rider but they must examine how this affects the overall schedule.

Ms. Norman asked for any other route changes that they feel should be implemented.

Ms. Madrid answered that Manhattan Beach does not receive feedback from riders or requests for stops. Ms. Petit noted that the same is true for El Segundo.

Ms. Madrid said that the mall stop request came from their council rather than riders. The council wants a stop on the mall property, rather than where it currently stops. The mall is

private property and Beach Cities Transit would need to submit a formal request to add a bus stop.

Ms. Madrid said that they are remodeling the mall and adding a parking structure.

Mr. Boyle said that remodeling can sometimes create an opportunity to include transit, but BCT would need a safe and operationally feasible location for a new stop.

Ms. Rooney added that BCT would want to establish a bus loading area with seating and amenities for travelers. She said that this stop could be utilized by transit systems other than BCT.

Ms. Norman asked the attendees to comment about reliability of service.

Mr. Carmichael asked Mr. Boyle which stops have the busiest traffic in terms of ons and offs.

Mr. Boyle said that they are currently analyzing the data to obtain these numbers.

Mr. Baum said that there is a meeting with operators would provide useful feedback on changes that riders and operators would like to see.

Mr. Boyle said that the drivers have good ideas and including them in the study creates a sense of ownership for the recommendations. Bus operators are often the best ambassadors and can explain changes to riders.

Ms. Norman asked about the perceptions of the City of Redondo Beach.

Diane Amaya of the City of Redondo Beach said that when she first started her job, the problems included pickups, bus signage and design of bus schedules.

Ms. Norman asked about the bus schedules.

Ms. Amaya answered that the schedules were deemed “too busy.”

Ms. Norman summarized that the feedback is unanimous with reliability issues and signage issues. She continued that Mr. Boyle will be developing options to make improvements in these areas. She explained that her past work in the South Bay transit gave her an appreciation of the challenges in providing service.

Mr. Boyle noted that morning service is usually on time but afternoon traffic poses a challenge for adhering to the bus schedules. He explained that a major goal is to provide reliable and easy to understand service for the riders.

Ms. Norman stated that they hope to ensure both frequency and reliability because adding time to the schedule can deter frequency but improve reliability. She asked if the cities are hopeful and committed for continuing funding in the future.

Ms. Madrid said that they will continue funding if their residents are benefiting from the service.

Ms. Petit stated that her city participates in many programs including Beach Cities Transit, Dial-a-Ride and MAX service, and it can be difficult to provide direction to residents and prevent overlapping services.

Ms. Norman agreed that this makes sense and she asked if they are satisfied with the leadership that Redondo Beach has provided.

Ms. Petit answered that they discuss these issues in their meetings and the recent drop in ridership is a concern.

Ms. Norman stated that the survey will provide data and Mr. Boyle will investigate the operational challenges. She continued that large changes are not always necessary in order to help these services operate efficiently. She asked for any further comments from the meeting attendees.

Mr. Boyle asked if there are any particular neighborhoods that are promising for transit that are not currently serviced. He said that there are safety issues in El Segundo, and wealthier neighborhoods in Manhattan Beach.

Ms. Madrid said that they serve the population west of Sepulveda but she has not heard of a need for service east of Sepulveda.

Ms. Petit said that they are unsure which groups are using the service which prevents them from marketing the service. Residents often use the service to travel to the beach. She said that they would like to promote the service for their events but these events often include street closures or activities after the buses stop running.

Ms. Petit said their residents are very centralized and no one is too far from the route.

Mr. Boyle asked if serving the business district accommodates most people, along with service along Grand Avenue and Main Street.

Ms. Petit said that Main Street serves residents and riders on Aviation or Sepulveda are probably employees.

Mr. Boyle said that he has not yet examined the boardings by city to compare residents and employees. City councils can sometimes overlook the importance of transit service to employers. He said that the 123 zip codes of residents was a surprise but their service does connect to the major routes. He said that breaking down the boardings by city will show usage by employees as well as residents. He summarized that El Segundo residents make up nine percent of riders, while Manhattan Beach and Hermosa Beach residents each account for three percent of riders.

Ms. Norman explained that here is a benefit to the residents whether they are using the service or not because if employees within a city are using the buses, this relieves traffic congestion on the streets. She said that the council discusses benefiting the residents but they must examine both direct and indirect benefits. She asked whether Manhattan Beach has ever completed a survey related to transit service with their residents.

Ms. Madrid answered no.

Ms. Norman said that this might benefit the city and the council. She said that even though the community is affluent, the baby boomer generation might want to use the transit service as they grow older and no longer drive. She said that there is a need to serve residents because they pay for the service and they must determine where and how to best serve these residents.

Ms. Petit noted that the service acts as a distributor for Metro Bus and the Green Line and she asked if this is reciprocal.

Mr. Boyle answered that people also access the Green Line and there are many people accessing jobs elsewhere. Ms. Norman said that this represents regional connectivity as well.

Mr. Boyle said that BCT service complements the regional transit network. A benefit of the smaller municipal systems is the ability to provide the local connection to Metro. He continued that smaller systems are looked upon more favorably as there are more complaints about the bigger systems, as the local systems are considered "my bus." He explained that they can build upon these benefits, including both local mobility and ties to the regional network.

Mr. Carmichael said that transit is a new area for him and he is learning and asking the basic questions. He said that he is eager to see the second half of the study. He continued that it is beneficial to examine where riders live and where people are getting on and off the buses. He said that the marketing strategy of a target audience and funding is important in order to get the most bang for their buck.

Mr. Boyle said that demographics of resident riders and their destinations will be helpful to the study and also to present to city councils. He said that ridership on Line 102 includes students in Redondo Beach while Line 109 is more geared toward workers.

Ms. Madrid stated that the City's only high school is on the east side of Sepulveda, so Manhattan Beach high school students do not use the service to get to school. She added that these students use the buses to travel to the beach.

Ms. Norman stated that they might think about collaborating with businesses regarding marketing elements of the service. She said that the businesses benefit from the bus service and the city's contributions and there should be conversation with possible assistance in marketing.

Mr. Boyle said that the meeting has been very helpful as they continue the study. He thanked the attendees for their participation and contributions. He said that they will produce recommendations that work for everyone as well as working on the street. He said that they are planning to finish the study by the end of April.

Ms. Rooney summarized that they are aware of signage, the time schedule and the marketing issues and they hope to work toward improvements in those areas. She said that there is more signage missing than they thought and although there are multiple problems with staffing and finishing other projects, they hope to move farther along on these issues this year.

Mr. Boyle said that the BCT signage posted at bus stops is recognizable but there are so many signs at some stops that a casual rider could easily be confused. One option he will look at is clockface schedules, in which the bus stops at the same time or times each hour. This helps riders know the arrival times without carrying a schedule. He said that they will examine this option in terms of operations and helping riders understand the system.

Ms. Rooney asked if there are other new developments in the cities that they should take into account.

Ms. Madrid answered that the Manhattan Village remodel is a five to ten year plan.

APPENDIX E
POTENTIAL REROUTING OF LINE 109 TO SERVE
MANHATTAN VILLAGE MALL

Beach Cities Transit
2011 Comprehensive Operational Analysis
Appendix E: Potential Rerouting of Line 109 to Serve Manhattan Village Mall

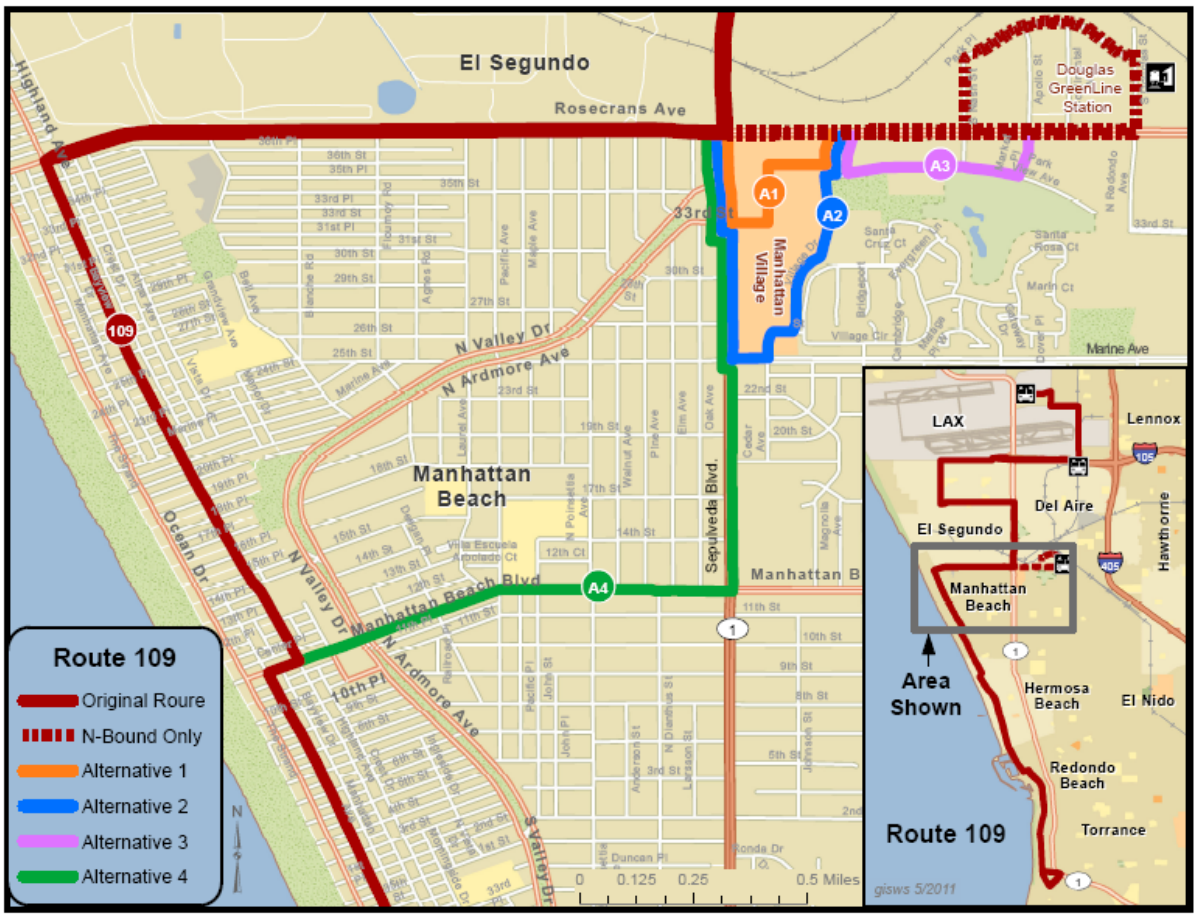
The only request for new service raised by the four cities in the roundtable was for Line 109 to serve Manhattan Village Mall more directly. Line 109 travels along Rosecrans Avenue near the mall. The closest stop is on Rosecrans just east of Village Drive, and is currently served only in the northbound direction on the way to Douglas Station. The COA proposal is to serve Douglas Station in both directions.

Criteria for assessing the viability of transit service or transit service concepts include:

- Ridership potential.
- Operational feasibility. Certain streets or areas present significant challenges for bus operation.
- Cost.

The COA identified four different options for providing direct service to Manhattan Village Mall. These options are listed below and shown in Figure E.1.

Figure E.1
Options at Manhattan Village Mall for Line 109



Options

Option 1 is to turn south from Rosecrans Avenue on Sepulveda Boulevard, enter the mall (see Figure E.2), and either continue through the mall to exit at Village Drive or to exit onto Sepulveda north to Rosecrans and resume the existing route. The Ocean Express trolley enters and exits the mall in the northbound direction on Sepulveda Boulevard.

Option 2 is to turn south from Rosecrans on Village Drive (see Figure E.3) and circle the mall via Village, Marine Avenue, and Sepulveda Boulevard before resuming the existing route.

Option 3 is to turn south from Rosecrans on Village Drive, then east on Park View and north on Market Place, resuming the existing route at Rosecrans.

Option 4 is to restructure the line entirely, replacing the segments along Highland Avenue and Rosecrans Avenue west of Sepulveda with a new routing east on Manhattan Beach Boulevard and north onto Sepulveda with a stop directly in front of the mall.

Figure E.2 Entrance to Manhattan Village Mall from Sepulveda Boulevard. The Ocean Express Trolley enters the mall with a stop near Tommy Bahamas behind the California Pizza Kitchen in the photo at the left.

Figure E.3 Village Drive. The left photo is taken from the MVM parking lot and shows the Village/ Park View intersection. The right photo is looking south on Village Drive, with the mall entrance after the red curb. Parking meters would need to be removed to establish a bus stop in this location.

In addition to these four options, the COA recommended provision of two-way service to the Douglas Station. While this recommendation would not provide service directly to Manhattan Village Mall, it would mean that the closest stop to the Mall (Rosecrans & Village Drive) would be served by buses traveling in both directions.

Options 1 and 2 and are analyzed below along with the effects of the recommended two-way service along Rosecrans to Douglas Station. Option 3 would not involve additional cost, but it would bring Line 109 only one short block closer to a Mall entrance (assuming parking meters could be removed along Village Drive) and cannot be expected to generate additional ridership. Option 4 is discussed separately below because it has far-reaching effects on other segments of Line 109.

Ridership

Existing ridership activity on the northbound 109 at Rosecrans Avenue & Village Drive, the closest stop to Manhattan Village Mall, is shown in Table E.1.

Table E.1
Existing Ridership Activity at Manhattan Village Mall
(Rosecrans Avenue & Village Drive) on Line 109

Direction	Weekday		Saturday		Sunday	
	On	Off	On	Off	On	Off
109 NB EB on Rosecrans	4	16	3	10	2	3
109 NB WB on Rosecrans	0	0	0	0	1	0

Proximity to the Mall does matter; there is no activity at the stop westbound on Rosecrans, which requires a passenger to cross the street. Note that Manhattan Village Mall is currently served only in the northbound direction.

The impact of changes to Line 109 is shown in Table E.2. The first change in Table E.2 adds southbound service to Douglas Station, which would make the same stops at Rosecrans Avenue & Village Drive as the current northbound line. Option 1 (entering the Mall) and Option 2 (circling the Mall, with multiple stops at the periphery that are closer than the current stop) bring the line into or at least much closer to Manhattan Village Mall. We assume that the first action would allow those who get off northbound to get on southbound for the return trip, boosting ridership by 16 on weekday, 10 on Saturday, and 3 on Sunday. We assume that the second action would increase total boardings under the two-way service option by 50 percent, resulting in 10 additional riders on weekdays, 7 on Saturday, and 2 on Sunday. Total weekday ridership on Line 109 is 600, so this represents approximately a five percent increase in ridership.

Table E.2
Projected Ridership Increase at Manhattan Village Mall on Line 109

Option	Weekday	Saturday	Sunday
Two-way service	16	10	3
Option 1 or Option 2	10	7	2
Total	26	17	5

There are two costs associated with these changes. The first is ridership delay for existing riders caused by the travel time increase; the second is the operational cost of adding time to the schedule.

Ridership Delay

Relevant factors include:

- There are 119 daily northbound passengers riding through on northbound Line 109 at Rosecrans & Village Way.
- 92 northbound passengers get off at Douglas Station. Only 6 of these alightings occur in the morning before the mall is open.
- There are 107 daily southbound passengers riding through on southbound Line 109 at Rosecrans & Sepulveda.
- The proposed change to two-way service at Douglas Station would not require extra travel time for northbound passengers but would add 6 minutes extra time for southbound passengers. Using the same assumptions as in Table E.2, weekday ridership would increase by 16 riders at Rosecrans & Village and by 92 riders at Douglas Station. Note that the COA used more conservative assumptions for calculating ridership increases and estimated 47 additional riders. For the purpose of this analysis, we use the same assumptions for both actions.
- Under Option 1 or Option 2, there would be 10 minutes extra travel time in both directions for current passengers. As shown in Table E.2, weekday ridership would increase by 10 passengers.

Table E.3 shows weekday ridership and travel time impacts under both changes. Two-way service is expected to add 108 riders (16 at Rosecrans & Village and 92 at Douglas Station), and add six minutes of travel time for 107 southbound passengers. Total person minutes of delay per new rider attracted is 5.9. A stop within or adjacent to the Mall is expected to add 10 passengers and add 10 minutes of travel time for 119 current northbound riders and 107 current southbound riders. Total person minutes of delay per new rider attracted is 226.0. Note than increasing the expected number of new riders by a factor of 10 to 100 would still result in 22.6 total person minutes of delay per new rider attracted.

Table E.3
Weekday Ridership and Travel Time Impacts at Manhattan Village Mall on Line 109

Change	New Riders	Riders Subject to Delay	Delay in minutes	Total Person-minutes of Delay	Total Person-minutes of Delay per New Rider
Two-way service	108	107	6	642	5.9
(Option 1 or Option 2)	10	226	10	2,260	226.0

Cost

Table E.4, adapted from the COA report, summarizes cost impacts of the two changes. Each change includes running time adjustments to improve line on-time performance and reliability. The provision of two-way service to Douglas Station can be achieved with current resources by

reducing recovery time slightly at the north end of the line. Both Option 1 and Option 2, by deviating the line to a stop within or immediately adjacent to the Mall, would add a minimum of 10 minutes travel time in each direction, requiring an extra bus on Line 109. This would require a fifth bus on Line 109 and would increase annual revenue hours and thus cost dramatically. Annual operating costs would increase by over $250,000 and the capital cost would be $432,000 for a new bus.

Table E.4 also includes an alternative to limit costs: reroute Line 109 directly into Manhattan Village Mall only during midday hours (11:00 a.m. to 4:00 pm). This alternative does reduce costs by about half (to approximately $134,000), but would still require an additional bus at a cost of $432,000.

Options 3 and 4 would have no fiscal impact. Option 3 is a minor reroute that would have negligible impacts on ridership and costs.

Option 4 would require giving up the existing segments of Line 109 on Highland Avenue and the western portion of Rosecrans Avenue. These segments account for 100 boardings (17 percent of total ridership) and 92 alightings on a typical weekday. These riders would have no other local transit options, because Line 109 is the only local transit service on these streets.

Table E.4
Options and Impacts for Line 109

Change	Change in Weekday Revenue Hours	Change in Sat/Sun Revenue Hours	Change in Annual Revenue Hours	Change in Annual Cost	Change in Peak Vehicles	Capital Cost
Change running time	-0.25	-0.22	-87	-$3,833	0	$0
Plus two-way service	0.12	-0.13	15	$661	0	$0
Plus Option 1 or Option 2	16.47	15.17	5,831	$256,914	1	$432,000
Plus Option 1 or 2, midday only (11-4)	10.38	3.76	3,044	$134,126	1	$432,000

Are there alternatives that could alleviate the need for an additional bus? Entering the Mall only in one direction could potentially be done with four buses for most of the day, but refueling requirements at the northern end of the terminus would require a fifth bus for several hours during the day, with an estimated annual cost in the neighborhood of $50,000 to $75,000. This alternative would go against one of the stated purposes of the COA: to provide bidirectional service all along a given line in order to make use of the bus easy to understand for riders.

There are legitimate operational concerns about bus service within the parking lot of a major mall. Turns are tight for a 32-foot bus, and competing automobile and pedestrian traffic create safety concerns. The Ocean Express trolley does operate within Manhattan Village Mall, but the trolley is much more visible than a BCT bus, owing to its paint scheme and appearance. There is also a paving cost associated with 41 daily trips by a heavy bus. A wider bus-only lane that could provide ready access from Sepulveda Boulevard to the stop within the Mall (assumed to be at Tommy Bahamas, the location of the trolley stop) would reduce operational concerns, but such changes are generally not popular with owners of shopping centers.

Summary

The conclusion in the COA is:

> *Providing direct service to Manhattan Village Mall is not recommended because it would require an additional bus, result in an inefficient schedule, and create legitimate operational concerns about bus service within the parking lot of a major mall. The current stop for Manhattan Village Mall is on Rosecrans just east of Village Drive, a one-block walk from the mall entrance nearest to Macy's. The introduction of two-way service to the Douglas Station means that this stop will be served in both the northbound and the southbound direction, thus enhancing access to the mall while minimizing resource requirements and operational issues.*

Current and potential BCT riders will have enhanced access to the nearest stop with the introduction of two-way service at this stop (a by-product of two-way service to Douglas Station). The cost of adding a fifth bus to the schedule to serve the Mall in both directions is high. There are also serious operational issues related to operating a fixed-route bus within a shopping center. The cost and ridership estimates can help stakeholders make an informed decision.

Line 109 Boardings Alightings COA Survey

Line 109 Weekday													
Southbound		**WEEKDAY**		SATURDAY		SUNDAY		**Weekday**	**Weekday**	**Sat**	**Sat**	**Sun**	**Sun**
Stop		On	Off	On	Off	On	Load	**on**	**off**	**on**	**off**	**on**	**off**
LAX City Bus Center		25	0	34	0	17	0	**8.3%**	**0.0%**	**17.6%**	**0.0%**	**13.2%**	**0.0%**
96 St/Airport Blvd		2	0	2	0	2	0	**0.7%**	**0.0%**	**1.0%**	**0.0%**	**1.6%**	**0.0%**
Century Blvd/Airport Blvd		4	0	3	0	2	0	**1.3%**	**0.0%**	**1.6%**	**0.0%**	**1.6%**	**0.0%**
Century Blvd/International Rd		17	0	1	0	1	0	**5.6%**	**0.0%**	**0.5%**	**0.0%**	**0.8%**	**0.0%**
Century Blvd/Aviation Blvd		11	0	2	0	4	0	**3.6%**	**0.0%**	**1.0%**	**0.0%**	**3.1%**	**0.0%**
Aviation Blvd/104 St		0	0	0	0	0	0	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Aviation Blvd/111 St		0	0	0	0	0	0	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Aviation Station		118	26	71	11	48	6	**38.9%**	**8.6%**	**36.8%**	**5.7%**	**37.2%**	**4.7%**
Imperial Hwy/Aviation Blvd		1	0	1	0	0	0	**0.3%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**
Imperial Hwy/Douglas St		1	1	0	10	0	0	**0.3%**	**0.3%**	**0.0%**	**5.2%**	**0.0%**	**0.0%**
Imperial Hwy/Nash St		1	0	0	0	0	2	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.6%**
Imperial Hwy/Hughes Way		0	3	0	1	0	1	**0.0%**	**1.0%**	**0.0%**	**0.5%**	**0.0%**	**0.8%**
Imperial Hwy/Sepulveda Blvd		1	3	0	0	0	0	**0.3%**	**1.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Imperial Hwy/California St		2	2	1	4	0	2	**0.7%**	**0.7%**	**0.5%**	**2.1%**	**0.0%**	**1.6%**
Imperial Hwy/Center St		3	2	2	2	0	4	**1.0%**	**0.7%**	**1.0%**	**1.0%**	**0.0%**	**3.1%**
Imperial Hwy/McCarthy Ct		0	2	0	11	0	10	**0.0%**	**0.7%**	**0.0%**	**5.7%**	**0.0%**	**7.8%**
Imperial Hwy/Sheldon St		0	6	2	1	4	5	**0.0%**	**2.0%**	**1.0%**	**0.5%**	**3.1%**	**3.9%**
Imperial Hwy/Eucalyptus Dr		0	5	0	0	4	1	**0.0%**	**1.7%**	**0.0%**	**0.0%**	**3.1%**	**0.8%**
Main St/Imperial Av		4	15	5	8	3	3	**1.3%**	**5.0%**	**2.6%**	**4.1%**	**2.3%**	**2.3%**
Main St/Walnut Av		0	1	0	0	0	2	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**1.6%**
Main St/Oak Av		1	0	0	0	0	4	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.1%**
Main St/Mariposa Av		4	5	2	1	1	4	**1.3%**	**1.7%**	**1.0%**	**0.5%**	**0.8%**	**3.1%**
Main St/Holly Av		3	22	2	8	3	5	**1.0%**	**7.3%**	**1.0%**	**4.1%**	**2.3%**	**3.9%**
Main St/Grand Av		7	15	8	7	5	7	**2.3%**	**5.0%**	**4.1%**	**3.6%**	**3.9%**	**5.5%**
Grand Av/Eucalyptus Dr		6	4	9	2	5	3	**2.0%**	**1.3%**	**4.7%**	**1.0%**	**3.9%**	**2.3%**
Grand Av/Sheldon St		0	7	0	2	0	0	**0.0%**	**2.3%**	**0.0%**	**1.0%**	**0.0%**	**0.0%**

Grand Av/Lomita St	2	3	1	1	0	2	**0.7%**	**1.0%**	**0.5%**	**0.5%**	**0.0%**	**1.6%**
Grand Av/Center St	3	5	0	0	1	0	**1.0%**	**1.7%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**
Grand Av/Kansas St	0	0	0	0	0	0	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Grand Av/Sepulveda Blvd	5	5	5	6	0	2	**1.7%**	**1.7%**	**2.6%**	**3.1%**	**0.0%**	**1.6%**
Sepulveda Blvd/El Segundo	26	2	3	2	1	1	**8.6%**	**0.7%**	**1.6%**	**1.0%**	**0.8%**	**0.8%**
Park Pl/El Segundo Plaza	8	8	3	10	1	2	**2.6%**	**2.6%**	**1.6%**	**5.2%**	**0.8%**	**1.6%**
Sepulveda Blvd/Rosecrans	7	6	5	14	5	4	**2.3%**	**2.0%**	**2.6%**	**7.3%**	**3.9%**	**3.1%**
Rosecrans Av/Walnut Av	0	3	1	0	0	0	**0.0%**	**1.0%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**
Rosecrans Av/Pacific Av	1	3	0	0	0	0	**0.3%**	**1.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Rosecrans Av/Blanche Rd	2	7	0	2	0	1	**0.7%**	**2.3%**	**0.0%**	**1.0%**	**0.0%**	**0.8%**
Highland Av/33 St	3	15	6	8	3	6	**1.0%**	**5.0%**	**3.1%**	**4.1%**	**2.3%**	**4.7%**
Highland Av/30 St-29 St mid-block	2	7	1	0	0	1	**0.7%**	**2.3%**	**0.5%**	**0.0%**	**0.0%**	**0.8%**
Highland Av/26 St	3	9	0	1	1	3	**1.0%**	**3.0%**	**0.0%**	**0.5%**	**0.8%**	**2.3%**
Highland Av/Marine Av	4	9	1	0	0	0	**1.3%**	**3.0%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**
Highland Av/18 St-17 Pl	0	1	1	0	0	0	**0.0%**	**0.3%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**
Highland Av/14 St	4	12	2	16	4	4	**1.3%**	**4.0%**	**1.0%**	**8.3%**	**3.1%**	**3.1%**
Manhattan Av/10 St-9 Pl mid-block	7	1	2	6	1	2	**2.3%**	**0.3%**	**1.0%**	**3.1%**	**0.8%**	**1.6%**
Manhattan Av/4 St-3 Pl mid-block	0	5	1	0	0	2	**0.0%**	**1.7%**	**0.5%**	**0.0%**	**0.0%**	**1.6%**
Manhattan Av/1 St	2	5	1	1	0	0	**0.7%**	**1.7%**	**0.5%**	**0.5%**	**0.0%**	**0.0%**
Manhattan Av/Longfellow Av	0	2	1	1	1	1	**0.0%**	**0.7%**	**0.5%**	**0.5%**	**0.8%**	**0.8%**
Manhattan Av/27 St	0	4	0	1	0	0	**0.0%**	**1.3%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**
Hermosa Av/25 St	1	3	0	0	1	0	**0.3%**	**1.0%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**
Hermosa Av/22 St	1	1	0	0	1	1	**0.3%**	**0.3%**	**0.0%**	**0.0%**	**0.8%**	**0.8%**
Hermosa Av/19 St-19 Ct mid-block	0	0	0	1	0	2	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**	**1.6%**
Hermosa Av/16 St	0	4	2	4	3	5	**0.0%**	**1.3%**	**1.0%**	**2.1%**	**2.3%**	**3.9%**
Hermosa Av/11 St	3	8	7	11	5	10	**1.0%**	**2.6%**	**3.6%**	**5.7%**	**3.9%**	**7.8%**
Hermosa Av/8 St	3	2	1	1	1	0	**1.0%**	**0.7%**	**0.5%**	**0.5%**	**0.8%**	**0.0%**
Hermosa Av/6 St-6 Ct mid-block	0	0	0	1	0	1	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**	**0.8%**
Hermosa Av/2 St	1	1	1	1	0	0	**0.3%**	**0.3%**	**0.5%**	**0.5%**	**0.0%**	**0.0%**

Harbor Dr/Yacht Club Way	1	1	0	1	0	0	**0.3%**	**0.3%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**
Beryl St/Harbor Dr	1	4	0	0	0	1	**0.3%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**
Catalina Av/Beryl St	0	0	0	2	0	1	**0.0%**	**0.0%**	**0.0%**	**1.0%**	**0.0%**	**0.8%**
Catalina Av/Carnelian St	0	2	0	0	0	1	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**
Catalina Av/Diamond St	0	3	0	2	0	4	**0.0%**	**1.0%**	**0.0%**	**1.0%**	**0.0%**	**3.1%**
Catalina Av/Emerald St	0	0	0	1	0	0	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**
Catalina Av/Garnet Av	0	2	1	0	0	0	**0.0%**	**0.7%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**
Catalina Av/Torrance Blvd	0	21	0	5	1	3	**0.0%**	**6.9%**	**0.0%**	**2.6%**	**0.8%**	**2.3%**
Catalina Av/Pearl St	0	0	0	0	0	0	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Catalina Av/Sapphire St	0	1	1	1	0	1	**0.0%**	**0.3%**	**0.5%**	**0.5%**	**0.0%**	**0.8%**
Catalina Av/Topaz St	0	0	0	0	0	0	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Catalina Av/Knob Hill Av	0	0	0	1	0	0	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**
Catalina Av/Av C	2	0	0	4	0	0	**0.7%**	**0.0%**	**0.0%**	**2.1%**	**0.0%**	**0.0%**
Catalina Av/Av F	0	3	0	1	0	1	**0.0%**	**1.0%**	**0.0%**	**0.5%**	**0.0%**	**0.8%**
Av I/Elena Av	0	13	1	14	0	4	**0.0%**	**4.3%**	**0.5%**	**7.3%**	**0.0%**	**3.1%**
Palos Verdes Blvd & Via Valencia - mid bloc	0	3	0	5	0	3	**0.0%**	**1.0%**	**0.0%**	**2.6%**	**0.0%**	**2.3%**
	303	303	193	193	129	128	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Line 109													
Northbound		**WEEKDAY**		SATURDAY		SUNDAY		**Weekday**	**Weekday**	**Sat**	**Sat**	**Sun**	**Sun**
Stop		On	Off	On	Off	On	Off	**on**	**off**	**on**	**off**	**on**	**off**
Palos Verdes Blvd & Via Valencia - mid bl		9	0	5	0	5	0	**3.0%**	**0.0%**	**4.2%**	**0.0%**	**5.5%**	**0.0%**
Catalina Av/Elena Av		6	0	1	0	1	0	**2.0%**	**0.0%**	**0.8%**	**0.0%**	**1.1%**	**0.0%**
Catalina Av/Av I		7	0	4	0	0	0	**2.4%**	**0.0%**	**3.3%**	**0.0%**	**0.0%**	**0.0%**
Catalina Av/Av F		1	0	2	0	0	0	**0.3%**	**0.0%**	**1.7%**	**0.0%**	**0.0%**	**0.0%**
Catalina Av/Av C		0	0	6	0	1	0	**0.0%**	**0.0%**	**5.0%**	**0.0%**	**1.1%**	**0.0%**
Catalina Av/Knob Hill Av		4	2	1	0	1	0	**1.3%**	**0.7%**	**0.8%**	**0.0%**	**1.1%**	**0.0%**
Catalina Av/Topaz St		0	0	0	0	0	0	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Catalina Av/Sapphire St		5	0	3	0	0	0	**1.7%**	**0.0%**	**2.5%**	**0.0%**	**0.0%**	**0.0%**
Catalina Av/Pearl St		0	0	0	0	2	1	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.2%**	**1.1%**
Catalina Av/Torrance Blvd		22	2	7	2	1	0	**7.4%**	**0.7%**	**5.8%**	**1.7%**	**1.1%**	**0.0%**
Catalina Av/Garnet Av		1	2	1	0	0	0	**0.3%**	**0.7%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**
Catalina Av/Emerald St		0	0	0	2	0	0	**0.0%**	**0.0%**	**0.0%**	**1.7%**	**0.0%**	**0.0%**
Catalina Av/Diamond St		3	1	3	3	1	0	**1.0%**	**0.3%**	**2.5%**	**2.5%**	**1.1%**	**0.0%**
Catalina Av/Carnelian St		2	0	1	0	0	1	**0.7%**	**0.0%**	**0.8%**	**0.0%**	**0.0%**	**1.1%**
Beryl St/Harbor Dr		0	2	2	0	2	1	**0.0%**	**0.7%**	**1.7%**	**0.0%**	**2.2%**	**1.1%**
Hermosa Av/Lyndon St		3	0	1	0	0	0	**1.0%**	**0.0%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**
Hermosa Av/2 St		1	2	0	2	3	0	**0.3%**	**0.7%**	**0.0%**	**1.7%**	**3.3%**	**0.0%**
Hermosa Av/6 St		2	0	0	0	1	0	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**
Hermosa Av/8 St		1	0	0	0	4	0	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**4.4%**	**0.0%**
Hermosa Av/10 St		9	4	5	8	8	1	**3.0%**	**1.3%**	**4.2%**	**6.7%**	**8.8%**	**1.1%**
Hermosa Av/16 St		4	1	3	2	8	1	**1.3%**	**0.3%**	**2.5%**	**1.7%**	**8.8%**	**1.1%**
Hermosa Av/19 St		2	0	1	0	0	0	**0.7%**	**0.0%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**
Hermosa Av/22 St		1	1	0	0	0	0	**0.3%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Hermosa Av/26 St		8	0	1	0	2	2	**2.7%**	**0.0%**	**0.8%**	**0.0%**	**2.2%**	**2.2%**

Manhattan Av/Longfellow Av	4	2	1	0	0	0	**1.3%**	**0.7%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**
Manhattan Av/1 St	0	1	0	0	0	0	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Manhattan Av/3 Pl-4 St mid block	10	4	2	1	2	1	**3.4%**	**1.3%**	**1.7%**	**0.8%**	**2.2%**	**1.1%**
Manhattan Av/10 Pl-11 St mid-block	3	4	9	1	0	1	**1.0%**	**1.3%**	**7.5%**	**0.8%**	**0.0%**	**1.1%**
Highland Av/14 St	21	3	7	0	1	1	**7.1%**	**1.0%**	**5.8%**	**0.0%**	**1.1%**	**1.1%**
Highland Av/18 Pl-19 St mid-block	1	1	0	1	0	0	**0.3%**	**0.3%**	**0.0%**	**0.8%**	**0.0%**	**0.0%**
Highland Av/Marine Av	12	2	2	0	0	0	**4.0%**	**0.7%**	**1.7%**	**0.0%**	**0.0%**	**0.0%**
Highland Av/26 St	2	1	0	0	3	2	**0.7%**	**0.3%**	**0.0%**	**0.0%**	**3.3%**	**2.2%**
Highland Av/30 Pl-31 St mid-block	4	4	0	0	0	1	**1.3%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**
Highland Av/33 St	6	1	0	1	2	3	**2.0%**	**0.3%**	**0.0%**	**0.8%**	**2.2%**	**3.3%**
Highland Av/Rosecrans Av	7	5	4	5	0	2	**2.4%**	**1.7%**	**3.3%**	**4.2%**	**0.0%**	**2.2%**
Rosecrans Av/Alma Av	15	3	8	1	1	0	**5.1%**	**1.0%**	**6.7%**	**0.8%**	**1.1%**	**0.0%**
Rosecrans Av/Blanche Rd	5	2	0	0	1	0	**1.7%**	**0.7%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**
Rosecrans Av/Pacific Av	8	2	1	0	0	1	**2.7%**	**0.7%**	**0.8%**	**0.0%**	**0.0%**	**1.1%**
Rosecrans Av/Walnut Av	0	2	0	0	0	2	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**2.2%**
Rosecrans Av/Village Dr	4	16	3	10	2	3	**1.3%**	**5.4%**	**2.5%**	**8.3%**	**2.2%**	**3.3%**
Douglas Station	10	92	1	23	3	15	**3.4%**	**31.0%**	**0.8%**	**19.2%**	**3.3%**	**16.3%**
Rosecrans Av/Village Dr	0	0	0	0	1	0	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**
Park Pl/El Segundo Plaza	3	4	3	0	3	3	**1.0%**	**1.3%**	**2.5%**	**0.0%**	**3.3%**	**3.3%**
Sepulveda Blvd/El Segundo	2	2	1	0	1	0	**0.7%**	**0.7%**	**0.8%**	**0.0%**	**1.1%**	**0.0%**
Grand Av/Sepulveda Blvd	6	2	1	4	1	0	**2.0%**	**0.7%**	**0.8%**	**3.3%**	**1.1%**	**0.0%**
Grand Av/Kansas St	0	0	4	2	0	2	**0.0%**	**0.0%**	**3.3%**	**1.7%**	**0.0%**	**2.2%**
Grand Av/Center St	2	0	0	0	0	3	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.3%**
Grand Av/Lomita St	4	1	1	0	0	1	**1.3%**	**0.3%**	**0.8%**	**0.0%**	**0.0%**	**1.1%**
Grand Av/Sheldon St	0	5	0	4	0	1	**0.0%**	**1.7%**	**0.0%**	**3.3%**	**0.0%**	**1.1%**
Main St/Holly Av	31	9	12	10	7	4	**10.4%**	**3.0%**	**10.0%**	**8.3%**	**7.7%**	**4.3%**
Main St/Mariposa Av	6	2	0	0	0	0	**2.0%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Main St/Oak Av	4	1	0	0	1	2	**1.3%**	**0.3%**	**0.0%**	**0.0%**	**1.1%**	**2.2%**
Main St/Walnut Av	2	0	0	0	0	0	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Main St/Imperial Av	6	1	8	0	5	1	**2.0%**	**0.3%**	**6.7%**	**0.0%**	**5.5%**	**1.1%**
Imperial Av/Eucalyptus Dr	1	1	0	0	2	0	**0.3%**	**0.3%**	**0.0%**	**0.0%**	**2.2%**	**0.0%**
Imperial Av/Sheldon St	2	0	2	1	0	1	**0.7%**	**0.0%**	**1.7%**	**0.8%**	**0.0%**	**1.1%**
Imperial Av/McCarthy Ct	0	2	0	0	0	0	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Imperial Av/Center St	3	3	2	3	7	2	**1.0%**	**1.0%**	**1.7%**	**2.5%**	**7.7%**	**2.2%**
California St/Imperial Av	1	2	1	1	1	0	**0.3%**	**0.7%**	**0.8%**	**0.8%**	**1.1%**	**0.0%**
Imperial Hwy/Sepulveda Blvd	3	5	0	0	2	0	**1.0%**	**1.7%**	**0.0%**	**0.0%**	**2.2%**	**0.0%**
Imperial Hwy/Hughes Way	2	1	0	2	0	0	**0.7%**	**0.3%**	**0.0%**	**1.7%**	**0.0%**	**0.0%**
Imperial Hwy/Nash St	0	1	0	0	0	0	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Imperial Hwy/Douglas St	1	1	0	0	0	0	**0.3%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Aviation Station	15	55	0	17	5	17	**5.1%**	**18.5%**	**0.0%**	**14.2%**	**5.5%**	**18.5%**
Aviation Blvd/Imperial Hwy	0	0	0	0	0	1	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**
Aviation Blvd/111 St	0	0	0	0	0	0	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Aviation Blvd/104 St	0	1	0	0	0	0	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Century Blvd/Aviation Blvd	0	4	0	2	0	2	**0.0%**	**1.3%**	**0.0%**	**1.7%**	**0.0%**	**2.2%**
Century Blvd/International Rd	0	5	0	1	0	1	**0.0%**	**1.7%**	**0.0%**	**0.8%**	**0.0%**	**1.1%**
Airport Blvd/Century Blvd	0	10	0	0	0	0	**0.0%**	**3.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
96 St/Airport Blvd-Jenny Av mid-block	0	1	0	0	0	1	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**
LAX City Bus Center	0	16	0	11	0	11	**0.0%**	**5.4%**	**0.0%**	**9.2%**	**0.0%**	**12.0%**
	297	297	120	120	91	92	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

TRANSIT SERVICE OPERATION AGR4EEMENT
BETWEEN THE CITY OF REDONDO BEACH AND
THE CITY OF MANHATTAN BEACH

THIS TRANSIT SERVICE OPERATION AGREEMENT (this "Agreement") is entered into by and between the City of Redondo Beach/Beach Cities Transit ("Redondo Beach" or BCT"), and the City of Manhattan Beach ("Manhattan Beach").

RECITALS

A. **WHEREAS**, Redondo Beach and Manhattan Beach previously entered into that certain Transit Service Operation Agreement ("First Agreement") effective July 1, 2006 for a two (2) year term to enable Beach Cities Transit Line 109 to take over public transportation services for the discontinued LACMTA Line 439.

B. **WHEREAS**, Redondo Beach and Manhattan Beach entered into that certain Transit Service Operation Agreement ("Second Agreement") effective July 1, 2008 in order to decrease Manhattan Beach's annual funding amount, change BCT's contact information, and extend the First Agreement for another two (2) year term.

C. **WHEREAS**, Redondo Beach and Manhattan Beach entered into that certain Transit Service Operation Agreement ("Third Agreement") effective July 1, 2010 in order to add a requirement that BCT and Manhattan Beach meet to develop additional marketing strategies to increase Line 109 ridership, input data from Line 109 in the Federal Transit Administration's National Transit data annual report and to provide those statistics to Manhattan Beach, provide for quarterly meetings between BCT and the cities of Redondo Beach, Manhattan Beach and El Segundo, further decrease Manhattan Beach's annual funding amount and extend the Second Agreement for another one (1) year term.

D. **WHEREAS**, Redondo Beach and Manhattan Beach entered into that certain Transit Service Operation Agreement ("Fourth Agreement") effective July 1, 2011 in order to decrease Manhattan Beach's annual funding amount and extend the Third Agreement for another one (1) year term.

E. **WHEREAS**, the current "Fourth Agreement" expires as of June 30, 2012, and the parties desire to continue such agreement on the terms and conditions set forth below.

THEREFORE, IN CONSIDERATION OF THE MUTUAL PROMISES CONTAINED HEREIN, THE PARTIES AGREE AS FOLLOWS.

1. **TERM**

This Agreement shall be effective as of July 1, 2012, and shall have a one (1) year term expiring on June 30, 2013. Manhattan Beach acknowledges that an agreement in similar form to this Agreement will need to be negotiated for continued Line 109 service beyond June 30, 2013. In the event Manhattan Beach intends to discontinue

Line 109 service following the expiration of this Agreement, Manhattan Beach agrees that it shall notify BCT of its intent to discontinue such service on or before December 30, 2012.

2. SERVICE DESCRIPTION

A. BCT shall operate Line 109 consistent with the maps shown in **Attachment A**, which is attached hereto and by this reference incorporated herein (Line 109" or the "Service").

B. BCT shall operate Line 109 on the days of the week, spread of service, and frequencies of service equal to or better than that which was operated by BCT immediately prior to the effective date of this Agreement. The service schedules on Line 109 as illustrated in **Attachment B**, which is attached hereto and by this reference incorporated herein.

C. BCT may adjust the route and schedule of Line 109; however, any changes or reductions to the Service in excess of 10% shall be brought to the City of Manhattan Beach in writing for review and comment prior to implementation.

D. BCT reserves its rights, at its sole discretion, to enter into contracts for Line 109 service with any other provider of its choice at any time without City of Manhattan Beach approval. BCT shall be responsible for any and all aspects of administration of the service contract, and shall assure that the contract includes provisions pertaining to insurance, age, maintenance and operation of vehicles, driver qualifications and other similar provisions typical of an agreement of that kind.

3. PASSENGER FARES

BCT may charge fares for the Service consistent with their existing fixed-route service. BCT will accept interagency transfers with adjacent transit operators and participate in the EZ Pass Program. BCT shall retain all farebox revenues. BCT Line 109 passenger fare revenues shall be used to offset operation expenses.

4. FUNDING

A. For costs associated with the operation of Line 109, the City of Manhattan Beach shall pay the City of Redondo Beach in accordance with this Section 4. The City of Manhattan Beach shall not pay BCT for capital costs nor shall the City of Manhattan Beach provide equipment to operate the Service.

B. Funding from Manhattan Beach shall be $18,297 for fiscal year 2012-13. In no event shall Manhattan Beach's funding obligation pursuant to this Section 4 exceed the foregoing amount. In the event actual fiscal year 2012-13 Line 109 net operating costs are less than the estimated costs and/or actual 2012-13 net operating revenues are greater than the estimated revenues, all excess funds resulting from any such decreased costs or increased revenues, if any, shall be reconciled through the final 4th quarter invoice of the 20 12-13 fiscal year. Upon such reconciliation, BCT shall return to Manhattan Beach any excess amounts previously paid by Manhattan Beach pursuant to Section 5C.

C. BCT is responsible for all marketing and promotion of the service. Notwithstanding the foregoing, the City of Manhattan Beach may advertise at its sole expense, but any reference to Beach Cities Transit must be approved in writing by the City of Redondo Beach prior to such reference. Only the Beach Cities Transit logo may be used to advertise or market the service.

D. BCT will meet with Manhattan Beach to develop additional marketing strategies directed towards increasing BCT Line 109 ridership. Manhattan Beach shall provide assistance for public outreach and information to target Manhattan Beach residents and non-resident community members.

5. REPORTING/INVOICING

A. BCT shall report to the City of Manhattan Beach on a quarterly basis, all of the following data for the Line 109 Service:

- passengers carried
- revenue hours operated
- revenue miles operated
- total operating costs

B. BCT shall submit said report to the Manhattan Beach City Manager in writing within fifteen (15) days after the end of each report quarter.

C. BCT shall submit quarterly invoices and reporting requirement to the Manhattan Beach City Manager and City of Manhattan Beach shall pay to BCT on a quarterly basis 1/4th of the annual funds to be provided. City of Manhattan Beach shall pay BCT within thirty (30) days of receipt of each quarterly report from BCT. First payment shall be due on November 30, 2012, representing payment for July 1, 2012, through September 30, 2012.

D. BCT shall incorporate Line 109 data into its Federal Transit Administration National Transit Data annual report for the entire Beach Cities Transit fixed route transportation system. BCT shall provide to Manhattan Beach annual NTD random sampling data which provides the statistics to estimate the number of passengers boarding and alighting by stop in Manhattan Beach, and the total estimated Manhattan Beach passengers. BCT shall be responsible for any and all aspects of administration of the service contract, and shall include provisions pertaining to insurance.

E. City of Manhattan Beach retains the right to audit the BCT's records of Line 109 Service, and may periodically monitor the Service.

F. BCT shall schedule quarterly joint meetings with the partnering Cities of El Segundo, Hermosa Beach and Manhattan Beach. BCT will provide a quarterly update of Line 109 services, and discuss coordinated marketing and public outreach efforts and operating and financing issues that affect BCT services.

6. **INSPECTION OF RECORDS**

Beach Cities Transit records relevant to this Agreement shall be available for inspection by City of Manhattan Beach at all reasonable times for a period of at least three (3) years for each year or after the termination date, whichever comes first.

7. **NON-DISCRIMINATION**

No person shall on the grounds of race, color, religion, national origin, ancestry, age, sex, physical or mental disability, be excluded from participation in, or be subject to discrimination in the operation of the Line 109 Service.

8. COORDINATION

A. BCT shall coordinate their services, to the extent practical, so that passengers transferring between transit operators will have minimal waiting times. This coordination will require transit agencies to communicate with each other as many weeks as possible in advance of any planned schedule change to these services that may affect passenger transfers.

B. The Manhattan Beach Project Manager for this project shall be the City Manager or his/her designee. BCT coordinator for this project shall be the Recreation, Transit & Community Services Director or his/her designee.

9. **WAIVER OF BREACH**

The waiver of each party of any breach of any provision of this Agreement shall not operate or be construed as a waiver of any subsequent breach of that same or any other provision.

10. **NOTICES**

A. All notices, requests, demands, or other communications under this Agreement will be in writing. Notice will be sufficiently given for all purposes as follows:

(1) Personal delivery. When personally delivered to the recipient: notice is effective on delivery.

(2) First Class mail. When mailed first class to the last address of the recipient known to the party giving notice: notice is effective three mail delivery days after deposit in an United States Postal Service office or mailbox.

(3) Certified mail. When mailed certified mail, return receipt requested: notice is effective on receipt, if delivery is confirmed by a return receipt.

(4) Overnight delivery. When delivered by an overnight delivery service, charges prepaid or charged to the sender's account: notice is effective on delivery, if delivery is confirmed by the delivery service.

(5) Facsimile transmission. When sent by fax to the last fax number of the recipient known to the party giving notice: notice is effective on receipt. Any notice given by fax will be deemed received on the next business day if it is received after 5:00 p.m. (recipient's time) or on a non-business day.

Addresses for purpose of giving notice are as follows:

Beach Cities Transit:

City of Redondo Beach
Recreation, Transit & Community Services Director
Attention: Line 109
415 Diamond St.
Redondo Beach, CA 90277-2836

Fax Number: 310-937-6621
With a copy to:

City Clerk
City of Redondo Beach
415 Diamond Street
Redondo Beach, CA 90277-2836

Fax Number: 310- 374-0220

City of Manhattan Beach:

City of Manhattan Beach
City Manager
Attention: Line 109
1400 Highland Avenue
Manhattan Beach, CA 90266-4795

Fax Number: 310-802-5051
With a copy to:

City Clerk
City of Manhattan Beach
1400 Highland Avenue
Manhattan Beach, CA 90266-4795

Fax Number: 310-802-5051

B. Either party may change its address or fax number by giving the other party notice of the change in any manner permitted by this Agreement.

11. SEVERABILITY

Should any part, term or provision of this Agreement or any document required herein to be executed be declared invalid, void or unenforceable, all remaining parts, terms and provisions hereof shall remain in full force and effect and shall in no way be invalidated, impaired or affected thereby.

12. INTEGRATION; AMENDMENT

This Agreement represents the entire understanding of the City of Manhattan Beach and Beach Cities Transit as to those matters contained in it. No prior oral or written understanding will be of any force or effect with respect to the terms of this Agreement. The Agreement may not be modified or altered except in writing signed by both parties.

13. INTERPRETATION

The terms of this Agreement should be construed in accordance with the meaning of the language used and should not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction that might otherwise apply.

14. GOVERNING LAW; JURISDICTION

This Agreement will be administered and interpreted under the laws of the State of California. Jurisdiction of any litigation arising from the Agreement will be in Los Angeles County, California.

15. COMPLIANCE WITH STATUTES AND REGULATIONS

Beach Cities Transit will be knowledgeable of and will comply with all applicable federal, state, county and city statutes, rules, regulations, ordinances and orders.

16. NON-LIABILITY OF CITIES

No officer or employee of either City will be personally liable to the other, in the event of any default or breach thereunder.

17. INDEMNIFICATION

Redondo Beach hereby agrees to defend, protect, indemnify and hold harmless Manhattan Beach, its officers, employees, elected officials and members of boards and commissions from and against any and all loss, damages, costs, expenses, liabilities, claims, demands, causes of action, proceedings, and judgments, including reasonable attorney's fees, expert fees and costs of suit arising directly or indirectly from or in any manner related to or in connection with or caused by the performance or failure of Redondo Beach, its agents, servants or employees to perform the services required of Redondo Beach employees under the terms of this Agreement.

Manhattan Beach hereby agrees to defend, protect, indemnify' and hold harmless Redondo Beach, its officers, employees, elected officials and members of boards and commissions from and against any and all loss, damages, costs, expenses, liabilities, claims, demands, causes of action, proceedings, and judgments, including reasonable attorney's fees, expert fees and costs of suit arising directly or indirectly from or in any manner related to or in connection with or caused by the performance or failure of Manhattan Beach, its agents, servants or employees to perform the services required of Manhattan Beach employees under the terms of this Agreement.

18. **AUTHORITY**

Redondo Beach and Manhattan Beach each warrant and represent that upon the approval of this Agreement by their respective City Councils, the undersigned City official is duly authorized to execute this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement in Redondo Beach, California, as of this _____day of June 2012.

CITY OF REDONDO BEACH/
BEACH CITIES TRANSIT

By:_____
Mike Gin
Mayor

APPROVED AS TO FORM:

_____
Mike Webb, City Attorney

ATTEST:

_____
Eleanor Manzano, City Clerk

CITY OF MANHATTAN BEACH/

By:_____
David N. Carmany
City Manager

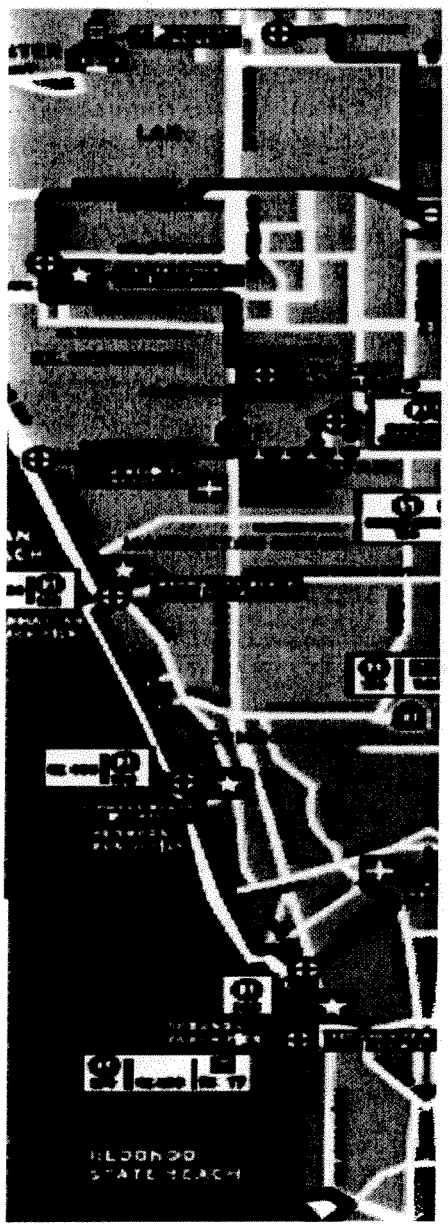
APPROVED AS TO FORM:

Quinn M. Barrow, City Attorney

ATTEST:

_____
Liza Tamura, City Clerk

Attachment A: Line 109 Map



Proposed Route Changes
BCT Line 109 route will remain the same except for the following planned changes:

Eastbound Rosecrans Avenue/Sepulveda Blvd.:
Route will turn southbound from Rosecrans Avenue at Village Drive to Parkview Avenue, returning northbound on Park Way to Nash St,

Greenline Douglas Station:
Route will provide service in both the northbound and southbound routes.

Revenue Service Mile Calculations

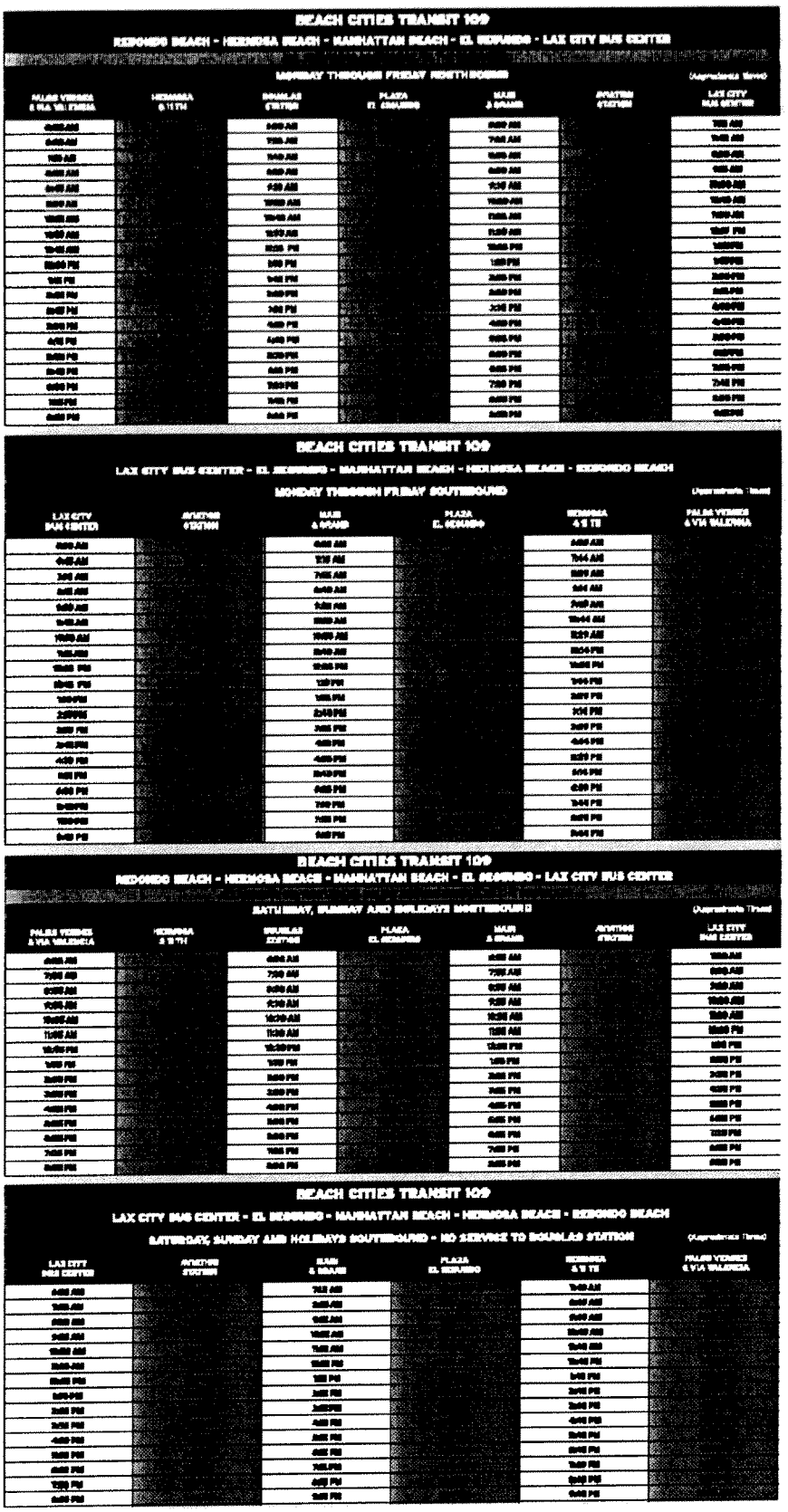
Revised Route Miles	NB Miles	%	SB Miles	%
Redondo Beach	2.4	12.90%	3.1	19.02%
Los Angeles	2.9	15.59%	2.8	17.18%
Hermosa Beach	2.2	11.83%	1.6	9.82%
Manhattan Beach	3.4	18.28%	3.2	19.63%
El Segundo	7.7	41.40%	5.6	34.36%
Total Miles	18.6	100.00%	16.3	100.00%

Revised Route Miles	NB Miles	%	SB Miles	%
Redondo Beach & Los Angeles	5.3	28.49%	6.9	42.33%
Hermosa Beach	2.2	11.83%	1.6	9.82%
Manhattan Beach	3.4	18.28%	2.2	13.49%
El Segundo	7.7	41.40%	5.6	34.36%
Total Miles	18.6	100.00%	16.3	100.00%

Revised Revenue Service Miles effective July 2010 (based on service changes effective June 28, 2009)

	Average Miles Per City	*%*
Redondo Beach & Los Angeles	***6.1***	***34.95%***
Hermosa Beach	***1.90***	***10.89%***
Manhattan Beach	***2.8***	***16.05%***
El Segundo	***6.65***	***38.11%***
Total Miles	***17.45***	***100.00%***

Attachment B: BCT Line 109 Time Schedule



BEACH CITIES TRANSIT 109

REDONDO BEACH - HERMOSA BEACH - MANHATTAN BEACH - EL SEGUNDO - LAX CITY BUS CENTER

MONDAY THROUGH FRIDAY NORTHBOUND

PALOS VERDES & VIA VALENCIA	HERMOSA & 11TH	DOUGLAS STATION	PLAZA EL SEGUNDO	MAIN & ROSECRANS	AVIATION STATION	LAX CITY BUS CENTER
4:55 AM		5:00 AM		5:07 AM		5:22 AM
5:55 AM		6:00 AM		6:07 AM		6:22 AM
6:55 AM		7:00 AM		7:07 AM		7:22 AM
7:55 AM		8:00 AM		8:07 AM		8:22 AM
8:55 AM		9:00 AM		9:07 AM		9:22 AM
9:55 AM		10:00 AM		10:07 AM		10:22 AM
10:55 AM		11:00 AM		11:07 AM		11:22 AM
11:55 AM		12:00 PM		12:07 PM		12:22 PM
12:55 PM		1:00 PM		1:07 PM		1:22 PM
1:55 PM		2:00 PM		2:07 PM		2:22 PM
2:55 PM		3:00 PM		3:07 PM		3:22 PM
3:55 PM		4:00 PM		4:07 PM		4:22 PM
4:55 PM		5:00 PM		5:07 PM		5:22 PM
5:55 PM		6:00 PM		6:07 PM		6:22 PM
6:55 PM		7:00 PM		7:07 PM		7:22 PM
7:55 PM		8:00 PM		8:07 PM		8:22 PM
8:55 PM		9:00 PM		9:07 PM		9:22 PM

BEACH CITIES TRANSIT 109

LAX CITY BUS CENTER - EL SEGUNDO - MANHATTAN BEACH - HERMOSA BEACH - REDONDO BEACH

MONDAY THROUGH FRIDAY SOUTHBOUND

LAX CITY BUS CENTER	AVIATION #1/2/3RD	MAIN & ROSECRANS	PLAZA EL SEGUNDO	HERMOSA & 11 TH	PALOS VERDES & VIA VALENCIA
5:00 AM		5:05 AM		5:22 AM	
6:00 AM		6:05 AM		6:22 AM	
7:00 AM		7:05 AM		7:22 AM	
8:00 AM		8:05 AM		8:22 AM	
9:00 AM		9:05 AM		9:22 AM	
10:00 AM		10:05 AM		10:22 AM	
11:00 AM		11:05 AM		11:22 AM	
12:00 PM		12:05 PM		12:22 PM	
1:00 PM		1:05 PM		1:22 PM	
2:00 PM		2:05 PM		2:22 PM	
3:00 PM		3:05 PM		3:22 PM	
4:00 PM		4:05 PM		4:22 PM	
5:00 PM		5:05 PM		5:22 PM	
6:00 PM		6:05 PM		6:22 PM	
7:00 PM		7:05 PM		7:22 PM	
8:00 PM		8:05 PM		8:22 PM	

BEACH CITIES TRANSIT 109

REDONDO BEACH - HERMOSA BEACH - MANHATTAN BEACH - EL SEGUNDO - LAX CITY BUS CENTER

SATURDAY, SUNDAY AND HOLIDAYS NORTHBOUND

PALOS VERDES & VIA VALENCIA	HERMOSA & 11TH	DOUGLAS STATION	PLAZA EL SEGUNDO	MAIN & ROSECRANS	AVIATION STATION	LAX CITY BUS CENTER
6:55 AM		7:00 AM		7:07 AM		7:22 AM
7:55 AM		8:00 AM		8:07 AM		8:22 AM
8:55 AM		9:00 AM		9:07 AM		9:22 AM
9:55 AM		10:00 AM		10:07 AM		10:22 AM
10:55 AM		11:00 AM		11:07 AM		11:22 AM
11:55 AM		12:00 PM		12:07 PM		12:22 PM
12:55 PM		1:00 PM		1:07 PM		1:22 PM
1:55 PM		2:00 PM		2:07 PM		2:22 PM
2:55 PM		3:00 PM		3:07 PM		3:22 PM
3:55 PM		4:00 PM		4:07 PM		4:22 PM
4:55 PM		5:00 PM		5:07 PM		5:22 PM
5:55 PM		6:00 PM		6:07 PM		6:22 PM
6:55 PM		7:00 PM		7:07 PM		7:22 PM
7:55 PM		8:00 PM		8:07 PM		8:22 PM

BEACH CITIES TRANSIT 109

LAX CITY BUS CENTER - EL SEGUNDO - MANHATTAN BEACH - HERMOSA BEACH - REDONDO BEACH

SATURDAY, SUNDAY AND HOLIDAYS SOUTHBOUND - NO SERVICE TO DOUGLAS STATION

LAX CITY BUS CENTER	AVIATION STATION	MAIN & ROSECRANS	PLAZA EL SEGUNDO	HERMOSA & 11 TH	PALOS VERDES & VIA VALENCIA
6:00 AM		7:05 AM		7:22 AM	
7:00 AM		8:05 AM		8:22 AM	
8:00 AM		9:05 AM		9:22 AM	
9:00 AM		10:05 AM		10:22 AM	
10:00 AM		11:05 AM		11:22 AM	
11:00 AM		12:05 PM		12:22 PM	
12:00 PM		1:05 PM		1:22 PM	
1:00 PM		2:05 PM		2:22 PM	
2:00 PM		3:05 PM		3:22 PM	
3:00 PM		4:05 PM		4:22 PM	
4:00 PM		5:05 PM		5:22 PM	
5:00 PM		6:05 PM		6:22 PM	
6:00 PM		7:05 PM		7:22 PM	
7:00 PM		8:05 PM		8:22 PM	
8:00 PM		9:05 PM		9:22 PM	

Proposed Time Schedule –Draft Weekday

109 Schedule WEEKDAY

PV & VV	Hermosa & 10 St	Highland & 14th	Douglas	Main & Holly	Aviation Station	Arr LAX Bus Ctr	Dep LAX Bus Ctr	Aviation Station	Main & Holly	Park Place	Highland & 14th	Hermosa & 10 St	PV & VV
							5:55	6:07	6:21	6:39	6:51	7:00	7:10
							6:40	6:52	7:06	7:24	7:36	7:45	7:55
6:00	6:17	6:28	6:47	6:58	7:08	7:18	7:25	7:37	7:51	8:09	8:21	8:30	8:40
6:30	6:47	6:58	7:17	7:28	7:38	7:48	8:10	8:22	8:36	8:54	9:06	9:15	9:25
7:20	7:37	7:48	8:07	8:18	8:28	8:38	8:55	9:07	9:21	9:39	9:51	10:00	10:10
8:05	8:22	8:33	8:52	9:07	9:17	9:27	9:40	9:52	10:06	10:24	10:36	10:45	10:55
8:50	9:07	9:18	9:37	9:52	10:02	10:12	10:25	10:37	10:51	11:09	11:21	11:30	11:40
9:35	9:52	10:03	10:22	10:37	10:47	10:57	11:10	11:22	11:36	11:54	12:06	12:15	12:25
10:20	10:37	10:48	11:07	11:22	11:32	11:42	12:15	12:27	12:41	12:59	13:11	13:20	13:30
11:05	11:22	11:33	11:52	12:07	12:17	12:27	13:00	13:12	13:26	13:44	13:56	14:05	14:15
11:50	12:07	12:18	12:37	12:52	13:02	13:12	13:45	13:57	14:11	14:29	14:41	14:50	15:00
12:35	12:52	13:03	13:22	13:37	13:47	13:57	14:30	14:42	14:56	15:14	15:26	15:35	15:45
13:40	13:57	14:08	14:27	14:42	14:52	15:02	15:15	15:27	15:41	15:59	16:11	16:20	16:30
14:25	14:42	14:53	15:12	15:27	15:37	15:47	16:00	16:12	16:26	16:44	16:56	17:05	17:15
15:10	15:27	15:38	15:57	16:12	16:22	16:32	16:45	16:57	17:11	17:29	17:41	17:50	18:00
15:55	16:12	16:23	16:42	16:57	17:07	17:17	17:30	17:42	17:56	18:14	18:26	18:35	18:45
16:40	16:57	17:08	17:27	17:42	17:52	18:02	18:15	18:27	18:41	18:59	19:11	19:20	19:30
17:25	17:42	17:53	18:12	18:27	18:37	18:47	19:00	19:12	19:26	19:44	19:56	20:05	20:15
18:10	18:27	18:38	18:57	19:12	19:22	19:32	19:45	19:57	20:11	20:29	20:41	20:50	21:00
18:55	19:12	19:23	19:42	19:57	20:07	20:17							
19:40	19:57	20:08	20:27	20:42	20:52	21:02	21:20	21:32	21:46	22:04	22:16	22:25	22:35
20:25	20:42	20:53	21:12	21:27	21:37	21:47							

109 Schedule - SATURDAY AND SUNDAY

PV & VV	Hermosa & 10 St	Highland & 14th	Douglas	Main & Holly	Aviation Station	Arr LAX Bus Ctr	Dep LAX Bus Ctr	Aviation Station	Main & Holly	Park Place	Highland & 14th	Hermosa & 10 St	PV & VV
							6:45	6:57	7:11	7:29	7:41	7:50	8:00
6:05	6:22	6:33	6:52	7:07	7:17	7:27	7:45	7:57	8:11	8:29	8:41	8:50	9:00
7:05	7:22	7:33	7:52	8:07	8:17	8:27	8:45	8:57	9:11	9:29	9:41	9:50	10:00
8:10	8:27	8:38	8:57	9:12	9:22	9:32	9:45	9:57	10:11	10:29	10:41	10:50	11:00
9:10	9:27	9:38	9:57	10:12	10:22	10:32	10:45	10:57	11:11	11:29	11:41	11:50	12:00
10:10	10:27	10:38	10:57	11:12	11:22	11:32	11:45	11:57	12:11	12:29	12:41	12:50	13:00
11:10	11:27	11:38	11:57	12:12	12:22	12:32	13:05	13:17	13:31	13:49	14:01	14:10	14:20
12:10	12:27	12:38	12:57	13:12	13:22	13:32	14:05	14:17	14:31	14:49	15:01	15:10	15:20
13:10	13:27	13:38	13:57	14:12	14:22	14:32	15:05	15:17	15:31	15:49	16:01	16:10	16:20
14:30	14:47	14:58	15:17	15:32	15:42	15:52	16:05	16:17	16:31	16:49	17:01	17:10	17:20
15:30	15:47	15:58	16:17	16:32	16:42	16:52	17:05	17:17	17:31	17:49	18:01	18:10	18:20
16:30	16:47	16:58	17:17	17:32	17:42	17:52	18:05	18:17	18:31	18:49	19:01	19:10	19:20
17:30	17:47	17:58	18:17	18:32	18:42	18:52	19:05	19:17	19:31	19:49	20:01	20:10	20:20
18:30	18:47	18:58	19:17	19:32	19:42	19:52	20:05	20:17	20:31	20:49	21:01	21:10	21:20
19:30	19:47	19:58	20:17	20:32	20:42	20:52	21:05	21:17	21:31	21:49	22:01	22:10	22:20
20:30	20:47	20:58	21:17	21:32	21:42	21:52							

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EXHIBIT D

Special Counsel Christi Hogin clarified that the only action at issue is that Council is being asked to receive and file minutes of meetings which you do not attend and approving minutes of the City Council as accurate. She added that there is no rule stating that these items need to be addressed separately.

MOTION: Councilmember Howorth moved to approve the subject minutes (a – m) but abstaining on (b). The motion was seconded by Mayor Pro Tem Tell and passed by the following unanimous roll call vote:

Ayes:	Powell, Lesser, Howorth, Tell and Mayor Montgomery.
Noes:	None.
Abstain:	Howorth (2b).
Absent:	None.

06/21/11-4. Consideration of an Amendment to the City's Financial Policies Regarding Classification of Fund Balances for Governmental Funds in Order to Comply with the Governmental Accounting Standards Board Statement (GASB 54)

Councilmember Lesser pulled this item to inquire about what the City's reserve does.

Finance Director Moe responded to Council's questions.

There was no public comment on this item.

MOTION: Councilmember Powell moved to adopt Resolution No. 6317 amending the City's Financial Policies adding a section regarding classification of fund balances for Governmental Funds to comply with GASB 54. The motion was seconded by Councilmember Howorth and passed by the following unanimous roll call vote:

Ayes:	Powell, Lesser, Howorth, Tell and Mayor Montgomery.
Noes:	None.
Abstain:	None.
Absent:	None.

06/21/11-6. Consideration of a Cost Sharing Agreement in the Amount of $25,266 with City of Redondo Beach to Continue Funding Beach Cities Transit Line 109 for Fiscal Year 2011-2012

Council had a discussion about the preliminary information provided by Beach Cities Transit as presented in the staff report.

Community Development Director Richard Thompson, Finance Director Bruce Moe and **Redondo Beach Transit Manager Joyce Rooney** responded to Council questions.

The following individual spoke on this item:

- **Jacque May, No Address Provided**

MOTION: Councilmember Howorth moved to approve the renewal of a one-year cost sharing agreement in the amount of $25,266 for Beach Cities Transit Line 109 for Fiscal Year 2011-2012 with the cities of Hermosa Beach, El Segundo, and Redondo Beach, contingent upon all cities participating. The motion was seconded by Councilmember Lesser and passed by the following unanimous roll call vote:

Ayes: Powell, Lesser, Howorth, Tell and Mayor Montgomery.
Noes: None.
Abstain: None.
Absent: None.

06/21/11-8. Consideration of a Resolution for Acceptance of a Grant from the California Department of Alcoholic Beverage Control for Increased Education and Enforcement Activities Regarding Alcoholic Beverage Control Laws in the Amount of $50,000 and Appropriate Said Amount from the Unreserved General Fund Balance, Which Will be Reimbursed by the Grant

A member of the audience pulled this item from the Consent Calendar for Council discussion.

The following individual spoke on this item:

- **Ed Caprielian, No Address Provided**

The Council thanked Police Chief Eve Irvine and the Manhattan Beach Police Department for the good work that they do.

MOTION: Councilmember Powell moved to approve accepting a reimbursable grant from the State Department of Alcohol Beverage Control; adopt Resolution No. 6316 approving the Chief of Police to execute a standard grant agreement with the State; and appropriate $50,000 from the unreserved General Fund balance which will be reimbursed by the grant. The motion was seconded by Councilmember Lesser and passed by the following unanimous roll call vote:

Ayes: Powell, Lesser, Howorth, Tell and Mayor Montgomery.
Noes: None.
Abstain: None.
Absent: None.

06/21/11-12. Consideration to Authorize the City Manager to Award a Contract to C.T. Georgiou Painting Co. for the Facilities Maintenance Painting 2011 Project for an Amount Not-to-Exceed $45,500

Councilmember Lesser questioned whether the flashing in the east side of the Police/Fire building will be included in this project.

Public Works Director Jim Arndt responded that the painting contract includes the railing and elevator construction but the Police/Fire building is not included in the current painting contract.

There was no public comment on this item.

MOTION: Councilmember Lesser moved to approve authorizing the City Manager to award a contract in the amount of $45,500.00 to C.T. Georgiou Painting Co. for the Facilities Maintenance Painting 2011 Project and approve authorizing the City Manager to approve additional work in an amount not-to-exceed $4,550.00 (10%), if required. The motion was seconded by Mayor Pro Tem Tell and passed by the following unanimous roll call vote:

Exhibit E: Beach Cities Transit Network