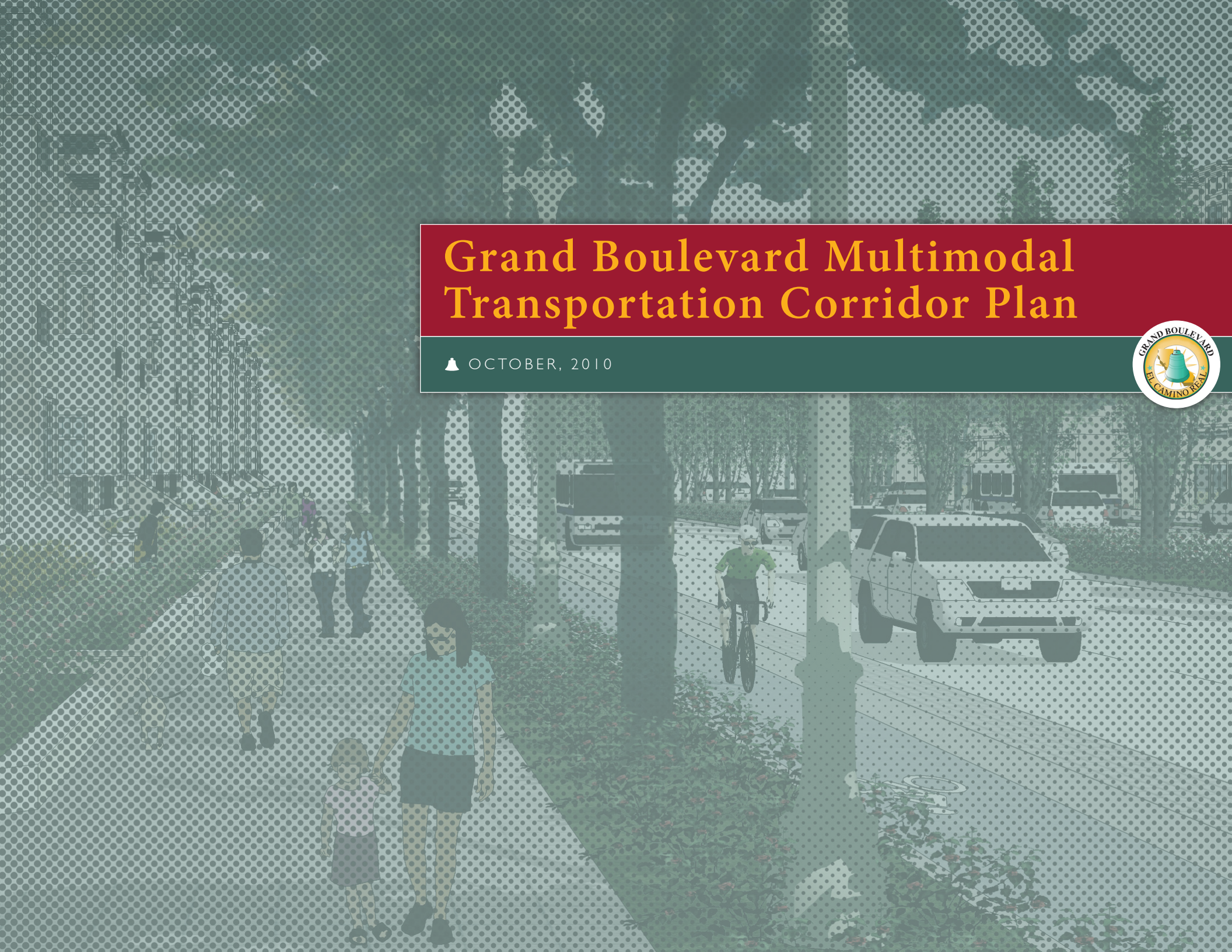
Grand Boulevard Multimodal Transportation Corridor Plan

OCTOBER, 2010



Acknowledgements

GRAND BOULEVARD INITIATIAVE TASK FORCE

Henry Gardner	ABAG
Ken Kirkey	ABAG
Lydia Tan	Bridge Housing
Kristy Wang	Bridge Housing
Bill Nack	Building Trades Council, San Mateo Co.
Neil Struthers	Building Trades Council, Santa Clara Co.
Tom Kasten	C/CAG
Rich Napier	C/CAG
Lee Taubeneck	Caltrans, District 4
Bijan Sartipi	Caltrans, District 4
Chi-Hwa Shao	CHS Development Group, Inc.
Mark Haesloop	CHS Development Group, Inc.
Coralin Feierbach	City of Belmont
Jerry Deal	City of Burlingame
David J. Canepa	City of Daly City
Ron Packard	City of Los Altos
John Boyle	City of Menlo Park
Richard Cline	City of Menlo Park
Gina Papan	City of Millbrae
Nadia Holober	City of Millbrae
Ronit Bryant	City of Mountain View
Margaret Abe-Koga	City of Mountain View
Laura Macias	City of Mountain View
Gail Price	City of Palo Alto
Barbara Pierce	City of Redwood City
Ken Ibarra	City of San Bruno
Matt Grocott	City of San Carlos
Pierluigi Oliverio	City of San Jose
Jack Matthews	City of San Mateo
Kevin Moore	City of Santa Clara
Rich Garbarino	City of South San Francisco
Susan Kennedy	City of South San Francisco
Chris Moylan	City of Sunnyvale
Jim Griffith	City of Sunnyvale
Lennie Roberts	Committee for Green Foothills
Steve Dostart	Dostart Development Company, LLC
Mary Boughton	First Community Housing
Geraldine O'Connor	Genentech, Inc.
Michele Beasley	Greenbelt Alliance
Russell Hancock	Joint Venture: Silicon Valley Network
Rose Jacobs Gibson	Joint Venture: Silicon Valley Network
Steve Heminger	MTC
Jim Baer	Premier Properties Mgmt.
Elaine Breeze	SAMCEDA
Rosanne Foust	SAMCEDA
Michael Scanlon	San Mateo County Transit District
Rose Guilbault	San Mateo County Transit District
Liz Kniss	Santa Clara County
Lucy Wicks	Stanford University
Judy Chan	Stanford University
Jerry Carlson	Town of Atherton
Jerry Gruber	Town of Atherton
Joe Silva	Town of Colma
Jay Benton	Town of Hillsborough
Michael Burns	VTA
John Ristow	VTA

GRAND BOULEVARD INITIATIAVE WORKING COMMITTEE

Christy Riviere	ABAG
Sigalle Michael	BAAQMD
Joe Kott	C/CAG
Jean Finney	Caltrans - District 4
Carlos de Melo	City of Belmont
William Meeker	City of Burlingame
Andrea Ouse	City of Colma
Tatum Mothershead	City of Daly City
Douglas Schmitz	City of Los Altos
Thomas Rogers	City of Menlo Park
David Petrovich	City of Millbrae
Martin Alkire	City of Mountain View
Jennifer Armer	City of Palo Alto
Claudia Olalla	City of Redwood City
Aaron Aknin	City of San Bruno
Deborah Nelson	City of San Carlos
Laurel Prevetti	City of San Jose
Lisa Grote	City of San Mateo
Carol Anne Painter	City of Santa Clara
Billy Gross	City of South San Francisco
Andrew Miner	City of Sunnyvale
Hanson Hom	City of Sunnyvale
Therese Trivedi	MTC
Corinne Goodrich	San Mateo County Transit District
Will Gibson	San Mateo County
Dan Collen	Santa Clara County
Jerry Gruber	Town of Atherton
Liz Cullinan	Town of Hillsborough
Robert Swierk	VTA

PROJECT STAFF

Steering Committee
Corinne Goodrich, San Mateo County Transit District
Rich Napier, City/County Association of Governments of San Mateo County (C/CAG)
Chris Augenstein, Santa Clara Valley Transportation Authority (VTA)

Project Director
Corinne Goodrich, San Mateo County Transit District

Project Managers
Emily Betts, San Mateo County Transit District
Tom Madalena, C/CAG
Robert Swierk, VTA

Project Staff
Marisa Espinosa, San Mateo County Transit District
Pamela Vasudeva, San Mateo County Transit District
Iris Yuan, San Mateo County Transit District
Sandy Wong, C/CAG
Peter Chen, VTA
Andrew Ittigson, VTA
David Kobayashi, VTA
George Naylor, VTA
Lilia Scott, VTA
Ya Wang, VTA

Caltrans, District 4 Staff
Aprile Smith, Office of Transit & Community Planning
Beth Thomas, Office of Transit & Community Planning

Consulting Staff
Terry Bottomley, Bottomley Design and Planning
Jim Daisa, Kimley-Horn Associates
Robert Betts, Wilbur Smith Associates
Cullen McCormick, Wilbur Smith Associates

VTA
San Mateo County TRANSIT DISTRICT
C/CAG
Joint Venture SILICON VALLEY NETWORK
SAMCEDA

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Executive Summary

The Grand Boulevard Initiative is an historic **inter-jurisdictional collaborative planning effort** to achieve a shared **vision** that links transportation and land use. Nineteen cities, San Mateo and Santa Clara counties, two transit agencies and two Congestion Management Agencies, and a number of other agencies and groups have **united to improve the performance, safety, and aesthetics** of the El Camino Real corridor between San Francisco and San Jose, California. The Vision of the Initiative is that "El Camino Real will achieve its full potential as **a place for residents to work, live, shop and play**, creating links between communities that promote walking and transit and an improved quality of life." This State Highway "will become a grand boulevard of **meaningful destinations shaped by all the cities along its length** and with each community realizing its full potential to become a destination full of valued places."

The goal of the Grand Boulevard Multimodal Transportation Corridor Plan is to facilitate development of a better match for land use and transportation on the El Camino Real Corridor from Daly City to San Jose's Diridon Station in support of smart growth. The plan is intended to guide the transformation of El Camino Real into a pedestrian and transit friendly, high-performing multimodal arterial where all modes of transportation move efficiently and safely. It explores alternative transit options within the communities along the corridor and examines multimodal opportunities and innovative approaches to achieve these improvements such as signal timing, signal prioritization, queue jump lanes for buses, bulb-outs, countdown signals and the integration/interoperability of these systems to provide seamless transitions across jurisdictional boundaries.

The project area for the Corridor Plan spans 43 miles north-south along the El Camino Real (State Hwy 82) corridor in San Mateo and Santa Clara Counties, from the San Francisco/Daly City border in the north to the San Jose Diridon Caltrain Station in the south. The El Camino Real corridor is predominantly auto-oriented and streetscape amenities that could enhance safety and livability are limited. The Grand Boulevard Multimodal Transportation Corridor Plan proposes vibrant nodes of community activity through a mix of land uses and transit-oriented development that will attract people and businesses. Higher mixed-use density along the corridor will also support bus rapid transit (BRT) to serve mid-distance bus trips. As a result, the Peninsula and the South Bay will benefit from better mobility in all modes, with increased safety, interconnectivity, and improved quality of life.

The Corridor Plan, as a multi-jurisdictional and long-range planning effort, is broad in scope. It touches on the key aspects of implementing coordinated smart growth on the corridor, including land use planning, transit planning, multimodal access and design, and corridor operations and management policy. The Plan was funded in 2007 by a Caltrans Statewide Planning Studies grant.

Chapter 1: Introduction

Chapter 1 provides a background and introduction to the Grand Boulevard Initiative (GBI). The GBI began in 2006 with the creation of a Task Force of entities with purview over the roadway and its surrounding uses. The goal of coordinating land use and transportation policy decisions for 43 miles of California State Highway 82 is ambitious. But the work of this "coalition of the willing" has demonstrated the potential to coordinate the transformation of an urban highway paralleled by regional rail service into a smart growth corridor. Success will expand the range of housing choices, spur economic development, and support existing investments in transportation and urban infrastructure and services.

The vision of the Grand Boulevard Initiative is that *"El Camino Real will achieve its full potential as a place for residents to work, live, shop and play, creating links between communities that promote walking and transit and an improved and meaningful quality of life."* This vision was adopted in October 2006 by the Grand Boulevard Task Force, a broad federation of interested public and private parties that challenges communities to rethink the corridor's potential for transformation. Stretching from Daly City to San Jose, the vision is of a boulevard that connects communities by a mix of land uses designed to attract people. Cities are encouraged to design for neighborhoods that include high quality building designs and diverse land uses; preserve historic buildings and places; enhance our economic and cultural diversity; and employ the broad involvement of residents, workers, and local businesses in the proceedings. Rail stations and bus facilities are valued not only as vital transportation services, but as public gathering places and assets to spur transit oriented development. Roadway improvements will be context-sensitive while continuing to meet the need to move people and commerce and preserve environmental resources. Above all, change will recognize and incorporate our history and create a sense of community.

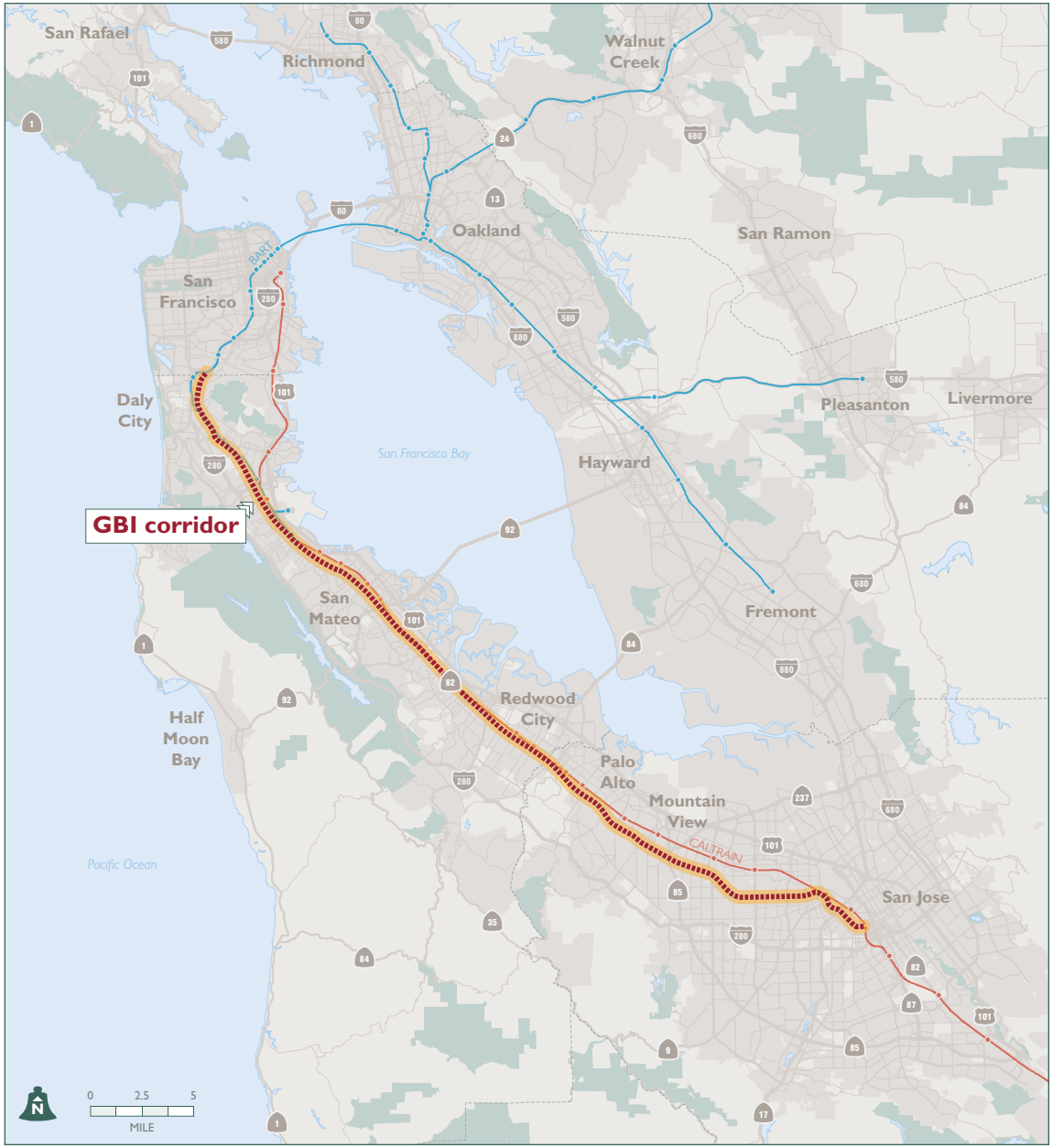
Chapter 2: Existing Corridor Conditions

Chapter 2 provides an overview of existing conditions and local community policies for the GBI corridor as reflected in the current configuration of the roadway, El Camino Real frontage parcel land use conditions, and street design guidelines. These conditions are depicted through text, photographs, and detailed existing conditions "prototypes."

Initial background research focused on confirming the general elements of a corridor-wide vision, identifying common pedestrian-, transit-, and bicycle-oriented streetscape design elements that provide a basis for Caltrans-supported street improvement guidelines. Background information was gathered through a survey of existing documents and through questionnaires and interviews with city staff.

Based on existing conditions, local policy plans, and the objectives of the Grand Boulevard Initiative, five general land use and roadway typology conditions are identified:

1. 4-Lane Node
2. 4-Lane Link
3. 6-Lane Node
4. 6-Lane Link
5. 4- or 6-Lane with No Parking



Grand Boulevard Initiative (GBI) corridor and regional context ***(right).***

The typologies reflect the basic "node" and "link" policy approaches that are being pursued implicitly or explicitly by local communities and transportation agencies, and they provide a basis for the Street Design Guidelines and Street Design Prototypes contained in Chapters 4 and 5. Node areas are generally adjacent to downtown commercial districts and/or transit hubs and have higher levels of density and pedestrian activity. Link areas accommodate a wider variety of land uses and forms of development and lie between Nodes.

Chapter 3: Planned Corridor Improvements

While Chapter 2 summarizes existing physical conditions, Chapter 3 provides a summary of land use, streetscape, and transportation plans and changes within approximately one-quarter mile of the El Camino Real corridor that will shape future conditions on the corridor. These plans helped inform the land use and transit scenarios modeled in the Corridor Plan. All plans included in this summary are created by cities and counties along the GBI corridor and have either been adopted since 2005, have draft documents available for public review, or are currently in the development process. Information summarized in this chapter includes base data on zoning changes, development designations for specific areas (for example TOD near station, downtown mixed-use, etc), housing densities and/or floor area ratio (FAR) information, and any other land use restrictions and/or designations along El Camino Real.

In addition, results to date from the existing City/County Association of Governments of San Mateo County (C/CAG) Transit-Oriented Development (TOD) and El Camino Real Incentive Programs and the Santa Clara Valley Transportation Authority (VTA) Community Design and Transportation (CDT) Program are included to provide an understanding of the effects that grant and incentive programs may have on the corridor.

Chapter 4: Multimodal Access Strategy

Chapter 4 provides an overview of mobility issues and current policies affecting multimodal access and design of capital improvement projects along the El Camino Real Corridor. The Multimodal Access Strategy recommends basing future transportation network mobility planning on the Corridor on four key objectives:

1. Create space within the right-of-way for multiple travel modes
2. Provide the facilities needed to promote multimodal travel
3. Differentiate mobility policies to reflect corridor development policies
4. Apply GBI-based performance measures in project planning and evaluation

These strategies promote multimodal transportation within the context of existing physical conditions and local community planning and development efforts. They focus on integrating transportation-related capital improvements and land use policies consistent with the general vision for the corridor. This is essential if the corridor is to evolve as a unified, attractive Grand Boulevard, rather than a collection of competing facilities and development efforts.

Chapter 5: Street Design Guidelines

Chapter Five builds on the Multimodal Access Strategy by recommending right-of-way improvements that promote multimodal travel and Transit-Oriented Development (TOD). The Chapter presents detailed guidance on street design issues commonly faced by jurisdictions on El Camino Real, and integrates these into prototypical examples of different street segment types on the Corridor. The Design Guidelines and Street Design Prototypes focus on encouraging multimodal access and a boulevard street environment, and are specifically intended to encourage locally-initiated street improvement projects. The Street Design Prototypes illustrate different combinations of roadway design elements, frontage improvements and transit facilities. The Guidelines and Prototypes both are keyed to a Design Guideline Matrix (in Appendix A) that lists relevant Caltrans standards, local community issues related to the standards, and the requirements for a Caltrans design exception.

The trees, lights, paving, and other materials shown in the Guidelines' images are not intended to establish a single design treatment for the corridor. Instead, they support a context-sensitive approach which promotes design appropriate to the physical environment and considers aesthetic, environmental, and community goals. The Guidelines and Prototypes are intended to be consistent with Caltrans, SamTrans, VTA, and C/CAG standards and policies. The extensive coordination with local and regional agencies undertaken as part of this effort pointed to a common theme – that greater flexibility in the Caltrans design standard will be essential to achieving the long-term street improvements needed to achieve the GBI vision. The Guidelines and Prototypes are also available in the online Street Design Toolbox, located at: http://grandboulevard.net/toolbox.

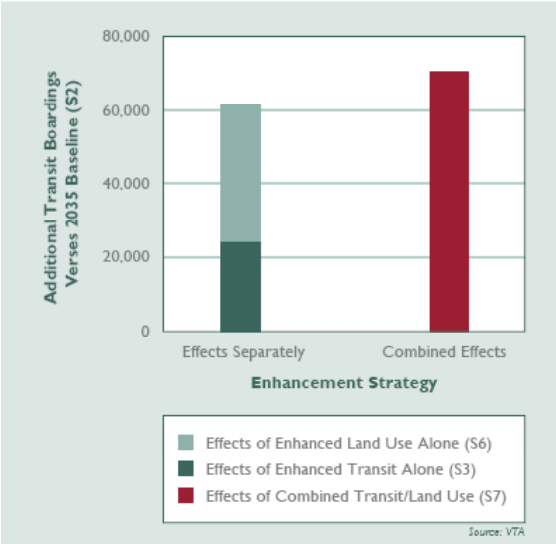
Refuge at mid-block crossing.

Physically-separated bikeway.

Chapter 6: Future Transit and Land Use Scenarios

Chapter 6 presents the results of the travel demand modeling efforts used to analyze future transit and land use scenarios for the corridor. The modeling effort evaluated transit improvements along the Corridor and considered potential implementation of Bus Rapid Transit (BRT), types of development patterns and levels of development intensity required to sustain transit improvements along the corridor.

There are Synergies to Increasing Land Use Densities and Enhancing Transit Together



For a horizon year of 2035, the results strongly supported the viability of an El Camino Corridor with rich transit service and nodes of dense development. Specifically, the modeling work resulted in three key conclusions:

- There are synergies to changing land use and transit service together. In other words, increasing land use densities and transit service levels together will have a greater effect on transit ridership than doing each separately.
- Bus Rapid Transit (BRT) can effectively mitigate the effects of traffic volume increases caused by land use intensification.
- The lowest daily Vehicle Miles Traveled (VMT) per household can be achieved with a combination of enhanced land use and enhanced transit.

The overall conclusion is that planning for growth in the corridor needs to be done in a more aggressive manner – with the highest land use intensifications come the greatest benefits. BRT and land use intensification can play a significant role in meeting greenhouse gas reduction goals. This has important policy implications for the future coordination of land use and transit policies on the Corridor.

While the results of the modeling effort show long-term promise for a combination of BRT and strategic land use intensification, they are just one type of data input that should be considered when determining policy direction for the Corridor. Chapter 7 builds on this analysis and explores additional ways to inform long-term transit and land use planning along the El Camino corridor.

Chapter 7: Future Transit Needs and Recommended Service

Chapter 7 identifies future transit service needs and a recommended level and type of transit service for the GBI corridor. The analysis includes a combination of quantitative and qualitative measures, which can generally be summarized as working towards five main objectives:

- Summarizing input on transit needs for the corridor
- Identifying potential market segments and transit characteristics
- Assessing compatibility of existing and projected land uses with enhanced transit
- Identifying broad capital improvements and estimating conceptual capital costs of enhanced transit
- Exploring the potential for cross-county enhanced transit service along the corridor

Based on the travel demand modeling and future transit service planning analyses, several preliminary recommendations about the type and level of enhanced transit service for the GBI corridor have been developed. In Santa Clara County VTA should proceed with planning and design for BRT service along the El Camino Real/The Alameda corridor. In San Mateo County, BRT holds great promise, but more detailed study is needed and should proceed with SamTrans' upcoming Comprehensive Operations Analysis.

SamTrans and VTA should consider a phased approach to implementing transit improvements as land use intensifies along the corridor. In Santa Clara County, VTA has already been taking this approach, with the introduction of the Rapid 522 ("BRT 1") service in 2005, and current planning and design efforts for a "BRT 2" service along El Camino Real. In San Mateo County, it is possible that a similar approach could be adopted, with limited stop or BRT 1 service being implemented in the near term and fuller BRT service in the longer term.

Additionally, the analysis indicates that sufficient land use densities are essential to support enhanced transit on the corridor. In Santa Clara County, the productivity of the Rapid 522 and Local Route 22 suggests that BRT has the potential to be successful. In San Mateo County, current low densities along many parts of the corridor will need significant investment to provide the ridership to support

BRT. Cities, towns, counties, and other agencies and advocacy groups should continue to promote transit-supportive growth along El Camino Real.

The high level analysis of a potential cross-county BRT, or "seamless" BRT, yielded mixed results. The modeling results indicated that there is some market for a seamless BRT service along the GBI corridor and that this service would be most attractive to travelers from roughly San Mateo to Sunnyvale. However, there are also potential issues related to farebox recovery associated with introducing a cross-county BRT service due to the longer service hours. It is clear that implementation would involve significant logistical hurdles, including fare policy, operations and maintenance responsibility, cost- and revenue-sharing, labor policies at the two agencies, and other considerations. Further study of the potential benefits, costs, and logistics of such a service is needed to determine whether such a service is feasible and would yield greater benefits than costs. At the same time, VTA and SamTrans will continue to plan for enhanced transit service along the GBI corridor within each county – VTA through its El Camino Real BRT Conceptual Engineering project and SamTrans through its Comprehensive Operations Analysis (COA). The two agencies can build on the high level of coordination already taking place, which includes coordination of schedule changes for transfers at the Palo Alto Transit Center, shared bus stop usage and adjustments, and honoring of VTA and SamTrans passes at all bus stops in Palo Alto.

Chapter 8: Corridor Operations and Management

Chapter 8 identifies policy options and best practices for overall operations and management of the GBI corridor. The chapter focuses primarily on options that involve multiple jurisdictions, or coordination between multiple public and private entities, and includes many case studies of such arrangements.

The goal of this effort is to develop a starting point for a possible future agreement between the Congestion Management Agencies (CMAs), Caltrans, and possibly other agencies involved in the management of the corridor.

Based the research on policy options and best practices contained in this chapter, the following potential areas of collaboration and action areas were identified:

1. BRT/enhanced transit in both counties
2. Signal priority and pre-emption along the Corridor
3. Creation of a bi-county Smart Corridor
4. Parking supply, design and management
5. Linking land use and transportation
6. Funding strategy and incentives to meet the GBI vision

Chapter 9: Conclusion and Next Steps

Chapter 9 concludes the document with an overview of the findings of the Corridor Plan as well as recommendations for next steps to translate these findings into implementation strategies. The recommended next steps are classified into four main areas and include the following:

Multimodal Access and Design:

- Congestion Management Agencies (CMAs) and local agencies should work with Caltrans to achieve greater flexibility in their design standards, and have that flexibility reflected in the 2010/11 update of the Highway Design Manual.
- Cities and counties should continue to plan for streetscape, pedestrian and bicycle improvements along the corridor, facilitated by the guidelines contained in this document.
- The transit agencies and CMAs, in coordination with the cities, counties and Caltrans, should advance multimodal street improvements along with enhanced transit, for instance through VTA's El Camino Real BRT project.

Planning for Future Land Use and Transit:

- Agencies with land use authority over the corridor should be aggressive in planning for increased densities at key transportation nodes.
- SamTrans and VTA should continue to seek funding to plan and implement an enhanced transit service on the corridor.
- SamTrans and VTA should conduct further study of the potential benefits, costs, and logistics of a cross-county BRT.
- CMAs should support TOD through grant incentives where possible and explore the use of potential performance measures where suitable.

Management and Operations:

- The agencies and cities should adopt a phased approach to planning for and implementing improvements along the corridor. One possible approach could involve three phases – near term, mid-term, and long-term – with different policies and actions in each phase.
- Those involved should maintain a long-term vision, but achieve it through incremental change.
- All parties should explore additional funding opportunities, including opportunities for multi-agency or public-private partnerships. This should be a broad-based effort involving all the parties and users with an interest in the GBI corridor. Particular attention should be paid to potential funding sources that are flexible and can be sustained over time.
- Support should be given to the GBI partner agencies so they are prepared for opportunities as they arise.

Education and Outreach:

- All parties involved should continue to pursue a dialogue with decision-makers and the public about the potential for enhanced transit service as well as related multimodal street improvements.
- The partner agencies should seek funding to create and carry out an outreach and civic engagement plan to build support for TOD on El Camino Real.

The full Grand Boulevard Multimodal Transportation Corridor Plan is available at www.grandboulevard.net.

1

Introduction

The Grand Boulevard Initiative is an **historic inter-jurisdictional collaboration** to bring about **regional planning** through a **shared vision that links transportation and land use**. Nineteen cities, San Mateo and Santa Clara counties, two transit agencies and two Congestion Management Agencies, and a number of other agencies and groups have united to improve the performance, safety, and aesthetics of the El Camino Real corridor between San Francisco and San Jose, California. The Vision of the Initiative is that "El Camino Real will achieve its full potential as a place for residents to work, live, shop and play, creating **links between communities** that promote walking and transit and an **improved quality of life**." This State Highway "will become a grand boulevard of **meaningful destinations** shaped by all the cities along its length and with each community realizing its full potential to become a destination full of valued places."

The Grand Boulevard Initiative began in 2006 with the creation of a Task Force of entities with purview over the roadway and its surrounding uses. The goal of coordinating land use and transportation policy decisions for 43 miles of California State Highway 82 is ambitious. But the work of this **"coalition of the willing"** has demonstrated the potential to coordinate the transformation of an urban highway paralleled by two regional rail systems into a **smart growth corridor.** Success will expand the range of housing choices, spur economic development, and support existing investments in transportation and urban infrastructure and services.

1.1. Envisioning a Grand Boulevard

1.1.1. The Need for Inter-Jurisdictional Collaboration

State Highway 82 is the only major north-south arterial between San Francisco and San Jose. Known as El Camino Real for most of its length, the road is also called Mission Street at the northern end of the corridor within Daly City and The Alameda at the corridor's southern end within the City of San Jose.

El Camino Real is like many other urban highways throughout the United States. Unquestionably a critical arterial, it is all too often a bland, featureless, traffic funnel that functions more like a local street in some places and an urban highway in others. Development is car-oriented and predominantly low density and strip-commercial, with few concentrations of both housing and jobs. The experience for pedestrians and bicyclists is not only poor but dangerous along most of the corridor. Walkable, vibrant public places are few and far between.

Despite its historical function, the roadway presents a substantial opportunity to develop mutually supportive transit infrastructure and land use patterns. Existing transit infrastructure the El Camino Real is significant. Two regional rail agencies and two county transit districts provide service within the corridor. Five of the six San Mateo County BART rail stations are located on or in close proximity to the highway, with 52,000 average weekday boardings. Ten Caltrain rail stations lie within ¼ mile of El Camino Real and another five stations are within ½ mile of the roadway, accounting for over half of average weekday passenger boardings. Bus service on El Camino is the backbone of both the San Mateo County Transit District (SamTrans) and the Santa Clara Valley Transportation Authority (VTA) systems. However the use of commute alternatives to the car (17%) is only slightly higher by residents living within ¼ mile of the corridor than for the counties as a whole (15%), reflecting the low density and lack of mixed use development and pedestrian accessibility.

As is common in California cities, many other agencies have jurisdiction within the corridor. The roadway is owned and operated by the California Department of Transportation (Caltrans) and each county has a State mandated Congestion Management Agency to develop Congestion Management and Countywide Transportation plans. Nineteen cities and two counties control the land-use and development of property adjacent to the road and special districts provide additional services. Each entity has plans that include El Camino Real and all these entities perform well within their area of purview. But the lack of a coordinated vision for the highway has hindered implementation. Indications of existing and potentially growing problems include:

- The highway carries high volumes of traffic but a majority of key intersections experience noticeable traffic delays (level of service D) in peak hours
- 40 intersections exceed the state average accident rate
- There are more jobs in each county than there are households and this imbalance is projected to significantly increase by 2030, causing even higher housing costs and in-commuting from other counties

El Camino Real carries more cars and hosts more businesses and residences than any other street on the Peninsula but has never had the benefit of an ongoing, coordinated planning process.

1.1.2. Evolution of the Initiative

The idea to transform El Camino Real into a Grand Boulevard evolved from a number of efforts initiated by a range of agencies. In San Mateo County, the concept originated in 2002 with an effort by the San Mateo County Transit District to revitalize the areas around the county's BART and Caltrain rail stations. In Santa Clara County in 2002/3, VTA, in partnership with the local jurisdictions along El Camino Real, identified this transit-rich corridor as an area to target development and implement new ideas about urban design as part of the Community Design and Transportation Program. Beginning in 2002, the Project for Public Spaces led The Peninsula Corridor Plan to challenge communities to think of transportation as not simply moving people and vehicles, but as the key to improving livability on the Peninsula. As cities developed their concept plans, five communities with rail stations on El Camino Real found that the road was a barrier to livability. The vision that resulted was to transform El Camino Real into a great street – a Grand Boulevard – that was walkable and livable. A Symposium held in late 2004 to launch the idea in San Mateo County featured different views of the corridor's potential by federal, state and local officials and leaders. They were united in the belief that the corridor falls short of its potential to become a place to live, work, shop and play.

At the same time, another effort to focus on the corridor was underway by Joint Venture Silicon Valley Network through a grant by the James Irvine Foundation. *Silicon Valley Main Street* (2004) helped the cities along the corridor in Santa Clara and San Mateo counties better understand the common challenges of Highway 82, highlighted success stories, and identified tools or models to guide local improvements. The excellent ideas brought forward in the study begged for implementation.

In late 2005 the leaders behind these two efforts agreed to explore whether both parties could collaborate on a Grand Boulevard Initiative that would include both San Mateo and Santa Clara counties. Other sponsors include VTA, the San Mateo County Economic Development Association (SAMCEDA) and the City/County Association of Governments of San Mateo County (C/CAG). Elected and appointed officials in all 19 cities, two counties, Caltrans, regional agencies and representatives from business, labor, housing and environmental conservation agreed to participate on a 47-member Grand Boulevard Task Force.

A March 2006 exploratory meeting led to the first official Task Force meeting in April 2006 and quarterly meetings have ensued. It was apparent from the beginning that the partnership brought a diversity of perspectives to the table and provided a forum for collaborative decision making, while respecting the autonomy and purview of each member. The Task Force adopted the Vision, Challenge Statement and Guiding Principles, demonstrating that different and potentially competing interests can collaborate to move the Grand Boulevard Initiative forward. There are no by-laws, no quorum requirements, and no formally adopted meeting minutes.

The Task Force is supported by a Working Committee comprised of staff representatives of the member entities. The San Mateo County Transit District provides the majority of staff support.

Currently, the Task Force has representation from the following entities:

- Association of Bay Area Governments (ABAG)
- Bridge Housing
- Building Trades Council, San Mateo County
- Building Trades Council, Santa Clara County
- Caltrans
- CHS Development Group, Inc.
- City of Belmont

- City of Burlingame
- City of Daly City
- City of Los Altos
- City of Menlo Park
- City of Millbrae
- City of Mountain View
- City of Palo Alto
- City of Redwood City
- City of San Bruno
- City of San Carlos
- City of San Jose
- City of San Mateo
- City of Santa Clara
- City of South San Francisco
- City of Sunnyvale
- City/County Association of Governments of San Mateo County
- Committee for Green Foothills
- Dostart Development Company
- First Community Housing
- Genentech, Inc.
- Greenbelt Alliance
- Joint Venture: Silicon Valley Network
- Metropolitan Transportation Commission (MTC)
- Premier Properties Mgmt.
- San Mateo County Economic Development Association (SAMCEDA)
- San Mateo County Transit District
- Santa Clara County
- Santa Clara Valley Transportation Authority (VTA)
- Stanford University
- Town of Atherton
- Town of Colma
- Town of Hillsborough

1.1.3. Accomplishments to Date

Adoption of Vision and Challenge Statement (October 2006)

Developing and adopting a Vision and Challenge was the Task Force's first undertaking.

The Grand Boulevard Vision:

El Camino Real will achieve its full potential as a place for residents to work, live, shop and play, creating links between communities that promote walking and transit and an improved and meaningful quality of life.

The Challenge:

El Camino Real will become a "grand boulevard of meaningful destinations" shaped by all the cities along its length and with each community realizing its full potential to become a destination full of valued places.

The Grand Boulevard Task Force is a broad federation of interested public and private parties that challenges communities to rethink the corridor's potential for housing and urban development, balancing the need for cars and parking with viable options for transit, walking, and biking.

Stretching from Daly City to San Jose, the vision is of a boulevard that connects communities by a mix of land uses designed to attract people. Cities are encouraged to design for neighborhoods that include high quality building designs and diverse land uses; preserve historic buildings and places; enhance our economic and cultural diversity; and employ the broad involvement of residents, workers, and local businesses in the proceedings. Rail stations and bus facilities are valued not only as vital transportation services, but as public gathering places and assets to spur transit oriented development. Roadway improvements will be context-sensitive while continuing to meet the need to move people and commerce and preserve environmental resources. Above all, change will recognize and incorporate our history and create a sense of community.

Adoption of the Guiding Principles (April 2007)

The Guiding Principles establish a working framework for each entity to improve El Camino Real. The Principles were drafted by staff from a review of the plans of various cities and agencies. The Task Force debated and refined the Principles at length and subsequently adopted them. To date, 21 Task Force member entities have adopted the principles in their own planning processes for El Camino.

Guiding Principles

1. Target housing and job growth in strategic areas along the corridor
2. Encourage compact mixed-use development and high-quality urban design and construction
3. Create a pedestrian-oriented environment and improve streetscapes, ensuring full access to and between public areas and private developments
4. Develop a balanced multimodal corridor to maintain and improve mobility of people and vehicles along the corridor
5. Manage Parking Assets
6. Provide vibrant public spaces and gathering places
7. Preserve and accentuate unique and desirable community character and the existing quality of life in adjacent neighborhoods
8. Improve safety and public health
9. Strengthen pedestrian and bicycle connections with the corridor
10. Pursue environmentally sustainable and economically viable development patterns

Building Momentum

Since its inception in 2006, the Grand Boulevard Initiative has been building momentum through bottom-up projects and plans designed to enhance collaboration and coordinated growth on the Corridor. Below is an overview of the many accomplishments over this short time period:

- Developed Existing Conditions Report (2006) as a first step toward understanding the corridor
- Held quarterly meetings of the Grand Boulevard Task Force
- Held monthly meetings of a Working Committee comprised of city and agency staff
- Created a GBI Website, Google Earth Project Map, and Development Resource Wiki
- Recognized exemplary projects through the 2007 & 2010 Grand Boulevard Awards Program
- Provided grant funding for a number of local plans and projects along the corridor. The San Mateo County Transit District awarded $2 million in federal earmark funds to five cities in San Mateo County as part of the Grand Boulevard Initiative (2007). VTA and C/CAG have provided a number of grants to cities along the corridor through their own grant and incentive programs over the past several years
- Published a 2008 Progress Report
- Held the 2009 Grand Boulevard Forum with over 300 participants
- Secured funding for two bi-county planning studies: this *Corridor Plan*, and Phase I of an Economic and Housing Opportunities Assessment of the Corridor (ECHO)
- Received the 2009 "Excellence" award from the San Mateo County Economic Development Association (SAMCEDA). The award is presented annually to a government entity, organization, department, board, commission or special district that applies a "positive approach to business development by implementing and developing methods to ease and simplify the regulatory process, and strives to achieve county-wide economic vitality."

- Received the American Planning Association California Northern 2010 Award in the category of: Leadership and Service Award - Distinguished Leadership Award – Organization

During this time period, there has also been considerable investment by cities and other entities into the Corridor. There are currently over 150 local policy documents in place that relate to the Corridor, including zoning codes, General Plans, Specific and Precise Plans. Sixteen of the nineteen communities have adopted focused policy and/or improvement plans for the Corridor. And all of this planning has started to translate into action. The 2008 GBI Progress Report showed over 100 projects underway on Corridor.

1.1.4. The Grand Boulevard Multimodal Transportation Corridor Plan

The goal of the Corridor Plan is to facilitate development of a better match for land use and transportation on the El Camino Real Corridor from Daly City to San Jose's Diridon Station in support of smart growth. The plan is intended to guide the transformation of El Camino Real into a pedestrian and transit friendly, high-performing multimodal arterial

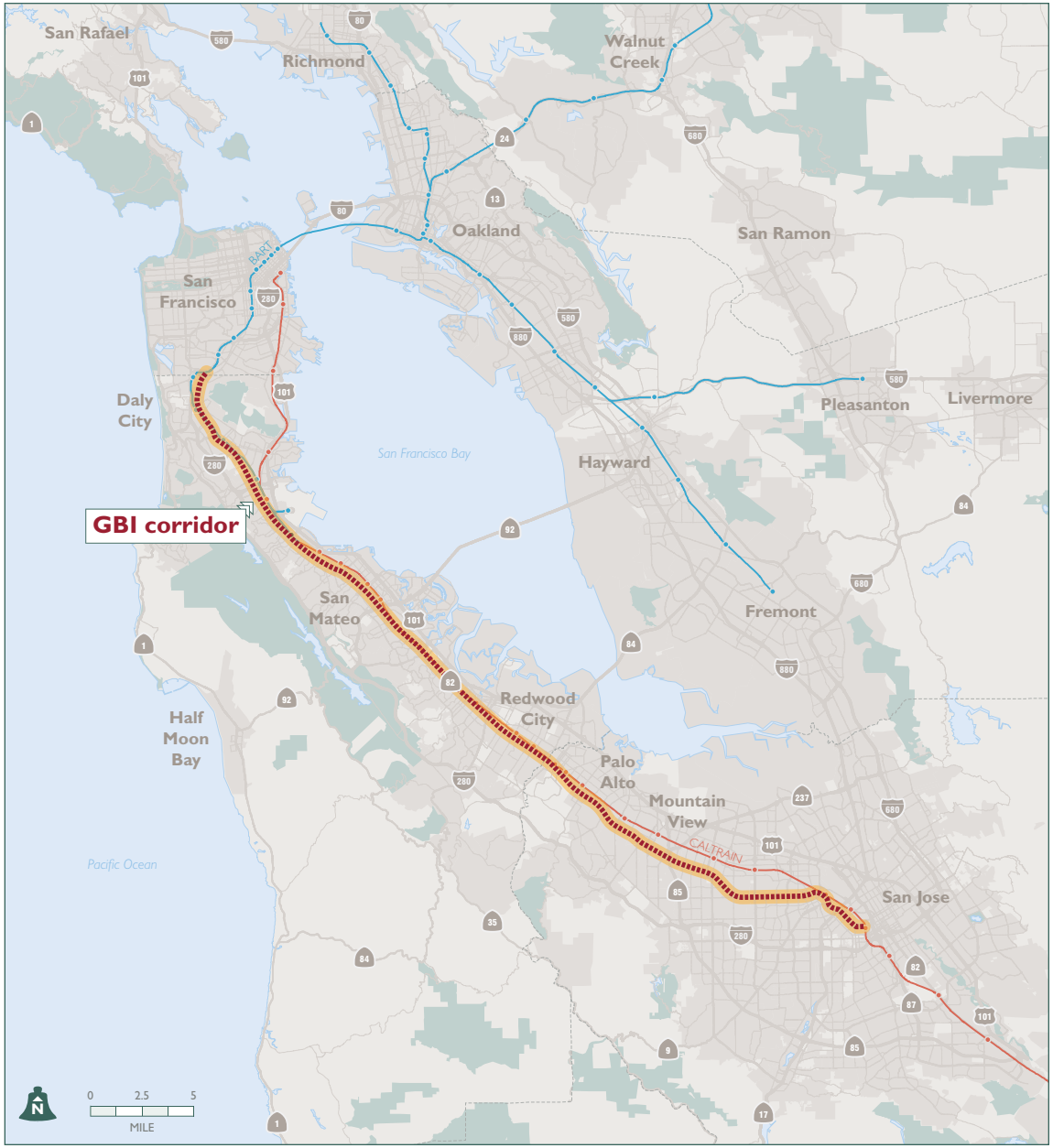
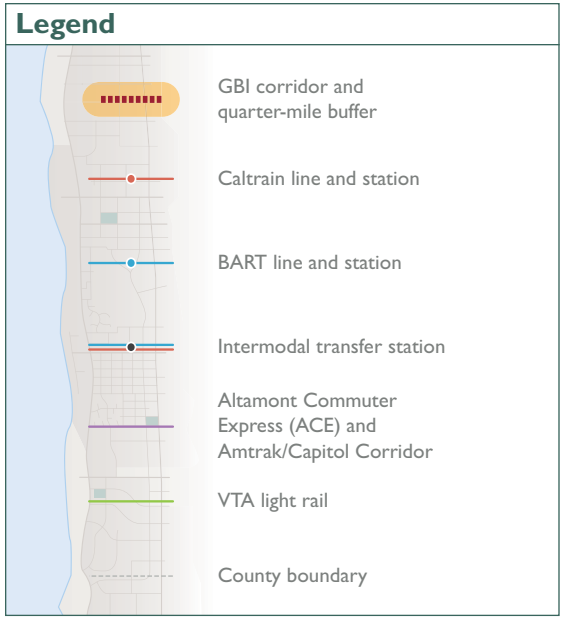


Figure 1-1 (right). Grand Boulevard Initiative (GBI) corridor and regional context



where all modes of transportation move efficiently and safely. It explores potential enhanced transit service within the communities along the corridor and examines multimodal opportunities and innovative approaches to achieve these improvements. Examples of the types of improvements explored include pedestrian bulb-outs, enhanced medians, queue jump or dedicated lanes for buses, improved bicycle accommodations, signal timing, signal prioritization, pedestrian countdown signals and the integration/interoperability of these systems to provide seamless transitions across jurisdictional boundaries.

The project area for the Corridor Plan spans 43 miles north-south along the El Camino Real (State Hwy 82) corridor in San Mateo and Santa Clara Counties. The study area end points are the San Francisco/Daly City border in the north and San Jose Diridon Caltrain Station in the south. An Existing Conditions Report produced for the Grand Boulevard Task Force in 2006 defined the corridor as ¼ mile on each side of the roadway and utilizes demographic data from census tracts coincident with El Camino. Figure 1-1 shows the GBI corridor in its regional context and Figure 1-2 provides a more detailed focus on the corridor and its surroundings.

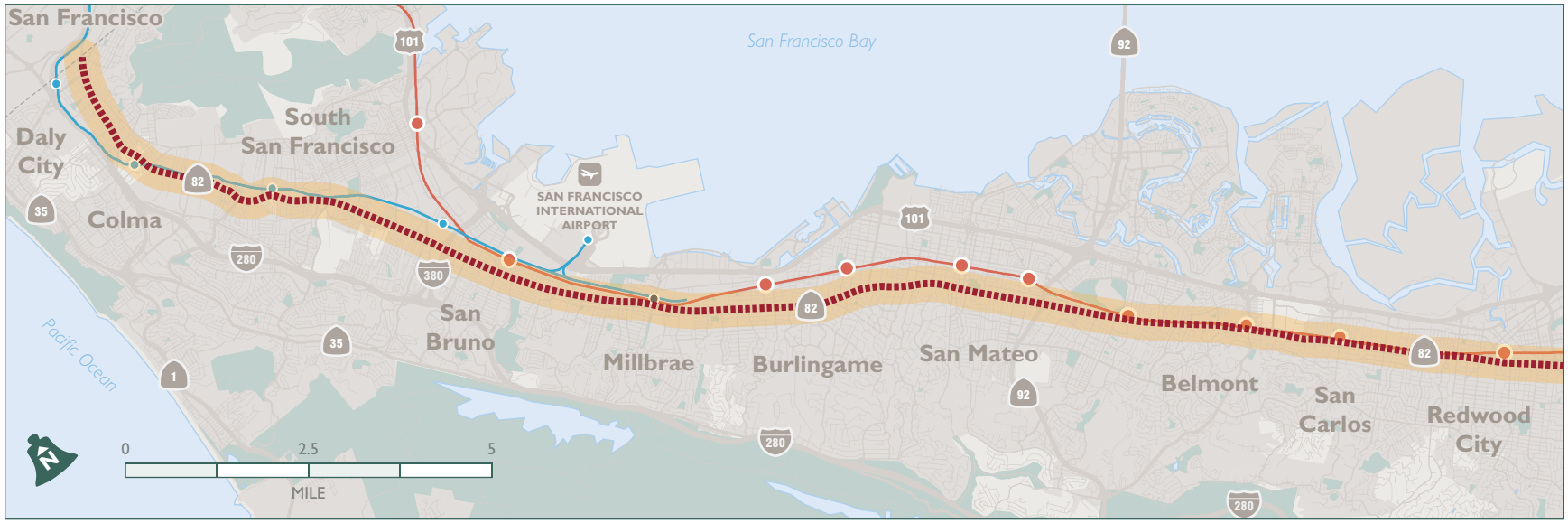


Figure 1-2. Grand Boulevard Initiative (GBI) corridor and surroundings

The El Camino Real corridor is predominantly auto-oriented and signage and other streetscape amenities that could enhance safety and livability are limited. The Grand Boulevard Multimodal Transportation Corridor Plan proposes vibrant nodes of community activity through a mix of land uses and transit-oriented development that will attract people and businesses. Higher mixed-use density along the corridor will also support bus rapid transit (BRT) to serve mid-distance bus trips. As a result, the Peninsula and the South Bay will benefit from better mobility in all modes, with increased safety, interconnectivity, and quality of life.

The Corridor Plan, as a multi-jurisdictional and long-range planning effort, is broad in scope. It touches on the key aspects of implementing coordinated smart growth on the corridor, including land use planning, transit planning, multimodal access and design, and corridor operations and management policy.

1.2. Context

1.2.1. Local/Corridor

El Camino Real serves as the central spine connecting numerous central business districts and downtowns throughout the San Francisco Peninsula and South Bay. An increase in the amount of development along the corridor is leading to additional traffic congestion and a plan to increase through-put for all travel modes is needed. A majority of key intersections experience noticeable traffic delays (level of service D) in peak hours and 40 intersections exceed the state average accident rate.

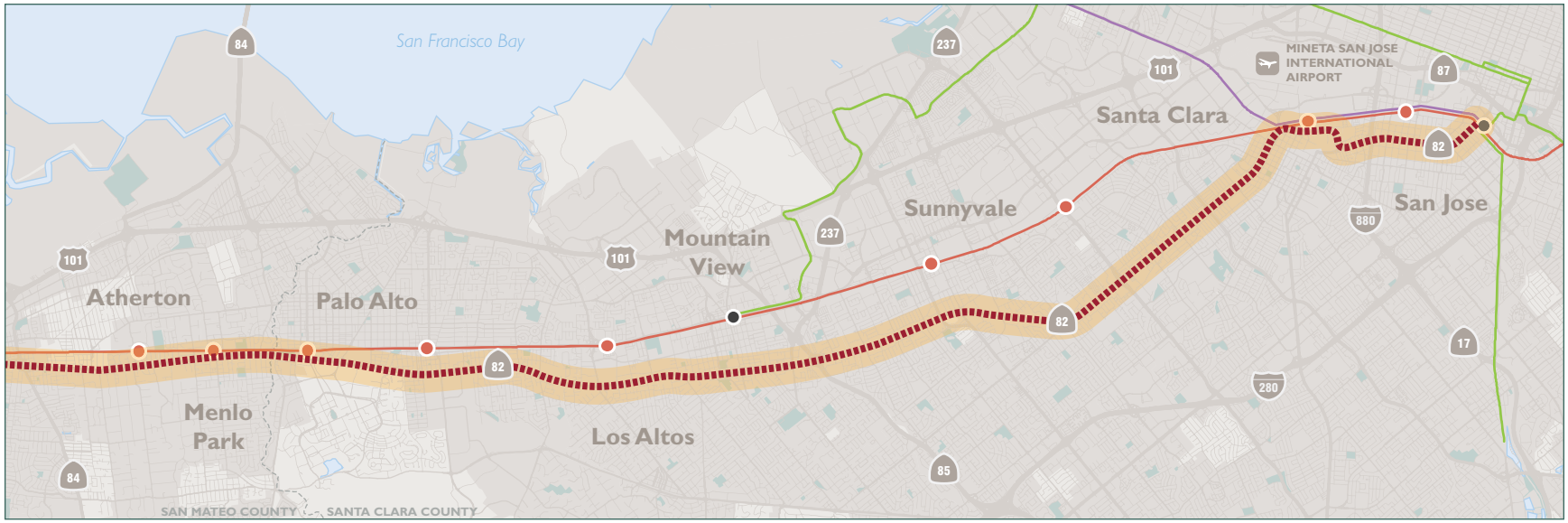


Figure 1-2 (continued). Grand Boulevard Initiative (GBI) corridor and surroundings

Transit infrastructure and service on El Camino Real are significant. Five of the six San Mateo County BART stations are located in close proximity to El Camino Real, and 15 Caltrain stations are located within approximately ½ mile of the Grand Boulevard corridor.

Bus service on El Camino Real is the backbone of both the VTA and SamTrans systems in terms of both frequency and productivity. SamTrans' 390 and 391 mainline El Camino Real bus routes account for 25% of daily passenger trips. VTA's 522 Rapid service (introduced in 2005) combined with Local Route 22 in the corridor constitute approximately 20% of all weekday boardings on the VTA bus system. Yet pedestrian and bicycle access to transit on the El Camino Real corridor remains difficult and the mode split for trips by corridor residents does not reflect significantly higher transit use than for the counties as a whole.

Several plans for enhancements to transit service within the GBI corridor are underway. VTA is planning to implement bus rapid transit (BRT) service along the El Camino Real/ The Alameda corridor as part of a larger initiative to introduce BRT on several corridors in Santa Clara County. In San Mateo County, planning is underway for the Dumbarton Rail project, which would provide a commuter rail link between the central portion of the Grand Boulevard corridor and the East Bay. At the southern end of the corridor, the BART Silicon Valley project would extend BART service to San Jose Diridon Station and the Santa Clara Caltrain Station, as a continuation of the Warm Springs extension (currently under construction) and the planned BART extension to Milpitas and the Berryessa area of San Jose.

City and County plans support increased density in the corridor and concentrations of population and jobs at major activity centers, all of which provides tremendous potential to support BRT development in the corridor, an important strategy for dealing with traffic congestion. Pedestrian activity along El Camino Real is minimal due to narrow and sometimes discontinuous sidewalks, as well as crossings that are difficult and potentially dangerous. Although El Camino Real is not equipped or designed to serve bicyclists, bicyclists use the corridor because travel between cities on other roadways is often difficult due to discontinuous local street patterns. The challenge is thus to balance the current and future need for cars and parking with enhanced options for transit and to enhance pedestrian and bicycle access and safety to support transit usage and improve quality of life.

1.2.2. San Francisco Bay Region

The Grand Boulevard corridor is important in the context of the entire San Francisco Bay Area region. The GBI corridor is one of the longest continuously developed urban arterial roadways in the Bay Area, and it runs through the largest city in the region by population (San Jose) as well as three other cities with populations of roughly 100,000 or more (Sunnyvale, Santa Clara, and San Mateo). The corridor is also located in close proximity to several of the Bay Area's most prominent universities, a number of major regional shopping centers, several regionally significant hospitals and medical centers, and some of the Bay Area's largest concentrations of technology employment.

At the regional level, two primary agencies are responsible for transportation planning, coordination and financing, the production of demographic projections, and other regional coordination activities, and have been involved as stakeholders in the Grand Boulevard Initiative.

The Metropolitan Transportation Commission (MTC) is the transportation planning, coordinating and financing agency for the nine-county San Francisco Bay Area. MTC functions as both the regional transportation planning agency – a state designation – and,

Figure 1-3. Priority development areas along GBI corridor

for federal purposes, as the region's metropolitan planning organization (MPO). As such, it is responsible for regularly updating the Regional Transportation Plan, a comprehensive blueprint for the development of mass transit, highway, airport, seaport, railroad, bicycle, and pedestrian facilities. MTC has established several innovative grant programs, including the Transportation for Livable Communities (TLC) Program, which provides planning and capital grants for small-scale transportation projects that enhance community vitality and promote walking, bicycling, and public transit use. The Commission's Low Income Flexible Transportation (LIFT) Program funds new or expanded services for getting low-income residents to and from work, school, and other essential destinations.

The Association of Bay Area Governments (ABAG) is the regional planning agency for the nine counties and 101 cities and towns of the San Francisco Bay region. ABAG is involved in planning, research, housing, and member services through programs that work to address regional economic, social, and environmental challenges.

In recent years, several regional agencies have collaborated to create the FOCUS Program in the Bay Area. "Focusing Our Vision" (FOCUS) is a Bay Area-wide effort to promote compact and equitable development that protects and enhances quality of life, and preserves open space and agricultural resources. FOCUS seeks to strengthen existing city centers, locate more housing near existing and future rail stations and quality bus lines, encourage more compact and walkable suburbs, and protect regional open space. FOCUS is being guided by the Joint Policy Committee (JPC). State legislation established the JPC to develop a regional planning forum including MTC, ABAG, the Bay Area Air Quality Management District (BAAQMD), and the Bay Conservation and Development Commission (BCDC).

In Santa Clara County, the VTA Community Design & Transportation Program (CDT)

Program preceded the development of the FOCUS Program and included a "blueprint" for development focused on the core urban areas, transit stations, and transit corridors (or "cores," "corridors," and "station areas") throughout the county. The CDT Program has been a model for emulation by other jurisdictions including the regional FOCUS program.

In 2007, the San Mateo City/County Association of Governments (C/CAG) and the Santa Clara Valley Transportation Authority (VTA) applied to designate the sections of El Camino Real in their respective counties as FOCUS Priority Development Areas (PDA). These sections have already been targeted and formally endorsed for growth by the respective local jurisdictions.

To be eligible to become a PDA, an area has to be within an existing community, near existing or planned fixed-transit, or served by comparable bus service, and planned for additional housing. These communities welcome more residents and are committed to creating more housing choices in locations easily accessible to transit, jobs, shopping, and services. The ABAG Executive Board approved both C/CAG's and VTA's applications and designated the one-quarter of a mile buffer around El Camino Real from Daly City (Mission Street) to San Jose (The Alameda) as a PDA. Figure 1-3 displays a map of this and other PDAs along the GBI corridor.

In addition to the GBI priority development area, seven cities along the corridor in San Mateo County and three in Santa Clara County nominated and achieved their own PDAs. They are: Daly City, San Bruno, Millbrae, San Mateo, San Carlos, Redwood City, and Menlo Park in San Mateo County, and Palo Alto, Mountain View, and San Jose in Santa Clara County.

Regional agencies have begun directing incentives to designated PDAs in the El Camino Real corridor to support sustainable development. In 2008, a competitive application process involving Bay Area jurisdictions resulted in $1.6 million in planning funds being awarded to the cities of San Jose and San Mateo and to the unincorporated San Mateo County area of North Fair Oaks for the creation of land use and transportation plans to support the development of livable communities near transit.

1.2.3. Statewide

Planning for Climate Change

California Senate Bill 375 (2008) aims to reduce greenhouse gas emissions through development of a Sustainable Communities Strategy, which integrates transportation and land-use planning. The law calls upon metropolitan planning organizations (MPOs) in 18 regions in California to develop an integrated transportation, land-use and housing plan known as a Sustainable Communities Strategy (SCS), with the ultimate goal of reducing greenhouse gas emissions for cars and light-duty trucks. In the Bay Area, this involves the Metropolitan Transportation Commission (MTC), as the MPO, and the region's Council of Governments, the Association of Bay Area Governments (ABAG).

SB 375 also waives certain requirements of the California Environmental Quality Act (CEQA) for projects in regions that develop a Sustainable Communities Strategy. The Strategy must integrate planning for transportation, land use and housing. Specifically, it must:

1. Identify specific areas in the nine-county Bay Area to accommodate all the region's projected population growth, including all income groups, for at least the next 25 years; and
2. Try to achieve targeted reductions in greenhouse gas emissions from cars and light trucks

The benefits of integrated land use and transportation:

- Integrating land uses (jobs, stores, schools, homes, etc.) and encouraging

more complete communities can reduce automobile trips and emissions

- Clustering more homes, jobs, and other activities around transit can make it easier to make trips by foot, bicycle, or public transit
- Planning land uses and transportation together can help improve the vitality and quality of life for our communities, while improving public health

ABAG and MTC will develop the SCS in partnership with the Bay Area Air Quality Management District and the San Francisco Bay Conservation and Development Commission. The four regional agencies will team with local governments, county congestion management agencies, local planning and public works directors, city and county managers, public transit agencies, interested residents, stakeholders, and community groups to ensure that all those with a stake in the outcome are actively involved in the preparation of the SCS. In San Mateo and Santa Clara Counties, the strong partnerships already forged through the success of the Grand Boulevard Initiative offer a solid foundation on which build the Sustainable Communities Strategy. The El Camino Corridor's status as a PDA also confirms the central role of the roadway in the Peninsula and South Bay. The Corridor Plan takes an important step towards establishing a common vision and plan for the area.

Caltrans Policy

Deputy Directive 64: Complete Streets Policy

In October 2008, Caltrans strengthened its "Deputy Directive 64" to reflect changing priorities and challenges. This "Complete Streets" policy[1] now reads as follows:

> "The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system."

Providing safe mobility for all users, including motorists, bicyclists, pedestrians and transit riders, contributes to the Department's mission/vision: "Improving Mobility Across California." Successful long-term implementation of this policy is intended to result in:

- More options for people to go from one place to another
- Less traffic congestion and greenhouse gas emissions
- More walkable communities (with healthier, more active people)
- Fewer barriers for older adults, children, and people with disabilities

Economically, complete streets can help revitalize communities, and they can give families the option to lower transportation costs by using transit, walking, or bicycling rather than driving to reach their destinations. Caltrans is actively engaged in implementing its complete streets policy in all planning, programming, design, construction, operations and maintenance activities, and products on the State Highway System.

Smart Mobility 2010

In February of 2010, Caltrans approved "Smart Mobility 2010: A Call to Action for the New Decade."[2] This document addresses the State mandate to find solutions to climate change, the need to reduce per-capita vehicle miles traveled, the demand for a safe transportation system that gets people and goods to their destinations, and the commitment to create a transportation system that advances social equity and environmental justice.

This publication supports Smart Mobility by:

1. Focusing attention on Smart Mobility as a response to the State's interrelated challenges of mobility and sustainability
2. Introducing the six principles that shape the Smart Mobility Framework: Loca-

1. Source: http://www.dot.ca.gov/hq/tpp/offices/ocp/complete_streets.html

2. Document posted online at: http://www.dot.ca.gov/hq/tpp/offices/ocp/smf_files/SmMblty_v6-3.22.10_150DPI.pdf

tion Efficiency, Reliable Mobility, Health and Safety, Environmental Stewardship, Social Equity, and Robust Economy

3. Introducing the concept of place types, a contemporary approach to planning and design. Seven place types are specifically designed as tools for planning and programming that implement Smart Mobility. The place types are: Urban Centers, Close-in Compact Communities, Compact Communities, Suburban areas, Rural and Agricultural Lands, Protected Lands, and Special Use Areas

The El Camino Real Corridor would fall under the "Close-in Compact Communities" category, as a "Close-in Corridor." As Caltrans shifts to a Smart Mobility approach, their design policies for an urban state highway such as El Camino Real should better reflect the local land use and transportation context.

1.2.4. Federal

In June of 2009, the United States Department of Transportation (DOT), Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD) created the unprecedented interagency Partnership for Sustainable Communities. Rooted in six Livability Principles, the three agencies are working together more closely than ever before to meet President Obama's challenge to coordinate federal policies, programs, and resources to help urban, suburban, and rural areas build more sustainable communities. Traditionally there has been no coordination among federal housing, transportation, and land use investments. The intent is that for the first time the federal government will speak with one voice when it comes to housing, transportation and environmental policy, and in doing so will be a partner to regions and local governments instead of a barrier.

In February of 2010, the U.S. Department of Housing and Urban Development announced the launch of HUD's new Office of Sustainable Housing and Communities (OSHC). The mission of the Office of Sustainable Housing and Communities is to create strong, sustainable communities by connecting housing to jobs, fostering local innovation, and helping to build a clean energy economy. In order to better connect housing to jobs, the office will work to coordinate federal housing and transportation investments with local land use decisions in order to reduce transportation costs for families, improve housing affordability, save energy, and increase access to housing and employment opportunities.

In the 2010 budget, Congress provided $150 million to HUD for a Sustainable Communities Initiative to improve regional planning efforts that integrate housing and transportation decisions and increase capacity to improve land use and zoning. Approximately $100 million of that total will be given to regional integrated planning initiatives through HUD's Sustainable Communities Planning Grant Program.

2

Existing Corridor Conditions

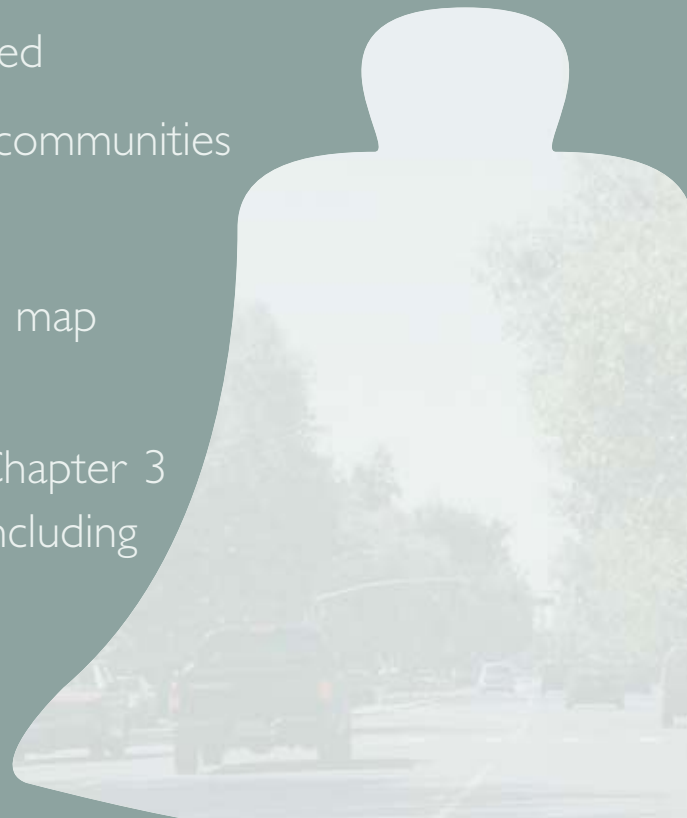
This chapter provides an **overview of existing conditions and local community policies** for the GBI corridor as reflected in the current configuration of the roadway, frontage land use conditions, and adopted street guidelines. These conditions are depicted through detailed **existing conditions "prototypes."**

Initial research focused on **confirming the general elements of a corridor-wide vision**, identifying common pedestrian-, transit-, and bicycle-oriented streetscape design elements that provide a basis for Caltrans-supported street improvement guidelines.

Background information was gathered in four ways:

- Existing policy documents and plans were obtained and reviewed
- A questionnaire was distributed to staff in the participating 19 communities
- Follow-up in-person and phone interviews were conducted
- Existing conditions were confirmed with supplemental field and map reviews

This chapter provides a summary of existing conditions, while Chapter 3 provides more information on planned corridor improvements, including land use, transportation, and streetscape planning efforts.



2.1. Corridor Conditions

Existing conditions findings are outlined in Table 2.1 and summarized below. Three general categories of existing roadway conditions are described below. They are listed in order of relative proportion to the corridor as a whole.

1. 6 Through Lanes / Striped or Landscaped Median / Curbside Parking - This condition occurs over 65% of the corridor, approximately 28 miles. It exists in Daly City, Colma, South San Francisco, San Bruno, Millbrae, Burlingame, Redwood City, Menlo Park, Palo Alto, Los Altos, Mountain View, Sunnyvale (portions), and Santa Clara. Frontage land uses are a mix of storefront, shopping center, and auto-oriented commercial, with limited residential and/or mixed-use development. Landscape medians exist throughout 22 miles, or approximately 80%, of these areas.

2. 4 Through Lanes / Striped or Landscaped Median / Curbside Parking - This condition occurs over 23% of the corridor, approximately 10 miles and is illustrated in Figure 2-1. It exists in Daly City, San Mateo, Belmont, San Carlos, Redwood City, and San Jose. Shallow frontage parcels create a land use pattern that consists primarily of storefront or right-of-way-abutting commercial development. With the exception of The Alameda in San Jose, this condition occurs only in San Mateo County communities. In some locations (e.g., Belmont, San Carlos) there are segments of roadway with 5 through lanes, 2 northbound and 3 southbound, but these segments are not continuous. Approximately 5.4 miles, or 54%, of these areas contain landscaped medians.

3. 4-6 Through Lanes / No Parking – This condition occurs for the most part in the residential areas of Burlingame and Atherton, and comprises approximately 5 miles, or 12%, of the overall corridor. The roadway is as narrow as 40 feet in Burlingame, the narrowest along the GBI corridor. There are no left turn lanes, and the roadway is bordered by large "heritage" eucalyptus trees and single family residential properties. In Atherton the roadway is much wider at 5 to 6 lanes, with a painted median and left turn pockets. Large, wooded, estate residential properties line the frontage. Atherton limits sidewalks along El Camino Real except at select commercial properties.

Right-of-way width, curb-to-curb dimensions, and frontage conditions vary significantly. Unique conditions exist in Colma, where much of the frontage consists of large cemetery properties; in South San Francisco, a portion of the roadway is bordered by a steep hillside on one side and a steep slope to a shallow valley on the other. In Millbrae's storefront commercial area, an "international boulevard" configuration exists with frontage access and angled parking separated from through travel lanes by a landscaped traffic island. Stanford University also has a unique frontage along El Camino Real, including athletic fields, the arboretum, and three of the five entrances to the campus, including Stanford's historic and formal entrance at Palm Drive. The entryways and arboretum are designated as Campus Open Space and must characteristically remain park-like and unimproved open space.

Figure 2-1. *Four through lane condition with landscaped median in Belmont*

Municipality	Number of Lanes - Median	Frontage Land Use Conditions	Specific Land Use Vision(s)	1st Floor Residential Permitted	Sidewalk Cafes Permitted	Project Planned or Underway	General Plan-Designated Bike Route	Street Guidelines Adopted
Atherton	5 / 6 - PM	Res	No	Yes	-	No	-	No
Belmont	4 - M	Mx C/SF	Yes	Yes / CUP	Yes / CUP	No	No	Yes
Burlingame	6 - M	Res	Yes	No	NA	No	No	Yes
Colma	4 / 6	Mx C/Cem	Yes	No	No	Yes / P	Yes	No
Daly City	4 - M	Mx C/SF/Res	Yes	Yes / Ltd	-	Yes / U	No	Yes
Hillsborough	4	Res	No	Yes	NA	Yes / U	No	No
Los Altos	6 - M	Mx C/Res	No	Yes	-	-	-	-
Menlo Park	4 / 6 - M	Mx C/SF	Yes	-	-	-	-	Yes
Millbrae	6 - M	Mx C/SF	Yes	-	-	-	-	Yes
Mountain View	6 - M	Mx C/SF/Res	Yes	Yes / Ltd	Yes	Yes	No	No
Palo Alto	6 - PM	Mx C / Res	Yes	Yes / Ltd	Yes / CUP	Yes / U	No / Planned	No
Redwood City	4 / 6 - M	Mx C/SF/Res	Yes	Yes / Ltd	Yes	Yes / U	No	Yes
San Bruno	6+ - M	Mx C/SF	Yes	Yes / Full	Yes	Yes / P	No	No
San Carlos	4 / 5 - M	Mx C/SF	Yes	Yes / Ltd	-	Yes	No	Yes
San Jose	4	Mx C/SF	Yes	Yes / Ltd	Yes	Yes / P	No / Planned	No / Planned
San Mateo	4 / 6 - PM	Mx C/SF/Res	Yes	Yes / Ltd	Yes	Yes / U	No	Yes
Santa Clara	6+ - M	Mx C/Res	Yes	Yes / Ltd	No	No	Yes/Planned	No
South San Francisco	6+ - PM	Mx C/SF	Yes	No	No	No	Yes	Yes
Sunnyvale	6 - PM	Mx C/Res	Yes	Yes / Ltd	Yes	Yes / P	Yes	No

Abbreviations	Mx	C	SF	Res	Ltd	CUP
	Mixed	Commercial/ Office	Storefront Commercial	Residential	Limited Area	Conditional Use Permit

Table 2-1. *Background Conditions Summary*

2.2. Street Design and Caltrans Standards

Communities and agencies promoting land use and urban design changes along the corridor have identified a number of recurring specific issues related to street design. In general, communities are attempting to increase opportunities for amenities and multimodal transportation within the confines of the existing right-of-way, and seek exemptions from Caltrans highway design standards. These standards are listed below. A number are the subject of Design Exception applications to Caltrans for projects currently underway.

1. Travel lane width - Current standard is 12 feet minimum.
2. Turn lane width - Current standard is 12 feet minimum.
3. Shoulder/breakdown lane width - Current standard is 8 feet minimum.
4. Corner bulb-outs - Current curb clearance standard is 4 feet minimum.
5. U-turn radii - Current standard is 50 feet minimum.
6. Mid-block pedestrian crossings - Signalized crossings required.
7. Bikeways/bike lanes - Current standard is 4 feet minimum bike lane width adjacent to parallel parking.
8. Gateways/monuments - Current standards not specific to feature(s).
9. Design speed - Current roadway configuration(s) allow for design speeds up to 50 miles per hour; no current standard exists for traffic calming measures.
10. Median width for street trees - Current standard is 6 feet setback from face of curb to trunk of tree; requires median to be 11 to 12 feet minimum.
11. Median end setback for street trees - Current sight distance standards require 100 feet setback minimum.
12. Parking zone street trees - Current curb clearance standard is 4 feet minimum.
13. Stormwater absorption - Complete runoff required (i.e. detention/percolation not permitted).
14. Street lighting fixtures - Type of fixtures (e.g. mast arm lengths) limited.

Figure 2-2. *Sidewalk frontage improvements along El Camino Real*

2.3. Land Use and Roadway Typologies

Based on existing conditions, local policy plans, and the objectives of the Grand Boulevard Initiative, five general land use and roadway typology conditions are identified. The typologies reflect the basic "node" and "link" policy approaches that are being pursued implicitly or explicitly by local communities, and they provide a basis for the Street Design Guidelines and Street Design Prototypes contained in Chapters 4 and 5. Node areas are generally adjacent to downtown commercial districts and/or transit hubs and have higher levels of density and pedestrian activity. Link

areas accommodate a wider variety of land uses and forms of development.

1. 4-Lane Node
    - Adjacent to downtown commercial district and/or transit center.
    - Curbside parking.
    - Vertical mixed-use with residential/office over commercial.
    - Relatively shallow frontage properties.
2. 4-Lane Link
    - Between Node areas.
    - Horizontal mixed-use, vertical mixed-use, or single use development.
    - Curbside parking.
    - Relatively shallow frontage properties.
3. 6-Lane Node
    - Adjacent to downtown commercial district and/or transit center.
    - Curbside parking.
    - Vertical mixed-use with residential/office over commercial.
    - Relatively deep frontage properties.
4. 6-Lane Link
    - Between Node areas.
    - Horizontal mixed-use, vertical mixed-use, or single use development.
    - Curbside parking.
    - Relatively deep frontage properties.
5. 4- or 6-Lane with No Parking
    - Between Node areas.
    - Curbside parking removed for a variety of potential reasons; e.g., bike lanes, transit lanes, sidewalk widening.

Prototype illustrations of these typologies are provided in Figures 2-4 through 2-8 on the following pages. Existing right-of-way and curb-to-curb dimensions vary slightly from what is depicted, and even slight variations may affect opportunities for street improvements. Following the prototype illustrations is a selection of existing condition photographs taken along the GBI corridor.

Figure 2-3. *Downtown San Carlos intersects with El Camino Real*

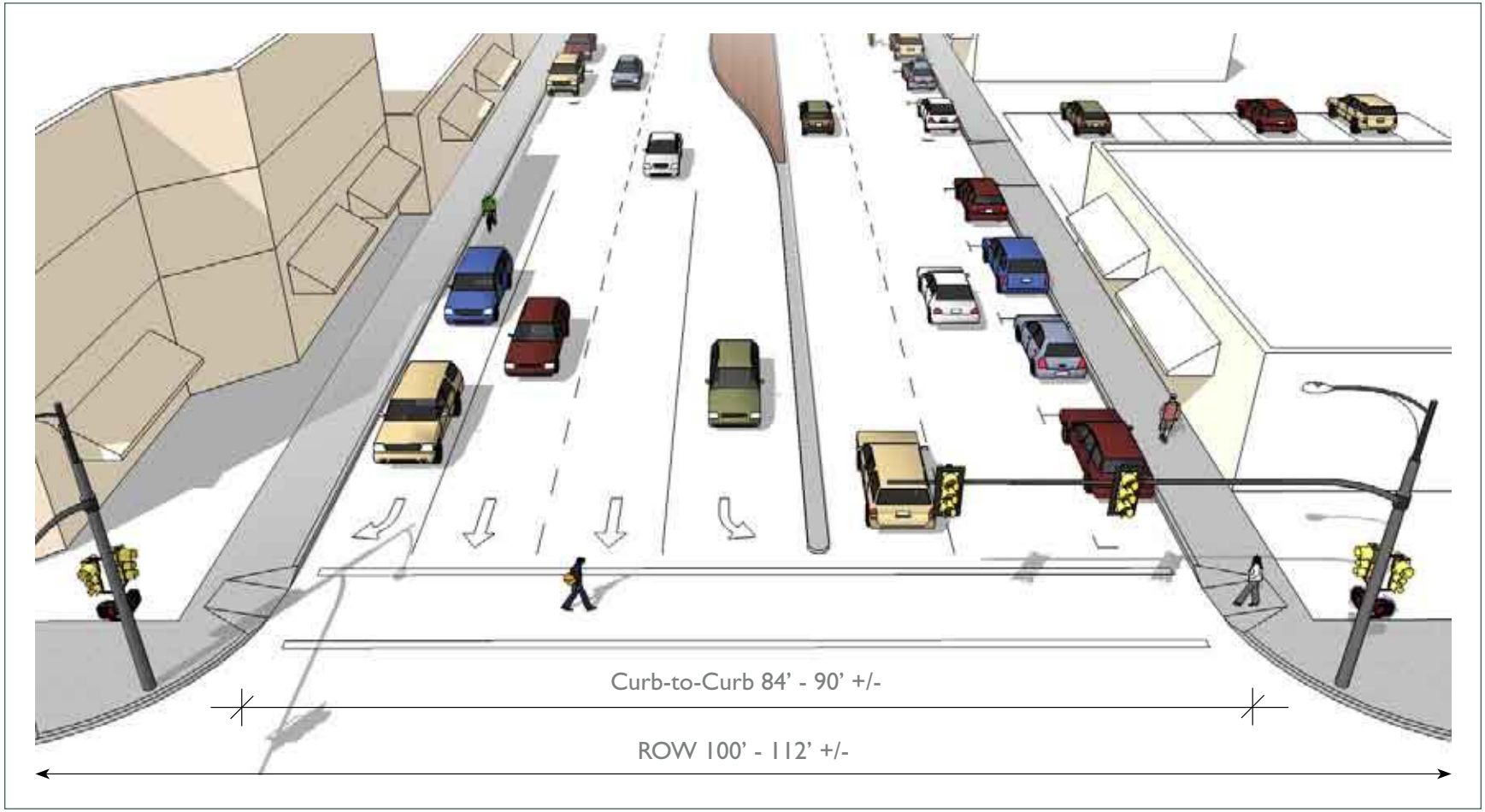


Figure 2-4. *Four-lane node configuration*

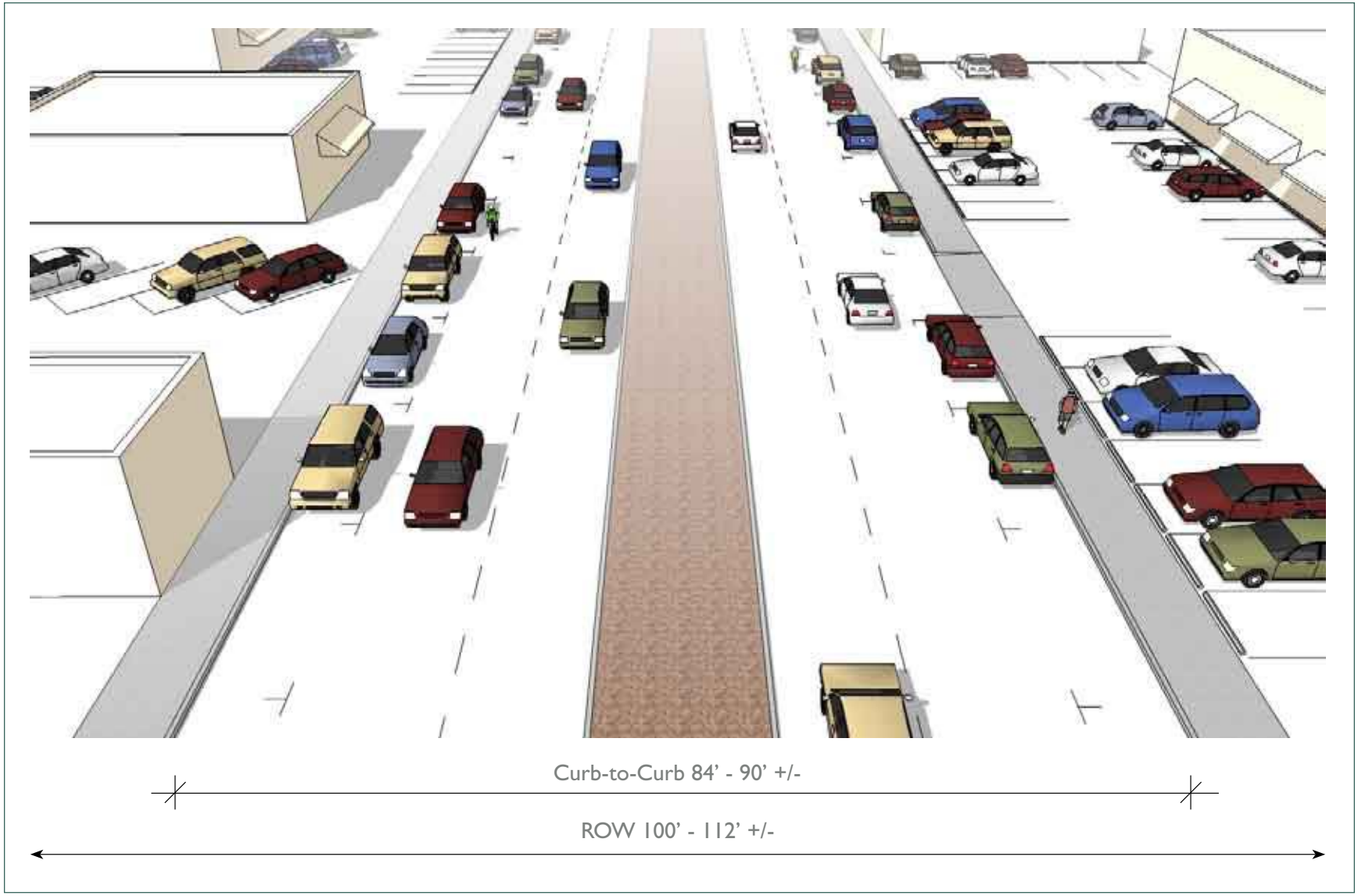


Figure 2-5. *Four-lane link configuration*

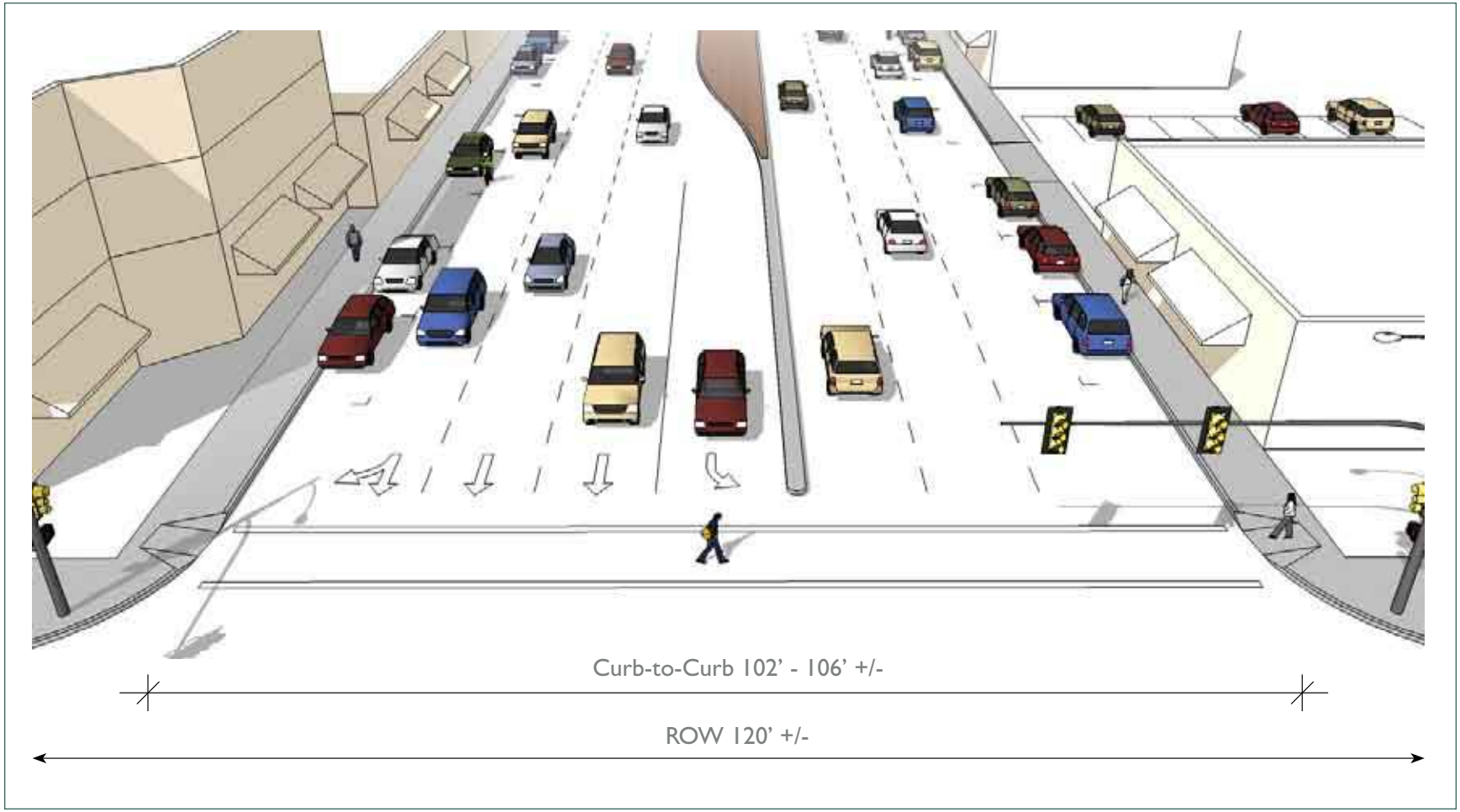


Figure 2-6. *Six-lane node configuration*

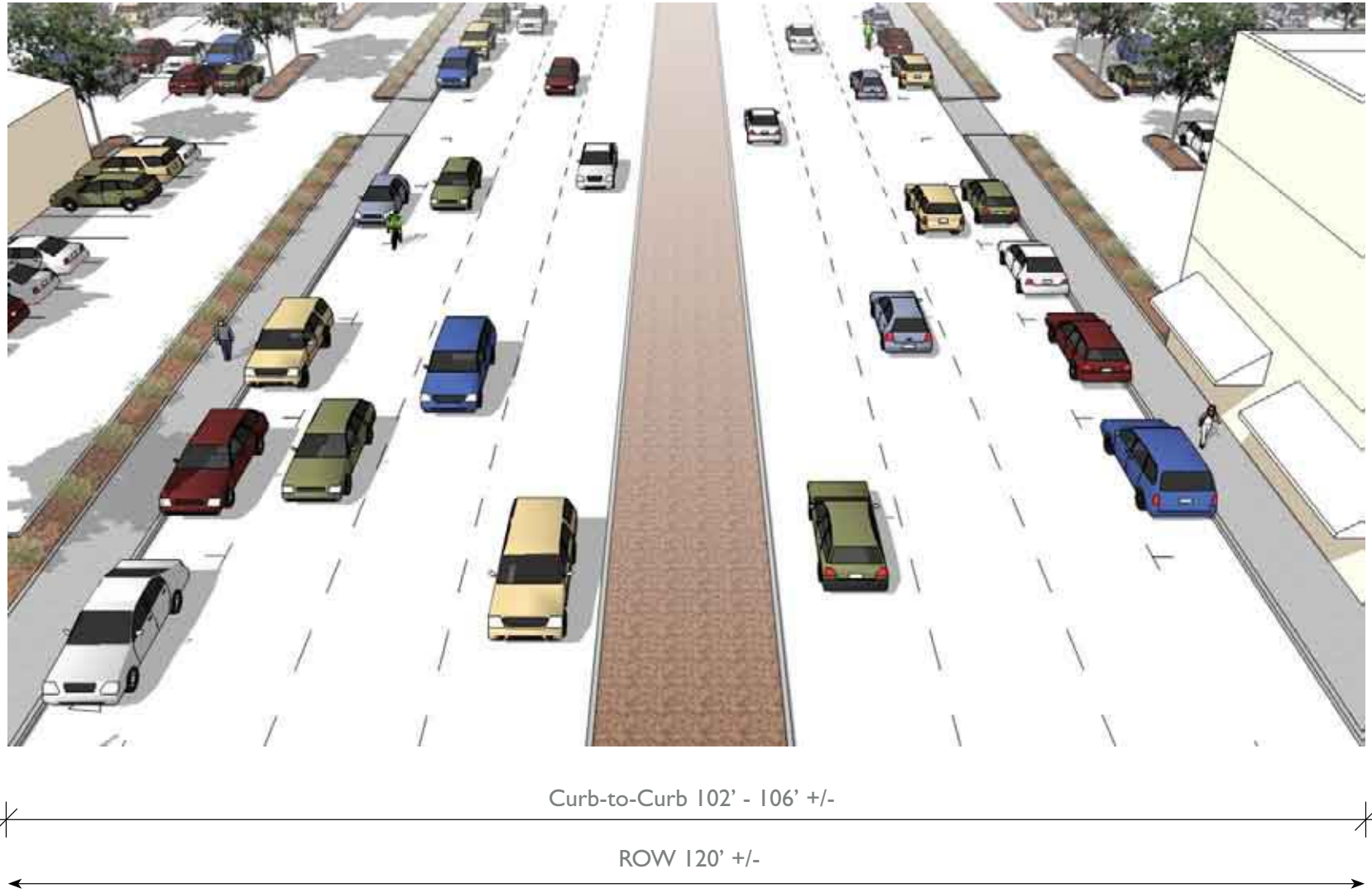


Figure 2-7. *Six-lane link configuration*

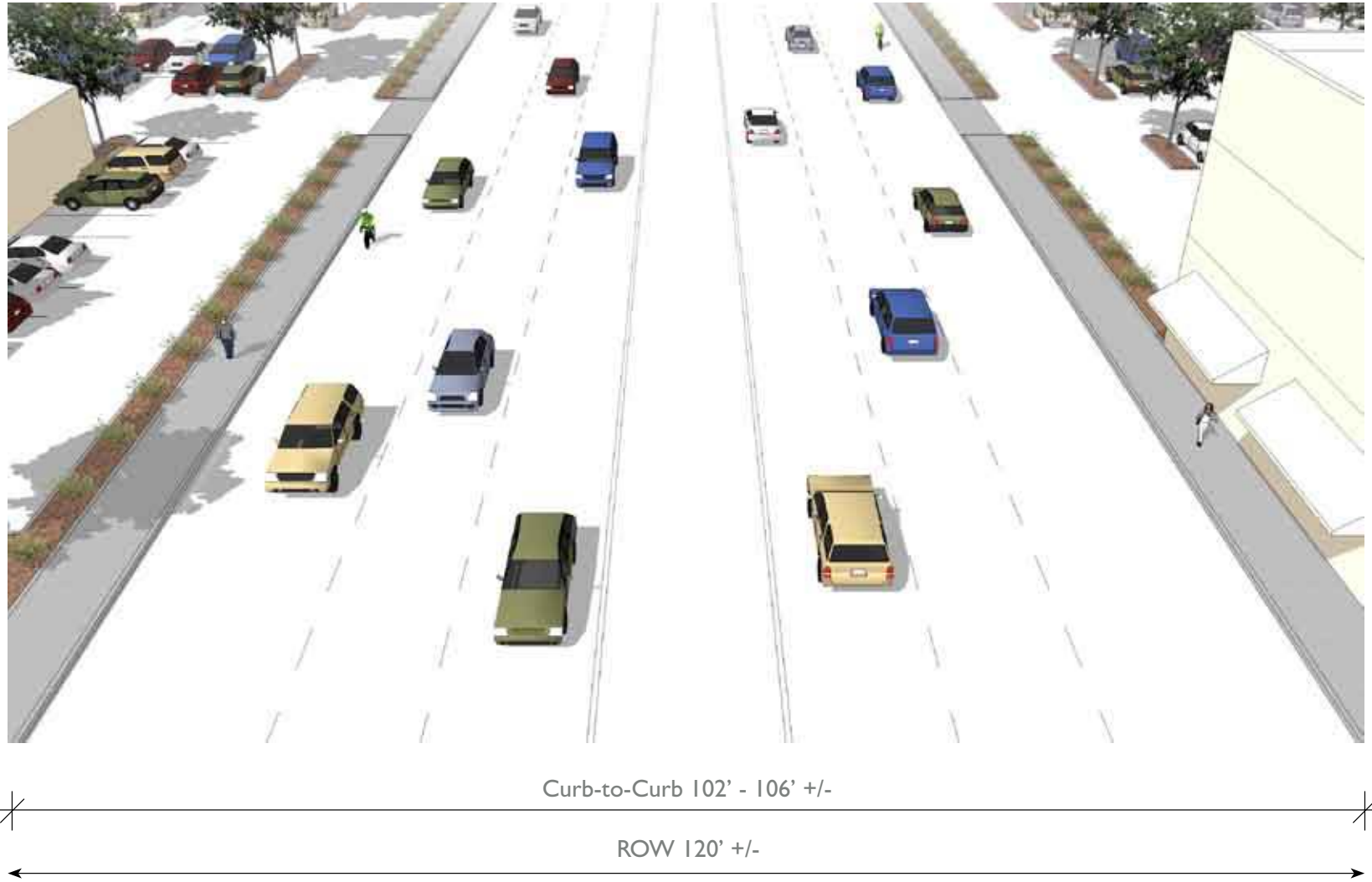


Figure 2-8. *Four- to six-lane no parking configuration*

Existing Conditions Photographs 1

1,2. Large-footprint commercial buildings on deep lots with parking in front.

3. Storefront commercial buildings on shallow lots with parking in front.

4,5. Storefront commercial buildings on shallow lots with curbside parking.

6. Mixed-use building with residential units over storefront retail.

7. Mid-rise residential and office development.

8. Frontage townhouses.

9. Residential buildings along The Alameda.

10. Four-lane condition at The Alameda.

11. Four-lane condition in Redwood City.

12. Six-lane condition along the Caltrain right-of-way.

13. Six-lane condition with large-block office frontage.

14. Six-lane condition with strip commercial style development.

15. No parking / narrow sidewalk condition.

Existing Conditions Photographs I

Existing Conditions Photographs 2

1

2

3

4

5

6

7

8

9

1. Improved sidewalks with new paving and street trees to encourage walking.
2. Narrow sidewalks and right-turn lanes in the place of curbside parking may affect the viability of frontage businesses.
3. Narrow, unimproved sidewalks are uninviting to pedestrians.

4,5. Long crosswalks could be shortened through the use of bulb-outs and pedestrian refuges.

6. Mid-block crossings could create safer conditions along long blocks.
7. Conifer trees in medians interfere with visibility.
8. Existing auto-oriented cobra-head street lights.
9. Bicyclists have limited designated road space.
10. Some existing bus stops need improvements such as bus shelters and adequate lighting.
11. Wider sidewalks and/or bus bulb-outs provide space for bus stop-associated amenities.
12. SamTrans bus in mixed-flow traffic.
13. VTA articulated bus in mixed-flow traffic.
14. Caltrain parallels El Camino Real along much of its alignment.
15. Caltrain stations are often located adjacent to or a few blocks from El Camino Real.

Existing Conditions Photographs 2

3

Planned Corridor Improvements

This chapter provides a **summary of land use, streetscape, and transportation plans and changes** within one-quarter mile of the El Camino Real corridor that will shape future conditions on the corridor. These plans helped **inform the land use and transit scenarios modeled** in the Grand Boulevard Multimodal Transportation Corridor Plan. All plans included in this document are created by cities and counties along the GBI corridor and have either been adopted since 2005, have draft documents available for public review, or are currently in the development process.

In addition, results to date from the City/County Association of Governments of San Mateo County's (C/CAG) existing Transit-oriented Development (TOD) and El Camino Real Incentive Programs and Santa Clara Valley Transportation Association's (VTA) Community Design and Transportation (CDT) Program are included to provide an understanding of the **effects that grant and incentive programs may have on the corridor**.

Information used to create this report includes base data on zoning changes, development designations for specific areas (for example TOD near station, downtown mixed-use, etc), housing densities and/or floor area ratio (FAR) information, and any other land use restrictions and/or designations along El Camino Real.

3.1. Land Use Planning Overview

3.1.1. San Mateo County

Between 2005 and the present, eleven cities in San Mateo County and San Mateo County developed, or are in the process of developing, policy documents which affect the land uses on the El Camino Real corridor. An overview of these changes is given below, beginning with the most northern city and moving south towards Santa Clara County:

- City of Daly City: General Plan Update
- City of South San Francisco: South El Camino Real General Plan Amendment
- City of South San Francisco: El Camino Real/Chestnut Avenue Land Use & Specific Plan
- City of San Bruno: General Plan
- City of San Bruno: Downtown and Transit Corridors Plan
- City of Millbrae: Zoning Ordinance and Zoning Map Update
- Town of Hillsborough: General Plan
- City of Burlingame: Downtown Specific Plan
- City of San Mateo: General Plan Update
- City of San Mateo: Bay Meadows Phase II
- City of San Mateo: Rail Corridor Transit-Oriented Development Plan
- City of San Mateo: Hillsdale Station Area Plan
- City of Belmont: Economic Development/Target Site Policy Amendments
- City of San Carlos: General Plan Update
- City of Redwood City: General Plan Update
- City of Redwood City: Downtown Precise Plan
- San Mateo County: North Fair Oaks Station Area Plan
- City of Menlo Park: El Camino Real/ Downtown Specific Plan

City of Daly City: General Plan Update

The City of Daly City is currently in the process of updating the General Plan and based on the public input at the Mission Street Urban Design Charrette conducted in November 2008. One of the goals is to transform Mission Street into a vibrant urban corridor. The draft Housing and Land Use Elements identify the need to rezone Mission Street from Light Commercial to a new designation, Commercial Mixed-Use. The Draft General Plan includes policies and incentives to support higher density mixed-use development. Incentives to be considered are reduced parking standards for transit-proximate mixed-use developments, an increased height allowance, and incentives to merge parcels to create larger development sites.

City of South San Francisco: South El Camino Real General Plan Amendment

In April 2010, the City of South San Francisco adopted a General Plan Amendment for the southern portion of El Camino Real to target higher intensities and to allow for mixed-use development throughout the planning corridor. The area covered by this plan encompasses the area between Chestnut Avenue and the City's southern boundary. The general plan amendment will allow more uses and increase the allowable floor area ratio, heights, bulk and mass and site planning. The amendment incorporates a new land use designation, El Camino Real Mixed Use, into the General Plan. This designation is intended to accommodate high-intensity active uses and mixed-use development in the South El Camino Real area and allows for a FAR of 2.50 with a FAR of 3.5 permitted through discretionary approval. In addition, building heights are increased to 80 feet, with height up to 120 feet allowed through discretionary review and approval.

A zoning code update is being performed with this effort and is complimentary to citywide zoning code update effort. Design guidelines have also been developed with the amendment and provide visual tools to assist in implementing regulations. The design guidelines reflect zoning code revisions.

The General Plan Amendment, with the change from commercial zoning to El Camino Real Mixed Use, will no doubt have an impact on land use densities and transit ridership in the area.

City of South San Francisco: El Camino Real/ Chestnut Avenue Land Use & Specific Plan

The Chestnut Avenue Land Use Plan and Specific Plan, currently in progress, will encompass an approximately 50 acre area along El Camino Real from Chestnut Avenue to South San Francisco BART. The plans will encourage development of the current commercially zoned area into a vibrant high density mixed-use neighborhood allowing for improved auto access as well as bicycle, pedestrian and open space connections. Development allowances will generally keep with those proposed as part of the South El Camino Real General Plan Amendment.

While the final plan for the Specific Plan has not been approved at this stage, the increased residential and commercial densities will no doubt have an impact on land use densities and transit ridership in the area.

City of San Bruno: General Plan

In March 2009, the City of San Bruno adopted their General Plan, which promotes balanced development through combining the conservation of established neighborhoods with the revitalization of the downtown area and other commercial and industrial areas. The information and decisions in the General Plan will be used in the upcoming Corridors Plan.

The General Plan includes proposed land use classifications for San Bruno and establishes a mix of uses for El Camino Real. A map of the land use classifications for the parcels along El Camino Real and in the surrounding areas is provided in Figure 3-1. The highlights for El Camino include:

- Transit-oriented development is slated along El Camino Real, from I-380 to the Civic Center located at Angus Ave, and has been designated a FAR of 2.0 for developments less than 20,000 square feet and 3.0 for those over 20,000 square feet.
- Mixed-use is planned for the downtown area from the Civic Center to Crystal Springs Rd. and requires that active uses be located on the ground floor while residential developments can only be located on second and upper floors of new developments. A FAR of 2.0 for developments less than 15,000 square feet and 3.0 for those over 15,000 square feet is established for the downtown mixed-use.
- The remaining length of El Camino Real, from Crystal Springs Rd. to San Juan Ave. is designated as multi-use residential and focuses on multi-family housing and new developments. It is given a base FAR of 2.0, with a maximum FAR of 3.0 for parcels more than 20,000 square feet with non-residential use not exceeding 0.6 FAR. New retail is only allowed on the condition that they are concentrated in existing retail districts.
- Continued commercial use is proposed for the existing Towne Center and The Shops at Tanforan with a Floor Area Ratio (FAR) of 1.2.

The majority of San Mateo Ave. from I-380 to El Camino Real, San Bruno Ave. east of San Mateo Ave., and portions of El Camino Real north of San Mateo Ave. were previously designated for Commercial and Industrial/Auto-Related uses. This plan changes the land use designations for these to Transit Oriented Development and/or Central Business District (Downtown Mixed Use), both of which allow residential developments. This General Plan update therefore could have high impact

on transit ridership and therefore a high impact on the Multimodal Transportation Corridor Plan.

City of San Bruno: Downtown and Transit Corridors Plan

The city of San Bruno is currently developing a San Bruno Downtown and Transit Corridor Plan, which is a Specific Plan that will implement the General Plan through the development of policies, programs and regulations for a localized area and in greater detail. The purpose of the San Bruno Downtown and Transit Corridors Plan is to craft a vision and steps to improve the public and private realm along the streets of El Camino Real, San Bruno Avenue, San Mateo Avenue and Huntington Avenue in the core of the city near the San Bruno Caltrain station. Design guidelines will be developed with this effort. This document may expand on the land use designations made in the General Plan and may therefore have an additional impact on land use densities and transit ridership in the project area.

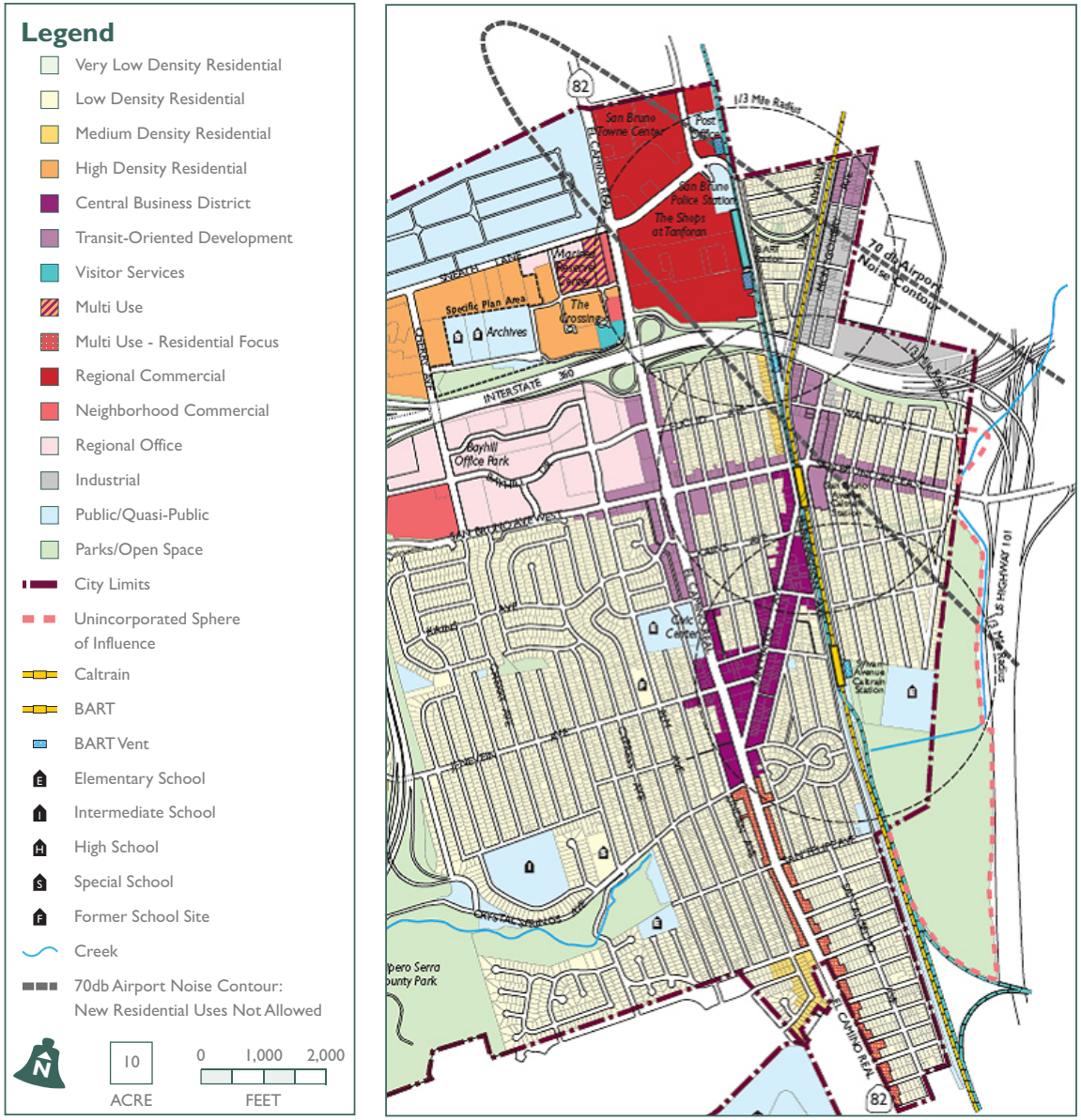


Figure 3-1. San Bruno General Plan Land Use Classifications: El Camino Real Area

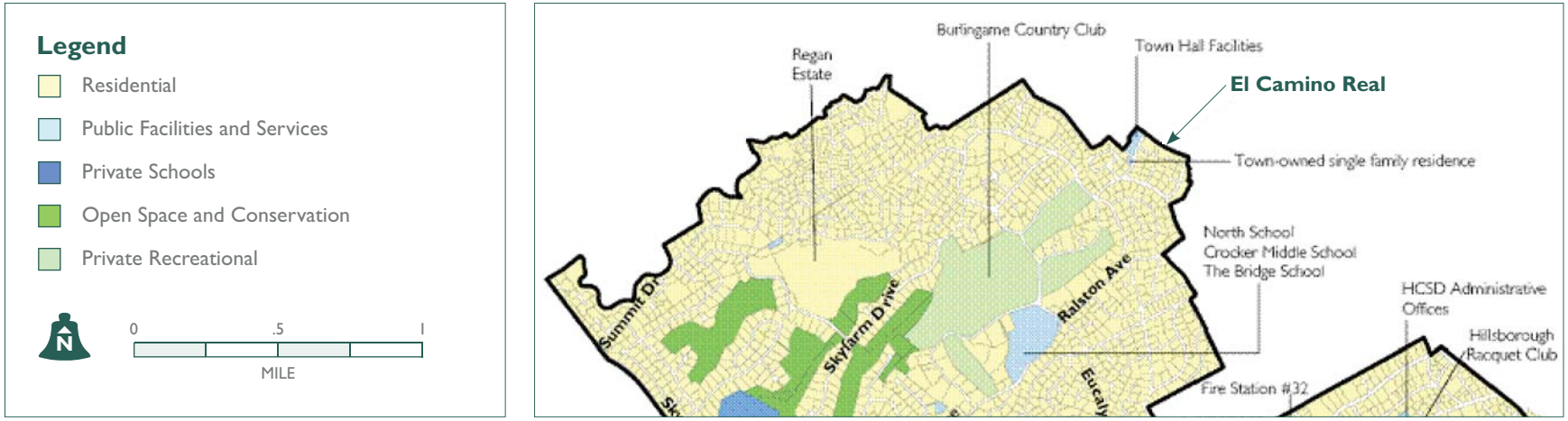


Figure 3-2. Hillsborough General Plan Land Use Designations: El Camino Real Area

City of Millbrae: Zoning Ordinance and Zoning Map Update

The updated Zoning Ordinance and Zoning Map, which became effective in November 2009, include a "Grand Boulevard Planned Development" (GBPD) Zone. This new zone allows for mixed-use and more intensive development along El Camino Real. Although a mixing of uses is possible through Conditional Use Permits and other mechanisms under the existing zoning, the GBPD Zone allows potentially higher densities and streamlines the process for achieving it. This emphasis on mixed-use along the entire Millbrae segment of El Camino Real will help facilitate plans for revitalization and intensification all along the corridor and will complement similar PD zoning that has been in use since 1998 in and around the Millbrae BART/Caltrain Station (under the Millbrae Station Area Specific Plan). The GBPD Zone will replace the existing zoning on a parcel-by-parcel basis as qualifying mixed-use projects are approved by the City. Over time, this new zone is envisioned to have a dramatic impact on land use densities within Millbrae and on transit ridership to and from Millbrae.

Town of Hillsborough: General Plan

The Town of Hillsborough adopted a new General Plan in March 2005. Only approximately one-fifth of a mile of El Camino Real is located in Hillsborough, specifically the west side from just north of Floribunda Ave. south to Bellevue Ave. See Figure 3-2 for a map of the land use designations.

The entire Town of Hillsborough, including the section along El Camino Real, is zoned as Residential and allows single-family dwellings and may also allow home businesses, second units, and other compatible uses as identified in the Hillsborough Municipal Code. The maximum allowed density is one single-family dwelling per one-half acre.

The Town Hall facilities are located on the north-west corner of El Camino Real and Floribunda Ave. This area has a land use designation of Public Facilities and Services (though

still zoned as Residential) and has a maximum allowed density of 25 percent floor area ratio for the first acre, and 15 percent for additional acreage.

Hillsborough has almost reached maximum development capacity and can only allow for 164 more homes within the entire town. The land use planned by this document will therefore have minimal impact on the Multimodal Transportation Corridor Plan.

City of Burlingame: Downtown Specific Plan

In early 2010, the City of Burlingame adopted the Downtown Specific Plan which guides the future development of Downtown Burlingame and builds upon the successful Burlingame Ave. commercial area. The downtown area studied in this plan encompasses the area between El Camino Real and the railroad right-of-way to the east, and between Oak Grove Ave. and Peninsula Ave. to the north and south, respectively. The focused development alternative, which is currently being developed, would allow new development throughout the downtown area under the existing regulations, but would encourage higher-density mixed-use developments along Howard Ave. and the streets between Howard Ave. and Burlingame Ave.

The increased residential and commercial densities planned for the downtown area will no doubt have an impact on land use densities and transit ridership in the area.

City of San Mateo: General Plan Update

The City of San Mateo is in the process of updating its General Plan, which provides the framework for all zoning and land use decisions. The San Mateo General Plan seeks to establish a balance between the need for new growth and preserving the existing high quality of life.

The General Plan supports new commercial and residential growth in the downtown and proposes to concentrate major new developments near transportation and transit corridors. Along El Camino Real, high density residential (36-50 units per acre and 3 to 5 stories) will be continue to be allowed from the northern city border south to Tilton. Commercial (FAR 1 to 2.5 and 35 to 55 foot building height) and high density residential will be allowed along the remainder of El Camino Real. In addition, the policies set forth in the General Plan allow for the implementation of the TOD land use designations created in the Rail Corridor Transit-Oriented Development and the development plans set forth in the Bay Meadows Specific Plan. See respective sections for the Rail Corridor Transit-Oriented Development and Bay Meadows Specific Plans for additional details on land use designations.

The update does not include changes to the land use designations. However, it does make several key changes. The changes relevant to El Camino Real are summarized below:

- It modifies land use policies to limit residential development in service commercial areas. Specifically, a new Policy LU 1.14 would require a "special use permit … for residential uses in areas designated as neighborhood commercial, regional community commercial, and executive office on the Land Use Plan except for mixed use land use designations."
- It contains new Circulation Element policies, including those that encourage bicycle and pedestrian connections and those incorporated from the Rail Corridor Transit-Oriented Development Plan.
- It contains policies to improve the City's sustainability and address climate change.

City of San Mateo: Bay Meadows Phase II

The Bay Meadows project is large transit-oriented development in San Mateo, with high density offices, housing, retail, and restaurants within a comfortable walking distance of the Hillsdale Caltrain Station.

The Bay Meadows II Specific Plan Amendment for the Bay Meadows Main Rack Trace area, approved November 7, 2005, established

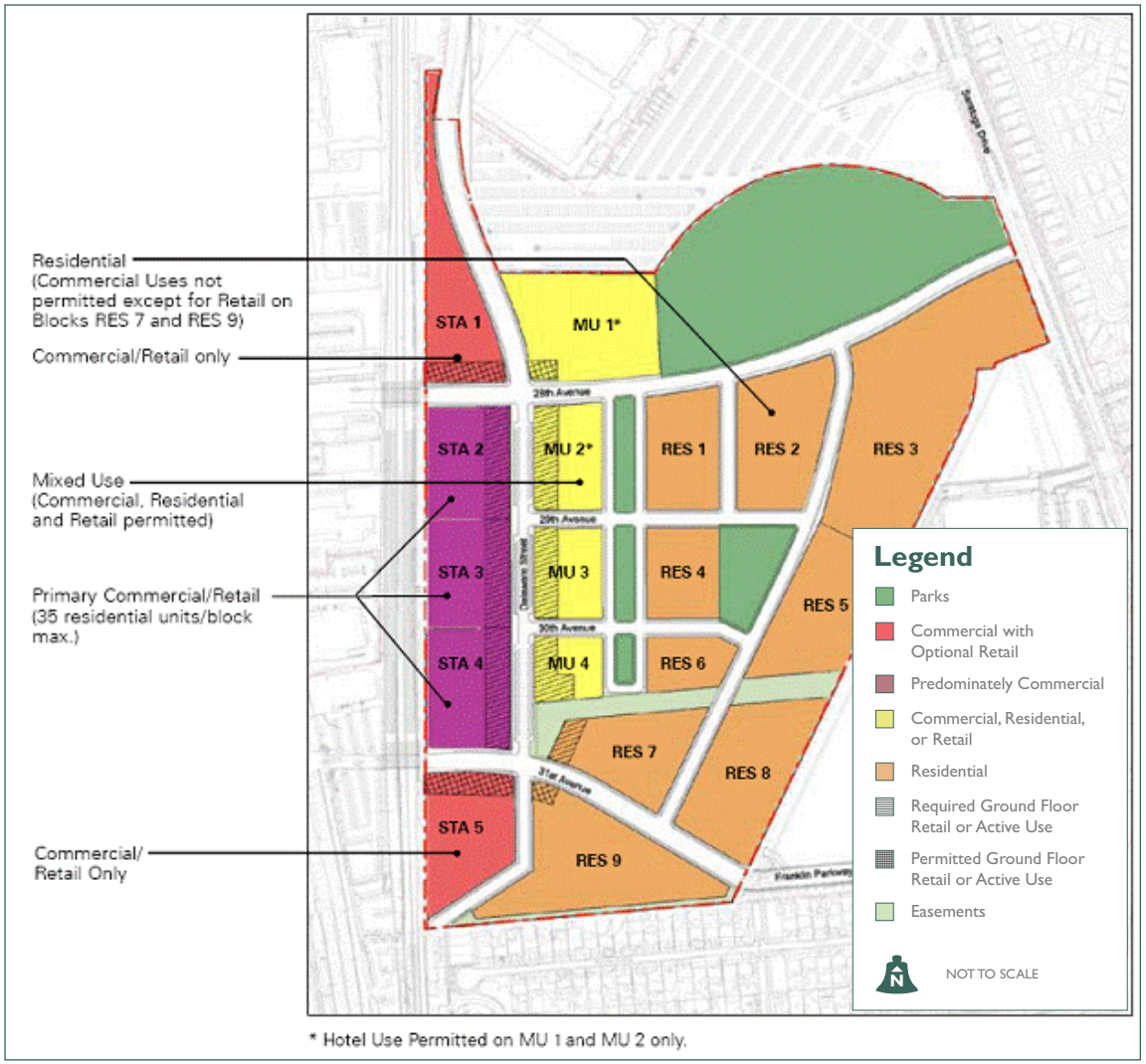


Figure 3-3. Bay Meadows Phase II Land Use Designations

the framework for the redevelopment of the Phase II area. The Bay Meadows Specific Plan for the Bay Meadows Race Track area, adopted in 1997, assumed that racing would continue on the main track, but allowed for future amendments should this change; the Phase II Amendment plans for full redevelopment of the main track area.

In June, 2005, the City Council adopted the San Mateo Rail Corridor Rail Transit-Oriented Development Plan. This policy document changed the General Plan land use designation for the Phase II Specific Plan Area from major institutions/special facilities to a new category called "transit-oriented development" and adopted a maximum height limit of 55 feet for that land use designation. Land use designations are shown in Figure 3-3. The Bay Meadows II Specific Plan Amendment implements the Corridor Plan and designates three main development types in the Hillsdale Station Area:

- The five station blocks total 11.6 acres and are located adjacent to the railway and the Caltrain Hillsdale Station. All of the station blocks area located within one-quarter of a mile of El Camino Real and within one-half of a mile of the Caltrain Hillsdale Station. The maximum FAR for the blocks is 2.5. Commercial (office and retail) uses are permitted on all five blocks, with residential permitted at a

maximum of 35 units per net acre on the three middle station blocks between 28th Avenue and 31st Avenue.

- The four mixed-use blocks total 8.4 acres and are located to the east of Delaware Street and west of the Community and Linear parks. Commercial, retail and residential uses at a maximum of 50 units per net acre are permitted on these blocks. The maximum FAR for the blocks is 2.5 for non-residential projects and 3.0 for residential projects.
- The nine residential blocks total 29.5 acres and area located in the eastern and southern are of the Bay Meadows II site, and allow residential at a minimum of 12 units per net acre and a maximum of 50 units per net acre. Retail uses are permitted on the Town Square frontages on Residential Blocks #7 and #9. The maximum FAR for the blocks is 3.0 for apartment, condominium and loft units, 1.5 for townhomes/rowhomes, and 1.0 for small lot single-family residences.

In 2008, the City of San Mateo approved three large planning applications for the development of almost the entire Bay Meadows Transit-Oriented Development site, consisting of 17 private blocks covering 50 acres. The approvals in 2008 include 750,000 square feet of Class A office space, 93,000 square feet of retail and restaurant space, 1,066 housing units, and two new neighborhood parks.

Most of the work related to the Site Development Permit for demolition and tree removal issued on May 15, 2008 has been completed. This work included the site clearing, tree removal, minor grading of the site related to the demolition, and associated Storm Water Pollution Prevention Plan measures in conjunction with demolition. The next phase of construction is scheduled to start construction in April 2009, which is authorized under the Phase I Site Development Permit. The scope of work consists of the infrastructure for blocks RES 1, 2, 3 (public streets and associated utilities), rough grading of the pads for blocks RES 1, 2, 3 and construction of the stormwater retention pond. Vertical construction on these three residential blocks is anticipated to begin as early as 2011.

The Bay Meadows project is an important component toward achieving increases in development density and transit ridership on the corridor, and is clearly an important factor for the land use scenarios proposed in the Multimodal Transportation Corridor Plan.

City of San Mateo: Rail Corridor Transit-Oriented Development Plan

The San Mateo Rail Corridor Transit-Oriented Development Plan was adopted on June 6, 2005. The plan created two TOD zones, generally located within one-half of a mile of either the Hayward Park Caltrain station or the Hillsdale Caltrain station. These two zones, as well as their respective land use designations, are provided in Figure 3-4. When adopting the TOD plan, the City also redesignated these areas as TOD in the General Plan and also changed the zoning to TOD. These areas are currently reflected as such on the General Plan Land Use and Zoning Maps.

Existing land uses with the Hayward Park and Hillsdale TOD zones are permitted to remain. However, all new developments are encouraged to be transit supportive and include elements such as housing, major employment centers, and local retail (cafes, grocery stores, etc). All new development within the TOD zones may have a reduced amount of parking from the city-wide standard along with a variety of other transportation demand management measures, and they must all join a Transportation Management Association that has been established. Large scale retail is discouraged as public transportation riders are unlikely to carry bulk purchase onto buses or trains. The maximum height restrictions

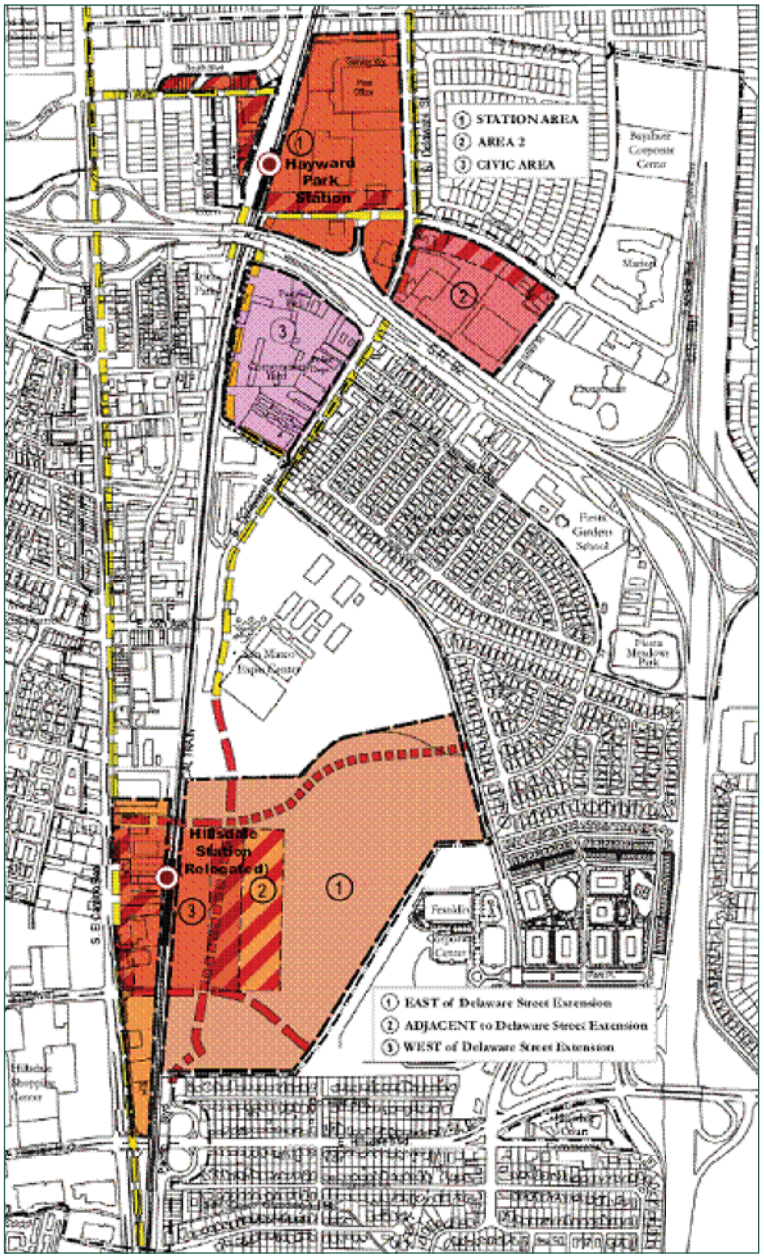


Figure 3-4. Rail Corridor TOD Plan Land Use Designations

range from 24 to 55 feet. The land use details for these two zones are as follows.

Hillsdale TOD zone:

- East of Delaware St. Extension.: Multi-family residential with a maximum of 50 units per net acre, a maximum FAR of 2.0 for employment and 3.0 for residential. Buildings are to be residential or employment only with no mixed-use. (Note, a majority of this area is further than one-quarter of a mile of El Camino Real but is still within one half of a mile of the Caltrain station).
- Adjacent to Delaware St. Extension: Medium density mixed-use developments with retail on the ground floor and residences or offices on upper floors. Maximum net residential density is 50 units per acre with a maximum FAR of 3.0.
- Between El Camino Real and Delaware St. Extension: High density mixed-use developments with retail on the ground floor and residences or offices on upper floors. Maximum net residential density is 50 units per acre with a maximum FAR of 3.0.
- South of 31st Ave, between El Camino Real and the Caltrain tracks: Medium density mixed-use developments with a maximum net residential density is 50 units per acre with a maximum FAR of 2.0.

Hayward Park TOD zone:

- Between El Camino Real and Delaware St., north of SR-92: Multi-family residential with net density between 35 to 50 units per acre, with the most intensive density development closest to the Caltrain station. Retail is designated a maximum overall FAR of 2.0 for this area, and 3.0 for retail fronting Concar Dr.
- Between El Camino Real and Delaware St., south of SR-92: Multi-family residential mixed-use with net density between 35 to 50 units per acre, permits employment use (adjacent to SR-92) with a maximum FAR of 1.0 and a maximum overall FAR of 2.0. A new public park or plaza is required (0.3 to 0.5 acres in size).
- East of Delaware St., between Concar Dr. and SR-92: Mixed-use development with 24 to 45 units per acre, a maximum FAR of 0.30 for retail and a maximum overall FAR of 2.0. (Note this area is between one-quarter and on-half mile from El Camino Real)

The creation of these TOD zones, particularly at the Hillsdale Station, which is served by Caltrain Baby Bullet service, is an important factor in the determination of potential high density land use nodes in the Multimodal Transportation Corridor Plan.

City of San Mateo: Hillsdale Station Area Plan

The scope of work for the Hillsdale Station Area Plan includes evaluating existing and alternative land uses of underutilized properties; analyzing market, regulatory and infrastructure conditions; preparing an environmental review document and a comprehensive station area plan with design guidelines, zoning regulations, and implementation strategies that encourage TOD in and around the study area. The Plan Area encompasses 151 acres (roughly .25 miles by 1.25 miles) of land in the City. The area stretches from the Caltrain right-of-way west to Flores Street and from 25th Avenue south to 36th Avenue. The Station Area Plan will establish criteria for new mixed-use developments and encourage shared parking with Caltrain users; facilitate the establishment of a new transportation hub for Caltrain, AC Transit, Sam Trans, and other mass transit services; and plan for new pedestrian and bicycle access connections from west of El Camino Real to the station area. The Station Area Plan will establish transitions to the future Bay Meadows Phase II neighborhood on the east side of the train tracks, as well as to the established commercial and residential neighborhoods west of El Camino Real.

Although this project is still in the early stages, the scope of work for this plan may require amendments to the General Plan and Zoning Ordinance and will therefore have an impact on land use densities and transit ridership in the area.

City of Belmont: Economic Development/Target Site Policy Amendments

Belmont continues to implement its comprehensive General Plan Update & Economic Development programs. The program includes targeting specific economic development sites (business recruitment, encouragement of mixed-use (residential/commercial) opportunities), aggressive property acquisition to facilitate Master Development projects, and offering a host of services to the business community to encourage business retention and growth. The long-term goals for the Emmett's Plaza, Firehouse Square, Belmont Station sites envision high quality redevelopment with an attractive mix of commercial, hotel, office, residential, open space and public gathering opportunities.

To further these goals, the City is in the midst of revising zoning regulations for these "Downtown Village Areas", the above-described Economic Development Target Sites, and the Downtown Specific Plan Area (DTSP). This project will update the City's planning and regulatory documents to be consistent with goals for Belmont Village,

Legend

- V2: Village Pedestrian Core
- V3: Village Corridors
- V4: Village Mixed Use Commercial
- VR: Village Residential Mixed Use
- R2: Residential (Duplex, Townhome, Small Lot Single Family)
- Planning Area Boundary

0 250 500
FEET

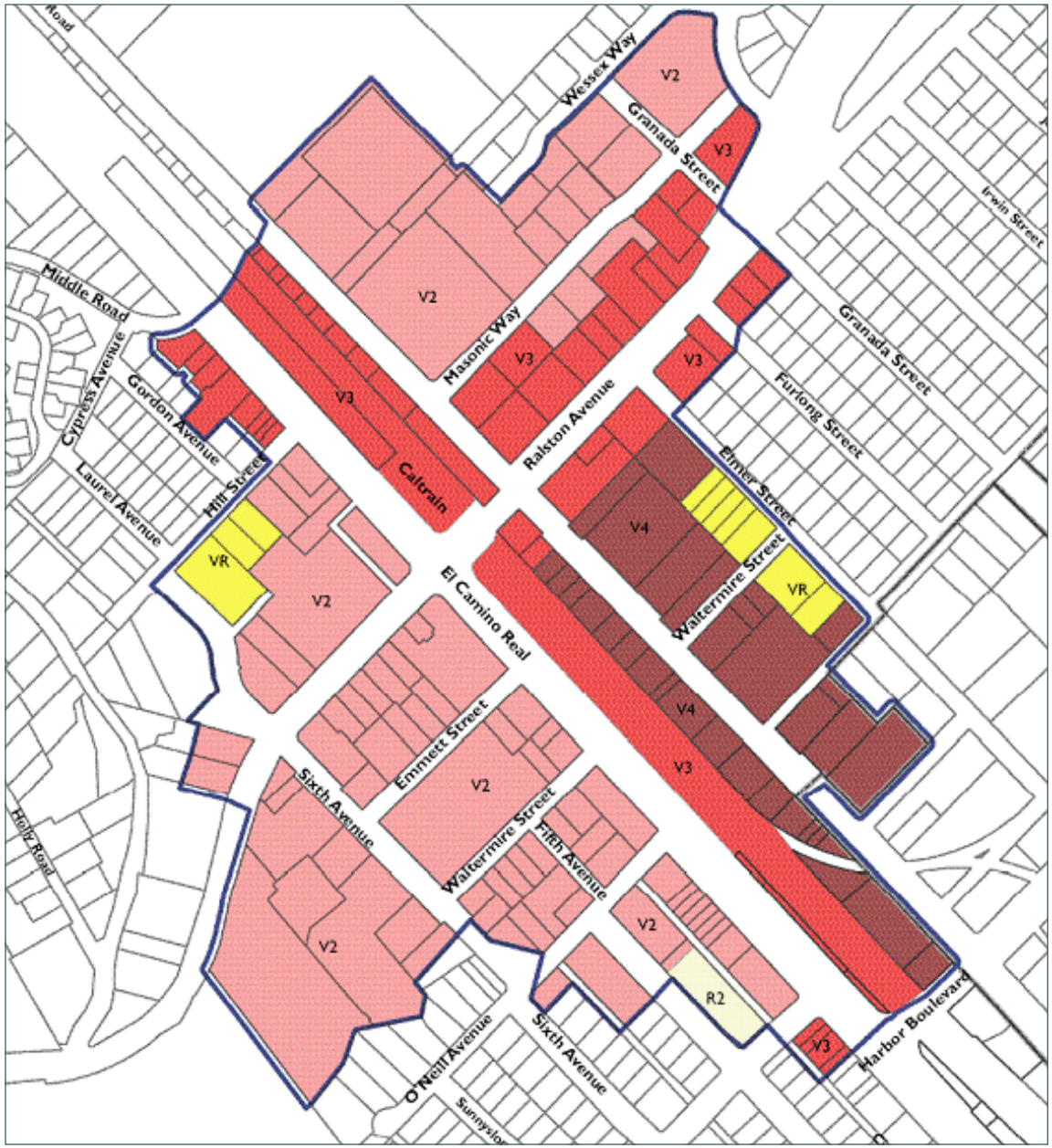


Figure 3-5. Proposed Belmont Village Zoning

including the three target sites. Draft zoning districts are being prepared to clarify, streamline, and update land use regulations, development standards, and design guidelines for the Belmont Village area. New development standards and design guidelines will be added to existing regulations to achieve the desired quality and character in development projects.

Proposed Belmont "Village Districts" Zoning

A draft zoning map of the proposed Belmont Village, displayed in Figure 3-5, includes four new districts and one existing residential district. The permitted land uses, development standards and design guidelines will be regulated in a new section of the Zoning Ordinance, Village Districts. Each district's purpose is defined as follows:

- V-1 Reserved. This district is reserved for future use.
- V-2 Pedestrian Core. The regulations for the V-2 District are intended to support the development and redevelopment of an active pedestrian-oriented village center. Retail, restaurant, and commercial service uses are the predominant uses on the ground floor. Public plazas and sidewalk areas with pedestrian amenities are provided. Office and residential uses are located on upper floors. The V-2 District also provides for hotel and entertainment uses. This district replaces the existing C2, C/R, CBD, C1, and E1 districts.
- V-3 Corridors. The V-3 District recognizes El Camino Real, Ralston Avenue and Old County Road as major transportation corridors within the Village. The regulations in this district are intended to provide a range of community and regional commercial uses, including auto-oriented uses, while supporting alternative modes of travel. Office and residential uses are allowed, particularly above the ground floor. Sidewalk areas are designed to be pedestrian-oriented, with street trees, street furniture, and other amenities. This district replaces the existing C3 and A Districts.
- V-4 Mixed Use Commercial. The V-4 District is intended to maintain and encourage a mix of retail, restaurant, office, commercial service, and public uses. Residential uses are allowed on upper floors. This district replaces the existing C4 district.
- V-R Residential Mixed Use. The V-R District is intended to provide for residential mixed use development which supports an active and vibrant Belmont Village by creating additional unique housing opportunities within the Village area. This district allows for a variety of housing types, such as small lot single family, live/work units, townhouses, condos, and apartments. In addition, certain retail and commercial service uses will be allowed on the ground floor. This district replaces the existing R4 district.
- R-2 Duplex Residential. No changes are being presented for the R2 District at this time.

The Belmont Village Districts Zoning Amendments are scheduled for Public Hearings with the Planning Commission & City Council in Summer/Fall 2010.

While the policy amendments to the Economic Development/Target Site are still underway, the direction that Belmont is moving in regards to land use, such as increasing mixed-use developments in the Belmont Village plan, will no doubt have a high impact on land use densities and transit ridership in the area.

City of San Carlos: General Plan Update

In October 2009, the City of San Carlos adopted the General Plan update, which plans for mixed-use developments in the downtown area and along El Camino Real. The plan will retain and enhance the vitality of the Downtown to ensure it remains a central point for social interaction and commercial activity.

The General Plan update introduces "mixed use" land use designations, which are located along previously Commercially designated El Camino Real and Laurel St. in the Downtown. A map of the land use for San Carlos is provided in Figure 3-6. The majority of El Camino Real and the area within two blocks are designated as medium density mixed use or retail/mixed use which allow 21 to 50 dwelling units per acre. Additional mixed use is located within the San Carlos downtown area along San Carlos Ave.

The introduction of higher-density residential housing within mixed use areas near the existing Caltrain station will no doubt have a high impact on land use densities and transit ridership in the area.

City of Redwood City: General Plan Update

The City of Redwood City is currently in the process of preparing a new General Plan. The focus for the El Camino Real corridor is to provide more housing and mixed-use developments in order to take advantage of the existing services, facilities, and public transit along the corridor.

The General Plan designates all of El Camino Real as mixed-use and varies the density levels from Mixed Use – Neighborhood (maximum 40 dwelling units per acre) along the south end of the city to Mixed Use – Corridor (maximum 60 dwelling units per acre), to Mixed Use – Downtown in the downtown area surrounding the Caltrain station where a limit is placed on the number of additional units and square feet of residential space instead of a density or FAR. The new General Plan calls for a moderate growth of 2,500 units for the Downtown area and 400,000 sq. ft. of additional nonresidential space. Medium, medium high, and high density residential, which allow 20, 30, and 40 dwelling units per acre, respectively, then begin within a block or two of El Camino Real. The draft land use map, as given in the November 2009 draft, is provided in Figure 3-7.

The concentration of mixed-use and residential developments in this plan along El Camino Real will influence overall densities and support transit ridership in the area.

City of Redwood City: Downtown Precise Plan

The City of Redwood City is currently in the process of revising and re-adopting the Redwood City Downtown Precise Plan (DTPP). This document established a vision for development in the heart of the city. It incorporates zoning regulations for private actions including standards for site development, street design, landscaping, public spaces, parking, architecture, and signage. The goal is to transform downtown Redwood City into a dense, mixed-use, walkable neighborhood featuring a large job base and a regional mass transit connection. Maximum height limits range from 3 to 12 stories, with the most common limit being 8 stories. See Figure 3-8 for a map of the DTPP Use Zones.

The DTPP includes extensive plans for mixed-use development in the downtown area, which includes a segment of El Camino Real and nearly 200 acres of land, most of which lies to the east of El Camino Real but is within one-half of a mile of it. The vision of the plan is that the DTPP will transform El Camino Real, from Brewster to Maple, from the existing strip development style to a pedestrian friendly, residential corridor with limited retail/commercial space. The west side of El Camino Real will have a maximum height of four stories. The east side, with the exception of the area between James Ave. and Jefferson Ave, will have a maximum height of eight stories with a four story streetwall to match the west side. There is a 10 story limit between James Ave. and Jefferson Ave. with a four story streetwall to match the west side. These changes are directly in line with the vision of the Grand Boulevard Initiative, and are important components of the land use scenarios to be modeled in the Multimodal Transportation Corridor Plan.

The increased population density to be

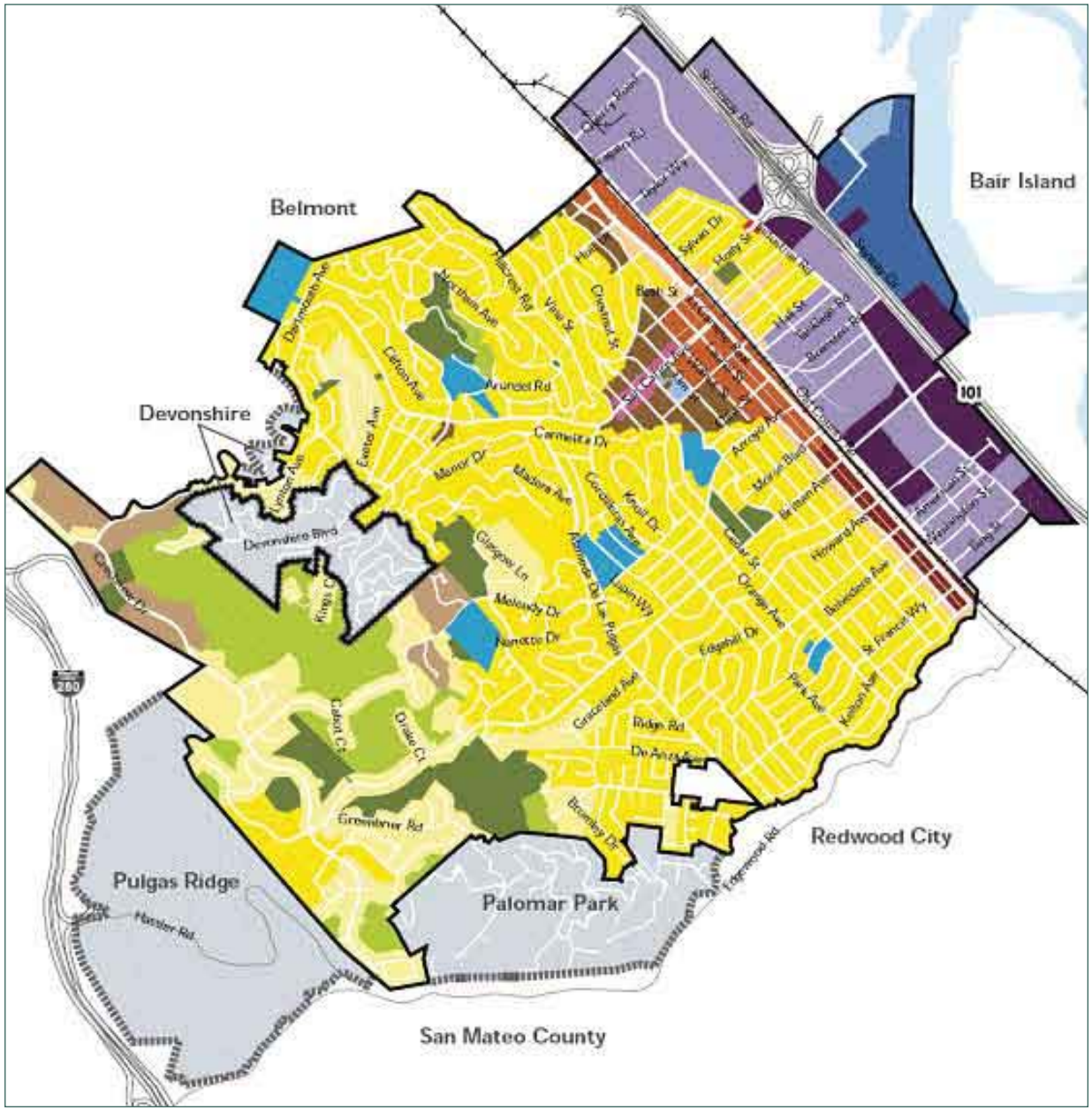


Figure 3-6. San Carlos General Plan Land Use Map

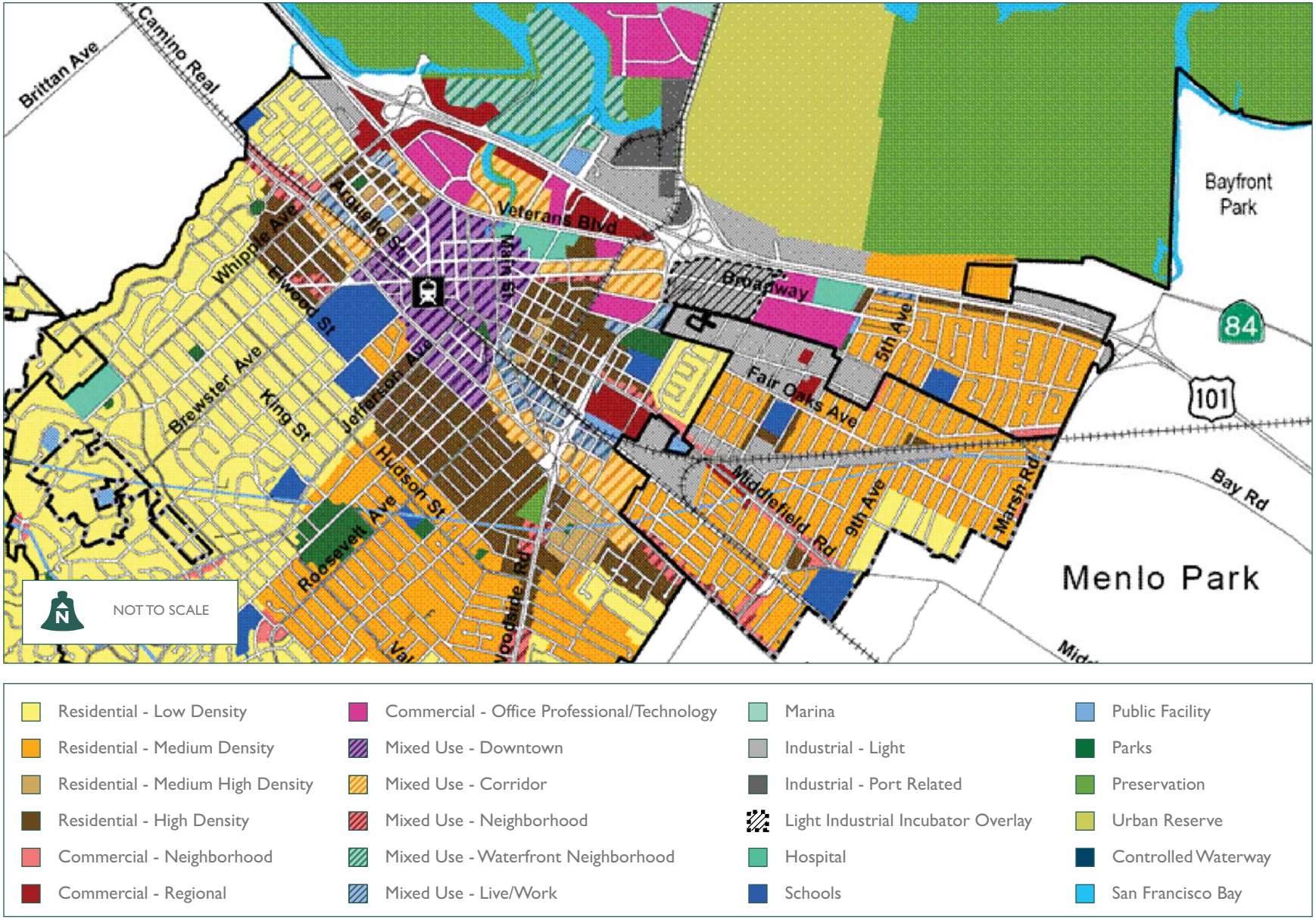


Figure 3-7. Redwood City Draft General Plan Land Use Map

Legend

- Entertainment District
- Downtown Core
- Downtown General
- Downtown Core Railroad
- Downtown General Railroad
- Active Ground Floor Uses Required
- ★ Historic Resources

NOT TO SCALE

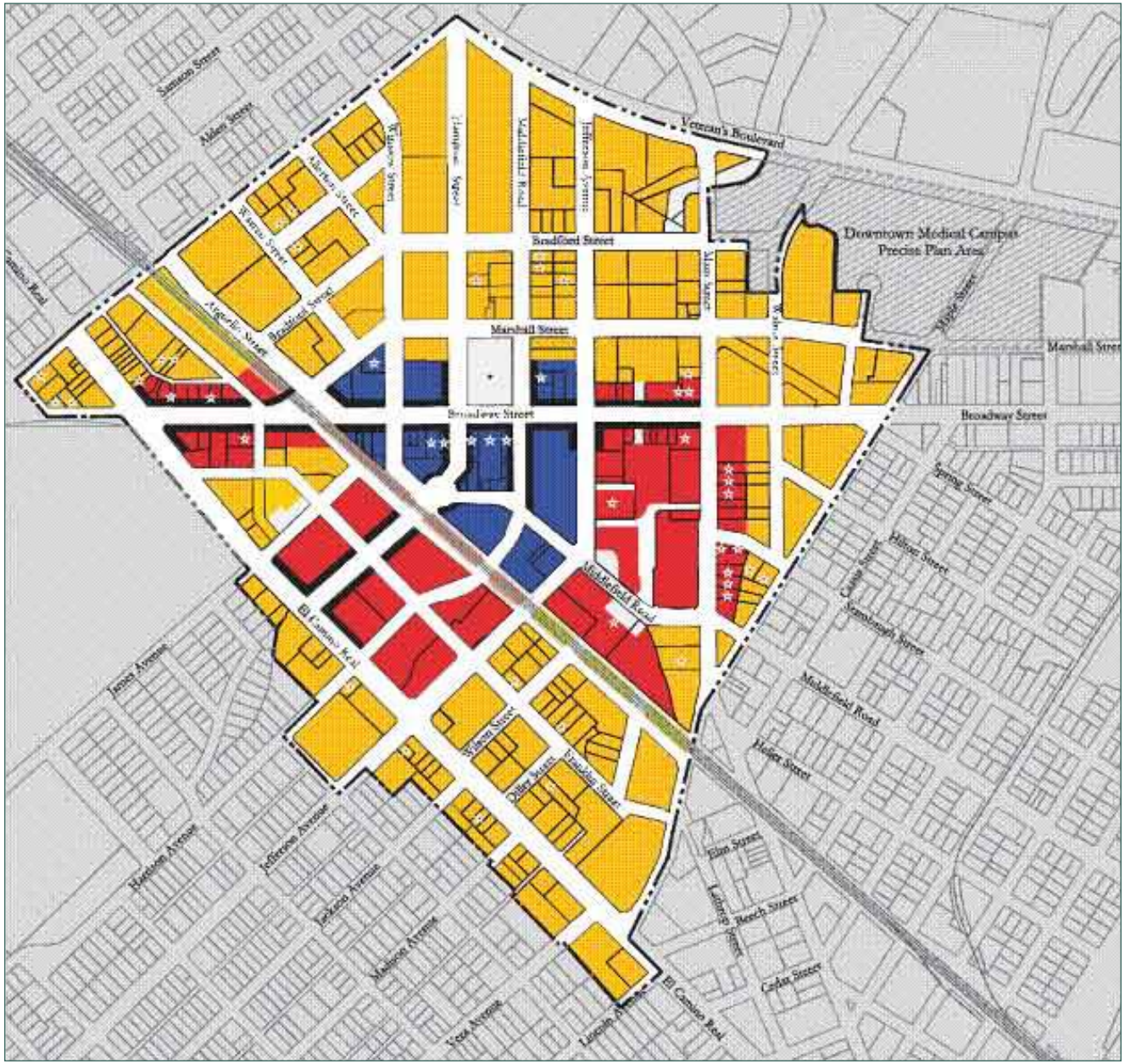


Figure 3-8. Redwood City Draft Downtown Precise Plan Use Zones

brought about by the zoning changes in the DTPP and the planned developments in the downtown area will almost certainly increase public transit use and will therefore impact the Multimodal Transportation Corridor Plan.

San Mateo County: North Fair Oaks Station Area Plan

North Fair Oaks is an unincorporated community situated west of El Camino Real between Redwood City, Atherton, and Menlo Park. The area is currently zoned primarily as residential, with some commercial designations along El Camino Real and Middlefield, and some industrial areas in the north east portion of the community. Commercial and other non-residential uses, as well as mixed-use development, are precluded in the areas of North Fair Oaks that are zoned for residential uses.

The goal of the North Fair Oaks Station Area is to transform the community into a diverse, transit-centered neighborhood with mixed-income housing. The plan will focus higher density residential zoning along El Camino Real and Middlefield Rd, the two main transit corridors in the community.

This plan will involve changes to zoning, land use designations, subdivision regulations, and changes to land use policies specific to North Fair Oaks, as well as the creation and identification of other policies and programs needed to support new development and transportation patterns in the area. The plan and its implementation will no doubt impact land use and transit ridership in the area.

City of Menlo Park: El Camino Real/Downtown Specific Plan

In early 2007, the City of Menlo Park City Council identified a goal to set a clear long-term plan for the El Camino Real and downtown areas. To achieve this goal, a two phase study was implemented. Phase I emphasized the community visioning process and in July 2008, the City of Menlo Park City Council accepted the El Camino Real/Downtown Vision Plan. This plan, which was developed through intensive outreach and discussion, reflects the vision of the community for the downtown and El Camino Real corridor and presents a starting point for future discussion and community planning. Included in the Vision Plan is the desire to provide additional housing in the project area, such as increasing activity near the Caltrain station through the addition of housing opportunities and mixed-use developments.

The City of Menlo Park is currently working on Phase II, the development of a Specific Plan. The Specific Plan will determine the implementation strategy for the vision developed in Phase I and will address questions such as the impacts and benefits to traffic and land use zoning/designation changes. In addition to the development and adoption of the Specific Plan, amendments to the General Plan and Zoning Ordinance, along with an Environmental Impact Report, will also be completed.

Although the specific land use designations have not yet been finalized, the direction that Menlo Park is moving in regards to their vision for land use, such as introducing residential and mixed-use developments at the Caltrain, and the possible amendments to the General Plan and Zoning Ordinance, are anticipated to have an impact on land use densities and transit ridership in the area.

3.1.2. Santa Clara County

Between 2005 and the present, four cities in Santa Clara County developed, or are in the process of developing, policy documents which affect the land uses on the El Camino Real corridor. An overview of these changes is given below, beginning with the most northern city and moving towards San Jose:

- City of Mountain View: General Plan Update
- City of Mountain View: San Antonio Center Precise Plan Update
- City of Sunnyvale: El Camino Real Precise Plan

- City of Santa Clara: General Plan Update
- City of Santa Clara: Santa Clara Station Area Plan
- City of San Jose: General Plan Update
- City of San Jose: Diridon Station Area Plan

City of Mountain View: General Plan Update

The City Of Mountain View is currently updating its General Plan through the Mountain View 2030 process. The General Plan is the City of Mountain View's blueprint for the future, a guide for the City that includes all of the aspects essential to creating a thriving and well-balanced community such as housing, transportation, parks and open space, community services and facilities, and land use. It establishes future growth and land use development goals and policies for the City. Mountain View's General Plan was last updated in 1992. The General Plan update will provide the City with goals and policies that more accurately reflect shared community values, potential change areas, and compliance with state law and local ordinances. The update will also provide a guide for future land use decisions.

In March 2008, the City began the visioning process for the General Plan update. This city-wide process actively engaged the community and key stakeholders in helping to envision the city's future through the year 2030. Through an extensive outreach effort, many residents were given the opportunity to share their ideas and opinions of the city's assets, challenges, values, and vision for the future. The product of this visioning process, the visioning report, is a synthesis and reflection of the community's input and feedback received from participants in the community process. The document serves as a starting point for the City's General Plan Update and provides guidance for future policy and planning decisions related to land use, housing, economic development, sustainability, and community services and facilities, along with other related planning efforts in the city. These include the Housing Element update, Environmental Sustainability Task Force recommendations, Parks and Open Space Plan, the Recreation Plan, Economic Development Strategy, and the Senior Advisory Task Force report.

Over the past year and a half, the Mountain View 2030 process has advanced from visioning to more specific planning and analysis. The City is currently considering alternate land use scenarios for the potential change areas, including the El Camino Real corridor. While specific land use densities have not been drafted at this stage, the growth and land use plans to be included in the General Plan Update may have an impact on land use densities and transit ridership in the area.

City of Mountain View: San Antonio Center Precise Plan Update

In January 2009, the Mountain View City Council approved a "gatekeeper request" to authorize the assignment of staff and other resources for an application for a General Plan amendment and an amendment to the San Antonio Center Precise Plan. The San Antonio Center Precise Plan covers an area that is directly adjacent to the Grand Boulevard Corridor, bounded by California Street to the north, San Antonio Road to the west, El Camino Real to the south, and Showers Drive to the east. The applicants for these amendments envision a revised Precise Plan which includes the following:

- Introduction of multi-family housing and parking structures to the existing mix of retail office and hospitality uses
- Intensification of the current allowed building area from 1.2 million square feet (about 0.5 FAR) to a higher density and revised development guidelines for setbacks, parking, etc.
- Improving site access and creating an internal circulation framework
- Development of an open space framework and design criteria.

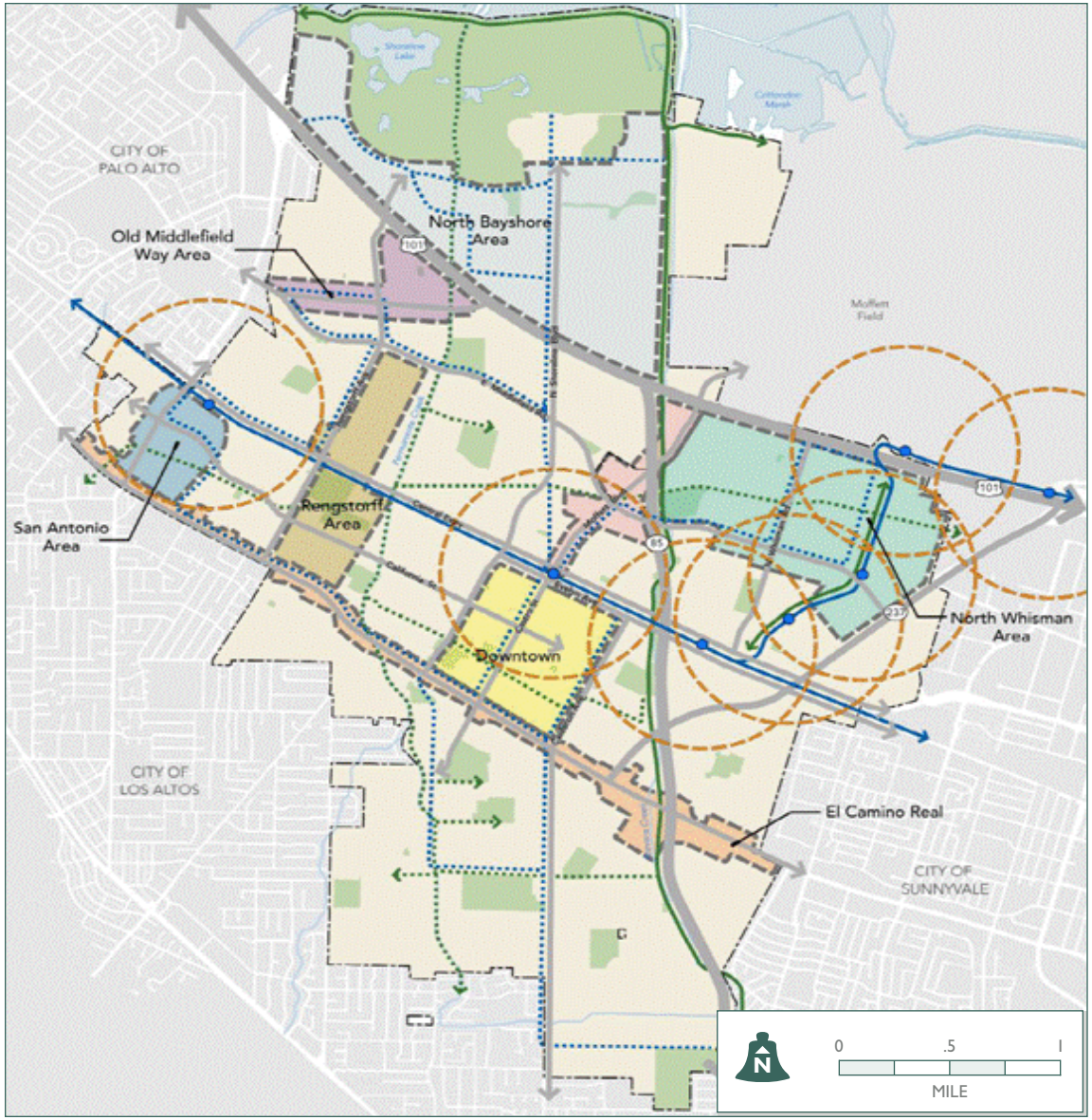


Figure 3-9. City of Mountain View Visioning Plan - Strategy Framework

The City's 1992 General Plan recognized the San Antonio Center as a major regional commercial center and the important role of maintaining the center's competitiveness by providing opportunities to rejuvenate and redevelop the area. The City's General Plan visioning process identified the center as a focus area in the General Plan update and emphasized the importance of the area as a major regional shopping destination and creating an exciting place to shop, work and live. The project is consistent with these goals and the City's Economic Development Strategy to stabilize and diversify the City's revenue and employment base.

The increased concentration of people to be brought about by the increased density, revised development guidelines, and introduction of housing to the San Antonio Center will likely increase public transit usage and will therefore have an impact the Multimodal Transportation Corridor Plan.

City of Sunnyvale: El Camino Real Precise Plan

The El Camino Precise Plan, adopted by the City of Sunnyvale on January 23, 2007, offers strategies to transform El Camino Real into a major commercial and transportation spine that provides desirable services in inviting, well-planned human scale-developments.

El Camino Real in Sunnyvale currently consists of general retail, auto dealerships, hotels, restaurants, and higher-density retail. The plan identifies four major areas (nodes) where relatively high-density development is encouraged. These four nodes, displayed graphically in Figure 3-10, are:

1. Western border of Sunnyvale at El Camino Real and Bernardo Ave.
2. Downtown, from west of Hollenbeck Ave. to Cezanne Dr.
3. Community center at El Camino Real and Fair Oaks Ave./Remington Dr.
4. El Camino Real between Wolfe Rd. and Fremont Ave.

The plan encourages developing mixed-use projects at the four nodes and discourages mid-block mixed-use developments. A minimum two-acre parcel is required for mixed-use projects that include residential unit and a minimum goal of 25 percent retail is suggested.

The plan establishes the vision for El Camino Real and sets forth design guidelines that will apply to all new developments in all locations along the street, as well as changes to the site development and building design of existing buildings. However, the Precise Plan does not change any existing land use designations, and future mixed-use or residential uses would be reviewed on a case-by-case basis, depending on how it works with the surrounding neighborhood and other local and regional issues. The level of impact that this plan should have on the Multimodal Transportation Corridor Plan is therefore uncertain, though may be high due to the potential increase in public transit use to, from and around the nodes.

City of Santa Clara: General Plan Update

The City of Santa Clara is currently undertaking a comprehensive update of its General Plan. The development of the General Plan is a collaborative effort between the City and the community to create a shared vision and outline policies that will guide development through 2035. The City has undertaken an aggressive community outreach approach to gather input from residents, business owners

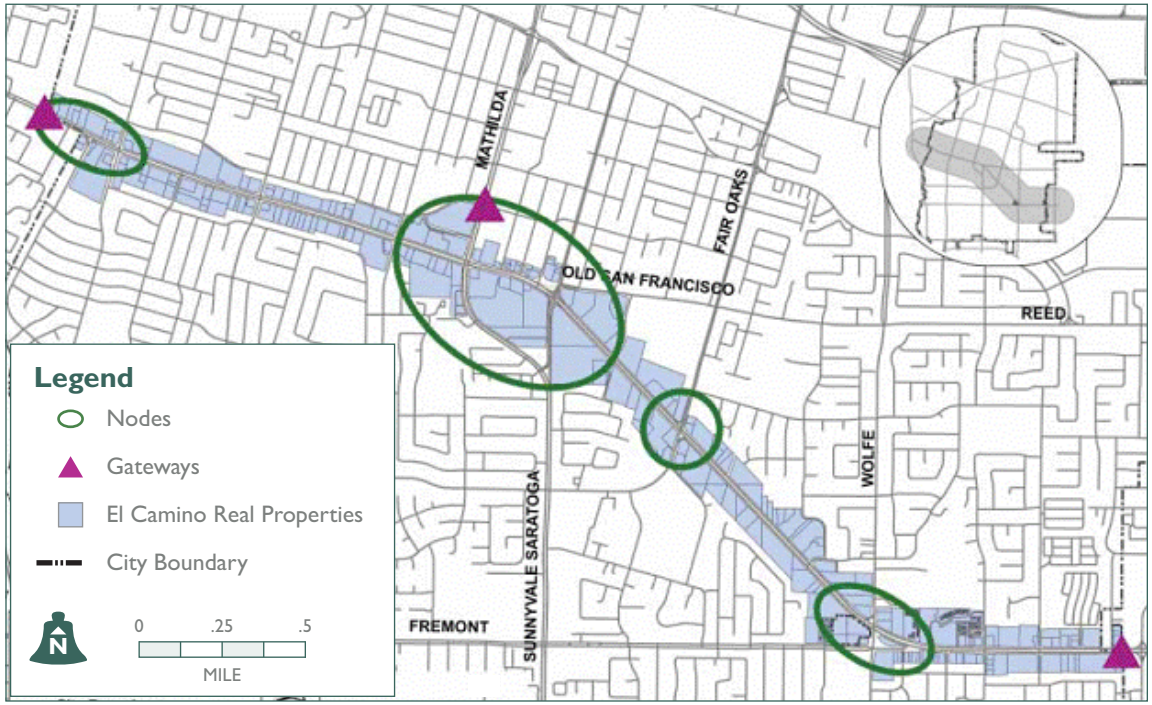


Figure 3-10. Sunnyvale El Camino Real Precise Plan Node Locations

and other stakeholders to help guide the planning process.

The City of Santa Clara has undergone great changes since the current General Plan was prepared in 1992. Market conditions and the larger metropolitan context surrounding the City have fluctuated over the past fifteen years; however, Santa Clara's economy has been resilient. The City's many assets have continued to attract residents and businesses and set the foundation for an even stronger future. In 2007, the City was home to over 114,000 residents, making it the third most populous city in Santa Clara County.

Many of the objectives of the City of Santa Clara's existing General Plan have been met and many new opportunities and challenges have emerged. As the City is surrounded by other incorporated communities, physical expansion is no longer a possibility. New development will need to fit within the existing community fabric. Santa Clara's evolution into a "built-out" City is an appropriate reason to take a fresh look at the vision for the City and it is a chance for residents, businesses and visitors to define its future. Much of the City, especially its residential neighborhoods, will not undergo land use changes in the new General Plan; however, in order to accommodate the City's share of the projected regional population, additional housing will need to be built in a way that is sensitive to established neighborhoods, respects historical resources, and supports transit use. As the City looks toward a future of infill growth, new development provides opportunities to enhance the existing community, creating more walkable places and new neighborhood-scale commercial destinations. The General Plan Update will also address new planning efforts now underway, such as the Downtown, near Lafayette and Homestead, and Santa Clara Station Area, at El Camino Real and Benton. To ensure the preservation of the City's existing assets and natural resources, the General Plan will incorporate additional elements, over and above the State's requirements, that address sustainability, historic preservation and neighborhood compatibility.

While specific land uses have not yet been adopted at this stage, infill growth for new housing and commercial development will likely result in increased land use densities and transit ridership in the area.

City of Santa Clara: Santa Clara Station Area Plan

The City of Santa Clara's General Plan Update highlights development for several Focus Areas including the area around the Santa Clara Transit Center. The Santa Clara Station Focus Area incorporates the elements developed in a cooperative planning effort between the City of Santa Clara, the City of San José and the Valley Transportation Authority (VTA). To implement the community vision, this Focus Area includes policies for the future development of the area surrounding the station. It provides guidance for land use, urban design, open space, streets, and other improvements. It also includes policies to integrate the Santa Clara Station and proposed new development in the Focus Area with existing surrounding neighborhoods, as well as with current and future plans for Santa Clara University.

In the Santa Clara Station Focus Area, existing development of low-intensity retail, office, residential and light industrial uses along El Camino Real would generally be replaced by larger scale, mixed-use development. This Focus Area will serve as a gateway into the City, improve the City's economic base with expanded office, hotel and retail uses, maximize opportunities for residential development and provide improved pedestrian, bicycle and transit connections.

A public review draft of the Santa Clara Station Area Plan has been prepared, but the plan has not yet been adopted by the City of Santa Clara or the City of San Jose. The Santa Clara Station Focus Area will be forwarded for consideration to the City Council as part of the City of Santa Clara's General Plan Update process. Zoning changes would be considered through project applications

Legend

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Very High Density Residential
- Regional Commercial (Emphasis on office and hotel uses)
- Regional Mixed Use (Emphasis on residential and commercial uses)
- Community Mixed Use
- Public/Quasi Public
- Light Industrial
- City Boundary
- Focus Area Boundary
- Potential Street
- Pedestrian Connection
- Pedestrian Orientation/ Active Street Frontage
- Proposed Open Space (Not to Scale)

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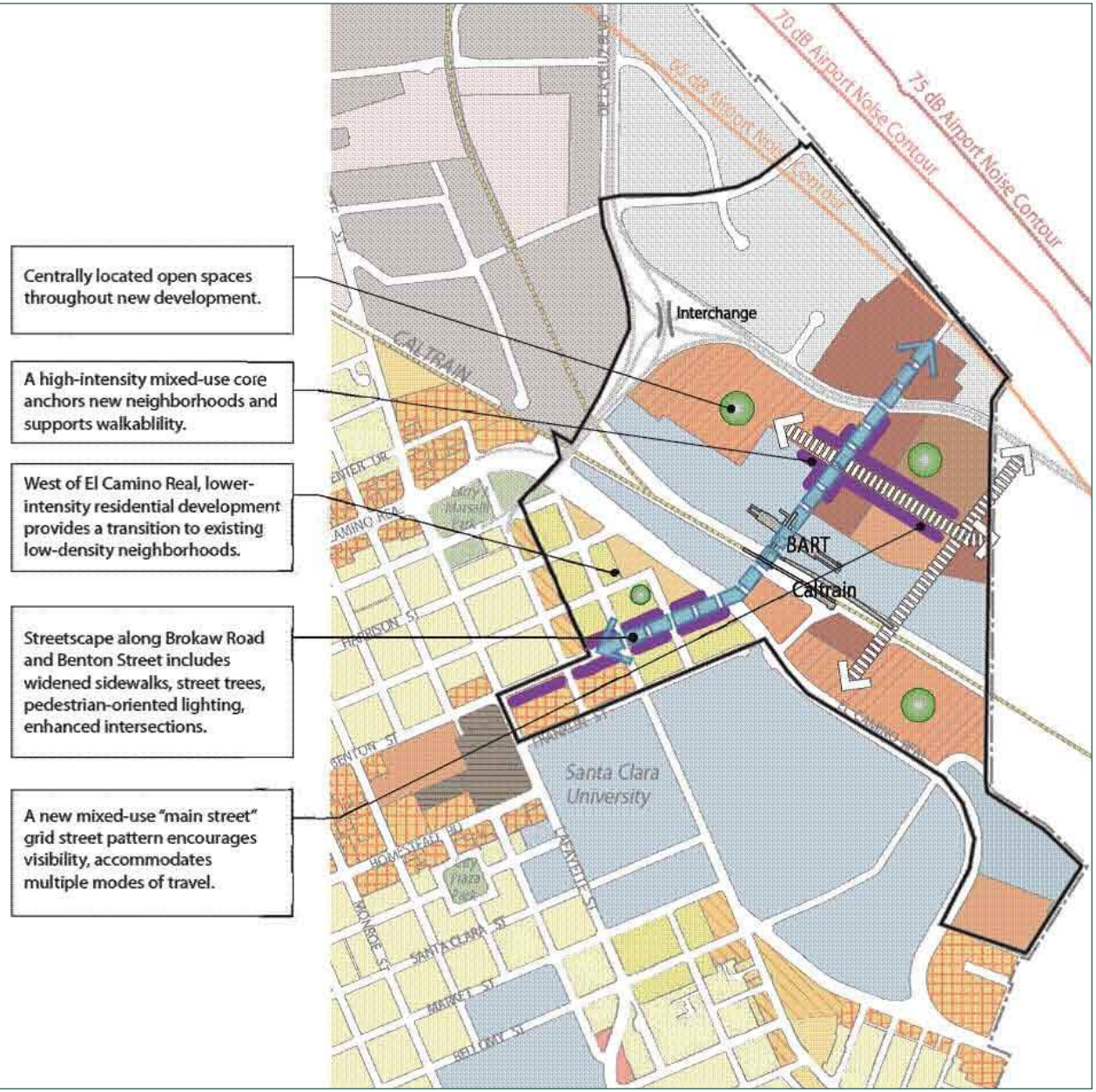


Figure 3-11. Santa Clara Station Area Plan Focus Area

for development in the Focus Area. The land use changes introduced for the Santa Clara Station Focus Area are anticipated to promote an increase in public transit use along El Camino Real and support the Multimodal Transportation Corridor Plan.

City of San Jose: General Plan Update

The City of San Jose is also conducting a General Plan update, to adjust their 1994 document to meet the changing needs of the city. On June 26, 2007 the City Council approved the proposed Guiding Principles, Work Program and Community Participation Program for the Envision San Jose 2040 General Plan Update. On August 7, 2007 the Council approved of the proposed membership of the Envision San Jose Task Force of community members to guide the General Plan Update process.

Over the past two and a half years, the Envision San Jose 2040 process has moved forward, and land use scenarios including different uses and densities have been proposed and evaluated. While specific land use densities have not been adopted at this stage, the development of this plan will have an impact on land use densities and transit ridership in the area.

City of San Jose: Diridon Station Area Plan

In 2008, the City of San Jose received a grant from the Metropolitan Transportation Commission (MTC) to develop a Station Area Plan for the Diridon Station Area as part of MTC's Station Area Planning Program. The Diridon Station Area, defined as the area within one half of a mile of Diridon Station, occupies a unique position in San Jose, and it the terminus of the Grand Boulevard Initiative study area. As Downtown San Jose continues to be transformed into a vital urban center, the Diridon Station is expected to be it major transit hub. With bus and light rail service, expanded commuter rail, a new BART station, and future high speed rail connections, the study area will also be a key regional hub for the entire Bay Area.

In June, 2009, the San Jose City Council approved the scope for the plan. The focus of the Plan will be to establish a strong but flexible planning framework that will maximize the TOD potential at the station area and create a vibrant regional center with high transit use and sense of place. The Station Area Plan project goals include:

- Enhance the existing residential neighborhood and add high density residential development.
- Provide a variety of commercial and mixed used development opportunities, ranging from large scale corporate or institutional sites to incremental infill development zones.
- Create a high, activity, lively pedestrian environment with excellent connectivity to downtown destinations and transit.
- Expand Diridon Station to create a well integrated center of architectural and functional significance.

While specific land use densities have not been adopted at this stage, the development of this plan will no doubt have a high impact on land use densities and transit ridership in the area.

City of San Jose: The Alameda: A Plan for the Beautiful Way

The Alameda: A Plan for "The Beautiful Way", is a vision designed to reinvigorate a commercial center, encourage multi-modal transportation, serve residents of surrounding neighborhoods, transit users, and business owners; contribute to a more livable and cohesive community; and foster economic and residential development.

The Redevelopment Agency, City of San Jose and The Alameda community were awarded a $250,000 Caltrans Community-Based Transportation Planning Grant for The Alameda corridor, an area covering approximately 1.5

miles between Diridon Station and Interstate Route 880. Included in this plan are design recommendations that are intended to help enliven The Alameda as a retail center and multi-modal transportation corridor and to foster economic development, while at the same time protecting the historic neighborhoods that surround it and making it the destination of choice for residents of the area.

3.2. Transportation and Streetscape Plans and Changes

As summarized in the prior sections of this chapter, numerous adopted policy documents have a bearing on land use, development, and capital improvements along the corridor. These include local general plans and zoning codes as well as focused area and specific plans that address discrete properties or portions of the corridor.

In general, these local land use policy plans, regulations, and development guidelines create a corridor land use pattern consisting of "nodes" and "links." Nodes are areas planned for mixed-use development, with higher densities and higher levels of pedestrian activity than link areas. Nodes are generally associated with transit centers, special development sites, or downtown commercial districts; eleven of the nineteen communities located within the boundaries of the GBI corridor have downtown districts that intersect or include a portion of El Camino Real. A number of the policy plans prepared for the corridor focus specifically on node areas. Examples include the Milbrae Station Area Specific Plan (1998), and the Santa Clara Station Area Plan (ongoing).

Links are areas located between nodes, where some land use change is anticipated but typical arterial commercial forms of development are also planned to remain. A number of these areas contain major shopping centers and "auto rows" that are important to local community tax bases. Other forms of development in these areas include apartment complexes, office campuses, and smaller-scale strip commercial developments. Links could also be considered to include residential and lower density properties that line the corridor frontage in Colma, Burlingame, and Atherton. Examples of focused plans that address link areas include the Palo Alto South El Camino Real Design Guidelines (2002) and the San Mateo El Camino Real Master Plan (2001).

Most local community plans address private development along the corridor but not improvements to the street right-of-way. Interviews indicate this is generally because of the lack of local jurisdiction and the real and perceived challenges associated with the Caltrans project review process. Fourteen adopted policy plans contain specific policy recommendations for capital improvements, including the three Transforming El Camino Real plans. Palo Alto's Master Schematic Design Plan for El Camino (2003) is no for its comprehensive background assessment of traffic calming and lane reduction approaches, and the participation of Caltrans staff. South San Francisco's recent El Camino Real Master Plan (2006) focuses on landscape improvements to medians and sidewalk frontages. Additionally, the City of San Jose recently completed The Alameda: A Plan for the Beautiful Way, a multimodal design and street improvement plan for The Alameda through a Caltrans-funded 'Community-Based Transportation Planning' grant.

VTA's *Community Design and Transportation Manual* (2003), *Pedestrian Technical Guidelines* (2003), and *Bicycle Technical Guidelines* (2007) contain specific recommendations and dimensioned plans for improvements to regional corridors, major roads, corridor streets, and multi-use streets that are directly applicable to the SR 82 corridor.

VTA has also recently completed a Bus Rapid Transit (BRT) Strategic Plan, which evaluates the feasibility and effectiveness of BRT service on six corridors in Santa Clara County. The June 2009 Final Report proposes

a combination of dedicated bus-only median lanes and mixed flow bus-and-auto lanes along El Camino Real and The Alameda between downtown Palo Alto and San Jose, with substantial "LRT-comparable" shelters and other amenities at BRT stations. Conceptual engineering for BRT along El Camino Real and The Alameda in Santa Clara County is scheduled to being in mid-2010.

A number of local communities currently have street improvement projects underway on El Camino Real. These include the following:

- *Daly City:* Between John Daly Boulevard and Parkview Avenue; includes transit plaza, sidewalk widening, median renovations, pedestrian crossings, street trees, and and lighting improvements.
- *San Bruno:* Between Noor Avenue and Jenevein Avenue; includes landscaped median islands and pedestrian signal installation at 9 intersections.
- *Millbrae:* Victoria Avenue and El Camino Real; includes new traffic signal, enhanced landscape median, pedestrian refuge, and improved crosswalks.
- *Hillsborough/Burlingame:* Floribunda Avenue/El Camino Real intersection, and between Oak Grove and Bellevue Avenue; includes turn lanes, pedestrian crossings, and frontage landscaping.
- *San Mateo:* Between 28th and 31st Avenues; includes landscaped median, pedestrian crossings, street tree and lighting improvements, and a monument sign.
- *San Carlos:* Between Oak Street and Olive Street; includes median renovation, pedestrian crossings, and street tree and lighting improvements.
- *Redwood City:* Project between Brewster Avenue and Broadway; includes sidewalk widening, median renovation, pedestrian crossings, and street tree and lighting improvements.
- *Palo Alto:* Stanford Avenue/El Camino Real intersection; includes improved pedestrian crossings, pedestrian refuges, widened medians, street trees, lighting, and bike lane improvements.
- San Jose: Pedestrian safety and streetscape improvements to the "Town Center" portion of The Alameda, between Stockton Avenue and Fremont Street; this project implements Phase 1A of the improvements identified in The Alameda: A Plan for the Beautiful Way and will be funded in part with a regional Transportation for Livable Communities grant, with design beginning in late 2010 and construction completion expected by February 2013.

3.3. CMA Grant and Incentive Programs

The following is a summary of projects that have received grants and or incentives for planning and capital projects through C/CAG's existing TOD and El Camino Real Incentive Programs and VTA's Community Design and Transportation Program. These results provide an understanding of the effects that these
grant and incentive programs may have on the corridor.

SamTrans kicked off its Comprehensive Operational Analysis (COA) in July of this year. The goal of the COA is to evaluate and restructure SamTrans services and operations to more efficiently and effectively serve the county's transit needs and meet regional transportation goals, within the constraints of the current financial and operating environment. Key Objectives of the COA include:

- Implementing the District's Strategic Plan goal of improving financial stability
- Identifying improvements to the bus transit system
- Evaluating opportunities to improve transit system's market share.

Program	Project Name	City	Status
TOD Housing Incentive Program	Franklin Street Apartments	Redwood City	Funded
TOD Housing Incentive Program	Colma BART Apartments	County of San Mateo	Funded
TOD Housing Incentive Program	1000 El Camino Real	San Carlos	Committed
TOD Housing Incentive Program	Montgomery Villas	Redwood City	Funded
TOD Housing Incentive Program	South San Francisco BART Station Transit Village	South San Francisco	Funded
TOD Housing Incentive Program	Landmark Plaza Development	Daly City	Funded
TOD Housing Incentive Program	Goodyear Site/Mid-Peninsula Housing Coalition	San Mateo	Committed
TOD Housing Incentive Program	Mission & Westlake - Mixed Use	Daly City	Committed
TOD Housing Incentive Program	Peninsula Habitat for Humanity	Daly City	Committed
TOD Housing Incentive Program	Park Paradise	Millbrae	Committed
TOD Housing Incentive Program	San Carlos Transit Village	San Carlos	Committed
El Camino Real Incentive Program	San Bruno Downtown and Transit Corridors Specific Plan	San Bruno	Funded

Table 3-1. *Projects funded on El Camino Real by C/CAG Incentive Programs*

Santa Clara Valley Transportation Authority Community Design & Transportation Program

The Santa Clara Valley Transportation Authority Community Design & Transportation Program (2003) recommends best practices for the integration of transportation, land-use planning, community design and decision-making in Santa Clara County. The CDT Program was developed through an extensive community outreach strategy in partnership with VTA Member Agencies, and was endorsed by all 15 Santa Clara cities and the county. The resulting CDT Manual of Best Practices for Integrating Transportation and Land Use is written to address the land-use and transportation choices of Santa Clara County, but could also benefit other jurisdictions. The CDT Manual identifies critical transportation corridors—including El Camino Real/The Alameda—and recommends policies and practices that cities can implement to promote transit- and pedestrian-friendly environments. The CDT Manual serves as a policy, technical, and design guide for city and regional planners, engineers, architects, and decision-makers, and highlights the importance of well designed, amenity-rich, compact development near transit, as well as the benefits of offering multiple transportation options. The Manual also emphasizes the importance of good design in improving the pedestrian environment and creating a sense of place.

VTA supports implementation of the CDT Program principles through with financial incentives, administered through the CDT Grant Program, which provides both Planning and Capital grants.

- CDT Planning Grants are intended to help the cities, towns, and county of Santa Clara develop, refine, and build on promising ideas, and prepare those plans, projects, and policies for implementation. The expected outcomes of this planning

process are projects that enhance pedestrian connections with transit facilities, improve the overall pedestrian environment, employ innovative and high-quality design, and make better use of land, infrastructure, and resources. The funds are from local sources of revenue and are available in amounts up to $150,000.

- The CDT Capital Grant Program funds capital projects that implement the guidelines of the CDT Manual. Outcomes of this process should be projects that are creative, employ innovative and high-quality design, improve the pedestrian environment, enhance connections with transit facilities, make better use of the land, infrastructure, and resources, and/or improve community mobility, livability, sustainability, and sense-of-place. The funds, from the Federal Transportation Enhancements and Congestion Management/Air Quality programs, are available in amounts up to $1.5 million and require a 20 percent local match.

To date, two rounds of planning grants and three rounds of capital grants have been awarded under the CDT Program. The first cycle of planning grants was awarded in 2004, and the second round was awarded in late 2008. The first cycle of capital grants was awarded in 2006, the second round was awarded in 2007, and the third round was awarded in spring 2009. Of the planning and capital grants awarded to date, two were awarded for plans or projects directly along the GBI corridor:

- Palo Alto – Stanford Avenue/El Camino Real Streetscape & Intersection Improvements (Capital Grants – Cycle 1)
- Sunnyvale – El Camino Real Multimodal Design Guidelines (Planning Grants – Cycle 2)

In addition, several additional grants have been awarded for citywide plans that may have an impact on the GBI corridor. These have included:

- San Jose – Pedestrian Master Plan (Planning Grants – Cycle 1)
- Mountain View – Pedestrian Master Plan (Planning Grants – Cycle 2)

C/CAG TOD and El Camino Real Incentive Programs

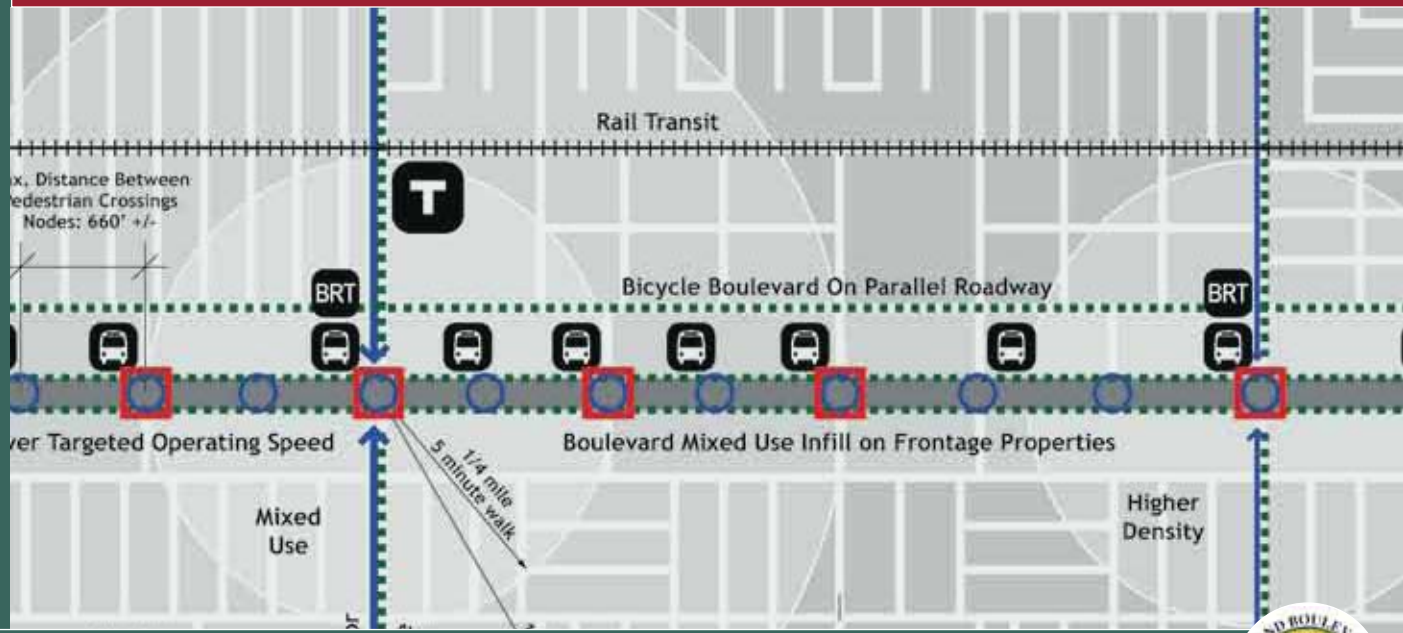
The purpose of studying El Camino Real is to examine the potential for increased housing in the County and to improve upon the mobility and "sense of place" along the corridor. The City/County Association of Governments of San Mateo County (C/CAG) has a vested interest in seeing that this vital county thoroughfare has capacity preserved while the roadway itself is improved upon both in terms of safety and aesthetics. As the Congestion Management Agency, C/CAG hopes to foster insightful thinking about ways that this opportunity corridor can help in the reduction of congestion through increased mixed-use densities and transit usage along the El Camino Real.

The El Camino Real incentive planning grants are available to all jurisdictions along El Camino Real in San Mateo County and funds will be available until the end of fiscal year 2010/2011 (June 30, 2011). The planning grant incentive funds are available up $50,000 and require a 50 percent match. In order to be eligible for the grant, the jurisdiction must commit to studying the land use, transportation, aesthetics, and potential issues along El Camino Real.

Table 3.1 summarizes the projects that have been funded and/or have funding committed through the C/CAG Incentive Programs on El Camino Real.

4

Multimodal Access Strategy



This chapter provides an **overview of mobility issues** and **current policies affecting multimodal access** and design of capital improvement projects along the SR 82 corridor. It also recommends a **revised approach to network mobility planning** based on the following four-pronged access strategy:

1. Create Space within the right-of-way for Multiple Travel Modes
2. Provide the Facilities Needed to Promote Multimodal Travel
3. Differentiate Mobility Policies to Reflect Corridor Development Policies
4. Apply GBI-Based Performance Measures in Project Planning and Evaluation

The strategies promote multimodal transportation within the **context of existing physical conditions** and **local community planning and development efforts.** They focus on **integrating** transportation-related capital improvements and land use policies consistent with the general vision for the corridor. This is essential if the corridor is to evolve as a unified, attractive Grand Boulevard, rather than a collection of competing facilities and development efforts.

4.1. Mobility Issues Overview

As State Route 82, El Camino Real has important transportation, economic, and public service functions on the San Francisco Peninsula. It is the primary thoroughfare connecting San Jose in the south to Daly City in the north, but also serves as a local street for the 19 communities its passes through. It is a commercial main street in some communities, as it passes through downtown and town center areas. SR 82 is also a critical conduit for local and regional transit, freight movement, emergency access, and in some areas, for incident management when Highway 101 is obstructed. With these various roles the road must accommodate multiple users and modes of travel. The needs of these users invariably compete, and therefore require a balance of mobility, accessibility, economic development, and livability.

4.1.1. The Different Needs of Different Users

As SR 82 extends from one area to another it may function differently and require different design features to serve the needs of different users. However, with a limited right-of-way, the roadway can not be designed to optimize mobility for all users simultaneously. For example, drivers predominately want minimal delays, minimal conflicts, and consistently designed facilities; they benefit from having separate turn lanes to increase capacity and more green signal time to reduce waiting. Designing to improve mobility for motorists means reducing the number of traffic signals and providing wider lanes for higher travel speeds.

By contrast, designing to improve mobility and access for pedestrians requires frequent opportunities to cross streets, longer pedestrian signal phases, wide sidewalks, and slower car traffic to improve safety. Pedestrians prefer to feel protected, with landscape strips, bike lanes, or parking lanes to buffer adjacent traffic. Attractive and interesting surroundings often encourage longer distance walking, and pedestrian-oriented lighting improves pedestrian safety at night. Disabled people have an even more significant challenge when a route is not accessible. Examples include gaps in sidewalks or a lack of signalized crossings.

Bicyclists' needs are fairly similar to those of pedestrians. While many cyclists also appreciate the street amenities favored by pedestrians, a higher priority for cyclists is a designated route or path that clarifies their status as a road user. Many cyclists prefer bike lanes or routes that connect in a continuous network. Bicyclists also need a smooth surface to ride on and secure bike parking at their destinations. Other useful amenities include signs to designate the bike routes and directional signs to key destinations.

In the continuum of user-oriented street design criteria, with auto-oriented design at one end pedestrian-oriented design at the other, transit is near the center. Like car drivers, bus drivers prefer wider lanes for easy maneuverability and minimal delays, but their patrons need ample sidewalks and frequent opportunities to cross the street to get to and from bus stops and stations. Patrons also benefit from benches, trash receptacles, bus shelters, trees, and lighting to feel comfortable and safe while they wait.

There are other important user groups too. Businesses need deliveries of products they use on a daily basis, and expect that the trucks that deliver these products can readily access their facilities. Emergency service providers use SR 82 as a primary response route. Because of its length and proximity to Highway 101 in some areas, freeway commuters find that it naturally serves as a bypass when the highway is obstructed.

4.1.2. Multimodal Access Issues

Although SR 82 has served multiple users for many years, until recently the focus of roadway design and capital improvements has

been on the mobility of motorists. As noted in Chapter 3, local communities and the GBI are working to establish a vision that emphasizes walkability, environmental sustainability, and the creation of attractive public places along the corridor and at adjacent nodes and town centers. To achieve this vision, a number of issues need to be addressed at the policy level as well as at the design level. Some of these issues include:

- Traffic speed
- Vehicle-orientation of the roadway and adjacent land uses
- Poor pedestrian connectivity around node and town center areas
- Lack of bus stop/waiting area facilities and amenities
- Perception (and reality) of SR 82 as a barrier to walking and bicycling
- Lack of sidewalks and/or narrow and obstructed sidewalks
- Non-conformance with Americans with Disabilities Act (ADA) requirements
- Long distances between protected crossings and lack of safe crossings at unsignalized intersections.
- Lack of pedestrian-oriented lighting
- Lack of dedicated bicycle lanes or convenient alternate bicycle routes
- Lack of landscaping and other pedestrian amenities
- Inability for businesses to use public right-of-way for economic development purposes (i.e., street cafes).

The design guidelines in Chapter 5 provide recommendations and prototypical designs to address the issues listed above, as well as other issues within the parameters of Caltrans design standards and the Caltrans "Design Exception" process.

4.2. Existing Multimodal Transportation Policies and Programs

State, regional, and local policies and programs govern or influence the design and operations of SR 82. Key policies and programs are described below.

4.2.1. State and Local Level of Service Standards

Caltrans' *Guide for the Preparation of Traffic Impact Studies* (2002) states that Caltrans "endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities." Caltrans acknowledges that this is not always feasible and encourages local and regional agencies to work with the State to develop appropriate target levels of service. Caltrans frequently defers to County Congestion Management Program standards on this issue.

The San Mateo County Congestion Management Program, established by State legislation and administered by the City/County Association of Governments (C/CAG) has established a minimum standard of LOS E on El Camino Real within its jurisdiction. The Santa Clara County Congestion Management Program has established a systemwide intersection standard of LOS E but maintains a goal of LOS D, although local jurisdictions are not required to conform to this goal. If an intersection was operating at LOS F in the baseline year (1991), its standard is set at LOS F.

Local agencies and cities have various level of service standards adopted through their general plans, typically ranging from LOS D to LOS E and deferring to Congestion Management Program standards where applicable.

4.2.2. Caltrans/C/CAG Joint Principles for Improvements on El Camino Real

In 2006, Caltrans and the San Mateo City/County Association of Governments (C/CAG) jointly agreed on policies and principles

to guide certain aspects of the design of El Camino Real. Key elements of this agreement include:

- Create mobility for multiple modes of transportation such as public transit and private and commercial vehicles, and consideration of bicycle and pedestrian movement along and crossing the corridor.
- Preserve the through-lane capacity on El Camino Real to allow for planned growth and increased densities (minimum two through-lanes required); consider potential dedicated bus lanes for express bus or bus rapid transit and incident management.
- Provide flexibility in turning capacity as determined by operating characteristics and safety considerations on a location specific basis.
- Consider development of express bus or bus rapid transit to encourage transit ridership, with better pedestrian connections between downtown centers and Caltrain/BART stations through design, aesthetics, and special crosswalk treatments.

The agreement emphasizes that "reasonable flexibility will be provided in the design standards" provided that safety and the basic transportation principles of the policy are maintained.

4.2.3. State "Complete Streets" Policies

California's 2007 Complete Streets Act (AB 1358) requires that when local agencies (e.g., cities and counties) update their general plan circulation elements, they identify how they will provide for the routine accommodation of all users of the roadway, including motorists, pedestrians, bicyclists, individuals with disabilities, seniors, and users of public transportation.

4.2.4. Caltrans' Deputy Directive 64

In 2008, Caltrans revised and strengthened Deputy Directive 64, *Complete Streets – Integrating the Transportation System*. This directive provides for the needs of all travelers who have legal access to state highways, requiring that the safety and mobility needs of bicyclists, pedestrians, and transit users be addressed in all projects. The Directive's objective is to facilitate bicycle, pedestrian, and transit travel by creating "complete streets" early in system planning and continuing through project delivery, maintenance, and operations. Key aspects of the directive as it relates to the design of SR 82 include:

- Ensure bicycle, pedestrian, and transit user needs are addressed and deficiencies identified during system and corridor planning, project initiation, scoping, and programming.
- Collaborate with local and regional partners to plan, develop, and maintain effective bicycle, pedestrian, and transit networks.
- Consult locally adopted bicycle, pedestrian, and transit plans to ensure that State highway system plans are compatible.
- Ensure projects are planned, designed, constructed, operated, and maintained consistent with project type and funding program to provide for the safety and mobility needs of all users with legal access to a transportation facility.
- Implement current design standards that meet the needs of bicyclists, pedestrians, and transit users in design, construction and maintenance work zones, encroachment permit work, and in system operations.
- Provide information to staff, local agencies, and stakeholders on available funding programs addressing bicycle, pedestrian, and transit travel needs.

4.2.5. Metropolitan Transportation Commission (MTC) "Complete Streets Checklist"

In 2006, MTC adopted regional policies for the accommodation of non-motorized travelers. For projects funded in whole or in part with regional funds, this policy (MTC Resolution No. 3765) calls for the routine accommodation of bicyclists and pedestrians consistent with Caltrans' Deputy Directive 64. MTC created a checklist encouraging agencies to consider routine accommodation of non-motorized travelers in project planning and design. The "Complete Streets Checklist" is intended for use early in the conception and/or design phase of projects so that any potential pedestrian and bicycle facilities can be included in the project budget. Local Congestion Management Agencies (CMAs) must ensure that project sponsors complete the Checklist before projects are submitted to MTC.

4.3. Recommended Access Strategy

The access strategy recommended for the Grand Boulevard has four basic elements:

1. Create space within the right-of-way to accommodate multiple travel modes. Current roadway and right-of-way conditions tend to accommodate automobile circulation at the expense of pedestrian, transit, and bicycle travel. There are two general ways to create the space needed to accommodate multiple modes: a) expand the existing ROW; and b) share the existing ROW more effectively. Though it may be accomplished in a limited number of areas, expanding ROW is for the most part prohibitively expensive. Sharing the existing ROW is the recommended strategy and is the focus of the Street Design Guidelines contained in Section IV.

2. Provide the facilities needed to promote multimodal travel. These facilities include bus shelters, bike ways, wider sidewalks, pedestrian crossing refuges, lighting, street trees, and other improvements and amenities that encourage non-auto travel. Guidelines for planning and installation of these facilities are provided in Chapter 5.

3. Differentiate mobility policies according to corridor conditions. Planning and design for travel modes should reflect the general land use approach being pursued by local communities. Land use approaches along SR 82 can be categorized as a linear network of "Node" and "Link" areas, as described in Chapter 3. Recommendations for tailoring multimodal access and improvements to these areas are provided under "Network Mobility Recommendations," below.

4. Apply GBI-based performance measures in project planning and evaluation. Performance measures should be established that promote the GBI vision and the requirements of Complete Streets legislation, while incorporating the operational objectives of SamTrans, VTA, C/CAG, Caltrans, and the Metropolitan Transportation Commission if pursuing regional funding. A summary of existing San Mateo County, Santa Clara County, and potential GBI performance measures is provided in Appendix A2.

4.4. Network Mobility Recommendations

4.4.1. Network Mobility Concept

Improving mobility for all users of a network of streets involves trade-offs, particularly in a constrained right-of-way environment. Designing streets for multiple modes requires sensitivity to how the street functions in the context of surrounding land uses and the needs of various user groups. Identifying the user groups and facilities that should receive preferential treatment is based on assessing each particular user's needs on a particular segment of a street, and how that street segment functions in that environment and within the surrounding network of streets.

Streets that extend through many cities, like SR 82, can support regional travel. However, where they pass through a town center or a node of higher density mixed-uses, they function as local streets serving local mobility. The basic challenge in establishing planning and design criteria is identifying where land use character and user needs change, and tailoring mobility policies as appropriate.

The Multimodal Access Strategy and accompanying Street Design Guidelines (Chapter 5) simplify this challenge based on the "node and link" land use policies being pursued by local communities. Nodes are areas planned for mixed-use development, with higher densities and higher levels of pedestrian activity than link areas. Nodes are generally associated with transit centers, special development sites, and/or downtown commercial districts. Links are areas located between nodes, where some land use change is anticipated but typical arterial commercial forms of development are also planned to remain. These areas typically include major shopping centers and "auto rows" that are important to local community tax bases. Other forms of development include apartment complexes, office campuses, and smaller-scale strip commercial centers.

The network mobility concept reflects the following objectives:

- Promote a high level of cross-street connectivity, particularly in node areas. High connectivity generally corresponds to a pedestrian scaled grid of small blocks and/or a high frequency of pedestrian crossings.
- Provide a greater frequency of signalized pedestrian crossings.
- Establish lower targeted operating speeds in Node areas, with synchronized traffic signals and other measures as needed.
- Provide direct pedestrian and bike access from the SR 82 corridor to major transit centers, particularly Caltrain, BART, and future High-Speed Rail, via intersecting arterial or collector streets.
- Accommodate commuter- and local access-oriented bicycle facilities on the corridor where feasible, supplemented by alternative facilities on parallel streets oriented to less experienced riders.
- Provide significant transit station facilities in node areas; signals, major BRT stations, and/or transfer points for multiple transit lines.
- Complete a continuous network of pedestrian facilities within ½-mile radius of node area. These facilities should include sidewalks on both sides of streets, pedestrian connections through long blocks, etc.
- Improve east-west transit, pedestrian, and bicycle links to the El Camino Real corridor and its concentration of commercial and transit facilities.

4.4.2. Network Connectivity Prototypes

The Connectivity Diagrams in Figures 4-1 and 4-2 illustrate prototypical multimodal connectivity guidelines for node and link areas consistent with the network mobility recommendations outlined in the previous section.

Figure 4-1 shows prototypical connectivity for four-lane segments with small block patterns; Figure 4-2 shows prototypical connectivity for six-lane segments with large block patterns. The fundamental connectivity guidelines are illustrated as follows.

Street Network

Prototypical street network conditions are:

- One-mile spacing of arterial streets.
- Typical minor street spacing (collector and local streets):
  - Four-lane, small block, Node areas = 200-400 feet
  - Four-lane, small block, Link areas = 400-800 feet
  - Six-lane, large block, Node areas = 800-1200 feet
  - Six-lane, large block, Link areas = 1200-2200 feet

Pedestrian Network Guidelines

- Sidewalks on both sides of public streets.
- Maximum distance between signalized crossings in Node areas of 660 feet (1/8 mile).
- Maximum distance between signalized crossings in Link areas of 1,320 feet (1/4 mile).
- Minimum distance between signalized and unsignalized crossing with pedestrian refuge in Node areas of 330 feet, or as close to 330 feet as possible given block size.
- On blocks 800 feet or longer, maximum distance of 400 to 600 feet (based on 800 and 1,300 foot long blocks) between public street and mid-block pedestrian path to parking or neighborhoods behind block.
- Signalized mid-block pedestrian crossings on blocks of 1,320 feet or greater where demand warrants signalization.

Bicycle Network Guidelines

- Bike lanes on corridor or, alternatively, sharrow markings in shared lanes.
- If no bike facilities on corridor (i.e. severely constrained right-of-way), parallel corridor with bike lanes, sharrow markings in shared lanes, or bicycle boulevard.

Transit Network Guidelines

- Local bus stops located per transit agency preference.[1]
- Bus Rapid Transit stations located per transit agency preference.[2]
- Transit transfer point within Node area or at major arterial intersections in Link areas.
- Caltrain station connection desirable within Node area if station outside of 10-minute walk distance.
- Concentration of transit-oriented mixed-use and infill development within Node areas and along the street frontage of Link areas.

1 In Santa Clara County, VTA's *Community Design & Transportation Manual* recommends local bus stop spacing of 500-900 feet in Downtowns/Urban Areas (essentially Nodes), and 1,000-1,300 feet in Suburban Areas (essentially Links).

2 In Santa Clara County, VTA's Service Design Guidelines recommend BRT station spacing of 3/4 mile, with exceptions for major trip generators.

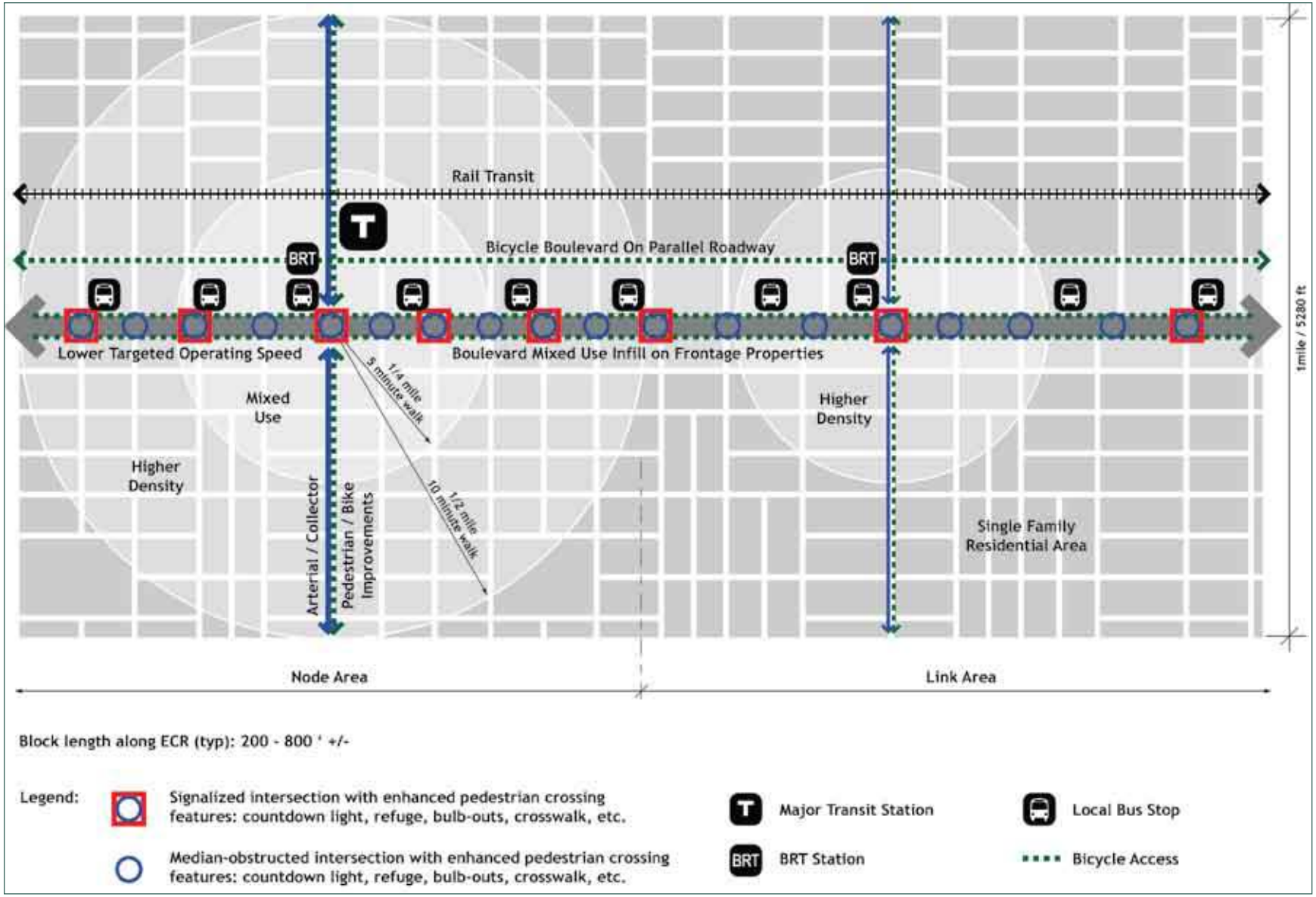


Figure 4-2. Connectivity Diagram. 4-lane, small blocks

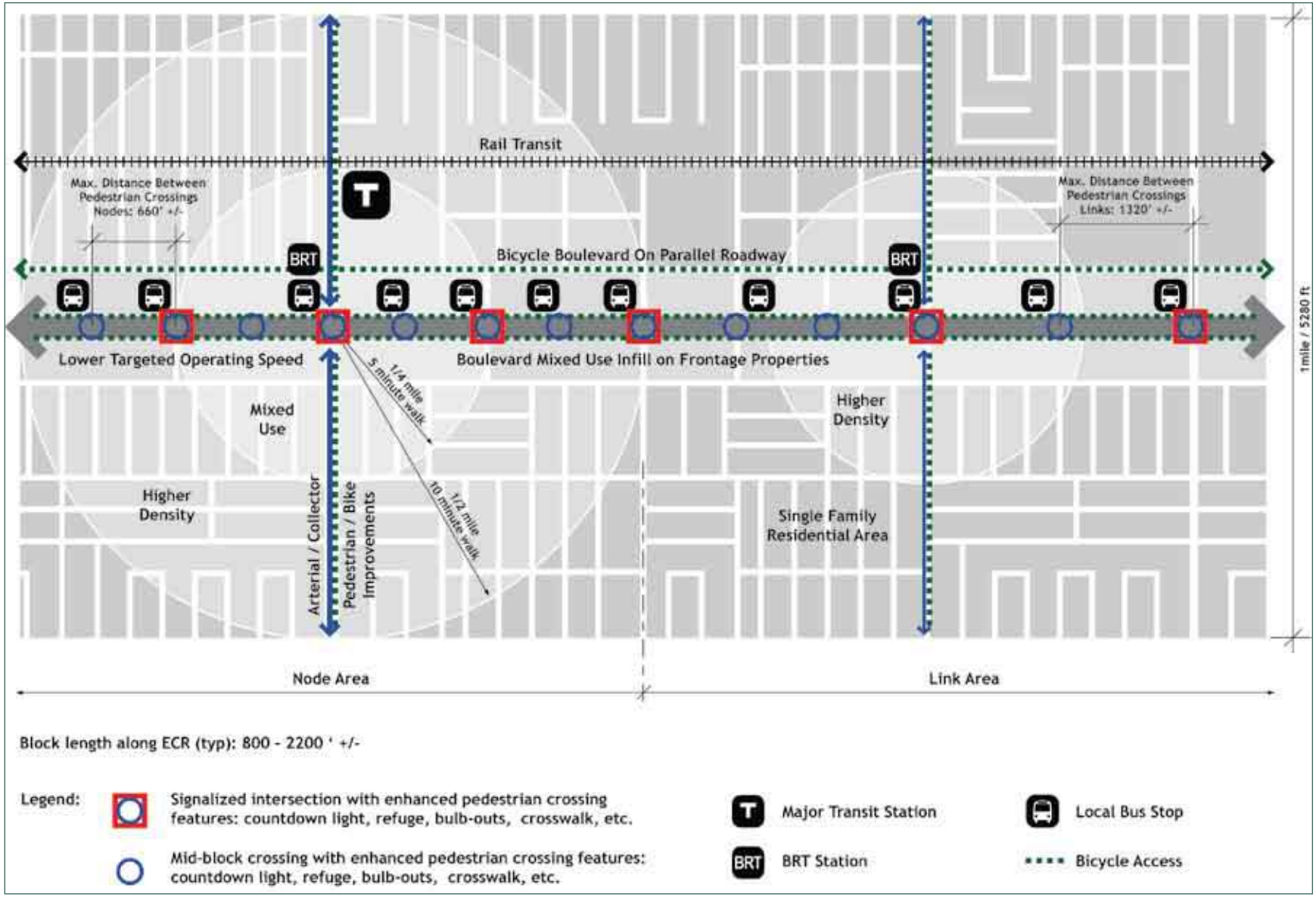


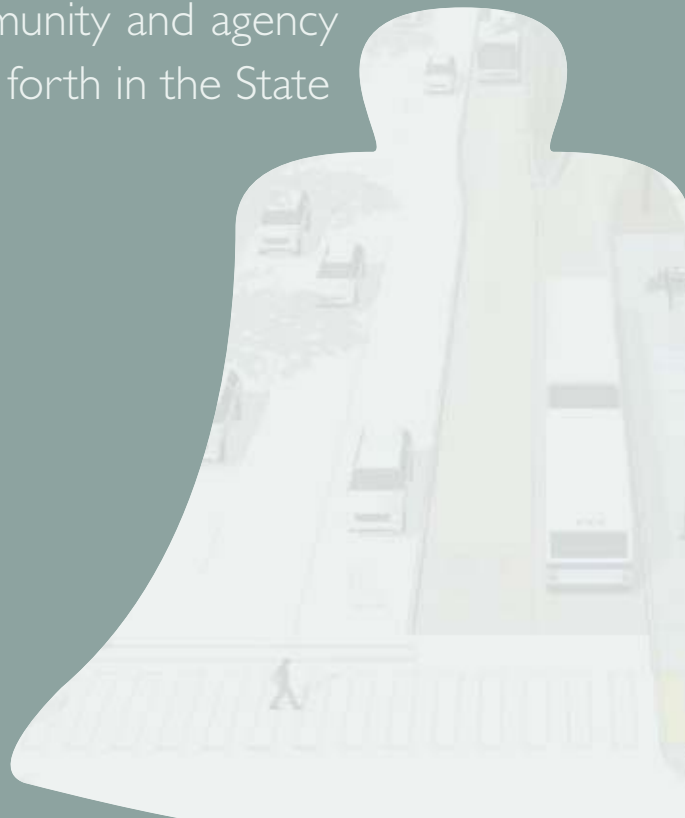
Figure 4-2. Connectivity Diagram. 6-lane, large blocks

5

Street Design Guidelines

The Street Design Guidelines and Street Design Prototypes contained in this chapter promote the basic elements of the Grand Boulevard vision. They focus on **encouraging multimodal access** and a **boulevard street environment,** and are specifically intended to encourage **locally-initiated street improvement projects**. The trees, lights, paving, and other materials shown in the Guidelines images are not intended to establish a single design treatment for the corridor. Individual communities and agencies are encouraged to establish materials and design treatments as they consider appropriate.

The Guidelines and Prototypes are intended to be consistent with Caltrans, SamTrans, VTA, and C/CAG standards and policies, but should be supplemented as needed with other reference sources as needed. These include the local community and agency policies and plans described in Chapter 3, as well as guidelines set forth in the State of California Highway Design Manual (HDM).



5.1. Context-Sensitive Design Guidelines Overview

The Street Design Guidelines support the Multimodal Access Strategy with recommendations for right-of-way improvements that promote multimodal travel and transit-oriented development (TOD). The guidelines range from addressing general issues, such as the importance of designing street improvements to add value to frontage land uses, to configuration of specific facilities, such as travel lanes, median islands, curb bulb-outs, and pedestrian crossings. The Guidelines support a context-sensitive approach which promotes design appropriate to the physical environment and considers aesthetic, environmental, and community goals. The Guidelines incorporate a number of the many transit agency and local community design policies and guidelines that have been prepared to date, and are intended to provide a common framework for the participating entities and Caltrans to work together toward the Grand Boulevard vision.

The Guidelines include Street Design Prototypes that illustrate different combinations of roadway design elements, frontage improvements, and transit facilities. Improvements that are consistent with basic Caltrans design standards are depicted, as well as modifications that may be considered for a "design exception."

The Guidelines and Prototypes both are keyed to a Design Guideline Matrix that lists relevant Caltrans standards, local community issues related to the standards, and the requirements for a design exception. The Design Guideline Matrix is provided in Appendix A1 to this document. Appendix A3 presents Caltrans Design Standard Exceptions Procedures, which outline the Caltrans project review and approval process. Finally, Appendix A4 contains Caltrans Fact Sheet summaries that provide examples of the kinds of information Caltrans requires of local communities and agencies when requesting design exemptions.

5.2.1. Street Design/Land Use Relationship

Design Issue: Street and right-of-way improvements related to multimodal transportation, transit oriented development (TOD), district revitalization, beautification and other objectives should be designed to complement frontage land use and development.

Recommendation: Base street design recommendations on a local corridor vision integrating frontage buildings, sidewalk spaces, and roadway/shoulder conditions. For example, storefront commercial space in mixed-use or standalone development generally benefits from on-street parking and/or convenient off-street parking, and from high roadway visibility. This condition is typical of node areas (see Figure 5-1a). Residential development, as might be typical in link areas, can be successful without curbside parking, with additional landscape materials to screen passing traffic (see Figure 5-1b).

Figure 5-1a. Mixed-use "node" frontage

Caltrans Matrix Reference: Not applicable.

Figure 5-1b. *Residential "link" frontage*

5.2.2. Lane Narrowing

Design Issue: Accommodating multiple alternative transportation modes effectively requires additional space within the SR 82 right of way. This can be accomplished by expanding the right-of-way – which can be costly, time-consuming, and disruptive to the frontage properties – or efficiently sharing space within the existing right-of-way.

Recommendation: Automobile travel lanes should be narrowed to the maximum extent feasible to accommodate multimodal transportation options. Figures 5-2a through 5-2d depict lane narrowing effects relative to pedestrian, bicycle, and transit travel modes:

a. Existing lanes, typically 12+ feet in width.

b. Improved pedestrian facilities, including bulb-outs and median refuges.

c. Designated bike lane.

d. Dedicated transit lanes for BRT and/or other transit modes, with curbside parking and corner curb bulb-outs.

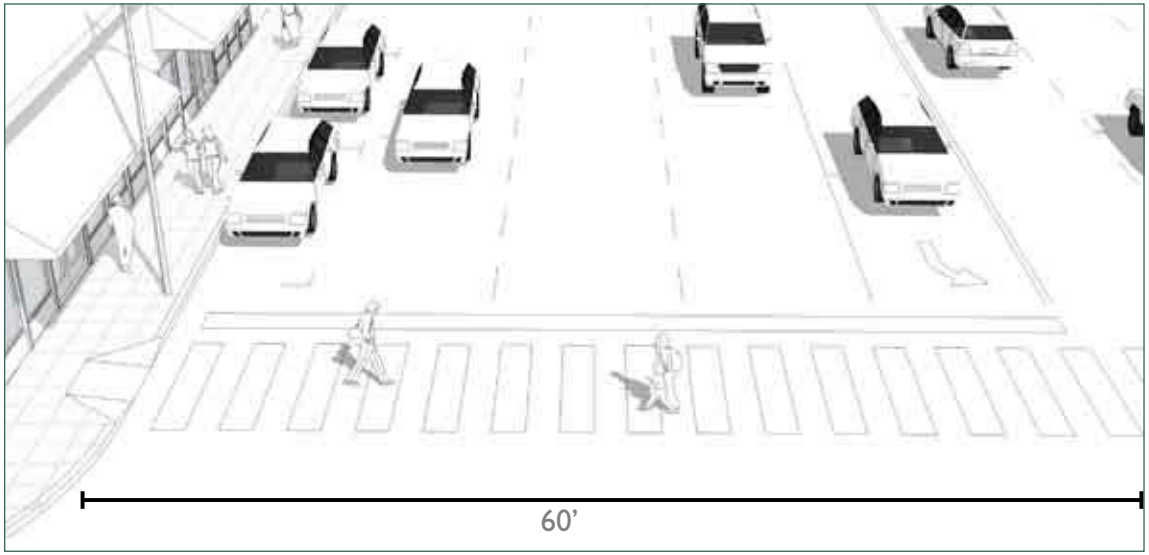


Figure 5-2a. *Existing conditions*

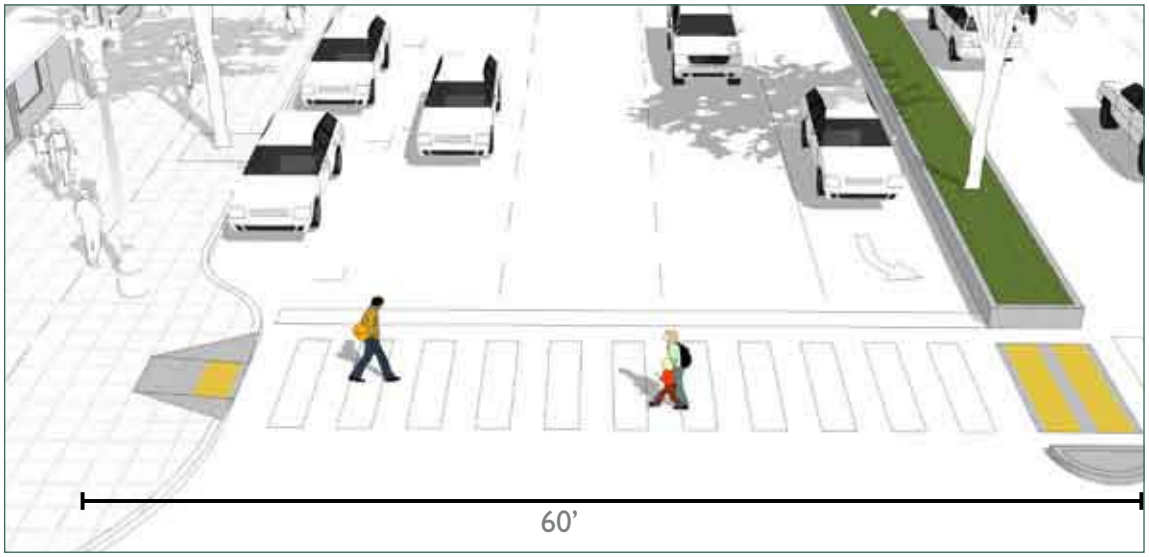


Figure 5-2b. *Improved pedestrian facilities*

Multiple modes can be accommodated in many locations along SR 82. Lane narrowing generally has a traffic calming effect as well, which can further promote multimodal transportation objectives.

Caltrans Matrix Reference: Design exception required; see Matrix section E.

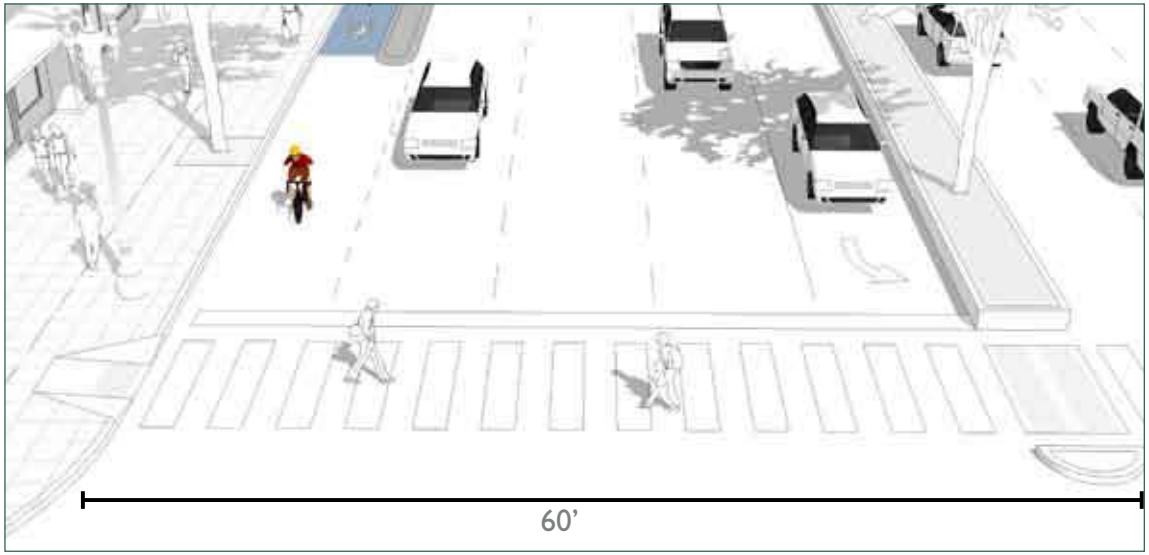


Figure 5-2c. *Designated bike lane*

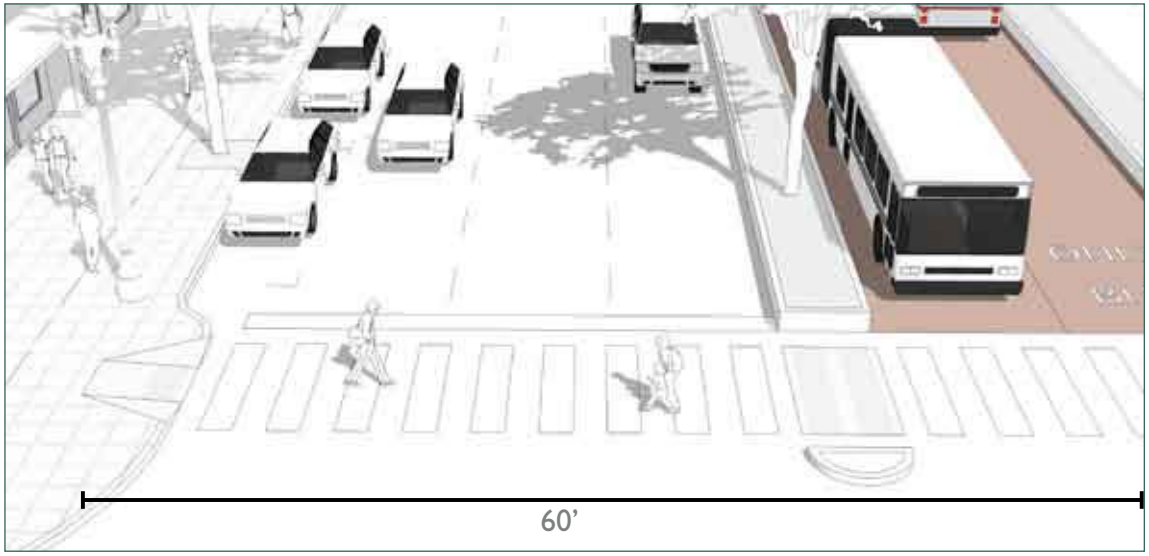


Figure 5-2d. *Designated transit lanes*

5.2.3. Lane Sharing

Design Issue: Even with lane narrowing, it may not be possible to accommodate dedicated facilities for different travel modes within existing or proposed right-of-way.

Recommendation: Options to explore multi-use of designated travel lanes should be explored. For example, some lanes may be narrowed to allow widening of others to accommodate multiple travel modes.

Figure 5-3 shows a 14-foot wide lane created to accommodate bus stop areas and bicycle as well as auto travel. Narrowed through- and turn lanes provide the additional width needed to include an 11-foot minimum bus stop area and expanded parking/travel lane width.

Caltrans Matrix Reference: Design exceptions required; see Matrix sections E and H.

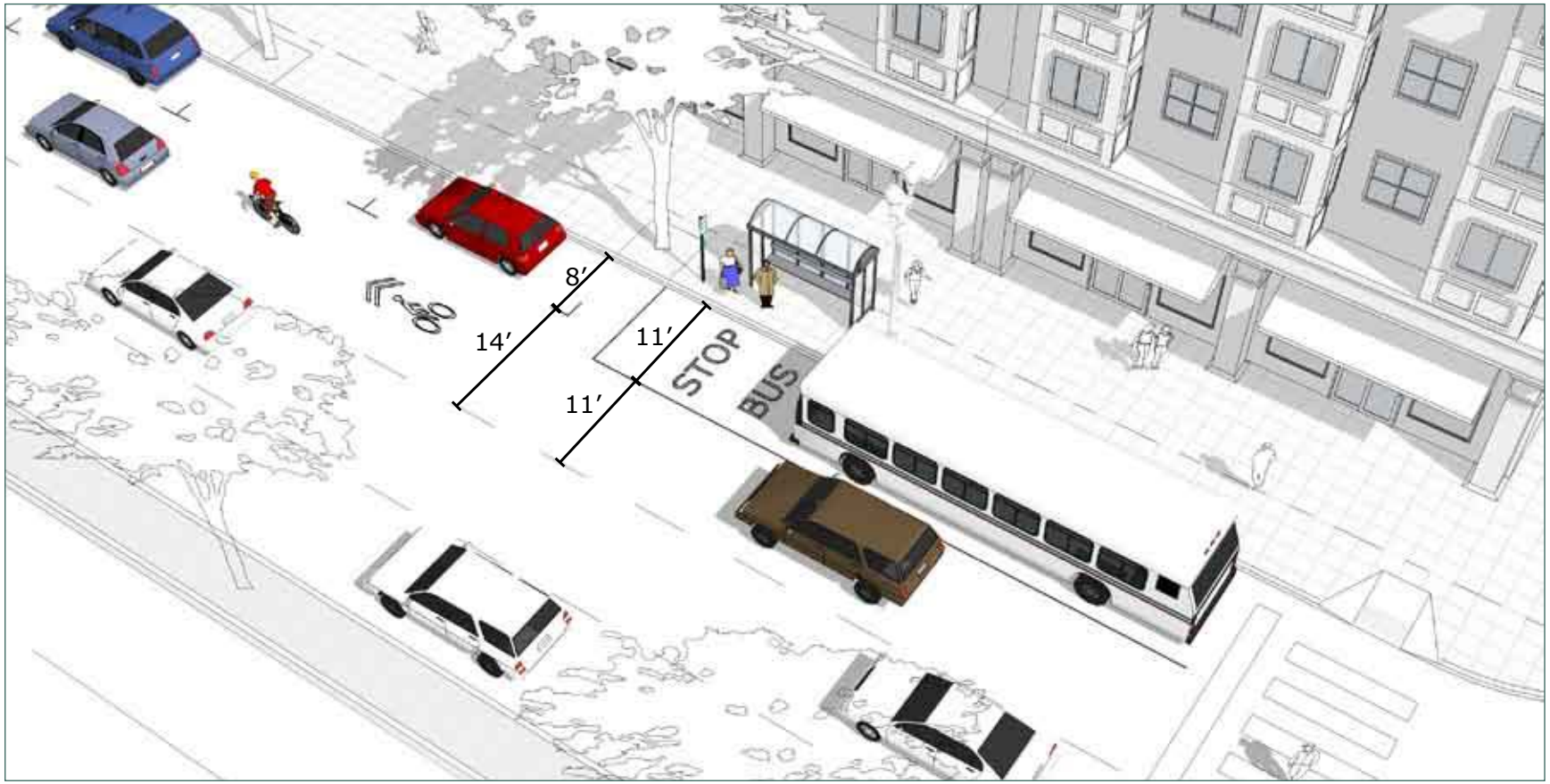


Figure 5-3. Shared travel lane

5.2.4. Shoulder Conditions

Design Issue: An 8-foot shoulder area is required for state roadways. However, the shoulder can serve a variety of different functions.

Recommendation: Shoulder areas should be configured to serve a variety of Grand Boulevard- and transportation-related functions. They should be designed as an integral part of the improvement concept for the street and policies for frontage land use and development.

Figures 5-4a through 5-4f depict different improvement approaches:

a. Curbside parking is recommended for storefront commercial and mixed use frontages where allowed by roadway width, taking into account all roadway users (transit, bicycles, and automobiles). Where curbside parking is provided, time-limited or metered parking should be considered.

b. Locating street trees within parking zone planters is an option where sidewalks are narrow and unlikely to be widened; a minimum 4-foot clearance is required between the planter and the adjacent travel lane. Subsurface utility conditions must be determined. A structural soil trench, and, depending on local conditions, pervious paving, are recommended for the parking zone.

c. Incorporating "rain garden" bulb-outs and planters to capture and biofilter runoff is an option that can be combined with curbside parking; minimum 4-foot clearance to adjacent travel lane required.

d. Where roadway width allows, a combined bike lane/parking area is an option where bike lanes are desired in a storefront commercial or mixed use area (11 or 12-foot minimum depending on curb type).

e. A dedicated bike lane is an option for frontages that do not contain storefront commercial space; minimum 6-foot width recommended (1-foot gutter, 5-foot lane).

f. If roadway width allows, a lane divider with a roll curb is an option to provide bicyclist protection.

Caltrans Matrix Reference: Design exceptions may be required; see Matrix sections G and H.

Figure 5-4a. *Curbside parking*

Figure 5-4b. *Curbside parking with parking zone planters (narrow sidewalk conditions)*

Figure 5-4c. *Curbside parking with rain garden bulb-outs and planters*

Figure 5-4d. Curbside parking and Class II bike lane

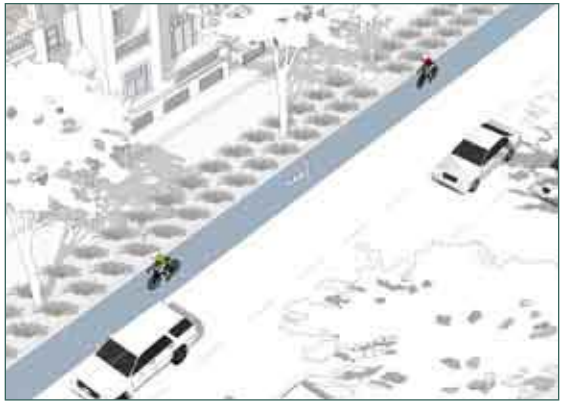


Figure 5-4e. Curbside Class II bike lane

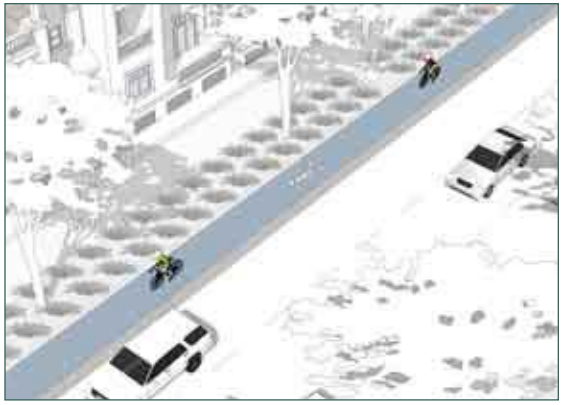


Figure 5-4f. *Curbside Class II bike lane with rolled curb divider*

5.3.1. Intersection Geometry

Design Issue: Intersections are the most complex roadway facilities, with turn lanes, pedestrian crossings, transit stops, signage, signals, and other elements all concentrated in one location. Multiple travel movements and modes all must share a limited area; the land value associated with the access and visibility of corner properties adds another dimension. However, vehicle-related design considerations alone generally determine intersection geometry, and accommodating cars and trucks often comes at the expense of other travel modes. For example, designing intersections for large vehicle- and/or higher-speed turning movements limits the potential to provide pedestrian refuges, small radius corners, bus stop bulb-outs, bike lanes, and other multimodal facilities.

Recommendation: Local communities and agencies should evaluate the function of an intersection relative to the full range of travel modes as well as frontage land use. The appropriate design vehicle should be used to support multimodal travel through intersections. For example, in node area intersections with high levels of pedestrian and/or transit transfer activity, corners should have the minimum radius feasible in order to reduce vehicle-turning speeds, shorten crosswalk distances, and to maximize bus stop waiting area. Dual left turn lanes should be eliminated to accommodate pedestrian refuges where possible, with longer stacking turn lanes and/or modified signal timing employed instead. Building setbacks should be considered to create additional sidewalk space and visibility of first floor businesses. Figures 5-5a through 5-5d depict the various intersection configuration possibilities for the GBI corridor.

Caltrans Matrix Reference: Design exception(s) may be required; see Matrix sections B, C, and T.

Figure 5-5a. *Dual left turn lanes*

Figure 5-5b. *Single left turn lane with pedestrian refuge and bulb-outs*

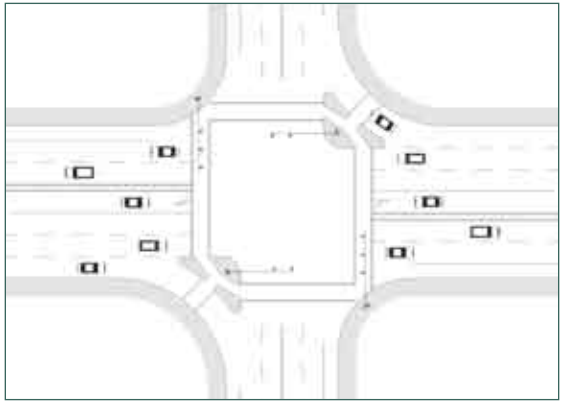


Figure 5-5c. *Slip lanes and large curb radii*

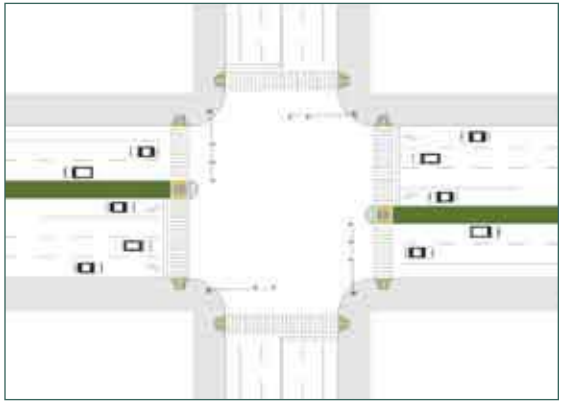


Figure 5-5d. *Traditional street corners with smaller curb radii*

5.3.2. Intersection Crossings

Design Issue: State law allows pedestrians to cross any street at an intersection unless otherwise prohibited. Pedestrian safety is a paramount concern, and intersections should therefore include facilities that reduce the potential for pedestrian and vehicle conflict consistent with multimodal and "Complete Streets" policy objectives. However, not all side streets and potential crossing locations are equal in terms of traffic levels, pedestrian activity, or visibility.

Many agencies do not mark crosswalks at unsignalized intersections because of concerns they provide a false sense of security. However, whether marked with crosswalks or not, unsignalized intersections remain important crossing points and are the most challenging condition for pedestrians. Particularly when crossing multiple lanes of traffic, pedestrians can face long crossings, continuous flow in both directions of traffic, and multiple threat risks (e.g., when a vehicle stopped for a pedestrian blocks the sightline of a vehicle passing in the adjacent lane).

Recommendation: Design and installation of street crossing improvements should reflect the range of pedestrian activity levels. The Federal Highway Administration (FHWA) report *Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations*, referenced by Caltrans in the appendix, does not recommend the use of marked crosswalks alone without other substantial improvements (see recommendations below) on multi-lane streets with speeds between 25 and 35 mph and traffic volumes of 15,000 vehicles per day or more (which represents most of SR 82). Figures 5-6a through 5-6e illustrate a range of crossing improvements from least to most pedestrian activity.

a. Existing Unsignalized Intersection

b. Unsignalized Intersection - Median refuge island, overhead pedestrian safety lighting

c. Unsignalized Intersection - Median refuge island, corner curb bulb-outs, overhead pedestrian safety lighting

d. Unsignalized Intersection with High Pedestrian Activity - Median refuge island and corner curb bulb-outs, continental crosswalk marking (potentially with in-pavement safety lighting), overhead pedestrian safety lighting, advanced high-visibility warning signs and pavement markings, advanced stop lines with supplemental signing ("Stop Here for Crosswalk"), and potentially in-street pedestrian crossing sign.

e. Signalized Intersection – Median refuge island on long crossings (80 feet or greater), corner curb bulb-outs, pedestrian countdown timers, standard crosswalk marking or special crosswalk paving, and advanced stop lines with supplemental signing ("Stop Here for Crosswalk").

Refuge islands are typically the most cost effective crossing improvement, in that they generally do not require grading and/or storm drain system modifications that can be required for corner curb bulb-outs. Refuges allow pedestrians to cross one direction of traffic at a time and thus only need to wait for a gap in one direction of traffic for each leg of the crossing. Refuges are therefore recommended as the first for priority for installation, roadway conditions permitting, with corner bulb-outs and other improvements second.

Caltrans Matrix Reference: May require design exception(s); see Matrix sections U, V, W, X, and Y.

Figure 5-6a. *Existing unsignalized intersection*

Figure 5-6b. *Unsignalized intersection with pedestrian refuge*

Figure 5-6c. *Unsignalized intersection with refuge and bulb-outs*

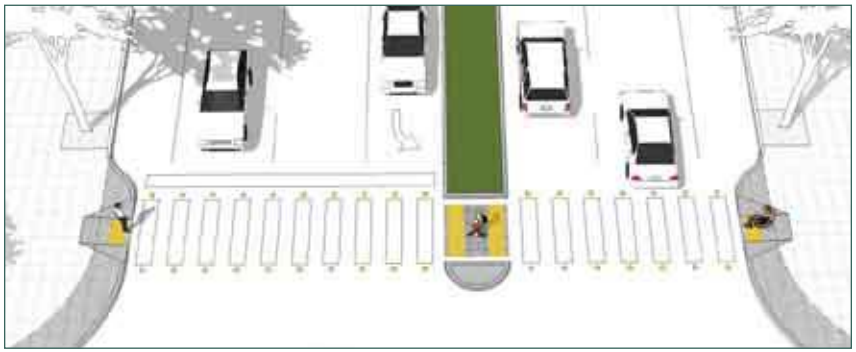


Figure 5-6d. *Unsignalized intersection with refuge, bulb-outs, striped crosswalk and optional in-pavement pedestrian-activated flashers*

Figure 5-6e. *Signalized intersection with refuge, bulb-outs, and striped crosswalk*

5.3.3. Mid-Block and Median-Obstructed Crossings

Design Issue: Distances between intersections and pedestrian crossings can be long – in some areas 2,000 feet or more. In other areas landscaped median islands extend through side street intersections and equally hinder crossing (see Figure 5-7a). Long distances between crossings deter pedestrian and bicycle circulation to and from mid-block or median obstructed locations within the corridor. Long block conditions are prevalent in Santa Clara County. Shorter blocks with median-obstructed crossings are more common in San Mateo County.

Recommendation: In node areas, signalized mid-block and/or median-obstructed crossings should be installed to provide for a maximum distance between crossings of approximately 660 feet (1/8 mile), or a 3.5-minute walk (see Figure 5-7b). In link areas, signalized mid-block crossings should be installed to provide a maximum distance between crossings of approximately 1,320 feet (1/4 mile), or a 7-minute walk. In addition to traffic and countdown pedestrian signals, sidewalk bulb-outs, advanced stop lines, safety lighting, and special paving treatments should be provided to encourage walking.

Mid-block pedestrian refuge islands may be configured as diagonal or "Z" crossings comprised of offset crosswalks with channelization or barriers that create a 'two-stage" crossing and direct pedestrians to face upstream to increase the pedestrian's awareness of traffic (see Figure 5-7c).

Caltrans Matrix Reference: Design exception required; see Matrix section V.

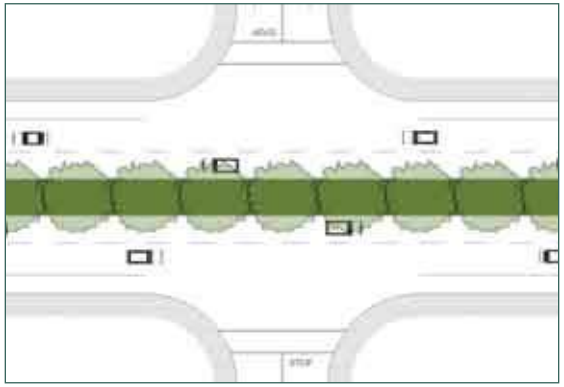


Figure 5-7a. Existing median-obstructed intersection

Figure 5-7b. Median-obstructed intersection with proposed crosswalk and mid-block refuge

Figure 5-7c. Mid-block crossing with bulb-outs, angled refuge, striped crosswalk, and pedestrian-activated signal

5.3.4. Crossing Refuges

Design Issue: Pedestrian crossing distances on SR 82 are relatively long, which exposes pedestrians to traffic for significant periods of time and can deter walking. Long crossing distances are of particular concern for seniors, children, and those with mobility impairments. Pedestrians who cannot cross completely in the time allotted by traffic signals, or who must wait for passing traffic, can be stranded in the roadway.

Recommendation: Signalized intersections should provide for pedestrian crossings timed at 3.5 feet/second (per recent MUTCD requirements). At signalized crossings 80 feet long or greater, or at unsignalized intersection crossings, pedestrian refuge islands should be installed as local conditions allow. In general, refuges should be installed in combination with corner curb bulb-outs (see Section 5.3.5). Because refuges are generally less costly to install, they are the first crossing improvement recommended if a construction budget is constrained. Refuges may or may not be located at signalized intersections; however, signals are strongly recommended for mid-block crossings and refuges.

Refuges should be a minimum 6 feet in width if a pedestrian signal control button is provided; without signal control the minimum should be 4 feet. A width of 8 feet or more is recommended to accommodate wheeled devices such as bicycles or strollers. Generally, signals should be timed to complete the entire crossing at 3.5 feet/second. A pedestrian control button can be installed on the refuge island only if the crossing is designed to be crossed in two stages. Figures 5-8a and 5-8b illustrate intersection and mid-block or median-obstructed refuge conditions.

Caltrans Matrix Reference: Design Exception may be required; see Matrix section V.

Figure 5-8a. Refuge at intersection

Figure 5-8b. Refuge at mid-block crossing

5.3.5. Corner Curb Bulb-Outs

Design Issues: Long street crossings can deter pedestrian circulation, and many locations, traffic and parked cars reduce the visibility of pedestrians at crosswalks. Additionally, storm drainage inlets at street corners are often located within pedestrian crosswalk areas.

Recommendation: Corner curb bulb-outs should be installed at all pedestrian crossings as conditions allow. A minimum 4-foot clearance is required between the bulb-out and the outside edge of the adjacent travel lane. Corner curb radii should be the minimum needed to accommodate vehicle turning movements given the local context; e.g., a radius of 15 feet is recommended in node areas that have substantial levels of existing or planned pedestrian or transit transfer activity. Curb radii may be increased to 25 to 30 feet to accommodate regular and frequent turning large vehicles such as buses. Curb radii in node areas should be as small as practical to reduce pedestrian crossing distance and reduce the speed of turning vehicles. Infrequent turning large vehicles should be allowed to encroach into opposing lanes on narrow side streets.

In general, the flat side of a bulb-out should be 20 to 30 feet in length along SR 82, allowing generous space for pedestrians as well as directional signs, pedestrian-oriented lighting, street furnishings and other amenities. Longer bulb-outs are recommended for bus stops consistent with local transit agency requirements. Shorter bulb-outs may be appropriate in storefront commercial areas to conserve on-street parking. Figures 5-9a through 5-9c illustrate these concepts.

Bulb-outs provide an opportunity to relocate storm inlets out of crosswalk areas, and to reduce crosswalk slopes to the 5% maximum required by ADA. However, the new drainage inlets and grading that can be associated with bulb-out construction can be costly. Where they exist, traffic signals typically need to be relocated as well. Refuge islands are recommended as the first priority crossing improvement, followed by corner bulb-outs and other crossing improvements as described above.

Caltrans Matrix Reference: There are no State Highway standards for bulb-outs; see Matrix section U.

Figure 5-9a. Short bulb-out (adjacent to storefront commercial curbside parking)

Figure 5-9b. Typical bulb-out

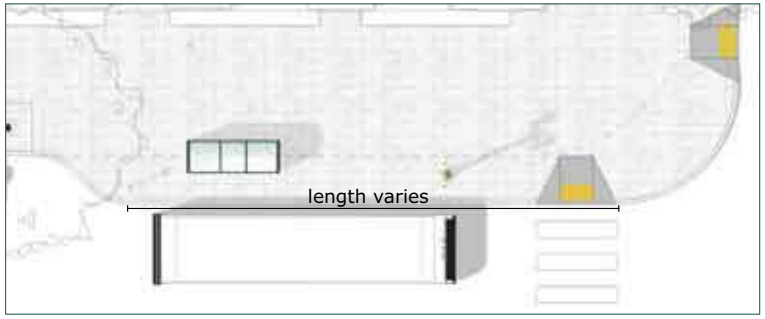


Figure 5-9c. Bus bulb-out

5.4.1. General Median Design

Design Issue: Median islands are typically installed to perform a traffic engineering function; e.g., channelize through-traffic, limit left turn movements, protect left turn pockets, etc. Additional features such as street lighting and informational signs are often incorporated, as is landscape beautification, which can also include light-mounted banners, architectural signs, and other features. In many cases, however, the function of these features conflict with frontage land uses. A typical mismatch occurs when tall shrubs and/or dense, low branching evergreen trees are planted within a commercial area, blocking cross-street views of storefronts, pedestrian crosswalks, and other district features.

Recommendation: Median design elements should be designed as part of an overall vision that incorporates frontage land use, development, and sidewalk improvements, consistent with Guideline 5.2.1 above. In general, median design elements should allow for side-to-side corridor visibility. Median islands should be considered as aesthetic elements in their own right, incorporating low planter walls, attractive light fixtures, and other design approaches that make them more than leftover roadway space. Figures 5-11a and 5-11b on the following page illustrate typical median cross-sections.

Caltrans Matrix Reference: Caltrans review of plant materials required; see Matrix section K.

5.4.2. Plant Materials

Design Issue: Plant materials in median islands benefit a Grand Boulevard street environment in multiple ways. However, plant species should be selected to reflect the visibility requirements and support the land use and development objectives of a boulevard street.

Recommendation: In general, median plant materials should be "high-low" to provide for corridor visibility; i.e., high-branching trees and low-growing shrubs (see Figure 5-10). To promote a boulevard appearance and maximize environmental benefits, trees should be regularly spaced, with species characteristics including a high-branching, broad spreading canopy; a more columnar form may be appropriate in locations with narrow clearances. Dense screen landscape plantings should be discouraged unless screening is needed to support frontage development, for example a designated residential boulevard area.

Caltrans Matrix Reference: Caltrans review of plant materials required; see Matrix section K.

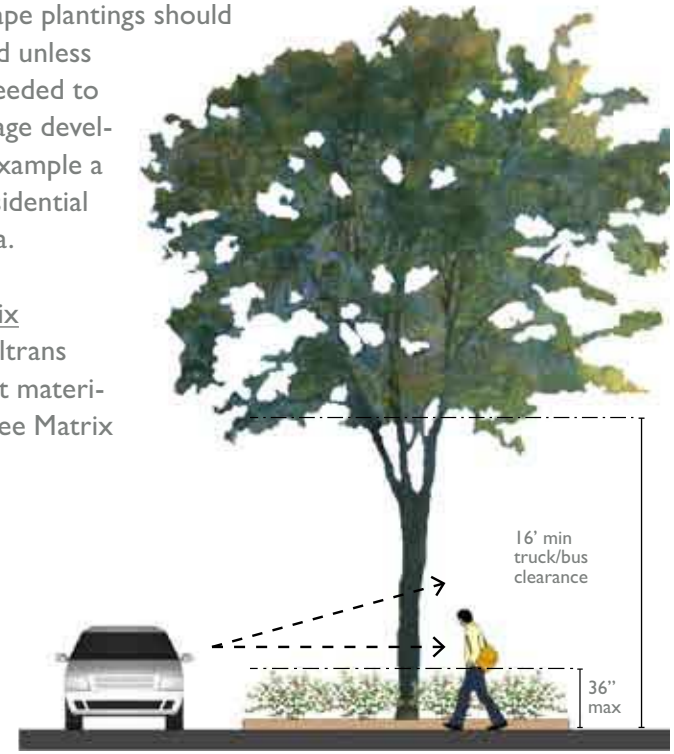


Figure 5-10. High-low median plantings

Figure 5-11a. *Commercial frontage and median with high-branching broad-canopy trees*

Figure 5-11b. *Residential frontage with double row of columnar trees*

5.4.3. Longitudinal Tree Clearance / Sight Distance

Design Issue: General policy for state highways is a minimum 100-foot sight distance setback of median street tree from intersection cross walk or stop bar. This significantly reduces the number of trees than can be planted, with associated effects on corridor beautification, pavement shading, greenhouse gas reduction, and other corridor improvement objectives. In areas with short blocks it may not be possible to plant any median street trees.

Recommendation: Street trees should be maximized along the corridor consistent with the GBI guidelines noted above. Median street trees may be located closer to cross walks or stop bars if a Caltrans-approved sight distance study determines that proposed tree location(s) meets safety requirements. All median streetscape design plans should incorporate sight distance studies in order to promote effective and attractive capital improvement investments.

Caltrans Matrix Reference: Design exception required; see Matrix section M.

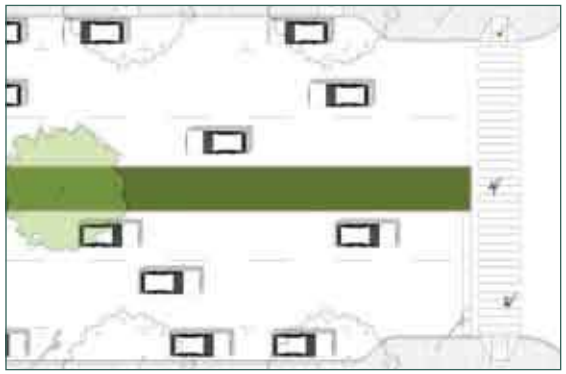


Figure 5-12a. *100' sight distance setback per Caltrans standard*

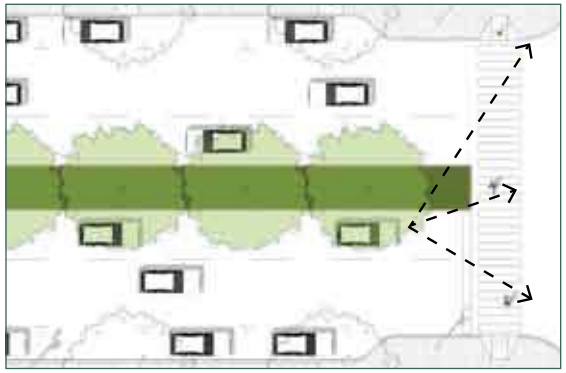


Figure 5-12b. *Reduced sight distance setback with sight distance study*

5.4.4. Lateral Tree Clearance / Median Barrers

Design Issue: Basic clearance requirement for state highways is minimum 5-foot setback of median street tree from face of median curb. If a mature tree is expected to have a trunk diameter of 1 foot, the median must be a minimum width of 11 feet. In many locations along the corridor through- and left-turn lanes do not leave room for an 11-foot median, but there may be room for a median that is narrower. Even if 11 feet is available, this requirement requires that trees be located in "single file" rather than a double or offset row, limiting options for planting design.

Recommendation: If roadway conditions are constrained and/or additional flexibility in streetscape design is desired, install planter wall/traffic barrier consistent with NCHRP 350 safety requirements. These barriers must be 18 inches in height, and can be solid concrete or a combination of concrete base and metal railing. They can be designed as attractive features of the streetscape. Figure 5-13a depicts a wide median with a typical concrete curb; Figure 5-13b depicts a narrow median with barrier and a single row of trees as well as a wide median with a staggered double row of trees.

Caltrans Matrix Reference: Design exception not required; see Matrix section L.

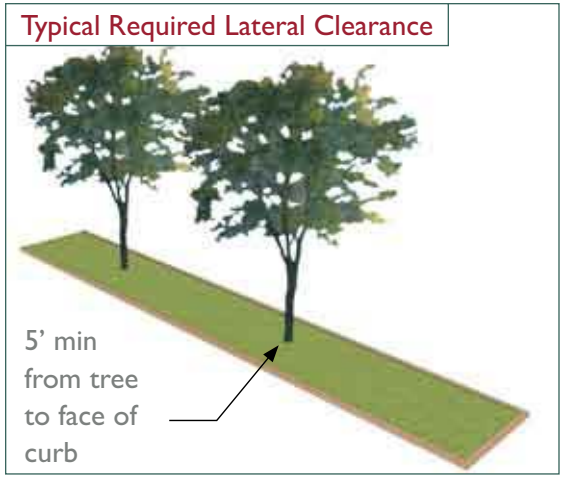


Figure 5-13a. Wide median with single row of trees

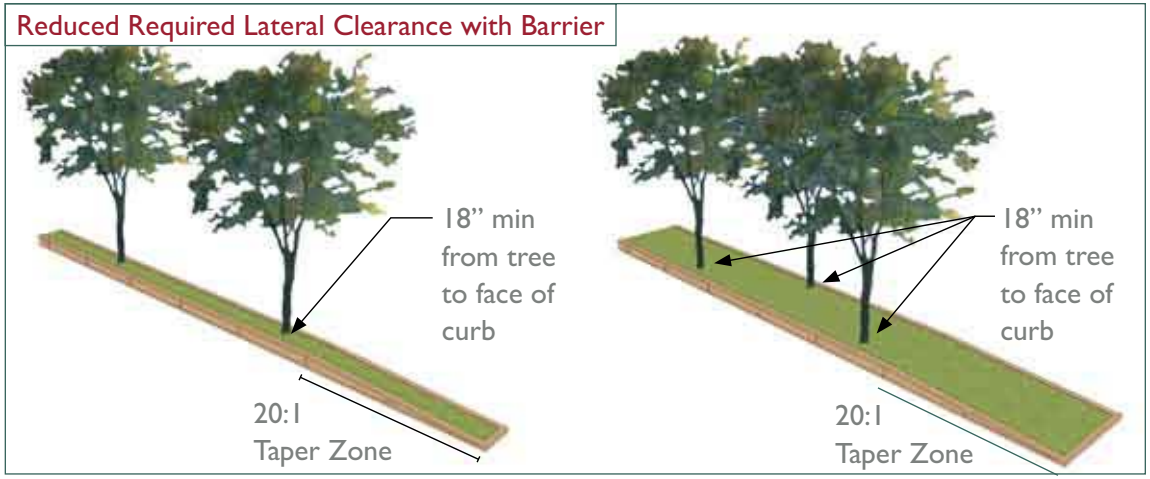


Figure 5-13b. Narrow median with single row of trees and barrier (left) and wide median with double row of trees and barrier (right)

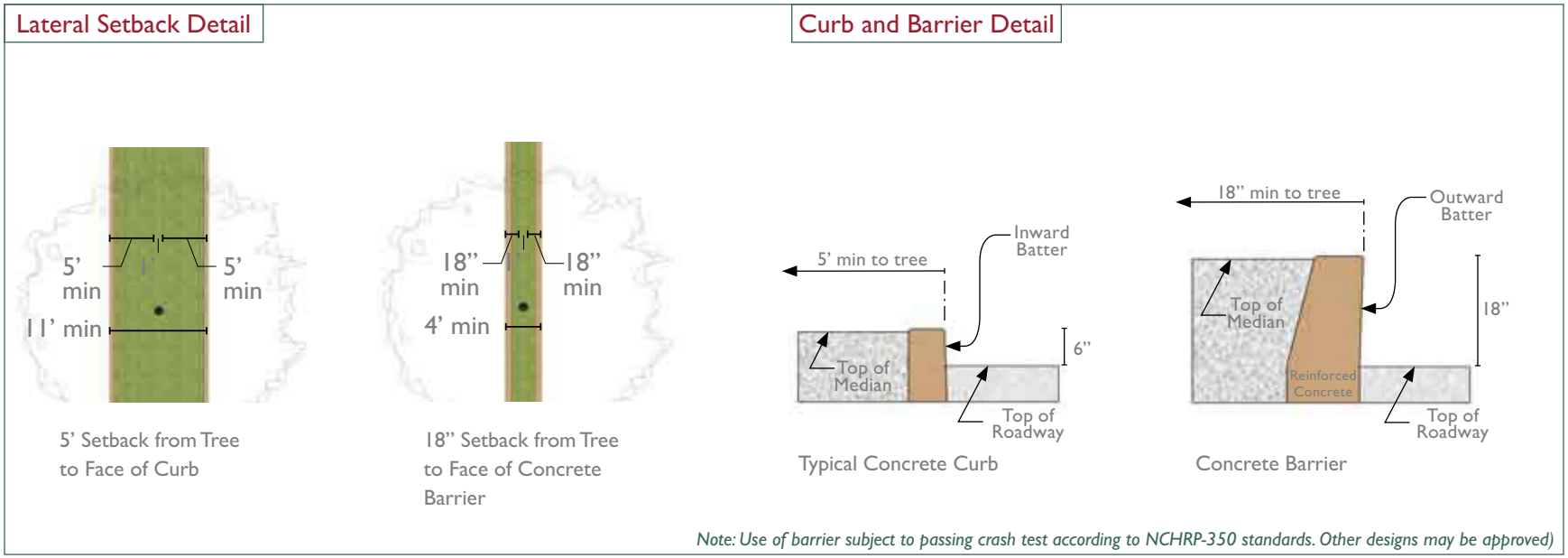


Figure 5-13c. Tree setback and curb/barrier details

5.5.1. Boulevard Sidewalk Width

Design Issue: Existing sidewalks throughout the SR 82 corridor are generally too narrow to support the "boulevard" street environment required to promote investment in transit-oriented mixed-use and infill residential development (see Figure 5-14). The predominant sidewalk width throughout the corridor is 8 feet. By comparison, sidewalks in heavily transit- and pedestrian-oriented areas, such as Market Street in San Francisco or First Street in San Jose, are 30 feet or more in width; internationally, even wider boulevard sidewalk areas are common.

Recommendation: Wider, more amenity-oriented sidewalks are essential for Grand Boulevard objectives to be achieved. Expanding sidewalks into the roadway is costly and requires substantial excess roadway area (though there are locations where this exists). Instead, new and re-development projects along the corridor frontage should provide a 10-foot or greater setback as needed to create a minimum 18-foot frontage sidewalk; see Sidewalk Zones, section below.

If walks cannot be widened to 18 feet due to adjacent property conditions or other factors, smaller setbacks are recommended as possible to promote GBI objectives. To the extent feasible, sidewalks should be configured to reflect Sidewalk Zones, and alternative design approaches, such as locating street trees in the parking zone (Guideline 5.2.4), should be considered.

Caltrans Matrix Reference: Not applicable.

Figure 5-14. Typical existing sidewalk

5.5.2. Sidewalk Zones

Design Issue: Among their functions, sidewalks provide a linear through-circulation route for pedestrians; "spillout" space for people entering and exiting frontage buildings and parked cars, and; area for boulevard amenities such as street trees, transit shelters, lighting, benches, outdoor cafes, and vendors.

Recommendation: Sidewalks should be configured to reflect the three basic sidewalk functions note above. As depicted in Figure 5-15, guideline recommendations include a 4-foot spillout zone adjacent to frontage buildings, a minimum 8-foot through walking zone, and a 6-foot amenity zone adjacent to the curb line for street trees, street lighting, and spillout area for curb-side parking.

In link areas with residential or office frontage land uses, the amenity zone could be used for a buffer landscape area. Variations in sidewalk paving patterns and/or materials should be considered to highlight the different sidewalk zones.

Caltrans Matrix Reference: Not applicable.

Figure 5-15. Sidewalk zones

5.5.3. Sidewalk Street Trees

Design Issue: Sidewalk street trees are an essential part of a Grand Boulevard vision for the corridor. In addition to beautification, benefits include pavement shading, greenhouse reduction, and, in combination with Low Impact Development elements, absorption of stormwater runoff.

Recommendation: Sidewalk street trees should be planted along all frontage sidewalks given sidewalk space and roadway visibility constraints. To promote a boulevard appearance and maximize environmental benefits, trees should be regularly spaced, with species characteristics including a high-branching, broad spreading canopy; a more columnar form may be appropriate in locations with narrow clearances. High-branching trees are recommended for visibility as well as street light and truck/bus clearance. Deciduous species are strongly recommended to provide sun in winter months.

Trees must be located a minimum 18 inches from face of curb per State highway design standards. However, a minimum tree well width of 4 feet and minimum setback of 2 feet 6 inches from face of curb is recommended. The location of street trees and streetlights should be coordinated to minimize conflicts.

Figure 5-16 depicts sidewalk street trees located at approximately 50 feet on center, with 6-foot square tree wells and a continuous pervious paving and subsurface structural soil trench located within the amenity zone area. Streetlights are depicted mid-way between the street trees. Figure 5-16 illustrates clearance and visibility considerations for sidewalk street trees.

Caltrans Matrix Reference: Caltrans review of plant materials required; see Matrix section K.

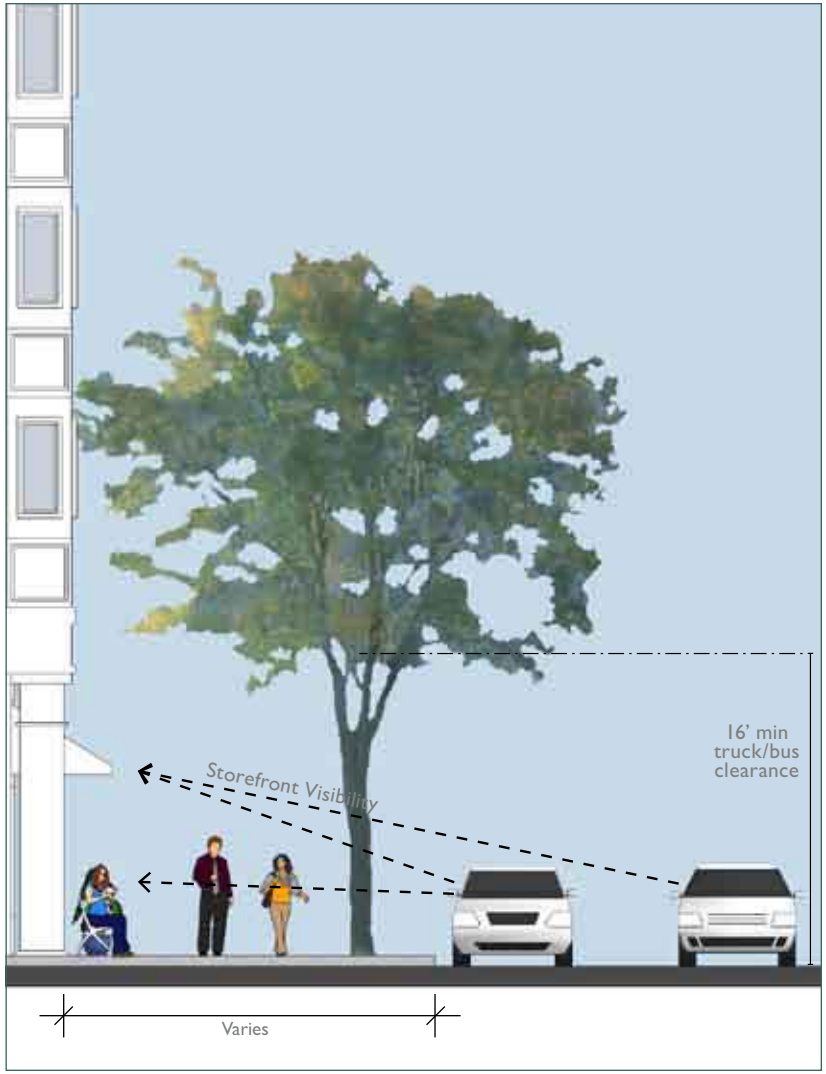


Figure 5-16. Street tree clearance and visibility

5.5.4. Pedestrian-Oriented Lighting

Design Issue: In most locations along the corridor, highway-type street lighting is the only type of lighting employed. This lighting is focused primarily on the roadway rather than on sidewalk areas. The sidewalk illumination provided is often blocked by frontage street trees, where they exist. These lighting conditions do not encourage pedestrian circulation, support investment in frontage properties, or promote the boulevard image desired for the corridor.

Recommendation: Pedestrian-oriented street lighting should be installed throughout the corridor, with supplemental highway-type lighting located at intersections if required. As shown in Figure 5-17, lights should be located mid-way between street trees, with heads mounted at levels to provide illumination beneath the street tree canopy. Heads should contain "cutoff" fixtures with shielding to support "dark sky" objectives and minimize impacts on adjacent buildings. Street light poles and fixtures should be attractive in design and coordinated with the design of frontage amenities and furnishings, such as bus shelters, benches, and kiosks.

Streetlights must be located a minimum 18 inches from face of curb per State highway design standards. However, a minimum setback of 2 feet 6 inches is recommended to allow for curbside parking door swing and/or frontage visibility. Aligning street lights with street trees can help create an orderly frontage appearance.

Caltrans Matrix Reference: Pedestrian-oriented streetlights require a Maintenance Agreement between the local community and/or agency and Caltrans; see Matrix section J.

Figure 5-17. Pedestrian-oriented lighting

5.5.5. Transit-Related Facilities

Design Issue: Supporting increased transit access to and from corridor destinations requires bus shelters, map/schedule kiosks and other facilities. For standard local bus service or BRT service operating in mixed-flow lanes with curbside stations, these transit-related facilities will be located in sidewalk areas. Sidewalk space is limited and these facilities have specific functional and spatial requirements.

Recommendation: Transit shelters, bicycle racks, and related facilities should be integrated into sidewalk design approaches. Sidewalk widening as recommended by the *Guidelines* allows flexibility to accommodate these elements. However, in many locations sidewalks will not be widened in the near term, if ever, yet these facilities will need to be accommodated.

Figures 5-18a through 5-18c depict a range of possible bus facilities and locations. For all conditions, a minimum 4-foot clearance between face of shelter and face of curb is assumed. Figure 5-18a shows an existing 8-foot sidewalk condition with no room for a shelter along a typical building frontage; Figure 5-18b shows a shelter on a 10-foot sidewalk adjacent to a non-storefront building with maintenance clearance behind and walking clearance in front; Figure 5-18c shows a shelter on a widened sidewalk area created by building setbacks or construction of a bus bulb-out.

Further discussion of elements and potential capital improvements associated with BRT, such as dedicated bus lanes and enhanced stations, is included in Chapter 7.

Caltrans Matrix Reference: Design exception may be required; see Matrix section Z.

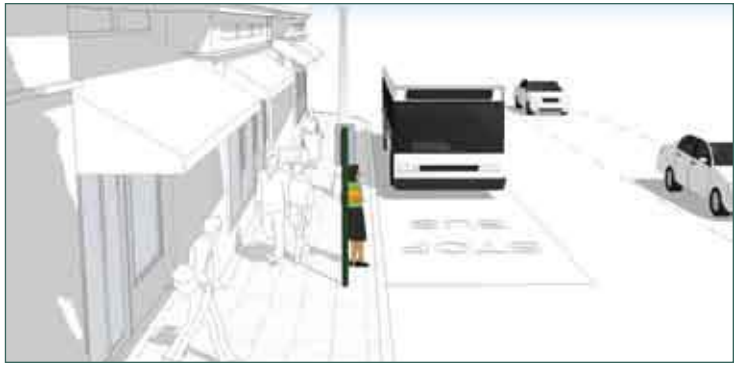


Figure 5-18a. *8' sidewalk: No space for bus shelter*

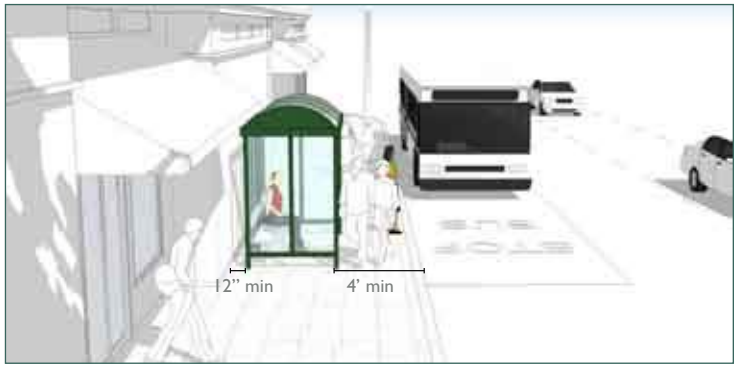


Figure 5-18b. *10' sidewalk: Bus shelter adjacent to building*

Figure 5-18c. *18' sidewalk: Bus shelter at curbside*

5.5.6. Bicycle-Related Facilities

Design Issue: Supporting increased bicycle access to and from corridor destinations requires bike racks and other facilities in sidewalk areas. Sidewalk space is limited and these facilities have specific functional and spatial requirements.

Recommendation: Bicycle racks and related facilities should be integrated into sidewalk design approaches. Sidewalk widening as recommended by the Guidelines allows flexibility to accommodate these elements. However, in many locations sidewalks will not be widened in the near term, if ever, yet these facilities will need to be accommodated.

Figures 5-19a and 5-19b depict alternate locations for bike bicycle parking: one adjacent to a frontage building with parallel orientation(s), the other perpendicular or diagonal to the frontage and adjacent to street tree wells. Minimum recommended clearance for parallel bike racks is 24 inches; minimum recommended clearance for perpendicular or angle racks is 36 inches. Large, multi-bike racks should have the same clearance requirements, but should be sited in locations where they do not conflict with pedestrian through access and spillout areas.

Caltrans Matrix Reference: Not applicable.

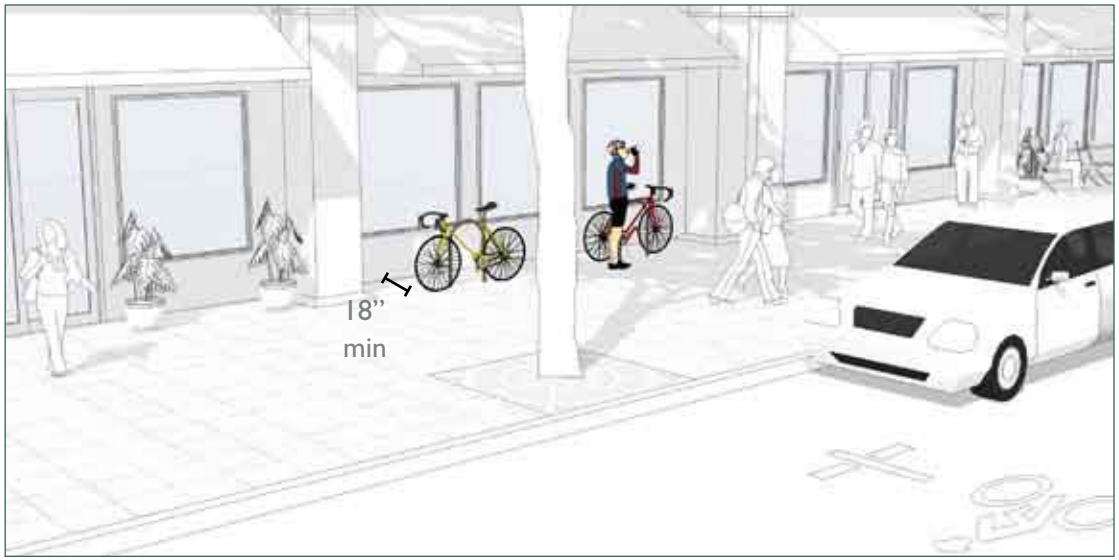


Figure 5-19a. "U"-rack bicycle parking adjacent to building frontage

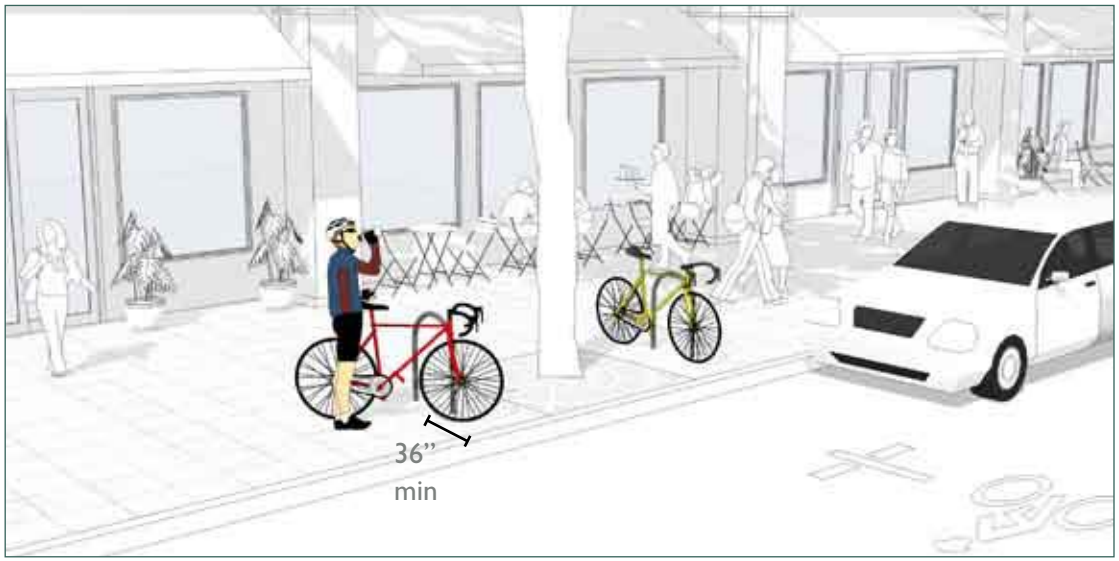


Figure 5-19b. "U"-rack bicycle parking adjacent to street tree wells

5.6.1. Stormwater Management Overview

Design Issue: Low impact design (LID) related to storm water infiltration and treatment has become a local, State, and Federal policy goal. With approximately 42 linear miles of roadway, stormwater management elements along SR 82 offer the potential to capture and biofilter significant amounts of stormwater.

Recommendation: A range of stormwater management elements should be considered for implementation along SR 82. This range of options is shown in the following stormwater management sections and the accompanying Figures 5-20 through 5-22. Pervious pavers can be used in areas such as sidewalk amenity zones to accept stormwater runoff from sidewalk surfaces. Stormwater curb extensions, planters, and swales can be used to accept runoff from street surfaces as well as bike lanes, sidewalks, and BRT platforms. "Green gutters" can accept stormwater runoff while providing a buffer between pedestrians and bike lanes.

New median islands should incorporate features to capture, biofilter, and perhaps detain the storm water that falls on them. Existing medians planned for renovation should also incorporate these features. In cases where a major roadway reconfiguration is planned, and/or where existing roadway grades permit, median stormwater swales can be designed to accept roadway storm water runoff as well. The *San Mateo County Sustainable Green Streets and Parking Lots Design Guidebook* and other State and regional best management practices guidelines should be consulted.

Caltrans Matrix Reference: Not applicable.

5.6.2. Curbside Parking

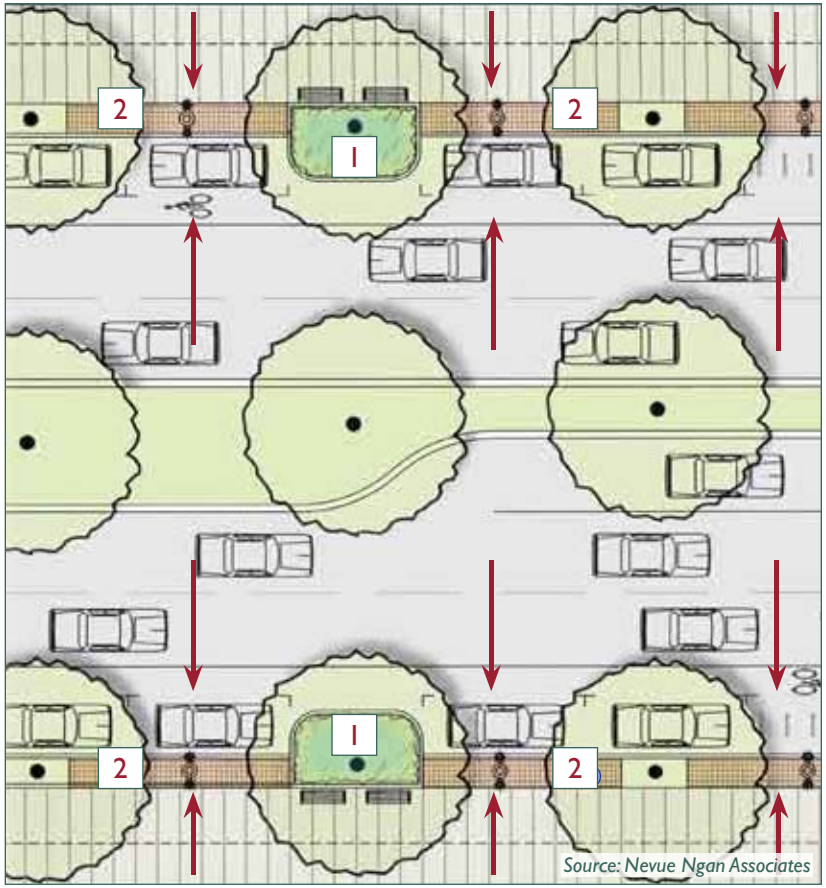


Figure 5-20. *Key design elements as indicated in figure:*

1. *Stormwater curb extensions accept runoff from street surfaces, and extend into the street as well as into the amenity zone.*
2. *Pervious pavers in the amenity zone accept stormwater runoff from sidewalk surfaces.*

5.6.3. Physically-Separated Bike Lane

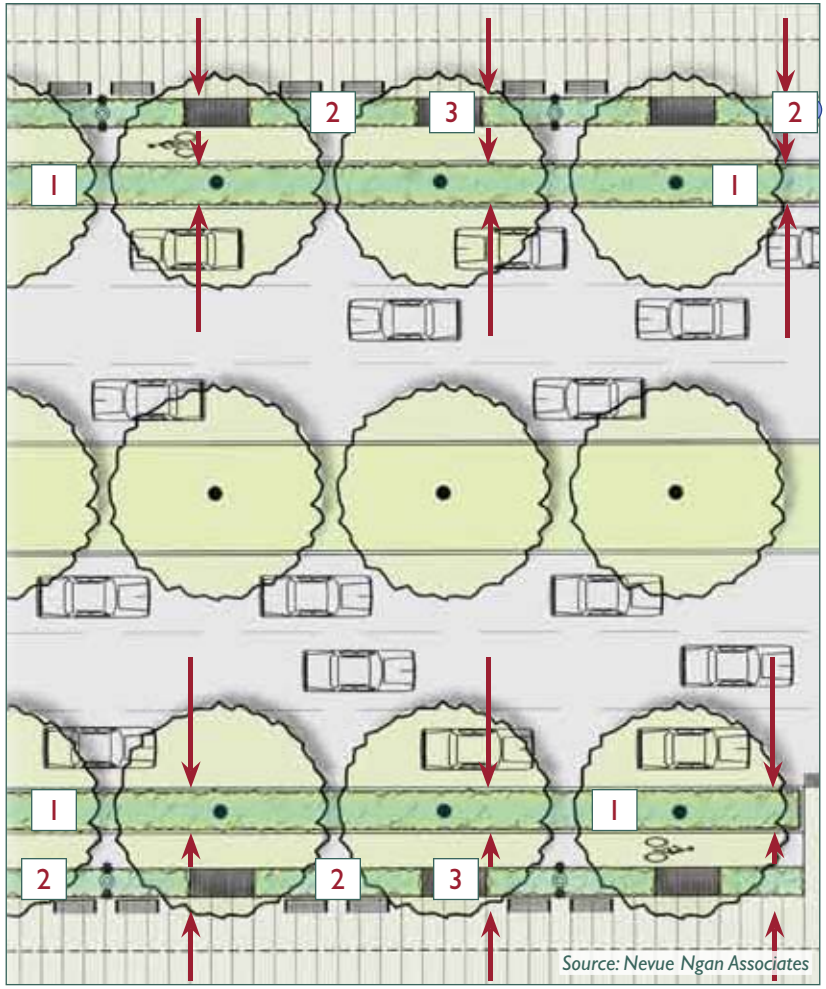


Figure 5-21. *Key design elements as indicated in figure:*

1. *Stormwater planter separates auto traffic from bike traffic. Planter accepts runoff from street and bike lane.*
2. *Green gutter accepts stormwater runoff from sidewalk zone and helps provide a buffer between bike traffic and pedestrians.*
3. *Dedicated crossings over the green gutter.*

5.6.4. Center Running BRT

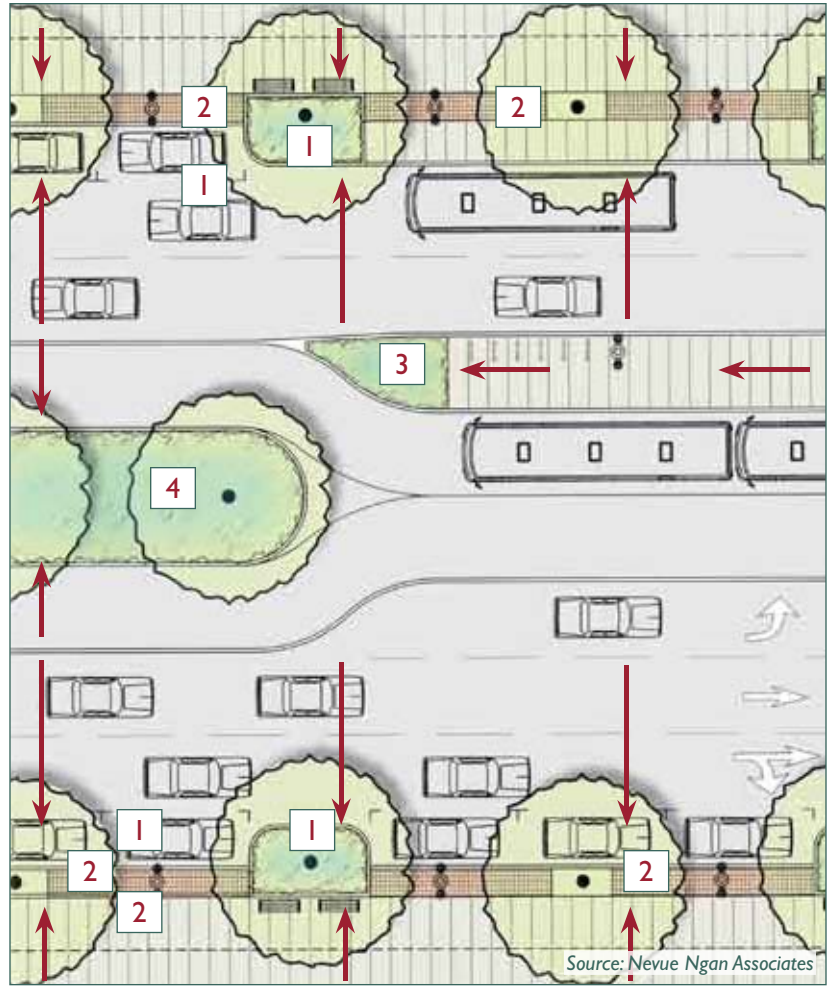


Figure 5-22. *Key design elements as indicated in figure:*

1. *Stormwater curb extensions accept runoff from street surfaces, and extend into the street as well as into the amenity zone.*
2. *Pervious pavers in the amenity zone accept stormwater runoff from sidewalk surfaces, including bus stops.*
3. *Stormwater curb extension accepts runoff from BRT platform.*
4. *Stormwater swale accepts runoff from BRT travel lanes.*

5.7.1. Frontage Treatment Concepts Overview

Creating a "grand boulevard" depends greatly on the quality of the sidewalk and frontage environment. The following frontage treatment guidelines depict a range of potential frontage design approaches, reflecting concepts developed by local communities and agencies, and/or feasible given frontage property conditions, and consistent with the objectives of the Grand Boulevard Initiative. The improvements depicted are not intended to be mutually exclusive; instead, they can be mixed and matched according to local conditions and local community objectives.

Figure 5-23 depicts a typical mid-block node or link area; though a 6-lane roadway is depicted the frontage condition shown is also typical of many 4-lane areas. Frontage properties vary in depth, with frontage development ranging from storefront commercial buildings to larger scale shopping centers, offices, and public facilities. Sidewalks are narrow, generally 8 feet in width, and curbside parking is provided along the frontage.

Highway-type cobra head streetlights are typical, and sidewalks are generally too narrow for significant street trees and other amenities. Median islands are discontinuous, and contain evergreen trees and other plant materials that block views of street frontages. This frontage condition is typical of many locations along the corridor, including portions of Belmont, San Carlos, Redwood City, Palo Alto, and Santa Clara.

Figure 5-23. *Typical existing frontage conditions*

5.7.2. Stormwater Infiltration

Design Issue: Cities, counties, and local agencies are promoting sustainable development and capital improvements in a variety of different ways. Low impact design (LID) related to stormwater infiltration and treatment is a common goal. As noted previously, San Mateo County's *Sustainable Green Streets and Parking Lots Design Guidebook* is a notable resource and reference. SB 790 and other State and Federal regulations can be expected to promote and likely require such treatment of stormwater runoff in the near future. However, current State highway design standards require complete drainage of stormwater.

Recommendation: Street improvements should incorporate stormwater infiltration and biofiltration features wherever feasible.

Figure 5-24 depicts a basic street improvement condition (i.e. widened sidewalk, consistent shade trees, ornamental streetlights) with stormwater infiltration features. These include: a) pervious paving, structural soil, and appropriate subsurface drainage facilities within the curbside amenity zone; b) a "rain garden" bulb-out with drainage inlets and subsurface drainage facilities, and: c) pervious paving with subsurface drainage facilities in the parking zone.

Dining within the right-of-way as depicted requires sidewalk relinquishment; Caltrans typically requires a minimum relinquishment of 1 to 2 blocks.

Caltrans Matrix Reference: Design exception(s) required; see Matrix section Q. Similar to requirements for streetscape amenities, Caltrans review of plant materials required; see Matrix section K.

Note: Sidewalk relinquishment or legislation allowing sidewalk seating on state right-of-way required.

Figure 5-24. *Basic street improvement package*

5.7.3. Physically-Separated Bikeway

Design Issue: In some communities, physically-separated (Class I) bikeways may be desired to encourage bicycle use and minimize conflicts with autos and other vehicles. Physically-separated bikeways are common in the city of Davis and other locations in the US and around the world.

Recommendation: Physically-separated bikeways can be a valuable element in a multimodal transportation strategy. However, they would be difficult to implement over large portions of the SR 82 corridor given the land area and associated parcel assembly required. Special intersection design approaches would be needed to accommodate the transition between off-street and on-street bikeway conditions. Redevelopment of large shopping center sites, office complexes, and government or institution-owned properties are potential candidates.

Figure 5-25 depicts a physically-separated bikeway along a link area residential and mixed-use frontage. A dismount area adjacent to an intersection is shown in the foreground; however, extensive use of dismount zones is discouraged.

Caltrans Matrix Reference: Not applicable for bikeways located outside the right-of-way. Caltrans review of plant materials required; see Matrix section K.

Figure 5-25. Basic street improvement package

5.7.4. Boulevard Frontage Access and Parking

Design Issue: In some locations it may be desirable to provide a frontage parking and access area that is separated from through traffic. This condition exists along a three-block stretch of El Camino Real in Millbrae north of Millbrae Avenue, and was proposed by Project for Public Spaces for San Carlos and other locations as part of the *Peninsula Corridor Plan*. This "international boulevard" design is also similar to the central portion of Shattuck Avenue in Berkeley, and is commonly employed in cities around the world.

Recommendation: This frontage treatment can be particularly effective in supporting street-oriented mixed-use and even residential development. Figure 5-26 depicts a typical condition, with frontage parking and one-way frontage access drive separated from adjacent through-traffic lanes by a landscaped island. Similar to the physically-separated bikeway frontage, a significant parcel size and/or parcel assembly would be required to implement this approach. However, unlike the physically-separated bikeway, continuity from parcel to parcel is less of an issue; i.e., the angled parking frontage could be implemented on a site-by-site basis provided the frontage is long enough to allow for efficient parking and safe access to and from the through-lanes.

In Paris, where this configuration was initially popularized, the City has reconfigured many of the boulevards to eliminate the frontage parking and access drive to create even more expansive sidewalk areas. The change is dramatic along the Champs Elysees, where grand-scale walkways accommodate pavilions, outdoor events, and extensive outdoor dining areas.

Caltrans Matrix Reference: Design exception may be required; see Matrix section P.

Figure 5-26. *Typical international boulevard configuration*

5.8.1. Street Design Prototypes Overview

The Street Design Prototypes illustrate street improvements consistent with this document's Street Design Guidelines and local community and Grand Boulevard Initiative objectives. The Prototypes focus on the features of a general corridor-wide vision with common pedestrian-, transit-, and bicycle-oriented design elements, and are intended to be consistent with Caltrans, SamTrans, VTA, and C/CAG standards and policies.

The Prototypes show a range of options for roadway improvements. Like the Guidelines, the Prototypes are specifically intended to encourage locally-initiated street improvement projects. The trees, lights, paving, and other materials shown in the prototype images are not intended to establish a single design treatment for the corridor. Rather, individual communities and/or agencies are encouraged to establish materials and design treatments as they consider appropriate.

Special attention will need to be paid to unique frontage conditions along the corridor, such as the Stanford University frontage in Santa Clara County, which according to the 2000 Stanford Community Plan and General Use Permit must retain an informal, park-like character. In areas such as these, local agency or institution plans or design guidelines (such as the Stanford University Plan for El Camino Frontage and the City of Palo Alto El Camino Real Master Schematic Design Plan) will form the basis for future improvements. However, a possible outcome of the GBI Multimodal Corridor Plan effort would be for local agencies/institutions to align their future plans to the GBI vision to the greatest extent possible.

Existing Conditions Prototypes

The prototypes reflect the "node" and "link" land use and development policy approaches being pursued by local communities. Node areas are generally adjacent to downtown commercial districts and/or transit hubs, and have higher densities and higher levels of pedestrian activity. Link areas accommodate a wider variety of land uses and forms of development than node areas, and are generally lower in density. Link areas typically include shopping centers, auto dealers, and office and residential complexes. Existing "prototype" conditions include the following:

- 4-Lane Node - Adjacent to a downtown commercial district and/or transit center. Curbside parking. Vertical mixed-use with residential/office over commercial. Relatively shallow frontage properties.
- 4-Lane Link - Between node areas. Horizontal mixed-use, vertical mixed-use, or single use development. Curbside parking. Relatively shallow frontage properties.
- 6-Lane Node - Adjacent to downtown commercial district and/or transit center. Curbside parking. Vertical mixed-use with residential/office over commercial. Relatively deep frontage properties.
- 6-Lane Link - Between node areas. Horizontal mixed-use, vertical mixed-use, or single use development. Curbside parking. Relatively deep frontage properties.
- 4- or 6-Lane Link with No Parking - Between node areas. No curbside parking due to bike lanes, transit lanes, sidewalk widening, or other factors.

The prototype images are organized into two categories:

Caltrans Standards: These images depict (a) existing conditions, (b) street improvements possible under current Caltrans standards, and (c) enhanced and/or alternate improvements that are possible with Caltrans-approved Design Exceptions. Exception 1 is an enhanced version of the basic Caltrans Standard improvements. Exception 2 addresses a particular condition; for the 4-lane node this is a narrow frontage sidewalk; for the 6-lane link it is a frontage bike lane.

BRT (Bus Rapid Transit) Conditions: These images depict the range of BRT scenarios envisioned by VTA and SamTrans consistent with Caltrans Standards and/or Design Exceptions.

The 4-lane condition is limited by ROW width to "mixed flow" service, with BRT vehicles sharing automobile lanes. The 6-lane conditions show either "mixed-flow" service or dedicated busways in the center of the ROW, with a variety of lane and median configurations. Figures 5-37 through 5-39 depict existing 6-lane conditions reduced to 4 lanes to accommodate dedicated busways. In Figures 5-40 and 5-41, generous existing ROW or acquisition of additional ROW allows for 6 lanes to be retained. All BRT stations are depicted at node locations.

Prototype Design Assumptions

Cross-Section Dimensions - The prototypes are based on minimum ROW and curb-to curb dimensions typical within the corridor. This requires that traffic engineering-related features be reduced as feasible to accommodate Boulevard-oriented multimodal circulation and streetscape improvements. Curb lines are generally depicted in the existing location to reflect the significant cost associated with relocation. If a street segment's curb-to-curb and/or ROW dimensions are greater than those depicted, the dimension of design features could be expanded accordingly.

Boulevard-Scale Sidewalks - The minimum desirable sidewalk width depicted is 18 feet, as consistent with specific plans, precise plans, and streetscape design plans prepared by local communities for portions of the corridor. However, the typical sidewalk width within the corridor is only 8 feet. Therefore, the prototypes generally depict (new) building setbacks of 10 feet to create the boulevard-scale sidewalks desired.

Street Trees - Large canopy shade trees are depicted in the images, consistent with the boulevard character desired by local communities and promoted by the GBI. In addition to their urban design and aesthetic qualities, large shade trees reduce urban heat island effects, aid in carbon dioxide absorption, and contribute to local property values.

Caltrans Review and Approval – The prototypes depict generic improvements subject to Caltrans review and approval; i.e., designs consistent with the dimensions and/or elements depicted herein are not guaranteed Caltrans approval.

5.8.2. Four-Lane Node - Existing Condition

Figure 5-27 at right depicts a node area intersection in a 4-lane section of the corridor. Frontage properties are shallow, with many less than 125 feet in depth. Frontage development consists of 1- and 2-story buildings with commercial use on the ground floor. Sidewalks are narrow, generally 8 feet in width though less in some locations.

Travel lanes are relatively wide, 12 feet or more, with curbside parking along both sides of the street. Left-turn pockets and painted or curbed and landscaped medians exist in most locations. In some communities free-right turn lanes (depicted) are common; in others, curbside parking extends to the corner. There are no special pedestrian-oriented elements, such as advance limit line or "continental" crosswalk striping.

This general condition is typical in San Mateo County communities, including Daly City, San Carlos, and Redwood City. The Alameda in San Jose has a similar configuration as well.

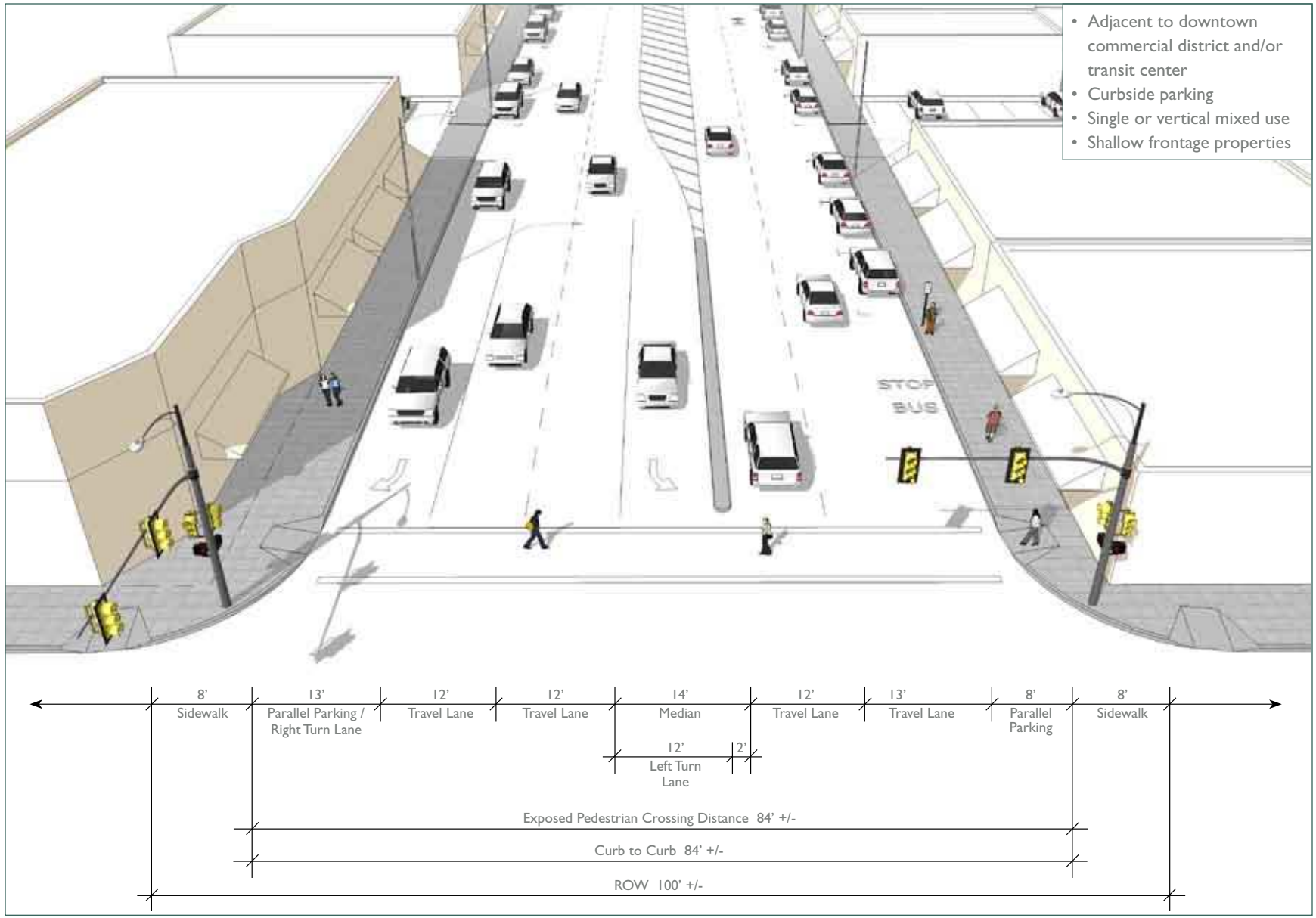


Figure 5-27. 4-lane node - Existing condition

5.8.3. Four-Lane Node Improvements - Caltrans Standards

Figure 5-28 depicts street improvements consistent with existing Caltrans design standards. Improvements include:

- Lane width: Through and turn lanes reduced to 12 feet to accommodate pedestrian refuge and median widening
- Pedestrian refuge: Minimum 4 feet in width
- Median landscaping: Trees 100 feet minimum from stop bar and crosswalk; trees 5 feet minimum from face of median curb
- Street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb
- Corner bulb-out: Minimum 4 feet clear/setback from travel lane; 25 feet flat side
- Sidewalk widening: Walk widened to 18 feet with building setback (right to pass easement or dedication)

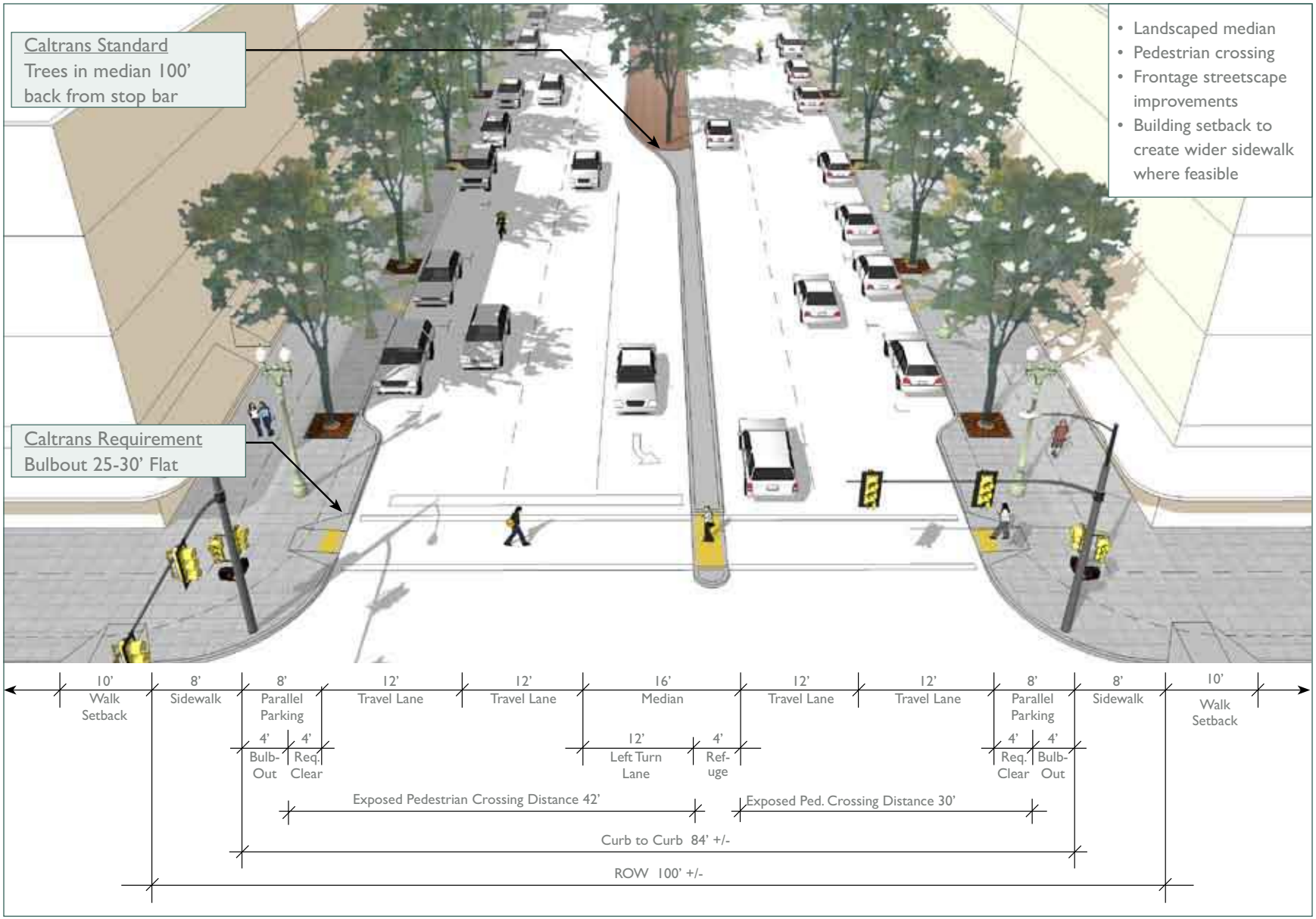


Figure 5-28. 4-lane node improvements - Caltrans standards

5.8.4. Four-Lane Node Improvements - Design Exceptions 1

Figure 5-29 depicts street improvements that are not consistent with basic Caltrans standards but possible if approved by Caltrans as Design Exceptions. Improvements include:

- Lane width: Through lanes reduced to 11 feet and left-turn lane reduced to 10 feet to accommodate widened median, pedestrian refuge, and shared bus, bike and auto lane; shared lane expanded to 14 feet.
- Pedestrian refuge: 8 feet in width
- Median landscaping: Trees less than 100 feet from stop bar subject to sight distance study; trees less than 5 feet from face of curb with approved barrier/curb.
- Street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb, typical
- Corner bulb-out: Minimum 4 feet clear/setback from travel lane; less than 25 feet flat side to accommodate curbside parking
- Sidewalk widening: Walk widened to 18 feet with building setback (right to pass easement or dedication)

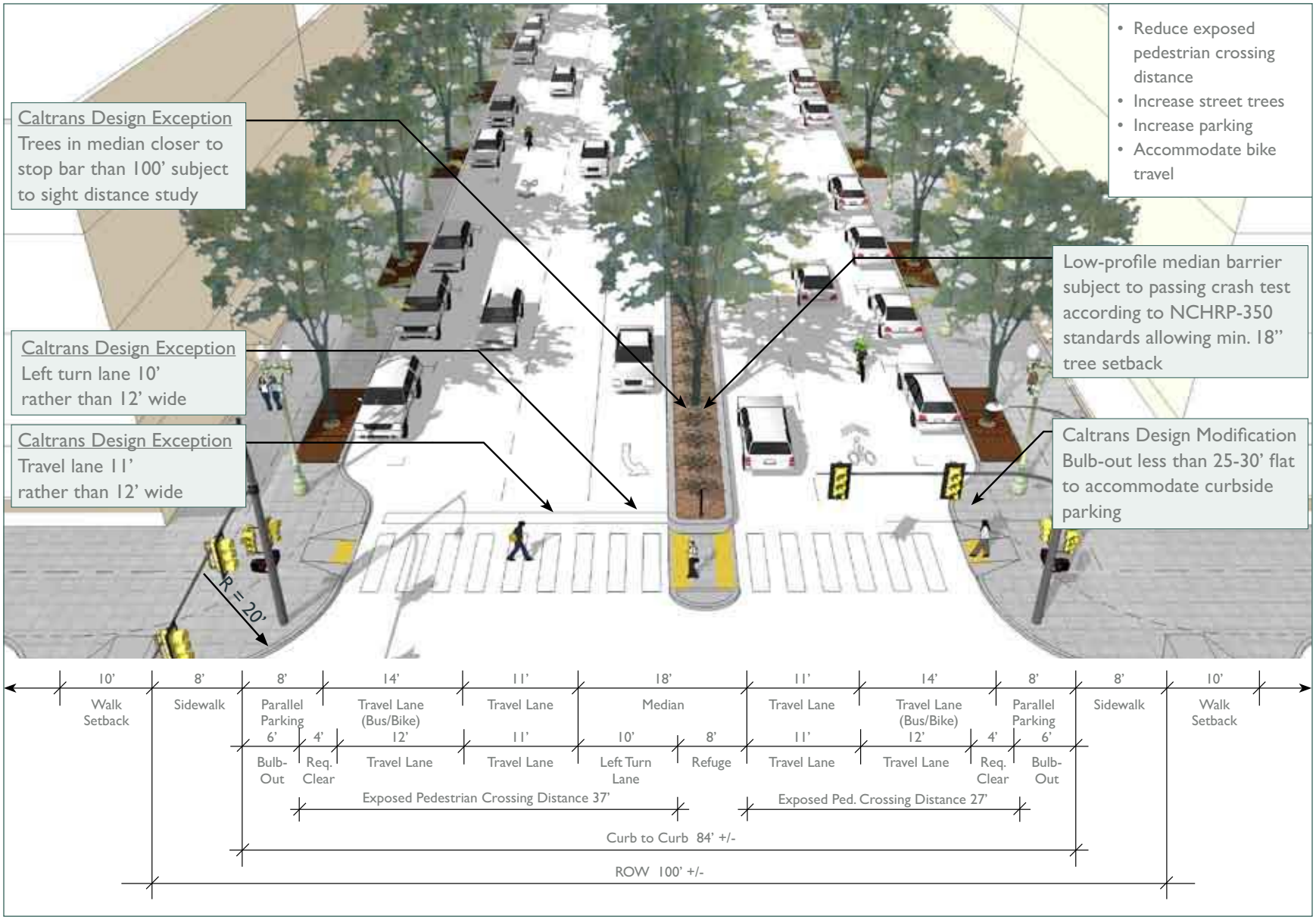


Figure 5-29. 4-lane node improvements - Design exceptions 1

5.8.5. Four-Lane Node Improvements - Design Exceptions 2 (Narrow Sidewalk / Local Bus Bulb-Out)

Figure 5-30 depicts street improvements that are not consistent with basic Caltrans standards but possible if approved by Caltrans as Design Exceptions. The main difference from the Design Exceptions 1 illustration is lack of sidewalk widening. Improvements include:

- Lane width: Through lanes reduced to 11 feet and left-turn lane reduced to 10 feet to accommodate widened median, pedestrian refuge, and shared bus, bike and auto lane; shared lane expanded to 14 feet.
- Pedestrian refuge: 8 feet in width
- Median landscaping: Trees less than 100 feet from stop bar subject to sight distance study; trees less than 5 feet from face of curb with approved barrier/curb.
- Street trees: In parking zone, planter minimum 4 feet clear/setback from travel lane.
- Ornamental streetlights: Minimum 18 inches from face of curb
- Corner bulb-out: Less than 25 feet flat side to accommodate curbside parking
- Sidewalk widening: None
- Bus bulb-out: 6-foot bulb-out allows for installation of bus shelter in areas with narrow sidewalks, requires bus to stop in travel lane

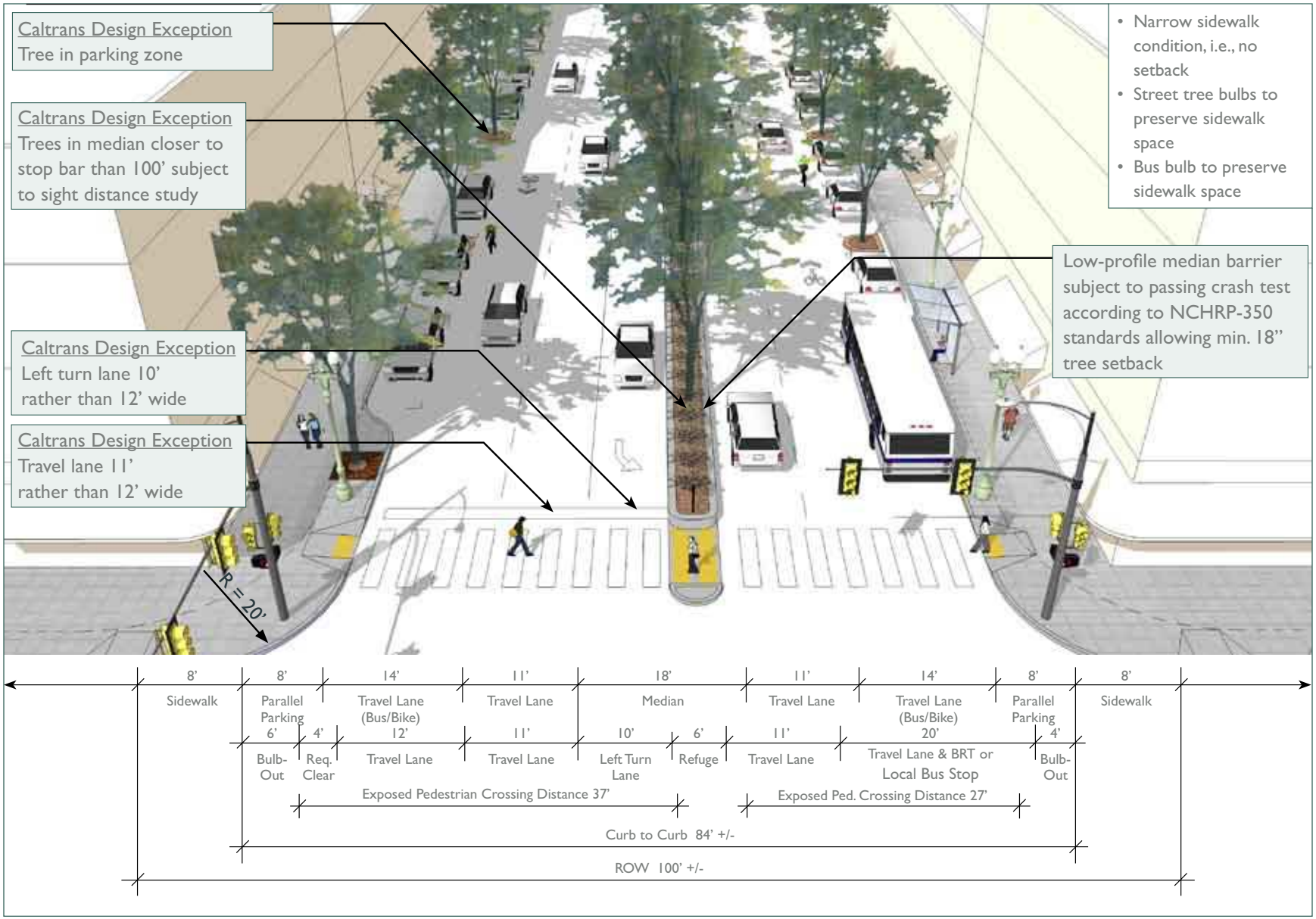


Figure 5-30. *4-lane node improvements - Design exceptions 2 (narrow sidewalk / local bus bulb-out)*

5.8.6. Six-Lane Link - Existing Condition

Figure 5-31 depicts a typical mid-block link area in a 6-lane portion of the corridor. Frontage properties are generally deep, with many more than 250 feet in depth. Frontage development ranges from shopping centers and office and residential complexes to stand-alone commercial buildings; there are many locations where properties are shallow, however, similar to the 4-Lane node condition. Sidewalks are narrow, generally 8 feet in width.

Travel lanes are relatively wide, 12 feet or more, with curbside parking along both sides of the street. Landscaped medians exist in most of these areas, with a mix of evergreen and deciduous trees and shrubs. Distances between pedestrian crossings are long, in many cases 1,000 feet or more. This general condition is most common in Santa Clara County communities, including Mountain View, Palo Alto, and Santa Clara.

Figure 5-31. *6-lane link - Existing condition*

5.8.7. Six-Lane Link Improvements - Caltrans Standards

Figure 5-32 depicts street improvements consistent with existing Caltrans design standards. Improvements include:

- Lane width: Through and turn lanes reduced to 12 feet to accommodate pedestrian refuge and median widening
- Mid-block pedestrian crossing: Traffic signal required; "continental" crosswalk striping and advance limit line recommended
- Median refuge: Minimum 4 feet width; diagonal configuration recommended for visibility
- Median landscaping: Trees 100 feet minimum from stop bar and crosswalk; trees 5 feet minimum from face of median curb
- Frontage street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb
- Mid-block bulb-out: Minimum 4 feet clear/setback from travel lane
- Sidewalk widening: Walk widened to 18 feet with building setback (not a Caltrans issue)

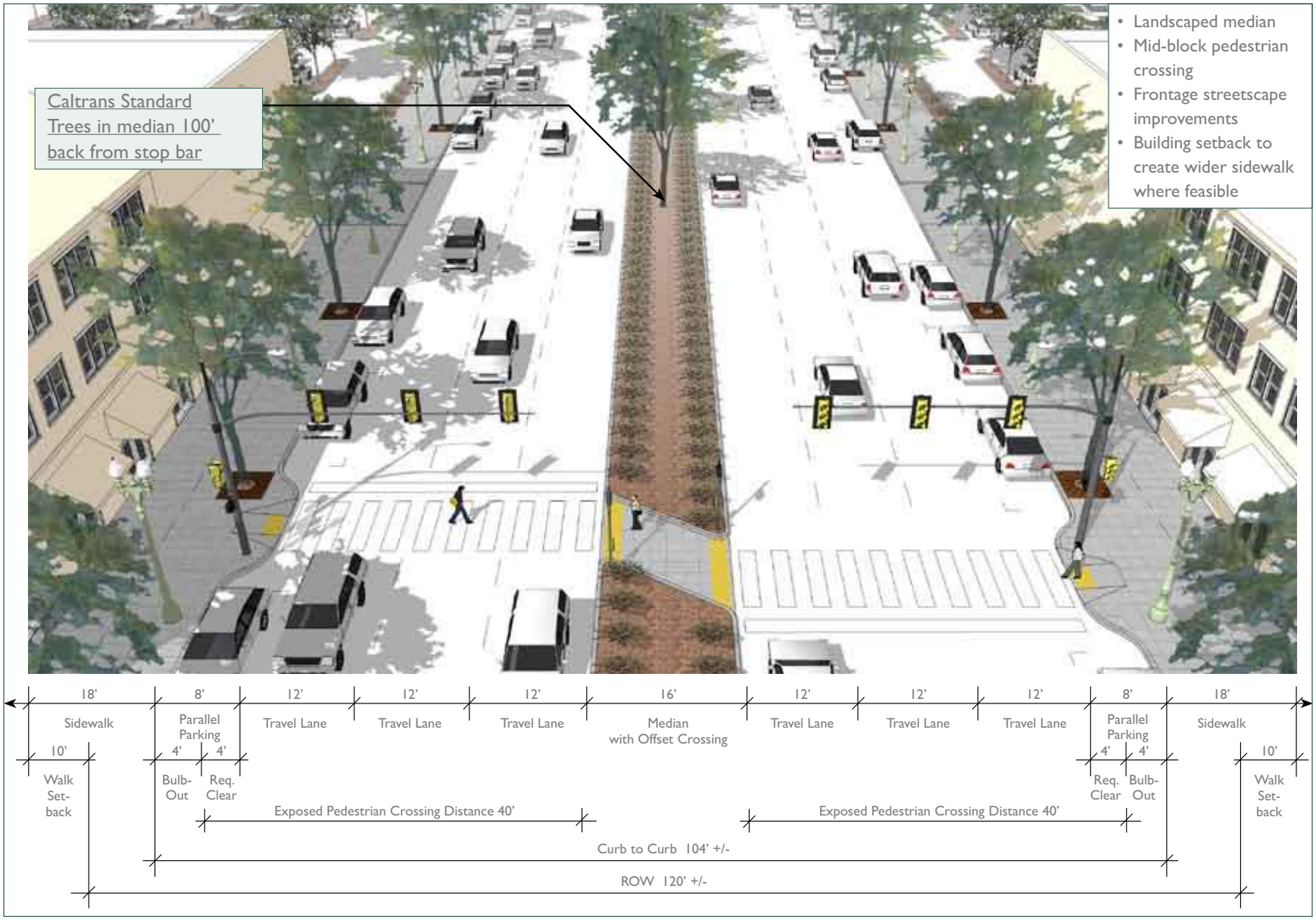


Figure 5-32. 6-lane link improvements - Caltrans standards

5.8.8. Six-Lane Link Improvements - Design Exceptions 1 (Reduced Crossing Distance)

Figure 5-33 depicts street improvements that are not consistent with basic Caltrans standards but possible if approved by Caltrans as Design Exceptions. The main difference from the Caltrans Standards is a wider median/refuge and reduced pedestrian crossing distance. Improvements include:

- Lane width: Through lanes reduced to 11 feet left-turn lane reduced to 10 feet to accommodate widened median, pedestrian refuge, and shared bus, bike and auto lane; shared lane expanded to 14 feet.
- Mid-block pedestrian crossing: Traffic signal required; "continental" crosswalk striping and advance limit line recommended
- Median refuge: Minimum 4 feet width (16 feet depicted); diagonal configuration recommended for visibility
- Median landscaping: Trees less than 100 feet from stop bar subject to sight distance study
- Frontage street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb
- Mid-Block bulb-out: Minimum 4 feet clear/setback from travel lane
- Sidewalk widening: Walk widened to 18 feet with building setback (not a Caltrans issue)

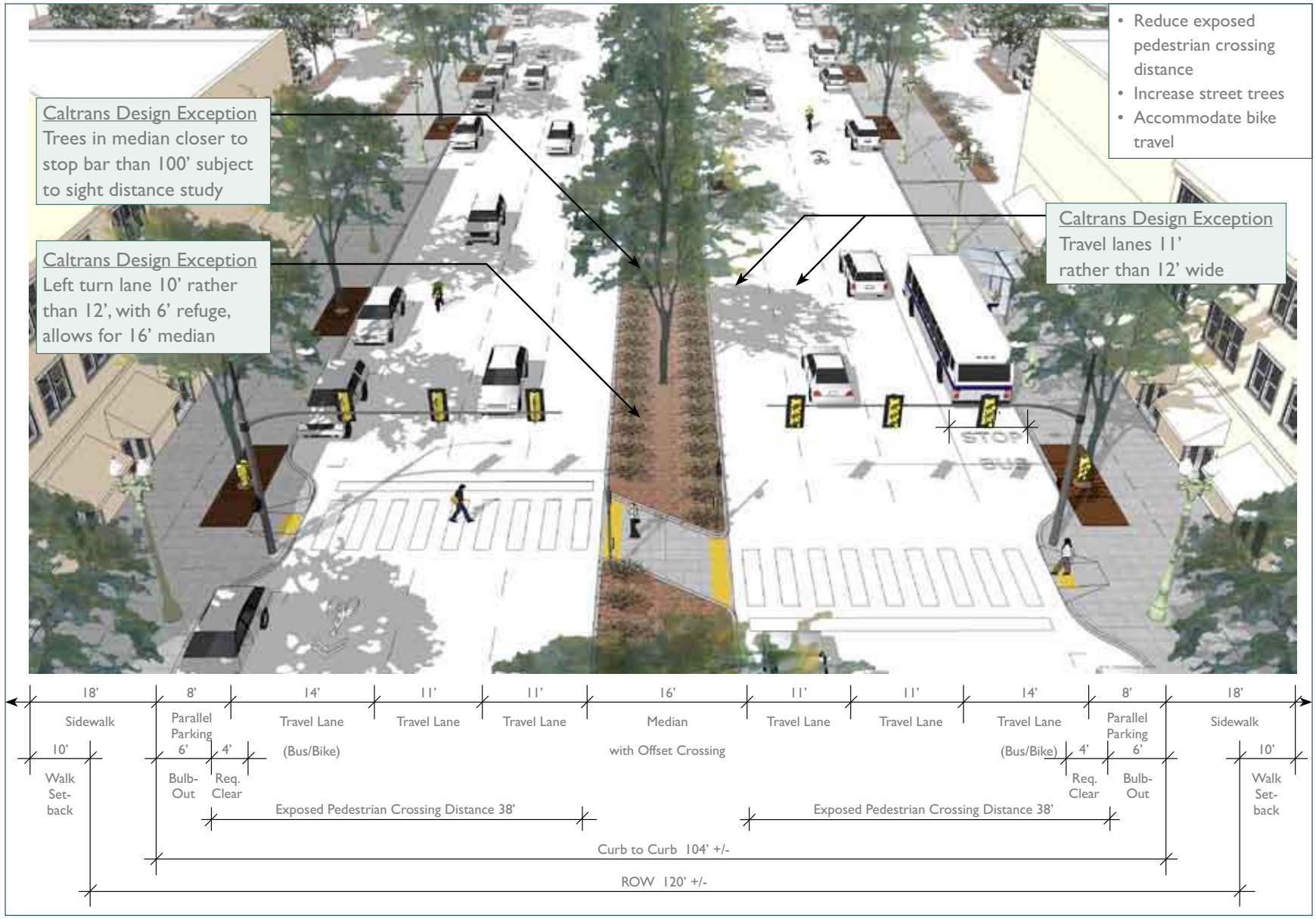


Figure 5-33. *6-lane link improvements - Design exceptions 1 (reduced crossing distance)*

5.8.9. Six-Lane Link Improvements - Design Exceptions 2 (Bike Lane)

Figure 5-34 depicts street improvements that are not consistent with basic Caltrans standards but possible if approved by Caltrans as Design Exceptions. The main difference from the Design Exceptions 1 illustration is substitution of a bike lane for curbside parking. Improvements include:

- Lane width: Through lanes reduced to 11 feet and left-turn lane reduced to 10 feet to accommodate widened median, pedestrian refuge, and dedicated bike lane
- Bike lane: Painted bike lane 6-foot width recommended (1-foot gutter, 5-foot lane); protective roll curb/island recommended if street width conditions permit
- Bus stop area: Minimum 11-foot width recommended; dashed bike lane stripe in this area
- Mid-block pedestrian crossing: Traffic signal required; "continental" crosswalk striping and advance limit line recommended
- Median refuge: Minimum 4 feet width (16 feet depicted); diagonal configuration recommended for visibility
- Median Landscaping: Trees less than 100 feet from stop bar subject to sight distance study
- Frontage street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb
- Sidewalk widening: Walk widened to 18 feet with building setback (not a Caltrans issue)

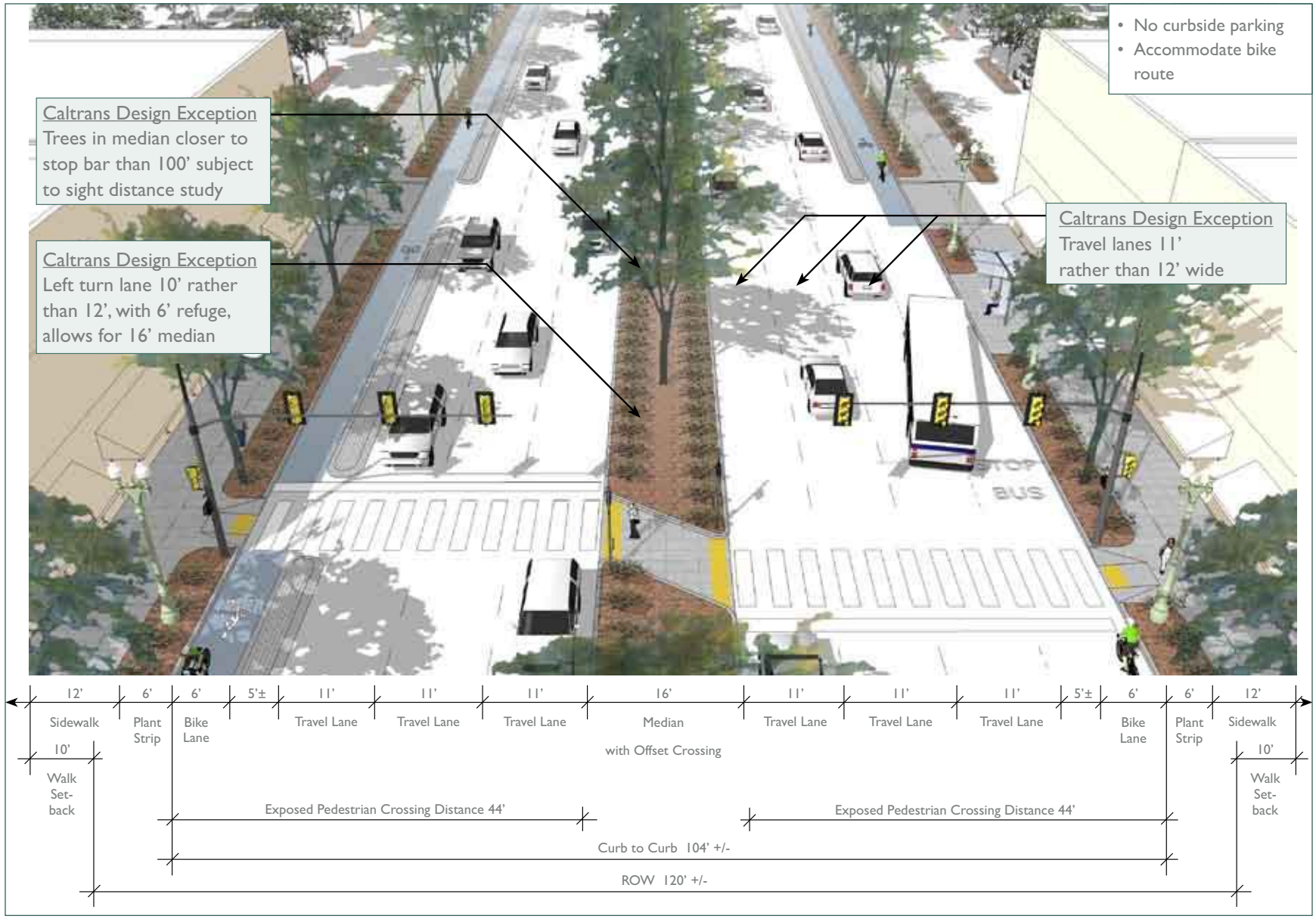


Figure 5-34. 6-lane link improvements - Design exceptions 2 (bike lane)

5.8.10. Four-Lane Node - BRT in Mixed Flow

Figure 5-35 depicts the following conditions:

- Lane configuration: 4 through lanes with median, left-turn lane, and mixed sharrow/bus/through lane
- Lane width: Through lanes reduced to 11 feet and left-turn lane reduced to 10 feet to accommodate refuge, sharrows
- BRT station area: Minimum 4-foot bulbout recommended; boarding area length and amenities to be determined by transit agency standards. Station shown in figure is for illustrative purposes only
- Frontage street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb
- Sidewalk widening: Walk widened to 18 feet with building setback where possible, or trees in parking zone to increase walk space (not a Caltrans design issue); frontage sidewalk space dedicated to bus shelter

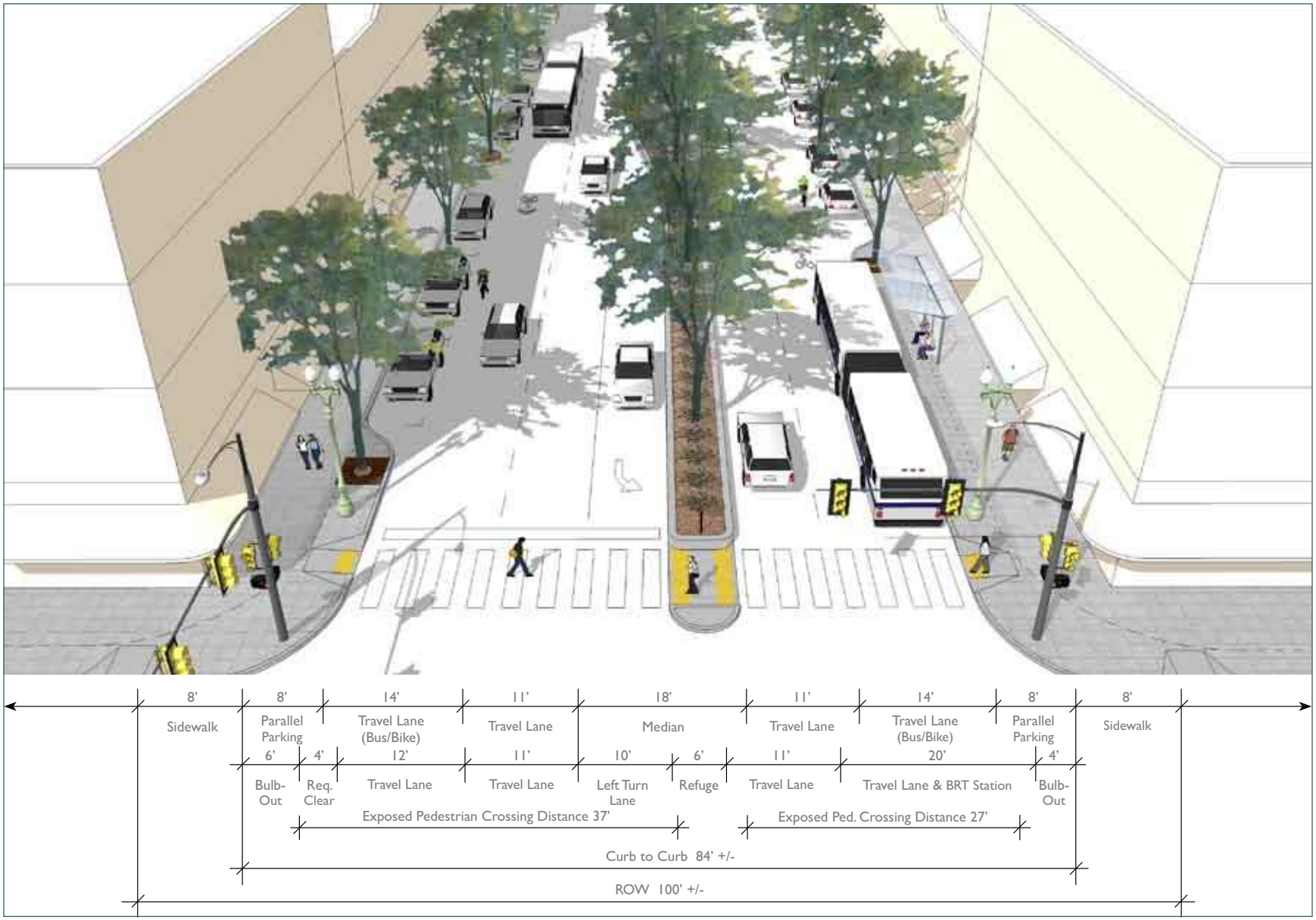


Figure 5-35. *4-lane node - BRT in mixed flow*

5.8.11. Six-Lane Node - BRT in Mixed Flow

Figure 5-36 depicts the following conditions:

- Lane configuration: 6 through lanes including mixed through/BRT/sharrow lane
- Lane width: Through lanes reduced to 11 feet and left-turn lane reduced to 10 feet to accommodate refuge, sharrow, bulb-outs
- Bus station area: Minimum 4-foot bulbout recommended
- Frontage street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb
- Sidewalk widening: Walk widened to 18 feet with building setback (not a Caltrans design issue); frontage sidewalk space dedicated to bus shelter

Figure 5-36. *6-lane node - BRT in mixed flow*

5.8.12. Six-Lane Node - BRT with Dedicated Lanes and Parallel Medians (Lane Reduction)

Figure 5-37 depicts the following conditions:

- Lane configuration: Through lanes reduced from 6 to 4 to create space for dedicated BRT lanes, station platforms, nested landscape medians, retention of curbside parking
- Lane width: Through lanes reduced to 11 feet and left-turn lane reduced to 10 feet to accommodate BRT lanes, platform/refuge
- Local bus stop area: minimum 11-foot width recommended
- Platform/refuge: 13-foot width recommended; 10-foot width minimum
- Frontage street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb
- Sidewalk widening: Walk widened to 18 feet with building setback (not a Caltrans design issue); frontage sidewalk space dedicated to shelter for local bus
- BRT station area: Boarding area length and amenities to be determined by transit agency standards. Station shown in figure is for illustrative purposes only

Figure 5-37. *6-lane node - BRT with dedicated lanes and parallel medians (lane reduction)*

5.8.13. Six-Lane Node - BRT with Dedicated Lanes and Center Median (Lane Reduction)

Figure 5-38 depicts the following conditions:

- Lane configuration: Through lanes reduced from 6 to 4 to create space for dedicated BRT lanes, station platforms, center landscape median, retention of curbside parking
- Lane width: Through lanes reduced to 11 feet and left-turn lane reduced to 10 feet to accommodate BRT lanes, platform/refuge
- Local bus stop area: Minimum 11-foot width recommended
- Platform/refuge: 13-foot width recommended; 10-foot width minimum
- Frontage street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb
- Sidewalk widening: Walk widened to 18 feet with building setback (not a Caltrans design issue); frontage sidewalk space dedicated to shelter for local bus
- BRT station area: Boarding area length and amenities to be determined by transit agency standards. Station shown in figure is for illustrative purposes only

Figure 5-38. *6-lane node - BRT with dedicated lanes and center median (lane reduction)*

5.8.14. Six-Lane Node - BRT with Dedicated Lanes and Bike Lanes (Lane Reduction)

Figure 5-39 depicts the following conditions:

- Lane configuration: Through lanes reduced from 6 to 4 to create space for dedicated BRT lanes, station platforms, nested landscape medians, bike lanes
- Lane width: Through lanes reduced to 11 feet and left-turn lane reduced to 10 feet to accommodate BRT lanes, platform/refuge
- Bike lane: Painted bike lane 6-foot width recommended (1-foot gutter, 5-foot lane); protective roll curb/island recommended if street width conditions permit
- Local bus stop area: Minimum 11-foot width recommended; dashed bike lane stripe in this area
- Platform/refuge: 13-foot width recommended; 10-foot width minimum
- Frontage street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb
- Sidewalk widening: Walk widened to 18 feet with building setback (not a Caltrans design issue); frontage sidewalk space dedicated to shelter for local bus
- BRT station area: Boarding area length and amenities to be determined by transit agency standards. Station shown in figure is for illustrative purposes only

Figure 5-39. *6-lane node - BRT with dedicated lanes and bike lanes (lane reduction)*

5.8.15. Six-Lane Node - BRT with Dedicated Lanes and Six Travel Lanes (No Parking)

Figure 5-40 depicts the following conditions:

- Lane width: Through lanes reduced to 11-12 feet and left-turn lane reduced to 10 feet to accommodate BRT lanes, station platforms, nested landscape medians, and 6 through lanes
- Local bus stop area: Minimum 11-foot width recommended
- Platform/refuge: 13-foot width recommended; 10-foot width minimum
- Frontage street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb
- Sidewalk widening: Walk widened to 18 feet with building setback (not a Caltrans design issue); frontage sidewalk space dedicated to landscape planting/biofiltration trench and shelter area for local bus
- BRT station area: Boarding area length and amenities to be determined by transit agency standards. Station shown in figure is for illustrative purposes only

Figure 5-40. *6-lane node - BRT with dedicated lanes and 6 travel lanes (no parking)*

5.8.16. Six-Lane Node - BRT with Dedicated Lanes and Six Travel Lanes (On-Street Parking, Reduced Median)

Figure 5-41 depicts the following conditions:

- Lane width: Through lanes reduced to 11-12 feet and left-turn lane reduced to 10 feet to accommodate BRT lanes, station platforms, landscape islands, 6 through lanes, and curbside parking
- Local bus stop area: Minimum 11-foot width recommended
- Platform/refuge: 13-foot width recommended; 10-foot width minimum
- Frontage street trees: Minimum 18 inches from face of curb
- Ornamental streetlights: Minimum 18 inches from face of curb
- Sidewalk widening: Walk widened to 18 feet with building setback (not a Caltrans design issue); frontage sidewalk space dedicated to landscape planting/biofiltration trench, pervious paving (adjacent to curbside parking) and shelter area for local bus
- BRT station area: Boarding area length and amenities to be determined by transit agency standards. Station shown in figure is for illustrative purposes only

Figure 5-41. *6-lane node - BRT with dedicated lanes and 6 travel lanes (on-street parking, reduced median)*

6

Future Transit and Land Use Scenarios

The purpose of this chapter is to present the results of the travel demand modeling efforts used for the Grand Boulevard Multimodal Transportation Corridor Plan. This modeling effort evaluated **transit improvements along the project corridor,** primarily through the potential implementation of **bus rapid transit (BRT)**, and also examined the types and levels of **development patterns required to sustain transit improvements** along the corridor.

The model was unique in that it covered both San Mateo and Santa Clara counties at a level of detail that could accurately estimate BRT ridership and focused development along transit corridors and at individual stop and station locations. Modeling analyses also took into consideration the geography of the GBI corridor itself, which covers a very large spatial area **over fifty miles in length** and also serves larger inter-regional travel markets, such as downtown San Francisco and San Jose.

6.1. Model Overview

The model used for the GBI study is an enhanced version of the Santa Clara VTA Countywide model. The VTA model encompasses a large geographical area consisting of the nine-county San Francisco Bay Area modeled by MTC and also Santa Cruz, Monterey, San Benito and San Joaquin Counties, as each of these counties is an important travel market into Santa Clara County. The VTA model was calibrated to 2000 Census data in 2003, and validated to year 2005 highway and transit observed conditions in 2008 during the development of VTA's countywide long-range transportation plan (Valley Transportation Plan 2035). At the time of this validation, the VTA Countywide model was also enhanced to model BRT alternatives explicitly in the mode choice equations using the results of market research performed as a part of the BRT Strategic Plan developed by VTA.

Following the completion of the base year 2005 validation, the model was used to develop ridership forecasts for the year 2035 planning horizon. This was accomplished by using the ABAG Projections 2007 socioeconomic data sets for the year 2035 and two additional future land use datasets based on intensified land use assumptions and adding in 2035 highway and transit network assumptions. The 2035 transportation network included projects assumed to be constructed and in operation in 2035, based on project descriptions provided in the latest version of the MTC Regional Transportation Plan (RTP) as well as the relevant countywide long-range transportation plans.

Before the model could be used to test transit and land use scenarios for the Corridor Plan, it needed to be refined to accurately reflect conditions in the bi-county El Camino Real corridor. The strategy for the GBI Corridor Plan travel demand modeling was therefore to add incremental improvements to the validated VTA Countywide model to refine the model performance in the project corridor. The GBI Corridor Plan modeling effort took place primarily during the spring and summer of 2009. In brief, the model enhancements implemented in the VTA Countywide model for the GBI study included the following:

- Addition of traffic analysis zones (TAZs) in San Mateo County to allow more detailed estimation of transit ridership and to more accurately reflect the impact of land use densification in the project corridor.
- Development of more detailed highway and transit networks for the portion of the corridor located in San Mateo County.
- Estimation of air-passenger trips to and from the San Francisco International Airport.
- Recalibration and validation of the model with the above enhancements to base year 2005 observed travel conditions in the project corridor.

The GBI corridor model update included recalibration of all aspects of the model, including auto ownership, trip generation, trip distribution and mode choice models. A new base year 2005 peak period highway and daily transit validation was then implemented to ensure that the new models were able to match observed travel patterns. Appendix B1 details the specific model enhancements, methodology, and results of the base year model validation.

The following sections provide a summary of the scenarios that were modeled and the results of the modeling forecasts.

6.2. Future Modeling Scenarios

6.2.1. Summary of Scenarios Modeled

As shown in Table 6-1, a total of seven scenarios were modeled, including: 2005 Existing, 2035 Baseline/No Project, and five 2035

Scenario	Forecast Year	Land Use Alternative	Transit Alternative
1	2005	2005 Existing	2005 Existing
2	2035	ABAG 2035 Baseline	2035 Baseline Transit
3	2035	ABAG 2035 Baseline	2035 Enhanced Transit (a,b)
4	2035	Moderate Land Use	2035 Baseline Transit
5	2035	Moderate Land Use	2035 Enhanced Transit (a,b)
6	2035	Enhanced Land Use	2035 Baseline Transit
7	2035	Enhanced Land Use	2035 Enhanced Transit (a,b)

Note:

a. Inter-agency transfer at county line

b. No inter-agency transfer at county line

Table 6-1. *Land use and transit scenarios modeled*

San Mateo County	Santa Clara County
Tier 1	Tier 1
Millbrae Caltrain/BART	Palo Alto Caltrain
San Mateo Caltrain	Santa Clara Caltrain/BART
Hillsdale Caltrain	San Jose Diridon Caltrain/BART
Redwood City Caltrain	
Tier 2	Tier 2
All Other Caltrain (Except Bayshore and South San Francisco)	California Avenue Caltrain
All BART (Except Millbrae and SF Airport)	All BRT Stations
All BRT Stations	

Table 6-2. *Tier 1 and Tier 2 station classification for future land use scenarios*

"Project" scenarios. For the three Enhanced transit scenarios, two variations in transit service were investigated. The first, the Enhanced Transit network ("a" scenarios), assumed the implementation of BRT service separately in the two counties along the GBI corridor with a transfer at the county line. The second, the Enhanced Transit with Seamless BRT network ("b" scenarios), assumed a new continuous BRT service running the length of the corridor. This chapter present results for the entire set of scenarios, including those with Seamless BRT (Scenarios 3b, 5b, and 7b); however, for simplicity, the Seamless BRT scenarios are not illustrated in the graphs presented in this chapter. Chapter 7 highlights the differences in performance of the two BRT options in greater detail.

6.2.2. Year 2035 Corridor-Wide Land Use Assumptions and Growth Patterns

The potential ridership, and hence the success of the possible implementation of BRT along the Grand Boulevard Initiative (GBI) project corridor, depends on the land use patterns around the stations – especially the patterns within walking distance of the stations. Besides estimating ridership, another major purpose of the study was to analyze

the impact of the various growth patterns on transit boardings, mode shift, vehicle miles traveled, and other indicators. Both the stand-alone and the combined effects of the implementation of BRT and intensified land use were evaluated.

In this study, all existing Caltrain and BART stations, future planned BART stations, and future potential BRT stations within one-half mile of El Camino Real were classified into Tier 1 and Tier 2 stations for the purpose of creating the GBI land use scenarios. The two tiers of stations in the San Mateo County and Santa Clara County portions of the GBI corridor are shown in Table 6-2.

As the table indicates, the Tier 1 stations are the regional rail stations including Millbrae, San Mateo, Hillsdale, Redwood City, Palo Alto, Santa Clara, and San Jose Diridon Station. The Tier 2 stations include all the local rail stations (both Caltrain and BART) and potential future BRT stations along El Camino Real. In San Mateo County, the Bayshore and South San Francisco Caltrain stations, and the San Francisco Airport BART Station, were excluded from the analysis because they are located more than one-half mile from the GBI corridor. In Santa Clara County, all Caltrain stations other than San Jose Diridon, Santa Clara, California Avenue, and Palo Alto were excluded because they were more than one-half mile from the GBI Corridor. Atherton

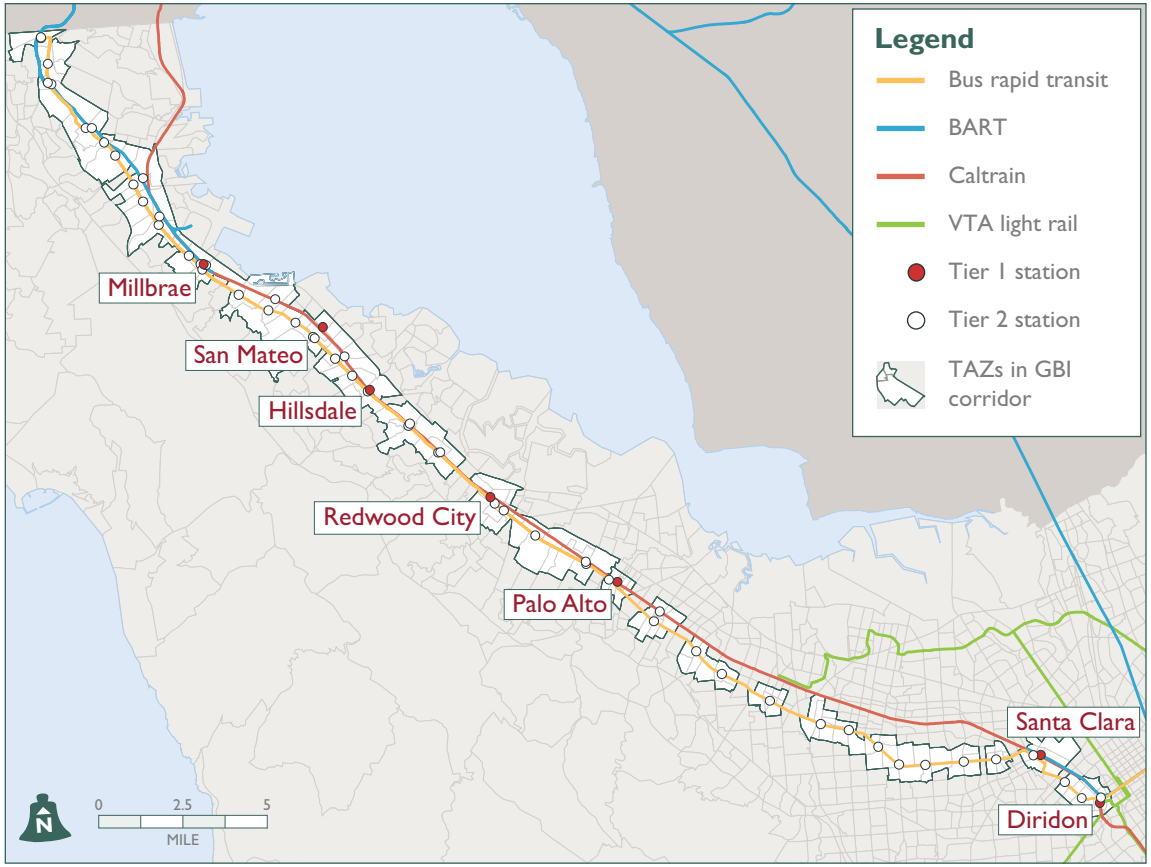


Figure 6-1. GBI corridor, transit stations, and TAZs

Station in San Mateo County and College Park Station in Santa Clara County were also excluded from the analysis because they are limited-service stations.

Assuming that one-third mile is a reasonable walking distance for regional rail stations and a quarter-mile for secondary rail and BRT stations, either a third-mile or quarter-mile buffer area was created for each station in the study scope according to whether it was classified as Tier 1 or Tier 2. These buffer areas are considered the primary market for two levels of land use intensification corresponding to two additional future year land use scenarios: Moderate and Enhanced. However, the analysis unit of the

Table 6-3. Density specification for future year land use scenarios

		San Mateo County		Santa Clara County	
	Tier	Residential	Employment	Residential	Employment
Moderate Land Use	1	40 DU/Acre	174 Emp/Acre (1.0 FAR)	55 DU/Acre	260 Emp/Acre (1.5 FAR)
	2	20 DU/Acre	87 Emp/Acre (0.5 FAR)	20 DU/Acre	130 Emp/Acre (0.75 FAR)
Enhanced Land Use	1	75 DU/Acre	348 Emp/Acre (2.0 FAR)	75 DU/Acre	348 Emp/Acre (2.0 FAR)
	2	40 DU/Acre	174 Emp/Acre (1.0 FAR)	40 DU/Acre	174 Emp/Acre (1.0 FAR)

Note: DU = Dwelling unit; FAR = Floor area ratio

transportation forecasting model is the traffic analysis zone (TAZ), the boundary of which is not consistent with that of the buffer area. Hence, the TAZs intersecting the buffer areas are used as an approximation for the project corridor. Figure 6-1 displays the TAZs, transit routes, and Tier 1 and Tier 2 stations in the GBI corridor.

In the development of the Moderate and Enhanced land use datasets, the portions inside and outside the buffer area are treated differently for the TAZs in the project corridor. Both housing and jobs for the portion inside the buffer area were increased according to density levels targeted based on industry standards and VTA Community Design & Transportation (CDT) Program guidelines, as shown in Table 6-3.

In the reallocation to achieve the density targets for the Moderate and Enhanced land use alternatives, the following constraints were assumed:

- Preserve county control totals from ABAG Projections 2007 figures – reallocate growth from outside to inside GBI corridor
- Do not borrow growth from rail stations outside GBI corridor
- In both counties, assume that 50 percent of land in station areas is potentially re-developable for both residential and commercial
- In San Mateo County, assume that 25 percent of the commercial acreage in station areas is counted as residential, for both scenarios.

The population and other socioeconomic data including households by income group, population by age group, and employment residents, were increased to keep the ratio to the housing units the same. In the case that the density threshold is already met in the ABAG projections for year 2035, the ABAG data were preserved. For the portion outside the buffer area, the ABAG data proportioned based on the area ratio are applied under the assumption that the original land use pattern is evenly distributed in a TAZ. The sum of the inside and outside portion thus derived constitutes the land use of each TAZ in the project corridor for the two additional land use alternatives, which are likely to be higher than the ABAG projections. The additional growth required in the project corridor by these alternatives is achieved by reallocating growth from TAZs outside GBI corridor to TAZs in the project corridor; the equations used to conduct this reallocation are listed under Growth Reallocation Equations in Appendix B2.

The detailed model assumptions and results, for the sake of organization, are reported in Appendix B; the reader will need to refer to those tables throughout the discussion in Chapter 6. Table B3-1 presents households and total employment for TAZs in the GBI corridor and outside the GBI corridor in

four land use datasets: the base year 2005, the year 2035 base land use scenario (ABAG Projections 2007 data), the year 2035 Moderate land use scenario, and the year 2035 Enhanced land use scenario. In San Mateo County the GBI project corridor is expected to experience an increase of over 24,800 households, or a 48 percent of total countywide growth, and over 90,800 jobs, or a 48 percent total countywide growth, between the years 2005 and 2035 under ABAG Projections 2007 assumptions. For the Moderate land use scenario in San Mateo County, an additional 8,900 households, or another 17 percent of county total growth, and an additional 9,800 jobs – or another 5 percent of county total growth – will be transferred from regions outside the corridor area to the region within the GBI corridor. For the Enhanced land use scenario in San Mateo County, an additional 17,900 households, or another 34 percent of county total growth, and an additional 35,300 jobs – or another 19 percent of county total growth – will be transferred to the GBI project corridor area. In the Enhanced scenario in San Mateo County, the household growth outside the GBI corridor area of San Mateo County would be eliminated and the job growth in the GBI corridor area would reach 73 percent of the county total growth.

In Santa Clara County the GBI corridor area is expected to experience an increase of over 14,300 households, or a 7 percent of total countywide growth, and over 47,800 jobs, or a 10 percent total countywide growth, between the year 2005 and 2035 under ABAG Projections 2007 assumptions. For the Moderate land use scenario in Santa Clara County, an additional 9,300 households, or another 4 percent of county total growth, and an additional 42,000 jobs – or another 8 percent of county total growth – will be transferred from regions outside the corridor to the area within the GBI corridor. For the Enhanced land use scenario in Santa Clara County, an additional 14,000 households, or another 7 percent of county total growth, and an additional 20,600 jobs – or another 4 percent of county total growth – will be transferred to the GBI corridor area. In the Enhanced scenario in Santa Clara County, the growth in the GBI corridor of Santa Clara County will reach 18 percent of county total growth for households and 22 percent of the county total growth for jobs. The higher opportunity for the growth of the corridor in Santa Clara County lies in the fact that the City of San Jose has a large amount of year 2035 projected growth outside of the corridor which can be reallocated.

Table B3-2 (see Appendix B) summarizes the change in jobs-per-household ratio across four land use scenarios. In San Mateo County, the ratio increases from 1.30 jobs per household to 1.68 jobs per household from year 2005 to 2035 under the assumptions of ABAG Projections 2007. Compared to the year 2035 base land use scenario, the ratios for both the Moderate and Enhanced scenarios are reduced slightly, which can be attributed mainly to the assumed conversion of 25 percent of commercial acreage to residential inside the GBI corridor for San Mateo County. The same assumption is not applied to Santa Clara County; hence, the ratio remains the same 1.71 jobs per household across all future year scenarios, though it has also been increased compared to the year 2005 ratio of 1.48 jobs per household.

Tables B3-3, B3-4, and B3-5 (see Appendix B) summarize the daily home-based work trips to/from San Francisco, San Mateo and Santa Clara Counties resulting from the application of the home-based work trip distribution models using the four land use datasets, and compare those with each other and with the year 2005 observed data. The year 2005 modeled trips match the observed trips very well with the biggest discrepancy being 2.1 percent, for trips between Santa Clara and San Mateo County, with the remainder all close to or less than 1 percent, which indicates that the model is reliable to be used to forecast the future year trips. The interchanges between these counties all exhibit a large percentage increase in home-based work person trips from year 2005 to 2035, about 50 percent or more, with trips from Santa

Clara to San Francisco exhibiting the largest percentage increasing by more than 100 percent between 2005 and 2035. These results indicate that the growing work trip demand from 2005 to 2035 will place an increasing burden on the highway and transit facilities between the three counties for peak period travel since most work trips occur during the peak period. Whether and to what level the possible implementation of BRT may relieve this burden is another investigation the study will undertake using the model results.

6.2.3. Year 2035 Transportation Network Assumptions

For this study, roadway and transit networks consistent with the county long range transportation plans were used as the basis for all future year scenarios. Two additional transit networks were created to evaluate the impact of transit enhancements on the travel patterns in the GBI corridor, both with and without intensified land use. The network assumptions for the three year 2035 transit alternatives are as follows:

1. 2035 Baseline Transit network, which includes:
    - Caltrain electrification and 114 train per day schedule
    - South San Francisco – Oakland ferry
    - Dumbarton rail extension
    - BART extension to San Jose/Santa Clara (full build – 6 stations in Santa Clara County)
    - BRT service along two other corridors in Santa Clara County (Santa Clara/Alum Rock and Stevens Creek)
2. 2035 Enhanced Transit network, which adds BRT along length of GBI corridor. The new BRT lines are assumed to have the following key attributes:
    - Frequent service, considerably faster than local routes
    - Dedicated lanes in portions of Santa Clara County; queue jump lanes in key locations in San Mateo County
    - High-quality vehicles, stations, and amenities
    - Same fare as local service along the corridor (assumption for modeling purposes)
3. 2035 Enhanced Transit with Seamless BRT network, which is the same as the second alternative except that it provides a seamless BRT connection along the GBI corridor, with no transfer required at the county line

None of the three 2035 transit networks include High-Speed Rail or the Caltrain Downtown Extension in San Francisco.

BRT in the Enhanced transit alternatives is assumed to be an overlay service, with local routes 390, 391 and 22 continuing to serve the corridor. The headways for BRT were assumed to be 10 minutes. BRT station locations would be 0.75-1 mile apart on average. BRT travel times were assumed to be 33 percent below local bus times in Santa Clara County and 25 percent below in San Mateo County.

It was also assumed that the BRT service would include other improvements, which would give BRT a premium over local bus in traveler's preferences and which were simulated in the model by using a "mode-specific coefficient" in the mode choice model. These other improvements could include:

- Enhanced low-floor vehicles with distinctive branding
- Ticket vending machines at most or all locations
- Transit signal priority (TSP) along the entire length of the corridor
- Real-time transit information along the entire length of the corridor

Chapter 7 provides more insight into what types of physical improvements and service enhancements might be most appropriate if BRT were to be implemented in the GBI

corridor.

Each of the transit alternatives were coded based on segment speed information, station locations, transit schedules and background feeder bus operating plans provided by SamTrans and VTA staff. The potential BRT stations in the corridor are listed below:

For BRT 391 serving San Mateo County (Stations listed from south to north):

- Palo Alto Caltrain
- El Camino/Ravenswood (northbound); El Camino/Live Oak (southbound)
- El Camino/5th Ave
- El Camino/Cedar (northbound); El Camino/Lincoln (southbound)
- El Camino/Jefferson
- El Camino/San Carlos
- El Camino/Ralston
- S. El Camino/W. Hillsdale
- S. El Camino/E. 25th Ave
- S. El Camino/17th Ave
- S. El Camino Real/E. 2nd Ave (northbound); S. El Camino Real/E. 4th Ave (southbound)
- N. El Camino Real/E Poplar
- El Camino Real/Burlingame
- El Camino/Broadway
- El Camino/Murchison
- El Camino/E. Millbrae
- El Camino/Silva
- El Camino/San Felipe
- El Camino/W. San Bruno
- El Camino/Sneath
- El Camino/W. Orange
- El Camino/Arroyo
- El Camino/Lawndale (northbound); El Camino/McLellan (southbound)
- El Camino/D St
- Mission/Price (northbound); Mission/School (southbound)
- Daly City BART

For BRT 522 serving Santa Clara County (Stations listed from north to south):

- Palo Alto Caltrain
- El Camino/California
- El Camino/Arastradero
- El Camino/Showers
- El Camino/El Monte*
- El Camino/Castro
- El Camino/Bernardo
- El Camino/Hollenbeck
- El Camino/Remington
- El Camino/Wolfe
- El Camino/Lawrence
- El Camino/Kiely
- El Camino/Scott
- Santa Clara Caltrain
- The Alameda/Naglee
- The Alameda/Julian
- San Jose Diridon Caltrain

* El Camino/El Monte is not currently a stop on the 522 Rapid. Though it was inadvertently coded in the future year transit network as a BRT station, its station area was not included in the land use intensification. Depending on whether the base or enhanced transit network is assumed, about 100 or 750 daily boardings were estimated for this station.

6.3. Modeling Results

There are a variety of evaluation measures that are produced by the models that indicate the performance of the alternatives. The following evaluation measures have been used to summarize the results of the GBI modeling analysis:

- Transit boardings
- Transit passenger-miles and trip lengths
- Travel mode share
- Vehicle miles traveled (VMT)
- Peak period traffic volumes
- BRT options comparison: Potential for

cross-county service (discussed in Chapter 7)

These evaluation measures were developed to help answer the following primary questions based on the modeling analysis:

1. Is there a market for enhanced transit (BRT) along the GBI corridor?
2. Are there benefits of implementing BRT and intensified land use together?
3. Are there other benefits besides increased transit ridership?
4. Are there benefits to potentially introducing cross-county BRT service along the GBI corridor?

The results of the GBI modeling analysis are presented in the sections below, organized by the different evaluation measures. As mentioned earlier, results of the cross-county BRT options comparison are presented in Chapter 7.

6.3.1. Transit Boardings

Transit boardings are one of the most basic measures of performance of a transit route or system. A boarding represents a single user getting on a transit vehicle to start a one-way trip. Thus a round trip involves two boardings, and a one-way trip with one transfer between routes or modes also involves

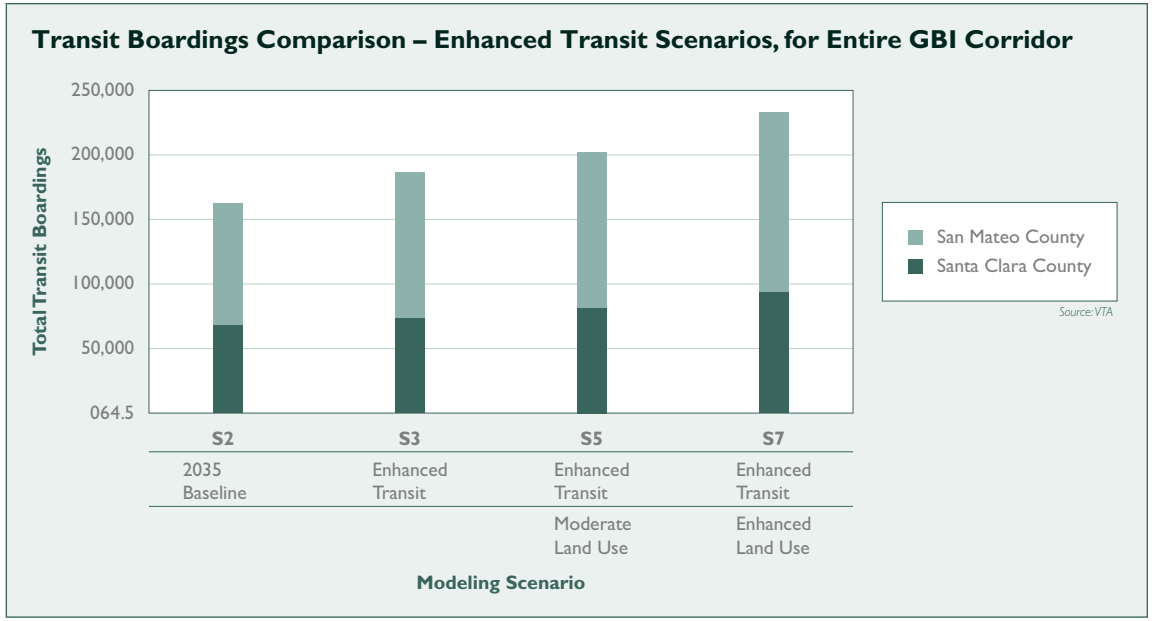


Figure 6-2. Transit boardings comparison. Enhanced transit scenarios, for entire GBI corridor

two boardings. For the GBI Corridor Plan modeling analysis, weekday boardings were chosen as one key indicator of the benefits of the different modeling scenarios.

Table B4-1 summarizes the total weekday boardings across all scenarios for all transit lines including local bus lines KX, 390 and 391, BRT 391, Caltrain and BART, serving the San Mateo County portion of corridor. Table B4-2 summarizes the total weekday boardings across all scenarios for all transit lines including local bus Line 22, BRT 522, Caltrain and BART, serving the Santa Clara County portion of corridor, with the last column showing the total boardings in the whole corridor including both the San Mateo and Santa Clara portions. For Line 22 and BRT 522, only the boardings for the stations inside the GBI corridor are summarized.

Table B4-2 shows a total of 162,550 weekday boardings estimated for the year 2035 Baseline, S2, scenario for the entire corridor, which more than doubles the 70,561 boardings modeled in year 2005. For the Moderate land use alternative, S4, transit boardings in the corridor will be 175,127, an increase of 12,577 boardings, or 7 percent, compared to the Baseline scenario. For the Enhanced land

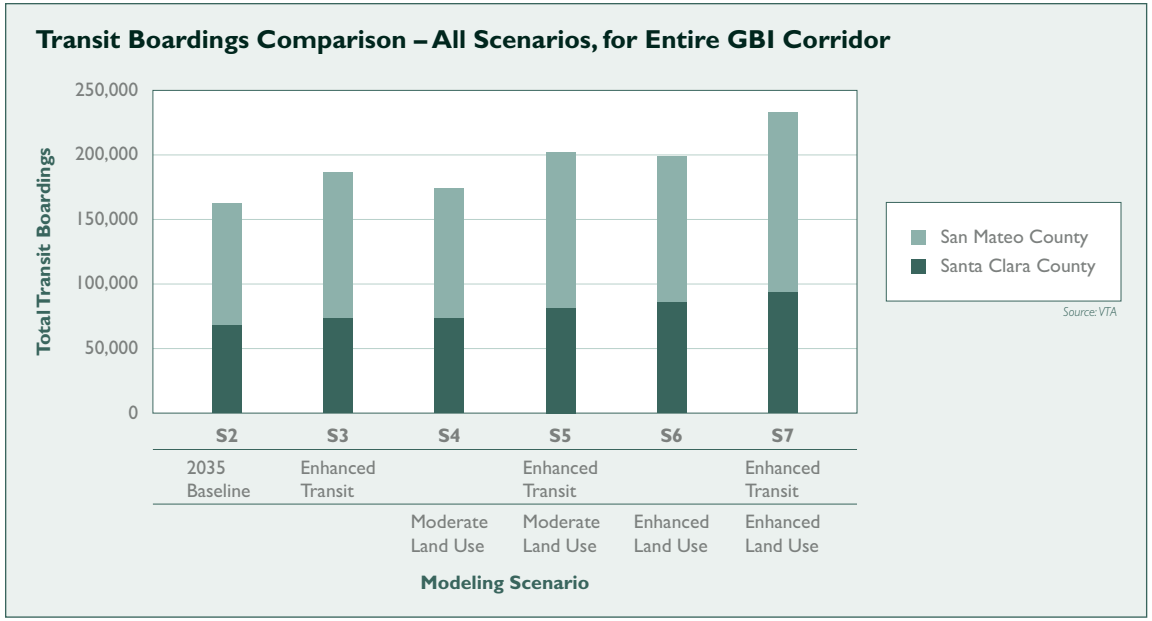


Figure 6-3. *Transit boardings comparison. All scenarios, for entire GBI corridor*

use alternative, S6, the transit boardings in the corridor are projected to be 200,438, an increase of 37,889 boardings, or 23 percent, comparing to baseline scenario. Scenario S3, the transit enhancement alone, will result in a total of 186,766 weekday boardings or an additional 24,216 boardings, or 15 percent, added to the baseline scenario. Scenario S7, the scenario combining both Enhanced land use and Enhanced transit, will result in a total of 233,380 weekday boardings, which represents an additional 70,830 boardings, or 44 percent, added to the baseline scenario.

Tables B4-1 and B4-2 show a slight drop in BART and Caltrain boardings in some scenarios relative to the 2035 baseline scenario as the consequence of the competition introduced by the new BRT service. Both Caltrain and BART ridership are projected to double from the year 2005 to 2035 and this model assumes the addition of one additional peak hour train per direction per weekday for Caltrain. The competition from BRT service may actually provide an essential complement to future Caltrain and BART facilities. The relationship between Caltrain and the potential future BRT service is explored further in Chapter 7.

Another interesting result shown in these two tables is that a "seamless" BRT (no transfer at the county line) does not have a substantial effect on total boardings in the corridor. Scenarios S3b and S5b, both seamless BRT scenarios, have slightly higher transit boardings than their respective BRT-with-transfer alternatives, S3 and S5. However, Scenario S7b has slightly lower transit boardings than Scenario S7. Considering that the elimination of transfers obviates the necessity for an inter-county passenger to get off one bus to board another at the county line, the slight impact may indicate that the induced transit trips due to the increased level of service resulted from the seamless transfer may well offset the negative impact on boarding.

Figure 6-2 depicts transit boardings graphically, showing the total weekday boardings along the GBI corridor in the 2035 Baseline, S2, versus the three scenarios that include Enhanced transit (S3, S5, and S7). Figure 6-2 includes boardings on all transit services in the corridor including local bus, potential new BRT, Caltrain, and BART. As the figure indicates, implementing BRT could lead to a 15 to 45 percent increase in weekday transit boardings along the corridor depending on the land use scenario.

Figure 6-3 depicts the modeling results in terms of weekday transit boardings along the corridor for the full range of alternatives,

including scenarios with and without enhanced transit. As the figure shows, projected ridership increases with both enhanced transit and intensified land use, but the two scenarios with the highest ridership include both land use intensification and BRT service.

The modeling results in the two figures above show that the implementation of the enhanced transit (BRT) and the intensification of land use both increase transit use in the corridor, and the greatest increases in weekday transit boardings are seen in the scenarios that implement BRT and intensified land use together (S5 and S7). In addition, the benefits of implementing BRT and intensified land use together are greater than their effects separately, as shown in Figure 6-4.

These results suggest that there are synergies to implementing enhanced transit (BRT) and intensified land use together – in other words, the whole of these actions is greater than the sum of the parts.

6.3.2. Transit Passenger-Miles and Trip Length

Transit passenger-miles is an indicator of the total amount of travel that occurs by transit on a given route or system, taking into account both the number of person-trips (boardings) and the length that each person rides. Transit passenger-miles represent another important indicator of the relative benefits or effectiveness of a transit route or system. Average transit trip length is an indicator of how long people are riding a given transit route or system on average. Trip length can be used to gain insight into the type of market a transit route serves – for instance, whether it serves a local/short-distance market or a regional/long-distance market.

Tables B4-3 and B4-4 summarize the transit passenger miles in the corridor. Similar patterns in the variation of passenger miles across scenarios are found as those encountered with the boardings shown in Tables B4-1 and B4-2, except that the seamless transfer scenarios increase transit passenger-miles in the corridor consistently compared to their corresponding BRT-with-transfer scenarios.

Tables B4-5 and B4-6 show the transit trip length for different transit lines in the corridor, which are calculated by dividing the transit passenger miles shown in Tables B4-3 and B4-4 by the transit boardings shown in Tables B4-1 and B4-2. Since Caltrain and BART both serve multiple counties, their respective trip length calculations are an approximation of the average length of the portion of trip traveled inside the GBI corridor in either county. As shown in these two tables, the introduction of new competition by the BRT

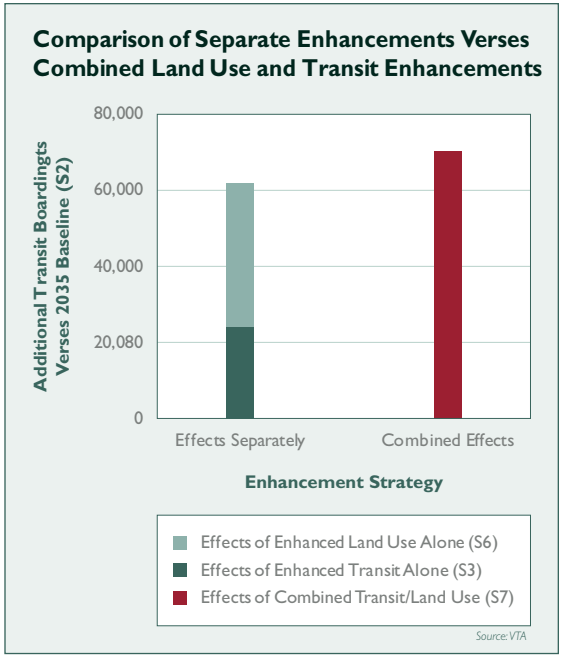


Figure 6-4. *Transit boardings comparison. Effects of separate enhancements verses combined land use and transit enhancements*

alternatives (Scenarios S3, S5 and S7), in comparison with their corresponding base transit alternatives (Scenarios S2, S4 and S6), reduces or increases the trip length of the competing transit modes in the corridor respectively depending on whether the other mode is local bus or commuter rail.

The effect of land use intensification on the trip length of various transit modes is less consistent, with the trip length of the same transit mode in the portion of the corridor located in one county moving in an opposite

direction from that in the other county. For example, in the San Mateo County portion of the corridor, the trip length of Caltrain is reduced from 16.14 miles in the base land use alternative (Scenario S2) to 13.87 miles in the enhanced land use alternative (Scenario S6). On the contrary, it is increased from 13.64 to 14.09 miles in the Santa Clara County portion of the corridor. The overall effect of the land use intensification on all transit modes, nevertheless, is no different from that of the transit improvements, in that both reduce the average transit trip length in the corridor as portrayed in the last column of Table B4-6. However, the overall reduction is likely realized through different means, from the transit improvement via increased mobility to areas close by and from the land use intensification via increasing the accessibility of proximate activity centers.

Figure 6-5 shows the relative transit trip lengths of local bus, BRT, and Caltrain for one representative scenario, S7 (Enhanced Transit and Enhanced Land Use). The patterns of the trip lengths for these three transit modes are similar in the other 2035 scenarios. In general, the average trip length for local El Camino bus service is about two to four miles, for new BRT service about six to eight miles, and for Caltrain about 14 to 16 miles. Segmented by trip lengths, the potential market for BRT appears to be clearly distinct from those served by local bus and Caltrain.

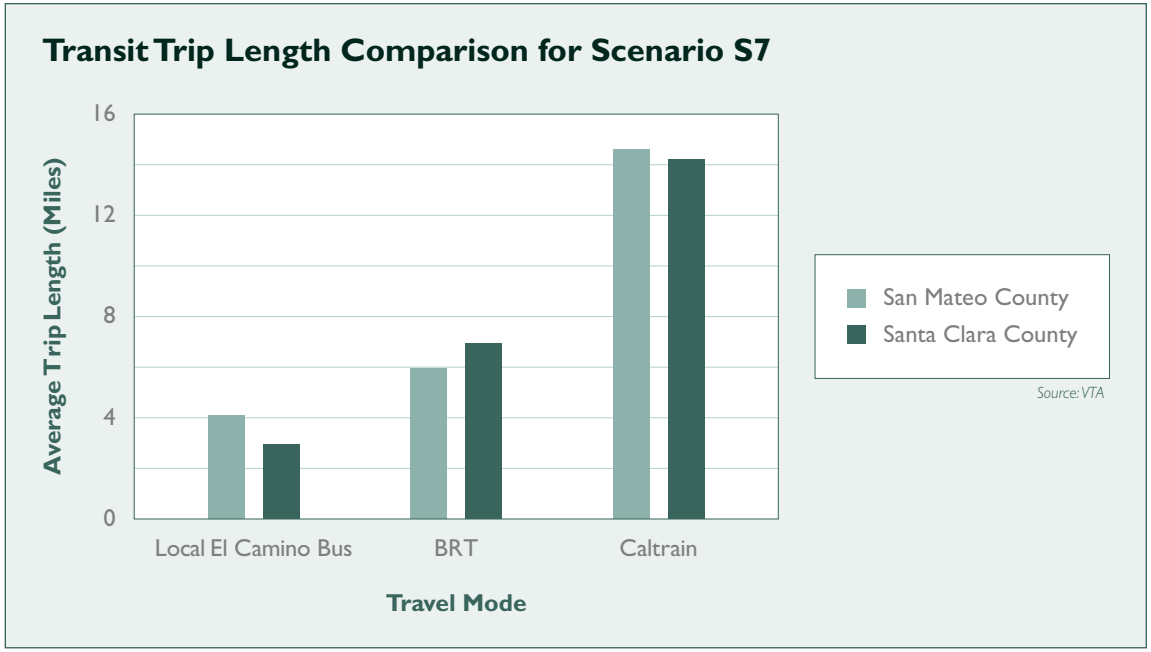


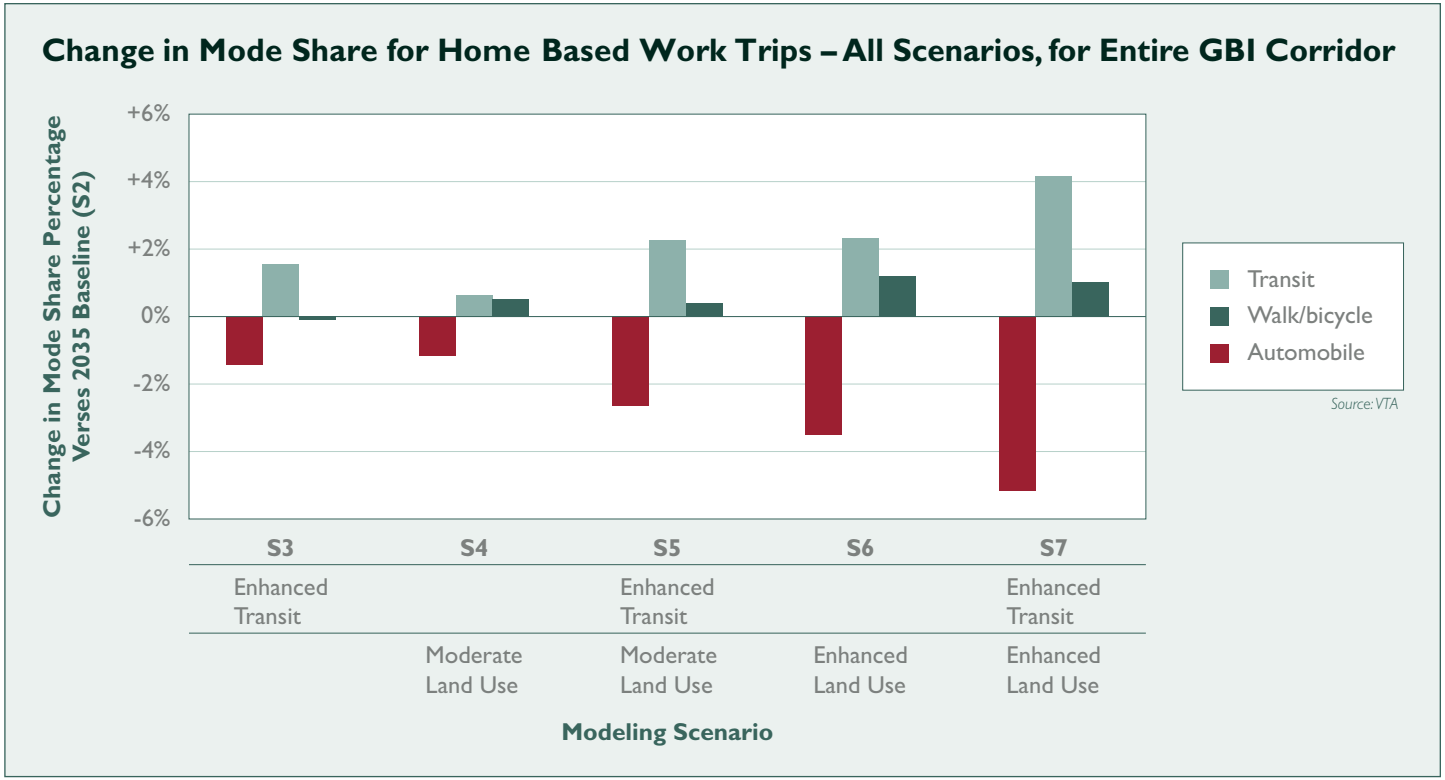
Figure 6-5. Transit trip length comparison for Scenario S7

6.3.3. Travel Mode Share

Travel mode share refers to the percentage of trips that are made by different modes of transportation. Mode share may be reported for different categories of trips – for instance, all trips, home-based work trips, or non-work trips. Travel mode share is often broken down into auto (drive alone and carpool), transit, and bike/walk modes, but may be reported at a finer level of detail in some cases. Since the goal of many transportation and land use planning efforts is to reduce the percentage of travel by single-occupant vehicle (drive alone), reporting this share as well as transit and walk/bike shares can be an indicator of the effectiveness of the planned improvements.

Table B5-1 and Figure 6-6 show the change in the share of the home based work trips in the GBI corridor among various modes: auto, transit, bike/walk. Only the work trips both originating and ending in the GBI corridor are included in the summary. The baseline scenario is projected to slightly increase transit and bike/walk shares to 6.32 percent and 12.37 percent, respectively, compared to 4.85 percent for transit and 11.71 percent for bike/

Figure 6-6. Change in mode shares. Home-based work trips inside GBI corridor



walk, respectively, in the year 2005. With the implementation of BRT alone in Scenario S3, the transit share can increase significantly from 6.32 percent in the baseline scenario to 7.87 percent, accompanied by a corresponding reduction of the auto share, though also with a slight reduction in the bike/walk share. Both land use intensification alternatives (Scenarios S4 and S6) unanimously increase both the transit and bike/walk share compared to the baseline scenario. The mode shift effect is the most pronounced in Scenarios S7 and S7b, the Enhanced Land Use and Enhanced Transit scenario. In these scenarios, the transit mode share increases by more than 4 percent to approximately 10.5 percent, the bike/walk share increases by one percent to 13.37 percent, and the auto mode share is correspondingly reduced by 5.19 percent.

Similar to the boardings results shown in Figure 6-3, the benefits of combining transit improvements with land use intensification on mode shifts are greater than the effects separately. Another interesting finding is that the seamless transfer also increases the transit share slightly comparing to the corresponding transfer alternative. For example, from Scenario S7 to S7b, the transit share increased from 10.50 percent to 10.59 percent.

6.3.4. Vehicle Miles Traveled (VMT)

The aggregate number of miles traveled by automobile in a given area, typically referred to as vehicle miles traveled (VMT), can be a useful measure of the effectiveness of transit enhancements or land use changes in meeting planning objectives. This is so because other factors, such as greenhouse gas emissions or energy consumption due to automobile use, are directly related to automobile VMT. The formula used to calculate VMT can be found in Appendix B2.

From the traffic assignments in the model, VMT were summarized within the GBI corridor, outside the GBI corridor, and countywide for both Santa Clara and San Mateo counties, for each scenario. These results are presented in Tables B5-2, B5-3, and B5-4 and in Figure 6-6.

Table B5-2 compares the VMT inside the GBI corridor across scenarios. The intensification of land use increases the total VMT in the corridor while the implementation of BRT reduces it. For example, under the Enhanced land use scenario, S6, the daily VMT in the corridor grows to 4,090,640, or an 8.6 percent increase over baseline S2. Under the same land use, the implementation of BRT, Scenario S7, reduces the increase of total daily VMT to 7.7 percent over baseline S2. The results shown here indicate that the implementation of BRT has a mitigating effect on the increased total daily VMT due to land use intensification. The daily VMT per household for all project scenarios, whether due to land use intensification or the BRT implementation, decreases compared to the baseline. VMT decreases from 22.35 in baseline to 22.25 in Scenario S3, and further reduces with the intensification of land use to 18.70 in Scenario S6. The lowest daily VMT per household,18.55, is achieved with the combination of enhanced land use and BRT in Scenarios S7 and S7b. This consistent reduction of VMT per household can be explained by two factors. First, land use intensification increases the opportunity for activity near the corridor and reduces the need to travel lengthy distances for daily amenities. Second, BRT encourages a shift from driving to transit by creating an option that reduces the need to drive overall.

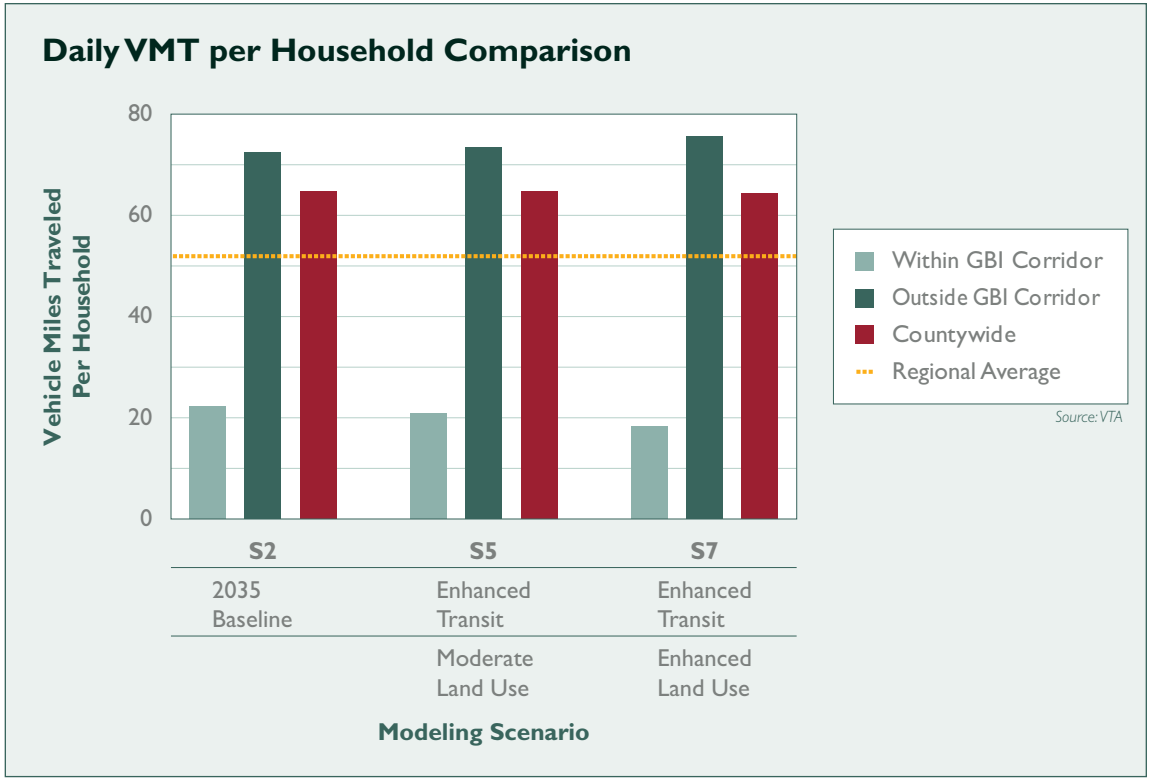


Figure 6-7. Daily VMT per household comparison

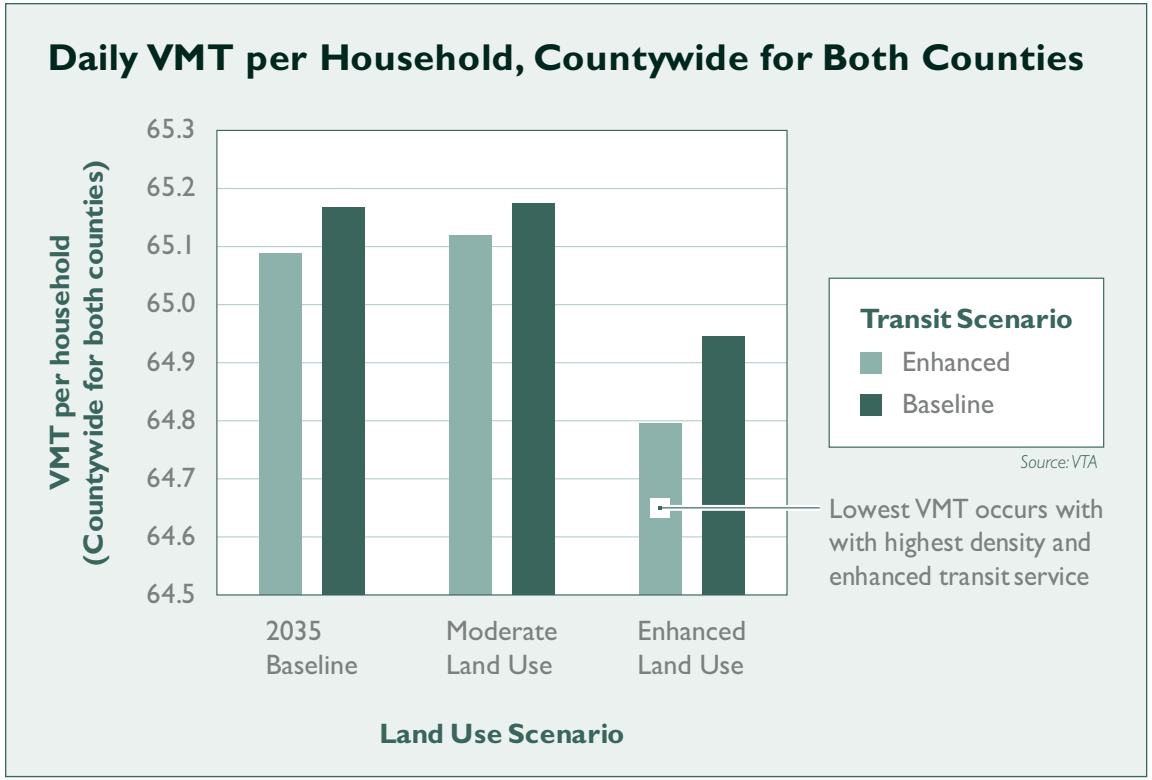


Figure 6-8. *Daily VMT per household, countywide for both counties*

Table B5-3 summarizes VMT outside the GBI corridor. The results presented show that the total daily VMT decreases with both the land use intensification and the BRT implementation. The largest reductions come in Scenarios S6 and S7, which can be mainly attributed to the reduction of household growth in these areas. The daily VMT per household outside the corridor increases with the increase of land use density in the corridor because the intensification within the corridor comes at the price of the reduced opportunity for activity outside the corridor. Daily VMT per household decreases with the implementation of BRT, which indicates that BRT would encourage a mode shift to transit for households both inside and outside the corridor. Overall, total daily VMT for all households and VMT per household in San Mateo and Santa Clara Counties reduce with all project scenarios (see table B5-4).

Figure 6-7 compares the VMT per household for Baseline S2, Enhanced Transit and Moderate land use Scenario S5, and Enhanced Transit and Enhanced land use Scenario S7. The chart shows that the households residing inside the GBI corridor on average travel far fewer miles per day by automobile than those living outside the corridor, or compared to the regional average.

Figure 6-8 compares the VMT per household for each modeling scenario (S2 through S7), at a countywide level for both San Mateo and Santa Clara Counties. This chart expands on the differences in countywide VMT levels shown in the previous figure. While the differences in VMT across the two counties for the different scenarios are relatively small, the chart shows that the greatest reduction in VMT is seen in Scenario 7, with both Enhanced Transit and the densest land use.

6.3.5. Peak Period Traffic Volumes

Automobile traffic volumes on key roadways are a key indicator of the overall level of vehicular traffic congestion in a corridor or area. Volumes may be reported on a daily basis or for a specific period (such as an AM or PM peak 3- or 4-hour period, or an AM or PM peak hour). Traffic volumes by themselves do not indicate how much congestion exists on a given roadway; to get a fuller picture of congestion levels, volumes should be compared to roadway capacity to determine roadway level of service (LOS). However, roadway traffic volumes by themselves can offer a broad indicator of the change in traffic congestion, and may help indicate whether congestion is likely to increase or decrease with a proposed transportation improvement or land use change. By reporting changes in roadway traffic volumes for the GBI modeling scenarios, it is possible to compare the scenarios against each other and see which are likely to have positive or negative impacts on traffic congestion.

Peak period traffic volumes at key screenline locations, as determined by the highway assignment model results, were compared across the future year scenarios to evaluate the impact of transit enhancements and land use intensification on traffic volumes. A set of 4 screenlines, roughly evenly spaced along the GBI corridor, was used; the combined traffic volume across the four screenlines was calculated for each scenario. For this purpose, the AM peak period is from 5AM to 9AM and the PM peak period is from 3PM to 7PM. The four screenlines used for this analysis are shown in Figure 6-9.

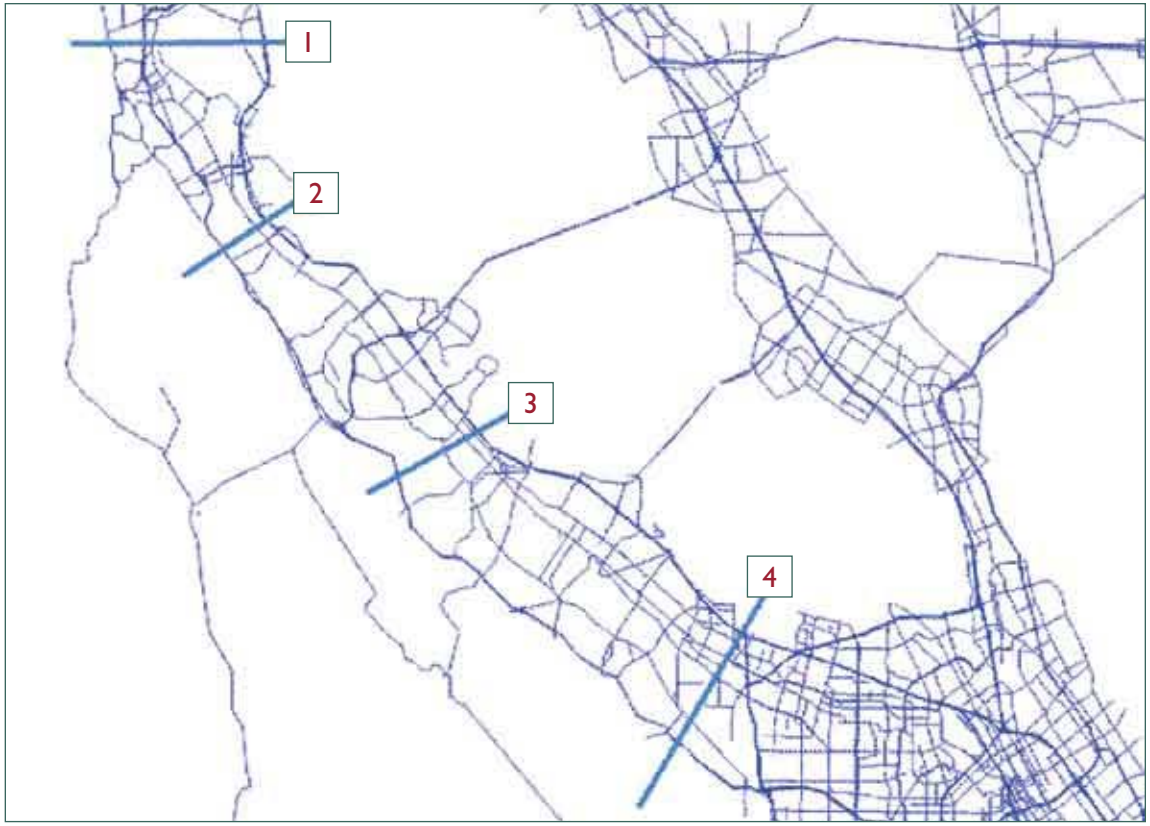


Figure 6-9. *Screenlines used for peak period traffic volume summaries*

Table B5-5 shows the peak period traffic volumes across the selected screenlines. Compared to the baseline, both land use intensification scenarios S4 and S6 increase the traffic volume across screenlines during peak periods. However, the implementation of BRT can significantly reduce the volumes, essentially mitigating the traffic impacts of the land use intensification. For instance, the traffic

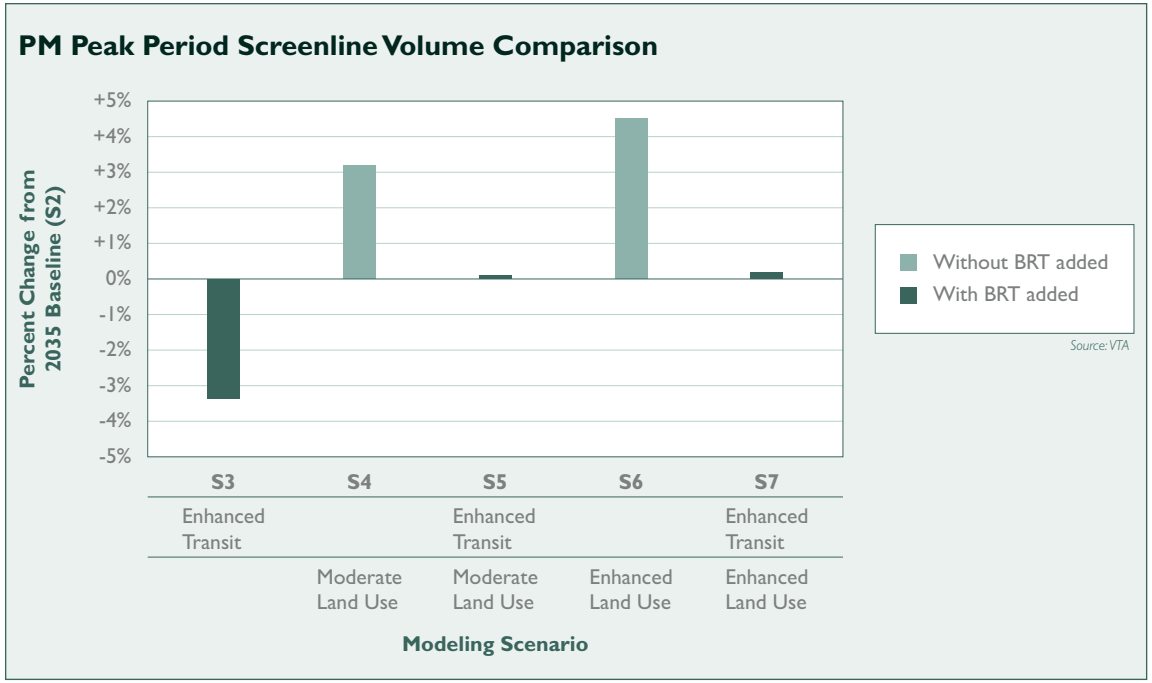


Figure 6-10. PM peak period screenline volume comparison

volume for scenario S3 is 0.21 percent lower than that for the baseline during the AM peak period and 0.34 percent lower during the PM peak period. Though moderate land use intensification scenario S4 increases the volume by 0.57 percent during the AM peak period and 0.32 percent during the PM peak, the implementation of BRT under the same land use assumption reduces volume growth to 0.22 percent during the AM peak period and 0.01 percent during the PM peak period, respectively. Similarly, Scenario S7 works in the same way as S6 by bringing down the growth in the screenline volume from 0.79 percent to 0.26 percent during the AM peak period and from 0.45 percent to 0.02 percent during the PM peak period.

Figure 6-10 further illustrates the mitigation effects of the BRT service on the increase in traffic volumes associated with land use intensification in the corridor.

6.4. Summary of Modeling Findings

The modeling analysis documented in this chapter set out to answer four primary questions. Based on the modeling results described in the previous section, it appears that the following answers have emerged:

1. Is there a market for enhanced transit (BRT) along the GBI corridor? Yes.
2. Are there benefits of implementing BRT and intensified land use together? Yes.
3. Are there other benefits besides increased transit ridership? Yes.
4. Are there benefits to potentially introducing cross-county BRT service along the GBI corridor? As Chapter 7 will discuss, results are mixed.

The following are key observations based on the findings of the travel demand modeling effort as a whole:

- BRT shows great potential along the GBI corridor, but would require significant financial investment and supporting land uses.
- Planning for growth in the corridor needs to be done in a more aggressive manner – with the highest land use intensifications come the greatest benefits.

- BRT and land use intensification can play a significant role in addressing VMT and greenhouse gas reduction goals.
- Further study is required before a conclusion can be drawn on potential cross-county BRT service.
- We should educate the public about how enhanced transit and land use together can improve livability.

While the results of the modeling effort show promise for a combination of BRT and strategic land use intensification, they are just one type of data input that should be considered when determining policy direction for the corridor. The next chapter will build on this analysis and explore additional sources of information with implications for long-term transit and land use planning along the El Camino Corridor.

7

Future Transit Needs and Recommended Service

This chapter identifies **future transit service needs** and a **recommended level and type of transit service** for the GBI corridor. The analysis of future transit needs and recommended transit service for the corridor includes a combination of quantitative and qualitative measures, which can generally be summarized as working towards five main objectives:

- Summarizing input on transit needs for the corridor
- Identifying **potential market segments** and transit characteristics
- Assessing compatibility of existing and projected land uses with enhanced transit
- Identifying broad **capital improvements** and estimating conceptual capital costs of enhanced transit
- Exploring the potential for **cross-county transit service** along the corridor

7.1. Summary of Transit Needs

Input on future transit needs for the Grand Boulevard corridor was solicited by the GBI partners (SamTrans, C/CAG and VTA) from the GBI Working Committee and the GBI Task Force at four meetings between October 2008 and March 2010. Some input was gathered early in the Corridor Plan process, before much technical work had been undertaken, and some input was gathered after the release of draft results of the travel demand modeling analyses contained in Chapter 6, which included consideration of enhanced transit (in the form of Bus Rapid Transit, or BRT) for the corridor. By including discussions with both the Working Committee and the Task Force, input on transit needs was received from public agency staff, private developers, advocacy groups (such as environmentalists and housing advocates), and some members of the general public who attended the two Task Force meetings.

The following is a summary of the key input that was received on transit needs in the GBI corridor through the process described above:

- Transit service on the GBI corridor should aim to attract choice riders. The design of services along the corridor should take into account the different market segments and orientation of the potential riders.
- Service should be fundamentally different from what exists now – it should be high-quality, faster, and more efficient than local bus service.
- Transit service on the GBI corridor should be seamless across county lines. There should be no transfer required, and ideally the same fare medium would be accepted in either county.
- The agencies involved in planning the service should provide incentives for people to ride, whether through financial incentives (e.g., fares or passes) or through a competitive travel time.
- Planning for enhanced transit along the GBI corridor should consider first-mile and last-mile connections, station access options, and possible feeder service, and park-and-ride facilities.
- Enhanced transit along the GBI corridor should be accompanied by streetscape, pedestrian, and bicycle improvements along the roadway.

In addition to the transit needs expressed through the GBI Working Committee and Task Force that are summarized above, the results of the travel demand modeling found in Chapter 6 also provide an input into recommendations on the type and level of transit service appropriate for the corridor. At the summary level, the travel demand modeling showed the following:

- There is a market for enhanced transit (modeled as BRT service) along the GBI corridor when looking at transit ridership and trip lengths.
- There are benefits to implementing BRT and enhanced land use together in the corridor.
- There are other benefits besides transit ridership, namely increased walking/cycling, reduced vehicle-miles traveled (VMT), and reduced roadway congestion levels.

7.2. Market Segments & Characteristics of Potential Enhanced Transit Service

The scope of the Corridor Plan called for the analysis of the potential transit market along the GBI corridor to identify characteristics of an enhanced transit service that would best match the market. This analysis of the market included two components:

- An analysis based on market segmentation data using the Service Planning Tool (SPT) available in each county

- An analysis of the different markets served by Caltrain/BART, local bus, and a potential enhanced transit service, based on trip length data and the physical characteristics of the transit corridors

These two analyses are described further in the following sections.

7.2.1. Service Planning Tool Analysis of Proposed Transit Improvements on El Camino Real

The transit Service Planning Tool (SPT), developed by Cambridge Systematics, Inc. (CS), uses original market research data, travel demand forecast model transportation networks, and county GIS files to analyze the impact of transit improvements on travel mode split. The SPT and accompanying data allow the examination of market preferences of the people located in specific zones, providing guidance from the community collected through previously-conducted surveys. The SPT estimates mode choice given changes in the service characteristics (e.g., wait time, price, etc.), network structure (e.g., number of transfers), or customer experience (e.g., real-time transit information, seat availability, etc.). The research that supports the tool was originally conducted for VTA in 2005 for the Comprehensive Operations Analysis (COA) and for SamTrans in 2004 to inform several planning efforts.

This analysis employed the SPT to evaluate the different types and levels of transit service along the El Camino Real corridor for the most positive impact. A full description of the methodology used in the SPT analysis is available in Appendix C.

The following recommendations take into consideration the results of this SPT analysis as well as previously conducted analyses completed by Cambridge Systematics. Recommendations are organized by type of improvement.

- Real-Time Transit Information (RTTI): In San Mateo County, the CS work suggests that RTTI would improve ridership along the entire corridor. In Santa Clara County, the analysis for the Corridor Plan using the VTA SPT suggests that the Central Santa Clara (I-880 to Lawrence/Halford) segment holds the most promise for an increase in bus ridership as a result of this improvement.
- Special Bus: The CS data indicates a positive response to a unique BRT vehicle throughout the corridor.
- Special Stations: The CS data indicates a positive response to unique BRT stations throughout the corridor.
- Travel Time Improvements: The CS work suggests a positive ridership response to increased bus speed due to infrastructure improvements (queue-jump lanes, signal prioritization, etc.), but the analysis using VTA's SPT does not provide support for skipping stops when looking at bus service independently. The data suggests that BRT service is warranted, and there remains a strong market for local bus service along this corridor.
- Other improvements: The CS work found that a range of additional improvements would increase ridership for both counties, including increased land use density (jobs and housing) within walking distance of the corridor; improved pedestrian environment through traffic calming, landscaping, building design guidelines, land use and sidewalk improvements; and an integrated shuttle access program.

7.2.2. Transit Trip Lengths & Corridor Alignments

Another way of looking at the market for service along the GBI corridor is to consider the lengths that customers ride on various transit services, and the physical alignment of the different transit corridors. This effort considered two main types of information:

1. Trip length data for local bus service, enhanced transit (BRT) and Caltrain from travel demand modeling discussed in Chapter 6
2. The physical layout of the GBI corridor in relation to Caltrain, BART, and local bus lines

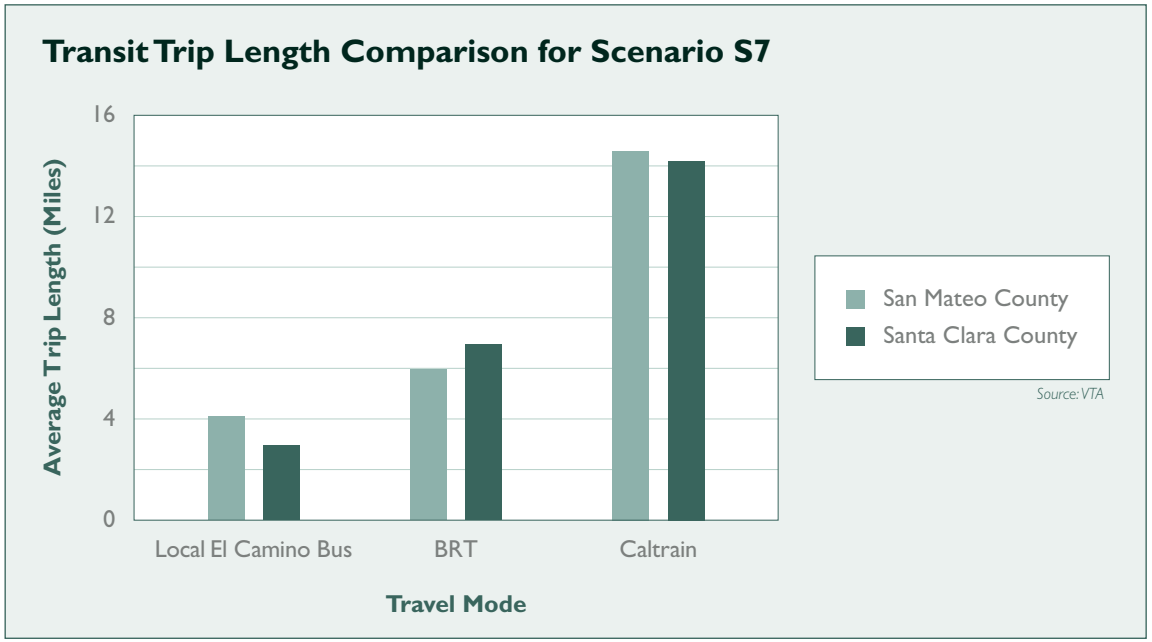


Figure 7-1. Projected 2035 transit trip lengths from travel demand modeling

Transit Trip Length Data

As part of the regional travel demand modeling, data on the average trip length of trips made on each transit service along the GBI corridor was assembled. These data were summarized for each of the 2035 modeling scenarios, and are discussed further in Chapter 6. Figures shown are for Scenario 7 (Enhanced Transit and Enhanced Land Use) but are similar for other modeling scenarios.

Figure 7-1 displays the differences in average transit trip lengths for the local El Camino bus service, potential enhanced transit/BRT along the GBI corridor, and Caltrain in modeling Scenario 7 (Enhanced Transit and Enhanced Land Use). The figure shows average trip lengths separately for each county, but the pattern is fairly similar for both counties. As the figure shows, it is projected that average trip lengths on local bus service would be roughly 2 to 4 miles, average lengths on enhanced transit/BRT would be roughly 6 to 8 miles, and average lengths on Caltrain would be roughly 14 to 16 miles. It is important to note that these lengths are calculated within each county, not for the entire length of the trips (i.e., not across county lines). In addition, only Caltrain stations within the study area (i.e., within one-third mile of the Corridor) were included in this analysis. These distinctions are important to keep in mind for the Caltrain trips, where the average trip length on the entire system (including trips from San Francisco south to Gilroy) is closer to 30 miles.

Based on the trip length data above, it appears that BRT along the GBI corridor would serve travelers making mid-length trips, who are a fairly distinct market from those making trips on either local bus or rail service. This suggests that BRT would not necessarily compete with existing transit services, at least

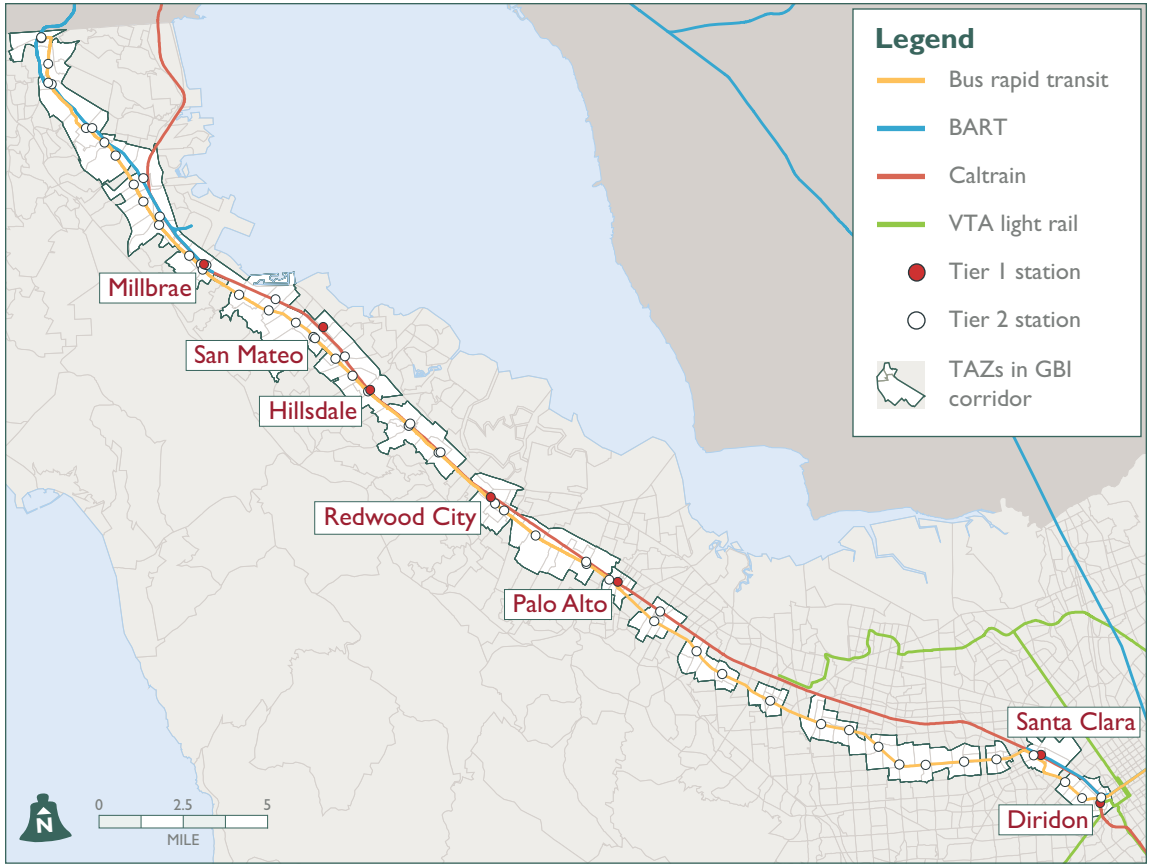


Figure 7-2. Transit corridor alignments

based on the lengths of trips travelers wish to make.

Comparison of Corridor Alignments

Another way of making observations about the potential market that an enhanced transit service along the GBI corridor could serve is by looking simply at the physical characteristics of the GBI corridor compared to the characteristics of nearby transit services.

Figure 7-2 shows the alignment of potential BRT service along the GBI corridor (in red), compared to existing and future planned BART service (in yellow), the Caltrain corridor (in green) and the VTA light rail system (as a dashed black line). The "Tier 1" and "Tier 2" station distinction is related to the modeling assumptions presented in Chapter 6. Local bus service along El Camino Real, while not explicitly noted in the legend, also generally follows the red line on the map.

The following observations can be made about the relationship between the GBI corridor and the Caltrain and BART corridors based on the physical characteristics of their different alignments:

- From Daly City to Millbrae: This area of the GBI corridor is generally within one-quarter mile of BART, but more than one mile from Caltrain. Therefore, the GBI corridor is frequently within walking distance of the BART corridor, but well beyond walking distance to Caltrain. The GBI corridor makes a close connection with both BART and Caltrain in Millbrae.
- Millbrae to Palo Alto: In this area the GBI corridor is generally within one-quarter mile, and sometimes within a few hundred feet, of the Caltrain alignment. Therefore, the GBI corridor is almost always within walking distance of the Caltrain line in this area. The GBI corridor makes a direct interface with BART and Caltrain in Millbrae, and a close interface with Caltrain at nearly every other station along this stretch.

- South of Palo Alto: In this area, the GBI corridor is generally three-quarters of a mile or more from the Caltrain line. The two exceptions are a close interface with Caltrain (and planned future BART service) at Santa Clara Station and with Caltrain, ACE, Capitol Corridor, VTA light rail, and planned future BART service at San Jose Diridon Station.

While these physical characteristics above do have some bearing on the potential market for GBI enhanced transit service compared to the nearby existing transit services, one factor they do not take into account is station spacing. Caltrain and BART stations are generally spaced at greater distances (usually 2 miles or more) than BRT stations, which are typically spaced about three-quarters of a mile to a mile apart. Similarly, BRT station spacing is considerably wider than local bus stop spacing, which may vary by agency policy but is often closer to one-eighth of a mile.

Trip Lengths and Corridor Alignments

The following preliminary findings and recommendations can be made from the analysis in previous sections.

- The transit trip length data suggest enhanced transit/BRT along the GBI Corridor may serve a distinct travel market rather than taking travelers away from existing nearby transit services.
- BRT along the GBI corridor would closely parallel the existing Caltrain and BART lines in some areas, especially in San Mateo County. BRT along El Camino Real in Santa Clara County would generally serve distinct areas apart from Caltrain. However, the spacing of station stops on each service also needs to be considered.
- Further study of potential travel markets and the relationship between the GBI corridor and other transit routes is needed to draw firmer conclusions and make additional recommendations.

7.3. Land Use & Transit Assessments

This section looks at projected land use trends and identifies any implications for transit service along the corridor. The section also looks at an example of setting land use density thresholds for transit service along the GBI corridor.

7.3.1. Overview of Projected Growth

Projected household and job growth in the 2035 Base Scenario (growth from 2005 to 2035, consistent with ABAG Projections 2007) was mapped for both San Mateo and Santa Clara counties at the TAZ level. The magnitude of projected growth was denoted on the maps by different shadings, with the smaller amounts of growth in lighter shading and the larger amounts in darker shading. The results of this exercise for the 2035 Base Scenario for projected growth in households are shown in Figure 7-3, and results for projected job growth are shown in Figure 7-4.

The level of growth projected in the 2035 Enhanced Land Use Scenario was also mapped across both counties for comparison. In the 2035 Enhanced Scenario, some of the projected growth in both households and jobs was redistributed from outside the GBI corridor to inside the GBI corridor to meet certain density targets selected for the station areas (existing Caltrain and potential future BRT) along the corridor. The density targets were conceptual-level thresholds, based on typical guidelines in planning literature, as well as guidelines developed as part of VTA's Community Design & Transportation (CDT) Program and Transit Sustainability Policy. Further information about the assumptions and methodology for the 2035 Enhanced Land Use Scenario in the travel demand modeling effort is included in Chapter 6. The results of this exercise for the 2035 Enhanced Land Use Scenario for projected growth in households are shown in Figure 7-5, and for projected growth in jobs in Figure 7-6.

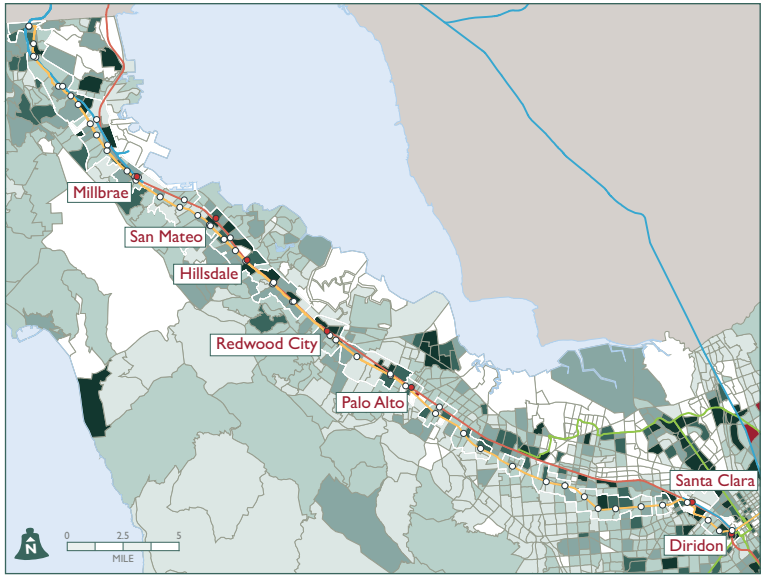


Figure 7-3. Projected household growth, 2005 to 2035 – Baseline Scenario

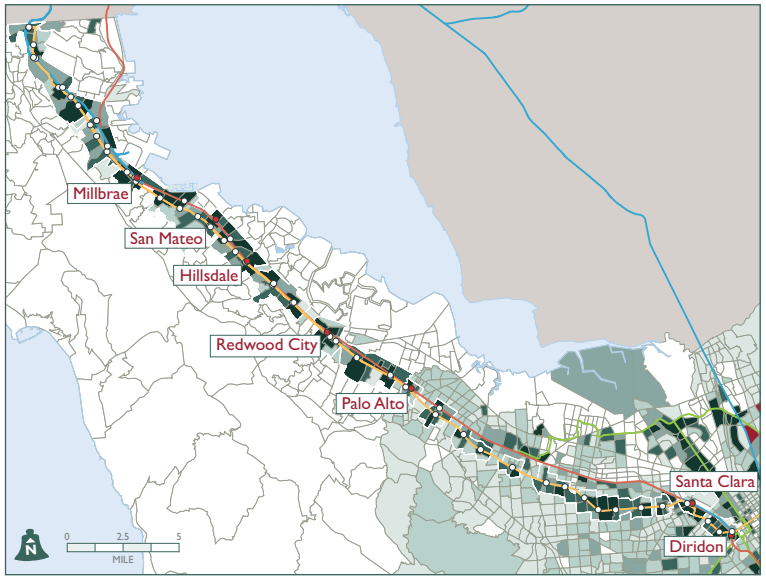


Figure 7-5. Projected household growth, 2005 to 2035 – Enhanced Land Use Scenario

Legend

2005 - 2035 Job Growth

- -2,398 - 0
- Zero growth
- 1 - 100
- 101 - 200
- 201 - 500
- 501 - 1,000
- 1,001 - 15,122

2005 - 2035 Household Growth

- -69 - 0
- Zero growth
- 1 - 50
- 51 - 150
- 151 - 250
- 251 - 500
- 501 - 5,000

Transit Service

- Bus rapid transit
- BART
- Caltrain
- VTA light rail
- Tier 1 station
- Tier 2 station

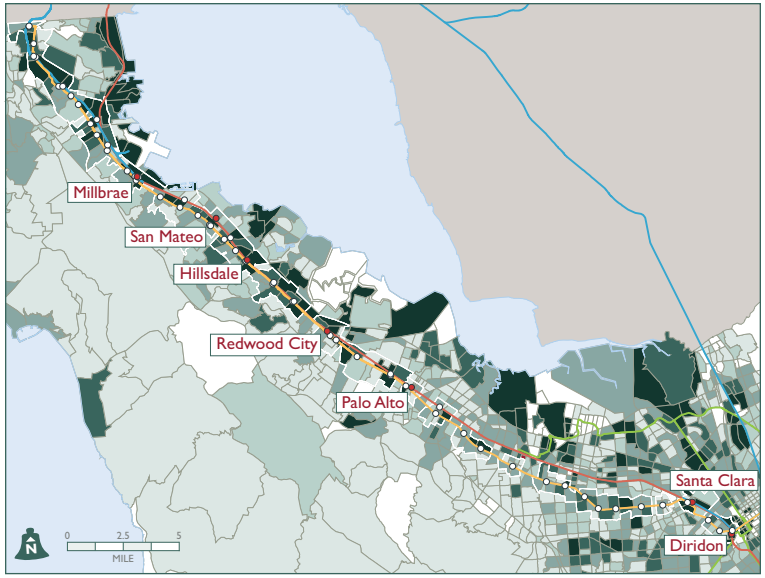


Figure 7-4. Projected job growth, 2005 to 2035 – Baseline Scenario

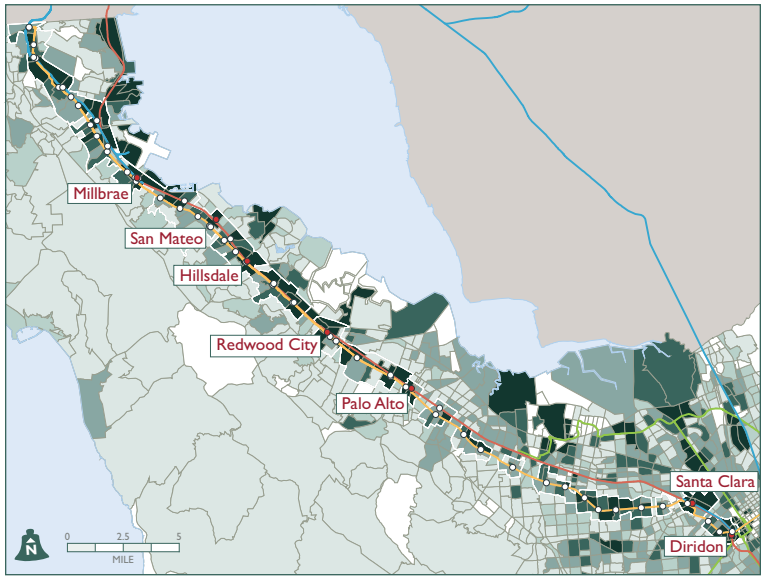


Figure 7-6. Projected job growth, 2005 to 2035 – Enhanced Land Use Scenario

The following are some observations on the overall projected growth trends across the two counties in the general vicinity of the GBI corridor, at a broad scale:

- In the 2035 Base Scenario, housing growth is relatively concentrated, while job growth is more dispersed. This can be seen by comparing the locations of the darker-shaded zones in Figure 7-3 and Figure 7-4; as the figures show, there are more dark areas, showing greater amounts of growth, outside the corridor in Figure 7-4 (showing jobs) than there are in Figure 7-3 (showing households).
- In the 2035 Enhanced Land Use Scenario, the difference is even more dramatic. This can be seen by comparing the areas of darker shading in Figure 7-5 and Figure 7-6. As can be seen in these two figures, in the 2035 Enhanced Scenario much of the growth in households is projected to occur within the GBI corridor (especially in San Mateo County), while there are still substantial pockets of job growth outside the GBI corridor.

The observations above have significant implications for how to provide transit service in the GBI corridor and nearby areas.

7.3.2. Projected Housing and Job Density within GBI Corridor

In addition to the overview of projected growth in San Mateo and Santa Clara counties, the study team looked at projected housing and job density within walking distance of the GBI corridor. Geographic information systems (GIS) analysis was performed using 2035 Baseline Scenario land use data (consistent with ABAG Projections 2007) to calculate the projected housing and job density by TAZ.

The area of this GIS analysis included only TAZs with centers located within ½ mile of the corridor. Residential density was calculated as the number of 2035 projected households over the projected residential acreage in 2035, while employment density was calculated as the number of projected jobs over the projected commercial/industrial acreage in 2035. Based on these projected 2035 residential and job densities, the TAZs in both counties were classified into several categories corresponding roughly to their ability to support levels of transit service. Table 7-1 shows the density thresholds that were used into this classification exercise. Job density is expressed as floor area ratio (FAR) because most municipalities generally regulate land use on this basis (rather than employees per acre). It was assumed that a FAR or 1.0 was equivalent to approximately 174 employees per acre, or 4 employees per 1,000 square feet (a typical assumption for office uses).

Figure 7-7 shows the projected 2035 residential density within walking distance of the GBI corridor in the 2035 Baseline Scenario, and Figure 7-8 shows similar information for projected job density. As can be seen in Figure 7-7, in the 2035 Baseline Scenario (consistent

Transit Service Type	Residential Density	Job Density/Quantity
Local Bus (Medium Frequency)	7 units/acre	7M – 20M square feet in nearby CBD
Bus Rapid Transit (BRT)	20 units/acre	1.0 FAR

Note: BRT figures are for the length of the corridor; station area thresholds are higher

Sources: TCRP Report 95, Chapter 15 – Land Use and Site Design, 2003; VTA Community Design & Transportation Manual, 2003

Table 7-1. *Typical land use thresholds to support enhanced levels of transit*

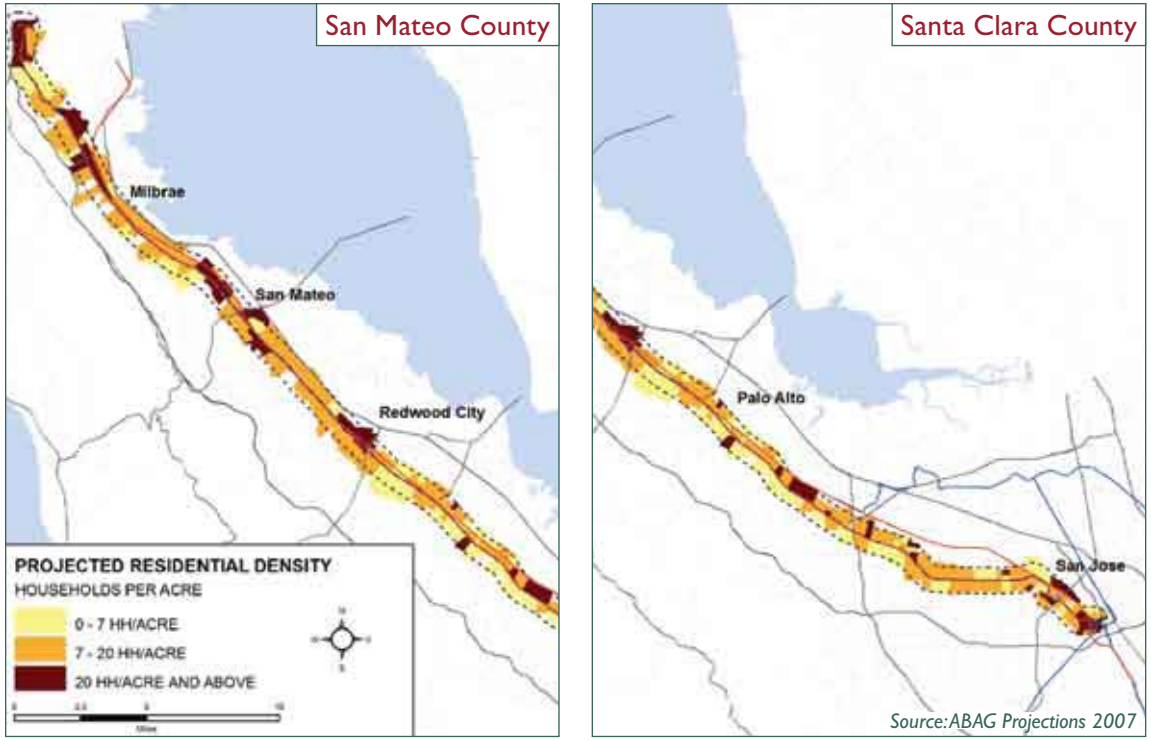


Figure 7-7. Projected 2035 residential density in GBI corridor – Baseline Scenario

with ABAG Projections 2007 data), residential density within walking distance of the GBI corridor is expected to fall in the 7 to 20 units/acre range for much of the corridor, with some TAZs within the corridor exceeding 20 units/acre – a density that is sometimes considered a threshold to support BRT service.

As Figure 7-8 illustrates, job density within walking distance of the GBI corridor in the 2035 Baseline Scenario is projected to generally be below a FAR of 0.5. However, significant clusters of employment with densities of at least 0.5 or even over 1.0 are projected to occur in areas such as San Mateo, Redwood City, Palo Alto, Mountain View, and San Jose. These areas are most likely to support BRT service according to the general thresholds described above.

In considering the implications of these projections of household and job density for the level and type of transit service for the GBI corridor, it is important to keep several things in mind:

- The density thresholds discussed in this section should not be taken in isolation. For instance, one should not look simply at projected residential density or job density, but the two in combination. When considering both types of development along the GBI corridor, it is likely that much of the corridor reaches density supportive of enhanced transit in the future.
- The local bus service along El Camino Real in both counties, and VTA's Rapid 522 service, are among the most productive routes in both agencies' systems now, and are likely to become more productive in the future. This is likely due to the combination of attractive origins and destinations along the corridor and the demographics and market orientation of the population near the corridor. This suggests that enhanced transit service such as BRT has the potential to be successful, based on current trends.
- Further analysis of ridership potential given existing land use and projected medium-term land use changes should be performed to better determine the potential market for BRT along the corridor. In Santa Clara County, such analysis has already been performed in the VTA BRT Strategic Plan.

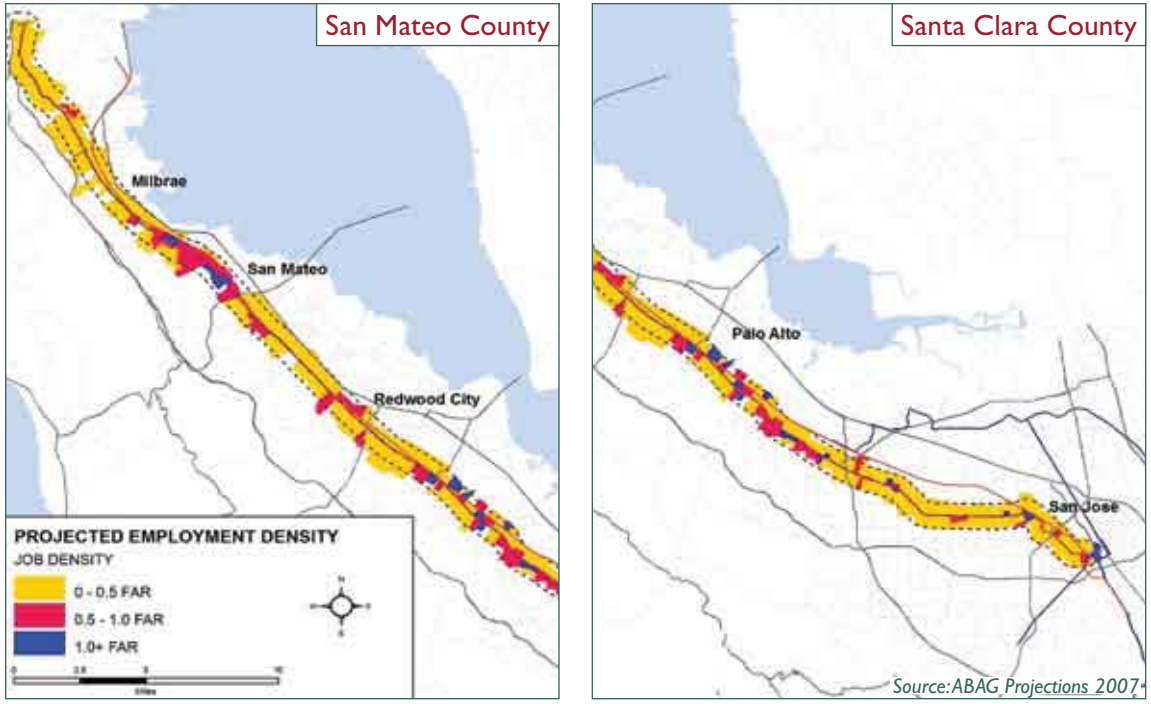


Figure 7-8. Projected 2035 job density in GBI corridor – Baseline Scenario

7.3.3. Projected Job Growth near GBI Corridor

A third area of land use analysis involved looking at projected job growth near the GBI corridor – in areas just beyond walking distance, but within a reasonable shuttle or feeder bus distance from the corridor. For the purposes of this analysis, the area of interest was defined as between one-half mile and three miles from the corridor. The objective of this analysis was to identify "hot spots" of job growth that are projected to occur in this area of interest, and consider ways to tie them to transit service along the GBI corridor. Job data from the 2035 Enhanced Land Use Scenario was used in the analysis.

A GIS analysis was performed using a methodology somewhat similar to that described in the previous section. Projected job density, and projected job growth (2005 to 2035) were calculated based on the 2035 Enhanced Land Use Scenario data, and TAZs were highlighted if they:

- Fell beyond walking distance but within reasonable shuttle distance (0.5 to 3 miles from the GBI corridor); and
- Were projected to reach a job density supportive of enhanced transit (1.0 FAR or 174 jobs/acre) in the 2035 Enhanced Land Use Scenario; or
- Were projected to see significant job growth (an increase of least 1,000 jobs from 2005) in the 2035 Enhanced Land Use Scenario.

The results of this analysis for the entire GBI corridor are shown in Figure 7-9. Areas of high job growth alone are shown in red, areas of transit-supportive job density are shown in dark blue, and areas meeting both criteria (growth and density) are shown in purple. As the figure shows, there are significant hot spots of job activity projected to occur just beyond walking distance of the GBI corridor, particularly east of the corridor closer to San Francisco Bay.

In addition to creating a corridor-level view of these areas, the study prepared more focused maps showing the projected hot spots in San Mateo and Santa Clara counties. Areas projected to reach the job thresholds or job densities described above were noted with shapes on the maps. Note that this was done simply through visual inspection and is meant to simply show areas of interest, not to exhaustively catalog all areas of projected job

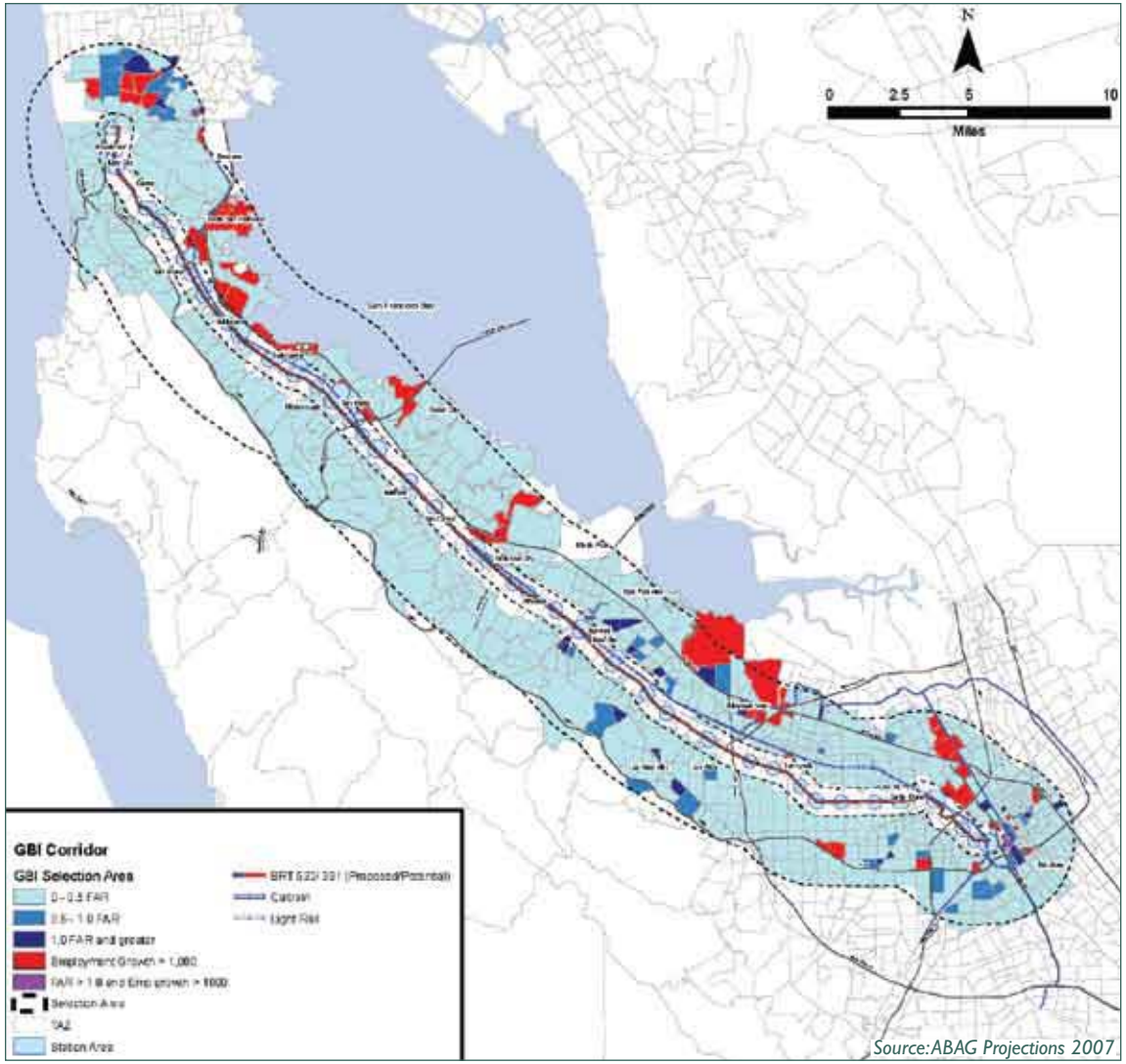


Figure 7-9. Projected job growth near the GBI corridor

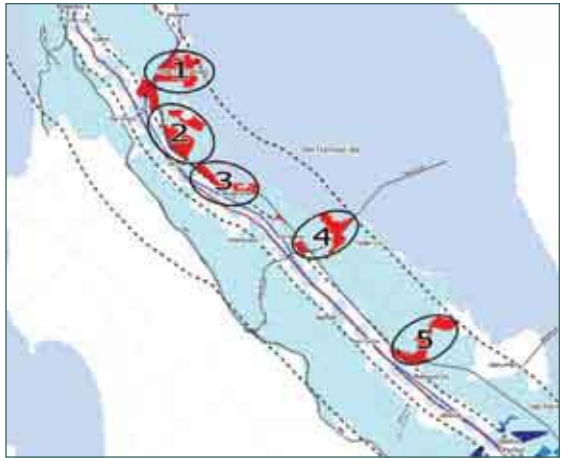


Figure 7-10. San Mateo County employment "hot spots"

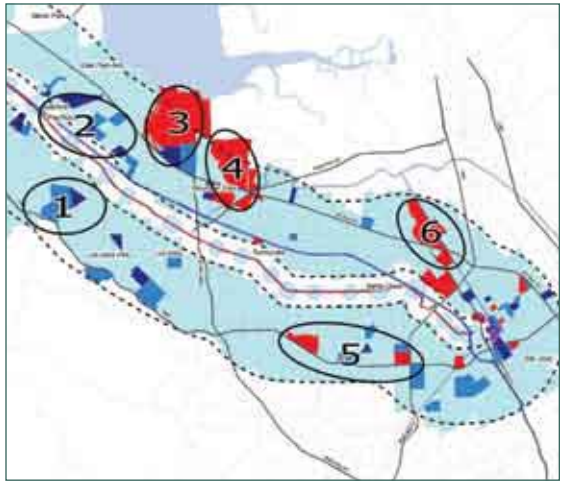


Figure 7-11. Santa Clara County employment "hot spots"

growth or density. The results of this exercise are shown in Figures 7-10 and 7-11.

Projected employment hot spots near the GBI corridor in San Mateo County, based on 2035 Enhanced Land Use data, include:

1. South San Francisco
2. SFO area - Millbrae/San Bruno
3. SFO area - Burlingame
4. Foster City/San Mateo
5. Redwood Shores/eastern Redwood City.

Projected employment hot spots near the GBI corridor in Santa Clara County, based on 2035 Enhanced Land Use data, include:

1. Stanford Research Park
2. Southeast Palo Alto
3. North Bayshore, Mountain View
4. Moffett/Middlefield area, Sunnyvale/Mountain View
5. Stevens Creek Boulevard corridor
6. North First Street corridor, San Jose.

After identifying the projected hot spots, employment growth, or density close to but beyond walking distance of the GBI corridor, the study team identified a number of possible options for how these hot spots could be tied to the main north-south transit services along the GBI corridor. These options, which are not meant to be an exhaustive list, could include the following:

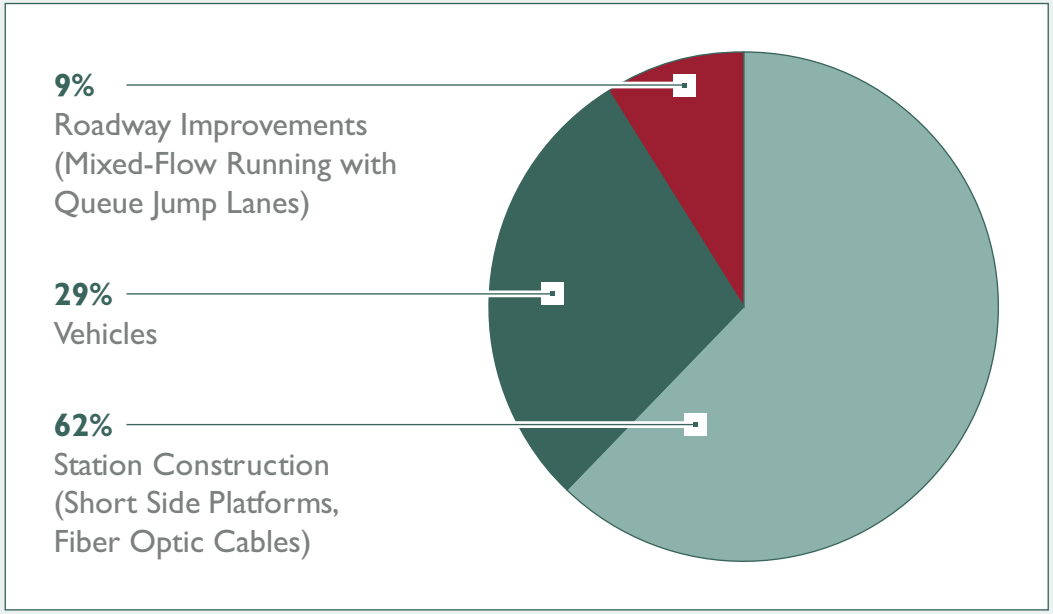
- Employer shuttles/feeder services to BRT and Caltrain
- Transit schedule coordination/timed transfers
- Pedestrian and bicycle connections and supporting facilities
- Physical improvements at BRT and Caltrain stations:
  - Providing curb space for shuttles
  - Providing enhanced passenger amenities
- Other transit improvements (e.g., VTA light rail system efficiency improvements, Stevens Creek BRT).

Several points about these options are worth noting. First, while these options were identified as possible ways to tie projected employment hot spots to transit service along El Camino Real, in many cases they could also tie job centers to Caltrain or BART stations near the GBI corridor as well; the options are not mutually exclusive but rather are often complementary. Second, increases in shuttle or feeder services will generally need to involve public-private partnerships, or private sector funding, due to budget constraints and service policies at the transit agencies along the corridor. Third, some of the areas shown as hot spots in this analysis may be served by other transit lines or may be targeted for other transit improvements unrelated to the Grand Boulevard Initiative. For instance, job concentrations just north of the Daly City/San Francisco line or along North First Street in San Jose are likely to be served by existing Muni, BART, or VTA services. Projected job hot spots along the Stevens Creek Corridor west of downtown San Jose are anticipated to be served by VTA's planned BRT line along this route.

7.4. Capital Improvements & Conceptual Costs

Based on the outcomes of the travel demand modeling and transit service planning analyses, a preliminary set of broad capital improvements to support enhanced transit on the GBI corridor was identified. This list was then used to develop conceptual capital cost estimates for enhanced transit service along the GBI corridor in each county.

Conceptual Capital Cost of "Standard BRT" along GBI Corridor in San Mateo County



Source: VTA

Transit Service Type	Conceptual Capital Cost (2009 dollars)	Broad Capital Improvements Included
Standard BRT Service	$120 million	• Roadway improvements • 31 high-end, branded vehicles • Station construction
Limited Stop Service	$25 million	• Bus stop signage • 33 standard vehicles

Table 7-2. Conceptual capital cost range for enhanced transit along GBI corridor in San Mateo County

Figure 7-12 (left). Conceptual capital cost of "Standard BRT" along GBI Corridor in San Mateo County

7.4.1. Approach and Key Assumptions

The following is the general approach for identifying capital improvement items for enhanced transit service along the GBI corridor in both counties.

- In Santa Clara County: Assume "BRT 2"[1] with a combination of dedicated and mixed-flow lanes, consistent with the assumptions of the 2009 VTA BRT Strategic Plan
- In San Mateo County: Assume a range of improvements to show the range of potential costs for enhanced service:
  - Lower end: "Limited Stop" service, mainly involving wider stop spacing, new distinctive signage at stops, and new vehicles (consistent with current SamTrans buses) to support overlay service
  - Higher end: "Standard BRT" service,

1. In its Transit Sustainability Policy/Service Design Guidelines, adopted in February, 2007, VTA defines two levels of BRT service, which differ according to the capital investment requirements and the level of infrastructure provided. VTA's policies define BRT 2 as generally involving operation in a dedicated right-of-way, arterial bus lanes, at-grade busways, grade-separated busways, rail-like stations with enhanced amenities, off-board fare collection and coordinated land use planning.

Figure 7-13 (right). Conceptual capital cost of "BRT 2" along GBI Corridor in Santa Clara County

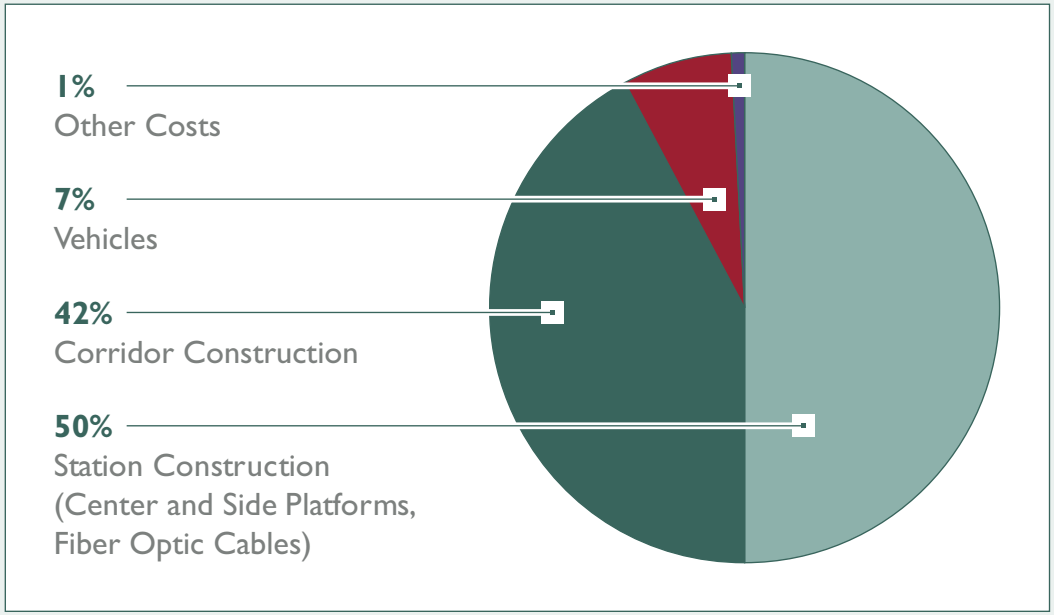
operating in mixed-flow with queue jump lanes at key intersections

The common assumptions about capital improvements for the possible implementation of BRT service in both counties include the following:

- Overlay service, operating on 10-minute headways
- Substantial, light rail-style stations (a mix of 90' and 160' and side median platforms were assumed in Santa Clara County; only 90' side platforms were assumed in San Mateo County)
- High-end, branded vehicles
- Queue jump lanes where no dedicated lanes would be used
- Fiber optic cables for communication, to support ticket vending machines at all or key stations

These cost estimates are conceptual, order-of-magnitude estimates of capital costs only. Estimates of operating costs, net operating costs, or cost per passenger are beyond the scope of the Multimodal Transportation Corridor Plan, but should be developed if BRT improvements are pursued. The VTA BRT Strategic Plan included such estimates for the portion of the corridor in Santa Clara County.

Conceptual Capital Cost of "BRT 2" along GBI Corridor in Santa Clara County



Source: VTA

Transit Service Type	Conceptual Capital Cost (2009 dollars)	Broad Capital Improvements Included
BRT 2 Service	$216 million	• Dedicated/mixed-flow roadway improvements • Station construction (center and side platform) • 14 high-end, branded vehicles

Table 7-3. Conceptual capital cost range for enhanced transit along GBI corridor in Santa Clara County

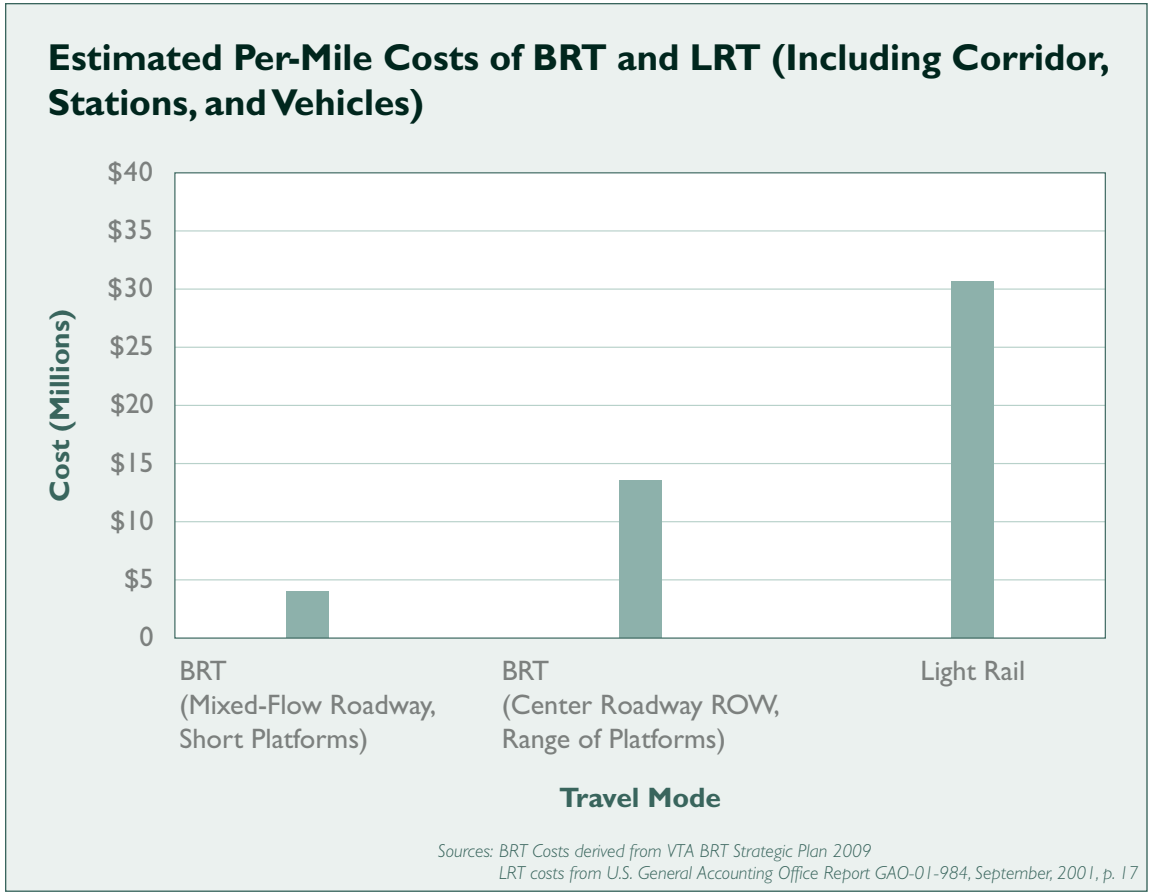


Figure 7-14. Estimated per-mile costs of BRT and LRT (including corridor, stations, and vehicles)

7.4.2. Conceptual Capital Costs: San Mateo County

Based on the assumptions about broad capital improvements described above and unit and per-mile costs developed in the VTA BRT Strategic Plan, conceptual capital cost estimates for enhanced transit along the GBI corridor in San Mateo County were developed. Two order-of-magnitude cost figures were developed, one for the lower-end service assumption (Limited Stop service) and one for the higher-end service assumption (Standard BRT). Table 7-2 shows the range of conceptual capital costs estimated for enhanced transit service along the GBI corridor in San Mateo County, along with the broad capital improvement items included in the estimates. Figure 7-12 shows the breakdown of conceptual capital costs for the Standard BRT service along the GBI corridor in San Mateo County.

7.4.3. Conceptual Capital Costs: Santa Clara County

To maintain consistency with the recent VTA BRT Strategic Plan, the same capital improvement items were assumed (to produce BRT 2 service as described in the previous section) and therefore the same conceptual capital cost figure from the Strategic Plan was used. This figure was roughly $216 million (in 2009 dollars) for implementation of service along the El Camino Real segment from Diridon Station to the Palo Alto Transit Center, without the optional loop at San Jose State University. This conceptual cost estimate includes only the incremental number of vehicles required to operate BRT service once the Santa Clara-Alum Rock BRT service from downtown San Jose to the Eastridge Mall has already been introduced.

Table 7-3 shows the estimated conceptual capital costs for implementing BRT 2 service along the GBI corridor in Santa Clara County, along with the broad capital improvement items included in the estimate. Figure 7-13

shows the breakdown of conceptual capital costs for the BRT 2 service along the GBI corridor in Santa Clara County.

7.4.4. Comparison of BRT Conceptual Capital Costs to Other Options

To provide a point of comparison as to how the capital costs presented in the previous two sections might compare to other enhanced transit options, information is provided in Figure 7-14 about per-mile costs of BRT in two different configurations contrast to the per-mile costs of light rail transit (LRT). The per-mile BRT costs are derived from the capital cost estimate in the 2009 VTA BRT Strategic Plan to show a lower-end and higher-end range of possible per-mile BRT costs and are specific to the Bay Area context. The per-mile LRT costs are from a United States General Accounting Office study and represent typical costs across the United States; costs in the Bay Area may be considerably higher.

7.5. BRT Options: Potential for Cross-County Service

This section discusses potential options for improving cross-county transit service coordination along El Camino Real. This concept was addressed in two ways:

1. In the travel demand modeling effort, scenarios with Enhanced Transit (BRT) operating individually along the GBI corridor in the two counties ("a" scenarios), and scenarios with BRT operating seamlessly along the length of the corridor ("b" scenarios) were both analyzed.

2. In the future transit service planning process discussed earlier in this chapter and in Appendix C, further analysis of the potential cross-county enhanced transit scenarios was performed, including an analysis of the potential impacts of a seamless BRT service along different portions of the corridor and other considerations of potentially implementing such a service.

The projected results of introducing a seamless BRT service on a corridor-wide level were summarized in Chapter 6 of the Corridor Plan. In that chapter, the tables generally presented results for the entire set of scenarios, including those with Seamless BRT (Scenarios 3b, 5b, and 7b). The figures in this section show the differences in performance between the two BRT options (with-transfer "a" scenarios and seamless "b" scenarios).

7.5.1. Analysis of Potential Cross-County Service: Corridor-Level Results

When transit enhancements are being considered, projected daily boardings are the most common indicator used to describe the general benefits and effectiveness of the service. Therefore the projected weekday boardings on the different BRT options in this study are presented in this section. However, when comparing transit enhancement options with and without transfers, looking at boardings figures alone does not tell the whole story. This is because the transit boardings may be artificially inflated by the presence of the transfer – i.e., some travelers who are making only a one-way trip are counted as two boardings when they transfer between routes or modes. For this reason, looking at linked transit trips can be another useful indicator of the effectiveness of a transit improvement. A linked transit trip is defined as a single one-way trip on transit, regardless of the number of transfers between modes; therefore, linked transit trips can be a useful way to show the level of usage of a transit route or system and factor out the effect of transfers.

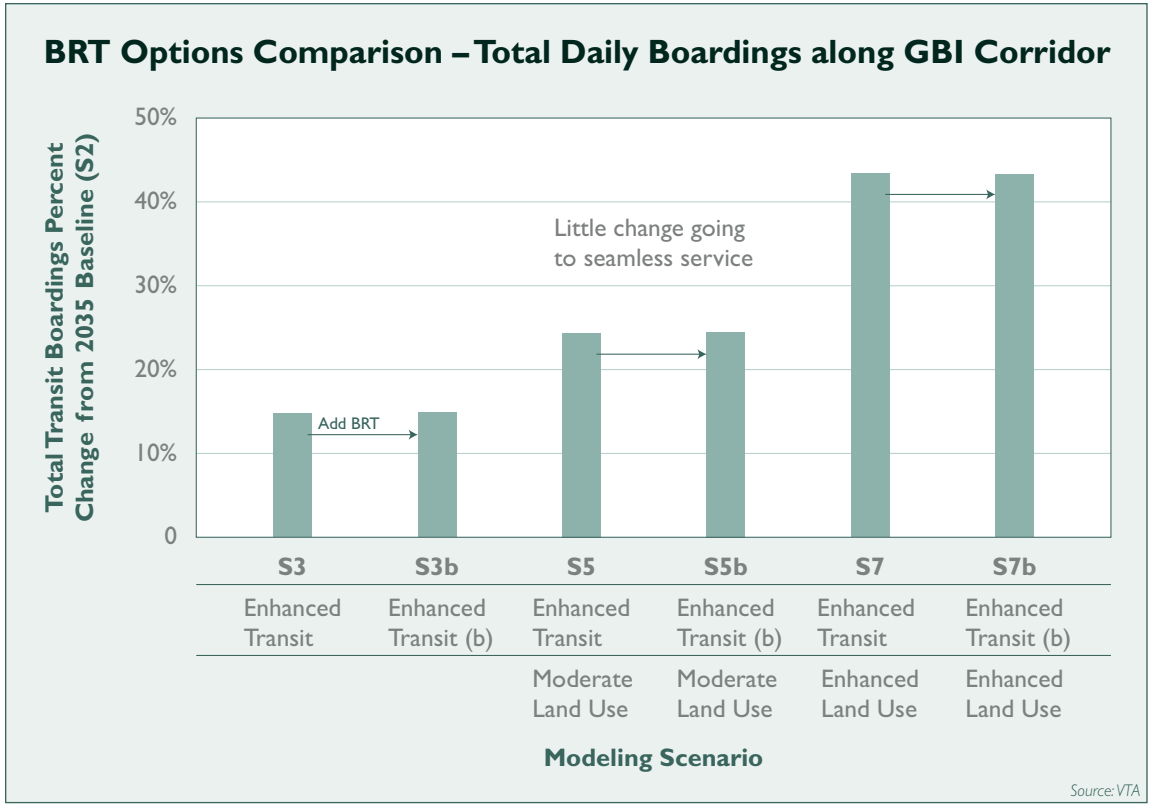


Figure 7-15. *BRT options comparison. Total daily boardings along GBI corridor (Change from Baseline Scenario)*

Figure 7-15 summarizes the projected weekday boardings for the all the modeling scenarios including the two BRT options (with and without transfer). Figure 7-16 shows the projected weekday linked transit trips for these same modeling scenarios and BRT options. It is important to note that while both of these charts show increases compared to the Baseline Scenario S2, they cover different geographic areas and sets of trips, so the magnitude of the changes are not directly comparable. The more important thing to note in each figure is the comparison between the 'a scenarios' (BRT with transfer) and 'b scenarios' (Seamless BRT), and whether the 'b scenarios' produce any difference from the 'a scenarios'.

As Figure 7-15 illustrates, a "seamless" BRT (no transfer at the county line) does not appear to have a substantial effect on total boardings in the corridor. Figure 7-15 shows that the 'separate BRT' and 'seamless BRT' options produce almost the same increase in transit boardings along the GBI corridor relative to the Baseline Scenario, S2. For instance, both of the Enhanced Transit with Base Land Use scenarios (Scenarios 3 and 3b) produce a roughly 15 percent increase in total weekday transit boardings along the corridor, and the Enhanced Transit with Enhanced Land Use scenarios (Scenarios 7 and 7b) both show nearly a 45 percent increase compared to the Baseline Scenario. The lack of change in boardings between each pair of scenarios is likely due to the the increased boardings resulting from the attractiveness of the seamless BRT service being balanced out by the reduction in transfer boardings at the county line.

As Figure 7-16 illustrates, the "seamless" BRT options generate some additional transit linked trips, suggesting that they are attractive to at least some travelers. Scenario 3, Enhanced Transit (separate BRT services) with Base Land Use produces a roughly 3 percent increase in total daily linked transit trips across Santa Clara and San Mateo Counties, while Scenario 3b (with seamless BRT service) yields a roughly 4 percent increase. The difference between the BRT options is slightly larger for the Enhanced Transit with Enhanced Land Use scenarios; Scenario 7

produces an increase of roughly 11 percent versus the Baseline Scenario, while Scenario 7b yields an increase closer to 12.5 percent. These results suggest that the 'b scenarios' are more attractive to travelers and therefore generate some additional linked transit trips.

7.5.2. Analysis of Potential Cross-County Service: Comparison along Portions of the Corridor

In addition to looking at the impacts of a potential cross-county service at the level of the entire GBI corridor, the study team also looked at how such a service might impact different portions of the corridor. This was done by taking the results of the modeling discussed in Chapter 6 and breaking it down to the level of individual BRT stations along the GBI corridor. The indicator used was combined daily boardings and alightings, which provides a look at the total level of passenger activity at each station regardless of the time of day or direction of travel. This measure is useful to show simply which stations see more activity in the separate BRT scenario, and which see more activity in the seamless BRT scenario. The results of this analysis are shown in Figures 7-17 and 7-18. The results are shown for Scenarios 7 and 7b (Enhanced Transit and Enhanced Land Use)

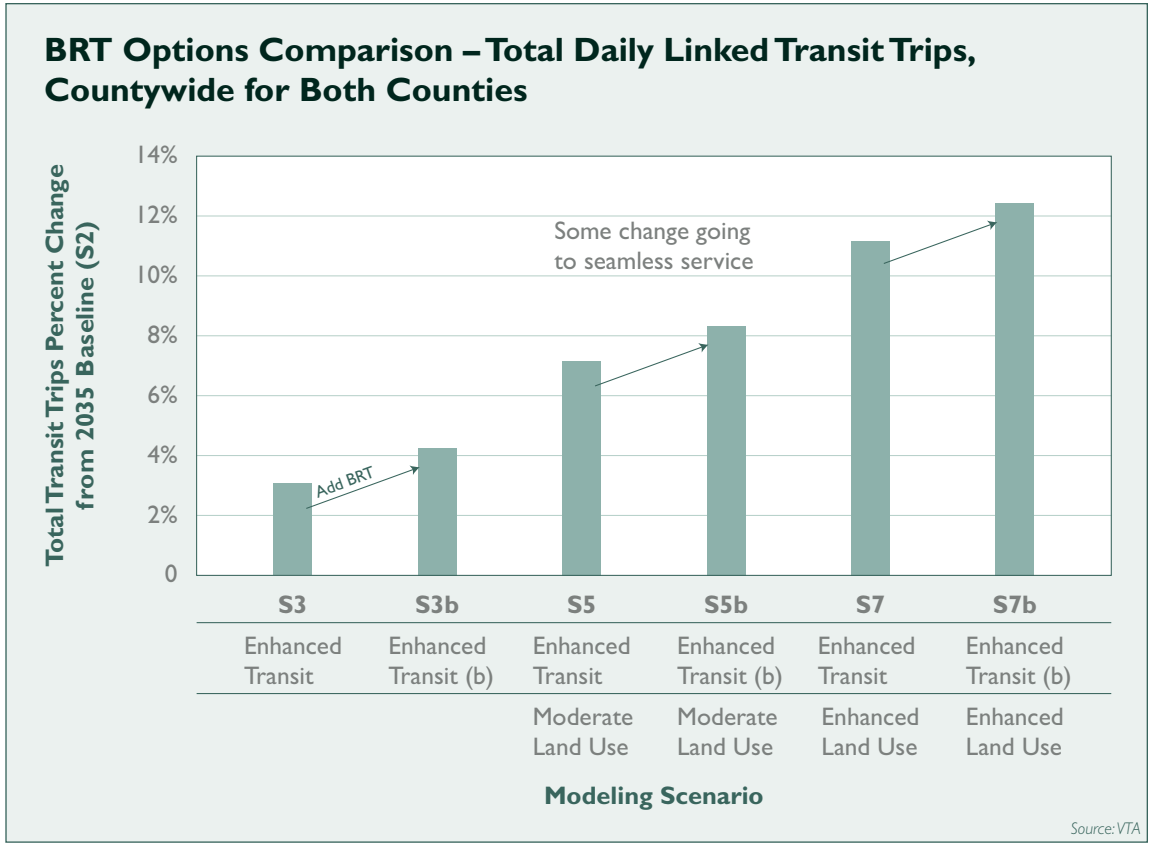


Figure 7-16. BRT options comparison. Total daily linked transit trips, countywide for both counties (Change from Baseline Scenario)

but the pattern is similar for Scenarios 3 and 3b as well as 5 and 5b.

In Figure 7-17, the BRT stations and segments with the highest boarding and alighting activity are shown as spikes in the graph, while the stations and segments with less activity are the dips or valleys in the graph. As the figure indicates, the main area with a decrease in activity as a result of a change from Scenario 7 (separate BRT) to Scenario 7b (seamless BRT) would be in Palo Alto, where a significant amount of transfer activity would be removed. The main segments that would see an increase in activity with a change from Scenario 7 to Scenario 7b would be from roughly

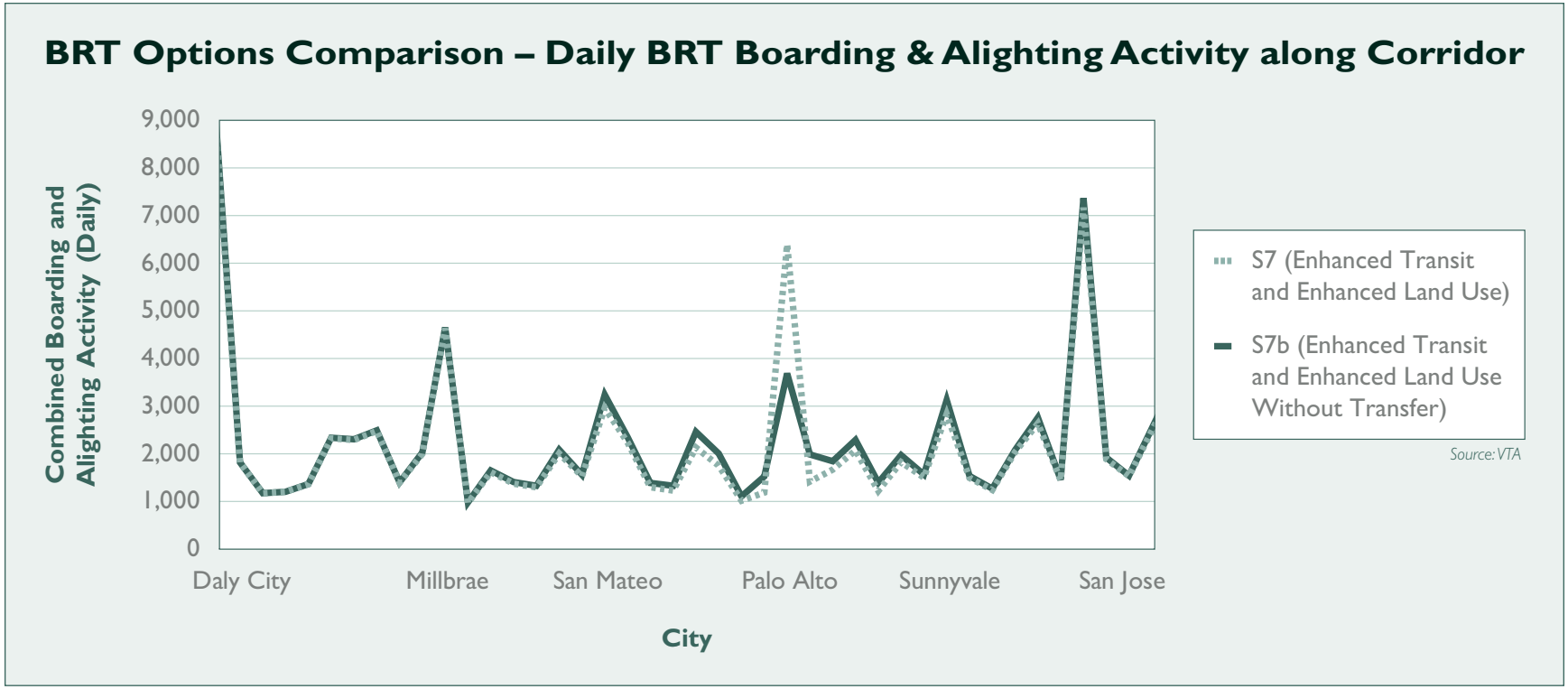


Figure 7-17. *BRT options comparison. Daily BRT boarding and alighting activity along GBI corridor*

San Mateo to Sunnyvale, with the exception of the Palo Alto Transit Center.

Figure 7-18 shows the results along the length of the GBI corridor in another way. This graph shows the difference in combined daily boarding and alighting activity between Scenario 7 and Scenario 7b. This graph shows the projected decrease in activity at the Palo Alto Transit Center, and the corresponding increase in activity at other stations to the north and south, with the introduction of seamless BRT service.

These two figures suggests that the segment of the GBI corridor that would benefit most from the introduction of a cross-county BRT service would be roughly between San Mateo and Sunnyvale. This is presumably the area where the seamless service would be the most attractive in comparison to separate BRT services running in each county. In areas farther north and south along the GBI corridor, a seamless BRT service appears to be less attractive – perhaps because the time savings of avoiding the transfer is relatively small compared to the overall trip length.

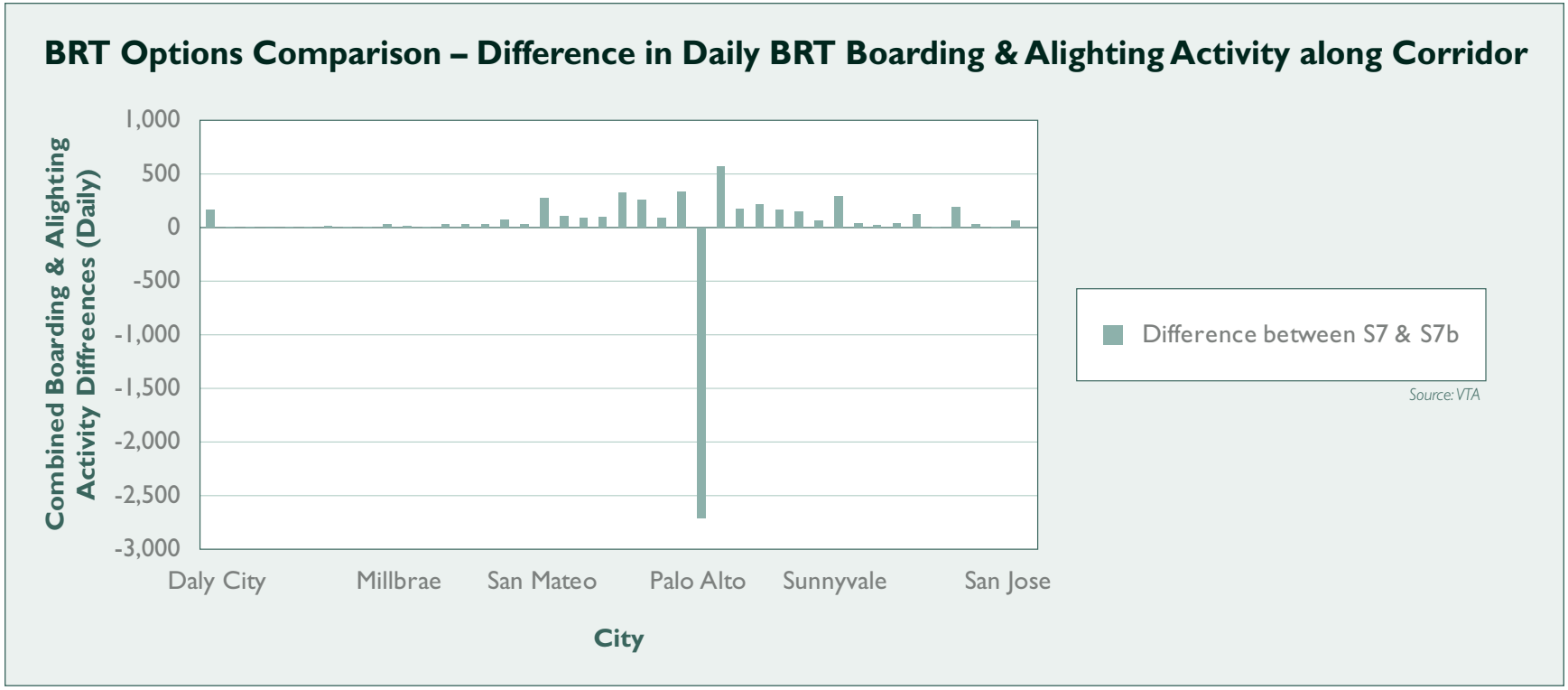


Figure 7-18. *BRT options comparison. Difference in daily BRT boarding and alighting activity along GBI corridor*

7.5.3. Potential Cross-County Service: Summary Observations

The modeling results summarized in this section show that the potential implementation of cross-county BRT service along the GBI corridor would likely yield mixed results:

- There appears to be some market for a seamless BRT service along the GBI corridor. The projected increase in linked transit trips with a seamless BRT service (compared to separate services) suggests that there is some market, and that there would be some benefits in terms of attracting more riders to transit. The fact that linked transit trips are increasing while boardings are holding steady suggests that transfer-related boardings are being reduced at the county line, which is also a positive improvement for travelers.
- It appears that a seamless BRT service would be most attractive to travelers from roughly San Mateo to Sunnyvale. This is an indication of the areas where the removal of the transfer would yield the greatest benefits, or make the seamless service the most attractive in comparison to separate BRT services.
- There are potential issues about fare policy and farebox recovery associated with introducing a cross-county BRT service.

This is because average trip lengths on the seamless service are expected to increase (compared to separate BRT services). If fares on the BRT service are kept the same as local service and a single fare is charged for BRT trips across county lines, the farebox recovery ratio (the percent of operating costs covered by fares) of the seamless BRT service would likely be lower than other similar services.[2]

- A cross-county BRT service could potentially compete with Caltrain or other longer-distance services. The extent to which a cross-county BRT service would compete with other transit services would be determined in part by fare policy, and in part by other characteristics such as those described in Section 1.2.2 of this chapter.
- Implementation would involve significant logistical hurdles, and requires further study. There are many logistics involved with the potential implementation of a cross-county BRT service along the GBI corridor, including fare policy, operations and maintenance responsibility, cost- and revenue-sharing, labor policies at the two agencies, and other considerations. Further study would be required to determine whether such a service is feasible and would yield greater benefits than costs.

2. The travel demand modeling of Enhanced Transit (BRT) service made the assumptions that BRT service would have the same fare as local service, and that BRT service across county lines in the seamless BRT scenarios would only cost a single fare.

7.6. Recommended Transit Service

Based on the travel demand modeling and future transit service planning analyses, several *preliminary* recommendations about the type and level of enhanced transit service for the GBI corridor have been developed:

- In Santa Clara County: VTA should proceed with planning and design for BRT 2 service along the El Camino Real/Alameda corridor. This recommendation is based both on the analysis in the Multimodal Transportation Corridor Plan as well as the VTA BRT Strategic Plan completed in spring 2009.
- In San Mateo County: BRT holds great promise for the San Mateo County portion of the GBI corridor, but more detailed study is needed and should proceed with SamTrans' upcoming Comprehensive Operations Analysis.

In addition to the above recommendations about the type and level of transit service along the GBI corridor, the study team has developed several preliminary recommendations in other areas. These include the following:

- Land use: Sufficient land use densities are essential to support enhanced transit on the Corridor. In Santa Clara County, the BRT Strategic Plan work has indicated that there are adequate densities to support the level of BRT planned for El Camino Real. In San Mateo County, current low densities along many parts of the Corridor will need significant investment to provide the ridership to support BRT. Cities, towns, counties, and other agencies and advocacy groups should continue to promote transit-supportive growth along El Camino Real.
- Phasing of transit improvements: SamTrans and VTA may want to consider a phased approach to implementing transit improvements as land use intensifies along the corridor. In Santa Clara County, VTA has already been taking this approach, with the introduction of the 522 Rapid ("BRT 1") service in 2005, and current planning and design efforts for BRT 2 service along El Camino Real. In San Mateo County, it is possible that a similar approach could be adopted, with Limited Stop or BRT 1 service being implemented in the near term and fuller BRT service in the longer term.
- Cross-county enhanced transit service:

Further study of the potential benefits, costs, and logistics of such a service is needed.

- Supporting improvements: The cities, towns, counties, CMAs, and other agencies and advocacy groups involved in the GBI should continue to plan for streetscape, pedestrian, and bicycle improvements along the corridor. These improvements could go hand-in-hand with enhanced transit service, but are also worthwhile to pursue in their own right.
- Education and outreach: All the parties involved in the GBI effort, both public and private, should continue to pursue a dialogue with decision-makers and the general public about the potential for enhanced transit service as well as related actions and issues.

8

Corridor Operations and Management

Source: Dan Burden

This chapter identifies **policy options and best practices for overall operations and management of the GBI corridor.** The chapter focuses primarily on options that involve multiple jurisdictions, or **coordination between multiple public and private entities**, and includes many case studies of such arrangements.

The goal of this effort was to **develop a starting point** for a possible future agreement between the Congestion Management Agencies (CMAs), Caltrans, and possibly other agencies involved in the management of the corridor.

8.1. Overview of Coordination Areas and Policy Options

As a starting point for this task, the study team identified three main work areas where coordination between agencies potentially could occur. These included:

1. Transit service
2. Roadway operations, management, and maintenance
3. Coordination on other areas including land use planning, parking supply and management, bicycle access, and pedestrian accommodations.

In addition, the team identified a range of policy options, or ways in which multi-agency coordination in the above areas could be achieved. These options include the following:

- Informal agency coordination
- Governmental resolutions of support
- Memorandums of Understanding (MOU)
- Cooperative agreements
- Joint Powers Agreements/Authorities
- Special districts
- Public-private partnerships or agreements
- Hybrid approaches – incorporating one or more elements of the above.

Sections 1.1.1 and 1.1.2 provide an overview of the possible areas and policy options for cross-agency coordination. Section 1.2 provides brief descriptions of examples and best practices of coordination from the Bay Area and elsewhere in the United States.

8.1.1. Areas of Coordination

Transit service

One common area where coordination between agencies occurs is in the provision of public transit service. This happens because public transit services are typically provided at the county or occasionally the city level, while people's travel patterns frequently cross county or city boundaries. Coordination on transit service provision can cover a variety of areas such as operation of the service, schedule coordination, fare policy coordination, or sharing of facilities and infrastructure. Coordination most often occurs between multiple public transit agencies, but it also can involve other public and private entities. Examples of such public-private coordination include contract operation of transit services, or schedule coordination between public and private operators within a single metropolitan region.

Roadway Operations, Management, and Maintenance

Coordination between multiple agencies is also common in the management of roadways, particularly those that cross jurisdictional boundaries and meet regional or longer-distance travel needs. Roadways may be owned by a single agency (as is the case for a state highway), but may cross multiple jurisdictional boundaries and involve coordinated policies and agreements in a number of areas, including traffic operations, access management, incident management, signal timing and coordination, tolling, and enforcement. Maintenance responsibilities generally reside with the owner of the roadway, but these responsibilities may also be shared with other public agencies (as in the case of signals) or even private partners (for sidewalk maintenance, litter abatement, and other specific tasks). Coordination also may occur in the area of streetscape design, aesthetics, branding (e.g., auto malls), and historical signage and interpretation (e.g., El Camino Real marker bells).

Coordination in Other Areas: Land Use, Parking, Bicycle and Pedestrian Accommodations

Coordination between multiple agencies along a corridor that spans multiple jurisdictions also may occur in other areas. These may

include land use planning along a corridor (particularly near jurisdictional boundaries); parking supply and management; establishment and maintenance of bicycle routes and facilities; and establishment and maintenance of sidewalks, crossings, and other pedestrian facilities.

8.1.2. Policy Options

A variety of options for policies and agreements between entities can be used to achieve coordination on goals in the areas described in the previous section. The sections below provide brief descriptions of the most common policy options.[1] This summary is not meant to be exhaustive, but is intended to cover the options that might be considered in the context of the GBI corridor.

Informal Agency Coordination

The simplest policy option for entities involved in planning for and managing a shared corridor is informal coordination at the agency level. The Grand Boulevard Initiative Task Force, Working Group, subcommittees, and ad hoc collaborative efforts are an excellent example of this type of informal coordination. Such coordination may lay the groundwork for other policy options, such as resolutions of support, cooperative agreements, or public-private partnerships, or they may continue on an ongoing basis without being formalized. This type of coordination is voluntary, and may or may not involve a formal commitment of agency staff or financial resources.

Governmental Resolution of Support

In this policy option, several governmental entities may pass a formal resolution of support indicating their intention to meet certain common objectives. This policy action has been frequently used in the Grand Boulevard Initiative process to date – for instance, in the adoption of the Guiding Principles by cities, towns, and other agencies along the corridor. These resolutions are a formal expression of the will of a governing body on a given policy at a particular point in time; however, they are subject to change, particularly if the members of the elected body change.

A resolution in support of corridor management may serve as an initial step toward a more formal and legally binding cooperative agreement. This policy option often is used as a vehicle for adopting a new plan or policy. Resolutions of support may be tentative and general in nature, or highly specific and binding. Different sorts of agreements may occur throughout a process. There may be an initial agreement to enter the process, agreements about scheduling and agendas, and final agreements on recommendations or actions.

Memorandum of Understanding

A Memorandum of Understanding (MOU) goes beyond a resolution to document the desire of involved parties to engage in a particular course of action and a pledge to commit to certain actions. The essential difference is that an MOU cannot be amended unilaterally, making it a stronger commitment to cooperative programs. For corridor management, an MOU is generally used to define roles and responsibilities of participating entities, as well as to establish common direction on a particular course of action. An MOU can serve as an intermediate step toward more extensive cooperation or it may be the only form of declaration in those places where a more formal or binding agreement will not be attained. An MOU may be created between two or more governmental entities or between governmental entities and private parties. In the GBI context, SamTrans, C/CAG and VTA entered into an MOU to manage the Multimodal Corridor Transportation Plan, laying out the responsibilities and contributions of each of the partners.

1. This information relies heavily on National Cooperative Highway Research Program (NCHRP) Synthesis 337, Cooperative Agreements for Corridor Management, 2004 – in particular pages 6 and 9 through 12. Sources for this section are NCHRP 337 unless otherwise noted.

Intergovernmental/ Cooperative Agreement

An intergovernmental agreement or cooperative agreement is a legal pact authorized by state law between two or more units of government, in which the parties contract for or agree on the performance of a specific activity through either mutual or delegated provision. Agreements such as this work best when responsibilities, financial obligations, and procedures are laid out in detail. This is the most binding, from a legal perspective, of the types of intergovernmental cooperation, short of the creation of a new agency. Cooperative agreements often are used to coordinate roadway maintenance issues, such as paving, signalization, signing, lighting, landscaping, access permitting, and construction activities within the right-of-way of a transportation facility. Maintenance agreements may take the form of an intergovernmental agreement between governments or a public–private agreement between a government and a private entity.

Joint Powers Agreement/ Authority

A joint powers agreement (JPA), in the broadest terms, is a contract among units of local government to do jointly whatever all participant agencies are authorized to do individually. In a joint powers agreement, partnering cities, counties, and/or special districts agree to perform services, cooperate with, or lend their powers to a new governmental entity created by the JPA.[2]

Joint Powers Authorities (also referred to as JPAs) may be used where:

- An activity naturally transcends the boundaries of existing public authorities. An example would be the Transbay JPA, set up to promote the construction of the Transbay Transit Center in San Francisco, with several transportation boards and counties around the Bay Area as members;
- Public entities seek economies of scale or increased efficiency by combining their efforts. Examples include the South Bayside Waste Management Agency (SBWMA), which provides waste management and diversion programs for over 460,000 San Mateo County residents. Another is the Santa Clara County Library System, which provides service to eight cities and unincorporated Santa Clara County.

Joint powers authorities are widely used in California (where they are governed by Section 6500 of the California Government Code), but they also are found in other states. A joint powers authority is distinct from the member authorities; they have separate boards of directors and budgets and they assume sole liability for their activities. These boards can be given any of the powers inherent in all of the participating agencies. The authorizing agreement states the powers the new authority will be allowed to exercise. Joint powers authorities are governmental entities, as defined by the Government Code and, as such, are covered under the same public meeting, conflict of interest, and public record requirements that apply to cities and counties. These authorities receive existing powers from the creating governments; thus, they are distinct from special districts, which receive new delegations of sovereign power from the state.[3]

While JPAs typically do not have the power to tax, they can be instituted as Community Service Districts, allowing them to assess taxes, subject to the restrictions and conditions of state law.

Special District

Special-purpose districts, or special districts, are independent governmental units that exist separately from, and with substantial administrative and fiscal independence from, general purpose local governments such as county and city governments. Special districts provide

2. http://www.dpi.state.nd.us/finance/jpa/faq.pdf; http://legal-dictionary.thefreedictionary.com/joint+powers+agreement

3. http://en.wikipedia.org/wiki/Joint_Powers_Authority

specific services that typically are not provided by general-purpose governments. The services they provide range from basic needs such as hospitals, sewerage, and fire protection to smaller necessities such as mosquito abatement and upkeep of cemeteries. Special districts can be used to provide transit or other transportation-related services. SamTrans and VTA are special districts.

Special districts are founded by some level of government in accordance with state law (either by general law or special acts) and exist in all states. Special districts are legally separate entities with at least some corporate powers. Districts are created by legislative action, court action, or public referendum. The procedures for creating a special district may include procedures such as petitions, hearings, voter or landowner approval, or government approval. Special districts are governmental entities and, as such, are covered under the same public meeting, conflict of interest, and public record requirements that apply to cities and counties.

Each district is governed by a board of directors, commissioners, supervisors, or the like. These boards may be appointed by public officials, appointed by private entities, popularly elected, or elected by benefited citizens (typically property owners). The board of a special district serves primarily as a managing board and often appoints a chief executive for day-to-day operations and decision making and policy implementation. Most districts have employees, but some districts exist solely to raise funds by issuing bonds and/or by providing tax increment financing.

The authorizing legislation may give a special district the power to tax (usually by a property tax but sometimes an excise or sales tax), issue municipal bonds, or set fees. Special districts also obtain funds from federal, state, and local appropriations; special assessments; sale of property; interest earnings; and utility revenue. Special districts may be enterprise (charge fees for services) or non-enterprise districts (typically dependent on property taxes).[4]

Public-Private Partnership or Agreement

Public-private partnerships are a general term for collaborative relationships between public agencies and private entities to achieve certain objectives. Public-private partnerships may be informal (similar to public agency coordination) or more formal. One policy option for formalizing such a partnership is a public-private agreement, which is a binding contract between two or more parties, with at least one being a governmental entity and another a private entity.

Public-private agreements in the corridor management context may address a number of areas. One common type of agreement covers the rights and responsibilities of each party in regard to the common boundary between a roadway and adjacent private property. Agreements for corridor management often involve developer mitigation, access conditions, future roadway improvements, and/or multiparty funding arrangements. Other agreements may be struck between a government agency and a utility provider, or may address access, easements, landscaping, joint occupancy of public right-of-way, parking, contract services, or maintenance.

Government agencies also may use agreements of this type – usually termed development agreements – as a way to require landowners or developers to make reasonable contributions toward whatever services and resources the government will need to provide as a result of a development. One example is the requirement for developers and/or employers to participate in and support a Transportation Management Association (TMA), such as the Bay Meadows TMA in the City of San Mateo. Note that these agreements are distinct from "mitigations," defined as developer-funded improvements, often to the public right-of-way, designed to reduce or eliminate negative impacts of a private development.

4. http://en.wikipedia.org/wiki/Special_districts

Hybrid Approach

In addition to the approaches described in the sections above, there also are hybrid approaches. These could involve a combination of actions, implemented at the same time or adopted in a phased approach over time. In the Grand Boulevard Initiative context, a hybrid approach already has been used to some extent. While GBI partners have operated through informal agency coordination for a number of years, they also have encouraged the adoption of city and county resolutions and ordinances consistent with the GBI Guiding Principles. In addition, several of the partner agencies entered into an MOU to complete the Multimodal Transportation Corridor Plan. The future holds the potential for additional coordination efforts, policies and agreements, as these have proved valuable tools.

8.2. Best Practices and Examples

This section provides brief descriptions of a number of best practices and examples of coordination in corridor operations and management. Examples are provided first along the GBI corridor where available, then elsewhere in the Bay Area, and in a few cases elsewhere in the United States. These examples are not meant to be exhaustive but rather to illustrate some of the ways coordination of corridor management efforts between different entities already is occurring. Examples are grouped into the three main areas identified in Section 1.1.1: transit service provision, roadway operations and management, and other areas of corridor management.

8.2.1. Transit Service Coordination Best Practices

The following sections provide brief descriptions of several arrangements in which multiple agencies, both public and private, collaborate to provide transit service and improvements.

Caltrain/Peninsula Corridor Joint Powers Board

The Peninsula Corridor Joint Powers Board (PCJPB, or JPB for short) is the governing body for the Caltrain commuter rail service between San Francisco and Gilroy. The agency is governed by a Joint Powers Agreement signed by three entities: VTA, the San Mateo County Transit District (SamTrans), and the City and County of San Francisco. Under the current agreement, SamTrans is the managing agency for Caltrain, and performs capital planning, service planning, budgeting, marketing, and customer service functions, in addition to supervising train operation. The current executive director of the Caltrain Joint Powers Board is the Executive Director of SamTrans. The JPB contracts with Amtrak to operate the trains and maintain the tracks and rolling stock.[5]

Dumbarton Express[6]

The Dumbarton Express is a transbay express bus route operating between the Union City BART Station and Stanford Research Park in Palo Alto operated through a cooperative agreement with a consortium of agencies. The

5. VTA Transportation Handbook, 2009, and Bay Rail Alliance website (http://www.bayrailalliance.org/pcjpb)

6. VTA Transportation Handbook, 2009 (http://www.vta.org/brochures_publications/pdf/ch_3.pdf)

consortium is comprised of the Alameda-Contra Costa Transit District (AC Transit), BART, the city of Union City, the San Mateo County Transit District (SamTrans), and VTA. These agencies all fund the net operating costs of the service.[7] Each member of the consortium pays a share of the operating expenses based on the origin and destination of the service's passengers as determined by a ridership survey. AC Transit manages and operates the service.

Highway 17 Express[8]

The Highway 17 Express provides bus service between downtown San Jose, Scotts Valley, and Santa Cruz. It is operated through a cooperative agreement involving VTA, the Santa Cruz Metropolitan Transit District (Santa Cruz Metro), the Capitol Corridor Joint Powers Authority, and the California Department of Transportation (Caltrans). VTA and Santa Cruz Metro equally share the majority of weekday net operating costs. The Capitol Corridor JPA and Caltrans provide funding for weekend and holiday service, and for costs associated with weekday trips not paid by VTA and Santa Cruz Metro. Santa Cruz Metro manages and operates the service.

Developer and Employer-Provided Shuttles

Developer and employer-provided shuttles are another example of coordination between multiple parties for the provision of transit services. In this case, service may be provided by a developer, property owner, employer, or homeowner/condominium association, or these entities may contribute funding to allow a transit agency or other entity to provide the service. There are a number of examples of arrangements of this type in the Bay Area. For instance, the City of San Jose has required that certain residential developments in the vicinity of the River Oaks light rail station provide or pay for the provision of shuttle services from the developments to the light rail station. This requirement has helped fund the River Oaks light rail shuttle, which has in recent years been operated by VTA. As another example, the Peninsula Corridor JPB, SamTrans, and the Peninsula Traffic Congestion Relief Alliance operate multiple shuttle routes for groups of employers, developers, and cities.

AC Transit East Bay BRT – Berkeley/Oakland/San Leandro

AC Transit is planning the East Bay Bus Rapid Transit (EBBRT) Project, a 17-mile bus rapid transit (BRT) line from Downtown Berkeley, through Downtown Oakland, to San Leandro, traveling generally along Telegraph Avenue and International Boulevard/East 14th Street. This project involves the implementation of BRT service as well as streetscape improvements and roadway modifications, since the BRT vehicles would travel in dedicated median bus lanes for much of the corridor. This project, which is currently in the design and environmental review phase, requires extensive coordination between AC Transit, cities along the corridor, Caltrans, and other agencies. Those other agencies include both funding partners and other organizations affected by the proposed project improvements. Among those agencies are utilities (public and private) and the Federal Transit Administration (FTA).[9]

An important outcome of the environmental planning phase will be the identification of permits and agreements that will be or likely will be required to design, construct and operate the East Bay BRT Project. Long term easements or joint use agreements will need to be executed with corridor cities and Caltrans for AC Transit to have continuing control over

7. Memo for AC Transit District Board of Directors meeting, January 20, 2010 (http://www.actransit.org/aboutac/bod/memos/da966c.pdf?PHPSESSID=)

8. VTA Transportation Handbook, 2009

9. AC Transit East Bay Bus Rapid Transit Project – Project Management Plan for Project Development Phase, September 2008 (http://www2.actransit.org/aboutac/bod/memos/5733c8.pdf), p. 27, 33

the BRT transitway and facilities, which are to be located in the existing public rights-of-way. These easements or agreements also will have to define responsibilities for facilities maintenance and repair. To date Caltrans and AC Transit have worked through issues related to planning BRT service on a state-owned facility through a Joint Project Development Team. The AC Transit Board of Directors is considering a motion to enter into a Cooperative Agreement with Caltrans for the East Bay BRT Project. That agreement would allow the AC Transit District to continue its current work and provide a legal framework for the District's future work with the State. The agreement being considered defines the roles and responsibilities of the District and of Caltrans, the preparation of necessary reports, determination of rights-of-way, and other issues. A similar agreement was required for the Richmond Parkway Transit Center Project, which also included state-owned facilities.[10]

Cleveland, Ohio Health Line BRT Public-Private Partnership

The Greater Cleveland Regional Transit Authority (RTA) introduced BRT service along the Euclid Avenue corridor, which runs from downtown to East Cleveland, in 2008. Just before the official ribbon-cutting on the new service, RTA announced a partnership with University Hospitals (UH) and the Cleveland Clinic that allowed these two prominent institutions to purchase the naming rights to the $200 million-plus Euclid Corridor line. Under this agreement, the Euclid Corridor BRT line was named the Health Line and the vehicles, stations, signage, and collateral material all were given a distinctive branding and logo.

The 25-year deal, announced in February 2008, called for University Hospital and the Cleveland Clinic to pay $6.25 million dollars for the naming rights. The deal has the potential to grow to $18 million as RTA sells sponsorships to stations along the 7-mile stretch of the line. Revenue generated from the deal is used to cover promotional costs and help fund the maintenance of the stations along the route.[11]

8.2.2. Roadway Operations and Management Best Practices

The following sections provide brief descriptions of several arrangements in which multiple agencies collaborate on roadway operations and management.

San Mateo County Smart Corridor Project

The San Mateo County Smart Corridor project is a joint effort by Caltrans and the City/County Association of Governments (C/CAG) of San Mateo County to address the traffic congestion on local streets and State Route 82 (El Camino Real) in San Mateo County. The project is located along portions of El Camino Real, parallel to the US 101 corridor from I-380 to Whipple Avenue in Redwood City, and includes perpendicular local arterial streets. The operation, maintenance, and management of the street, highway, and freeway network along this corridor are within the jurisdictional responsibilities of several city, county, state, and transportation agencies. This project is an initial investment to develop an Intelligent Transportation System (ITS) infrastructure in San Mateo County.

Since 2007, C/CAG, the project sponsor, has been meeting actively with the community and local agencies to identify traffic management needs and has developed a project to address those needs. Stakeholders include all public works offices, local law enforcement and public safety departments, transportation agencies, and Caltrans. Cameras, informational signs, other traffic operation systems (TOS) elements, and an interconnect between local and State traffic signal systems to and from the US-101 freeway, on local streets and on El

10. Memo for AC Transit District Board of Directors meeting, May 12, 2010 (http://www.actransit.org/aboutac/bod/memos/550d7c.pdf)

11. GCRTA news release, February 28, 2008 (http://www.riderta.com/nu_newsroom_releases.asp?listingid=1142)

Camino Real would provide traffic managers with the tools to manage traffic congestion in the county.

The Smart Corridor project will implement inter-jurisdictional traffic management strategies by deploying integrated ITS elements and providing local jurisdictions the tools to manage both recurring and non-recurring traffic congestion by improving traffic operations and mobility, optimizing existing roadway facilities, and addressing system efficiency and safety. The project will implement communications infrastructure, traffic signal improvements, signal system interconnect, changeable message signs, closed circuit television cameras, and a vehicle detection system.

The San Mateo County Smart Corridor Project is composed of 5 separate projects. C/CAG estimates that there will be a total of 5 Cooperative Agreements between C/CAG and Caltrans over the course of the Smart Corridor Project:

1. Program Approval and Environmental Document (executed)
2. Design (executed)
3. Construction Phase for El Camino and other locations within the State right-of-way (in process)
4. Construction Phase for local arterials and streets (potential)
5. Integration (to be determined).

There is also a Construction Administration Funding Agreement for construction management of the Smart Corridor (El Camino project) between C/CAG and the County of San Mateo.

In addition to these Cooperative Agreements, the Smart Corridor Project has involved a number of MOUs, including the following:

1. General Concept Level MOU between C/CAG and cities (executed)
2. General Operations and Maintenance MOU between C/CAG and funded cities, which are Belmont, Burlingame, Millbrae, Redwood City, San Bruno, San Carlos, and San Mateo (in process)
3. Another Operations and Maintenance MOU between C/CAG and Caltrans
4. A batch of specific detailed MOU's between Caltrans and each of the funded cities (future).

Silicon Valley ITS Program

In 2001, Caltrans, the California Highway Patrol, the cities/towns of Campbell, Cupertino, Fremont, Los Gatos, Milpitas, San Jose, and Santa Clara, as well as the County of Santa Clara, MTC, and VTA entered into an MOU for the Silicon Valley Intelligent Transportation Systems (SV – ITS) Program. The purpose of the MOU was to work cooperatively on the development and implementation of ITS projects throughout portions of Silicon Valley. The MOU established the process to set up a board and committee to guide the program and identified anticipated roles and responsibilities of each party.

The objectives of the SV – ITS program, as laid out in the MOU, are:

- Improved multi-jurisdictional traffic signal coordination, including the use of signal timings that provide superior response to or adapt to traffic conditions
- Improved ability to respond to traffic incidents
- Improved ability to manage traffic flows associated with incidents and congestion on area roadways
- Better integrated transportation system that considers all travel modes (automobile, transit, bicycle, and pedestrian)
- Better and more reliable real-time traveler information.

Through the SV – ITS program, the MOU parties agreed to coordinate the activities necessary for the program's development and implementation into their respective traffic and transit management systems and to participate in the real-time exchange of transportation

data and information to support regional transportation management. In the MOU, the parties also acknowledged that funding, project efforts, and the identification of specific duties and responsibilities with regard to implementing the program would be accomplished through future agreements between all, or various members, of the parties. The term of the MOU extended for four years and allowed the parties to accomplish a number of ITS implementation activities. While the MOU was not extended after 2005, informal coordination has continued among a number of the parties to build on the program and continue information-sharing.

VTA 522 Rapid Implementation

In 2003, VTA and Caltrans entered into an MOU regarding the implementation of the first phase of BRT along State Route 82/ El Camino Real in Santa Clara County. This MOU identified the respective parties' roles and responsibilities as they pertain to project planning and engineering, related capital elements, and ongoing operation. The MOU provided a guide to the intentions and policies of VTA and Caltrans in areas including, but not limited to, bus signal priority development and implementation, advanced bus stop design and implementation, advanced traveler information systems, and other activities. The MOU did not authorize funding or function as a legally binding contract. However, the MOU did facilitate the implementation of VTA's 522 Rapid service, which incorporated bus signal priority and modest stop enhancements, and which has achieved significant travel time savings over local service as well as ridership gains since its introduction in 2005.

8.2.3. Other Coordination Best Practices

There are numerous examples of interagency collaboration on corridor management and improvement efforts covering areas other than transit service and roadway operations and management. The following sections present brief descriptions of several of these programs and efforts.

VTA Community Design & Transportation Program

The Santa Clara Valley Transportation Authority (VTA) Community Design & Transportation (CDT) Program recommends best practices for the integration of transportation, land use planning, community design, and decision-making in Santa Clara County, and provides a framework for future land development. The CDT Program was developed through a strategic combination of technical and academic research, analysis of local issues and opportunities, and extensive community outreach in partnership with VTA Member Agencies (the 15 cities of Santa Clara County as well as the County of Santa Clara). The Program was endorsed formally by all Member Agencies through council or Board actions. The Program included a "blueprint" for development focused on the core urban areas, transit stations, and transit corridors throughout the county. The CDT Program was the first of its kind in the Bay Area, and demonstrates leadership commitment by VTA and its Member Agencies to work in partnership to manage growth and redevelopment in the county in an efficient and sustainable pattern. The CDT Program has been a model for emulation by other jurisdictions including the ABAG and MTC "FOCUS" program, as discussed in Chapter 1.

One product of the CDT Program is the comprehensive CDT *Manual of Best Practices for Integrating Transportation and Land Use*, written to address land use and transportation choices in Santa Clara County, but which also could benefit other jurisdictions. The CDT *Manual* identifies critical transportation corridors – including El Camino Real/The Alameda – and recommends policies and practices cities can implement to promote transit- and pedestrian-friendly environments. The CDT *Manual* serves as a policy, technical, and design guide for city and regional planners, engineers, architects, and other decision-makers, and highlights the importance of well designed, amenity-rich, compact development near

transit, as well as the benefits of offering multiple transportation options. The *Manual* also emphasizes the importance of good design in improving the pedestrian environment and creating a sense of place.

VTA supports implementation of the CDT Program principles with financial incentives, administered through the CDT Grant Program, providing both Planning and Capital grants.

1. CDT Planning Grants are intended to help the cities and county develop, refine, and build on promising ideas, and prepare those plans, projects, and policies for implementation. The expected outcomes of this planning process are projects that enhance pedestrian connections with transit facilities, improve the overall pedestrian environment, employ innovative and high-quality design, and make better use of land, infrastructure, and resources. The funds are from local sources of revenue and are available in amounts up to $150,000.

2. CDT Capital Grants funds capital projects that implement the guidelines of the CDT Manual. Outcomes of this process will be projects that are creative; employ innovative and high-quality design; improve the pedestrian environment; enhance connections with transit facilities; make better use of land, infrastructure, and resources; and/or improve community mobility, livability, sustainability, and sense of place. The funds, from the Federal Transportation Enhancements and Congestion Management/Air Quality programs, are available in amounts up to $1.5 million and require a 20 percent local match.

Chapter 3 presents further information about the VTA CDT Grant Program, including examples of grants that have been awarded for plans and capital projects along the GBI corridor.

C/CAG El Camino Real Incentive Program and TOD Housing Incentive Program

C/CAG offers two programs intended to incentivize improvements along corridors and in specific areas within San Mateo County: the El Camino Real Incentive Program and Transit-Oriented Development Housing Incentive Program.

El Camino Real Incentive Program

This Program is designed to support studies of El Camino Real to encourage increased housing while improving mobility and promoting a sense of place along the corridor. The City/County Association of Governments of San Mateo County (C/CAG) has a vested interest in seeing that this vital county thoroughfare has capacity preserved while the roadway itself is improved, both in terms of safety and aesthetics. As the San Mateo County Congestion Management Agency, C/CAG hopes to foster insightful thinking about ways that this opportunity corridor can help in the reduction of congestion through increased densities, mixed-use development, and transit usage along El Camino Real.

The El Camino Real incentive planning grants are available to all jurisdictions along El Camino Real in San Mateo County and funds will be available until the end of fiscal year 2010/2011 (June 30, 2011). The planning grant incentive funds are available up to $50,000 and require a 50 percent match. In order to be eligible for the grant, the jurisdiction must commit to studying land use, transportation, aesthetics, and other potential issues along El Camino Real.

Transit-Oriented Development Housing Incentive Program

The goal of the C/CAG Transit Oriented Development (TOD) Housing Incentive Program is to promote, support, and facilitate high-density residential housing projects near transit services throughout the county in order to improve the coordination between land use and transportation. The C/CAG TOD program provides financial incentives to jurisdictions that build eligible TOD housing projects

by rewarding them with funds for transportation projects.

TOD housing projects must be permanent, high-density residential housing with a minimum density of 40 units per net acre, located within one-third of a mile from a Caltrain or BART station or on a frontage parcel of El Camino Real/Mission Street. An incentive of up to $2,000 per bedroom is provided. For developments with a minimum of 10 percent of the units set aside for low or moderate-income households, an additional incentive of up to $250 per affordable bedroom is provided.

Chapter 3 provides further information about the C/CAG El Camino Real Incentive Program and TOD Housing Incentive Program, including a table of projects that have been funded or have had funding committed.

Valley Fair Mall Expansion MOU

In 2007, the City Councils of San Jose and Santa Clara approved an MOU authorizing the limited delegation of authority regarding planning, permit approval, and inspection responsibilities for the proposed expansion of the Valley Fair Mall, which straddles the boundary between the two cities. The Westfield Valley Fair Mall is located on 70 acres on the north side of Stevens Creek Boulevard between Winchester Boulevard and Interstate 880. The mall, which totals approximately 2 million square feet of retail and commercial space, crosses the boundary between the City of San Jose and the City of Santa Clara, with approximately three quarters of the mall in San Jose, and the westernmost shops located in the City of Santa Clara.

During the previous Valley Fair Mall expansion in 1999, the Cities of San Jose and Santa Clara coordinated development review, permitting, and approvals, and subsequent plan check, building inspection, and collection of construction taxes. As with the current expansion proposal, San Jose acted as the lead agency for the environmental impact report (EIR), and the project was approved through the authority of the City of San Jose. At that time, the planning directors of the two cities cooperated informally, without an MOU.

In 2006, Westfield filed a Site Development Permit to allow an approximately 650,000 square foot expansion of the existing shopping center, including two new anchor stores, up to 70 shops, and reconfiguration and relocation of parking garages and ancillary buildings. Some of the proposed new square footage and improvements cross the city boundary between San Jose and Santa Clara. Due to the large scale of the proposal, and existing area-wide traffic and circulation concerns, an EIR has been prepared for the proposed project, with the City of San Jose as the lead agency, and the City of Santa Clara participating as a responsible agency which will allow Santa Clara decision-makers to use the EIR for environmental clearance for approval of development permits within their city limits.

In addition, in 2007 the two cities agreed to formally authorize the limited delegation of authority for planning, permit approval, and inspection responsibilities through the approval of an MOU. One of the features of the MOU, adopted in 2007, is that all construction taxes will be collected and distributed on a square footage basis and will be paid to the jurisdiction in which the construction is located, regardless of which jurisdiction provides the plan check and inspection.[12] The proposed mall expansion has been temporarily placed on hold due to economic conditions, but if or when the expansion is pursued, the cities are likely to continue to coordinate their efforts.

San Pablo Avenue Corridor Specific Plan – El Cerrito/Richmond

The cities of El Cerrito and Richmond in Contra Costa County are in the process of jointly developing a Specific Plan for the San Pablo Avenue corridor, which will cover land use planning, streetscape elements, and

12. Memo for San Jose City Council meeting, June 4, 2007 (http://www.sanjoseca.gov/clerk/Agenda/061907/061907_04.11.pdf)

other improvements.[13] This corridor has AC Transit's San Pablo Rapid service in place, an introductory BRT service somewhat similar to VTA's 522 Rapid service, although with real-time information displays and enhanced shelters at key stops. The San Pablo Avenue Specific Plan is a culmination of efforts from the two cities to jointly address the issues and opportunities along their common corridor.

A major goal of the cities embarking on this unique joint specific plan is to achieve a seamless environment where unified land use and design standards make the constraints posed by a zigzagging municipal boundary line and misaligned cross-streets less of an obstacle to the revitalization of the Avenue. Once adopted, the San Pablo Avenue Specific Plan will guide all new development in the Planning Area, regardless of political jurisdiction. As part of the Specific Plan effort, the San Pablo Avenue Advisory Committee (SPAAC) was organized to further inform the development of the plan. The committee includes elected officials and key staff from El Cerrito and Richmond, residents and business owners from both communities, as well as representatives from regional organizations.[14]

State Road 7/US 441 Partnership – South Florida

On the southern Atlantic coast of Florida in Broward, Miami-Dade, and Palm Beach counties, a partnership has been established to promote the aesthetic and economic revitalization of the 25.6-mile State Road 7/US 441 corridor. This State Road 7/US 441 Collaborative ("the Collaborative") is made up of representatives from each jurisdiction along the corridor as well as a number of other agencies. The Collaborative has two interlinking goals:

1. Create and sustain a partnership organization recognized and supported by all 14 of the jurisdictions along the State Road 7 Corridor

2. Improve the corridor and its communities by coordinating local resources and planning to promote the economic vitality, aesthetic improvement, community redevelopment, and safety of the corridor

The Collaborative formalized its efforts by entering into the State Route 7 Partnership Agreement in 2001. The agreement was signed by 14 participating jurisdictions and 7 agencies, including Florida DOT District 4, Broward County MPO, South Florida Regional Planning Council, Broward County School Board, South Florida Water Management District, Treasure Coast Regional Planning Council, and Florida Department of Community Affairs. Under the agreement, each jurisdiction has assigned a Designee and an Alternate to serve on a Steering Committee. The Partnership Agreement acknowledges that the document is not intended to be a contract, and that each party has different interests, priorities, and responsibilities. However, the document signifies the cooperative intent of the parties.

The Collaborative was successful in obtaining federal funding for the creation of a strategic master plan for the corridor, along with a variety of other grants and resources. The master plan process includes design charrettes to identify redevelopment potential along the corridor and to gather feedback on the desires of corridor residents. The corridor is served by a heavily used public bus system and plans are underway for additional service, as well as roadway widening. Another objective of the Collaborative is to facilitate pedestrian and transit-oriented development along the corridor. In March 2004, the Collaborative commissioned the Urban Land Institute to conduct a market assessment and development review for the State Road 7 Corridor

13. City of El Cerrito website (http://www.el-cerrito.org/planning/Avenue.html)

14. Draft San Pablo Avenue Specific Plan, July 2009 (http://www.el-cerrito.org/planning/pdf/draftspa_volume1-revised.pdf)

in Broward County. Broward County government has also agreed to proceed with a new mixed-use land use category that will assist with State Road 7 redevelopment.[15] In October of 2003, the State Road 7/U.S. 441 Collaborative began work on the development of a Strategic Master Plan for the entire 25.6 mile corridor. Implementation of the Strategic Master Plan for State Road 7 will be coordinated with each jurisdiction and agency – such as the road widening project currently underway by the Florida Department of Transportation, the bus rapid transit pilot project, road resurfacing projects, and landscaping improvements.[16]

8.3. Policy and Coordination Options for the GBI Corridor

This section synthesizes the key information from the prior parts of this chapter and applies them to the GBI corridor context. It summarizes a variety of possible strategies and approaches that could be used to pursue the key improvements considered earlier in this Corridor Plan as well as in other GBI collaboration efforts. While this section is not intended to prescribe a single course of action, it does provide preliminary recommendations on a number of policy options and areas to explore further. It is likely that the GBI partners will choose to proceed with a kit of policies, rather than a single policy, so this section reflects this approach.

8.3.1. Current Roles and Future Opportunities

Policy options for management and operation of the GBI corridor are likely to involve agencies and entities working in their current roles, as well as certain entities taking on new roles to seize opportunities as they arise. Table 8-1 displays a matrix showing where public agencies and private entities currently have a role in different aspects of corridor management and operations, and where these agencies and entities may be able to play a role in the future. In this table:

- Areas where an entity has a current role are shown with a check mark
- Areas where an entity does not currently play a role but could in the future are shown with 'X' marks
- Areas where entities have some role currently but where this role could be expanded are shown with both a check and an 'X'.

As Table 8-1 indicates, transportation agencies (CMAs, transit operators, and Caltrans) currently play a role in activities related to transit service and facilities; roadway policies, traffic operations, and maintenance activities; parking management (at transit stations); and bicycle and pedestrian accommodations. Cities and counties generally play a role in roadway management and operations, land use, parking supply and management, bicycle accommodations, and pedestrian accommodations, but they currently play less of a role in the provision of transit services or facilities. Private businesses and developers are currently involved mainly in parking supply, parking management, and the provision of bicycle and pedestrian accommodations, but generally do not play a role in transit services, roadway policies and operations, or land use planning.

As indicated in Table 8-1, areas where public agencies or private entities could potentially take advantage of new opportunities include the following:

1. *Provision of transit services – private developers, employers, and cities:* Private businesses (e.g., developers, employers, building owners, or residential property managers) could play a larger role in the provision of

15. National Cooperative Highway Research Program (NCHRP) Synthesis 337, Cooperative Agreements for Corridor Management, 2004, p. 11, and The State Route 7/ US 441 Collaborative Partnership Agreement (http://www.sfrpc.org/data/sr7/2SR7.pdf)

16. State Road 7/ US 441 Collaborative web page (http://www.sfrpc.com/sr7.htm)

✓ Current Role
X Future Opportunity

	CMAs	Transit Agencies	Caltrans	Cities and Counties	Private Businesses	Private Developers
Transit Services						
Transit Operations		✓		X	✓ X	X
Transit Facilities		✓	X	X	X	X
Roadway Management and Operations						
Roadway Policies	✓	X	✓	✓		
Trafic Operations	✓		✓	✓		
Maintanence						
• *Roadways*	✓		✓	✓	X	X
• *Sidewalks*			✓	✓	X	X
• *Transit Facilities*		✓		✓	X	X
Other Corridor Issues						
Land Use Planning				✓		
Parking Supply			✓ X	✓		✓
Parking Management	✓ X	✓		✓	✓	✓
Bicycle Acommodations	✓	✓	✓ X	✓	✓	✓ X
Streetscape/Pedestrian Accommodations	✓		✓ X	✓		✓ X

Note: In this table, Counties refers to the County of San Mateo and County of Santa Clara and the unincorporated areas within their jurisdiction.

Table 8-1. *Current roles and future opportunities for GBI corridor management*

transit services in and along the corridor. Certain employers (such as Google, Yahoo, Genentech, employers in the Stanford Research Park, and others) provide shuttle services that are specifically tailored to their employee commute needs and are generally open to employees only. Other major employers such as Stanford University provide extensive shuttle services that serve their own employees and commuters as well as the general public. There may be opportunities in the future for private employers, institutions, and developers to play a larger role in the provision of transit services by contributing funding for operation of transit agency services, providing shuttles that are open to the general public and integrated with the larger transit network, providing funding for transit facility construction through sponsorship deals, or similar arrangements. Cities can help play a role here by creating districts, transportation management associations, or other arrangements to facilitate private sector involvement. Caltrans can help facilitate the implementation of enhanced transit services (such as BRT) by helping accommodate new transit facilities in the roadway design. One important consideration for developer partnerships in providing transit service is for arrangements to be specific and enforceable, and to ensure that they

can be sustained and enforced over time even as properties are sold or property management responsibilities change.

2. *Roadway policies – transit agencies:* Transit agencies have traditionally not been involved in the development of policies regarding roadway management or operations and maintenance, except in limited cases where transit facilities are located within a roadway right-of-way (such as bus stops or transit centers). Since one potential outcome of the GBI Corridor Plan is the advancement of plans for bus rapid transit (BRT) and/or enhanced bus service in the corridor, it will be important for transit agencies (including SamTrans and VTA) to partner with other agencies (such as Caltrans and the cities and counties) on the development and refinement of roadway-related policies to ensure that they are supportive of enhanced transit service. For example, SamTrans and VTA can work with Caltrans, C/CAG, and the cities and counties in evaluating the operational impacts of transit priority measures, such as dedicated bus lanes and queue jump lanes, to allow transit vehicles to move more quickly while maintaining a reasonable level of service for automobiles.

3. *Roadway maintenance – opportunities for private sector involvement and agency partnerships:* Frequently during the GBI Corridor Plan process the topic of maintenance responsibility and costs was raised when discussing the possibility of enhancing the streetscape or implementing more pedestrian, bicycle, and transit-friendly elements. For instance, the GBI partners might desire to install pedestrian-scale lighting, street furniture, or planters along the corridor to make it more attractive and pedestrian-friendly. Under the current roadway ownership and maintenance arrangement between Caltrans and the cities and counties, there is insufficient funding to maintain such enhanced streetscape amenities, and in some areas there is a significant deferred maintenance burden of even the existing roadway facilities. To address this challenge and help implement improved streetscape features and multimodal accommodations, it could be helpful to create assessment districts, new funding agreements, or public-private partnerships. Arrangements involving the private sector could include programs such as sponsorship, advertising, or naming rights agreements, similar to the partnership for the new Health Line BRT service in Cleveland.

4. *Parking management – partnership between CMAs, cities/counties, and the private sector:* Parking is a resource that is expensive to provide, and the supply and pricing of parking plays a large role in determining how people choose to travel. Given the improvements studied in the GBI Corridor Plan – improved streetscapes, multimodal accommodations, and enhanced transit – it will be vital to ensure that parking policies along the corridor are supportive of these and other improvements if they are to achieve the greatest benefit. Cities and counties play the lead role in determining parking supply and management through zoning ordinances; parking regulations; the provision of public parking; and, in some cases, through parking pricing, shared public/private parking (such as at the Daly City War Memorial Community Center), and the creation of parking districts. Private developers play a role in determining the quantities of parking supplied in new developments, transit agencies and private businesses manage their own parking resources, and CMAs play a role by requiring analysis of parking provisions through the Congestion Management Program Transportation Impact Analysis process. There is an opportunity for these public and private entities to work together more closely to manage parking resources, re-examine and reform parking requirements, and explore flexible parking arrangements such as shared parking, in-lieu fees, or unbundled parking. Caltrans can also be a partner on parking supply and management by working with local agencies on

roadway design modifications that influence the allocation of roadway space.

5. *Bicycle and pedestrian accommodations – private business and developer involvement:* Private developers currently play a role in this area by installing bicycle parking, lockers, showers, sidewalks, and internal pathways in new developments. Private employers play a role by maintaining bicycle and pedestrian accommodations on their own premises and occasionally through more innovating programs such as commuter alternatives and incentives, on-site bicycle sharing, and employee health programs. However, there is an opportunity for the private sector to play a larger role in this area. Cities, counties, and CMAs could work with developers to improve the quality and connectivity of pedestrian and bicycle accommodations in new developments. Private employers and institutions could level the playing field by providing parking cashout as a financial incentive and investing further in innovative pedestrian and bicycle programs.

Table 8-2 shows these potential future opportunities in matrix form, highlighting the different parties that would likely be involved in these efforts. The opportunity areas in the matrix correspond with the numbers in the list of opportunities above.

	CMAs	Transit Agencies	Caltrans	Cities and Counties	Private Businesses	Private Developers	Opportunity Areas
Transit Services							
Transit Operations		*		*	*	*	1
Transit Facilities		*	*	*	*	*	
Roadway Management and Operations							
Roadway Policies	*	*	*	*			2
Trafic Operations							
Maintanence							
• *Roadways*	*		*	*	*	*	3
• *Sidewalks*			*	*	*	*	
• *Transit Facilities*		*		*	*	*	
Other Corridor Issues							
Land Use Planning							
Parking Supply							
Parking Management	*		*	*	*	*	4
Bicycle Acommodations	*		*	*	*	*	5
Streetscape/Pedestrian Accommodations	*		*	*		*	

Note: In this table, Counties refers to the County of San Mateo and County of Santa Clara and the unincorporated areas within their jurisdiction.

Table 8-2. *Multi-agency partnership opportunities in the GBI context*

9

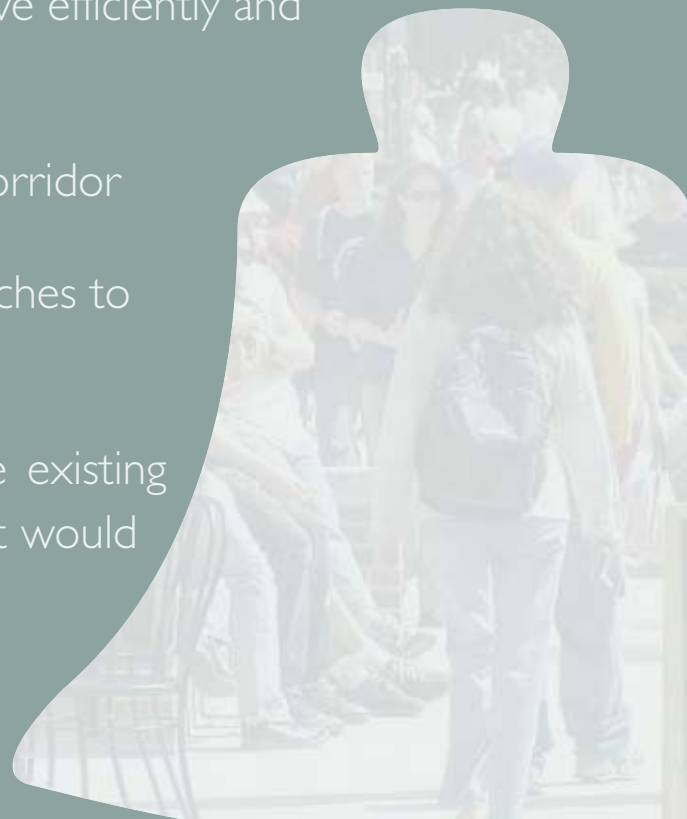
Conclusion and Next Steps

Source: Dave Burden

The purpose of this Chapter is to **summarize the findings** of the different components of the Multimodal Transportation Corridor Plan and to propose the **next steps** for advancing these findings into **effective implementation strategies** that will enable the transformation of the El Camino Real Corridor. The objectives of the Corridor Plan are as follows:

- Facilitate a better match for **land use and transportation** on the El Camino Real Corridor
- Transform the Corridor into a **pedestrian and transit friendly, high-performing multimodal arterial** where all modes of transportation move efficiently and safely
- Improve **transit options** within the communities along the corridor
- Examine **multimodal opportunities** and innovative approaches to achieve these improvements.

The Plan addresses these four objectives by first examining the existing conditions on the Corridor and then exploring the strategies that would allow these objectives to be realized.



9.1. Overview of Findings

The existing conditions assessment revealed that 15 of the 19 cities have policy documents developed or underway which affect the future land use and transportation scenarios on the Corridor. A review of these plans found that the majority are currently or are planning to designate El Camino Real for mixed-use, increased density, transit-oriented development, and housing. Congestion Management Agency and transit agency programs were also found to be shaping the Corridor, such as VTA's Community Design and Transportation Program (CDT) and BRT Strategic Plan, and C/CAG's TOD Incentive Program.

A consistent theme in these documents was the use of "Node" and "Link" approaches to organize land use and design policies. Building on this theme, Chapter Four presents a Multimodal Access Strategy incorporating five general land use and roadway typology conditions reflecting the general conditions of the Corridor. Based on these typologies, and the multimodal access issues identified through interviews with city and county staff, a strategy for network mobility planning was developed based around four key recommendations:

1. Create Space within the Right of Way (ROW) for Multiple Travel Modes
2. Provide the Facilities Needed to Promote Multimodal Travel
3. Differentiate Mobility Policies to Reflect Corridor Development Policies
4. Apply GBI-Based Performance Measures in Project Planning and Evaluation.

These strategies are complemented by "Connectivity Guidelines" for different place types, with emphasis on access for all modes.

Chapter Five built on the Multimodal Access Strategy by recommending right-of-way improvements that promote multimodal travel and Transit-Oriented Development (TOD). Prototypes illustrate the different combinations of roadway design elements, frontage improvements, and transit facilities, and individual design elements are presented with an explanation of common design issues, recommendations, illustrations, and references to a comprehensive matrix of Caltrans design guidance (Appendix A). The extensive coordination with local and regional agencies undertaken as part of this effort pointed to a common theme – that greater flexibility in the Caltrans design standard will be essential to achieving the long-term street improvements needed to achieve the GBI vision.

Chapter Six summarizes an extensive effort to use Travel Demand Forecasting to evaluate the potential for increased densities and transit service on the Corridor, and the relationship between these. For a horizon year of 2035, the results strongly supported the viability of an El Camino Corridor with rich transit service and nodes of dense development. Specifically, the modeling work resulted in three key conclusions:

- There are synergies to changing land use and transit service together. In other words, increasing land use densities and transit service levels together will have a greater effect on transit ridership than doing each separately.
- Bus Rapid Transit (BRT) can effectively mitigate the effects of traffic volume increases caused by land use intensification.
- The lowest daily Vehicle Miles Traveled (VMT) per household can be achieved with a combination of enhanced land use and enhanced transit.

The overall conclusion is that planning for growth in the corridor needs to be done in a more aggressive manner – with the highest land use intensifications come the greatest benefits.

Chapter Seven builds on the results of the modeling by looking specifically at future transit needs and options to address these. The modeling results indicate clearly that sufficient land use densities and ridership potential are essential to support enhanced transit.

In San Mateo County, current low densities along many parts of the Corridor need significant investment to provide the ridership to support BRT. However, BRT holds great promise for this portion of the GBI corridor once adequate land use densities are achieved. Based on these results, SamTrans is planning on conducting a more detailed study of bus service on El Camino Real in the upcoming Comprehensive Operations Analysis (COA).

In Santa Clara County, the productivity of the Rapid 522 and Local Line 22 suggests that full BRT service on El Camino has the potential to be successful. The Corridor Plan recommends that VTA continue to move forward with implementing BRT service along the El Camino Real/The Alameda corridor.

The high level analysis of a potential cross-county BRT, or "seamless" BRT, yielded mixed results. The modeling results indicated that there is some market for a seamless BRT service along the GBI corridor and that this service would be most attractive to travelers from roughly San Mateo to Sunnyvale. However, there are also potential issues related to farebox recovery associated with introducing a cross-county BRT service due to the longer service hours. It is clear that implementation would involve significant logistical hurdles, including fare policy, operations and maintenance responsibility, cost- and revenue-sharing, labor policies at the two agencies, and other considerations. Further study of the potential benefits, costs, and logistics of such a service is needed to determine whether such a service is feasible and would yield greater benefits than costs. At the same time, VTA and SamTrans will continue to plan for enhanced transit service along the GBI corridor within each county – VTA through its El Camino Real BRT Conceptual Engineering project and SamTrans through its Comprehensive Operations Analysis (COA). The two agencies can build on the high level of coordination already taking place, which includes coordination of schedule changes for transfers at the Palo Alto Transit Center, shared bus stop usage and adjustments, and honoring of VTA and SamTrans passes at all bus stops in Palo Alto.

9.2. Potential Action for Operations and Maintenance

Chapter Eight identified areas of opportunity and potential collaboration in overall operations and maintenance of the corridor. Building on these areas, the study team has identified a number of potential action areas that could help advance the concepts explored in the GBI Corridor Plan as well as other proposals considered by the GBI Task Force and Working Committee. These action items are organized into three main areas – Transit, Roadway Management and Operations, and Other Corridor Issues. The potential action areas and agency tiers (agencies who might be involved) are shown in Table 9-1.

As the table indicates, some of these potential actions involve building on existing programs or plans (for instance, working with Caltrans on the Highway Design Manual Update to help facilitate implementation of the GBI Corridor Plan multimodal design concepts); some involve new implementation activities (for instance, incorporating pedestrian amenities at transit stations/stops); and some involve studying or exploring new opportunities (for instance, exploring potential funding mechanisms such as assessment districts, or exploring flexible/multimodal Level of Service policies).

Agency Tiers	Transit	Roadway Management and Operations		Other Corridor Issues				Funding
	Service and Facilities	*Traffic Operations*	*Maintenance*	*Land Use Planning*	*Parking Supply and Management*	*Bicycle Access/ Accommodations*	*Streetscape/Pedestrian Accommodations*	*Capital; Operations & Maintenance*
Corridor-Wide/ All Agencies			• Explore potential joint maintenance of GBI corridor (all or in part)	• Explore potential assessment district for ECR improvements			• Develop Implementation Plan(s) for Corridor Plan concepts	• Identify/develop new funding sources and partnerships
CMAs	• Pursue BRT project development (Santa Clara County) • Explore potential for BRT/enhanced transit (San Mateo County) • Preserve capacity for BRT (with Caltrans)	• Explore potential Operating Agreement • Implement Emergency Vehicle Preemption • Create a Smart Corridor through ITS (with Caltrans, cities)	• Explore sustainable funding sources for corridor operations & maintenance	• Use existing Incentive Program (C/CAG) and CDT Program/grants (VTA) • Support GBI corridor as a PDA	• Explore relocation/ alternatives to on-street parking (with Caltrans & cities) • Work with cities on off-street parking management/policies	• Build on countywide and city Bicycle Plans	• Work with Caltrans to incorporate urban arterials standards into Highway Design Manual. Key areas: • Lane widths • Median design • Curb radii • Transit facilities • Signals & lighting	• Work with regional/ state/federal agencies on flexible, sustainable funding sources
Transit Agencies	• Explore potential for BRT/enhanced transit (San Mateo County) • Implement Transit Signal Priority (where not already in place) • Continue to explore value/need for seamless bus travel between the counties			• Support GBI corridor as a PDA	• Manage parking supply at stations, emphasize alternative access		• Incorporate enhanced amenities at stations/stops where feasible	• Work with regional/ state/federal agencies on flexible, sustainable funding sources
Caltrans	• Preserve capacity for BRT (with CMAs) • Support design of enhanced transit stations/facilities	• Facilitate signal coordination and Transit Signal Priority • Allow pre-determined traffic signal timing flexibility on ECR for the cities/counties			• Explore relocation/ alternatives to on-street parking (with CMAs & cities)	• Support bicycle accommodations proposed by cities, others	• Work with CMAs, others to allow design flexibility while preserving through capacity • Support pedestrian enhancements proposed by cities, others	
Cities and Counties	• Support plans for BRT/enhanced transit	• Explore flexible/ multimodal LOS policies		• Plan/zone for TOD around transit stations with increased density • Pursue Lot Merger Incentive Program (e.g. Daly City)	• Explore relocation/ alternatives to on-street parking (with CMAs & Caltrans) • Incrementally reduce off-street parking requirements in new developments	• Build on countywide and city Bicycle Plans	• Require new developments to improve ECR streetscape	

Note: In this table, Counties refers to the County of San Mateo and County of Santa Clara and the unincorporated areas within their jurisdiction.

Table 9-1. *Potential action areas*

9.3. Next Steps

9.3.1. Multimodal Access and Design

As noted above, working with Caltrans to achieve greater flexibility in their design standards for urban arterials will be essential to achieving the long-term street improvements needed to achieve the vision. Caltrans has been a supportive and active partner to both the Corridor Plan and the larger Grand Boulevard Initiative. Cities should continue to plan for streetscape, pedestrian, and bicycle improvements along the corridor, and this planning will be facilitated by the guidelines contained in this document. The transit agencies and CMA, in coordination with the cities, counties and Caltrans, should also advance multimodal street improvements along with enhanced transit, for instance through VTA's El Camino Real BRT project.

However, the long-term transformation of the Corridor will most likely depend on a more comprehensive streamlining or revision of the current standards currently applied to El Camino Real as a State Highway. The current 2010/11 update of the Caltrans Highway Design Manual (HDM) and future HDM updates present opportunities to achieve the necessary flexibility in design standards. Ultimately, the introduction of specific standards for multimodal urban arterials into the HDM may be beneficial.

9.3.2. Planning for Future Land Use and Transit

Agencies with land use authority over the Corridor should be aggressive in planning for increased densities at key transportation nodes. The level of transit desired on the Corridor to support a sustainable and livable environment will only be possible with robust land uses and activity centers to support it.

SamTrans and VTA should continue to seek funding to plan and implement an enhanced transit service on the Corridor, and should consider a phased approach to implementing transit improvements as land use intensifies. VTA's El Camino Real BRT Conceptual Engineering process and the SamTrans Comprehensive Operations Analysis (COA) represent near-term opportunities to plan for enhanced transit.

SamTrans and VTA should conduct further study of the potential benefits, costs, and logistics of a cross-county BRT.

CMAs should support TOD through grant incentives where possible and explore the use of potential performance measures, such as those discussed in Chapter Four and Appendix A, where suitable.

9.3.3. Management and Operation

Based on the opportunity areas, areas of collaboration, and possible action areas, the following preliminary recommendations have been developed related to management and operation of the GBI corridor:

1. *Adopt a phased approach to planning for and implementing improvements along the corridor:* One possible approach could involve three phases – near term, mid-term, and long-term – with different policies, actions, and means of interagency coordination – in each phase. For instance:

    a. Near-term: Continue current structure of informal coordination with governmental resolutions of support, with the Task Force and Working Groups functioning as the coordinating entities. Adopt MOUs, Cooperative Agreements, or similar tools as necessary to achieve certain specific goals.

    b. Mid-term: Consider adopting a more formal agreement such as an MOU between all interested cities/towns along the corridor as well as the counties, CMAs, transit agencies, Caltrans, and other agencies. Use this agreement to achieve certain targeted goals. Build on related efforts such as

the VTA El Camino Real BRT project or the C/CAG Smart Corridor project and learn from these models.

c. Long-term: Explore the possibility of adopting formal structures to fund and implement different functions, such as cross-county enhanced transit service, streetscape improvements and maintenance, joint land use planning efforts, or parking management districts.

2. *Maintain a long-term vision, but achieve it through incremental change.*

3. *Explore additional funding opportunities, including opportunities for mutli-agency or public-private partnerships.* This should be a broad-based effort involving all the parties and users with an interest in the GBI corridor. Particular attention should be paid to potential funding sources that are flexible and can be sustained over time.

4. *Ensure that the GBI partner agencies are prepared for opportunities as they arise.*

9.3.4. Education and Outreach

All the parties involved in the GBI effort, both public and private, should continue to pursue a dialogue with decision-makers and the general public about the potential for enhanced transit service as well as related multimodal street improvements. The partner agencies for the Grand Boulevard Initiative should seek funding to create and carry out an outreach and civic engagement plan in order to build support for Transit-Oriented Development on El Camino Real.