TRANSIT ORIENTED DEVELOPMENT

Omnitrans Resource Document

CONTENTS

TRANSIT-ORIENTED DEVELOPMENT (TOD) GUIDELINES

Although many parts of California were developed with the automobile in mind, recent experience has shown that concentrating development near transit, often called Transit-Oriented Development (TOD) or Transit Villages, is an effective way to shift more trips from automobiles to transit. TODs can serve as a catalyst for economic development and community improvements which focus on the new access provided by the transit service.

This synergy between land use and transportation is a goal of the "livable communities," "sustainable communities," or "smart growth" philosophies. Smart growth can take the form of TODs in which a compact mix of uses may be provided within pleasant walkable environments focused on transit stations. The Federal Transit Administration (FTA) recognizes the potential positive impacts of the establishment of transit-supportive land uses around transit facilities and evaluates projects based on their ability to generate ridership and economic development through land use changes.

The main purpose of this section is to provide general guidelines for Omnitrans and its member cities to use in planning for and evaluating development adjacent to transit. The guidelines will also assist the FTA in assessing transit supportive uses and policies as part of its overall rating process.

In planning transit, the urban design approach is to identify how the existing urban fabric along the transit corridors and at stations can be transformed to a more transit supportive environment that also supports local goals for development and revitalization. Transit Supportive/TOD guidelines are the subject of this section. Topics discussed in this section include:

- TOD Definition and Characteristics;
- Support for Transit Villages at the Federal, State, and Regional Levels;
- Principles and Benefits of TODs;
- Examples of TODs in Western United States;
- General TOD Guidelines;

TOD Definition and Characteristics

TOD refers to a compact, mixed-use, pedestrian-oriented neighborhood or district surrounding a transit station. TODs often feature a variety of residential types combined with retail, employment centers, public areas and other services. TODs typically have a radius of one-quarter to one-half mile (which represents pedestrian scale distances) with a rail or bus station as the center (Figure 1-1). The center of the TOD is surrounded by relatively high-intensity / density development, with density of development gradually reducing outwards to be compatible with non-transit-oriented uses. A TOD area is convenient for employees and residents to travel to the transit station by foot, bicycle, or transit, yet also accommodates vehicles.

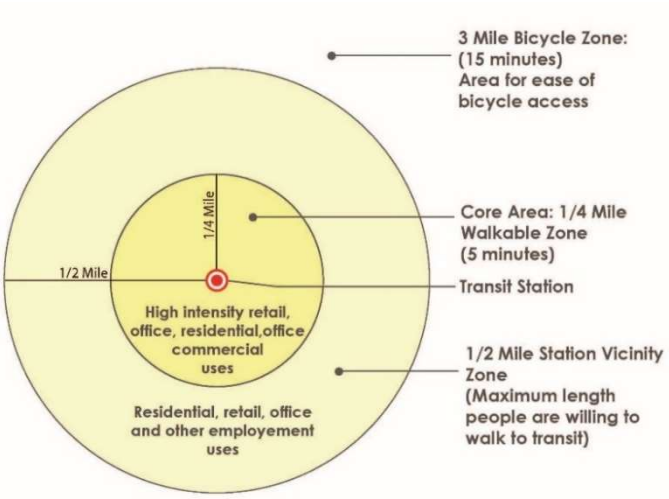

Figure 1-1: Basic TOD Design

Transit-oriented developments are often called Transit Villages. Figure 1-2 illustrates the building blocks of the TOD Concept. Typical characteristics of a TOD within ¼ to ½ mile of a station include the following:

- An attractive, functional, and accessible transit station with pedestrian and transit amenities as the focus for the TOD area
- A mix of uses such as office and other employment, retail, entertainment, residential, office, and recreational facilities that foster transit usage, walking to the station, and opportunities for people to work, shop, live and play in the area, illustrated in Figures 1-4 and 1-5.
- Inviting public and civic spaces near stations.
- Building entrances oriented toward the street with parking behind buildings or underground (Figure 1-6).
- Well-designed and managed parking such as public parking structures, shared parking between land uses, appropriate parking requirements, and bike parking facilities to reduce the land devoted to parking
- Pedestrian connections such as sidewalks, pedestrian paths, and private paseos leading to the station and between uses.
- A bicycle network consisting of bike paths or designated bike lanes, connecting the transit station with other transit stops, the surrounding area, and citywide network (Figure 1-8).

Figure 1-2: TOD Concept

Development in walking distance of BRT station to encourage alternatives to automobile trips, thereby reducing traffic congestion and improving air quality in the area

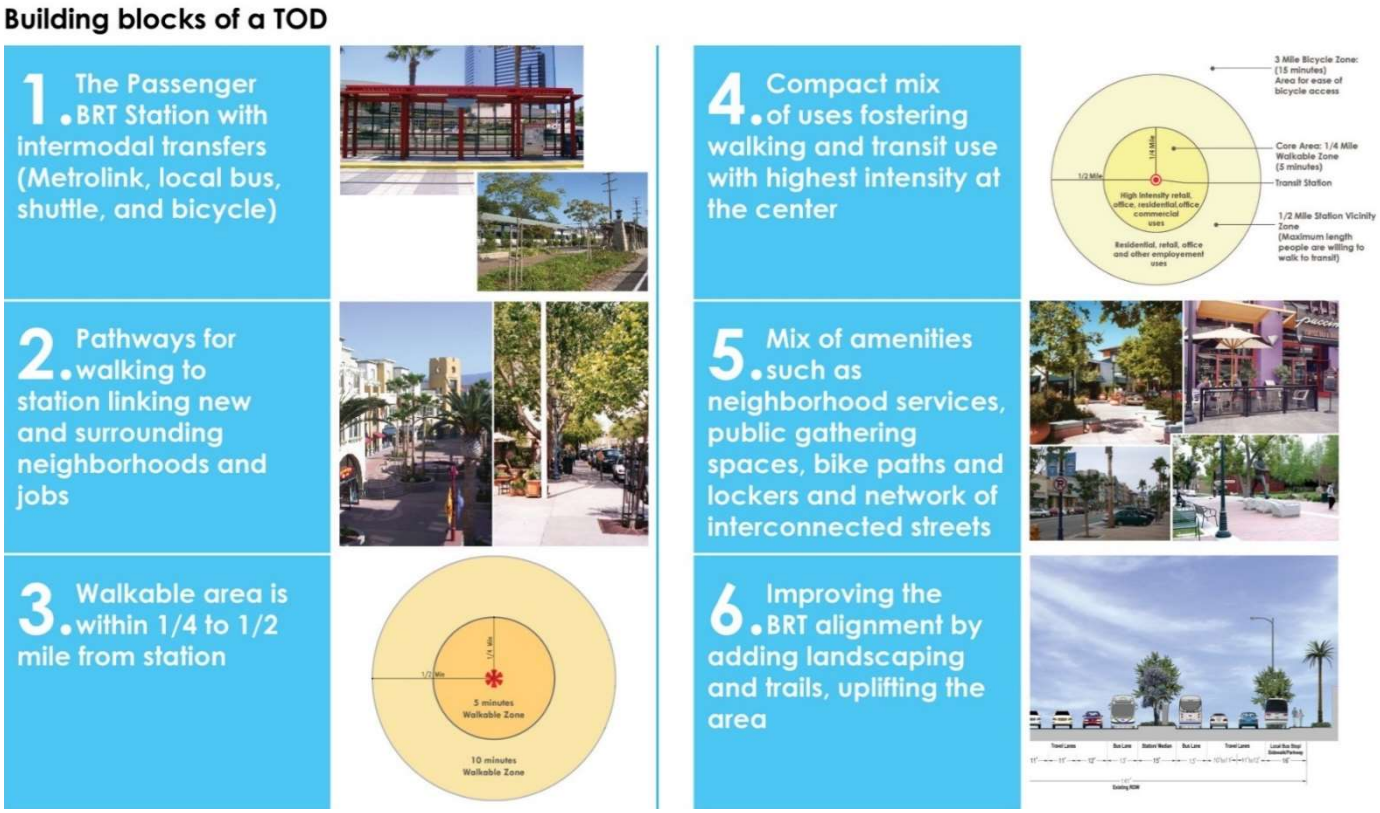

Figure 1-3: Higher intensity/density development adjacent to the Fontana Transit Center

Figure 1-4: Mixed-use development with inviting public spaces connected to a transit station in Fruitvale, CA

Figure 1-5: Retail and restaurants located on ground floors with residential above in this mixed-use area in San Diego, CA

Figure 1-6: Examples of building entrances oriented toward the street with parking behind buildings or underground. Example: Downtown Redlands, CA (left) and San Francisco, CA (right)

Figure 1-7: A mixed-use area with landscaped pedestrian pathways and textured paving of parking areas, Rancho Cucamonga, CA

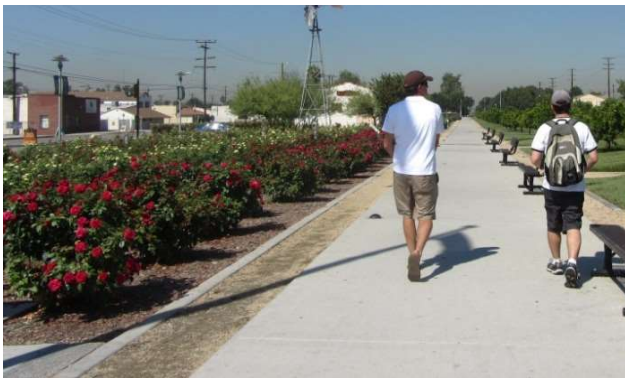

Figure 1-8: Pacific Electric Trail in Fontana, CA with ample pedestrian & bicycle amenities

As part of a TOD, an interconnected network of streets where walkways, landscaping, and pedestrian/bicycle amenities receive priority (Figure 1-9)

Pedestrian-friendly streets with features such as the following:

- Adequate sidewalk widths for at least two or more people to walk side by side (Figures 1-9 & 1-10);
- Street trees at the curb in parkways or tree wells, in combination with drought-tolerant landscape and water retention and filtration areas
- A row of parked cars on the street to provide a buffer between the pedestrians and moving traffic (Figure 1-11)
- Curb nubs to reduce pedestrian crossing distances (Figure 1-12)
- Pedestrian-oriented signage
- Pedestrian scale lighting.

Figure1-9: A pedestrian-friendly environment with adequate sidewalk widths and street trees in tree wells

Figure 1-10: Wider pedestrian streetscapes along high-density housing at Victoria Gardens, Rancho Cucamonga, CA

Figure1-11: Angled parking protects pedestrians from moving traffic in Yucaipa's mixed-use Old Town District

Figure1-12: Traffic calming feature such as this typical green street facility in Portland, OR

Support for Transit Villages (Federal, State, and Regional)

The TOD Vision is consistent with the strategies, policies, and plans of many local, state, regional and national governmental agencies and national development organizations. Among these are the Federal Transit Administration (FTA), Southern California Association of Governments (SCAG), the State of California, and the Urban Land Institute (ULI).Some previous initiatives include the following:

- Livable Communities Initiative established by Federal Transit Administration (FTA)
- State of California Transit Village Development Planning Act
- AB32 and AB375 (recent California state laws) addressing sustainability and Greenhouse Gas (GAG) issues
- Southern California Association of Governments Compass Blueprint Program

- Southern California Association of Governments 2012-2035 Regional Transportation Plan and Sustainable Communities Strategy.

FEDERAL: Federal Transit Administration (FTA)

The Federal Transit Administration (FTA) has increased its focus and funding for TODs. With examples from Atlanta to Austin to Chicago, the FTA has sought to provide research, resources, and funding opportunities to communities for integrating land use and transportation planning to build new developments around transit. For more information about TODs and recent funding opportunities, visit: https://www.transit.dot.gov/TOD.

STATE: Housing and Community Development (HCD)

The California Department of Housing and Community Development (HCD) promotes safe, affordable homes and vibrant, inclusive, sustainable communities for all Californians. The HCD publishes information about long-term housing plans for the state as well as building standards and grants and funding. In recent years, HCD has offered grants (also in conjunction with the FTA) for developers, localities and transit agencies working to develop TODs. For more information visit: https://www.hcd.ca.gov/

REGIONAL: Southern California Association of Governments (SCAG)

Founded in 1965, the Southern California Association of Governments (SCAG) is a Joint Powers Authority under California state law, established as an association of local governments and agencies that voluntarily convene as a forum to address regional issues. Under federal law, SCAG is designated as a Metropolitan Planning Organization (MPO) and under state law as a Regional Transportation Planning Agency and a Council of Governments.

The SCAG region encompasses six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura) and 191 cities in an area covering more than 38,000 square miles. The agency develops long-range regional transportation plans including sustainable communities strategy and growth forecast components, regional transportation improvement programs, regional housing needs allocations and a portion of the South Coast Air Quality management plans. For more information on SCAG's long-range transportation plans as well as other reports, data, tools and resources, visit their website: https://scag.ca.gov/transportation.

REGIONAL: Urban Land Institute (ULI)

The Urban Land Institute is a 501(c) (3) nonprofit research and education organization supported by its members. Working to represent the entire spectrum of land use and real estate development disciplines (for both private enterprises and public services), ULI facilitates an open exchange do ideas, information, and experience. The mission of ULI is to shape the future of the build environment for transformative impact in communities worldwide.

ULI Americas has many product councils that work for this exchange of ideas, information and experience, including one focused specifically on TODs (https://americas.uli.org/transit-oriented-development-council-todc/). ULI also offers various centers and initiatives to provide research to developers, communities, and organizations. For more information visit: https://americas.uli.org/research/centers-initiatives/.

Principles and Benefits of TODs

The San Bernardino Valley is estimated to experience considerable growth by the year 2035. Concentrating growth in walkable districts near transit stations rather than scattered throughout the valley will assist in improving air quality by reducing automobile trips and their carbon emissions, promoting economic development clusters, increasing housing choices, assisting in the affordability of housing by reducing the need for multiple cars in a family, reducing city costs for extending and maintaining expansive infrastructure, providing health benefits for workers and residents through walking & biking, and addressing a growing demand for convenient infill urban housing and neighborhoods. Table 1-1 lists some of the principles and benefits of TODs. These walkable transit district principles and benefits are appealing to changing demographics and growing preferences for a more convenient community life. The benefits are categorized as environmental, economic, and social.

Table 1-1: TOD Principles and Benefits

TOD Principles
TODs occupy land within ¼ mile to ½ mile radius around a rail or bus station, or within 125 to 500 acres. Typically, TOD areas are composed of three elements: TOD contains transit and passenger amenities, Core area is contained within a five-minute walk or about a 1/4 mile around the station, and the most dense employment, residential, and retail uses are in this area. A less dense neighboring ring within a ten-minute walk or about ¼ to ½ mile from the station contains residential, commercial, and other uses. A TOD must be a walkable, pedestrian-oriented area with amenities such as street trees, benches, crosswalks, decorative paving, and public art. Direct pedestrian connections between different land uses should be provided. TODs have walking or bike/trail pathways to the regional transit system and shuttle links to the area outside the ½-mile area to provide extended connectivity. Plans, policies, and zoning provisions relating to the density and mix of uses such as pedestrian based building setbacks; providing incentives such as density bonuses; floor area ratio increases; reduction of parking requirements; etc. play a significant role in facilitating a TOD, by making the area transit and pedestrian orientated.
Benefits
Economic • *Catalyst for economic development*: TODs can act as a catalyst for nearby properties to invest in development and take advantage of the higher land use density, customer base and walkable TOD community. • *Redevelopment*: TODs can be used to redevelop vacant or underutilized properties and declining auto oriented neighborhoods. • *Increased property value*: TODs can be used to revitalize the area within ¼ mile of the station. • *Decrease infrastructure costs*: TODs help reduce infrastructure costs due to compact and infill development that can use existing capacity and does not use as much capacity as

TOD Principles
auto based development. • *Revenue for transit systems*: Increased ridership leads to additional revenues for transit service. • *Reduced household spending*: By reducing auto, parking and travel costs, TODs contribute to an expansion of household net income and community spending. Households that use transit and reduce the need for one car can save up to $9,000 per year. Environmental • *Increased transit ridership and decreased congestion:* By decreasing driving, TODs result in reduced congestion. • *Improved air quality and energy consumption*: Decreased auto trips lead to lower emissions which results in improved air quality. • *Conservation of land and open space*: TODs are compact developments, and therefore, consume less land than lower-intensity, auto-oriented development. Social • *Increased housing and employment choices*: TODs provide a diversity of housing and employment types in conveniently close proximity to the transit station. • *Greater mobility choices*: By creating activity nodes linked by transit, TODs increase mobility options in congested areas. Young people, the elderly, those without cars or not wanting to drive also have mobility options. • *Health benefits*: By providing more opportunities for walking and bicycling, TODs can foster healthier lifestyles. • *Enhanced sense of community*: Bringing more people and businesses closer in a pedestrian environment creates an activity hub, as TODs enhance community engagement and activity. • *Enhanced public safety:* By creating more active pedestrian places used throughout the day and night provides "eyes on the street", that helps TODs increase safety. • *Quality of life*: by reducing the driving time for long automobile commutes, people can recapture this wasted time for other activities.
Sources: Statewide Transit-Oriented Development Study; Gruen Associates/HDR.

General TOD Guidelines

These general guidelines offer key aspects for TODs but also the unique conditions in the area must be considered. Many of the guidelines may already be a part of a city's general plan and zoning. The general TOD guidelines aim to ensure development, which is supportive of transit, walkable, aesthetically pleasing, attentive to detail, and sensitive to existing and surrounding development. The general TOD guidelines are organized as follows:

- A Mixture of Land Uses and Compact Development
- Prototypical Building Types
- A Pedestrian/Bicycle-Friendly Environment and Facilities
- Well-designed Parking and Access
- Architectural Design Character and Massing
- Outdoor Open Space Network
- Building Entries and Service Access
- Building and Site Access
- Signage
- Sustainable Development

Figure 1-13: A mix of transit supportive uses, Portland Downtown

A Mixture of Land Uses and Compact Development

Mix of uses: A mixture of land uses, appropriate for a TOD and supporting facilities, is encouraged to foster walking within the development to the transit stations and to the surrounding land uses. These may include uses such as residential, retail, restaurant, offices, entertainment uses, hotel, public facilities, open spaces, and other employment uses.

- The mixture of land uses may vary depending on existing conditions in the station area and the major development concept/theme envisioned for an area. For example, some TODs may emphasize employment and regional retail with higher-density housing, such as in a downtown area and some TODs may be more neighborhood-oriented with moderate density housing and neighborhood retail and restaurants focused on a pedestrian gathering space.

Economic development and job creation: Employment intensive businesses that benefit from being within walking distance of transit should be identified and promoted.

- Over time support the conversion of heavy-industrial uses within a TOD to more employment intensive uses, mixed use, and other transit supportive uses. Relocation of these heavy-industrial uses, storage uses, and automobile-oriented uses to other parts of the city should be addressed. (See Figure 1-14)

Figure1-14: A former industrial building in San Diego has been converted into a mixed-use destination.

Compact Development:
Compact development with a mix of uses places more people in walking distance of the station and fosters walking between uses minimizing some auto trips. To generate transit ridership and reduce automobile dependency, highest residential densities and floor area ratios permitted in the city should be allowed within ½ mile of a transit station. In a downtown area this may mean multi-story buildings. In a more suburban location, this may mean townhomes near the stations and small lot single-family homes further from the station. To encourage property owners, developers, and city decision makers to support compact development and provide a customer base for commercial uses, minimum densities should be required, as well as incentives for achieving maximum preferred densities.

- Cities should include minimum and desired densities and floor area ratios. In areas without strong economic conditions, projects may comply with minimum densities and floor area ratios by providing to the City a phased development plan that shows how increased density could be achieved such as later converting surface parking into more intensive uses.
- Incentives per state law may be provided such as the 25% increase beyond the City's highest density, if public benefits are provided and other incentives are provided such as reduced parking, streamlined processing, and streamlined CEQA.

Prototypical Building Types

The ½ mile TOD area occupies over 500 acres, providing new development opportunities for many types of uses and building types interspersed with viable existing uses. Development within the TOD may take the form of separate uses such as duplexes, bungalow cottages, 4- to 6-plexes, townhomes, multifamily housing, offices and retail shopping areas and also new prototypical development such as mixed-use development which combines residential with one or more of the following uses: offices, retail, entertainment, restaurants, community facilities or similar non-residential uses. Mixed-use projects may be arranged vertically (typically ground-floor retail or restaurant with residential above) or horizontally (typically commercial uses on a portion of the property lined by pedestrian connections to residential uses such as part of a unified development).

Although other uses may also be found, as mentioned previously., the following Figure 1-15 illustrates a range of building types typically found in TODs.

- Middle-density housing including duplexes, bungalow cottages, 4- to 6-plexes, townhomes and garden courtyard apartments typically varying from 14 to 24 units/dwelling units/acre.
- Higher-density housing including courtyard apartments or condominiums, and other multi-family residential vary from 20 to 60 units/acre and above.

- Live-work units typically have one- to two-story residential over ground level office and parking.
- Retail/restaurant uses clustered in a main street configuration or in a town center with a highly walkable environment.
- Entertainment and hospitality uses such as auditoriums, theater, cinemas, bowling alley, skating rinks, comedy clubs, music clubs, and hotels
- Employment intensive offices such as professional, government, knowledge-based, research and development, and call centers
- Employment intensive manufacturing and production such as small high-value products assembly, clothing, etc.
- Cultural or institutional facilities such as artist and crafts studios, galleries, libraries, museums, churches
- Healthcare facilities
- Recreational facilities including parks, community gathering facilities, and sports fields.

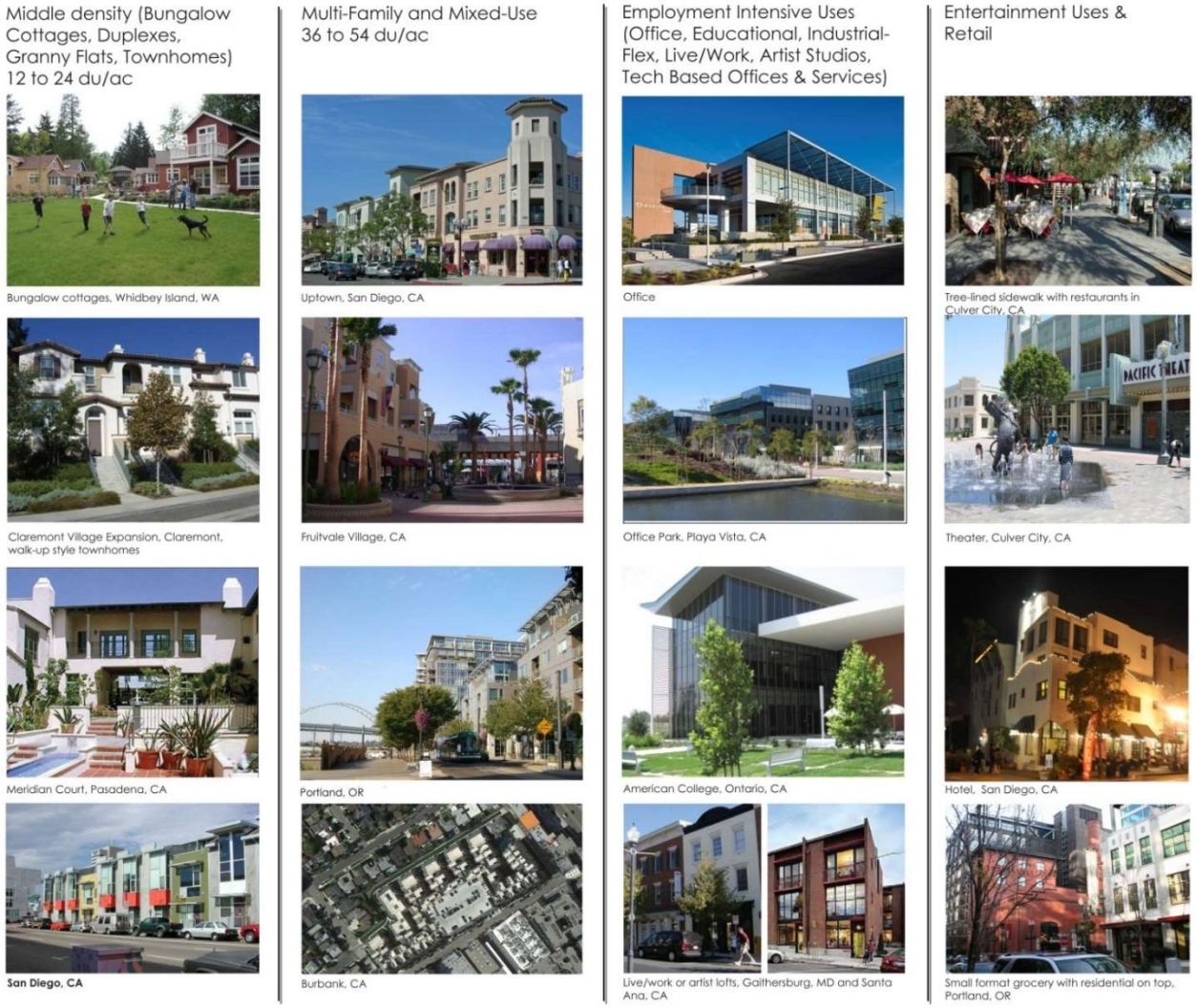

Figure 1-15: Residential / Mixed-Use Building Types

A Pedestrian/Bicycle-Friendly Environment and Facilities

Continuous pedestrian and bicycle network leading to the transit station: A major component of any TOD is the creation of connections and linkages from the TOD neighborhood to the transit station. Within the ½-mile TOD area, a plan for and implementation of a continuous, attractive landscaped pedestrian network should be provided linking the mix of land uses to the transit station. A bicycle network consisting of multi-purpose paths for pedestrian and bicycles, bike paths or designated bike lanes should also be included within three miles of transit station.

Adequate sidewalk width: Adequate sidewalk width should be provided to accommodate pedestrians in street rights-of-way. Devices such as curb nubs or "bump outs" and sidewalk easements on private property are methods to provide adequate sidewalk width in constrained right-of-way condition. Sidewalks and parkways 12′ to 15′ are desirable as they are wide enough for street trees at the curbs, pedestrian amenities, and for at least two people to pass each other. Sidewalks or curb parkway width on arterials should not be less than 10′.

Public and private streetscape improvements: Along each of the streets in a TOD streetscape enhancement should be included to make the area more walkable. These enhancements include landscaping of sidewalk areas along the curb, street furniture, special paving, gateway improvements, pedestrian lighting, pedestrian signage, seating, local bus stops, landscaped medians, water features, decorative crosswalks, and other amenities.

Safety for pedestrians and bicyclists: Transit station design should be integrated with the surrounding urban fabric by providing adequate pedestrian amenities, public open space, and well-lit interconnected walkways and bike paths. More pedestrian and bicycle activity should be provided to encourage more eyes on the station area to enhance a sense of safety for all users. Safe and secure facilities, such as restrooms and bike racks, should not be isolated and located far from the station entry.

Buffer: Pedestrian pathways and sidewalks should be buffered from moving traffic by providing street trees or other street features along the curbside.

Outdoor dining: Outdoor dining may occur on a portion of the paved sidewalk or in adjacent private area, as shown in Figure 1-16.

Pedestrian-scaled blocks: To foster a walkable environment, a regularized grid and short pedestrian scaled blocks of 400′ to 600′ or less are the preferred patterns. Large automobile-oriented blocks should be scaled down to make them more walkable by providing public access through them, organizing development around open spaces, and pedestrian-scaled access ways, such as paseos.

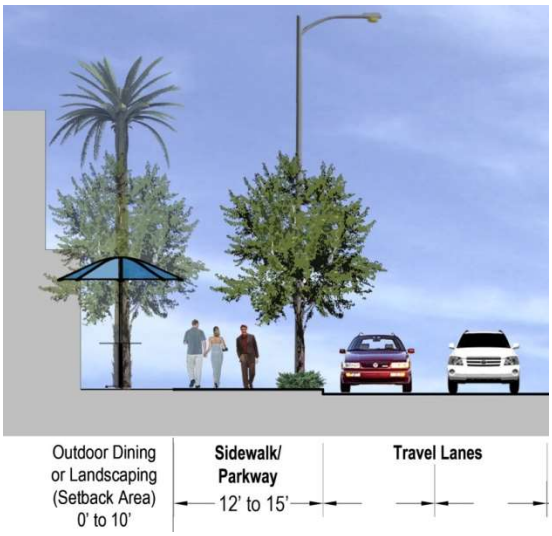

Figure 1-16: Outdoor dining adjacent to a comfortable pedestrian environment.

Figure 1-17: Wide sidewalks with ample space for pedestrians in Culver City.

Ground level uses: Pedestrian-oriented uses should be located at the ground level of buildings fronting the sidewalks, where feasible, see Figures 1-17 – 1-19.

Wayfinding: TODs should provide wayfinding signage, visual cues, and public art to communicate the activities in the TOD and the linkages to transit and these activities.

Pedestrian pathways under and over freeways and railroad lines: In San Bernardino County, many of the 1/2-mile area around the proposed BRT or light rail lines stations encompass freeways and railroads which are barriers to pedestrian movement. Attractive, well-lit pedestrian and bicycle paths should be designed along major arterials over and under the barriers providing access from one part of a TOD to another part.

Figure 1-18: Streetscape enhancements such as landscaping of sidewalk areas, medians, and other amenities.

Figure 1-19: Bus shelter in Santa Monica with amenities such as sufficient lighting and seating.

Well-designed Parking and Access

Amount of parking: As transit is available within walking distance of uses within a TOD, the amount of on-site parking required for development should be less than for other areas of the city. Each city should consider reduced parking standards in TOD areas. In addition to a reduction in required parking, city standards may include provisions for shared parking, unbundled parking, in-lieu parking fees, provisions for transit passes or other mechanisms.

Location of parking: To emphasize the pedestrian realm, on-site parking is discouraged adjacent to the sidewalk along major streets but instead should be located underground or at the rear of the parcels with convenient pedestrian access to non-residential and residential uses. On-street parking, where appropriate, is encouraged to buffer pedestrians along the sidewalk, as well as shared parking access/structures.

Figure 1-20: Public parking located at the rear of the parcels with convenient pedestrian access and parking.

Screening of parking: Existing or new parking spaces in lots which face a street should be screened from the view from the street by a hedge or a low masonry wall and vines. Parking garages should be designed with generous landscaping and canopy trees surrounding them.

Parking access: When available, access to parking should be from side streets and from alleys. This minimizes traffic congestion and does not break the pedestrian realm with multiple parking access points along major streets. Joint use or combined driveways are encouraged. The width of driveway area cuts should be minimized, see Figure 1-21.

Figure 1-21: Guidelines for parking design in a TOD

Parking garage design: The design of parking structures should be compatible with the design of the main building. Wrapping an above ground parking structure with residential units, retail, or office is encouraged to screen parking from public view.

Safety and security: Safety and security of the people using the facility are of paramount importance. Therefore, parking structures design should consider open, glass stairwells and glass-backed elevators and should eliminate potential hiding places. Energy efficient lighting should be provided to improve safety. A balance between daylighting, interior lighting and exterior lighting should be addressed to provide adequate lighting. Lights should be vandal resistant and easy to maintain. Security devices such as video, audio and emergency buttons that call into the booth or local police station can be added safety measures.

Parking structures located away from street frontage: Above ground parking structures should not open onto major streets unless there is no feasible alternative. If parking structures are located on a major street, the ground floor should be devoted to pedestrian-friendly retail, service and restaurant uses.

Interconnected parking: Where possible, link the new parking with that of adjacent development to facilitate vehicular and pedestrian movements, especially when streets are congested.

Shared use of parking: Shared parking with a management plan should be included in a new TOD to minimize traffic congestion and parking demand.

Street Layouts: To provide dispersed access to transit from TOD uses and a more walkable pedestrian environment a grid network of local through streets with sidewalks is preferred over a system of superblocks and cul-de-sacs.

Street width: In order to slow traffic and make wider pedestrian linkages consider a modification in the lane widths of streets and an increase in pedestrian sidewalk widths, where appropriate.

Safety devices: To make an area safer for pedestrians include devices such as "Z" crossings of major streets, median refuge areas for pedestrians, beeping crosswalk signals, countdown timers, and embedded flashing devices in crosswalks at non-signalized intersections. (See Figure 1-22.)

Figure 1-22: High visibility crosswalks increase pedestrian safety.

Bike lane streets, bike boulevards, and amenities: Plan for an integrated bike network within the TOD and connections to a regional bike network. This may include bike paths, two-way buffered bike lanes, or bike boulevards, sharrows, bike boxes at intersections, and bike storage or repair shops at major activity centers.

Traffic Calming: To channel traffic to the arterial streets and minimize impacts on the community, traffic calming techniques such as curb extensions, chokers, speed bumps, and raised crosswalks should be used, Figure 1-23.

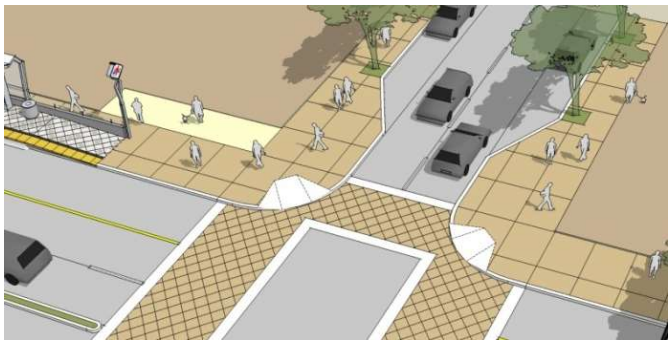

Figure 1-23: A curb extension (nub) is a traffic calming technique to slow traffic speed.

Architectural Design Character and Massing

Tailor designs to reflect uniqueness of an area: TODs should vary in design character based on the urban design theme envisioned and unique characteristics of the specific geographic location. Features should also be sensitive to the local context.

Visual interest at street level: The form of buildings and architectural details should be designed to create visual interest for pedestrians at the street level using techniques such as staggering the frontage of the building, recessing doors and windows, and providing varied display windows. In addition, clear glass rather than dark tinted glass or reflective glass should be incorporated along ground level frontages to increase a building's visual and physical interaction with those on the sidewalk and create a safer and more vibrant pedestrian environment, see Figure 1-24.

Awnings can be a part of this visual interest and should project over doors and windows and not blank walls. Open ended awnings are preferred over closed in awnings. Creative steel, canvas, and glass awnings with signage incorporated are encouraged.

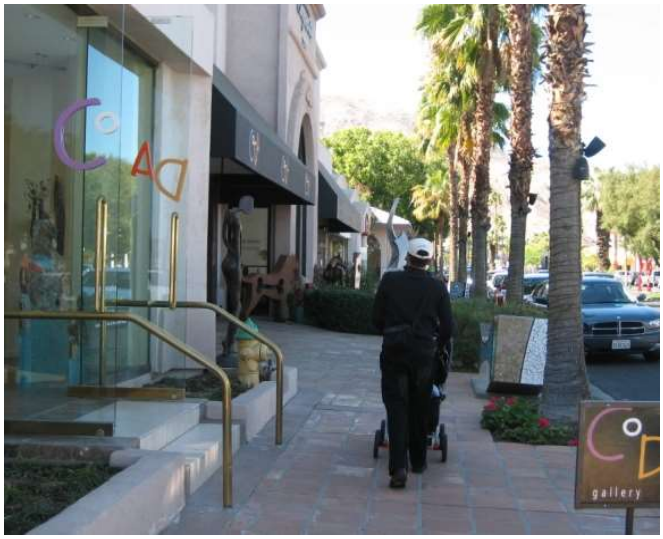

Figure 1-24: Awnings, clear glass display windows, and architectural articulation at street level

Figure 1-25: Buildings and architectural details with visual interest for pedestrians at street level

Articulated building facades and massing: To create visual interest and to avoid large bulky façades and blank walls, buildings should be articulated in form using techniques such as some stepping back of upper floors, stepped terraces, changes in plane, recessed windows, bay windows, balconies, trellises, which create shadow lines, varied roof lines and changes in color (Figure 1-25)

Equal design treatment on facades: Buildings should be designed to be attractive in all directions. Where the rear or sides of the building are visible from streets and alleys, these facades should receive equal design treatment to the main facade.

Building location to emphasize each street as an urban space: One of the most important elements in creating vital economic development and walkable TODs is to implement "build to-line standards" or a "building frontage line" along streets to establish a continuous "street wall" adjacent to the pedestrian realm. Buildings would be located close to the building frontage line with its building entries facing the sidewalks. Setbacks from the street wall should be limited to courtyards, outdoor dining spaces, and public plazas. (Figure 1-25) Parking should not be located between the pedestrian realm and building façade but should be in the rear of buildings or underground.

Building heights: Building heights should vary within the TOD with taller structures near the station, along wider streets and serve as focal points.

Ground floor uses and design: In areas designated for mixed-use, ground floor retail, restaurants, and other pedestrian-friendly uses are preferable at the ground floor along the pedestrian realm. However, recognizing that there may not be a market for the entire ground floor of multiple blocks for the uses, residential use on the ground floor may be permitted with the following guidelines:

- Residential units located on the ground floor of facing the pedestrian realm should be designed with articulated facades, including features such as awnings, elevated steps, stoops and entrances, recessed windows, patios, windows treated for privacy and pedestrian interest and landscaping.

- The more public areas of the residential units, such as lobbies, exercise rooms, living rooms, or dining areas, should face the street while more private areas, such as bedrooms, should be located in the rear or upper floors.

Materials and colors: Materials and colors should be selected to unify the building appearance and fit into the pedestrian realm context. For example, avoid chain link fences, imitation rock/stone veneer and extensive use of wood siding, heavily textured stucco walls, adobe, or slump stone masonry.

Contemporary, pedestrian-friendly design: Buildings should be designed to be visually attractive and fit with the vision of a pedestrian-friendly, vibrant streetscape. For example, contemporary glass storefronts inserted into an older building, if sensitive to the building key architectural features, are encouraged as it merges the old and new character of a TOD.

Lighting: Lighting is encouraged to accent facades at night and provide security and wayfinding for public and private open spaces. Avoid lighting that interferes with residential uses.

Energy efficient designs: Buildings design and site planning shall consider passive solar and ventilation techniques, as well as specification of "green" materials.

Outdoor Open Space Network

A network of open spaces: In addition to the pedestrian network along sidewalks, well-proportioned outdoor open spaces such as landscaped sidewalks, paseos, plazas, terraces, courtyards, gardens, and decks should be incorporated into TODs and connected, where possible, forming an open space network, Figure 1-28.

Location and character of common open spaces: Common recreational areas of private development should be centrally located and preferably be designed as courtyards, plazas, and outdoor rooms. The location and character of an outdoor space should consider its function, the size of the project, and the surrounding environment Figure 1-26.

- Plazas are for public gathering and social interaction and should be designed to be visible from the sidewalk, to address the solar orientation, and to include pedestrian amenities such as ample seating, eating places, plants, trees, fountains, sculptures, and other public art. Small

Figure 1-26: Well defined courtyards and quiet areas for day and night time use.

plazas are appropriate at corners and adjacent to transit stops to provide additional space for waiting near the intersection. Plazas should be designed at or near the grade of the sidewalks and designed not to interrupt the street wall. Outdoor dining and other uses that activate the space should be located adjacent to or be a part of a plaza.

- Courtyards should be well defined by buildings and/or landscape elements and provide quiet areas for residents of a project as well as active recreational uses such as places for children's playgrounds, pools, and fountains. Courtyards are typical of traditional Southern California architecture and provide opportunities for residential windows to face internal creating attractive spaces away from the busy traffic on the street and providing opportunities for pedestrian amenities and public art.

- Gardens, patios, and decks are opportunities for smaller open space areas. These should be landscaped and appropriately planted to provide outdoor spaces for more individual use.

Figure 1-27: Encourage pedestrian connections through buildings to the pedestrian realm.

Figure 1-28: Special features such as water elements can activate a public space.

Pedestrian/bicycle connections through private development to the pedestrian realm: To connect the sidewalk to building entries and parking in the rear, pedestrian / bicycle connections adjacent to a building are encouraged, especially at or near mid-block. These connections could include public/private paseos, alley enhancements, private trees or trails and may require dedications in easements to facilitate a connected network, see Figure 1-27.

Human-scale walkway design: Decorative materials and generous landscaping should be provided on pedestrian walkways through and adjacent to new projects which are complimentary or of the same design as the treatment of the pedestrian realm.

Special features: To encourage social interaction, activate a public space and provide a unique identity for an area. Special features such as public art and water elements are encouraged, see Figure 1-28. Water could introduce a sense of relaxation and mask traffic noise.

Lighting: Lighting should be used to guide pedestrians through an open space, to eliminate hidden areas, and to accent special features without interfering with the adjacent residential uses.

Building Entries and Service Access

Building entries oriented to street frontage: To promote active pedestrian-friendly streets each individual tenant or business establishment and residential lobbies should be oriented to and be accessible from the major street frontage and directly from the public sidewalk. This will also ensure safety of pedestrians by encouraging "eyes on the street."

Entries emphasized: Sidewalk pedestrian entries to shops and residential lobbies should be prominently highlighted with features such as two-story height entries, unique awnings, overhangs, trellises or other distinctive features. Shop and major building entries may be recessed to create a gracious entry provided that the recess enhances the street wall or a plaza along the street frontage.

Service areas concealed: Where possible, service areas should be located at the rear of the building unless these areas can be concealed within the interior of the building design. Loading docks, service/storage areas and mechanical equipment should be screened from public streets and neighborhoods.

Compatibility with Surrounding Development

Privacy between land uses: The building and site designs should address privacy between residential units and other non-residential uses on the site and on adjacent properties. Some of the considerations to include in city guidelines to address TOD's adjacent to a single-family zone include:

- Transitioning building height from the maximum permitted building height to a lower height, when directly adjacent to the single-family zone. However, the height would not need to match the single-family height or transition at all when a single-family adjacent zone is at higher elevation than the TOD development.
- Mixed-use projects should be designed to minimize motor vehicle circulation through local single-family neighborhood streets.
- Guest parking areas should be located and designed to be convenient to minimize parking in residential neighborhoods.
- Facades and garages that face existing single-family should be designed to be comparable with the setbacks and scale of the existing development.

Public spaces distinguished from private spaces: The design should provide visual and physical cues that demark the public space from the private space.

Passageways for light and air: To integrate new buildings with the surrounding area they are encouraged to provide passageways that allow for light and air to adjacent buildings and that connect to the pedestrian realm (Figure 1-29).

Noise mitigation adjacent to arterials: Noise insulation techniques such as double pane or laminated glass should be used in residential units adjacent to heavily traveled corridors.

Building and Site Access

Access from side streets and alleys: Vehicular access should be provided from the side streets, adjacent alleys, and parallel streets. Traffic calming techniques should be provided to minimize intrusion of traffic into adjacent neighborhoods.

Pedestrian amenities at street crossings: Pedestrian crossings at arterials should include items such as curb extensions at intersections, decorative crosswalk paving, shortened turning radii for cars, complementary plant materials and pedestrian lighting, public art, and bus shelters.

Figure 1-29: Passageways provide opportunities for light and air.

Signage

Clear distinctive signage: Signage should be pedestrian-oriented, distinctive, clear, and uniformly and consistently applied (Figure 1-30). For mixed-use projects, signage may operate at several scales: identification of individual stores, restaurants, entertainment centers and offices; identification of a group of such businesses and identification of residential units.

Figure 1-30: Project signage should be distinctive and clear.

Sustainable Development

Constructing transit and creating transit-oriented developments supports economic and environmental sustainability as discussed previously under benefits of TOD. In designing TOD projects, sustainable features should be incorporated. The following are some sustainable guidelines to consider:

- Use healthy, long-lasting, local, and recycled materials.
- Consider alternative energy sources such as wind power and efficient HVAC systems, natural ventilation, and other energy producing equipment.
- Buildings should be designed utilizing passive daylight strategies including building shaping, building overhangs and louvers and other shading devices, spectrally sensitive glazing, photo voltaic panels, appropriate placed landscaping for shading effects, light-color and reflective roofing, and solar massing strategies to reduce solar gain.
- Plan for water conservation, storage, and reuse by including features such as low flow appliances and fixtures, reuse of grey water for landscaping and permeable surfaces, drought-tolerant plants, bioswales, rain gardens, storm water retention ponds, outdoor recreational spaces, tree canopies, and green roofs.

Examples of TOD's in Western United States

Below are more details on a few examples of recent Transit-Oriented Developments.

Southern California

Mission Meridian Village, South Pasadena - The South Pasadena Metro Gold Line was designed to include a town square with pedestrian amenities and artwork. The Mission Meridian Village, adjacent to the Metro Gold Line in South Pasadena transformed an older retail and residential area to include 67 condominiums, 5,000 square feet of retail space, two levels of subterranean parking containing 280 parking spaces, and a bicycle store and storage facility. It is located within two minutes of the Metro Gold Line Mission station and is designed in styles in keeping with the surrounding neighborhood, see Figure 1-31. As a TOD, Mission Meridian Village has been a success. In 2006, it won both the AIA Honor Award for Multifamily Residential developments and Congress for New Urbanism Charter Award. This development and the station have stimulated other pedestrian-friendly compatible developments in the area. (Source: Gruen Associates and www.challc.com).

Figure 1-31: Mission Meridian Village, South Pasadena, CA

Holly Street Village, Pasadena - The Holly Street Village in Pasadena was built in anticipation of the Memorial Park Gold Line Station. The project includes 374 apartments in 7 buildings, 200,000 square feet of parking, and 11,000 square feet of offices and retail on the ground floor. The light rail station is located at ground level of the main building of the project. (Source: San Bernardino County Long Range Transit Plan).

Figure 1-32: Holly Street Village, Pasadena, CA

Figure 1-32: Holly Street Village, Pasadena, CA

Figure 1-33: Del Mar Station, Pasadena, CA

Del Mar Station, Pasadena CA - Completed in 2007 in Pasadena on the Metro Gold Line, the Del Mar Station is a dense, mixed-use development based on the concept of historic transit plazas of Europe. The four- to seven-story buildings, organized around a 1-acre plaza and the train station, have 347 apartment units and 11,000 square feet of retail use, Figure 1-33. (Source: The New Transit Town, Best Practices in Transit-Oriented Development).

Figure 1-33: Del Mar Station, Pasadena, CA

Village Walk, Claremont, CA - Village Walk is a TOD located within an eight-minute walk of the Claremont Metrolink Station. It is also near Claremont Village, as well as the five Claremont Colleges. Completed in 2006, there are 186 condominiums, lofts, town homes and duplexes. On the main street of Indian Hill Boulevard and the adjacent blocks, new shops, offices, restaurants, a boutique hotel, a five-screen movie theater, a public parking structure with retail tenants, and a public plaza were constructed, see Figure 1-34 below. (Source: City of Claremont website).

Figure 1-34: Village Walk, Claremont, CA

Grossmont Trolley Center, La Mesa - Completed in 2010 in the City of La Mesa, the Grossmont Trolley Station TOD consists of two levels of structured parking on both sides of Grossmont Center Drive, 527 one- and two-bedroom apartments on three and four-levels above the parking, and 3,000 square feet of commercial. The TOD is constructed on a seven and one-half acre site adjacent to the existing Grossmont Trolley Station and replaces 600 surface parking spaces. The Grossmont Trolley Station had only a steep staircase connecting the trolley station to the Grossmont Center with its active uses at the top of the bluff (Figure 1-35). Two elevators were constructed to improve access to the bluff as well as additional transit and pedestrian amenities. A bus court drop-off and pick-up encircles the development and provides access to the replacement parking. The award-winning Fairfield Residential Development follows design standards and guidelines prepared by the City of La Mesa with assistance from Gruen Associates. A portion of the apartments are available to very low- and moderate-income households. (Source: Gruen Associates, City of La Mesa)

Figure 1-35: Grossmont Trolley Center, La Mesa, CA

Northern California and Oregon

Fruitvale Transit Village, Oakland - Fruitvale Transit Village is a mixed-use development adjacent to the Fruitvale Bay Area Rapid Transit (BART) District station in Oakland. Fruitvale Village was conceptualized as a need to revitalize the existing neighborhood businesses and a plan to better integrate businesses into transit station development. It includes approximately 40,000 square ft. of retail and restaurant space, approximately 114,000 square ft. of office space including a senior center, a health clinic, and a library, and 47 units of mixed income housing. These uses are connected through a pedestrian plaza to the Fruitvale BART station. Phase I was completed in 2004. Phase II, divided into three parts, calls for 450 additional units (Figure 1-36). *(Source: The Unity Council).*

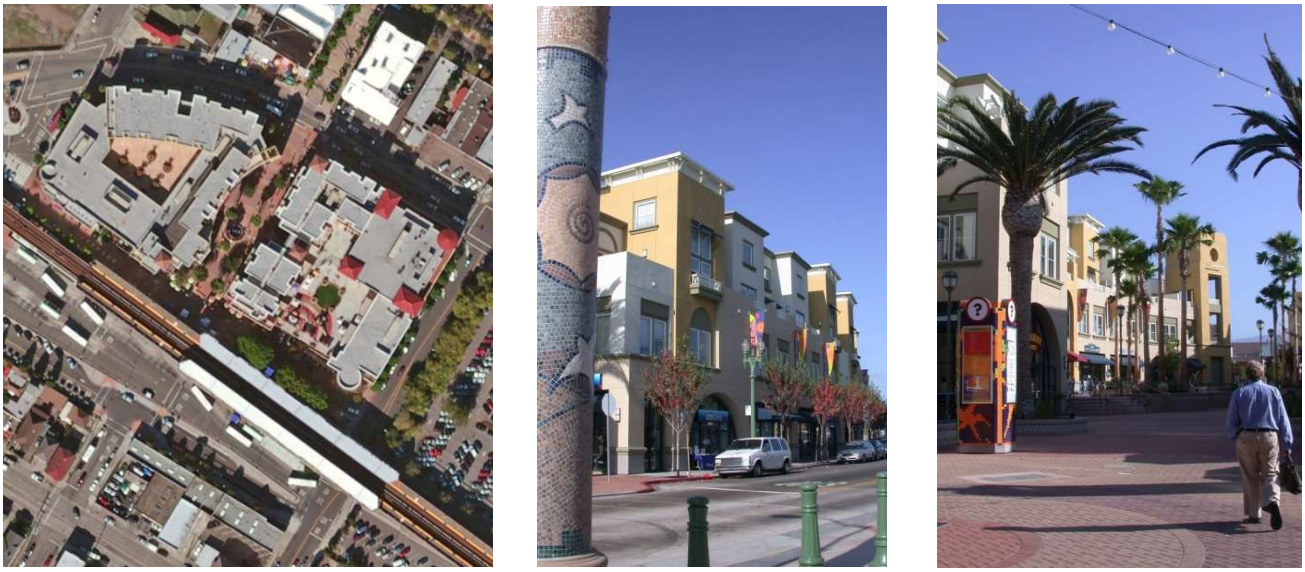

Figure1-36: Fruitvale Transit Village, Oakland, CA

Orenco Station, Hillsboro, OR – Located in Portland's growing high-tech corridor, Orenco Station is situated immediately south of the Intel Ronler Acres plant, a manufacturing and Research and Development facility that employs 16,000 people. In 1999, the National Association of Home Builders named Orenco Station "America's Community of the Year." Started in 1997 on an old nursery site, it is a 1,100-acre new town with a 52-acre village center with mixed-use shops, services and residential. It has a range of housing types and prices (rental units, live-work units, loft units above retail, single family) that includes over 4,300 residential units as well as 200,000 square feet retail uses and 800,000 square feet of office uses, Figure 1-37. There is a pedestrian access to the MAX light rail station that extends from the town center. The town center has four-story residential with ground floor retail along the main street. Currently, the walk from the Orenco Station to the town center takes approximately seven minutes and there is room for increased development of this area.
(Source: Planetizen)

Figure 1-37: Orenco Station, Hillsboro, OR

The Pearl District, Portland, OR – Much has been made of the success of Portland's Pearl District and it is not unwarranted. Since the first residential units were built in 1994 more than 3,500 lofts, condos and apartments have sprung up in the 85-block area, with many more on the drawing board. The area was transformed from an older commercial/industrial area. The Pearl District's zoning emphasizes multi-use structures with street-level food, service, and retail shops, as well as residential and office uses, see Figure 1-38. The Portland Streetcar, which runs north and south through the Pearl District every 13 minutes, makes connections with light rail (MAX) as well as the bus transit mall. There is also a strong emphasis on public spaces and parks. Agreements with the City of Portland and property developers have allowed the creation of several parks such as Jamison Square and Tanner Springs Park and provided tax abatement. Part of the reason that the Pearl District has been so successful is the great diversity of the area. In 2008, rents and property prices increased drastically, pricing-out average Portland residents as well as independent retailers. However, this may change with recent housing market adjustments.
(*Source: www.tndwest.com*)

Figure 1-38: Pearl District, Portland, OR

Bus Rapid Transit Examples

Although Bus Rapid Transit is relatively new in the United States there are several notable TOD examples. The Cleveland Healthline BRT project has resulted in renovation along Euclid Avenue with more than $5 billion worth projects underway or constructed along five mile[1]. The Metro Orange Line in the San Fernando Valley of Los Angeles is an exclusive lane BRT stimulating major residential project developments around the Canoga Station in Warner Center. Pittsburgh's East BRT, built within a railroad right-of-way has been a catalyst for new development, see Figures 1-39 through 1-41.

Source: Google Earth

Figure 1-39: Cleveland's Euclid Corridor BRT has paved the way to economic development

[1] http://www:columbusunderground.com/forums/topic/cleveland-euclid

Figure 1-40: Metro Orange Line in the San Fernando Valley, LA with new major residential development around stations.

Source: Google Earth

Figure 1-41: Pittsburgh's East BRT with a new pedestrian bridge across the busway to connect the development to the station.