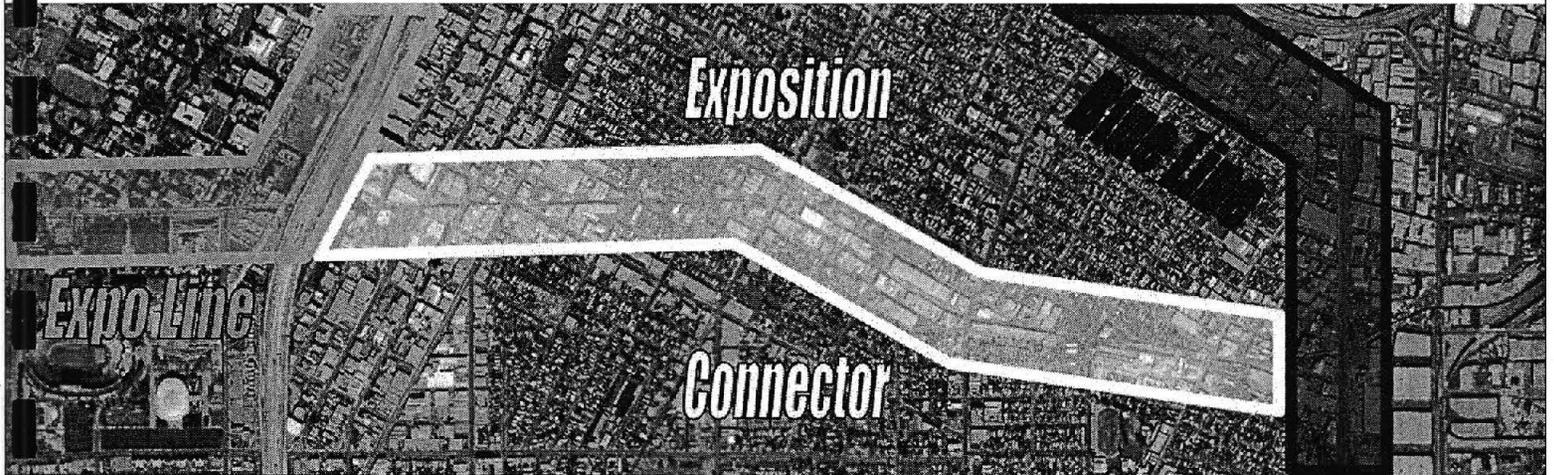


Long Beach Blue Line and Exposition Line Connector Study



Final Report

December 15, 2006



Metro

STV Incorporated

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Table of Contents

EXECUTIVE SUMMARY	I
Introduction	I
Study Framework	I
Phase I: Initial Screening	II
Phase II: Alternatives Analysis	III
Phase III: Development Strategy	V
1. INTRODUCTION	1
1.1. Study Purpose	1
1.2. Study Framework	1
1.3. Report Structure	2
2. STUDY CONTEXT	3
2.1. Existing Conditions	3
2.1.1. Study Corridor	3
2.1.2. Area Surrounding Study Corridor.....	3
2.1.3. Transportation System in the Study Area.....	4
2.2. Future Conditions	7
2.2.1. Mid-City / Exposition Light Rail Project	7
2.2.2. Harbor Subdivision	8
2.2.3. Regional Connector	9
2.2.4. Crenshaw Transit Corridor	9
2.3. Transportation Needs in Exposition Connector Area	10
3. GOALS FOR INITIAL SCREENING.....	11
3.1. Goals for Initial Screening (Phase I) Analysis	11
3.2. Initial Screening (Phase I) Criteria	12
4. PHASE I: DEFINITION OF ALTERNATIVES AND INITIAL SCREENING.....	13
4.1. Approach to Defining and Evaluating Alternatives	13
4.2. Pedestrian / Bicycle Path Alternative	13
4.2.1. Alternative P-1: Pedestrian / Bicycle Path via ROW.....	13
4.3. Busway Alternatives	14
4.3.1. Alternative B-1: At-Grade Busway via ROW.....	14
4.3.2. Alternative B-2: At-Grade Busway via ROW and Jefferson Blvd	15
4.4. Rail Alternatives	16
4.4.1. Alternative R-1: At-Grade Rail via ROW between Jefferson Blvd and Flower St.....	16
4.4.2. Alternative R-2: At-Grade Rail via ROW and Jefferson Boulevard.....	18
4.4.3. Alternative R-3: Rail via ROW with Below-Grade Segment West of Jefferson Blvd	19
4.5. Summary of Initial Screening (Phase I) Analysis	21
5. REFINEMENT OF BUILD ALTERNATIVES.....	22
5.1. Goals of This Analysis	22
5.2. Alternative R-2: At-Grade Rail via ROW and Jefferson Blvd	23
5.2.1. Alignment.....	23
5.2.2. Stations.....	24
5.3. Alternative R-3: Rail via ROW with Below-Grade Segment West of Jefferson Blvd	25



- 5.3.1. Alignment.....25
- 5.3.2. Stations.....25
- 5.3.3. Vehicles.....26
- 6. DEFINITION OF NO-BUILD AND NON-ROW ALTERNATIVES.....27**
 - 6.1. No-Build Alternatives.....27**
 - 6.1.1. Alternative N-1: North Movement via Exposition & Red Lines.....27
 - 6.1.2. Alternative S-1: South Movement via Exposition and Blue Lines.....27
 - 6.2. Non-ROW Alternatives.....28**
 - 6.2.1. Alternative N-2: North Movement via Regional Connector.....28
 - 6.2.2. Alternative N-3: North Movement via Flower, Washington, Alameda.....29
 - 6.2.3. Alternative S-2: South Movement via Jefferson, Central, Vernon.....29
 - 6.2.4. Alternative S-3: South Movement via Jefferson, Broadway, Slauson.....29
 - 6.2.5. Alternative S-4: South Movement via Crenshaw Corridor, Harbor Subdivision.....30
 - 6.3. Summary of Alternatives.....30**
- 7. PHASE II: DETAILED ALTERNATIVES ANALYSIS.....33**
 - 7.1. Basic Alternative Characteristics.....33**
 - 7.1.1. Length.....33
 - 7.1.2. Number of Stations.....34
 - 7.1.3. Capital Construction Costs.....35
 - 7.1.4. Operating and Maintenance Costs.....36
 - 7.2. Transit System Benefits and Impacts.....37**
 - 7.2.1. Travel Time – Through Study Area.....37
 - 7.2.2. Travel Time – Into / Out of Study Area.....38
 - 7.2.3. Interface with Transit Network.....40
 - 7.2.4. Ability to Accommodate Additional Service (Capacity).....41
 - 7.3. Local Community Benefits and Impacts.....42**
 - 7.3.1. Revitalization Potential.....42
 - 7.3.2. Impacts to Other Modes of Transportation (Automobile, Pedestrian).....43
 - 7.3.3. Noise and Vibration Impacts.....44
 - 7.4. Summary.....46**
 - 7.5. Conclusion.....48**
- 8. PHASE III: CORRIDOR DEVELOPMENT STRATEGY.....50**
 - 8.1. Alignment Alternatives.....50**
 - 8.2. Current State of Corridor.....51**
 - 8.2.1. Right-of-Way Width.....51
 - 8.2.2. Current Right-of-Way Use.....52
 - 8.2.3. Property Uses Adjoining Right-of-Way.....53
 - 8.3. Development Options.....54**
 - 8.3.1. Landscape Buffer.....54
 - 8.3.2. Development Adjacent to Rail Line.....55
 - 8.3.3. Development Above Rail Line.....56
 - 8.3.4. Rail Below Grade (or Underground Easement), Development Above.....57
 - 8.3.5. Station Platforms.....58
 - 8.4. Potential Right-of-Way Development Strategy.....59**
 - 8.4.1. Development Over ROW.....59
 - 8.4.2. Development Adjacent to ROW.....59
 - 8.4.3. Landscape Buffer.....60
 - 8.4.4. Retain Current Use in Near-Term.....60
 - 8.4.5. Seek Leases in Near-Term.....61

8.5. Summary of Potential Development Strategy

61

APPENDIX I: TRACK CONNECTIONS WITH BLUE AND EXPOSITION LINES.....A
 Jefferson / Flower Connection to Exposition Corridor (Alternative R-2 West)..... A
 Exposition / Flower Connection to Exposition Corridor (Alternative R-3 West) A
 Connection to Long Beach Blue Line Corridor (Alternative R-2 & R-3 East)..... A

Figures

Figure 1.1. Exposition Connector Corridor and Surrounding Area.....1
 Figure 2.1. Land Use in Exposition Connector Area.....4
 Figure 2.2. Metro Routes in Study Area5
 Figure 2.3. Exposition Line Phase I – Route Map7
 Figure 2.4. Exposition Line Phase II – Route Map.....8
 Figure 2.5. Route of Harbor Subdivision9
 Figure 4.1. Alternative B-1: At-Grade Busway via ROW.....15
 Figure 4.2. Alternative B-2: At-Grade Busway via ROW and Jefferson Blvd15
 Figure 4.3. Alternative R-1: At-Grade Rail via ROW between Jefferson Blvd and Flower St.....17
 Figure 4.4. Alternative R-2: At-Grade Rail via ROW and Jefferson Blvd18
 Figure 4.5. Alternative R-3: Rail via ROW with Below-Grade Segment West of Jefferson Blvd20
 Figure 5.1. Movements Served by Exposition Connector22
 Figure 5.2. Alternative R-2: At-Grade Rail via ROW and Jefferson Blvd24
 Figure 5.3. Alternative R-3: Rail via ROW with Below-Grade Segment West of Jefferson Blvd25
 Figure 6.1. No-Build Alternative Routes27
 Figure 6.2. Non-ROW Alternative Routes28
 Figure 6.3. Route of Alternative S-4 (Crenshaw / Harbor).....30
 Figure 6.4. Alternatives for North Movement.....31
 Figure 6.5. Alternatives for South Movement32
 Figure 8.1. Rail Alternatives for Exposition Connector50
 Figure 8.2. Exposition Connector Right-of-Way Width.....51
 Figure 8.3. Current Exposition Connector ROW Use.....53
 Figure 8.4. Land Uses Adjoining Exposition Connector.....53
 Figure 8.5. Light Rail Transit with Landscape Buffer – Newark, New Jersey54
 Figure 8.6. Cross-Section of Light Rail with Landscape Buffer54
 Figure 8.7. Affordable Housing adjacent to Light Rail – Barrio Logan Station, San Diego, CA55
 Figure 8.8. Light Rail Running Behind Development – Newark, New Jersey.....55
 Figure 8.9. Cross-Section of Light Rail with Adjoining Development.....55
 Figure 8.10. Development Above Light Rail – Del Mar Station, Gold Line, Pasadena, CA56
 Figure 8.11. Cross-Section of Light Rail with Development Above.....56
 Figure 8.12. Development Above Streetcar – Portland State University, Portland, OR.....56
 Figure 8.13. Doorframe Slab (DFS) Tunneling Method.....57
 Figure 8.14. Townhouses & Parks above Underground Rail – Orange Line, Boston, MA57
 Figure 8.15. Development Adjoining Light Rail Station – Rio Vista West Station, San Diego, CA58
 Figure 8.16. Cross-Section of At-Grade Light Rail Station58
 Figure 8.17. Potential Right-of-Way Development Strategy59

Tables

Table 2.1. Existing / Planned Transit Service in Study Area.....	5
Table 4.1. Evaluation of Alternatives versus Initial Screening Criteria	21
Table 6.1. Alternatives for North Movement.....	31
Table 6.2. Alternatives for South Movement	32
Table 7.1. Lengths of Alternatives – North Movement	33
Table 7.2. Lengths of Alternatives – South Movement	34
Table 7.3. Number of Stations – North Movement.....	34
Table 7.4. Number of Stations – South Movement.....	34
Table 7.5. Capital Construction Costs – North Movement.....	35
Table 7.6. Capital Construction Costs – South Movement.....	35
Table 7.7. Annual Operating and Maintenance Costs – North Movement.....	37
Table 7.8. Annual Operating and Maintenance Costs – South Movement	37
Table 7.9. Travel Times through Study Area – North Movement.....	38
Table 7.10. Travel Times through Study Area – South Movement.....	38
Table 7.11. Travel Times Into / Out of Study Area (minutes).....	39
Table 7.12. Interface with Transit Network	41
Table 7.13. Ability to Accommodate Additional Service (Capacity)	42
Table 7.14. Revitalization Potential.....	43
Table 7.15. Traffic and Pedestrian Impacts – North Movement	44
Table 7.16. Traffic and Pedestrian Impacts – South Movement	44
Table 7.17. Noise and Vibration Impacts – North Movement.....	45
Table 7.18. Noise and Vibration Impacts – South Movement.....	45
Table 7.19. Summary of Alternative Evaluation Measures – North Movement.....	46
Table 7.20. Summary of Alternative Evaluation Measures – South Movement	47
Table 8.1. Exposition Connector Right-of-Way Width.....	51
Table 8.2. Current Exposition Connector ROW Use.....	52
Table 8.3. Land Uses Adjoining Exposition Connector	53

References

- Area Maps.* Windows Live Local, <http://local.live.com>, August 2006.
- Aerial Photos.* Google Earth, <http://earth.google.com>, August 2006.
- Blue Line Connection Preliminary Planning Study.* Metro, 1993
- California TOD Database.* Caltrans, 2006.
- Doorframe Slab Method.* Dr. Sauer Group, <http://dr-sauer.com>, October 2004.
- Downtown Strategic Plan.* Los Angeles Community Redevelopment Authority, 1990.
- Exposition – Long Beach Blue Line Connector Presentation.* Metro, February 2005.
- Exposition Metro Line Construction Authority.* <http://www.buildexpo.org>, August 2006.
- Letter to Supervisor Michael Antonovich from Neighbors for an Improved Community.* September, 2001.
- Los Angeles County Assessor Maps, 2006.
- Metro Route Maps and Timetables, June 2006.
- Mid-City / Westside Transit Corridor Draft EIS / EIR.* Metro, April 2001.
- Mid-City / Exposition LRT Project – Final EIS/EIR.* Metro, 2005.
- 2004 National Transit Database.* Federal Transit Administration, 2004.
- NYCSubway.org, 2006.
- Smart Growth Illustrated.* US Environmental Protection Agency, 2006.
- Southeast Los Angeles Community Plan Land Use Map.* City of Los Angeles – City Planning Department, June 2006.

Acronyms

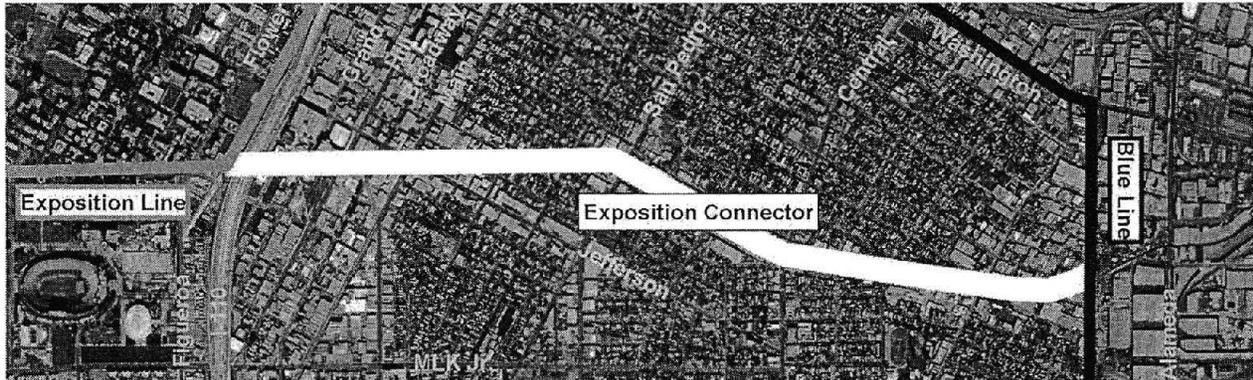
ATSF	Atchison, Topeka, and Santa Fe Railroad
BRT.....	Bus Rapid Transit
DFS.....	Doorframe Slab (Tunneling Method)
DMU.....	Diesel Multiple Unit
EIS/EIR	Environmental Impact Statement / Environmental Impact Report
EMU	Electric Multiple Units
LAX	Los Angeles International Airport
LRT.....	Light Rail Transit
Metro	Los Angeles County Metropolitan Transportation Authority
MIS.....	Major Investment Study
ROW	Right-of-Way
UP	Union Pacific Railroad
USC.....	University of Southern California

EXECUTIVE SUMMARY

INTRODUCTION

The Long Beach Blue Line and Exposition Line Connector Study sets forth a strategy for the development of the Metro-owned Exposition Connector right-of-way in South Los Angeles. The 2.2 mile long corridor, which stretches from the Blue Line on the east to the Exposition Line on the west, is shown in the figure below.

Exposition Connector Corridor and Surrounding Area



The Exposition Connector is currently not used for transportation purposes, as the Exposition Light Rail Line that has recently begun construction turns north at Flower Street instead of following the Exposition Corridor for its entire length to the Blue Line. This study examines how development can be accommodated in the corridor whether with or without a future transportation use. If transportation uses are found to be viable, this study explores how best to integrate any future transit usage with proposals for development in the corridor area.

STUDY FRAMEWORK

This study generally addresses two questions:

- Is the Exposition Connector useful as a transportation corridor?
- How can development be accommodated in the corridor area (whether with or without a transit line)?

To accomplish this investigation, the study has been broken into three phases, as shown below and in the following sections.

- **Phase I – Initial Screening** – Explores Transportation System Benefits and Compatibility with Development Objectives for a large set of transportation alternatives
- **Phase II – Detailed Alternatives Analysis** – Further explores transit utility of corridor by comparing alternatives using the Exposition Connector versus No-Build and Non-ROW alternatives

- **Phase III – Development Strategy** – Explores how best to accommodate development and integrate it with any corridor transit uses found feasible in the first two phases of the study

PHASE I: INITIAL SCREENING

In Phase I of the study, a large number of alternatives were evaluated to determine if they had any major flaws that would eliminate them from further consideration. A total of six alternatives were evaluated, including one bicycle / pedestrian path, two busways, and three rail lines. The three major evaluation criteria included:

- **Benefit to Accessibility** – Transportation alternatives should provide a meaningful new benefit to accessibility or to the operation of the transportation system to warrant investment.
- **Compatibility with Revitalization Objectives** – Each alternative was assessed for its compatibility with proposals for immediate revitalization of industrial properties along the corridor.
- **Safety** – Alternatives that created safety conflicts that either required costly or incompatible mitigation measures were eliminated from consideration.

Of the six alternatives, only two were found to be consistent with these criteria (as shown in the table below). Alternatives R-2 and R-3 were deemed suitable for further evaluation in Phase II of the study.

Evaluation of Alternatives versus Initial Screening Criteria

Alternative	Criteria for Elimination in Initial Screening			Carried Forward for Further Evaluation
	Minimal Travel Time Improvement	Incompatible with Revitalization	Safety Concerns	
Pedestrian / Bicycle				
P-1: Pedestrian / Bicycle Path via ROW	X		X	
Busway				
B-1: At-Grade Busway via ROW	X	X	X	
B-2: At-Grade Busway via ROW and Jefferson Blvd	X		X	
Rail				
R-1: At-Grade Rail via ROW between Jefferson and Flower		X	X	
R-2: At-Grade Rail via ROW and Jefferson Blvd				X
R-3: Rail via ROW with Below-Grade Segment West of Jefferson Blvd				X

PHASE II: ALTERNATIVES ANALYSIS

Two rail alternatives were determined to be suitable for further study in Phase I of the study. They were:

- R-2: Rail on Exposition Connector ROW and Jefferson Boulevard (At-Grade)
- R-3: Rail on Exposition Connector ROW with Grade Separation on Western Segment

There were two movements evaluated in this study: Exposition to Union Station (North Movement) and Exposition to Long Beach (South Movement). For each movement, build alternatives (including both local and express options for one alternative), non-ROW alternatives, and no-build alternatives were evaluated to determine which provide the greatest benefit to the transportation system and surrounding community. The alternatives for each movement are shown in the tables below, and in the figures on the following page.

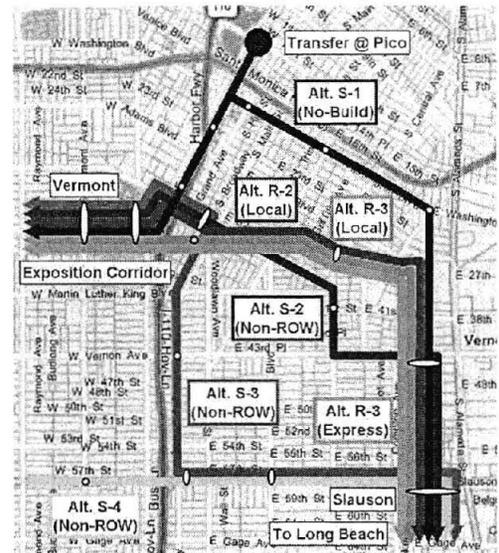
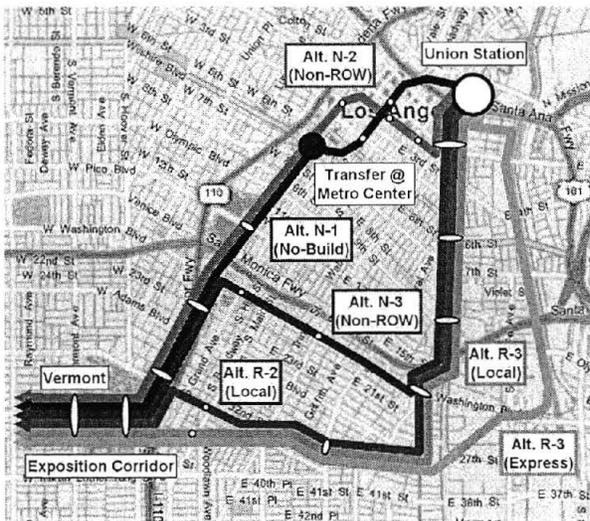
North Movement Alternatives

Alternative	Type	Route (Northbound from Exposition Line Vermont Station)
R-2	Local	Exposition Line > Jefferson Blvd > Exposition Connector > Blue Line > Alameda St > Union Station
R-3	Local	Exposition Line > Exposition Connector > Blue Line > Alameda St > Union Station
R-3	Express	Exposition Line > Exposition Connector > UP Tracks > LA River > Union Station
N-1	No-Build	Exposition Line > 7th / Metro Center > Red Line > Union Station
N-2	Non-ROW	Exposition Line > Regional Connector > Union Station
N-3	Non-ROW	Exposition Line > Blue Line > Alameda Street > Union Station

South Movement Alternatives

Alternative	Type	Route (Southbound from Exposition Line Vermont Station)
R-2	Local	Exposition Line > Jefferson Blvd > Exposition Connector > Blue Line
R-3	Local	Exposition Line > Exposition Connector > Blue Line
R-3	Express	Exposition Line > Exposition Connector > Blue Line
S-1	No-Build	Exposition Line > Pico Station > Blue Line
S-2	Non-ROW	Exposition Line > Jefferson Blvd > Central Ave > Vernon Ave > Blue Line
S-3	Non-ROW	Exposition Line > Jefferson Blvd > Broadway > Harbor Subdivision > Blue Line
S-4	Non-ROW	Exposition Line > Crenshaw Corridor > Harbor Subdivision > Blue Line

Alternatives for North Movement (left) and South Movement (right)



The alternatives shown above were evaluated using 11 quantitative and qualitative measures, including:

- Length
- Number of Stations
- Capital Construction Cost
- Operations and Maintenance Cost
- Through Travel Time
- Local Travel Time
- Transit Interface
- Expansion Potential (Capacity)
- Revitalization Potential
- Traffic / Pedestrian Impacts
- Noise and Vibration Impacts

Based on these evaluations, several major conclusions stood out. They are:

- **Cost** – Build Alternatives fall on the lower end of the cost ranges for construction and operations
- **Travel Time** – Build Alternatives generally provide modest benefits to travel times to Union Station and the Long Beach corridor, and significant improvements to Central City East and the Westside
- **Community Impacts** – The traffic, pedestrian, noise, and vibration impacts of the Build Alternatives as compared to the Non-ROW Alternatives are generally low
- **Revitalization Potential** – The Build Alternatives will allow for significant revitalization of the industrial properties abutting the Exposition Connector ROW, but will need closer coordination of development and transit than the Non-ROW alternatives
- **Flexibility** – The Build Alternatives stand out among the other alternatives with their ability to accommodate both North and South Movements in one corridor
- **Capacity** – The off-street nature of the Exposition Connector as well as its connections to other high-capacity links allow it to accommodate the higher levels of service projected for the future Metro transit system.

For these reasons, it is recommended that Metro retain access to the right-of-way.

PHASE III: DEVELOPMENT STRATEGY

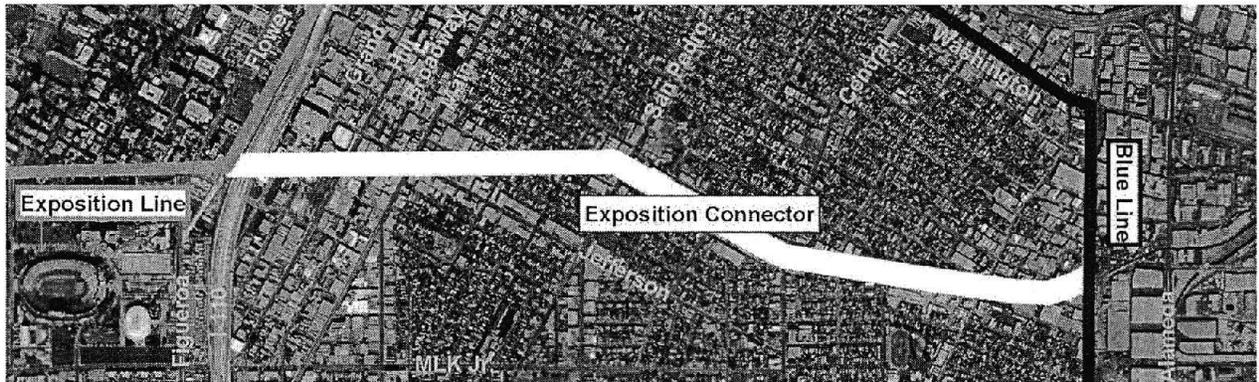
Given that Phase II of the study determined that rail along the Exposition Connector was a feasible option and that Metro should retain access to the right-of-way for future use, Phase III set forth a strategy for development in the corridor area. Phase III examined several current aspects of the corridor, such as right-of-way width, current use, and surrounding land uses to determine areas in which development is most feasible.

Several options were set forth for the future character of the corridor, such as a landscape buffer, development adjacent to the future rail line, development over the rail envelope, rail below-ground with development above, and station areas. Each of these types of development would be suitable for certain sections of the right-of-way, with examples from across the country showing how such an application can fit in with the surrounding community. A preliminary development plan for the corridor was also developed, which can act as a reference for any future development in the Exposition Connector area.

1. INTRODUCTION

This study documents the development of a use strategy for a portion of the Exposition Corridor right-of-way (ROW) owned by the Los Angeles County Metropolitan Transportation Authority (Metro). While much of the Exposition Corridor ROW will be utilized to construct the planned Exposition Light Rail Transit (LRT) line, the eastern-most portion between the Blue Line (Long Beach Blvd) and the Exposition Line (Flower Street) is not included in the project. This section of the right-of-way, which will be referred to as the Exposition Connector, is the focus of this study. The route of the Exposition Connector is shown below in Figure 1.1.

Figure 1.1. Exposition Connector Corridor and Surrounding Area



Source: Google Earth, STV Incorporated

1.1. STUDY PURPOSE

This purpose of this study is to define a strategy that guides how requests for development on Metro-owned rights-of-way can be considered and accommodated. The need for this strategy is motivated by requests made by stakeholders in communities surrounding the Exposition Connector to revitalize industrially-zoned properties along the right-of-way. Some proposals, in fact, request to combine portions of right-of-way with adjoining properties to create larger development sites. Among the uses proposed for the right-of-way and adjacent sites by certain stakeholders are housing (medium-density), mixed use developments (primarily a combination of housing and retail), and pocket parks. Thus, this study is designed to define a framework to integrate use of the Metro-owned Exposition Connector property with these proposals for development of industrial areas surrounding it.

1.2. STUDY FRAMEWORK

To consider and respond to development requests, Metro can follow one of two courses of action. If Metro can definitively decide that it can abandon the right-of-way, it can accommodate development through direct sales or leases of property. If there is a possibility that Metro, local communities, and the region may benefit from keeping rights to pass through its right-of-way, Metro can accommodate development as long as conditions for future access to the relevant portions of the right-of-way are retained. With either course of action, development requests can be considered immediately and under similar time frames, as long as the strategy is clearly defined.

The chosen course of action for responding to development requests, therefore, rests upon the determination of whether or not Metro can confidently conclude that portions or all of the Exposition Connector right-of-way have no potential use that can benefit the local and regional transportation system and can, therefore, be abandoned. For each portion of the Exposition Connector right-of-way, Metro can decide to abandon right-of-way if it can definitively assert three key conditions:

1. Lack of Transportation System Benefit – There are no potential transportation system needs that can be satisfied by use of the right-of-way segment
2. Incompatibility with Land Use Integration and Development Objectives – Any potential uses of the corridor are incompatible with accommodation of proposals for housing and mixed-use development on the right-of-way
3. Poor Performance of Solutions that Use the Right-of-Way – After comparison between solutions that do use the right-of-way and solutions that do not, the solutions that do use the right-of-way perform much less favorably

The evaluation in this study is, therefore, structured to explore these three conditions. The evaluation of the corridor is presented in two phases, with a third phase examining how transportation options in the corridor can be developed in conjunction with the surrounding community. These phases are:

- **Phase I – Initial Screening** – Explores Conditions 1 and 2 (Lack of Transportation System Benefit and Incompatibility with Development Objectives)
- **Phase II – Detailed Alternatives Analysis** – Explores Condition 3 by comparing alternatives using the Exposition Connector versus No-Build and Non-ROW alternatives
- **Phase III – Development Strategy** – Explores how best to integrate any corridor transit uses found feasible in the first two phases with the development of the surrounding community

1.3. REPORT STRUCTURE

This report begins with a description of the existing conditions in the study area in Chapter 2. Following that is a description of planned transportation and development projects that could influence the plans for the Exposition Connector. Chapter 3 contains a discussion of how priorities of community stakeholders and of Metro determine what alternatives should be considered. Chapter 4 presents the results of the Initial Screening Analysis (Phase I), that evaluates an initial group of transportation alternatives in the corridor for compatibility with respect to community development desires and local and regional transportation needs. Chapter 5 further refines the alternatives found to be feasible in Phase I of the study, while Chapter 6 defines several additional alternatives that do not use the Exposition Connector to which the Build Alternatives can be compared. The Detailed Alternatives Analysis (Phase II) is described in Chapter 7, including the measures used to evaluate the alternatives and the results of the evaluation. Chapter 8 presents a possible Corridor Development Strategy (Phase III) to integrate the proposed transit use with community development projects.

2. STUDY CONTEXT

This section presents the context of the study area surrounding the Exposition Connector right-of-way. There are two primary subsections – Existing Conditions and Future Conditions.

2.1. EXISTING CONDITIONS

This section reviews the existing conditions in the study area. These conditions include the state of the Metro-owned right-of-way, the surrounding properties, and the transit lines in the area.

2.1.1. Study Corridor

The study area surrounds a railroad corridor that was once part of the Exposition Line service of the Pacific Electric Railway system which started operation in the early twentieth century. Since the discontinuation of service on the corridor in the late 20th century by its then owner, the Southern Pacific Railroad, the Exposition Line has not hosted a transportation service. Metro (through its predecessor agency, the Los Angeles County Transportation Commission) purchased the right-of-way along with several other corridors in the early 1990s.

In 2005, Metro certified the Environmental Impact Report for Phase I of the Exposition Line. This line, which is currently under development, extends light rail from downtown Los Angeles to Culver City. It extends south from downtown Los Angeles along Flower Street to the Exposition right-of-way, where it will turn west and follow the ROW to Culver City. This leaves the portion of the Exposition right-of-way east of Flower Street with an undefined use. For the purposes of this study, this remaining portion of the right-of-way (between Flower Street and Long Beach Boulevard) is called the Exposition Connector.

It is important to note that the Exposition Connector crosses many city streets at an angle (especially in its western extent), creating challenges to its utility as a transportation corridor. In addition, the Exposition Connector right-of-way crosses several intersections diagonally. Such conditions require special attention to at-grade crossings and safety and traffic control devices to ensure a safe operation of a transportation investment.

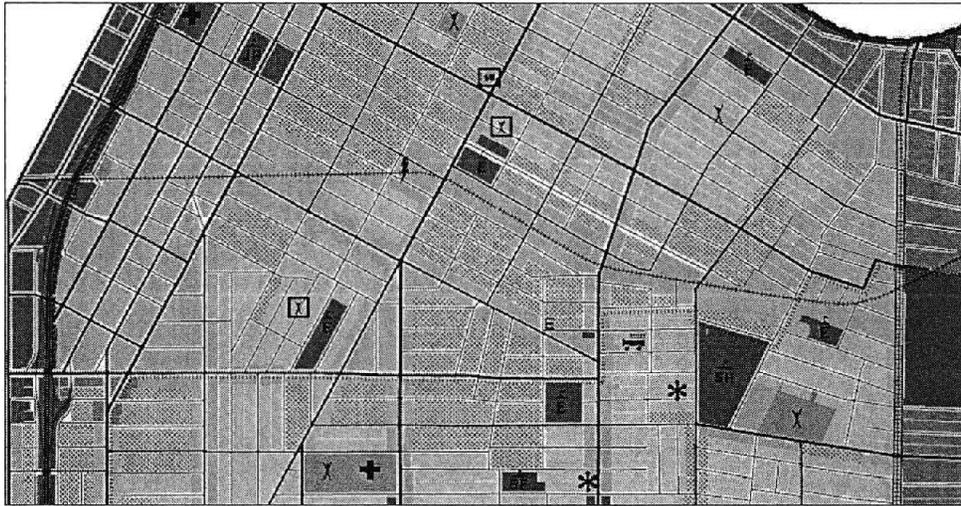
2.1.2. Area Surrounding Study Corridor

The study area is defined as the area surrounding the Exposition Connector right-of-way, roughly bound by Adams Boulevard on the north, Long Beach Avenue to the east, Slauson Avenue to the south, and Flower Street / I-110 to the west. This area of South Los Angeles lies within the Southeast Los Angeles Community Plan area and is bound by various districts – downtown Los Angeles and I-10 to the north, Exposition Park to the west, and the industrial districts of Los Angeles and the City of Vernon to the east.

The corridor study area itself consists of a mix of industrial and residential development. This Exposition Connector corridor can be organized into three zones. The first zone is bound on the west by Flower Street and I-110 (the Harbor Freeway) and on the east by South Main Street. This zone is largely characterized by industrial uses including a mix of industrial businesses, warehousing, schools and some multifamily residential buildings. The study area between

South Main Street and South San Pedro Street largely consists of residential development, a majority of which are single family residential units. The block that surrounds the right-of-way between South Main Street and Maple Avenue (bound also by Jefferson Street and 32nd Street) is industrial in use. East of San Pedro Street, the Exposition Corridor lies between 29th Street and 31st Street. Within this narrow strip of land, industrial uses predominate. Single family residential units predominate to the north and south of the industrial strip. The planned land uses (which don't differ much from the existing uses) from the Southeast Los Angeles Community Plan are shown in Figure 2.1. Tan denotes residential uses, pink and red retail, and blue commercial and industrial.

Figure 2.1. Land Use in Exposition Connector Area

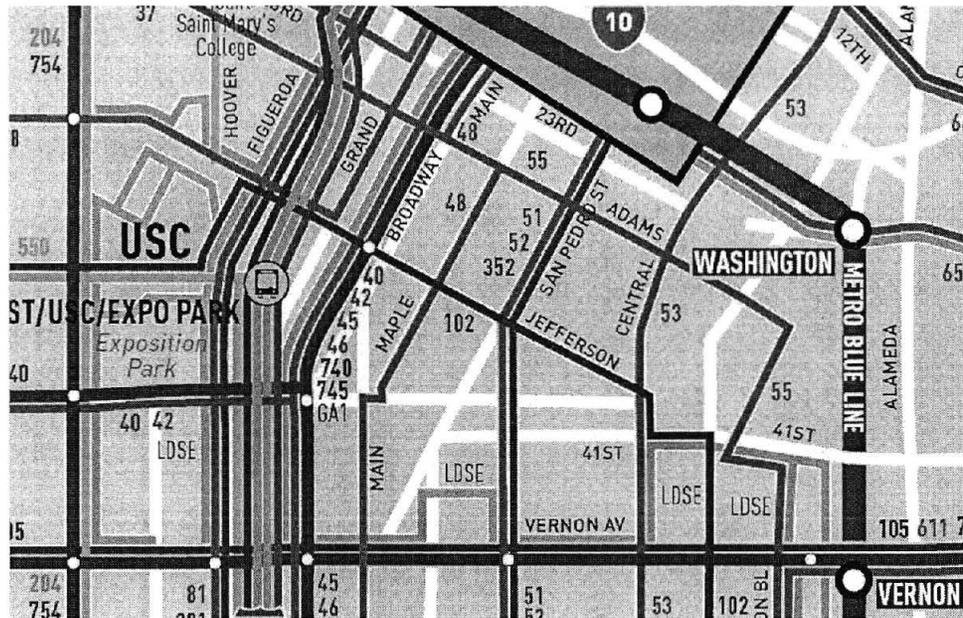


Source: Southeast Los Angeles Community Plan

2.1.3. Transportation System in the Study Area

As described in Section 2.1.1, the corridor will be bound by two light rail lines and is served by several bus lines. A summary of the transit services in the area is provided in Table 2.1, with their routes shown in Figure 2.2.

Figure 2.2. Metro Routes in Study Area



Source: Metro

Table 2.1. Existing / Planned Transit Service in Study Area

Service	Mode	Alignment in Study Area	Connections to	Peak Period Headway (minutes)	Peak Period Trips per Hour
Blue Line	Light Rail	North-South in exclusive ROW parallel to Long Beach Boulevard	Downtown Los Angeles via Washington Street (north) Long Beach (south)	6	12
Exposition Line	Light Rail	Exposition Corridor and Flower Street Corridor	Culver City (west), Downtown Los Angeles (north)	Not Yet Operational	
Line 38	Local Bus	West Jefferson Boulevard / Grand Avenue	West Jefferson Boulevard (west), Downtown Los Angeles via Grand Avenue (north)	10	6
Line 40	Local Bus	Broadway	Downtown Los Angeles (north), South Bay Galleria via MLK, Crenshaw, Florence, La Brea/Hawthorne (south)	8	8
Line 740	Rapid Bus	Broadway	Downtown Los Angeles (north), South Bay Galleria via MLK, Crenshaw, Florence, La Brea/Hawthorne (south)	10	6
Line 42	Local Bus	Broadway	Downtown Los Angeles (north), LAX (southwest)	12	5
Line 45 / 46	Local Bus	Broadway	Downtown Los Angeles (north)	6	10
Line 745	Rapid Bus	Broadway	Downtown Los Angeles (north)	4	15

Service	Mode	Alignment in Study Area	Connections to	Peak Period Headway (minutes)	Peak Period Trips per Hour
Line 48	Local Bus	Maple Avenue	Downtown Los Angeles (north), San Pedro Street corridor (south)	15	4
Line 51 / 52 / 352	Local / Limited Stop Bus	San Pedro Street	Downtown Los Angeles (north), Avalon Boulevard corridor (south)	4	15
Line 53	Local Bus	Central Avenue	Downtown Los Angeles (north), Central Avenue (south)	4 – 5	13
Line 753	Rapid Bus	Central Avenue	Downtown Los Angeles (north), Central Avenue (south)	Not Yet Operational	
Line 55	Local Bus	Compton Avenue / Adams Boulevard	Downtown Los Angeles (north), Compton Avenue	3 – 4	17
Line 102	Local Bus	Jefferson Boulevard (connecting to Figueroa and Coliseum)	Exposition Boulevard (west), Hooper Avenue and Florence Blue Line Station (east/south)	30	2
Line 105	Local Bus	Vernon Avenue	West Hollywood, Beverly Hills, and Baldwin Hills (west), Huntington Park (east)	15	4
DASH King-East	Local Bus	Grand Ave / MLK Jr. Blvd / Central Ave / 23 rd St	Local DASH circulator route	20	3

Source: Metro, LADOT

As the summary shows, the light rail lines which lie to the east and west of the study area operate or will operate fairly frequently and provide connections to downtown Los Angeles and points further to the west (Culver City) and south (Long Beach). Connecting to the light rail services from the study area requires use of a cross-town bus, likely Line 102 which operates relatively infrequently at once every 30 minutes during the peak hour.

Bus service connections in north-south corridors are fairly robust, with three strong corridors in the study area. The Broadway corridor hosts a significant number of services including 6 different bus route patterns (40, 42, 45, 46, 740, and 745) with a combined frequency of 48 vehicles per hour in the peak hour in the peak direction. The San Pedro Street corridor also hosts a significant frequency of service (3 route patterns: 51, 52, and 352) with a combined frequency of 15 vehicles per hour in the peak hour in the peak direction. Thus service to the central area in downtown Los Angeles (including both the Broadway corridor and the 7th Street corridor (west of San Pedro Street) and the southern portions of South Los Angeles is strong. The Central Avenue corridor has frequencies of 13 vehicles per hour in the peak direction. It is envisioned for implementation of Metro Rapid service in 2007.

As indicated earlier, cross-town service from the corridor in the east-west direction (either toward West Los Angeles or to East Los Angeles and Vernon / Huntington Park) is relatively weak in the heart of the study area. More frequent east-west services lie to the north and south edges of the corridor – along Adams Boulevard and Vernon Avenue, respectively.

2.2. FUTURE CONDITIONS

There are several future area transit projects currently in the planning or conceptual stages that have a bearing on the potential value of the Exposition Connector. These planned projects are discussed in the following sub-sections.

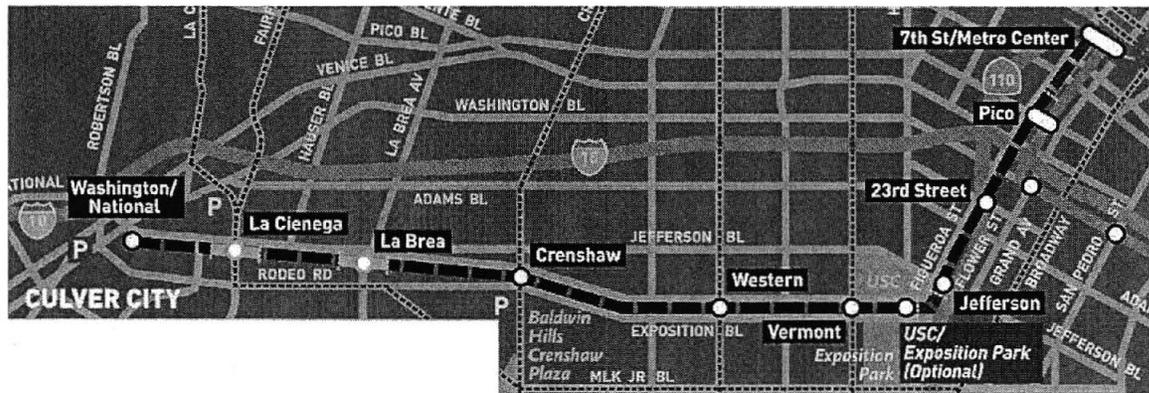
2.2.1. Mid-City / Exposition Light Rail Project

The Mid-City / Exposition Light Rail Project (Exposition Line) is planned to bring light rail (LRT) service from Downtown Los Angeles to Culver City, with a future phase extending service to Santa Monica. Using the currently abandoned Exposition Rail Corridor, which runs parallel and to the south of I-10, this line will be built in two stages. The first stage will run from Downtown Los Angeles to the Washington / National station in Culver City. Phase II is planned to extend from Culver City to Santa Monica. The two phases are described in the following sub-sections.

2.2.1.1 Phase I: Downtown Los Angeles to Culver City

Phase I of the Exposition Line will provide service from Downtown Los Angeles to Culver City. The line will begin at the current Blue Line terminus of 7th St / Metro Center, and run on the existing Blue Line tracks along Flower Street. The Exposition Line will continue south along Flower after the Blue Line tracks make the turn east to Washington Blvd, and turn east where Flower meets the Exposition right-of-way near USC. The line will continue along the Exposition Corridor for the remainder of the route, ending at the Washington / National station in Culver City. The route for Phase I of the Exposition Line is shown below in Figure 2.3.

Figure 2.3. Exposition Line Phase I – Route Map



Source: Metro

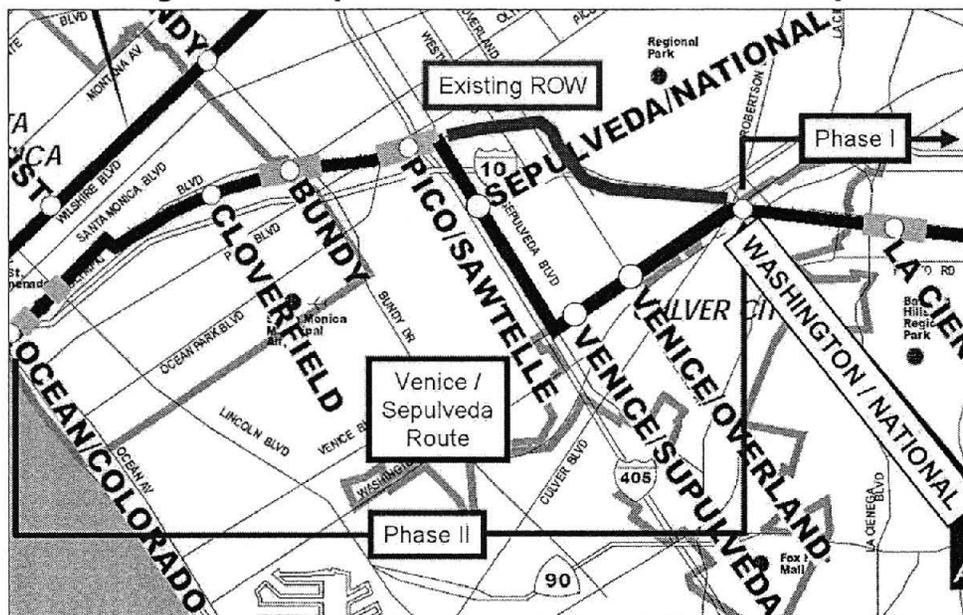
The first phase of the Exposition Line has begun construction, with completion expected in 2010. Since this phase of the line is already under construction, it is considered "built" for the purposes of this study. Therefore, the no-build alternatives from the Exposition Corridor to Union Station and the Long Beach Corridor assume that light rail service is already running on the Exposition Line.

2.2.1.2 Phase II: Culver City to Santa Monica

Long range plans call for the Exposition Line to be extended further west to Santa Monica in a second phase of construction. Detailed planning for Phase II is underway, while preliminary forecasts expect construction to be completed by 2015. In the Environmental Impact

Statement / Report (EIS/EIR) for the corridor completed in 2001, the preferred alignment deviated from the Exposition ROW at Venice Blvd to follow an alignment along Venice and Sepulveda Blvds, returning to the ROW near Pico Boulevard. Both the Venice / Sepulveda alignment from the EIS/EIR and an alignment that does not deviate from the Exposition ROW are likely to be included in the next planning study. The possible routes for Phase II of the Exposition Line are shown in Figure 2.4.

Figure 2.4. Exposition Line Phase II – Route Map



Source: Metro, STV Incorporated

2.2.1.3 Exposition Connector relation to Exposition Line

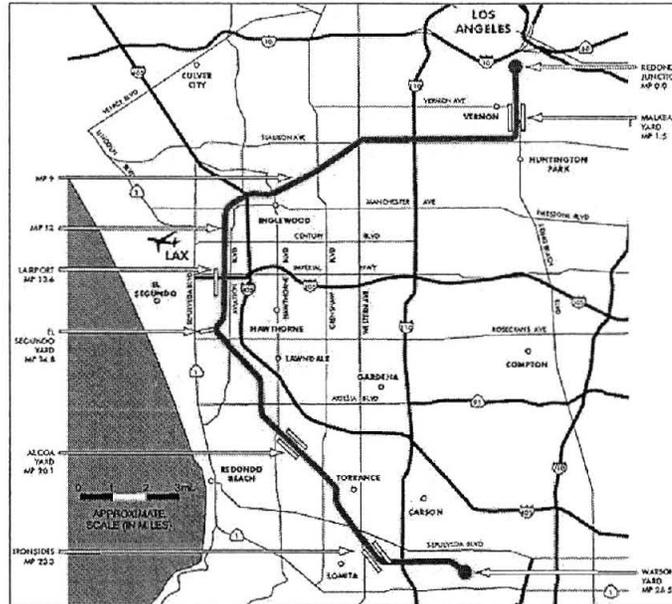
In the Draft EIS/EIR for the Exposition Line, the Exposition Connector was considered to be used as a non-revenue connector between the Exposition Line and the Long Beach Blue Line. In response to consultation with community stakeholders, this non-revenue portion of the Exposition Line was subsequently removed from the project before the Final EIR was released, and today the Exposition Connector section of the right-of-way is not part of the Exposition LRT project. This study is examining the future role of the Exposition Connector in the region's transportation system and the surrounding community.

2.2.2. Harbor Subdivision

The Harbor Subdivision is a lightly used railroad line that runs from just south of downtown Los Angeles past Los Angeles International Airport (LAX) to near the Port of Los Angeles. In the study area, it runs adjacent to and just north of Slauson Avenue, roughly two miles south of the Exposition Connector. It was bought from the Atchison, Topeka, and Santa Fe (ATSF) railroad in 1993 along with many other freight subdivisions and is currently owned by Metro. While the subdivision used to be one of the major routes into and out of the Ports of Los Angeles and Long Beach for the ATSF (now BNSF) Railroad, it was supplanted by the Alameda Corridor and today only carries local freight trains. The corridor is currently under study by Metro to determine its future role in the region's transportation system. Preliminary findings show that

rail service may be feasible for the subdivision, especially on the segment from downtown Los Angeles to LAX. The route of the Harbor Subdivision is shown in Figure 2.5.

Figure 2.5. Route of Harbor Subdivision



Source: Metro

2.2.3. Regional Connector

With the planned completion of the Gold Line Eastside Extension in 2009 and the Exposition Line in 2010, there will be a total of four light rail lines serving the downtown Los Angeles area. The Exposition Line is planned to end at the current Blue Line terminus at 7th St / Metro Center, while the Gold Line Eastside extension will be joined with the current Pasadena Gold Line at Union Station. A proposal for Regional Connector project is being considered to bridge the gap between Metro Center and Union Station with a rail link through downtown to connect all four light rail lines.

Metro has recently allocated funds to begin the preliminary planning stages of the Regional Connector project. Its route, station locations, and implementation schedule have not yet been formulated. For this study, its most likely route and station locations are included as part of a non-ROW alternative (as described in Section 6.2.1).

2.2.4. Crenshaw Transit Corridor

This study assumes that the Crenshaw Transit Corridor extends along Crenshaw Blvd from the Exposition Line to near Florence Blvd, where it joins the Harbor Subdivision for the remainder of its route south to Los Angeles International Airport (LAX). The line would also likely extend to downtown Los Angeles using the Exposition Corridor, which could introduce capacity constraints in some sections (such as Flower Street). This corridor was the subject of a recent Major Investment Study (MIS) carried out by Metro to determine the feasibility of building a new transit line in the area. The MIS studied rapid bus, busway, and light rail alternatives, and was completed in early 2003. There is not currently a firm timetable for building a new transit line

in the corridor, but Metro will likely begin a more detailed feasibility analysis for the Crenshaw Corridor in 2007.

2.3. TRANSPORTATION NEEDS IN EXPOSITION CONNECTOR AREA

After examining the current and planned transportation network in the study area, there are several needs that stand out that a new transportation investment on the Exposition Connector may help address. These needs are:

1. **Enhanced East / West Connectivity through Study Area** – The Exposition Connector area currently has poor connections in the east / west direction. While north / south trips have many options, east / west trips are generally only served by the infrequent 102 Line on Jefferson Blvd. Other options require longer walks further north and south to Adams, Washington, and Vernon Boulevards. A new investment along the Exposition Connector may improve east / west trips within the community, as well as outside it further west along the rest of the Exposition Corridor.
2. **Links from Exposition Connector Area to Central City East / Union Station** – Another movement that is currently underserved is from the Exposition Connector area to Central City East and the Union Station area. Current north / south transit lines from the area are mostly concentrated in the congested Broadway Corridor downtown, making trips further north and east very slow. A new transportation investment along the Exposition Connector with a proper connection to the north may greatly improve this trip movement.
3. **Regional Connectivity to Exposition Corridor / Long Beach / Union Station** – As mentioned above, many of the current transit links in the area are local buses to Downtown and South Los Angeles. These local buses provide for very slow trips to more distant locations. A new transportation investment along the Exposition Connector could allow for faster trips to destinations outside the immediate study area. The connection to Union Station should be extremely beneficial given its many connections to regional transit lines
4. **Increased Capacity through Downtown Los Angeles** – The Exposition Connector may also be able to increase the capacity of rail lines through Downtown Los Angeles. With the existing Blue Line operating very close to its maximum capacity and the Exposition Line soon to be added to the Flower Street Corridor north of Washington, capacity may be constrained in the future. The junction at Flower and Washington faces significant constraints currently. Any future investments, such as the Crenshaw Corridor, may likely not be able to use the Flower Corridor without major infrastructure improvements. The Exposition Connector, coupled with a proper north / south connection at its eastern end, could provide a second link through Downtown Los Angeles for future transit investments that provides for additional accessibility and additional system capacity.

In order to be considered useful, the transportation alternatives developed in Section 4 will need to be defined to fulfill these transportation system and mobility needs for the Exposition Connector area. Otherwise, they may be determined to be of no benefit.

3. GOALS FOR INITIAL SCREENING

The evaluation of the right-of-way is divided into two phases. The first phase consists of an initial screening analysis that considers a comprehensive set of alternatives and subjects them to a set of defined criteria to determine if any potential uses of the right-of-way are worthy of further consideration. The second phase of evaluation consists of a performance analysis that compares any remaining alternatives with other alternatives that do not use the right-of-way to determine whether or not the performance of alternatives that do use the right-of-way is satisfactory to determine that Metro has a potential use

As indicated in the introduction, there were three conditions established for this study that determine if Metro can confidently dispose of a piece of right-of-way:

1. **Lack of Transportation System Benefit** – There are no potential transportation system needs that can be satisfied by use of the right-of-way segment.
2. **Incompatibility with Land Use Integration and Development Objectives** – Any potential uses of the corridor are incompatible with accommodation of proposals for housing and mixed-use development on the right-of-way.
3. **Poor Performance of Solutions that Use the Right-of-Way** – After comparison between solutions that do use the right-of-way and solutions that do not, the solutions that do use the right-of-way perform much less favorably.

Phase I (Initial Screening) incorporates an analysis of the first two conditions. Phase II (Detailed Alternatives Analysis) incorporates an analysis of the third condition.

3.1. GOALS FOR INITIAL SCREENING (PHASE I) ANALYSIS

The goals pursued during the initial screening incorporate consideration of the conditions (existing and future) in the study area (transportation and land use) and input from local stakeholders contributed to the priorities for consideration and assessment of alternatives. These priorities are articulated as follows:

- **Benefit to Accessibility** – The study area benefits from frequent and direct access into the central business district of downtown Los Angeles. Potential transportation solutions should provide meaningful accessibility benefits or capacity improvement above and beyond the existing and planned system in a cost-effective manner to justify preservation of the right-of-way for those purposes. More specifically, transportation use would need to meet one or more of the following criteria in a cost-effective manner:
 - Provide more direct service with significantly lower travel times (through higher speeds or fewer transfers) than existing/planned transit service
 - Enhance connections to areas with lower frequency service
 - Provide new connections to areas not currently served
 - Expand system capacity or provide operational flexibility, enhancing reliable system operation.
- **Compatibility with Revitalization Objectives** – Solutions should support and be compatible with requests for housing development and/or development of industrial properties around the right-of-way. Community stakeholders have identified revitalization of industrial properties for the purposes of housing, especially on the western (west of Main

Street) portion of the corridor, as a high priority. Revitalization may also potentially include mixed use development, community facilities (such as a gymnasium or community center), or community spaces (such as pocket parks or plazas). To address desires expressed by community stakeholders, any solutions identified for the long-term will be evaluated for compatibility with revitalization in the short-term. Furthermore, any solution should have:

- Appropriate Scale and Sensitive Design – Must match the intensity & character of residential areas & activity centers in the area and generally support development
- Minimal Environmental Impact – Environmental impacts should have feasible mitigations
- **Safety** – Physical conflicts among users of all transportation systems (pedestrians, bicycles, automobiles, buses, and rail vehicles) should be minimized.

3.2. INITIAL SCREENING (PHASE I) CRITERIA

For each of the goals identified above, criteria to screen alternatives and eliminate them from further consideration are defined:

- **Benefit to Accessibility** – Each alternative is analyzed to determine if there are any operational characteristics that result in minimal travel time benefit or minimal improvement to the transportation system.
- **Compatibility with Revitalization Objectives** – Industrial properties west of Main Street have been proposed for revitalization by certain community stakeholders. Each alternative is assessed for its compatibility with proposals for immediate development of these industrial properties.
- **Safety** – Each alternative is analyzed to determine if it would cause any potential significant safety concerns. Alternatives that create safety conflicts that either require costly or incompatible mitigation measures are eliminated from consideration.

Those alternatives that pass through this initial screening are advanced to Phase II of the study, subjecting them to a more detailed analysis against alternatives that do not use the Exposition Connector ROW.

4. PHASE I: DEFINITION OF ALTERNATIVES AND INITIAL SCREENING

The purpose of this section is to thoroughly evaluate if Metro can dispose of the Exposition Connector right-of-way by presenting transportation alternatives for consideration and describing if they satisfy initial screening criteria to be considered for more detailed analysis. Out of six transportation uses considered, only two were determined to be worthy of more detailed analysis. All alternatives involving pedestrian/bikeways and busways were eliminated in the initial screening.

4.1. APPROACH TO DEFINING AND EVALUATING ALTERNATIVES

Within this chapter, each alternative is generally described with respect to its intent and markets served. An alignment description is provided with a discussion of implementation considerations. Finally, a discussion of whether or not the alternative is included based on an evaluation against project goals is provided.

Because transportation uses require the use of a continuous right-of-way, the determination that the Exposition Connector right-of-way is of no use to Metro and can be sold must be made after careful consideration of a broad set of transportation alternatives. Thus, an exhaustive set of transportation alternatives has been developed. Each transportation alternative is defined as a combination of three elements:

- **Mode** – Three major modes of transportation – pedestrian/bicycle, bus, and rail (light rail or similarly scaled technologies such as Electric Multiple Units (EMU)) – are considered. Due to considerations of cost and compatibility with existing Blue Line and Exposition Line, heavy rail (subway or elevated) is not considered. Also, due to lack of compatibility with the character of the neighborhoods surrounding the Exposition Connector and lack of compatibility with existing light rail infrastructure, commuter rail trains with locomotives are also not considered.
- **Alignment** – The placement of the alternative in space and within railroad and street rights-of-way, defines how vehicles can traverse the study corridor. Different alignments face different physical constraints and offer different accessibility benefits.
- **Travel Pattern** – Transportation systems can serve different travel patterns. Only those travel patterns that experience significant benefits to accessibility can justify a transportation investment.

4.2. PEDESTRIAN / BICYCLE PATH ALTERNATIVE

There is only one alternative that defines a pedestrian / bicycle path along the Exposition Connector ROW.

4.2.1. Alternative P-1: Pedestrian / Bicycle Path via ROW

This section describes the one pedestrian / bicycle path alternative considered for implementation along the Exposition Connector ROW

4.2.1.1 General Description and Markets Served

Alternative P-1 would extend an at-grade pedestrian / bicycle path along the right-of-way between Long Beach Boulevard and the intersection of Exposition Boulevard / Flower Street. Such a bike path could provide a linkage between Exposition Park and communities to the east such as Vernon and Huntington Park, introducing a new east-west transportation alternative. Given the narrow width needed for a bike path, the remainder of the right-of-way could be developed as green space, housing, or some other community use.

4.2.1.2 Alignment Description

Alternative P-1 would follow the Exposition Right-of-Way between Long Beach Boulevard and Flower Street. Crossings at major intersections would be signal-controlled in order to provide for safety for both pedestrians and bicyclists. Connections to destinations at either end of the bikeway would be necessary.

4.2.1.3 Initial Screening

This alternative is eliminated from future consideration because:

- **Minimal Accessibility Benefit** – Routing of a pedestrian/bicycle path in the western portion of the right-of-way is not as direct as parallel arterial streets, leading to minimal travel time benefit. Community stakeholders indicated that such a path would provide limited utility over and above the existing network of streets and sidewalks.
- **Safety Concerns** – Multiple mid-intersection and mid-block crossings at oblique angles require significant installation of signals to ensure safe operation. Such treatments would likely involve greater cost than the potential benefit could justify.

4.3. BUSWAY ALTERNATIVES

There are two busway alternatives to be considered for the Exposition Connector right-of-way. Both are at-grade solutions designed to tie into the existing street network, with one using the Exposition Connector for its entire length and the other using Jefferson Blvd for its western extents. These two alternatives are discussed in the following section.

4.3.1. Alternative B-1: At-Grade Busway via ROW

4.3.1.1 General Description and Markets Served

Alternative B-1 would extend an at-grade busway along the Exposition Connector right-of-way for its entire length between Long Beach Boulevard and Flower Street. Such a busway could host services linking passengers originating in south Los Angeles and communities along the Los Angeles River such as Huntington Park, Maywood, and Bell and destined toward Exposition Park and West Los Angeles. It could also host services that connected residents in Southwest Los Angeles, Mid-Cities, and the Pico-Union area destined to industry in Vernon and Los Angeles and activity centers in Huntington Park. The route of this alternative is shown in Figure 4.1.

4.3.1.2 Alignment Description

Alternative B-1 would install at-grade bus-only lanes along the entire length of the Exposition Connector between Long Beach Blvd and Flower Street. Crossings at intersections would be controlled by traffic signals.

Figure 4.1. Alternative B-1: At-Grade Busway via ROW



Source: Google Earth, STV Incorporated

4.3.1.3 Initial Screening

This alternative is eliminated from further consideration for several reasons, including:

- **Minimal Accessibility Benefit** – The routing of busway in the western portion of the right-of-way is not as direct as parallel arterial streets. Difficult junctions at the ends of right-of-way (at Long Beach Boulevard and Exposition Boulevard and in the middle of the right-of-way limit the ability to maintain any speed advantage.
- **Safety Concerns** – Multiple mid-intersection and mid-block crossings at skewed angles, especially between San Pedro Street and the Harbor Freeway require significant installation of signals and warning devices for pedestrians and motorists to ensure safe operation.

4.3.2. Alternative B-2: At-Grade Busway via ROW and Jefferson Blvd

4.3.2.1 General Description and Markets Served

Alternative B-2 would follow an alignment similar to Alternative B-1 with a variation on the western portion of the alignment. The busway would end on the west at Jefferson Boulevard, near the intersection of Main Street. Instead of using the right-of-way west of Main Street, buses would divert from the right-of-way to Jefferson Boulevard to connect to points further west. Such an alternative would serve the same markets as Alternative B-1. The route of Alternative B-2 is shown in Figure 4.2.

Figure 4.2. Alternative B-2: At-Grade Busway via ROW and Jefferson Blvd



Source: Google Earth, STV Incorporated

4.3.2.2 Alignment Description

Alternative B-2 would install at-grade bus-only lanes along the Exposition Connector from Long Beach Blvd to Jefferson Blvd. Buses would then use Jefferson Blvd for the remainder of the route to Flower Street.

4.3.2.3 Initial Screening

This alternative is eliminated from further consideration for many of the same reasons as Alternative B-1:

- **Minimal Accessibility Benefit** – The routing of busway in the western portion of the right-of-way is not as direct as parallel arterial streets. Difficult junctions at the ends of right-of-way (at Long Beach Boulevard and Exposition Boulevard and in the middle of the right-of-way limit the ability to maintain any speed advantage.
- **Safety Concerns** – Multiple mid-intersection and mid-block crossings at skewed angles, especially between San Pedro Street and Jefferson Blvd require significant installation of signals and warning devices for pedestrians and motorists to ensure safe operation.

4.4. RAIL ALTERNATIVES

Three rail alignments are considered for the Exposition Connector along with the potential train movements that could use them. The rail alignments considered include:

- **Alternative R-1:** At-Grade Rail via ROW between Jefferson Blvd and Flower St
- **Alternative R-2:** At-Grade Rail via ROW and Jefferson Blvd
- **Alternative R-3:** Rail via ROW with Below-Grade Segment West of Jefferson Blvd

4.4.1. Alternative R-1: At-Grade Rail via ROW between Jefferson Blvd and Flower St

4.4.1.1 General Description and Markets Served

Alternative R-1 would use the Exposition Connector for a connection between the Blue Line and Exposition Line. Development of this rail infrastructure could provide for two different movements:

4. **Exposition Corridor to Union Station** – Linking the Westside, Mid-City, South Los Angeles through communities and industrial districts in Central City East to Union Station
5. **Exposition Corridor to Long Beach Corridor** – Linking the Westside, Mid-City and South Los Angeles to Long Beach.

It could also serve special events at the University of Southern California (USC) and the Los Angeles Memorial Coliseum by taking passengers from Union Station (with its many transportation options) directly to the Exposition Park area. The route of this alternative is shown in Figure 4.3.

Figure 4.3. Alternative R-1: At-Grade Rail via ROW between Jefferson Blvd and Flower St



Source: Google Earth, STV Incorporated

4.4.1.2 Alignment Description

Alternative R-1 would extend rail service along the Exposition Connector at-grade for the entire length between the Blue Line and Exposition Line. To the west, it would connect with the Exposition LRT Line near the Exposition Park Station, where the Exposition Line emerges from a tunnel beneath the Figueroa Street / Exposition Boulevard intersection. To the east, Alternative R-1 could interface with the Long Beach Blue Line for travel to the south and could use one of several possible corridors (Alameda Street, San Pedro Street, or the Los Angeles River corridor) to reach Union Station to the north.

Facilitating connections to the north (toward Union Station via Central City East) have been mentioned as part of two previous studies – the *Blue Line Connection Preliminary Planning Study* and the *Downtown Strategic Plan*.

Local stations along the Exposition Connector corridor could be designated at major arterial streets with frequent bus service. Given Metro's current average station spacing for rail systems one to two stations are likely to be designated. Broadway, San Pedro Street, and Central Avenue are potential candidates for such stations.

4.4.1.3 Initial Screening

This alternative (with at-grade operation along the entire length of the Exposition Connector) is eliminated from future consideration due to a number of physical factors:

- Community Incompatibility** – Connection from an at-grade line on the Exposition Connector with the planned Exposition LRT line, which is below-grade around the intersection of Exposition and Flower, requires significant and costly modifications to the infrastructure at the junction. Such modifications may involve requirements to take lanes from existing streets, thus creating barriers to traffic and pedestrian flow that may negate any benefit to the rail connection. Furthermore, such modifications to the at-grade infrastructure may create significant traffic impacts on both sides of the I-110 freeway. Furthermore, the goal of some community members to develop plots of land immediately to the east of I-110 may be facilitated by other, more feasible at-grade rail alignments in this area (such as Jefferson Boulevard).

- **Safety Concerns** – Many skewed at-grade crossings of major streets between San Pedro Street and the Harbor Freeway create potential conflicts between trains and motorists, likely necessitating enhanced safety measures and slower operating speeds of at-grade operation.

4.4.2. Alternative R-2: At-Grade Rail via ROW and Jefferson Boulevard

4.4.2.1 General Description and Markets Served

Alternative R-2 is very similar to R-1, but would use a short on-street segment to avoid many of the skewed street crossings between Main Street and Flower Street. Between these two points, the alignment would follow Jefferson Boulevard instead of the Exposition Connector right-of-way. The infrastructure associated with Alternative R-2 could provide for three different markets or travel patterns (one more than Alternative R-1):

1. **Exposition Corridor to Union Station** – Westside, Mid-City, South Los Angeles through communities and industrial districts in Central City East to Union Station
2. **Exposition Corridor to Long Beach Corridor** – Westside, Mid-City and South Los Angeles to Long Beach
3. **Downtown Los Angeles Flower Street Corridor to Long Beach Corridor** – Can serve as an alternate to the Washington Boulevard Corridor currently used by the Blue Line

Like Alternative R-1, Alternative R-2, could also serve special events at USC and the Coliseum by providing a direct link for passengers between Union Station (with its many transportation options) and the Exposition Park area. The route of Alternative R-2 is shown in Figure 4.4.

Figure 4.4. Alternative R-2: At-Grade Rail via ROW and Jefferson Blvd



Source: Google Earth, STV Incorporated

4.4.2.2 Alignment Description

Alternative R-2 would depart from the Exposition Connector Corridor at Jefferson Boulevard and continue west along Jefferson to Flower Street. At Flower, rail vehicles would join the Exposition Line just south of the Jefferson Station. From there, trains could either turn south to follow the Exposition Line to the west or turn north to follow the Flower Street Corridor serving the Jefferson Station and all stations to the north toward the 7th Street / Metro Center Station terminal.

4.4.2.3 Initial Screening

This alternative will be carried forward for further evaluation because it avoids many of the elements that may contribute to cost and may detract from community goals of housing development in Alternative R-1.

This alternative avoids the junction at the Exposition right-of-way and Flower Street. Joining the Exposition Line at the intersection of Flower and Jefferson avoids creating obtrusive and expensive infrastructure at this junction and also directs rail infrastructure to Jefferson Boulevard, potentially freeing up right-of-way west of Main Street for revitalization. Also, with this alternative, there are fewer safety conflicts that must be mitigated and greater compatibility with community revitalization goals.

The three travel patterns that Alternative R-2 can host experience different accessibility benefits:

1. **Exposition Corridor to Union Station** – Among the three potential markets served by this alignment, Alternative R-2 provides the most benefit (both regional and local) to the connection between Exposition Corridor and Union Station (via the Exposition Connector Corridor and Central City East). No existing service currently provides a direct connection to these travel markets, especially the linkage with Central City East.
2. **Exposition Corridor to Long Beach Corridor** – Upon completion of the Exposition Line, passengers will be able to travel between the Exposition Corridor and the Long Beach corridor through a new, although indirect means – a transfer between the two lines at Pico Station. A new connection via the Exposition Connector Corridor will remove this transfer and provide a reduction in travel time between the two lines and provide new connectivity for passengers along the Exposition Connector.
3. **Downtown Los Angeles Flower Street Corridor to Long Beach Corridor** – Alternative R-2 provides only minor accessibility benefits between the Flower Street Corridor and the Long Beach Corridor. This connection is already served by an at-grade rail link along Washington Boulevard, so there is a minimal accessibility benefit. Using the Exposition Connector for this movement may be useful in the future as the Washington Blvd Corridor (especially the Washington / Flower intersection) reaches capacity.

Of the three travel patterns served by Alternative R-2, the Exposition Corridor to Union Station corridor experiences the greatest accessibility benefit. While passengers who travel the other two travel patterns, experience some benefit, the benefit may not be great enough on their own to justify a significant capital investment. Therefore, future analysis and evaluation of Alternative R-2 will focus most on the accessibility benefits of Travel Pattern 1 – Exposition Corridor to Union Station.

4.4.3. Alternative R-3: Rail via ROW with Below-Grade Segment West of Jefferson Blvd

In all of the alternatives discussed so far, the diagonal crossings on the western portion of the Exposition Connector required special consideration for safety treatments. The final of the three rail alternatives seeks to avoid these obstacles by routing the line underground west of Jefferson Blvd.

4.4.3.1 General Description and Markets Served

Alternative R-3 would follow the same route and serve the same markets as Alternative R-1, but would include an underground segment for rail on the western portion of the Connector, likely west of Jefferson Blvd.

Like Alternative R-1, development of this rail infrastructure could serve two different travel patterns:

1. **Exposition Corridor to Union Station** – Linking the Westside, Mid-City, South Los Angeles through communities and industrial districts in Central City East to Union Station
2. **Exposition Corridor to Long Beach Corridor** – Linking the Westside, Mid-City and South Los Angeles to Long Beach.

It could also serve special events at USC and the Coliseum by taking passengers from Union Station (with its many transportation options) directly to the Exposition Park area. The underground section could provide for faster, more direct connections for all of the potential travel patterns. The routing of Alternative R-3 is shown in Figure 4.5.

Figure 4.5. Alternative R-3: Rail via ROW with Below-Grade Segment West of Jefferson Blvd



Source: Google Earth, STV Incorporated

4.4.3.2 Alignment Description

Alternative R-3 would extend rail service along the Exposition Connector at-grade between the Blue Line and Jefferson Blvd. Between Jefferson Blvd and Flower Street, the rail alignment would descend below grade to connect with the Exposition LRT Line in an underground junction.

4.4.3.3 Initial Screening

This alternative is determined to be worthy of further analysis. The below grade segment on the western end of the Exposition Connector alignment removes many of the difficult grade crossings and safety conflicts, and also allows for easier development above the right-of-way. Although the underground construction will raise the project cost, there are corresponding benefits to removing grade crossing conflicts (safety and more direct connections). In addition, reservation of right-of-way below grade may facilitate development on the western segment.

4.5. SUMMARY OF INITIAL SCREENING (PHASE I) ANALYSIS

Table 4.1 illustrates the initial screening criteria and the various alternatives that were developed through this study. Two rail alternatives were determined to be appropriate for further study in Phase II of analysis. They are:

- **Alternative R-2:** At-Grade Rail via ROW and Jefferson Blvd
- **Alternative R-3:** Rail via ROW with Below-Grade Segment West of Jefferson Blvd

Table 4.1. Evaluation of Alternatives versus Initial Screening Criteria

Alternative	Criteria for Elimination in Initial Screening			Carried Forward for Further Evaluation
	Minimal Travel Time Improvement	Incompatible with Revitalization	Safety Concerns	
Pedestrian / Bicycle				
P-1: Pedestrian / Bicycle Path via ROW	X		X	
Busway				
B-1: At-Grade Busway via ROW	X	X	X	
B-2: At-Grade Busway via ROW and Jefferson Blvd	X		X	
Rail				
R-1: At-Grade Rail via ROW between Jefferson and Flower		X	X	
R-2: At-Grade Rail via ROW and Jefferson Blvd				X
R-3: Rail via ROW with Below-Grade Segment West of Jefferson Blvd				X

Alternatives only involving busways and pedestrian / bicycle paths have been eliminated from consideration due to limited accessibility benefit over existing infrastructure and safety conflicts.

In the next phase of analysis, the two remaining rail alternatives will be compared to alignments that serve the same travel patterns, but do not use the right-of-way. Performance measures such as cost and accessibility benefit will be quantified.

For the North Movement, the Exposition Connector can open a second corridor through Downtown Los Angeles. While the current infrastructure in the Flower Street corridor will be able to handle the initial stages of Exposition Line service in 2010, as service is expanded the corridor will approach its capacity. Chokepoints include the Flower / Washington intersection where the Exposition and Blue Lines meet, as well as the 7th St / Metro Center terminal where vehicles must reverse direction. If the Regional Connector is built in the future to connect the Blue and Exposition Lines to the Gold Line, another chokepoint will be introduced at the northern junction (near the intersection of 1st and Alameda Streets). At some point, possibly when Exposition Line service expands or if a Crenshaw LRT line is built, the Flower Street corridor will reach or surpass its capacity.

The South Movement from Exposition to Long Beach will also be evaluated in this study. The method to make this movement when Exposition Line service commences (through a transfer between the lines at the Pico Station) is not an attractive option because of the need to change trains and its addition of several miles of out-of-direction travel. The Exposition Connector may serve as a more direct option for this movement.

To evaluate options for these two movements, various alternatives will be analyzed in the following sections. For each movement, two build alternatives (including both local and express options for one alternative), two non-ROW alternatives, and one no-build alternative will be evaluated to determine which provide the greatest benefit to the transportation system and surrounding community. The results of this analysis will then be used in subsequent reports to help define a use strategy for the Exposition Connector right-of-way.

5.2. ALTERNATIVE R-2: AT-GRADE RAIL VIA ROW AND JEFFERSON BLVD

5.2.1. Alignment

Alternative R-2 will extend light rail service at-grade along the Exposition Connector, using Jefferson Boulevard for the western segment (between the Exposition ROW / Jefferson intersection and Flower Street) to avoid the many skewed intersections between Main Street and the Harbor Freeway along the Exposition ROW.

- **Western Segment** – Alternative R-2 (and all other alternatives and movements) will use the Exposition Line west of the Flower / Exposition intersection. For purposes of calculating operating costs in Section 7.1.4, the western termini of all the alternatives are assumed to be the Washington / National station in Culver City, although Santa Monica or a station along the Crenshaw Corridor may serve as terminals if those lines are built.
- **Exposition Connector** – The Exposition Connector will be used for much of Alternative R-2's route, but it will not use the portion between roughly Main and Flower Streets. Instead, the Alternative will run on-street in Jefferson Blvd and join the Exposition Line tracks at the Flower / Jefferson intersection. The proposed eastern and western connections to the Exposition and Blue Line tracks are described in more detail in Appendix I.
- **North Movement** – The North Movement will turn north at the intersection of the Exposition Connector with the Blue Line (at Long Beach Blvd), allowing the Washington station to be shared by both lines. North of Washington Blvd, the Alternative will transition a block east to Alameda Street, with this report assuming this will be done in the vicinity of

I-10. Alameda will be followed the rest of the way to Union Station, with this alternative joining the Gold Line Eastside Extension at the intersection of 1st and Alameda Streets.

- **South Movement** – The South Movement will turn south at the Exposition Connector / Blue Line junction, and follow the Blue Line to Long Beach.

The route of Alternative R-2 through the Exposition Connector area is shown in Figure 5.2. The route for its northern portion along Alameda Street is shown in Figure 6.4.

Figure 5.2. Alternative R-2: At-Grade Rail via ROW and Jefferson Blvd



Source: Google Earth, STV Incorporated

5.2.2. Stations

Given that Alternative R-2 is focused on local, light rail service along the Exposition Connector, there will likely be several stations located along the right-of-way. While the locations of these stations are not required to be definitive, the number of stations is established in this section to allow for a proper comparison of the various alternatives. Later investigations and consultations with stakeholders will be essential to properly locating the stations.

Given these parameters, two stations are located along the Exposition Connector right-of-way for the purposes of this study. They are at:

- Jefferson / Broadway
- Central / Exposition ROW

In addition, for the new north-south segment along Alameda Street there would also be several new stations. These are also tentatively placed based on existing / future transit lines and land uses. Their locations are:

- Washington / Long Beach (existing Blue Line Station)
- Olympic / Alameda
- Sixth / Alameda
- First / Alameda (Gold Line Eastside Extension Station – Under Construction)

5.3. ALTERNATIVE R-3: RAIL VIA ROW WITH BELOW-GRADE SEGMENT WEST OF JEFFERSON BLVD

5.3.1. Alignment

Alternative R-3 would use the right-of-way for its entire length, but travel underground for the far western segment. This will bypass many skewed grade crossings at major streets between Jefferson Blvd and Flower Street. Alternative R-3 could carry both local and express service on its alignment.

- **Western Segment** – Alternative R-3 would follow the Exposition Line west of the Flower / Exposition intersection.
- **Exposition Connector** – Alternative R-3 would diverge from the Exposition Line underneath the Flower / Exposition intersection (see Appendix I for a detailed figure). It would continue underground along the Exposition Connector to just east of the Jefferson / Main intersection, where it would surface and follow the Connector for the remainder of the route at-grade.
- **North Movement** – The local service for Alternative R-3 would follow the same routing (along the Blue Line and Alameda) as Alternative R-2. The express routing would continue east following the existing Union Pacific tracks to the Los Angeles River, where it would follow the existing Metrolink tracks north, and use the planned Union Station Run-Through tracks to enter Union Station.
- **South Movement** – Both local and express service would follow the Blue Line south to Long Beach.

The route of Alternative R-3 through the Exposition Connector area is shown in Figure 5.3. Figure 6.4 also shows the route further north of the Exposition Connector area.

Figure 5.3. Alternative R-3: Rail via ROW with Below-Grade Segment West of Jefferson Blvd



5.3.2. Stations

Alternative R-3's local service will have the same stations as Alternative R-2, but with the Broadway station possibly underground along the right-of-way instead of at-grade on Jefferson Blvd. The express service will likely not have stations in the Exposition Connector area.



5.3.3. Vehicles

The express routing for Alternative R-3 would likely require cars heavier than standard light rail vehicles due to its running on existing freight railroad tracks east of the Exposition Connector / Blue Line junction. A Diesel Multiple Unit (DMU) or Electric Multiple Unit (EMU) type car may be appropriate.

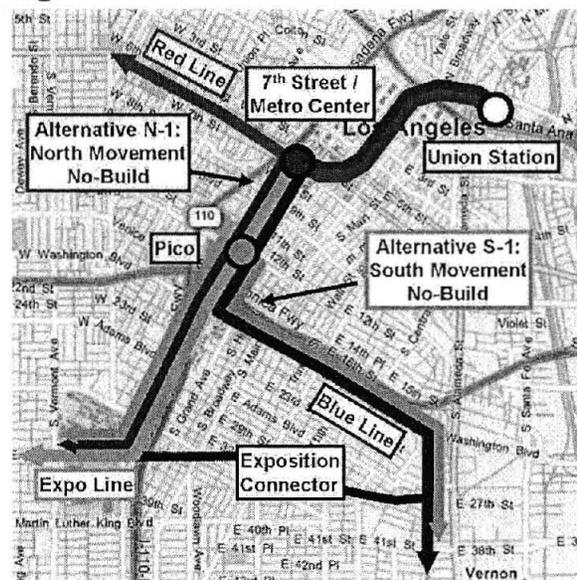
6. DEFINITION OF NO-BUILD AND NON-ROW ALTERNATIVES

In order to properly evaluate if the right-of-way can be abandoned, alternatives that use the right-of-way must be compared with alternatives that do not. This section introduces several additional alternatives that do not use the right-of-way, including No-Build and Non-ROW options. These are described in the following sections.

6.1. NO-BUILD ALTERNATIVES

For this study, one no-build alternative has been formulated for each movement. These alternatives are pictured in Figure 6.1, and described in the following sub-sections. Although they are No-Build alternatives, they include already programmed investments, most notably the Exposition LRT Line slated to begin service in 2010.

Figure 6.1. No-Build Alternative Routes



Source: Windows Live Local, STV Incorporated

6.1.1. Alternative N-1: North Movement via Exposition & Red Lines

Alternative N-1 represents the no-build alternative for the Exposition Corridor to Union Station movement (North Movement). This follows the Exposition Line to its planned terminus at 7th Street / Metro Center, where passengers must transfer to the Red Line subway line for the ride to Union Station. This Alternative is shown in purple in Figure 6.1.

6.1.2. Alternative S-1: South Movement via Exposition and Blue Lines

Alternative S-1 is the no-build alternative for the Exposition to Long Beach movement (South Movement). This alternative necessitates a transfer at the Pico station from the Exposition Line to the Blue Line to complete the movement. This alternative is shown in green in Figure 6.1.

6.2. NON-ROW ALTERNATIVES

In addition to No-Build alternatives, several additional alternatives have been developed which include new rail line construction outside the Exposition Connector right-of-way. These alternatives eliminate the need for transfers between lines (which are needed to reach the ultimate destinations of Long Beach and Union Station in the No-Build alternatives) and allow the Exposition Connector ROW to be used for other purposes.

A total of five non-ROW alternatives have been developed, with two (N-2 & N-3) for the North Movement and three (S-2, S-3, & S-4) for the South Movement. The routes of these five alternatives are shown in Figure 6.2, and described in the following sub-sections.

Figure 6.2. Non-ROW Alternative Routes



Source: Windows Live Local, STV Incorporated

6.2.1. Alternative N-2: North Movement via Regional Connector

Alternative N-2 represents the Regional Connector project, which will join the Exposition and Blue Lines to the Gold Lines (both Pasadena and Eastside) through a new downtown subway. This project will soon undergo preliminary studies, but is currently not past the first stages of planning. The route of the Connector is not yet defined, but this study assumes an alignment along Flower, Second, and Alameda Streets between Metro Center (the current Blue Line

terminus) and Union Station. Existing / planned stations would be used along the Exposition and Blue Lines. Stations for the Regional Connector are assumed to be located at Flower / 3rd, 2nd / Broadway, 2nd / Los Angeles, and 1st / Alameda, as well as the terminal stop at Union Station. The route for Alternative N-2 is shown in purple in Figure 6.2.

6.2.2. Alternative N-3: North Movement via Flower, Washington, Alameda

Alternative N-3 was formulated to serve as an alternative to the Exposition Connector by using Washington Boulevard instead of the Exposition ROW. This alternative would follow the Exposition Line to the intersection of Flower Street and Washington Blvd (its junction with the Blue Line). It would then turn east, following the Blue Line tracks. Where the Blue Line currently turns south (Long Beach Avenue), the alternative would turn north and follow the Long Beach Blvd / Alameda Street alignment used by Alternatives R-2 and R-3. Additional capital investments may be needed to improve the capacity constrained junction at Flower and Jefferson, as LADOT foresees significant traffic impacts along this segment from increased light rail service. The stations planned for the build alternatives along Alameda Street (see Section 4.1.4) would also be used for this alternative. Alternative N-3 is shown in gold in Figure 6.2.

6.2.3. Alternative S-2: South Movement via Jefferson, Central, Vernon

Alternative S-2 was evaluated by Metro in a previous study as an on-street alternative to the Exposition Connector for the South Movement. It would leave the Exposition Line at the intersection of Flower Street and Jefferson Avenue, and head east on Jefferson. The alternative would then turn south at Central Ave, and follow it to Vernon Avenue (the Metro study also included Avalon Blvd as a N-S option, but for this study Central was chosen). At Vernon, the alternative would turn east, joining the Blue Line just north of the Vernon Station. The remainder of the route to Long Beach would be along the existing Blue Line corridor. Stations are assumed for this study to be located at: Central / 41st and Jefferson / Broadway. Alternative S-2 is shown in pink in Figure 6.2.

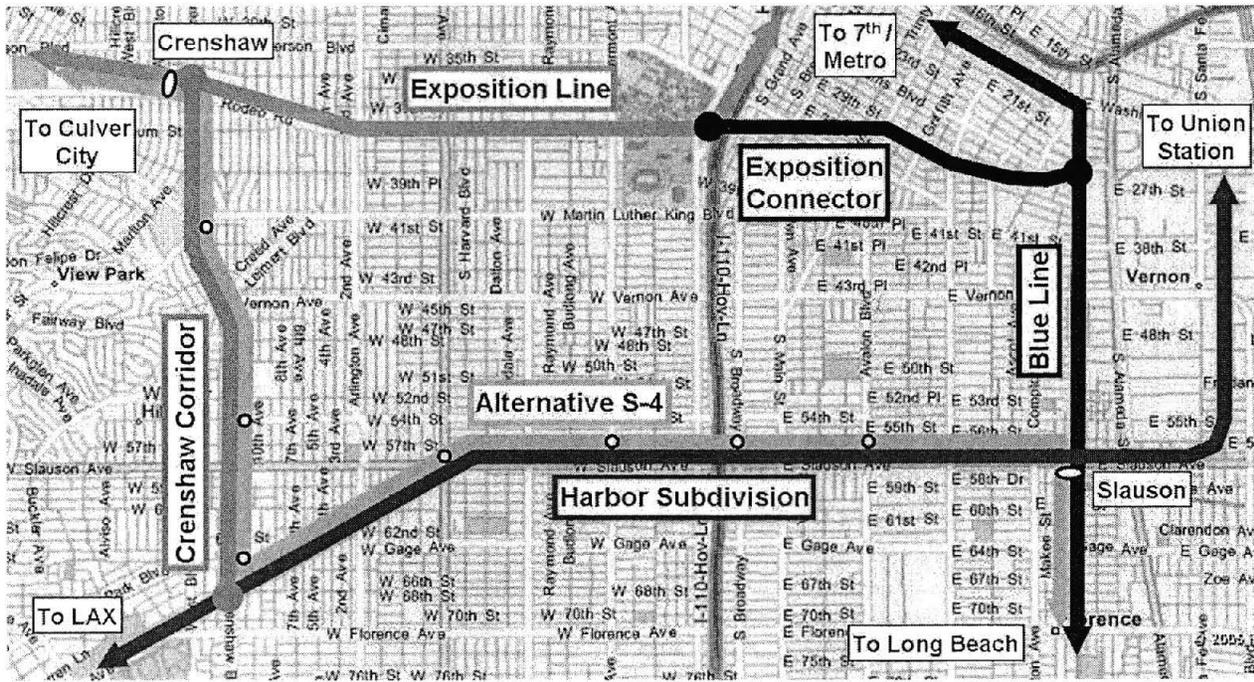
6.2.4. Alternative S-3: South Movement via Jefferson, Broadway, Slauson

Alternative S-3 was recommended by community members as a way to serve the Exposition to Long Beach corridor without using the Exposition Connector. It would leave the Exposition Line at Jefferson Blvd and head east. At Broadway, the alternative would turn south and head to Slauson Avenue. There, it would turn east and use the Metro-owned Harbor Subdivision right-of-way to the north of Slauson Avenue. It will join the Blue Line just north of the Slauson Station, and continue the rest of the way along the existing Blue Line corridor. The use of the Harbor Subdivision for this line could be problematic, as it is currently being studied by Metro for other uses and may not have space available to accommodate two transit lines (it is only 40 feet wide on average). In addition, this alternative would have to be elevated near the Slauson Blue Line Station, adding significant costs. Stations are assumed for this study to be located at: Avalon / Slauson, Broadway / Slauson, Broadway / Vernon, and Broadway / Jefferson. Alternative S-3 is shown in green in Figure 6.2.

6.2.5. Alternative S-4: South Movement via Crenshaw Corridor, Harbor Subdivision

A second community-recommended alternative would also use the Harbor Subdivision, but for a much longer distance. Alternative S-4 would diverge from the Exposition Line at the Crenshaw Station and continue south along the Crenshaw Blvd Transit Corridor, which is currently under study for future light rail or bus rapid transit service. This alternative would then turn east at Crenshaw's intersection with the Harbor Subdivision, and run parallel to Slauson Blvd for the remainder of the route to the Blue Line Slauson station. As with Alternative S-3, this alternative may also interfere with Metro's plans for the Harbor Subdivision, which is currently under study for future transit service. For the purposes of this study, stations would be located at Avalon / Slauson, Broadway / Slauson, Vermont / Slauson, Western / Slauson, Crenshaw / Hyde Park, Crenshaw / 54th, and Crenshaw / MLK Jr. The route of Alternative A-4 east of Vermont Ave is shown in yellow in Figure 6.2, with the full route shown in Figure 6.3.

Figure 6.3. Route of Alternative S-4 (Crenshaw / Harbor)



Source: Windows Live Local, STV Incorporated

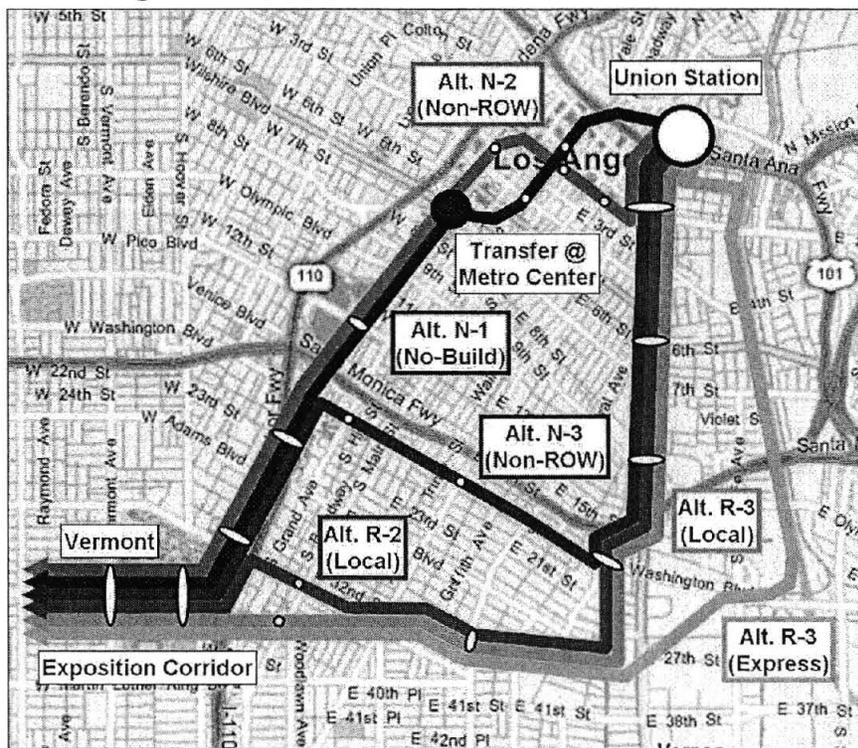
6.3. SUMMARY OF ALTERNATIVES

With the No-Build and Non-ROW Alternatives defined, there are now a sufficient number of alternatives for each movement to carry out an analysis of their benefits and impacts with the intent of determining if the ROW can be abandoned. Each movement has No-Build, Non-ROW, Local Build, and Express Build alternatives defined. The alternatives for the North Movement (Exposition to Union Station) are summarized in Table 6.1 and shown in Figure 6.4. For the South Movement (Exposition to Long Beach), they are summarized in Table 6.2 and shown in Figure 6.5.

Table 6.1. Alternatives for North Movement

Alternative	Type	Route (Northbound from Exposition Line Vermont Station)
R-2	Local	Exposition Line > Jefferson Blvd > Exposition Connector > Blue Line > Alameda St > Union Station
R-3	Local	Exposition Line > Exposition Connector > Blue Line > Alameda St > Union Station
R-3	Express	Exposition Line > Exposition Connector > UP Tracks > LA River > Union Station
N-1	No-Build	Exposition Line > 7th / Metro Center > Red Line > Union Station
N-2	Non-ROW	Exposition Line > Regional Connector > Union Station
N-3	Non-ROW	Exposition Line > Blue Line > Alameda Street > Union Station

Figure 6.4. Alternatives for North Movement

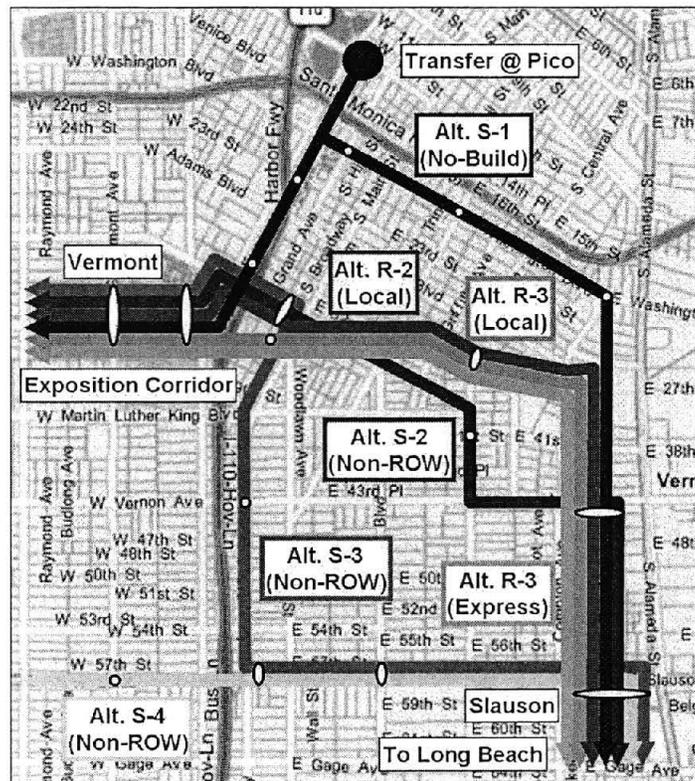


Source: Windows Live Local, STV Incorporated

Table 6.2. Alternatives for South Movement

Alternative	Type	Route (Southbound from Exposition Line Vermont Station)
R-2	Local	Exposition Line > Jefferson Blvd > Exposition Connector > Blue Line
R-3	Local	Exposition Line > Exposition Connector > Blue Line
R-3	Express	Exposition Line > Exposition Connector > Blue Line
S-1	No-Build	Exposition Line > Pico Station > Blue Line
S-2	Non-ROW	Exposition Line > Jefferson Blvd > Central Ave > Vernon Ave > Blue Line
S-3	Non-ROW	Exposition Line > Jefferson Blvd > Broadway > Harbor Subdivision > Blue Line
S-4	Non-ROW	Exposition Line > Crenshaw Corridor > Harbor Subdivision > Blue Line

Figure 6.5. Alternatives for South Movement



Source: Windows Live Local, STV Incorporated

7. PHASE II: DETAILED ALTERNATIVES ANALYSIS

This section presents an analysis of the alternatives described in the last chapters. Included in this analysis are quantitative measures such as travel time and construction cost as well as qualitative measures such as community impacts and flexibility. Section 7.1 describes the basic characteristics of each alternative such as length, number of stations, and capital and operating costs. Section 7.2 measures the benefits and impacts of each alternative on the local and regional transportation network, while Section 7.3 measures the benefits and impacts of the alternatives on the local community.

Note: For the North Movement, only the segments of each alternative between the Exposition Line Vermont Station and Union Station are being analyzed. For the South Movement, only the segments between the Exposition Line Crenshaw Station and Blue Line Slauson Station are being analyzed. Beyond this, all build and non-ROW alternatives are identical.

For each table, the extreme values (highest and lowest) are highlighted in bold.

7.1. BASIC ALTERNATIVE CHARACTERISTICS

The following sub-sections present basic information about each alternative, including length, number of stations, capital construction cost, and operating and maintenance cost.

7.1.1. Length

Table 7.1 and Table 7.2 present the length of each alternative in the study area (between the Exposition Line Vermont Station and Union Station northbound, and between the Exposition Line Crenshaw Station and Blue Line Slauson Station southbound).

Table 7.1. Lengths of Alternatives – North Movement

Alternative	Type	Length (mi)
R-2	Local	6.2
R-3	Local	6.0
R-3	Express	6.8
N-1	No-Build	5.0
N-2	Non-ROW	5.3
N-3	Non-ROW	6.4

North Movement Comments – The no-build alternative provides the shortest route (although a transfer is needed), and the Non-ROW alternative using the proposed Regional Connector (N-2) trails closely. The express routing using the Exposition Connector (R-3) features the longest route because of its eastward swing to the LA River.

Table 7.2. Lengths of Alternatives – South Movement

Alternative	Type	Length (mi)
R-2	Local	7.3
R-3	Local	7.1
R-3	Express	7.1
S-1	No-Build	9.5
S-2	Non-ROW	7.2
S-3	Non-ROW	7.9
S-4	Non-ROW	8.4

South Movement Comments – Alternatives R-3 and S-2 provide the most direct routing with Alternative R-2 trailing closely. The no-build alternative is over 2 miles longer than the Build Alternatives.

7.1.2. Number of Stations

Table 7.3 and Table 7.4 show the number of stations proposed for each alternative in the study area.

Table 7.3. Number of Stations – North Movement

Alternative	Type	# of Stations
R-2	Local	7
R-3	Local	7
R-3	Express	0
N-1	No-Build	7
N-2	Non-ROW	9
N-3	Non-ROW	9

North Movement Comments – The express alternative does not have stations in the study area. The two non-ROW alternatives have the most stations, mainly because of the close spacing of the stations in the Flower Street and Washington Blvd corridors.

Table 7.4. Number of Stations – South Movement

Alternative	Type	# of Stations
R-2	Local	6
R-3	Local	6
R-3	Express	0
S-1	No-Build	10
S-2	Non-ROW	6
S-3	Non-ROW	7
S-4	Non-ROW	7

South Movement Comments – Again, the express alternative does not stop in the study area. The no-build has the most stations because of its longer length, and the other alternatives are roughly equal at 6 or 7 stations each.

7.1.3. Capital Construction Costs

Rough estimations of the construction costs for the alternatives are given in Table 7.5 and Table 7.6. In addition, other costs associated with special conditions, preliminary engineering, design services, design/build professional services, agency costs and contingency are not included. The costs calculated only include the basic guideway and track costs, as well as stations and vehicles. As all alignments either function within Metro-owned right-of-way or city-owned streets, right-of-way costs are assumed to be separate. All costs are in 2006 dollars.

Table 7.5. Capital Construction Costs – North Movement

Alternative	Type	Capital Cost (millions)
R-2	Local	\$ 131
R-3	Local	\$ 170
R-3	Express	\$ 108
N-1	No-Build	N/A
N-2	Non-ROW	\$ 644
N-3	Non-ROW	\$ 164

North Movement Comments – Alternative R-3’s express alternative has the lowest capital cost because of its use of existing tracks along the Los Angeles River. Alternative R-2 costs less than R-3 since it does not need the relatively expensive tunnel in its western portion. The Regional Connector (Alternative N-2) has a cost magnitudes above the other alternatives because of its almost exclusively underground construction, while Alternative N-3 has a high cost because of modifications needed at the Flower / Washington intersection. The Build alternatives also generally require fewer new vehicles than the Non-ROW alternatives.

Table 7.6. Capital Construction Costs – South Movement

Alternative	Type	Capital Cost (millions)
R-2	Local	\$ 157
R-3	Local	\$ 204
R-3	Express	\$ 179
S-1	No-Build	N/A
S-2	Non-ROW	\$ 201
S-3	Non-ROW	\$ 223
S-4	Non-ROW	\$ 241

South Movement Comments – Alternative R-2 has the lowest capital costs for the South Movement. Alternative R-3 has a higher cost because of its underground segment. Alternative S-4 has the highest cost, mostly due to the new construction needed for the east-west portion along the Harbor Subdivision (the other alternatives use the planned Exposition Line tracks for their east-west portions). Alternatives S-2 and S-3 also include costs of roughly \$20 million needed to relocate on-street parking to off-street garages for their in-street sections.

In general, the alternatives that use the most existing track have the lowest capital cost. The no-build alternatives have no new costs because of their complete use of existing / planned infrastructure. Vehicle costs (roughly \$3 million per car) also have a large effect, especially for the longer South Movement where roughly 40 new cars are needed per alternative as compared to roughly 20 cars per alternative for the North Movement.

It should be noted that the Exposition Connector segment of the Build Alternatives can be shared by both movements. So the costs of the segment along the Exposition Connector could be shared between both movements. To implement both movements for the non-ROW alternatives would require two separate investments.

In addition, improvements likely will be needed on the Flower and Washington corridors (especially at the Flower / Washington intersection) to be able to accommodate the increased service offered by Alternatives N-2 and N-3. LADOT has noted that impacts to auto traffic from expanded service along Washington would be unacceptable, so additional construction costs would likely be incurred by Alternative N-3 in this section.

7.1.4. Operating and Maintenance Costs

In addition to the capital construction costs of the alternatives, the annual operating and maintenance costs are also of interest. These are summarized in Table 7.7 and Table 7.8.

To calculate the costs, several assumptions have been made. They include:

- **Levels of Service** – The Blue and Exposition Lines are assumed to be operating at five minute headways during the peak period. The Build and Non-ROW Alternatives will operate on top of these existing lines at 10 minute headways during the peak (6 hours per day) and at 20 minute headways at other hours (10 hours per day). This will give combined frequencies of 3 minutes, 20 seconds on the Exposition Line west of Vermont/Crenshaw and the Blue Line south of Slauson during the peak period if one new movement is accommodated, and 2 minutes, 30 seconds if both are.
- **Extent of Routes** – All Non-ROW and Build Alternatives are assumed to run from Culver City to Union Station for the North Movement and Culver City to Long Beach for the South Movement.
- **Method of Estimation** – O&M costs are estimated based on the latest data available from the National Transit Database (NTD) concerning Metro's light rail operating costs. These costs were in 2004 dollars, and have been escalated to 2006 dollars.

Table 7.7. Annual Operating and Maintenance Costs – North Movement

Alternative	Type	Annual O&M Cost (millions)
R-2	Local	\$ 9.8
R-3	Local	\$ 8.7
R-3	Express	\$ 6.8
N-1	No-Build	N/A
N-2	Non-ROW	\$ 8.7
N-3	Non-ROW	\$ 10.4

North Movement Comments –The R-3 express alternative has the lowest operating costs given its lack of stations and short running time through the area. The R-3 local and Regional Connector (N-2) have slightly higher costs, although it is questionable if the Regional Connector will have enough capacity to accommodate the service levels associated with this analysis. N-3, with its long running time, has the highest O&M costs for this movement.

Table 7.8. Annual Operating and Maintenance Costs – South Movement

Alternative	Type	Annual O&M Cost (millions)
R-2	Local	\$ 17.4
R-3	Local	\$ 17.4
R-3	Express	\$ 16.4
S-1	No-Build	N/A
S-2	Non-ROW	\$ 18.4
S-3	Non-ROW	\$ 18.5
S-4	Non-ROW	\$ 18.5

South Movement Comments – Once again, the express alternative has the lowest O&M costs. The two local Build Alternatives are roughly one million dollars more per year, while the three non-ROW alternatives are another million more each. The costs are roughly proportional to running time.

7.2. TRANSIT SYSTEM BENEFITS AND IMPACTS

The following sub-sections compare the various alternatives based on their effects on the area transit system. Measures of performance include the travel time through the study area, the travel time for area residents to destinations outside the area, the overall connections to the rest of the transit system, and the ability to accommodate expanded service or new lines.

7.2.1. Travel Time – Through Study Area

Table 7.9 and Table 7.10 show the travel times through the study area for the various alternatives. A 5 minute transfer time was included for transfers between lines for the No-Build Alternatives. Delay times for the various stations were also included, with 20 seconds assumed

to load passengers and additional acceleration and deceleration times added based on the speed of the segment.

Table 7.9. Travel Times through Study Area – North Movement

Alternative	Type	Travel Time (min)
R-2	Local	21
R-3	Local	21
R-3	Express	12
N-1	No-Build	22
N-2	Non-ROW	22
N-3	Non-ROW	26

North Movement Comments – The express alternative provides the shortest travel time, as it does not have stations in the study area. The two local build alternatives have 21 minute travel times, while N-1 and N-2 are one minute longer. Alternative N-3, which runs on-street for almost its entire length, has the longest travel time at 26 minutes.

Table 7.10. Travel Times through Study Area – South Movement

Alternative	Type	Travel Time (min)
R-2	Local	22
R-3	Local	22
R-3	Express	15
S-1	No-Build	39
S-2	Non-ROW	24
S-3	Non-ROW	26
S-4	Non-ROW	27

South Movement Comments – Again, the express alternative offers the shortest travel time. Alternatives R-2 and R-3 have fairly short travel times because of their exclusive right-of-way through the Exposition Connector, although the non-ROW alternatives are only several minutes longer. The no-build alternative, with its detour far to the north to the Pico station, has a travel time much longer than the other alternatives.

7.2.2. Travel Time – Into / Out of Study Area

In addition to the more regional connectivity analyzed in Section 7.2.1, the improvements to local connectivity are analyzed in this section. A hypothetical transit rider was placed at the intersection of Jefferson Blvd and Broadway, which is the area of the neighborhood that would be served by the most existing and potential future transit lines. The travel time for this rider was then examined for four destinations served by the two movements examined in this study:

- **North Movement to Union Station** – To measure accessibility to jobs accessible by rail throughout Southern California
- **North Movement to 6th / Alameda** – To measure accessibility to jobs in Central City East

- **South Movement to Blue Line Slauson Station** – To measure accessibility to the south towards Long Beach
- **Combined (West Movement) to Exposition Line Vermont Station** – To measure accessibility to jobs and activity centers on the Westside

There were several assumptions made to simplify the analysis, including:

- **Time of Day** – The rider is assumed to be making a trip at 8 am
- **Walk to Nearest Station** – If an alternative does not serve the Jefferson / Broadway intersection, riders will walk to the nearest station on that line (at 2.5 miles per hour)
- **Waiting Time** – An average wait time was added to each travel time to take into account the frequency of service on the lines. The wait time is equal to half the average headway at 8 am.
- **Existing Bus Service** – Since the Broadway / Jefferson intersection is already well-served by Metro bus service, the quickest trips available via existing bus lines were also included in this analysis. These are shown in the last line of the table
- **Alternative R-3 Express Service** – This service does not stop in the study area and is not included in this analysis

Results of the analysis are shown in Table 7.11.

Table 7.11. Travel Times Into / Out of Study Area (minutes)

Alternative	Type	North Movement		South Movement to Slauson	Combined (West Move) to Vermont
		To Union Station	To 6 th / Alameda		
R-2	Local	22	18	15	6
R-3	Local	22	17	14	5
N-1	No-Build	29	35 ⁺	–	13
N-2	Non-ROW	28	37 ⁺	–	12
N-3	Non-ROW	36	31	–	12
S-1	No-Build	–	–	37	13
S-2	Non-ROW	–	–	16	9
S-3	Non-ROW	–	–	18	9
S-4	Non-ROW	–	–	28	–
Bus*	Exist. Bus	21	21	33	21

* - Bus Lines used: North - Union Station: 740 / 745; North - 6th / Alameda: 740 / 745 on Broadway, 18 on 6th; South Movement: 745 on Broadway, transfer to 108 / 358 on Slauson; West Movement: 102

⁺ - 60 / 360 bus line needed to connect from 7th / Metro Center to 6th / Alameda

- **North Movement to Union Station** – Existing bus lines in the Broadway corridor provide a very good connection to Union Station. Two Rapid lines, the 740 and 745, run on very short headways during peak periods (roughly every three minutes) and can make the trip up Broadway to Union Station in roughly twenty minutes. Alternatives R-2 and R-3 are projected to only be a minute slower, but may be more reliable since they will run rail vehicles in dedicated rights-of-way compared to buses on the very congested Broadway

corridor. The no-build and non-ROW alternatives are much slower because riders will have to walk about ¼ mile east to the Jefferson Exposition Line station to catch a train.

- **North Movement to 6th / Alameda** – The Central City East area that would be well served by the new lines along Alameda does not have the same level of bus service as Union Station as a destination. The corner of 6th and Alameda was chosen as a secondary destination to evaluate the benefits of mobility improvements to the Central City West area. The Build alternatives offer a 3 to 4 minute improvement over existing bus service (which requires a transfer) and 17-20 minute improvements over existing and planned rail lines (which require two ¼ mile walks and a transfer to the 60 bus).
- **South Movement to Slauson** – For the South Movement, the build alternatives and Alternatives S-2 and S-3 provide definite improvements over the no-build and existing bus services (cutting travel times roughly in half). Alternative R-3 provides the shortest trip time, with Alternatives R-2 and S-2 following closely. The trip using existing bus lines (the 745 on Broadway and 108 / 358 on Slauson) is slowed by the need to transfer at the Broadway / Slauson intersection. Alternative S-4 does not directly serve the Broadway / Jefferson area, so the 745 is used to reach the Broadway / Slauson station where riders can transfer to the rail line for the remainder of the trip. This provides a small decrease in travel time compared to existing bus service, but overall the alternative is not competitive against the other rail alternatives.
- **Combined (West Movement) to Vermont** – The West Movement is the shortest of the three and can be served by alternatives for both the North and South Movements, but has a fairly large variation in trip times among the alternatives. Alternative R-3, which would be underground for much of the trip, provides the fastest and most direct connection. The on-street Jefferson Blvd alternatives (R-2, S-2, and S-3) are not far behind. The no-build and North Movement alternatives have longer travel times because of the walk needed to reach them at the Exposition Jefferson Station. While the local bus service (Line 102) is very direct, it is also infrequent, running at 30 minute headways. Alternative S-4 does not serve the Broadway / Jefferson area.

7.2.3. Interface with Transit Network

Each alternative is rated in Table 7.12 for its interface with other transit lines in the area. Alternatives that negatively affect other lines or duplicate service are given a poor rating, while alternatives that provide new connections to currently unserved areas or are able to accommodate more than one movement are given a good or very good rating.

Table 7.12. Interface with Transit Network

Alternative	Type	Transit Interface	Comments
R-2	Local	Very Good	Allows for both North and South Movements on a single right-of-way. Brings new transit options, especially to west and south, for Exposition Connector neighborhood. Express service between Westside, Long Beach, and downtown would be extremely beneficial.
R-3	Local	Very Good	
R-3	Express	Very Good	
N-1	No-Build	N/A	Uses existing lines
N-2	Non-ROW	Good	Regional Connector will connect Blue, Exposition, and Gold Lines. No service in Exposition Connector area
N-3	Non-ROW	Poor	May conflict with Blue Line on Washington Street, as well as Washington / Flower intersection. No service in Exposition Connector area
S-1	No-Build	N/A	Uses existing lines
S-2	Non-ROW	Good	Allows for South Movement without significant impacts to other lines. No other lines likely to use this routing.
S-3	Non-ROW	Good	Route along Slauson will have to be coordinated with Metro plans for transit along Harbor Subdivision to LAX. Blue Line is elevated at Slauson Station, necessitating an expensive aerial connection.
S-4	Non-ROW	Good	Provides interface with Crenshaw Corridor service to LAX. Route along Slauson will have to be coordinated with Metro plans for transit along Harbor Subdivision to LAX.

The Build Alternatives using the Exposition Connector receive the highest ratings, mainly because of their ability to accommodate regional movements to both the north and south and their service to the Exposition Connector neighborhood. The Non-ROW alternatives generally receive good ratings, with Alternative N-3 receiving a poor rating because of its possible conflicts with Blue and Exposition Line service in the Washington Corridor. The North Movement alternatives (N-2 and N-3) are penalized somewhat because they do not directly serve neighborhoods in the Exposition Connector area.

7.2.4. Ability to Accommodate Additional Service (Capacity)

Also of importance when evaluating these alternatives is their ability to accommodate additional service. With the many light rail lines converging in the Downtown Los Angeles area and continued ridership growth, soon they may have to be expanded to keep the quality of service high. In addition, service from new transit corridors such as the Crenshaw Corridor and Exposition Line Phase II would need to be accommodated. Table 7.13 rates the alternatives on their ability to handle additional service.

Table 7.13. Ability to Accommodate Additional Service (Capacity)

Alternative	Type	Expansion Potential	Comments
R-2	Local	Very Good	Will act as second corridor into Downtown Los Angeles, freeing up some capacity on Flower Street Corridor.
R-3	Local	Very Good	
R-3	Express	Very Good	
N-1	No-Build	Poor	Flower Street Corridor, especially Flower / Washington junction, is nearing capacity
N-2	Non-ROW	Poor	Regional Connector will initially be able to accommodate Blue, Exposition, and Gold Line services, but likely no additional lines
N-3	Non-ROW	Poor	Washington Street corridor, especially Washington / Flower junction, is nearing capacity
S-1	No-Build	Poor	Flower Street Corridor, especially Flower / Washington junction, nearing capacity
S-2	Non-ROW	Good	Avoids Flower and Washington corridors, so should not run into any major bottlenecks, but will be tough to expand service by large amount on on-street sections.
S-3	Non-ROW	Good	Avoids Flower and Washington corridors, so should not run into any major bottlenecks, but will be tough to expand service by large amount on on-street sections.
S-4	Non-ROW	Good	Avoids Flower and Washington corridors, so should not run into any major bottlenecks, but may face constraints on narrow Harbor Subdivision if shared with other Metro service

The build alternatives along the Exposition Connector receive the highest marks because of their ability to open a second corridor into / through Downtown Los Angeles. The no-build and North Movement non-ROW alternatives (N-1, N-2, N-3, & S-1) receive a poor rating because of the difficulty of expanding service in the Flower and Washington corridors. The South Movement non-ROW alternatives generally have some extra capacity, but will face difficulties expanding service because of their on-street nature or use of the narrow Harbor Subdivision.

7.3. LOCAL COMMUNITY BENEFITS AND IMPACTS

The final set of evaluations examines the effects that the various alternatives will have on the surrounding community. These include benefits like spurring development in industrial areas, as well as impacts such as noise, vibration, and reduced safety.

7.3.1. Revitalization Potential

The community in the area surrounding the Exposition Corridor has expressed a strong desire to see the many industrial properties in the area developed as housing. Table 7.14 ranks the alternatives on their potential to spur the revitalization of the study area.

Table 7.14. Revitalization Potential

Alternative	Type	Revitalize. Potential	Comments
R-2	Local	Good	Allow for the revitalization of areas around the ROW, and on top of the ROW for its western section. Will also allow for development of station areas and the Alameda St corridor
R-3	Local	Good	
R-3	Express	Good	
N-1	No-Build	Very Good	All four of these alternatives allow for the revitalization of areas around the Exposition Connector ROW as well as the actual right-of-way itself
N-2	Non-ROW	Very Good	
N-3	Non-ROW	Very Good	
S-1	No-Build	Very Good	
S-2	Non-ROW	Good	These alternatives allow for the revitalization of the Exposition Connector ROW and surrounding area, but may face problems developing their on-street sections because of parking and traffic restraints.
S-3	Non-ROW	Good	
S-4	Non-ROW	Very Good	Allows for the revitalization of areas around the Exposition Connector ROW as well as the actual right-of-way itself

The No-Build and Non-ROW alternatives allow the best revitalization prospects for the Exposition Connector right-of-way because they allow for development on top of the property currently owned by Metro. Alternatives S-3 and S-4 may face problems with revitalization along their on-street portions away from the stations, as the installation of light rail will likely have negative parking and traffic impacts. The Build Alternatives will allow for the western portion of the right-of-way itself to be revitalized, and should spur development in the station areas and on Alameda Street.

7.3.2. Impacts to Other Modes of Transportation (Automobile, Pedestrian)

Given that many of the alternatives run for significant segments on the street, they will interact with other modes of transportation like automobiles and pedestrians. Table 7.15 and Table 7.16 rank the alternatives based on their negative effects on these other modes, such as reduced pedestrian safety, loss of parking and / or travel lanes, and increased congestion. The length of new construction on-street is also included in the tables, as this type of right-of-way has the largest impacts on other modes of transportation.

Table 7.15. Traffic and Pedestrian Impacts – North Movement

Alternative	Type	Traffic and Ped. Impact	Length On-Street (mi)	Comments
R-2	Local	Medium-High	2.5	Traffic / parking displacements along Jefferson, Alameda
R-3	Local	Medium	2.0	Traffic / parking displacements along Alameda
R-3	Express	Low	0.0	No new on-street construction
N-1	No-Build	Low	0.0	
N-2	Non-ROW	Medium-Low	0.0	No new on-street construction, but additional vehicles are likely to disrupt Washington / Flower intersection
N-3	Non-ROW	Medium-High	2.0	Traffic / parking displacements along Alameda, additional vehicles disrupting Washington / Flower intersection

North Movement Comments – Alternatives R-3 (Express) and N-1 (No-Build) have no new in-street construction, giving them the lowest impacts for this movement. Alternatives R-2, R-3 (Express) and N-3 include roughly 2 miles of in-street running on Alameda Street, inducing significant impacts to traffic and parking. Alternatives N-2 and N-3 will both also affect traffic operations at the Washington / Flower intersection because of the addition of new vehicles to the existing lines.

Table 7.16. Traffic and Pedestrian Impacts – South Movement

Alternative	Type	Traffic and Ped. Impact	Length On-Street (mi)	Comments
R-2	Local	Medium-Low	0.5	Traffic / parking displacements along Jefferson
R-3	Local	Low	0.0	No new on-street construction
R-3	Express	Low	0.0	
S-1	No-Build	Low	0.0	
S-2	Non-ROW	High	2.7	Traffic / parking displacements along Jefferson, Central, Vernon
S-3	Non-ROW	High	2.4	Traffic / parking displacements along Jefferson, Broadway
S-4	Non-ROW	Low	0.0	No new on-street construction

South Movement Comments – The three build alternatives and Alternative S-4 all receive low to medium-low ratings, with only R-2 including a short in-street segment along Jefferson. Alternatives S-2 and S-3 have the highest traffic impact, as much of their route is on-street. Even though the lengths are comparable to the Alameda Street segment for the North Movement, the neighborhoods traversed for the South Movement are primarily residential or commercial. The effect of losing parking / travel lanes will be much harder felt in these areas than in the primarily industrial area along Alameda.

7.3.3. Noise and Vibration Impacts

An inevitable effect of moving large rail vehicles at-grade is noise and vibration effects felt at surrounding properties. Table 7.17 ranks the alternatives based on their proximity to residential

and commercial uses that would be affected by the noise and vibration effects. Industrial uses will likely not be affected as much, as will new development that can be designed to minimize impacts from service along the right-of-way.

Table 7.17. Noise and Vibration Impacts – North Movement

Alternative	Type	Noise / Vib. Impacts	Comments
R-2	Local	Medium-Low	Will mostly traverse industrial areas, with residential uses abutting the corridor in two short sections along the Exposition Connector ROW (Maple to San Pedro and Hooper to Compton). Development along corridor can be designed to minimize exposure to noise and vibration effects.
R-3	Local	Medium-Low	
R-3	Express	Medium-Low	
N-1	No-Build	Low	Uses existing lines and does not expand service levels
N-2	Non-ROW	Low	Will be underground for new segment
N-3	Non-ROW	Low	Will be traversing a mainly industrial area

North Movement Comments – The build alternatives have the largest impacts for the north movement, mainly since the other alternatives largely avoid residential areas and use existing lines. Roughly five blocks of existing housing abuts the Exposition Connector, and these properties would likely need improvements to minimize noise and vibration impacts.

Table 7.18. Noise and Vibration Impacts – South Movement

Alternative	Type	Noise / Vib. Impacts	Comments
R-2	Local	Medium-Low	Will mostly traverse industrial areas, with residential uses abutting the corridor in two short sections along the Exposition Connector ROW (Maple to San Pedro and Hooper to Compton). Development along corridor can be designed to minimize exposure to noise and vibration effects.
R-3	Local	Medium-Low	
R-3	Express	Medium-Low	
S-1	No-Build	Low	Uses existing lines and does not expand service levels
S-2	Non-ROW	Medium-High	Traverses mostly residential and commercial neighborhoods. Most exposure will be to portions of properties facing street, which may be designed to minimize noise impacts
S-3	Non-ROW	Medium-High	
S-4	Non-ROW	Medium-Low	Will travel on corridors that already have rail service or are planned to in the future, so the route may not have significant incremental increases to noise and vibration.

South Movement Comments – As with the North Movement, the build alternatives would affect several blocks of residential development along the Exposition Connector. The Non-ROW alternatives would likely have higher impacts because of their routes through mostly residential / commercial neighborhoods, with Alternative S-4's impact expected to be lower because it will be running in corridors planned for other transit services.

7.4. SUMMARY

Table 7.19 and Table 7.20 summarize the eleven measures used to evaluate the various alternatives in the previous sections for the North and South Movements respectively.

Table 7.19. Summary of Alternative Evaluation Measures – North Movement

Alternative	Type	Length (miles)	# of Stations	Capital Cost (mil)	O&M Cost (mil)	Transit Interface	Expansion Potential
R-2	Local	6.2	7	\$ 131	\$ 9.8	Very Good	Very Good
R-3	Local	6.0	7	\$ 170	\$ 8.7	Very Good	Very Good
R-3	Express	6.8	0	\$ 108	\$ 6.8	Very Good	Very Good
N-1	No-Build	5.0	7	N/A	N/A	N/A	Poor
N-2	Non-ROW	5.3	9	\$ 644	\$ 8.7	Good	Poor
N-3	Non-ROW	6.4	9	\$ 164	\$ 10.4	Poor	Poor

Alternative	Type	Through Travel Time (minutes)	Local Travel Time (min)			Revitalization Potential	Traffic / Pedestrian Impacts	Noise / Vibration Impacts
			North: LAUS	North: 6 th /Ala	West			
R-2	Local	21	22	18	6	Good	Med-High	Med-Low
R-3	Local	21	22	17	5	Good	Medium	Med-Low
R-3	Express	12	–	–	–	Good	Low	Med-Low
N-1	No-Build	22	29	35	13	Very Good	Low	Low
N-2	Non-ROW	22	28	37	12	Very Good	Med-Low	Low
N-3	Non-ROW	26	36	31	12	Very Good	Med-High	Low
Bus	Existing	–	21	21	21			

Table 7.20. Summary of Alternative Evaluation Measures – South Movement

Alternative	Type	Length (miles)	# of Stations	Capital Cost (mil)	O&M Cost (mil)	Transit Interface	Expansion Potential
R-2	Local	7.3	6	\$ 157	\$ 17.4	Very Good	Very Good
R-3	Local	7.1	6	\$ 204	\$ 17.4	Very Good	Very Good
R-3	Express	7.1	0	\$ 179	\$ 16.4	Very Good	Very Good
S-1	No-Build	9.5	10	N/A	N/A	N/A	Poor
S-2	Non-ROW	7.2	6	\$ 201	\$ 18.4	Good	Good
S-3	Non-ROW	7.9	7	\$ 223	\$ 18.5	Good	Good
S-4	Non-ROW	8.4	7	\$ 241	\$ 18.5	Good	Good

Alternative	Type	Through Travel Time (minutes)	Local Travel Time (min)		Revitalization Potential	Traffic / Pedestrian Impacts	Noise / Vibration Impacts
			South	West			
R-2	Local	22	15	6	Good	Med-Low	Med-Low
R-3	Local	22	14	5	Good	Low	Med-Low
R-3	Express	15	–	–	Good	Low	Med-Low
S-1	No-Build	39	37	13	Very Good	Low	Low
S-2	Non-ROW	24	16	9	Good	High	Med-High
S-3	Non-ROW	26	18	9	Good	High	Med-High
S-4	Non-ROW	27	28	–	Very Good	Low	Med-Low
Bus	Existing	22	33	21			

7.5. CONCLUSION

In the preceding section, the two build alternatives judged suitable for further study in the Initial Screening portion of this study were evaluated against No-Build and Non-ROW alternatives to determine if they had a large enough benefit to the transit network and community to justify not abandoning the Exposition Connector right-of-way. The evaluations revealed several major conclusions concerning the utility of the right-of-way for future transit operations, as summarized below.

1. **Low Capital and Operating Costs** – In general, the Build Alternatives that use the Exposition Connector right-of-way fall on the lower end of the cost ranges for construction and operations. Their direct routings and off-street running reduce operating costs, and with the exception of the tunnel portion of Alternative R-3 also lead to low construction costs.
2. **Shorter Travel Times** – The Build Alternatives generally provide modest benefits to travel times to Union Station and the Long Beach corridor, but much more significant potential accessibility improvements to employment centers in Central City East and towards the Westside.
3. **Low Community Impacts** – The community impacts of the Build Alternatives as compared to the Non-ROW Alternatives are generally low. Their off-street alignment minimizes impacts to pedestrians and autos, and the generally industrial nature of the area surrounding the Exposition Connector ROW should minimize the number of residences and businesses affected by noise and vibration
4. **Development Potential** – The Build Alternatives will allow for significant development of the industrial properties abutting the Exposition Connector ROW, but will need closer coordination of development and transit than the Non-ROW alternatives. The Non-ROW alternatives will allow for more complete development of and a broad array of revitalization strategies in the corridor (including the Metro-owned ROW), but because of their traffic, pedestrian, and noise impacts could hamper businesses and residences along their paths away from station areas.
5. **Superior Flexibility** – The Build Alternatives stand out among the other alternatives with their ability to accommodate both North and South Movements in one corridor. While Alternative N-3 could also accommodate movements to the north and south, it faces serious capacity constraints because of its on-street portions and cannot offer the same flexibility. All other Non-ROW alternatives only serve one movement, and need to be built in combinations to serve both.
6. **Additional Capacity** – The most critical comparison between the Build and Non-ROW alternatives is the ability to accommodate capacity expansion required for regional projects such as the Crenshaw Corridor and Exposition Phase II. The on-street portions of the existing and planned lines, as well as all Non-ROW alternatives severely constrict capacity and leave little room for future expansions. The off-street nature of the Exposition Connector as well as its connections to other high-capacity links such as the Exposition Corridor to the west, the Long Beach Corridor to the south, and the Los Angeles River Corridor to the east and north allow it to accommodate the higher levels of service projected for the future Metro transit system.

For these reasons, it is recommended that Metro retain access to the right-of-way. Development proposals on or around the right-of-way should be entertained such that the

rights of passage for a potential rail transit facility is preserved and such that environmental clearance of such a facility is not compromised.

8. PHASE III: CORRIDOR DEVELOPMENT STRATEGY

In the previous chapters of this study, it was determined that the Exposition Connector right-of-way has major utility as a transit corridor and that access for a future rail line should be preserved. In addition to its possible transit function, the Exposition Connector ROW is also a focus of development efforts in the surrounding community, with the addition of affordable housing stock as the primary focus. This chapter examines ways in which the Exposition Connector ROW can both accommodate development of surrounding properties, thus facilitating community revitalization, and preserve the potential for a future transportation investment.

The first section reviews the alignment options considered for the corridor in previous reports, and the land needed in the ROW for a transit line. The second section examines the right-of-way in detail, including its width and surrounding land uses. The third section presents strategies for development around the ROW, including examples from other projects around the country. The final sections recommend strategies for development of the corridor including suggested joint development guidelines.

8.1. ALIGNMENT ALTERNATIVES

Two rail alternatives were evaluated as feasible for the Exposition Connector right-of-way in earlier chapters of this report. These alignments both use the section of the Exposition Connector east of Jefferson Blvd, but differ in their western portions. Alternative R-2 runs on-street on Jefferson Blvd and meets the Exposition Light Rail Line at Jefferson's intersection with Flower Street. Alternative R-3 runs underground west of Jefferson, meeting the Exposition Line underground at the intersection of Exposition Blvd and Flower Street. An aerial view of the alignments and right-of-way is shown in Figure 8.1.

Figure 8.1. Rail Alternatives for Exposition Connector



Source: Google Earth, STV Incorporated

Both alignments do not use the surface of the western half mile of the right-of-way between Jefferson Blvd and Flower St (shown in purple), allowing it to be revitalized for non-transit uses. The portion east of Jefferson Blvd (shown in green) would be used by both of the alternatives. A 30' wide strip of right-of-way will need to be preserved in this section for future rail use, with a wider section (roughly 40') preserved in station areas (likely near Central Avenue and Broadway).

8.2. CURRENT STATE OF CORRIDOR

To properly determine future development strategies for the Exposition Connector corridor, it is important to first catalogue its current state. This section examines the width of the Metro-owned property, and its current uses.

8.2.1. Right-of-Way Width

The Exposition Connector ROW has a variety of widths from the Exposition Line to the Blue Line. The majority of the Connector is 60' in width, so this is considered "normal" in this document. Other sections are narrower or wider, as shown in Table 8.1 and Figure 8.2.

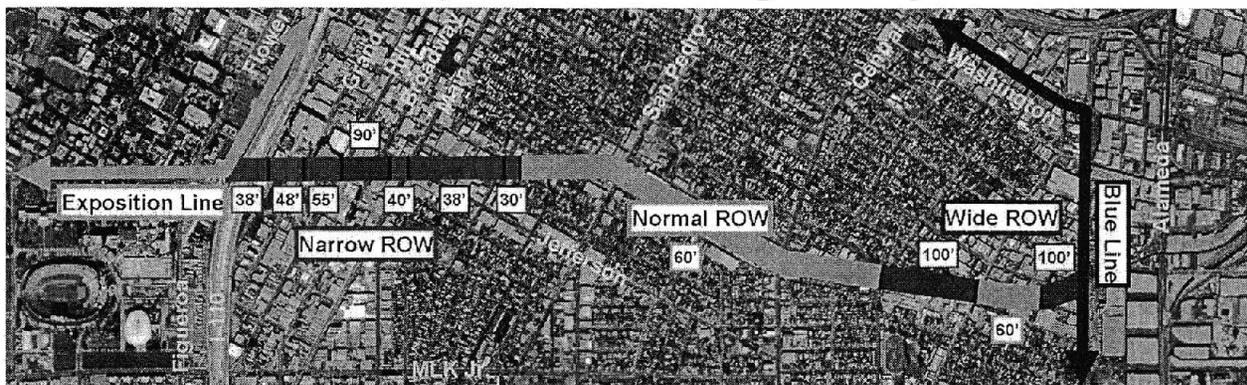
Table 8.1. Exposition Connector Right-of-Way Width

From	To	Length (ft)	Width (ft)	Classification
Flower St	Hope St	600	38	Narrow
Hope St	Grand Ave	460	48	Narrow
Grand Ave	Hill St	480	55	Narrow
Hill St	Broadway	650	90	Wide
Broadway	Main St	280	40	Narrow
Jefferson Blvd	Maple Ave	1,210	38	Narrow
Maple Ave	32 nd St	200	30	Narrow
32 nd St	Hooper Ave	5,160	60	Normal
Hooper Ave	Compton Ave	1,300	100	Wide
Compton Ave	Nevin Ave	850	60	Normal
Nevin Ave	Long Beach Ave	550	100	Wide

Total	Narrow	3,230 (28%)	41.6 (avg)
	Normal	6,010 (51%)	60.0 (avg)
	Wide	2,500 (21%)	97.4 (avg)

Entire Exposition Connector	11,740 (2.22 mi)	62.9 (avg)
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Figure 8.2. Exposition Connector Right-of-Way Width



Source: Google Earth, Assessor Maps, STV Incorporated

As shown, over 50% of the right-of-way is 60 feet in width. The entire portion east of 32nd Street is at least 60 feet wide (100 feet in some portions), while west of 32nd Street the corridor is generally narrower than 60 feet. The narrowest section of the ROW is south of the Maple / 32nd intersection, at 30 feet in width. A light rail line, which requires 30 feet of width, can fit through the entire corridor without acquiring additional property. On the eastern segment of the corridor, excess right-of-way may be available for development.

8.2.2. Current Right-of-Way Use

Currently, several sections of the Exposition Connector are leased to various entities for temporary use. In general, these portions of the ROW are used for parking or storage, since the leases do not allow more permanent uses. Several additional portions are leased, but currently not used. In addition, some sections are currently not leased and currently vacant. The various current uses for the Exposition Connector ROW are shown in Table 8.2 and Figure 8.3.

Table 8.2. Current Exposition Connector ROW Use

From	To	Length (ft)	Classification
Flower St	Hill St	1,540	Leased, In-Use
Hill St	Broadway	650	Leased, Vacant
Broadway	Main St	280	Leased, In-Use
Jefferson Blvd	Maple Ave	1,210	Vacant
Maple Ave	32nd St	200	Leased, In-Use
32nd St	San Pedro St	1,380	Vacant
San Pedro St	Griffith Ave	1,340	Leased, In-Use
Griffith Ave	Naomi Ave	1,860	Leased, Vacant
Naomi Ave	Compton Ave	1,880	Leased, In-Use
Compton Ave	Nevin Ave	850	Vacant
Nevin Ave	Long Beach Ave	550	Leased, In-Use (N), Vacant (S)

Total	Leased, In-Use	5,515 (47%)
	Leased, Vacant	2,510 (21%)
	Vacant	3,715 (32%)

Figure 8.3. Current Exposition Connector ROW Use



Source: Google Earth, Assessor Maps, STV Incorporated

8.2.3. Property Uses Adjoining Right-of-Way

Currently, many of the properties abutting the Exposition Connector are industrial or commercial in nature. Uses include warehouses, textile factories, auto shops, and other light industries plus several restaurants and other small businesses. Several stretches of the right-of-way run through residential neighborhoods, which would likely experience higher impacts than the industrial and commercial uses. The adjoining land uses are shown in Table 8.3 and Figure 8.4.

Table 8.3. Land Uses Adjoining Exposition Connector

Adjoining Land Use	Length (ft)	Length (%)
Residential	1,745	15%
Industrial, Commercial, Other	9,995	85%

Figure 8.4. Land Uses Adjoining Exposition Connector



Source: Google Earth, STV Incorporated

8.3. DEVELOPMENT OPTIONS

Given the wide range of conditions along the Exposition Connector, there are a variety of development options for the corridor. This section describes several methods to develop the right-of-way to accommodate both transit and development, as well as giving examples from other light rail lines around the country.

8.3.1. Landscape Buffer

For sections of the right-of-way through areas that are not likely to be developed extensively, a landscaped buffer or greenway may be a good treatment to separate the rail line from surrounding development. One candidate area for this treatment is along the existing residential sections of the right-of-way (generally the segment between 30th and 32nd Streets). This stretch may be a good candidate for this type of treatment, since the surrounding properties may likely retain their current residential character and the right-of-way itself, at 60' wide, is narrow. Assuming 30' of ROW is needed for the rail line, the remaining 30 feet of width could be used for a landscaped buffer. Such a buffer could be purely decorative and maintained by Metro, leased to surrounding property owners for their personal use, or possibly used by the surrounding area as a community garden, small parkway, or other type of shared use.

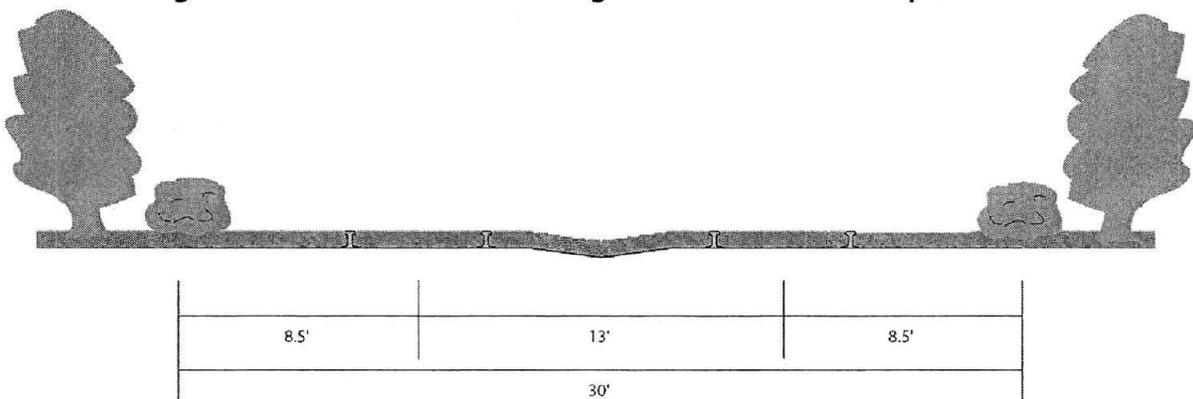


Figure 8.5. Light Rail Transit with Landscape Buffer – Newark, New Jersey

Source: NYCSubway.org

An example of a light rail line with a landscaped buffer in Newark, New Jersey is shown in Figure 8.5, with a cross-section of this type of treatment shown in Figure 8.6.

Figure 8.6. Cross-Section of Light Rail with Landscape Buffer



Source: STV Incorporated

8.3.2. Development Adjacent to Rail Line

In areas where development of surrounding properties is possible, there are several options to integrate this development with a future rail line. In lower density areas, development could be between one and three stories tall and could use the space along the right-of-way not needed for transit use. The additional space along in the ROW could be used to supplement the adjoining property, with possible uses including residences or parking.

In the interim until a rail line is built, the entire ROW could possibly be developed, although the space through which the rail line would run could only be used for temporary uses such as parking. There would also need to be accommodations to allow for this parking to be replaced when the rail line is built, such as extra space in another part of the development. Development such as this would screen the right-of-way from the surrounding community, and could likely be accomplished in the very near future if suitable property adjoining the right-of-way can be found.

Several examples of development adjacent to light rail are given in this section. Figure 8.7 shows new affordable housing in the Barrio Logan area of San Diego adjacent to a light rail stop. Figure 8.8 shows development with a light rail line running immediately behind the property in Newark, New Jersey. Figure 8.9 gives a schematic view of such development.



Figure 8.7. Affordable Housing adjacent to Light Rail – Barrio Logan Station, San Diego, CA

Source: Smart Growth Illustrated, US EPA

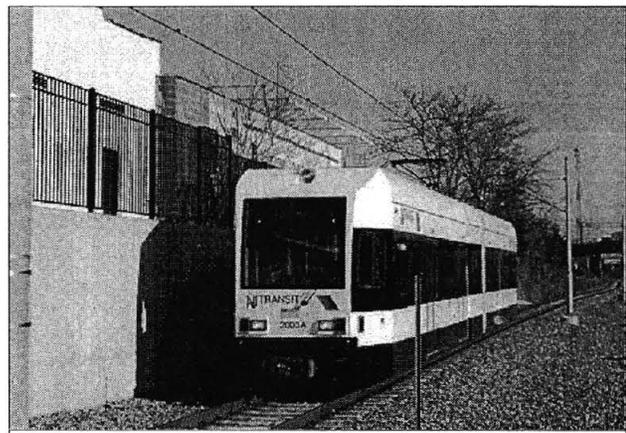
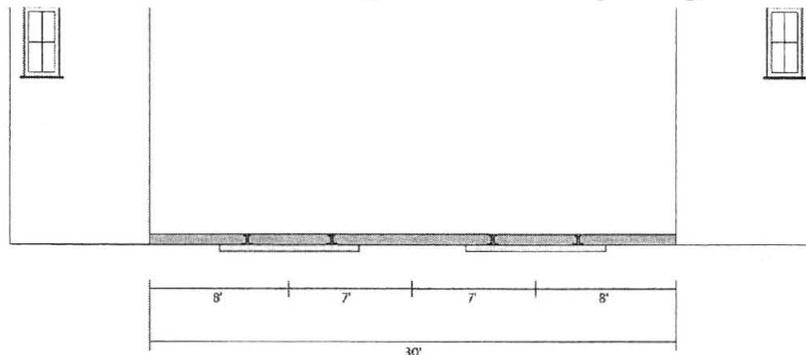


Figure 8.8. Light Rail Running Behind Development – Newark, New Jersey

Source: NYCTSubway.org

Figure 8.9. Cross-Section of Light Rail with Adjoining Development



Source: STV Incorporated

8.3.3. Development Above Rail Line

In higher-density sections of the corridor such as its western portion, it may be possible to build larger buildings surrounding the right-of-way. Although several plots can be combined to form a larger piece of land to build on, in some cases it may be necessary to combine properties on opposite sides of the right-of-way. Since space needs to be preserved along the right-of-way for a potential rail line, the best way to accomplish this is design projects to span above the rail line. In this way, large developments can be constructed without interfering with future rail operations. One section of the right-of-way that may be suited for this type of development is between Main Street and Broadway. The adjacent land to the north is already owned by Metro, and in the future a rail station may be placed in this area (allowing for density and parking benefits). Other sites along the corridor, such as the stretch between San Pedro and Hooper, may also be suitable for such development.

Figure 8.10 shows a joint development project above the Gold Line in Pasadena. Figure 8.11 shows a schematic cross-section of development above light rail. Figure 8.12 shows academic buildings at Portland State University above the Portland (OR) Streetcar.

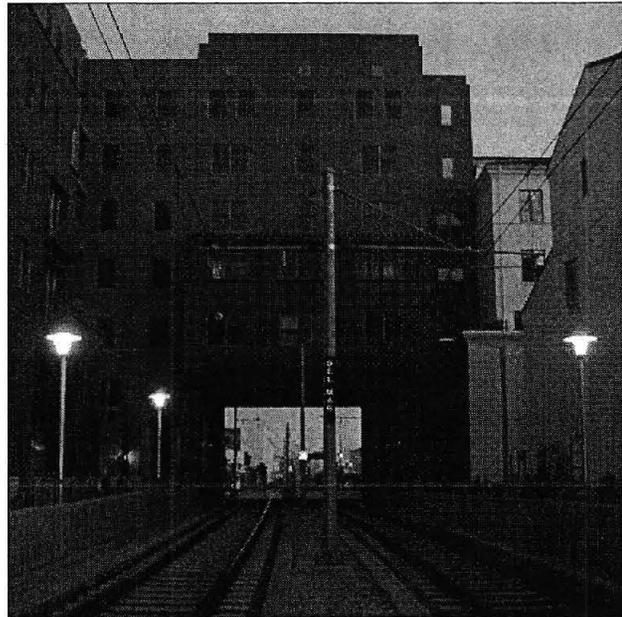


Figure 8.10. Development Above Light Rail – Del Mar Station, Gold Line, Pasadena, CA

Source: STV Incorporated

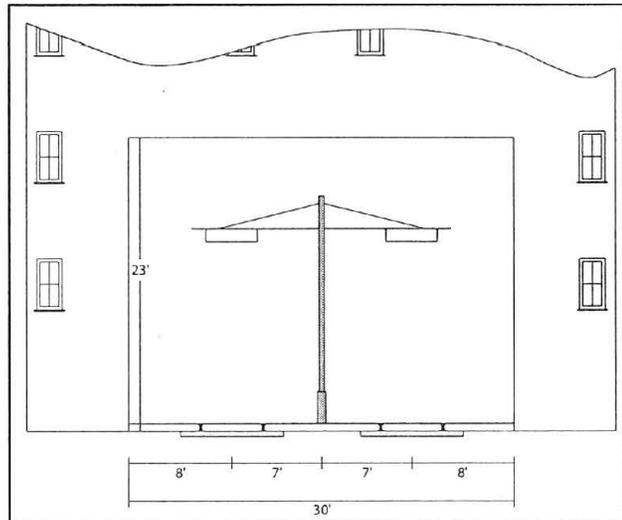


Figure 8.11. Cross-Section of Light Rail with Development Above

Source: STV Incorporated

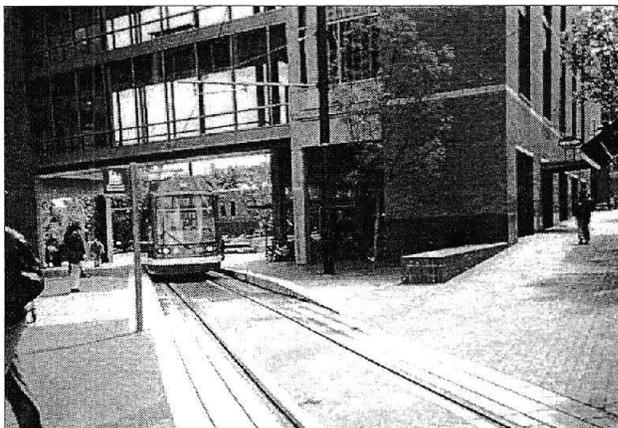


Figure 8.12. Development Above Streetcar – Portland State University, Portland, OR

Source: Metro

8.3.4. Rail Below Grade (or Underground Easement), Development Above

For the section of the Exposition Connector between Jefferson Blvd and Flower Street, Metro may want to preserve the option of extending rail below grade to improve safety and allow for more extensive development above ground. One possible method to accomplish this is called Doorframe Slab (DFS) Tunneling, shown in Figure 8.13. The main advantage of the DFS tunneling method, in which the ceiling of the tunnel is built first and the rest of the tunnel is excavated completely underground at a later date, is its minimum disruption above ground.

While the DFS tunneling method is primarily intended to minimize disruption to surface streets, it is also a useful way to allow for development above underground rail or an easement preserved for rail. If development was ever to occur on top of the right-of-way, the slab upon which it rests would be built allowing it to serve as the ceiling for the tunnel. The foundations of the buildings would also need to be arranged so that they would not interfere with the tunnel. With a ceiling already in place, a tunnel for the proposed rail line could easily be built through the area in the future with minimum disruption to surface structures.

Figure 8.14 shows an example of above-ground development / below-ground rail, in this case housing and parks above the Orange Line in Boston, Massachusetts. This coupling of rail and development can completely mask the fact that a high-capacity rail link is running through the area.

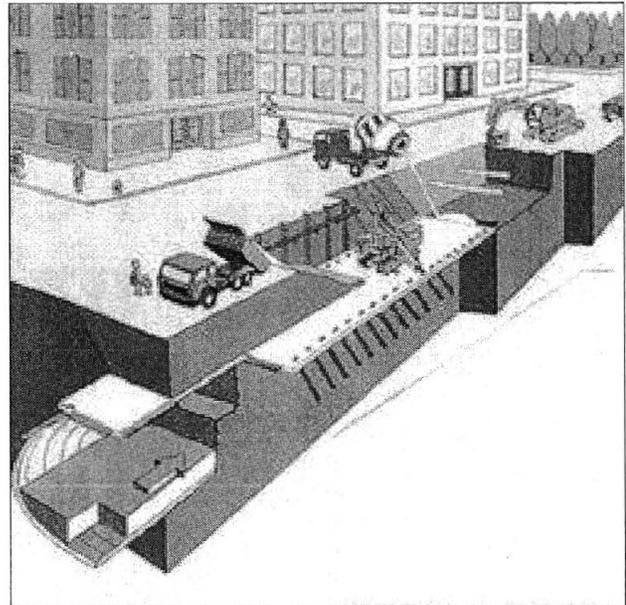


Figure 8.13. Doorframe Slab (DFS) Tunneling Method

Source: Dr. Sauer Group

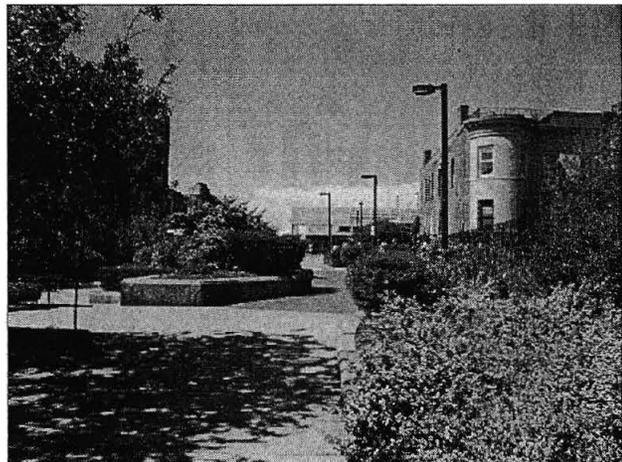


Figure 8.14. Townhouses & Parks above Underground Rail – Orange Line, Boston, MA

Source: STV Incorporated

8.3.5. Station Platforms

At locations where stations are planned for the Exposition Corridor, there would be a slightly different character to the right-of-way. First, the width of ROW needed for the station is greater than that needed for the normal running way, with roughly 40 feet needed instead of 30. This extra width is needed for the station platforms.

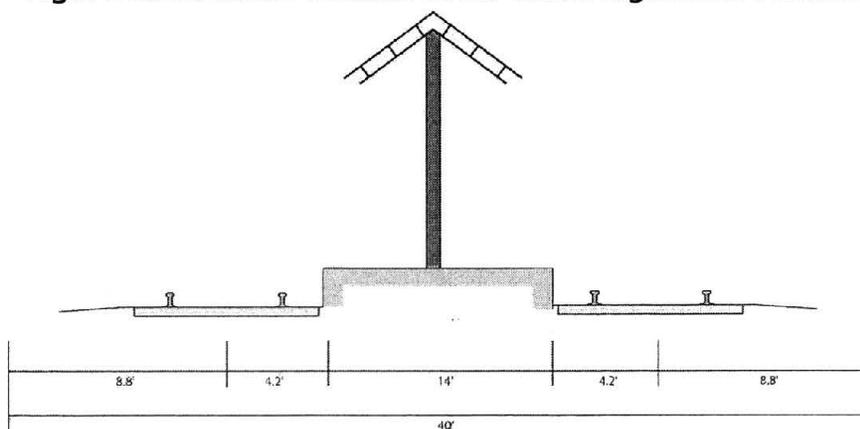
There are additional development incentives for projects near transit stations. These include increased maximum density, reduced parking requirements, aid in consolidating properties, combined hearing processes, and other means to encourage transit-oriented development. These incentives can be powerful aids to encouraging development and revitalization of specific sites. Figure 8.15 shows an example of station area transit-oriented development from San Diego.



Figure 8.15. Development Adjoining Light Rail Station – Rio Vista West Station, San Diego, CA
Source: California TOD Database, Caltrans

There will likely be two stations along the Exposition Connector based on current Metro station siting practices (roughly one mile apart for light rail). As described in Chapter 5, for this study the stations are assumed to be at Central Ave and Broadway. The Central Ave station would likely be an at-grade station, with a layout similar to that shown in Figure 8.16. The configuration of the Broadway station could take one of several forms, including at- or below-grade and on or off the ROW. One possible configuration could be partially underground in the ROW, similar to the Memorial Park Station on the Gold Line in Pasadena.

Figure 8.16. Cross-Section of At-Grade Light Rail Station



Source: STV Incorporated

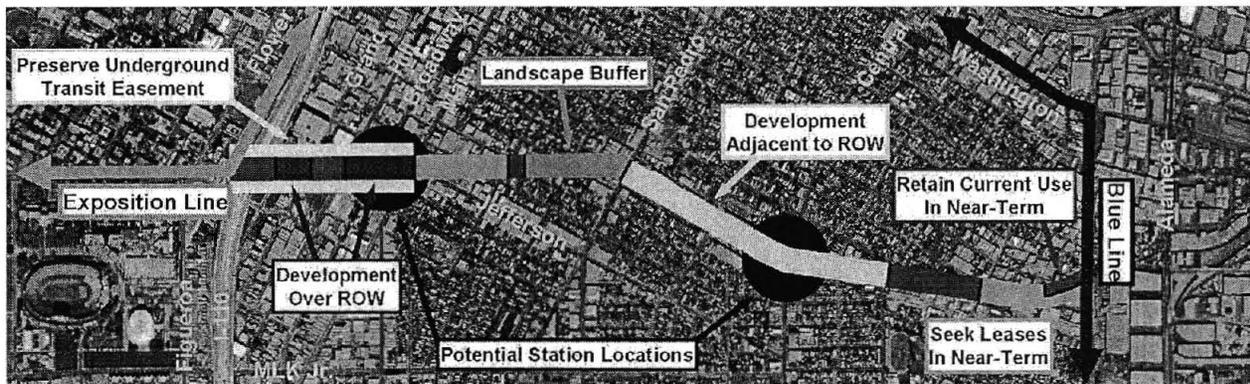
8.4. POTENTIAL RIGHT-OF-WAY DEVELOPMENT STRATEGY

Given the various types of right-of-way development described in the previous section as suitable for the Exposition Connector and a study of local conditions, one possible strategy for developing the right-of-way is presented in this section.

This development strategy is preliminary in nature and is only a suggestion by the consultant project team based on the space in the corridor needed for transit, examinations of surrounding land uses, and development strategies used in other areas around the country. Any actual development proposals will need to be coordinated with the City of Los Angeles, the local community, Metro, and other agencies with jurisdiction.

Figure 8.17 shows the different types of development proposed, with each discussed separately below.

Figure 8.17. Potential Right-of-Way Development Strategy



Source: Google Earth, STV Incorporated

8.4.1. Development Over ROW

- **Color in Figure 8.17:** Purple
- **Discussed in Section:** 8.3.3
- **Sections of Corridor:** Hope to Grand, Hill to Main
- **Special Conditions:** Underground easement for transit (shown in grey) needs to be preserved, Proposed station near Broadway (shown in black) could allow for denser development around Hill to Main section
- **Comments:** These sections of the ROW (especially Hill to Main) are among the most ready for development

8.4.2. Development Adjacent to ROW

- **Color in Figure 8.17:** Yellow
- **Discussed in Section:** 8.3.2
- **Sections of Corridor:** San Pedro to Hooper

- **Special Conditions:** Station proposed at Central (shown in black) could allow for denser development. More width (40') needs to be preserved at this location
- **Comments:** This section through lower-density residential neighborhoods is among the most ready for development, especially near San Pedro.

8.4.3. Landscape Buffer

- **Color in Figure 8.17:** Green
- **Discussed in Section:** 8.3.1
- **Sections of Corridor:** 30th to 32nd
- **Special Conditions:** None
- **Comments:** Development not likely for the single-family homes surrounding this stretch, so corridor should be beautified in coordination with the adjacent residents and the surrounding community.

8.4.4. Retain Current Use in Near-Term

- **Color in Figure 8.17:** Red
- **Discussed in Section:** N/A
- **Sections of Corridor:** Flower to Hope, Grand to Hill, Maple to 32nd, Compton to Hooper, Nevin to Long Beach (part)
- **Special Conditions:** Western portions need to preserve underground easement for future rail line
- **Comments:** For these stretches of ROW, their current uses (generally leased industrial storage) should be preserved for a variety of reasons listed below.
 - **Flower to Hope:** Is under the Harbor Freeway and not suitable for development. Should retain current use for DMV
 - **Grand to Hill:** Large USC services building to north and new school to south are not suitable sites for development. Current use of the site by USC should be preserved
 - **Maple to 32nd:** Used as parking for small taqueria, which should be retained
 - **Hooper to Compton:** Large container loading / unloading / storage yard to south will be difficult to revitalize due to its size
 - **Nevin to Long Beach:** Area is still mainly industrial, and is not feasible to revitalize as housing at this time

While these stretches of ROW may not currently be feasible for revitalization, in the future conditions may change and they may become more attractive. In that case, these properties should be re-examined. The eastern stretches (Compton to Hooper and Nevin to Long Beach) are particularly attractive because of their width (100 feet), and may make good sites in the future for housing and/or parks and community uses.

8.4.5. Seek Leases in Near-Term

- **Color in Figure 8.17:** Orange
- **Discussed in Section:** N/A
- **Sections of Corridor:** Jefferson to Maple, Compton to Long Beach
- **Special Conditions:** None
- **Comments:** These stretches of right-of-way run through large concentrations of industrial properties, and do not seem likely to be developed as residential or commercial properties in the near term. The parcels are currently vacant and unused, and in the near-term leases for compatible uses can contribute to maintenance of the land. In the future, if the surrounding blocks become less industrial in nature, development may be feasible.

8.5. SUMMARY OF POTENTIAL DEVELOPMENT STRATEGY

As the examples given in the preceding sections show, development and new transit lines can work together to strengthen a community. The new transit line gives residents additional mobility options, and ridership on the line benefits from new residents drawn to the revitalized area along the corridor. Although plans for rail service along the Exposition Connector are not yet definite, development of the corridor can nonetheless proceed as desired by area residents. This report detailed a preliminary strategy for developing the corridor such that it can serve both current community revitalization needs as well as future transit needs.

There are several portions of the Exposition Connector that can undergo development almost immediately, as Metro has indicated that they are ready to work with joint development projects in several areas. These include the section in the vicinity of Broadway, as well as the long section between San Pedro and Hooper. Other sections of the right of way, such as the section between 30th and 32nd Streets, can be beautified in the interim to improve conditions for local residents. The farthest western and eastern stretches of the right-of-way are still largely industrial, and may take longer to develop into housing or businesses. In all cases, the corridor needs to be developed such that it preserves a 30 foot wide strip of land (40 feet near stations) that can be converted to transit use in the future without adverse impacts. West of Jefferson Blvd, these requirements may be slightly less strenuous since future rail lines will likely run underground or on-street on Jefferson.

Metro's policies can accommodate development and support community revitalization along the Exposition Connector as requested by stakeholders within the community. Pursuing development and revitalization requires engagement with the City of Los Angeles to explore changes to the zoning of parcels in the area. The City is currently studying what locations are appropriate to redesignate from industrial use to residential and other uses.

The possibility of the development of rail in the corridor should help a great deal in spurring revitalization of the surrounding area. Policy support and associated incentives for development near transit may promote development and encouraging revitalization in the area. The preliminary development concepts presented in this report can serve as resources that can assist in accommodating both development and community revitalization.

APPENDIX I: TRACK CONNECTIONS WITH BLUE AND EXPOSITION LINES

An analysis of potential uses of infrastructure must establish if those uses are physically feasible. For this reason, simple preliminary engineering analyses were undertaken to establish if critical connections with existing rail infrastructure are feasible. Detailed plans for the connections at each end of the Exposition Connector are included in this Appendix. These include the Jefferson / Flower connection used by Alternative R-2, the underground connection at Exposition / Flower used by Alternative R-3, and the eastern connection with the Blue Line used by all build alternatives.

Jefferson / Flower Connection to Exposition Corridor (Alternative R-2 West)

On its western end, Alternative R-2 ties into the planned Exposition LRT Line at the intersection of Jefferson Blvd and Flower Street. The intersection is constrained in several directions, with the overpass structure for the Harbor Freeway (I-110) just to the east and the Jefferson Blvd Exposition Line station planned for just north of the intersection. STV analyzed whether a proper connection can be made at this intersection, and found that a connection in one direction is feasible without major modifications to the surrounding structures. Since the main movements analyzed in this report are towards the Exposition Corridor (to the south at this junction), that was the connection included in the schematic. A northern connector may also be included in the future (allowing for an alternative to the Washington Blvd segment for Blue Line trains), but such a connection will necessitate modifications to the Harbor Freeway overpass structure and the Jefferson Blvd Exposition Line station.

A schematic of the Jefferson / Flower Connection is included in Sheet R-2 W.

Exposition / Flower Connection to Exposition Corridor (Alternative R-3 West)

The western connection of Alternative R-3 to the Exposition Line would be underground near the Exposition / Flower intersection. There are several options for this connection, including grade-separated and at-grade. Two at-grade connections are included, one with a single track and one with double track. These would be the cheapest options, but would introduce operational constraints because of the crossing of several different movements underground. Another option would be to completely grade-separate the two lines, which would allow for the smoothest operations but have greater capital costs. A connection to the north (allowing Long Beach Corridor > Exposition Connector > Flower Corridor movements) could be beneficial in the future, but is currently not included in plans for the junction.

Schematics of the options for this connection are included in Sheets R-3 W.1 to 3. Sheet W.1 shows the grade separated option, W.2 shows the single track at-grade option, and W.3 shows the double track at-grade option.

Connection to Long Beach Blue Line Corridor (Alternative R-2 & R-3 East)

At the eastern end of the Exposition Connector, there are also several options for the routing vehicles. The movement found in the Initial Screening to offer the most promise is from the

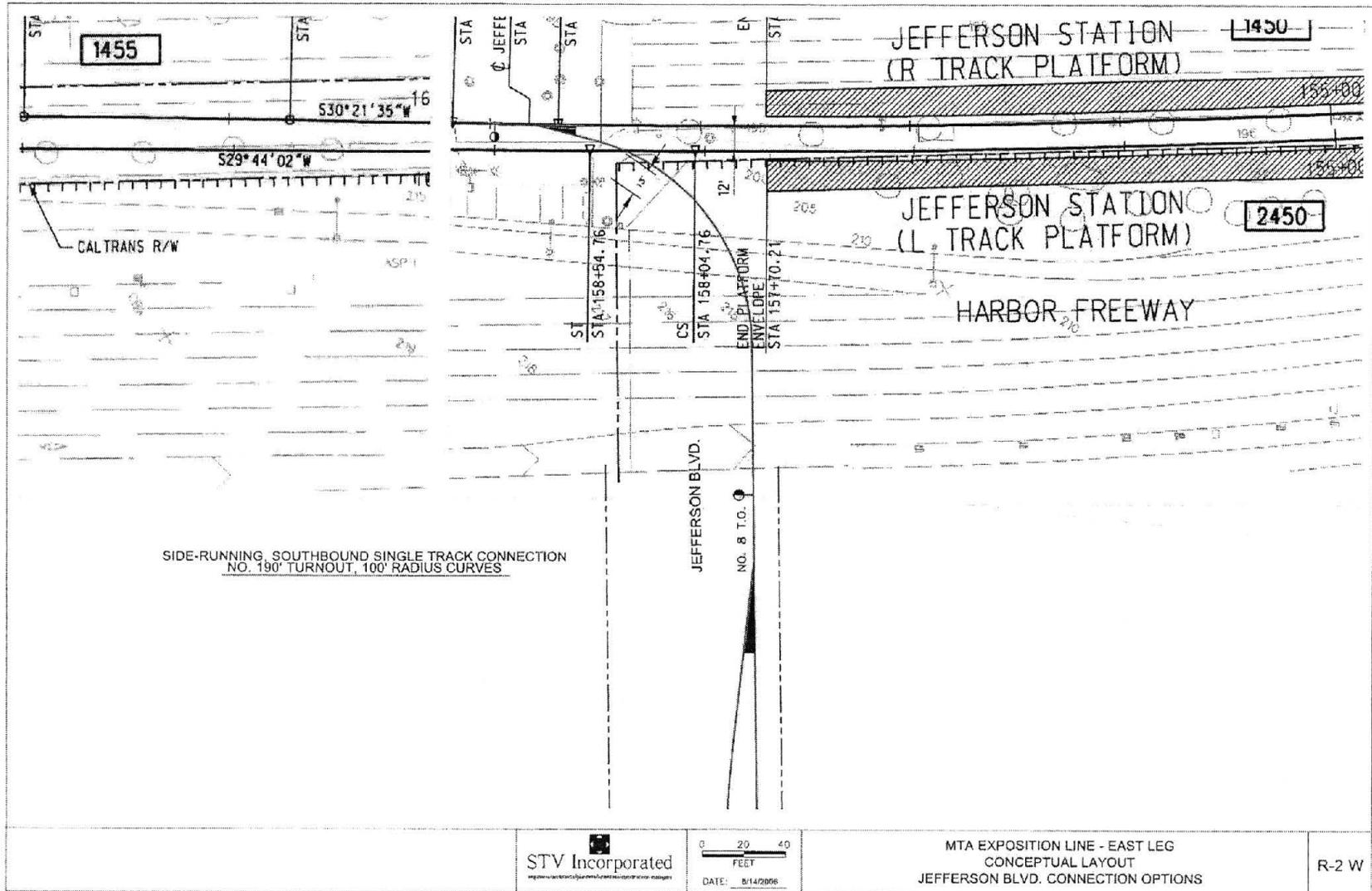
Exposition Corridor to Union Station (North Movement). There are several possible routes for reaching Union Station, with the two most likely being Alameda Street and the Los Angeles River.

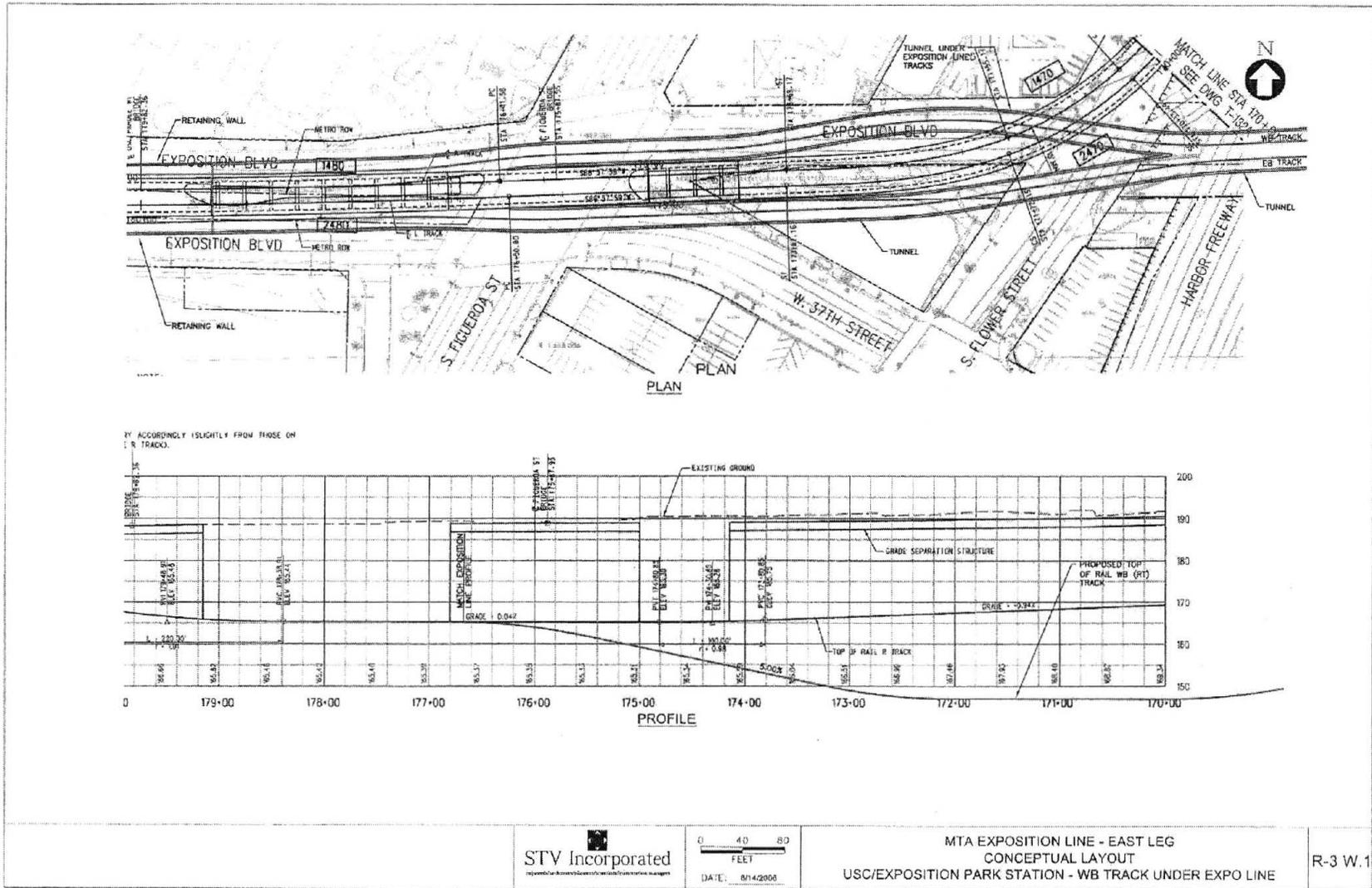
The Alameda Street routing would provide for local service along a corridor to the east of downtown. To connect to Alameda Street, there are several possible options. The most feasible is to use the Blue Line corridor for a short distance, then transition to Alameda Street to the north of Washington Boulevard. This allows for the joint use of the Blue Line Washington Station, as well as the possibility of routing some Blue Line trains to the east of downtown (possibly an express service). Another possibility would be to use the space to the east of the existing Blue Line tracks if additional capacity at the Washington / Long Beach Blvd intersection is needed. In this case, a grade separated crossing of the Blue Line / Exposition Connector Service could be a possibility. For the local light rail service envisioned for Alternatives R-2 and R-3, the better route for the North Movement would be Alameda Street, which has more ridership potential and a more direct route to Union Station.

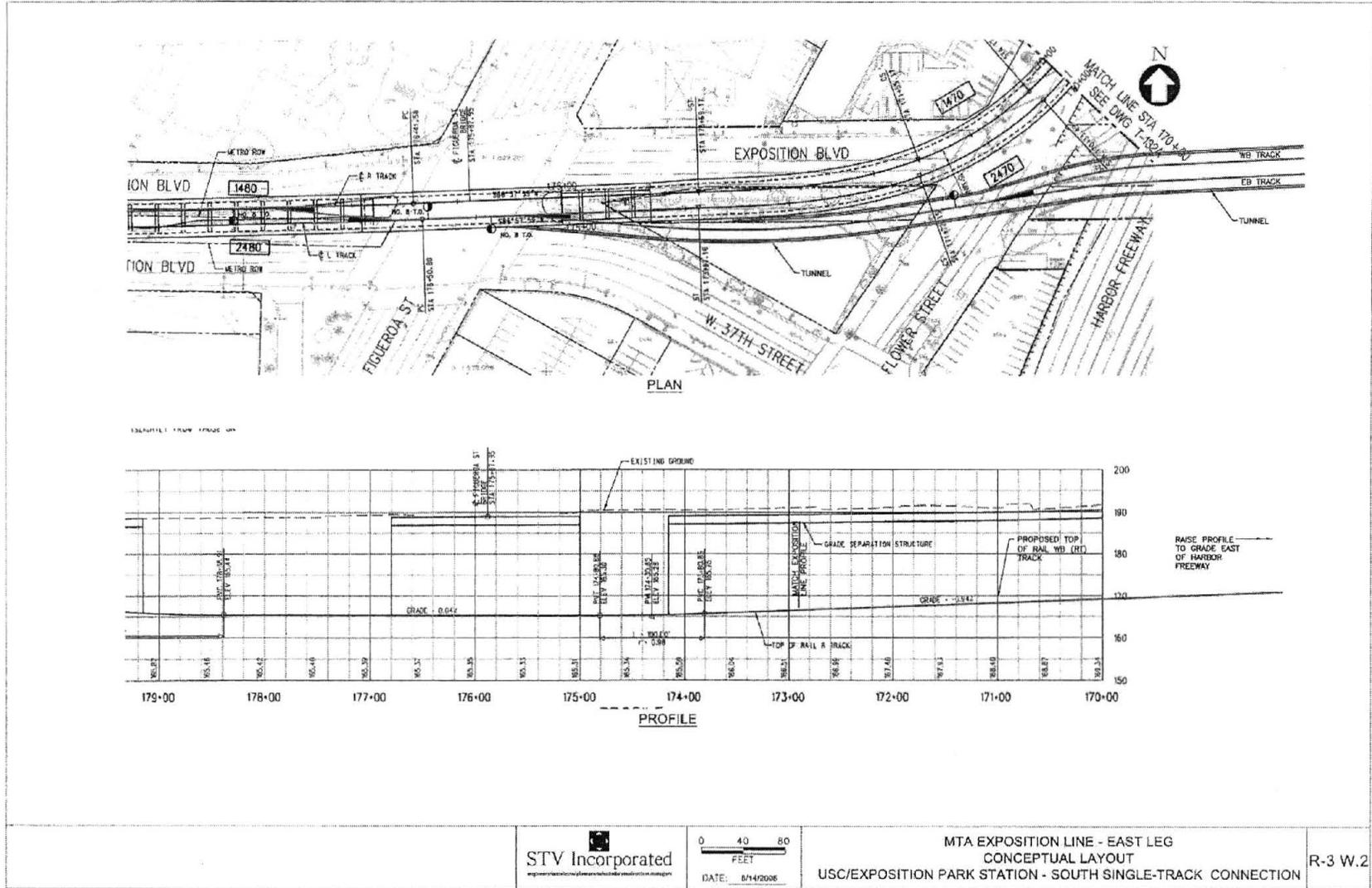
The North Movement for Alternative R-3's express option will continue east past the Blue Line, following the existing Union Pacific tracks to the Los Angeles River. It would then turn north and follow the Metrolink tracks (including the planned Run-Through Tracks) into Union Station. This route would be completely grade-separated or gate-controlled, and provide a very fast connection for movements from the Westside (using the Exposition Connector) and Long Beach into Union Station. To the south, the Express South Movement could use the existing Blue Line tracks, or perhaps the UP tracks adjoining them if freight service is eventually moved to the Alameda Corridor.

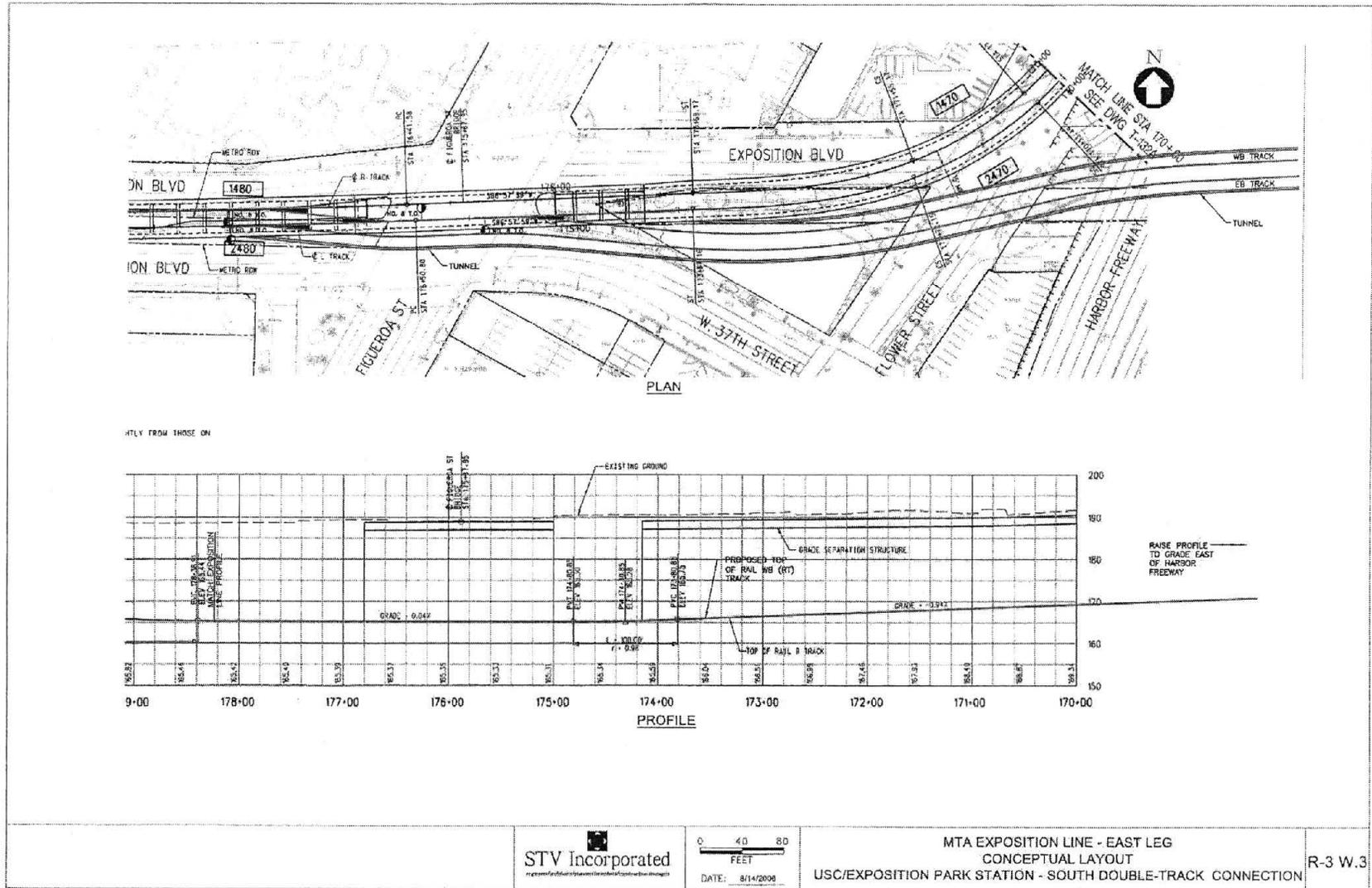
A connection is also needed for the South Movement of the Build Alternatives. This connection could be accomplished using a small amount of new right of way (currently parking lots), and would allow for the South Movement as well as service from the Long Beach to Flower Corridor (acting as an alternative to Washington Blvd).

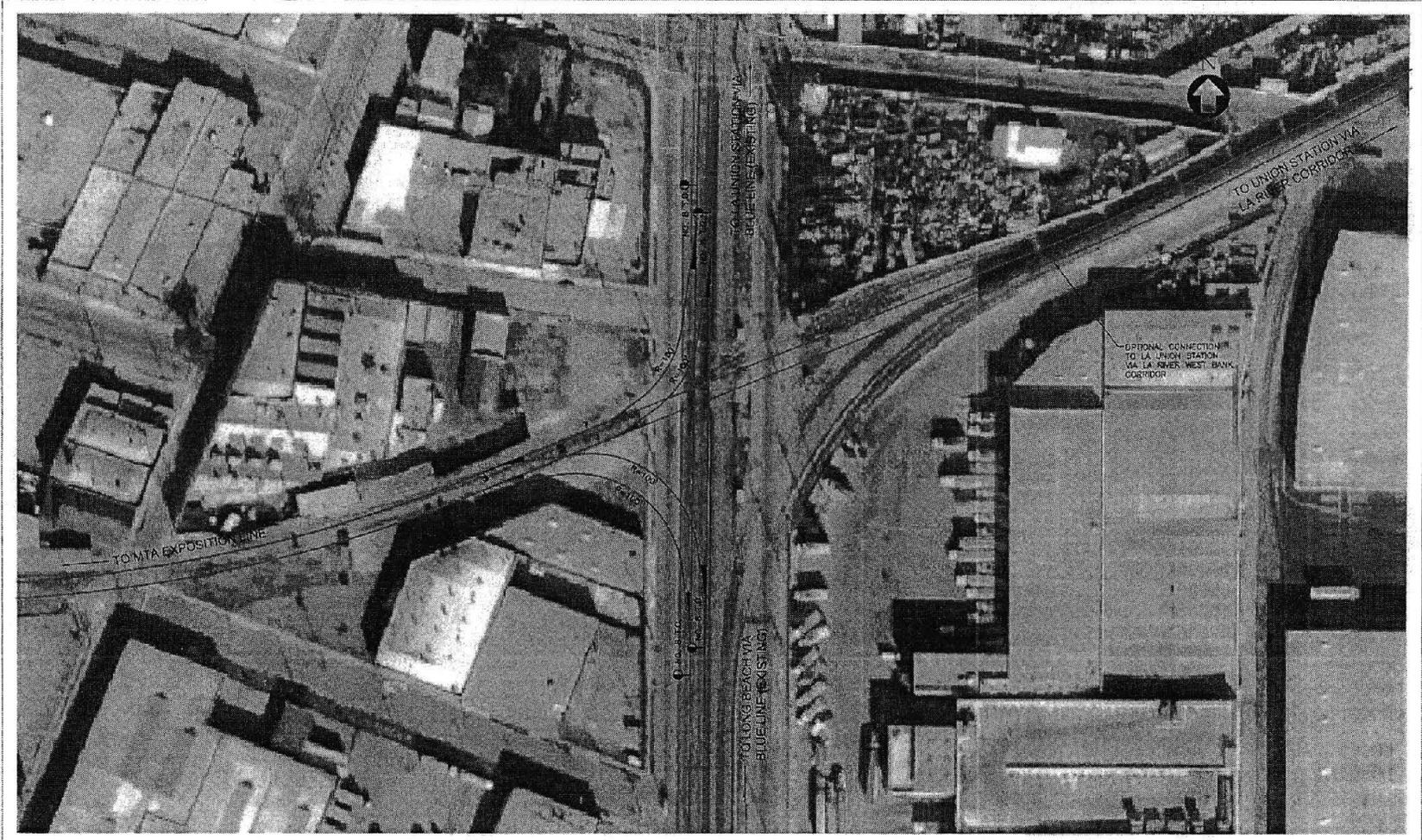
If local and express options are implemented for both the North and South Movements, then three connections would be needed at the junction (Exposition to Blue Line North, Exposition to Blue Line South, and Exposition to UP Tracks East). A schematic showing an at-grade configuration for a junction that can handle these movements is shown on Sheet R E.











 STV Incorporated <small>Engineering, Planning, Architecture, Construction Management</small>	 <small>DATE: 8/14/2006</small>	MTA EXPOSITION LINE - EAST LEG CONCEPTUAL LAYOUT EAST CONNECTION TO BLUE LINE	R E
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