CITY OF MERCED | BELLEVUE CORRIDOR COMMUNITY PLAN

PUBLIC REVIEW DRAFT

FINDINGS REPORT

January 23, 2014

CONTENTS

1. Introduction 5

2. Key Findings 5

3. Recommendations 11

1. INTRODUCTION

This Report summarizes key findings and recommendations from economic, circulation, complete streets, and land use and zoning background reports prepared as part of the Bellevue Corridor Community Plan (BCCP) project. The findings and recommendations herein will serve as a basis for the draft BCCP chapters and the Urban Village Form-Based Code. A detailed description of the BCCP project can be found in the Foundation Report and Draft Introduction Chapter.

Findings and recommendations were drawn from the following reports:

Economic Analysis. This study, prepared by Economic Planning Systems, examines the economic context of the BCCP area, and identifies relevant market, demographic, and real estate trends.

Transit Priority Project & Public Right-of-Way. This study, prepared by Nelson\Nygaard Consulting Associates Inc., analyzes Transit Priority Project (TPP) requirements, planned Transitways, potential service options, and the circulation network and street design.

Complete Streets. This study, prepared by City Staff. This study, prepared by the City of Merced Planning Staff, provides an overview of complete streets, describes a framework applicable to the BCCP, and provides a comparative analysis of existing policies with proposed BCCP complete street policies.

Zoning, Development and Land Use Standards to Implement the Bellevue Corridor Community Plan. This study, prepared by Tony Perez Associates, addresses how the relevant direction in the Urban Design and BCCP sections of the General Plan will be implemented in the BCCP.

2. KEY FINDINGS

2.1. **Regional Market.** The Merced regional market is characterized by continuing weak economic conditions, depressed housing prices, and stressed local government finances. While recent market activity suggests economic recovery, a return to healthy economic conditions is likely to be gradual.

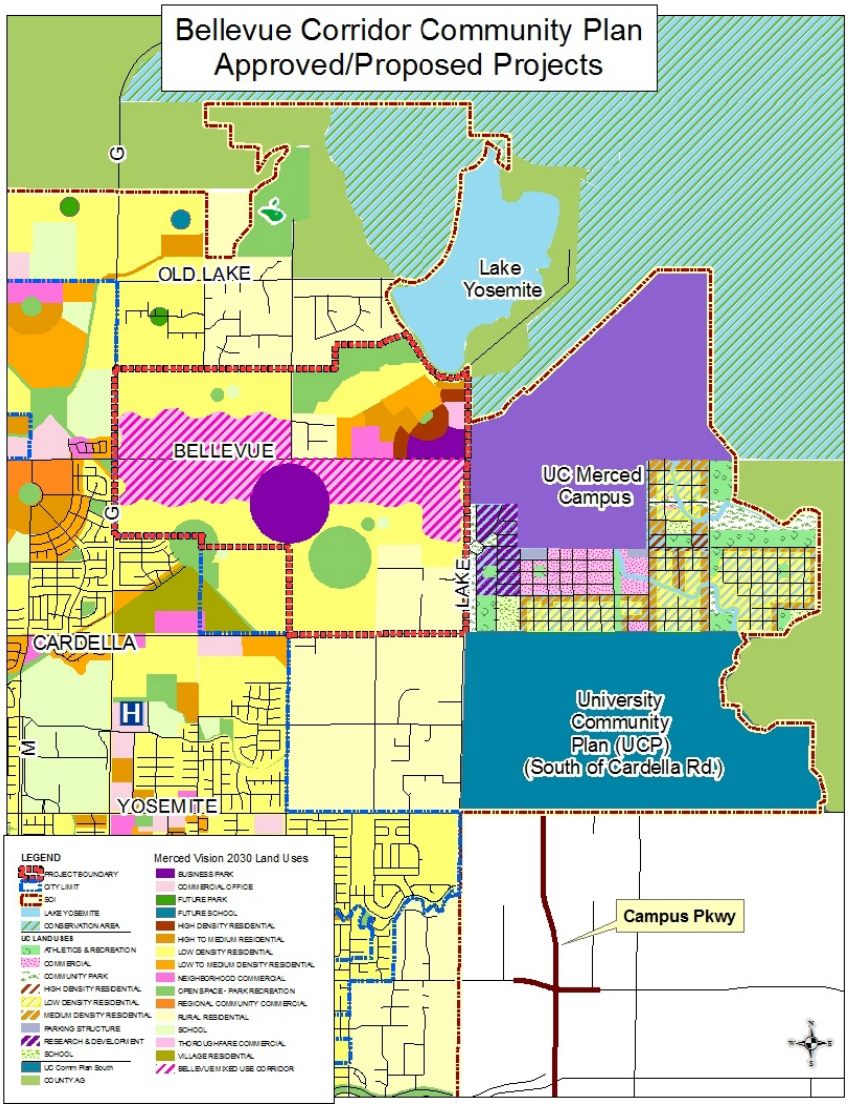
2.2. **Demographics.** Recent statewide and regional growth forecasts indicate a wide range of potential future population growth scenarios (from 45,000 (Woods & Poole Economics, Inc.) to 160,000 (Merced County Association of Governments) by 2030) for Merced County, suggesting a high level of uncertainty associated with the type and amount of new real estate development.

2.3. **Development Capacity.**

Planned Development. During the past several decades, the City has entitled and planned for a substantial amount of new development within its Sphere of Influence; other nearby jurisdictions have also created significant development capacity. There are over 21,000 housing units and over seven million square feet of office and commercial uses in approved plans and projects within, adjacent to, or near the BCCP, This includes the University Community Plan, which encompasses almost 2,000 acres including parks, schools, and streets. The Plan calls for over 11,000 residential units, 1.4 million square feet of commercial (office and retail), and 2.3 million square feet of R&D. In the Project Description in the EIR for UC Merced and the University Community Project, the

University Community is divided into the Community North (about 800 acres), which is covered by the EIR, and the Community South, which is not covered by the EIR.

Map of Approved Plans and Projects Near the BCCP (from the City of Merced)



List of Approved Plans and Projects Near the BCCP (from the City of Merced)

PLANS AND PROJECTS	Detached			Attached			Office [3]		Commercial	
	DU	Acres	Density	DU	Acres	Density	Sq.Ft.	Acres	Sq.Ft.	Acres
Bandoni Sunset GP[8]	45	4.5	10	810	45	18	0	0	313,000	20.5
Bright Homes Map	168	39.8	4.2	0	0	0	0	0	0	0
Guardanapo GP	306	56	5.5	216	17.6	12.3	196,000	18	0	0
Bellevue Ranch [1, 5, 7]	4,533	896	4.5	1,216	76	16	501,000	23	1,403,000	92
Mercy Medical Center (MMC) [6]	0	0	0	0	0	0	600,000	17	0	0
Mercy Cancer Center	0	0	0	0	0	0	12,730	1.7	0	0
Merced Pavilion (MOB)	0	0	0	0	0	0	65,500	0.5	0	0
Future MMC Expansion	0	0	0	0	0	0	200,000	10	0	0
Moraga Map	520	102	5	0	0	0	0	0	0	0
Palisades Park Map	155	48.9	3.2	0	0	0	0	0	0	0
Paseo Map and GP	6	0.8	8	85	8.5	10	0	0	39,400	8.5
Vista Del Lago	58	75.7	0.8	0	0	0	0	0	0	0
West Hills Estates Map	26	30.4	0.9	0	0	0	0	0	0	0
Yosemite Lake Estates	1,388	278	5	0	0	0	0	0	15,000	6
University Community										
Towncenter - Mixed Use Area [4]	0	0	0	540	N/a[8]	N/a[8]	313,600	7.5	183,000	7.5
Towncenter - Other Areas	0	**0**	0	1,418	45	30	292,700	5	130,700	8
Research and Development Use							2,308,300	71		
Other UCP Areas [2]	7,385	890	8.3	2,274	85	26.8	140,000	9	328,400	21
Total	**14,590**	**2,422**	**6.0**	**6,559**	**277**	**23.7**	**4,629,830**	**163**	**2,412,500**	**164**

Notes:
1. Includes all existing and planned amounts.
2. Data extrapolated from 2009 EIR/EIS for the 2009 UCM LRDP & UCP, Table 2.0-6, Page 2.0-41.
3. As a unique use, the *Research and Development Use* is "called-out" under the Office Category. The R&D site is located west of the Town Center.
4. These amounts are in addition to "Towncenter-Other Areas" and "Other UCP Areas". The 15-acre area is divided bewteen office and commercial uses.
5. Includes 2529 "detached standard" units (562 ac) and 2004 "detached patio" units (334 ac) at density of 4.5 and 6 DU/acre respectively.
6. Currently at 260,000 sq. ft., long-term 600,000.
7. A FAR of 0.5 was used to estimate future office use, and a FAR of 0.35 was used for commercial. (In other cases, acreage based on submitted plans/documents.)
8. Part of 15 acre mixed use area. Acreage included under Office and Commercial.

2.3.1. Factors and Limitations. Development cannot be realized without substantial investments in infrastructure, including expanded utility capacity and major transportation system improvements, as well as environmental clearance. Fiscal and institutional factors will also influence the location and timing of new development and associated infrastructure. Scarce funding resources and depressed housing prices constrain development-based financing. The County's jurisdiction in the area limits ability of the City to extend municipal services. City annexation of the BCCP area will require LAFCO approval and likely a tax sharing agreement.

2.4. Impact of UC Merced. UC Merced is anticipated to drive growth proximate to the campus, supporting levels of absorption and density that may not be achievable elsewhere in the County. Areas proximate to the campus are likely to support more dense development patterns, especially for sites that are easily accessible (walkable). UC-related development adjacent to the campus will be governed by the manner and pace in which UC programs grow.

UC Merced and the surrounding districts could evolve into an innovation hub. As research advances and technologies become commercial, UC programs will "spin-off" economic activity. The degree of technology transfer, independent enterprise, and space demand is unknown.

2.5. Development Competition. The timing and share of market demand captured by the BCCP will depend on how a range of highly uncertain economic and institutional factors unfold over time.

2.5.1. Citywide Competitive Advantages. While the City competes with other locations in Merced County and the broader San Joaquin Valley for jobs and associated commercial real estate development, it maintains a number of competitive advantages that make it well positioned to capture a disproportionate share of growth. These advantages include:

- Growth associated with UC Merced;

- Planned high-speed rail station;
- Downtown core, retail, and other amenities;
- Existing municipal sewer and water infrastructure and associated operations, maintenance, and financing options; and
- The City's location at the gateway to Yosemite.

2.5.2. BCCP Area Competitive Advantages. While the Bellevue Corridor likely to face direct competition from other areas planned for development within and outside the City's Sphere of Influence, including the University Community, it is well positioned for growth due the following factors:

- The BCCP creates the opportunity to absorb UC Merced-related uses, without a "leap-frog" development pattern;
- The BCCP area is large enough to accommodate a diversity of urban uses;
- A number of large parcels are adequately sized for development without assembly;

2.5.3. Infrastructure. While both the planned University Community and the Bellevue Corridor will need to resolve a number of infrastructure and institutional issues before development can occur, Bellevue appears to have a competitive advantage in this regard. Bellevue benefits from existing infrastructure (water and sewer are in place, though upgrades are needed). Depending on how a number of institutional and infrastructure issues are resolved, the Bellevue Corridor appears well-positioned to capture a portion of the regional growth currently designated to occur on the University Community plan area.

2.6. Planned Circulation Network.

2.6.1. Street Types. The General Plan describes street types and corresponding designs for the City. The relative street types include Arterials, Collectors, Locals, and Transitways. Bellevue Road is a planned Arterial.

2.6.2. Arterial Grid. The planned arterial street grid network described in the Merced General Plan would distribute nearly all traffic through a grid of arterial streets placed one mile apart. As planned, the high volume of traffic on arterials may not be conducive to creating walkable, "complete streets" bordered by transit-supportive land uses.

2.6.3. Transitway Corridors and Hubs. The Transitway Corridors as planned in the General Plan are M Street and Bellevue Road/Atwater Merced Expressway (transit passengers would transfer between M Street and Bellevue/AME buses at a transit center at the intersection of M Street and Bellevue Road). The travel distance between Downtown Merced and UC Merced based on this alignment is seven miles with a typical transit travel time of 26 to 35 minutes. Several transit stations or hubs have also been identified including, (1) the UCM transit hub near Lake Road, ¼ mile south of Bellevue Road, (2) the Bellevue Ranch transit hub, on M street just south of Bellevue Road, and (3) the high-speed train station in downtown Merced near M and 16th Streets.

2.6.4. Regional Loop System / Expressways. The proposed regional loop system, which would connect Bellevue Avenue and the Atwater Merced Expressway with Campus Parkway and a potential

southern extension across Highway 99, may challenge the idea of creating a TPP on Bellevue Avenue within the study area. Regional expressways tend to encourage lower-density development patterns and can discourage adjacent residential development (within a half mile), thus potentially not supporting a TPP corridor along Bellevue Road.

2.6.5. **Complete Streets Benefits.** Access to public space is critical to safe, healthy, and prosperous communities. Successful implementation of a comprehensive *complete street* program can accomplish numerous public benefits including: support for existing businesses, reduced public and private costs, business attraction, increased development potential, reduced air pollution and greenhouse gases, reduced traffic collisions, provision for safe routes to school; health benefit, and increased mobility options for all, notably those unable to drive.

2.6.6. **The California Complete Streets Act (AB 1358).** This laws states in part, **"**Commencing January 1, 2011, upon any substantial revision of the circulation element [this would include adding a circulation element to a community plan] , the legislative body shall modify the circulation element to plan for a balanced, multimodal transportation network that meets the needs of all users of the streets, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan."

2.6.7. **Foundational Goals and Policies**. The City's General Plan envisions that all streets should be designed as "Complete Streets" which address all modes of motorized and non-motorized transportation, including vehicles, transit, pedestrians, and bicycles. These goals and policies form a foundation upon which to design, build, and construct complete streets within the Bellevue Corridor Community Plan.

2.6.8. **Bellevue Corridor Community Plan (BCCP) Circulation.** The *Merced Vision 2030 General Plan* and public comments gathered during the community outreach efforts of the BCCP are the cornerstones that define the vision of the BCCP. The overall vision for circulation is to provide multi-modal transportation system throughout the planning area for use by vehicles, pedestrians, bicycles, and public transit, consistent with the principles of the General Plan's Urban Design Chapter. These principles emphasize planning, design, and construction for all modes in a manner that results in high usage levels. As such, roadways are treated as the essential element in the urban fabric that *connects* rather than *separates* neighborhoods located on opposite sides of a road. Separation of neighborhoods typically occur when road planning, design, and construction focuses primarily on vehicular travel, to the detriment of other travel modes.

2.6.9. **Placemaking.** Streets comprise a large portion of publicly owned land in cities and towns. Streets are a huge part of any community's public space network, and historically served as meeting places, playgrounds for children, marketplaces, and more. As populations spread out from city centers, most American cities have come to view streets primarily as conduits for moving vehicles from one place to another. While moving vehicles is one of their purposes, streets are spaces, even destinations in and of themselves, for example, the intersection of Canal Street and Main Street (Bob Hart Square) in downtown Merced.

2.7. **Future Traffic Volumes.** Traffic volumes on planned arterials based on buildout described by the General Plan are as follows for the BCCP:

Bellevue Road. The forecasted traffic volume for Bellevue Road is between 50,000 and 60,000 vehicles per day within the BCCP area. This volume of traffic typically requires a six-lane configuration (up to eight lanes in some cases) in an Expressway or Major Arterial alignment in order to satisfy level-of-service standards.

Cardella Road. The forecasted traffic volume for Cardella Road is between 30,000 and 40,000 daily vehicles. This volume of traffic typically requires a four-lane configuration.

G Street. The forecasted traffic volume for G Street is over 30,000 vehicles per day. This volume of traffic typically requires a four-lane configuration.

Gardner Road. The forecasted traffic volume for Gardner Road is just over 30,000 vehicles per day. This volume of traffic typically requires a four-lane configuration.

2.8. Transit Priority Projects.

2.8.1. Definition. Transit Priority Areas were introduced in California's Senate Bill 375, which was intended to align regional transportation, land use, housing and greenhouse gas emission reduction planning. Transit Priority Projects (TPPs) are housing or mixed-use residential projects with 20 dwellings per acre or more that are located within a Transit Priority Area and meet the following criteria:

- Contain at least 50 percent residential use. If non-residential uses are between 26 and 50 percent, 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.

2.8.2. Transit-Adjacent vs. Transit-Oriented Development. The intent of a TPP is to encourage transit-oriented development (TOD). However, the creation of truly transit-oriented land uses along transit corridors can be a challenge and often results in transit-adjacent development (TAD) that is not truly transit oriented.

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). Characteristics include: a grid street pattern, high densities, mostly underground or structured parking, pedestrian-focused design, bicycle access and parking, multi-family homes, office an retail land uses (especially along main streets), vertically and horizontally mixed land uses, and stores and local-servicing land uses designed for pedestrian access. Older segments of Merced's street network were developed with land uses oriented toward adjacent streets, a desirable trait for promoting TOD.

TAD is characterized by land use patterns within a half-mile radius of a transit station that do not use the proximity to transit to promote compact, focused development that fosters multimodal transportation. Characteristics include: a suburban street pattern, low densities, dominance of surface parking, limited or no pedestrian access, single-family homes, industrial land uses, segregated land uses, and gas stations, car dealerships, drive-thru stores and other auto-focused land uses. Newer segments of the M Street Transitway Corridor have been developed with characteristics of TAD. Land uses are internally oriented with sound walls separating the transit corridor from adjacent residences.

2.9. Urban Village Concept. The Urban Village is essentially a neighborhood with high connectivity and internal variety that are served by some type of commercial area The Urban Village includes an "Inner

Village" which contains the most intense housing in the neighborhood along with any civic, commercial or retail businesses, as well as an "Outer Village" that contains the least intense housing in the neighborhood any parkland and schools.

2.10. **Open Space.** The General Plan establishes an integrated framework of open spaces. Chapter 7 'Open Space, Recreation and Conservation' identifies eight types of park space ranging from Mini-Parks and Neighborhood Parks to Athletic Parks and Linear Parks.

2.11. **Urban Design Guidelines.** The General Plan provides design guidelines for the following:

Street Design. This includes guidance on a variety of subjects including commercial streets to street vistas, street trees, pedestrian routes, and bike parking.

Commercial Areas. This addresses parking lots, architectural character, landscaping, Center configuration, building setbacks, and upper story uses in Centers.

Residential Areas. This addresses the appearance of single- and multi-family housing types including building entries, garages, facades, building setbacks and heights.

Overall Community. This addresses a wide variety of subjects aimed at enhancing Merced's identity as a community.

3. RECOMMENDATIONS

3.1. **Plan Name.** If the BCCP continues using 'Corridor' as an implementation term as described below, the Plan name should be changed from Bellevue *Corridor* Community Plan to Bellevue Road Community Plan or another acceptable name.

3.2. **Circulation Network.**

3.2.1. **Traffic Dispersal Strategy.** As part of the BCCP effort, the City should consider a dispersal strategy within 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 to help disperse traffic that would access potential mixed-use development and reduce volumes on the adjacent arterials.

3.2.2. **Recommended Elements of the BCCP *Complete Street* Program.** *Complete-stree*t approaches and designs to be used when crafting prescriptive right-of-way cross sections and design templates for Plan streets and adjacent public and semi-public spaces should consider: street networks and road classifications, traveled way design, intersection design, pedestrian design, bikeway design, transit accommodations and placemaking.

3.2.3. **Apply the Grid Street Network.** The chosen street network design of a city is a significant factor in determining whether the environmental, social, and economic needs of its residents can be met. A street network can foster or constrain economic and social activity, enhance or limit social equity in ability to travel and provide or negate a setting for high quality design at all scales: building, neighborhood, and region.

3.2.4. **Road Design is Land Use Design.** The design of the road is critical to the design of the entire street right-of-way because it affects not just the users in the road, but those using the entire right-of-way, including the areas adjacent to the street. This in turn affects the design and vitality of the adjacent land uses. Select the best right-of-way to support and enhance the desired land uses.

3.2.5. Boost Bicycle Usage. Bicycle infrastructure should use planning and designing options, from shared roadways to separate facilities, to accommodate as many user types as possible and to provide a comfortable experience for the greatest number of cyclists.

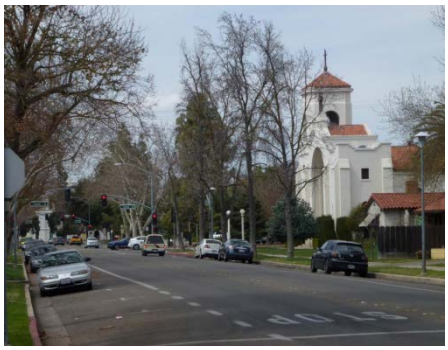
3.2.6. Use the Road to Create Special Places for People to Gather. Within the plan area, identify road segments and/or intersections that can also be public spaces, places that offers greater value to pedestrians, bicyclists, and transit riders, and which create a unique site for business and community events.

3.2.7. Benchmark and Performance Measures. Conventional street design applies auto-centric performance measures. The most common is the Level of Service (LOS), which seeks to maintain flow of vehicles and leads to widening streets and intersections, removing on-street parking, and other strategies to accommodate the flow of traffic. These techniques undermine the goals and tenets of complete streets. To meet the goals and tenets of complete streets, the BCCP plan should adopt additional benchmarks and performance measures.

3.2.8. Boulevard. A variation of the boulevard configuration, including on-street parking, could be considered as part of a complete street strategy for Bellevue Road.

3.2.9. Mixed-Use Collector. The City should consider introducing a "mixed-use collector" street type that allows on-street parking, shorter distances and less setbacks from the sidewalks. The provision of collector streets within the BCCP area can help to reduce traffic volumes on portions of Bellevue and Cordella, 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. Mixed-use collectors can be modeled after existing, walkable "complete street" segments in Downtown Merced.

Mixed-Use Collector Prototypes: Downtown Merced



3.2.10. Transitway Corridors. The UC Merced campus is a key transit trip attractor with a transit hub near Lake Road about ¼ mile south of Bellevue Road. With this in mind, the City should plan as direct a transit corridor as possible between UC Merced and Downtown Merced, and/or the potential high speed rail station and include:

- A Transitway corridor for BRT with dedicated bus lanes between Downtown and UC Merced via M Street or G Street; or

- A Transitway corridor for RBS with shared travel lanes on the Bellevue Road/Atwater Merced Expressway (AME).

3.3. Transit Priority Projects.

3.3.1. Development Standards Implications. The TPP requirements should be implemented through standards for the blocks within a half-mile of a major transit stop once those areas are identified in the vision for the BCCP.

3.3.2. Transit Options. Bus Rapid Transit and Rapid Bus Service are potential transit options for the BC. On some corridors, RBS can achieve similar travel time savings as could be achieved with dedicated bus lanes, with substantial cost savings. This may be a viable option for the Bellevue Road and AME segments.

3.4. Blocks.

3.4.1. Walkable Block. The term 'walkable block' should refer to blocks that are not large and do not favor vehicles to the exclusion of pedestrians. A walkable block is typically up to 600 feet long in any direction and has pedestrian-oriented streetscapes with vehicular speeds that are typically less than 35 miles per hour. If speeds need to be higher, such as along a Boulevard, the street is designed to be in balance with the pedestrian activity expected along its edges. Block sizes within the BCCP area should range from 200 to 600 feet.

3.4.2. Blocks System. Using a system of flexible blocks allows an owner to map out a preferred pattern that can be adjusted as needs or priorities change while still adding up to a coherent pattern of land uses. Mapping out the potential blocks on a property enables an owner to move forward with different areas of the property while knowing generally how each portion will connect and make sense with the rest. The mapping of blocks only becomes official when a subdivision is approved. Through this approach, there is less need to map blocks and lots prematurely. In addition, using this approach will help when the market is changing for other types of development that were not anticipated when drafting the BCCP and standards.

3.4.3. Retail and Business. Implementation standards should generate blocks and streets that are conducive to retail and business environments which may also need large parking areas while connecting with adjacent neighborhoods.

3.5. Land Uses.

3.5.1. Mix of Uses. The BCCP should include a mix of uses: residential, retail, office, research and development (R & D)/flexible space.

3.5.2. Ability to Adapt to the Market. Knowing that land use demand will change over time, the BCCP should identify the sizes of buildings that are expected and then accommodate not require a variety of land uses that may be in demand over the long term. Then, the BCCP code should provide standards that identify the maximum sizes of buildings (in stories and length, not FAR) depending upon their location and adjacencies along with a set of allowable land uses so that the owner has flexibility on to occupy the building over time.

3.5.3. R & D/Flexible Space. Planning for 2.5 to 5 MSF R&D/flexible space around UC Merced would be aggressive but also allow for "upside potential".

3.6. Organizing Components. The Urban Village concept described in the General Plan is best implemented using traditional city environments: Centers, Neighborhoods, Districts, and Corridors.

3.6.1. Centers. Centers are concentrations of non-residential and residential activity such as retail, office and service commercial with housing that is more intense than the housing in Neighborhoods or along corridors. The main purpose of Centers is to provide the focal points of business, housing, and civic activity that serve a variety of needs. Centers are sometimes located in geographically central locations but are typically located between Neighborhoods along key streets or at the edges of Districts and along Corridors.

The recommended Regional, Community and Neighborhood Center types described below modify and build upon the Center concepts described in the General Plan. A Regional Center type should be added and the Community Center type should be merged with the Neighborhood Center to provide flexibility to respond to the changing retail industry. Additionally, the minimum acreage requirements are modified based on the trend toward smaller stores in the retail industry.

3.6.1.1. Center Types.

Regional. Regional Centers contain retail and service businesses that attract customers from the region. This typically includes anchor stores that have the widest trade area of stores in Merced. A planned Regional Center is centered 0.5 miles west of the intersection of Bellevue Road and "G" Street.. Regional Centers should be a minimum of 20 acres for the Center and a minimum of 20 acres for urban residential for a total required minimum size of 40 acres.

Community. Community Centers contain retail and service businesses aimed at the greater Bellevue area. This typically includes a supermarket, pharmacy, ancillary retail, professional office, junior anchor stores, and health clubs. Community Centers should be a minimum of 20 acres for the Center and a minimum of 10 acres for urban residential for a total required minimum size of 30 acres.

Neighborhood. Neighborhood Centers contain retail and services aimed at the nearby Neighborhoods. This typically includes a supermarket, additional anchor, major ancillary retail, and provisional office. The Neighborhood Center should also incorporate the Convenience Center type as described in the General Plan, which was intended to include a convenience mini-market with some ancillary retail. Neighborhood Centers should be a minimum of five acres for the Center and a minimum of 10 acres for urban residential for a total required minimum size of 15 acres.

3.6.1.2. Characteristics.

Components. Centers consist of interconnected, walkable blocks of commercial or mixed uses. The second component of each Center is the immediately adjacent area that typically focuses on more intense residential or mixed-use residential (generally the Urban Residential Neighborhood type as described below.

Location and Layout. Centers are located adjacent to the intersection of a collector or side street and a major arterial while the Urban Residential Neighborhood areas are located further into the site, away from the major arterial but with high interconnectivity to the Center. It is essential that the commercial and retail space be visible to and accessible by

community-wide traffic. Some of the commercial buildings should be located along the arterial to shape the streetscape while providing strong views of the parking for larger tenants farther from the arterial.

To create connectivity, side streets should be inserted into the larger shopping center pattern to break up the mass of buildings, promote walking from adjacent neighborhoods and generate an appealing physical character.

The land for each Center should be as efficient as possible so as not to result in physical separations that waste land and to create positive adjacencies with neighboring residences.

Flexible Buildings. The development standards should provide a variety of flexible building types, rather than conventional zoning requirements, to address the wide range of uses (including civic) in Centers and as the way to realize commercial space. The standards should offer a variety of compatible building sizes that can be adjacent to each other and still generate an appealing physical character. The standards should require connectivity along the streetscapes adjacent to facades instead of cutting up a development site with unnecessary and poorly visible pedestrian-only pathways.

3.6.2. Neighborhoods. Neighborhoods are primarily residential areas consisting of a variety of housing choices. Neighborhoods will comprise most of the area and will be shaped by Centers, Districts and Corridors. There are three types of neighborhoods: Urban Residential, Neighborhood Residential, and Rural Residential. The appropriate neighborhood type depends on factors such as location, role and intensity. Different neighborhoods can and should be located next to each other for variety, flexibility and adaptation to changing conditions.

3.6.2.1. Types

Urban Residential. This is the most intense of the neighborhood types. Housing typically ranges from rowhouses to courtyard apartments to dense apartment buildings in a variety of sizes. Mixed-use activity typically occurs in the transitions between this neighborhood type and adjacent Districts, Corridors or Centers. Urban Residential streetscapes are typically shaped by narrow, tree-lined streets with on-street parking and short front yards, and entries to buildings directly from the front yard.

Neighborhood Residential. This is the typical neighborhood type with housing types ranging from single-family houses to a variety of house-form multi-family buildings such as duplexes and quadplexes. Neighborhood Residential Streetscapes are typically shaped by tree-lined streets with on-street parking and a variety of moderate to large front yards and entries to buildings directly from the front yard.

Rural Residential. This is the least intense of the neighborhood types and housing typically ranges from single-family housing in agricultural settings to single-family houses in rural settings. Rural Residential streetscapes are typically shaped by natural features with a rural character along both sides of streets and large yards around all sides of buildings.

3.6.2.2. Characteristics

Components. Each neighborhood consists of interconnected, walkable blocks.

Building Type. The primary building in Neighborhoods is the house and its various multi-family versions. Some Urban Residential Neighborhoods will have house-form buildings and larger, denser residential or mixed-use buildings.

The house-form range of building types that is most appropriate based on location, role, and overall intensity should be applied. The ability of the house-form range to adapt to the three neighborhood environments inherently provides for a realistic variety of housing choices and allows each neighborhood to adjust to its setting with flexibility and predictability.

3.6.3. Districts. Districts are areas with a unique size or function, typically as R & D or light industrial.

3.6.3.1. Types

Research and Development. These Districts are typically high in proportion of employees to building area and may have outdoor areas for activities such as light assembly and testing.

Light Industrial. These Districts are typically low in proportion of employees to building area and have large outdoor areas for activities such as assembly and testing.

3.6.3.2. Characteristics

Components. Each District consists of interconnected, walkable blocks that are large enough to accommodate the large size of buildings associated with the unique activities of the Districts. Blocks are not as interconnected as in other areas of quadrants but are connected to adjacent blocks and their environments.

Streetscapes. District streetscapes are typically shaped by tree-line streets with on-street parking and short front yards or commercial shopfronts along the sidewalk with entries to buildings directly from the sidewalk.

Buildings and Adjacencies. The primary buildings in Districts are the largest of buildings in the BCCP. These block-form buildings are sometimes located within the middle of a site but often are toward the street behind a front yard or commercial shopfront to emphasize space at the rear of sites for maneuvering of vehicles and equipment.

Adjacent Neighborhoods are buffered by streetscapes that serve as a physical transition between large office and light industrial buildings on one side of a street to larger residential building such as those in the Urban Residential Neighborhood type. Alternatively, transitions can be made at the rear of a District and the rear of a Neighborhood type, but this puts more focus on the need for compatibility between outdoor activities on both sides of the boundary.

Where Districts are immediately adjacent to a major thoroughfare, buildings are oriented to front on the thoroughfare or at least orient a side of the building along the thoroughfare to shape and provide identity to the streetscape.

3.6.4. Corridors. The term 'Corridor' refers to the land on both sides of a major thoroughfare but only for the half-block or lots fronting the thoroughfare. The main purpose of a corridor is to function as the segment of development and activity between major components such as Centers and Districts and to buffer Neighborhoods from major thoroughfares.

3.6.4.1. Types

Urban. These Corridors are typically the Urban Neighborhood Residential environment adjusted for office and housing along major thoroughfares. Urban Corridor streetscapes are typically shaped by tree-lined streets with on-street parking and a variety of modest front yards. Where office activity is included, ground floor commercial shopfronts along the sidewalk provide entries to buildings directly from the sidewalk.

Neighborhood. These Corridors are typically the Neighborhood Residential environment adjusted for the type of housing appropriate along major thoroughfares. Neighborhood Corridor streetscapes are typically shaped by tree-lined streets with on-street parking and large front yards with entries to buildings directly from the front yards.

3.6.4.2. Rural. These Corridors are typically the Rural Residential Neighborhood environment adjusted for interface along major thoroughfares. Rural Corridor streetscapes are typically shaped by the natural or rural character along both sides of streets and a variety of the largest front yards in the Plan area.

3.6.4.3. Characteristics

Components. Each Corridor consists of lots that face each side of the major thoroughfare connecting directly to the adjacent blocks in Centers, Neighborhoods, or Districts.

Buildings and Adjacencies. Buildings in Corridors are primarily a variety of house-form and block-form buildings that are in keeping with the intended physical character of a Corridor segment. Adjacent areas and buildings are typically buffered by physical transitions in building scale and massing along the side and rear boundaries of Corridor lots.

3.7. Open Space. Upon establishing the intent and role of each quadrant in the BCCP, the corresponding range of appropriate open space types as described by the General Plan will be identified for adjustment to each environment within Centers, Neighborhoods, Districts and Corridors.

3.8. Scale, Interconnectivity and Compatible Adjacencies. The issues of scale, interconnectivity and compatible adjacencies should be addressed in the standards. We recommend using an approach that identifies the range of building types and sizes for the various types of Centers, Neighborhoods, Districts and Corridors. This information can be adjusted for each location and translated into clear development standards for each implementing zone.

3.9. Building Size and Intensity. Using a scale of size and intensity that sorts buildings into two categories (Block-Form and House-Form), the appropriate buildings and sizes can be identified for each environment. Buildings in Centers, Districts and Corridors fall into mostly the Block-Form category with some House-Form buildings. Buildings in Neighborhood areas fall entirely into the House-Form category.

REPORT 1:

Economic Analysis for the Bellevue Corridor Community Plan

MEMORANDUM

To: Lisa Wise Consulting

From: Jason Moody, Walter Kieser, and Ben Sigman

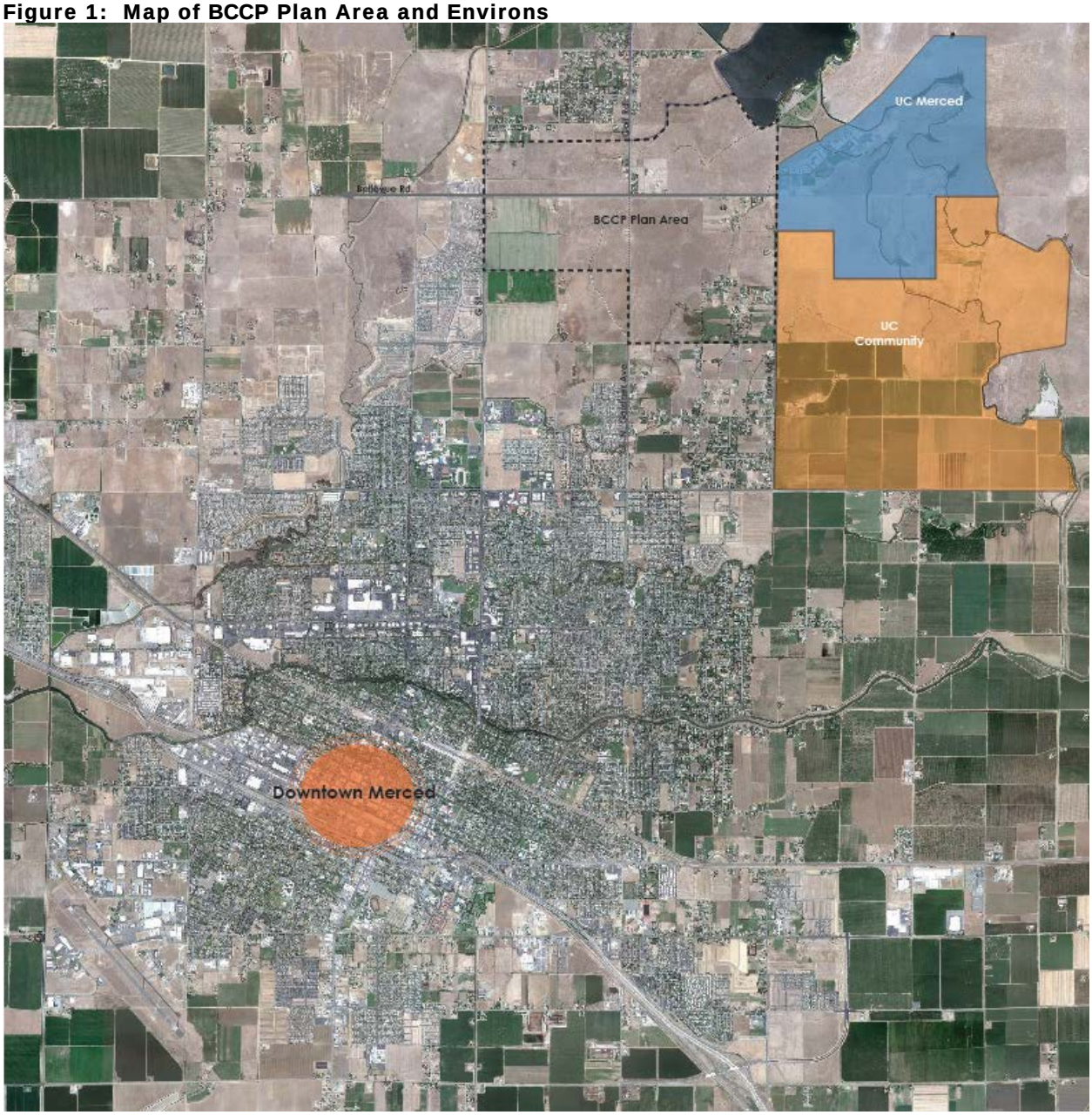
Subject: Economic Analysis for the Bellevue Corridor Community Plan; EPS #21139

Date: January 18, 2012

The City of Merced has retained a planning team led by Lisa Wise Consulting (LWC) to prepare the Bellevue Corridor Community Plan (BCCP). As a part of this team, Economic & Planning Systems, Inc. (EPS) is tasked with providing an assessment of real estate market conditions affecting development feasibility. This memorandum provides our assessment, including a general background on existing market conditions, future growth prospects, and supply and demand dynamics. Following consideration of this market assessment, EPS will work with the BCCP team to prepare recommendations concerning specific development opportunities and strategies for the Bellevue Corridor.

The Bellevue Corridor is located northeast of the City of Merced, roughly five miles from downtown Merced and Highway 99. As illustrated in **Figure 1**, the BCCP Area is located between G Street and the University of California, Merced (UC Merced) campus, within unincorporated Merced County. With the exception of the UC Merced campus, the Bellevue Corridor is presently characterized by rural residential and agricultural uses, though nearby areas within the City boundary exhibit suburban residential development patterns and some commercial uses. The Plan area is located within the City's Sphere of Influence and is considered for urban expansion by the City's General Plan.

Figure 1: Map of BCCP Plan Area and Environs



Sources: LWC and City of Merced

Key Findings Concerning Economic Context

1. ***Consideration of an appropriate land use program for the Bellevue Corridor occurs within a regional market context characterized by continuing weak economic conditions, depressed housing prices, and stressed local government finances.***

While recent market activity suggests economic recovery, a return to healthy economic conditions is likely to be gradual.

The Great Recession continues to have a profound effect on real estate market conditions in the San Joaquin Valley, including Merced County and the City of Merced. The San Joaquin Valley remains one of the most severely affected regions in the United States in terms of foreclosures, "up-side down" properties, construction industry contraction, and unemployment. Merced County, in particular, has been hard hit. In 2010, for example, residential foreclosures as a share of total housing units was greater in Merced County than any other county in California, one of the hardest hit states in the nation.[1]

Weakness in the residential market remains a persistent and harmful drag on the Merced economy. Currently, home pricing remains below construction cost for most product types and homebuilders are unable to compete with existing re-sale properties available in the marketplace. Specifically, after City of Merced single-family residential prices peaked at more than $230 per square foot in 2005, values plummeted to roughly $60 per square foot in 2009, and have hovered in the $60 to $70 range since. Price recovery is likely to be slow, with substantial existing "latent supply" associated with bank-held properties, speculative ownership, and pending foreclosures coming to market in the future. While there was virtually no new residential construction in Merced in 2009 and 2010 (building permit activity dropped to nearly zero), permitting did pick up in 2011.

2. ***Recent statewide and regional growth forecasts indicate a wide range of potential future population growth scenarios for Merced County, suggesting a high level of uncertainty associated with the type and amount of new real estate development.***

Demographic forecasts for Merced County vary widely by source, ranging from a high of 160,000 to a low of 45,000 new residents by 2030. While recent private forecasts indicate the county might grow by 45,000 between 2010 and 2030, the Merced County Association of Governments projection is for nearly 160,000 new residents over the same time period. Meanwhile, California's most recent Department of Finance forecast indicates that the population of Merced County will increase by about 100,000 between 2010 and 2030, consistent with recent projections prepared on behalf of the eight San Joaquin Valley regional planning organizations. Taken as a whole, these projections reveal that actual growth depends on a number of variables that are difficult to predict with a certainty at this time.

3. ***During the past several decades the City of Merced has entitled and planned for a substantial amount of new development within its Sphere of Influence; other nearby jurisdictions have also created significant development capacity.***

In Merced, as is the case in most other San Joaquin Valley jurisdictions, planned development capacity greatly exceeds short- and, in many cases, long-range development forecasts. While the recently-adopted update of the City of Merced General Plan reduced previous development capacity, substantial development capacity remains available.[2] By

[1] RAND California; DataQuick; US Census Bureau; and EPS.

[2] Merced Vision 2030 General Plan includes a combined SUDP/SOI that is slightly smaller than the 1997 SOI.

way of example, a reasonable estimate of development capacity within and near the BCCP Area, even after recent reductions, suggests planned and approved projects to the northeast of the City could generate about 21,000 housing units and 7 million square feet of non-residential real estate.[3]

4. ***Merced's planned development capacity cannot be realized without substantial investments in infrastructure, including expanded utility capacity and major transportation system improvements, as well as environmental clearance.***

   In the context of relatively unconstrained land supply, development and absorption of particular areas or at specific sites will depend on availability of infrastructure, including utility capacity (e.g., sewer and water) and transportation improvements. Much of the entitled land both within and outside the City of Merced's Sphere of Influence does not have the level of infrastructure needed to accommodate planned of approved growth. In addition, development in many of the areas planned for expansion (or the infrastructure needed to serve these areas) still needs to obtain a variety of environmental clearances (e.g., CEQA/NEPA, ESA).

5. ***Fiscal and institutional factors will also influence the location and timing of new development and associated infrastructure.***

   Although the Bellevue Corridor is within the City's Sphere of Influence, the County's jurisdiction in the area limits the ability of the City to extend municipal services and infrastructure to new development. City annexation of the BCCP area will require approval by the Merced LAFCO, and likely the negotiation of a new property tax-sharing agreement with the County (without such an agreement the City will not receive property taxes from the area). Moreover, the persistence of depressed housing prices continues to make the development-based financing that historically provided funding for needed infrastructure much more constrained and challenging.

   Even regional-serving beneficial projects are proving difficult to fund, due in part to increasing conflict and tension between local jurisdictions as they compete for scarce fiscal resources. By way of example, the Atwater/Merced Expressway Project (AME) would transform Bellevue Road into a regional transportation route, creating a high-volume road that connects Highway 99 (at Buhach Rd), Castle Air Force Base, and UC Merced. However, the timing and funding for the AME project remain uncertain with more than $120 million still needed to cover the cost of the first two phases (I-99 to SR 59 at Bellevue).

6. ***While the City of Merced competes with other locations in Merced County and the broader San Joaquin Valley for jobs and associated commercial real estate development, it maintains a number of competitive advantages that make it well positioned to capture a disproportionate share of growth.***

   Various cities in the US 99 corridor, including Modesto and Turlock, as well as nearby Atwater and unincorporated areas such as Castle Air Force Base offer alternatives to Merced as

[3] City of Merced, January 2013

locations for both business and housing. However, the City of Merced possesses a number of competitive attributes that will enable it to compete effectively for regional growth potential:

- UC Merced, the only University of California Campus in the San Joaquin Valley;
- Likely location of a future high-speed rail station and existing multi-modal public transit;
- Stable, diverse community with attractive residential neighborhoods and appealing urban form (including a historic Downtown);
- "Gateway" to Yosemite and other outdoor recreation areas; and
- Convenient and successful retail shopping options (e.g., Merced Mall).

Key Findings Concerning the Bellevue Corridor

1. ***While the Bellevue Corridor is well positioned for growth, it is likely to face competition from other areas planned for development both within and outside the City Sphere of Influence.***

   The BCCP area location between developed portions of the City and the UC Merced Campus creates the opportunity to absorb UC Merced-related uses, without a "leap-frog" development pattern. The Plan area is large enough to accommodate a diversity of urban uses including a range of residential formats, retail uses, office, and institutional uses. In addition, a number of relatively large parcels are adequately sized for development without site assembly, a cost advantage over development areas with smaller sites. However, the existing development pattern that includes a number of rural residential developments may include some "hold out" property owners that constrain capacity and design of new development.

   While the Bellevue Corridor is a logical location for the City's expansion, existing development capacity within the existing City limit, especially in North Merced (e.g., Bellevue Ranch), will have a substantial cost advantage over the Bellevue Corridor location until a substantial portion of that existing approved development capacity is absorbed. In addition, the Bellevue Corridor could compete directly with planned development in the University Community that lies immediately south of the UC Merced Campus.

2. ***UC Merced is anticipated to drive growth proximate to the campus, supporting levels of absorption and density that may not be achievable elsewhere in the County.***

   At build out, UC Merced anticipates having a student population of 25,000, faculty and staff population of 6,500, and other daily population of about 600.[4] Current schools include the School of Engineering, School of Natural Sciences, and School of Social Sciences, Humanities and Arts, while planned schools include a School of Management and School of Medicine. UC Merced is committed to research activities, having already established programs such as the Health Sciences Research Institute, Sierra Nevada Research Institute, UC Merced Energy Research Institute and University of California Advanced Solar Technologies Institute. Funding is in place for additional research institutes in a number of other specialized fields.

[4] 2009 DEIS/DEIR

UC Merced will be the primary economic driver of real estate development in the Bellevue Corridor. This strategic location is likely to support clustered and more dense development patterns, especially for sites that are easily accessible (i.e., within walking distance) from the UC campus. Over time improved roadway connections such as the Atwater/Merced Expressway Project (described above) and the Campus Parkway Project, a connection between the Bellevue Corridor and Highway 99 to the south, may also expedite development of the BCCP area.

The time frame for UC-related development adjacent to the campus will be affected by the manner and pace in which UC programs grow. Currently, the State's fiscal crisis is affecting UC Merced's ability to proceed with its capital investment program for the campus, which may actually create opportunities for private sector actors to pursue real estate development that supports the campus expansion goals. The UC recently convened a ULI panel to evaluate the impacts and feasibility of a more "distributed growth" model for the UC as a potential mechanism address funding shortfalls.

3. ***While both the planned University Community and the Bellevue Corridor will need to resolve a number of infrastructure and institutional issues before development can occur, Bellevue appears to have a competitive advantage in this regard.***

Though UC Merced is located in unincorporated Merced County and is not within the service area of the utilities provided by the City of Merced, the campus area is provided water and wastewater service by the City of Merced under a Pre-Annexation Agreement. Water is primarily supplied by a line constructed within the roadway alignment of Bellevue Road. A sanitary sewer line also runs along Bellevue and connects to the City of Merced's sewer system at an existing trunk line on G Street, near Merced College. Although the sewer pipeline under Bellevue Road is sized to serve the full development of the campus, upgrades to the existing trunk line on G Street would be required.[5] There is no existing infrastructure of this nature serving the UC Community Plan area.

While detailed infrastructure cost estimates would be required to quantify any advantage the BCCP has over the UC Community Plan area, the presence of existing sewer and water lines along Bellevue Road suggests that new development could be more readily accommodated within the BCCP area. The timing and ease of annexation to the City of Merced, and thus the provision of urban services, would also seem to favor Bellevue Corridor since its location represents a more logical extension of the existing City limits.

4. ***Depending on how a number of institutional and infrastructure issues are resolved, the Bellevue Corridor appears well positioned to capture a portion of the regional growth currently designated to occur on the University Community Plan area.***

The University Community Plan, located along the southern border of the UC Merced campus, calls for more than 800 acres of new residential, retail, office/R&D, and other urban land

[5] Ibid.

uses, as summarized in **Figure 2**.[6] The Plan was designed to capture economic activity generated by UC Merced (and students, faculty, and staff), based on its demand for goods and services in the regional economy. However, as noted above, the Community Plan must address a number of challenges before construction can commence, including the provision of adequate infrastructure and other public services. In many respects, the Bellevue Corridor is equally or better positioned to capture market demand generated by the UC, given the corridor's location, access to infrastructure, ownership patterns, and other factors. Ultimately, the timing and share of market demand absorbed by these two areas, or other competitive locations nearby, will depend on how a range of highly-uncertain economic and institutional factors unfold over time.

Figure 2: Land Use Summary for the University Community (Northern Area)

Land Use	Town Center	Neighborhoods	Total
Single Family			
Units	1,418	3,356	4,774
Acres	45	330	375
Multi-Family			
Units	-	480	480
Acres	4	10	14
Mixed-Use			
Office (Sq. Ft.)	313,600	-	313,600
Retail (Sq. Ft.)	183,000	-	183,000
Housing (units)	540	-	540
Total Acres	15	-	15
Retail			
Sq. Ft.	130,700	78,400	209,100
Acres	8	6	14
Research & Development			
Sq. Ft.	2,308,300	-	2,308,300
Acres	71	-	71
Other[1]	66	273	339
Total Acres			**828**

(1) Includes schools, parks, and public ROW.

[6] Based on the land program described in the UC Merced and University Community Project EIS/EIR which has California Environmental Quality Act (CEQA) clearance.

5. ***While demand for research and development space is unknown, a high-level case study analysis reveals that planning for 2.5 to 5 million square feet of R&D/flex space around UC Merced would be aggressive, but also allow for upside potential.***

   The uncertainty surrounding UC Merced's future research programs and their potential for technology transfer and independent enterprise, coupled with the lack of an established real estate market for R&D space in Merced, make it difficult to establish a reliable estimate of long-run demand for research space. A review of market areas with a UC campus reveals that these areas support a range real estate market demand for R&D/flex space (see **Figure 3**). For example, Yolo County, near Sacramento and home to the UC Davis campus (established more than 50 years ago), supports about 500,000 square feet of R&D/Flex space. Meanwhile Orange County, where UC Irvine is located, supports roughly 18 million square feet of such space. Employment in scientific industries in Orange County is dramatically higher than in both Yolo and Merced Counties. Consideration of real estate market factors, employment characteristics, and UC programs suggest that Merced will attract demand for R&D space, but it is unlikely to exceed 5 million square feet.

Figure 3: Research and Development Case Study Findings

UC Host County	Nonfarm Employment	PSTS (% of Nonfarm)[1]	R&D/Flex Space (MSF)
Yolo (UC Davis)	113,000	6%	0.5
Merced	82,000	3%	***2.3*** [2]
Riverside	800,000	5%	2.7
Orange (UC Irvine)	1,876,000	9%	18

(1) Professional, Scientific, and Professional Services Sector

(2) Proposed development (see **Figure 2** above)

Sources: US Bureau of Economic Analysis; CoStar Group; and Economic & Planning Systems

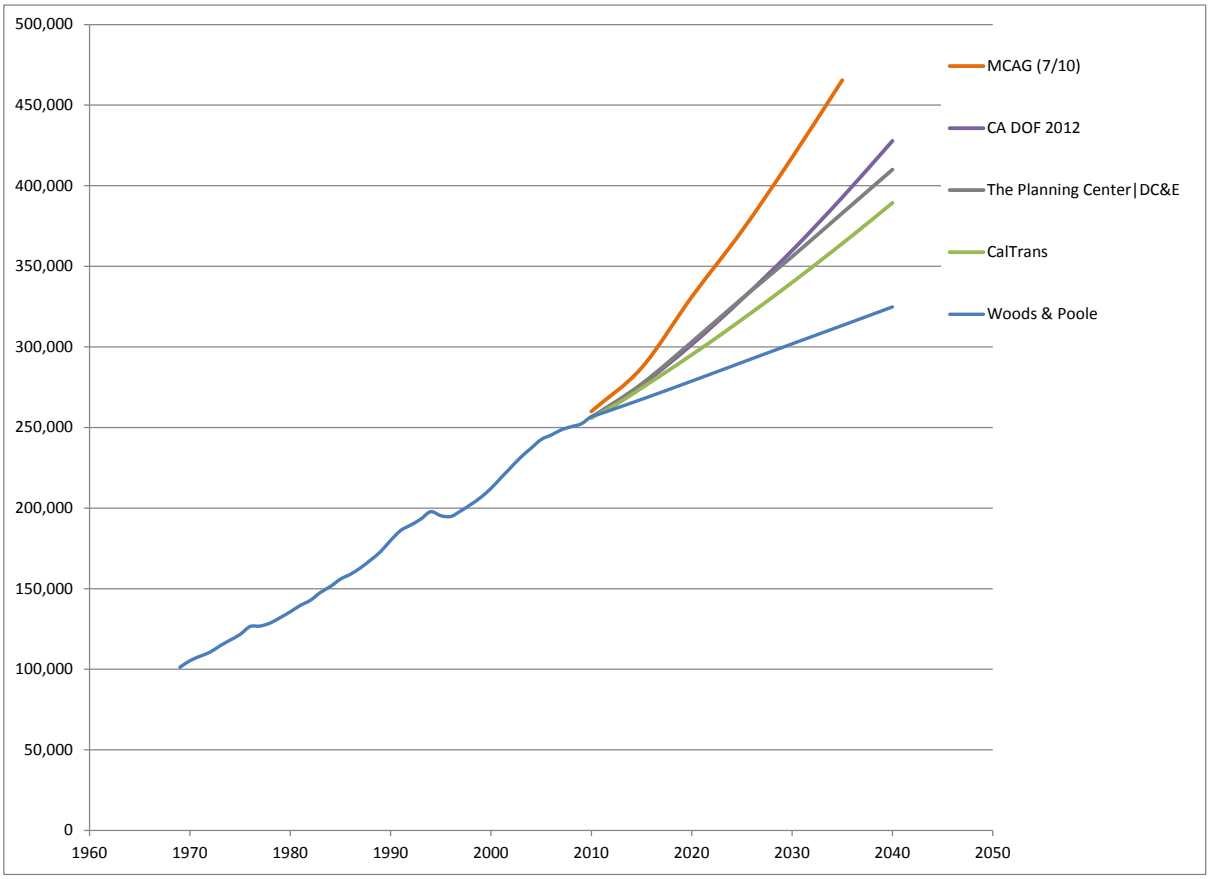
Socio-Economic Trends

Regional socio-economic trends and projections indicate moderate levels of growth and real estate development will continue in Merced County over the next two decades. Recent studies of San Joaquin Valley demographics indicate that Merced County might grow by about 100,000 people by 2030.[7] More conservative forecasts indicate that the County will grow by only 45,000 people (Woods & Poole), while relatively aggressive projections the indicate the figure could be 160,000 (Merced County Association of Governments) over the same time horizon. These

[7] Demographic Forecast for the San Joaquin Valley, Planning Center|DC&E, 2012 and California Department of Finance 2012.

forecasts suggest that average annual population growth rates will likely range from 0.8 percent to 2.4 percent in Merced County.

Figure 4: Total Population Forecasts for Merced County



Sources: Merced County Association of Governments (July 2010); State of California, Department of Finance (DOF); Woods & Poole Economics, Inc., 2012 State Profile; California Department of Transportation, Long-Term Socio-Economic Forecasts by County; San Joaquin Valley Demographic Forecasts 2010 to 2050, The Planning Center|DC&E, 2012; Economic & Planning Systems, Inc.

A recent study by The Concord Group (TCG) considers new housing demand under the population growth forecast prepared by The Planning Center|DC&E. In Merced County, TCG forecasts average annual demand for roughly 1,390 residential units per year (2010-50), one new residential unit for every 3.7 new persons over the next 40 years. Interestingly, TCG projects a significant increase in multifamily housing. The forecast indicates that about 46 percent of new units in the county will be in multifamily projects. This finding is in stark contrast to over 20 years of permit history data which indicate that less than 5 percent of Merced County's new housing units have been multifamily units. TCG's results are reflective of national data that indicate a preference for multifamily products among households with similar demographic characteristics to those households found in Merced County. In the City of Merced, TCG projects that 64 percent of housing demand will be for multifamily units, versus only 11 percent historically.

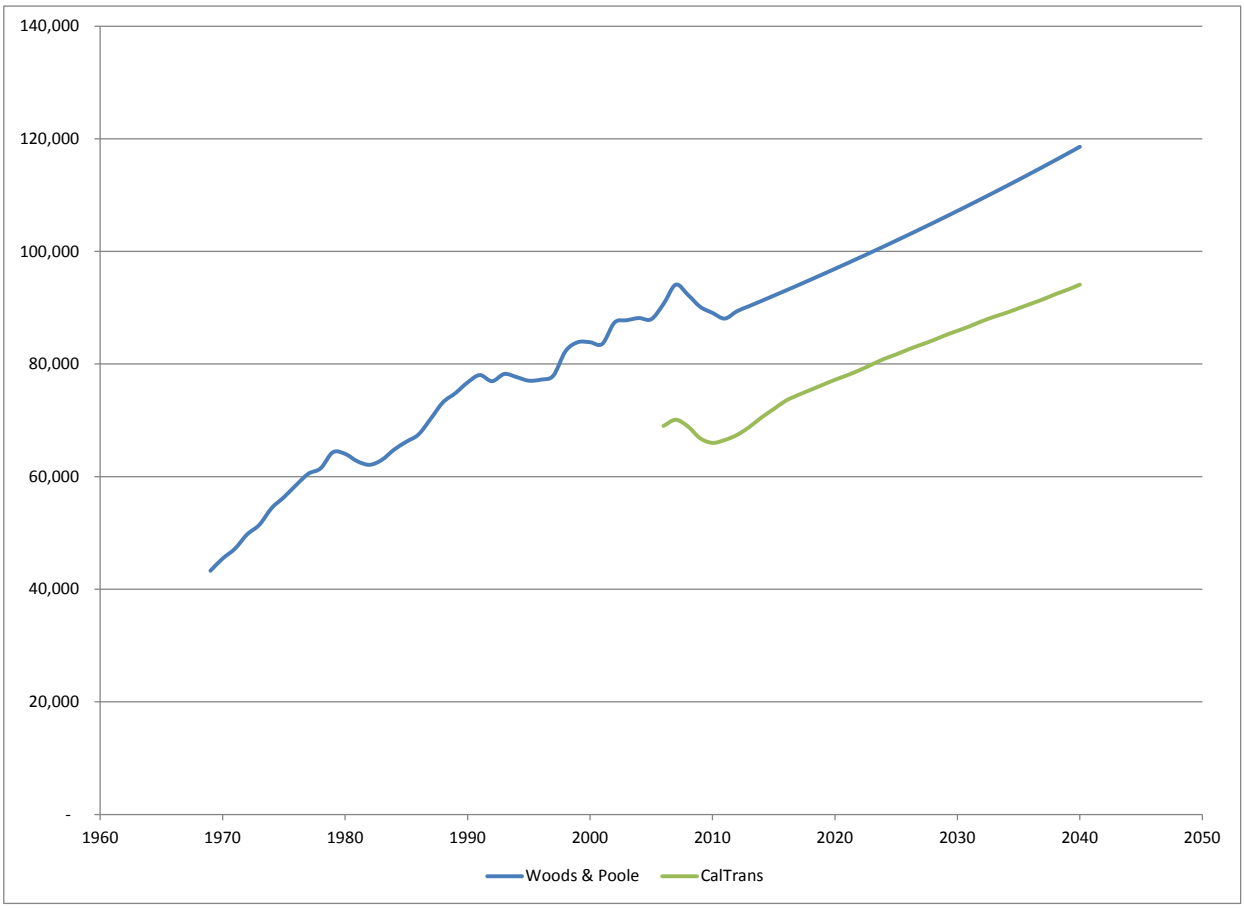
Employment projects support the notion of continued growth in Merced County, although it is unclear whether job growth will be sufficient to support the most aggressive population growth projections. A relatively conservative but well-accepted forecast of employment in Merced County from Woods & Poole indicates that average annual job growth will be approximately 0.9 percent, an increase of about 18,000 jobs over 20 years and 28,000 by 2040.[8] By comparison, the California Department of Transportation forecasts an employment growth rate of about 1.3 percent over the same period.

EPS calculations reveal that 18,000 new jobs over 20 years could support average annual net new demand for 100,000 square feet of office space each year in Merced County. There will also be demand for additional retail and industrial/flex commercial uses. Having captured nearly all County-wide office growth in recent years, the City of Merced is well-positioned to continue to attract new real estate development projects.[9]

[8] Ibid.

[9] While the forecasts are consistent in terms of projected absolute employment growth, the historical and future employment levels reported by Woods & Poole are systematically higher that those reported by the California Department of Transportation due to underlying data sources.

Figure 5: Employment Forecasts for Merced County



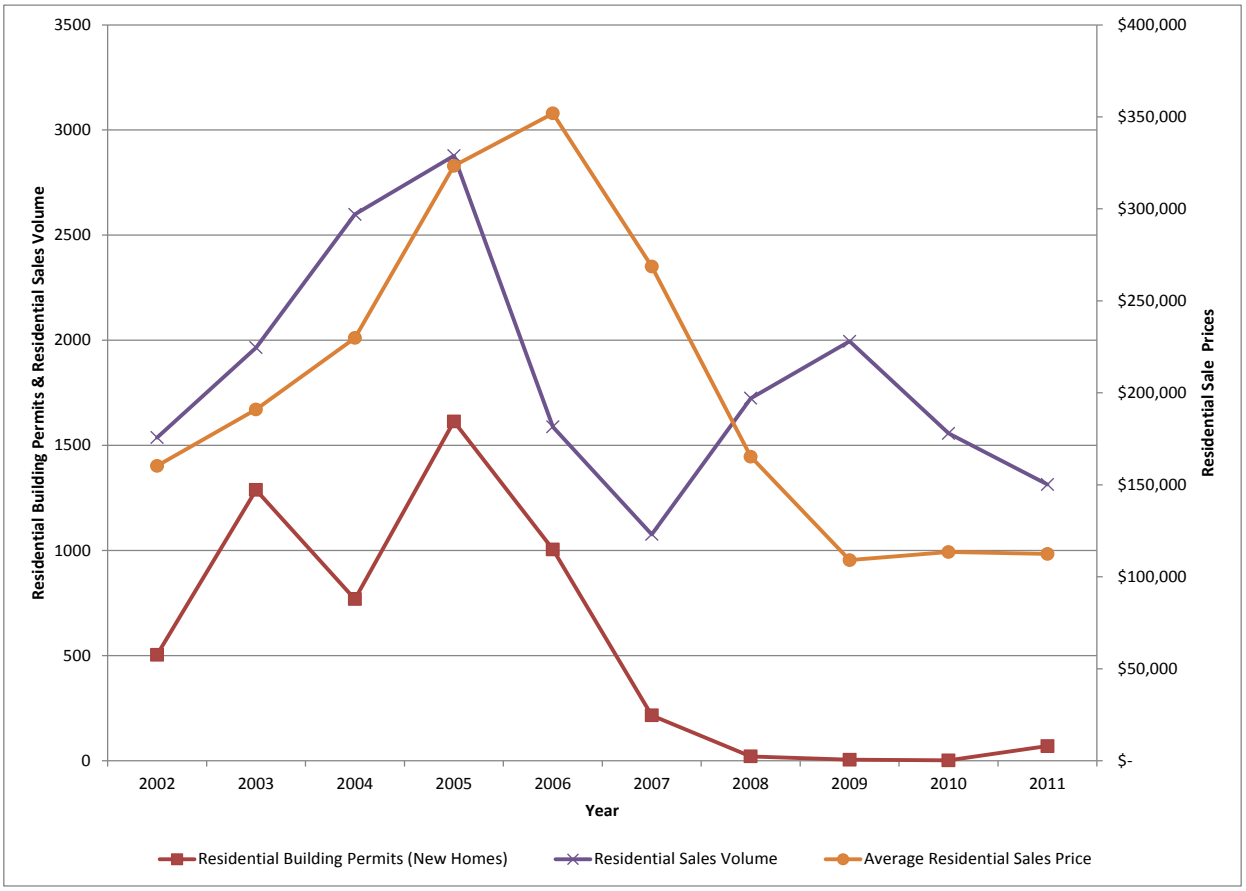
Sources: Woods & Poole Economics, Inc., 2012 State Profile; California Department of Transportation, Long-Term Socio-Economic Forecasts by County; Economic & Planning Systems, Inc.

Real Estate Trends

Residential Market

Recent residential real estate market activity in the City of Merced has increased since hitting a cyclical low in 2007 and there are indications that over time conditions will return to a more normal market and construction activity. However, while prices have stabilized with an average home selling for about $110,000 over the past three years, values remain well below the peak price of $350,000 for an average home in 2006. Sales volumes plummeted with the market prices in 2007, but bounced back as investors entered the market in 2008 and 2009, though transaction volumes have fallen off since then, likely due to diminished market inventory. A substantial portion of market activity is attributable to investors seeking to reap gains as housing market improves. While City permitting of new homes dropped to nearly zero in 2009 and 2010, Merced issued 70 permits for new homes in 2011, a positive sign for housing developers in the City.

Figure 6: City of Merced Residential Permits, Sales, and Prices

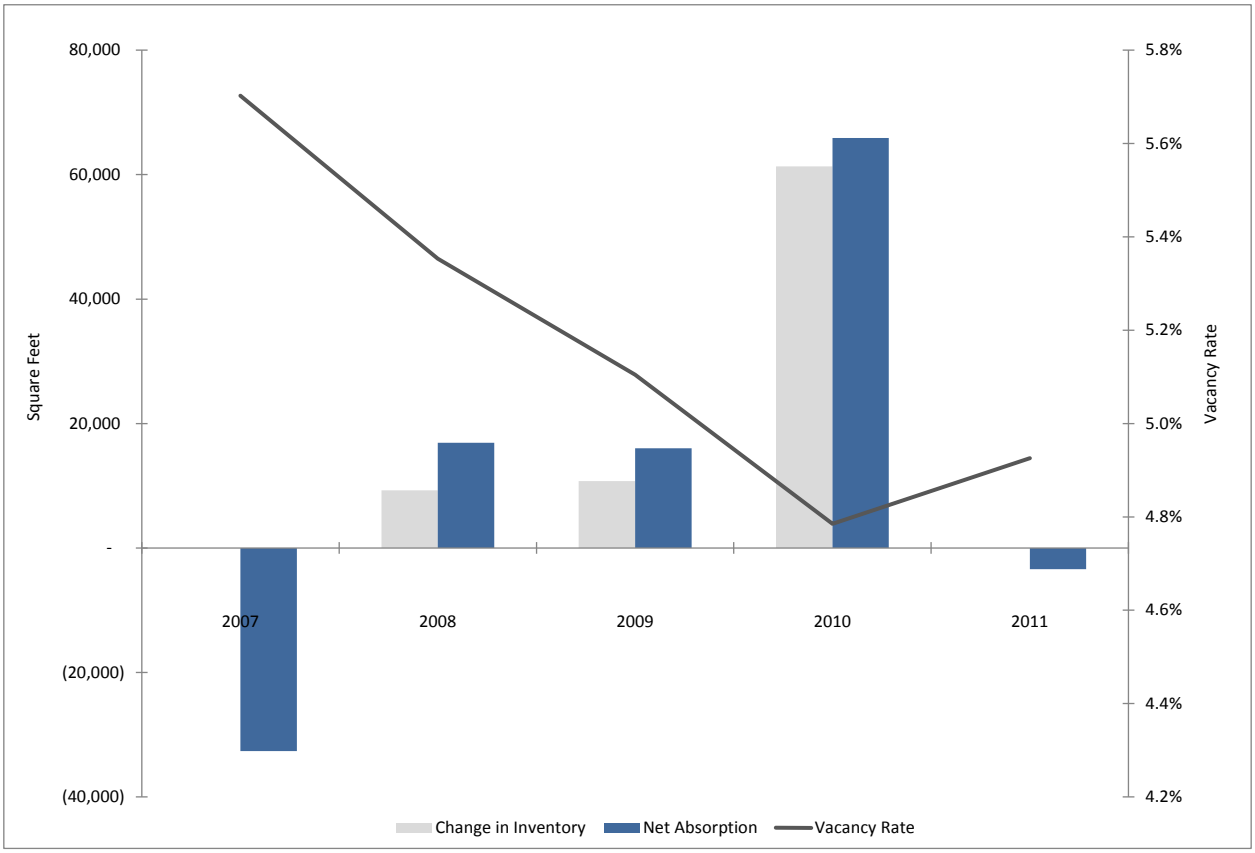


Source: RAND California and EPS

Office Market

Considering the dismal macroeconomic trends in the US during recent years, the City of Merced office market has performed well. Office vacancy has fallen since 2007 and remains below 5 percent, even with over 80,000 square feet of new space introduced in the market during that timeframe. Vacancy countywide is over 10 percent. Despite a relatively healthy market for office space in the City, with lease rates for new space in the range of $1.25 to $1.50 per square foot (per month), office development has been generally limited to single-story structures.

Figure 7: City of Merced Office Market Trends

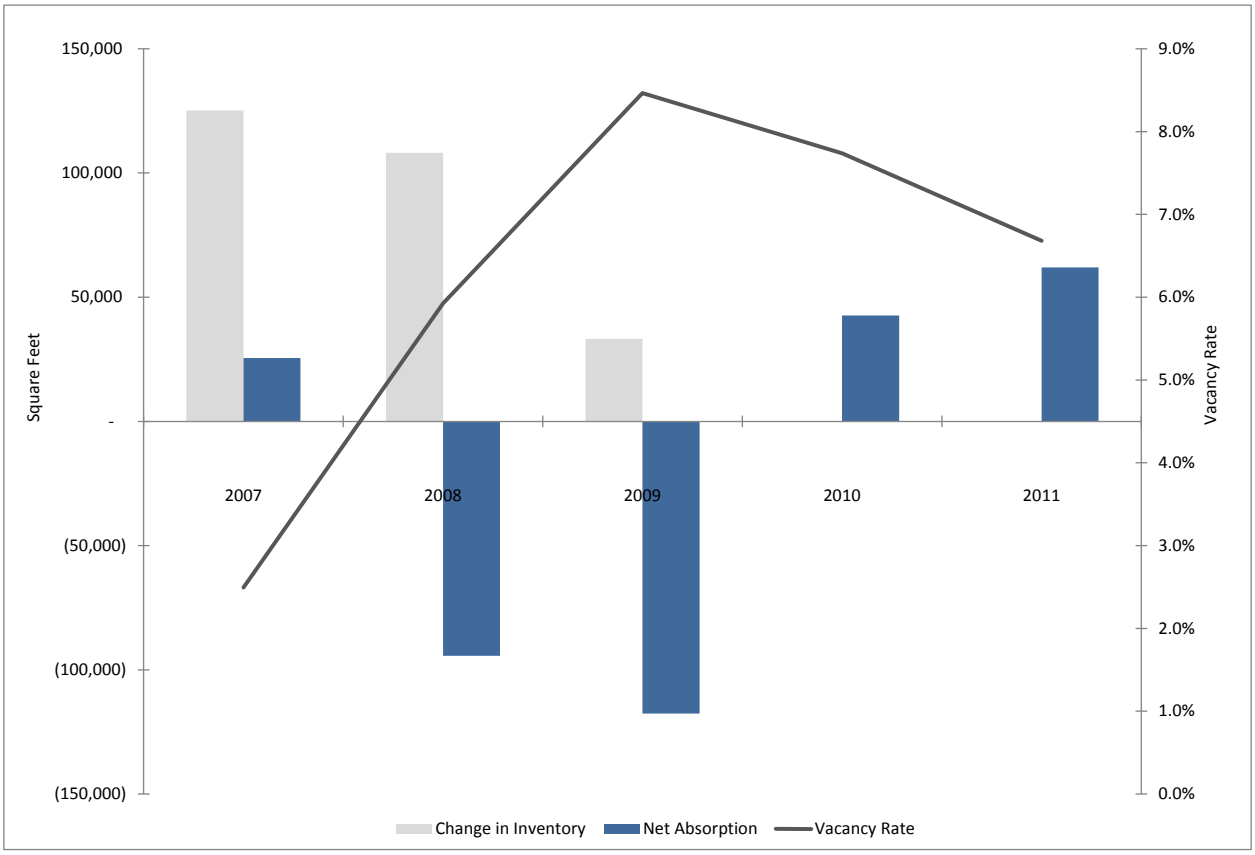


Sources: CoStar Group; Economic & Planning Systems, Inc.

Retail Market

Developers delivered over a quarter of million square feet of new retail development in the City of Merced between 2007 and 2009, about 30 percent of total deliveries in the County during that period. However, the development of this new retail space, in combination with negative net absorption, pushed the City's retail vacancy rate up dramatically. Retail vacancy peaked at about 8 percent in 2009 but fall to less than 7 percent in 2011, as retailers have filled unoccupied spaces. These are similar trends to those observed in the County overall. The available data indicate that positive net absorption of retail space may be partially attributable to more affordable leases, with average asking rates now as much as 50 percent less than their pre-recession peak.

Figure 8: City of Merced Retail Market Trends

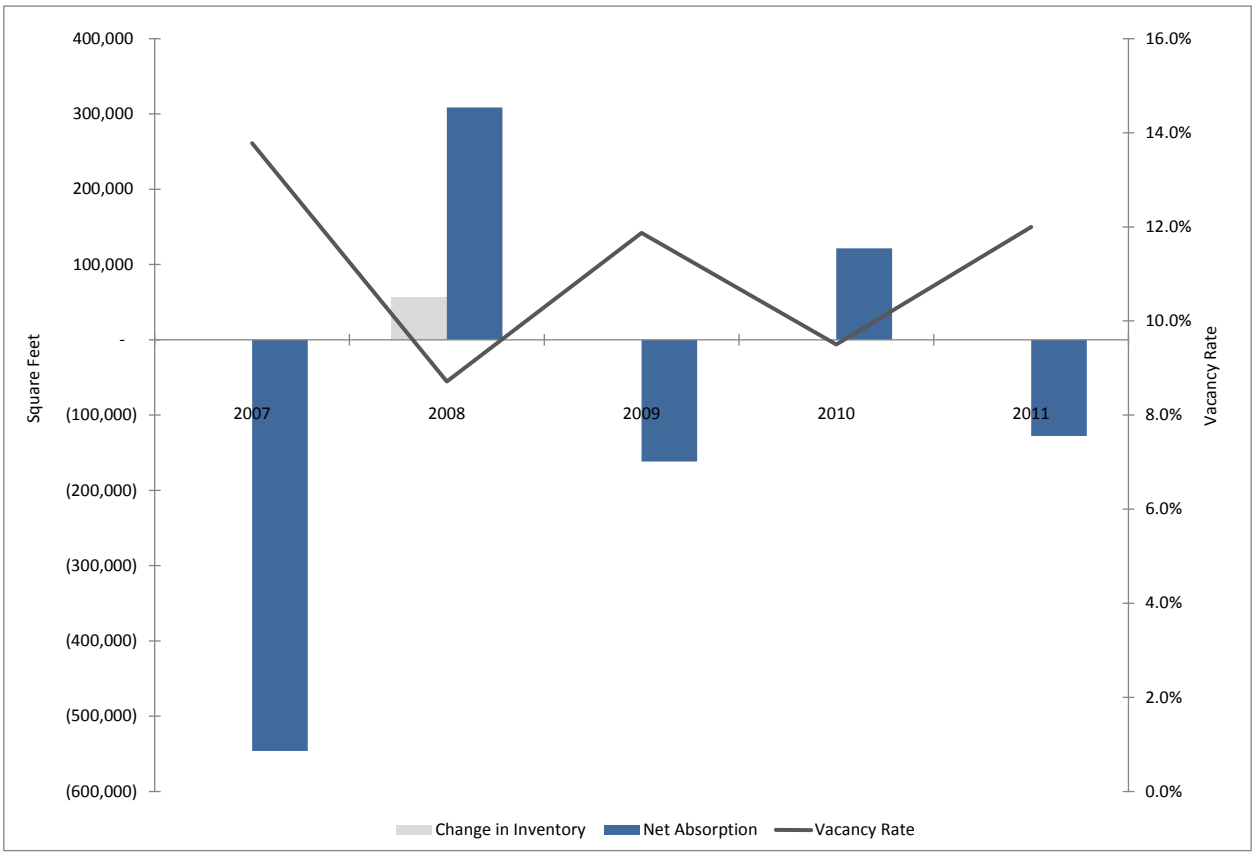


Sources: CoStar Group; Economic & Planning Systems, Inc.

Industrial Market

The market for industrial real estate in the City of Merced has been volatile in recent years, with dramatic swings in net absorption. Significant negative net absorption in 2007, combined with existing vacancy, left nearly 700,000 square feet of unoccupied industrial space in the City of Merced. However, 2008 and 2010 saw positive net absorption and industrial vacancy is lower today than in 2007. With built space available, there has been little new development of industrial real estate in recent years.

Figure 9: City of Merced Industrial Market Trends



Sources: CoStar Group; Economic & Planning Systems, Inc.

Land Market

Even with recent changes to the City's planned expansion areas, there is significant entitled land capacity within Merced's Sphere of Influence.[10] A recent EPS study determined that there is un-built development capacity for roughly 30,000 dwelling units and 12 million square feet of commercial space in sphere of influence areas located to the north and east of the current city boundary. Some undeveloped land is already entitled for new projects, with those approved projects enjoying a substantial cost advantage over creating new subdivision plans. Outside of the Merced Sphere of Influence, future competition is anticipated to come from nearby growth areas such as Atwater and Castle Air Force Base.

In addition, a significant amount of campus-related demand could be accommodated by land controlled by the UC and its partners. The UC Merced campus includes approximately 225 acres for student neighborhoods (accommodating 12,500 beds) and 75 acres for research and development uses. Further, University Community (northern area) located south of the UC

[10] The Merced Vision 2030 General Plan, which was adopted by the City Council on January 3, 2012, revises the planned urban expansion area around Merced (now a combined Specific Urban Development Plan and Sphere of Influence) to be "slightly smaller than the 1997 Sphere of Influence".

Merced campus is envisioned to provide housing and services for 30,000 people. Even more development is planned for University Community South. While the Bellevue Corridor is well positioned to capture growth associated with the evolution of UC Merced, it likely will compete with the campus and campus village areas to accommodate growth associated with UC Merced.

Reflective of the availability of undeveloped land, there is a notable market for raw land in and around Merced. A review of available data reveals that over 5,000 acres has transacted in ZIP codes around the City of Merced (95303, 95340, 95341, 95348, and 95388) since 2002. Excluding identifiable property "flips" and land purchased for conservation, EPS estimates that about 2,000 acres was sold for development from 2002 through mid-2012. The available data reveal that six transactions accounted for more than half of the acreage sold. The buyers of these large parcels reported that the purchases were made as investments, to hold for future development, or for development of single family homes.

REPORT 2:

Transit Priority Project

& Public Right-of-Way

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.

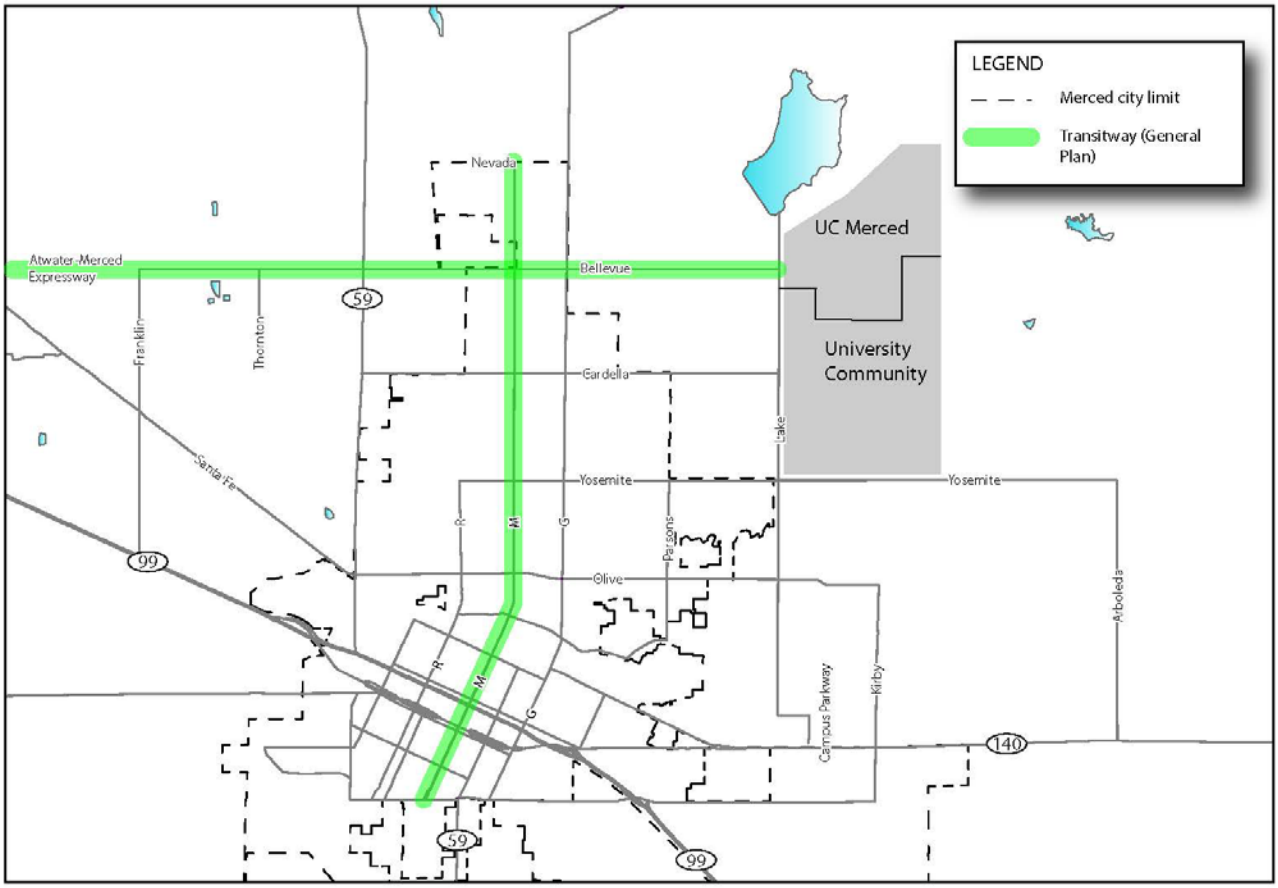
"Transit priority projects" are projects that meet the following criteria (see Appendix A for the full ordinance):

- 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)

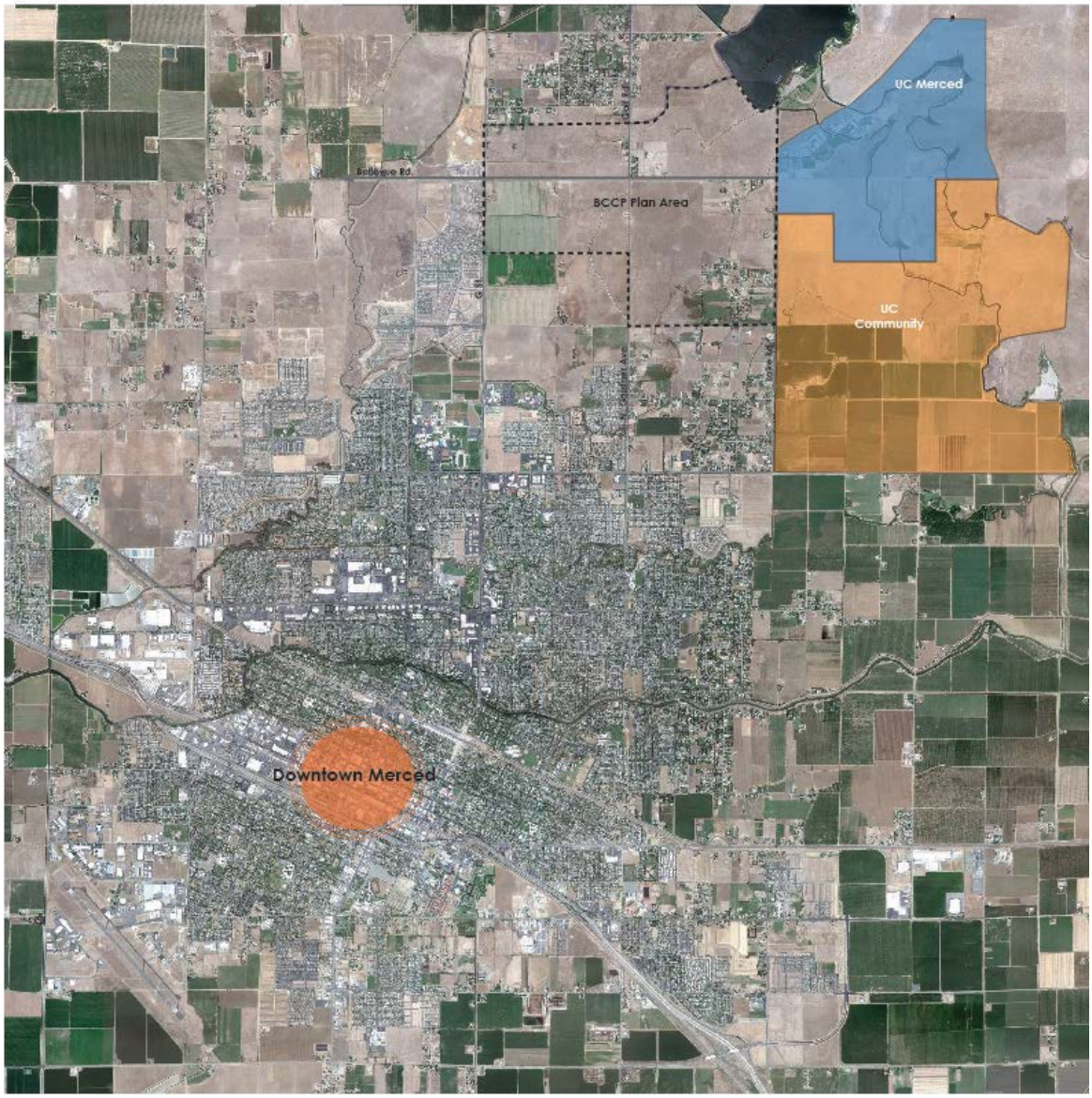


The Merced General Plan designates M Street and Bellevue Avenue / Atwater Merced Expressway (AME) as future "transitway" corridors. As described in the General Plan: transit passengers would transfer between M Street and Bellevue/AME buses at a proposed transit center to be located at the intersection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



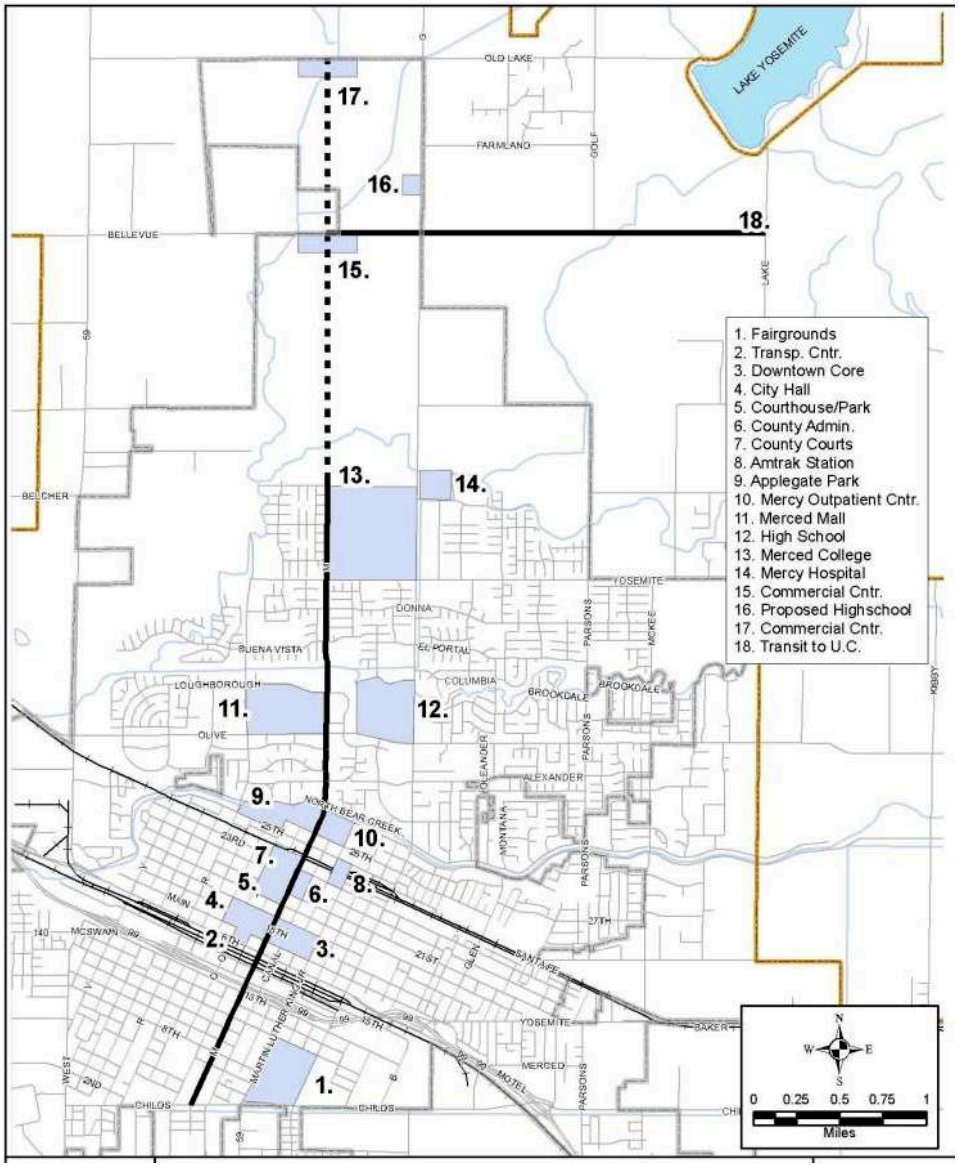
The BCCP area borders a key trip attractor – the UC Merced campus. As part of the BCCP effort: the City may wish to ***consider provision of a more direct transit corridor between UC Merced and Downtown Merced****, particularly given the anticipated "expressway" configuration for the proposed Merced 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.*

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.

Figure 1-3 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.

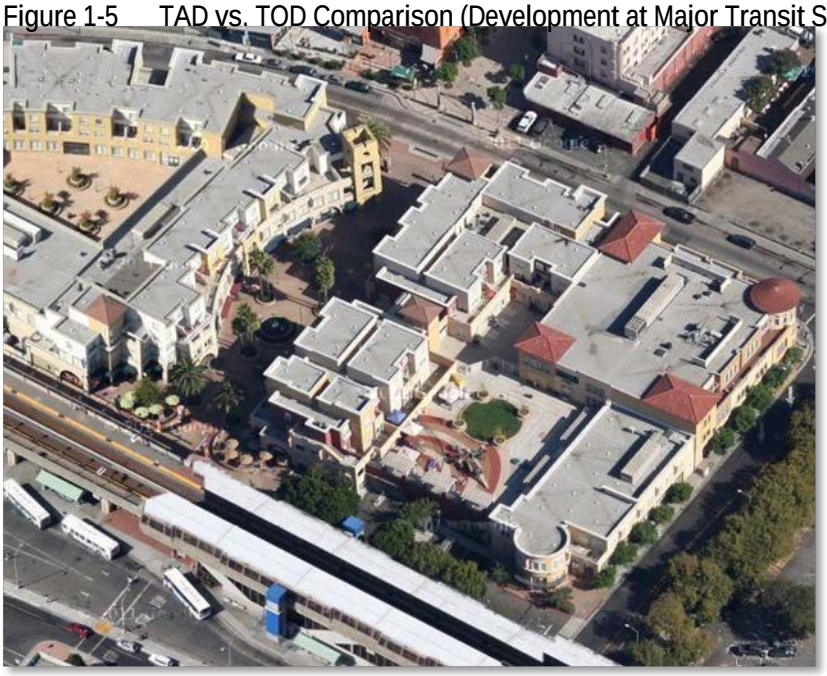
- **Transit Oriented Development (TOD)** is characterized by land use patterns that are oriented to maximize access to transit stations within a half-mile radius (a ten-minute walk).
- **Transit Adjacent Development (TAD)** is characterized by land use patterns within a half-mile radius of a transit 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 1-4 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 1-5 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 1-6 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 1-7 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[11]. 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[12], 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[13] 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[14]. The route is also relatively cost-effective to operate, at $1.54 per boarding[15].

---

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

[12] 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.

[13] 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.

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.

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

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

Figure 1-8 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 1-9 BRT Median Station Example: Eugene EMX

Source: Creative Commons license: http://creativecommons.org/licenses/by-sa/2.0/)

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.**[16]
  - 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.

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

– 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 1-10 RBS Station Amenity Example: LA Metro Rapid Kiosk

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

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[17]:

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

[17] 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[18].

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 boardings[19].

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 boardings[20].

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.

---

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

[19] National Transit Database

[20] 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 1-11 RBS Station Amenity Example: Ticket Machine (Stockton)

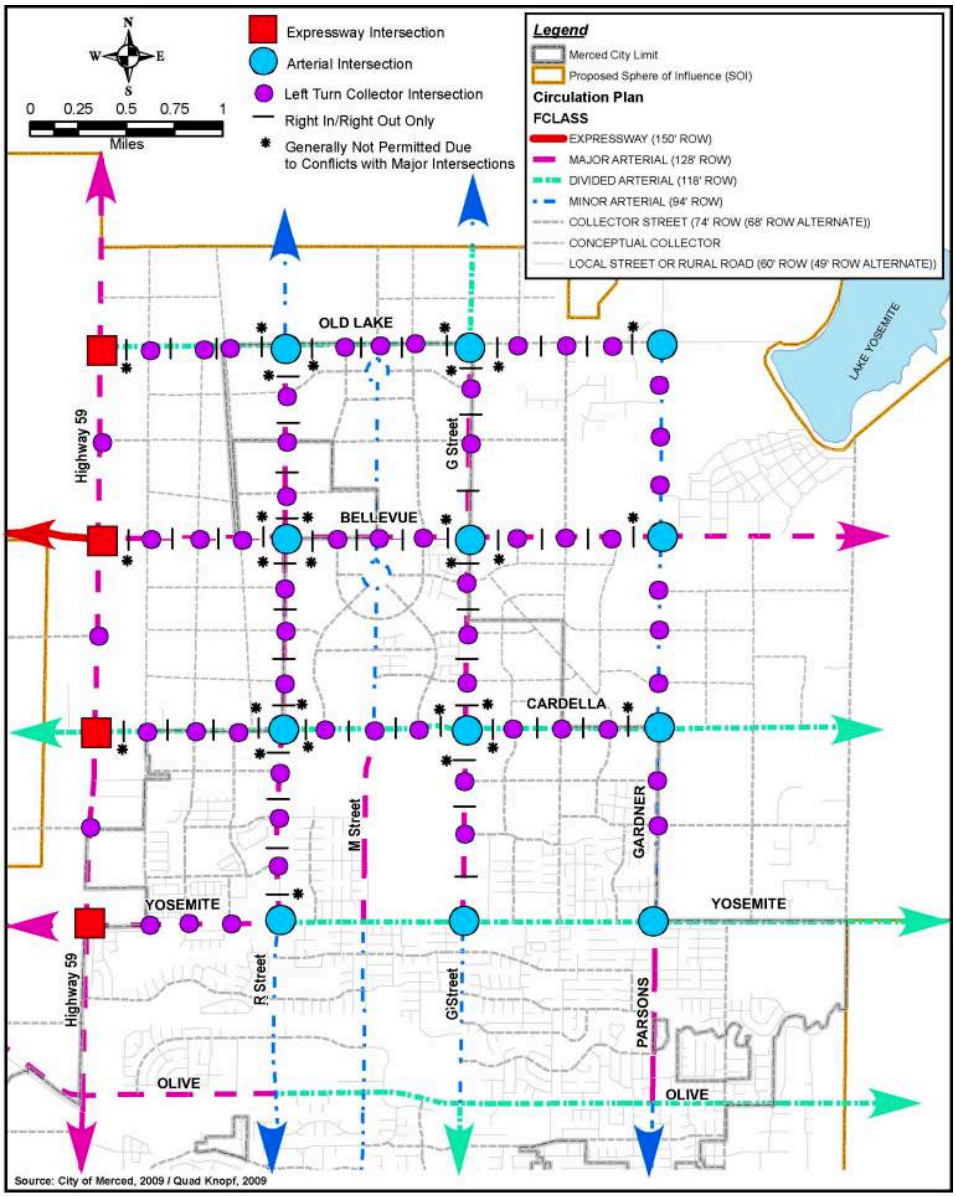
Photo Source: San Joaquin RTD

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.

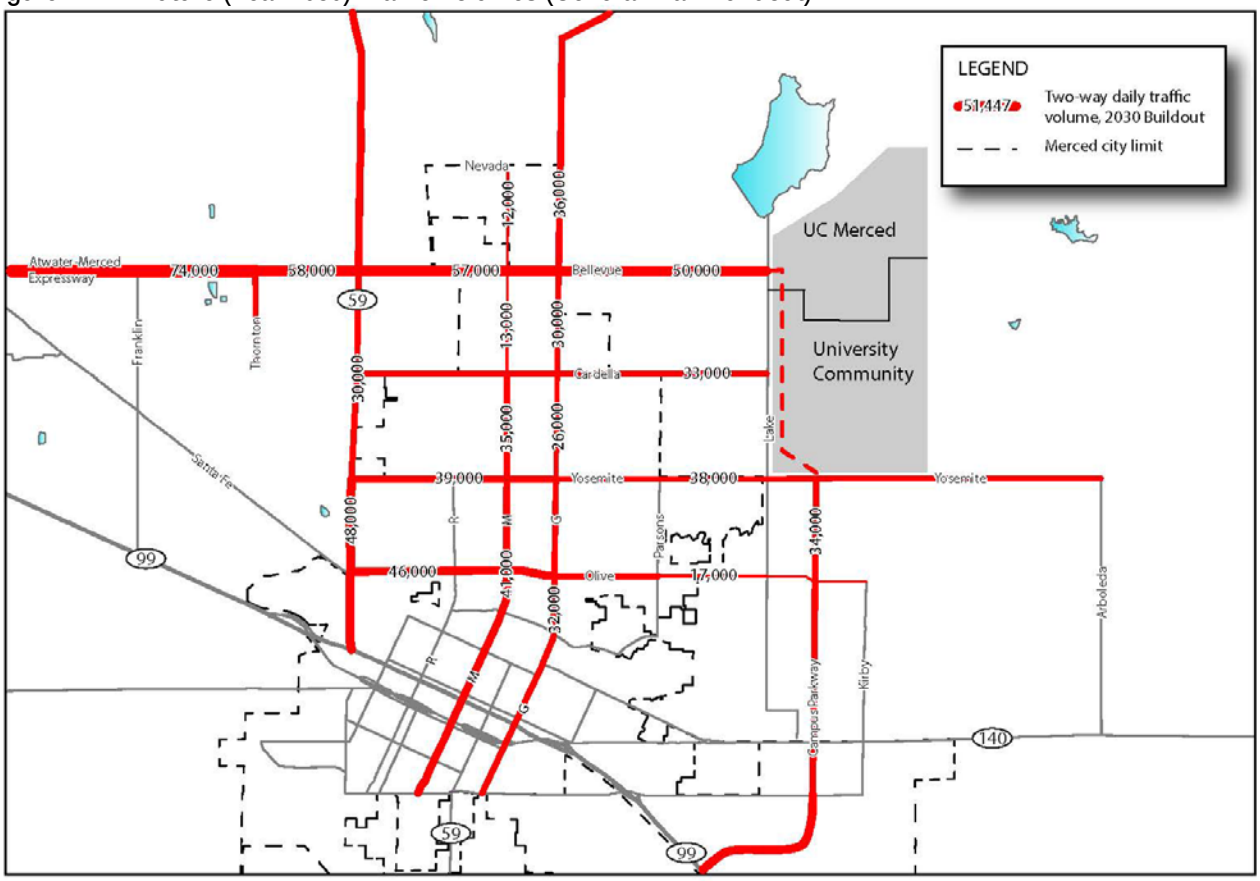
Planned Bikeway Network

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 2-2 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 2-3A Expressway (General Plan Drawing)

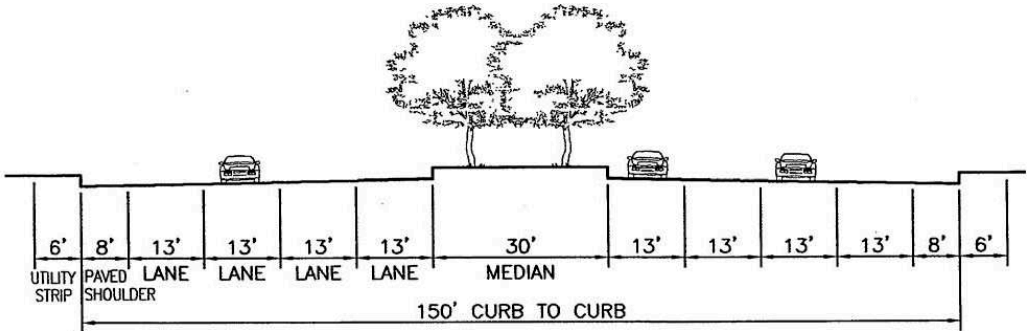
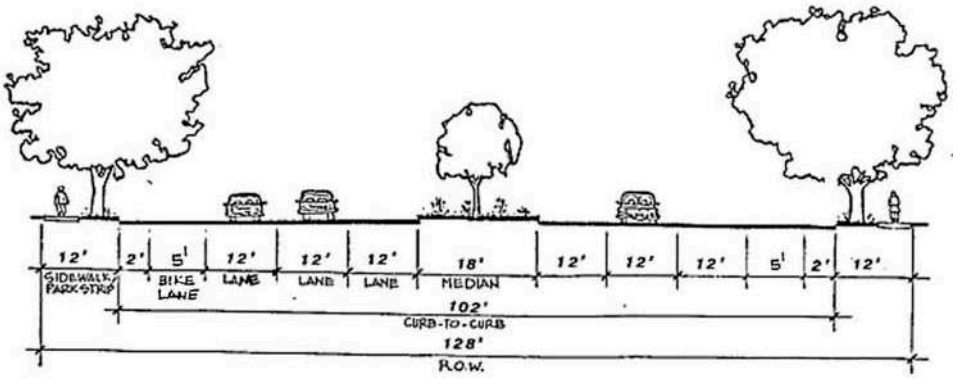


Figure 2-3B Major Arterial (General Plan Drawing)



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 2-3C Divided Arterial (General Plan Drawing)

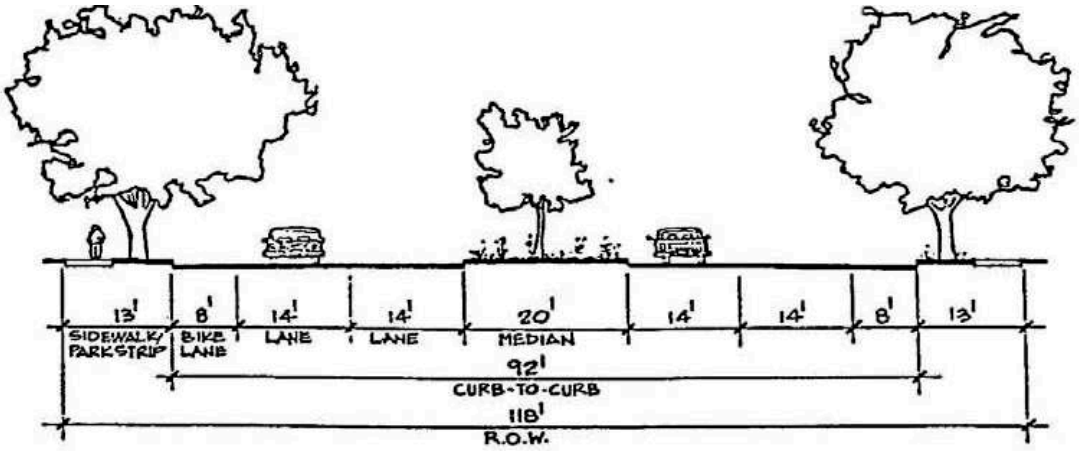


Figure 2-3D Minor Arterial (General Plan Drawing)

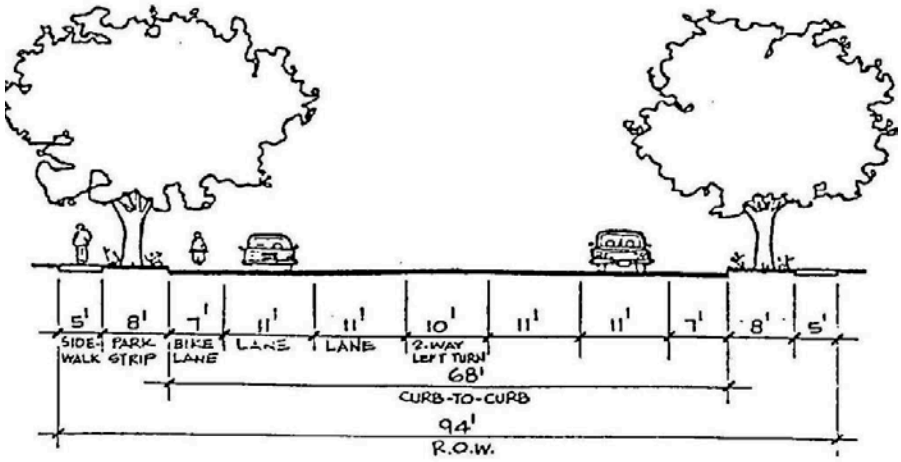
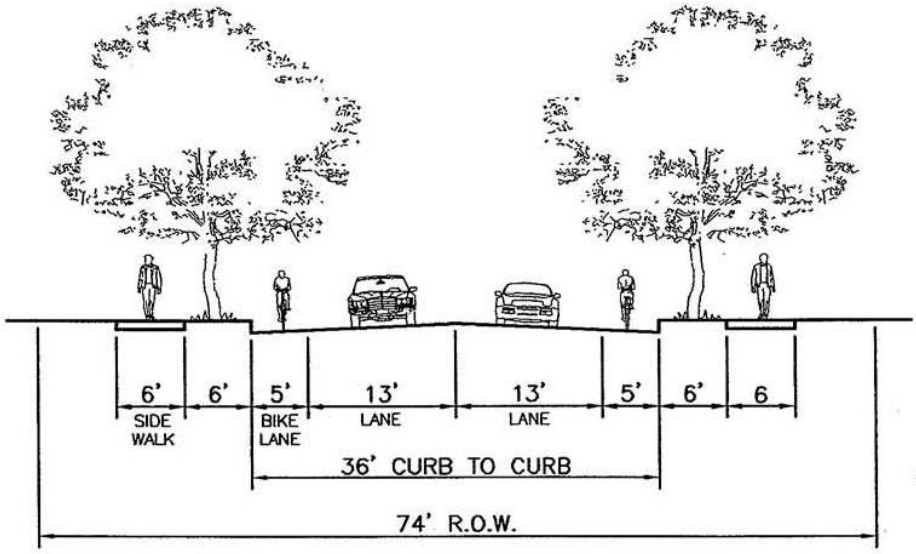


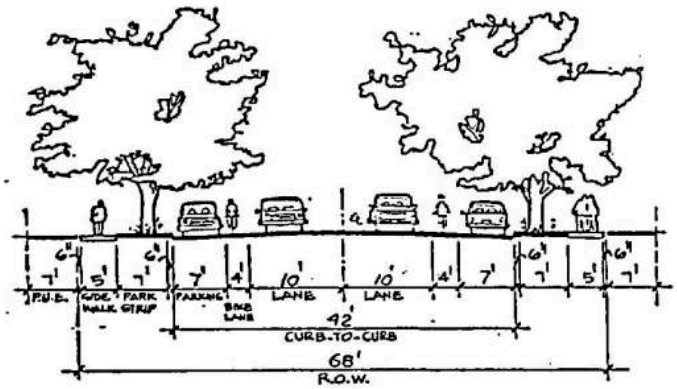
Figure 2-3E Transitway (General Plan Drawing)



"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).

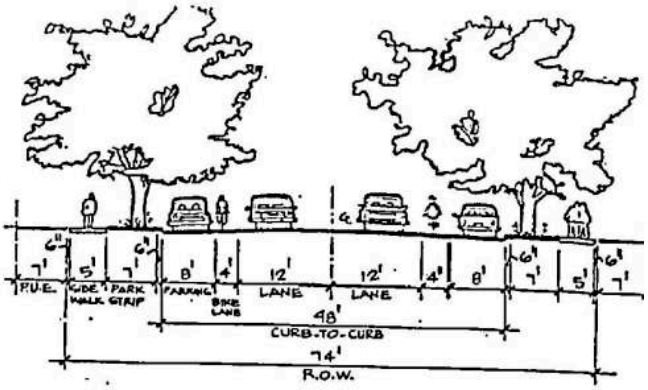
Figure 2-3F Collector (General Plan Drawing)



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 2-4 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 2-5 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 2-6 Boulevard Example: Octavia Boulevard Cross Section

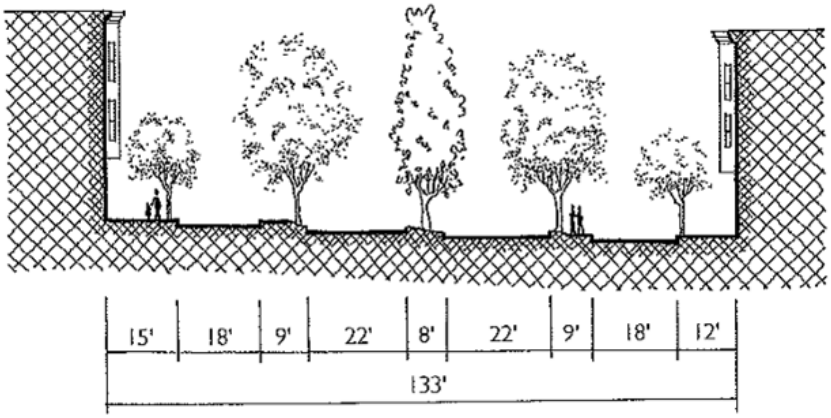


Figure 2-7 Boulevard Example: Octavia Boulevard (Photos)

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 2-8 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.

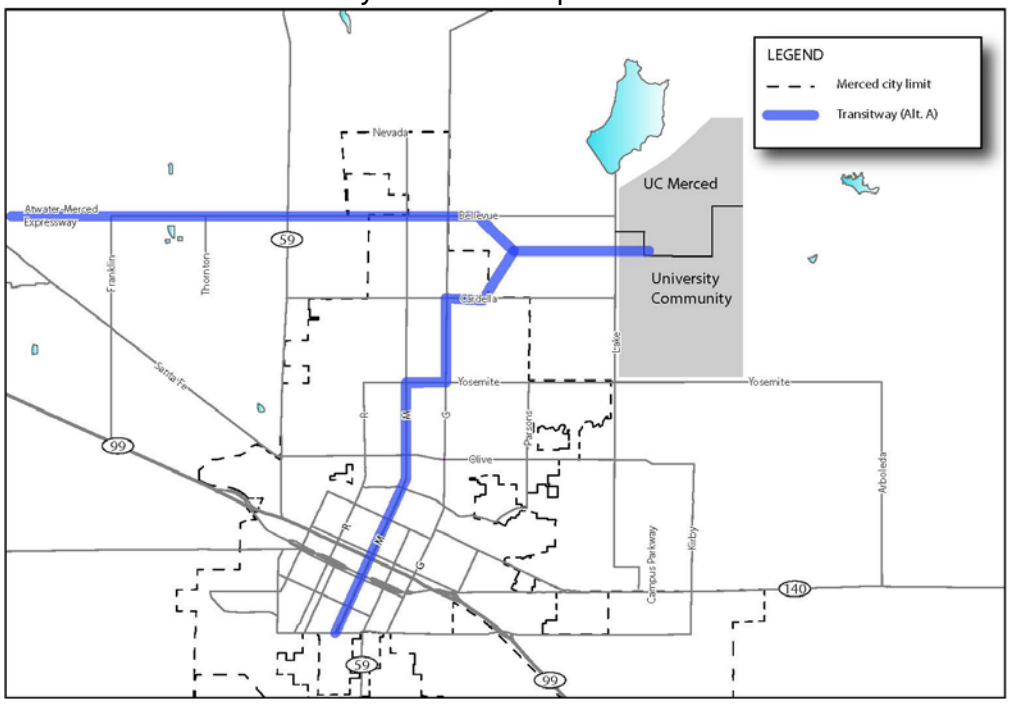
In comparison, planned streets in Merced that would carry similar traffic volumes are generally envisioned to include 4 lanes within a wider right-of-way, no on-street parking, longer walking distances and land uses set further back from the sidewalk.

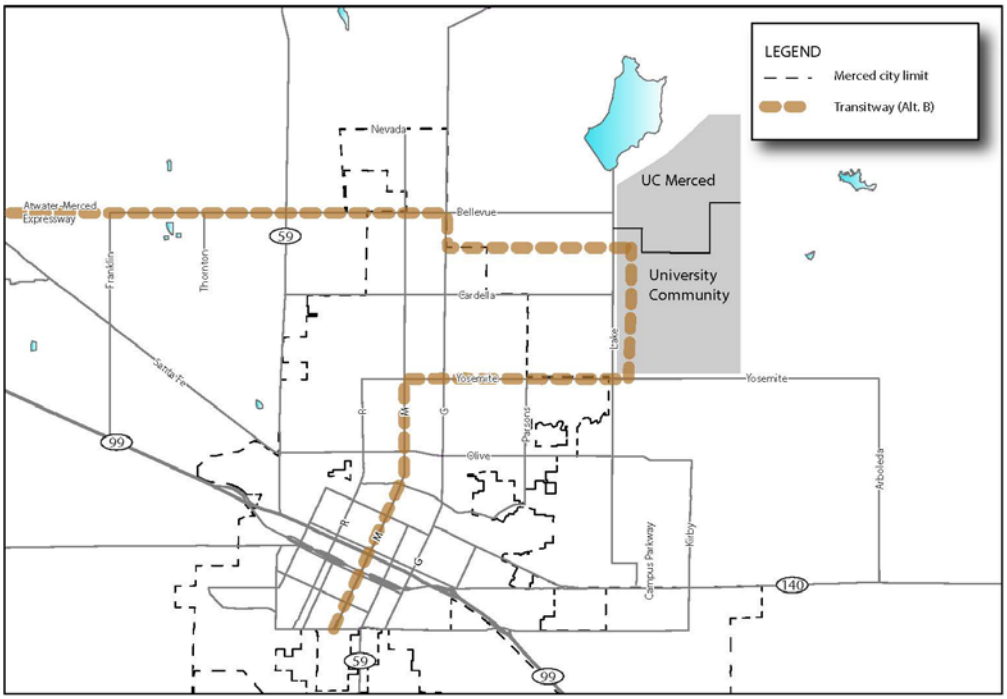
To allow a similar street and land use configuration with the BCCP area (including on-street parking): the City may wish to consider allowing the introduction of a new street type: Mixed Use Collectors.

2. Preliminary Recommendations

Transitways

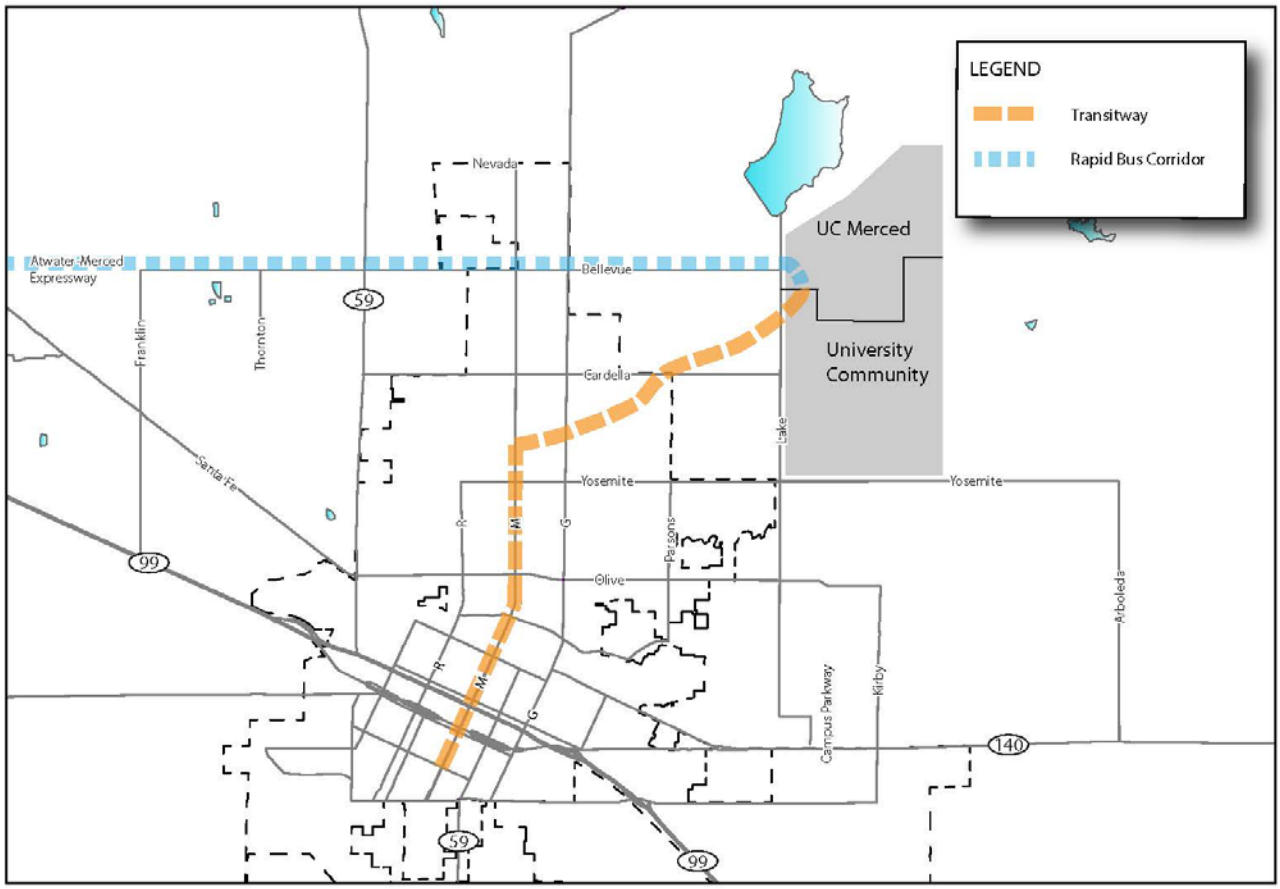
Figure 3-1 Alternative Transitway Corridor Concepts





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.

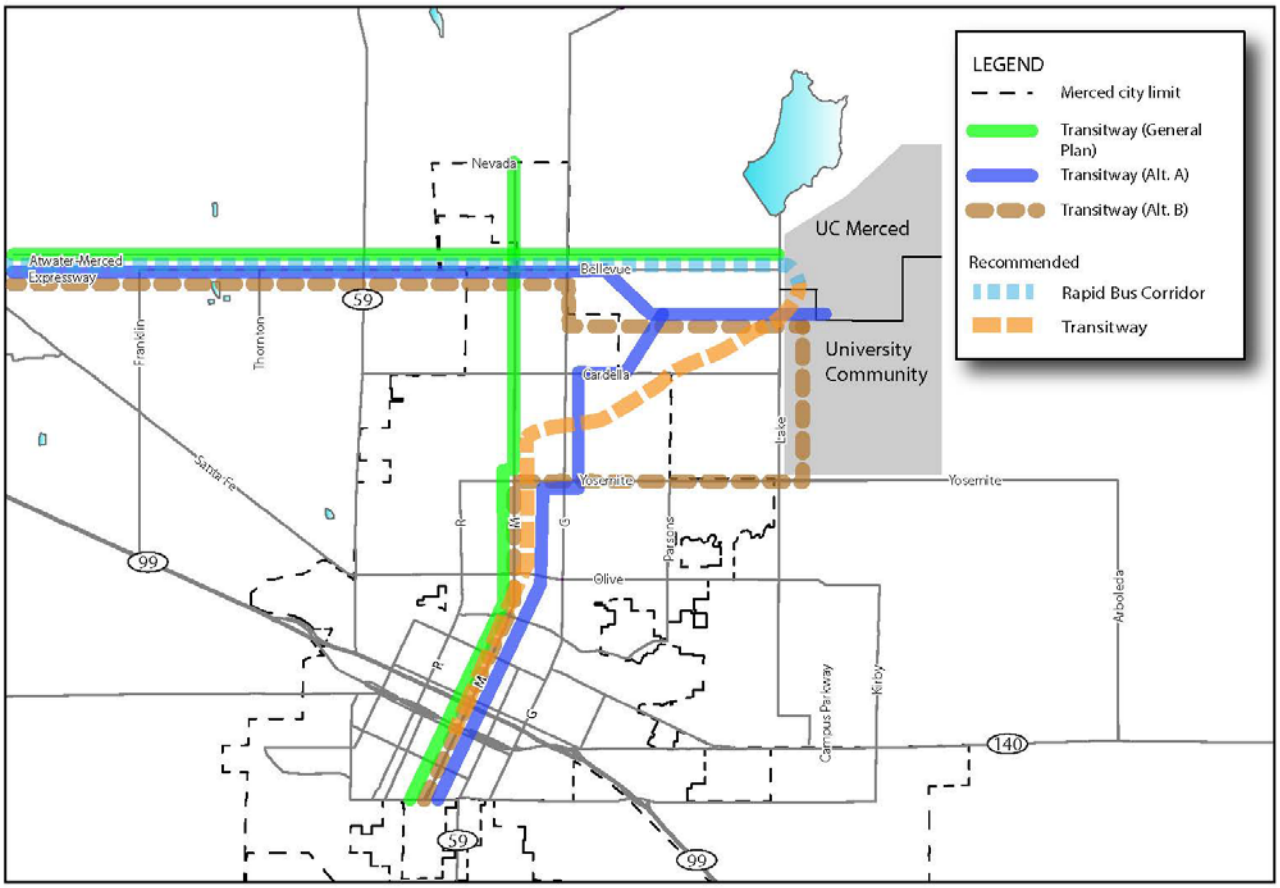
Figure 3-2 Modified Transitway Corridors for BCCP (Concept)



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

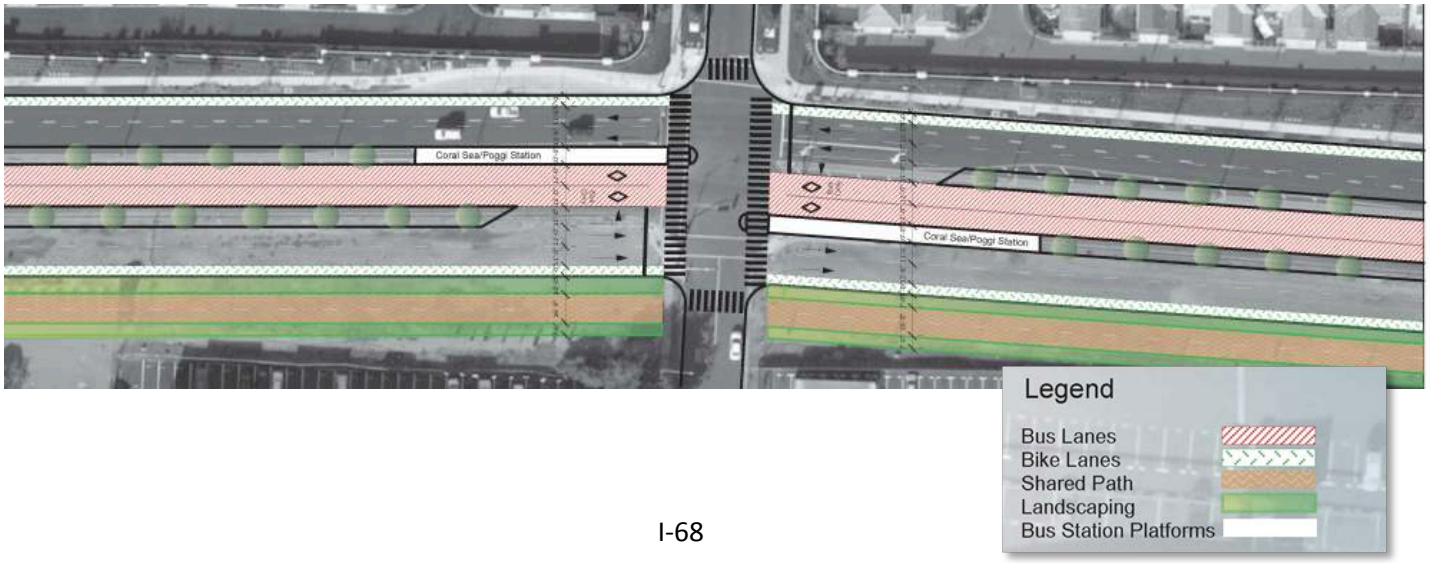
1. ***Transitway Corridor for potential Bus Rapid Transit (BRT) with dedicated bus lanes between Downtown Merced and UC Merced*** *via M Street and an alternate "diagonal" configuration to serve the medical center and potential mixed-use development south of Bellevue Road (incorporating a portion of 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



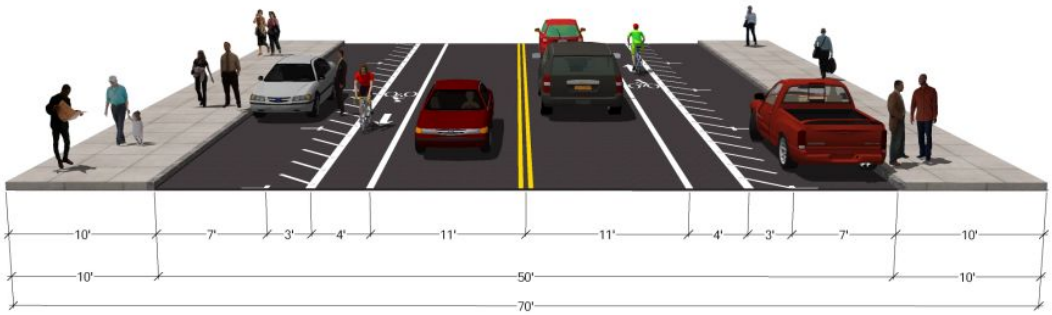
The travel distance between Downtown Merced and UC Merced, based on the Modified Transitway concept shown above, is approximately six (6) miles, representing a potential 15 percent reduction in distance, travel time, operating and construction costs.

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.

REPORT 3:

Complete Streets

January 24, 2013

CONTENTS

1. Purpose of Memorandum

2. Implementation and Recommendations

2.1 Research, Collect, and Assess existing "Complete Streets" *Merced Vision 2030 General Plan* Policies

2.2 Recommendations for how to implement the Merced General Plan complete street related policies and implementing actions.

2.3 Listing of community plan specific "Complete Streets" policies for later consideration.

3. Bibliography and Acknowledgements

1. PURPOSE OF MEMORANDUM

This memorandum addresses how complete street policies will be developed and implemented in the BCCP. The BCCP will need to result in a comprehensive approach that achieves the goals for the Bellevue area as well as those of the City as a whole.

In order to generate and apply appropriate "complete street" policies for the BCCP area, the following actions are necessary:

- Research, collect, and assess existing "Complete Streets" Merced Vision 2030 General Plan Policies
- Provide recommendations for how to implement the Merced General Plan complete street related policies and implementing actions. This will include specific ideas that can be used to craft prescriptive right-of-way cross sections and design templates for all Plan area streets and adjacent public and semi-public spaces
- Listing of community plan specific "Complete Streets" policies for later consideration
- A transportation-related vision supported by the community that can be articulated in enough detail in the BCCP to guide development

The analysis in this Memorandum addresses the first three steps above. The analysis is in narrative format to expose and discuss issues that need to be clarified in order to move forward confidently. Based on community input through the public process, the consultant team will then work with the community to prepare the fourth item, the transportation-related vision for the BCCP area. The vision will then be turned into part of the transportation chapter of the Bellevue Corridor Community Plan, containing specific goals, policies, and implementing actions.

2. IMPLEMENTATION AND RECOMMENDATIONS

2.1 Research, Collect, and Assess existing "Complete Streets" *Merced Vision 2030 General Plan* Policies

2.1.1 Introduction

For many reasons, the State of California AB 1358, *The California Complete Streets Act*, was passed and gives direction to local governments to address "complete streets" in their general plans. This section discusses the benefits of complete streets, state legislation and policies, and the City of Merced's existing "complete streets" policies.

2.1.2 What are Multimodal Transportation Networks, otherwise known as complete streets?

Multimodal transportation networks allow for all modes of travel including walking, bicycling, and transit to be used to reach key destinations in a community and region safely and directly. Jurisdictions can use complete streets design to construct networks of safe streets that are accessible to all modes and all users no matter their age or ability. Complete streets are defined by various interest groups and Caltrans below:

- **The National Complete Streets Coalition**
  Complete streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists, and transit riders of all ages and abilities must be able to safely move along and across a complete street. Creating complete streets means transportation agencies must change their orientation toward building primarily for cars. Instituting a complete streets policy ensures that transportation agencies routinely design and operate the entire right of way to enable safe access for all users.

- **The American Planning Association (APA)**
  Complete streets serve everyone – pedestrians, bicyclists, transit riders, and drivers – and they take into account the needs of people with disabilities, older people, and children. The complete streets movement seeks to change the way transportation agencies and communities approach every street project and ensure safety, convenience, and accessibility for all.

- **The California Department of Transportation (Caltrans)**
  A transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit vehicles, truckers, and motorists, appropriate to the function and context of California Department of Transportation (Caltrans) Complete Streets Policy:

  The *California Department of Transportation Deputy Directive 64-Revision #1: 'Complete Streets: Integrating the Transportation System'* (DD-64-R1) was released on October 2, 2008.

DD-64-R1 directs Caltrans staff to support increased mobility and access for all Californians on Caltrans built and maintained roads.

2.1.3 Potential Benefits of Multimodal Transportation Networks

Access to public space is critical to safe, healthy, and prosperous communities. Successful implementation of a comprehensive *complete street* program can accomplish numerous public benefits:

- **Supporting Existing Businesses**

  A network of complete streets can be safer and more appealing to residents and visitors, which can benefit retail and commercial development. Streets designed to maximize social value, also spurs healthy economic exchange. In this way, multimodal streets can improve conditions for existing businesses by helping revitalize an area and attracting new economic activity.

- **Reduced Public and Private Costs**

  Integrating sidewalks, bike facilities, transit amenities, and safe crossings in the early planning phases of roadway construction in both residential and commercial development reduces the complexity and costs of attempting to retrofit years later.

- **Business Attraction**

  Communities that support "complete streets" strive to create amenities that will enhance the quality of life of its residents, improve the physical and social environment in ways that attract businesses and workers, and contribute to economic development. In this way, streets become arteries distributing prosperity. Streets that invite social interaction are more likely to ensure prosperous growth...

- **Development Potential**

  Population growth will put greater demands on existing streets. If streets continue to largely function to move people traveling in motor vehicles, they will not be able to accommodate this growth. Streets will need to enable people to do more while traveling less and to travel more efficiently. Alternatives to single occupant vehicles must also be pursued to provide for the needs of an increasing population.

- **Greenhouse Gas (GHG) Emission Reduction**

  The need to reduce transportation-related GHG emissions was highlighted in the California Air Resources Board's (CARB) *2008 AB 32 Climate Change Scoping Plan*. Transportation accounts for 38 percent of California's GHG emissions. Studies show that even with aggressive state and federal vehicle efficiency standards and the use of alternative fuels, meeting the State's GHG reduction goals will require a shift in the mobility choices of the average Californian.

- **Reduced Traffic-Related Collisions**

  Multimodal transportation networks, using complete streets best practices, can lead to safer travel for all roadway users. Designing streets and travel routes that consider safe travel for all modes can reduce the occurrence and severity of vehicular collisions with pedestrian and bicyclists.

- **Safe Routes to Schools**

  Local multimodal transportation networks address the needs of parents and children by providing safe active transportation options to and from schools. Doing so can reduce vehicle trips, reduce congestion, improve road safety near schools, and increase children's activity rates.

- **Health Benefits**

Multimodal transportation networks that allow people to walk or bicycle as a viable transportation option can promote an active lifestyle. These active transportation modes increase physical activity rates. Frequent exercise is known to reduce obesity rates and lower the risk of heart disease and diabetes. A comprehensive transportation network that allows safe walking and bicycling to multiple destinations, including transit, promotes better health.

- **Air Quality**

  Reducing the amount that people drive by increasing the opportunity for walking, bicycling, and transit also reduces vehicle emissions. Emissions from vehicles are a major contributor to poor air quality, which in turn, is a major contributor to health ailments such as asthma. Although poor air quality is not always the cause of asthma, vehicle emissions are a major contributor to asthma related illnesses.

- **Mobility Options**

  Multimodal transportation networks provide options and increase mobility for people who cannot or do not drive to stay connected to their communities. This is especially important for people with disabilities and for all people as they age. Without alternatives to the automobile, these individuals can easily become socially isolated; unable to access essential resources such as grocery stores, houses of worship, and medical care.

2.1.4 The California Complete Streets Act (AB 1358) [1]

On September 30, 2008, Governor Arnold Schwarzenegger signed Assembly Bill 1358, the California Complete Streets Act. The Act states: "In order to fulfill the commitment to reduce greenhouse gas emissions, make the most efficient use of urban land and transportation infrastructure, and improve public health by encouraging physical activity, transportation planners must find innovative ways to reduce vehicle miles traveled (VMT) and to shift from short trips in the automobile to biking, walking, and use of public transit."

The legislation impacts local general plans by adding the following language to Government Code Section 65302(b)(2)(A) and (B):

A. Commencing January 1, 2011, upon any substantial revision of the circulation element, the legislative body shall modify the circulation element to plan for a balanced, multimodal transportation network that meets the needs of all users of the streets, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan.

B. For the purposes of this paragraph, "users of streets, roads, and highways" means bicyclists, children, persons with disabilities, motorists, movers of commercial goods, pedestrians, users of public transportation, and seniors.

2.1.5 California Department of Transportation (Caltrans) Complete Streets ` Policy:

The *California Department of Transportation Deputy Directive 64-Revision #1: 'Complete Streets: Integrating the Transportation System'* (DD-64-R1) was released on October 2, 2008. DD-64-R1 directs Caltrans staff to support increased mobility and access for all Californians on Caltrans built and maintained roads. DD-64-R1 states that Caltrans will:

1.

- "Provide for the needs of travelers of all ages and abilities in all planning, programming, design construction, operations, and maintenance activities and products on the State Highway System;
- View transportation improvements (new and retrofit) as opportunities to improve safety, access, and mobility for all travelers and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system;
- Develop integrated multimodal projects in balance with community goals, plans, and values; addressing the safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding;
- Facilitate bicycle, pedestrian, and transit travel by creating "complete streets' beginning early in system planning and continuing through project delivery and maintenance and operations; and,
- Collaborate among all (Caltrans) department functional units and stakeholders to develop a network of complete streets."

DD-64-R1 is limited to Caltrans owned and maintained streets, roads, and highways and focuses on the planning, construction, and maintenance of complete streets and when possible, on the creation of multimodal networks. The goals of DD-64-R1 provide important guidance for the design of streets that make up a local integrated multimodal transportation network.

Caltrans' *Complete Streets Implementation Action Plan* and other information on Caltrans' complete street policies can be found at the following website:

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

2.1.6 City of Merced Complete Street Policies

The Merced Vision 2030 General Plan is a statement of the community's vision of its long-term or ultimate physical form, and is a guiding framework for land use decisions. The heart of the General Plan is the set of integrated and internally consistent "Goals," "Policies," and "Implementing Actions." *Goals* state finished conditions--the community's vision of what should be done and where. *Policies* state the City's clear commitment on how these *Goals* will be achieved. *Implementing Actions* carry out the *Policies* and are specific.

While there are many "Complete Street" Implementing Actions in the City's General Plan that also apply to the BCCP area, the goal and related policies that guide the development of streets for use by all modes of transportation are presented below.

Goal: A Comprehensive System of "Complete Streets" Addressing all Modes of Transportation

Complete-Street Related

Policy T-1.1: Design streets consistent with circulation function, affected land uses, and all modes of transportation.

Policy L-3.1: Create land use patterns that will encourage people to walk, bicycle, or use public transit for an increased number of their daily trips.

Policy UD-1.2: Distribute and design urban villages to promote convenient vehicular, pedestrian, and transit access.

Policy UD-1.1: Apply transit-ready development or urban village design principles to new development in the City's new growth areas.

Policy L-3.3: Promote site designs that encourage walking, cycling, and transit use.

Transit-Related

Policy T-2.1: Provide for and maintain a major transitway along "M" Street and possibly along the Bellevue Road/Merced-Atwater Expressway and Campus Parkway corridors.

Policy T-2.2: Support and enhance the use of public transit.

Policy T-2.3: Support a safe and effective public transit system.

Bike-Related

Policy T-2.4: Encourage the use of bicycles.

Policy T-2.5: Provide convenient bicycle support facilities to encourage bicycle use.

Policy T-2.6: Maintain and expand the community's existing bicycle circulation system.

Policy OS-3.2: Maintain and expand the City's bikeway and trail system.

Pedestrian-Related

Policy T-2.7: Maintain a pedestrian-friendly environment.

Policy T-2.8: Improve planning for pedestrians.

In summary, the City's General Plan envisions that all streets should be designed as "Complete Streets" which address all modes of motorized and non-motorized transportation, including vehicles, transit, pedestrians, and bicycles. These goals and policies form a foundation upon which to design, build, and construct complete streets within the Bellevue Corridor Community Plan.

2.2 Recommendations for How to Implement the Merced General Plan Complete Street Related Policies and Implementing Actions

This section will suggest complete-street approaches and designs for use in crafting prescriptive right-of-way cross sections and design templates for all Plan area streets and adjacent public and semi-public spaces in the Planning Area. Suggested elements of the BCCP Complete Street Program include:

- Street Networks and Classification
- Traveled Way Design
- Intersection Design
- Pedestrian Design
- Bikeway Design
- Transit Accommodations
- Placemaking

Los Angeles County Model Design Manual for Living Streets

Much of Section 2.2 is from the *Los Angeles County Model Design Manual for Living Streets*. Acknowledgement of the individuals who worked to prepare the design manual are listed at the end of the background memorandum on complete streets.

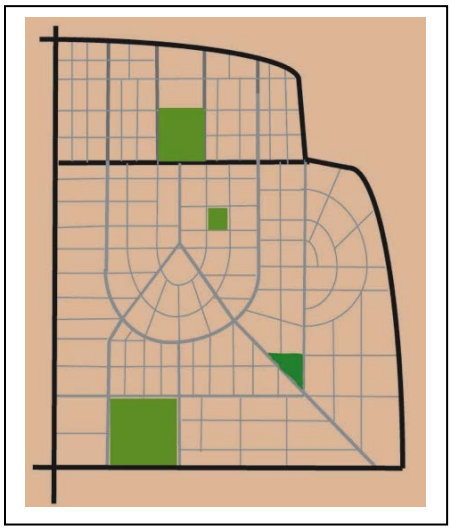
2.2.1 Street Networks and Classification

The chosen street network design of a city is a significant factor in determining whether the environmental, social, and economic needs of its residents can be met. A street network can foster or constrain economic and social activity, enhance or limit social equity in ability to travel and provide or negate a setting for high quality design at all scales: building, neighborhood, and region. Generally, two street networks exist in an urban area, the "Hierarchical" and "Grid" street patterns.

Grid Street Network

Traits

- Highly Connected Streets
- Traffic Dispersed throughout network
- Slower vehicle travel
- Additional road spaces allows for higher density
- The grid street network is built to walking dimensions
- Offers many route choices that connect origins with their destinations



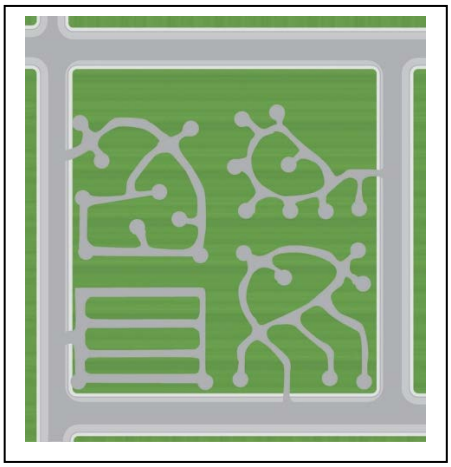
Outcomes

- More conducive to walking and bicycling
- Reduces vehicle miles traveled and associated air pollution impacts
- Low rate of severe car-related injuries
- Quicker response times and reduced service costs
- Compact Urban Form and associated reduced public service costs
- Conservation of farmland and open spaces

Hierarchical Street Network

Traits

- Low Street Connectivity
- Traffic Focused at points and segments
- Higher vehicle speeds
- Street pattern creates amorphous development sites



Outcomes

- Reduced the number of people walking and bicycling
- Increased vehicle miles traveled and associated air pollution impacts
- Higher rate of severe injury
- Challenged fire response time and related costs
- Limits development options

ESSENTIAL PRINCIPLES OF SUSTAINABLE STREET NETWORKS

Complete street networks come in many shapes and forms, but have the following overarching principles in common:

- The complete street network both shapes and responds to the natural and built environment.
- The complete street network privileges trips by foot, bike, and transit.
- The complete street network is built to walking dimensions.
- The complete street network works in harmony with other transportation networks, such as pedestrian, bicycle, transit, and private vehicle networks. Large parts of all of these networks are coincidental with the street network, but if any parts are separate from the street network, they must connect and interact with the network.
- The complete street network protects, respects, and enhances a city's natural features and ecological systems.
- The complete street network maximizes social and economic activity.

Street Types

Federal Highway Function and Classification system contains the conventional classification system that is commonly accepted to define the function and operational requirements for streets. These classifications are also used as the primary basis for geometric design criteria. Traffic volume, trip characteristics, speed and level of service, and other factors in the functional classification system relate to the mobility of motor vehicles, not bicyclists or pedestrians, and do not consider the context or land use of the surrounding environment. This approach, while appropriate for high speed rural and some suburban roadways, does not provide designers with guidance on how to design for living streets or in a context-sensitive manner.

The street types described here provide mobility for all modes of transportation with a greater focus on the pedestrian. The functional classification system can be generally applied to the street types in this document. Designers should recognize the need for greater flexibility in applying design criteria, based more heavily on context and the need to create a safe environment for pedestrians, rather than strictly following the conventional application of functional classification in determining geometric criteria.

Boulevard (conventionally arterials)
A boulevard is a street designed for high vehicular capacity and moderate speed, traversing an urbanized area. Boulevards serve as primary transit routes. Boulevards should have bike lanes. They may be equipped with bus lanes or side access lanes buffering sidewalks and buildings. Many boulevards also have landscaped medians. Boulevards traverse and connect districts and cities, primary a longer distance route for all vehicles, including transit.

Avenue (conventionally collectors)

An avenue is a street of moderate to high vehicular capacity and low to moderate speed acting as a short distance connector between urban centers and may or may not be equipped with a landscaped median. Avenues traverse and connect districts, and links street with boulevards for all vehicles including transit.

Street (conventionally local streets)
A street is a local, multi-movement facility suitable for all urbanized transect zones and all frontages and uses. A street is urban in character, with raised curbs (except where curbless treatments are designed), drainage inlets, wide sidewalks, parallel parking, and trees in individual or continuous planters aligned in an alley. Character may vary in response to the commercial or residential uses lining the street. Streets serves neighborhoods; connects to adjoining neighborhoods and serve local function for vehicles and transit.

Alley/Lane
An alley or lane is a narrow street, often without sidewalks. Alleys and lanes connect streets and can provide access to the backs of buildings and garages.

Main Street
Main streets feature slower vehicle speeds, favor pedestrians most, contain the highest level of streetscape features, and are typically dominated by retail and other commercial uses Main Streets function differently than other streets in that it is a destination.

Bike Boulevard
A Bike Boulevard is a through street for bicycles, but short distance travel for motor vehicles. Bike Boulevards are usually local streets with low traffic volumes

Festival Street
Festival Streets contain traffic calming, flush curbs, and streetscape features that allow for easy conversion to public uses such as farmers' markets and music events.

2.2.2 Traveled Way Design

Streets and their geometric design have traditionally focused on the movement of motor vehicles, resulting in street environments that neglect other users. This emphasis can be seen in wide travel lanes, large corner radii, and turn lanes that severely impede the safety of pedestrians and the overall connectivity for non-automobile users. The geometric design of the traveled way and intersections has usually reflected the need to move traffic as quickly as possible. A paradigm shift needs to occur to reclaim the public right-of-way for pedestrians and bicyclists and create living streets.

Traveled way design in this chapter is defined as the part of the street right-of-way between the two faces of curbs and can include parking lanes, bicycle lanes, transit lanes, general use travel lanes, and medians. The design of the traveled way is critical to the design of the entire street right-of-way because it affects not just the users in the traveled way, but those using the entire right-of-way, including the areas adjacent to the street.

As a note on terminology, "traveled way" in this document is more or less the equivalent of "roadway" in most conventional design manuals: the curb-to-curb portion of a curbed street.

ESSENTIAL PRINCIPLES OF TRAVELED WAY DESIGN

The following key principles should be kept in mind for a well-designed traveled way:

- **Design to accommodate all users.** Street design should accommodate *all* users of the street, including pedestrians, bicyclists, transit users, automobiles, and commercial vehicles. A well-designed traveled way provides appropriate space for all street users to coexist.
- **Design using the appropriate speed for the surrounding context.** The right design speed should respect the desired role and responsibility of the street, including the type and intensity of land use, urban form, the desired activities on the sidewalk, such as outdoor dining, and the overall safety and comfort of pedestrians and bicyclists. The speed of vehicles impacts all users of the street and the livability of the surrounding area. Lower speeds reduce crashes and injuries.

Senior citizens need more time to cross the street (Credit: Ryan Snyder)

- **Design for safety.** The safety of all street users, especially the most vulnerable users (children, the elderly, and disabled) and modes (pedestrians and bicyclists) should be paramount in any design of the traveled way. The safety of streets can be dramatically improved through appropriate geometric design and operations.

CROSS SECTIONAL ELEMENTS

Living street design treats streets as part of the public realm. The street portion of the public realm is shaped by the features and cross section elements used in creating the street. Attention to what features are included, where they are placed, and how the cross section elements are assembled is necessary.

On-Street Parking

On street parking can be important in the urban environment for the success of the retail businesses that line the street and to provide a buffer for pedestrians and help calm traffic speeds. On-street parking occupies about half the surface area per car compared to off-street, which requires driveways and aisles for access and maneuvering. However, cities should manage demand for on-street parking by charging market-rate prices. Free or underpriced parking encourages people to drive instead of taking transit, biking, or walking. Parking expert Donald Shoup recommends setting variable parking prices to target a 15 percent vacancy rate for curb parking. In addition to encouraging people to curtail driving, it also creates turnover that benefits retailers by making convenient parking available for short shopping trips.

Reverse-in angled parking: Boise, ID (Credit: Dan Burden)

Where angle parking is proposed for on-street parking, designers should consider the use of reverse-in angle (or front out) parking in lieu of front-in angled parking. Motorists pulling out of reverse-in angled parking can better see the active street they are entering. This is especially important to bicyclists. Moreover, people exiting cars do so on the curb side and aren't likely to step into an active travel lane.

Another tool for on-street parking is the park assist lane. Often when on-street parking is provided on busy roads, drivers find it difficult to enter and leave their parked vehicle. Where space is available, consideration should be given to adding a park assist lane between the parking lane and travel way to provide 3 feet of space so car doors can be opened and vehicles can enter or depart with a higher degree of safety and less delay. Bike lanes can serve this function as well. Parking assist lanes also narrow the feel of the travel lane and slow traffic.

Bicycle Facilities

Bicycle facilities within the traveled way may include bicycle lanes, bicycle boulevards, other types of shared roadways (with or without shared lane markings), and cycle tracks.

Transit Facilities

Transit accommodations within the traveled way may include dedicated transit lanes, bus bulbs, bus pullouts, and other features.

Travel Lanes

Travel lane widths should be provided based on the context and desired speed for the area that the street is located in. Table 4.3 shows lane widths and the associated speeds that are appropriate. In low speed urban environments, lane widths are typically measured to the curb face instead of the edge of the gutter pan.

Consequently, when curb sections with gutter pans are used, the vehicle, bike, and parking lane all include the width of the gutter pan.

In order for drivers to understand how fast they should drive, lane widths have to create some level of driver discomfort when driving too fast. The presence of on-street parking is important in achieving the speeds shown in Table 4.3. When designated bike lanes or multi-lane configurations are used, there is more room for large vehicles, such as buses, to operate in, but car drivers will feel more comfortable driving faster than is desired.

Alleys can be designed as one-way or two-way. Right-of-way width should be a minimum of 20 feet with no permanent structures located within the right-of-way that would interfere with vehicle access to garages or parking spaces, access for trash collection, and other operational needs. Pavement width should be a minimum of 12 feet. Coordination with local municipalities on operational requirements is essential to ensure that trash collection and fire protection services can be completed.

Turn Lanes

The need for turn lanes for vehicle mobility should be balanced with the need to manage vehicle speeds and the potential impact on the border width such as sidewalk width. Turn lanes tend to allow higher speeds to occur through intersections, since turning vehicles can move over to the turn lane, allowing the through vehicles to maintain their speed.

Left-turn lanes are considered to be acceptable in an urban environment since there are negative impacts to roadway capacity when left turns block the through movement of vehicles. Sometimes just a left-turn pocket is sufficient, just long enough for one or two cars to wait out of traffic. The installation of a left-turn lane can be beneficial when used to perform a road diet such as reducing a four lane section to three lanes with the center lane providing for turning movements.

In urban places, normally no more than one left-turn lane should be provided. While right turns from through lanes may delay through movements, they also create a reduction in speed due to the slowing of turning vehicles. The installation of right-turn lanes increases the crossing distance for pedestrians and the speed of vehicles; therefore, exclusive right turn lanes should rarely be used except at “T” intersections. When used, they should be mitigated with raised channelization islands. See Chapter 5, “Intersection Design,” for more details.

Medians

Medians used on urban streets provide access management by limiting left turn movements into and out of abutting development to select locations where a separate left turn lane or pocket can be provided. The reduced number of conflicts and conflict points decreases vehicle crashes, provides pedestrians with a refuge as they cross the road, and provides space for landscaping, lighting, and utilities. These medians are usually raised and curbed. Landscaped medians enhance the street or help to create a gateway entrance into a community.

Well-designed street medians bring multiple benefits (Credit: Dan Burden)

Medians can be used to create tree canopies over travel lanes, contributing to a sense of enclosure. As shown in Table 4.4, medians vary in width. Recommended widths depend on available right-of-way and

function. Because medians require a wider right-of-way, the designer must weigh the benefits of a median with the issues of pedestrian crossing: distance, speed, context, and available roadside width.

2.2.3 Intersection Design

Most conflicts between roadway users occur at intersections, where travelers cross each other's path. Good intersection design indicates to those approaching the intersection what they must do and who has to yield. Exceptions to this include places where speeds are low (typically less than 18 mph) or where a shared space design ("naked streets") causes users to approach intersections with caution. Conflicts for pedestrians and bicyclists are exacerbated due to their greater vulnerability, lesser size, and reduced visibility to other users.

Lively intersection (Credit: Dan Burden)

This chapter describes design considerations in intersection geometry and intersection signalization, as well as roundabouts and other features to improve safety, accessibility, and mobility for all users. The benefits and constraints of each feature are examined and the appropriate use and design of each feature are described.

ESSENTIAL PRINCIPLES OF INTERSECTION DESIGN

The following principles apply to all users of intersections:

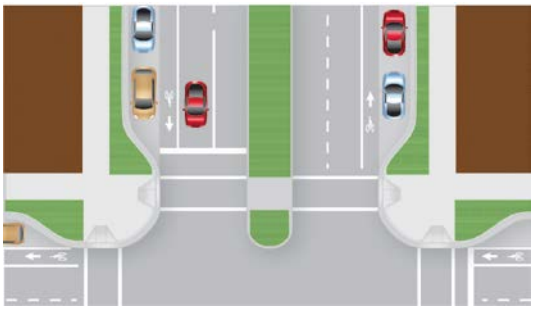
- Good intersection designs are compact.
- Unusual conflicts should be avoided.
- Simple right-angle intersections are best for all users since many intersection problems are worsened at skewed and multi-legged intersections.
- Free-flowing movements should be avoided.
- Access management practices should be used to remove additional vehicular conflict points near the intersection.
- Signal timing should consider the safety and convenience of all users and should not hinder bicycle or foot traffic with overly long waits or insufficient crossing times.

INTERSECTION GEOMETRY

Intersection geometry is a critical element of intersection design, regardless of the type of traffic control used. Geometry sets the basis for how all users traverse intersections and interact with each other.

Corner Radii
This intersection geometry feature has a significant impact on the comfort and safety of non-motorized users. Small corner radii provide several benefits.

Curb Extensions
Where on-street parking is allowed, curb extensions should be considered to replace the parking lane at crosswalks. Integrating curb extensions and on-street



Curb extensions (Credit: Michele Weisbart)

parking into the sidewalk corridor enhances pedestrian safety and the walking experience.

Crosswalk and Ramp Placement
Crosswalks and ramps at intersections should be placed so they provide convenience and safety for pedestrians.

On-Street Parking Near Intersections
On-street parking should be positioned far enough away from intersections to allow for good visibility of pedestrians preparing to cross the street. Curb extensions allow parking to be placed closer to the intersection.

Right-Turn Channelization Islands
Right-turn lanes should generally be avoided as they increase the size of the intersection, the pedestrian crossing distance, and the likelihood of right-turns-on-red by inattentive motorists who do not notice pedestrians on their right. However, where there are heavy volumes of right turns (approximately 200 vehicles per hour or more), a right-turn lane may be the best solution to provide additional vehicle capacity without adding additional lanes elsewhere in the intersection.

2.2.4 Pedestrian Design

Nowhere is the concept of **universal** access more important than in the design of the pedestrian environment. While perhaps not intuitively obvious at first glance, this is the realm of streets with the greatest variation in user capabilities, and thus the realm where attention to design detail is essential to effectively balance user needs. This is also the realm where signs and street furniture are located, and where transitions are made between modes (e.g., driver or passenger to pedestrian via parking, bus stop/train station, or bike rack). The pedestrian environment includes sidewalks, curb ramps, crosswalks, bus stops, signs, and street furniture.

Sidewalks constructed without adequate design guidelines (Credit: Chanda Singh)

Without design guidelines, sidewalks are often too narrow, utility poles obstruct travel, steep driveway ramps are impassable to wheelchair users, and bus stops become blocked by the disorderly placement of shelters, poles, trash receptacles, and bike racks.

With well-defined guidelines, sidewalks are built to accommodate pedestrians of all ages and physical abilities, and become inviting pedestrian environments as the adjacent picture shows.

Designing the pedestrian realm for universal access enables persons with disabilities to live independently and lead full, enriched lives; they are able to go to work and to school, to shop, and otherwise engage in normal activities. Moreover, walking environments that accommodate people with disabilities improve walking conditions for everyone. People with strollers and rolling suitcases can make their way about with ease. Children can mature by learning to navigate through their neighborhoods with independence. Inaccessible pedestrian networks, on the other hand, can lead to people becoming housebound and socially isolated, which in turn can lead to a decline in well-being and a host of associated negative health outcomes such as depression.

LAND USE AND SIDEWALK DESIGN GUIDELINES

The sidewalk design guidelines in this chapter integrate design and land use to provide safe and convenient passage for pedestrians. Sidewalks should have adequate walking areas and provide comfortable buffers between pedestrians and traffic. These guidelines will ensure sidewalks in all development and redevelopment provide access for people of all ages and physical abilities.

Walking requires two important features in the built environment: people must walk along streets and they must get across streets. Crossing a street should be easy, safe, convenient, and comfortable. While pedestrian behavior and intersection or crossing design affect the street crossing experience, motorist behavior (whether and how motorists stop for pedestrians) is the most significant factor in pedestrian safety.

Crossings are a necessary part of the pedestrian experience (Credit: Sky Yun)

A number of tools exist to improve pedestrian safety and to make crossing streets easier. Effective traffic management can address concerns about traffic speed and volume. A motorist driving more slowly has more time to see, react, and stop for a pedestrian. The number of pedestrians also influences motorists; in general, motorists are more aware of pedestrians when more people walk. Most tools to address crossing challenges are engineering treatments, but tools from the enforcement, education, and planning toolboxes are also important.

Providing marked crosswalks is only one of the many possible engineering measures. When considering how to provide safer crossings for pedestrians, the question should *not* be: "Should I provide a marked crosswalk?" Instead, the question should be: "What are the most effective measures that can be used to help pedestrians safely cross the street?" Deciding whether to mark or not mark crosswalks is only one consideration in creating safe and convenient pedestrian crossings.

ESSENTIAL PRINCIPLES OF PEDESTRIAN CROSSINGS

The following principles should be incorporated into every pedestrian crossing improvement:

- Pedestrians must be able to cross roads safely. Cities have an obligation to provide safe and convenient crossing opportunities.
- The safety of all street users, particularly more vulnerable groups, such as children, the elderly, and those with disabilities, and more vulnerable modes, such as walking and bicycling, must be considered when designing streets.
- Real and perceived safety must be considered when designing crosswalks—crossing must be “comfortable.” A “safe” crossing that no one uses serves no purpose.
- Crossing treatments that have the highest crash reduction factors (CRFs) should be used when designing crossings.
- Safety should not be compromised to accommodate traffic flow.

Curb extensions and median make crossing four-lane streets safer and more manageable.
(Credit: Dan Burden)

- Good crossings begin with appropriate speed. In general, urban arterials should be designed to a maximum of 30 mph or 35 mph (note: 30 mph is the optimal speed for moving motor vehicle traffic efficiently).
- Every crossing is different and should be selected and designed to fit its unique environment.

The following issues should also be considered when planning and designing crossings:

- Ideally, uncontrolled crossing distances should be no more than 21 feet, which allows for one 11-foot lane and one 10-foot lane. Ideally, streets wider than 40 feet should be divided (effectively creating two streets) by installing a median or two crossing islands.
- The number of lanes should be limited to a maximum of three lanes per direction on all roads (plus a median or center turn lane).
- There must be a safe, convenient crossing at every transit stop.
- Double (or triple) left or right turns concurrent (permissive) with pedestrian crossings at signalized intersections must never be allowed.
- Avoid concurrent movements of motor vehicles and people at signalized intersections.
- People should never have to wait more than 90 seconds to cross at signalized intersections.
- Pedestrian signals should be provided at all signalized crossings where pedestrians are allowed.

2.2.5 Bikeway Design

Bicyclists operate a vehicle and are legitimate road users, but they are slower and less visible than motor vehicles. Bicyclists are also more vulnerable in a crash than motorists. They need accommodation on busy, high-speed roads and at complex intersections. Cyclist skill level also provides a wide variety of speeds and expected behaviors. Bicycle infrastructure should use planning and designing options, from shared roadways to separate facilities, to accommodate as many user types as possible and to provide a comfortable experience for the greatest number of cyclists.

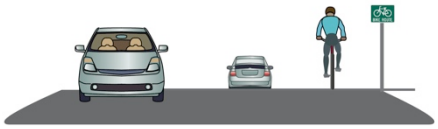
ESSENTIAL PRINCIPLES OF BIKEWAY DESIGN

The following principles inform the recommendations made in this chapter:

- Bicyclists should have safe, convenient, and comfortable access to all destinations.
- Every street is a bicycle street, regardless of bikeway designation.
- Street design should accommodate all types, levels, and ages of bicyclists.
- Bicyclists should be separated from pedestrians.
- Bikeway facilities should take into account vehicle speeds and volumes, with
  - Shared use on low volume, low-speed roads.
  - Separation on higher volume, higher-speeds roads.
- Bikeway treatments should provide clear guidance to enhance safety for all users.
- Since most bicycle trips are short, a complete network of designated bikeways has a grid of roughly ½ mile.

BIKEWAY TYPES

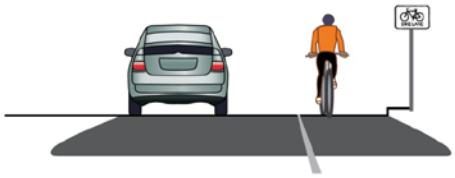
Shared Roadways - A shared roadway is a street in which bicyclists ride in the same travel lanes as other traffic. There are no specific dimensions for shared roadways. On narrow travel lanes, motorists have to cross over into the adjacent travel lane to pass a cyclist. Shared roadways work well and are common on low-volume, low-speed neighborhood residential streets, rural roads, and even many low-volume highways In California shared roadways are known as Class III bikeways.



Shared-use path
(Credit: Marty Bruinsma)

Bicycle Boulevards - A bicycle boulevard is a street that has been modified to prioritize through bicycle traffic but discourage through motor vehicle traffic. Traffic calming devices control traffic speeds and discourage through trips by automobiles. Traffic controls limit conflicts between automobiles and bicyclists and give priority to through bicycle movement at intersections.

Shoulder Bikeways - This facility accommodates bicycle travel on rural highways and country roads by providing a suitable area for bicycling and reducing conflicts with faster moving motor vehicles.



Bike Lanes - Portions of the traveled way designated with striping, stencils, and signs for preferential use by bicyclists, bike lanes are appropriate on avenues and boulevards. They may be used on other streets where bicycle travel and demand is substantial. Where on-street parking is provided, bike lanes are striped on the left side of the parking lane. In California bike lanes are designated as Class II bikeways.

Cycle Tracks - Cycle tracks are specially designed bikeways separated from the parallel motor vehicle travelway by a line of parked cars, landscaping, or a physical buffer that motor vehicles cannot cross. Cycle tracks are effective in attracting users who are concerned about conflicts with motorized traffic.

Shared Use Paths - Shared use paths are facilities separated from motor vehicle traffic by an open space or barrier, either within the highway right-of-way or within an independent right-of-way. Bicyclists, pedestrians, joggers, and skaters often use these paths. Shared-use paths are appropriate in areas not well served by the street system, such as in long, relatively uninterrupted corridors like waterways, utility corridors, and rail lines. They are often elements of a community trail plan. Shared use paths may also be integrated into the street network with new subdivisions as described in Chapter 3, "Street Networks and Classifications." In California shared-use paths are designated as Class I bikeways.

Shared-use path
(Credit: Marty Bruinsma)

2.2.6 Transit Accommodations

Public transit serves a vital transportation function for many people; it is their access to jobs, school, shopping, recreation, visitation, worship, and other daily functions. Except for subways and rail lines on exclusive rights-of-way, most transit uses streets. For transit to provide optimal service, streets must accommodate transit vehicles as well as access to stops. Transit connects passengers to destinations and is an integral component of shaping future growth into a more sustainable form. Transit design should also support placemaking.

ESSENTIAL PRINCIPLES OF DESIGNING STREETS FOR TRANSIT

Public transit should be planned and designed as part of the street system. It should interface seamlessly with other modes, recognizing that successful transit depends on customers getting to the service via walking, bicycling, car, taxi, or paratransit. Transit should be planned following these principles:

Bus stops are centers of activity (Credit: Ryan Snyder)

- Transit has a high priority on city streets.
- The busiest transit lines should have designated bus lanes.
- Where ridership justifies, some streets, called transit malls, may permit only buses or trains in the travelled way. These often also allow bicycles.
- Technology should be applied to increase average speeds of transit vehicles where appropriate.
- The essential streetscape elements for transit include signs, shelters, and benches. Shelters should be located in a sidewalk's furniture zone so they don't conflict with the pedestrian zone.
- Transit stops should be easily accessible, with safe and convenient crossing opportunities.
- Transit stops should be active and attractive public spaces that attract people on a regular basis, at various times of day, and all days of the week.
- Transit stops should also provide other amenities to make waiting for the next bus comfortable.
- Transit stops function as community destinations. The largest stops and stations should be designed to facilitate programming for a range of community activities and events.
- Transit stops should provide space for a variety of

Bus stop shelter (Credit: Sky Yim)

amenities in commercial areas, to serve residents, shoppers, and commuters alike.

- Transit stops should be attractive and visible from a distance.
- Transit stop placement and design influences accessibility to transit and network operations, and influences travel behavior/mode choice.
- Zoning codes, local land use ordinances, and design guidelines around transit stations should encourage walking and a mix of land uses (see Chapter 13, "Designing Land Use along Living Streets").
- Streets that connect neighborhoods to transit facilities should be especially attractive, comfortable, and safe and inviting for pedestrians and bicyclists.

Bicycle facilities at transit stations encourage intermodal travel: Los Angeles, CA

2.2.7 Placemaking

Placemaking for Streets

Streets comprise a large portion of publicly owned land in cities and towns. Streets are a huge part of any community's public space network, and historically served as meeting places, playgrounds for children, marketplaces, and more. As populations spread out from city centers, most American cities have come to view streets primarily as conduits for moving vehicles from one place to another. While moving vehicles is one of their purposes, streets are spaces, even destinations in and of themselves. Conceiving of a street as a public space and establishing design guidelines that serve multiple social functions involves several fundamental steps. Behind them all is a redefinition of whom streets ought to serve. By approaching streets as public spaces, cities redirect their attention from creating merely traffic conduits to designing a place that offers greater value to pedestrians, bicyclists, and transit riders.

PLACEMAKING FOR STREETS

In order to be places, streets must

- Augment and complement surrounding destinations, including other public spaces such as parks and plazas
- Reflect a community's identity
- Invite physical activity through allowing and encouraging active transportation and recreation
- Support social connectivity
- Promote social and economic equity
- Be as pleasant and accessible for staying as for going
- Prioritize the slowest users over the fastest
- Balance mobility and public space functions

So that people can

- Walk and stroll in comfort
- Sit down in nice, comfortable places, sheltered from the elements
- Meet and talk—by chance and by design
- Look at attractive things along the way
- See places that are interesting
- Feel safe in a public environment
- Enjoy other people around them
- And get where they need to go

2.3 Listing of Community Plan Specific "Complete Streets" Policies for Later Consideration.

The *Merced Vision 2030 General Plan* and public comments gathered during the community outreach efforts of the BCCP are the cornerstones that define the vision of the BCCP. The overall vision for circulation is to provide multi-modal transportation system throughout the planning area for use by vehicles, pedestrians, bicycles, and public transit, consistent with the principles of the General Plan's Urban Design Chapter. These principles emphasize planning, design, and construction for all modes in a manner that results in high usage levels. As such, roadways are treated as the essential element in the urban fabric that *connects* rather than *separates* neighborhoods located on opposite sides of a road. Separation of neighborhoods typically occur when road planning, design, and construction focuses primarily on vehicular travel, to the detriment of other travel modes. Consistent with *Merced Vision 2030 General Plan* Transportation Policy T-2.1 (Implementing Action 2.1d), the BCCP emphasizes travel by all transportation modes.

To achieve this vision within the BCCP, plan goals, policies, and implementation actions need to be prepared and adopted for later use by the community. Section 2.3 provides a suggested set of tools to help with this process, and include:

- State Context of Mandatory Circulation Element Issues
- Suggested Goals
- Policy Development Considerations
- Suggested BCCP Complete-Street Policies
- Suggested BCCP Benchmarks and Performance Measures

2.3.1 Mandatory Circulation Element Issues

The circulation element shall contain objectives, policies, principles, plan proposals, and/or standards for planning the infrastructure to support the circulation of people, goods, energy, water, sewage, storm drainage, and communications. Mandatory circulation element issues as defined in statute include: major thoroughfares, transportation routes, terminals, any military airports and ports, and other local public utilities and facilities. Additionally, the statute requires the circulation element be modified to plan for a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways. The statute defines "all users of streets, roads, and highways" as "bicyclists, children, persons with disabilities, motorists, movers of commercial goods, pedestrians, users of public transportation, and seniors." Transportation networks should additionally consider pedestrian, bicycle, and transit routes, which may not always be located on or along streets, roads, and highways. Circulation elements shall also take into consideration the provision of safe and convenient travel that is suitable to the rural, suburban, or urban context of a local jurisdictions general plan. This could include policies and implementation measures for both retrofitting and developing streets to serve multiple modes and the development of multimodal transportation network design standards based on street types.

2.3.2 Suggested Goals

Guiding Principle

Development of the Bellevue Corridor Community Plan will occur in a manner that enhances the safety, access, convenience and comfort of all users of all ages and abilities, including pedestrians (including

people requiring mobility aids), bicyclists, transit users, motorists, and freight drivers, through the design, operation, and maintenance of the transportation network so as to create a connected network of facilities accommodating each mode of travel that is consistent with and supportive of the local community, recognizing that all streets are different and that the needs of various users will need to be balanced in a flexible manner.

Goals state the broad, overriding outcomes a city wants to achieve. The goals of designing complete streets are to: [2]

- Serve the land uses that are adjacent to the street; mobility is a means, not an end
- Encourage people to travel by walking, bicycling, and transit, and to drive less
- Provide transportation options for people of all ages, physical abilities, and income levels
- Enhance the safety and security of streets, from both a traffic and personal perspective
- Improve peoples' health
- Create livable neighborhoods
- Reduce greenhouse gas emissions and other air pollution
- Reduce energy consumption
- Promote the economic well-being of both businesses and residents
- Increase civic space and encourage human interaction

2.3.3 Policy Development Considerations

The following suggestions are examples of possible complete street policy areas that could be used to prepare the circulation element for the *Bellevue Corridor Community Plan*. [1]

Streets, Roads, and Highways

- The availability of a mix of transportation modes and the infrastructure to support those modes to meet community needs
- The consideration of street patterns; curvilinear, grid, modified grid, etc
- The design of streets (including, but not limited to, width, block size, etc.)
- The consideration of sidewalks and curbs as a standard street design principle
- The consideration of bicycle lanes and/or shared lanes as a standard street design principle
- The consideration of transit accessibility and transit priority measures as a standard street design principle
- The consideration of shade trees and planting strips as a standards street design principle
- The consideration of traffic calming measures (narrower travel lanes, roundabouts, raised medians, speed tables, planting strips, etc.)
- The safety of the traveling public, including pedestrians and bicyclists
- The accessibility and accommodation of bicycle and pedestrian traffic, where appropriate, on and across major thoroughfares
- The design of intersections and public right-of-ways to include adequate and safe access for all users including pedestrians, bicyclists, and motorists of all ages and abilities
- The development of a connected system of streets, roads, and highways that provides continuous, safe, and convenient travel for all users

- The consideration of separate performance and level-of-service standards for bicycle and pedestrian traffic or integrated performance and level-of-service standards that include multiple modes
- The development and improvement of transit, including transit services within a roadway right-of-way
- The consideration of bus HOV lanes or other exclusive right-of-way for transit vehicles

Truck Routes

- The development of proposed truck routes and policies supporting truck route regulations
- The accessibility and accommodation of pedestrian and bicycle traffic, where appropriate, on truck routes

Pedestrian and Bicycle Routes

- The development of a comprehensive pedestrian and/or bicycle plan. See California Streets and Highways Codes Sec. 891.2 requirements for bicycle transportation plans
- The development and improvement of pedestrian and bicycle routes, on and off, streets, roads, and highways. Consider special accommodations such as car-free zones, bicycle boulevards, and paths
- The connectivity of pedestrian and bicycle routes between homes, job centers, schools and facilities, and other frequently visited destinations
- The development of Safe Routes to School programs that address pedestrian and bicycle safety for a two mile radius around all elementary, middle, and high school facilities
- The development of pedestrian and bicycle facilities along routes that support the use of these routes such as benches, shelters, trees, bicycle parking, etc.
- The dedication and preservation of independent alignments (utility, abandoned waterways, or live rail right-of-ways) for the development of bicycle paths
- The development of performance and level-of-service standards for pedestrian and bicycle routes and intersection.
- The development and use of marketing and incentive programs to promote the increase of walking and bicycling

Transit Routes

- The development and improvement of public and private transit routes
- The development and improvement of access to and from transit routes by walking and bicycling and by people with disabilities
- The development of performance and level-of-service standards for transit routes and intersections that consider all transportation modes

Public and Private Transit Terminals

- The location and characteristics of transit terminals to maximize accessibility by all modes of transportation
- The development and improvement of both public and private transit terminals and stops
- The development of inter-modal transfer facilities, such as bicycle parking and bus transfer stations
- The provision of adequate and safe transit facilities including covered shelters, lighting, safe crossings, and locations that support eyes on the street
- The provision of safe and efficient multimodal access to and within transit terminals, complying with ADA standards

Transit and Railroads

- The development and improvement of transit and paratransit services, including mass rapid transit services, commuter light rail and heavy rail metro/subway systems, in consultation with the appropriate transportation agencies
- The accessibility and accommodation of all transit users
- The review and/or development of paratransit plan proposals for jitneys, car pooling, van pooling, taxi service, dial-a-ride, etc.
- The adoption of technology that creates a more effective usage of existing transit such as real time monitors and personalized automatic notification arrivals

Land Uses and Transportation Integration

- The development of transit-oriented development standards, including the appropriate mix of density and intensity of land uses near transit stations, parking requirements, and service and delivery requirements
- The creation of land use patterns, such as mixed-use overlay districts, that allow frequently visited destinations to be accessible by multiple transportation modes
- The availability of transportation infrastructure needed to accommodate increased density and transit-oriented development

Transportation Operations Management

- The development of transportation operations management policies, such as the consideration of reducing speeds, separating pedestrians and bicyclists from vehicle traffic, and adding or upgrading traffic control devices, etc.
- The provision of adequate crossing times and detection for all users at signalized intersections, consistent with AB 1581 (Fuller, Statutes of 2007)
- The appropriate balancing of needs of various users when establishing speed limits for motor vehicles, consistent with AB 2767 (Jackson, Statutes of 2000)

Parking Facilities

- The provision of bicycle parking
- The development of strategies for the control of parking demand such as improved transit services, amenities for bicyclists, subsidized rideshare vehicles, and the consideration of eliminating minimum parking requirements
- The development of strategies for the management of vehicle parking supply such as increased parking fees, graduated parking fees, shared parking, metered on-street parking, staggered work schedules, etc.

2.3.4 Suggested Set of Complete Street Policies

To ensure success of Complete Streets in the BCCP, it is important that the planning and project development process includes consideration of these policies.

All Users and All Modes

Cities will incorporate the full range of appropriate streets elements when planning and designing their transportation networks.

Cities will enhance the safety, access, convenience, and comfort of users of all ages and abilities. Cities understand that children, elderly adults, and persons with disabilities will require special accommodations.

Cities will plan, design, and build high quality access and mobility for pedestrians, bicyclists, and transit passengers.

Connectivity

Cities will design, operate, and maintain a transportation system that provides a highly connected network of streets that accommodate all modes of travel.

Cities will seek opportunities to repurpose rights-of-way, and to add new rights-of-way to enhance connectivity for pedestrians, bicyclists, and transit.

Cities will prioritize non-motorized connectivity improvements to services, schools, parks, civic uses, regional connections, and commercial uses.

Cities will require large, new developments to provide interconnected street networks with small blocks that connect to existing or planned streets on the perimeter of the development.

Jurisdiction

A city's complete streets policy document is intended to cover all roads, streets, and alleys in the city.

Every city agency, including public works, planning, redevelopment, street services, and others will follow the policies in this document.

Cities will require all developers to obtain and comply with their standards.

Phases

Cities will apply their complete streets policy document to all roadway projects including those involving operations, maintenance, new construction, reconstruction, retrofits, repaving, rehabilitation, or changes in the allocation of pavement space on an existing roadway. This also includes privately built roads intended for public use.

Transportation facilities are long-term investments that should be designed and constructed to anticipate all current and future demand and connectivity needs. Those planning and designing street projects will give due consideration to bicycle, pedestrian, and transit facilities from the very start of planning and design work. This will apply to all street construction, re-construction, re-paving, and re-habilitation projects, or changes in the allocation of pavement space on an existing roadway (such as the reduction in the number of travel lanes or removal of on-street parking).

Complete streets may be achieved through single projects or incrementally through a series of smaller improvements or maintenance activities over time.

Cities will draw on all sources of transportation funding to implement complete streets.

Exceptions

Complete streets will be included in all street construction, reconstruction, repaving, and rehabilitation projects, except under one or more of the following conditions:

A. A project involves only ordinary maintenance activities designed to keep assets in serviceable condition, such as mowing, cleaning, sweeping, spot repair, concrete joint repair, or pothole filling, or when interim measures are implemented on temporary detour or haul routes.
B. The City Council exempts a project due to an excessively disproportionate cost of establishing a bikeway, walkway, or transit enhancement as part of a project.
C. The City Engineer and the Planning Manager jointly determine that the construction is not practically feasible or cost effective because of significant or adverse environmental impacts to waterways, flood plains, remnants of native vegetation, wetlands, mountainsides, or other critical areas, or due to impacts on neighboring land uses, including from right of way acquisitions.
D. The City Engineer issues a documented exception that application of complete streets principles is unnecessary or inappropriate.
E. The Director of Development Services issues a documented exception where changes to the street may detract from the historical or cultural nature of the street or neighborhood.

Design

Cities will adopt new complete streets design guidelines to guide the planning, funding, design, construction, operation, and maintenance of new and modified streets while remaining flexible to the unique circumstances of different streets where sound engineering and planning judgment will produce context-sensitive designs.

Cities will incorporate the street design guidelines' principles into all city plans, manuals, rules, regulations, and programs as appropriate. As new and better practices evolve, cities will incorporate those as well.

Cities will keep street pavement widths to the minimum necessary.

Cities will provide well-designed pedestrian accommodation in the form of sidewalks or shared-use pathways on all arterial and collector streets and on local streets.

Cities will provide frequent, convenient, and safe street crossings. These may be at intersections designed to be pedestrian friendly, or at mid-block locations where needed and appropriate.

Cities will provide bicycle accommodation along all avenues, boulevards, and connector streets.

Where physical conditions warrant, cities will plant trees and manage streetwater whenever a street is newly constructed, reconstructed, or relocated.

Context Sensitivity

Cities will plan their streets in harmony with the adjacent land uses and neighborhoods.

Cities will design their streets with full input from local stakeholders.

Cities will design their streets in harmony with natural features such as waterways, slopes, and ravines.

Cities will design their streets to connect or provide continuity between existing trail or path networks, where appropriate.

Cities will design their streets with a strong sense of place. They will use architecture, landscaping, streetscaping, public art, signage, etc. to reflect the community, neighborhood, history, and natural setting.

Cities will coordinate with merchants along Main Street corridors to develop vibrant retail districts.

Performance Measures

Use performance measures below

Implementation Plan

Cities will adopt and apply a complete-street design manual.

Cities will incorporate complete streets concepts into the next circulation element of their general plans.

Cities will either implement complete streets designs on every street, or initiate the process by preparing and adopting bicycle plans, pedestrian plans, green streets plans, Safe Routes to School plans, and an Americans with Disabilities Act transition plan.

2.3.5 Suggested Benchmark and Performance Measures

Conventional street design applies auto-centric performance measures. The most common is the Level of Service (LOS), which seeks to maintain flow of vehicles and leads to widening streets and intersections, removing on-street parking, and other strategies to accommodate the flow of traffic. These techniques undermine the goals and tenets of complete streets.

To meet the goals and tenets of complete streets, communities should adopt the following benchmarks and performance measures. [2]

BENCHMARKS

- Every street and neighborhood is comfortable to walk and bicycle in.
- Every child can walk or bike to school safely.
- Seniors, children, and disabled people can cross all streets safely and comfortably.
- An active way of life is available to all.
- There are zero traffic fatalities.
- Retail streets become one of the most popular destinations for tourists in the country.

PERFORMANCE MEASURES

- Street fatalities and injuries decrease for all age groups.
- The number of trips by walking, cycling, and transit increases.
- Vehicle travel is reduced.
- Prevailing speeds of vehicles on local streets decrease.
- Retail sales and tourism increase.
- Resident satisfaction increases.

3. BIBLIOGRAPHY AND ACKNOWLEDGEMENTS

Bibliography:

1. Update to the General Plan Guidelines: Complete Streets and the Circulation Element. Governor's Office of Planning and Research. December 15, 2010

2. *Los Angeles County Model Design Manual for Living Streets*

Acknowledgements

The *Los Angeles County Model Design Manual for Living Streets* was utilized to prepare "Report 3 of Appendix I of the BCP; and, 2) portions of the Circulation Chapter of the BCP. The City of Merced expresses its gratitude to those individuals who prepared this manual, and who enabled such manual to be adopted, customized, or modified to meet the needs of the BCC. The following individuals are acknowledged and credited as contributors to the *Los Angeles County Model Design Manual for Living Streets*.

Suzanne Bogert, Director of RENEW, Los Angeles County Department of Public Health.

Ryan Snyder, President of Ryan Snyder Associates, Federal Highway Administration Pedestrian Safety Design Instructor, Complete Streets Instructor, National Safe Routes to School Instructor. National Sustainable Building Program Instructor. UCLA Urban Planning Instructor. Coordinated street manual project, worked on all chapters, and contributed many of the photos.

Colleen Callahan, Deputy Director of the UCLA Luskin Center for Innovation. Managed Chapter 11.

Michael Ronkin, Owner, Designing Streets for People LLC. Complete Streets Instructor, Federal Highway Administration Pedestrian Safety Design Instructor. Provided content editing for entire manual.

Jean Armbruster, Director of the Policies for Livable, Active Communities and Environments (PLACE) program for the Los Angeles County Department of Public Health. Contributed to Chapter 6.

Edward Belden, LEED-AP. Senior Scientist at the Council for Watershed Health. Contributed to Chapter 11.

Pippa Brashear, Project Manager at Project for Public Spaces. Contributed to Chapter 12.

Madeline Brozen, Program Director for the UCLA Complete Streets Initiative, UCLA Luskin School of Public Affairs. Contributed to Chapter 2.

Marty Bruinsma, Graphic Designer and Artist. Illustrated numerous graphics throughout this manual.

Dan Burden, Executive Director of the Walkable and Livable Communities Institute, internationally recognized authority on bicycle and pedestrian facilities and creating livable communities. Contributed to all chapters and contributed many of the pictures.

Julia Campbell, LEED AP, EIT. Master of Urban and Regional Planning student at the UCLA Luskin School of Public Affairs; graduate student researcher for the UCLA Luskin Center for Innovation and formerly a hydraulic engineer focusing on stormwater management. Contributed to and edited Chapter 11.

Lisa Cirill, M.S., P.A.P.H.S. Chief of California Active Communities, a joint unit of the California Department of Health and the University of California, San Francisco. Contributed to Chapter 2.

Art Cueto, Planning Manager at Transtech. Contributed to Chapter 9.

J.R. DeShazo, Director of the UCLA Luskin Center for Innovation. Contributed to Chapter 11.

Peter Eun, Member, Federal Highway Administration Resource Center Safety and Design Team. Federal Highway Administration Pedestrian Safety Design Instructor. Contributed to Chapter 7.

Charlie Gandy, Mobility Coordinator for the City of Long Beach, California. Contributed to Chapter 2.

Norman Garrick, Ph.D. Associate Professor at the University of Connecticut in the Department of Civil and Environmental Engineering. Board member of the Congress for New Urbanism. Contributed to Chapter 3.

Said Gharbieh, BSc, MSc, FCIHT, FCIT, MBIM. Principal at Arup. Leads Arup's transportation planning business in Southern California. Contributed to Chapter 3.

Ellen Greenberg, PE. Associate Principal at Arup; heads the Integrated Planning department. A lead author of *Context Sensitive Design Solutions for Major Urban Thoroughfares for Walkable Communities.* Contributed to Chapter 3.

Gayle Haberman, Policy Analyst of the Policies for Livable, Active Communities and Environments (PLACE) program for the Los Angeles County Department of Public Health. Contributed to Chapter 2.

Andre Haghverdian, PE. President of Pivot Group, Inc., a civil engineering and construction firm. Contributed to Chapter 11.

Holly Harper, Architect and Initiative Coordinator for Calles Para la Gente Boyle Heights. Contributed to Chapter 11.

Billy Hattaway, Managing Director of Transportation, Florida with VHB Miller Sellen. Author of the new "Traditional Neighborhood Development" chapter of the Florida GreenBook. Contributed to Chapters 4 and 5.

Brett Hondorp, AICP. Vice President, Association of Pedestrian and Bicycle Professionals. Principal with Alta Planning + Design. Contributed to Chapter 8.

Julia Lave Johnston, Director of the Land Use and Natural Resources Program at the University of California, Davis, Extension. Formerly Deputy Director for Planning Policy in the California Governor's Office of Planning and Research. Contributed to Chapter 2.

Peter Lagerwey, Senior Planner and Regional Office Director for Toole Design Group in Seattle, Washington. Federal Highway Administration Pedestrian Safety Design Instructor, Complete Streets Instructor, National Safe Routes to School Instructor. Contributed to Chapter 7.

Brad Lancaster, Author of *Rainwater Harvesting for Drylands and Beyond*. Conducts permaculture consulting, design, and education. Contributed to Chapter 11.

Stephanie Landregan, FASLA, LEED-AP. Director for the Landscape Architecture Program at UCLA Extension. City of Glendale Planning Commissioner. Contributed to Chapter 11.

Ian Lockwood, PE, Loeb Fellow. Principal at AECOM. Widely recognized as one of the leading traffic engineers in North America. Contributed to Chapters 3, 10, and 15.

Jana Lynott, AICP. Senior Strategic Policy Advisor for Transportation and Livable Communities at the Public Policy Institute of AARP. Author of *Planning Complete Streets for an Aging America.* Contributed to Chapters 6 and 13.

Mukul Malhotra, Principal at MIG, Inc. Coordinator of 2011 Streets Project Conference in Berkeley, California. Contributed to Chapters 4 and 5.

Tim Mann, RLA. Principal at Lynn Capouya, Inc. Landscape Architects. Contributed to Chapter 11.

Barbara McCann, Executive Director of the National Complete Streets Coalition. Contributed to Chapter 2.

Cullen McCormick, UCLA Urban Planning Masters Student. Contributed to manual design.

Jessica Meaney, California Policy Manager for the Safe Routes to School National Partnership. National Safe Routes to School Instructor. Contributed to Chapter 2.

Lys Mendez, master's student of urban planning at UCLA. Contributed preliminary editing.

Rock Miller, PE. President-elect of the Institute of Transportation Engineers. Principal at Stantec. Contributed to Chapters 1, 4, 5, and 8.

Kelly Morphy, Director of Outreach and Communications, Walkable and Livable Communities Institute. Contributed to Chapter 15.

Michael Moule, PE, TE, PTOE. Principal at Nelson\Nygaard Consulting Associates. Past president of the Association of Pedestrian and Bicycle Professionals. Co-author of the 2011 AASHTO Bike Guide, co-author of *Roundabouts: An Informational Guide*, 2010. Federal Highway Administration Pedestrian Safety Design Instructor, Complete Streets Instructor, Contributed to Chapters 4, 5, and 8.

Deborah Murphy, **Associate AIA.** Principal of Deborah Murphy Urban Design + Planning and Founder of Los Angeles Walks. Contributed to Chapter 11.

Narasimha Murthy, Ph.D., TE. President of Murthy Transportation Consultants. Contributed to Chapters 4 and 5.

Margot Ocañas, Policy Analyst with the Renewing Environments for Nutrition, Exercise, and Wellness (RENEW) program for the Los Angeles County Department of Public Health. Assisted on several chapters.

Lisa Padilla, AIA, LEED-AP. Architect and Urban Designer. Principal of Cityworks Design. Contributed to Chapter 13.

Simon Pastucha, Chief Urban Designer for the City of Los Angeles. Contributed to Chapters 13 and 15.

Jen Petersen, Ph.D. Urban sociologist. Chief Officer of Ideas and Operations at Creative Commercial Real Estate in New York City. Contributed to Chapter 12.

Grace Phillips, Principal of Gracescapes. Sustainable landscape professional. Master's of Urban Planning student. Contributed to Chapter 11.

Francis Reilly, Urban Planner. Prepared the InDesign layout for the manual.

James Rojas, Urban Planner. Founder of the Latino Urban Forum. Contributed to Chapter 9.

David Sargent, Principal at Sargent Town Planning. Contributed to Chapter 13.

Will Schroeer, Director of Policy and Research for Smart Growth America. Wrote Chapter 14.

Jessica Scully, Writer and Editor. Former technical communication instructor at the University of California, Irvine. Edited the entire manual.

Chanda Singh, Transportation Planner with Ryan Snyder Associates. Contributed to Chapters 3 and 6.

Heather Smith, Planning Director of the Congress for New Urbanism. Played a significant role in producing the *Context Sensitive Design Solutions for Major Urban Thoroughfares for Walkable Communities.* Contributed to Chapter 3.

Pat Smith, ASLA, AICP, Certified Arborist. Principal of Patricia Smith Landscape Architecture. Contributed to Chapter 11.

Gary Toth, Senior Director, Transportation Initiatives for the Project for Public Spaces. Primary author of the Pennsylvania and New Jersey State Departments of Transportation *Smart Transportation Guide*. Contributed to Chapter 9.

Michael Wallwork, PE. President of Alternate Street Design. Traffic engineer and nationally renowned roundabout and traffic calming designer. Contributed to Chapters 4, 5, and 10.

Michele Weisbart, Graphic and Web Designer. Created most of the graphics in the manual as well as the layout.

Scott Windley, Accessibility Specialist, U.S. Access Board. Contributed to Chapter 6.

Will Wright, Director of Government and Public Affairs for the American Institute of Architects in Los Angeles. Contributed to Chapter 2.

Sky Yim, Sky Yim Photography. Contributed many of the photos.

Paul Zykofsky, AICP, Associate AIA. Associate Director, Local Government Commission. Federal Highway Administration Pedestrian Safety Design Instructor, Complete Streets Instructor, National Safe Routes to School Instructor. Contributed content editing.

Useful Definitions [1]

Air Installation Compatible Use Zone (AICUZ): A land use compatibility plan prepared by the U.S. Department of Defense for military airfields. AICUZ plans serve as recommendations to local government bodies having jurisdiction over land uses surrounding these facilities.

Airport: An area of land or water that is used or intended to be used for the landing and taking off of aircraft, and includes its building and facilities, if any.

Airport Land Use Compatibility Plan: A plan adopted by an Airport Land Use Commission, which sets forth policies for promoting compatibility between airports and the land uses which surround them.

All Users: Users of streets roads and highways including bicyclists, children, persons with disabilities, motorists, movers of commercial goods, pedestrians, users of public transportation and seniors.

Arterial: A major street carrying the traffic of local and collector streets to and from freeways and other major streets, with controlled intersections and generally providing direct access to properties.

Bicycle Boulevard: The Bicycle Boulevard Design Guidebook defines a Bicycle Boulevard as "low-volume and low-speed streets that have been optimized for bicycle travel through treatments such as traffic calming and traffic reductions, signage and pavement markings, and intersection crossing treatments.

Bicycle Lane: According to Caltrans' Highway Design Manual, Chapter 1000, a bicycle lane is a Class II Bikeway and provides a striped lane for one-way bicycle travel on a street or highway,

Bicycle Path: According to Caltrans' Highway Design Manual, Chapter 1000, a bicycle path is a Class I Bikeway and provides a completely separated right of way for the exclusive use of bicycles and pedestrians with cross flow by motorists minimized.

Bus Rapid Transit (BRT): The Federal Transit Administration defines BRT as a "combination of facility, systems, and vehicle investments that convert conventional bus services into a fixed-facility transit service, greatly increasing their efficiency and effectiveness to the end user."

Collector: A street for traffic moving between arterial and local streets, generally providing direct access to properties.

Complete Street: The National Complete Streets Coalition defines complete streets as follows:

> Complete streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists, and transit riders of all ages and abilities must be able to safely move along and across a complete street.

> Creating complete streets means transportation agencies must change their orientation toward building primarily for cars. Instituting a complete streets policy ensures that transportation agencies routinely design and operate the entire right of way to enable safe access for all users.

The American Planning Association (APA) describes complete streets as follows:

> Complete streets serve everyone – pedestrians, bicyclists, transit riders, and drivers – and they take into account the needs of people with disabilities, older people, and children. The complete streets movement seeks to change the way transportation agencies and communities approach every street project and ensure safety, convenience, and accessibility for all.

The California Department of Transportation (Caltrans) defines complete streets as follows:

> A transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit vehicles, truckers, and motorists, appropriate to the function and context of the facility. Complete street concepts apply to rural, suburban, and urban areas.

Connectivity: A well connected circulation system with minimal physical barriers that provides continuous, safe, and convenient travel for all users of streets, roads, and highways.

Conventional Highway: According to the California Highway Manual, a conventional highway is, "a highway without control of access which may or may not be divided. Grade separations at intersections or access control may be used when justified at spot locations."

Expressway: A highway with full or partial control of access with some intersections at grade.

Farm-to-Market: Transportation facilities which provide connections between areas of agricultural production, processing, and storage facilities to agricultural distribution and sales activities.

Freeway: A highway serving high-speed traffic with no crossings interrupting the flow of traffic (i.e., no crossings at grade). Streets and Highways Code §23.5, in part, states that "Freeway means a highway in respect to which the owners of abutting lands have no right or easement of access to or from their abutting lands or in respect to which such owners have only limited or restricted right or easement of access."

Heliport: A facility used for operating, basing, housing, and maintaining helicopters.

Local Scenic Highway: A segment of a state or local highway or street that a city or county has designated as "scenic."

Local Street: A street providing direct access to properties and designed to discourage through traffic.

Level-of-Service: According to the Transportation Research Board's 2000 Highway Capacity Manual Special Report, Level-of-Service is a qualitative measure describing the efficiency of a traffic stream. It also describes the way such conditions are perceived by persons traveling in a traffic stream. Level-of-Service measurements describe variables such as speed and travel time, freedom to maneuver, traffic interruptions, traveler comfort and convenience, and safety. Measurements are graduated, ranging from level-of-Service A (representing free flow and excellent comfort for the motorist, passenger, or pedestrian) to Level-of-Service F (reflecting highly congested traffic conditions where traffic volumes exceed the capacities of streets, sidewalks, etc.). Level-of-Service can be determined for freeways, multi-lane highways, two-lane highways, signalized intersections, intersections that are not signalized arterials, and transit, bicycle, and pedestrian facilities.

Light Rail or Light Rail Transit (LRT): A form of urban rail public transportation which typically travels at a lower speed and capacity than heavy and metro rail systems, but typically travels at higher speeds and capacity than traditional tram systems. LRT operates mostly in private right-of-ways, but can also at times be incorporated into public right-of-ways.

Major Thoroughfare: A major passageway such as a street, highway, railroad line, or navigable waterway that serves high traffic volumes.

Multimodal Transportation Network: A well balanced circulation system that includes multiple modes of transportation that meets the needs of all users of streets, roads, and highways. §65302(b)(2)(A).

National Scenic Byway: A segment of a state or interstate highway route that the United States Forest Service has designated as a scenic byway or which another federal agency has designated as a national scenic and recreational highway.

Official County Scenic Highway: A segment of a county highway the Director of Caltrans has designated as "scenic."

Official State Scenic Highway: A segment of a state highway identified in the Master Plan of State Highways Eligible for Official Scenic Highway Designations and designated by the Director of Caltrans.

Paratransit: Transportation systems such as jitneys, car pooling, van pooling, taxi service, and dial-a-ride arrangements.

Railroad Depot: A railroad terminal where passengers and goods are loaded and unloaded.

Recreational Trails: Public areas that include pedestrian trails, bikeways, equestrian trails, boating routes, trails, and areas suitable for use by persons with disabilities, trails and areas for off-highway recreational vehicles, and cross-country skiing trails.

Route: A sequence of roadways, paths, and/or trails that allow people to travel from place to place.

Scenic Highway Corridor: The visible area outside the highway's right-of-way, generally described as "the view from the road."

Terminal: A station, stop, or other transportation infrastructure along or at the conclusion of a transportation route. Terminals typically serve transportation operators and passengers by air, rail, road, or sea (i.e., airports, railroad depots, transit stops and stations, and ports and harbors).

Transit-Oriented Development (TOD): A moderate- to high-density development located within an easy walk or bicycle of a major transit stop, generally with a mix of residential, employment, and shopping opportunities. TOD encourages walking, bicycling, and transit use without excluding the automobile.

Utilities: A set of services provided by local public utilities such as electricity, natural gas, water, and sewage.

Walkability: The measurement of how walkable a community is. Walkable communities typically include footpaths, sidewalks, street crossing, or other pedestrian oriented infrastructure.

REPORT 4:

Zoning, Development and Land Use Standards to Implement the Bellevue Corridor Community Plan

January 22, 2013

CONTENTS

1. Purpose of Memorandum 79

2. Implementation and Recommendations 121

2.1 Implementing the Urban Village Concept with the Key Features of the Bellevue Corridor Planning Area 121

2.2 Implementing Merced's Urban Village Concept through the BCCP 121

1. PURPOSE OF MEMORANDUM

This memorandum addresses how the relevant direction in Chapter 3 of the City of Merced (City) 2030 General Plan (Land Use) will be implemented in the BCCP. The BCCP will need to result in a comprehensive approach that achieves the goals for the Bellevue area as well as those of the City as a whole.

The land within the BCCP area is located within the City's Sphere of Influence, not yet within the incorporated City boundaries. As a result, there is no City zoning on the properties. The BCCP will serve as a tool for describing the vision and establishing zoning, development and land use standards for the 2.5-square mile area. Zoning will be the primary tool for implementing the vision described in the BCCP.

In order to generate and apply the appropriate zoning, development and land use standards to the BCCP area, the following are necessary:

- Recommendations for how to implement the Urban Village concept balanced with the key features of the planning area;
- A vision supported by the community that can be articulated in enough detail in the BCCP to be implemented through zoning;
- Evaluation of the vision to determine which of the City's current zoning districts and standards are appropriate to implement the vision and direction in the BCCP; and
- Identification of zoning standards necessary to implement the vision and direction in the BCCP.

The analysis in this Memorandum addresses the first item above. The analysis is in narrative format to expose and discuss issues that need to be clarified in order to move forward confidently. Based on community input through the public process, the consultant team will then work with the community to prepare the second item, the vision for the BCCP area. The vision will then be turned into a complete plan that will be accompanied by zoning, development and land use standards for implementation.

2. IMPLEMENTATION AND RECOMMENDATIONS

2.1 Implementing the Urban Village Concept with the Key Features of the Bellevue Corridor Planning Area

The BCCP process should ensure that the General Plan is implemented at the appropriate level (e.g., policy or regulation). This memo directs implementation of the General Plan Urban Village concept (Section 3.6.2) and the Bellevue Corridor planning area (Section 3.7.4). Key features and direction from these sections of the General Plan are summarized below.

Key Features and Issues to be Addressed in the BCCP:

- Economics/Market: Long-term sustainability and demand to determine size and location of research and development (R & D), medical/professional offices, retail/commercial, and housing;
- Land Use: Implementation of the Urban Village concept; compatible and complementary land uses, influence and effects from the UC on nearby land; interface with existing rural areas; a variety of housing types and densities in addition to job-generating land uses;
- Transportation/Circulation: Establish Bellevue Road as a multi-modal access corridor that unifies rather than separates the opposite sides of the road; Establish a system of collector streets and arterials to encourage internal circulation within the BCCP area;
- Public Facilities: Location and financing of public facilities; off-street bike and pedestrian paths; parks and open space;
- Environment: Lake Yosemite Inundation Area; Sensitive species and habitat conservation;
- Character/Design: Establish design guidelines for development along Bellevue Road; Consider the natural hill on the south side of Bellevue between G and Gardner as a focal point.

The following analysis will refer back to these key features, with recommendations on approaches or adjustments as necessary to best support these key features. For example, 1) how to incorporate employment land uses such as R & D parks; 2) compatibility issues of buildings and land uses with adjacent regional transit and roads; and 3) accommodation for transit priority projects.

2.2 Implementing Merced's Urban Village Concept through the BCCP

The Urban Village concept (about 1 square mile, or 64 acres) establishes options for new growth at a scale larger than that of individual projects: new pieces of Merced. The Urban Village concept is essentially a pattern of approximately four neighborhoods (about 160 acres each) with high connectivity and internal variety that are served by some type of commercial area as well as areas for industrial uses or business parks. Each neighborhood has its own shape, role and intensity based on its location and the BCCP vision, as established in the General Plan. Each group of four neighborhoods is expected to have an "Inner Village" which contains the most intense housing in the neighborhood along with any civic, commercial or retail businesses, as well an "Outer Village" that contains the least intense housing in the neighborhood and any parkland and schools.

The traditional city, one that matures while easily adapting to changing conditions, is based on an observable structure of Centers, Neighborhoods, Districts and Corridors. Merced is such a city, especially its downtown and adjacent neighborhoods. Each quadrant in the BCCP will be a mix of at least two of the traditional city environments mentioned above. The range of mixing depends upon the vision and policy direction of the BCCP.

In the analysis presented in this memo, we implement the Urban Village concept using our experience with the traditional city approach of Centers, Neighborhoods, Districts and Corridors. To summarize how our recommended approach implements the Urban Village concept, Tables 1 and 2 compare the General Plan's direction for the structure of new growth areas with our recommendations for the new structural pieces of Merced's growth. Each of the traditional city environments (Centers, Neighborhoods, Districts, and Corridors) is described following Tables 1 and 2.

Table 1: Urban Village Concept	
Innver Village	**Outer Village**
Approximate amount in 1 Square Mile = 1/3	**Approximate amount in 1 Square Mile = 2/3**
Core Commercial Area	**3.1.Low Density Residential Area**
Either of 3 types of Core Commercial Areas: **Community = 20 to 60 acres** **Neighborhood = 10 to 20 acres** **Convenience = 3 to 10 acres**	**3.2. Min Dwellings per Acre = 2** **Max Dwellings per Acre = 6**
Village Core Residential	**3.3.Open Space and Schools**
Min Dwellings per Acre = 7 **Min Average Dwellings per Acre = 10** **Max Dwellings per Acre = 30**	
Range of Land Uses: The Inner Village may contain a wide variety of commercial, retail and business-park type uses as well as the most intense housing within the area.	**Range of Land Uses:** The Outer Village may contain a wide variety of lower density housing choices.
The Urban Village Concept and its direction identified above has been translated on the next page into a system of physical components that can be establisihed, adjusted and applied to each of the square mile sections or 'quadrants' in the BCCP. Moving forward, the system of Centers, Neighborhoods, Districts and Corridors will implement the Urban Village Concept.	

Table 2: Implementation			
Centers	**Neighborhoods**	**Districts**	**Corridors**
Approximate amount in Quadrant = Distributed along Corridors at least 1/2 mile apart	**3.4. Approximate amount in Quadrant =** at least 50% or more depending upon location	**Approximate amount in Quadrant =** Distributed along Corridors between Centers, buffering Neighborhoods from large roads	**3.5. Approximate amount in Quadrant =** Square mile defined by Corridors ; may be applied to 1/2 mile areas
Description and Types	**Description and Types**	**Description and Types**	**Description and Types**
Centers are located to serve adjacent neighborhoods and districts and are typically located along a Corridor. One of three types of Centers is applied to a location along a Corridor or along the edges of a District or Neighborhood. Streets and streetscapes are the most urban of all in the BCCP. Three types of centers provide for the expected range of land use activity:	Neighborhoods are located between Corridors and accommodate a wide range of housing choices with the most intense housing nearer Corridors, Centers, and Districts. Depending upon location, Neighborhoods are composed of at least two and up to three Neighborhood Residential environments. Streets and streetscapes respond to and support the three general environments. Three types of Neighborhood-Residential provide for the expected range of land use activity:	Districts are areas that because of their size or function are neither neighborhoods or centers such as business and research parks. Districts are typically located along or near Corridors and may contain non-residential activity as well as Urban Residential. Streets range from urban for office areas to industrial for manufacturing areas. Two types of Districts provide for the expected range of land use activity:	Corridors are areas typically 1 block deep along the square-mile and half-mile grid. Corridors buffer neighborhoods from larger roads and are punctuated by Centers with Districts occurring as well and may contain a wide variety of non-residential and residential land use activity. Streets and streetscapes respond to and support the three general environments. Three types of Corridors provide for the expected range of land use activity:
Regional: Contains retail and service businesses that attract customers from the region.	**Urban Residential:** Consists of the most intense housing in the neighborhood and typically up to 25% of the total housing area depending upon location.	**3.6. Workplace:** Consists primarily of large office or light industrial buildings with jobs that attract employees from Merced and the region.	**Urban:** Segments that primarily consist of Urban Residential housing and District development. The street section along these segments is the most robust to accommodate mixed-use activity.
Community: Contains retail and service businesses and services aimed at the greater Bellevue area	**Neighborhood Residential:** Consists primarily of single-family housing and typically up to 75% of the total housing area depending upon location.	**Recreation:** Consists of unique recreationally-oriented activities and buildings.	**Neighborhood:** Segments that primarily consist of Neighborhood Residential housing. The street section along these segments is neighborhood-oriented.
Neighborhood: Contains retail and service businesses and services aimed at the nearby neighborhoods	**Rural Residential:** Consists primarily of single-family housing and typically up to 25% of the total housing area depending upon location.		**Rural:** Segments that primarily consist of Rural Residential housing. The street section along these segments is the least intense of all with natural landscaping and detailing.

Combining and Applying the Above Components: The actual combinations and amounts of each of the four components depends upon the vision and policy direction for each square mile or 'quadrant' in the BCCP.

Component A: Centers

Terminology: The term "Center" refers to concentrations of non-residential and residential activity such as retail, office and service commercial with housing that is more intense than the housing in neighborhoods or along corridors.

Purpose: The main purpose of Centers is to provide the focal points of business, housing and civic activity that serve a variety of needs. Centers are sometimes located in geographically central locations but typically are located between neighborhoods along key streets or at the edges of Districts and along Corridors.

Application to the BCCP: We recommend three types of centers as shown in Table 2. The appropriate type of center depends upon many factors such as location, role and intensity within the BCCP area.

As individual neighborhoods, districts and corridors will vary from one another across the 2.5 square-mile area, centers in the area will also vary in size, intensity, layout, physical character, range of land uses.

Based on our interpretation of the direction from the General Plan, the size of Centers appears to be at the larger end of the spectrum. Because Centers will vary in response to their context and economic role, we have provided an expanded discussion about the size of Centers below to clarify expectations.

The General Plan identifies a quarter-mile walking distance for how Centers are to be sized and integrated with adjacent areas. This distance translates into about three walkable blocks in any direction. For the purposes of the BCCP we recommend that the term 'walkable block' refer to blocks that are not large and that do not favor vehicles to the exclusion of pedestrians. In our experience, a walkable block is typically up to 600 feet long in any direction and has pedestrian-oriented streetscapes with vehicular speeds that are typically less than 35 miles per hour. If speeds need to be higher such as along a boulevard, the street is then designed to be in balance with the pedestrian activity expected along its edges. As discussed in other parts of this memorandum, while there are exceptions, these factors tend to make a street conducive to people walking or wanting to be on the street: all important factors for the viability of Centers. When these factors increase numerically, the tendency is for the resulting environment to be one where people do not feel as comfortable walking or cycling. Over time, such streets present a less than appealing address for the buildings and activities along these streets.

Local Example of a Walkable Center: As a local example of a walkable Center, Downtown Merced and the adjacent neighborhoods illustrate the above points very well. A summary of Downtown Merced and the adjacent neighborhoods is provided below:

Downtown Merced:

Role: The Main Street for Merced.

Size: Approximately 100 acres; This regional center consists of eight blocks from R to G Street on each side of Main Street extending north for two blocks into the adjacent neighborhoods and south for one block toward Highway 99. The blocks range in size from 400 to 425 x 325 feet.

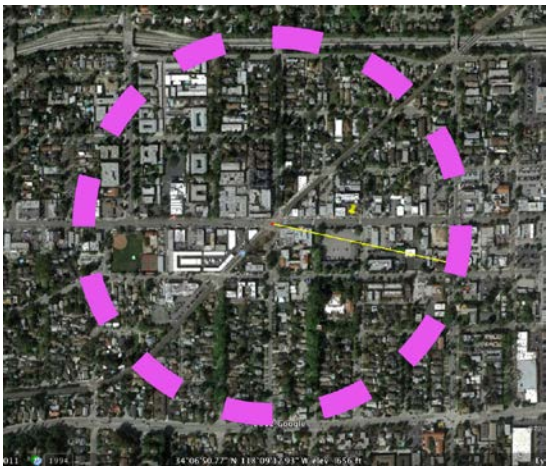
Physical Character: Most buildings are single- and two-stories with some taller buildings in the core. The ambience feels that of a small city as distinct from a town.

Example of a Range of Centers. In order to provide additional perspective on the size of Centers, the following examples are provided. The examples are listed from most intense and urban to least intense and rural for

successful Centers in a variety of physical and economic contexts ranging from small cities to small towns: South Pasadena, Healdsburg, Rancho Santa Fe, and Los Olivos.

Each of the following examples could serve entirely or partially as models for adaptation to the BCCP. The actual models to be adapted depend upon a range of factors, namely location and role in the overall mix and structure of the BCCP area.

Table3: Centers Comparison



Most Urban

South Pasadena, CA

Non-Residential Portion of Center: 20 acres

Physical Character: A small city at the upper end of the intensity spectrum.

Characteristics: A Local 'main street' at Mission and Meridian Streets. This 'center' consists of 4 blocks on both sides of Mission Street and is essentially 1 block deep as it connects with adjacent neighborhoods of single- and multi-family houses.

The blocks range in size with some at 220 x 280 feet, some at 275 x 280 feet and some at 280 x 345 feet.

Most buildings are single-story with some two-story buildings.

Healdsburg, CA

Non-Residential Portion of Center: 23 acres

Physical Character: A small town.

Characteristics: A community-oriented Main street and town square. This 'center' consists of 3 blocks on each side, surrounding a central town square and then connecting with adjacent neighborhoods of single- and multi-family houses. There is some corridor 'main street' development north and south of these 9 blocks. These blocks are perceived as the 'center'.

The blocks range in size but are generally between 235 to 260 feet x 260 to 275 feet.

Most buildings are two-stories with a few 3-story buildings.

Note: The area within the purple circle is the land within a 1/4 mile of each example's physical center.

Table 3: Centers Comparison

Most Rural

Rancho Santa Fe, CA

Non-Residential Portion of Center: 39 acres

Physical Character: A very small town with some rural character.

Characteristics: A local Main street. This 'center' consists of 3 blocks on each side, with one block at the south end that contains a hotel resort. These 7 blocks then connect with adjacent neighborhoods of estate-type houses in all directions.

The blocks range in size with some at 160 x 235 feet and some at 235 x 550 feet.

Most buildings are single-story with a few two-story buildings.

Los Olivos, CA

Non-Residential Portion of Center: 16 acres

Physical Character: A very small town with entirely rural character.

Characteristics: A local Main street at Grand and Alamo Pintado Avenues. This 'center' consists of 3 blocks on both sides of Grand Avenue and is one block deep as it connects with single- and small multi-family buildings in the adjacent neighborhoods.

The blocks range in size with half at 300 x 315 feet and the other half at 300 x 460 feet.

Most buildings are single-story with some two-story buildings.

Note: The area within the purple circle is the land within a 1/4 mile of each example's physical center.

The above examples show that whether or not the individual tenants are aimed at the region, the entire community, or at the neighborhood level, less rather than more acreage is needed to generate a viable Center. This is important when considering that *Implementing Action 1.2.b (page 6-12)* identifies that commercial areas should typically be of the following size depending upon the type.

Type of Center	Required Size of Center (Acres)	Required Size of Urban Residential	Total Required Size of Center (acres)
Regional: We recommend adding the Regional Center type. Typically includes anchor stores that have the widest trade area of stores in Merced. Only 1 is realistic in the BCCP.	We recommend Min 20	We recommend Min 20	We recommend Min 40
Community: Typically includes a supermarket, pharmacy, ancillary retail, professional office, junior anchor stores, health club	GP Reqmt: 20-60 We recommend Min 20	GP Reqmt: 40-80 We recommend Min 10	GP Reqmt: 100 Min 30
Neighborhood: Typically includes a supermarket, additional anchor, major ancillary retail, provisional office	GP Reqmt: 10-20 We recommend Min 5	GP Reqmt: 50-60 We recommend Min 10	GP Reqmt: 70 Min 15
Convenience: Typically includes a convenience mini-market with some ancillary retail. We recommend incorporating this type into the Neighborhood Center type.	GP Reqmt: 3-10 We recommend incorporating this type into Neighborhood Center type	GP Reqmt: 40-47 We recommend incorporating this type into Neighborhood Center type	GP Reqmt: 50 We recommend incorporating this type into Neighborhood Center type

Based on the above information in implementing action 1.2.b, discussion is needed to understand the role and effect of the identified parameters. With the variety of changes occurring in the retail industry, the above assumptions about acreage and associated business activity are at the large end of the scale. Increasingly, retail stores are shrinking in size and are beginning to include small versions of other stores within their footprint. With this in mind, and recognizing the intent and work that went into the above information, we recommend providing alternative ways of implementing the above policy direction for acreage. For example, adding a Regional Center type and allowing the Community Center to be developed and function within the acreage for a Neighborhood Center is one way to provide flexibility that responds to the rapidly changing retail industry. In addition we recommend eliminating the Convenience Center type and incorporating it into the Neighborhood Center because it most often occurs within a Neighborhood Center. Accordingly, we recommend lowering the acreage requirements as shown above in the table along with parameters to be developed for the range of Centers identified earlier in 'Implementation' that will

be based on the BCCP vision. Last, we recommend using a variety of flexible buildings instead of conventional zoning requirements to address the wide range of uses (including civic) and as the way to realize commercial space. Over time, this approach is more realistic than applying a strict zoning requirement for a land use when there is no market to support its existence.

Main Components of Centers: Each Center consists of interconnected, walkable blocks of commercial or mixed uses in three types of environments focused on one of three types of business/service-oriented activity, as described in the table on the preceding page: Regional Center, Community Center, Neighborhood Center. The second component of each Center is the immediately adjacent area that typically focuses on more intense residential or mixed-use residential. This second component is typically the Urban Residential Neighborhood type and is described on page 12.

In general, the Center is adjacent to the intersection of a collector or side street and a major arterial while the Urban Residential Neighborhood areas are located further into the site, away from the major arterial but with high interconnectivity to the Center. The location of the Center adjacent to a key intersection along a major arterial is critical to the success of the commercial and retail space. It is essential that commercial and retail space be visible to and accessible by community-wide traffic. This highlights the importance of connectivity to draw customers from both the highly visible arterial and from side streets that intersect with the arterial. Instead of the commercial stores being located at the back of a large parking lot, the interconnected models place a few buildings along the arterial to shape the streetscape while providing strong views of the parking for larger tenants farther from the arterial. To further create connectivity, side streets should be inserted into the larger shopping center pattern to break up the mass of the buildings, promote walking from adjacent neighborhoods, and generate an appealing physical character for the shopping center. We recommend that the implementation standards generate blocks and streets that are conducive to retail and business environments which may also need large parking areas while connecting with adjacent neighborhoods.

Buildings and Adjacencies in Centers: Another key factor to address in the implementation standards is how to locate buildings that are meant to attract motorists from arterials and ensure that they are also good neighbors to adjacent residences. This concern is threefold: 1) massing and scale, 2) adjacent outdoor activity such as truck deliveries and 3) connectivity that is inviting, not circuitous and running through the backs of buildings or through large amounts of parking. We recommend that the standards address these issues by providing a variety of compatible building sizes that can be adjacent to each other and still generate an appealing physical character. Some buildings are more appropriate near or facing a large road and some buildings are more appropriate near or facing adjacent residential. Each group of buildings has needs and physical characteristics that can be identified and anticipated. This is in contrast to the typical approach of a setback between buildings based on land use. The setback approach has little effect on buildings that are long, simply making a longer building a bit further away but not really lessening the effects. The key issue to focus on is building size not building use. In response, the requirements need to vary depending upon building height and length for small and large buildings. We recommend that the standards require connectivity along the streetscapes adjacent to facades instead of cutting up a development site with unnecessary and poorly visible pedestrian-only pathways that are not used much.

The land for each Center should be as efficient as possible so as not to result in physical separations that waste land, and to create positive adjacencies with neighboring residences. As a result, the opportunity to mix ingredients will be high. Mixing these ingredients is achievable in a variety of ways: within the same

building, adjacent to one another, or across and down the street from each other. For the mixing to be effective, how and to what degree the mixing occurs needs to be in response to the particular Center and its location, role and intensity.

Component B: Neighborhoods

Terminology: The term "Neighborhood" refers to the primarily residential areas consisting of a variety of housing choices.

Purpose: The main purpose of Neighborhoods is to serve as the primary source of places to live in the area. Neighborhoods comprise most of a traditional city and are shaped by Centers, Districts and Corridors. According to the General Plan, Neighborhoods are to comprise the majority of each quadrant and are to consist mainly of regular neighborhoods of single-family houses.

Application to the BCCP: We recommend that Neighborhoods be made of three types as shown in Table 2: Urban Residential, Neighborhood Residential, and Rural Residential. The appropriate type of neighborhood depends upon many factors such as location, role and intensity. It is important to keep in mind that different neighborhood types can and should be located next to each other for variety, flexibility and adaptation to changing conditions.

Main Components of Neighborhoods: Each Neighborhood consists of interconnected, walkable blocks of housing in three types of environments – Urban Residential, Neighborhood Residential, Rural Residential.

Urban Residential. These areas are the most intense of the three neighborhood types and housing types typically range from rowhouses to courtyard apartments to dense apartment buildings in a variety of sizes. Mixed-use activity typically occurs in the transitions between this neighborhood type and adjacent Districts, Corridors or Centers. Streetscapes are typically shaped by narrow, tree-lined streets with on-street parking and short front yards and entries to buildings directly from the front yard.

Neighborhood Residential. These areas are the typical neighborhood type with housing types ranging from single-family houses to a variety of house-form multi-family buildings such as duplexes and quadplexes in some locations. Streetscapes are typically shaped by tree-lined streets with on-street parking and a variety of moderate to large front yards and entries to buildings directly from the front yard.

Rural Residential. These areas are the least intense of the three neighborhood types and housing types typically range from single-family houses in an agricultural setting to single-family houses in rural settings. Streetscapes are typically shaped by natural features with a rural character along both sides of streets and a variety of large yards around all sides of buildings.

Buildings and Adjacencies in Neighborhoods: The primary building in Neighborhoods is the house and its various multi-family versions. Some of the Urban Residential Neighborhoods will tend to have house-form buildings and larger, more dense residential or mixed-use buildings. In response, we recommend applying the House-Form range of building types that fits each Neighborhood area based on location, role and overall intensity expectations. For example, some neighborhoods might be adjacent to Centers and will likely use the more intense (Urban Residential) end of the House Form range. Other neighborhoods might be adjacent to single-family neighborhoods and will tend to use the middle (Neighborhood Residential) portion of the House-Form range. Other neighborhood residential areas might be adjacent to more rural-oriented character and will tend to use the lower (Rural Residential) end of the House-Form range. The ability of the House-Form range to adapt to these three basic neighborhood environments inherently provides for a realistic variety of housing choices in each Neighborhood and allows each Neighborhood to adjust to its setting and expectations with flexibility and predictability.

Component C: Districts

Terminology: The term 'District' refers to an area that cannot and should not be expected to appear or function as a Center, Neighborhood or Corridor because of its unique size or function typically as Research & Development or Light Industrial.

Purpose: The main purpose of Districts is to enable development that uses land differently than Centers, Neighborhoods, and Corridors to function effectively while integrating into the whole. Districts can range from airports to hospitals to business parks. Some may incorporate residential, retail and commercial but not in the same way as Centers or Corridors.

Application to the BCCP: We recommend two types of Districts as shown in Table 2: Research & Development, and Light Industrial. The appropriate type of District for each quadrant and its locations depends upon many factors such as location, role and intensity.

Research & Development District. These areas are typically high in proportion of employees to building area and have outdoor areas for activities such as light assembly and testing. Streetscapes are typically shaped by tree-lined streets with on-street parking and short front yards or commercial shopfronts along the sidewalk with entries to buildings directly from the sidewalk.

Light Industrial District. These areas are typically low in proportion of employees to building area and have large outdoor areas for activities such as assembly and testing. Streetscapes are typically shaped by tree-lined streets with on-street parking and short front yards or commercial shopfronts along the sidewalk with entries to buildings directly from the sidewalk.

Main Components of Districts: Each District consists of interconnected, walkable blocks that are large enough to accommodate the large sizes of buildings associated with the unique activities of Districts. Blocks are not as interconnected as in other areas of quadrants but are connected to adjacent blocks and their environments.

Buildings and Adjacencies in Districts: The primary buildings in Districts are the largest of buildings in the BCCP. These block-form buildings are sometimes located within the middle of a site but often are toward the street behind a front yard or commercial shopfront to emphasize room in the rear of sites for maneuvering of vehicles and equipment.

Adjacent Neighborhoods are buffered by streetscapes that serve as a physical transition between large office and light industrial buildings on one side of a street to larger residential buildings such as those in the Urban Residential Neighborhood type. Alternatively, transitions can be made at the rear of a District and the rear of a Neighborhood type but this puts more focus on the need for compatibility between outdoor activity on both sides of the boundary.

Where Districts are immediately adjacent to a major thoroughfare, buildings are oriented to front the thoroughfare or at least orient a side of the building along the thoroughfare. In this way, the District does its part to shape and provide identity to the streetscape along major thoroughfares.

Component D: Corridors

Terminology: The term 'Corridor' refers to the land on both sides of a major thoroughfare but only for the half-block or lots fronting the thoroughfare. (Note: If the Plan continues using 'Corridor' as an implementation term, the Plan named should be changed from Bellevue *Corridor* Community Plan to Bellevue Road Community Plan (or another acceptable name).)

Purpose: The main purpose of a corridor is to function as the segment of development and activity between major components such as Centers and Districts and to buffer Neighborhoods from major thoroughfares.

Application to the BCCP: We recommend three types of Corridors as shown in Table 2: Urban Corridors, Neighborhood Corridors, and Rural Corridors. The appropriate type of Corridor depends upon many factors such as location, role and intensity. As the thoroughfare passes through each quadrant in the BCCP, appropriate Corridors will be identified in response to the vision and physical character expected for each area.

Urban Corridors. These areas are typically the Urban Neighborhood Residential environment adjusted for office and housing along major thoroughfares. Streetscapes are typically shaped by tree-lined streets with on-street parking and a variety of modest front yards. Where office activity is described, ground floor commercial shopfronts along the sidewalk provide entries to buildings directly from the sidewalk. Side streets from adjacent areas intersect with the major thoroughfare while maintaining the streetscape and character of the adjacent area.

Neighborhood Corridors. These areas are typically the Neighborhood Residential environment adjusted for the type of housing appropriate along major thoroughfares. Streetscapes are typically shaped by tree-lined streets with on-street parking and large front yards with entries to buildings directly from the front yards. Side streets from adjacent areas intersect with the major thoroughfare while maintaining the streetscape and character of the adjacent area.

Rural Corridors. These areas are typically the Rural Residential Neighborhood environment adjusted for its interface along major thoroughfares. Streetscapes are typically shaped by the nature or rural character along both sides of streets and a variety of the largest front yards in the area. Side streets from adjacent areas intersect with the major thoroughfare while maintaining the streetscape and character of the adjacent area.

Main Components of Corridors: Each Corridor consists of lots that face each side of the major thoroughfare connecting directly to the adjacent blocks in Centers, Neighborhoods, or Districts.

Buildings and Adjacencies in Districts: The primary buildings in Corridors are a variety of house-form and block-form buildings in response to the intended physical character of the particular segment. Adjacent areas and buildings are typically buffered by physical transitions in building scale and massing along the side and rear boundaries of Corridor lots.

General Topics

In support of the Centers, Neighborhoods, Districts, and Corridors that will organize and shape the variety of environments in the BCCP area, we have identified ten key general topics that need to be discussed for direction on their implementation.

1. Transit Priority Project Compliance: The requirements for 'transit priority projects 'are discussed in detail in the transportation analysis being prepared by other members of the consultant team. Key among those requirements are the following: a) minimum 50 percent of the transit priority project needs to be residential, b) the residential portion of the project needs to be at least 20 units per acre, and c) the project must be within a half mile of a major transit stop or transit corridor. We recommend that the above requirements be implemented through standards for the blocks within a half-mile of a major transit stop once those areas are identified in the vision for the BCCP.

2. Open Space, Parks & Plazas. The approach of Centers, Neighborhoods, Districts, and Corridors integrates open space in each of these environments depending upon the intended physical character and land use intensity to be established by the vision: all Centers Neighborhoods, Districts, and Corridors have some form of open space, depending upon location and role in the BCCP. This approach then takes the direction from the General Plan and applies it according to the vision for each environment.

There is a difference between the larger open spaces of Neighborhood areas and the more urban and compact open spaces of Centers, Districts and Corridors. Within Centers, Districts and Corridors, the amount of open space is less important as compared to how that open space, for example an urban plaza, is shaped by non-residential ground floors.

The General Plan establishes an integrated framework of open spaces. Chapter 7 'Open Space, Recreation and Conservation' (page 7-4) identifies eight types of park space ranging from Mini-Parks and Neighborhood Parks to Athletic Parks and Linear Parks. We recommend that upon establishing the intent and role of each quadrant in the BCCP, the corresponding range of appropriate Park Types be identified for adjustment to each environment within Centers, Neighborhoods, Districts and Corridors. This will allow each of these environments to internally distribute its open spaces as needed in the following general manner:

> **Centers.** Open spaces in these environments are the most physically intense and urban of all open spaces in the BCCP. These open spaces are smaller and typically gathering places such as plazas that are often lined by ground floor retail or service businesses.
>
> **Neighborhoods.** Open spaces in these environments are the least physically intense and suburban of all open spaces in the BCCP. These open spaces are larger and typically range from parks and community gardens to playgrounds and sportsfields. Which of these open space types are appropriate depends upon the vision for the area and which of the three neighborhood environments is being applied.
>
> **Districts.** Open spaces in Districts are less frequent than in the other environments and can range from a plaza that serves as an outdoor employee area to more suburban-oriented small parks that can serve as buffers for adjacent blocks.
>
> **Corridors.** Open spaces in these environments tend to be similar to the intensity and size of those in Neighborhoods. These open spaces are typically parks in response to the intended physical character of the adjacent thoroughfare.

Compatibility with nearby and adjacent businesses and houses is key when arranging blocks and placing buildings near open space. As the planning process moves forward, more information will be developed about which open spaces are most compatible with each of the above environments.

3. Scale, Interconnectivity and Compatible Adjacencies. Housing in the Urban Residential Neighborhoods will be the bridge between the typical Neighborhood Residential areas at one end of an area and Centers at the other end. While the Neighborhood Residential areas and Centers only share a boundary with one of these three environments, the Urban Residential Neighborhoods share boundaries with two: the more intense Centers and the less intense Neighborhood Residential areas. The interface between these different environments is critical to effective connections while generating a cohesive whole.

In many successful communities, Urban Residential Neighborhoods seamlessly serve the Centers while being a positive neighbor to the less intense Neighborhood Residential areas. In order to do so, residential development in the Urban Residential Neighborhoods needs to include a range of options for developers and the public that responds to the BCCP vision. In our experience, the most effective way to deal with this issue of adjacencies and transitions is through a combination of flexible blocks and a range of appropriate building types that best fit and function on each type of block. For every physical environment, there are certain buildings and sizes that result in positive adjacencies that can be identified and translated into standards. Similarly, there are buildings and sizes that do not make for appealing adjacencies that can be identified. We recommend that the issues of scale, interconnectivity and compatible adjacencies be addressed in the standards.

In addition to each building needing to be a positive neighbor, each building needs to contribute to the walkable environment of blocks to generate identity while adding to the whole. For example, it is possible to achieve the General Plan's minimum densities and direction for interconnectivity and yet generate an environment that does not result in positive adjacencies. Typically, this occurs by not appropriately connecting the scale (the types and sizes of individual buildings) with frontage (how the facades of buildings shape streetscapes) and streets (the variety of street types that support and generate certain environments).

Aside from knowing how many units a building can generate (its density), it is equally important to know what façade lengths and building heights result from certain building intensities. This information helps us to know the sizes of buildings and their site-needs, which in turn helps to identify the appropriate variety of streets and streetscapes to support these environments. If a building is too large or not large enough, or not located appropriately to the adjacent sidewalk and streetscape, the result can easily become a numerically compliant yet incongruous combination of buildings and environments. These subjects are all interrelated and need to be considered as a part of the whole. The 'whole' being each of the various environments ultimately identified by the vision for each quadrant. We recommend using an approach that identifies the range of building types and sizes for the various types of Centers, Neighborhoods, Districts and Corridors. This information can be adjusted for each location and translated into clear development standards for each implementing zone.

4. Block-Size. Block-size is essential in establishing the degree to which a place is walkable and connected. Block-size is also critical to land use flexibility (see '*5. Block-Size and Land Use Flexibility*' below). Generally, as block-length increases, it becomes less conducive for people to walk. Longer distances between intersections can encourage 'j-walking' and higher vehicle speeds, making the walking experience less appealing. We recommended a block size range of 200 to 600 feet. The blocks in Downtown Merced including the Downtown Neighborhoods are an example of walkable blocks. Most Downtown Merced blocks are 325 by 400 feet with

most including alleys. These blocks provide for high interconnectivity of vehicles and pedestrians while yielding very useable sites for the types and sizes of buildings that could be expected in these environments. The range of land uses appropriate for the intended environment will determine how individual blocks should be developed. For example, block-sizes need to be larger in Districts than in the other three environments. The appropriate range of block sizes for each environment will be based on the vision for each quadrant and its expected environments.

5. Block-Size and Land Use Flexibility. Organizing land into a system of blocks is as old as the practice of making cities and towns. The current practice of carving up land on demand is efficient from the perspective of need but not always efficient from the perspective of future options. Typically, land is carved out in response to a specific project. If that project becomes infeasible or isn't what the current developer wants to do on that site, the carved out land also might become infeasible or unrealistic. As an alternative, using a pattern of flexible blocks allows an owner to map out a preferred pattern that can be adjusted as needs or priorities change while still adding up to a coherent pattern of land uses. Mapping out the potential blocks on a property enables an owner to move forward with different areas of the property while knowing generally how each portion will connect and make sense with the rest. The mapping of blocks only becomes official when a subdivision is approved. Through the recommended approach, there is less need to map blocks and lots prematurely. In addition, using this approach will also help when the market is changing for other types of development that were not anticipated when drafting this plan and standards. Having a system of flexible blocks, the owner can adjust entire blocks or portions of blocks in response. Without a system of flexible blocks, mapping often is at the scale of projects. Projects do not always want to or need to concern themselves with the remainder of a property. Understanding property from the perspective of potential blocks provides a higher degree of understanding about options and flexibility than the current practice of developing superblocks or individual projects.

Implementing Action 1.2.d (page 6-13) states that *"The village street system should provide multiple and parallel routes between the Core Commercial Area and the rest of the village. In no case shall trips which could be internal to a square mile bound by arterials be forced onto an arterial."*

This action requires a network of interconnected streets. We recommend implementing this direction through standards for block-size and streets that make a range of blocks for Centers, Neighborhoods, Districts, and Corridors. An important component of this subject is the frequency of intersections in order for connectivity to disperse rather than concentrate traffic. For example, some plans have addressed 'connectivity' by having a network. But when that network is based on a pattern of fewer connections that force most traffic on to a few rather than more streets, the results are not positive. Over time, these less connected environments tend to dilute and not support the physical character of the adjacent areas. We recommend that the BCCP provide a range of street types for developers to choose from that both work from a circulation perspective to generate effective connectivity and the sense of place and value expected in the wide range of environments throughout the BCCP area.

6. Floor Area Ratio (FAR)

Implementing Action 1.3b (page 6-19) The General Plan states that *"…Commercial areas must be developed at sufficient intensity (typically a Floor Area Ratio [FAR] of at least 0.25) to create a focus of activity at the center of villages.'*

Implementing Action 1.3c states that *'Office areas should be built at an intensity that concentrates activity near transit stops and Commercial Areas.'* Further, this implementing action identifies a FAR of 0.35 to 0.60 as *'encouraged without structured parking and may be as high as 1.0 with structured parking'*.

The FAR requirement is quantitative and does not provide any indication of how the resulting building might be located on its site or how large it may be. Aside from the FAR and overall building height, neighbors or neighboring property owners may have little information about the building(s) that may occur next door. For example, a FAR of 0.25 could mean a single-story building covering ¼ of its site. Or, it could mean a two-story building covering 1/8 of the site and so forth. The implementing action identifies this FAR as a minimum with the next implementing action encouraging a higher FAR for office development. Effectively, the identified FAR range is 0.25 to 0.60 with the higher end of the range expecting office development.

This raises three key questions: 1) How much office is enough to comply with the intent of the General Plan? 2) How is the FAR calculated and is it the best tool for informing standards? 3) What happens when the uses in the building change over time?

All or Some Office? The General Plan language is clear about encouraging office development at a higher FAR than other land uses. As an employment generator, office development is certainly important. However, as stated, does the General Plan prevent a mixed-use building where residential is the majority of the building with an entire ground floor of office? Even if that ground floor is large? The drawing in Figure 6.15 (page 6-24) indicates that the building is not entirely office but the above policy direction could be interpreted a few ways. As currently stated, Implementing Action 1.3c could unintentionally result in smaller buildings than are necessary in the mid-term, possibly resulting in tenants choosing other sites or in demolition and reconstruction of relatively new buildings to suit new tenants. We recommend not connecting land use to the amount of allowable square feet (FAR). Knowing that land use demand will change over time, we recommend identifying the sizes of buildings that are expected and then *accommodating not requiring* the variety of land uses that may be in demand over the long term. We also recommend standards that identify the maximum sizes of buildings (in stories and length, not FAR) depending upon their location and adjacencies along with a set of allowable land uses so that the owner may choose how to occupy the building over time.

FAR Range: Depending upon the particular quadrant, the stated FAR range could be seen as very low. Although the Bellevue Corridor planning area is at Merced's northern end, individual Centers will range in intensity with some at the low end of the allowable FAR and others possibly needing more intensity than a 1.0 FAR. We recommend interpreting this upper limit based on the following discussion.

A key distinction is whether the far is FAR expected in the aggregate for an area prior to making blocks or for the individual blocks once they are identified? If for the entire area, the FAR is high but if for individual blocks and lots, it is low as explained below. It is important to keep in mind that a 'site' being prepared and sold by an owner might be small, ¼ -acre for example. Or, a 'site' might be a five-acre parcel or even larger. While the formula is the same, the meaning of the outcome (maximum FAR) is very different. In both cases, the FAR number is a lump sum. But, the FAR for a ¼-acre site speaks directly to the types and sizes of buildings that can work on the site while the FAR for a five-acre site stays a lump sum that could mean one or many buildings with no indication about size. The lump sum FAR information is useful for quickly identifying the total allowed FAR for an entire area but because it still has to be interpreted as to how many buildings and of what size, the tendency is to decrease these numbers. The reasoning is usually that such an amount is substantial and perhaps too much to deal with for an area, leaving the questions to the application-review process.

If the FAR is intended to simply forecast how much commercial or mixed-use square footage is expected in areas, this needs to be understood. It is critical to avoid confusing the role of FAR with regulation. As discussed, FAR is excellent at measuring how much development is expected. But, it is far less effective at informing the actual development of individual blocks and sites. We recommend keeping the FAR information at the aggregate level, as a maximum to inform infrastructure capacity, for example. Then, along with the vision, we recommend identifying the appropriate types of buildings and their associated outcomes to generate standards that deliver the range of expected outcomes. In this way, the FAR is applied at the policy level and does not have to continue as a layer of regulation. Often, this process is reversed: FAR limits are established and the vision is to conform to that abstract numerical direction.

7. Retail and Civic Land Use Activity: The General Plan description of commercial areas (Section 6.4.2) identifies retail and civic uses as key components of commercial areas. The ability to realize shops and civic uses is dependent upon when shops and civic uses are supportable by customers. As any land use activity responds to the needs of the area and the population, it is especially true for shops and civic uses: Shops won't appear until a sufficient customer base is established. We recommend that the approach for involving these uses be to *enable rather than require* shops and civic uses. The possibility for shops, office space and civic uses needs to in place so that when the timing is correct, those uses can be realized and located effectively. We recommend allowing buildings that in the short term utilize ground floors and upper floors for other uses but in the long term can easily be converted to shops, office space and civic uses. This gives property owners the option of moving forward while avoiding a scenario that may result in vacant land for years while waiting for the shops, office space and civic uses to be built from scratch. This approach requires a change to how parking standards are currently calculated. We recommend that except for residential buildings which should have their parking on the same site as the dwellings, non-residential parking be handled in a grouped manner as is practical for the location. This allows the sharing of parking spaces as in shopping centers and reduces unnecessary parking spaces while letting that land be used in other ways.

8. Residential Density

Implementing Action 1.4a (page 6-25) states *'A mix of residential densities, ownership patterns, cost, and building types is desirable in Villages.'*

Figure 6.16 'Housing Types' of the General Plan identifies 12 housing types ranging from a 'Carriage House' to 'Garden Apartments'. This range of choices is very broad and the information and graphics are abstract, and are intended to be developed further for implementation. The chart has minimal information about each housing type, however, it provides specifics such as '*maximum 3 stories*'. The following numerical direction is provided in the descriptions of housing types on pages 6-27 through 6-29:

	Single-Family Housing Types		Multi-Family Housing Types
	Gross Density Range per Acre	Density Range w/ancillary unit	Density Range
Zero-Lot Line Homes	7 - 10	17.5	
Small-Lot Single Family Homes	6 - 8	14	
Standard Lot Single-Family Homes	2 - 6	10.5	
Estate Residences	Up to 2	3.5	
Podium Apartments		n.a.	20 - 30
Garden Apartments		n.a.	16 - 22
Small Multiplexes		n.a.	10-18
Townhouses			10 - 20

The above information raises a few questions: What if there are emerging or recent housing types that would fit well in Merced but are not implicit in the above list? In addition, such numbers, while accurate about certain outcomes, reflect a certain set of assumptions that may or may no longer apply. For example, by adjusting the size of a lot by a small amount for very good reasons, the above assumptions can change substantially and a proposal may technically be out of compliance despite being a good idea and within the vision. Last, the term 'housing type' is accurate as long as all of the building is used for residential purposes. But what if a building contains mostly housing but has some non-residential activity? That possibility appears to only exist by viewing a commercial building as having some housing in it. But then what direction is there about the density of housing in those cases?

We recommend the Block-Form and House-Form approach as a way to transition the housing type information in the General Plan to a robust and flexible system that will translate the policy direction into standards for the BCCP.

9. Block-Form and House-Form Buildings. Another way to describe and understand density-related terms is to consider them within the context of what is physically intended in the each Center, Neighborhood, District, and Corridor. Centers are intended for the highest of density while at the other end of the spectrum are Neighborhood areas: Urban Residential, Neighborhood Residential, and Rural Residential. In between these two ends of the spectrum are Districts and Corridors. Using a scale of size and intensity that sorts buildings into two categories (Block-Form and House-Form), the appropriate buildings and sizes can be identified for each environment. Buildings in Centers, Districts and Corridors fall into mostly the Block-Form category with some House-Form buildings. Buildings in Neighborhood areas fall entirely into the House-Form category. Most regulations and policies are not equipped to make this distinction and as a result, rely on vague or complicated mathematical approaches.

House-Form buildings. These are buildings that regardless of land-use, are the size of what most people would expect for houses, including large houses. While there are certain repeating characteristics from one community to another, the parameters for 'House-Form' buildings in Merced need to be identified through the process of preparing the standards.

Block-Form buildings. These are buildings that are either individually small but abut to form a block or large buildings that occupy portions of blocks or entire blocks. Centers, Districts and Corridors may include some House-Form buildings but consist primarily of Block-Form buildings.

The House and Block building forms each have a variety of *building types* not *housing* types to choose from according to need and intended physical character. Each building type has inherent density and size outcomes that can be expressed, discussed and adjusted. The House-Form and Block-Form approach replaces the FAR and density approach, which typically imposes arbitrary numerical limits not connected to physical realities. The House-Form and Block-Form approach begins with identifying the range of buildings and sizes that could be expected in the BCCP, then identifying the numerical resultants of those buildings. Within these two categories of buildings, owners will have several choices to apply to their property in a variety of ways.

Through the recommended approach above, the issue of density is moot as it is controlled directly by parking. This approach requires some additional thought when initially proposing the building in order to provide flexibility on the site for less or more parking over the life of a building. However, this approach lets the building be pursued as a reusable container regardless of density.

Policy direction can be articulated throughout the BCCP in a way that is based on the physical realities and needs of buildings. For example, instead of requiring minimum densities in a particular area, which may be impractical or may leave out good ideas because of numerical limits, this approach enables the selection of appropriate building types based on relevant factors that are connected to the intended physical environment. This approach also enables policy direction for 'mixture' of certain densities to be more realistically implemented by identifying the appropriate building types and then establishing percentage ranges for mixing by location.

10. Implementation through Zoning and Standards. The above information will guide how the BCCP vision is expressed at the policy level and ultimately in implementing standards. The proposed structure of Centers, Neighborhoods, Districts and Corridors is easily translated into zoning and standards that deliver the vision one project at a time while adding up to a desirable whole. Such standards range in level of detail according to the desired level of regulation for the expected results across the 2.5 square-mile area. Some areas might need

or warrant more detailed standards while other areas or topics might benefit from less detail. The system we can apply is in direct response to the proposed structure described in this memo and adjustable across a number of topics. First, however, upon the vision being established, we will test the City's zoning and standards that could be used in the BCCP to determine if the vision is implementable through those standards.