NELSON NYGAARD

MEMORANDUM

To: Lisa Wise

From: Colin Burgett

Date: October 31, 2012

Subject: *Bellevue Community Corridor Plan* Background Report: **Transit Priority Project & Public Right-of-Way**

This memorandum provides background reports concerning proposed Transit Priority Project (TPP) and the future public right-of-way network (i.e., streets, paths, and transitways) relevant to the *Bellevue Corridor Community Plan* (BCCP).

The BCCP is intended to guide the physical development of approximately 1,920 acres of currently unincorporated land north of the current City of Merced and west of the University of California (UC) Merced campus. Key goals identified for public right-of-way include:

- **The establishment of standards for circulation and "complete streets", "transit priority projects", and land uses, site plans, and building design**
- A key goal of this planning effort is to ensure that the future street network includes elements that will provide:
  - Capacity to accommodate anticipated travel on the Bellevue Road corridor
  - Coherent and pedestrian-friendly streetscapes
  - Design elements to accommodate all modes of transportations
  - Road connections to UC Merced

Report Overview

This report is divided into the following three sections:

1. **Transit Priority Project (TPP)**
   a. Definition of TPP
   b. City's Planned Transitways
   c. Land Use & Transportation Challenges
   d. Potential Transit Service Options
2. **Public Right-of-Way**
   a. Planned Circulation Network & Street Design
   b. Constraints & Opportunities Related to TPP
3. **Preliminary Recommendations**

a. Transitway Alignment Alternatives

b. Mixed Use Collectors

1. TRANSIT PRIORITY PROJECT

This section provides information relevant to potential transit service, and transit-related physical improvements, that would support the City's goal of identifying "transit priority project" (TPP) locations within the Plan Area.

Definition of "Transit Priority Project"

Transit Priority Areas were introduced in California's Senate Bill 375 (SB 375) intended to align regional transportation, land use, housing and greenhouse gas emissions planning.

- A key element of SB 375 is the option for regions and their local governments to provide significant California Environmental Quality Act (CEQA) regulatory streamlining incentives for Transit Priority Projects.
- Transit Priority Projects are housing or mixed-use residential projects with 20 dwellings per acre or more that are located within a Transit Priority Area. CEQA streamlining can provide time certainty, cost and benefits needed by infill and transit-oriented development.

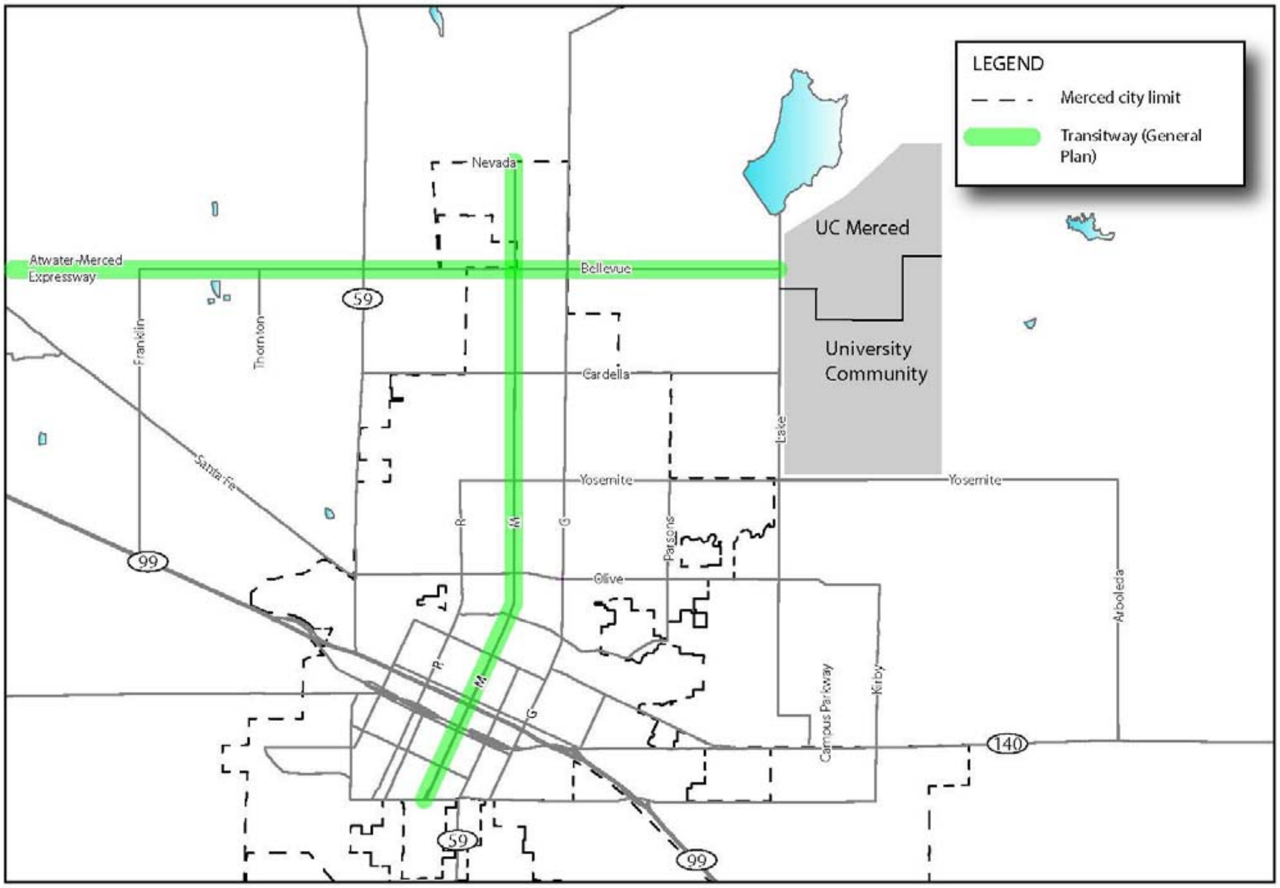
"Transit priority projects" are projects that meet the following criteria (see Appendix A for the full ordinance):

- Contain at least 50% residential use
  - If non-residential uses are between 26% and 50%, a floor area ratio (FAR) of not less than 0.75 is required
- Minimum net density of 20 dwelling units per acre
- **Located within one-half mile of either a major transit stop or high-quality transit corridor included in a regional transportation plan, with service intervals of not less than 15 minutes during peak hours.**

This report focuses primarily on the transportation-related components of creating a TPP corridor in the BCCP area.

City's Planned Transitways

Figure 1-1 Planned Transitways (Merced General Plan)

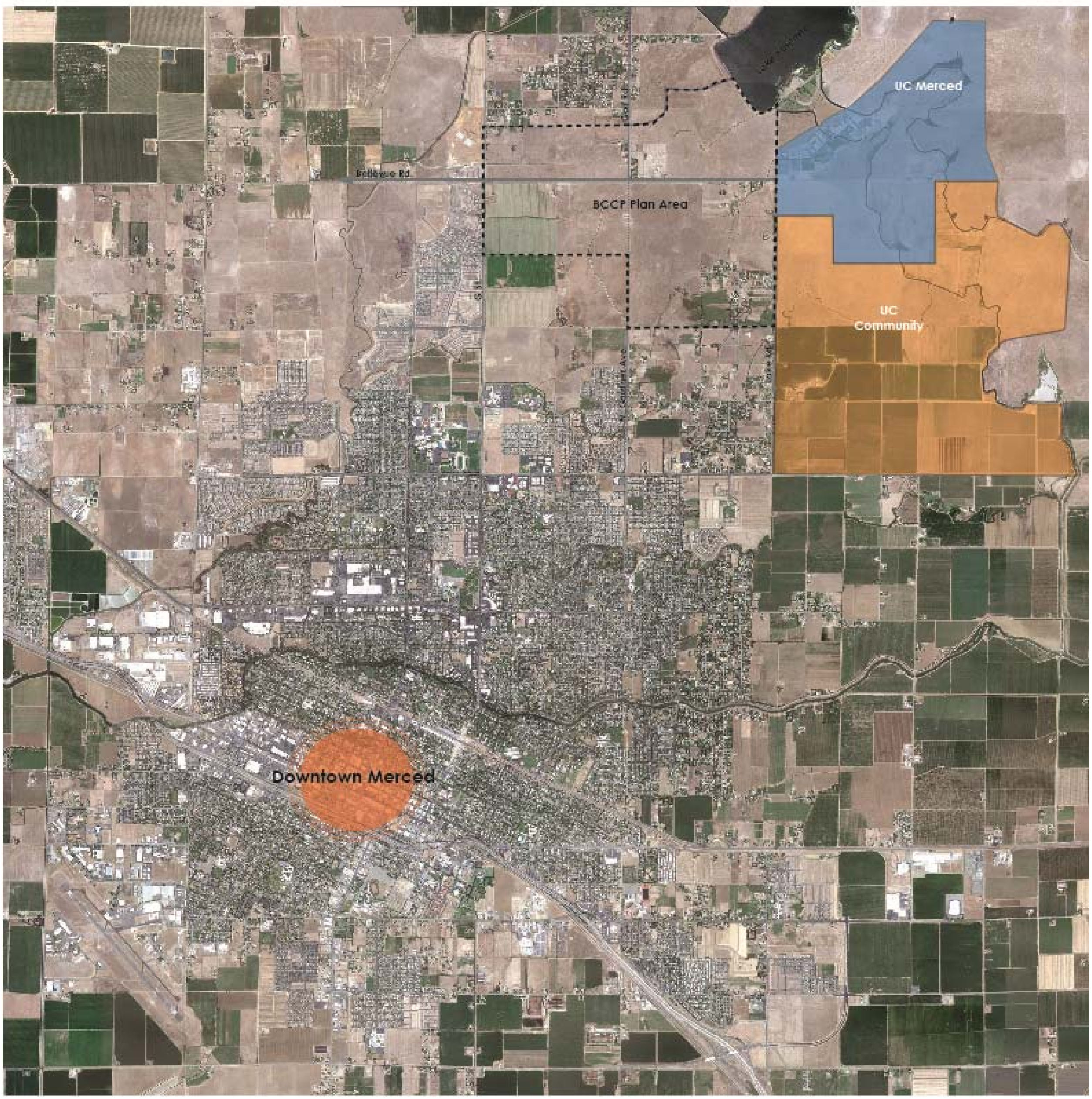


The Merced General Plan designates M Street and Bellevue Avenue / Atwater Merced Expressway (AME) as future "transitway" corridors. As described in the General Plan: transit passengers would transfer between M Street and Bellevue/AME buses at a proposed transit center to be located at the intersection of Bellevue Road and M Street.

The travel distance between Downtown Merced and UC Merced, based on the M Street + Bellevue alignment, is approximately seven (7) miles. *Typical transit travel time for a corridor of this distance is 26 to 35 minutes.*

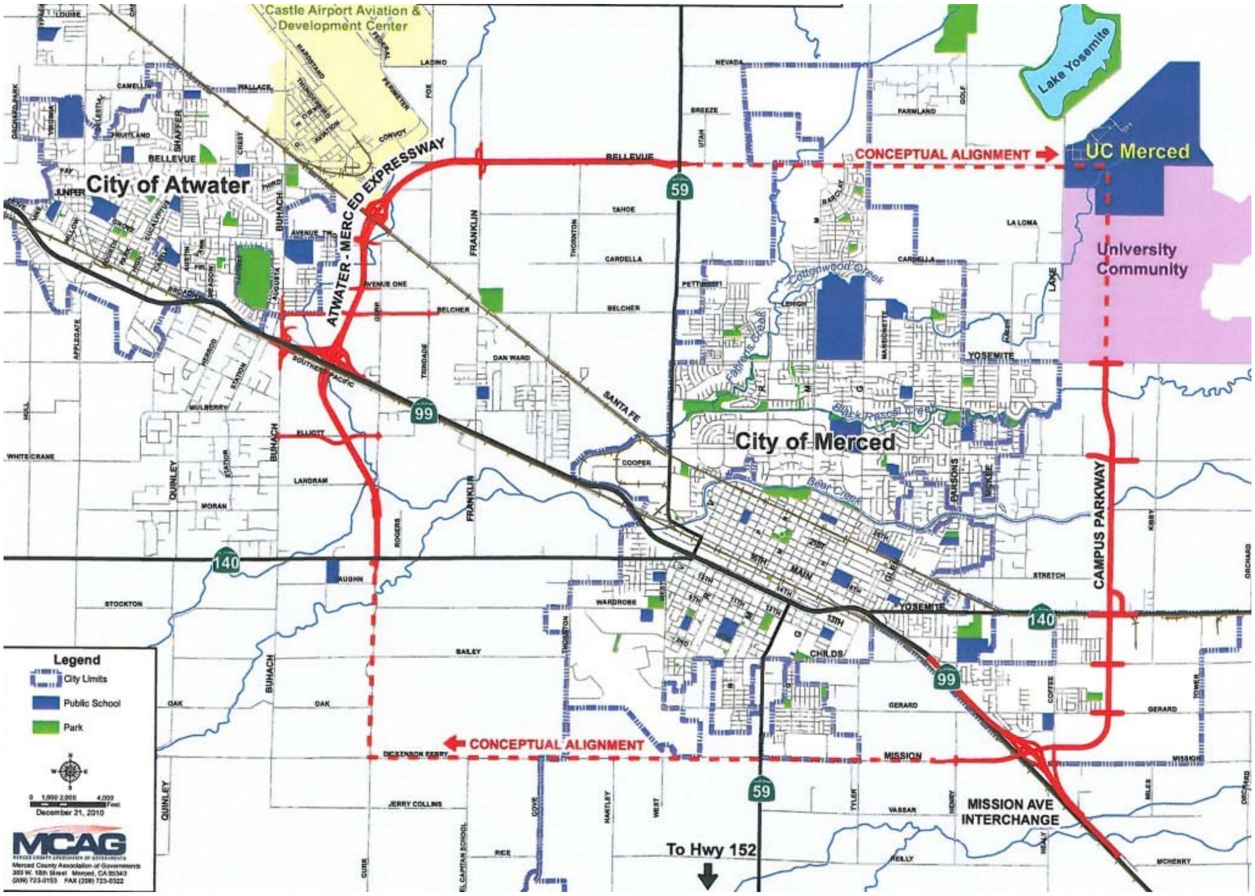
Land Use & Transportation Challenges

Figure 1-2 Plan Area Proximity to UC Merced & Downtown



The BCCP area borders a key trip attractor – the UC Merced campus. As part of the BCCP effort: the City may wish to ***consider provision of a more direct transit corridor between UC Merced and Downtown Merced****, particularly given the anticipated "expressway" configuration for the proposed Merced Loop system (see Figure 1-3) as well as potential trip attractors on G Street (including the medical center), Castle Airport, and potential mixed-use development south of Bellevue Road.*

Figure 1-3 Proposed Merced Loop System

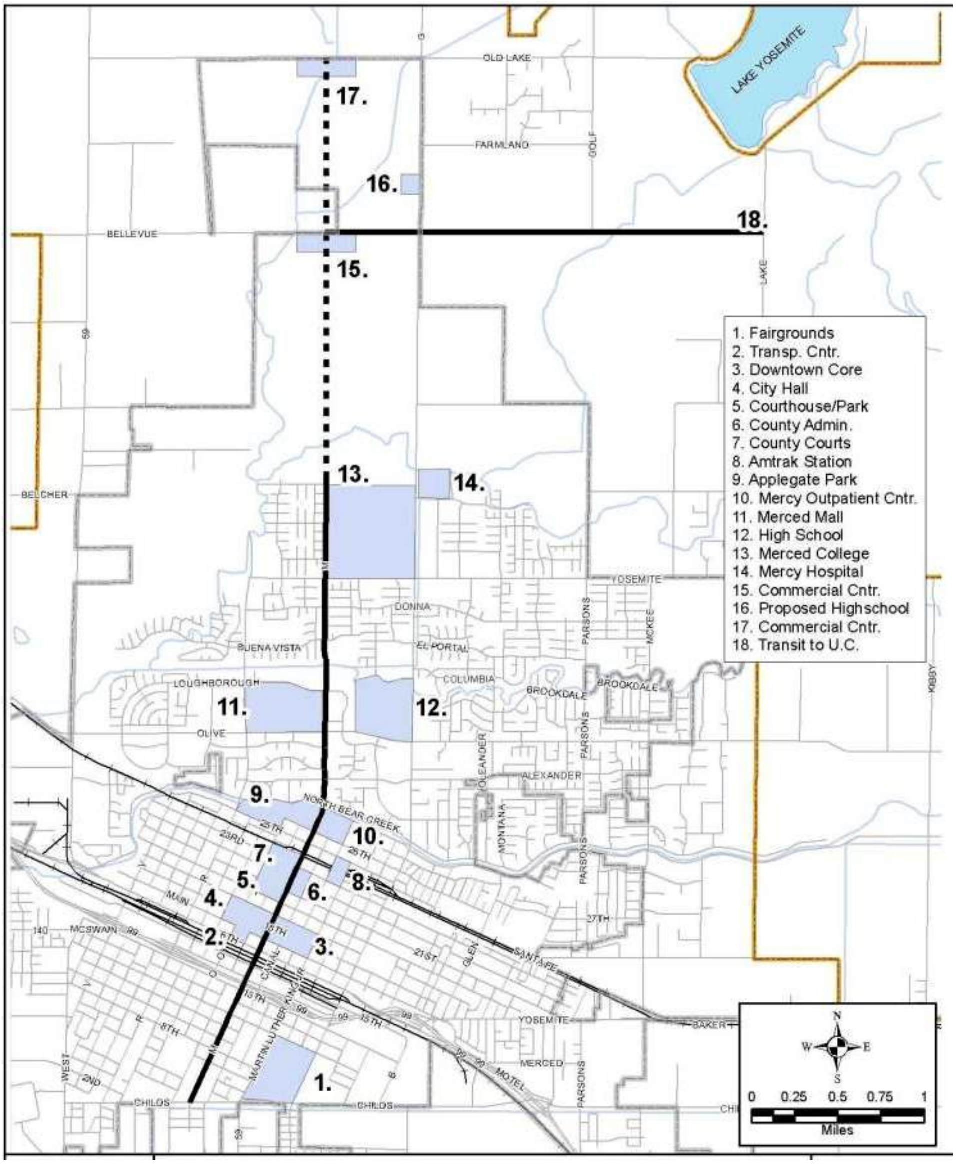


The proposed regional loop system, which would connect Bellevue Avenue and the Atwater Merced Expressway (AME) with Campus Parkway and a potential southern extension across Highway 99, may conflict with the goal of creating a Transit Priority Project (TPP) corridor on Bellevue Avenue within the study area.

Regional expressways tend to encourage lower-density development patterns and can discourage adjacent residential development (within one-half mile), thus potentially not supporting the goal of creating a TPP corridor along Bellevue Road itself.

Note: proposed segment through University Community and UC Merced would be located further west than shown above (i.e., closer to the western border of the University Community and UC Merced campus).

Figure 1-4 Transitway & M Street Land Uses (General Plan)



Transit-Adjacent vs. Transit-Oriented Development

As described in the introduction, providing a high level of frequent transit service to the Plan Area is just one part of the requirement to create a TPP. The intent of the TPP is to ultimately encourage transit oriented development (TOD). However, the creation of truly transit-oriented land uses along transit corridors can be a challenge, often resulting in transit adjacent development (TOD) that is not truly transit oriented.

- **Transit Oriented Development (TOD)** is characterized by land use patterns that are oriented to maximize access to transit stations within a half-mile radius (a ten-minute walk).
- **Transit Adjacent Development (TAD)** is characterized by land use patterns within a half-mile radius of a transit station that do not use this proximity to transit to promote compact, focused development that fosters multimodal transportation.
- Figure 1-5 adapts a chart composed by John L. Renne to differentiate between TADs and TODs, and Figure 1-7 illustrates an example of "transit-adjacent" (not "transit-oriented") development on an existing corridor near the BCCP area.

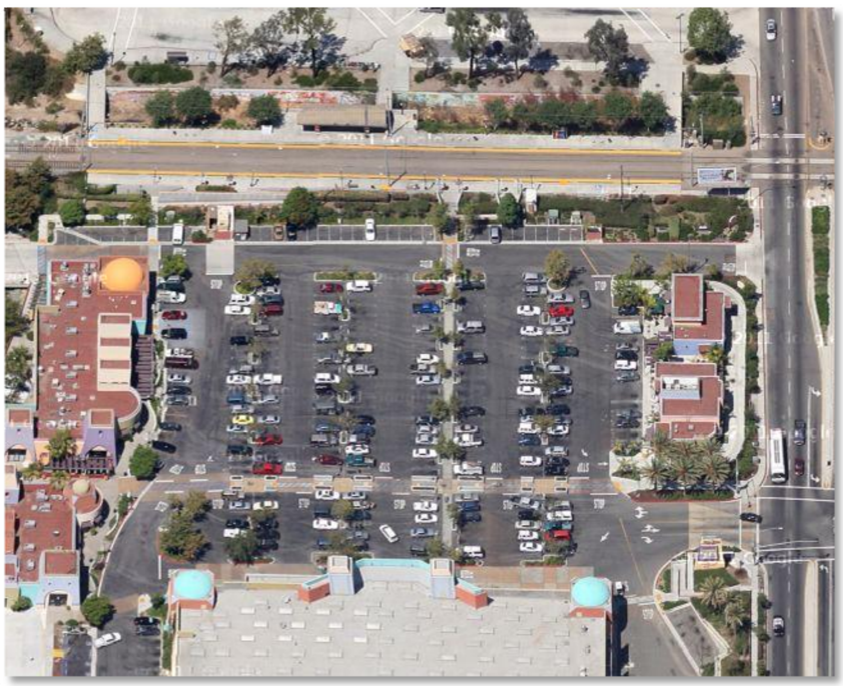
Figure 1-5 TOD vs. TAD

Characteristics of Station Area Development Patterns	
TAD (Transit-Adjacent Development)	**TOD (Transit-Oriented Development)**
Suburban street pattern	Grid street pattern
Low densities	High densities
Dominance of surface parking	Mostly underground or structured parking
Limited or no pedestrian access	Pedestrian-focused design
Limited or no bicycle access/parking	Bicycle access/parking
Single-family homes	Multi-family homes
Industrial land uses	Office and retail land uses, especially along main streets
Segregated land uses	Vertically and horizontally mixed land uses
Gas stations, car dealerships, drive-thru stores and other auto-focused land uses	Stores and local-serving land uses designed for pedestrian access

Source: Adapted from Renne, 2009 (i)

Figure 1-6 TAD vs. TOD Comparison (Development at Major Transit Stops)

Transit Oriented Development (TOD) Example *– characterized by a development pattern that orients land uses for pedestrian access to adjacent transit station (while parking is relocated to a less-central location).*



Transit Adjacent Development (TOD) Example *– characterized by a large surface parking lot that occupies most of the site bordering a transit station (and drive-through windows serving key land uses within the site).*

Figure 1-7 TAD vs. TOD Comparison (Merced Photo Examples)

Newer segments of the M Street Transitway corridor have been developed with characteristics of ***Transit Adjacent Development (TAD)*** *as land uses are internally oriented, with sound walls separating the transit corridor from adjacent residences.*

Older segments of Merced's street network were developed with land uses oriented towards adjacent streets – a desirable trait for promoting ***Transit Oriented Development (TOD)***

Potential Transit Service Options

Several types of transit service and physical improvement types would support the level of permanency envisioned for a TPP site, including:

- Bus Rapid Transit (BRT)
- Rapid Bus Service (RBS)

Bus Rapid Transit (BRT) improvement and service options would provide dedicated travel lanes for bus service in combination with high-occupancy transit vehicles, enhanced boarding platforms and signal pre-emption measures to minimize travel time and maximize potential ridership. BRT systems have been implemented in over 25 cities in North America.

Figure 1-8 Bus Rapid Transit (BRT) Examples

BRT vehicles currently in operation in Los Angeles, California (left) and Las Vegas, Nevada.

Examples of dedicated bus lanes and BRT stop amenities in Eugene, OR (left) and Vancouver (BC).

Key features of BRT systems including the following elements:

- **Dedicated Bus Lanes** that remove or reduce conflicts between cars and buses. This provides a BRT vehicle with its own travel lane free of conflicting traffic, double-parked or stopped vehicles. Removing these causes of delay can significantly increase the speed, efficiency, and reliability of transit service, which in turn can improve rider experience and increase transit ridership.
- **Transit Traffic-Signal Priority** helps buses to spend less time stopped at red lights, enabling faster trips and more reliable overall service.
- **Faster Boarding through Improved Fare Collection** is a key element of BRT. Passengers pay before boarding the vehicle at easy-to-use, convenient paystations on the station platform and then are able to board through any door. Once on the bus, tickets or monthly passes serve as proof of payment when requested by inspectors. This multi-door boarding, proof-of-payment system eliminates the need for buses to wait while all passengers pay at the front door, removing a significant factor in vehicle delay. It also improves the rider experience by allowing for a wider variety of payment choices including multi-use universal transit cards, monthly passes, and credit cards.
- **Modern, Low-Floor, High-Capacity Buses** with multiple doors allow for more convenient and faster boarding/exiting, and provide passengers with a more comfortable and quieter ride.
- **Distinctive Stations and Boarding Areas,** ranging from protected shelters to large transit centers, are designed to serve as both traveler amenities and neighborhood enhancements. Improved bus stops aim to enhance safety and comfort for waiting passengers and strengthen neighborhood identity by including better signage and maps, high-quality shelters, and lighting.
- **Real-Time Information** tells riders when the next bus will arrive, allowing users more control over their time.
- **Streetscape, Bicycle, and Pedestrian Access Improvements** such as landscaping, countdown signals, bicycle racks, and well-designed crosswalks, enhance the adjacent neighborhoods and make the street safer and more comfortable for pedestrians and bicyclists accessing the bus stops. Good street design enhances safety and comfort for residents, shoppers, and other users, and gives the street a cohesive sense of identity.

BRT can reduce travel times, increase reliability, and attract new riders, at a lower construction cost compared to more expensive alternatives.

Typical BRT Cost Range (Physical Improvements): $6 million to $25 million per mile

BRT Example: Eugene EMX

The Eugene/Springfield area (home of the 22,000-student University of Oregon) has an estimated population in its urbanized area in the year 2008 of about 240,000[1]. Despite a relatively small population, the area is served by a fully featured BRT service between the two cities' downtowns and major trip generators. The Emerald Express (EMX) includes several different segments with varying design and operational characteristics:

- About three-fifths of the existing route is in bus-only lanes in the median.
- In addition to downtown Eugene and Springfield, the initial EmX route (named the "Green Line"), **serves two college campuses (the University of Oregon, with 22,000 students, and Northwest Christian College) and a major regional hospital (Sacred Heart Medical Center).** Ridership has exceeded expectations.

Within 17 months of the Green Line's introduction in early 2007, ridership in the corridor had roughly doubled from 2,700 to 5,400 average weekday boardings[2], or about 675 boardings per unidirectional mile. EmX service was free until late-2009). Ridership on the Green Line is now about 90 passengers per hour of revenue service. By reducing delay, dedicated rights-of-way improve not just speed, but reliability. On-time performance significantly improved.

- The Green Line replaced a local bus line (Route 11), and has reportedly reduced approximate average end-to-end travel times over the four-mile route from up 16-22 minutes[3] to a predictable 15 minutes.
- While these savings may appear insignificant on a per-trip basis, more passengers ride during the most congested peak periods, when time savings are greater, and dedicated rights-of-way ensure that transit speeds remain relatively constant over time, even as traffic congestion increases. Lane Transit District, the operator of EmX, has estimated that cumulative time saved by all riders could reach 175,000 hours annually within roughly 20 years.

The Green Line cost about $6.15 million per mile to construct, significantly less than the $30 to $50 million per mile it is estimated a light rail line might have cost[4]. The route is also relatively cost-effective to operate, at $1.54 per boarding[5].

The EMX line is served by six vehicles (four in service, plus two spares) purchased at a cost of $960,000 each. EmX (Emerald Express) vehicles are specially designed 63-foot buses with doors on both sides (so that some stops can be center island platforms) and stops feature raised platforms to allow near-level boarding.

[1] U.S. Census Bureau American Community Survey, 2006-2008

[2] The primary source for information in this case study is *From Buses to BRT: Case Studies of Incremental BRT Projects in North America,* by John Niles and Lisa Callghan Jerram for the Mineta Transportation Institute, 2010.

[3] Travel times for Route 11 vary by source. According to the EmX Frequently Asked Questions page at the Lane Transit District website (http://www.ltd.org/search/showresult.html?versionthread=6d517154d17fc3e09be84a0ee196bd7b), the projected 16-minute travel time for the Green Line was projected to amount to a six-minute savings. Other sources have reported travel time for Route 11 of 16 minutes. It is likely that this discrepancy is a result of different speeds at different times of day, as transit vehicles operating in traffic are often much slower during peak periods.

[4] Lane Transit District staff, as cited in *From Buses to BRT: Case Studies of Incremental BRT Projects in North America*

[5] For Fiscal Year 2009-10, according to information provided by LTD staff

Figure 1-9 BRT Median Transitway Example: Eugene EMX

Source: Flickr user "functoruser" (used under Creative Commons license: http://creativecommons.org/licenses/by-sa/2.0/)

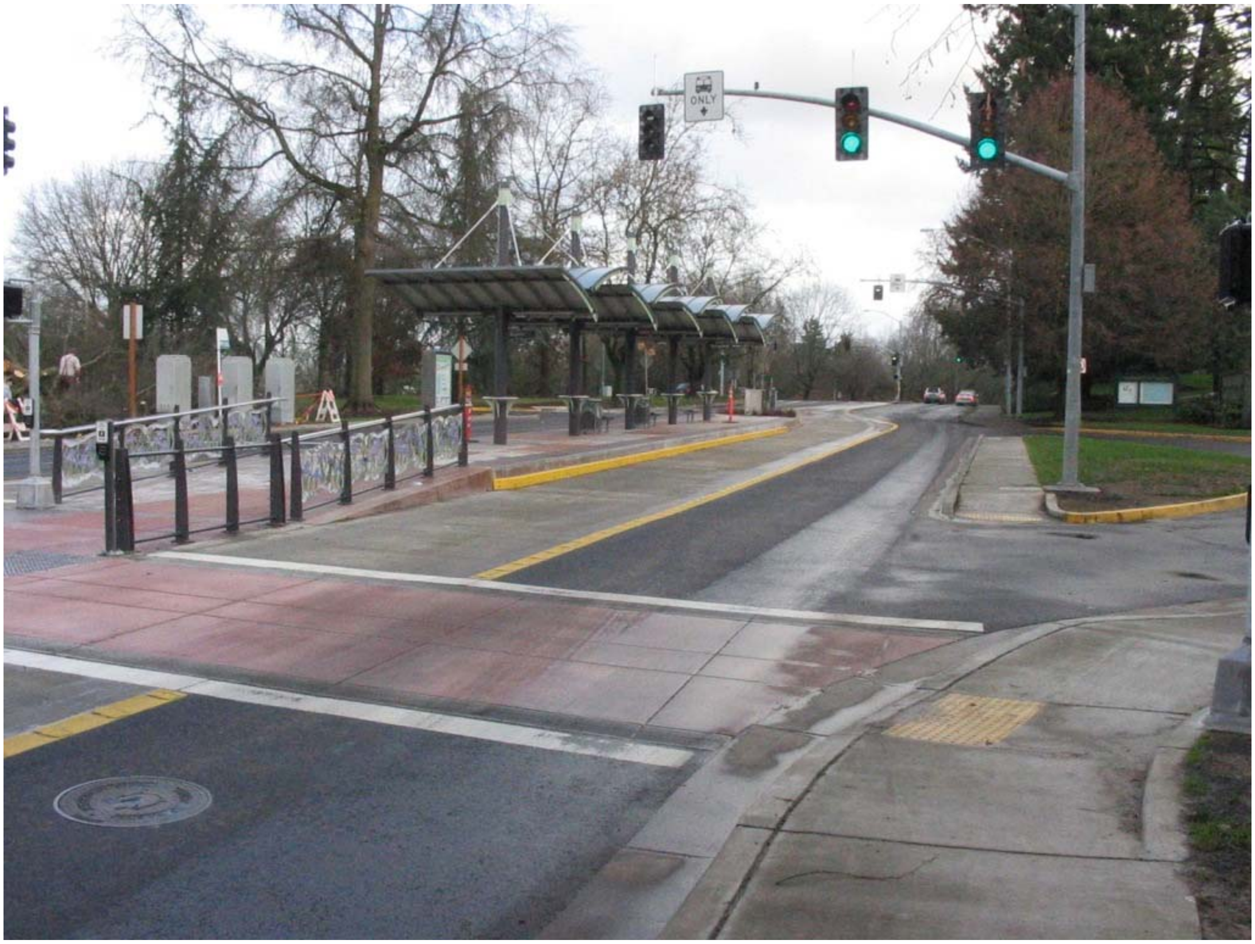
3-mile BRT line was constructed in Eugene, Oregon at a cost of approximately $25 million. Several other US cities are proposing to implement BRT including San Francisco and Oakland.

EmX serves as an especially illustrative example of the design and flexibility afforded by BRT:

- While much of the EmX alignment is provided within a "median busway" (similar to the proposed "median busway" on segments in Merced), designers were constrained in other locations by a policy decision to limit impacts on traffic and parking.
- In some segments, EmX buses operate in curbside bus lanes.
- Also, as shown in Figure 2, in some segments there is only a single bus lane shared by buses in both directions. According to LTD staff, this limits the capacity of the system to seven-minute headways, or about 800 to 900 passengers per hour in each direction.
- Currently, buses run every 10 minutes, and ridership reaches around 500 passengers per hour during peak periods.

Another notable design element of EmX is its raised platforms enabling near-level boarding. This allows able-bodied passengers to simply step onto or out of vehicles, rather than up or down. More importantly, it can greatly reduce the time required for passengers using wheelchair or other mobility devices, or passengers with strollers, to be loaded and unloaded.

Figure 1-10 BRT Median Station Example: Eugene EMX



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Rapid Bus Service (RBS) would provide some of the same key elements as BRT, but with:

- Shared travel lanes with motor vehicles on most segments
- Incorporating measures to increase bus operating speed including:
  - Traffic-signal priority measures
  - Bus queue jump lanes at some locations
  - Enhanced boarding platforms to reduce "dwell" time for buses and facilitate faster boarding for passengers

On some corridors, RBS service can achieve similar travel time savings for buses as could be achieved with dedicated bus lanes, with a substantial cost savings. This may be especially applicable to Bellevue Road and the Atwater Merced Expressway (AME) segments.

Typical RBS Cost (Physical Improvements): ~$150,000 to $300,000 per mile

RBS Example: San Pablo Rapid (Oakland/Berkeley/Emeryville/Richmond)

Examples include the "San Pablo Rapid" service operated in the San Francisco Bay Area by AC Transit that resulted in travel time reductions and increased ridership on the San Pablo Boulevard corridor that connects Oakland, Emeryville, Berkeley, Albany, El Cerrito and Richmond.

The San Pablo Rapid (AC Transit Line 72R) is a 14-mile "rapid bus" line (with buses operating in mixed-flow traffic) on a four-lane roadway (2 lanes in each direction). The rapid service began operation in June 2003 and runs along San Pablo Avenue covering two counties and seven cities; San Pablo, Richmond, El Cerrito, Albany, Berkeley, Emeryville, Oakland. The 72R operates from Monday through Friday from 6:00 am to 7:00 pm. The service operates on 12 minute headways.

Planning for BRT service along the San Pablo Avenue Corridor began in 1995 as a coordinated effort between the cities bisected by this corridor and AC Transit as a way to improve the economic vitality, mobility, accessibility, and quality of this corridor. **Key attributes of the San Pablo Rapid are:**

- **There are 26 bus stops over the 14 mile segment and each stop is spaced approximately 0.54 miles apart.**
  - Each stop is equipped with a shelter or kiosk as well as NextBus real-time bus arrival data, schedule, map, bench, trash bin and lighting.
- **The service employs transit signal prioritization at intersections, Automatic Vehicle Locator technology, and Automatic Passenger Counters.**
  - Compared to the previous "limited" bus service (72L), the 72R has reduced the travel time from one end of the corridor to the other by 12 minutes which is equivalent to a 17% reduction in travel time as compared to the 72L and 21% compared to local service (72 and 73).
- **The total capital cost for the project was approximately $3.2 million or $228,571 per mile**.[6]

[6] The San Pablo Rapid BRT Project Evaluation funded by the Federal Transit Administration. June 2006.

- The cost for the 72R was lower than is typical for in-street mixed traffic alignments due to the fact that AC Transit already had the necessary vehicles and did not have any right-of-way acquisition costs.
- Funding for this project came from Contra Costa and Alameda County allocated federal funds as well as a federal budget earmark.

Net Ridership on the San Pablo corridor increased by 8.5% after the implementation of the rapid bus service.

RBS Example: Los Angeles Metro Rapid

The Los Angeles County Metropolitan Transportation Authority's (MTA) Metro Rapid program serves to demonstrate that buses can be made significantly faster and more attractive to potential riders at relatively little cost using methods relevant to cities of all sizes.

Figure 1-11 RBS Station Amenity Example: LA Metro Rapid Kiosk

Source: Flickr user "fredcamino"
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The Metro Rapid program was a pioneering effort in North American rapid bus service. Its first two lines, in the Wilshire/Whittier and Ventura corridors, were rolled out in the year 2000. Today, the network encompasses 25 lines spanning roughly 440 miles.

This rapid deployment has been made possible by a relatively simple approach emphasizing eight no- or low-cost attributes[7]:

- Frequent service
- Traffic signal priority
- Headway-based schedules
- Simple routes
- Widely-spaced stops
- Integration with local routes
- Low-floor buses
- Distinct branding

[7] The primary source for information in this case study is *From Buses to BRT: Case Studies of Incremental BRT Projects in North America,* by John Niles and Lisa Callghan Jerram for the Mineta Transportation Institute, 2010.

Of the attributes listed above, only two incur notable cost, according to MTA:

- **Signal priority or "Intelligent Transportation Systems" (ITS) treatments cost approximately $100,000 per mile to implement.**

- **Metro Rapid stops, with varying amenities, cost about $50,000 apiece.** While all Rapid buses are low-floor models, with higher-capacity buses used on some lines, Metro has purchased vehicles through its regular procurement process, so Rapid buses are, in effect, ordinary buses distinguished by their color-coded (red) livery featuring prominent logos.
- **The total cost to implement Metro Rapid has averaged about $240,000 per mile.**

The Metro Rapid program grew out of a late-1990s study that found that MTA buses spent roughly half their travel time stopped, either at stops or at red lights. The simplest way to speed buses is to have them make fewer stops, and Rapid stops are approximately 0.7 miles apart on average, compared to 0.3 miles on limited-stop routes and 0.2 miles on local routes.

The Rapid system has achieved impressive gains in speed and ridership. Rapid buses are on average about 25 percent faster than local buses, and between 2000 and 2007 ridership in Rapid corridors, including both Rapid and local lines, increased by about 20 percent. Studies conducted on the first two lines (Wilshire/Whittier and Ventura) shortly after their debut found that about one-third of riders were new to transit, and that one-third of the improvements in speed could be attributed to signal priority. The other improvements can be attributed to fewer stops, far-side stop locations, low-floor buses, headway-based schedules, and a coordinated management effort by field supervisors and central control.

The system's low cost has also allowed it to be expanded primarily using federal Congestion Mitigation and Air Quality (CMAQ) funding rather than more restrictive Federal Transit Administration (FTA) Small Starts program grants. Operating costs, meanwhile, are relatively low at $2.51 per boarding[8].

RBS Example: Stockton Metro Express

Stockton has an urbanized area population of about 350,000 and the annual San Joaquin Regional Transit District, or RTD ridership, in 2008, was about 4.8 million annual boardings9.

The first route in Stockton's Metro Express system, Route 40 (additional routes are under construction and planned), runs from Downtown north past two college campuses (the University of the Pacific and San Joaquin Delta College) and two major shopping centers (Weberstown and Sherwood Malls). Most of the route is along major arterials (Pacific Avenue and the one-way couplet of North El Dorado and Center Streets), and stops are on average more than a mile apart.

Route 40 is a "rapid" line without bus-only lanes – yet within three years of introduction, it has almost tripled ridership in the corridor, from fewer than 1,000 daily boardings on three local routes serving the alignment to about 2,700 daily boardings10.

According to RTD staff, productivity now stands at about 42 passengers per hour, and the service's farebox recovery ratio is close to 50 percent.

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[8] Based on Fiscal Year 2010 budget and 3rd Quarter FY09-10 data, as provided by MTA staff

[9] National Transit Database

[10] Presentation by Paul Rapp, Marketing and Communications Manager for RTD

Route 40 is relatively fast for a bus route operating in traffic: average scheduled one-way travel time during peak periods is 23 minutes, over roughly a 5.7 mile route, for an average speed including stops of nearly 15 miles per hour.

This can be attributed to several factors, including low-floor buses, traffic signal priority, and a system of prepaid boarding allowing simultaneous boarding through all doors.

Boarding through all doors may be the most notable feature because it is a relatively rare attribute for a rapid bus line. While ticket vending machines (TVMs) can be somewhat costly (the Transit Cooperative Research Program's *Report 118: Bus Rapid Transit Practitioner's Guide*, gives an average cost of $65,000 per TVM), a "proof-of-payment" or honor system can reduce average dwell time per boarding from between 3.6 and 4.3 seconds (for passengers paying cash fares) to between 2.25 and 2.75 seconds. On a relatively high-ridership service, this can represent a significant savings: for example, if just one second was saved per passenger, but 60 passengers were to board over the course of a trip, it would amount to a savings of one minute per trip.

Metro Express is also notable for its relatively elaborate and highly visible stops, with double-canopied shelters offering benches as well as distinctive "lean rails." These high-profile facilities contribute to a branding strategy that also includes distinctly designed buses.

Figure 1-12 RBS Station Amenity Example: Ticket Machine (Stockton)

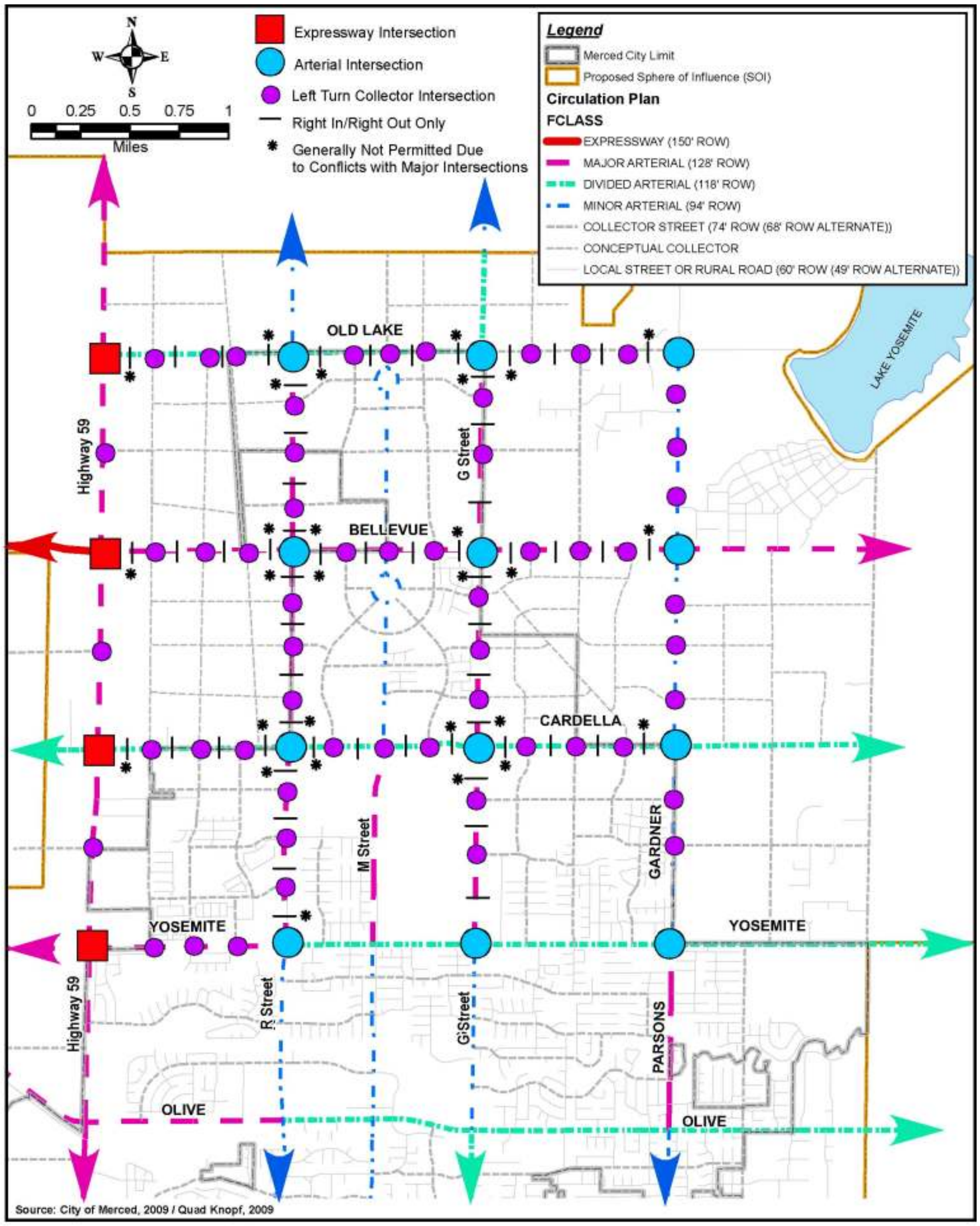
Photo Source: San Joaquin RTD

2. PUBLIC RIGHT-OF-WAY

Planned Circulation Network

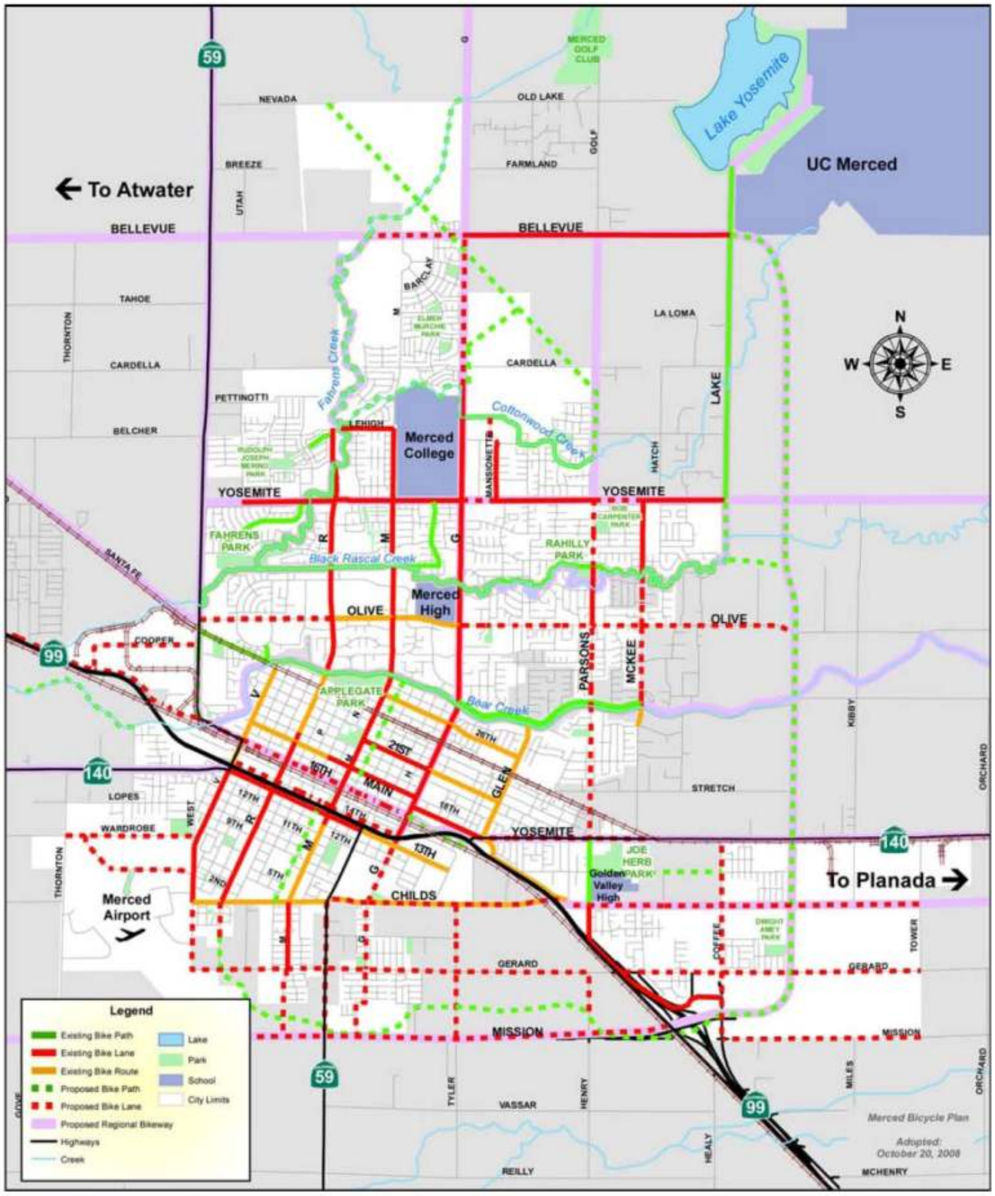
The recently adopted Merced General Plan identifies the key components of the City's planned circulation network.

Figure 2-1 Planned Arterial Grid Network



The planned street network would distribute nearly all traffic via a grid of arterial streets placed one mile apart.

Figure 2-2 Planned Bikeway Network

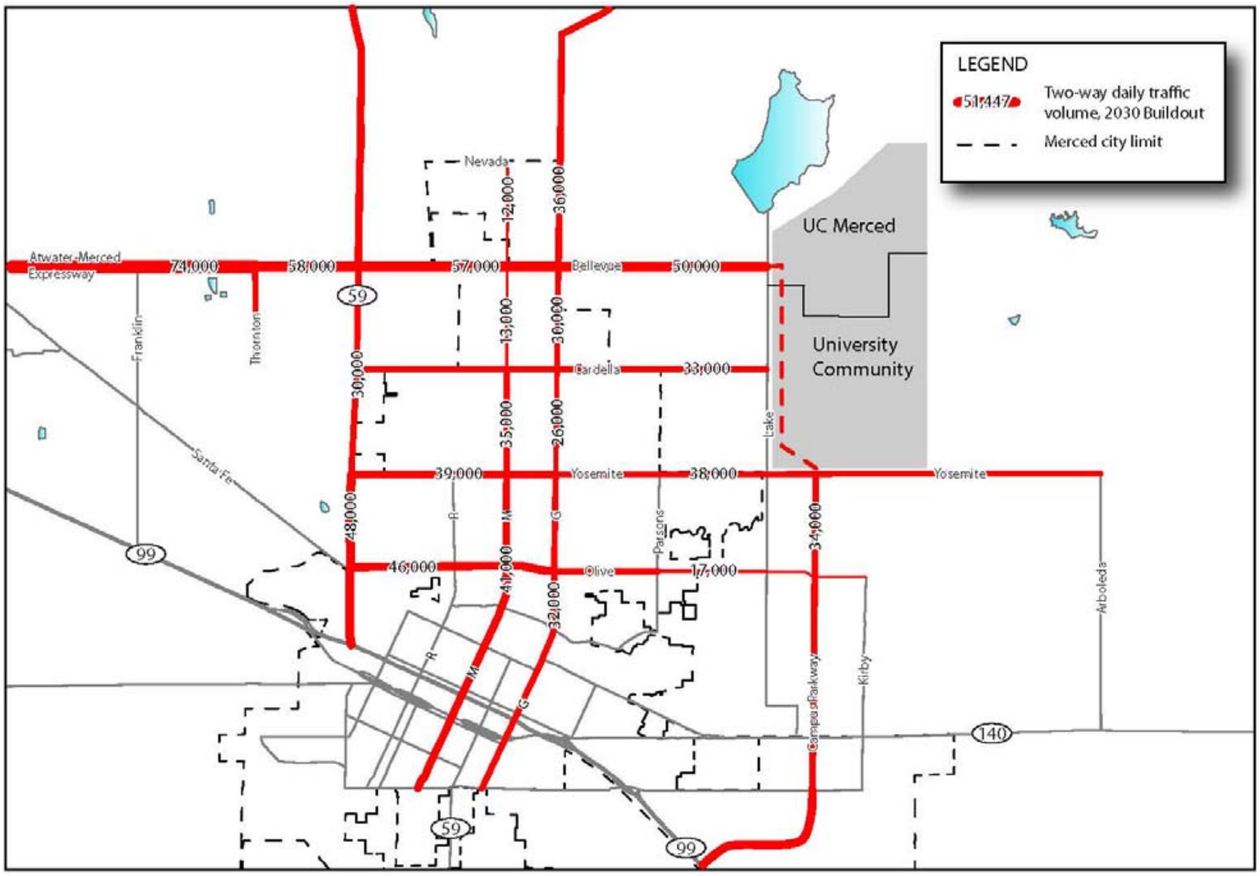


The planned bikeway network would primarily follow the same pattern as arterial streets placed one mile apart, with the exception of Cardella Street that was not included in the General Plan bikeway network.

Note: the General Plan bikeway map above was derived from an older map that does not show the precise boundary of the UC Merced campus.

Future Traffic Volumes

Figure 2-3 Future (Year 2030) Traffic Volumes (General Plan Buildout)



Forecasted traffic volumes at buildout of the General Plan land uses are shown above:

- ***Between 50,000 and 60,000 daily vehicles on Bellevue Road*** *within the BCCP area*
  - *This volume of traffic will typically require a* ***6-lane configuration*** *(and/or 8 lanes in some cases). Alternatively: the City could consider modifying the planned one-mile grid in this area to include a "half-mile" network of arterial and collector streets to better disperse traffic and reduce the ultimate width requirement for Bellevue Road.*
  - *Note: this traffic forecast is based on potentially ambitious land use assumptions*
- ***Between 30,000 and 40,000 daily vehicles on Cardella Road, and over 30,000 daily vehicles on G Street***
  - *This volume of traffic will typically require a* ***4-lane configuration***

The planned, high volume of traffic on the planned arterials may not be conducive with the goal of creating walkable "complete streets" bordered by transit-supportive land uses. *As part of the BCCP effort, the City may wish to consider a "dispersal" strategy with the BCCP area. For example: creation of a "half-mile grid" of Mixed Use Collector streets (to augment the one-mile grid of Arterial Streets) within the BCCP area can help to disperse traffic that would access potential mixed-use development, and reduce volumes on the adjacent arterials.*

Planned Street Design (General Plan Cross-sections)

Figure 2-4A Expressway (General Plan Drawing)

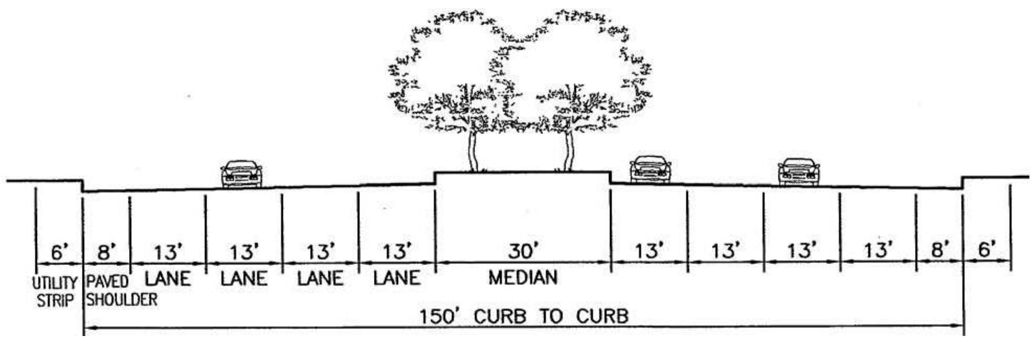
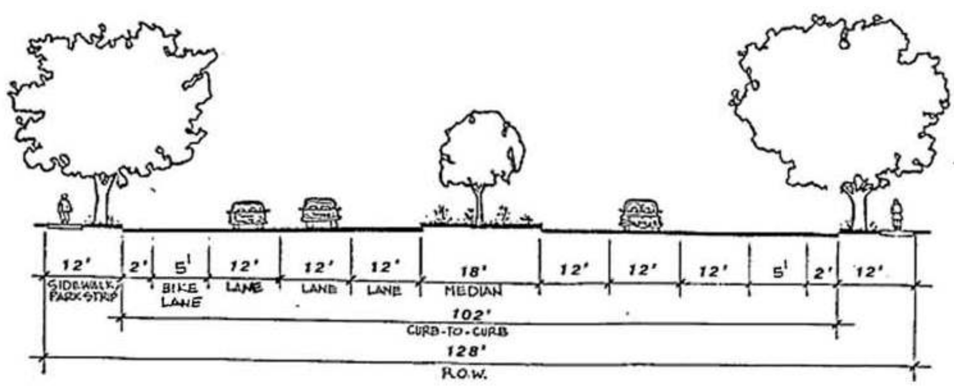


Figure 2-4B Major Arterial (General Plan Drawing)



Based on forecasted traffic volumes on Bellevue Road: an Expressway or Major Arterial alignment (as shown above) may ultimately be required to satisfy level of standards (LOS) at buildout. Alternatively, the potential need for a 6-lane alignment could be reduced by dispersing a potion of traffic to "Mixed Use Collectors".

Figure 2-4C Divided Arterial (General Plan Drawing)

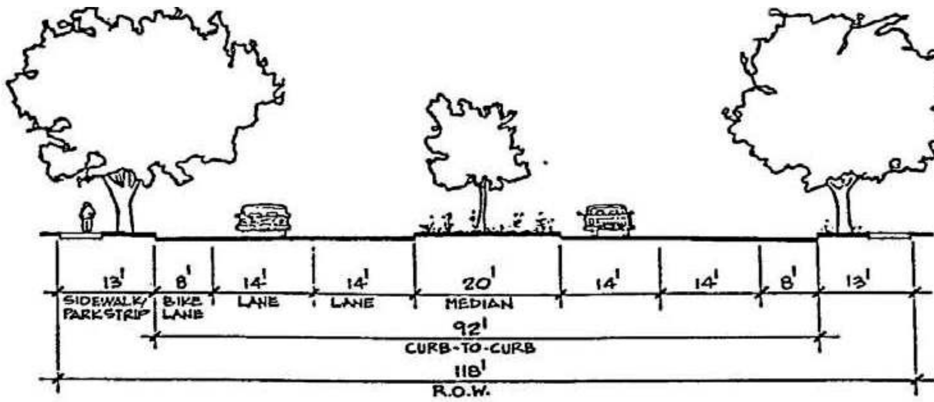


Figure 2-4D Minor Arterial (General Plan Drawing)

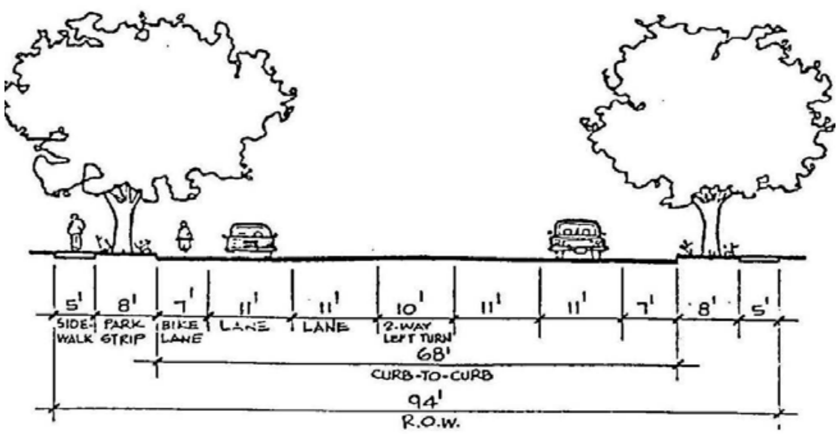
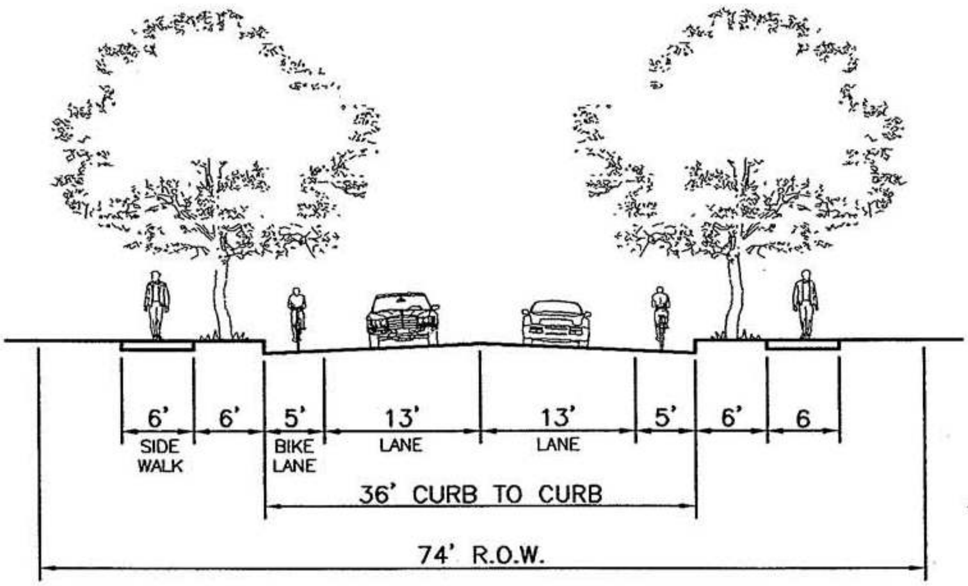


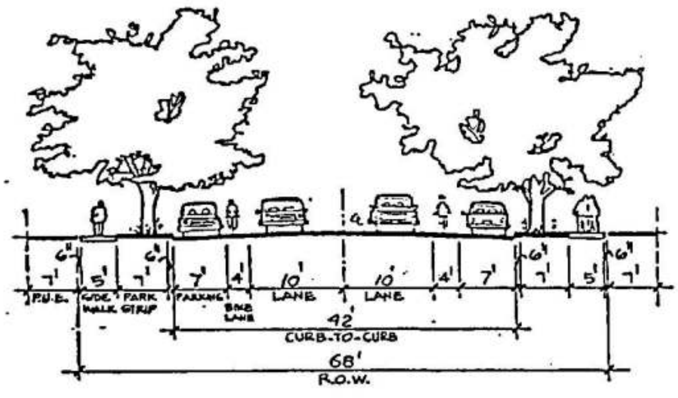
Figure 2-4E Transitway (General Plan Drawing)



"Transit Only" Segment

As shown in the General Plan: the Transitway is designated as a "Transit Only" facility (although the General Plan drawing suggests its use will not limited only to transit vehicles).

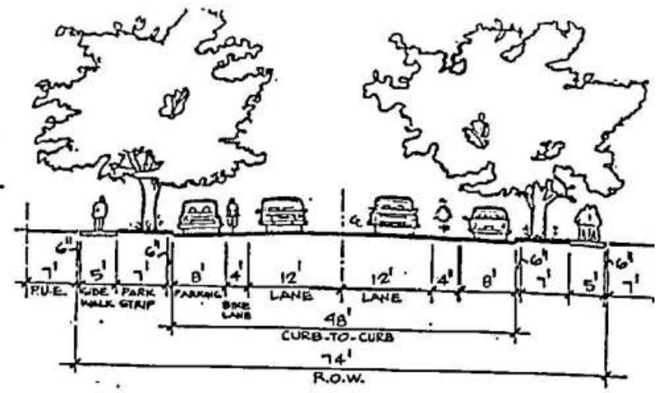
Figure 2-4F Collector (General Plan Drawing)



Collector Street Alternate

NOTES FOR ALTERNATE COLLECTOR:

1) 68 feet of right-of-way may be permitted where supported by a traffic analysis to assure that the narrower street would not be overloaded. Analysis would include trip generation and distribution based on existing and future land use and circulation system. Additional width may be necessary at intersection where analysis shows need for turn lane(s).
2) Fronting lots would be permitted on collectors where a traffic analysis shows daily traffic volumes will not exceed 1,500 vehicles under ultimate conditions.
3) On-street parking may be deleted if adequate, convenient off-street parking is provided in a subdivision design.
4) A subdivision design with deletion of on-street bike lanes may be permitted if adequate, convenient Class I bikepath is available.



Collector

The General Plan description of Collector Streets is limited to Residential Collectors only (i.e., non-residential collector streets are not envisioned to be built with new development). *As part of the BCCP effort: the City may wish to consider allowing a "Mixed Use Collector" street type to allow for a dispersal of a portion of traffic from Bellevue Road.*

Figure 2-5 Street Type Summary Table (General Plan)

Road Classification	*Right-of-Way*	*# of Lanes*	*Driveway Access Restrictions*	*Street Intersection Spacing*	*Parking*
Expressway (Atwater-Merced & Campus Parkway)	150	4-6	Full	1/2 – 1 mile	No
Major Arterial	128 feet	4-6	Full	1/4 - 1/2 mile	No
Arterial	128 feet	4-6	[1]Partial	1/4 - 1/2 mile	No
Divided Arterial	118 feet	4-6	[1]Partial	1/4 - 1/2 mile	No
Minor Arterial	94 feet	2-4	[1]Partial	1/8 - 1/4 mile	Generally Not Permitted
Major Collector	[2]68-74 ft	2-4	[3]Partial	As needed	[3]Permitted in Selected Areas
Collector	68 ft	2	[4]Partial	As needed	[4]Permitted in Selected Areas
Local	[5]51-62 ft	2	No	As needed	Permitted
Transitway	[6]Varies	2-6	[6]Varies	[6]Varies	[6]Varies

Constraints & Opportunities Related to TPP

What does a high-volume street look like?

This section several photo examples of high-volume streets relevant to the potential design of Bellevue Road, forecasted to carry between 50,000 and 60,000 daily vehicles within the BCCP area.

Expressway Example: Lawrence Expressway

The following images captured from Google Streetview provide an indication of the general nature of the Lawrence Expressway in Sunnyvale, California. It is clearly very much an auto-dominated streetscape, with narrow bike lanes and relatively narrow sidewalks with no planted strip separation from the street. In its favor, signalized intersections with crosswalks are closely spaced which makes for an easier walking experience than if the street had ½ mile spacing between intersections.

Figure 2-6 High Volume Expressway Example: Lawrence Expressway (Photos)

Lawrence Expressway at Bollinger Road

Source: Google Maps Streetview, © Google 2012

Lawrence Expressway at Lehigh Drive (Kaiser Permanente)

Source: Google Maps Streetview, © Google 2012

Lawrence Expressway at Miraloma Way

Source: Google Maps Streetview, © Google 2012

Lawrence Expressway at Prospect Road

Source: Google Maps Streetview, © Google 2012

*As shown in the photos above: **expressway designs are generally not conducive to the creation of walkable corridors with transit-oriented land uses**. As a result: the City may wish to relocate the proposed Transitway corridor (through the BCCP area) to a lower-volume parallel route.*

High-volume Street Example: Octavia Boulevard

Figure 2-7 Boulevard Example: Octavia Boulevard Cross Section

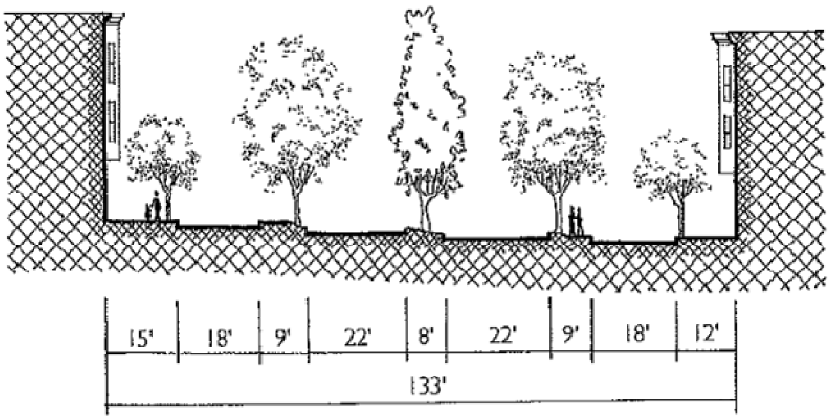
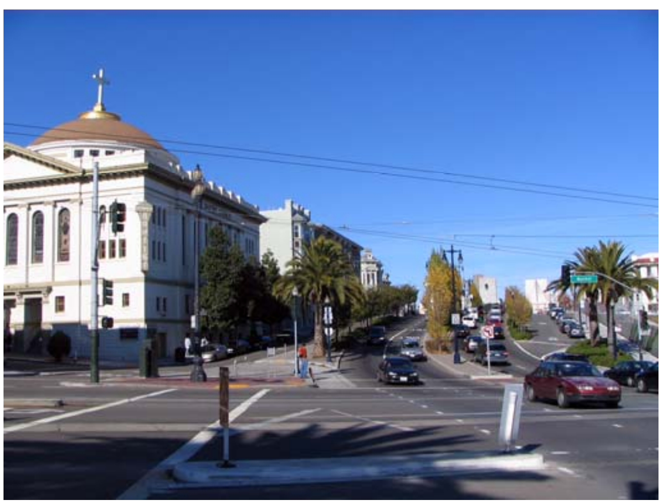


Figure 2-8 Boulevard Example: Octavia Boulevard (Photos)



Octavia Boulevard in San Francisco carries 45,000 daily vehicles with just four travel lanes within a 133-foot wide right-of-way that also accommodate on-street parking within a "boulevard configuration". *A variation of this configuration could be considered as part of a "complete street" strategy for Bellevue Road.*

Lower Volume Street Example: Valencia Street

Valencia Street in San Francisco carries 20,000 daily vehicles and 5,000 daily bicyclists, as well as a very high volumes of pedestrians, with just 2 motor vehicle lanes within a 62.5 foot right-of-way.

- A key advantage of the narrower right-of-way is that relatively short 60-second signal cycles can efficiently accommodate vehicle and pedestrian movements.
- Wider streets, by contrast, require lengthier 90 to 120 second cycles, resulting in lengthier vehicle queues and extended delays, including longer waits for pedestrians between "WALK" intervals.

Figure 2-9 Complete Street Example: Valencia Street (Photo)

Source: Google Maps Streetview, © Google 2012

This 2-lane segment of Valencia Street in San Francisco carries 20,000 daily cars and 5,000 daily bicyclists, within a 62-foot wide right-of-way.

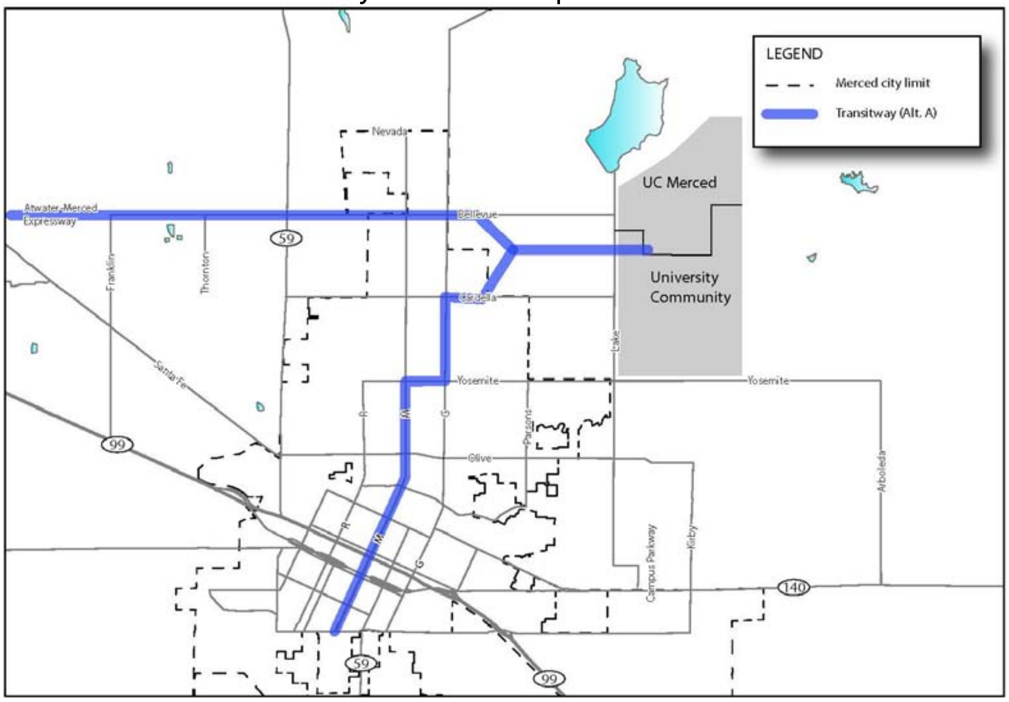
In comparison, planned streets in Merced that would carry similar traffic volumes are generally envisioned to include 4 lanes within a wider right-of-way, no on-street parking, longer walking distances and land uses set further back from the sidewalk.

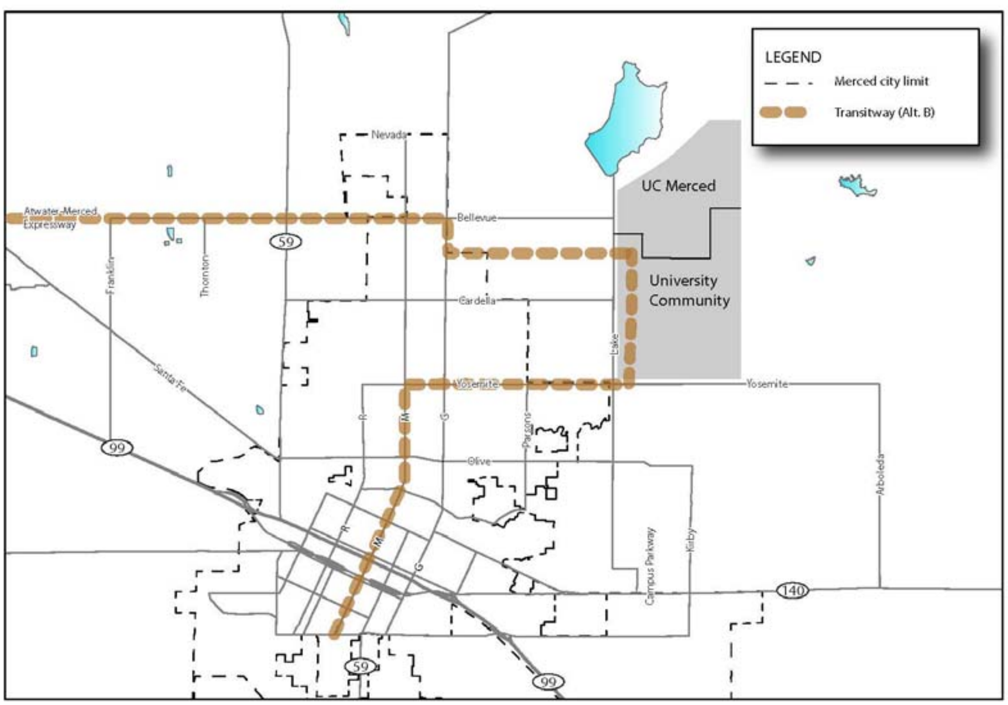
To allow a similar street and land use configuration with the BCCP area (including on-street parking): the City may wish to consider allowing the introduction of a new street type: Mixed Use Collectors.

3. PRELIMINARY RECOMMENDATIONS

Transitways

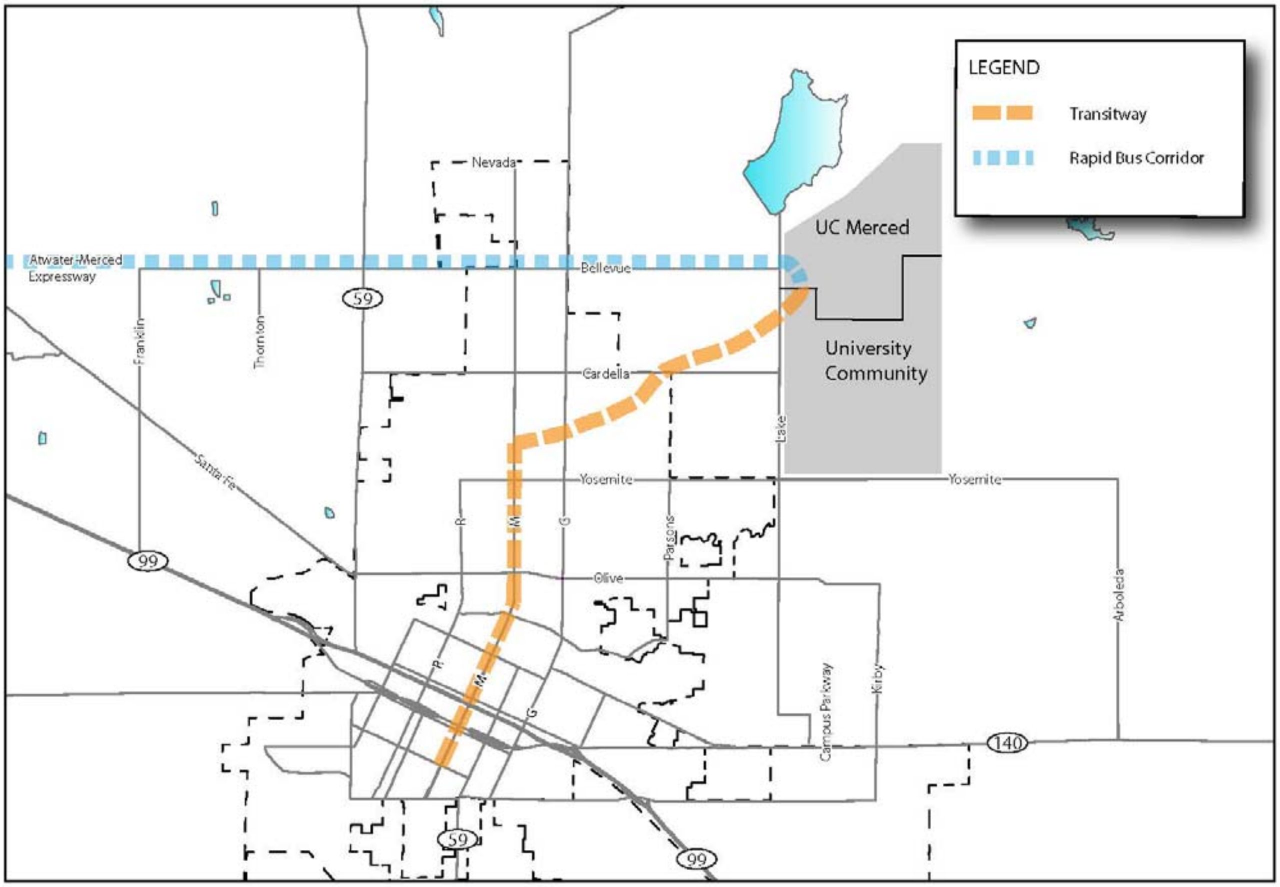
Figure 3-1 Alternative Transitway Corridor Concepts





Alternative transitway corridors shown above would provide for more direct connections between Downtown and UC Merced. See Figure 3-2 below for a modified concept.

Figure 3-2 Modified Transitway Corridors for BCCP (Concept)

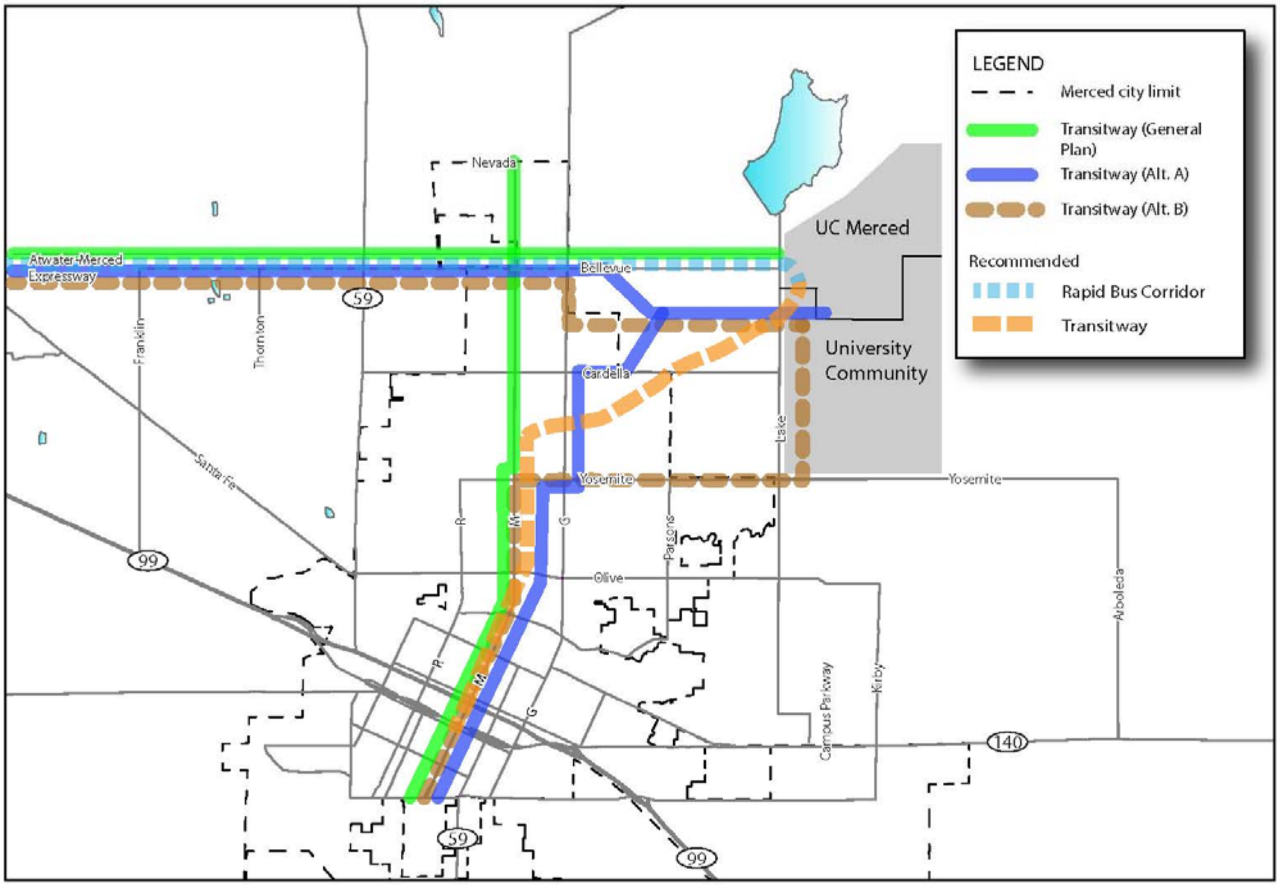


As shown above: modification of the planned Transitway could include:

1. ***Transitway Corridor for potential Bus Rapid Transit (BRT) with dedicated bus lanes between Downtown Merced and UC Merced*** *via M Street and an alternate "diagonal" configuration to serve the medical center and potential mixed-use development south of Bellevue Road (incorporating a portion of the Cardella corridor). See description of Eugene EMX BRT service type option in Section 1 of this report.*

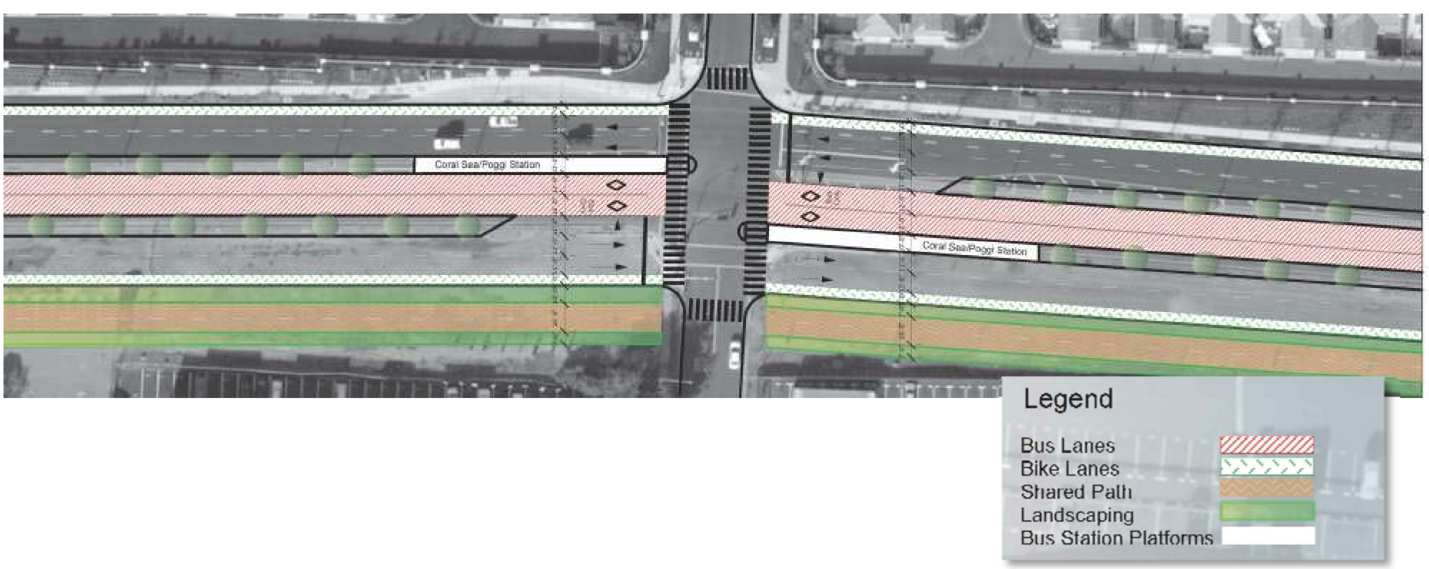
2. ***Transit Corridor for Rapid Bus Service (RBS) with shared travel lanes on Bellevue Road / Atwater Merced Expressway (AME)****. See description of RBS Service options in Section 1 of this report.*

Figure 3-3 Comparison of Transitway Route Options



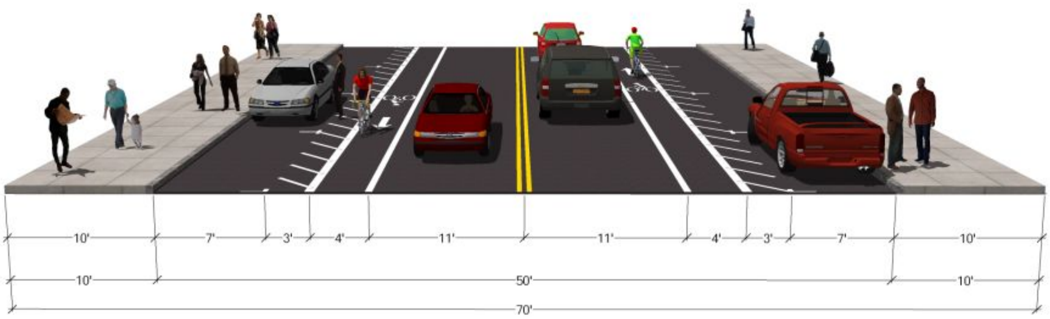
The travel distance between Downtown Merced and UC Merced, based on the Modified Transitway concept shown above, is approximately six (6) miles, representing a potential 15 percent reduction in distance, travel time, operating and construction costs.

Figure 3-4 Transitway Design for Bus Rapid Transit (Concept)



Mixed Use Collectors

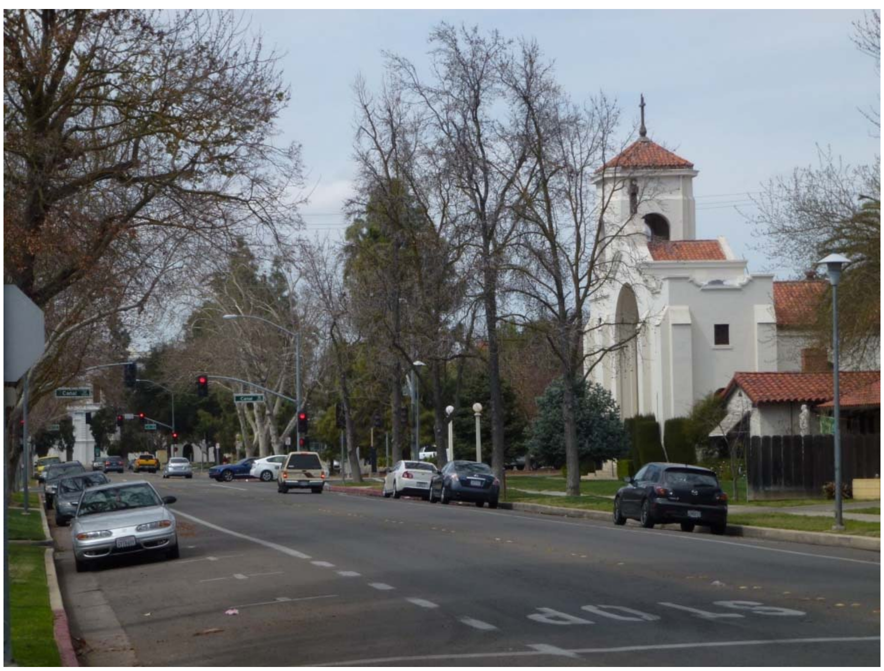
Figure 3-5 Mixed Use Collector Concept Drawing



As described in previous sections: the Merced General Plan does not currently specify the provision of Collector Streets as part of non-residential development. ***The BCCP could include creation of a "Mixed Use Collector" street type to support the Plan goals related to complete streets.***

In particular: the provision of collector streets within the BCCP area can help to reduce traffic volumes on portions of Bellevue Road and Cordella Road, ***creating a "half-mile grid" of Arterial and Mixed-Use Collectors within the Plan area, to better disperse future traffic growth and allow for narrower street types (including narrower arterial streets), more conducive to pedestrian circulation.***

Figure 3-6 Mixed Use Collector Prototypes: Downtown Merced



Although not part of the General Plan street types: the creation of Mixed Use Collectors can be modeled after existing, walkable "complete street" segments in Downtown Merced.

APPENDIX A

Transit Priority Project Definition

PUBLIC RESOURCES CODE SECTION 21155-21155.3

21155. (a) This chapter applies only to a transit priority project that is consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy, for which the State Air Resources Board, pursuant to subparagraph (H) of paragraph (2) of subdivision (b) of Section 65080 of the Government Code, has accepted a metropolitan planning organization's determination that the sustainable communities strategy or the alternative planning strategy would, if implemented, achieve the greenhouse gas emission reduction targets.

(b) For purposes of this chapter, a transit priority project shall (1) contain at least 50 percent residential use, based on total building square footage and, if the project contains between 26 percent and 50 percent nonresidential uses, a floor area ratio of not less than 0.75; (2) provide a minimum net density of at least 20 dwelling units per acre; and (3) be within one-half mile of a major transit stop or high-quality transit corridor included in a regional transportation plan. A major transit stop is as defined in Section 21064.3, except that, for purposes of this section, it also includes major transit stops that are included in the applicable regional transportation plan. For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. A project shall be considered to be within one-half mile of a major transit stop or high-quality transit corridor if all parcels within the project have no more than 25 percent of their area farther than one-half mile from the stop or corridor and if not more than 10 percent of the residential units or 100 units, whichever is less, in the project are farther than one-half mile from the stop or corridor.

21155.1. If the legislative body finds, after conducting a public hearing, that a transit priority project meets all of the requirements of subdivisions (a) and (b) and one of the requirements of subdivision (c), the transit priority project is declared to be a sustainable communities project and shall be exempt from this division.

(a) The transit priority project complies with all of the following environmental criteria:

(1) The transit priority project and other projects approved prior to the approval of the transit priority project but not yet built can be adequately served by existing utilities, and the transit

priority project applicant has paid, or has committed to pay, all applicable in-lieu or development fees.

(2) (A) The site of the transit priority project does not contain wetlands or riparian areas and does not have significant value as a wildlife habitat, and the transit priority project does not harm any species protected by the federal Endangered Species Act of 1973 (16 U.S.C. Sec. 1531 et seq.), the Native Plant Protection Act (Chapter 10 (commencing with Section 1900) of Division 2 of the Fish and Game Code), or the California Endangered Species Act (Chapter 1.5 (commencing with Section 2050) of Division 3 of the Fish and Game Code), and the project does not cause the destruction or removal of any species protected by a local ordinance in effect at the time the application for the project was deemed complete.

(B) For the purposes of this paragraph, "wetlands" has the same meaning as in the United States Fish and Wildlife Service Manual, Part 660 FW 2 (June 21, 1993).

(C) For the purposes of this paragraph:

(i) "Riparian areas" means those areas transitional between terrestrial and aquatic ecosystems and that are distinguished by gradients in biophysical conditions, ecological processes, and biota. A riparian area is an area through which surface and subsurface hydrology connect waterbodies with their adjacent uplands. A riparian area includes those portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems. A riparian area is adjacent to perennial, intermittent, and ephemeral streams, lakes, and estuarine-marine shorelines.

(ii) "Wildlife habitat" means the ecological communities upon which wild animals, birds, plants, fish, amphibians, and invertebrates depend for their conservation and protection.

(iii) Habitat of "significant value" includes wildlife habitat of national, statewide, regional, or local importance; habitat for species protected by the federal Endangered Species Act of 1973 (16 U.S.C. Sec. 1531, et seq.), the California Endangered Species Act (Chapter 1.5 (commencing with Section 2050) of Division 3 of the Fish and Game Code), or the Native Plant Protection Act (Chapter 10 (commencing with Section 1900) of Division 2 of the Fish and Game Code); habitat identified as candidate, fully protected, sensitive, or species of special status by local, state, or federal agencies; or habitat essential to the movement of resident or migratory wildlife.

(3) The site of the transit priority project is not included on any list of facilities and sites compiled pursuant to Section 65962.5 of the Government Code.

(4) The site of the transit priority project is subject to a preliminary endangerment assessment prepared by an environmental assessor to determine the existence of any release of a hazardous substance on the site and to determine the potential for exposure of future occupants to significant health hazards from any nearby property or activity.

(A) If a release of a hazardous substance is found to exist on the site, the release shall be removed or any significant effects of the release shall be mitigated to a level of insignificance in compliance with state and federal requirements.

(B) If a potential for exposure to significant hazards from surrounding properties or activities is found to exist, the effects of the potential exposure shall be mitigated to a level of insignificance in compliance with state and federal requirements.

(5) The transit priority project does not have a significant effect on historical resources pursuant to Section 21084.1.

(6) The transit priority project site is not subject to any of the following:

(A) A wildland fire hazard, as determined by the Department of Forestry and Fire Protection, unless the applicable general plan or zoning ordinance contains provisions to mitigate the risk of a wildland fire hazard.

(B) An unusually high risk of fire or explosion from materials stored or used on nearby properties.

(C) Risk of a public health exposure at a level that would exceed the standards established by any state or federal agency.

(D) Seismic risk as a result of being within a delineated earthquake fault zone, as determined pursuant to Section 2622, or a seismic hazard zone, as determined pursuant to Section 2696, unless the applicable general plan or zoning ordinance contains provisions to mitigate the risk of an earthquake fault or seismic hazard zone.

(E) Landslide hazard, flood plain, flood way, or restriction zone, unless the applicable general plan or zoning ordinance contains provisions to mitigate the risk of a landslide or flood.

(7) The transit priority project site is not located on developed open space.

(A) For the purposes of this paragraph, "developed open space" means land that meets all of the following criteria:

(i) Is publicly owned, or financed in whole or in part by public funds.

(ii) Is generally open to, and available for use by, the public.

(iii) Is predominantly lacking in structural development other than structures associated with open spaces, including, but not limited to, playgrounds, swimming pools, ballfields, enclosed child play areas, and picnic facilities.

(B) For the purposes of this paragraph, "developed open space" includes land that has been designated for acquisition by a public agency for developed open space, but does not include lands acquired with public funds dedicated to the acquisition of land for housing purposes.

(8) The buildings in the transit priority project are 15 percent more energy efficient than required by Chapter 6 of Title 24 of the California Code of Regulations and the buildings and landscaping are designed to achieve 25 percent less water usage than the average household use in the region.

(b) The transit priority project meets all of the following land use criteria:

(1) The site of the transit priority project is not more than eight acres in total area.

(2) The transit priority project does not contain more than 200 residential units.

(3) The transit priority project does not result in any net loss in the number of affordable housing units within the project area.

(4) The transit priority project does not include any single level building that exceeds 75,000 square feet.

(5) Any applicable mitigation measures or performance standards or criteria set forth in the prior environmental impact reports, and adopted in findings, have been or will be incorporated into the transit priority project.

(6) The transit priority project is determined not to conflict

with nearby operating industrial uses.

(7) The transit priority project is located within one-half mile of a rail transit station or a ferry terminal included in a regional transportation plan or within one-quarter mile of a high-quality transit corridor included in a regional transportation plan.

(c) The transit priority project meets at least one of the following three criteria:

(1) The transit priority project meets both of the following:

(A) At least 20 percent of the housing will be sold to families of moderate income, or not less than 10 percent of the housing will be rented to families of low income, or not less than 5 percent of the housing is rented to families of very low income.

(B) The transit priority project developer provides sufficient legal commitments to the appropriate local agency to ensure the continued availability and use of the housing units for very low, low-, and moderate-income households at monthly housing costs with an affordable housing cost or affordable rent, as defined in Section 50052.5 or 50053 of the Health and Safety Code, respectively, for the period required by the applicable financing. Rental units shall be affordable for at least 55 years. Ownership units shall be subject to resale restrictions or equity sharing requirements for at least 30 years.

(2) The transit priority project developer has paid or will pay in-lieu fees pursuant to a local ordinance in an amount sufficient to result in the development of an equivalent number of units that would otherwise be required pursuant to paragraph (1).

(3) The transit priority project provides public open space equal to or greater than five acres per 1,000 residents of the project.

21155.2. (a) A transit priority project that has incorporated all feasible mitigation measures, performance standards, or criteria set forth in the prior applicable environmental impact reports and adopted in findings made pursuant to Section 21081, shall be eligible for either the provisions of subdivision (b) or (c).

(b) A transit priority project that satisfies the requirements of subdivision (a) may be reviewed through a sustainable communities environmental assessment as follows:

(1) An initial study shall be prepared to identify all significant or potentially significant impacts of the transit priority project, other than those which do not need to be reviewed pursuant to Section 21159.28 based on substantial evidence in light of the whole record. The initial study shall identify any cumulative effects that have been adequately addressed and mitigated pursuant to the requirements of this division in prior applicable certified environmental impact reports. Where the lead agency determines that a cumulative effect has been adequately addressed and mitigated, that cumulative effect shall not be treated as cumulatively considerable for the purposes of this subdivision.

(2) The sustainable communities environmental assessment shall contain measures that either avoid or mitigate to a level of insignificance all potentially significant or significant effects of the project required to be identified in the initial study.

(3) A draft of the sustainable communities environmental

assessment shall be circulated for public comment for a period of not less than 30 days. Notice shall be provided in the same manner as required for an environmental impact report pursuant to Section 21092.

(4) Prior to acting on the sustainable communities environmental assessment, the lead agency shall consider all comments received.

(5) A sustainable communities environmental assessment may be approved by the lead agency after conducting a public hearing, reviewing the comments received, and finding that:

(A) All potentially significant or significant effects required to be identified in the initial study have been identified and analyzed.

(B) With respect to each significant effect on the environment required to be identified in the initial study, either of the following apply:

(i) Changes or alterations have been required in or incorporated into the project that avoid or mitigate the significant effects to a level of insignificance.

(ii) Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency.

(6) The legislative body of the lead agency shall conduct the public hearing or a planning commission may conduct the public hearing if local ordinances allow a direct appeal of approval of a document prepared pursuant to this division to the legislative body subject to a fee not to exceed five hundred dollars ($500).

(7) The lead agency's decision to review and approve a transit priority project with a sustainable communities environmental assessment shall be reviewed under the substantial evidence standard.

(c) A transit priority project that satisfies the requirements of subdivision (a) may be reviewed by an environmental impact report that complies with all of the following:

(1) An initial study shall be prepared to identify all significant or potentially significant effects of the transit priority project other than those that do not need to be reviewed pursuant to Section 21159.28 based upon substantial evidence in light of the whole record. The initial study shall identify any cumulative effects that have been adequately addressed and mitigated pursuant to the requirements of this division in prior applicable certified environmental impact reports. Where the lead agency determines that a cumulative effect has been adequately addressed and mitigated, that cumulative effect shall not be treated as cumulatively considerable for the purposes of this subdivision.

(2) An environmental impact report prepared pursuant to this subdivision need only address the significant or potentially significant effects of the transit priority project on the environment identified pursuant to paragraph (1). It is not required to analyze off-site alternatives to the transit priority project. It shall otherwise comply with the requirements of this division.

21155.3. (a) The legislative body of a local jurisdiction may adopt traffic mitigation measures that would apply to transit priority projects. These measures shall be adopted or amended after a public hearing and may include requirements for the installation of traffic control improvements, street or road improvements, and contributions to road improvement or transit funds, transit passes for future residents, or other measures that will avoid or mitigate the traffic impacts of those transit priority projects.

(b) (1) A transit priority project that is seeking a discretionary approval is not required to comply with any additional mitigation measures required by paragraph (1) or (2) of subdivision (a) of Section 21081, for the traffic impacts of that project on intersections, streets, highways, freeways, or mass transit, if the local jurisdiction issuing that discretionary approval has adopted traffic mitigation measures in accordance with this section.

(2) Paragraph (1) does not restrict the authority of a local jurisdiction to adopt feasible mitigation measures with respect to the effects of a project on public health or on pedestrian or bicycle safety.

(c) The legislative body shall review its traffic mitigation measures and update them as needed at least every five years.