REPORT

DATE: June 1, 2006

TO: Transportation and Communications Committee (TCC)

FROM: Naresh Amatya, Lead Regional Planner, 213-236-1885, amatya@scag.ca.gov
Philip Law, Acting Senior Planner, 213-236-1841, law@scag.ca.gov

SUBJECT: Draft Amendment to the 2004 Regional Transportation Plan (RTP)

EXECUTIVE DIRECTOR'S APPROVAL:

RECOMMENDED ACTION:
Approve the release of the Draft 2004 RTP Amendment, including the addendum to the Program EIR, for a 30-day public review and comment period.

SUMMARY:
Omnitrans has requested that SCAG amend the 2004 Regional Transportation Plan (RTP) to add a bus rapid transit project, called sbX for San Bernardino Express, to provide improved service along the E Street transit corridor in San Bernardino County. SCAG staff has determined that the RTP, if amended, would continue to meet the conformity requirements, including emissions analysis and financial constraint. The Draft 2004 RTP Amendment document is attached for your review.

BACKGROUND:
Omnitrans has completed its Bus Rapid Transit Major Investment Study, which resulted in a locally preferred alternative that the Omnitrans Board approved on December 7, 2005. The project is ready to advance to the project development phase, but will not receive approval to do so from the Federal Transit Administration until the project is included in the RTP. The sbX project is not currently included in the 2004 RTP.

Amending the 2004 RTP to include the sbX project requires modeling the proposed project, conducting a conformity determination (including emissions analysis, financial constraint, and interagency consultation), preparing an addendum to the RTP Program EIR, circulating the amendment for public review and comment, and responding to comments before final adoption by the Regional Council. SCAG staff has determined that amending the 2004 RTP to include the sbX project will not adversely impact the RTP's conformity, including the emissions analysis and financial constraint.

Staff anticipates returning to the Executive Committee in August 2006 for final approval of the amendment.

FISCAL IMPACT:
Funds for RTP development are included in the FY 05/06 and FY 06/07 Overall Work Program.

DRAFT

2004 REGIONAL TRANSPORTATION PLAN AMENDMENT

June 1, 2006

SOUTHERN CALIFORNIA

ASSOCIATION of GOVERNMENTS

CONTENTS

Introduction 1

Project Description 2

Fiscal Impact 4

Conformity Findings 5

Addendum to the 2004 RTP Program Environmental Impact Report (PEIR) 11

Public Review and Comment 20

Attachment A – Omnitrans Request for RTP Amendment 21

LIST OF FIGURES

Figure 1 – Map of sbX E Street Transit Corridor 3

INTRODUCTION

The Southern California Association of Governments (SCAG) is the designated Metropolitan Planning Organization (MPO) for six counties in Southern California, including Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. As the MPO, SCAG is required to develop and update the Regional Transportation Plan (RTP). The RTP is a long-range plan that identifies multi-modal regional transportation needs and investments over the next 25 years.

SCAG adopted the current operating 2004 RTP on April 1, 2004 (resolution #04-451-2), and amended it once on February 2, 2006 (resolution #06-471-3). The RTP was developed in a comprehensive, cooperative, and continuing process that involved a broad spectrum of transportation and related stakeholders, as required under the Transportation Equity Act for the 21st Century (TEA-21).

Omnitrans, a public transit agency providing bus service to parts of San Bernardino County, has requested that SCAG amend the 2004 RTP to include the E Street Transit Corridor project, called sbX (see Attachment A). The sbX project is located within the cities of San Bernardino and Loma Linda in San Bernardino County.

The purpose of this document is to identify the specific details of the 2004 RTP Amendment and to ensure that the proposed changes are consistent with federal and state requirements, including the TEA-21 planning requirements and the Transportation Conformity Rule. All associated analyses for the RTP amendment are incorporated into this document.

PROJECT DESCRIPTION

The 2004 RTP Amendment will add a new Bus Rapid Transit (BRT) project called sbX, which stands for San Bernardino Express. BRT is designed to provide fast, high-quality bus service. It can operate in mixed traffic or in dedicated guide-ways, take advantage of signal priority at intersections, board and alight passengers through streamlined processes, and improves bus stop spacing at planned stations. The 2004 RTP calls for a region-wide BRT expansion, including additional service for Los Angeles County's Metro Rapid system and the implementation of new BRT systems in Orange and Riverside Counties. The addition of sbX will bring BRT to San Bernardino County.

sbX E Street Transit Corridor

The sbX project is a 16-mile BRT project located in the cities of San Bernardino and Loma Linda in San Bernardino County. The project serves 16 stops along the E Street Transit Corridor, including California State University at San Bernardino in the north and Loma Linda University Medical Center and the VA Hospital in the south. The anticipated completion date for this project is 2010. The sbX is depicted in Figure 1.

Specifically, the Amendment adds the following text to Table 4.10 (page 108) of the 2004 RTP document:

Table 4.10
Transit Corridor Projects

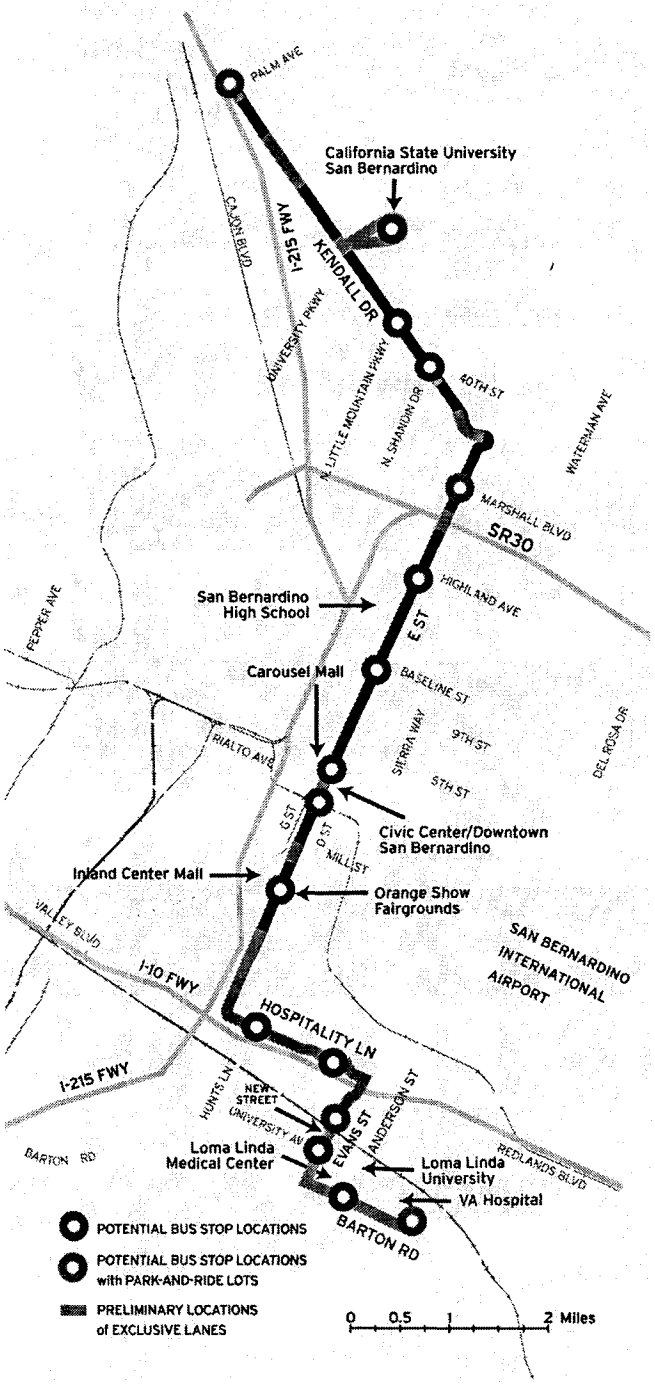
Project	*Type*	*Implementation Schedule*	*County*
sbX E Street Transit Corridor	Bus Rapid Transit	2010	San Bernardino

The Amendment further revises page I-173 of the 2004 RTP Technical Appendix I by adding the following text:

2004 RTP – Plan Projects

CO	Category	Route/Program	From	To	Description	Public Funding	Private/ Other Funding	Completion Year	RTP ID
SB	Transit	sbX E Street Transit Corridor	San Bernardino	Loma Linda	Bus Rapid Transit	$153,000,000		2010	4TR0603

Figure 1 – sbX E Street Transit Corridor



FISCAL IMPACT

The 2004 RTP Amendment includes the addition of the Omnitrans' E Street Transit Corridor bus rapid transit (BRT) project—also known as the San Bernardino Express (sbX). After reviewing funding considerations for this project, SCAG finds that the amendment does not adversely impact the financial constraint of the 2004 RTP. The Plan remains financially constrained. The fiscal impact of the amendment is summarized below.

The sbX BRT service along the E Street Transit Corridor in the cities of San Bernardino and Loma Linda has a total capital cost of $153 million (Long-term Locally Preferred Alternative) with an annualized operating cost of $12.5 million.

In the 2004 RTP, SCAG included $364 million for local transit service in San Bernardino County. This level of funding was set aside in anticipation of new rapid transit (BRT) projects as identified in Omnitrans' short-range plan for FY2004-FY2009. The following initial sources of funding have been identified to cover capital project costs:

- FTA Section 5309 – 50 percent (New Starts/Small Starts)
- FTA Section 5307 – 20 percent
- Measure I – 30 percent

It is anticipated that funding for operating costs would come from a combination of passenger fare revenues, Measure I, and Local Transportation Funds (LTF).

In order to become eligible for federal funds, Omnitrans is following the New Starts process, as prescribed by the Federal Transit Administration (FTA). Accordingly, detailed financial plan development efforts are underway—with more extensive evaluation of funding sources for the local match of federal funds.

CONFORMITY FINDINGS

Federal Requirements

Federal and state regulations require that a transportation conformity process must be undertaken by SCAG as the Metropolitan Planning Organization (MPO) of the region prior to the amendment's approval and conformity finding by the Regional Council. This includes an interagency consultation, release of the draft document for a 30-day public review and comment period, SCAG's responses on the written comments, and a public hearing at the Regional Council meeting prior to the final action on the amendment. Once the Regional Council approves the amendment, it will then be submitted to the federal agencies for the final conformity determination.

Sections 93.119(e) and 93.122(g) are the relevant parts of the Transportation Conformity rule for these amendments.

Conformity Status of Current RTIP and RTP

On June 7, 2004, the federal conformity determination for the 2004 RTP was issued for the following non-attainment and maintenance areas:

- South Coast Air Basin (SCAB – Ozone, CO, NO2, and PM10)
- San Bernardino County portion of the Mojave Desert Air Basin (MDAB – PM10)
- Coachella Valley portion of the Salton Sea Air Basin (SSAB - PM10)
- Imperial County portion of SSAB (Ozone and PM10)

The federal conformity determination for the Ventura County portion of the South Central Coast Air Basin (ozone) and the Southeast Desert Modified ozone area was issued by the federal agencies on June 16, 2004 although the effective date for the conformity determination for the entire SCAG 2004 RTP, including all of the air basins is June 7, 2004.

On October 4, 2004, the federal agencies approved funding and determined conformity of the 2004 RTIP. The federal funding approval of the 2004 RTIP will expire on October 4, 2006. The 2004 RTIP is based on the 2004 RTP and implements the projects and programs included in the fiscal years (2004/05 – 2009/20010) of the 2004 RTP.

On March 30, 2006 a federal conformity determination for the 2004 RTP was issued for the South Coast Air Basin which is designated as non attainment for PM2.5.

Summary of the 2004 RTP Regional Emissions Analyses

The regional emissions analysis methodology for this amendment to the 2004 RTP uses two sets of calculations. For pollutants with emissions budgets the test used is the budget test. Only one pollutant in the SCAB (PM2.5) does not currently have a budget, until the budget is established, the less than base year test is used for analysis. A summary of the regional emissions analysis (conformity finding) is tabulated below.

The regional emissions analysis for the amendment was performed using SCAG's Regional Transportation Model used for the 2004 RTP and RTIP, and utilizes the planning, socioeconomic and model assumptions from the 2004 RTP and RTIP. The applicable conformity findings and detailed modeling assumptions can be found at:

http://www.scag.ca.gov/rtp2004/2004draft/FinalPlan.htm

and:

http://www.scag.ca.gov/rtip/final04/SecII.pdf

Conformity Findings

SCAG has completed its analysis of the proposed changes to the 2004 RTP. SCAG's findings for the approval of this amendment are as follows:

Overall

Statement of Fact: Inclusion of this amendment in the 2004 RTP would not change any other policies, programs and projects which were previously approved by the federal agencies on June 7, 2004.

Finding: SCAG has determined that the 2004 RTP Amendment is consistent with all federal and state requirements and complies with the federal conformity regulations.

Regional Emissions Analysis – South Coast Air Basin (SCAB)

Finding: The 2004 RTP Amendment's regional emissions for Ozone precursors (NOx, ROG/VOC) are consistent with all applicable emissions budgets for all milestone, attainment, and planning horizon years (2003 SIP)

Finding: The 2004 RTP Amendment's regional emissions for CO are consistent with all applicable emissions budgets for all milestone, attainment, and planning horizon years (2003 SIP).

Finding: The 2004 RTP Amendment's regional emissions for NO2 are consistent with all applicable emissions budgets for all milestone, attainment, and planning horizon years (2003 SIP).

Finding: The 2004 RTP Amendment's regional emissions for PM10 (particulate matter less than 10 microns in size) precursors are consistent with all applicable emissions budgets for all milestone, attainment, and planning horizon years (2003 SIP).

Finding: The 2004 RTP Amendment's regional emissions for direct PM2.5 and NOx are less than the baseline year (2002) for the 24-hour and the annual standard in the SCAB.

Timely Implementation of TCMs

Finding: The 2004 RTP Amendment does not change funding and timely implementation of SCAB TCM projects. All SCAB TCM projects in the federally approved conforming 2004 RTP are given funding priority and are on schedule for implementation.

Fiscal Constraint Analysis

Finding: All projects listed in the 2004 RTP (including the proposed amendment) are financially constrained for all fiscal years. Fiscal constraint is analyzed in a separate section of this report.

Interagency Consultation and Public Involvement Analysis

Finding: SCAG has consulted with the respective transportation and air quality planning agencies. The proposed sbX E Street Corridor was discussed at the Transportation Conformity Working Group (which includes representatives from the respective air quality and transportation planning agencies) on February 28, 2006. In addition, the proposed Amendment to the 2004 RTP will undergo the required consultation and public participation process. A 30 day public comment period announcement is expected to be posted on the SCAG website by Thursday, June 1, 2006.

Regional Emissions Analysis – South Coast Air Basin (SCAB)

The South Coast Air Basin (SCAB) covers the urbanized portions of Los Angeles, Orange, Riverside, and San Bernardino counties, and is within the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The proposed project is located within the SCAB; emissions changes in other air basins due to the proposed project are negligible and therefore are not included in this summary report.

OZONE – SUMMER (8HR)

ROG	YR 2005	YR 2008	YR 2010	YR 2020	YR 2030
Amended 2004 RTP	258.467	212.754	151.201	107.250	73.187
BUDGET	**263.000**	**216.000**	**155.000**	**155.000**	**155.000**

NOx	YR 2005	YR 2008	YR 2010	YR 2020	YR 2030
Amended 2004 RTP	542.271	453.459	349.166	184.312	120.859
BUDGET	**546.000**	**464.000**	**352.000**	**352.000**	**352.000**

Conformity finding requirement: RTP emissions must be equal to or less than budget

CARBON MONOXIDE (CO) - WINTER

CO	YR 2005	YR 2010	YR 2020	YR 2030
Amended 2004 RTP	2,597.739	1,808.566	859.986	530.271
BUDGET	**3,361.000**	**3,361.000**	**3,361.000**	**3,361.000**

Conformity finding requirement: RTP emissions must be equal to or less than budget

NITROGEN DIOXIDE (NO2) - WINTER

NOx	YR 2005	YR 2010	YR 2020	YR 2030
Amended 2004 RTP	613.664	448.688	205.652	133.040
BUDGET	**686.000**	**686.000**	**686.000**	**686.000**

Conformity finding requirement: RTP emissions must be equal to or less than budget

PARTICULATE MATTER LESS THAN 10 MICRONS (PM10) - ANNUAL AVERAGE

	YR 2006	YR 2010	YR 2020	YR 2030
ROG				
Amended 2004 RTP	245.350	188.885	106.482	72.544
BUDGET	**251.000**	**251.000**	**251.000**	**251.000**
NOx				
Amended 2004 RTP	534.144	417.857	192.763	125.758
BUDGET	**549.000**	**549.000**	**549.000**	**549.000**
PM10				
Amended 2004 RTP	165.927	163.355	161.520	163.923
BUDGET	**166.000**	**166.000**	**166.000**	**166.000**

Conformity finding requirement: RTP emissions must be equal to or less than budget

DIRECT PM2.5 EMISSIONS - 24-Hour

	YR 2002	YR 2010	YR 2020	YR 2030
Amended 2004 RTP				
Exhaust	10.48	9.48	8.82	9.20
Tire Wear	0.83	0.89	0.99	1.08
Brake Wear	1.97	2.10	2.25	2.44
Total PM2.5 Exhaust	**13.27**	**12.47**	**12.06**	**12.72**
Base Year Emissions	**13.27**	**13.27**	**13.27**	**13.27**
Difference from Base Year	**0.00**	**-0.80**	**-1.21**	**-0.55**

Conformity finding requirement: RTP emissions must be equal to or less than base year

DIRECT PM2.5 EMISSIONS - Annual

	YR 2002	YR 2010	YR 2020	YR 2030
Amended 2004 RTP				
Exhaust	3,825	3,460	3,219	3,358
Tire Wear	303	325	361	394
Brake Wear	719	767	821	891
Total PM2.5 Exhaust	**4,844**	**4,552**	**4,402**	**4,643**
Base Year Emissions	**4,844**	**4,844**	**4,844**	**4,844**
Difference from Base Year	**0.00**	**-292**	**-442**	**-201**

Conformity finding requirement: RTP emissions must be equal to or less than base year

OXIDES OF NITROGEN (NOx) - 24-Hour

	YR 2002	YR 2010	YR 2020	YR 2030
Amended 2004 RTP	**715.34**	**417.86**	**192.76**	**125.76**
Base Year Emissions	**715.34**	**715.34**	**715.34**	**715.34**
Difference from Base Year	**0.00**	**-297.48**	**-522.58**	**-589.58**

Conformity finding requirement: RTP emissions must be equal to or less than base year

OXIDES OF NITROGEN (NOx) - Annual

	YR 2002	YR 2010	YR 2020	YR 2030
Amended 2004 RTP	**261,099**	**152,518**	**70,359**	**45,902**
Base Year Emissions	**261,099**	**261,099**	**261,099**	**261,099**
Difference from Base Year	**0**	**-108,581**	**-190,741**	**-215,198**

Conformity finding requirement: RTP emissions must be equal to or less than base year

ADDENDUM TO THE 2004 RTP PROGRAM ENVIRONMENTAL IMPACT REPORT (PEIR)

Introduction

This document is an Addendum to the Final Program Environmental Impact Report (PEIR) for the 2004 Regional Transportation Plan (RTP or "Plan"), prepared and certified by the Southern California Association of Governments (SCAG) in April 2004 and as amended on February 2, 2006.

Omnitrans, a public transit agency providing bus service to parts of San Bernardino County, has requested that SCAG amend the 2004 RTP to include the E Street Transit Corridor project, a bus rapid transit (BRT) project called sbX (see Attachment A). The sbX project is located within the cities of San Bernardino and Loma Linda in San Bernardino County. This 2004 PEIR Addendum evaluates the potential environmental effects associated with including the sbX project in the 2004 RTP.

As the Lead Agency under the California Environmental Quality Act (CEQA) (Pub. Res. Code Section 21000 et seq.) SCAG prepared a Final PEIR (SCH No. 2003061075) to evaluate the potential environmental impacts associated with implementation of the Plan. The Plan is a long-range program that addresses the transportation needs for the six-county SCAG Region through 2030. Although the Plan has a long-term time horizon under which projects are planned and proposed to be implemented, federal and state mandates ensure that the Plan is both flexible and responsive in the near term. Therefore, the Plan is regarded as both a long-term regional transportation blueprint and as a dynamic planning tool subject to ongoing refinement and modification.

The Plan includes both specific projects and strategies that address transportation and urban form. The purpose of the PEIR is to identify the potentially significant environmental impacts associated with the implementation of the projects, programs, and policies included in the Plan. The PEIR serves as the informational document to inform decision-makers, agencies and the public of the potential environmental consequences of approving the 2004 RTP.

The 2004 RTP PEIR, focused on broad policy goals, alternatives and program-wide mitigation measures (*CEQA Guidelines* Section 15168(b)(4)).[1] As such, the PEIR is considered a first tier document that serves as a regional-scale environmental analysis and planning tool that can be used to support subsequent, site-specific project-level CEQA analyses.

Section 15152 of the *CEQA Guidelines* indicates that subsequent environmental analyses for separate, but related, future projects may tier off the analysis contained in the PEIR. The *CEQA Guidelines* do not require a Program EIR to specifically list all subsequent activities that may be within its scope. If site-specific EIRs or negative declarations will subsequently be prepared for specific projects broadly identified within a Program EIR, then site-specific analysis can be deferred until the project level environmental document is prepared (Sections 15168, 15152) provided deferral does not prevent adequate identification of significant effects of the planning approval at hand.

[1] Unless otherwise indicated, all citations by section number are to the *CEQA Guidelines* (Cal. Administrative Code, tit. 14, Section 15000 et seq.)

Basis for Addendum

When an EIR has been certified and the project is modified or otherwise changed after certification, then additional CEQA review may be necessary. The key considerations in determining the need for and appropriate type of additional CEQA review are outlined in Section 21166 of the Public Resources Code (CEQA) and *CEQA Guidelines* Sections 15162, 15163 and 15164.

Section 21166 of CEQA specifically provides that a Subsequent or Supplemental EIR is not required unless the following occurs:

(1) Substantial changes are proposed in the project which will require major revisions of the EIR.
(2) Substantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions in the EIR.
(3) New information, which was not known and could not have been known at the time the EIR was certified as complete, becomes available.

An Addendum may be prepared by the Lead Agency that prepared the original EIR if some changes or additions are necessary, but none of the conditions have occurred requiring preparation of a Subsequent EIR (Section 15164(a)). An Addendum must include a brief explanation of the agency's decision not to prepare a Subsequent EIR and be supported by substantial evidence in the record as a whole (Section 15164(e)). The Addendum to the EIR need not be circulated for public review but it may be included in or attached to the Final EIR (Section 15164(c)). The decision-making body must consider the Addendum to the EIR prior to making a decision on the project (15164(d)).

The conditions described in CEQA section 15162 subdivision (a) have not occurred. As described in the project description, the sbX project is a 16 mile Bus Rapid Transit (BRT) designed to facilitate movement within San Bernardino and Riverside Counties. The proposed inclusion of the sbX project does not require a major revision to the PEIR, as no new significant environmental effects have been identified, nor did the analysis identify a substantial increase in the severity of previously identified significant effects. Furthermore, the sbX does not represent a substantial change to the circumstances under which the project (i.e., the Plan) was undertaken. Although the sbX is not specifically included in the RTP, it is consistent with the goals and polices of the Plan and therefore does not represent a substantial change, as no new significant environmental effects have been identified. While the proposed changes to the RTP may represent "*New information of substantial importance...*" as stated in 15162(a)(3), these changes to the project will not result in one or more significant effects not discussed in the previous EIR, nor result in impacts that are substantially more severe than shown in the previous EIR. No changes to the mitigation measures contained in the 2004 PEIR are proposed.

For the reasons set forth in this Addendum, SCAG has determined that an Addendum to the 2004 PEIR is the appropriate CEQA document because the proposed changes to the Plan do not meet the following conditions of Section 15162(a) for preparation of a Subsequent EIR:

(1) Substantial changes are proposed in the project which will require major revisions in the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.
(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence, at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
    a. The project will have one or more significant effects not discussed in the previous EIR;
    b. Significant effects previously examined will be substantially more sever than shown in the previous EIR;
    c. Mitigation measures or alternative previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
    d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Purpose

This amendment to the 2004 RTP is requested to allow Omnitrans to move forward with the necessary environmental analysis as required by the Federal Transit Administration and under NEPA. The purpose of this Addendum is to evaluate the environmental effects of formally including the following project in the 2004 RTP:

> **sbX E Street Transit Corridor** – The sbX E Street Transit Corridor 16-mile BRT project located in the cities of San Bernardino and Loma Linda in San Bernardino County.

Ominitrans is currently proposing to implement the Locally Preferred Alternative which consists of 16 stops, including California State University at San Bernardino in the north and Loma Linda University Medical Center and the VA Hospital in the south. The Locally Preferred Alternative generally follows Kendall Drive from California State University south to E Street, through downtown San Bernardino, east on Hospitality Land and south to Loma Linda. It runs through a variety of land uses including low-density residential to the north and more intense commercial development along E Street. The southern end of the corridor includes public, educational and medical facilities.

As currently proposed, the downtown portion along E Street would require the removal of some parking, but would not require taking a lane of traffic as in some other proposed alignments. The southern portion from the Hospitality Lane commercial area to the VA Hospital uses an elevated transitway that would be constructed as part of the project. The elevated transitway would extend over I-10 and connect to the Evans Street Corridor, which is included as a separate project in the 2004 RTP. The Locally Preferred Alternative is depicted in Figure 1. The project route is still subject to further refinements that will be done through project specific review and analysis. The anticipated completion date for this project is 2010.

The 2004 RTP includes hundreds of projects, and thus, one project represents a relatively minor modification to the entire Plan. The inclusion of the sbX E Street Transit Corridor is a refinement to the 2004 RTP based on a continuous need to improve and integrate transportation and land use planning in the region. Furthermore, this project will be fully assessed at the project-level by the implementing agency in accordance with CEQA, NEPA and all other applicable regulations.

Although the proposed sbX E Street Transit Corridor was not identified in the 2004 RTP PEIR, the project is consistent with the scope, goals and policies contained in the 2004 RTP and evaluated in the 2004 PEIR. The PEIR broadly discusses potential significant impacts at the programmatic level based on conceptual project plans and broadly defined transportation corridors. An evaluation of general corridors, proposed alignments and programs is inclusive and adequate for purposes of a programmatic level environmental assessment.

As stated, Omnitrans has identified the Locally Preferred Alternative for the E Street Project, although the project route is still subject to further refinements. The purpose of this amendment to the RTP and Addendum to the PEIR is to allow Omnitrans to move forward with the necessary project specific route refinement and environmental analysis required by the Federal Transit Administration and NEPA. The alternative selected through the NEPA process could differ in whole, or in part, from the Locally Preferred Alternative. As such, SCAG has assessed the additional project at the programmatic level, and finds that inclusion of the project is consistent with the analysis, mitigation measures and Findings of Fact contained in the 2004 PEIR. Further, SCAG finds that the inclusion of the proposed project in the RTP does not significantly affect the comparison of alternatives or the potential significant impacts previously disclosed in the 2004 PEIR.

Analysis of Impacts

Land Use

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general as well as specific components of the sbX E Street Corridor, such as the Evan Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general would be expected to occur.

Although the sbX E Street Transit Corridor, as described, would generally operate along existing right of way, some portions of the Locally Preferred Alternative would involve new construction. One of the segments, the Evans Street Corridor, is included in the 2004 RTP, a second segment - an elevated transitway over I-10 to the Evans Street Corridor is not currently in the RTP.

It is possible that site specific impacts could occur, particularly on segments where new construction is proposed. Impacts expected would primarily be to sensitive receptors. Although the 2004 PEIR did not analyze the sbX project specifically, it did conclude that that projects similar in size and scope to the sbX E Street Corridor could cause significant unavoidable impacts. Impacts from the sbX Transit Corridor would be expected to fall within the range of impacts previously identified. The analysis in the 2004 PEIR (p. 3.1-1- 3.1-20) adequately addressed impacts to the region that could result from implementation of the RTP at the program level. Therefore, incorporation of the sbX E Street Corridor project into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 PEIR.

Population, Housing and Employment

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

Implementation of the proposed project could result in site specific impacts such as induced growth along the proposed corridor. In addition, the proposed project could contribute to cumulative impacts on population, housing and employment. These impacts are within the range of impacts assessed at the programmatic level in the 2004 RTP PEIR (p. 3.2-12 -3.2-16). Furthermore, detailed project-level analysis will be performed by the implementing agency. This analysis will also include mitigation measures as appropriate. Inclusion of the proposed project into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 RTP PEIR.

Transportation

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

The 2004 PEIR identifies four significant impacts from implementation of the 2004 RTP; these include increased Vehicle Miles Traveled (VMT), higher average delay, increased heavy duty truck delay and a cumulatively considerable impact on counties outside the SCAG Region. As a transit project, the sbX project would be expected to have a beneficial effect on transportation related impacts identified in the PEIR. The proposed project would link major activity centers including Loma Linda VA Hospital, Loma Linda University and California State University San Bernardino. This option is consistent with PEIR mitigation measures included in the 2004 PEIR intended to reduce delay; these include maximizing the benefits of the land-use transportation connection (p. 3.3-24). Furthermore, transit projects such as the sbX E Street Corridor are generally considered to off-set potential impacts of the overall transportation network. Analysis in the 2004 PEIR adequately addressed impacts that could result from projects such as the sbX E Street Transit Corridor at the program level. The proposed project will be evaluated at the project-level to identify potential localized transportation impacts. Incorporation of the project into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 PEIR.

Air Quality

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

The proposed project would not have a significant adverse effect on regional air quality. The sbX E Street Corridor is considered a Transportation Control Measure (TCM) and as such would provide an air quality benefit to the region. The regional emissions analysis performed for the RTP Amendment determined this project would not result in an exceedence of established emissions budgets within the South Coast Air Basin. Therefore, incorporation of this

project into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 PEIR.

Noise

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

The increase in bus service along the proposed route could cause an increase in ambient noise levels. However, the assessment in the 2004 PEIR noise chapter (3.5-17- 3.5-27) adequately evaluates these impacts at the programmatic level and includes mitigation measures to be implemented at the project level. Impacts from the sbX E Street Corridor would be expected to fall within the range of impacts previously identified. The sbX E Street Corridor will be further analyzed at the project level to determine if site specific impacts would occur and to identify appropriate mitigation measure. The analysis in the 2004 RTP PEIR adequately addresses impacts that could result from this project at the program level. Incorporation of the sbX E Street Corridor into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 RTP PEIR.

Aesthetics and Views

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

Implementation of the proposed project is not anticipated to cause a significant adverse impact on aesthetics or views. The proposed modifications would be on an existing system and, with the exception of the elevated transitway over I-10, at grade. The 2004 PEIR identifies significant impacts on aesthetics and views such as obstruction of scenic views by construction, creating a visual contrast with the overall character of an area and a cumulative impact due to increased urbanization in the region (p. 3.6-11 – 3.6-22). Impacts from the sbX Transit Corridor would be expected to fall within the range of impacts previously identified. Furthermore, the 2004 PEIR determined that improvements proposed on existing systems, such as the sbX E Street Corridor, would be less substantial than those potentially created by new system projects (p. 3.6-13). The analysis in the 2004 PEIR adequately addresses impacts that could result from this project at the program level. Incorporation of the proposed project into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 PEIR.

Biological Resources

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

The proposed project would be implemented on existing roadways and would not be anticipated to significantly impact biological resources. In the event that a route is identified that impacts biological resources, mitigation measures proposed in the Biological Resources chapter may

help reduce or eliminate potential impacts associated with the proposed projects. Detailed project-level analysis, including project level mitigation measures, will be conducted by the implementing agency. The analysis in the 2004 PEIR adequately addresses impacts that could result from this project at the program level. Incorporation of this change into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 PEIR.

Cultural Resources

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

The 2004 PEIR concluded that improvements proposed in exiting rights of way, such as new bus-ways would have limited potential to impact historic resources, archeological resources, and paleontogical resources (p. 3.8-18 - 3.8-24). As such, the sbX E Street Transit Corridor would not be anticipated to have a significant impact on cultural resources in the region. The analysis in the 2004 PEIR adequately addresses impacts that could result from this project at the program level. Incorporation of this project into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 PEIR.

Geology, Soils and Seismicity

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

The sbX E Street Corridor project would primarily use existing right-of-way and would not involve significant earth moving activities. Impacts that could occur from the sbX Transit Corridor would be expected to fall within the range of impacts previously identified. In addition, incorporation of mitigation measures proposed in the 2004 PEIR would alleviate impacts associated with seismic safety (p. 3.9-19-3.9-22). Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency. Therefore, the analysis in the 2004 PEIR adequately addresses impacts that could result from this project at the program level. Incorporation of the proposed project into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 PEIR.

Hazardous Materials

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

The 2004 PEIR concluded that general improvements to the transportation system would facilitate the movement of all types of goods including hazardous materials (p. 3.10-7 - 3.10-9). The sbX E Street Corridor would not specifically facilitate, increase or decrease the transport of hazardous materials; detailed project-level analysis for the project, including mitigation measures as appropriate, will be conducted by implementing agency. Impacts that could occur are within the range of impacts identified in the PEIR. The analysis in the 2004 PEIR adequately

addresses impacts that could result from this project at the program level. Incorporation of these changes into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 PEIR.

Energy

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

Transit project in general (including the sbX E Street Corridor) would be expected to have less than significant impact on consumption of petroleum and diesel fuels. Nonetheless, the 2004 PEIR concludes that "new transit vehicles and transit stations for Maglev, Metrolink, light rail and rapid bus would require electricity and natural gas during project operation" and identifies mitigation measures to reduce these impacts (p. 3.11-13 - 3.11-16). Impacts that could occur by including the the sbX Transit Corridor in the RTP would be expected to fall within the range of impacts previously identified. Detailed project-level analysis for the projects, including mitigation measures as appropriate, will be conducted by implementing agency. The analysis in the 2004 PEIR adequately addresses impacts that could result from this project at the program level. Incorporation of these changes into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 PEIR.

Water Resources

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

The 2004 PEIR identified an increase in impervious surfaces as a significant adverse impact (p. 3-12-23 - 3.12-29). The sbX E Street Corridor will generally be implemented on the existing network and right-of-way and therefore would not cause a substantial increase in the overall amount of impervious surfaces in the region. Impacts to water resources that could occur from including the sbX Transit Corridor in the RTP would be expected to fall within the range of impacts previously identified. However, it is possible that site specific impacts could occur due to the proposed project. Therefore, detailed project-level analysis for the projects, including mitigation measures as appropriate, will be conducted by implementing agency. The analysis in the 2004 PEIR adequately addresses impacts that could result from this project at the program level. Incorporation of this project into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 PEIR.

Public Services and Utilities

sbX E Street Corridor – The 2004 RTP and PEIR included BRT projects in general, as well as specific components of the sbX E Street Corridor, at a programmatic level. The previously identified environmental impacts associated with these components and BRT projects in general, would be expected to occur.

The 2004 PEIR identifies several types of projects that would require an increase in the level of police, fire and medical services. These include projects involving new roadways and transit

related projects that require the construction of new transit stations (3.13.9-3.13-14). The proposed sbX E Street Corridor does not fall into either of these categories and therefore is not anticipated to have a significant adverse impact on police, fire and/or medical services. The analysis in the 2004 PEIR adequately addresses impacts that could result from this project at the program level. Incorporation of this project into the 2004 RTP would not result in any additional significant impacts beyond those identified in the 2004 PEIR.

Comparison of Alternatives

Including the sbX E Street Corridor in the 2004 RTP would not appreciably affect the comparison of alternatives in the 2004 PEIR in any meaningful way. The project is contemplated within the scope of the programmatic-level comparison among the alternatives considered in the 2004 PEIR: 1) No Project, 2) Modified 2001 RTP Alternative 3) The PILUT 1 (Infill) Alternative 4) The PILUT 2 (Fifth Ring) Alternative. The project is consistent with PILUT 1 as it would facilitate urban transportation. The analysis in the Comparison of Alternatives chapter of the 2004 PEIR is not significantly affected by the inclusion of the sbX project in the RTP. Therefore, no further comparison is required at the programmatic level. Project-level comparisons of alternatives, however, will be conducted by implementing agency when it prepares a CEQA/NEPA document for the project.

Long Term Effects

The sbX E Street Corridor is within the scope of the discussion presented in the long-term effects chapter of the 2004 PEIR, which includes an assessment of programmatic level unavoidable impacts, irreversible impacts, growth inducing impacts, and cumulative impacts. Unavoidable and irreversible impacts from the inclusion of this specific project in the 2004 RTP is reasonably covered by the unavoidable and irreversible impacts previously discussed in the certified 2004 PEIR. Unavoidable and irreversible impacts will be further analyzed by implementing agency at the project level. Any growth inducing impacts are expected to be approximately equivalent to those previously disclosed in the 2004 PEIR. Overall, the project is within the scope of the broad, programmatic-level impacts identified and disclosed in the PEIR. Thus, the proposed change is consistent with the findings on long-term effects in the 2004 PEIR. Detailed analysis of impacts on long-term effects will be conducted by the implementing agency at the project level.

Conclusion

The 2004 RTP includes a database with hundreds of projects. The inclusion of an additional project, the details of which have yet to be determined, and that is not likely to result in significant new construction, would have a negligible change in environmental impact when viewed in light of the scope and nature of the entire Plan.

After completing its programmatic environmental assessment of these changes, SCAG finds that adoption of the proposed RTP Amendment would not result in either new significant environmental effects or a substantial increase in the severity of previously identified significant effects. The proposed changes as expressed in the 2004 RTP Amendment, therefore, are not substantial changes which would require major revisions to the PEIR. Thus, a subsequent or supplemental EIR is not required and this Addendum fulfills the requirements of CEQA.

PUBLIC REVIEW AND COMMENT

SCAG is required to provide a 30-day public review and comment period for the Draft Amendment. A Notice of Availability and Public Hearing will be posted on the SCAG website at www.scag.ca.gov on or about June 1, 2006, and published in major newspapers in the six-county region. The Draft Amendment will be made available on the SCAG website and copies will be available for review at SCAG and at public libraries throughout the region (the listing of libraries will be provided on the SCAG website). Written comments will be accepted until 5:00pm July 7, 2006 and should be directed to:

Philip Law
Southern California Association of Governments
818 W. 7th St., 12th Floor
Los Angeles, CA 90017

or to: law@scag.ca.gov

A public hearing will be held at SCAG from 9:00am to 10:00am on July 6, 2006. All of the public comments received will be summarized in the final Amendment document, along with SCAG's responses to those comments. SCAG's Executive Committee is currently scheduled to consider approving the Amendment on August 17, 2006. The adopted Amendment will be sent to the appropriate state and federal agencies for their approval.

ATTACHMENT A

OMNITRANS REQUEST FOR RTP AMENDMENT

OMNITRANS

April 17, 2006

Hasan Ikhrata
Director of Planning and Policy
Southern California Association of Governments
818 West Seventh Street, 12th Floor
Los Angeles, California 90014-3435

Subject: **Request for Amendment to the RTP to include sbX: E Street BRT Project**

Dear Mr. Ikhrata:

Omnitrans respectfully requests an amendment to the 2004 RTP to include Omnitrans sbX: E Street BRT project. This project will include preliminary engineering, environmental impact study, final design and construction.

Required by ISTEA, Omnitrans completed its Bus Rapid Transit Major Investment Study (MIS). The MIS yield the locally preferred alternative (LPA) and on December 7, 2005, Omnitrans Board of Directors adopted and approved the E Street Corridor as the LPA.

On January 19, 2006, the RSTIS Peer Review Group met and determined that the E Street Transit Corridor project had met SCAG and FTA/FHWA requirements, and that the project is ready to advance from planning to the project development phase.

The funding for this project will come from the following:

- FTA Section 5309 – 50%
- FTA Section 5307 – 20%
- Measure I – 30%

Omnitrans has worked closely with SANBAG and they are on-board with the financial plan of this project. Furthermore, this project will not jeopardize any funding that is already committed to other projects.

Enclosed, you will find supporting documentation for the sbX project. The documentation includes the Overview, Capital Costs, Operating Costs, Annualized Cost and Travel Demand Forecasts and Benefits.

Omnitrans • 1700 West Fifth Street • San Bernardino, CA 92411
Phone: 909-379-7100 • Web site: www.omnitrans.org • Fax: 909-889-5779

Serving the communities of Chino, Chino Hills, Colton, County of San Bernardino, Fontana, Grand Terrace, Highland, Loma Linda, Montclair, Ontario, Rancho Cucamonga, Redlands, Rialto, San Bernardino, Upland and Yucaipa.

We would like to thank you in advance for your time and consideration of our project. If you need any other information, please feel free to contact Rohan Kuruppu, Director of Planning at (909) 379-7251 or at Rohan.Kuruppu@Omnitrans.org.

Sincerely,

Durand L. Rall
CEO/ General Manager

Cc: Phillip Law, Acting Senior Planner, SCAG
Rohan Kuruppu, Project Manager, Omnitrans

E Street Transit Corridor Project - Phase I

Locally Preferred Alternative Summary Report

Prepared for:

Omnitrans

Prepared by:

Parsons

In Association with:

Gruen Associates
Patti Post & Associates
Moore Iacofano Goltsman Inc.

April 2006

TABLE OF CONTENTS

- CHAPTER 1 – OVERVIEW 1
- CHAPTER 2 – CAPITAL COSTS 21
- CHAPTER 3 – OPERATING COSTS 29
- CHAPTER 4 – ANNUALIZED COSTS 31
- CHAPTER 5 – TRAVEL DEMAND FORECASTS AND BENEFITS 33

LIST OF EXHIBITS

Exhibit 1.1 Major System-wide Transit Corridors 2
Exhibit 1.2 Conceptual Design for Transit-Oriented Development at E Street and North Mall Way 4
Exhibit 1.3 Conceptual Design for Loma Linda Transcenter and Transit-Oriented Development at the VA Hospital 4
Exhibit 1.4 Schedule for Project Development 5
Exhibit 1.5 E Street Transit Alternatives 6
Exhibit 1.6 Preferences Reported in Community Workshops 9
Exhibit 1.7 Public Preferences from the October 19th Open House 11
Exhibit 1.8 Locally Preferred Alternative 12
Exhibit 1.9 Locally Preferred Alternative (Short Term) 14
Exhibit 1.10 Redlands Rail Alignment 16
Exhibit 5.1 Route 2 Daily Loads at sbX Station Locations 33
Exhibit 5.2 Population Density in E Street Corridor 34
Exhibit 5.3 Employment Density in E Street Corridor 35
Exhibit 5.4 Year 2030 Ridership Profiles 39
Exhibit 5.5 Peak Hour Boarding Volumes 41

LIST OF TABLES

Table 1.1 Locally Preferred Alternative 13
Table 1.2 Locally Preferred Alternative (Short Term) 15
Table 1.3 Cost Effectiveness of LPA in Compared to TSM 17
Table 1.4 Status and Next Steps 17
Table 2.1 Major Capital Project Costs (Long-Term LPA) 22
Table 2.2 Major Capital Project Costs (Long-Term LPA) (Annualized Cost) 23
Table 2.3 Major Capital Project Costs (Short-Term LPA) 24
Table 2.4 Major Capital Project Costs (Short-Term LPA) (Annualized Cost) 25
Table 2.5 Station Costing Detail 26
Table 2.6 Summary of Capital Costs 28
Table 3.1 Operating Cost Calculations (All Routes that vary between Alternatives) 30
Table 4.1 Comparison of Annualized Costs 31
Table 5.1 Annual Special Event and Visitor Trips in E Street Corridor 36
Table 5.2 Year 2030 Linked Transit Trips 37
Table 5.3 Daily Ridership Statistics for Transit Routes Serving San Bernardino Valley 38
Table 5.4 Daily Ridership Characteristics for E Street Corridor Routes 39
Table 5.5 Station Activity - TSM 40
Table 5.6 Station Activity - LPA 40
Table 5.7 Modes of Access and Egress at Transit Stations 40
Table 5.8 Drive Access and Parking Demand at Stations 41

CHAPTER 1 - OVERVIEW

Omnitrans has completed a study to determine the best way to implement an enhanced state-of-the-art rapid transit service along the E Street Corridor in the cities of San Bernardino and Loma Linda. A Locally Preferred Alternative (LPA) was selected and has been adopted by the Omnitrans Board of Directors and other local agencies and jurisdictions within the E Street Corridor. The LPA serves California State University at San Bernardino (CSUSB) in the north; traverses central San Bernardino to Loma Linda University Medical Center and the VA Hospital in the south.

The selected mode of transport is known as Bus Rapid Transit (BRT). Within the San Bernardino Valley, BRT has been branded as sbX, which stands for San Bernardino Express. The new high-tech, user-friendly system will offer more frequent service, fewer stops, and higher average speeds than traditional bus service. Investing in this new transportation system will greatly improve Omnitrans' ability to meet growing travel demands, encourage redevelopment, and maintain economic vitality in the Corridor. The E Street Transit Corridor Project would be the first segment in a valley wide system of interconnected sbX service. As shown in Exhibit 1.1, seven transit corridors were identified in the San Bernardino Valley as candidates for premium service.

E Street Corridor Description

The E Street Corridor is about 16 miles long, generally following Kendall Drive from California State University south to E Street, through downtown San Bernardino, east on Hospitality Lane, and south to Loma Linda. It runs through a variety of land uses, from low-density residential development in the north to commercial development along E Street. The core downtown area has some of the highest concentrations of office and public facilities in the Omnitrans service area. The southern end of the Corridor contains significant public, educational and medical facilities. The Corridor supports about 121,000 people and more than 71,000 jobs. Many residents have low incomes and/or are transit-dependent. About 28 percent of the population lives below the poverty line and 16 percent of the households in the corridor have no automobile.

Purpose and Need for the Project

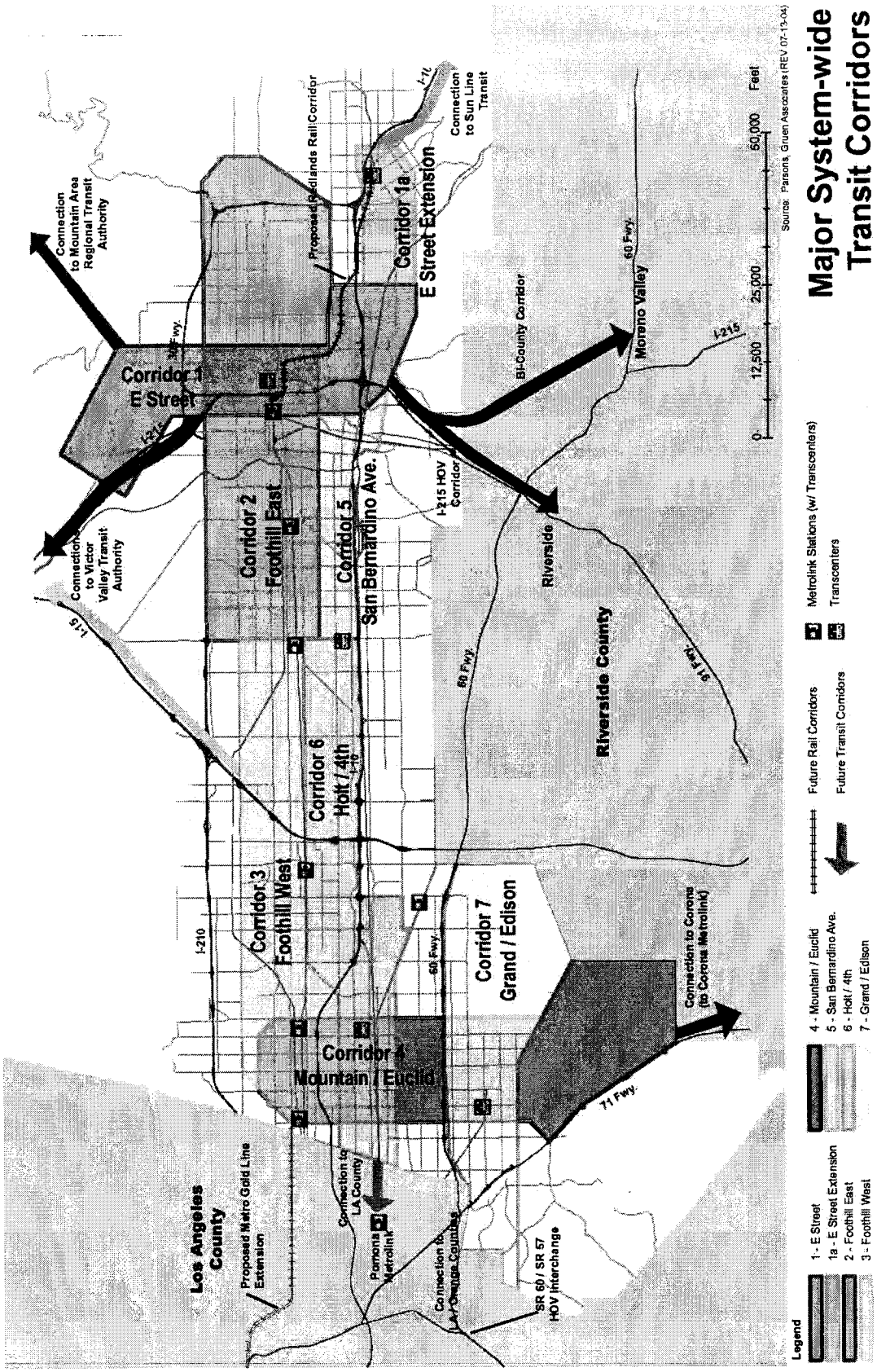
Numerous key deficiencies and needs were identified in the E Street Corridor. Existing transit services are slower than auto travel. Given that the Corridor has high transit dependency and an aging population, this translates into reduced mobility for many residents. It also results in low usage by other potential riders, particularly during lunchtime and mid-day periods. The Corridor is in need of a catalyst to help accelerate revitalization efforts that have not yet been successful. Depressed economic conditions in the central Corridor create a disconnect in development between south and north. Parking capacity is a problem at the university and hospital campuses. Scheduling existing transit routes is difficult because of the potential for delays, particularly crossing the I-10 Freeway. This problem will get much worse as population and employment grow.

Project Objectives

Alternative transit scenarios were designed to address the deficiencies and needs identified above. Each of the five alternatives below was evaluated based on their ability to meet the following project objectives:

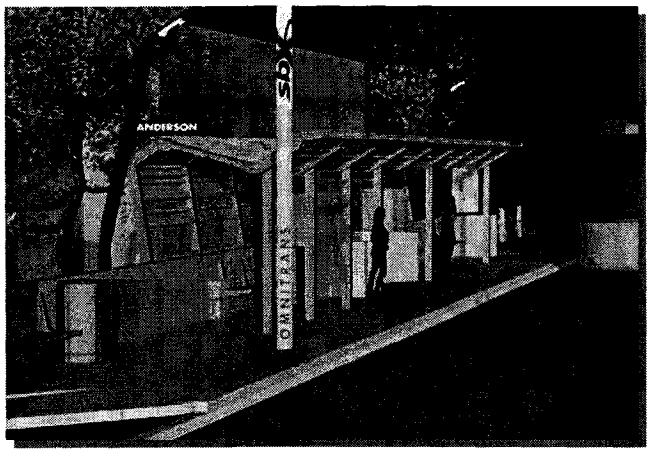
1. Enhance mobility and accessibility
2. Encourage economic growth and redevelopment
3. Improve transit operations
4. Provide a cost-effective solution

Exhibit 1.1: Major System-wide Transit Corridors



The sbX can serve as a catalyst for community improvements. In turn, new development can foster increased transit usage. This synergy between land use and transportation can take the form of Transit-Oriented Developments (TODs).

The benefits of TODs are numerous and the concept was studied for six of the proposed sbX stations. As part of this analysis, the draft General Plans for the Cities of San Bernardino and Loma Linda were reviewed for transit supportive plans and policies. Suggestions for modifications were provided to both cities.



For example, at the Inland Center Mall, TOD improvements could better connect the mall uses with activity on E Street, including sbX service. Exhibit 1.2 shows how land use changes and landscaping along with sidewalk and bridge improvements could create a stronger, more attractive connection between the mall and the E Street Corridor.

Transit-Oriented Development at the Loma Linda Veterans Administration Hospital (Exhibit 1.3) has the potential to make the VA easier to reach by transit, while increasing parking for those arriving by car. It would also create a new transit center to ease regional connections and provide better transit access to City Hall and the Loma Linda University Medical Center East Campus.

Project Development Process

Omnitrans, in cooperation with the San Bernardino Associated Governments, SCAG and other public entities, completed an analysis of alternatives in the Corridor in compliance with guidelines from the Federal Transit Administration (FTA).

Stakeholders who have worked with the sponsoring agencies in the E Street Corridor Transit Project include:

- The Cities of San Bernardino and Loma Linda
- The City of San Bernardino Economic Development Agency
- San Bernardino County
- San Bernardino Associated Governments (SANBAG)
- Southern California Association of Governments (SCAG)
- Caltrans, District 08
- Federal Transit Administration (FTA)
- The Southern California Regional Rail Authority (Metrolink)
- California State University – San Bernardino
- Loma Linda University Adventist Health Sciences Center
- VA Loma Linda Healthcare System
- The Inland Center Mall

The overall planning and project development process for federally-funded transit projects is prescribed by the Federal Transit Administration (FTA), and is referred to as the New Starts Process. Omnitrans is following the New Starts process (Exhibit 1.4) in order to become eligible for discretionary federal funds for implementing premium transit service in the E Street Corridor.

Exhibit 1.2: Conceptual Design for Transit-Oriented Development at E Street and North Mall Way

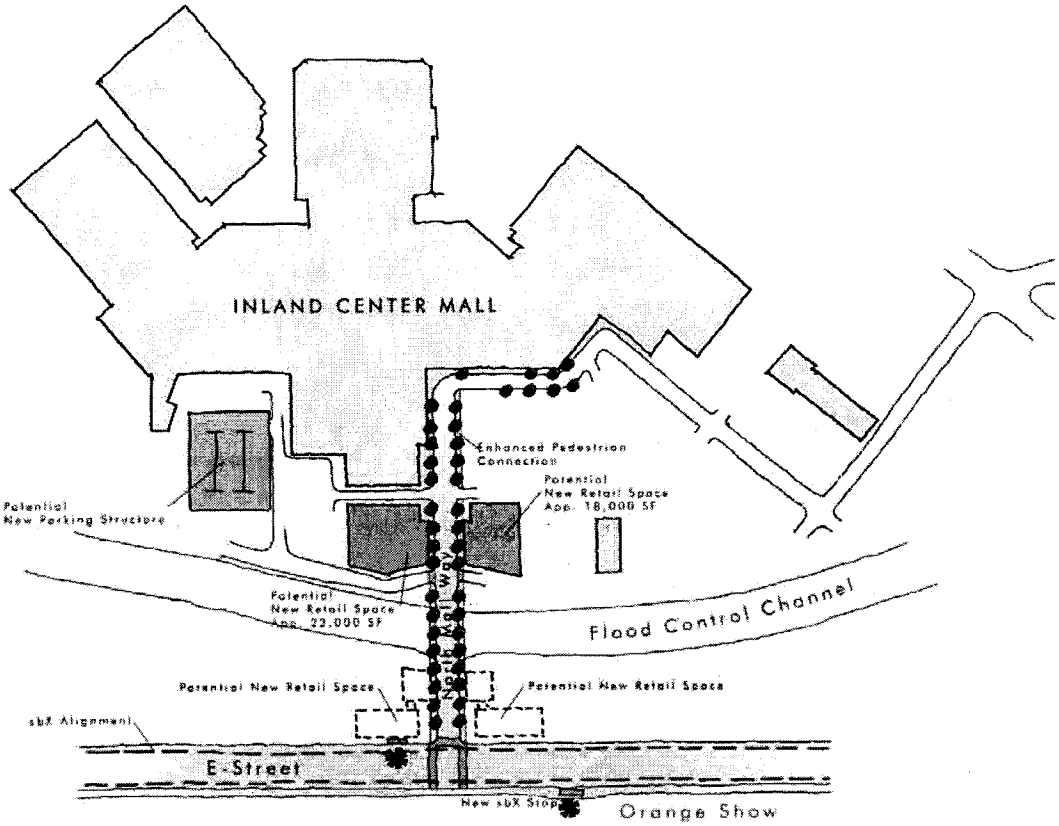


Exhibit 1.3: Conceptual Design for Loma Linda Transcenter and Transit-Oriented Development at the VA Hospital

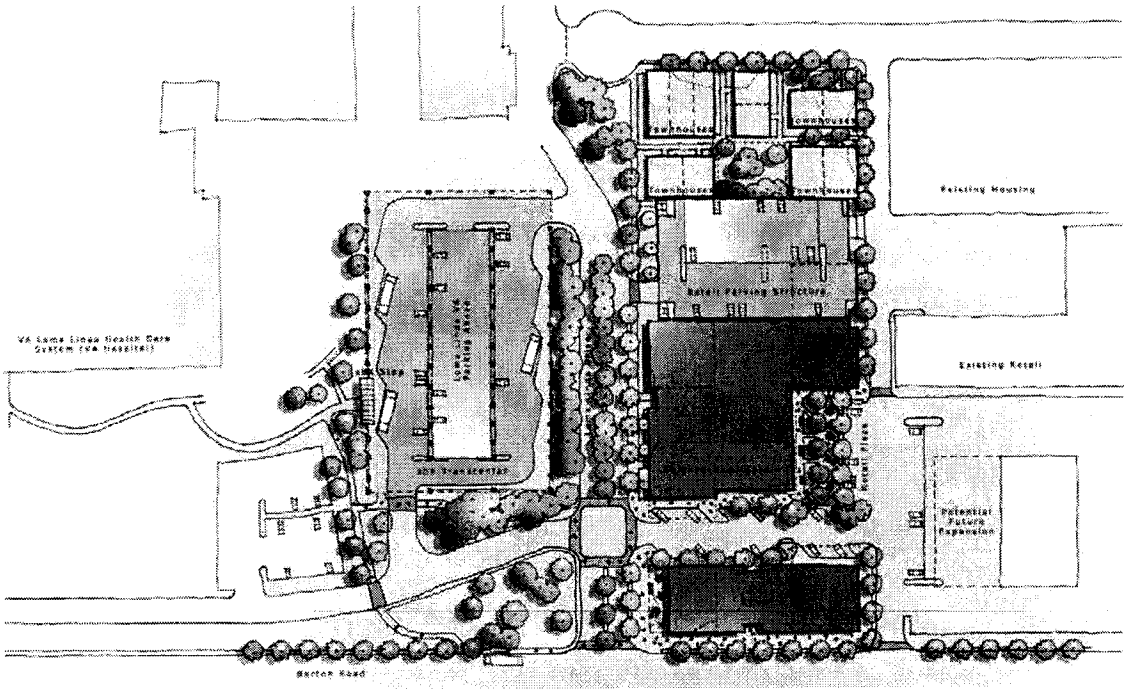
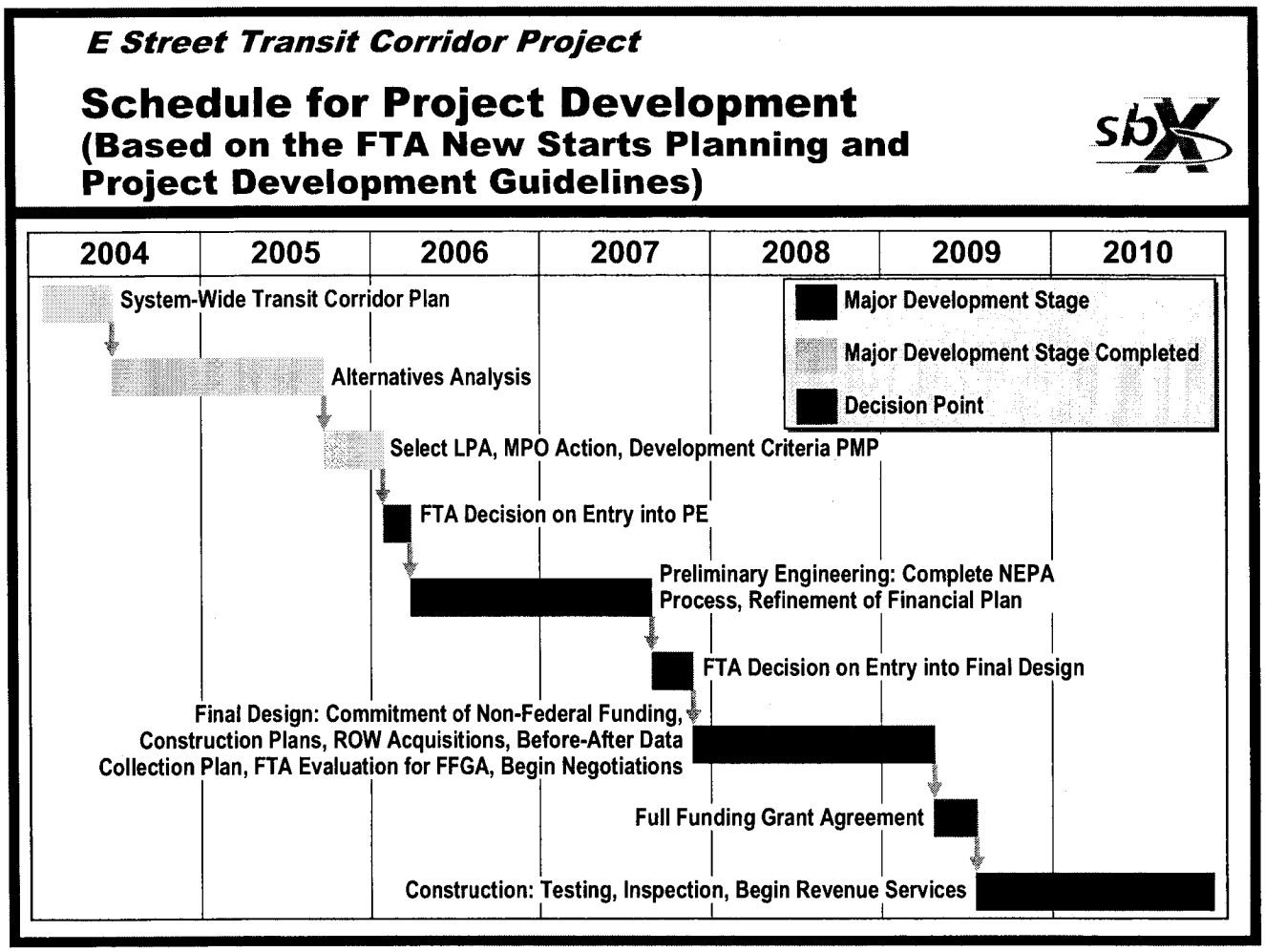
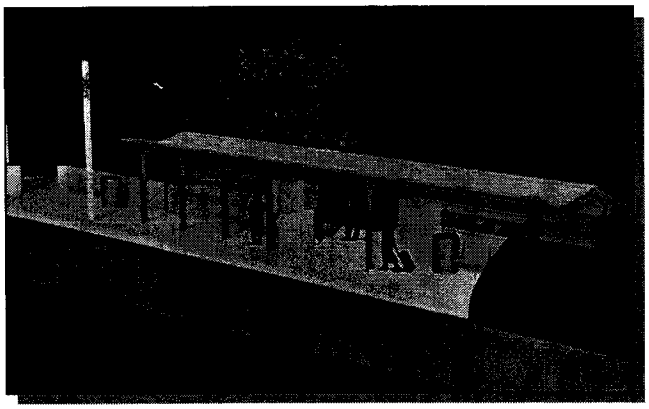


Exhibit 1.4: Schedule for Project Development

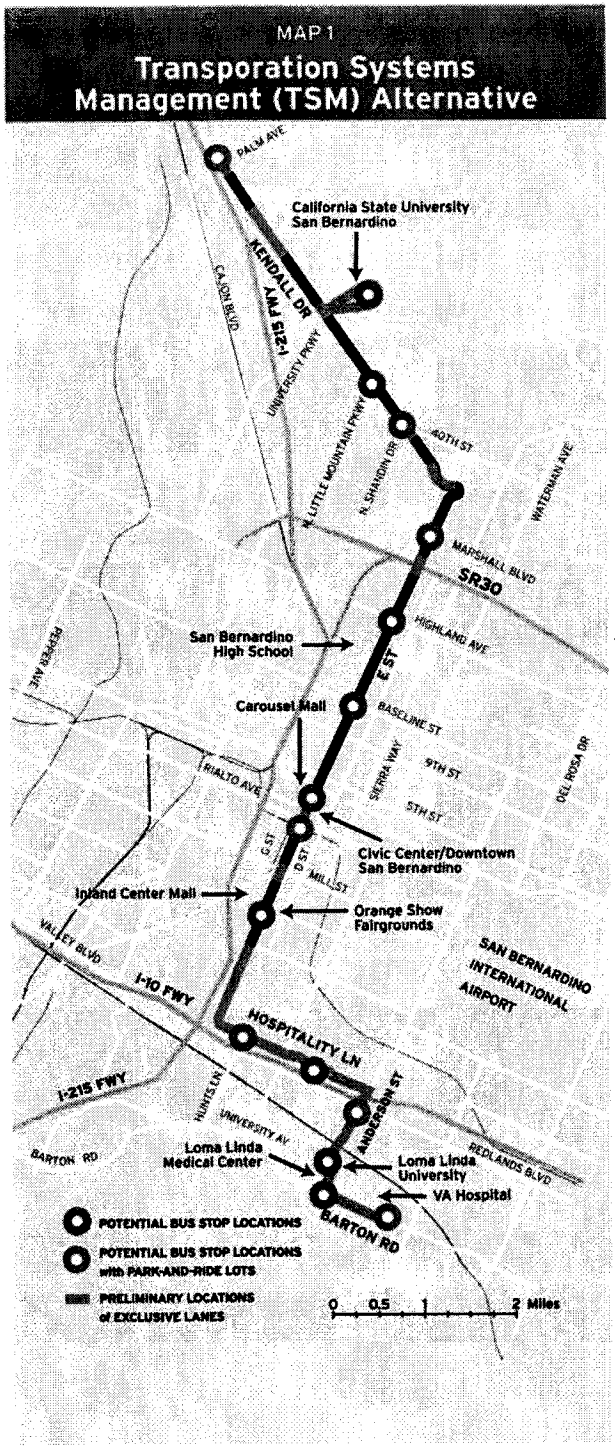




The final step in the Alternatives Analysis phase was **Detailed Alternatives Analysis**. During this phase, conceptual engineering, environmental and community impact analysis was performed on the final Corridor alternatives which included:

- **No Build**, included only existing and committed projects and services;
- **Transportation Systems Management (TSM)**, which added planned service improvements to existing and committed projects. It added a new limited stop bus service on E Street that used the routing of Omnitrans Route 2 (see Exhibit 2.5); and
- **Three (3) Bus Rapid Transit (BRT) alternatives** in the E Street Corridor would implement sbX on different alignments through the Corridor. They use the alignments shown in Exhibit 1.5. Alternatives 1 and 2 use a proposed elevated transitway to cross over I-10.

Exhibit 1.5: E Street Transit Alternatives



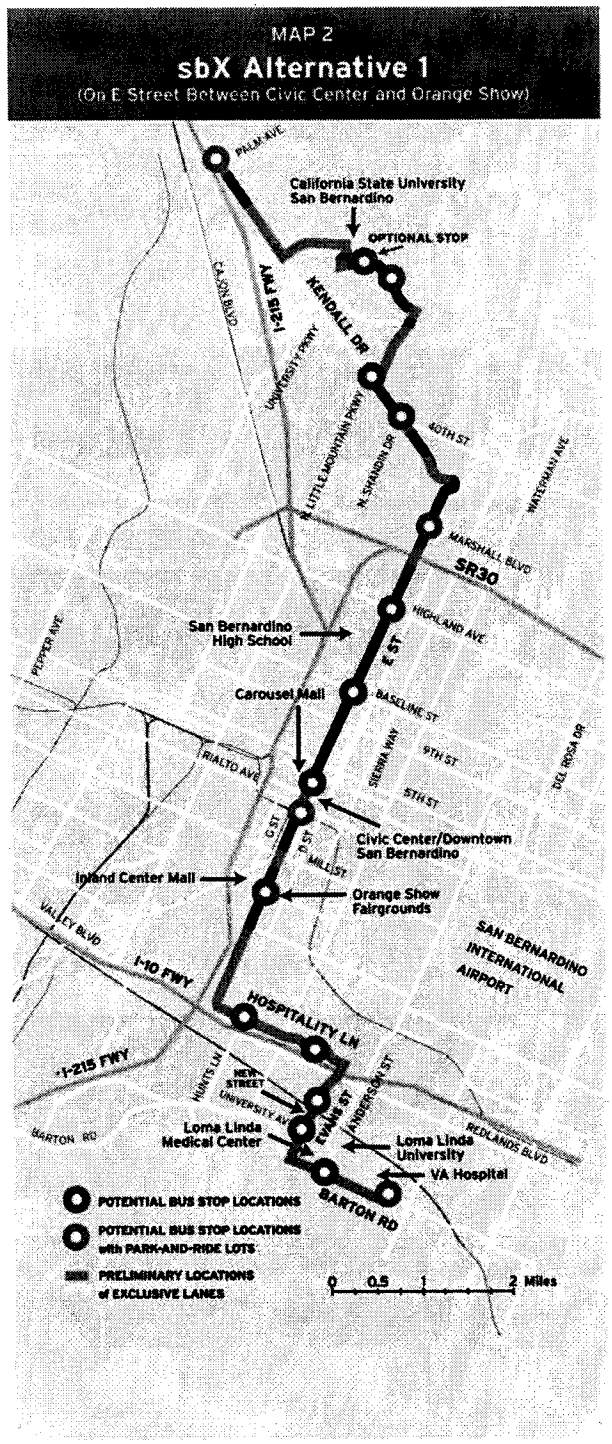
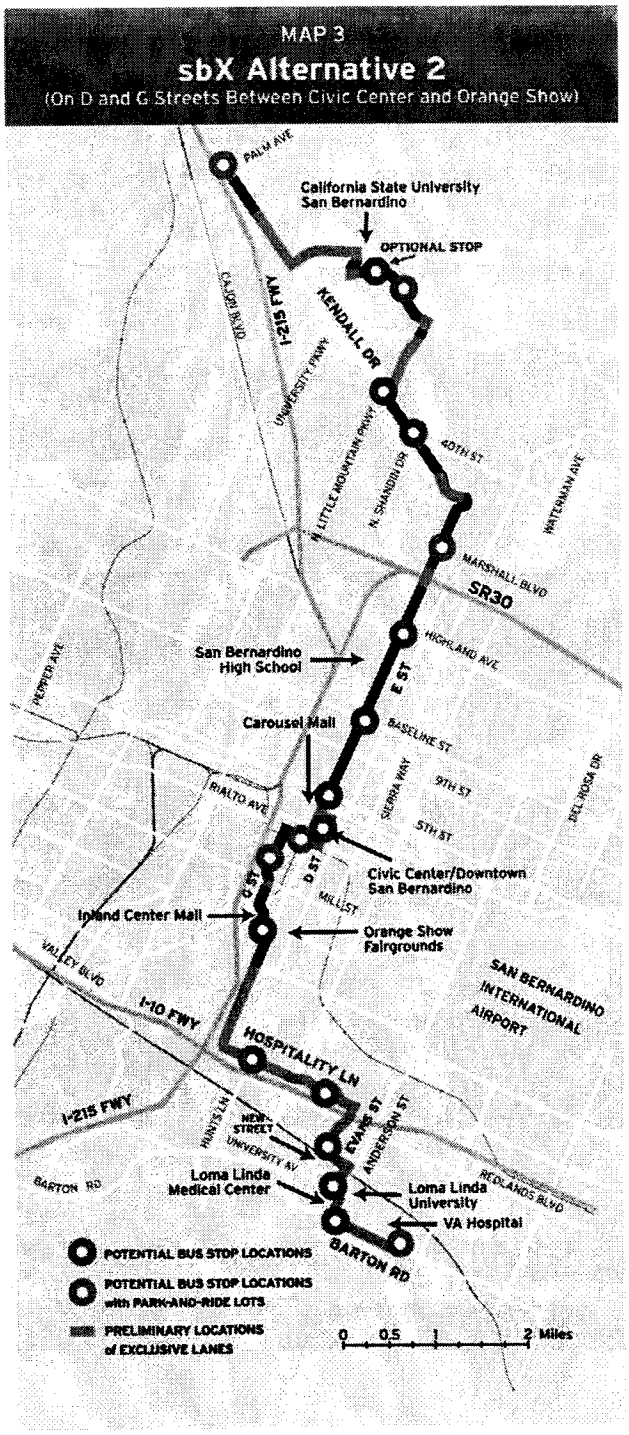
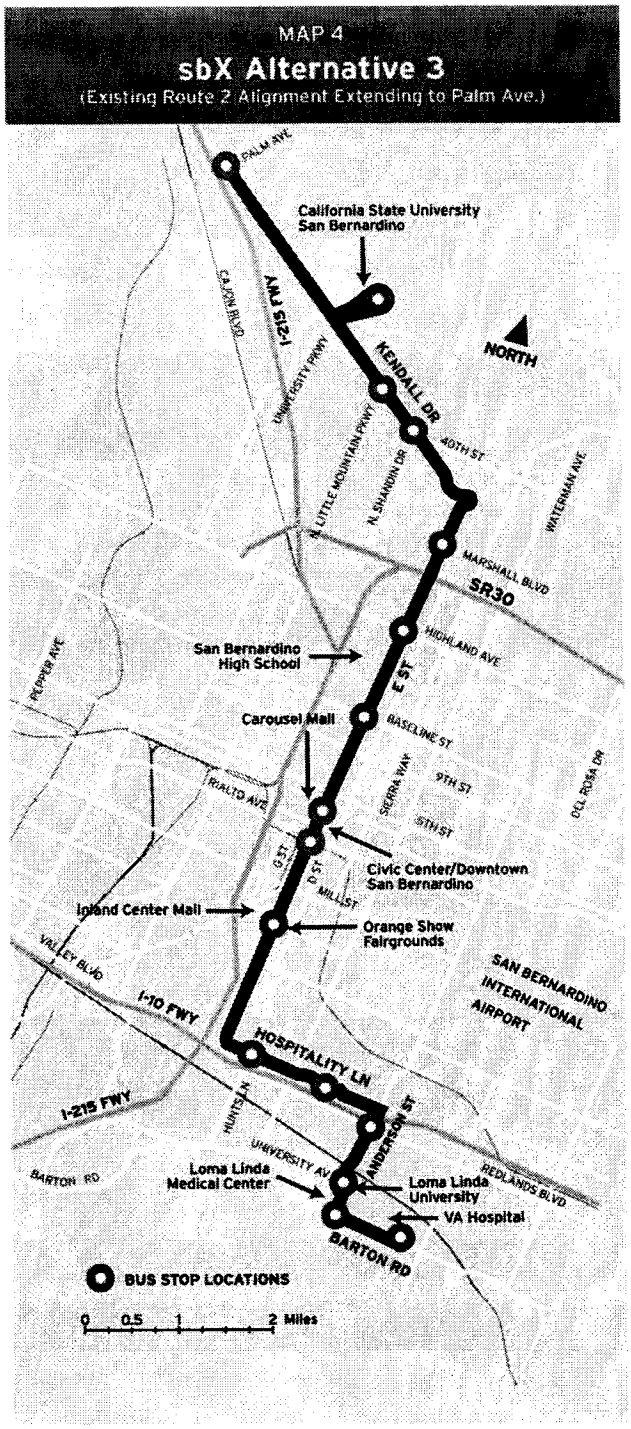


Exhibit 1.5 (Continued): E Street Transit Alternatives





The primary objective of the Detailed Alternatives Analysis was to evaluate the five final alternatives (two baselines and three BRT Build) and their alignments and select the highest ranked alternatives/alignments for consideration as the Locally Preferred Alternative (LPA).

The evaluation was conducted in two stages. First, the five alternatives including the three (3) BRT alternatives were compared to each other. Then, for the BRT alternatives, alignments were evaluated in the north, downtown, central and southern portions of the Corridor to determine how they compared against each other based on the MOEs.

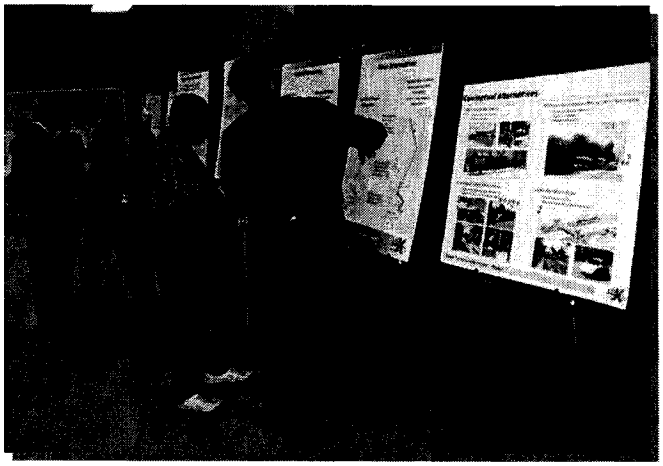
For most of the MOEs in the evaluation, quantitative values were calculated such as for ridership forecasts, costs and cost-effectiveness. However, some MOE values were qualitative in nature such as community support and land use conformity

Input from Stakeholders and the General Public

Continuous input was received from key corridor stakeholders and the general public from the system planning phase through the completion of the detailed Alternatives Analysis.

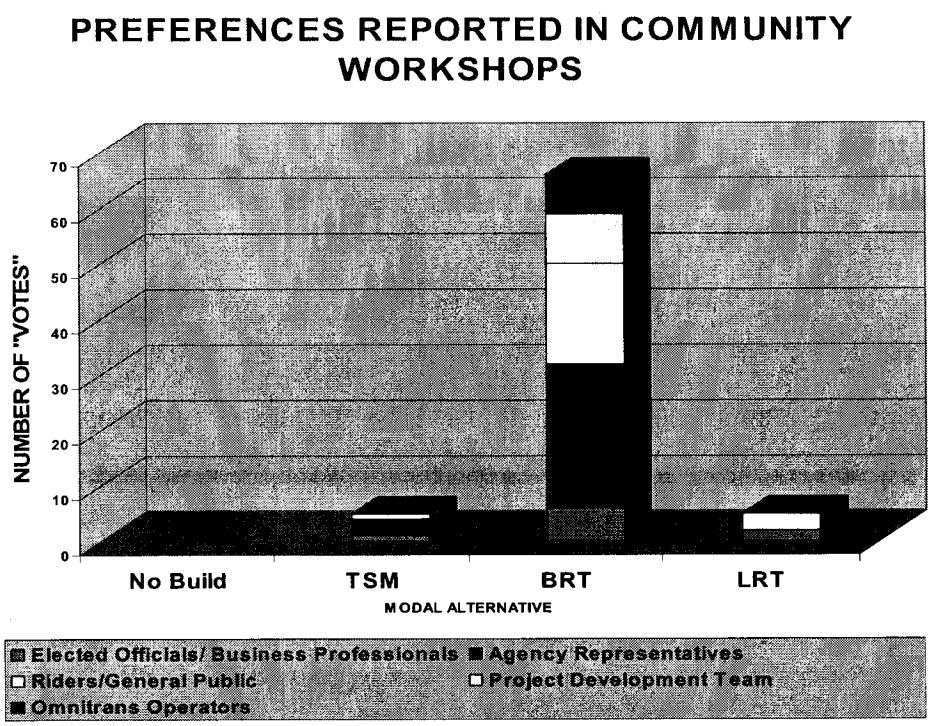
The public involvement program for the conceptual alternatives analysis phase elicited comments on the four types of Transportation Modal Alternatives: the No-Build, Transportation Systems Management (TSM), Bus Rapid Transit (BRT) and Light Rail Transit (LRT). In addition, the individual alignment alternatives for the North, Downtown, Central and Southern portions of the E Street Corridor were scrutinized and commented on in several different forums held throughout the Corridor. The process involved the following meetings, conferences, and workshops held during February and March 2005:

- February 7th sbX Leadership Conference held at the Radisson Hotel in downtown San Bernardino was attended by over 100 Elected Officials, Business Leaders/Professionals, Agency Representatives, transit riders, and members of the general public. The attendees were grouped into three delegations and rotated to three different topical venues at the conference. The attendees were given an opportunity to turn in comment sheets and indicate their preferences on transportation modes and specific alignment choices for each of the four portions of the E Street Corridor.

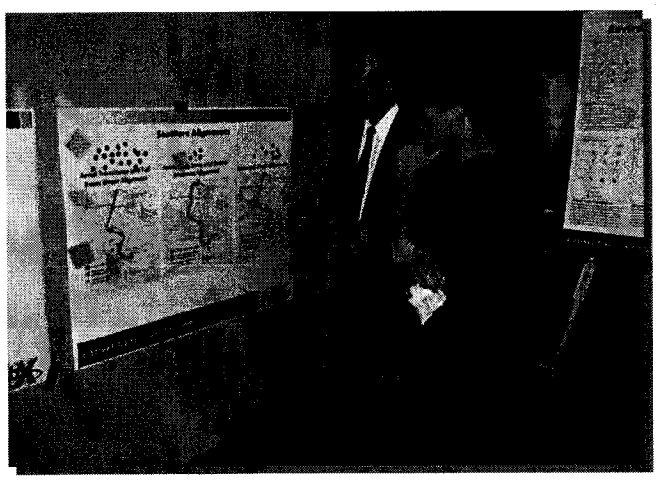


- February 9th Public Open House at the Feldheym Public Library in central San Bernardino was attended by over 30 members of the general public, including Omnitrans riders. The Open House was set up in a manner identical to the sbX Leadership Conference with attendees rotating between three topical stations and indicating their preferences on transportation modal options and alignments for each of the 4 geographic groupings in the Corridor. Those present were asked to indicate which mode of transit they preferred to see built in the E Street Corridor. They overwhelmingly selected BRT over LRT (Exhibit 1.6).
- February 23rd Project Development Team (PDT) Meeting held at the City of San Bernardino – Economic Development Agency. PDT members attending the meeting were asked to select their choices of alignments by geographic grouping. After weighing the technical information, PDT members unanimously supported the selection of BRT over LRT as the preferred mode to carry forward into Detailed Alternatives Analysis.

Exhibit 1.6: Preferences Reported in Community Workshops



- March 1st and 2nd Workshops with Omnitrans Coach Operators and Administrative staff. Attendees were asked to select their choice of alignment by geographic grouping in the E Street Corridor.



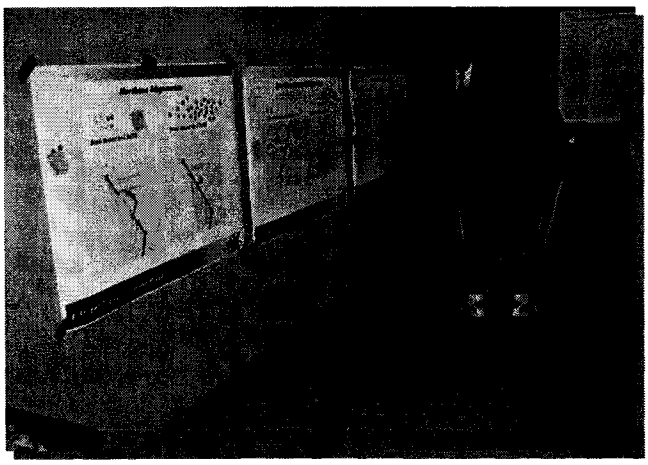
- February 17th meeting of the SCAG Regionally Significant Transportation Improvement Strategy (RSTIS) Peer Review Committee held at the Southern California Association of Government's office in Los Angeles.
- February 15th presentation to the Planning and Productivity Committee (PPC) of the Omnitrans Board of Directors.

To assist in the evaluation of the detailed alternatives for the E Street Corridor, a comprehensive public involvement program and stakeholder outreach was conducted to determine which segments of those alternatives and station locations were supported locally within the Corridor. During the spring and summer of 2005, a series of stakeholder meetings were held throughout the Corridor to obtain stakeholder support for the E Street Transit Corridor Project and receive input on specific station siting and alignments. This input, along with the October 19, 2005, public open house/workshop, provided the Project Development Team (PDT) with information on which alignments will be supported locally in the E Street Corridor.

The final set of five detailed alternatives was presented to the following forums for review and comment:

- Stakeholders meetings/workshops with key staff from the Cities of San Bernardino and Loma Linda, California State University-San Bernardino (CSUSB), the Inland Center Mall, Loma Linda University Medical Center and the VA Hospital.
- A community open house/workshop held on October 19, 2005, at the Feldeym Public Library in Central San Bernardino.
- Project Development Team (PDT) workshops on detailed alternatives held on July 27, August 24, and October 26, 2005.

Prior to the October 19 Public Open House/Workshop, a project information mailer was sent out to over 10,000 households. The mailer portrayed the alternatives, provided information on their performance, and encouraged the general public to view study documents on the project web site - www.estreet-sbX.com – and comment on the alternatives. Omnitrans also provided telephone numbers in the mailer for the public to call with comments. Numerous comments were received from the general public through the media.



The October 19, 2005, public open house was set up with specific workstations that presented information on the performance of each of the five detailed alternatives. The public was shown information on the performance of the competing segments in the north, downtown, central and southern portions of the Corridor. The competing segments were:

- North: Kendall/University "front side" entrance and station at CSUSB versus a "backside" entrance to the campus that uses Little Mountain and a new internal Campus Road with a backside station.
- Downtown: An alignment straight down E Street versus a D Street alignment.
- Central: An alignment straight down E Street versus a G Street alignment to the Inland Center Mall.
- South in Loma Linda: A transitway over the I-10 Freeway to the proposed Evans Street Corridor versus an alignment on Anderson. A third option uses Evans in the northern portion of Loma Linda and Anderson in the south.

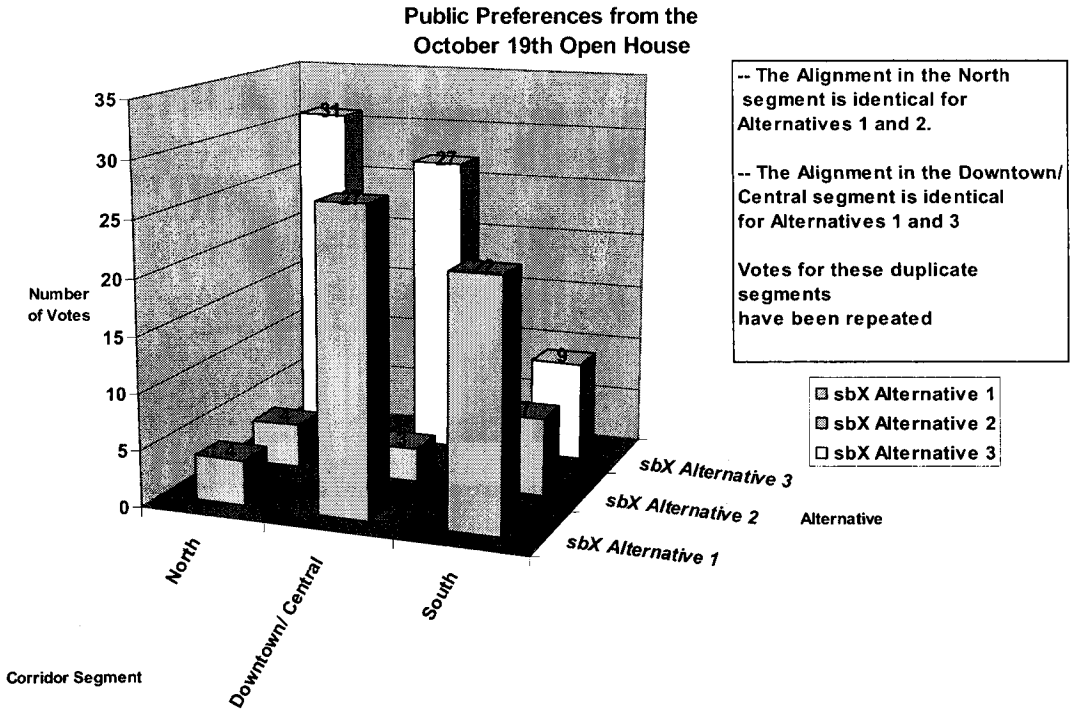
The workshop was attended by over 70 members of the general public. After viewing project exhibits, the public workshop attendees were asked to identify the alignments they felt best met the various categories of evaluation criteria. The alignments that the general public liked best (Exhibit 1.7) were recorded and documented for consideration by the Project Development Team (PDT).

Workshops were also held with Corridor stakeholders to determine which station locations and alignments were supported and fit best into local master plans and growth plans. Both CSUSB and LLUMC have new Campus Master Plans and gave the Project Team specific input on their preferences. For CSUSB, the preferred alignment is that shown in Alternative 3. It is a "front side" station at the entrance to the Campus that CSUSB officials felt worked best for their future Campus Expansion Plans.

Similarly for LLUMC, officials were able to provide clear direction on station siting and their strong support for the Evans Street Alignment. Until the entire Evans Street Corridor is developed in the future, the alignment shown in Alternative 2 may be appropriate as a short-term operational segment.

To determine how strongly supported each alternative is by stakeholders and the public, specific ranking information was collected at the above forums and was used in the comprehensive evaluation of the detailed alternatives.

Exhibit 1.7: Public Preferences from the October 19th Open House



Findings from the Evaluation and Candidate LPA

Based on the comprehensive technical evaluation presented in this report and public/stakeholder input, the candidate Locally Preferred Alternative (LPA) for the E Street Project contains the following geographic segments.

- The northern portion from Kendall/Palm to SR-30 is the alignment included in Alternative 3. The primary reasons for this are its directness of service, support from CSUSB stakeholders, and its service to neighborhoods along Kendall Drive.
- The downtown portion along E Street is the alignment included in Alternatives 1 and 3. The E Street alignment does remove some parking, but its impacts are far less than those associated with D Street where the taking of a lane of traffic would be needed as well as the removal of parking. The City of San Bernardino favors the E Street alignment over the D Street alignment for the above reasons. The E Street alignment also provides a more direct service through the downtown area and is seen as having the potential to positively influence future development at the Carousel Mall.
- The central portion from Rialto to Hospitality Lane is the alignment included in Alternatives 1 and 3. It is more of a direct connection than the G Street alignment and is favored by Inland Center Mall stakeholders who prefer a station on E Street near the mall.
- The southern portion from the Hospitality Lane Commercial Area to the VA Hospital uses the elevated transitway over I-10 to the Evans Street Corridor.

The locally adopted LPA is shown in Exhibit 1.8 with detail about its performance shown in Table 1.1. It is possible that the entire Evans Street Corridor may not be complete when the LPA is constructed and open for service. If that is the case, a short-term LPA is also included (see Exhibit 1.9) which uses the northern portion of Evans Street and then crosses over to Anderson Street using a proposed connector road. If the northern segment of Evans Street has not been built by the time the sbX project opens, temporary service will commence on Anderson. Table 1.2 shows the performance of the short-term LPA.

Exhibit 1.8: Locally Preferred Alternative

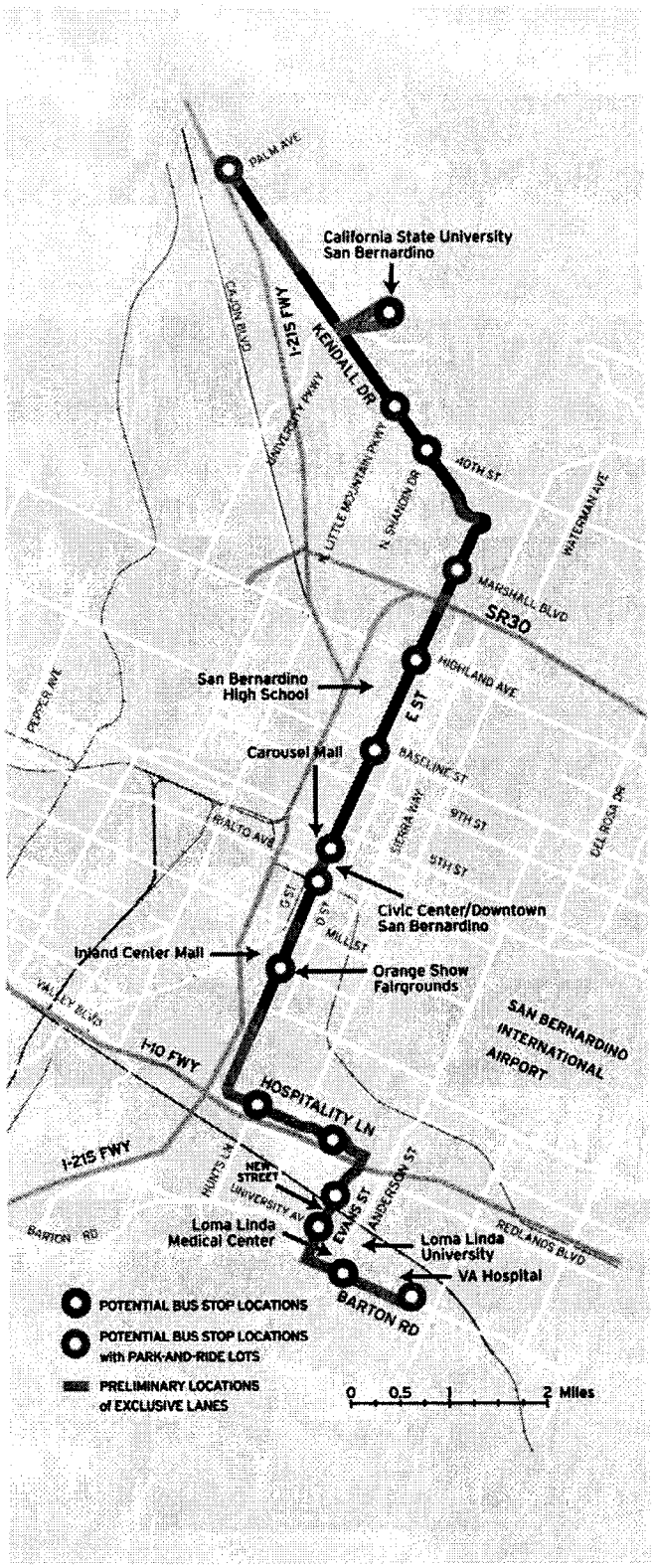


Table 1.1: Locally Preferred Alternative

Station Location	P+R Spaces	Distance in Miles	Queue Jumper	Acquisition/Easement Required	
				Area Required within 300' on either side of intersection (square foot)	Remarks
Kendall at Palm Ave.	80	0.00	Yes	44,000	Includes Park and Ride (surface parking), ROW for 300' south of intersection even though station is further south. Joint development potential on 12.8 acre vacant site
CSUSB-South		2.41		2,700	Removes some landscaping
Kendall Dr. at N. Little Mountain Dr.		1.35	Yes	900	May be difficult due to extremely narrow sidewalks
Kendall Dr. at Shandin Hills/40th St.		0.68	Yes		
E Street at Marshall Blvd.	150	1.58	Yes	55,000	Park and Ride (surface parking)
E St. at Highland Ave.		0.92	No		With Sidewalk Extension
E St. at Baseline St.		1.00	No		With Sidewalk Extension
E St. at Carousel Mall		1.09			Curb extension
E St. at Rialto Ave. north of RR	170	0.38		3,000	Park and Ride (surface parking) On Intermodal Transportation Center (Transcenter) site (Prior acquisition assumed)
E St. at North Mall Way		0.99	No	2,590	Includes linkage up to the bridge and up to the station near Orange Show Fairgrounds. Assumes 5' sidewalk could be added to the bridge (not a part of the project). Does not include linkage to shopping center
Hospitality Lane at Hunts Lane		1.70		7,800	Nearside Stop for EB
Hospitality Lane east of Carnegie Drive		0.92		8,400	
Evans Street at Academy Wy.	440	0.85		176,000	Includes Park and Ride (surface parking)
Evans St. at University Ave.		0.47		4,800	
Barton Road. at Anderson St.		0.59		11,400	
Barton Road at Loma Linda Dr.	120	0.93		155,000	Includes shared parking and replacement parking (total 600 spaces). Station and parking for sbX on 1st floor of parking structure, VA parking on levels 2, 3, and 4.
16 Stops *	**960**	**15.86**			
* Excluding Potential Future Stations					

Exhibit 1.9: Locally Preferred Alternative (Short Term)

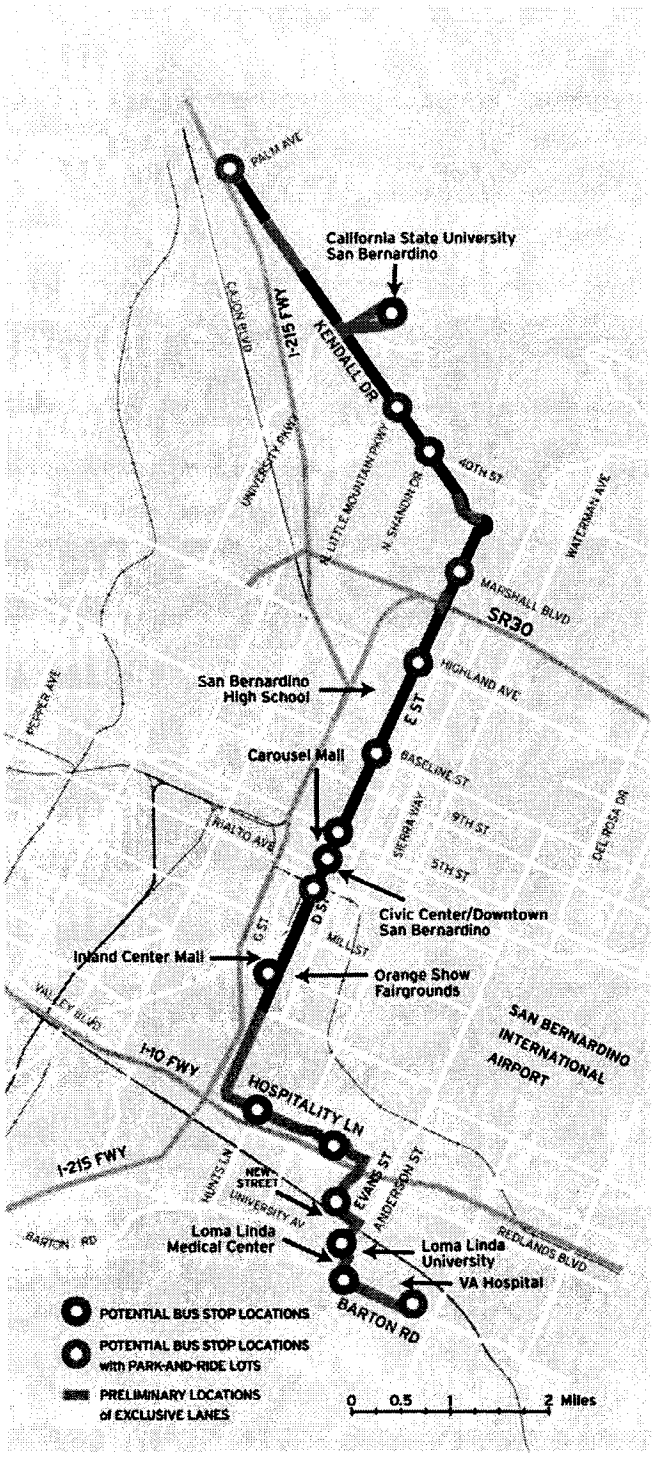


Table 1.2: Locally Preferred Alternative (Short Term)

Station Location	P+R Spaces	Distance in Miles	Queue Jumper	Acquisition/Easement Required: Area Required within 300' on either side of intersection (square foot)	Acquisition/Easement Required: Remarks
Kendall at Palm Ave.	80	0.00	Yes	44,000	Includes Park and Ride (surface parking), ROW for 300' south of intersection even though station is further south' Joint development potential on 12.8 acre vacant site.
CSUSB-South		2.41		2,700	Remove some landscaping
Kendall Dr. at N. Little Mountain Dr.		1.35	Yes	900	May be difficult due to extremely narrow sidewalks
Kendall Dr. at Shandin Hills/40th St.		0.68	Yes		
E Street at Marshall Blvd.	150	1.58	Yes	55,000	Park and Ride (surface parking)
E St. at Highland Ave.		0.92	No		With Sidewalk Extension
E St. at Baseline St.		1.00	No		With Sidewalk Extension
E St. at Carousel Mall		1.09			Curb extension
E St. at Rialto Ave. north of RR	170	0.38		3,000	Park and Ride (surface parking) On Intermodal Transportation Center (Transcenter) site (Prior acquisition assumed)
E St. at North Mall Way		0.99	No	2,590	Includes linkage up to the bridge and up to the station near Orange Show Fairgrounds. Assume 5' sidewalk could be added to the bridge (not a part of the project). Does not include linkage to shopping center
Hospitality Lane at Hunts Lane		1.70		7,800	Nearside Stop for EB
Hospitality Lane east of Carnegie Drive		0.92		8,400	
Evans Street at Academy Wy.	440	0.85		176,000	Includes Park and Ride (surface parking)
Anderson St. and Stewart St.		0.54		18,000	
Anderson St. at Barton Road		0.43		16,200	
Barton Road at Loma Linda Drive	120	0.93		155,000	Includes shared parking and replacement parking (total 600 spaces). Station and parking for sbX on 1st floor of parking structure, VA parking on levels 2, 3, and 4.
17 Stops *	**960**	**15.79**			

* Excluding Potential Future Stations

As shown in Table 1.1, the LPA includes 16 stations and is approximately 15.9 miles in length from the Palm/Kendall Station in the north to the VA Hospital and the Loma Linda Transcenter in the south.

The E Street LPA along with the Extension of Metrolink to the proposed San Bernardino Transcenter will create a new multimodal hub at E Street and Rialto that also connects to the proposed Redlands Rail Line (Exhibit 1.10).

Cost-Effectiveness/Benefit Assessment

The cost effectiveness of the Locally Preferred Alternative was calculated based on the ratio of the incremental cost of new service, divided by the incremental user benefit of the new service. The cost of new service was expressed in terms of annual dollars required for both capital costs and operating costs. The user benefits of new service were expressed in terms of annual hours of transit travel time savings.

The cost benefits of the LPA Alternative, as compared to the TSM Alternative, are summarized in Table 1.3. The data in this table showed that the cost effectiveness of the LPA Alternative is $12.53 per hour of transit travel time savings.

Exhibit 1.10: Redlands Rail Alignment

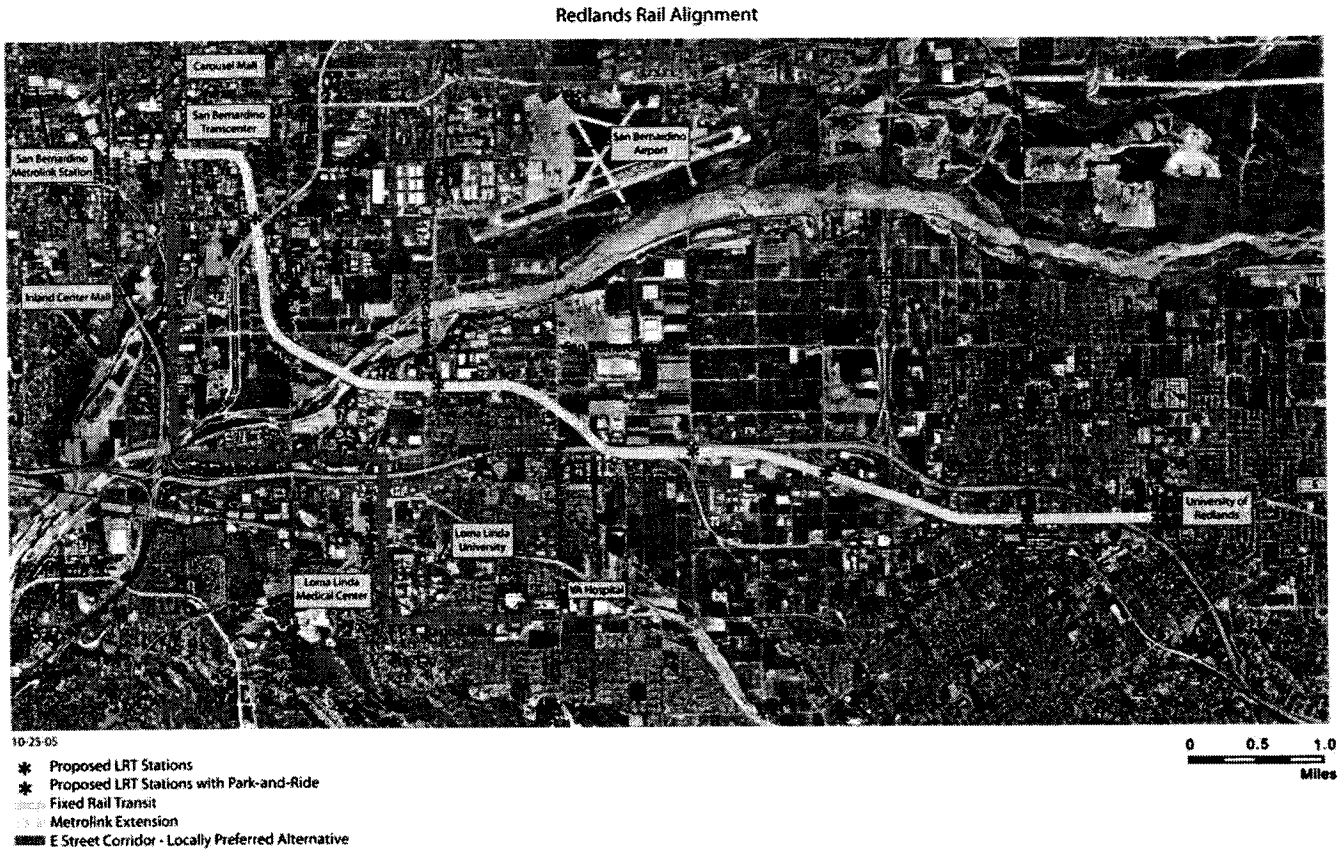


Table 1.3: Cost Effectiveness of LPA in Compared to TSM

Alternative	Annual Capital and Operating Cost	Annual Time Savings Benefit (Hours)	Cost Effectiveness (per Hour of Benefit)
TSM	$21,493,000	-	-
LPA	$24,763,000	261,000	$12.53

Next Steps in the Project Development Process

LPA Adoption and Inclusion in the SCAG RTP. The selection of the Locally Preferred Alternative (LPA) was determined by the PDT on October 26, 2005 based on the results of the detailed alternatives analysis and input from the general public, stakeholders, and agencies. As shown in Table 1.4, the recommendations of the PDT were presented to the Omnitrans Planning and Productivity Committee (PPC) on November 9, 2005, SANBAG's Plans & Programs Committee on November 16 and was adopted by the Omnitrans and SANBAG Boards on December 7, 2005. The LPA was also adopted by the San Bernardino and Loma Linda City Councils in December 2005.

Table 1.4: Status and Next Steps

• Project Development Team Recommended the LPA on October 26, 2005
• Omnitrans Board PPC – November 9, 2005 (Approved)
• SANBAG PPC – November 16, 2005 (Approved)
• San Bernardino City Council – December 5, 2005 (Approved)
• Omnitrans Board – December 7, 2005
• SANBAG Board – December 7, 2005
• Loma Linda City Council – Early 2006
• SCAG RSTIS Committee – January 19, 2006
• PDT Member Organizations – January through March, 2006
• Federal Transit Administration (FTA) – March/April, 2006

Upon completion of all local adoptions, Omnitrans will receive a Letter of Completion from the Southern California Association of Governments (SCAG). The Letter of Completion is issued by SCAG's Regionally Significant Transportation Investment Strategy (RSTIS) Committee.

Next, SANBAG and Omnitrans will nominate the LPA as part of the package of projects from San Bernardino County for inclusion in the next update of the Regional Transportation Plan (RTP) in early 2006. Then the LPA is taken before the appropriate SCAG RTP Committees for consideration in the next RTP's Adopted Plans and Programs list.

Transition into Preliminary Engineering and Environmental Studies

In addition to the LPA Report, several activities and deliverables need to be produced prior to the commencement of Preliminary Engineering and Environmental Studies.

Scope of Work for Detailed Alternatives Analysis. For environmental transition, a scope of work will be prepared by the Project Team for a Detailed Environmental Analysis that will be performed under the guidelines of the National Environmental Protection Act (NEPA).

Prepare Financial Plan. The following steps will be conducted in preparing the financial plan.

Identify Federal Funding Sources. The first task in developing the Financial Plan will be to identify the capital funding sources available from the Federal Government. One issue to be specifically addressed is the pros and cons of seeking Section 5309 New Starts funding. Depending on the cost and service plan of the BRT project, it may be more advantageous to enter the new "small starts" category of funding which has a federal participation cap of $75 million. This would enable the BRT project to enter a more streamlined New Starts rating process. To accomplish this task, the Project Team will evaluate various Federal funding programs available to Omnitrans.

Evaluate Sources of Funding for Local Match. The next task will be to evaluate funding sources for the local match of Federal funds. The degree of local match funding will be a major factor in the FTA's New Starts project evaluation process. A high level of matching funds from state and local sources demonstrates both that the project has strong local support, and that the Federal participation would be leveraged to a greater extent than for competing projects with lower matching levels from other metropolitan areas.

The local match requirement for the capital costs will be segmented and evaluated by type of capital expenditure. For example, potential joint-use facilities and opportunities for public/private partnerships will be evaluated as an opportunity for private investment to fund a portion of the capital cost. Vehicle costs will be assessed for a lease-purchase option in order to reduce the initial capital outlay.

Stability and Reliability Analysis. Once the Financial Plan is developed, the next task will be to evaluate the plan's ability to deal with funding contingencies such as delays in federal funding, changes in local economic activity, and some degree of unforeseen cost escalation. In order to evaluate the stability and reliability of the funding plan, two types of "What if" analysis will be done. A stability analysis will be performed to measure the plan's ability to withstand changes in the driving variables in the sources of revenue. The plan should be able to manage a reasonable amount of changes in the underlying assumptions without unduly impacting the funding requirements of the plan. Changes in economic growth projections, unanticipated declines in ridership, or adverse changes to the level of inflation should be the type of variables the plan should be able to withstand. A reliability analysis will be performed to measure the plan's ability to be influenced by changes in the legislative and political environment.

Risk Analysis. In the cost side, each major component of the transportation system will be reviewed to ensure that sufficient allowance has been made to deal with unforeseen contingencies. This analysis will essentially measure the plan's ability to manage cost overruns and unanticipated delays and expenses beyond the planned expenditure levels.

Prepare Draft Program Management Plan. A Draft Program Management Plan will be prepared as required by FTA prior to approval for entry into Preliminary Engineering. The Draft Program Management Plan will include:

- Roles and Responsibilities of Key Participants;
- Quality Control and Assurance;

POTENTIAL FUNDING SOURCES FOR LOCAL MATCH	
State and Local Funds	• State Transit Assistance Funds • Transit Development Act (TDA) Funds • Motor Fuel Taxes • Vehicle Registration Fees • Special Purpose Local Option Sales Taxes • Special Tax Allocation Districts
Ancillary Revenues (Net of Cost of Operating)	• Parking Fees • Concessions • Advertising • Joint Development • Public / Private Partnerships
Innovative Financing Tools	• Capital Leases – Lease / Lease Back Program • Vendor Financing of Rolling Stock • Lease – Purchase Procurements • Various Short-Term Financing Programs

- Design Management;
- Real Estate and Other Property Acquisition;
- Risk Management;
- Safety and Security;
- Construction and Procurement Management;
- Testing and Preparation for Revenue Start-Up;
- Human Resources;
- Labor Relations and Dispute Resolution; and
- Legal Requirements, Assurances and Agreements.

Prepare New Starts Report. A New Starts Report will be prepared for submittal to FTA. This report will include:

- Project Justification Information (mobility improvements, environmental benefits, operating efficiencies, cost effectiveness,

transit supportive existing land use policies, and future patterns, and other factors);

- Financial Plan (proposed share from sources other than Section 5309 New Starts, strength of proposed capital funding plan, ability to fund operation and maintenance);
- Fleet Management Plan; and
- Draft Program Management Plan.

Prepare Request to Enter PE. A formal request for approval to enter Preliminary Engineering will be prepared for submittal to FTA.

Transition to Preliminary Engineering. Transition to Preliminary Engineering will involve the preparation of the Administrative Record (project files) and a scope of work that Omnitrans can use to supplement this contract.

Documents Needed for Transition to PE
LPA Report
20-Year Capital Program Financial Plan
20-Year Operating Program Financial Plan
20-Year Cash Flow
Draft Program Management Plan
New Starts Report
Fleet Management Plan
Request to Enter Preliminary Engineering
Administrative Record

This page intentionally left blank.

CHAPTER 2 - CAPITAL COSTS

The calculation of the Capital Costs for the various alternatives was assembled from four elements, which were summarized into the Standard Cost Categories (SCC) "Main Spreadsheet".

Tables 2.1 through 2.4 show two pages of the SCC; the "Main Spreadsheet" and "BUILD Annualized", for the Long-Term and Short-Term LPAs. Please note that costs are entered into the spreadsheet in thousands of dollars. This means that an entry of 472 represents $472,000 and an entry of 20,100 represents a cost of $20,100,000. The line items described below refer to those labeled on these Tables.

Those elements that contributed to the Capital Cost calculation are:

- **Right of Way Summary Sheets.** As part of the corridor definition and right-of-way analysis, a series of spreadsheets was constructed to compute where acquisition may be required. These spreadsheets provide estimates of the cost of real estate required to accommodate widening in the Corridor. In addition, they estimate the amount of the Corridor subject to roadway modification, as well as the length subject to simple re-striping. This provides input to line items 10.02, 10.03, and 60.01 in the SCC.
- **Structure Estimates.** These estimates provided cost estimates for the various structures (e.g. bridge widening) required for the various alternatives. Those components of cost for line items in the 80s, and line 90 of the SCC are computed separately for the entire Alternative.
- **Station Costing.** These provided estimates for capital costs for the stations. The station costing was comprised of a large number of elements, resulting in many entries in the SCC. The station costing spreadsheet, shown in Table 2.5, provided input to line items 20.01, 20.06, 40.05, 40.06, 40.07, 50.05, 50.06, and 60.01.

Table 2.1: Major Capital Project Costs (Long-Term LPA)

Major Capital Project Costs - Main Worksheet (Rev. 1, Jan. 21, 2005)

Project	E-Street BRT - LPA {Long-Term}	Today's Date	10/6/05
Location	San Bernardino, CA	Yr of Base Year Dollars	2005
Project ID	XXXX (TEAM-Fast Track Cross-Ref. ID - automatically assigned by Fast Track; call to obtain)		
Phase	AA	Yr of Revenue Ops	2010
Contracting Method	Design Bid Build, Design Build, CM at Risk, e	Forecast Year	2030
Number of Route Miles	15.55	Number of Stations	16

Year of Base Year Dollars should match year in "Today's Date."

YOE Dollars automatically arrive from Inflation Calculation to YOE worksheet.

Base Year Dollars Total should match Base Year Dollars Total on the Allocated Contingency worksheet.

	Quantity	Base Year Dollars Total (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**9.65**	**30,875**	**$ 3,199**	**56%**	**20%**	**34,920**
10.01 Guideway: At-grade exclusive right-of-way						
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	4.89	21,688	$ 4,435			
10.03 Guideway: At-grade in mixed traffic	4.54	321	$ 71			
10.04 Guideway: Aerial structure	0.22	8,865	$ 40,295			
10.05 Guideway: Built-up fill						
10.06 Guideway: Underground cut & cover						
10.07 Guideway: Underground tunnel						
10.08 Guideway: Retained cut or fill						
10.09 Track: Direct fixation						
10.10 Track: Embedded						
10.11 Track: Ballasted						
10.12 Track: Special (switches, turnouts)						
10.13 Track: Vibration and noise dampening						
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**16**	**11,167**	**$ 698**	**20%**	**7%**	**12,587**
20.01 At-grade station, stop, shelter, mall, terminal, platform	16	8,167	$ 510			
20.02 Aerial station, stop, shelter, mall, terminal, platform						
20.03 Underground station, stop, shelter, mall, terminal, platform						
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.						
20.05 Joint development						
20.06 Automobile parking multi-story structure		3,000				
20.07 Elevators, escalators						
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.65	**4,062**	**$ 421**	**7%**	**3%**	**4,658**
30.01 Administration Building: Office, sales, storage, revenue counting						
30.02 Light Maintenance Facility		4,062				
30.03 Heavy Maintenance Facility						
30.04 Storage or Maintenance of Way Building						
30.05 Yard and Yard Track						
40 SITEWORK & SPECIAL CONDITIONS	9.65	**4,974**	**$ 515**	**9%**	**3%**	**5,749**
40.01 Demolition, Clearing, Earthwork						
40.02 Site Utilities, Utility Relocation		989				
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments						
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks						
40.05 Site structures including retaining walls, sound walls		608				
40.06 Pedestrian / bike access and accommodation, landscaping		472				
40.07 Automobile, bus, van accessways including roads, parking lots		2,905				
40.08 Temporary Facilities and other indirect costs during construction						
50 SYSTEMS	9.65	**3,867**	**$ 401**	**7%**	**3%**	**4,425**
50.01 Train control and signals						
50.02 Traffic signals and crossing protection						
50.03 Traction power supply: substations						
50.04 Traction power distribution: catenary and third rail						
50.05 Communications		537				
50.06 Fare collection system and equipment		3,330				
50.07 Central Control						
Construction Subtotal (Sum Categories 10 - 50)	9.65	**54,944**	**$ 5,694**	**100%**	**36%**	**62,338**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.65	**11,950**	**$ 1,238**		**8%**	**13,691**
60.01 Purchase or lease of real estate		11,950				
60.02 Relocation of existing households and businesses						
70 VEHICLES (number)	**33**	**17,650**	**$ 535**		**12%**	**20,107**
70.01 Light Rail						
70.02 Heavy Rail						
70.03 Commuter Rail						
70.04 Bus	10	5,000	$ 500			
70.05 Other	23	12,650	$ 550			
70.06 Non-revenue vehicles						
70.07 Spare parts						
80 PROFESSIONAL SERVICES	9.65	**43,107**	**$ 4,467**		**28%**	**49,352**
80.01 Preliminary Engineering		6593				
80.02 Final Design		13,736				
80.03 Project Management for Design and Construction		10,989				
80.04 Construction Administration & Management		10,989				
80.05 Insurance		200				
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		200				
80.07 Surveys, Testing, Investigation, Inspection		200				
80.08 Agency Force Account Work		200				
90 UNALLOCATED CONTINGENCY		**25,000**			**16%**	**28,698**
Subtotal (Sum Categories 10 - 90)	9.65	**152,651**	**$ 15,819**		**100%**	**174,187**
100 FINANCE CHARGES		**0**			**0%**	**0**
Total Project Cost (Sum Categories 10 - 100)	9.65	**152,651**	**$ 15,819**		**100%**	**174,187**

Below, please include notes, commentary, etc. to clarify usage of categories and line items, to note special conditions, reasons for cost change, etc.

YOE Construction Cost per Mile (X000)	$ 6,460
YOE Total Project Cost per Mile (X000)	**$ 18,050**
Base Year Soft Costs & Contingency/Construction (80 + 90) / (10 thru 50)	124%

Enter finance charges on Inflation Calculation to YOE worksheet.

Table 2.2: Major Capital Project Costs (Long-Term LPA) (Annualized Cost)

Major Capital Project Costs - BUILD Annualized Cost (Template 8) (Rev. 1, Jan. 21, 2005)

Project	E-Street BRT - LPA {Long-Term}	Today's Date	10/6/05
Location	San Bernardino, CA	Yr of Base Year Dollars	2005

For the BUILD alternative, simply spread the Contingency according to perceived Risks. When the project includes buses, insert the appropriate Annualization Factor. The rest is automatically calculated.

	Quantity	Base Year Dollars Total (X000)	Spread proportionally Professional Services over Categories 10 through 50 (X000)	Spread Unallocated Contingency according to perceived Risks (X000)	Total with Professional Services and Unallocated Contingency spread (X000)	Years of Useful Life	Annualization Factor (based on 7% rate) [.07/1 - (1.07)^-no. yrs]	Annualized Cost = Total with Professional Services and Contingency spread x Ann. Factor (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**9.65**	**30,875**			**60,097**			**4,637**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0	0	5,000	5,000	80	0.0703	352
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	4.89	21,688	17,016		38,704	30	0.0806	3,119
10.03 Guideway: At-grade in mixed traffic	4.54	321	252		574	20	0.0944	54
10.04 Guideway: Aerial structure	0.22	8,865	6,955		15,820	80	0.0703	1,112
10.05 Guideway: Built-up fill	0.00	0	0		0	80	0.0703	0
10.06 Guideway: Underground cut & cover	0.00	0	0		0	70	0.0706	0
10.07 Guideway: Underground tunnel	0.00	0	0		0	70	0.0706	0
10.08 Guideway: Retained cut or fill	0.00	0	0		0	80	0.0703	0
10.09 Track: Direct fixation		0	0		0	30	0.0806	0
10.10 Track: Embedded		0	0		0	20	0.0944	0
10.11 Track: Ballasted		0	0		0	35	0.0772	0
10.12 Track: Special (switches, turnouts)		0	0		0	30	0.0806	0
10.13 Track: Vibration and noise dampening		0	0		0	30	0.0806	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**16**	**11,167**			**24,928**			**1,770**
20.01 At-grade station, stop, shelter, mall, terminal, platform	16	8,167	6,407	5,000	19,574	70	0.0706	1,382
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0		0	70	0.0706	0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0		0	70	0.0706	0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0		0	70	0.0706	0
20.05 Joint development	0	0	0		0	70	0.0706	0
20.06 Automobile parking multi-story structure	0	3,000	2,354		5,354	50	0.0725	388
20.07 Elevators, escalators	0	0	0		0	30	0.0806	0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		**4,062**			**9,248**			**670**
30.01 Administration Building: Office, sales, storage, revenue counting		0	0		0	50	0.0725	0
30.02 Light Maintenance Facility		4,062	3,186	2,000	9,248	50	0.0725	670
30.03 Heavy Maintenance Facility		0	0		0	50	0.0725	0
30.04 Storage or Maintenance of Way Building		0	0		0	50	0.0725	0
30.05 Yard and Yard Track		0	0		0	80	0.0703	0
40 SITEWORK & SPECIAL CONDITIONS		**4,974**			**9,877**			**863**
40.01 Demolition, Clearing, Earthwork		0	0		0	100	0.0701	0
40.02 Site Utilities, Utillty Relocation		989	776		1,765	100	0.0701	124
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0		0	100	0.0701	0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0		0	100	0.0701	0
40.05 Site structures including retaining walls, sound walls		608	477		1,085	80	0.0703	76
40.06 Pedestrian / bike access and accommodation, landscaping		472	370		842	20	0.0944	80
40.07 Automobile, bus, van accessways including roads, parking lots		2,905	2,279	1,000	6,184	20	0.0944	584
40.08 Temporary Facilities and other indirect costs during construction		0	0		0	100	0.0701	0
50 SYSTEMS		**3,867**			**7,901**			**746**
50.01 Train control and signals		0	0		0	30	0.0806	0
50.02 Traffic signals and crossing protection		0	0		0	30	0.0806	0
50.03 Traction power supply: substations		0	0		0	40	0.0750	0
50.04 Traction power distribution: catenary and third rail		0	0		0	30	0.0806	0
50.05 Communications		537	421		958	20	0.0944	90
50.06 Fare collection system and equipment		3,330	2,613	1,000	6,943	20	0.0944	655
50.07 Central Control		0	0		0	30	0.0806	0
Construction Subtotal (Sum Categories 10 - 50)		**54,944**			**112,051**			**8,686**
60 ROW, LAND, EXISTING IMPROVEMENTS		**11,950**			**22,950**			**1,608**
60.01 Purchase or lease of real estate		11,950		11,000	22,950	100	0.0701	1,608
60.02 Relocation of existing households and businesses		0			0	100	0.0701	0
70 VEHICLES (number)	**33**	**17,650**			**17,650**			**1,938**
70.01 Light Rail	0	0			0	25	0.0858	0
70.02 Heavy Rail	0	0			0	25	0.0858	0
70.03 Commuter Rail	0	0			0	25	0.0858	0
70.04 Bus	10	5,000			5,000	12 to 18	0.1098	549
70.05 Other	23	12,650			12,650	varies	0.1098	1,389
70.06 Non-revenue vehicles	0	0			0	varies		0
70.07 Spare parts	0	0			0	varies		0
80 PROFESSIONAL SERVICES		**43,107**						
80.01 Preliminary Engineering		6,593						
80.02 Final Design		13,736						
80.03 Project Management for Design and Construction		10,989						
80.04 Construction Administration & Management		10,989						
80.05 Insurance		200						
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		200						
80.07 Surveys, Testing, Investigation, Inspection		200						
80.08 Agency Force Account Work		200						
90 UNALLOCATED CONTINGENCY		**25,000**						
Subtotal (Sum Categories 10 - 90)		**152,651**	43,107	25,000	**152,651**			**12,233**

Table 2.3: Major Capital Project Costs (Short-Term LPA)

Major Capital Project Costs - Main Worksheet (Rev. 1, Jan. 21, 2005)

Project	E-Street BRT - LPA {Short Term}	Today's Date	10/6/05
Location	San Bernardino, CA	Yr of Base Year Dollars	2005
Project ID	XXXX (TEAM-Fast Track Cross-Ref. ID - automatically assigned by Fast Track; call to obtain)		
Phase	AA	Yr of Revenue Ops	2010
Contracting Method	Design Bid Build, Design Build, CM at Risk, e	Forecast Year	2030
Number of Route Miles	15.66	Number of Stations	16

Year of Base Year Dollars should match year in "Today's Date."

YOE Dollars automatically arrive from Inflation Calculation to YOE worksheet.

Base Year Dollars Total should match Base Year Dollars Total on the Allocated Contingency worksheet.

	Quantity	Base Year Dollars Total (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)	Below, please include notes, commentary, etc. to clarify usage of categories and line items, to note special conditions, reasons for cost change, etc.
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**9.75**	**32,383**	**$ 3,321**	**57%**	**21%**	**36,724**	
10.01 Guideway: At-grade exclusive right-of-way							
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	5.05	22,398	$ 4,435				
10.03 Guideway: At-grade in mixed traffic	4.48	317	$ 71				
10.04 Guideway: Aerial structure	0.22	9,668	$ 43,945				
10.05 Guideway: Built-up fill							
10.06 Guideway: Underground cut & cover							
10.07 Guideway: Underground tunnel							
10.08 Guideway: Retained cut or fill							
10.09 Track: Direct fixation							
10.10 Track: Embedded							
10.11 Track: Ballasted							
10.12 Track: Special (switches, turnouts)							
10.13 Track: Vibration and noise dampening							
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**16**	**11,167**	**$ 698**	**20%**	**7%**	**12,587**	
20.01 At-grade station, stop, shelter, mall, terminal, platform	16	8,167	$ 510				
20.02 Aerial station, stop, shelter, mall, terminal, platform							
20.03 Underground station, stop, shelter, mall, terminal, platform							
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.							
20.05 Joint development							
20.06 Automobile parking multi-story structure		3,000					
20.07 Elevators, escalators							
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.75	**4,062**	**$ 417**	**7%**	**3%**	**4,658**	
30.01 Administration Building: Office, sales, storage, revenue counting							
30.02 Light Maintenance Facility		4,062					
30.03 Heavy Maintenance Facility							
30.04 Storage or Maintenance of Way Building							
30.05 Yard and Yard Track							
40 SITEWORK & SPECIAL CONDITIONS	9.75	**4,913**	**$ 504**	**9%**	**3%**	**5,676**	
40.01 Demolition, Clearing, Earthwork							
40.02 Site Utilities, Utility Relocation		1,017					
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments							
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks							
40.05 Site structures including retaining walls, sound walls		624					
40.06 Pedestrian / bike access and accommodation, landscaping		472					
40.07 Automobile, bus, van accessways including roads, parking lots		2,800					
40.08 Temporary Facilities and other indirect costs during construction							
50 SYSTEMS	9.75	**3,867**	**$ 397**	**7%**	**2%**	**4,425**	
50.01 Train control and signals							
50.02 Traffic signals and crossing protection							
50.03 Traction power supply: substations							
50.04 Traction power distribution: catenary and third rail							
50.05 Communications		537					
50.06 Fare collection system and equipment		3,330					
50.07 Central Control							
Construction Subtotal (Sum Categories 10 - 50)	9.75	**56,392**	**$ 5,784**	**100%**	**36%**	**64,070**	
60 ROW, LAND, EXISTING IMPROVEMENTS	9.75	**12,888**	**$ 1,322**		**8%**	**14,813**	
60.01 Purchase or lease of real estate		12,888					
60.02 Relocation of existing households and businesses							
70 VEHICLES (number)	**33**	**17,650**	**$ 535**		**11%**	**20,107**	
70.01 Light Rail							
70.02 Heavy Rail							
70.03 Commuter Rail							
70.04 Bus	10	5,000	$ 500				
70.05 Other	23	12,650	$ 550				
70.06 Non-revenue vehicles							
70.07 Spare parts							
80 PROFESSIONAL SERVICES	9.75	**44,222**	**$ 4,536**		**28%**	**50,686**	
80.01 Preliminary Engineering		6767					
80.02 Final Design		14,098					
80.03 Project Management for Design and Construction		11,278					
80.04 Construction Administration & Management		11,278					
80.05 Insurance		200					
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		200					
80.07 Surveys, Testing, Investigation, Inspection		200					
80.08 Agency Force Account Work		200					
90 UNALLOCATED CONTINGENCY		**25,000**			**16%**	**28,698**	
Subtotal (Sum Categories 10 - 90)	9.75	**156,151**	**$ 16,015**		**100%**	**178,374**	
100 FINANCE CHARGES		**0**			**0%**	**0**	
Total Project Cost (Sum Categories 10 - 100)	9.75	**156,151**	**$ 16,015**		**100%**	**178,374**	

YOE Construction Cost per Mile (X000)	$ 6,571
YOE Total Project Cost per Mile (X000)	**$ 18,295**
Base Year Soft Costs & Contingency/Construction (80 + 90) / (10 thru 50)	123%

Enter finance charges on Inflation Calculation to YOE worksheet.

Table 2.4: Major Capital Project Costs (Short-Term LPA) (Annualized Cost)

Major Capital Project Costs - BUILD Annualized Cost (Template 8) (Rev. 1, Jan. 21, 2005)

Project	E-Street BRT - LPA {Short Term}	Today's Date	10/6/05
Location	San Bernardino, CA	Yr of Base Year Dollars	2005

For the BUILD alternative, simply spread the Contingency according to perceived Risks. When the project includes buses, insert the appropriate Annualization Factor. The rest is automatically calculated.

	Quantity	Base Year Dollars Total (X000)	Spread proportionally Professional Services over Categories 10 through 50 (X000)	Spread Unallocated Contingency according to perceived Risks (X000)	Total with Professional Services and Unallocated Contingency spread (X000)	Years of Useful Life	Annualization Factor (based on 7% rate) [.07/1 - (1.07)^-no. yrs]	Annualized Cost = Total with Professional Services and Contingency spread x Ann. Factor (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**9.75**	**32,383**			**62,777**			**4,838**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0	0	5,000	5,000	80	0.0703	352
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	5.05	22,398	17,564		39,962	30	0.0806	3,220
10.03 Guideway: At-grade in mixed traffic	4.48	317	249		566	20	0.0944	53
10.04 Guideway: Aerial structure	0.22	9,668	7,582		17,250	80	0.0703	1,213
10.05 Guideway: Built-up fill	0.00	0	0		0	80	0.0703	0
10.06 Guideway: Underground cut & cover	0.00	0	0		0	70	0.0706	0
10.07 Guideway: Underground tunnel	0.00	0	0		0	70	0.0706	0
10.08 Guideway: Retained cut or fill	0.00	0	0		0	80	0.0703	0
10.09 Track: Direct fixation		0	0		0	30	0.0806	0
10.10 Track: Embedded		0	0		0	20	0.0944	0
10.11 Track: Ballasted		0	0		0	35	0.0772	0
10.12 Track: Special (switches, turnouts)		0	0		0	30	0.0806	0
10.13 Track: Vibration and noise dampening		0	0		0	30	0.0806	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**16**	**11,167**			**24,924**			**1,770**
20.01 At-grade station, stop, shelter, mall, terminal, platform	16	8,167	6,404	5,000	19,571	70	0.0706	1,382
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0		0	70	0.0706	0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0		0	70	0.0706	0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0		0	70	0.0706	0
20.05 Joint development	0	0	0		0	70	0.0706	0
20.06 Automobile parking multi-story structure	0	3,000	2,353		5,353	50	0.0725	388
20.07 Elevators, escalators	0	0	0		0	30	0.0806	0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		**4,062**			**9,247**			**670**
30.01 Administration Building: Office, sales, storage, revenue counting		0	0		0	50	0.0725	0
30.02 Light Maintenance Facility		4,062	3,185	2,000	9,247	50	0.0725	670
30.03 Heavy Maintenance Facility		0	0		0	50	0.0725	0
30.04 Storage or Maintenance of Way Building		0	0		0	50	0.0725	0
30.05 Yard and Yard Track		0	0		0	80	0.0703	0
40 SITEWORK & SPECIAL CONDITIONS		**4,913**			**9,766**			**851**
40.01 Demolition, Clearing, Earthwork		0	0		0	100	0.0701	0
40.02 Site Utilities, Utility Relocation		1,017	798		1,815	100	0.0701	127
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0		0	100	0.0701	0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0		0	100	0.0701	0
40.05 Site structures including retaining walls, sound walls		624	489		1,113	80	0.0703	78
40.06 Pedestrian / bike access and accommodation, landscaping		472	370		842	20	0.0944	79
40.07 Automobile, bus, van accessways including roads, parking lots		2,800	2,196	1,000	5,996	20	0.0944	566
40.08 Temporary Facilities and other indirect costs during construction		0	0		0	100	0.0701	0
50 SYSTEMS		**3,867**			**7,899**			**746**
50.01 Train control and signals		0	0		0	30	0.0806	0
50.02 Traffic signals and crossing protection		0	0		0	30	0.0806	0
50.03 Traction power supply: substations		0	0		0	40	0.0750	0
50.04 Traction power distribution: catenary and third rail		0	0		0	30	0.0806	0
50.05 Communications		537	421		958	20	0.0944	90
50.06 Fare collection system and equipment		3,330	2,611	1,000	6,941	20	0.0944	655
50.07 Central Control		0	0		0	30	0.0806	0
Construction Subtotal (Sum Categories 10 - 50)		**56,392**			**114,613**			**8,875**
60 ROW, LAND, EXISTING IMPROVEMENTS		**12,888**			**23,888**			**1,674**
60.01 Purchase or lease of real estate		12,888		11,000	23,888	100	0.0701	1,674
60.02 Relocation of existing households and businesses		0			0	100	0.0701	0
70 VEHICLES (number)	**33**	**17,650**			**17,650**			**1,938**
70.01 Light Rail	0	0			0	25	0.0858	0
70.02 Heavy Rail	0	0			0	25	0.0858	0
70.03 Commuter Rail	0	0			0	25	0.0858	0
70.04 Bus	10	5,000			5,000	12 to 18	0.1098	549
70.05 Other	23	12,650			12,650	varies	0.1098	1,389
70.06 Non-revenue vehicles	0	0			0	varies		0
70.07 Spare parts	0	0			0	varies		0
80 PROFESSIONAL SERVICES		**44,222**						
80.01 Preliminary Engineering		6,767						
80.02 Final Design		14,098						
80.03 Project Management for Design and Construction		11,278						
80.04 Construction Administration & Management		11,278						
80.05 Insurance		200						
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		200						
80.07 Surveys, Testing, Investigation, Inspection		200						
80.08 Agency Force Account Work		200						
90 UNALLOCATED CONTINGENCY		**25,000**						
Subtotal (Sum Categories 10 - 90)		**156,151**	44,222	25,000	**156,151**			**12,487**

Table 2.5: Station Costing Detail

	Station Costing Detail	Unit	Quantity	Unit Cost	Site Cost	Comments	LPA - Long Term			LPA - Short Term		
							Units	Cost	Sub Total	Units	Cost	Sub Total
20.01 At-grade station, stop, ...												
	48' Canopy	LS	1	$141,000	$141,000		4	$564,000		4	$564,000	
					$98,700		13	$1,283,099		13	$1,283,099	
					$70,500		12	$845,999		12	$845,999	
	Sidewalk (120'x18')	SF	2160	$6	$12,960		30	$388,800		30	$388,800	
	Electrical for Lighting	LS	1	$10,000	$10,000		30	$300,000		30	$300,000	
	Solar Power (optional)	LS	2	$4,000	$8,000		30	$240,000		30	$240,000	
	Lighting (Poles)	LS	2	$7,000	$14,000		30	$420,000		30	$420,000	
	Lighting Under Canopy	LS	1	$50,000	$50,000		30	$1,500,000		30	$1,500,000	
	Light To Alert Passengers of Bus	LS	1	$2,000	$2,000		30	$60,000		30	$60,000	
	Water Hookup	LS	1	$5,000	$5,000		30	$150,000		30	$150,000	
	Misting System	LS	1	$4,000	$4,000	Assumes Water & Electrical	30	$120,000		30	$120,000	
	Benches	LS	4	$3,000	$12,000		30	$360,000		30	$360,000	
	Station Marker/Logo Sign	LS	1	$8,000	$8,000		30	$240,000		30	$240,000	
	System/Neighborhood Map	LS	1	$5,000	$5,000		30	$150,000		30	$150,000	
	Signs	EA	10	$500	$5,000		30	$150,000		30	$150,000	
	Public Art	Allowance	1	$10,000	$10,000		30	$300,000		30	$300,000	
	Trash Receptacle	LS	3	$3,000	$9,000		30	$270,000		30	$270,000	
	Decorative Crosswalks	LS	1	$20,000	$20,000		30	$600,000		30	$600,000	
	Street Trees	EA	5	$1,500	$7,500	Trees every 40 ft	30	$225,000		30	$225,000	
Subtotal									**$8,166,898**			**$8,166,898**
20.06 Automobile parking multi-story structure												
	Parking Structure	Space	1	$25,000	$25,000		120	$3,000,000		120	$3,000,000	
Subtotal									**$3,000,000**			**$3,000,000**

Table 2.5 (Continued): Station Costing Detail

	Station Costing Detail	Unit	Quantity	Unit Cost	Site Cost	Comments	LPA - Long Term			LPA - Short Term		
							Units	Cost	Sub Total	Units	Cost	Sub Total
40.05 Site structures including retaining walls, sound walls												
	2.5 Ft tall wall enclosure (poured concrete)	LF	80	$100	$8,000		21	$168,000		23	$184,000	
	Curb Extension (Concrete)	LS	1	$20,000	$20,000		22	$440,000		22	$440,000	
Subtotal									**$608,000**			**$624,000**
40.06 Pedestrian / bike access and accommodation, landscaping												
	Landscaping	Allowance	1	$5,000	$5,000		30	$150,000		30	$150,000	
	Windscreen	Allowance	2	$5,000	$10,000		30	$300,000		30	$300,000	
	Bike Racks	LS	2	$360	$720		30	$21,600		30	$21,600	
Subtotal									**$471,600**			**$471,600**
40.07 Automobile, bus, van accessways including roads, parking lots												
	Surface Parking	Space	1	$3,500	$3,500		830	$2,905,000		800	$2,800,000	
Subtotal									**$2,905,000**			**$2,800,000**
50.05 Communication												
	Passenger Telephone	LS	1	$10,000	$10,000		30	$300,000		30	$300,000	
	Security Devices (Cameras)	Station	1	$5,000	$5,000		30	$150,000		30	$150,000	
	Variable Message Sign	LS	1	$2,900	$2,900		30	$87,000		30	$87,000	
Subtotal									**$537,000**			**$537,000**
50.06 Fare Collection System And Equipment												
	Ticket Vending Machine	LS	1	$60,000	$60,000		48	$2,880,000		48	$2,880,000	
	Validator	LS	1	$15,000	$15,000		30	$450,000		30	$450,000	
Subtotal									**$3,330,000**			**$3,330,000**
60.01 Purchase of Lease of Real Estate												
		See RoW Worksheet							$7,105,720			$7,769,320
Total									**$26,124,218**			**$26,698,818**

- **Operating Costs Calculation Spreadsheet.** The operating cost calculation presented in the following chapter was used to provide the number of buses required for each alternative. These buses are capital cost items, which are entered on line items 70.04 and 70.05 of the SCC. In addition, the "fair share" cost of the light maintenance facility currently planned by Omnitrans (as a portion of the 260 bus capacity) is added to line item 30.02.

A summary of the resulting capital and annualized capital costs for the four alternatives (No Build, TSM, Long-Term LPA, Short-Term LPA) is shown in Table 2.6. The alternatives range from $70,437,000 for the TSM to $156,151,000 for the Short-Term LPA. This corresponds to annualized costs ranging from $5,909,000 for the TSM to $12,487,000 for the Short-Term LPA.

The capital costs developed in the "Main Spreadsheet" can be annualized based on an assumption of the number of years of useful life for each element. One benefit to the great detail required by the SCC is that differing annualization factors can be applied to each line item. Tables 2.2 and 2.4 show the annualization calculation (built into the SCC) for the Long-Term and Short-Term LPA. The last three columns on the right show: the useful life, the annualization factor (based on a 7% discount rate), and the resultant annualized cost for each line item. The line items are summed to obtain the total annualized cost for the alternative. The useful lives and discount rate (annualization factors) are fixed by the FTA for all capital cost items other than buses.

Table 2.6: Summary of Capital Costs

Alternatives	Total Capital Cost	Annualized Capital Cost
No Build	$8,100,000	$830,000
TSM Alternative	$70,437,000	$5,909,000
sbX LPA {Long-Term}	$152,651,000	$12,233,000
sbX LPA {Short-Term}	$156,151,000	$12,487,000

CHAPTER 3 - OPERATING COSTS

In addition to capital costs, operating costs for each alternative were developed. These could then be combined to provide an annualized total cost for each alternative, which would be more directly comparable.

sbX operating costs share components with bus operating costs. Each comes from a combination of vehicle service hours and the cost per vehicle service hour.

Vehicle service hours include the time spent in actual service, layover time at the end of the route and time, if necessary, to turn the bus around at each end of the route. Computing vehicle service hours included the following steps:

- The distance of each alignment has been measured. Round trip times have been simulated.
- Layover times need to be 10% of the round trip running time, with a minimum of 10 minutes, according to Omnitrans' labor agreement with the bus operators
- Turnaround times for each alignment were estimated by the project team subject to further refinement later in the study
- Adding these three separate estimates, a total time for each round trip was computed for each alignment
- Round trip time multiplied by the number of round trips per day yields the daily vehicle service hours, which were annualized by multiplying by 311, the current Annualization factor for Omnitrans fixed route service.
- Calculations of operating costs used Omnitrans' average bus operating ($82.24) cost, from the Short Range Transit Plan (SRTP) for 2004 to 2009.
- Multiplying the annual vehicle service hours by the average operating cost yields estimated annual cost for any alignment.

The results of this calculation are shown in Table 3.1. The TSM Alternative has a larger operating cost than the LPAs since more buses are required to cover the route (as the sbX is faster) and hence, require more vehicle service hours and a greater operating cost.

Table 3.1: Operating Cost Calculations (All Routes that vary between Alternatives)

Alternatives	Routes	Peak Round Trip Miles	Peak Round Trip Minutes	Headway Peak	Headway OP	Weekday # Round Trips	Weekday Veh Serv Hours	Weekday Veh Serv Miles	Peak Vehicles Required	Weekday Operating Cost	Annual Operating Cost	Annual Oper. $ per Alternative
No Build Alternative		27.0	138	15	15	72	188	2016	13	$15,500	**$4,880,000**	**$4,880,000**
TSM Alternative	Route 2 Limited	32.0	112	5	5	216	461	7137	31	$37,900	**$11,932,000**	
	Route 2	27.0	138	20	20	54	141	1512	10	$11,600	**$3,652,000**	**$15,584,000**
sbX LPA {Long-term}	sbX	31.1	80	5	5	216	343	6934	23	$28,200	**$8,878,000**	
	Route 2	27.0	138	20	20	54	141	1512	10	$11,600	**$3,652,000**	**$12,530,000**
sbX LPA {Short-term}	sbX	31.3	81	5	5	216	344	6981	23	$28,300	**$8,909,000**	
	Route 2	27.0	138	20	20	54	141	1512	10	$11,600	**$3,652,000**	**$12,561,000**

Assumptions:
- 5 minute turnaround per round trip
- 1 mile turnaround per round trip
- 10% layover
- 10 minute minimum layover per round trip
- 6 peak hours
- 12 off-peak hours
- Operating cost of $82.24 per hour (from 2004 SRTP)
- Number of vehicles includes 20% spares
- Annualization Factor (from 2004 SRTP pp G-15)

CHAPTER 4 - ANNUALIZED COSTS

The annualized costs from Tables 2.6 and 3.1 can be combined to provide the total annualized cost of each alternative.

Table 4.1 shows the total annualized cost for each alternative. The TSM alternative, which includes the same Park and Ride (PNR) facilities as in the LPA, albeit with fewer spaces, as well as requiring more buses to service the route, has a total annualized capital cost of $21,493,000 while the LPA Alternatives are $24,763,000 for the Long-Term LPA, and $25,048,000 for the Short-Term LPA.

Table 4.1: Comparison of Annualized Costs

Alternatives	Annualized Capital Cost	Annualized Operating Cost	Total Annualized Cost	Increment Above No Build	Increment Above TSM
No Build Alternative	$830,000	$6,192,000	$7,022,000	$0	
TSM Alternative	$5,909,000	$15,584,000	$21,493,000	$14,471,000	$0
sbX LPA {Long-Term}	$12,233,000	$12,530,000	$24,763,000	$17,741,000	$3,270,000
sbX LPA {Short-Term}	$12,487,000	$12,561,000	$25,048,000	$18,026,000	$3,555,000

This page intentionally left blank.

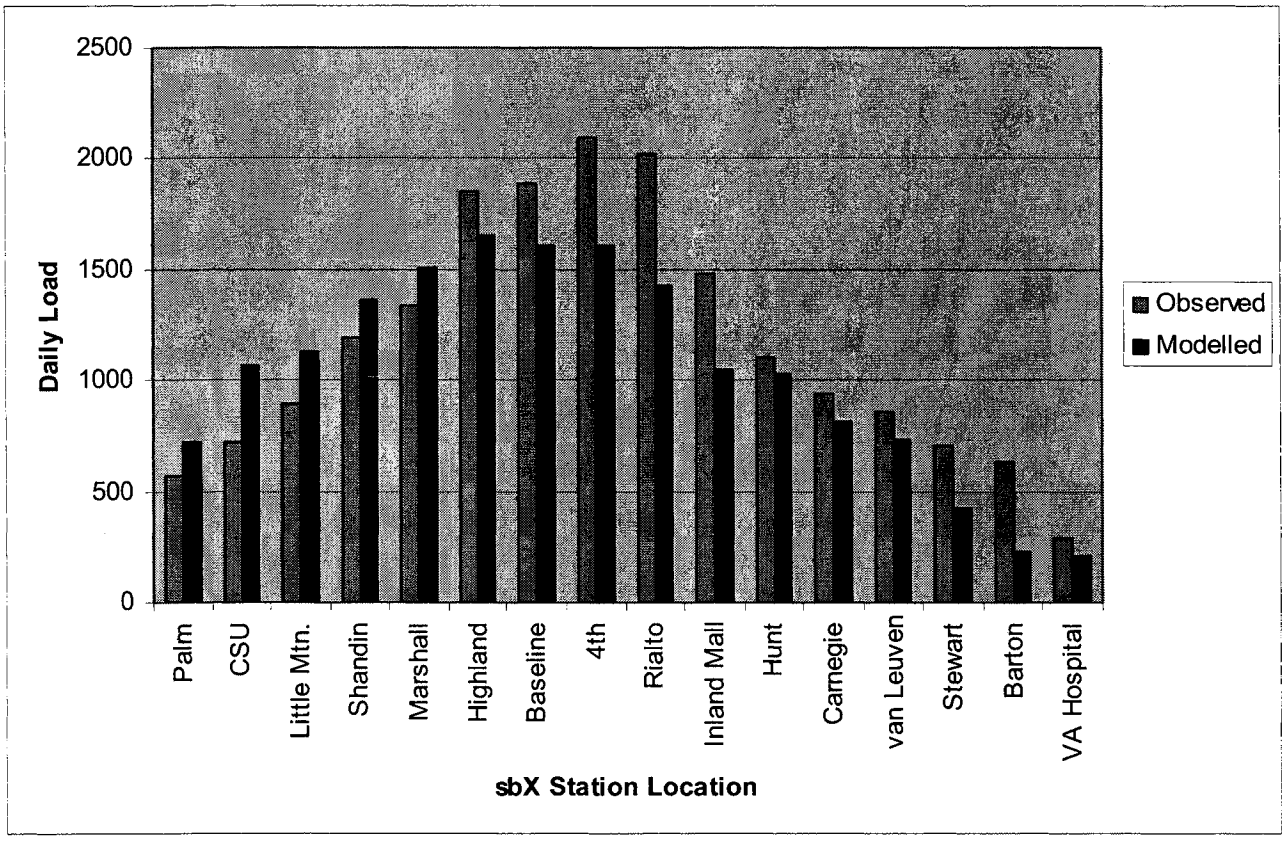
Travel Demand Model

The San Bernardino Valley Travel Model (SBVM) was developed specifically for the purpose of creating travel demand forecasts of transit ridership in the San Bernardino Valley and the E Street Corridor. These forecasts were used to estimate future transit ridership on the different alternatives being tested, and to assess the relative benefits of the various alternatives.

The SBVM is similar in structure to the Southern California Association of Governments (SCAG) model, with additional detail added in the San Bernardino Valley. The other major difference between the SBVM and SCAG models is that SBVM includes a more robust mode choice model that is based on the mode choice model developed for and used by OCTAM. This mode choice model is better suited for testing the range of transit modes available in the San Bernardino Valley.

The SBVM was developed and calibrated to provide an accurate representation of existing transit ridership in the San Bernardino Valley and the E Street Corridor. Exhibit 5.1 presents a comparison of the observed and modeled load profiles for Omnitrans Route 2. This exhibit shows how closely the model estimated the ridership on the transit route through the E Street Corridor. The validation of the transit assignment element of the SBVM is strongly demonstrated by this exhibit.

Exhibit 5.1: Route 2 Daily Loads at sbX Station Locations



Horizon Year 2030 Travel Demand Forecasts for the LPA

This section describes the results of the transit assignments for the LPA versus the No Build and TSM Baselines.

Background Assumptions

The No Build, TSM, and LPA model runs for the horizon year (2030) all include the same background assumptions. This is done so that the travel demand forecast results isolate the impacts of the different networks and ignore the incremental impacts of other factors.

For the purposes of the E Street Corridor analysis, all of the model runs are based on a single horizon year (2030), a single scenario of population and employment growth (based on the SCAG Baseline forecast for Year 2030), and a single highway network (based on the SCAG Baseline network, plus highway improvements in the San Bernardino Valley that are funded by the extension of Measure I).

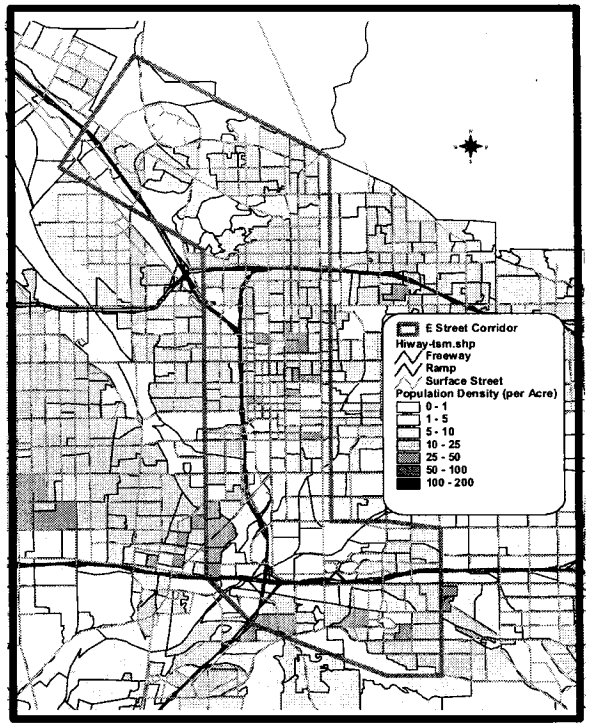
Socioeconomic Data

The background socioeconomic data used in the SBVM travel demand forecasts is based on the Year 2030 SCAG data. Detailed analysis of the SCAG data showed that population and employment growth forecasts for the City of San Bernardino were applied using constant growth rates. I.e. all SCAG TAZs within the City of San Bernardino had the same growth rates for residential data and the same growth rates for employment data.

In order to produce more realistic forecasts, the socioeconomic data for the City of San Bernardino was reallocated to SCAG zones. The reallocation was based on other available information, including land use forecasts used in the CTP and East Valley models, and land use projections of the City of San Bernardino.

The horizon year (2030) population and employment forecasts used in the detailed analysis are displayed graphically in Exhibits 5.2 and 5.3. Exhibit 5.2 displays the forecast population density for the SBVM TAZs within and adjacent to the E Street Corridor, while Exhibit 5.52 displays the employment density for the same TAZs.

Exhibit 5.2: Population Density in E Street Corridor

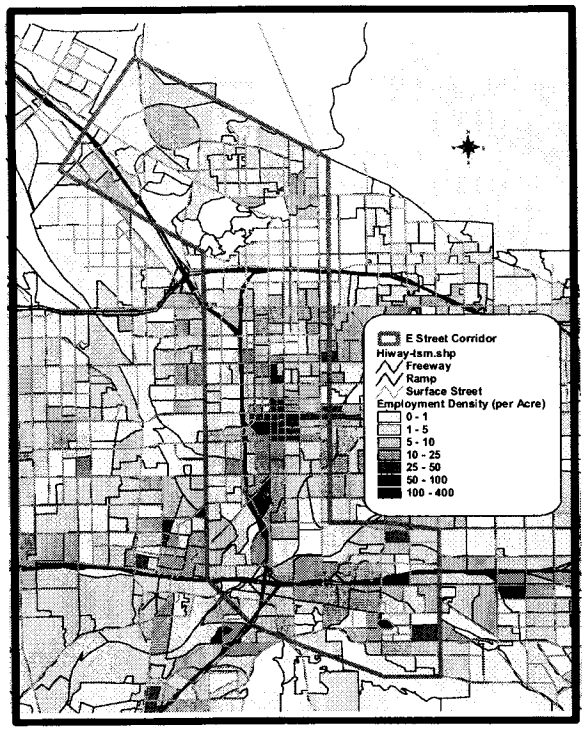


Highway Networks

The horizon year transportation networks are based on the SCAG Baseline networks, plus highway improvements that are funded by the extension of San Bernardino County Measure I. These highway improvements are summarized in Appendix A.

The SCAG Baseline networks were analyzed to ensure that the area type coding was consistent with the level of development forecast in the E Street Corridor. This analysis showed that some facilities in the Corridor were coded with the suburban area type, when they were forecast to experience growth that warranted their classification as either urban or urban business district.

Exhibit 5.3: Employment Density in E Street Corridor



Transit Networks

The baseline transit networks used for the comparative analysis include over 1,000 regional transit routes. Transit routes serving the San Bernardino Valley were coded to a greater level of detail than routes in the rest of the region.

Summary descriptions of these No Build and TSM baseline networks are presented here.

The No Build network includes only existing plus funded transportation improvements in the E Street Corridor. For fixed route transit, this level-of-service is defined in the Omnitrans SRTP as the Financially Constrained Scenario. The No Build Baseline also includes an increase in transit frequency on Route 2 serving the E Street Corridor, from 30-minute to 15-minute headways. Other changes in transit operations in the E Street Corridor include: a new San Bernardino Transcenter at Rialto Street and E Street; the proposed Redlands Rail Line plus supporting shuttles; a Loma Linda circulator service; a circulator service for California State University-San Bernardino; and new regional transit services operated by the Victor Valley Transit Authority and Orange County Transit Authority.

The TSM Baseline includes all facilities and services in the No Build Baseline plus certain planned or trend line service enhancements as defined in local service plans for Omnitrans, the Southern California Regional Rail Authority (Metrolink Commuter Rail), and the existing level of service of other operators in the area. The higher service levels associated with the Omnitrans Short Range Transit Plan's Up to Design Guidelines Scenario are included in this network. The improved levels of transit service reflected in the TSM and LPA networks have a profound impact on transit demand in the detailed analysis.

The TSM Baseline includes both Route 2 service at 20 minute headways and limited stop service on the Route 2 alignment operating at 5 minute headways. For roadway elements in the TSM Baseline, it is assumed that the construction of Evans Street will be completed from Redlands Boulevard south to Barton Road in Loma Linda.

The LPA network has north-south oriented lines that connect the numerous activity centers in the E Street Corridor. The LPA network has the same background transit services as those defined in the TSM Baseline, with minor deviations to serve route-specific transfer locations. The LPA network includes both Route 2 service at 20-minute headways and the premium, sbX service operating at 5 minute headways, but not the limited stop service on Route 2. Roadway elements in the LPA are the same as for the TSM Baseline.

Special Generator and Visitor Trips

A small portion of the potential demand for transit in the E Street Corridor will come from trips that are not estimated in the four-step modeling process. These additional trips include trips made by visitors to the region and trips destined for special events that are not made on a daily basis. A detailed analysis was conducted to identify and quantify these potential trips.

Table 5.1 presents a list of over a dozen attractions and events within the E Street Corridor that have the potential to attract a significant number of transit trips to the Corridor. Special care was taken to avoid double counting trips that would have been generated by the standard modeling procedures.

This table includes the number of annual visits to each of these attractions or events, and the estimated number of additional transit trips that could be associated with these sites annually. These annual estimates were converted to daily transit riders for both the TSM and BRT baselines. Eventually, these daily trip ends were used to amend the ridership forecasts along the transit alignments. A total of 640 daily transit trip ends (320 transit trips) were added to the daily transit trip tables for assignment in the LPA, and 310 daily transit trip ends (155 transit trips) were added in the TSM baseline.

Ridership Forecasts

Transit ridership can be reported as either linked trips or unlinked trips. Linked trips are trips made for a purpose from an origin point to a destination point. Linked transit trips can involve the use of more than one transit vehicle. Unlinked trips are associated with the in-vehicle portion of transit travel on individual transit vehicles. In general, a linked transit trip with one transfer will include two unlinked transit trips. Linked trips are used to compare the total number of trips, and new trips, for the No Build, TSM and LPA. Unlinked trips (passenger boardings) are used to describe the relative amount of activity on transit routes for the No Build, TSM and LPA.

The total number of linked transit trips associated with the No Build, TSM and LPA is summarized in Table 5.2 This table displays the estimated number of transit trips in both San Bernardino County and the E Street Corridor.

Table 5.1: Annual Special Event and Visitor Trips in E Street Corridor

Generator	Annual Attendance	TSM Baseline		LPA	
		Annual Transit Trips	Daily Transit Trips	Annual Transit Trips	Daily Transit Trips
CSUSB					
Coussoulis Arena Events	180,000	5,400	20	16,200	50
North San Bernardino Little League Complex	60,000	1,800	10	5,400	20
Downtown San Bernardino					
Convention Center	100,000	5,000	20	10,000	30
Route 66 Rendezvous	500,000	25,000	80	50,000	160
Hotel Rooms	90,000	4,500	10	9,000	30
Arrowhead Credit Union Park	350,000	17,500	60	35,000	110
Orange Show Fairgrounds					
National Orange Show Festival	100,000	5,000	20	10,000	30
Citrus Fair Festival	50,000	2,500	10	5,000	20
Other Events	50,000	2,500	10	5,000	20
Hospitality Lane					
Restaurants	1,200,000	3,000	10	6,000	20
Hotel Rooms	300,000	15,000	50	30,000	100
Loma Linda University Medical Center	450,000	3,600	10	10,800	40
Veterans Administration Medical Center	460,000	1,000	-	3,000	10
All Generators	3,890,000	91,800	310	195,400	640

Table 5.2: Year 2030 Linked Transit Trips

	No Build	TSM	LPA
San Bernardino County	118,779	140,083	142,152
New Trips - vs. No Build	-	21,304	23,373
New Trips - vs. TSM	-	-	2,069
E Street Corridor	32,985	39,933	41,906
New Trips - vs. No Build	-	6,948	8,921
New Trips - vs. TSM	-	-	1,973

This table shows that the LPA is forecast to attract approximately 2,000 new transit trips to San Bernardino County, and that almost all of these new trips will be within the E Street Corridor.

The daily unlinked transit ridership forecasts for the No Build, TSM and LPA are summarized in Table 5.3. This table shows that the TSM is forecast to experience almost 70,000 more transit boardings than the No Build on transit routes that serve the San Bernardino Valley. This includes a large number of additional boardings associated with level of service improvements for Omnitrans and Metrolink services, and the extension of the Gold Line into the western portion of the San Bernardino Valley.

In the E Street Corridor, the TSM is forecast to have 5,900 more unlinked transit trips than the No Build along the standard alignment. A large number of these boardings will be reallocated from the Route 2 local bus service to the Route 2 – Limited service.

The Route 2/sbX service combination in the LPA is forecast to serve almost 4,000 more unlinked transit trips than the Route 2/Limited service combination in the TSM. This accounts for almost all of the additional ridership in the San Bernardino Valley, where the remainder of the horizon year transit service is assumed to be constant between the TSM and LPA.

Table 5.3 also shows that the LPA is forecast to serve 1.6 percent more daily transit riders in the San Bernardino Valley than the TSM. The ridership differences between the TSM and LPA is mostly confined to Routes 2, 2 – Limited, and sbX, with very minor ridership impacts on other routes in the San Bernardino Valley.

Table 5.3: Daily Ridership Statistics for Transit Routes Serving San Bernardino Valley

Operator	Name	No Build	TSM	LPA
Routes Serving Route 2 Alignment				
Omnitrans	Route 2	7,446	3,460	3,196
Omnitrans	Route 2 - Limited	-	9,855	-
Omnitrans	sbX	-	-	14,060
Route 2 Alignment Subtotal		7,446	13,315	17,256
Other Routes Serving E Street Corridor				
Omnitrans	17 Routes	53,482	63,610	63,827
Metrolink	Union Station	12,776	15,814	15,788
Redlands Rail	1 Route	5,953	5,040	5,232
Riverside	Route 25	4,011	3,998	4,022
Victor Valley	1 Route	225	193	107
MARTA	2 Routes	309	287	275
Corridor Subtotal		76,756	88,942	89,251
Routes Serving Rest of East Valley				
Omnitrans	Routes 22, 29, 90, & feeders	6,757	8,152	8,202
Riverside	Routes 36 & 204	541	551	557
East Valley Subtotal		7,298	8,703	8,759
Routes Serving West Valley				
Omnitrans	16 Routes	48,288	54,838	54,821
Other Operators	3 Routes	43,164	86,792	86,774
West Valley Subtotal		91,452	141,630	141,595
All Routes Serving San Bernardino Valley				
San Bernardino Valley Total		182,952	252,590	256,861

Other performance characteristics for Route 2, Route 2 – Limited, and sbX are displayed in Table 5.4. This table shows the sbX alignment saves over 15 minutes off of the Route 2 – Limited service run time, and that the resulting ridership increases by over 4,000 total daily passenger boardings. The daily ridership for the sbX service in the LPA is forecast to be over 14,000 daily passenger boardings, as compared to fewer than 10,000 daily passenger boardings on the TSM's Limited service.

Route Profiles

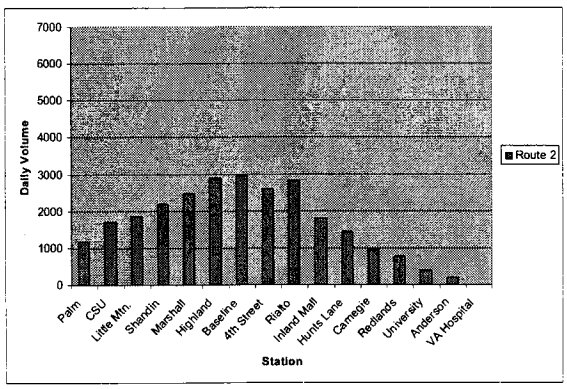
Route profiles are graphics used as a visual aid to display the transit ridership along a transit alignment. The E Street Corridor route profiles for the No Build, TSM and LPA are displayed in Exhibit 5.4. These graphics show the locations of and relatives magnitudes of the peak load points. The peak ridership points for the No Build and TSM Baselines are located north of downtown San Bernardino, between the Baseline and 4th Street stations, while the peak load point for the LPA is located south of the Rialto Street Transcenter. The peak load point for the LPA carries more than 20 percent more daily passengers than for the TSM.

Table 5.4: Daily Ridership Characteristics for E Street Corridor Routes

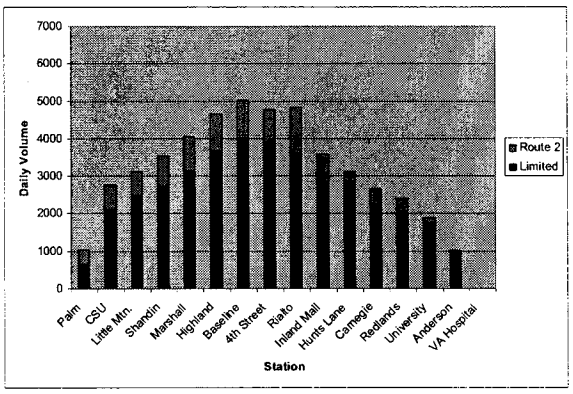
Measure	No Build	TSM	LPA
Route 2			
Travel Time in Minutes	69.0	69.1	68.9
Vehicles Required	13	10	10
Forecast Riders	7,891	3,460	3,196
Passenger Miles	26,145	10,150	9,680
Route 2 - Limited / sbX			
Travel Time in Minutes	-	55.9	40.2
Vehicles Required	-	31	23
Forecast Riders	-	9,855	14,060
Passenger Miles	-	39,234	52,097
All Routes Serving Alignment			
Vehicles Required	13	41	33
Forecast Riders	7,891	13,315	17,256
Passenger Miles	26,145	49,384	61,777
Average Trip Length (Miles)	3.31	3.71	3.58

Exhibit 5.4: Year 2030 Ridership Profiles

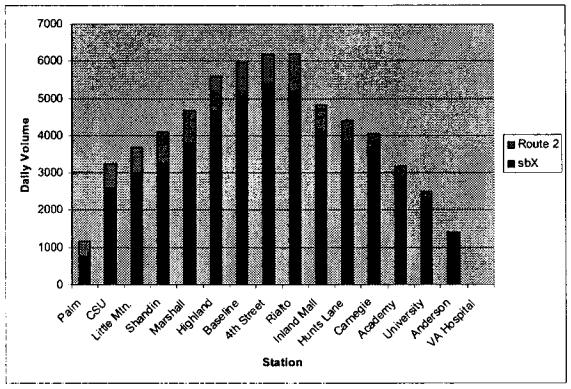
No Build Ridership Profile



TSM Ridership Profile



LPA Ridership Profile



Activity at Stations

The total daily station activity forecasts for the TSM and LPA are summarized in Tables 5.5 and 5.6. These tables show the boarding and alighting forecasts for the stations along each alignment. These tables display the access and egress forecasts in production-attraction format, where the "home-end" of trips are at the access end of trips, and the "work-end" of trips are at the egress end. This data shows that the Rialto Street Transcenter station will be the busiest station in the system in both the TSM and the LPA.

Daily activity at transit stations by modes of access and egress is summarized in Table 5.7. This table shows that more than 40 percent of the daily sbX trips are expected to use another transit route to access the sbX system.

Drive access to stations with park-and-ride lots is summarized in Table 5.8. This table shows the horizon year demand for parking spaces at the park-and-ride lots for both the premium services (sbX or Route 2 Limited), and for all transit routes serving the stations.

Peak hour boardings at transit stations are displayed in Exhibit 5.5. These graphics show estimates of the number of transit riders who will be at the stations waiting for the premium services during the AM and PM peak hours. This data is used to estimate the station sizes and amenity requirements for the horizon year.

Table 5.5: Station Activity - TSM

Station	Access	Egress	Total
Palm	542	123	665
CSU (Front)	473	1,397	1,870
Little Mountain	394	95	489
Shandin	294	135	429
Marshall	698	95	793
Highland	1,087	469	1,556
Baseline	504	298	802
4th and E	182	817	999
Rialto	3,194	1,863	5,057
Inland Mall (Ext.)	249	1,028	1,277
Hunts	263	970	1,233
Carnegie	174	652	826
Redlands	475	448	923
Stewart	165	417	582
Barton	436	501	937
VA Hospital	569	394	963

Table 5.6: Station Activity - LPA

Station	Access	Egress	Total
Palm	611	142	753
CSU (Front)	552	1,773	2,325
Little Mountain	457	114	571
Shandin	340	161	501
Marshall	871	113	984
Highland	1,375	654	2,029
Baseline	644	395	1,039
4th and E	288	1,357	1,654
Rialto	4,447	3,052	7,499
Inland Mall	303	1,300	1,603
Hunts	331	1,268	1,599
Carnegie	219	801	1,020
Evans/Academy	1,314	697	2,011
Evans/University	671	757	1,428
Barton/Anderson	449	672	1,121
VA Hospital	867	485	1,352

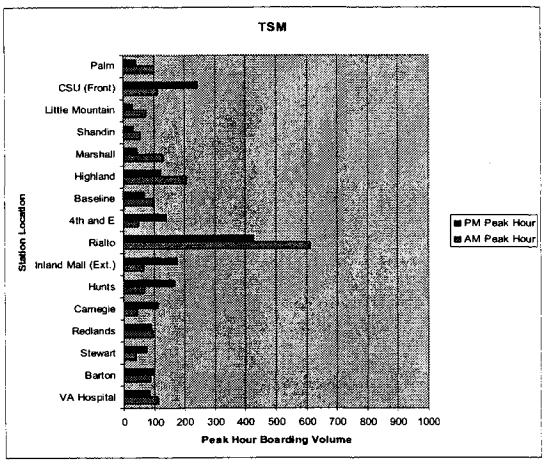
Table 5.7: Modes of Access and Egress at Transit Stations

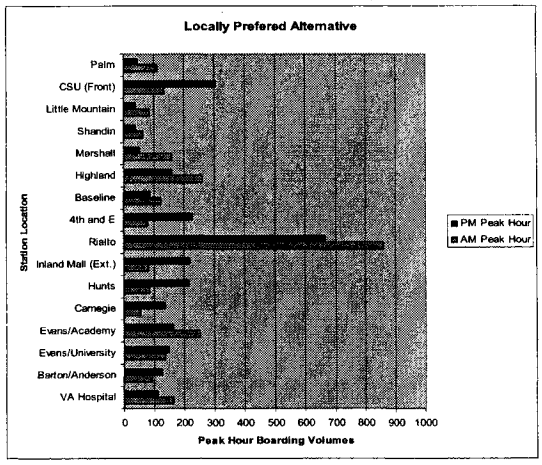
Description	Access to sbX/Limited by Mode				Egress from sbX/Limited by Mode		
	Walk	Drive	Transfer	Total	Walk	Transfer	Total
TSM	4,820 50%	1,020 11%	3,860 40%	9,700	6,940 72%	2,760 28%	9,700
LPA	5,570 41%	2,240 16%	5,940 43%	13,750	10,370 75%	3,370 25%	13,740

Table 5.8: Drive Access and Parking Demand at Stations

	Drive Access to Stations		PNR Spaces	
TSM				
Station	**Limited**	**Total**	**Limited**	**Total**
Palm	126	182	80	103
Marshall	304	378	122	151
Rialto	335	1,260	134	504
Redlands	288	300	115	120
VA Hospital	190	534	76	214
Total	**1,243**	**2,654**	**527**	**1,092**
LPA				
Station	**sbX**	**Total**	**sbX**	**Total**
Palm	116	172	76	99
Marshall	358	443	143	177
Rialto	388	1,447	155	579
Evans/Academy	1,075	1,075	430	430
VA Hospital	298	693	119	277
Total	**2,235**	**3,830**	**923**	**1,562**

Exhibit 5.5: Peak Hour Boarding Volumes





Cost Benefit Analysis

The travel time savings benefits resulting from the transit alternatives were calculated first using the Summit software package. The results of the initial application of the Summit software indicates that the LPA will account for 806,000 annual hours of travel time savings when compared to the TSM.

However, this estimate is quite high, since it equates to more than ten minutes of travel time savings for each trip on the sbX. Our calculations indicate that the average trip on sbX will save approximately 4.0 minutes of travel time when compared to the Route 2 Limited service modeled in the TSM.

Using a more conservative approach, we estimate that the average trip using sbX will save four minutes of travel time, and that the LPA will account for approximately 261,000 annual hours of travel time savings when compared to the TSM.

The cost effectiveness of transit service is calculated as the ratio of the incremental cost of new service to the incremental user benefit of the new service. For the LPA, the cost effectiveness is calculated as $12.53 per hour of travel time savings.

This page intentionally left blank.