West Valley Connector
Transit Priority Evaluation
Draft Report

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1.0 INTRODUCTION

Omnitrans is proposing to implement a premium quality transit service in the West Valley Connector extending from Pomona to Fontana modeled after elements of the sbX service in San Bernardino. A key component of such service is improved travel time, which can be achieved with fewer stops, dedicated bus lanes and transit signal priority. This chapter presents a Transit Priority Evaluation (TPE) with the intention of demonstrating that implementing a Transit Signal Priority (TSP) system for the proposed West Valley Connector corridor will help expedite and improve operations of the current public transportation system.

Signal priority modifies the normal signal operation process to better accommodate transit vehicles, while pre-emption (typically reserved for emergency vehicles and heavy rail) interrupts the normal process for special events. Section 4A.02 of the CA Manual on Uniform Traffic Control Devices (MUTCD) defines pre-emption and priority as follows:

- Pre-emption Control – the transfer of normal operation of a traffic control signal to a special control mode of operation.
- Priority Control – a means by which the assignment of right-of-way is obtained or modified.

Furthermore, section 4D.13 of CA MUTCD reads:

“Traffic control signals may be designed and operated to respond to certain classes of approaching vehicles by altering the normal signal timing and phasing plan(s) during the approach and passage of those vehicles. The alternative plan(s) may be as simple as extending a current display green interval or as complex as replacing the entire set of signal phases and timing.”

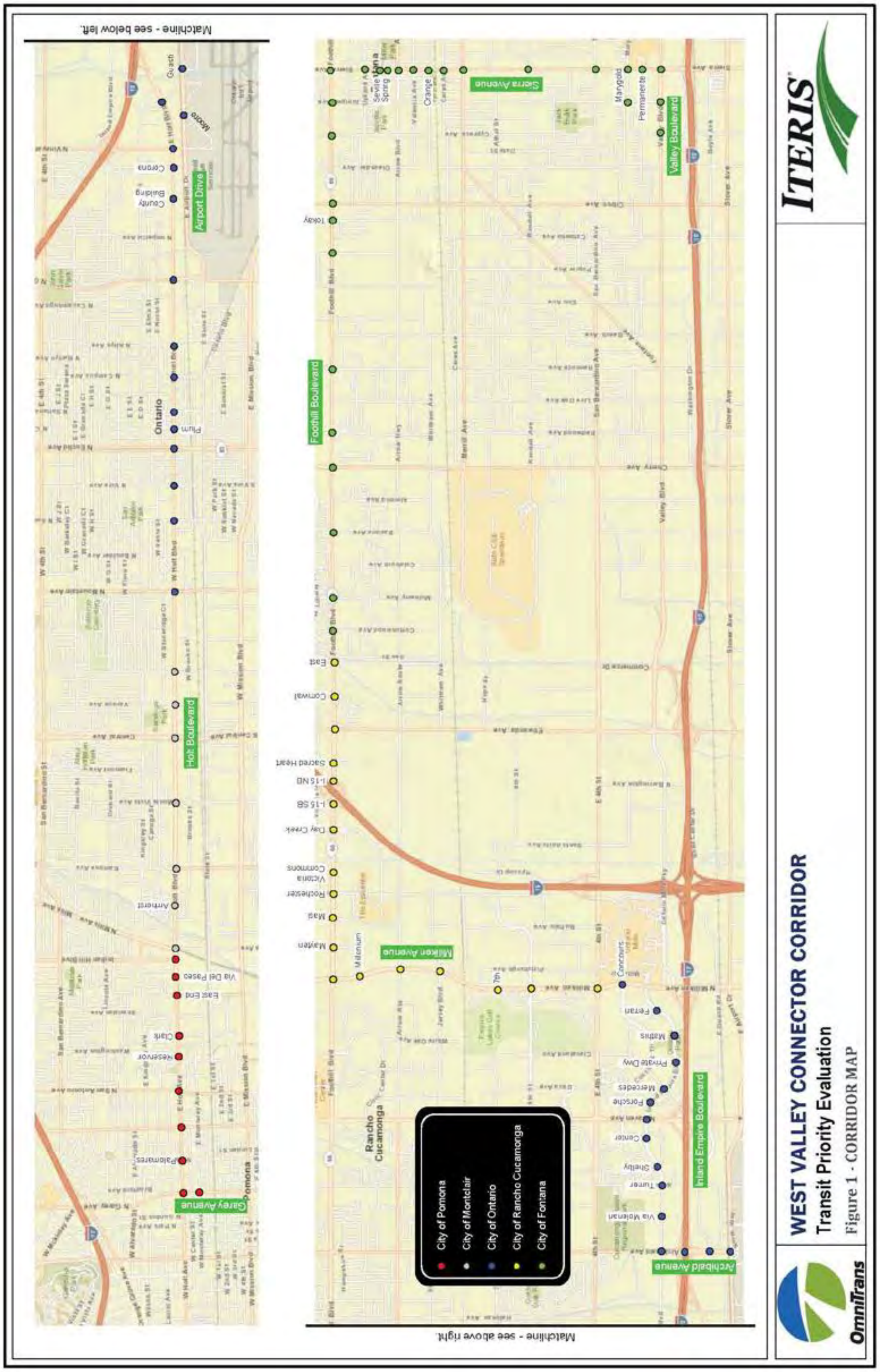
The TSP system suggested for the West Valley Connector would be based on the technologies, hardware, and software that have been deployed along the Omnitrans sBX Green Line route. This TPE documents the proposed transit priority systems that would be implemented throughout the corridor in the cities of Pomona in Los Angeles County; Montclair (though not expected to participate in the TSP component of the project), Ontario, Rancho Cucamonga, and Fontana in San Bernardino County. While this document is only an evaluation, recommendations will also be provided based on proven methods to ensure a smooth running transit operation. A much more in-depth analysis and a preliminary design report would be necessary in order to provide accurate design plans and estimates for the deployment of the TSP system; these will be accomplished during the next phase of project development.

2.0 EXISTING CONDITIONS

The implementation of a bus signal priority system at the signalized intersections along the West Valley Connector corridor will be discussed in detail throughout this report. A site visit of the corridor was conducted to document traffic signal characteristics and any conditions which would inhibit the implementation a bus priority system. A description of the corridor in each jurisdiction is provided along with field data collected to demonstrate an understanding of what currently exists and what may need to be modified.

The West Valley Connector Corridor map is illustrated in **Figure 1**. The map presents a layout of the entire corridor showing the transit path as well as the signalized intersections to be discussed as part of this evaluation. Each agency is color coordinated, where red dots represent the City of Pomona, grey dots represent the City of Montclair, blue for the City of Ontario, yellow for the City of Rancho Cucamonga, and green for the City of Fontana. This figure will serve as the guide for the complete corridor layout.

FIGURE 1: CORRIDOR MAP



2.1 PROJECT CORRIDOR DESCRIPTION

This section describes the West Valley Connector corridor as it passes through each of the six jurisdictions. The jurisdictions include Pomona, Montclair, Ontario, Rancho Cucamonga, County of San Bernardino, and Fontana.

Starting with the west terminus of the route, the proposed route would begin at the Pomona Transit Center at the intersection of Main Street/Commercial Street in the City of Pomona. The route would continue north on Main Street for a short distance and then turn east onto Monterey Avenue. The route would then run along Monterey Avenue for two blocks, at which time it would then run north on Garey Avenue for another two blocks bringing it to the Garey Avenue/Holt Boulevard intersection. Along Holt Boulevard it would then head eastbound approximately eight miles on Holt Boulevard, of which approximately two miles are within the City of Pomona.

The proposed West Valley Connector route would continue east along Holt Boulevard for approximately two miles within the City of Montclair. The City is currently not planning to implement a TSP system in that portion of the corridor. While Montclair would not be a part of the TSP system, the existing traffic signal and street light infrastructure which runs throughout the city could be utilized to create a continuous communications path.

Within the City of Ontario, the route would continue east along Holt Boulevard for approximately four and a half miles. The route would transition south along Vineyard Avenue for a short distance to the Airport Drive intersection. The route would then run along a one mile segment of Airport Drive between Vineyard Avenue and Archibald Avenue, serving Ontario International Airport patrons. The route would continue along Archibald Avenue from Airport Drive to Inland Empire Boulevard, a distance of approximately half a mile. Archibald Avenue is classified as a principal arterial and provides direct access to I-10 via a single-point urban interchange. From Archibald Avenue, the route would continue east along Inland Empire Boulevard to Milliken Avenue, a distance of approximately 3.75 miles. The route would continue east of Milliken Avenue serving Ontario Mills patrons along Mills Circle northbound, then west along Concours Street back to Milliken Avenue. The route would continue along Milliken Avenue for a short distance to the City boundary at 4th Street.

Within the City of Rancho Cucamonga, the route would continue north along Milliken Avenue for approximately two miles, to the Foothill Boulevard intersection. Along Foothill Boulevard, the proposed route would run approximately 2.4 miles between Milliken Avenue on the west and the City boundary on the east at East Avenue. Foothill Boulevard provides direct access to I-15 via a partial cloverleaf interchange.

The route would continue east along Foothill Boulevard through the City of Fontana for approximately four and a half miles to Sierra Avenue. A short segment of Foothill Boulevard, between Hemlock Avenue and Almeria Avenue is part of unincorporated San Bernardino County, though no traffic signals in this stretch are operated by the County. The proposed route would turn south on Sierra Avenue for approximately 2.25 miles, serving downtown Fontana and the Transportation Center (Metrolink Station), to Marygold Avenue. The route would traverse Marygold Avenue westbound to Juniper Avenue southbound to Valley Boulevard eastbound and back north on Sierra Avenue where it would terminate at the Kaiser Permanente Medical Facility.

2.2 EXISTING INFRASTRUCTURE

A TSP system consists of three main components: transit vehicle detection on the bus, bus-to-intersection communication, and a traffic signal control system. These components will be discussed in further detail in **Section 3**. The following sub-sections describe the existing traffic signal controller characteristics and the communication infrastructure, which are two of the three main components of a TSP system, in each jurisdiction.

2.2.1 CITY OF POMONA

There are 10 signalized intersections in the City of Pomona along Monterey Avenue, Garey Avenue, and Holt Boulevard within the study corridor. The City of Pomona utilizes a combination of infrastructure for communication; namely, twisted pair and fiber optic. Existing communication between the study intersections in the City of Pomona is continuous and all signals are currently online. The quality of that communication is unknown as of now and should be investigated further during the design phase. **Table 1** summarizes the traffic signal hardware and communication characteristics of the intersections within the City of Pomona.

TABLE 1: POMONA INTERSECTIONS

Main Corridor	Cross Street	Controller Type	Cabinet Type	Communications Infrastructure
Monterey Ave	Garey Ave	170	332	Twisted Pair/Fiber Optic
Garey Ave	Holt Blvd	170E	332	Twisted Pair/Fiber Optic
Holt Blvd	Palomares St	170E	332	Twisted Pair
Holt Blvd	Towne Ave	170E	332	Twisted Pair
Holt Blvd	San Antonio Ave	170E	332	Twisted Pair/Fiber Optic
Holt Blvd	Reservoir St	170E	336	Twisted Pair
Holt Blvd	Clark Ave	170E	332	Twisted Pair
Holt Blvd	East End Ave	170E	332	Twisted Pair
Holt Blvd	Via Del Paseo	170E	332	Twisted Pair
Holt Blvd	Indian Hill Blvd	170E	332	Twisted Pair

2.2.2 CITY OF MONTCLAIR

There are seven signalized intersections in the City of Montclair along Holt Boulevard. Signal priority for the West Valley Corridor Connector is not being considered in the City of Montclair (at the city's request), however the existing street lights and traffic signals may be utilized to run a wireless network to connect the City of Pomona on the west to the City of Ontario on the east, along Holt Boulevard. The existing infrastructure could potentially be utilized, but as of now, detailed information is unknown. A wireless communication system will most likely be the easiest path to take as operations would not be interrupted, thus truly bypassing the City of Montclair altogether.

2.2.3 City of Ontario

There are 31 signalized intersections in the City of Ontario (two are owned and operated by Caltrans) along Holt Boulevard, Airport Drive, Archibald Avenue, Inland Empire Boulevard, and Milliken Avenue within the study route. Communications infrastructure in the City of Ontario consists of a mixture of leased copper line, wireless, fiber optic, and twisted pair.

Table 2 summarizes the traffic signal hardware and communication characteristics of the intersections within the City of Ontario.

Table 2: Ontario Intersections

Main Corridor	Cross Street	Controller Type	Cabinet Type	Communications Infrastructure
Holt Blvd	Mountain Ave	ASC/2	NEMA P	Leased Copper Line
Holt Blvd	San Antonio Ave	ASC/2	NEMA P	Wireless Radio
Holt Blvd	Vine Ave	ASC/2	NEMA P	Wireless Radio
Holt Blvd	Euclid Ave	N/A	332	Unknown
Holt Blvd	Plum Ave	ASC/2	NEMA P	Fiber Optic
Holt Blvd	Sultana Ave	ASC/2	NEMA P	Fiber Optic
Holt Blvd	Campus Ave	ASC/2	NEMA P	Wireless Radio
Holt Blvd	Bon View Ave	ASC/2	NEMA P	Wireless Radio
Holt Blvd	Grove Ave	ASC/2	NEMA P	Leased Copper Line
Holt Blvd	County Building	ASC/2	NEMA P	Twisted Pair
Holt Blvd	Corona Ave	ASC/2	NEMA P	Twisted Pair
Holt Blvd	Vineyard Ave	ASC/2	NEMA P	Twisted Pair
Holt Blvd	Guasti Rd	ASC/2	NEMA P	Twisted Pair
Guasti Rd	Archibald Ave	ASC/2	NEMA P	Twisted Pair
Archibald Ave	Airport Dr	ASC/2	NEMA P	Twisted Pair
Airport Dr	Moore Wy	ASC/2	NEMA P	Twisted Pair
Airport Dr	Terminal Wy	ASC	NEMA P	Twisted Pair
Airport Dr	I-10 Ramps	N/A	N/A	Unknown
Archibald Ave	Inland Empire	ASC/2	332	Fiber Optic
Inland Empire Blvd	Via Molenari	ASC/3	332	Fiber Optic
Inland Empire Blvd	Turner	ASC/2	NEMA P	Fiber Optic
Inland Empire Blvd	Shelby St	ASC/3	NEMA P	Twisted Pair
Inland Empire Blvd	Center Ave	ASC/3	NEMA P	Twisted Pair
Inland Empire Blvd	Haven Ave	ASC/2	NEMA P	Twisted Pair
Inland Empire Blvd	Porsche Wy	ASC/2	NEMA P	Twisted Pair
Inland Empire Blvd	Mercedes Ln	ASC/2	NEMA P	Twisted Pair
Inland Empire Blvd	Private Dwy	ASC/2	NEMA P	Twisted Pair
Inland Empire Blvd	Mathis/Car Max	ASC/2	NEMA P	Twisted Pair
Inland Empire Blvd	Ferrari Ln	ASC/2	NEMA P	Twisted Pair
Inland Empire Blvd	Miliken Ave	ASC/2	NEMA P	Twisted Pair
Miliken Ave	Concours St	ASC/2	NEMA P	Twisted Pair

2.2.4 City of Rancho Cucamonga

There are 18 signalized intersections along the study route within the City of Rancho Cucamonga (two are owned and operated by Caltrans) along Milliken Avenue and Foothill Boulevard. Communications infrastructure found in Rancho Cucamonga is composed of mainly twisted pair. There are currently no foreseeable issues, however, the reliability and quality of the communication lines will need to be determined during the design phase of the project. **Table 3** summarizes the traffic signal hardware and communication characteristics of the intersections with the City of Rancho Cucamonga.

Table 3: Rancho Cucamonga Intersections

Main Corridor	Cross Street	Controller Type	Cabinet Type	Communications Infrastructure
Milliken Ave	4th St	ASC/2	NEMA P	Twisted Pair
Milliken Ave	6th St	ASC/2	NEMA P	Twisted Pair
Milliken Ave	7th St	ASC/2	NEMA P	Twisted Pair
Milliken Ave	Jersey Blvd	ASC/2	NEMA P	Twisted Pair
Milliken Ave	Arrow Rte	ASC/2	NEMA P	Twisted Pair
Milliken Ave	Millenium Ct	ASC/2	NEMA P	Twisted Pair
Milliken Ave	Foothill Blvd	ASC/3	NEMA P	Twisted Pair
Foothill Blvd	Mayten Ave	ASC/3	NEMA P	Twisted Pair
Foothill Blvd	Masi Dr	ASC/3	NEMA P	Twisted Pair
Foothill Blvd	Rochester Ave	ASC/3	NEMA P	Twisted Pair
Foothill Blvd	Victoria Cmns.	ASC/3	NEMA P	Twisted Pair
Foothill Blvd	Day Creek Blvd	ASC/2	NEMA P	Twisted Pair
Foothill Blvd	I-15 SB Ramps	N/A	332	Unknown
Foothill Blvd	I-15 NB Ramps	N/A	332	Unknown
Foothill Blvd	Sacred Heart	ASC/3	NEMA P	Twisted Pair
Foothill Blvd	Etiwanda Ave	ASC/3	NEMA P	Twisted Pair
Foothill Blvd	Cornwall Ave	ASC/3	NEMA P	Twisted Pair
Foothill Blvd	East Ave	ASC/3	NEMA P	None

2.2.5 City of Fontana

There are 28 signalized intersections in the City of Fontana along Foothill Boulevard and Sierra Avenue within the study route. Leased copper line and fiber optic are the communications infrastructure found throughout the City of Fontana. The quality of both the leased copper line and fiber optic will be determined during the design phase. **Table 4** summarizes the traffic signal hardware and communication characteristics of the intersections within the City of Fontana.

Table 4: Fontana Intersections

Main Corridor	Cross Street	Controller Type	Cabinet Type	Communications Infrastructure
Foothill Blvd	Cottonwood Ave	ASC/3	NEMA P	Leased Copper Line
Foothill Blvd	Mulberry Ave	ASC/2	NEMA P	Leased Copper Line
Foothill Blvd	Banana Ave	ASC/2	NEMA P	Leased Copper Line
Foothill Blvd	Cherry Ave	ASC/2	NEMA P	Leased Copper Line
Foothill Blvd	Redwood Ave	ASC/3	NEMA P	Leased Copper Line
Foothill Blvd	Hemlock Ave	ASC/3	NEMA P	Leased Copper Line
Foothill Blvd	Almeria Ave	ASC/2	NEMA P	Fiber Optic
Foothill Blvd	Tokay Ave	ASC/2	NEMA P	Fiber Optic
Foothill Blvd	Citrus Ave	ASC/2	NEMA P	Fiber Optic
Foothill Blvd	Cypress Ave	ASC/3	NEMA P	Fiber Optic
Foothill Blvd	Juniper Ave	ASC/2	NEMA P	Fiber Optic
Foothill Blvd	Sierra Ave	ASC/2	NEMA P	Fiber Optic
Sierra Ave	Upland Ave	ASC/2	NEMA P	Fiber Optic
Sierra Ave	Seville Ave	ASC/2	NEMA P	Fiber Optic
Sierra Ave	Spring St	ASC/2	-	Fiber Optic
Sierra Ave	Arrow Blvd	ASC/2	NEMA P	Fiber Optic
Sierra Ave	Valencia Ave	ASC/2	NEMA P	Fiber Optic
Sierra Ave	Orange Wy	ASC/2	NEMA P	Fiber Optic
Sierra Ave	Ceres Ave	ASC/2	NEMA P	Fiber Optic
Sierra Ave	Merrill Ave	ASC/2	NEMA P	Fiber Optic
Sierra Ave	Randall Ave	ASC/2	NEMA P	Fiber Optic
Sierra Ave	San Bernardino	ASC/2	NEMA P	Fiber Optic
Sierra Ave	Marygold Ave	ASC/2	NEMA P	Fiber Optic
Marygold Ave	Juniper Ave	ASC/2	NEMA P	Leased Copper Line
Juniper Ave	Valley Blvd	ASC/2	NEMA P	Leased Copper Line
Valley Blvd	Inland Empire Ctr	ASC/2	NEMA P	Leased Copper Line
Valley Blvd	Sierra Ave	ASC/2	NEMA P	Fiber Optic
Sierra Ave	Permanente Dwy	ASC/2	NEMA P	Fiber Optic

2.2.6 *County of San Bernardino*

As mentioned earlier, a short segment of Foothill Boulevard, between Hemlock Avenue and Almeria Avenue is part of unincorporated San Bernardino County, though no traffic signals within this stretch are operated by the County. Therefore, signal priority for the West Valley Corridor Connector would not be implemented at any County intersections.

2.3 EXISTING SYSTEMS ON CURRENT TRANSIT VEHICLES

The third component of a TSP system is transit vehicle detection. Omnitrans currently uses Trapeze TransitMaster IDS (Intelligent Decision Support).

3.0 POTENTIAL ENHANCEMENTS

The following section provides an overview of transit priority options and their impacts on the operation of signalized intersections, as well as a summary of proposed sbX stations along the West Valley Connector corridor.

3.1 TRANSIT SIGNAL PRIORITY (TSP) SYSTEM

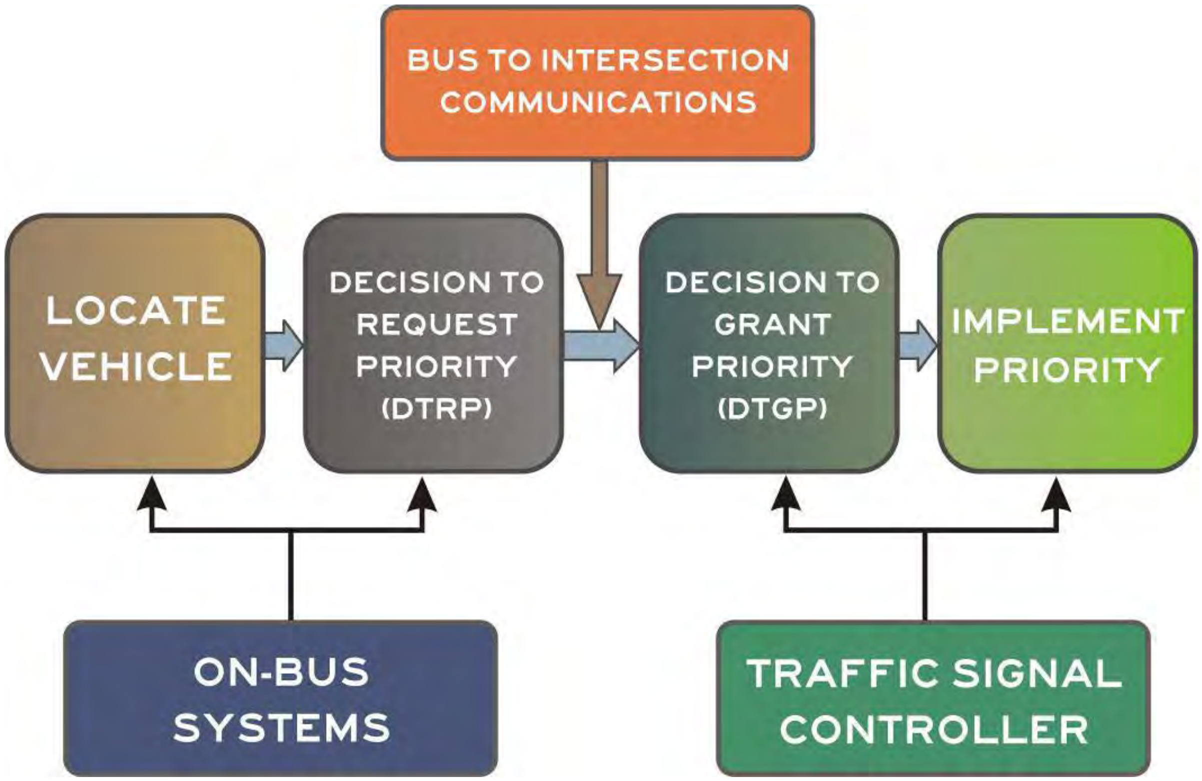
As discussed earlier, although signal priority and signal pre-emption are often used synonymously, they are in fact different processes. While they may utilize similar equipment, signal priority *modifies* the normal signal operation process to better accommodate transit vehicles, while pre-emption *interrupts* the normal process for special events such as an approaching train or responding emergency vehicle.

Objectives of emergency vehicle pre-emption include reducing response time to emergencies, improving safety and stress levels of emergency vehicle personnel, and reducing accidents involving emergency vehicles at intersections. Light rail systems are also often equipped with pre-emption at grade crossings or intersections to reduce accidents. On the other hand, objectives of TSP include improved schedule adherence and improved transit travel time efficiency while minimizing impacts to normal traffic operations.

As mentioned earlier, the following three major components are required in a TSP system, as depicted in **Figure 2**:

- GPS-based on-bus system to determine bus location and to initiate requests for priority;
- Bus-to-intersection communications, with the necessary communications equipment installed on the vehicle and at signalized intersections; and
- Traffic signal controller hardware and firmware to recognize the bus signal priority request message and grant/not grant that request.

FIGURE 2: BUS SIGNAL PRIORITY STEPS



The request for priority can be based on factors specified by bus operations management, such as the location of the bus and the current time relative to its operating schedule. A "smart bus" system will have to be in place for such a system to operate. For the discussions included in this report, it is assumed a "smart bus" system will be deployed.

The decision to grant priority (DTGP) is based on factors specified by the local traffic engineering officials, such as time of day, traffic volumes on the cross streets, and minimum time intervals between successive priority implementations (such as not granting priority on back-to-back cycles or every third or fourth cycle only).

3.1.1 Priority Types

In order to achieve transit signal priority and provide preferential treatment to transit vehicles there are two types of priority which may be used:

- Passive
- Active

Passive Priority: In this type of priority, signal coordination is used to favor the progression of transit vehicles. No transit vehicle detection technology or transit signal priority on the controller side is utilized to achieve this type of priority. Instead, dwell times at stops are estimated to develop progression schemes. This type of priority is mostly used for one-way progression and the impact to vehicle progression in the direction opposite to the transit vehicle progression is significant. Although this system has been used in various parts of the country (i.e. Broadway Street in Oakland, CA) it is not a very reliable system and, as a result, not recommended.

Active Priority: Active priority utilizes transit vehicle detection technologies and priority algorithms to accommodate transit vehicles. There are two types of active priority:

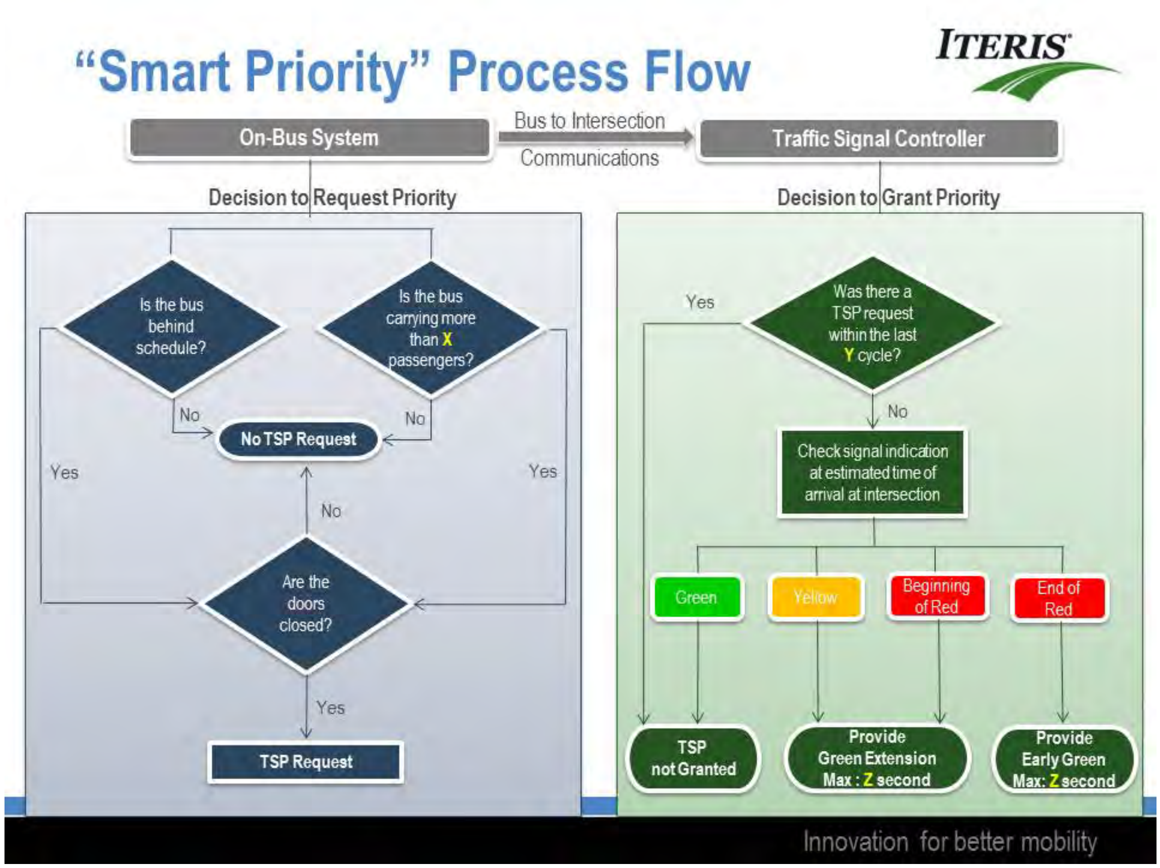
- Headway-Based
- Schedule-Based

In headway-based priority, transit signal priority requests are granted based on pre-determined time intervals (e.g. every 15 minutes). In these cases, transit signal priority emitters are always on and depending on the settings, some systems may not grant priority more than once within the time interval.

In schedule-based priority, transit signal priority is requested and granted only if a transit vehicle is behind schedule. This type of priority requires an automated vehicle identification (AVL) system and a scheduling system to determine whether a transit vehicle is behind schedule.

Another on-bus system, called “smart priority”, could potentially be programmed to allow the TSP vehicle to move through the system rapidly depending on conditions such as if the bus is behind schedule, if the bus is carrying more than a specified number of passengers and so forth. From there, the system would determine if the doors are closed at which time it would then transmit a TSP Request to the traffic signal controller and the controller would then determine whether to grant priority or not. While this is only one scenario of many, the actual process of the described scenario is shown in **Figure 3.**

FIGURE 3: "SMART PRIORITY" PROCESS FLOW



3.2 Queue Jumps

Queue jump service along the corridor should be considered where the cost of implementation is low and will achieve the highest benefit/cost ratio. As such, a queue jump would be applicable if:

- No roadway construction is needed (i.e. the queue jump would fit within existing right-of-way). Ideally, the intersection has an existing right-turn only lane.
- The bus stop is at a far side location. This would allow for the most efficient use of the queue jump and signal priority system.

The typical queue jump scenario would be one in which the bus is allowed to bypass a standing queue of vehicles at an intersection by pulling into the existing right-turn-only pocket. A revised traffic signal display facing that right-turn pocket would present the bus with permission to enter the intersection on a circular red (which is still holding back the queue being jumped), while at the same time turning on the right-turn-overlap phase to clear out any right-turning vehicles which might be in front of the bus. **Figure 4** provides a schematic of the improvements required to allow for queue jump operation. **Figure 5** provides the necessary phase modifications for the queue jump signal operation. In addition to signal modifications, the appropriate bus detection would have to be implemented.

FIGURE 4: QUEUE JUMP INTERSECTION MODIFICATION SCHEMATIC

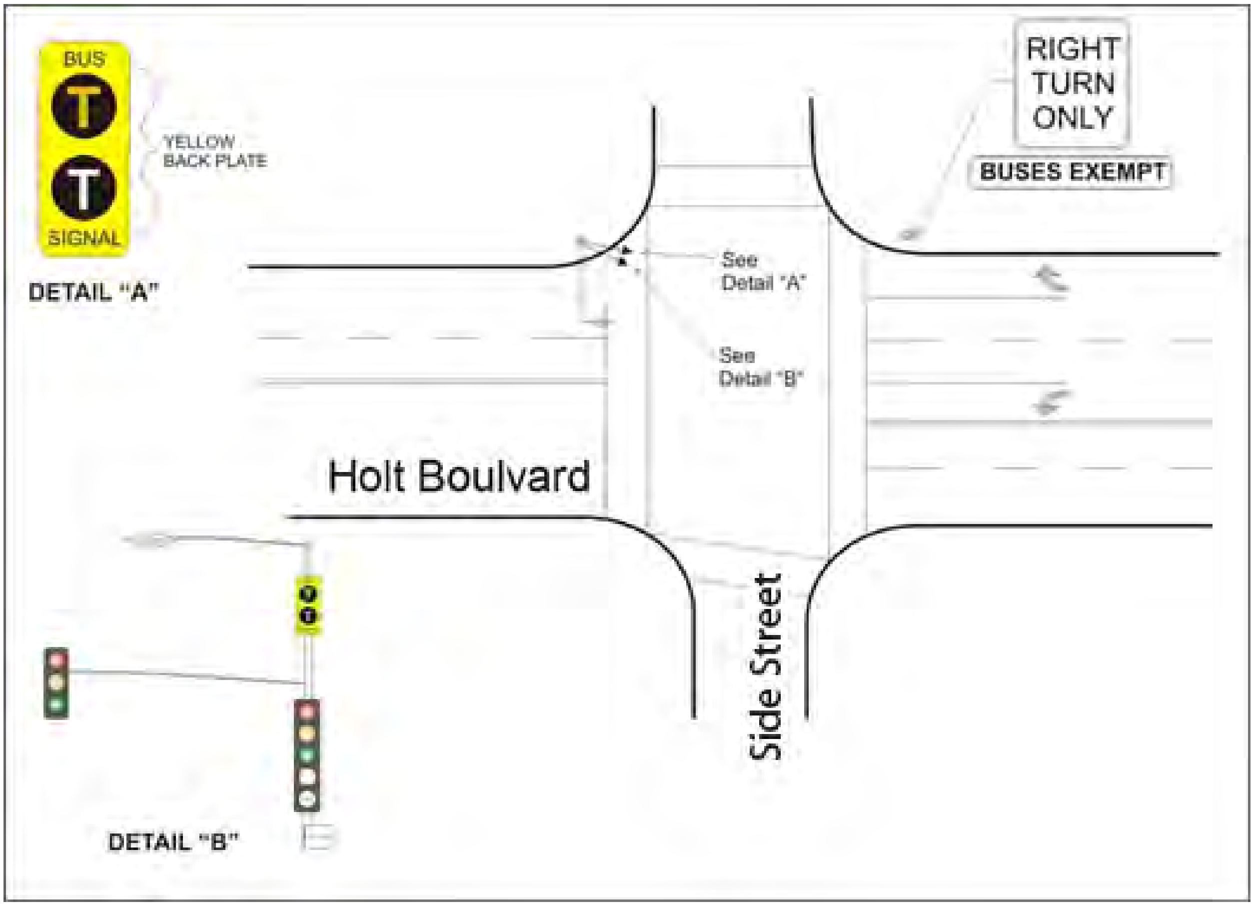
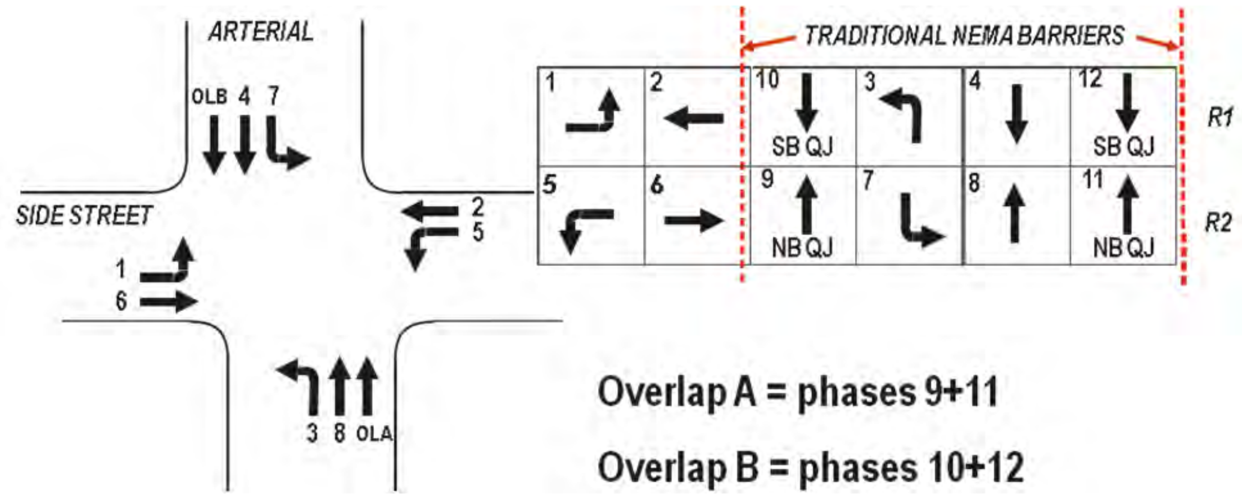


FIGURE 5: QUEUE JUMP INTERSECTION MODIFICATION SCHEMATIC



3.3 TRAFFIC IMPACTS OF TSP

With implementation of TSP, there would be a limited likelihood of traffic impacts to non-transit vehicles passing through intersections along the West Valley Connector route. Negative impacts that could result would likely be negligible. These impacts include the increase in queue lengths at side street approaches by potentially one or two vehicles, assuming an average green-time extension of eight to ten seconds. The increased queue length would be the result of reduced side street green times, though the minimum green time and pedestrian interval would not be violated. Non-transit vehicles traveling along the corridor would benefit from the green time extension.

Currently, bus headways are 15 minutes, thus there are only four potential green extensions per hour per direction. In a typical 90-second cycle length, there are 40 green phases per hour. If only four green phases have the potential to be extended, that is only 10% of the hourly total, thus not a significant percentage. The proposed Rapid service will operate on 10-minute headways during peak periods, which would mean up to six green phases per hour have the potential to be extended or 15% of the hourly total; again, not a significant percentage.

3.4 WHERE TSP WOULD BE MOST BENEFICIAL

Current traffic operations show generally low levels of congestion along most of the corridor. However, future growth along Holt Boulevard, most notably between Mountain Avenue and Vineyard Avenue in the City of Ontario, is expected to more than double traffic volumes during both the a.m. and p.m. peak periods. Assuming no change to the current roadway configurations, this could result in increased congestion being experienced by buses serving the corridor. Consequently, TSP in the Ontario segment of the corridor should provide significant benefits to transit riders.

The Sierra Avenue segment in the City of Fontana does currently operate under congested conditions near the Kaiser Permanente Medical Complex. With continued traffic growth in the area, this section of Sierra Avenue is expected to operate below acceptable levels during future conditions as well. Consequently, TSP would provide significant benefits to transit riders in the Sierra Avenue segment of the route.

TSP would provide benefits to transit riders along the entire West Valley Connector route when buses fall behind schedule due to congestion or other conditions, such as heavy boarding activity at certain stops (e.g., numerous bicycles or wheelchairs), delays related to driveway activity, parking maneuvers, and other activities that delay buses. But the two segments discussed above are the ones most likely to experience recurrent congestion and where TSP may be most beneficial.

3.5 Proposed Bus Stop Locations

While local buses will continue to use the existing stops without TSP, the sbX buses will stop only at the new proposed stations. **Table 5** summarizes the locations of future potential sbX stations. The table shows whether the stops are near-side or far-side stops. This is in reference to where a bus stop is located in relation to the intersection based on the direction of travel. A near-side stop is a stop located before the intersection and a far-side stop is a stop located after the intersection. This is important to note as a near side stop could potentially create an unnecessary delay from an otherwise smooth running system and would not be able to take advantage of the green time extension that a TSP system provides. In order to reduce the impacts, other “smart priority” functionality will need to be added to the TSP system such as the status of the bus doors (closed or open) to the on-bus technology.

TABLE 5: PROPOSED STATION LOCATIONS

Main Corridor	Cross Street	Operating Agency	Near-Side / Far-Side Stops	
			EB or NB	WB or SB
Garey Ave	Holt Blvd	Pomona	Far Side	WB Far Side on Holt Blvd SB Far Side on Garey Ave
Holt Blvd	Towne Ave	Pomona	Far Side	Far Side
Holt Blvd	Clark Ave	Pomona	Far Side	Near Side
Holt Blvd	Indian Hill Blvd	Pomona	Far Side	Far Side
Holt Blvd	Ramona Ave	Montclair	Far Side	Far Side
Holt Blvd	Central Ave	Montclair	Far Side	Far Side
Holt Blvd	Mountain Ave	Ontario	Far Side	Far Side
Holt Blvd	San Antonio Ave	Ontario	Far Side	Near Side
Holt Blvd	Euclid Ave	Ontario	Far Side	Near Side
Holt Blvd	Campus Ave	Ontario	Far Side	Far Side
Holt Blvd	Grove Ave	Ontario	Far Side	Far Side
Holt Blvd	Vineyard Ave	Ontario	Far Side	Far Side
Terminal Way	None	Ontario	Far Side	None
Archibald Ave	Inland Empire	Ontario	Far Side	Near Side
Inland Empire	Haven Ave	Ontario	Far Side	Far Side
Ontario Mills Mall	Mills Cir	Ontario	Far Side	None
Milliken Ave	Foothill Blvd	Rancho Cucamonga	Far Side on Foothill Blvd	Far Side on Milliken Ave
Foothill Blvd	Day Creek Blvd	Rancho Cucamonga	Far Side	Far Side
Foothill Blvd	Mulberry Ave	Fontana	Far Side	Far Side
Foothill Blvd	Cherry Ave	Fontana	Far Side	Far Side
Foothill Blvd	Citrus Ave	Fontana	Far Side	Far Side
Foothill Blvd	Sierra Ave	Fontana	None	WB Far Side on Foothill Blvd SB Far Side on Sierra Ave
Sierra Ave	Randall Ave	Fontana	Far Side	Far Side
Sierra Ave	Marygold Ave	Fontana	Near Side	None

As shown in **Table 5**, 46 stations are proposed through the corridor (plus the three Metrolink onsite stations), consisting of both near-side and far-side stops. Since the small number of near-side stops (five of 46) is not significant, these should not be a potential cause of delay in the proposed TSP system. The delay would be caused by the rapid transit vehicles getting caught in the queue of right-turning vehicles. To avoid this situation, integration of the "smart priority" on-bus system, described earlier, should be considered at near side locations.

4.0 RECOMMENDATIONS

The purpose of a TSP system is to ensure that the public transportation vehicles move more rapidly. A TSP system deployed along the West Valley Connector corridor would certainly provide the benefits of such an implementation. Expediting current public transit vehicles by reducing the travel time would certainly encourage more ridership. In the previous section, various TSP treatment concepts were presented which ties into this section where the enhancements are now recommended based on proven working systems.

A combination of the methods listed in **Section 3**, TSP and Queue Jump, would be the recommendation best suited for the needs of a rapid transit system along the West Valley Connector corridor. Both methods have been proven in real world “on the street” tests. TSP can currently be seen running on Omnitrans sbX Green Line buses. By deploying TSP and a limited amount of Queue Jump measures, which have a proven track record, a smooth running system should result.

Communication is very important with a TSP system and as such it is recommended that a wireless communication system between the transit vehicles and traffic controller cabinets be implemented. This will ensure constant reliable communication and a virtually lag-free operation. The wireless system has been reliable and proven itself time and again.

Once communication from the transit vehicles arrives at the traffic signal cabinets it needs to connect over the network, which is where the existing infrastructure comes into play. By utilizing as much existing communication infrastructure as possible, overall costs can be reduced. A TSP system is not very taxing on an existing network, which facilitates deployment and implementation.

While collecting existing field data, a few locations were noted that could be potential queue jump locations. While this recommendation is based on field collected data, further analysis would be required to determine if indeed these are good candidates for the treatment. These potential queue jump locations include:

- Holt Boulevard & East End Avenue
- Holt Boulevard & Bon View Avenue
- Foothill Boulevard & Etiwanda Avenue
- Foothill Boulevard & Citrus Avenue
- Foothill Boulevard & Sierra Avenue

5.0 ESTIMATED COSTS

This section provides an overview of the projected costs to install and operate a TSP system on the West Valley Connector corridor. **Table 6** presents the early evaluation cost estimate for the implementation of a TSP system, based on similar projects in other jurisdictions (i.e. City of Monterey Park, Long Beach, Compton, South Gate, etc.).

TABLE 6: EARLY EVALUATION COST ESTIMATE

Task and Description	Total Estimated Cost	Notes
Preliminary Engineering	$100,000	Agency Coordination to develop the RFP, budget and concept
Project Management	$200,000	Agency PM activities
Project Management	$250,000	Consultant Project Management
Develop Design Documents	$100,000	Consultant to develop design docs (PDR, Training docs, etc.)
Develop Engineering Design Plans	$721,000	Consultant developing design plans
Equipment Procurement	$651,000	TSP Equipment procurement
Intersection Implementation	$465,000	TSP equipment installation
Spare Equipment Procurement	$25,000	Spare equipment
System Maintenance	$180,000	Annual O&M
On Field TSP System Support	$50,000	TSP system support
On Bus System Support	$75,000	System Integration support
Sub - Total	*$2,817,000*	
Contingency (25%)	*$704,250*	
Total	**$3,521,250**	

As shown in **Table 6**, the total cost is projected to be $3,521,250. Since this is a planning-level document, a 25% contingency fee was added to the initially developed cost to account for any unforeseen situations that may cause an increase in the design or implementation phase of the contract. Costs associated with a typical intersection would include developing engineering plans, and procuring and implementing the equipment at each intersection. In addition, maintenance of the system on an annual basis is included in the cost estimate. These maintenance costs would be in addition to each agency's current annual traffic signal maintenance fee. It is estimated that a yearly fee of $2,100 per intersection be allocated for TSP maintenance.

While the costs may vary depending on the necessary equipment, the range of those costs should fall within the estimate shown in **Table 6**.

6.0 SUMMARY

In summary, TSP would benefit the West Valley Connector corridor by creating a rapid transit system with relatively little signal delay time. Utilizing the existing communication infrastructure and then incorporating a wireless communication system from the transit vehicles back to the existing network would be the most cost effective manner of deployment. Omnitrans already uses wireless systems in other rapid transit projects, so implementation would likely be smooth.

TSP would have a range of benefits including improved bus travel times and reliability through the corridor, thus leading to both reduced emissions and increased ridership. Based on research conducted along other urban bus corridors, it is projected that transit priority could result in a five second decrease in bus travel time per intersection. Through the West Valley Connector corridor's 80+ signalized intersections, the total travel time savings could be between six to seven minutes in each direction, equating to an approximately seven percent travel time reduction.

West Valley Connector Corridor – Analysis of Alternatives

Travel Demand Model Methodology and Ridership Results

draft technical

memorandum

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1.0 Overview of Modeling Approach

The purpose of the West Valley Connector Corridor Alternatives Analysis Project is to evaluate alternatives for the introduction of premium transit services along the Holt Boulevard/Foothill Boulevard Corridor between the City of Pomona in Los Angeles County and the Cities of Montclair, Ontario, Rancho Cucamonga, and Fontana in San Bernardino County; and to identify the alternatives that best serve local transportation needs. The original corridor studied for the project followed the current alignment of Omnitrans Route 61. During the course of the evaluation of conceptual alternatives, Omnitrans expanded the scope of the Project to include a hybrid alternative connecting the Route 61 and Route 66 Corridors, with a transition at Milliken Avenue.

The existing transit markets in the West Valley Connector Corridor are primarily comprised of two distinct markets that are best described by the mode of transit service that they use: local bus riders on Omnitrans and commuter rail riders on Metrolink. There are several key differences between these travel markets. The local bus riders are generally low income, mostly walk to transit, use the local bus for a wide range of trip purposes, and make relatively short trips. By comparison, the Metrolink riders are generally higher income, mostly are choice riders who drive to transit, using Metrolink almost exclusively for commuting, and make very long transit trips, with an average trip length of more than 30 miles.

This technical memorandum summarizes modeling methodology and model validation for the evaluation of conceptual alternatives for the West Valley Connector Corridor Alternatives Analysis Project. Several travel demand models were available for this analysis. However, none of the available models was ideal for all aspects of the analysis.

- The Southern California Association of Governments (SCAG) model is the accepted regional modeling tool for the six-county SCAG region and is updated and revalidated frequently for each Regional Transportation Plan (RTP) update. However, this model lacks detail in the West Valley Connector Corridor and is not validated to the transit route level of detail necessary to study changes to this corridor.
- The San Bernardino (SBTAM) model is a recently developed subregional modeling tool for application within San Bernardino County. This tool was developed by San Bernardino Associated Governments (SANBAG) primarily for the purpose of analyzing highway impacts. However, this model was not validated to the transit route level of detail necessary to study alternatives in this corridor.

- The San Bernardino Valley Focus Model (SBVFM) is a focused model derived from the SCAG model in 2003. The SBVFM was updated in conjunction with the 2008 SCAG RTP, using a year 2003 validation year. The SBVFM has been used successfully for several transit planning studies in the San Bernardino Valley, including the E Street Corridor Project. However, this model hasn't been rigorously validated for validated for highway analysis since the 2008 SCAG RTP. A more recent validation would be preferable for the traffic and vehicle miles traveled (VMT) analyses.
- Recent Federal Transit Administration (FTA) guidance has shown a preference for the use of observed travel and transit data for the purposes of transit corridor projects like the West Valley Connector Corridor. Omnitrans has recently completed an on-board survey of the entire Omnitrans system, which provides a good resource for the data driven approach preferred by FTA. However, the on-board survey data required a significant amount of post-processing and quality control to be able to use it in the conceptual analysis.

The approach adopted for the West Valley Connector Corridor Alternatives Analysis Project called for the consultant team to "hit the ground running" upon receiving a Notice to Proceed from Omnitrans. In order to achieve this goal, we used the best tools available for each aspect of the conceptual analysis. Further, we proposed to transition to a more intensive analysis of the final alternatives using the data driven approach preferred by FTA.

1. The SBVFM was used for preparing ridership forecasts for the conceptual analysis of transit alternatives.
2. The SBTAM was used to quantify the traffic impacts and VMT benefits of the transit alternatives.
3. The sketch planning tool that utilizes observed ridership data and incremental travel time benefits provided by transit alternatives was used for final alternatives analysis and for selection of the Locally Preferred Alternative.

Section 2.0 of this technical memorandum provides a summary of the development of the SBVFM from the SCAG regional model.

Section 3.0 presents a summary of the model validation effort required for the San Bernardino Valley and the West Valley Connector Corridor. Key validation issues encountered during the validation process are described along with the solutions used to improve the model and complete the model validation. This section also describes the process used to apply the SBVFM to produce travel forecasts of transit ridership and user benefits for opening year and horizon year conditions.

Section 4.0 presents summaries of the ridership forecast results for conceptual transit alternatives tested for opening year conditions and for horizon year conditions.

Additional details regarding other elements relevant to the West Valley Connector Corridor Alternatives Analysis Project can be found in other documents referenced herein.

2.0 Travel Demand Model Methodology

The primary forecasting tool employed for the evaluation of conceptual alternatives for the West Valley Connector Corridor Alternatives Analysis Project is the SBVFM, which is a focused model derived from the SCAG regional model. SCAG is the metropolitan planning organization for this region. The SCAG model originally used to develop the SBVFM was updated in conjunction with the 2008 RTP, using a year 2003 validation year. Elements of the SCAG model are documented in *2003 SCAG Model Validation and Summary – Regional Transportation Model* (January 2008).

The SBVFM uses the basic structure of the SCAG model, with the mode choice model derived from the Orange County Transportation Authority Model (OCTAM) – customized for use in the San Bernardino Valley – and focused definition of the networks and zone system within the San Bernardino Valley.

The SBVFM employs the traditional 4-step modeling process used in the SCAG model. Special features of the SBVFM include the following:

- All person trips are modeled (including nonmotorized);
- Auto-ownership is tied to transit accessibility;
- Person trip data is split into peak and off-peak trips before application of distribution models;
- Feedback loops are used for highway and transit skims;
- Logsums are used to estimate composite impedance for application within trip distribution models for home-based work trip purpose;
- Vehicle trip data is split into four time periods and converted to origin-destination format using time-of-day models; and
- Transit trip data is assigned to peak (AM) and off-peak (midday) time periods in production-attraction format.

2.1 Zone System

The SBVFM uses a zone system comprising 3,056 transportation analysis zones (TAZ) in the SCAG region. The development of the SBVFM zone system was accomplished in two steps. First, 259 TAZs in the two regional statistical areas (RSA), which comprise the San Bernardino Valley area, were split into 1,811 TAZs using zone boundaries defined in other local models used in the San Bernardino Valley. Then, the SCAG TAZs in remote areas of Ventura, Los

Angeles, Orange, Riverside, and Imperial Counties were aggregated to coarser levels of detail, reducing the number of zones outside of San Bernardino County by 2,605. The net result was to decrease the number of zones in the SCAG region from 4,109 to 3,056. Table 2.1 displays a comparison of the number of TAZs in each of the six SCAG counties, plus the other centroids, in the SCAG zone system and in the SBVFM zone system.

Table 2.1 Transportation Analysis Zones in SCAG Counties

County	SCAG TAZs	SBVFM TAZs
Ventura	210	6
Los Angeles	2,243	541
Orange	666	225
Riverside	478	320
San Bernardino	402	1,954
Imperial	110	10
Total	4,109	3,056

2.2 SOCIOECONOMIC DATA

The SBVFM uses the same socioeconomic input data used in the SCAG model, except that the data has been aggregated or split to fit into the SBVFM zone system. Key socioeconomic data used in the SBVFM include the following variables:

- Total population,
- Resident population,
- Workers,
- Single-family households,
- Multiple family households,
- K-12 school enrollment,
- College/university enrollment,
- Retail employment,
- Service employment,
- Basic employment, and
- Median household income.

2.3 TRIP PURPOSES

Trips made for different purposes have been found to have different characteristics, such as average trip lengths and mode shares. Therefore, separate models are used to estimate the number of trips for different purposes. The most frequently used trip purposes in travel demand models are home-based work, home-based other, and non-home based.

The SBVFM uses the same 13 trip purposes that are used in the SCAG models. These include six home-based work trip purposes, five home-based other trip purposes, and two non-home-based trip purposes. These trip purposes are summarized below.

- Home-based work-direct:
  - Low income (less than $25,000);
  - Middle income ($25,000 to $49,999); and
  - High income ($50,000 or more)
- Home-based work-strategic:
  - Low income;
  - Middle income; and
  - High income.
- Home-based elementary and high school.
- Home-based college and university.
- Home-based shopping.
- Home-based social-recreational.
- Home-based other.
- Work-based other.
- Other-based other.

2.4 TRIP GENERATION

Trip generation is the process of estimating how many person trips are generated within each TAZ. The trip generation procedures used in the SBVFM are identical to the procedures used in the SCAG model. Trip generation models estimate both productions (the home end of trips) and attractions (the non-home end of trips). Finally, the productions and attractions are "balanced" so that the regional totals match for each trip purpose.

Trip productions are estimated for each TAZ using a cross-classification procedure. First, the households in each TAZ are stratified into household categories. For example, for home-based work trips, the households are stratified into a matrix of household categories based on the number of persons in the household, the number of workers in the household, and the income level of the household. The cross-classification variables for the work and nonwork trip purposes are summarized below.

- Home-based work and work-based other (three-way cross classification):
  - Six household size groups (1, 2, 3, 4, 5, 6+);
  - Four workers per household groups (0, 1, 2, 3+); and
  - Three income-level groups (low, middle, high).
- Home-based nonwork and other-based other (two-way cross classification):
  - Six household size groups (1, 2, 3, 4, 5, 6+); and
  - Five auto ownership-level groups (0, 1, 2, 3, 4+).

After households have been stratified, trip production rates are applied to each household category, and the resulting trips are aggregated in each TAZ for use in subsequent models. Trip attractions are estimated by a set of linear equations that convert households, employees, and school enrollment to trip attractions.

2.5 Transportation Networks

The SBVFM uses an integrated transportation network that includes mixed-flow and exclusive facilities for highway, truck, and transit modes. The network structure is similar to the structure developed for the SCAG models, with some refinements designed to ease the analysis of trips that may be influenced by the transportation alternatives in the detailed analysis, such as a refined coding of access to transit stations.

Highway Networks

The SBVFM uses separate networks for four different time periods:

1. AM peak – 6:00 a.m. to 9:00 a.m.;
2. Midday – 9:00 a.m. to 3:00 p.m.;
3. PM peak – 3:00 p.m. to 7:00 p.m.; and
4. Nighttime – 7:00 p.m. to 6:00 a.m.

The primary difference between the four networks is the highway capacity, which is a function of the number of hours of duration of each time period.

The links in the networks are coded with each of the modes that are available. The available highway modes include mixed-flow links, shared ride high-occupancy vehicle (HOV) links (two or more persons), carpool HOV links (three or more persons), toll links, and truck links for three classes of heavy vehicles.

The highway networks are comprised of nodes and links that connect centroids that represent the 3,056 TAZs in the SCAG region. The highway network also includes 40 external stations that represent highway connections to areas outside of the SCAG region, 12 airports, 40 port zones, and 150 park-and-ride stations that allow the model to simulate travel between the highway network and the integrated transit network.

The highway network comprises more than 100,000 directional highway links. Each link is characterized by several attributes, including 7 area types, 10 facility classes, number of travel lanes, link capacity, free-flow speed, and observed speed. The latter three attributes are estimated for each link with the use of lookup tables – a based on the area type, facility type, number of lanes, and other link variable.

The highway network includes attributes and modes that identify toll facilities and truck facilities. Toll facilities in the region are currently limited to Orange County, as per the definition of the 2012 SCAG RTP. The model has the capacity to include toll facilities anywhere in other locations, including the opportunity to test toll facilities on I-10, which would impact Metrolink ridership.

Link attributes defining truck facilities serve two purposes. First, they allow the user to restrict or prohibit the use of links by certain classes of heavy-duty trucks. Second, they allow the model assignment algorithm to assign truck trips separately from other modes, which allows the user to convert truck trips to Passenger Car Equivalents (PCE).

Transit Networks

The SBVFM includes two transit networks integrated with the AM peak period and midday period highway networks. The AM peak transit network is used to assign and model transit trips made in the AM and PM peak periods, and the midday transit network is used to assign and model transit trips made in the midday and evening off-peak periods. All transit trips are assigned in production-attraction format.

The transit networks are integrated with the highway networks so that mixed-flow links can carry both highway and transit modes, and exclusive links can carry various transit modes. The transit networks also include auxiliary transit links that allow trips to access transit services and to transfer between transit routes. In all, the SBVFM transit networks include 13 transit modes and 8 auxiliary transit modes.

The transit networks include transit lines that are characterized by itineraries, stop locations, headways, and dwell times. The AM peak transit network includes more than 1,500 transit lines in the region, including 30 Omnitrans routes, 2 Metrolink routes, and 2 other operators serving the San Bernardino Valley.

2.6 Highway and Transit Skims

One of the main objectives of the highway and transit networks is to allow an accurate and comparative representation of the travel times and costs between centroids by various modes of travel. The travel times and costs estimated by the model are commonly referred to as skims. The highway and transit skims are used as input to both the trip distribution and mode choice models.

Highway skims for both the peak and off-peak time periods are based on the travel time on the shortest time paths. The highway operating speeds are estimated using equilibrium assignment algorithms that adjust the operating speeds on the links as a function of the demand-capacity ratio for the link. In model application, the highway skims are based on feedback speeds resulting from three iterations of the 4-step modeling procedure. The in-vehicle highway travel times are augmented with terminal times associated with the locations of the trip ends. The SBVFM calculates separate highway skims for both HOV trips and drive alone trips (which are restricted from using HOV links).

Transit skims comprise a combination of variables that have been found to affect both the choice of the transit mode and the path choice for transit options. The variables include the in-vehicle transit travel time, access time between centroids and transit stops, wait time, number of transfers, and transit fare. The in-vehicle travel times are estimated using different procedures for transit routes using mixed-flow and exclusive facilities. For transit routes that operate on links that are coded as mixed-flow facilities, the transit operating speeds are estimated as a function of the highway operating speed. For exclusive transit links, the operating speeds are derived from published schedules. The SBVFM calculates separate transit skims for four sets of transit paths for both walk-access and drive-access paths. The four sets of transit paths are distinguished by the transit modes that are allowed for the trip, as follows:

1. The **local bus** paths allow only transit modes defined as local;
2. The **premium express bus** paths can use transit modes described as either local bus or express bus;
3. The **premium urban** paths can use any transit mode described as local bus, express bus, bus rapid transit (BRT), light-rail transit (LRT), or subway transit (heavy rail); and
4. The **commuter rail** paths can use any transit mode.

2.7 Trip Distribution

The SBVFM trip distribution models use a gravity model to distribute trips. These models use the procedures and gamma function friction factors similar to those developed for the SCAG trip distribution models. However, the gamma function coefficients are recalibrated specifically for use in the SBVFM.

The input data to the trip distribution models include productions and attractions output from the trip generation models, and impedance data from highway and transit skims. Three different types of travel impedance are used for different types of trip distribution models. The six home-based work trip purposes use composite impedance logsums, which also serve as the denominator in the mode choice equations. The composite impedance logsums for the medium-income and high-income households include all travel modes, while the composite impedance logsums for the low-income households exclude drive-alone skims from the logsum calculation. The other seven trip purposes use impedances derived exclusively from highway travel times.

The distribution process creates 26 person trip tables, including both peak-period and off-peak period trip tables for each of the 13 trip purposes estimated by the trip generation models. Following application of the trip distribution models, the 26 resulting trip tables are aggregated to 14 person trip tables, as summarized below in Table 2.2.

Table 2.2 Trip Purposes from Trip Generation and Trip Distribution Models

Trip Generation Models (26 Tables)	Trip Distribution Models (14 Tables)
Peak Period Home-Based Work Direct – Low Income	Peak Home-Based Work – Low Income
Peak Period Home-Based Work Strategic – Low Income	
Peak Period Home-Based Work Direct – Medium Income	Peak Home-Based Work – Medium Income
Peak Period Home-Based Work Strategic – Medium Income	
Peak Period Home-Based College/University	
Peak Period Home-Based Work Direct – High Income	Peak Home-Based Work – High Income
Peak Period Home-Based Work Strategic – High Income	
Peak Period School (K-12)	Peak School (K-12)
Peak Period Home-Based Shopping	Peak Home-Based Other
Peak Period Home-Based Social-Recreational	
Peak Period Home-Based Other	
Peak Period Work-Based Other	Peak Work-Based Other
Peak Period Other-Based Other	Peak Other-Based Other
Off-Peak Period Home-Based Work Direct – Low Income	Off-Peak Home-Based Work – Low Income
Off-Peak Period Home-Based Work Strategic – Low Income	
Off-Peak Period Home-Based Work Direct – Medium Income	Off-Peak Home-Based Work – Medium Inc.
Off-Peak Period Home-Based Work Strategic – Med. Income	
Off-Peak Period Home-Based College/University	
Off-Peak Period Home-Based Work Direct – High Income	Off-Peak Home-Based Work – High Income
Off-Peak Period Home-Based Work Strategic – High Income	
Off-Peak Period School (K-12)	Off-Peak School (K-12)
Off-Peak Period Home-Based Shopping	Off-Peak Home-Based Other
Off-Peak Period Home-Based Social-Recreational	
Off-Peak Period Home-Based Other	
Off-Peak Period Work-Based Other	Off-Peak Work-Based Other
Off-Peak Period Other-Based Other	Off-Peak Other-Based Other

2.8 Mode Choice

The SBVFM mode choice model uses the basic structure developed for the OCTAM mode choice model. However, the modal bias constants have been recalibrated specifically for use in the SBVFM.

The mode choice model application is performed separately for the peak and off-peak time periods for five trip purposes (home-based work, home-based school, home-based other, work-based other, and other-based other).

Different modal constants are used for households in the three income classes for home-based work and home-based other trips. The home-based work stratification of households by income class is output from the trip distribution models. The home-based other stratification of households by income class is estimated for each TAZ as a constant share of the total person trips.

The TAZ data is split into three walk access markets – short walk, long walk, and no transit – based on a geographic information system (GIS) analysis of the relationship between the zone boundaries and the transit stop locations.

The regional modal bias constants were adjusted to match observed modal shares derived from regional household survey data. The modal bias constants were further refined for San Bernardino County to observed ridership data from transit boarding counts collected in the year 2006.

2.9 Time-of-Day and Assignment Procedures

The procedures from the preceding three steps (trip generation, trip distribution, and mode choice) are used to create vehicle and transit trip tables in production-attraction format for peak and off-peak trips for five trip purposes.

The time-of-day factors are used to convert the vehicle trip tables from production-attraction format to origin-destination format for the four time periods (AM peak, midday, PM peak, and nighttime). The resulting vehicle trip tables are then assigned to the highway networks using a multiclass assignment procedure for three auto modes (drive alone, two-person, and three-or-more person) and three truck modes (light-heavy vehicle, medium-heavy vehicle, and heavy-heavy vehicle).

The transit trip tables are assigned in production-attraction format to the AM peak transit network (peak transit trips) and the midday transit network (off-peak transit trips). The transit trips are assigned separately to the four sets of transit paths before the assignment results are aggregated together.

2.10 ADDITIONAL MODEL DEVELOPMENT AND VALIDATION TOOLS

Additional tools and documents used to complete this model validation include the following:

- *SCAG 2008 Regional Transportation Plan* (RTP), and *SCAG 2008 Regional Transportation Improvement Program* (RTIP) are used to validate the background highway and transit networks for the Base Year (2007) conditions;
- *SCAG 2012 Regional Transportation Plan* (RTP), and *SCAG 2012 Regional Transportation Improvement Program* (RTIP) are used to update the model to current conditions and validate the transit networks in the West Valley Connector Corridor for the Base Year (2012) conditions;
- *Omnitrans Short-Range Transit Plan, 2008 to 2013, Final Report* (July 2007) is used to validate the model's ability to replicate transit ridership on individual transit routes;
- *San Bernardino Associated Governments Profile of Transit Riders in San Bernardino County – Final Report* (March 2007) is used to validate the model's ability to replicate characteristics of transit riders served by Omnitrans bus routes and Metrolink rail routes;
- Omnitrans On-board Survey data (2006) is used to validate the model's ability to replicate transit trips and origin-destination data in the West Valley Connector Corridor;
- *2011 Onboard, Access and Omnilink Rider Study* (2011) is used to validate the model's ability to replicate current transit ridership and origin-destination data in the West Valley Connector Corridor;
- Omnitrans on/off count data, collected between 2006 and 2012, are used to validate passenger activity on bus routes and at bus stops in the West Valley Connector Corridor; and
- Metrolink route level ridership data, collected in 2010 is used to validate total ridership on Metrolink routes in the region.

3.0 Travel Demand Model Validation

The model validation process is presented sequentially from the coarser level to the finer level of analysis as follows:

- Regional model validation;
- San Bernardino Valley/Omnitrans systemwide validation;
- Metrolink ridership on routes serving the West Valley Connector Corridor; and
- West Valley Connector Corridor study area and bus route segments in West Valley Connector Corridor.

3.1 Regional Validation

The regional transportation system in the SBVFM is virtually identical to the transportation system in the parent SCAG Regional Model, except in the San Bernardino Valley where additional network detail was added. The SCAG model was validated to Year 2003 conditions. Validation of the SCAG model is documented in 2003 SCAG Model Validation and Summary – Regional Transportation Model (January 2008).

The SBVFM is a focus model derived from the most recent update of the SCAG Regional Model, with the mode choice component of the model derived from the OCTAM. First developed in 2004, the SBVFM has been used in several projects in the San Bernardino Valley. The SBVFM was developed specifically to satisfy the FTA guidelines for transit modes for New Starts projects. The SBVFM was applied successfully to complete the Alternatives Analysis phase of the E Street Corridor Project, and to bring that project into the Project Development phase.

The model validation effort for the evaluation of conceptual alternatives for the West Valley Connector Corridor Alternatives Analysis Project includes two levels of model validation: a full validation of the model to 2006/2007 conditions, and a partial validation to 2012 conditions. The most recent comprehensive model validation of the SBVFM was updated to replicate base year 2006/2007 conditions. The current version of the SBVFM used for the evaluation of conceptual alternatives included a partial validation limited to transit ridership in the West Valley Connector Corridor study area.

This full model validation update to 2006/2007 conditions included the following elements:

- Socioeconomic data interpolated between 2003 and 2010 data;
- Highway network updated to reflect freeway projects throughout the region;
- Transit networks updated to reflect regional rail and rapid bus services;
- Highway network updated to reflect highway improvements in the San Bernardino Valley; and
- Transit networks updated to reflect accurately Omnitrans bus services and Metrolink rail service.

Several regional validation issues arose from the conversion of the SCAG regional model to the SBVFM. The most important issues were related to the trip distribution and mode choice models. Each of these issues was identified and addressed to maintain validation of the regional application of the models to the focus model.

The key issue with the trip distribution model arose as a result of the disaggregation of zones within the San Bernardino Valley focus area. The finer zone structure within the focus area resulted in many more opportunities for short trips than within the SCAG regional model. Since the trip distribution element of the regional model had been calibrated with relatively few short trips (less than six minutes in highway travel time), there was limited data with which to calibrate the gravity models for the shorter trip lengths.

A secondary concern with the trip distribution model involves the impact that the aggregation of zones outside of the San Bernardino Valley focus area has on the transit skims, particularly in regards to egress from transit outside of San Bernardino County, most notably for Metrolink trips to downtown Los Angeles and beyond. This concern is mitigated by the fact that the transit network is maintained at the SCAG level of definition throughout the region, and the TAZ aggregation is limited (approximately two SCAG zones for each SBVFM zone) between the San Bernardino Valley and downtown Los Angeles. Survey data shows that approximately 25 percent of the Metrolink trips from the eastern San Bernardino Valley travel beyond downtown Los Angeles.

The focus model must also deal with a significantly larger number of possible trips of shorter lengths. When the regional trip distribution model was applied within the context of the focus model, the result was that the model created far more very short trips than appropriate. In order to correct this problem, it was necessary to recalibrate the short trip length friction factors. This effort produced trip distributions and trip tables that were consistent with the results of the regional model validation. Separate recalibration efforts were completed for home-based work trips for three income groups, plus seven other trip purposes, each in two aggregate time periods (the peak period encompasses AM peak period and PM peak period travel, and the off-peak period encompasses midday and evening travel).

The key issue with the SBVFM mode choice model was the high ratio of transit boardings to linked transit trips, resulting from the average number of transfers assigned to each transit trip. To correct this problem, the coefficients for second wait (transfer wait) were adjusted from 2.0 times first wait to 3.0 times first wait. This adjustment was applied to all travel modes for both the path-builder and mode choice model to maintain consistency within the models.

Other elements of the models were not adversely affected by the transition from the regional model to the focus model, and did not require additional adjustment. These elements include the trip generation model and highway assignment algorithms.

3.2 San Bernardino Valley/Omnitrans Bus System Validation

The primary providers of transit service in the San Bernardino Valley are Omnitrans, which operates 29 local bus routes and one express bus route; and Metrolink, which provides regional commuter rail service between downtown Los Angeles and the San Bernardino Valley.

For model validation, the San Bernardino Valley portion of the SBVFM was updated from the year 2003 conditions reflected in the SCAG model validation to year 2006/2007 conditions. This update includes highway improvements in the San Bernardino Valley and local bus services updates. Since the on-board transit survey was conducted in 2006, the validation transit network replicates the local bus routes as they existed in 2006.

Several validation issues were encountered during validation of the mode choice models at the San Bernardino Valley level of detail. The issues requiring the most significant effort to achieve model validation included trip purpose and ridership on low- vs. high-frequency bus routes.

The original application of the SBVFMs resulted in a lower percentage of work and school trips on Omnitrans bus route than were observed from the Omnitrans on-board bus survey. This problem was corrected by applying distinct adjustments to the transit bias constant within the mode choice models for each of the five trip purposes.

The original application of the focus model also showed a systemwide under-assignment of transit trips on high-frequency transit routes (less than 30-minute headways) and over-assignment of transit trips on low-frequency transit routes (60-minute headways). The original version of the path-builders used in the model included a cap on wait time equivalent to a 30-minute headway. This cap was adjusted to a 60-minute headway, and the relative assignments on low-frequency vs. high-frequency services improved.

Other important elements of the model were not adversely affected by the transition from the regional model to the focus model, and did not require additional adjustment. These elements include the wealth variable and the relative shares of ridership on local and premium transit modes. The transit travel time functions required only a very minor adjustment to calibrate travel times to bus schedules.

The total boardings on each of the local bus routes operated by Omnitrans are summarized in Table 3.1. This table shows that the daily assignments for most of the transit routes are within +/-800 daily boardings, or within +/-30 percent of the daily ridership; and the Root Mean Square Error (RMSE) for the transit routes is 0.252, which is well within the industry standard for the validation of local transit route ridership.

Table 3.1 Observed and Estimated Year 2006/2007 Omnitrans Ridership

Route #	Type of Route	Headway	Observed	Modeled	Difference	Ratio
1	East Valley Local	15	3,462	4,135	673	1.19
2	East Valley Local	15	4,113	4,510	397	1.10
3	East Valley Local	20	2,821	2,138	-683	0.76
4	East Valley Local	20	2,876	2,075	-801	0.72
5	East Valley Local	30	1,820	1,414	-406	0.78
7	East Valley Local	30	1,030	1,271	241	1.23
8	East Valley Local	60	828	1,193	365	1.44
9	East Valley Local	60	1,041	1,186	145	1.14
10	East Valley Local	30	1,278	1,546	268	1.21
11	East Valley Local	30	1,272	895	-377	0.70
14	East Valley Local	15	3,968	3,172	-796	0.80
15	East Valley Local	30	2,591	3,419	828	1.32
19	East Valley Local	30	2,627	3,000	373	1.14
20	East Valley Local	30	635	210	-425	0.33
22	East Valley Local	20	2,000	1,679	-321	0.84
28	East Valley Local	60	150	118	-32	0.79
29	East Valley Local	60	209	113	-96	0.54
31	East Valley Local	60	94	301	207	3.21
60	West Valley Local	60	723	644	-79	0.89
61	West Valley Local	15	5,349	4,597	-752	0.86
62	West Valley Local	30	1,370	1,741	371	1.27
63	West Valley Local	30	1,203	914	-289	0.76
65	West Valley Local	30	1,094	1,129	35	1.03
66	West Valley Local	15	3,072	2,957	-115	0.96
67	West Valley Local	60	702	573	-129	0.82
68	West Valley Local	30	1,373	1,919	546	1.40
70	West Valley Local	60	348	325	-23	0.93
71	West Valley Local	60	807	869	62	1.08
75	West Valley Local	60	107	141	34	1.31
90	Express	45	1,225	915	-310	0.75
Total			50,189	49,099	-1,090	0.98

Relative shares of local bus trips in the San Bernardino Valley made for five trip purposes are summarized in Table 3.2. The results shown in this table are expected since the transit bias constants for the San Bernardino Valley were calibrated to match the distribution of transit trips by trip purpose.

Table 3.2 Omnitrans Ridership by Trip Purpose

Trip Purpose	Actual	Target
Home-Based Work	34%	34%
Home-Based Other	34%	34%
Work-Based Other	7%	7%
Home-Based School	16%	16%
Other-Based Other	9%	9%

The year 2006 Omnitrans on-board bus survey reports that 53 percent of Omnitrans riders were from households with annual incomes of less than $20,000. The SBVFM accurately reflected this observation, with the mode choice models producing 54 percent of its transit trips from lower-income households.

3.3 West Valley Connector Corridor Study Area

The current version of the SBVFM used for the evaluation of conceptual alternatives was partially validated to confirm and improve the transit ridership in the West Valley Connector Corridor study area. This validation process included a finer level review of the travel times and access coding to improve the transit ridership forecasts for existing Omnitrans routes serving the length of the Route 61 Corridor.

When the range of alternatives was expanded to include a hybrid alternative connecting the Route 61 and Route 66 Corridors, the coverage area for the partial validation was also expanded to include the alignment for Omnitrans Route 66.

3.4 Travel Demand Model Application

As described previously, the primary forecasting tool employed for evaluation of conceptual alternatives for the West Valley Connector Corridor Alternatives Analysis Project is the SBVFM, which is a focused model derived from the SCAG regional model. Elements of the SCAG model are documented in *2003 SCAG Model Validation and Summary – Regional Transportation Model* (January 2008).

The SBVFM uses the basic structure of the SCAG model, with the mode choice model derived from the OCTAM – customized for use in the San Bernardino

Valley – with a focused definition of the networks and zone system within the San Bernardino Valley.

The SBVFM employs the traditional 4-step modeling process used in the SCAG model. Special features of the SBVFM include the following:

- All person trips are modeled (including nonmotorized);
- Auto-ownership is tied to transit accessibility;
- Person trip data is split into peak and off-peak trips before application of distribution models;
- Feedback loops are used for highway and transit skims;
- Logsums are used to estimate composite impedance for application within trip distribution models for the home-based work trip purpose;
- Vehicle trip data is split into four time periods and converted to origin-destination format using time-of-day models; and
- Transit trip data is assigned to peak (AM) and off-peak (midday) time periods in production-attraction format.

The travel demand model methodology and validation are described in Sections 2.0 and 3.0 of this technical memorandum, respectively.

Following validation of the SBVFM, this model was used to produce travel forecasts and compile user benefit data for future year conditions to assess future year transit ridership sensitivity for several combinations of transit alternatives for the Route 61 Corridor.

Application of the SBVFM was performed in two steps: creation of baseline person trip tables; and application of mode choice models and transit assignments for transit alternatives. This two-step process was utilized in order to comply with FTA requirement for New/Small Starts projects that requires alternatives analyses to use common person trip tables and common highway skim data.

The SBVFM could, hypothetically, be applied in a single step process whereby each transit scenario is run through the complete model stream. This approach would allow the model to recognize the incremental effects that the transit scenarios have on the highway skims and trip distribution (e.g., if a transit scenario attracted significant ridership from auto modes, traffic volumes for that scenario would be lower and highway speeds would be faster). The highway travel time impacts would result in changes to the highway and transit skims, the trip distribution, as well as the mode choice results.

Under the two-step application process, the baseline person trip tables were created by preparing the input data for the baseline alternative (socioeconomic data files and highway and transit networks) and running the model stream through three full feedback loops to bring the skims and trip distribution models into a state of equilibrium.

A new database was then built for each future transit scenario using a transit network coded to represent the operations of that transit scenario. The baseline person trip tables and highway skims were then used to build transit skims for each transit scenario, and the mode choice model was used to create a final set of highway and transit trip tables. The transit trip tables were assigned to the transit networks and the results were analyzed to compare the transit scenarios.

4.0 Ridership Forecasts for West Valley Connector Corridor Alternatives

This chapter documents the conceptual transit alternatives and ridership forecast results for opening year (2015) and horizon year (2035) analyses. The conceptual alternatives process included the definition, network coding, model application and transit assignment of over a dozen conceptual transit alternatives. These conceptual alternatives included variations of route alignment, station spacing, exclusive lanes, and service frequency for the premium transit service and underlying local transit service. The conceptual alternatives initially tested used variations of the existing alignment of Omnitrans Route 61 along Holt Boulevard and San Bernardino Avenue, between the Pomona Metrolink station and the South Fontana Transfer Center. This alignment was ultimately amended into a hybrid of Omnitrans Routes 61 and 66, with a transition from Holt Boulevard to Foothill Boulevard along Milliken Boulevard in Rancho Cucamonga.

For the purposes of this document, brief descriptions and ridership forecasts are presented for the original 15 conceptual alternatives. More detailed ridership forecasts are presented for a No Project alternative, a Transportation Systems Management (TSM) alternative, and three Build alternatives. The three Build alternatives presented in the detailed analysis all serve a common alignment from the City of Pomona in Los Angeles County to the City of Fontana, via the Cities of Montclair, Ontario and Rancho Cucamonga, and are differentiated by varying levels of exclusive lanes along the alignment.

4.1 Description of Alternatives

The conceptual analysis looked at 15 transit alternatives in the western portion of the San Bernardino Valley. The initial alternatives studied were all aligned along the existing alignment of Omnitrans Route 61, between the Pomona Metrolink Station in Los Angeles County through the Cities of Montclair, Ontario and Fontana to the Fontana Metrolink Station.

The conceptual alternatives were distinguished primarily by variations in station spacing, availability of exclusive guideway segments, and underlying local bus service. Some alternatives included minor variations to the station locations, most notably at Ontario International Airport and Victoria Gardens. Along with ridership forecasts, each conceptual alternative was evaluated based on other criteria, including capital and operating costs. Subsequent conceptual alternatives were designed and modified to test and optimize tradeoffs between performance and cost variables.

All conceptual alternatives were compared to a No-Project alternative that carries 6,100 daily riders on Omnitrans Route 61, with a total one-way travel time of approximately 95 minutes in the peak periods.

Conceptual Alternative A – 18 Station Rapid with All Mixed Flow

The first conceptual alternative was distinguished by a Rapid style premium bus service operating in mixed-flow service along the entire 20-mile length of the Route 61/Holt Boulevard Corridor. The Rapid service was designed to serve 18 bus stations, approximately one stop every mile, operating at a 10-minute headway throughout the service span. This Rapid service was supplemented by underlying local bus service along existing Omnitrans Route 61, assumed to operate with 30-minute headways.

The Rapid bus service for Conceptual Alternative A was assumed to achieve a total one-way travel time of approximately 69 minutes in the peak periods, a 26-minute improvement over the existing Route 61. The ridership forecast for this alternative was 5,950 daily riders on the Rapid service, plus 2,400 riders on Route 61, for a total 8,350 riders in the Route 61/Holt Boulevard Corridor, an increase of 37 percent over existing Route 61.

Conceptual Alternative B – 18 Station BRT with All Exclusive Lanes

The second conceptual alternative was a BRT style premium bus service operating in exclusive lanes along the entire 20-mile length of the Route 61/Holt Boulevard Corridor. The BRT service was designed to serve 18 bus stations, approximately one stop every mile, operating at a 10-minute headway throughout the service span. This BRT service was supplemented by underlying local bus service along existing Omnitrans Route 61, assumed to operate with 30-minute headways.

The BRT service for Conceptual Alternative B was assumed to achieve a total one-way travel time of approximately 57 minutes in the peak periods, a 38-minute improvement over the existing Route 61. The ridership forecast for this alternative was 6,490 daily riders on the BRT service, plus 2,360 riders on Route 61, for a total 8,850 riders in the Route 61/Holt Boulevard Corridor, an increase of 45 percent over existing Route 61.

Conceptual Alternative C – 30 Station Rapid without Underlying Local

Conceptual Alternative C was distinguished by a Rapid style premium bus service operating in mixed-flow service along the entire corridor, serving 30 bus stations, approximately one stop every two-thirds of a mile. This service was assumed to operate at a 10-minute headway throughout the service span.

The Rapid bus service for Conceptual Alternative C was assumed to achieve a total one-way travel time of approximately 75 minutes in the peak periods, a 24-minute improvement over the existing Route 61. The ridership forecast for this alternative was 7,700 daily riders on the Rapid service, an increase of 26 percent over existing Route 61.

Conceptual Alternatives D, E, and F – 18 Station BRT with Some Exclusive Lanes

Conceptual Alternatives D, E, and F are BRT style premium bus service operating in exclusive lanes along varying portions of the 20-mile length of the Route 61/Holt Boulevard Corridor. Conceptual Alternative D included 10 miles of exclusive lanes, Conceptual Alternative E included 5 miles, and Conceptual Alternative F included 3.5 miles of strategically located exclusive lanes. Each of these BRT services was designed to serve 18 bus stations, approximately one stop every mile, operating at a 10-minute headway throughout the service span. These BRT services were each supplemented by underlying local bus service along existing Omnitrans Route 61, assumed to operate with 30-minute headways.

The BRT services for Conceptual Alternative D, E, and F were assumed to achieve a total one-way travel time of approximately 64, 66, and 67 minutes, respectively, in the peak periods, which equated to between 28- and 31-minute improvements over the existing Route 61. The ridership forecast for Conceptual Alternative D was 6,160 daily riders on the BRT service, plus 2,390 riders on Route 61, for a total 8,550 riders in the Route 61/Holt Boulevard Corridor, an increase of 40 percent over existing Route 61. The ridership forecast for Conceptual Alternative E was 6,070 daily BRT riders and 2,390 local riders, for a total 8,460 daily riders, a 39-percent increase over Route 61. The ridership forecast for Conceptual Alternative F was 6,050 daily BRT riders and 2,390 local riders, for a total 8,440 daily riders, a 38-percent increase over Route 61.

Conceptual Alternative G – 30 Station BRT with 3.5 Miles of Exclusive Lanes and Reduced Underlying Local Service

Conceptual Alternative G was distinguished by a BRT style premium bus service operating in exclusive lanes along 3.5 miles of the Route 61/Holt Boulevard Corridor. The exclusive lanes were located primarily between Benson Avenue and Vineyard Avenue in Ontario. The BRT service was designed to serve 30 bus stations, approximately one stop every two-thirds of a mile, operating at a 10-minute headway throughout the service span. This BRT service was supplemented by underlying local bus service along existing Omnitrans Route 61, assumed to operate with 60-minute headways.

The BRT service for Conceptual Alternative G was assumed to achieve a total one-way travel time of approximately 72 minutes in the peak periods, a 23-minute improvement over the existing Route 61. The ridership forecast for

Conceptual Alternative G was 7,730 daily riders on the Rapid service, plus 1,020 riders on Route 61, for a total 8,750 riders in the Route 61/Holt Boulevard Corridor, an increase of 43 percent over existing Route 61.

Conceptual Alternatives H and I – 30 Station BRT with 3.5 Miles of Exclusive Lanes and Varying Underlying Local Service

Conceptual Alternatives H and I were variations on Conceptual Alternative G with varying levels of service on the underlying local bus service on Omnitrans Route 61. Conceptual Alternatives H and I were distinguished by 30-minute and 20-minute headways on Route 61, respectively. As with Conceptual Alternative G, the exclusive lanes for Alternatives H and I were located between Benson Avenue and Vineyard Avenue in Ontario. The BRT service was designed to serve 30 bus stations, operating at a 10-minute headway throughout the service span.

The BRT services for both Conceptual Alternatives H and I were assumed to achieve a total one-way travel time of approximately 72 minutes in the peak periods, a 23-minute improvement over the existing Route 61. The ridership forecast for Conceptual Alternative H was 7,490 daily riders on the Rapid service, plus 2,060 riders on Route 61, for a total 9,550 riders in the Route 61/Holt Boulevard Corridor, an increase of 57 percent over existing Route 61. The ridership forecast for Conceptual Alternative I was 7,180 daily riders on the Rapid service, plus 3,300 riders on Route 61, for a total 10,480 riders in the Route 61/Holt Boulevard Corridor, an increase of 72 percent over existing Route 61.

Conceptual Alternatives J and K – 30 Station BRT with Varying Exclusive Lanes and 60-Minute Underlying Local Service

Conceptual Alternatives J and K were variations on Conceptual Alternative G with varying amounts of exclusive lanes. Conceptual Alternative J was distinguished by 10 miles of exclusive lane service and Conceptual Alternative K featured mixed-flow service along the entire alignment. The premium services were designed to serve 30 bus stations, operating at a 10-minute headway throughout the service span.

The BRT services for Conceptual Alternatives J and K were assumed to achieve a total one-way travel time of approximately 70 and 75 minutes, respectively, in the peak periods, which represent 25- and 20-minute improvements, respectively, over the existing Route 61. The ridership forecast for Conceptual Alternative J was 7,860 daily riders on the Rapid service, plus 1,020 riders on Route 61, for a total 8,880 riders in the Route 61/Holt Boulevard Corridor, an increase of 46 percent over existing Route 61. The ridership forecast for Conceptual Alternative K was 7,610 daily riders on the Rapid service, plus 1,030 riders on Route 61, for a total 8,640 riders in the Route 61/Holt Boulevard Corridor, an increase of 42 percent over existing Route 61.

Conceptual Alternative L – Foothill Branch Hybrid Concept

Conceptual Alternative L introduced the concept of a new alignment for the premium bus service in the West Valley Connector Corridor. The new alignment was designed to serve the Route 61 alignment in the western portion of the corridor, between the Pomona Metrolink Station and Ontario Mills, and then transitioned via Milliken Avenue to follow the Route 66 alignment along Foothill Boulevard to the Fontana Metrolink Station. This alternative included a Rapid style premium bus service along the entire length of the West Valley Connector Corridor, with no exclusive lanes. This Rapid service was designed to serve 28 bus stations along the alignment, approximately one stop every three-quarters of a mile, operating at a 10-minute headway throughout the service span.

The Rapid service was supplemented by underlying local bus service along existing Omnitrans Routes 61, 66, and 81. The underlying local bus services were assumed to operate with 60-minute headways in the segments that were overlapped by the BRT service. Service frequencies for the portions of the local bus routes that were not overlapped by the BRT service (i.e., Omnitrans Route 61 from Ontario Mills Mall to Fontana Metrolink and Route 66 from Montclair Transcenter to Milliken Avenue) were assumed to operate at the current service frequencies, 15 minutes for both Routes 61 and 66.

The Rapid service for Conceptual Alternative L was assumed to achieve a total one-way travel time of approximately 74 minutes in the peak periods, a 21-minute improvement over the existing Route 61. The ridership forecast for Conceptual Alternative L was 7,600 daily riders on the Rapid service, plus 2,420 riders on Route 61 and 2,760 riders on Route 66, for a total 12,780 riders in the combined Route 61 and Route 66 Corridor. This represents an increase of 3,180 daily riders over the combined existing demand of 9,600 weekday passengers on Omnitrans Routes 61 and 66, an increase of 33 percent.

Conceptual Alternative M (Slim BRT) – Hybrid Concept with 3.5 Miles of Exclusive Lanes

Conceptual Alternative M was also described as the *Slim BRT Alternative with Local Underlay*. This alternative included a BRT style premium bus service along the 26-mile length of the West Valley Connector Corridor, Following the Route 61 alignment in the western portion of the corridor from the Pomona Metrolink Station to Ontario Mills, and then transitioning via Milliken Avenue to follow the Route 66 alignment along Foothill Boulevard to the Fontana Metrolink Station, and finally continuing on Sierra Avenue to a terminal station at Kaiser Hospital in Fontana. The BRT service was designed to operate with 3.5 miles of exclusive lanes located between Benson Avenue and Vineyard Avenue in Ontario, and in mixed-flow traffic lanes throughout the remainder of the corridor. This route served 27 bus stations, approximately one stop every mile, operating at a 10-minute headway throughout the service span.

This conceptual BRT service was supplemented by underlying local bus service along existing Omnitrans Routes 61, 66, and 81. As in Alternative L, the underlying local bus services were assumed to operate with 60-minute headways in the segments that were overlapped by the BRT service, and the portions of Routes 61 and 66 that were not overlapped by the BRT service were assumed to maintain the 15-minute same service frequencies as existing service.

The BRT service for Conceptual Alternative M was assumed to achieve a total one-way travel time of approximately 77 minutes in the peak periods. This travel time was an 18-minute improvement over the existing Route 61, even though the hybrid alignment was approximately 10 percent longer than Route 61. The ridership forecast for Conceptual Alternative M was 8,400 daily riders on the Rapid service, plus 2,050 riders on Route 61 and 2,910 riders on Route 66, for a total 13,360 riders in the combined Route 61 and Route 66 Corridors. This represented an increase of 3,760 daily riders over the existing demand on Omnitrans Routes 61 and 66, an increase of 39 percent.

Conceptual Alternative N (Full BRT) – Hybrid Concept with 6.5 Miles of Exclusive Lanes

Conceptual Alternative N was also described as the *Full BRT Alternative with Local Underlay*. This alternative included a BRT style premium bus service along the same 26-mile alignment followed by Conceptual Alternative M, from the Pomona Metrolink Station to Kaiser Hospital in Fontana. The BRT service operated with 6.5 miles of exclusive lanes. The exclusive lanes were located between Benson Avenue and Vineyard Avenue on Holt Boulevard in Ontario, and between Cherry Avenue and Sierra Avenue on Foothill Boulevard in Fontana. The BRT service operated in mixed-flow traffic lanes throughout the remainder of the corridor in this alternative. This route was designed to serve 27 bus stations, approximately one stop every mile, operating at a 10-minute headway throughout the service span.

As in Conceptual Alternative M, this conceptual BRT service was supplemented by underlying local bus service along existing Omnitrans Routes 61, 66, and 81. The underlying local bus services were assumed to operate with 60-minute headways in the segments that were overlapped by the BRT service. The portions of Routes 61 and 66 that were not overlapped by the BRT service were assumed to maintain the same service frequencies as existing service.

The BRT service for Conceptual Alternative N was assumed to achieve a total one-way travel time of approximately 75 minutes in the peak periods. This travel time was a 20-minute improvement over the existing Route 61, even though the hybrid alignment was approximately 10 percent longer than Route 61. The ridership forecast for Conceptual Alternative N was 8,480 daily riders on the Rapid service, plus 2,040 riders on Route 61 and 2,910 riders on Route 66, for a total 13,430 riders in the combined Route 61 and Route 66 Corridor. This represents an increase of 3,830 daily riders over the existing demand on Omnitrans Routes 61 and 66, an increase of 40 percent.

Conceptual Alternative O (Rapid) – Hybrid Concept with All Mixed-Flow Lanes

Conceptual Alternative O was also described as the *Rapid Alternative with Local Underlay*. This alternative included a Rapid style premium bus service along the same 26-mile alignment followed by Conceptual Alternatives M and N, from the Pomona Metrolink Station to Kaiser Hospital in Fontana. This Rapid service was designed to operate on mixed-flow traffic lanes throughout the entire length of the West Valley Connector Corridor, with no exclusive lanes. This route was coded to serve 27 bus stations, approximately one stop every mile, operating at a 10-minute headway during the AM and PM peak periods, and 15-minute headways throughout the remainder of the service span.

This Rapid service was supplemented by underlying local bus service along existing Omnitrans Routes 61, 66, and 81. The underlying local bus services were assumed to operate with 60-minute headways in the segments that were overlapped by the BRT service. Service frequencies for the portions of the local bus routes that were not overlapped by the BRT service (i.e., Omnitrans Route 61 from Ontario Mills Mall to Fontana Metrolink and Route 66 from Montclair Transcenter to Milliken Avenue) were adjusted (equilibrated) to provide the appropriate level of service to maintain productivity standards (i.e., service frequencies for Routes 61 and 66 reduced from 15 minutes to 30 minutes and 20 minutes, respectively).This alternative was designed to improve the travel time through the West Valley Connector Corridor for the lowest possible investment in capital cost and operating costs.

The BRT service for Conceptual Alternative O was assumed to achieve a total one-way travel time of approximately 79 minutes in the peak periods. This travel time was a 16-minute improvement over the existing Route 61, even though the hybrid alignment was approximately 10 percent longer than Route 61. The ridership forecast for Conceptual Alternative O was 8,030 daily riders on the Rapid service, plus 1,690 riders on Route 61 and 2,500 riders on Route 66, for a total 12,220 riders in the combined Route 61 and Route 66 Corridors. This represents an increase of 2,620 daily riders over the existing demand on Omnitrans Routes 61 and 66, an increase of 27 percent.

No Project Alternative

The No Project Alternative was defined to include existing and committed infrastructure, facilities, and services contained in the SCAG Federally approved transportation plan, the Federal Statewide Transportation Improvement Program (FSTIP), and no premium service along the West Valley Connector Corridor. A No Project Alternative provides an essential benchmark to test whether project alternatives improve future transit service compared to improvements planned to be implemented without the proposed project. The No Project Alternative was defined to include existing transit services in the San Bernardino Valley, consisting of 29 local bus routes and 1 express bus route operated by Omnitrans. The No Project Alternative also included the E Street Corridor sbX (BRT) project and the one-mile extension of Metrolink service to the new San Bernardino Transit Station at Rialto and E Streets in downtown San Bernardino.

Three local Omnitrans bus routes act as the primary source of transit service within the West Valley Connector Corridor, while the other transit routes provide transfer opportunities throughout the Omnitrans service area. The three local bus routes that currently operate in the West Valley Connector Corridor – Omnitrans Routes 61, 66, and 81 – provide approximately one bus stop every one-quarter mile.

No Project Hybrid (TSM) Alternative

The No Project Hybrid Alternative was defined to be identical to the No Project Alternative, with the exception that Omnitrans Routes 61 and 66 were modified to create a hybrid local bus route that follows the same alignment served by the hybrid conceptual alternatives, and that hybrid local bus route was assumed to operate at 10 minute headways during the peak periods. This No Project Hybrid Alternative allowed for a more direct comparison of the ridership and user benefits of the Build alternatives than would be possible by comparing the Build alternatives to the No Project Alternative. This alternative also serves as the TSM Alternative to compare the ridership benefits of the conceptual alternatives to a lower cost alternative.

The No Project Hybrid Alternative included all of the existing transit services in the San Bernardino Valley, consisting of 29 local bus routes and one express bus route operated by Omnitrans, the E Street Corridor sbX (BRT) project and the one-mile extension of Metrolink service to the new San Bernardino Transit Station at Rialto and E Streets in downtown San Bernardino.

Two of the local bus routes that currently operate in the West Valley Connector Corridor – Omnitrans Routes 61 and 66 – were replaced by a hybrid Routes 61/66 that generally follows the same alignment as the Rapid bus route in Conceptual Alternative O, plus truncated versions of Routes 61 and 66 covering the portions of existing alignments of Routes 61 and 66 that are not served by the hybrid alignment. The conceptual goal of this hybrid local alignment was to provide a similar level of service to that provided by the No Project Alternative, while also providing the ability to isolate and understand the relative benefits resulting from the alignment changes from benefits resulting from level of service improvements.

4.2 Operating Plans for Selected Alternatives

Detailed ridership results were compiled and tabulated for three of the conceptual alternatives (Alternative M-Slim BRT, Alternative N-Full BRT, and Alternative O-Rapid) and for the two No Project alternatives (No Project and Hybrid/TSM).

Operating Plans

Operating plans for selected conceptual alternatives are displayed in Table 4.1. The operating assumptions include service frequency, number of stations, and station-to-station run time estimates for the alternatives.

For the purposes of estimating ridership forecasts, the opening year (2015) and horizon year (2035), operating plans are based on the same assumptions.

Table 4.1 Operating Plans for West Valley Connector Corridor Alternatives

Variable	Slim BRT	Full BRT	Rapid
Number of stations	27	27	27
Length (miles)	26	26	26
Travel time (minute)	77	75	79
Peak headway (minute)	10	10	10
Off-peak headway (minute)	10	10	15

Interface with Other Existing and Planned Transit Services

Both No Project and Build alternatives assume that Metrolink will be extended from the existing Santa Fe Depot to the new E Street Transit Center at E Street and Rialto in San Bernardino, and that the recently completed E Street sbX will be in operation. The Omnitrans local bus routes would be routed to serve the new E Street Transit Center in downtown San Bernardino to provide access to Metrolink Commuter Rail service to Downtown Los Angeles and Riverside, E Street sbX service, and local bus services.

Existing transit service in the study area includes 29 local fixed-route bus routes, including three routes that serve the West Valley Connector Corridor alignments (Omnitrans Routes 61, 66, and 81). Alignments for all of the Omnitrans routes, with the exception of the West Valley Connector Corridor routes, were assumed to be maintained with only minor alignment variations to provide convenient transfer with the West Valley Connector Corridor route, and to serve the new San Bernardino Transit Station at E Street.

Local Service Frequency

Service frequencies for transit routes serving the West Valley Connector Corridor for both the No Project and Build alternatives for both analysis years are displayed in Table 4.2.

Table 4.2 Peak Headways for Local Transit Routes in West Valley Connector Corridor (Peak/Off-Peak)

Omnitrans	No Project	No Project	Slim BRT	Full BRT	Rapid

Route		Hybrid			
Year 2015					
Route 61	15	15	15	15	30
Route 66	15	15	15	15	20
Route 81	60	60	60	60	60
Year 2035					
Route 61	15	15	15	15	15
Route 66	15	15	15	15	15
Route 81	60	60	60	60	60

Year 2015 operating plans for local transit services in the West Valley Connector Corridor are displayed graphically in Figures 4.1, 4.2, and 4.3. Figure 4.1 displays the operating plan for the No Project Alternative, with Omnitrans Routes 61 and 66 operating along their existing alignments at their current 15-minute headways.

Figure 4.1 Operating Plan for Year 2015 No Project Alternative

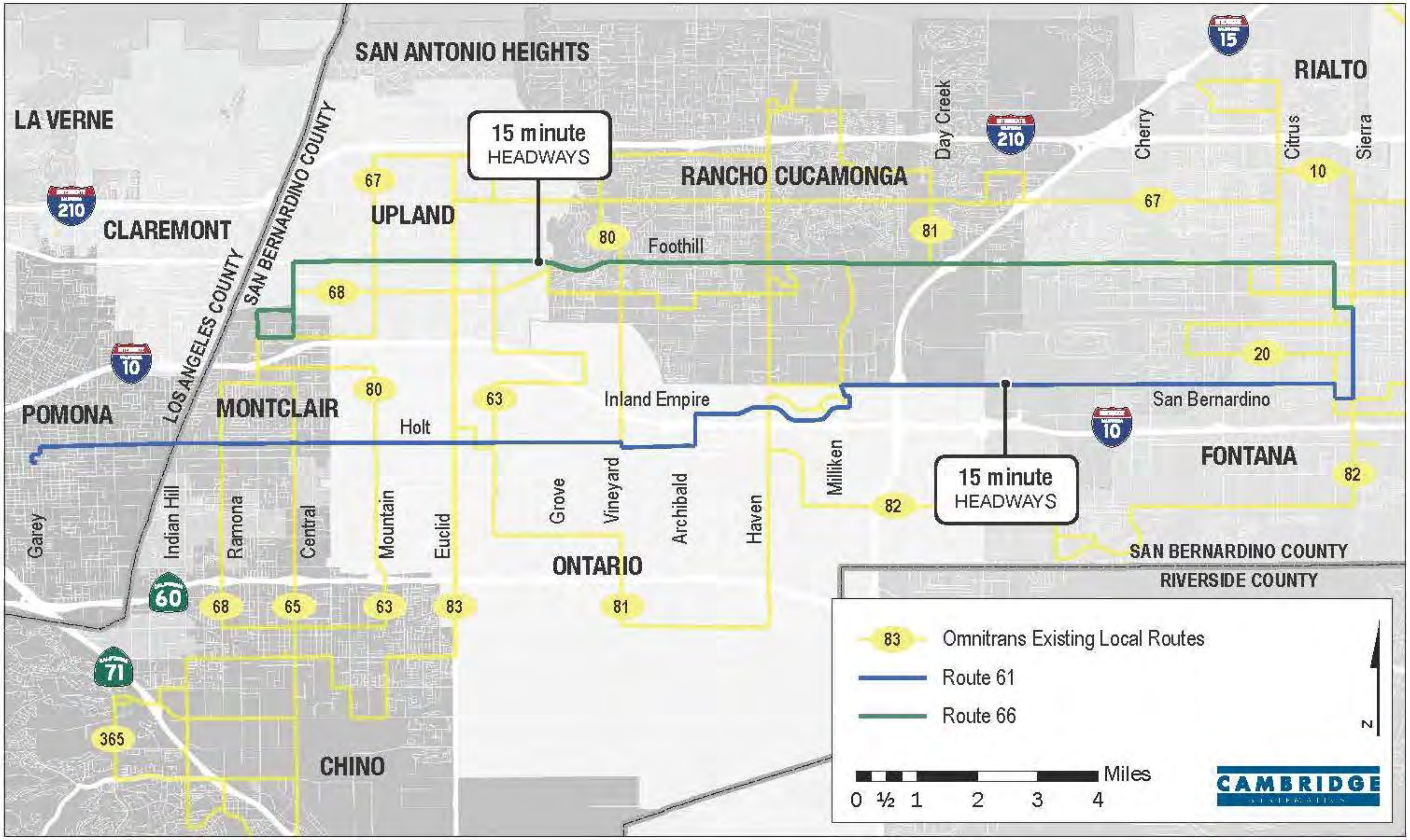


Figure 4.2 displays the operating plan for the No Project Hybrid (TSM) Alternative. As described above, this alternative included the West Valley Connector Corridor (WCC) Rapid route operating at 10-minute peak and 15-minute off-peak headways, with Omnitrans Routes 61-B and 66-B being truncated to provide service on the portions of the existing alignments that would not be served by the WCC Local route. The headways on Routes 61-B (30 minutes) and 66-B (20 minutes) were equilibrated to provide sufficient service to serve the forecast ridership demand on these route segments.

Figure 4.3 displays the operating plan for the Rapid Alternative. As described above, this alternative included the West Valley Connector Corridor Rapid route operating at 10-minute peak and 15-minute off-peak headways. Local service for the existing alignments of Omnitrans Routes 61 and 66 was redesigned to be served by two sets of local services that maintain a sufficient level of service to the current ridership on these routes. Routes 61-A and 66-A were coded to be identical to existing Omnitrans Routes 61 and 66, except that they would operate at 60-minute headways along the entire alignment. As in the TSM Alternative, Routes 61-B and 66-B were truncated to provide service on the portions of the existing alignments that would not be served by the WCC Rapid route. The headways on Routes 61-B (60 minutes) and 66-B (30 minutes) were equilibrated to provide sufficient service to serve the forecast ridership demand on these route segments. The headways displayed on Figure 4.3 show the effective headways experienced by combining the service frequencies for the A and B services on the local bus routes. For example, Route 66-A was coded to provide a 60-minute headway between Montclair and Fontana, and Route 66-B was coded to provide a 30-minute headway between Montclair and Rancho Cucamonga. The combined effective headways of these two routes would provide 20-minute effective headways between Montclair and Rancho Cucamonga, the same level of service provided on this segment in the TSM alternative.

Figure 4.2 Operating Plan for Year 2015 No Project Hybrid (TSM) Alternative

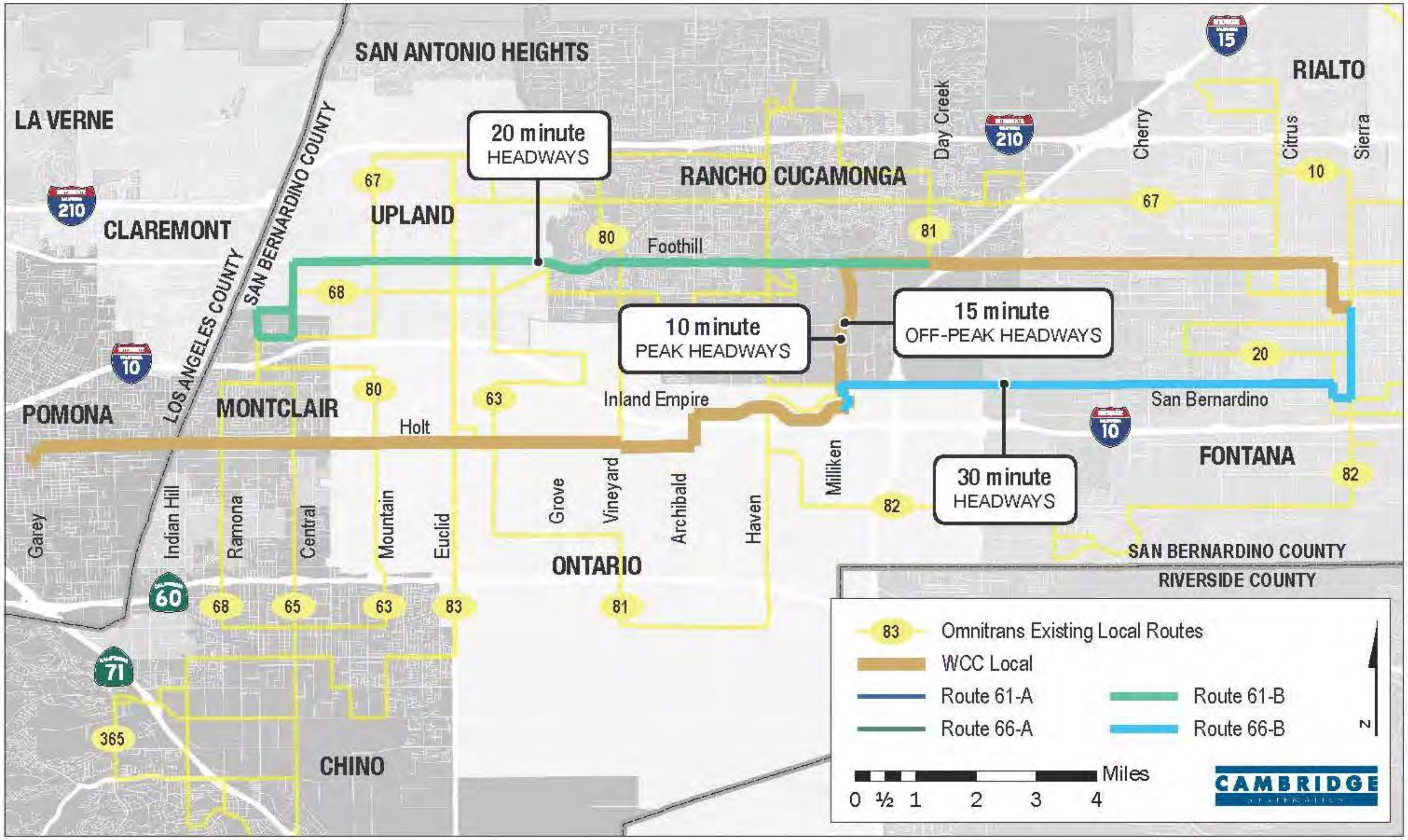
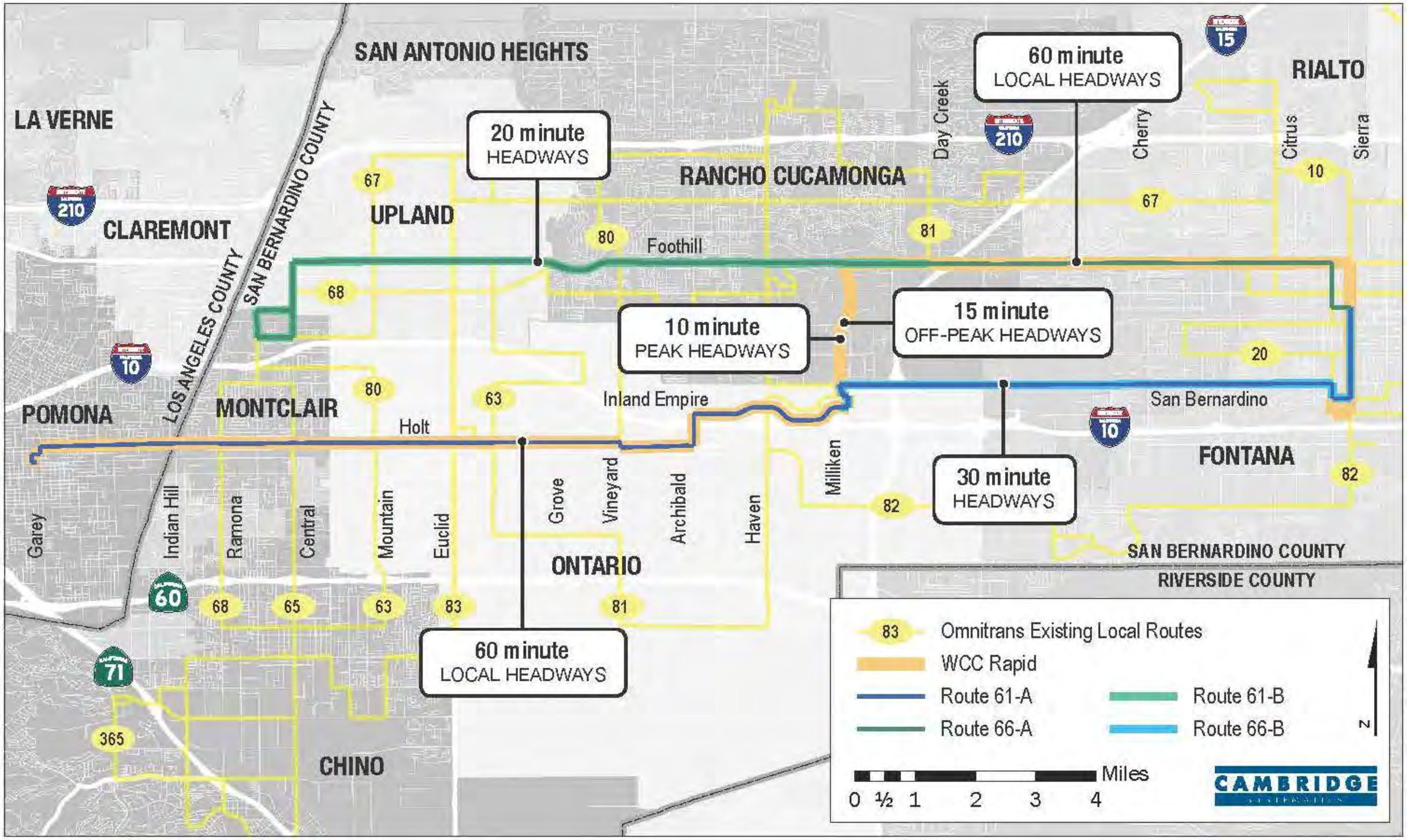


Figure 4.3 Operating Plan for Year 2015 Rapid Alternative



4.3 TRANSIT RIDERSHIP FORECASTS – OPENING YEAR 2015

The ridership forecasts for the No Project and Build alternatives documented in this section were prepared for opening year 2015 using socioeconomic data derived from SCAG RTP 2012. The ridership forecasts are based on the operating plans for the alternatives, as described above.

Linked Transit Trips – New Transit Trips

Transit trips can be quantified as either linked trips or unlinked trips. Linked transit trips are the number of trips made from a point of origin to a destination location. Unlinked trips are the number of passengers boarding transit vehicles. For example, a transit trip that requires two transit vehicles to complete is quantified as one linked trip and two unlinked trips.

The total numbers of daily linked transit trips associated with the No Project and Build alternatives are summarized in Table 4.3. The linked transit trip estimates are tabulated from the application of the SBVFM, and include transit trips throughout the San Bernardino Valley, including both Omnitrans and other transit services, such as Metrolink, Foothill Transit, RTA, and MARTA. The transit trip estimates are summarized for all trip purposes, for home-based work trips, and for home-based work trips by low-income households (which serve as a surrogate for transit-dependent households).

Table 4.3 Daily Linked Transit Trips for West Valley Connector Corridor Alternatives – Opening Year 2015

Variable	No Project	TSM	Slim BRT	Full BRT	Rapid
Total – All Trip Purposes					
Transit Trips	48,340	48,310	49.590	49,640	48,920
New Transit Trips	–	-30	1,250	1,300	580
Mode Share	1.01%	1.01%	1.04%	1.04%	1.03%
Total – Home-Based Work Trip Purpose					
Transit Trips	23,680	23,700	24,080	24,110	23,800
New Transit Trips	–	20	400	430	120
Mode Share	2.28%	2.29%	2.32%	2.32%	2.29%
Low Income – Home-Based Work Trip Purpose					
Transit Trips	7,220	7,220	7,480	7,500	7,350
New Transit Trips	–	0	260	280	130
Mode Share	5.71%	5.71%	5.92%	5.93%	5.81%

The data in this table shows that the Build alternatives are forecast to generate between 580 and 1,300 new transit trips in the region, and increase the overall transit mode share for travel in the San Bernardino Valley from 1.01 percent to between 1.03 and 1.04 percent of all trips in the region. As we would expect, the faster BRT alternatives attract more new transit trips than the Rapid alternative.

When the transit alternatives were designed, the major variable differentiating the alternatives was the inclusion of exclusive lanes that differentiates Rapid Bus and BRT modes. The results tabulated in Table 4.3 show that the inclusion of exclusive lanes is forecast to have a relatively large impact on the generation of new transit trips, approximately 700 additional new trips in the corridor.

Home-based work trips are forecast to account for approximately one-half of the transit trips in the San Bernardino Valley, and they are forecast to account for approximately one-third of the new transit trips resulting from the West Valley Connector Corridor alternatives.

Unlinked Transit Trips – Transit Ridership by Route

The ridership forecasts, tabulated as daily unlinked transit ridership for the transit routes serving the West Valley Connector Corridor study area in the No Project and Build alternatives, are summarized in Table 4.4. This table shows that the three Build alternatives are forecast to generate between 2,650 and 3,920 additional unlinked transit trips in the Corridor.

Table 4.4 Daily Transit Trips (Boardings) for West Valley Connector Corridor Routes – Opening Year 2015

Variable	No Project	TSM	Slim BRT	Full BRT	Rapid
Corridor Route[a]	–	7,540	8,470	8,540	8,030
Route 61	6,100	760	2,050	2,040	1,690
Route 66	3,500	1,850	2,890	2,890	2,500
Routes 81	690	750	740	740	720
Total – All Routes	10,290	10,900	14,150	14,210	12,940
Additional Boardings	–	610	3,860	3,920	2,650

[a] The “Corridor Route” for each alternative is the route that spans the full West Valley Connector Corridor.

Comparison of these ridership forecasts to the new trips presented in Table 4.3 shows that the majority of passengers riding the West Valley Connector Corridor premium bus route are forecast to be existing transit riders who alter their transit paths to include the premium bus route. In opening year 2015, a relatively small share (between 7 and 15 percent) of the passengers on the premium bus route is assumed to be new transit riders. More than one-half of the ridership on the premium bus routes is forecast to be diverted from the existing local bus routes, and the remaining 25 to 30 percent of trips on the premium service are assumed to be diverted from other existing bus routes.

Most Omnitrans bus routes that operate outside the West Valley Connector Corridor study area and interface with West Valley Connector Corridor premium bus are forecast to experience minor ridership gains with the Build alternatives, as compared to the No Project Baseline, due to the improved mobility and travel times offered by the West Valley Connector Corridor premium bus route. Similarly, ridership on the Metrolink routes that interface with the West Valley Connector Corridor – the San Bernardino and Inland Empire-Orange County Metrolink Lines – is forecast to increase with the Build alternatives due to the improved connectivity offered by the West Valley Connector Corridor premium bus route.

Ridership Activity at Stations

The daily station activity forecasts for West Valley Connector Corridor premium bus route are summarized in Table 4.5. This table shows the number of daily boardings (and alightings) forecast for the stations.

Table 4.5 Daily Transit Boardings at West Valley Connector Corridor Stations – Year 2015

Station	Slim BRT	Full BRT	Rapid
Pomona Metrolink	771	772	743
Holt & Garey	439	438	430
Holt & Towne	257	258	245
Holt & Clark	420	422	408
Holt & Indian Hill	520	521	501
Holt & Ramona	440	439	416
Holt & Central	372	372	353
Holt & Mountain	333	334	313
Holt & San Antonio	143	143	136
Holt & Euclid	385	386	357
Holt & Campus	289	289	270
Holt & Grove	186	186	175
Airport & Vineyard	61	62	58
Ontario Airport	56	57	53
Inland Empire & Archibald	121	122	118
Inland Empire & Haven	193	197	183
Ontario Mills Mall	293	297	264
Rancho Metrolink	420	423	395

Station	Slim BRT	Full BRT	Rapid
Foothill at Milliken	533	540	460
Foothill at Day Creek	52	52	45
Foothill at Mulberry	94	93	86
Foothill at Cherry	160	163	153
Foothill at Citrus	272	276	258
Foothill at Sierra	519	531	490
Fontana Metrolink	388	395	380
Sierra & Randall	160	164	161
Sierra & Kaiser	593	607	578
Total	8,470	8,540	8,030

The data in Table 4.5 indicates that station activity is forecast to be spread throughout the corridor, and that the most active stations are forecast to be at the terminal stations: Pomona Metrolink and Sierra at Kaiser. Other active stations are forecast to be located at transit centers and intersections where transfers between other transit routes are available.

Transit Loads

Transit loads are the number of passengers on transit vehicles at any point on the transit route. Transit *loads* differ from transit *activity*, which represents the number of passengers boarding and alighting at each station. Daily transit loads are tabulated for the West Valley Connector Corridor alternatives in Table 4.6.

The data in this table shows that all three Build alternatives are forecast to have similar route profiles, with the BRT alternatives having slightly higher transit loads than the Rapid alternative. The peak transit load points for each alternative are forecast to be located in the western half of the corridor, on Holt Boulevard between Indian Hill and Ramona, near the border between San Bernardino and Los Angeles Counties. Transit loads are forecast to be maintained at a relatively high level throughout most of the corridor, with transit loads remaining at least 60 percent of the peak load point from Garey Avenue in Pomona to Sierra Avenue in Fontana.

Table 4.6 Daily Transit Loads between West Valley Connector Corridor Station – Opening Year 2015

From Station	To Station	Slim BRT	Full BRT	Rapid
Pomona Metrolink	Holt & Garey	771	772	743
Holt & Garey	Holt & Towne	1,042	1,042	1,007
Holt & Towne	Holt & Clark	1,284	1,284	1,235
Holt & Clark	Holt & Indian Hill	1,120	1,122	1,069
Holt & Indian Hill	Holt & Ramona	1,472	1,477	1,409
Holt & Ramona	Holt & Central	1,440	1,445	1,369
Holt & Central	Holt & Mountain	1,343	1,350	1,269
Holt & Mountain	Holt & San Antonio	1,177	1,184	1,102
Holt & San Antonio	Holt & Euclid	1,189	1,197	1,109
Holt & Euclid	Holt & Campus	1,060	1,067	982
Holt & Campus	Holt & Grove	995	1,004	911
Holt & Grove	Airport & Vineyard	944	955	861
Airport & Vineyard	Ontario Airport	946	959	866
Ontario Airport	Inland Empire & Archibald	930	944	851
Inland Empire & Archibald	Inland Empire & Haven	949	962	865
Inland Empire & Haven	Ontario Mills Mall	910	927	831
Ontario Mills Mall	Rancho Metrolink	902	926	834
Rancho Metrolink	Foothill at Milliken	943	971	876
Foothill at Milliken	Foothill at Day Creek	921	958	855
Foothill at Day Creek	Foothill at Mulberry	916	954	854
Foothill at Mulberry	Foothill at Cherry	907	946	850
Foothill at Cherry	Foothill at Citrus	912	951	859
Foothill at Citrus	Foothill at Sierra	912	950	862
Foothill at Sierra	Fontana Metrolink	705	727	673
Fontana Metrolink	Sierra & Randall	672	687	648
Sierra & Randall	Sierra & Kaiser	593	607	578

4.4 TRANSIT RIDERSHIP FORECASTS – HORIZON YEAR 2035

The ridership forecasts for the No Project and Build alternatives documented in this section were prepared for horizon year 2035 using socioeconomic data derived from SCAG RTP 2012. The ridership forecasts are based on the operating plans for the alternatives, as described above in Section 4.2.

Linked Transit Trips – New Transit Trips

The total numbers of daily linked transit trips associated with the No Project and Build alternatives are summarized for the horizon year 2035 in Table 4.7. The linked transit trip estimates are tabulated from the application of the SBVFM, and include transit trips throughout the San Bernardino Valley including both Omnitrans and other transit services, such as Metrolink, Foothill Transit and MARTA. The transit trip estimates are summarized for all trip purposes, for home-based work trips, and for home-based work trips by transit dependent households.

Table 4.7 Daily Linked Transit Trips for West Valley Connector Corridor Alternatives – Horizon Year 2035

Variable	No Project	TSM	Slim BRT	Full BRT	Rapid
Total – All Trip Purposes					
Transit Trips	72,370	72,670	74,720	74,770	74,400
New Transit Trips	–	300	2,350	2,400	2,030
Mode Share	1.22%	1.23%	1.26%	1.26%	1.26%
Total – Home-Based Work Trip Purpose					
Transit Trips	36,510	36,600	37,560	37,590	37,460
New Transit Trips	–	90	1,050	1,080	950
Mode Share	2.99%	3.00%	3.07%	3.08%	3.07%
Low Income – Home-Based Work Trip Purpose					
Transit Trips	11,320	11,400	11,630	11,660	11,530
New Transit Trips	–	-80	310	340	210
Mode Share	7.40%	7.45%	7.60%	7.61%	7.53%

The data in this table shows that the Build alternatives are forecast to generate between 2,030 and 2,400 new transit trips in the region, and increase the overall transit mode share for travel in the San Bernardino Valley from 1.22 percent to 1.26 percent of all trips in the region. As we would expect, the faster BRT alternatives are forecast to attract more new transit trips than the Rapid alternative.

Home-based work trips are forecast to account for approximately one-half of the transit trips in the San Bernardino Valley, and they are forecast to account for approximately 45 percent of the new transit trips resulting from the West Valley Connector Corridor alternatives.

Unlinked Transit Trips – Transit Ridership by Route

The ridership forecasts, tabulated as daily unlinked transit ridership for the transit routes serving the West Valley Connector Corridor study area in the No Project and Build alternatives, are summarized for the horizon year 2035 in Table 4.8. This table shows that the four Build alternatives are forecast to generate between 5,000 and 5,800 additional unlinked transit trips in the West Valley Connector Corridor.

Table 4.8 Daily Transit Trips (Boardings) for West Valley Connector Corridor Routes – Horizon Year 2035

Variable	No Project	TSM	Slim BRT	Full BRT	Rapid
Corridor Route[a]	–	10,150	13,250	13,370	12,520
West (Route 61)	8,500	1,540	2,350	2,340	2,370
Central (Route 66)	4,900	3,070	3,510	3,520	3,510
East (Routes 81)	400	390	410	410	410
Total – All Routes	13,800	15,150	19,520	19,640	18,810
Additional Boardings	–	1,350	5,720	5,840	5,010

[a] The "Corridor Route" for each alternative is the route that spans the full West Valley Connector Corridor.

Comparison of these ridership forecasts to the new trips presented in Table 4.7 shows that the majority of passengers riding the West Valley Connector Corridor premium bus route are forecast to be existing transit riders who alter their transit paths to include the premium bus route. In horizon year 2035, between 40 and 41 percent of the passengers on the premium bus route are assumed to be new transit riders, and that the remaining 59 to 60 percent of trips on the premium service are assumed to be diverted from other existing bus routes.

Ridership Activity at Stations

The daily station activity forecasts for the West Valley Connector Corridor premium bus route Build options in the horizon year 2035 are summarized in Table 4.9. This table shows the number of daily boardings (and alightings) forecast for the stations.

Table 4.9 Daily Transit Boardings at West Valley Connector Corridor Stations – Year 2035

Station	Slim BRT	Full BRT	Rapid
Pomona Metrolink	1,442	1,444	1,338
Holt & Garey	102	102	86
Holt & Towne	115	115	108
Holt & Clark	366	366	344
Holt & Indian Hill	1,370	1,373	1,314
Holt & Ramona	693	696	629
Holt & Central	784	786	775
Holt & Mountain	683	682	650
Holt & San Antonio	201	199	189
Holt & Euclid	917	923	870
Holt & Campus	244	246	234
Holt & Grove	784	788	734
Airport & Vineyard	108	109	103
Ontario Airport	192	192	178
Inland Empire & Archibald	210	210	198
Inland Empire & Haven	465	472	435
Ontario Mills Mall	375	381	369
Rancho Metrolink	346	352	315
Foothill at Milliken	505	513	484
Foothill at Day Creek	219	220	206
Foothill at Mulberry	112	114	104
Foothill at Cherry	248	252	240
Foothill at Citrus	397	410	382
Foothill at Sierra	942	963	893
Fontana Metrolink	577	594	569
Sierra & Randall	123	126	112
Sierra & Kaiser	680	691	656
Total	13,200	13,320	12,520

The data in Table 4.9 indicates that the most active stations are forecast to be located at transit centers and intersections where transfers between other transit routes are available.

Transit Loads

Transit loads are the number of passengers on transit vehicles at any point on the transit route. Daily transit loads are tabulated for the West Valley Connector Corridor alternatives in Table 4.10.

The data in this table shows that all three Build alternatives are forecast to have similar route profiles, with the highest transit loads being located on Holt Boulevard between Ramona and Euclid Avenues.

Table 4.10 Daily Transit Loads between West Valley Connector Corridor Stations – Horizon Year 2035

From Station	To Station	Slim BRT	Full BRT	Rapid
Pomona Metrolink	Holt & Garey	1,442	1,444	1,343
Holt & Garey	Holt & Towne	1,377	1,380	1,292
Holt & Towne	Holt & Clark	1,490	1,493	1,399
Holt & Clark	Holt & Indian Hill	1,503	1,507	1,410
Holt & Indian Hill	Holt & Ramona	2,609	2,615	2,461
Holt & Ramona	Holt & Central	2,704	2,712	2,503
Holt & Central	Holt & Mountain	2,749	2,760	2,556
Holt & Mountain	Holt & San Antonio	2,571	2,582	2,385
Holt & San Antonio	Holt & Euclid	2,595	2,605	2,401
Holt & Euclid	Holt & Campus	2,302	2,315	2,108
Holt & Campus	Holt & Grove	2,187	2,201	1,993
Holt & Grove	Airport & Vineyard	1,886	1,903	1,708
Airport & Vineyard	Ontario Airport	1,871	1,890	1,697
Ontario Airport	Inland Empire & Archibald	1,783	1,800	1,616
Inland Empire & Archibald	Inland Empire & Haven	1,693	1,709	1,538
Inland Empire & Haven	Ontario Mills Mall	1,553	1,578	1,418
Ontario Mills Mall	Rancho Metrolink	1,518	1,551	1,401
Rancho Metrolink	Foothill at Milliken	1,445	1,485	1,343
Foothill at Milliken	Foothill at Day Creek	1,512	1,561	1,412
Foothill at Day Creek	Foothill at Mulberry	1,511	1,562	1,419
Foothill at Mulberry	Foothill at Cherry	1,504	1,558	1,415
Foothill at Cherry	Foothill at Citrus	1,494	1,549	1,402
Foothill at Citrus	Foothill at Sierra	1,367	1,420	1,286
Foothill at Sierra	Fontana Metrolink	994	1,025	954
Fontana Metrolink	Sierra & Randall	757	764	721
Sierra & Randall	Sierra & Kaiser	682	690	656

West Valley Connector Capital Cost Evaluation

	Existing Service	TSM - Improved Existing Service	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Alternative G (C+F)	Alternative H (C+F)	Alternative I (C+F)	Alternative J (C+D)	Alternative K (C)	Alternative L (Hybrid)	Alternative M (L + 3.5)	Alternative N (L + 6.5)
	No Build 15-min Route 61	**TSM 10-min Route 61**	**BRT All Mixed Flow, 18 stations plus 30-min. Rte 61**	**BRT 20 miles excl. lanes, 18 stations plus 30-min. Rte 61**	**BRT all mixed flow, 30 stations replaces Rt. 61**	**BRT 10.0 miles excl. lanes, 18 stations, plus 30-min. Rte 61**	**BRT 5 miles excl. lanes, 18 stations, plus 30-min. Rte 61**	**BRT 3.5 miles excl. lanes, 18 stations, plus 30-min. Rte 61**	**BRT 3.5 miles excl. lanes, 30 stations plus 60-min. Rte 61**	**BRT 3.5 miles excl. lanes, 30 stations, plus 30-min. Rte 61**	**BRT 3.5 miles excl. lanes, 30 stations, plus 20-min. Rte 61**	**BRT 10.0 miles excl. lanes, 30 stations, plus 60-min. Rte 61**	**BRT All mixed flow, 30 stations, plus 60-min. Rte 61**	**BRT mixed flow w/Foothill branch, 28 stations, plus 60-min. Rte 61/66**	**BRT 3.5 miles excl. lanes, 27 stations, plus 60-min. Rte 61/66**	**BRT 6.5 miles excl. lanes, 27 stations, plus 60-min. Rte 61/66**
BRT run time (EB/WB)	95/90	95/90	68.5/69.2	57.3/56.5	74.5/75.2	63.0/63.5	65.5/65.9	66.3/67.0	72.5/73.0	72.5/73.0	72.5/73.0	69.0/69.5	74.5/75.2	73.2/75.1	76.4/78.0	75.0/76.5
BRT speed	12.6	12.6	17.8	21.5	16.4	19.3	18.6	18.4	16.9	16.9	16.9	17.7	16.4	19.5	19.9	20.3
BRT buses/hour	0	0	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Route 61 / 66 buses/hour	4	6	2	2	0	2	2	2	1	2	3	1	1	1	1	1
Travel time savings over NB	-	-	-28%	-40%	-22%	-34%	-31%	-30%	-24%	-24%	-24%	-27%	-22%	-23%	-20%	-21%
Route 61 /66 ridership	6,100	7,470	2,400	2,360	-	2,390	2,390	2,390	1,020	2,060	3,300	1,020	1,030	5,180	4,960	4,950
BRT ridership	-	-	5,950	6,490	7,700	6,160	6,070	6,050	7,730	7,490	7,180	7,860	7,610	7,600	8,400	8,480
Total ridership	6,100	7,470	8,350	8,850	7,700	8,550	8,460	8,440	8,750	9,550	10,480	8,880	8,640	12,780	13,360	13,430
% improvement over NB	-	22%	37%	45%	26%	40%	39%	38%	43%	57%	72%	46%	42%	33%	39%	40%
Total ridership rank	17	16	14	8	15	11	12	13	9	6	5	7	10	3	2	1
Capital cost	$0	$13,125,000	$143,680,401	$362,928,421	$191,432,499	$242,443,705	$194,468,303	$179,231,932	$224,962,170	$224,962,170	$224,962,170	$289,580,193	$190,816,888	$179,172,869	$212,015,712	$242,488,454
O&M cost	$5,996,250	$8,763,750	$9,256,950	$8,236,950	$6,630,000	$8,619,450	$9,001,950	$9,001,950	$9,053,700	$9,384,450	$10,768,200	$8,926,200	$9,436,200	$13,678,179	$13,678,179	$13,678,179
O&M cost per rider	$3.17	$3.78	$3.58	$3.00	$2.78	$3.25	$3.43	$3.44	$3.34	$3.17	$3.31	$3.24	$3.52	$3.45	$3.30	$3.99
O&M Cost effectiveness rank	4	15	14	2	1	6	10	11	9	3	8	5	13	12	7	17
% higher cost/rider over NB	NA	19%	13%	-5%	-12%	3%	8%	9%	5%	0%	5%	2%	11%	9%	4%	26%
Annualized capital cost	$0	$594,563	$6,508,722	$16,440,657	$8,671,892	$10,982,700	$8,809,414	$8,119,207	$10,190,786	$10,190,786	$10,190,786	$13,117,983	$8,644,005	$8,116,531	$9,604,312	$10,984,727
O&M + ann. cap cost per rider	$3.17	$4.04	$6.09	$8.99	$6.41	$7.40	$6.79	$6.54	$7.09	$6.61	$6.45	$8.01	$6.75	$5.50	$5.62	$7.20
Total Cost effectiveness rank	1	2	6	17	7	15	12	9	13	10	8	16	11	4	5	14

Holt Blvd. O&M Costs per Alternative
7-28-14 with updates

		No Build		TSM		"Shadow" service w/BRT		Alternative A		Alternative B	
	Holt Blvd. Option	Existing Service (Route 61: 15-min)		Improved Existing Service (Route 61: 10-min)		Route 61: 30-min headway		All Mixed Flow plus 30-min Route 61		Max. - 20 miles excl. lanes plus 30-min Route 61	
	Year	2015	2035	2015	2035	2015	2035	2015	2035	2015	2035
	Travel time Each Way (PM Peak) EB/WB	85.0 85.0	110.0 105.0	85.0 85.0	110.0 105.0	85.0 85.0	110.0 105.0	68.5 69.2	90.0 90.0	57.3 56.5	70.0 70.0
	Round Trip (PM Peak)	170.0	215.0	170.0	215.0	170.0	215.0	137.7	180.0	113.8	140.0
	Recovery	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
	Cycle (Peak)	195.5	247.3	195.5	247.3	195.5	247.3	158.4	207.0	130.9	161.0
	Faster Factor (Base)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
	Cycle (Base)	185.7	234.9	185.7	234.9	185.7	234.9	150.4	196.7	124.3	153.0
	Faster Factor (Eve)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
	Cycle (Eve)	176.0	222.5	176.0	222.5	176.0	222.5	142.5	186.3	117.8	144.9
	Faster Factor (Wkend)	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
	Cycle (Wkend)	180.8	228.7	180.8	228.7	180.8	228.7	146.5	191.5	121.1	148.9
Annual Hours (Peak)	Cycle	195.5	247.3	195.5	247.3	195.5	247.3	158.4	207.0	130.9	161.0
	Headway	15	15	10	10	30	30	10	10	10	10
	Vehicles	14	17	20	25	7	9	16	21	14	17
	Span	4	4	4	4	4	4	4	4	4	4
	Daily Hours	56	68	80	100	28	36	64	84	56	68
	Days	255	255	255	255	255	255	255	255	255	255
	Annual Hours	14,280	17,340	20,400	25,500	7,140	9,180	16,320	21,420	14,280	17,340
Annual Hours (Base)	Cycle	185.7	234.9	185.7	234.9	185.7	234.9	150.4	196.7	124.3	153.0
	Headway	15	15	10	10	30	30	10	10	10	10
	Vehicles	13	16	19	24	7	8	16	20	13	16
	Span	7	7	7	7	7	7	8	8	8	8
	Daily Hours	91	112	133	168	49	56	128	160	104	128
	Days	255	255	255	255	255	255	255	255	255	255
	Annual Hours	23,205	28,560	33,915	42,840	12,495	14,280	32,640	40,800	26,520	32,640
Annual Hours (Eve)	Cycle	176.0	222.5	176.0	222.5	176.0	222.5	142.5	186.3	117.8	144.9
	Headway	15	15	10	10	30	30	10	10	10	10
	Vehicles	12	15	18	23	6	8	15	19	12	15
	Span	4	4	4	4	4	4				
	Daily Hours	48	60	72	92	24	32	0	0	0	0
	Days	255	255	255	255	255	255	255	255	255	255
	Annual Hours	12,240	15,300	18,360	23,460	6,120	8,160	0	0	0	0
Annual Hours (Wkend)	Cycle	180.8	228.7	180.8	228.7	180.8	228.7	146.5	191.5	121.1	148.9
	Headway	15	15	10	10	30	30	10	10	10	10
	Vehicles	13	16	19	23	7	8	15	20	13	15
	Span	12.5	12.5	12.5	12.5	12.5	12.5				
	Daily Hours	162.5	200	237.5	287.5	87.5	100	0	0	0	0
	Days	104	104	104	104	104	104	104	104	104	104
	Annual Hours	16,900	20,800	24,700	29,900	9,100	10,400	0	0	0	0
	total daily hours	357.5		522.5		188.5		192		160	
	Total Annual Hours	66,625	82,000	97,375	121,700	34,855	42,020	48,960	62,220	40,800	49,980
	O&M Cost/Hour	$ 90.00	$ 90.00	$ 90.00	$ 90.00	$ 90.00	$ 90.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00
	TOTAL ANNUAL O&M COST	$5,996,250	$7,380,000	$8,763,750	$10,953,000	$3,136,950	$3,781,800	$6,120,000	$7,777,500	$5,100,000	$6,247,500
		No Build		**TSM**		**Route 61: 30-min headway**		**Alternative A**		**Alternative B**	
	20% spare peak vehicles	3	4	4	5	2	2	4	5	3	4
	total vehicles required	17	21	24	30	9	11	20	26	17	21
		66,413.6 actual rev hours				**Cost of BRT + Rt 61 30-min**		**$9,256,950**	**$11,559,300**	**$8,236,950**	**$10,029,300**
		$ 5,995,426 Omnitrans' FY 2013 actual cost									

		Alternative C		Alternative D		Alternative E		Alternative F		"Shadow" service w/BRT	
	Holt Blvd. Option	BRT 30 stations replaces Rt. 61		10.0 miles excl. lanes plus 30-min Route 61		5 miles excl. lanes plus 30-min Route 61		3.5 miles excl. lanes plus 30-min Rte 61		Route 61: 60-min headway	
	Year	2015	2035	2015	2035	2015	2035	2015	2035	2015	2035
	Travel time Each Way (PM Peak) EB/WB	74.5 75.2	95.0 95.0	63.0 63.5	79.0 79.0	65.5 65.9	83.0 83.0	66.3 67.0	87.0 87.0	85.0 85.0	110.0 105.0
	Round Trip (PM Peak)	149.7	190.0	126.5	158.0	131.4	166.0	133.3	174.0	170.0	215.0
	Recovery	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
	Cycle (Peak)	172.2	218.5	145.5	181.7	151.1	190.9	153.3	200.1	195.5	247.3
	Faster Factor (Base)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
	Cycle (Base)	163.5	207.6	138.2	172.6	143.6	181.4	145.6	190.1	185.7	234.9
	Faster Factor (Eve)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
	Cycle (Eve)	154.9	196.7	130.9	163.5	136.0	171.8	138.0	180.1	176.0	222.5
	Faster Factor (Wkend)	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
	Cycle (Wkend)	159.2	202.1	134.6	168.1	139.8	176.6	141.8	185.1	180.8	228.7
Annual Hours (Peak)	Cycle	172.2	218.5	145.5	181.7	151.1	190.9	153.3	200.1	195.5	247.3
	Headway	10	10	10	10	10	10	10	10	60	60
	Vehicles	18	22	15	19	16	20	16	21	4	5
	Span	4	4	4	4	4	4	4	4	4	4
	Daily Hours	72	88	60	76	64	80	64	84	16	20
	Days	255	255	255	255	255	255	255	255	255	255
	Annual Hours	18,360	22,440	15,300	19,380	16,320	20,400	16,320	21,420	4,080	5,100
Annual Hours (Base)	Cycle	163.5	207.6	138.2	172.6	143.6	181.4	145.6	190.1	185.7	234.9
	Headway	10	10	10	10	10	10	10	10	60	60
	Vehicles	17	21	14	18	15	19	15	20	4	4
	Span	8	8	8	8	8	8	8	8	7	7
	Daily Hours	136	168	112	144	120	152	120	160	28	28
	Days	255	255	255	255	255	255	255	255	255	255
	Annual Hours	34,680	42,840	28,560	36,720	30,600	38,760	30,600	40,800	7,140	7,140
Annual Hours (Eve)	Cycle	154.9	196.7	130.9	163.5	136.0	171.8	138.0	180.1	176.0	222.5
	Headway	10	10	10	10	10	10	10	10	60	60
	Vehicles	16	20	14	17	14	18	14	19	3	4
	Span									4	4
	Daily Hours	0	0	0	0	0	0	0	0	12	16
	Days	255	255	255	255	255	255	255	255	255	255
	Annual Hours	0	0	0	0	0	0	0	0	3,060	4,080
Annual Hours (Wkend)	Cycle	159.2	202.1	134.6	168.1	139.8	176.6	141.8	185.1	180.8	228.7
	Headway	10	10	10	10	10	10	10	10	15	15
	Vehicles	16	21	14	17	14	18	15	19	13	16
	Span									12.5	12.5
	Daily Hours	0	0	0	0	0	0	0	0	162.5	200
	Days	104	104	104	104	104	104	104	104	104	104
	Annual Hours	0	0	0	0	0	0	0	0	16,900	20,800
	total daily hours	208		172		184		184		218.5	
	Total Annual Hours	53,040	65,280	43,860	56,100	46,920	59,160	46,920	62,220	31,180	37,120
	O&M Cost/Hour	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 90.00	$ 90.00
	TOTAL ANNUAL O&M COST	**$6,630,000**	**$8,160,000**	$5,482,500	$7,012,500	$5,865,000	$7,395,000	$5,865,000	$7,777,500	$2,806,200	$3,340,800
		Alternative C		**Alternative D**		**Alternative E**		**Alternative F**		**Route 61: 60-min headway**	
	20% spare peak vehicles	4	5	3	4	4	4	4	5	1	1
	total vehicles required	22	27	18	23	20	24	20	26	5	6
		NA	**NA**	**$8,619,450**	**$10,794,300**	**$9,001,950**	**$11,176,800**	**$9,001,950**	**$11,559,300**	**Cost of BRT + Rt 61 60-min**	

Alternative G (C+F) 3.5 miles excl. lanes plus 60-min Route 61		"Shadow" service w/BRT Route 61: 20-min headway		Alternative J (C+D) 10.0 miles excl. lanes plus 60-min Route 61		Alternative K Alt. C (mixed flow) plus 60-min Route 61		Alternative L Hybrid w/Foothill to Fontana Metrolink (all mixed flow), plus 60-min. Routes 61/66; 28 stations		Alternative M Hybrid w/Foothill extended to Kaiser Hosp. w/3.5 miles excl. lanes, 27 stations, plus 60-min. Routes 61/66		Alternative N West Valley Connector Initial Project Definition: w/6.5 miles excl. lanes, 27 stations, plus 60-min. Routes 61/66		"Shadow" service w/BRT Route 66: 60-min headway		"Shadow" service w/BRT Route 66: 15-min headway		Low Cost Limited Stop/Rapid Alt. N-3 (all mixed flow), plus 60-min. Routes 61/66; 27 stations; reduced off-peak/ no weekend BRT service		Alt. N-2 Alt. N-2 w/6.5 miles excl. lanes, 27 stations, plus 60-min. Routes 61/66; reduced off-peak/ no weekend BRT service		TSM Route 66: 10-min headway	
2015	**2035**	**2015**	**2035**	**2015**	**2035**	**2015**	**2035**	**2015**	**2035**	**2015**	**2035**	**2015**	**2035**	**2015**	**2035**	**2015**	**2035**	**2015**	**2035**	**2015**	**2035**	**2015**	**2035**
72.5 73.0	90.0 90.0	85.0 85.0	110.0 105.0	69.0 69.5	90.0 90.0	74.5 75.2	95.0 95.0	73.2 75.1	90.0 90.0	76.4 78.0	90.0 90.0	75.0 76.5	90.0 90.0	72.0 60.0	110.0 105.0	72.0 60.0	110.0 105.0	78.4 80.0	90.0 90.0	75.0 76.5	90.0 90.0	72.0 60.0	110.0 105.0
145.5	180.0	170.0	215.0	138.5	180.0	149.7	190.0	148.3	180.0	154.4	180.0	151.5	180.0	132.0	215.0	132.0	215.0	158.4	180.0	151.5	180.0	132.0	215.0
15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
167.3	207.0	195.5	247.3	159.3	207.0	172.2	218.5	170.5	207.0	177.6	207.0	174.2	207.0	151.8	247.3	151.8	247.3	182.2	207.0	174.2	207.0	151.8	247.3
5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
159.0	196.7	185.7	234.9	151.3	196.7	163.5	207.6	162.0	196.7	168.7	196.7	165.5	196.7	144.2	234.9	144.2	234.9	173.1	196.7	165.5	196.7	144.2	234.9
10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
150.6	186.3	176.0	222.5	143.3	186.3	154.9	196.7	153.5	186.3	159.8	186.3	156.8	186.3	136.6	222.5	136.6	222.5	163.9	186.3	156.8	186.3	136.6	222.5
7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
154.8	191.5	180.8	228.7	147.3	191.5	159.2	202.1	157.8	191.5	164.2	191.5	161.2	191.5	140.4	228.7	140.4	228.7	168.5	191.5	161.2	191.5	140.4	228.7
167.3	207.0	195.5	247.3	159.3	207.0	172.2	218.5	170.5	207.0	177.6	207.0	174.2	207.0	151.8	247.3	151.8	247.3	182.2	207.0	174.2	207.0	151.8	247.3
10	10	20	20	10	10	10	10	10	10	10	10	10	10	60	60	15	15	10	10	10	10	10	10
17	21	10	13	16	21	18	22	18	21	18	21	18	21	3	5	11	17	19	21	18	21	16	25
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
68	84	40	52	64	84	72	88	72	84	72	84	72	84	12	20	44	68	76	84	72	84	64	100
255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
17,340	21,420	10,200	13,260	16,320	21,420	18,360	22,440	18,360	21,420	18,360	21,420	18,360	21,420	3,060	5,100	11,220	17,340	19,380	21,420	18,360	21,420	16,320	25,500
159.0	196.7	185.7	234.9	151.3	196.7	163.5	207.6	162.0	196.7	168.7	196.7	165.5	196.7	144.2	234.9	144.2	234.9	173.1	196.7	165.5	196.7	144.2	234.9
10	10	20	20	10	10	10	10	10	10	10	10	10	10	60	60	15	15	15	15	10	10	10	10
16	20	10	12	16	20	17	21	17	20	17	20	17	20	3	4	10	16	12	14	17	20	15	24
8	8	7	7	8	8	8	8	8	8	8	8	8	8	7	7	7	7	10	10	8	8	7	7
128	160	70	84	128	160	136	168	136	160	136	160	136	160	21	28	70	112	120	140	136	160	105	168
255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
32,640	40,800	17,850	21,420	32,640	40,800	34,680	42,840	34,680	40,800	34,680	40,800	34,680	40,800	5,355	7,140	17,850	28,560	30,600	35,700	34,680	40,800	26,775	42,840
150.6	186.3	176.0	222.5	143.3	186.3	154.9	196.7	153.5	186.3	159.8	186.3	156.8	186.3	136.6	222.5	136.6	222.5	163.9	186.3	156.8	186.3	136.6	222.5
15	15	20	20	15	15	15	15	15	15	15	15	15	15	60	60	15	15	15	15	15	15	10	10
11	13	9	12	10	13	11	14	11	13	11	13	11	13	3	4	10	15	11	13	11	13	14	23
		4	4											4	4	4	4					4	4
0	0	36	48	0	0	0	0	0	0	0	0	0	0	12	16	40	60	0	0	0	0	56	92
255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
0	0	9,180	12,240	0	0	0	0	0	0	0	0	0	0	3,060	4,080	10,200	15,300	0	0	0	0	14,280	23,460
154.8	191.5	180.8	228.7	147.3	191.5	159.2	202.1	157.8	191.5	164.2	191.5	161.2	191.5	140.4	228.7	140.4	228.7	168.5	191.5	161.2	191.5	140.4	228.7
15	15	20	20	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	10	10
11	13	10	12	10	13	11	14	11	13	11	13	11	13	10	16	10	16	12	13	11	13	15	23
		12.5	12.5											7	7	7	7					7	7
0	0	125	150	0	0	0	0	0	0	0	0	0	0	70	112	70	112	0	0	0	0	105	161
104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104			104	104
0	0	13,000	15,600	0	0	0	0	0	0	0	0	0	0	7,280	11,648	7,280	11,648	0	0	0	0	10,920	16,744
196		271		192		208		208		208		208		115		224		196		208		330	
49,980	62,220	50,230	62,520	48,960	62,220	53,040	65,280	53,040	62,220	53,040	62,220	53,040	62,220	18,755	27,968	46,550	72,848	49,980	57,120	53,040	62,220	68,295	108,544
$ 125.00	$ 125.00	$ 90.00	$ 90.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 125.00	$ 89.00	$ 89.00	$ 89.00	$ 89.00	$ 105.00	$ 105.00	$ 125.00	$ 125.00	$ 89.00	$ 89.00
$6,247,500	$7,777,500	$4,520,700	$5,626,800	$6,120,000	$7,777,500	$6,630,000	$8,160,000	$6,630,000	$7,777,500	$6,630,000	$7,777,500	$6,630,000	$7,777,500	$1,669,195	$2,489,152	$4,142,950	$6,483,472	$5,247,900	$5,997,600	$6,630,000	$7,777,500	$6,078,255	$9,660,416
Alternative G (C+F)		**Route 61: 20-min headway**		**Alternative J (C+D)**		**Alternative K**		**Alternative L**		**Alternative M**		**Alternative N**		**Route 66: 60-min headway**		**Route 66: 15-min headway**		**Low Cost Limited Stop/Rapid**		**Alt. N-2**		**Route 66: 10-min headway**	
4	5	2	3	4	5	4	5	4	5	4	5	4	5	1	1	3	4	4	5	4	5	4	5
21	26	12	16	20	26	22	27	22	26	22	26	22	26	4	6	14	21	23	26	22	26	20	30
$9,053,700	**$11,118,300**	**Cost of BRT + Rt 61 60-min**		**$8,926,200**	**$11,118,300**	**$9,436,200**	**$11,500,800**	**$13,678,179**		**$13,678,179**		**$13,678,179**	**$15,555,000**					**$12,296,079**		**$14,742,597**	**$15,555,000**		

Rapid Bus Station Costing Detail
7/16/2014

7/28/2014

				Pomona					Montclair		Ontario									
	Description	**Unit**	**Unit Cost**	**Pomona Metrolink**	**Holt and Garey**	**Holt & Towne**	**Holt & Clark**	**Holt & Indian Hill**	**Holt & Ramona**	**Holt & Central**	**Holt & Mountain**	**Holt & San Antonio**	**Holt & Euclid**	**Holt & Campus**	**Holt & Grove**	**Holt & Vineyard**	**Ontario Airport**	**Inland Empire & Archibald**	**Inland Empire & Haven**	**Ontario Mills Mall**
20.00 Station Items (EB and WB platforms, except single platform at Metrolink static																				
10 x 40' Station Platform	Standard Boarding Area Platform (40' L x10' W)	Ea.	5,000					5,000	10,000	10,000	5,000	10,000			10,000	10,000	5,000	5,000	5,000	5,000
sbX Pylon[1]	Similar to sbX design; pylon with logo pole and signature light	Ea.	30,000	30,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	30,000	60,000	60,000	30,000
Standard Station Signage	Standard Omnitrans Signage Cost	Ea.	400	400	800	800	800	800	800	800	800	800	800	800	800	800	400	800	800	400
Shelter	with uniform design	Ea.	90,500		181,000	181,000	181,000	181,000	181,000	181,000	181,000	181,000	181,000	181,000	181,000	181,000	90,500	181,000	181,000	90,500
Benches	accessible seating area	Ea.	4,400		8,800	8,800	8,800	8,800	8,800	8,800	8,800	8,800	8,800	8,800	8,800	8,800	4,400	8,800	8,800	4,400
Map/Schedule Display	with map display on one side	Ea.	6,500		13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	6,500	13,000	13,000	6,500
Trash receptacles	one per platform	Ea.	660		1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	660	1,320	1,320	660
Bike Racks	one per platform	Ea.	515		1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	515	1,030	1,030	515
Variable Message Signs	one per platform	Ea.	20,000		40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	20,000	40,000	40,000	20,000
Lighting	LED Uplight Platform Light integrated with canopy	Ea.	1,330		2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660	1,330	2,660	2,660	1,330
Fare collection	On-board fareboxes incl. in vehicle cost		N/A																	
Public Art (optional)		Ea.	30,000																	
Landscaping/Pedestrian enhancements[2]	will vary by location	Ea.	150,000		150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	50,000	150,000	150,000	150,000
12 x 60' Bus Pads	cost may be shared with local jurisdiction	Ea.	10,000		10,000	20,000	20,000	10,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	10,000	10,000	20,000	20,000	10,000
Security Cameras	2 per platform	Ea.	3,000	6,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	6,000	12,000	12,000	6,000
Emergency Telephone	1 per platform	Ea.	1,000	1,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	1,000	2,000	2,000	1,000
	Cost per station			**$37,400**	**$482,610**	**$492,610**	**$492,610**	**$487,610**	**$502,610**	**$502,610**	**$497,610**	**$502,610**	**$492,610**	**$492,610**	**$502,610**	**$492,610**	**$226,305**	**$497,610**	**$497,610**	**$326,305**

$10,998,255

				Rancho Cucamonga			Fontana						
	Description	**Unit**	**Unit Cost**	**Rancho Metrolink**	**Foothill & Milliken**	**Foothill & Day Creek**	**Foothill & Mulberry**	**Foothill & Cherry**	**Foothill & Citrus**	**Foothill & Sierra**	**Fontana Metrolink**	**Sierra & Randall**	**Sierra & Permanente Dr. (Kaiser Hosp.)**
20.00 Station Items (EB and WB platforms, except single platform at Metrolink static													
10 x 40' Station Platform	Standard Boarding Area Platform (40	Ea.	5,000				10,000	10,000					5,000
sbX Pylon[1]	Similar to sbX design; pylon with logo	Ea.	30,000	30,000	60,000	60,000	60,000	60,000	60,000	60,000	30,000	60,000	30,000
Standard Station Signage	Standard Omnitrans Signage Cost	Ea.	400	400	800	800	800	800	800	800	400	800	400
Shelter	Upgraded shelter with wind screen w	Ea.	90,500				181,000	181,000	181,000	181,000		181,000	90,500
Benches	Standard Omnitrans 6' bench with ac	Ea.	4,400		8,800	8,800	8,800	8,800	8,800	8,800		8,800	4,400
Map/Schedule Display	Stand-alone; use advertising case wit	Ea.	6,500	6,500	13,000	13,000	13,000	13,000	13,000	13,000	6,500	13,000	6,500
Trash receptacles	one per platform	Ea.	660		1,320	1,320	1,320	1,320	1,320	1,320		1,320	660
Bike Racks	one per platform	Ea.	515		1,030	1,030	1,030	1,030	1,030	1,030		1,030	515
Variable Message Signs	one per platform	Ea.	20,000		40,000	40,000	40,000	40,000	40,000	40,000		40,000	20,000
Lighting	LED Uplight Platform Light integrated	Ea.	1,330		2,660	2,660	2,660	2,660	2,660	2,660		2,660	2,660
Fare collection	On-board fareboxes incl. in vehicle cost		N/A										
Public Art (optional)		Ea.	30,000										
Landscaping/Pedestrian enha	will vary by location	Ea.	150,000		150,000	150,000	150,000	150,000	150,000	150,000		150,000	150,000
12 x 60' Bus Pads	cost may be shared with local jurisdic	Ea.	10,000				10,000	20,000	20,000	20,000		20,000	10,000
Security Cameras	2 per platform	Ea.	3,000	6,000	12,000	12,000	12,000	12,000	12,000	12,000	6,000	12,000	6,000
Emergency Telephone	1 per platform	Ea.	1,000	1,000	2,000	2,000	2,000	2,000	2,000	2,000	1,000	2,000	1,000
	Cost per station			**$43,900**	**$291,610**	**$291,610**	**$492,610**	**$502,610**	**$492,610**	**$492,610**	**$43,900**	**$492,610**	**$327,635**

Notes:

[1] *sbX Pylon cost = $30,000*

[2] *Landscaping/Pedestrian enhancements: Landscaping cost on sbX varies. Therefore, an average of $150,000 has been used for cost estimation, except at Ontario Airport where minimal improvements would be required.*

Rapid Bus Station Costing Detail
7/16/2014

PUBLIC OUTREACH
WEST VALLEY CONNECTOR CORRIDOR

May – June 2014

S U M M A R Y   R E P O R T

INTRODUCTION

Between May-June, 2014, Omnitrans conducted public outreach activities for the West Valley Connector Corridor project. The purpose of the outreach activities was to explain the purpose and objectives of the project, and provide a range of opportunities to answer questions and collect comments from the public. The outreach activities summarized in this report include:

- Public outreach meetings (2)
- Rider information sessions (2)
- Operator information session
- Community survey

Project Background

Omnitrans is working to improve mobility in the San Bernardino Valley with an enhanced, state-of-the-art bus rapid transit system. The West Valley Connector Corridor is the next segment in this system. The project goals are:

- Respond to growth in Fontana, Rancho Cucamonga, Ontario, Montclair and Pomona
- Provide faster, more attractive transit service on Holt Blvd./Route 61 and Foothill Blvd./Route 66 corridors
- Connect all major activity centers including Ontario Mills, Convention Center and Ontario Airport; Victoria Gardens, schools, downtown and civic center areas; 3 Metrolink stations; and major employers such as Kaiser Permanente Hospital
- Support the cities' plans
- Analyze all viable alternatives to determine the best option

After screening 18 options over a 12 month evaluation process, Rapid Bus is the best choice based on ridership demand, vehicle capacity, and the cities' input. The project includes continuation of the current Routes 61 and 66 local service on 60 minute headways. The new Rapid bus service would provide:

- Limited stop service with sbX branding

- 10-minute peak/15-min. off peak headway
- 24 stations plus 3 Metrolink connections
- Transit Signal Priority (TSP)
- Enhanced stations and lighting
    - NextBus arrival information
    - Security cameras/emergency phone

Public input is critical to defining the project design and service features. In addition to extensive outreach to the cities' transportation planning, engineering, and public works departments, the project team conducted targeted outreach to major employers and businesses in the project area. Specific outreach activities included two public information meetings, rider information sessions at two transit centers on the corridor, an operator information session, and a community survey.

OVERALL FINDINGS

Overall, community members expressed support for the project. Key project elements that community members like about the project include:

- Increased service frequency
- Reduced travel time
- Improved connectivity to major destinations
- Enhanced station comfort and amenities
- Expanded real-time service and schedule information

Additional items important to community members include:

- Ensuring coordinated scheduling with other routes and modes
- Expanding service along other key corridors
- Providing more space for riders with bicycles
- Maintaining consistent and low fares across Omnitrans services
- Minimizing impacts to traffic flow and parking

PUBLIC OUTREACH MEETINGS

On June 3 and 4, 2014, Omnitrans conducted two (2) Public Outreach Meetings in the project area. The purpose of the meetings was to (a.) explain the purpose and objectives of the project, and (b.) provide a meaningful opportunity to answer questions and collect comments from participants.

Public Notifications

Public notifications of the meetings included a range of tactics included a variety of tools and methods, including:

- Printed Notice Distribution: On May 21, 2014, nearly 300 postcard notices were distributed to the project contact list including Project Development Team members, elected officials and staff from participating cities, large employers, major activity centers, business organizations including Chambers of Commerce, educational representatives, other government agencies and other interested stakeholders. A copy of the postcard is included as Appendix A.
- E-blast Notice Distribution: Similar to the postcard, an electronic notice was distributed via email to the project contacts on May 15, May 22 and June 2, 2014. A copy of the notice is included as Appendix B.
- On-board Rider Alert Notices: Omnitrans staff designed and placed an on-board rider alert card on Routes 61 and 66.
- Website: Omnitrans provided a web link the project notice and community survey, as did the City of Montclair. Screenshots of the websites are included as Appendices C and D.
- Public Announcements - City Council Meetings: Project team members provided meeting announcements during the public comment portion of City Council meetings most closely associated with the project alignment. A copy of the announcement script is included as Appendix E:

City Council	**Date**
City of Ontario	Tuesday, May 6
City of Montclair	Monday, May 19
City of Rancho Cucamonga	Wednesday, May 21
City of Fontana	Tuesday, May 27
City of Pomona	Monday, June 2

Project team members with Arellano Associates led development, coordination and distribution of public notifications in coordination with Omnitrans staff.

Meeting Format

The first public outreach meeting was held on June 3, 2014 at Ontario Senior Center located at 225 East B Street, Ontario. The second public outreach meeting was held on Wednesday, June 4, 2014 at North Hills Community Church located at 10601 Church Street, Suite 118, Rancho Cucamonga. Participants were invited to arrive at their convenience anytime between 4:00 and 7:00 p.m. to participate in an open house format, and/or to participate in a presentation and group discussion at 4:30 p.m. and 6:00 p.m.

Approximately 30 community members attended the public outreach meetings. Upon signing in, participants received an agenda, a survey form for submitting written comments from the workshop, and a project information sheet (see Appendices F, G and H). The open house included a series display boards that provided project overview, service options and features, alignment alternatives, purpose and need, alternatives analysis process, preferred option, and station design elements. Project team members engaged participants one-on-one to answer questions as requested. Additionally, two iPad kiosks with Wi-Fi access allowed participants to complete the project survey online.

During the presentation, project team members provided a more detailed review of the information on the display boards. A facilitated, open discussion allowed participants to ask questions and provide input about the project purpose and background, as well as their desired features for rapid bus service. Project team members recorded key discussion points on a large wallgraphic in real-time. A photo-reduced copy is included as Appendix I.

Summary of Discussion

Overall, the majority of participants expressed support for the project. Following is a summary of discussion points from the meetings.

- Strengthen connectivity and service to the proposed major destinations, other Omnitrans routes, and other transportation modes
- Enhance access to and comfort of transit vehicles, particularly for those who are mobility impaired
- Design comfortable stations that protect from the weather
- Provide real-time scheduling and arrival information at stations
- Educate the community about the service brand, and distinguish it from local bus service
- Support safer streets design through station designs
- Avoid impacts to traffic and parking
- Improve customer service from transit operators
- Maintain affordable transit fares that match local service
- Expand capabilities to carry bikes on transit vehicles
- Leverage underutilized parking at transit station areas for transit-oriented development
- Address constrained circulation at Fontana Transit Center

RIDER INFORMATION SESSIONS

On June 3 and 5, 2014, Omnitrans conducted two (2) Rider Information Sessions in the project area. The purpose of the meetings was to engage current Omnitrans riders of Routes 61 and 66 to (a.) provide a brief overview of the project purpose and proposed features, and (b.) collect input and reactions. The first session was held on June 3, 2014 at Fontana Transit Center, and the second session was held on June 5, 2014 at Ontario Mills Transfer Center. Project team members displayed two display boards with information, and engaged approximately 50 riders participants in brief discussions.

Overall, most riders expressed support for the project. Following are key discussion points from riders.

- Increase frequency of existing routes instead of implementing new routes
- Lower fares
- Extend hours on Route 29
- Accelerate implementation (2-3 years is too long)
- Reduce the number of existing stops to improve travel time

OPERATOR INFORMATION SESSIONS

Omnitrans provided a brief overview of the project to transit operators to solicit their input based on their experience in the project area. Approximately 35 operators provided verbal and written comments, with key points summarized as follows:

- Consider additional freeway-based service versus rapid service (e.g., Route 90)
- Strengthen connections, including:
    - Montclair Transit Center
    - San Bernardino to Montclair
    - Service span to San Bernardino
- Consider alignment revisions:
    - Extending to San Bernardino
    - Expanding service along Foothill Blvd.
    - Running on Archibald
- Address route navigation and timeliness challenges:
    - Turns at Monterrey, Valley, Marygold and Sierra
    - Space at Pomona Transit Center
    - Crossing railroad tracks at Ontario Airport
    - Closely located stops in Pomona
- Expand amenities at stops including security cameras and shade
- Minimize walking distances from stops to major destinations
- Address the increase in passengers with bikes
- Refine the sbX service and experience
    - Provide right-sized stations
    - Strengthen marketing
- Consider enhancing other routes:
    - Expand service to Yucaipa/Redlands
    - Improve scheduling of Route 82
    - Expand weekend service from Ontario Mills to Victoria Gardens
    - Expand service on Route 14 to address feed from the West Valley Connector

COMMUNITY SURVEY

From May 21 to June 11, 2014, Omnitrans provided a community survey to collect public comments on service enhancements for the West Valley Connector Corridor and the current Routes 61 and 66. While not a statistically valid survey, the purpose was to provide an additional source of qualitative information about interest in the proposed service and desired amenities. A copy of the survey is included as Appendix G.

The survey was distributed (a.) electronically through a web page, and (b.) in paper format. As part of public notification of the Public Outreach Meetings, respondents were asked to review the project display boards and complete the survey at the web page. Additionally, some participants at the Public Outreach Meetings and Rider Information Sessions completed web-based or paper-based versions of the survey. A total of 27 surveys were submitted. Detailed responses are included as Appendix J, and a summary of key findings follows:

- About half of respondents are current riders of Route 61 or 66 who ride anywhere from daily to once weekly.
- About half of respondents indicated that the West Valley Connector would serve their destinations.
- On a scale of 1 to 10 (10 being the most important), respondents indicated how important are the following factors to them in deciding whether to ride. The following percentages indicated how many respondents rated 10 for each factor:
    - Frequency (53%)
    - Reliability (60%)
    - Hours of Service (67%)
    - Travel Time/Speed (44%)
    - Station Access (40%)
    - Bus Crowding/Capacity (40%)
    - Easy to Use (47%)
- Respondents assigned a varied level of importance to each of the following station amenities:
    - Shelter/Bench
    - Trash Cans
    - Bike Racks
    - Route Map
    - NextBus Arrival Information Signs
    - Recognizable Route Sign/Logo
    - Public Art
    - Attractive Landscaping
    - Security Cameras/Emergency Telephone

    - Enhanced Lighting
- About half of respondents said they would ride the service.

Appendix A
Printed Notice

POMONA MONTCLAIR ONTARIO RANCHO CUCAMONGA FONTANA

West Valley Connector Corridor

OmniTrans
Connecting Our Community

Public Outreach Meetings

Premium transit service is planned for routes 61 and 66!

Come learn about how the proposed project could reduce travel times, increase ridership, connect major activity centers and employment centers, promote development in corridor cities and provide convenient connections to Metrolink service. Join us at one or both Public Outreach Meetings for the West Valley Connector Corridor and share your comments about the proposed project. Content will be the same at both meetings.

Tuesday, June 3, 2014
4-7 p.m.
Ontario Senior Center
225 East B Street
Ontario, CA 91764

Wednesday, June 4, 2014
4-7 p.m.
North Hills Community Church
10601 Church Street, Suite 118
Rancho Cucamonga, CA 91730

Presentations will be provided at 4:30 p.m. and 6:00 p.m.
Interpretación en Español y refrigerios estarán disponibles en las reuniones públicas. Spanish interpretation and light refreshments will be available at Outreach Meetings.

Rider Information Sessions featuring information about the project are also available as follows. Drop by before or after your Omnitrans trip.

Tuesday, June 3, 2014
7-10 a.m.
Fontana Transit Center

Thursday, June 5, 2014
3-6 p.m.
Ontario Mills Mall Transfer Center

For more information please call the Planning Administrative Secretary, Tembi Morales at (909) 379-7250 or tembi.morales@omnitrans.org. If you would like to be added to the project database to recieve updates, please call Maria Yanez-Forgash at (909) 627-2974 or email myanez-forgash@arellanoassociates.com.

Proposed Service for the West Valley Connector

Appendix B
E-blast Notice

POMONA MONTCLAIR ONTARIO RANCHO CUCAMONGA FONTANA

West Valley Connector Corridor

OmniTrans

Public Outreach Meetings

Premium transit service is planned for routes 61 and 66!

Come learn about how the proposed project could reduce travel times, increase ridership, connect major activity centers and employment centers, promote development in corridor cities and provide convenient connections to Metrolink service. Join us at one or both Public Outreach Meetings for the West Valley Connector Corridor and share your comments about the proposed project. Content will be the same at both meetings.

Tuesday, June 3, 2014
4-7 p.m.
Ontario Senior Center
225 East B Street
Ontario, CA 91764

Wednesday, June 4, 2014
4-7 p.m.
North Hills Community Church
10601 Church Street, Suite 118
Rancho Cucamonga, CA 91730

Presentations will be provided at 4:30 p.m. and 6:00 p.m.

Interpretación en Español y refrigerios estarán disponibles en las reuniones públicas.
Spanish interpretation and light refreshments will be available at Outreach Meetings.

Rider Information Sessions featuring information about the project are also available as follows. Drop by before or after your Omnitrans trip.

Tuesday, June 3, 2014
7-10 a.m.
Fontana Transit Center

Thursday, June 5, 2014
3-6 p.m.
Ontario Mills Mall Transfer Center

For more information please call the Planning Administrative Secretary, Tembi Morales at (909) 379-7250 or tembi.morales@omnitrans.org. If you would like to be added to the project database to recieve updates, please call Maria Yanez-Forgash at (909) 627-2974 or email myanez-forgash@arellanoassociates.com.

Proposed Service for the West Valley Connector

Appendix C

Omnitrans Website

Omnitrans Page 1 of 1

OmniTrans
Connecting Our Community

Select Language | Search

Contact | Careers | Bid Opportunities

BLOG

Services | NexTrip | Schedules/Maps | Fares/Passes | How To Ride | News/Events | About

Prev Next

123456

TRIP PLANNER

FROM Address and City

TO Address and City

DEPART ARRIVE

DATE mm/dd/yyyy

TIME 12:05 P M

PLAN IT

For advanced search options, visit *Google Transit*

RIDER ALERTS

For a list of current route detours, visit *Rider Alerts*

NEXTRIP

NexTrip

Get real time arrival information via text message, online or by phone! For more information *click here*

ONLINE STORE

Purchase passes, merchandise and more. *Click here* to visit the Omnitrans online store.

Latest Updates

Omnitrans employees donate to Locks of Love

Posted on June 11, 2014 | Leave a comment

A few Omnitrans employees are sporting a new look at the office. Dispatcher Al Mooney and Coach Operators Marianne Rose and Linda Buckley recently took advantage of a Super Cuts special that offered free haircuts to clients who were willing ... READ MORE>

Dump the Pump Day to feature KGGI radio celebrities, prize drawing & free bus passes

Posted on June 9, 2014 | Leave a comment

GET A FREE OMNITRANS BUS PASS FOR JUNE 19TH! Download the Omnitrans app or visit our website at www.omnitrans.org for a coupon redeemable for a free day pass valid on Thursday, June 19th. Use your free pass to ride any Omnitrans fixed route ... READ MORE>

OmniNews

Get a free bus pass for Dump the Pump Day!

Print this coupon redeemable for a free day pass valid on June, 19th, Dump the Pump Day. Or you can use the digital coupon exclusively available on our Omnitrans app. You can download the Omnitrans app for free on Google Play, iTunes and Amazon. READ MORE>

West Valley Connector : premium service planned

Omnitrans is planning premium transit service for the West Valley along current Route 61 and 66 corridors. The proposed service could reduce travel times, increase ridership, connect major activity centers and employment centers, promote development, and provide convenient connections to Metrolink. READ MORE>

Services
Fixed Route
sbX
Omnilink
OmniGo
Access ADA Service

NexTrip
Quick Guide
Real Time Arrivals
ADA Version
NexTrip Alerts
NexTrip iPhone App
NexTrip Android App

Schedules/Maps
Route Number
Cities
Colleges
High Schools
Hospitals
Parks
Shopping
Ontario Airport
Disneyland
County Jail

Fares/Passes
Omnitrans Store
Fare Table
Bus Passes
Senior Disability
GoSmart/Students
Accepted Fare Media

How To Ride
Plan Your Trip
Deposit Your Fare
Transfer Centers
Bike Rack
Using a Mobility Device
Rules of the Road
Safety & Security

News/Events
News Releases
Meetings & Agendas
Newsroom
Publications

About Omnitrans
Overview
Board
Executive Staff
Transit Advertising
Plans/Reports/Guidelines
Career Opportunities
Procurement
Contact Omnitrans
Other Transit Sites

Privacy | 511
Email Login

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http://omnitrans.org/ 6/12/2014

Appendix D

Montclair Website

City of Montclair, CA - Calendars Page 1 of 2

Low Graphics Version

MONTCLAIR CALIFORNIA Calendars

search go • our city • calendars • city services • departments • FAQ's • contact us • site help

Homepage > Calendars Email

June 2014

Su	M	Tu	W	Th	F	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Calendar Legend
Current Selected Date
Day has events

JUMP TO TODAY

June 2014

JUMP TO MONTH

Committees & Commissions
- Planning Commission
- Community Action Committee
- Code Enforcement Committee Meeting

Closed Fridays
- Alternate Friday Schedule

City Council
- General Meeting
- Special Meetings

Human Services
- Family Services
- Recreation Events
- Youth Services

City Events
- Delegations & Visits
- Elections
- Ground Breakings
- Official Openings
- Special City Events

Holidays
- Holiday Observed

Fire Department
- Misc. Events
- Code Enforcement

Police Dept.
- Holidays
- Police Dept Events
- Open House

Calendars

Tuesday, June 3, 2014

View List By: DAY WEEK MONTH YEAR

Printable Version:

Omnitrans West Valley Connector Corridor Informational Session
City Events - Special City Events

Location: Fontana Transit Center

An informational session on Omnitrans' West Valley Connector Corridor project, which is a planned upgrade to Routes 61 and 66, is scheduled between 7:00 and 10:00 a.m. Click on the attached flyer for more information.
Click Here for more Info

Date: 6/3/2014
Time: 7:00 AM - 10:00 AM

Contact: Maria Yanez-Forgash, Arellano Associates @ (909) 627-2974

Add to my Outlook Calendar:

Omnitrans West Valley Connector Corridor Public Outreach Meeting
City Events - Special City Events

Location: Ontario Senior Center, 225 East B Street, Ontario, CA 91764

A public outreach meeting on Omnitrans' West Valley Connector Corridor project, which is a planned upgrade to Routes 61 and 66, is scheduled between 4:00 and 7:00 p.m. Click on the attached flyer for more information.
Click Here for more Info

Date: 6/3/2014
Time: 4:00 PM - 7:00 PM

Contact: Maria Yanez-Forgash, Arellano Associates @ (909) 627-2974

Add to my Outlook Calendar:

http://www.cityofmontclair.org/cals/default.asp 6/12/2014

Appendix E

Public Announcement Script

OmniTrans

Omnitrans West Valley Connector

City Council Announcement Script – Approximately 2 minutes in length

As of May 5, 2014

Good Evening, my name is Laura Muna-Landa and I am working on the behalf of Omnitrans and would like to share some information about Omnitrans' West Valley Connector Corridor Rapid transit project. The West Valley Connector project is a Rapid bus project that will improve traveling along Holt Boulevard and Foothill Boulevard through the cities of Pomona, Montclair, Ontario, Rancho Cucamonga and Fontana. We invite the community to come to our public outreach meetings on June 3 and 4 to learn how the proposed project will reduce travel times, increase ridership, connect major activity centers and employment centers, and promote development in the corridor cities. These meetings also provide an opportunity for the community to give input on the project. We want to know what people want to see in a premium transit service that they would want to ride.

The meetings will be held on Tuesday, June 3 at the Ontario Senior Center and Wednesday, June 4 at North Hills Community Church in Rancho Cucamonga. Both meetings are 4-7pm with presentations at 4:30pm and 5:30pm.

Notification of these meetings is also being made via eblast notices to project stakeholders and postcard mailers. Information will be posted on the Omnitrans website, and we will work with staff of each of the cities to get information out through the cities' websites as well.

Again, the community meetings are on Tuesday, June 3 at the Ontario Senior Center and Wednesday, June 4 at North Hills Community Church in Rancho Cucamonga. Both meetings are 4-7pm.

And if you are an existing transit rider, we will also have convenient rider information sessions featuring information about the project. Drop by before or after your Omnitrans trip on Tuesday, June 3 from 7-10am at the Fontana Transit Center or Thursday, June 5 from 3-6pm at the Ontario Mills Mall Transfer Center.

All of this information will be posted shortly, at www.omnitrans.org.

Appendix F

Project Outreach Meeting Agenda

West Valley Connector Corridor

OmniTrans
Connecting Our Community.

PUBLIC OUTREACH MEETINGS

Tuesday, June 3, 2014
4:00 p.m. – 7:00 p.m.
Ontario Senior Center
225 East B Street
Ontario

Wednesday, June 4, 2014
4:00 p.m. – 7:00 p.m.
North Hills Community Church
10601 Church Street
Rancho Cucamonga

A G E N D A

Session #1	*Session #2*	
4:00 p.m.	*5:30 p.m.*	I. **Open House**
4:30	*6:00*	II. **Community Presentation** • Study Background • Alternatives Analysis Process • Preferred Option • Next Steps
4:50	*6:20*	III. **Community Discussion** • Amenities and Features • Station Locations • Frequency and Travel Time
5:30	*7:00 pm*	*Close*

Appendix G

Community Survey, page 1 of 2

OmniTrans
Connecting Our Community

West Valley Connector
Public Feedback Survey
June 3-5, 2014

1) Do you currently ride Route 61 or Route 66? Yes____ No_____
If yes, where do you travel to and from? ____________________
How often? ____________________

2) Do you currently transfer to another bus route or other mode (e.g., Metrolink) to get to your destination? Yes____ No____
If yes, which route(s)? ____________________

3) Would the West Valley Connector Project serve where you are going? Yes____ No ____

4) On a scale of 1-10 (10 being the most important), how important are the following factors to you in deciding whether to ride?

a.	Frequency	1	2	3	4	5	6	7	8	9	10
b.	Reliability	1	2	3	4	5	6	7	8	9	10
c.	Hours of service	1	2	3	4	5	6	7	8	9	10
d.	Travel Time/Speed	1	2	3	4	5	6	7	8	9	10
e.	Station access	1	2	3	4	5	6	7	8	9	10
f.	Bus Crowding/Capacity	1	2	3	4	5	6	7	8	9	10
g.	Easy to use	1	2	3	4	5	6	7	8	9	10

5) On a scale of 1-10 (10 being the most important) how do you rate the following station amenities:

a.	Shelter	1	2	3	4	5	6	7	8	9	10
b.	Bench	1	2	3	4	5	6	7	8	9	10
c.	Trash Cans	1	2	3	4	5	6	7	8	9	10
d.	Bike Racks	1	2	3	4	5	6	7	8	9	10
e.	Route map	1	2	3	4	5	6	7	8	9	10
f.	NextBus Arrival Information Signs	1	2	3	4	5	6	7	8	9	10
g.	Recognizable Route Sign/Logo	1	2	3	4	5	6	7	8	9	10
h.	Public Art	1	2	3	4	5	6	7	8	9	10
i.	Attractive Landscaping	1	2	3	4	5	6	7	8	9	10
j.	Security Cameras/Emergency Telephone	1	2	3	4	5	6	7	8	9	10
k.	Lighting	1	2	3	4	5	6	7	8	9	10

Turn over...

1

Appendix G
Community Survey, page 2 of 2

OmniTrans
Connecting Our Community

6) Would you ride the West Valley Connector Rapid Bus? Yes____ No____
Why or why not? ______________________________
What else would prompt you to ride it? ______________________________

7) Have you ridden on the new sbX Green Line (E Street) BRT service in San Bernardino?
Yes____ No_____
What did you like most about that service? ______________________________

8) Other comments? ______________________________

____

Staying Connected:

Please add me to the project database to receive updates. Yes _____ No ______
Email: ______________________ Phone number: ______________

Thank you for your interest and for your help in improving Omnitrans' services.

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Appendix H

Project Information Sheet, page 1 of 2

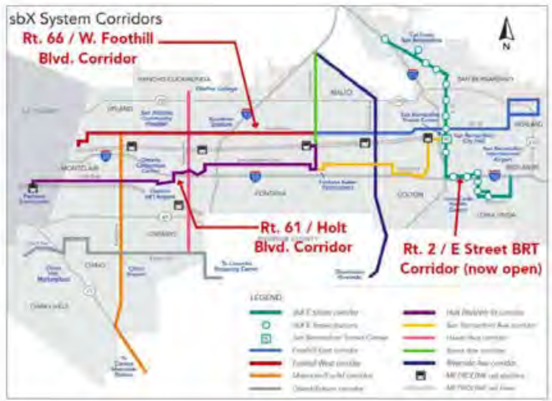
West Valley Connector Corridor

PROJECT INFORMATION SHEET

OmniTrans
Connecting Our Community.

Overview

The San Bernardino Valley will experience growing traffic congestion and one million more people by 2030. Omnitrans is working to improve mobility in the Valley with an enhanced, state-of-the-art bus rapid transit system. The West Valley Connector Corridor is the next segment in this system. The project goals are:



- Respond to growth in Fontana, Rancho Cucamonga, Ontario, Montclair and Pomona
- Provide faster, more attractive transit service on Holt Blvd./Route 61 and Foothill Blvd./Route 66 corridors
- Connect all major activity centers including Ontario Mills, Convention Center and Ontario Airport; Victoria Gardens, schools, downtown and civic center areas; 3 Metrolink stations; and major employers such as Kaiser Permanente Hospital
- Support the cities' plans
- Analyze all viable alternatives to determine the best option

After screening 18 options over a 12 month evaluation process, Rapid Bus and Bus Rapid Transit (BRT) are the best choices based on ridership demand, vehicle capacity, and the cities' input. Both have:

- Limited stop service
- Frequent headways
- Transit Signal Priority (TSP)
- Distinct sbX image/branding
- Enhanced stations and lighting
  - NextBus arrival information
  - Security cameras/emergency phone

BRT also features:

- Dedicated sbX lanes or queue jumpers
- Integrated with local service
- Level boarding
- Off-board fare collection

Appendix H

Project Information Sheet, page 2 of 2

West Valley Connector Rapid Bus

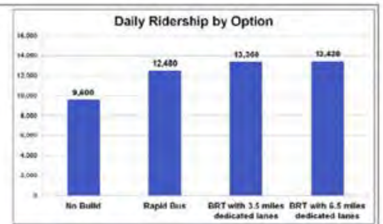
The project includes continuation of the current Routes 61 and 66 local service on 60 minute headways. The new **Rapid bus** service would provide:

- Limited stop service with sbX branding
- 10-minute peak/15-min. off peak headway
- 24 stations plus 3 Metrolink connections
- Transit Signal Priority (TSP)
- Enhanced stations and lighting
  - NextBus arrival information
  - Security cameras/emergency phone

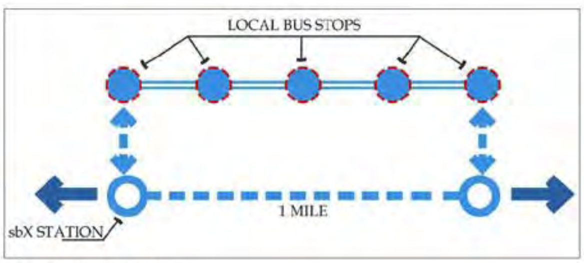
Ridership:

30%-40% higher ridership with Rapid Bus or BRT (based on 2014 ridership)

By 2035 ridership would increase an additional 50%

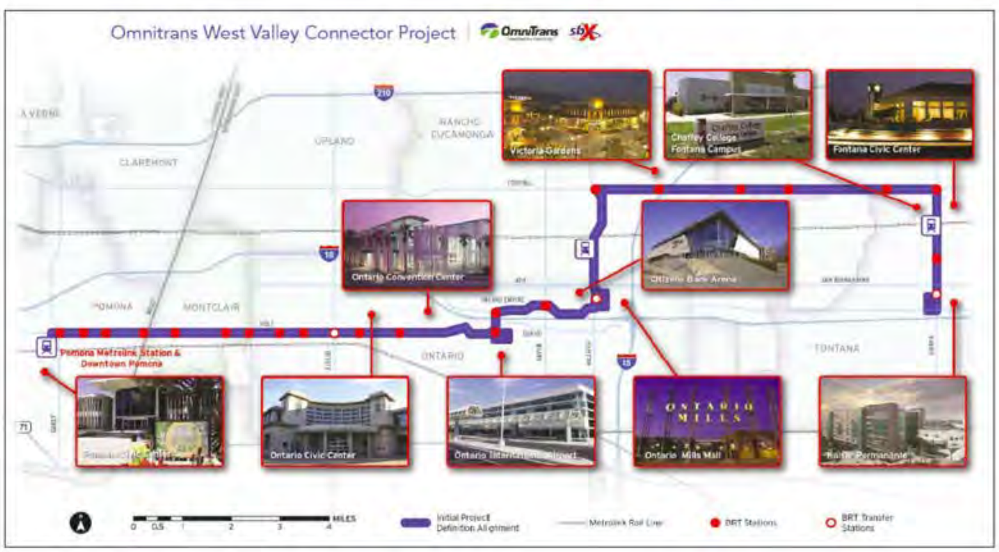


OPTION	CAPITAL COST
No Build – existing local Rt. 61/66	n/a
Rapid Bus (all mixed flow)	$25M
BRT (3.5 to 6.5 miles dedicated lanes)	$212M-$242M



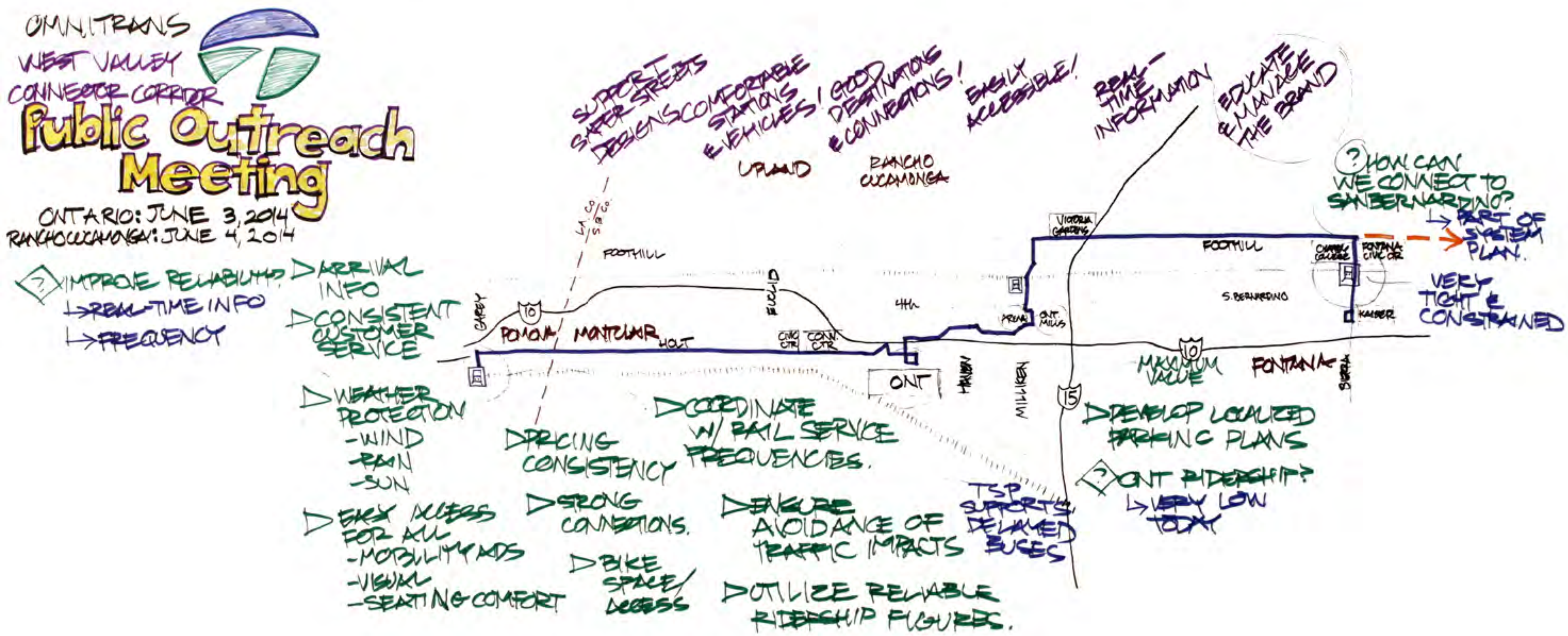
Limited stop service

Enhanced stations



Appendix I

Wallgraphic (photo-reduced)



Appendix J
Survey Results

Survey Results

Survey Name: Omintrans Survey
Response Status: Partial & Completed
Filter: None
Jul 02, 2014 11:08:37 AM

Do you currently ride Route 61 or Route 66?

	Number of Respon	Response Ratio
Yes	15	55.5%
No	6	22.2%
No Responses	6	22.2%
Total	27	100%

If yes, where do you travel to and from?

San Bernardino Transit center to ontairo airpot and the ontairo mills shopping cneter
Pomona
Ap o
Mostly Upland to Rancho
Downtown San Bernardino to Riverside Ave.
From Ontario to Montclair plaza. Chino towards Ontario mills mall...
Fontana metrolink to Haven on 66
Daily rider of Route 66, often covering the entire route at one time when traveling between West and East Valley. On Fridays, I will ride the 66 between 6-10 times throughout the day.
Downtown Ontario to Chaffey College Fontana Campus
I travel mostly from grove to pomona or fontana.
Work
Fontana Metrolink - Etiwanda & San Bernardino
Pomona to Ontario Mills
Daily
Route 66 from Fontana Metrolink to Milliken or Haven.

How often?

several times a month
Weekly
Weekly
3 to 4 days a week
Once every 2 to 3 weeks
Daily during the week, and alternating between Saturday and Sunday weekend service
5 times a week
every weekend and twice a week
Mon-Sun
Daily
Not that often.
During working hours.
Once every two or three weeks.

Do you currently transfer to another bus route or other mode (e.g., Metrolink) to get to your destination?

	Number of Respon	Response Ratio
Yes	12	44.4%
No	8	29.6%
No Responses	7	25.9%
Total	27	100%

If yes, which route(s)?

do not rember the rout numbers
66
Route 22
61 towards Pomona metrolink
I use the 14 when going to East Valley from Montclair
I use route 80,61,65, and 68
14 to 61 and 14 to 66 and back
Take Metrolink or 14 Foothill
66 or 61 - Sometimes on the hour a long wait.
Route 19 or 15

Would the West Valley Connector Project serve where you are going?

	Number of Respon	Response Ratio
Yes	13	48.1%
No	5	18.5%
No Responses	9	33.3%
Total	27	100%

On a scale of 1-10 (10 being the most important), how important are the following factors to you in deciding whether to ride?

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	1	2	3	4	5	6	7	8	9	10
Frequency	2 13%	2 13%	0 0%	1 7%	0 0%	1 7%	1 7%	0 0%	0 0%	8 53%
Reliability	4 27%	0 0%	0 0%	0 0%	0 0%	0 0%	1 7%	0 0%	1 7%	9 60%
Hours of Service	2 13%	1 7%	1 7%	0 0%	0 0%	0 0%	0 0%	0 0%	1 7%	10 67%
Travel Time/Speed	2 13%	0 0%	2 13%	0 0%	0 0%	0 0%	4 25%	1 6%	0 0%	7 44%
Station Access	3 20%	1 7%	0 0%	0 0%	0 0%	3 20%	0 0%	1 7%	1 7%	6 40%
Bus Crowding/Capacity	2 13%	0 0%	1 7%	1 7%	1 7%	3 20%	0 0%	0 0%	1 7%	6 40%
Easy to Use	2 13%	2 13%	0 0%	0 0%	1 7%	0 0%	0 0%	2 13%	1 7%	7 47%

On a scale of 1-10 (10 being the most important), how do you rate the following station amenities?

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	1	2	3	4	5	6	7	8	9	10
Shelter/Bench	3 19%	0 0%	0 0%	1 6%	2 13%	1 6%	0 0%	1 6%	1 6%	7 44%
Trash Cans	2 14%	2 14%	0 0%	1 7%	1 7%	0 0%	0 0%	2 14%	1 7%	5 36%
Bike Racks	2 13%	0 0%	1 6%	1 6%	1 6%	0 0%	2 13%	1 6%	1 6%	7 44%
Route Map	1 7%	1 7%	2 13%	0 0%	1 7%	0 0%	1 7%	1 7%	2 13%	6 40%
NextBus Arrival Information Signs	3 20%	1 7%	0 0%	0 0%	1 7%	0 0%	0 0%	1 7%	1 7%	8 53%
Recognizable Route Sign/Logo	1 7%	0 0%	1 7%	3 20%	0 0%	0 0%	0 0%	3 20%	1 7%	6 40%
Public Art	4 27%	1 7%	0 0%	1 7%	0 0%	4 27%	1 7%	0 0%	0 0%	4 27%
Attractive Landscaping	3 20%	2 13%	0 0%	1 7%	0 0%	4 27%	2 13%	1 7%	0 0%	2 13%
Security Cameras/Emergency Telephone	2 13%	1 7%	1 7%	1 7%	2 13%	0 0%	0 0%	0 0%	0 0%	8 53%
Enhanced Lighting	3 20%	1 7%	1 7%	1 7%	1 7%	0 0%	0 0%	1 7%	1 7%	6 40%

Would you ride the West Valley Connector Rapid Bus?

	Number of Respon	Response Ratio
Yes	13	48.1%
No	3	11.1%
No Responses	11	40.7%
Total	27	100%

Why or why not?

I would as long as it goes to the ontair aiport but it needs to stop at each turnamal so that riders do not have to walk a long distance to get on the bus or having to wait on ontiaro airport buses which could cases riders be late for a transfer route. Please see if this can be added as a opetion to the rout so people travaling back to san Bernardino area would not have to end up wating a entire houer for antother bus to come for them.
Much more convenient
get faster to catch the silver streak bus to cal state LA
The Foothill corridor makes a lot more sense. There i greater traffic on the Foothill corridor than on Holt. Ridership would increase as well.
It may speed up my trip, IF it connects well enough to Route 22 and if the stop downtown is not too inconvenient ... these are issues with the "SBX" route on E Street, compared to the formerly more convenient Route 2
The having to wait and transfer onto another bus

Does not cover Upland or the western half of Foothill Boulevard in Rancho Cucamonga, which serves as a major business and employment center even for East Valley residents. It would be better to have a service complimenting the Foothill Transit Silver Streak, operating via the 10 Freeway between Pomona, Montclair, Ontario Mills, Fontana, Arrowhead Regional Medical Center, and Downtown San Bernardino.
I would because it looks easy and fun
Saves time
If it was faster than regular service and served the airport.
To connect on time.
To ride to mall locations.
Probably more because reduction in local frequency would force me to ride.

What else would prompt you to ride it?

Weekend houers and earler stat and later end times.
spending less on gas
I would be more likely to ride it if it connected all of the West and East Valley cities by continuing onto San Bernardino instead of ending at Fontana.
how safe it would be
Cost
Longer span of service
To go to church.

Have you ridden on the new sbX Green Line (E Street) BRT service in San Bernardino?

	Number of Respon	Response Ratio
Yes	5	18.5%
No	9	33.3%
No Responses	13	48.1%
Total	27	100%

If yes, what did you like most about that service?

takes a lot less time but a new rout needs to be made avaluble between cal state and valley college and another one between the transit center and valley college so studnets can make 7Am classes without having to run to class or be late.
Nice stations
Why, of course saves me gas plus the traffic
Faster speed due to fewer stops along the route
Nice buses and nice stations

Additional comments:

Need to start some of your bus routers earler such as rout 7 and make it run tell 10PM so studnets taking a late class at valley college can make it home without running into transpertashion problems.
Thank you
can the bus go all the way to cal poly?
However, what I have not liked about "SBX" so far ... poor connections to 4th Street bus stops, Mill Street, and Waterman Ave.; unpredictable arrival times; not fast enough to make up for service cutbacks to Route 2 and long walks to/from stops
There is going to be a gap between Fontana and San Bernardino if the West Valley Connector is constructed as planned. The focus needs to be on developing a full solution to east-west travel needs of the region. The West Valley Connector running along Holt Boulevard is not going to attract the more affluen residents of Upland and Rancho Cucamonga, which are part of the commuter market described in the FY2015 Marketing Plan. Therefore, there is going to be a large potential ridership demographic being lost by not simply developing the full Foothill Blvd corridor instead.

Proposed 60 minute local headway is way too limited. I would prefer a local headway of no worse than 30 minutes, similar to the Green Line or OCTA Bravo. There are a lot of people that cannot walk long distances especially in the heat. Rather than 10 minute peak/15 off peak headway maybe 15 peak, 20 off peak, with 30 local service and robust Nextbus information to tell people when the next trip is coming.

Also how reliable will the Rapid be around shopping centers during the holiday season? There definitely needs to be special lanes or queue bypasses at Ontario Mills, or there should be an off site transit center that does not require fighting traffic headed to the mall. Also, Omnitrans should consider running the new line up Central to the Montclair Plaza area and Montclair Transcenter, for better connections to express service downtown and to the future Metro Gold Line.

Cutbacks on local services (such as when Route 2 was reduced with SBX) will/do usually eat up time savings, when one has to walk further to/from stops and/or make an extra transfer to complete trip.

Please add me to the project database.

	Number of Respon	Response Ratio
Yes	6	22.2%
No	5	18.5%

No Responses	16	59.2%
Total	27	100%

Contact Information:

First Name	5
Last Name	4
Work Phone	4
Email Address	5