California's Transit Village Movement

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Abstract

Transit villages—dense, mixed-use communities near rail stops—could increase rail ridership and reduce automobile dependency; however, few good examples exist in the U.S. today. Barriers to building transit villages include questionable market viability, conservative lending practices, and neighborhood opposition to multi-family housing. This paper shows, however, that there is a reasonably strong market demand for well-designed transit-oriented neighborhoods. After viewing visual images of simulated transit villages, more respondents from the San Francisco Bay Area expressed a willingness to live in a moderately dense community with nice amenities than in one with a third lower densities but little neighborhood open space or consumer services. Many current occupants of transit-based housing in California are young professionals living in one or two person households with just one car. What most distinguishes tenants of transit-based housing is their tendency to work in downtowns and other locations well-served by rail transit. The demand for good quality housing near rail has allowed some rail-served apartments in the Bay Area to command rent premiums. Strong market interest in rail-based housing, coupled with recent state enabling legislation, bode favorably for the future of transit villages in California.

Introduction

In California, a movement is currently under way to create transit villages around urban rail stations. In October 1993, Governor Pete Wilson signed the Transit Village Act, Assembly Bill 3152, which encourages cities and counties to build higher density housing and more concentrated development around the state's rail stops. California has invested over \$10 billion in urban rail transit infrastructure over the past 20 years and is poised to spend upwards of \$60 billion more over the next 30 years (mainly in Southern California). Yet most development in recent years has turned its back on transit, focused on freeway-served suburban corridors instead. Since the 1972 opening of the Bay Area Rapid Transit (BART) system, 35 million square feet of private office space has been built in parts of Alameda and Contra Costa Counties unserved by BART, compared to only 9 million square feet within one-half mile of BART stations in the two East Bay counties (mostly limited to downtown Oakland, Walnut Creek, and Concord) (Cervero and Landis 1995).

One consequence of growth occurring away from transit stops has been mass transit's declining market share of metropolitan trips. While transit journeys rose in absolute numbers in California during the 1980s (one of the few states where this was the case), transit's share of commute trips fell in the state's four largest metropolitan areas, despite their new rail systems: greater Los Angeles—5.4 to 4.8 percent; San Francisco Bay Area—11.9 to 10 percent; San Diego—3.7 to 3.6 percent; and Sacramento—3.7 to 2.5 percent. Nor do these trends appear to be slowing. A "State of the Commute" report by the Commuter Transportation Services (1994)—the annual tracking study of commuter behavior in the greater Los Angeles region—showed Southern California's drive-alone rate increased from 77 percent in 1992 to 79 percent in 1993.

Given the tremendous sunk investment states like California have in urban rail transit, these ridership trends are worrisome. Transit villages, proponents argue, will help reverse, or at least stave off, the trend toward growing auto-dependency and shrinking transit market share. Besides capitalizing on expensive public investments in rail, proponents argue that focusing future development around rail stops will produce other social benefits: increased regional ac-

cessibility and reduced traffic congestion along rail-served corridors; a more compact, sustainable urban form that conserves energy and reduces pollution; increases in affordable housing; more choices on where to live and how to travel; increased mobility for the transportation disadvantaged; and the creation of village environments where people from all walks of life come into daily contact with each other, similar to America's streetcar communities of yesteryear.

This article examines recent progress toward creating transit villages around California's urban rail stations. Examples of housing development clustered around California rail stations are described, followed by a discussion of the opportunities and barriers to transit villages. The market potential for large-scale transit village development is then assessed using visual simulation techniques. Characteristics of California's existing rail-based housing projects are later profiled in terms of tenant composition, ridership levels, and rent premiums. The article concludes with a discussion of California's transit village legislation and other public policy initiatives that might be pursued in promoting future rail-oriented development.

Defining Transit Villages

The somewhat nostalgic-sounding name of "transit villages" has gained currency in recent years to describe places conducive to transit riding—compact, mixed-use communities that, by design, invite residents, workers, and shoppers to drive their cars less and use transit more. Under California's Transit Village Act, transit villages extend roughly a quarter mile from a transit station, a distance that can be covered by foot in about five minutes; beyond this distance, suburbanites are far more likely to drive to their destinations rather than walk to a station to access a train. The centerpiece of the transit village is the station itself and the civic and public spaces that surround it. The transit station is what connects village residents and workers to the rest of the region, providing convenient and ready access to downtown, major activity centers (e.g., sports stadium, college campuses), and other popular destinations. The surrounding public square or open area serves the very important function of being a communal gathering place and a site of special events and celebrations—a modern-day agora. In the

mornings, the public square might be converted to an outdoor farmer's market, populated by flower stalls, fruit stands, and food vendors. On weekends, concerts might be held there. What is important is that the transit station functions as a window, or gateway, to the rest of the region and is physically tied to and associated with the village's major gathering place. Such settings are common at rail stations throughout Europe. Residents are drawn to transit nodes by the attractiveness and vibrancy of the surrounding civic areas. And concessionaires, street artists, and neighborhood merchants are drawn to these settings because of the heavy walk-on traffic. It's a win-win proposition.

Transit villages are hardly new ideas. They borrow from the visions of early city planners like Ebenezer Howard in England and Frederic Law Olmstead and Edward Bellamy in America, who advanced the idea of building pedestrian-oriented garden cities. Howard's vision was to build self-sufficient satellite communities of around 30,000 inhabitants that would orbit London, separated by protected greenbelts and connected by inter-municipal railways. Some vestiges of transit villages survive in the former streetcar suburbs of turn-of-the-century America, such as Shaker Heights in Cleveland, Chestnut Hill in Boston, Riverside near Chicago, and Roland Park in Baltimore. Streetcar suburbs depended on pedestrian access to transit to reach downtown jobs and neighborhood centers, since many were built prior to the invention of the automobile. America's early rail-served neighborhoods featured a range of housing from large estates to small cottage houses, had distinctive gridiron street patterns, and focused on a prominent civic space near the rail stop to instill a sense of community. In order to attract early residents to distant suburbs, these early transit villages were designed as safe, secure, and attractive places—notably with the placement of the train depot and public square in the heart of the community and the use of restrictive covenants and other development standards to control the physical environment.

In recent years, the terms "neo-traditional" development and "new urbanism" have gained currency to describe places that are compact, "quaint"-feeling, and rich in land-use mixture, and as a result, are more conducive to walking and transit riding. New urbanists, like Miami-based Andres Duany and Californian

Peter Calthorpe, borrow many of the successful elements from traditional American towns like Princeton, New Jersey and Annapolis, Maryland. Among the hallmarks of neo-traditional designs are a commercial core within walking distance of several thousand residents, a well-connected grid-like street network, narrow roads with curbside parking (to buffer pedestrians), back-lot alleys, diverse land uses, and varying styles and densities of housing.

Outside of a few turn-of-the-century neighborhoods, few good examples of transit village development can be found in the U.S. today. Of course, there are high-rise apartment towers near subways in big cities like New York and Chicago and some recent mixed-use concentrations near suburban rail stations in metropolitan Washington, D.C. (e.g., Ballston, Bethesda) and San Francisco's East Bay (e.g., Walnut Creek, Pleasant Hill); however, few such places could be characterized as "villages." Europe perhaps offers the best modern-day examples of transit village development, where dozens of compact, mixed-use satellite communities are interconnected by regional rail systems in metropolises like Stockholm and Copenhagen. Europe's transit villages are built on a scale that encourages pedestrian circulation. Most rail stops focus on town centers with a public square and an outdoor marketplace. The accent on livability is showcased by pedestrian amenities—park benches, newspaper kiosks, bus shelters, sidewalk cafes, open-air markets, and arcades designed to protect pedestrians from the elements. In Vällingby, one of Stockholm's rail-served satellites, the rail station shares space with a super market, where returning customers can do their daily shopping on the way home. The station is adjacent to a car-free village square lined with more shops and service establishments, including several daycare centers (Figure 1). More than 50 percent of Vällingby's employed residents commute by transit—despite the fact that Sweden has one of the highest per capita car ownership rates in Europe (Cervero 1995).

It is important to recognize that transit villages are not just physical entities. There are important social and economic objectives behind the transit village concept as well. One objective is to create an urban milieu that brings people from many walks of life into daily, face-to-face contact. Early streetcar villages had these qualities. Today's auto-oriented suburbs, in contrast, have segregated

Figure 1. Vällingby station area, a pedestrian-friendly, car-free town center. Entry to rail station via shopping center and surrounding civic space. High-density mixed land uses near station taper off to lower densities farther away. Photo by Jeff Kenworthy.

cultures and isolated people by age, class, and race—old from young, rich from poor, whites from blacks. Social commentators like Anthony Downs (1994) blame low-density and class-segregated growth for creating deep divisions in American society and for isolating, both physically and socioeconomically, many blacks, Hispanics, and recent immigrants. Social integration is extremely difficult to achieve in a *laissez-faire* society with high levels of automobility and personal freedom. Transit villages are just one of many ways of building new kinds of communities that offer wider lifestyle choices. By creating an attractive, lively, but safe neighborhood environment, it is likely that a subpopulation of people from different social backgrounds and income levels will be drawn to these settings. While these ideals are admittedly steeped in beliefs of physical determinism, experience shows, both historically and internationally, that transit-oriented

settings can impart a sense of belonging and an attachment to place, besides inducing people to ride transit.

Transit villages must also be economically viable and financially self-sustaining. Creating attractive urban environments that have good transit access to the rest of the region should, by definition, produce economic benefits. Foremost, the advantages of being near rail in an attractive urban environment should translate into higher property values and commercial rents. To the degree that governments can recapture some of these economic benefits, such as through property tax proceeds or special benefit assessments, then transit villages, in theory, can become economically self-supporting. Transit villages might also spin-off secondary economic benefits—such as providing opportunities for joint development (e.g., building a retail store adjacent to a rail station and generating lease revenues for a transit authority), station-area concessions (e.g., food kiosks), and community-based services (e.g., operating jitney connections between a neighborhood and the transit stop).

Transit villages could also serve as catalysts to economic development and community rebuilding. Recently, the Federal Transit Administration and Department of Housing and Urban Development joined forces to create a “Livable Communities” initiative that aims to empower distressed inner-city neighborhoods across the U.S. by making them eligible for special grants and tax credits. Some livable communities, like the Fruitvale district in Oakland, California, receive urban rail services. The hope is that by creating better quality neighborhoods in areas with superior transit services, private capital will return to these areas, putting them on a road to financial recovery. In the case of the Oakland’s Fruitvale neighborhood, community leaders hope to one day create a transit village focused on the BART station (Knack 1995). Plans call for building attractive apartments, creating a public square, and siting a child care center near the station, as well as transforming the BART station itself into a true intermodal transfer center. The neighborhood also hopes to create a mobility enterprise that would provide neighborhood jitney services and reverse-commute runs to suburban job centers, with local residents in charge of operating, dispatching, maintaining, and servicing the shuttle vans.

Rail-Focused Development in California

California is a natural breeding grounds for a transit village movement in that it is the nation's most urbanized and transit-oriented state. California has the most urban rail transit systems—at current count, two heavy rail, five light rail, and three commute rail services—and the highest metropolitan population densities in the nation (Larson 1993).

While modern-day transit villages remain merely a concept today, inroads have been made in recent years in focusing housing development near rail stations in California that could form the building blocks of future transit villages. Table 1 lists 26 large housing projects built within one-quarter mile of California urban rail stations between 1985 and 1994; collectively, these projects have added over 6,500 housing units within easy walking distance of rail stops. Most are rental apartment complexes with densities of 20 to 60 dwelling units (du) per acre, well above the 12-15 du per acre benchmark used by planners as minimum thresholds necessary to support rail in the suburbs (Puskarev and Zupan 1977). Presently, both Santa Clara County Light Rail and BART are in the process of converting surface parking lots at several stations into residential/retail projects. Developers have been attracted to these sites since, by building on existing parking lots, they do not bear the risk of negotiating land purchases among multiple property owners, any one of whom can hold out, thereby stalling a project. Bay Area planners hope that building housing atop former park-and-ride lots will eventually lead to mini-communities mushrooming around dozens of rail stations, as was envisaged when BART was conceived over 40 years ago.

Local governments are doing a lot to promote transit-oriented development in California. In the Bay Area, the cities of Hayward, Union City, El Cerrito, and Pleasant Hill have recently formed redevelopment districts around BART stations for the very purpose of jump-starting new development (see Figure 2 for a map of the BART system and its stations). El Cerrito's redevelopment authority has used tax-exempt financing to help underwrite the cost of assembling land and financing nearly \$10 million of the \$14 million in infrastructure improvements necessary to support several housing projects near the Del Norte BART station. The city worked closely with a developer to create the Del Norte Place

Table 1. Major Housing Projects Near California Rail Stations, Built Between 1985 and 1994

<i>Rail System</i>	<i>Station Name</i>	<i>Property Name</i>	<i>City</i>	<i>Units</i>	<i>Year Built</i>	<i>Density*</i>	<i>Unit Type</i>
BART	El Cerrito Del Norte	Del Norte Place	El Cerrito	135	1992	30	rental
BART	Pleasant Hill	Park Regency	Pleasant Hill	892	1992	43	rental
BART	Pleasant Hill	Treat Commons	Pleasant Hill	510	1987	40	rental
BART	Pleasant Hill	Bay Landing	Pleasant Hill	360	1986-1988	37	rental
BART	Pleasant Hill	Wayside Plaza: Phase 1	Pleasant Hill	36	1985-1986	24	ownership
BART	Pleasant Hill	Wayside Plaza: Phase 2	Pleasant Hill	60	1986-1987	60	ownership
BART	Pleasant Hill	Wayside Plaza: Phase 3	Pleasant Hill	60	1987-1988	60	rental
BART	Union City	Verandas	Union City	360	1988-1989	36	rental
BART	South Hayward	The Foothills	Hayward	188	1986-1987	33	rental
BART	Fremont	Mission Wells	Fremont	392	1989-1991	35	rental
SCCLRT	Almaden	The Homes at Almaden Lake	San Jose	84	1993	12	ownership
SCCLRT	Almaden	The Apts. at Almaden Lake	San Jose	144	1994	37	rental
SCCLRT	Almaden	Park Almaden	San Jose	370	1989-1994	40	ownership
SCCLRT	Civic Center	Ryland Mews	San Jose	132	1993	33	rental
SCCLRT	River Oaks	Villagio	Santa Clara	273	1989	25	ownership
SCCLRT	River Oaks	Elan	Santa Clara	941	1991	25	rental
SCCLRT	River Oaks	The Fountains	Santa Clara	226	1993	NA	rental
CalTrain	Mt. View	Park Place	Mt. View	370	1989	49	rental
CalTrain	Mt. View	Villa Mariposa	Mt. View	248	1985-1986	28	rental
CalTrain	California Ave.	Palo Alto Central	Palo Alto	74	1985	18	ownership
CalTrain	California Ave.	California Park Apartments	Palo Alto	45	1989	NA	rental
SD Trolley	Amaya	Villages of La Mesa	La Mesa	384	1989	20	rental
SD Trolley	La Mesa	La Mesa Village Plaza	La Mesa	95	1991	NA	ownership
SD Trolley	Barrio Logan	Mercado del Barrio	San Diego	144	1994	NA	rental
SD Trolley	47th Street	Creekside Villas	San Diego	144	1989	NA	rental
SRT	Butterfield	Windsor Ridge	Sacramento	112	1988	NA	rental
LA-Blue Line	Pacific@5th	Bellamar	Long Beach	160	1990	NA	rental
LA-Blue Line	Transit Mall	Pacific Court	Long Beach	142	1992	NA	rental

Note: BART = Bay Area Rapid Transit; SCCLRT = Santa Clara County Light Rail Transit; CalTrain = CalTrain Commuter Rail Service; SD Trolley = San Diego Trolley; SRT = Sacramento Regional Transit; LA-Blue Line = Los Angeles Metrorail Blue Line Light Rail Transit; NA = not available or not known.

**Number of dwelling units per acre.*

Source: NTRAC Project Database, 1994.

Figure 2. BART system map.

project, a 135-unit apartment complex with 19,000 square feet of ground-floor retail; 27 of the units are priced below market as set asides for low-and moderate-income families (Figure 3). To make the project work, the redevelopment authority became an equity partner, leasing land to the developer for \$1 per year and 15-20 percent of cash flow. Del Norte Place has leased rapidly. It opened in mid-1992 and by mid-1993, 97 percent of its apartments were occupied.

The Bay Area's best example of suburban transit-oriented development encircles the Pleasant Hill BART station. Between 1988 and 1993, over 1,800 housing units and 1.5 million square feet of class A office space was built within a quarter mile of the Pleasant Hill station (Figure 4). Pleasant Hill's success is attributable to three key factors: one, the creation of specific plan in the early 1980s that served as a blueprint for targeting growth near the rail station over the ensuing 15 years; second, the existence of a proactive redevelopment authority

Figure 3. Del Norte Place mixed-use project at El Cerrito del Norte Station. The project abuts the BART station and is separated from the aerial BART track by a linear park. Photo by Robert Cervero.

whose staff aggressively sought to implement the plan by assembling irregular parcels into developable parcels and issuing tax-exempt bond financing for public and private improvements; and third, having a local elected official who became the project's "political champion," working tirelessly and participating in innumerable public hearings to shepherd the project through to implementation (Cervero, Bernick, and Gilbert 1994). Current plans call for converting two BART parking lots at the Pleasant Hill station into structured replacement parking to open up land for restaurants, retail shops, and a regional cultural-entertainment complex, activities that are currently missing but are widely viewed as vital toward creating a more village-like atmosphere.

Plenty of building activity can also be found around other rail stations in California. In Santa Clara County, over 2,500 apartment and condominium units

Figure 4. Pleasant Hill BART station area. Some 1,800 housing units and 1.5 million square feet of office and retail building space surround the Pleasant Hill station. Photo from BART files.

have been built near light rail stops in the past five years. A recently completed 250-unit project, Almaden Lake Village, was built on the transit district's park-and-ride lot adjacent to the Almaden station. As part of the County's Housing Initiative Program, plans are under way to build an additional 1,700 units of moderate-density housing (at 12 to 40 du per acre) near light rail stations over the next five years. Sacramento's updated General Plan calls for using an array of development incentives at 13 light rail stations, including higher allowable densities, lower minimum parking requirements, tax increment financing, and industrial development bonds. The City of San Diego has perhaps done the most in recent years to embrace transit-oriented design concepts, adopting a formal policy "to direct growth into compact neighborhood patterns of development, where living and working environments are within walkable distances of transit sys-

Figure 5. Amaya Station area on the El Cajon line. More than 300 apartment units of the Villages of La Mesa abut San Diego Trolley's Amaya Station. Photo by Robert Cervero.

tems" (City Council Policy 600-39). Since 1990, more than 380 modern apartment units have been built adjacent to the La Mesa-Amaya light rail station (Figure 5). Currently under construction is Otay Ranch, a master-planned community adjacent to the cities of San Diego and Chula Vista, that will feature five village clusters, at blended densities of 18 du per acre, and, developers hope, will be served directly by an extension of the trolley line.

Opportunities and Barriers to Transit Villages

Market Opportunities

Three types of opportunities are working in favor of transit village development in states like California. One opportunity has been demographic growth in population groups that are prime candidates for transit-oriented living: young households, retirees, childless households, and in-migrants from foreign countries. In the San Francisco Bay Area, for instance, the share of population in the 25-to-34 and 65-and-over age groups increased from 23.5 percent in 1980 to 30.8 percent in 1990. These households tend to be small, and for financial and convenience reasons, require less space and are more inclined to live in attached housing units. In greater Los Angeles, 30 percent of households in 1990 contained no children; in the inner suburbs, two-thirds of households were childless. In addition, immigration added over 2 million to the population of the Los Angeles-Anaheim MSA and nearly 600,000 to the San Francisco-Oakland MSA during the 1980s (Speare 1993). Because many new arrivals to the U.S. migrate to urban centers and seek affordable housing, more compact communities near rail stops might appeal to many.

A second trend that favors transit villages is the growing willingness of transit agencies and local governments to leverage private investments near rail stations. Specifically, the ability to assemble land—such as through eminent domain, condemnation, or redevelopment takings—and thus help write down costs appeals to many developers (Bernick 1993). For many transit agencies, surface parking lots surrounding stations are their biggest development asset. Parking lots represent large tracts of pre-assembled, cleared land that are relatively cheap to build upon. Converting park-and-ride lots to housing constitutes *de facto* land

banking. One of the reasons why so much urban growth has clustered around rail stations in cities like Toronto and Stockholm is that local governments were able to acquire land over and beyond what was necessary to build rail stations, allowing them to lease or sell extra land to real estate developers. In the U.S., eminent domain laws prohibit excess land acquisitions. Reusing park-and-ride lots achieves similar results to land banking, however. Such was the case at the Ballston station in Arlington, Virginia, when its status changed from a terminal to an intermediate station following the extension of Metrorail's Orange Line to Vienna, Virginia. The relocation of park-and-ride spaces and a bus transfer facility to the new terminal freed up land, helping to trigger a massive redevelopment of the Ballston station area, including the construction of a 28-story office-residential-retail complex above the station.

A third opportunity for transit village development is today's receptive policy and legislative environment for coordinating transit and land use decisions. Recent federal initiatives such as the 1991 national surface transportation act (ISTEA), clean air act amendments (CAAA), and Empowerment Zone/Enterprise Communities (EZ/EC) programs provide funding sources and a legislative context for promoting transit-oriented development. ISTEA explicitly calls for a close coordination of transportation projects and urban development. Clean air laws encourage transit initiatives, such as transit-supportive development, as a possible transportation control measure (TCM) in non-attainment areas. The EZ/EC program promotes such neighborhood transportation strategies as mobility enterprises and neighborhood intermodal travel centers. Transit villages are clearly consonant with these legislative initiatives.

Barriers to Transit Villages

Working against transit village development in California and elsewhere loom two significant barriers: (1) fiscal: factors that detract from the financial feasibility of transit-oriented projects, such as questionable market viability and lack of conventional financing; and (2) political: land-use policies and NIMBY forces that impede multi-family housing development.

Americans' preference for low-density living is firmly rooted. A 1993 survey by the Building Industry Association of Northern California found that 82 percent of surveyed households preferred a single-family home over all housing types. It is a fundamental rule, according to one northern California developer, that "as density goes up, the general interest from the consumer goes down" (Bookout 1992, 15). In part because of the questionable marketability of denser housing, coupled with the softness of today's real estate markets and the fallout from the savings and loans crisis of the late-1980s, banks are understandably hesitant to provide permanent financing for largely untested products like transit-based housing. The higher construction costs, development fees, and risks associated with higher density housing are also major financial obstacles. As multi-unit buildings become taller, costs for design, construction, and liability insurance increase commensurately. Beyond 40 du per acre, podium or other expensive parking structures become necessary. Once construction goes above four stories, the more expensive steel-frame construction, elevators, and lobby areas drive up unit costs. While, in theory, denser housing near rail stops should produce less traffic than if the same number of units were built as single-family homes, in practice denser projects pay relatively higher impact fees. A series of recent lawsuits holding condominium builders liable for faulty construction as late as 10 years after project completion has also frightened some California developers away from the high-density housing market.

A pair of "isms"—localism and NIMBYism—stand as the biggest political hurdles to transit village development. In California, Proposition 13, the 1978 initiative that reduced local governments' capacities to generate revenues through property taxes, is often blamed for prompting communities to be more competitive than cooperative. Some jurisdictions keep high-density housing out through fiscal zoning—"zoning in" high tax-yielding land uses, like office parks, and "zoning out" service-demanding activities, notably apartments (that burden already overburdened schools and city services). To many, transit-based housing carries with it the specter of more crowded schools and congestion, the stigma of low-income projects, and the prospect of tarnishing the character of an estab-

lished neighborhood, thus lowering property values. NIMBY opposition to apartment proposals resulted in restrictive land-use policies and the passage of building moratoria in several neighborhoods surrounding BART stations that were prime for more intensive redevelopment, including Rockridge, North Berkeley, Walnut Creek, and the Mission District in San Francisco. In Hunt Valley, Maryland, a major employment hub north of Baltimore that recently received light rail services, NIMBY pressures resulted in the rezoning of prime land that was proposed for some 1,500 apartment units to a rural-conservation designation, despite the presence of light rail and an imbalance of more than three jobs for every available housing unit in the area.

The Market for Transit Villages

Relatively little is known about the market potential of transit village development, in large part because little has been built to date, mainly due to the barriers cited above. Transit-oriented communities such as the celebrated Laguna West development south of Sacramento, designed by architect Peter Calthorpe (1993), have struggled financially and for the most part incorporate modest transit provisions. Presently, the entire transit village movement seems caught in a "Catch-22": there are few examples, in part, because of questionable market feasibility, and the market potential of transit villages is questionable because there are few examples.

In the absence of good U.S. examples of transit villages, researchers with the National Transit Access Center (NTRAC) at the University of California recently attempted to dynamically simulate them using computer-generated images (Cervero and Bosselmann 1994). The main objective was to gauge the degree to which people might be willing to accept higher densities needed to sustain rail transit services in exchange for more public amenities, like neighborhood parks and close-by retail shops and eateries. Nine photoslide images that simulated a "walk" through four neighborhoods with different density/amenity mixes were presented to residents of the San Francisco Bay Area in the spring of 1994. Each simulated "walk" began by showing a view out the rear and front windows of a hypothetical house located three blocks from a BART station, pro-

ceeded along two residential streets toward a neighborhood retail plaza, and ended at a nearby public square fronting a BART station.

As the densities of the four photosimulated neighborhoods increased from 12 to 24 to 36 to 48 du per acre, so did the acreage of public parks, number of shops, and amount of landscaping in the neighborhoods increase. These densities span the minimum necessary to support rail transit (12 du per acre), as established by Pushkarev and Zupan (1977), as well as the upper boundary (48 du per acre) of what can be built without going to more expensive steel-framed structures with elevators, lobby space, and structured parking. Four photoslide im-

1

3

2

4

Figure 6. Four slide images of a computer-simulated transit village designed at 12 dwelling units per acre. The first image shows a view out of a second-story window into the rear yard of a house in the village. The second shows a view out the front door looking down the street. The third shows houses at the end of the street. The fourth depicts a modest retail plaza that leads to the nearby rail station.

ages created for two of the simulated transit villages—the 12 du per acre one with the fewest neighborhood amenities and the 48 du per acre one with the most amenities—are shown in Figures 6 and 7. All images were generated using three-dimensional computer modeling and animation techniques. Factors such as building style and newness, the amount of sunlight, and street widths were controlled so that only densities and amenities varied across the neighborhoods.

Based on the survey responses of 170 Bay Area residents who viewed the slides, the lowest density neighborhood was the most preferred—58 percent of the respondents ranked it as the most desirable. However, far more respondents

1

3

2

4

Figure 7. Four slide images of a computer-simulated transit village designed at 48 dwelling units per acre. The first image shows a view out of a second-story window into a courtyard. The second shows a view out the front door looking down the street. The third shows houses at the end of the street (that did not exist in the lower-density neighborhoods). The fourth depicts a retail plaza with more activities.

liked the transit village built at 36 du per acre with nicer public amenities than the transit village designed at 24 du per acre but with fewer community services or amenities. Notably, people preferred tightly spaced two-and-a-half story row houses with modest backyards located near a public park and retail shops, to one-to two-story row houses with larger rear yards and more street frontage, but with no nearby park and fewer local services. Those most receptive toward higher-density transit villages were young adults with moderate incomes who currently reside in apartments.

Profiling Residents of Transit-Based Housing

Of course, the limitation of visual simulations, however attractive or fanciful they might be, is that they are nonetheless "make-believe." Many developers and lenders are unlikely to invest in transit-oriented projects until a clear consumer demand can be demonstrated. While no true modern-day transit villages exist in the U.S. today, there is plenty of transit-based housing from which one can begin to infer the likely market profiles of transit village residents. We recently surveyed the residents of 28 large-scale housing projects near California rail stations (Cervero and Menotti 1994). Tenants tended to be young professionals, singles, and empty-nesters, with typically just one car per household. In 12 housing projects near BART, for instance, there was an average of 1.66 people and 1.26 vehicles per household, compared to an average of 2.40 people and 1.64 vehicles for all other households in the same census tracts (Table 2). More than 90 percent of transit-based households had just one or two occupants, compared to 58 percent of households in surrounding tracts. Fewer than 8 percent of transit-based households had children. More than 70 percent of surveyed households near BART had one or no vehicles, compared to 48 percent of households in the same census tracts. While tenant characteristics of transit-based housing were not statistically different from characteristics of surrounding census tracts, based on mean statistics from Table 2, it is clear that those choosing to live in apartments and condominiums near rail stops live in comparatively small households with relatively low automobile ownership rates.

Table 2
Matched-Pair Comparisons of Household and Occupant Characteristics
of Transit-Based Housing and Surrounding Census Tracts

	Transit Based-Housing		Surrounding Census Tract		Matched Pair t Statistic	Prob- ability
	Mean	Std. Dev.	Mean	Std. Dev.		
Household Characteristics						
Persons/household	1.66	0.81	2.39	1.37	1.90	.091
No. of vehicles available	1.26	0.68	1.61	1.11	1.56	.165
Occupant Characteristic						
Age (17+ years)	36.3	14.7	42.1	17.7	1.38	.196

Note: The "Surrounding Census Tract" consists of the census tract that encompasses the housing project, with the estimated population for the transit-based housing projects netted from census tract data.

What most distinguishes residents of housing near California rail stations is their tendency to work downtown and in other locations well served by transit. In the case of five apartment and condo complexes near the Hayward and San Leandro BART stations, 43 percent of employed residents worked in downtown San Francisco or Oakland, compared to just 13 percent of employed residents in the surrounding census tracts. And an estimated one-half of the residents of 1,800 apartment units near the Pleasant Hill BART station worked in downtown San Francisco or Oakland, compared to a citywide average of just 10 percent. In a study of residential location choice in greater Philadelphia, Voith (1991) found similar examples of residential sorting, wherein people gravitated toward locations with comparative accessibility advantages to job sites. Census tracts with commuter rail service nearby had 12 percent more of their residents working in downtown Philadelphia than did surrounding census tracts. Like BART, Philadelphia's rail system radially connects suburban communities to the CBD.

Builders are starting to realize that a number of downtown workers, many of whom are young professionals earning good wages, are attracted to rail-based

housing. Projects with nice amenities and which cater to the tastes of young professionals seem to appeal to many childless households seeking condominiums and apartments near rail. One example is the Park Regency apartment complex near the Pleasant Hill BART station, an upmarket complex complete with a pool, spa/sauna, and recreational building that has a waiting list to move in. Three-quarters of the Park Regency's occupants are in the 18-34 year age group, and more than 50 percent earn more than \$40,000 annually. Another high-amenity project is Del Norte Place near the El Cerrito del Norte BART station; its marketing brochures emphasizes the project's fireplaces, bay views, ground-floor retail, and proximity to BART. In an interview with *The New York Times*, the project developer stated that he aggressively put in a bid to the El Cerrito redevelopment authority to build on the site because he believes living near rail stations will become increasingly attractive as regional traffic congestion worsens (McCloud 1992).

With so many residents of transit-based housing working downtown and other rail-served destinations, these projects should generate high rates of rail commuting. Recent surveys show that Californians living within a quarter mile of an urban rail system are around three times as likely to commute by rail transit as the average worker living in the same city (Cervero 1994). One-third of employed residents living in apartments and condominiums near BART stations commute by rail, compared to 8 percent of all commuters living in the three BART-served counties (San Francisco, Alameda, and Contra Costa). The two most important determinants of rail usage are trip destination and availability of free parking. Among those living in multi-family projects near BART stations and heading to San Francisco job sites with no free parking, nearly 9 out of 10 work trips are by BART. If they can park free in downtown San Francisco, around 60 percent commute by rail. For commutes to secondary urban centers like Oakland and Berkeley, around half are by BART. For all other destinations (where often workers park free), on average only 6 percent of commute trips by station-area residents are by rail. Clearly, clustering housing around rail stops will do little good if, as during much of the 1980s, job growth occurs mainly along suburban freeway corridors. Both ends of work trips—housing and job sites—must

be within reasonable proximity of stations if clustered growth is to pay significant transportation and environmental dividends—in short, more mixed-use transit village development is necessary.

Because rail-based households own relatively few cars and frequently patronize transit, zoning standards should be relaxed to allow just one parking space per unit at complexes near rail stations. This would lower construction costs by an estimated \$12,000 per unit in the Bay Area (the typical cost of a tuck-under, podium parking space), and also create a more pedestrian-oriented environment. Tenants with more than one car might be given the option of leasing a second space. Another novel idea suggested by Holtzclaw (1994) would have banks grant those living in rail-based condominiums an “efficient-location” loan for home purchases. If rail-based housing lowers transportation costs (mainly in the form of only having to own one car), then these savings might be subtracted from principal, interest, taxes, and insurance expenses when calculating mortgage qualifications. This acknowledges that lower transportation costs frees more money for housing consumption. Such loan adjustments could further attract prospective homebuyers to transit village locations.

Rail-Based Housing and Rents

If rail-based housing projects are becoming increasingly desirable addresses, this should be reflected in rent levels. Comparisons were recently made between 1994 rents at multi-unit projects within a quarter mile of the Pleasant Hill BART station versus otherwise similar projects in Pleasant Hill and the nearby cities of Walnut Creek and Concord that were beyond walking distance of a rail stop (Bernick, Cervero, and Menotti 1994). Rents per square foot for one bedroom/one bathroom units near the Pleasant Hill station were \$1.20, compared to an average of \$1.09 for similar projects (in terms of size, age, and amenities) in the same geographic submarket but away from BART. Two bedroom/two bathroom units near the Pleasant Hill stations leased for around \$1.09 per square foot compared to around \$0.94 per square foot for comparable units away from BART. These findings translate into a 10 to 15 percent rent premium associated with being near BART.

A hedonic price model was also estimated for measuring the rent premium commanded by rail-based housing. Using multiple regression analysis, a hedonic price model does what matched-pair comparisons are unable to: statistically control for a large number of attributes of the "housing bundle," allowing the unique effects of each attribute (including proximity to BART) to be parcelled out.

Table 3 presents the findings of the estimated model. Units within a quarter-mile of the Pleasant Hill BART station rented for around \$34 more per month than otherwise comparable units farther away from BART, controlling for the influence of unit size, amenities, and other factors. More bathrooms, bedrooms, and amenities like playgrounds and weight rooms likewise increase monthly rents. Table 3 also reveals that units in more compact projects rent for more than comparable units in lower-density ones. Project density, it should be noted, reflects units per acre within a complex as opposed to the density of the surrounding neighborhood. The rental premium associated with compact projects could reflect the benefits of tenants being closer to pools, playgrounds, and other amenities, as well as living in a communal setting. The rail-based projects used in this analysis, moreover, were comparatively dense, suggesting some interaction between these two factors—closeness to stations and project density. The finding that both proximity to transit and project compactness get capitalized into higher rents bodes well for the future of transit village development in the Bay Area.

Stimulating the Market for Transit Villages

Perhaps the most promising recent development in California's transit village movement was the passage of the Transit Village Act, AB 3152. The Act stipulates that no public works projects, tentative subdivision maps, or parcel maps may be approved, nor zoning ordinances adopted or amended, within an area covered by a transit village plan unless the map, project, or ordinance is consistent with the adopted transit village plan. This was a small but important step toward bringing the transit village idea to fruition. The bill, as originally drafted, would have allowed municipalities to designate a "transit village district," similar to a redevelopment district, with special land assemblage and tax increment financing privileges. The original bill also stipulated that developers

Table 3
Hedonic Price Model for Multi-Family Rental Units in the
Pleasant Hill Station Area and Surrounding Submarket, 1994

Dependent variable = rent per month, in dollars

<i>Variable</i>	<i>Coefficient</i>	<i>T-statistic</i>	<i>Significance</i>
BART station within one-quarter mile (1=yes, 0=no)	34.101	1.526	.133
Size of unit (sq.ft.)	.427	6.497	.000
No. of bedrooms	29.488	1.497	.141
No. of bathrooms	42.039	2.657	.011
Playground on site (1=yes, 0=no)	30.461	1.689	.097
Weight room on site (1=yes, 0=no)	66.544	4.721	.000
Project density (units/acre)	.397	1.380	.174
Project age (in years, from 1991)	-10.971	-6.200	.000
Project in Concord (1=yes, 0=no)	-129.842	-8.878	.000
Proportion of total units in project of unit type	-44.545	-1.567	.124
Laundry room on site (1=yes, 0=no)	-21.221	-1.105	.275
<i>Summary Statistics:</i>			
Number of observations	60		
R-Squared	.919		
F statistic	49.331		
Significance F	.000		

building within the district be granted density bonuses of at least 50 percent. Because of stiff opposition from fiscal conservatives, most of these provisions were later stripped from the bill. Regardless, the Act gave newfound legitimacy to California's transit village movement.

As passed, AB 3152 is a voluntary statute encouraging cities and counties to plan more intensive development around rail stations, though it provides few fiscal powers or special authority to do so. Sponsors hope the bill will be expanded in coming years to provide more financial incentives, perhaps granting transit village districts priority access to discretionary state funds, such as from the national transportation act (ISTEA) and fuel price rebate programs. California's transit village movement suffered a recent setback, however, when Governor Wilson vetoed an Assembly Bill (AB 1338) in the spring of 1995 that would have established local revolving funds (from state and federal transportation plan-

ning monies) and provided loans to cities and counties to enable them to prepare specific transit village plans. The veto, most observers agree, had more to do with the generally conservative fiscal mood of the times than an opposition to the principle of transit-oriented development. Still, the veto underscores the reality that transit-oriented development is not high on the priority lists of many politicians, and that transit villages face an uphill struggle in becoming a reality in states like California.

Notwithstanding such political setbacks, it is encouraging that some housing projects near rail stations are leasing quickly, commanding rent premiums, and attracting residents who patronize transit. Local governments can leverage transit-oriented development by emulating what was done in Pleasant Hill and El Cerrito—namely, by creating specific plans to guide development and using tax increment financing and other tools to assist with land assemblage and absorb some of the risks of project development. Given some of the doubts over the marketability of higher density housing and today's conservative lending practices, some degree of risk-sharing between the public and private sectors will be necessary if transit villages are ever to take form. Relaxing zoning standards to allow fewer parking spaces at rail-based projects and rewarding those buying condominiums near rail stops with "efficient-location" loans would further promote transit-oriented growth. Together, strong market interest, public-private cooperation, and a conducive public policy environment would prove a powerful combination in taking the transit village movement from idea to implementation. ♦

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