

**Transit-Oriented Development in San Diego County:  
Incrementally Implementing a Comprehensive Idea**

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## **Abstract**

While transit-oriented development (TOD) has become an increasingly popular planning idea, very few studies have examined how localities plan for and implement transit-oriented projects. This paper helps fill that gap by studying the TOD implementation process near stations on the oldest of the current generation of light rail lines – the San Diego Trolley. Interviews with planning directors in the region, supplemented by zoning data, archival research, and inspection of station-area land use, all suggest that TOD is a niche market in the region. There are several barriers which have constrained TOD implementation in San Diego County. TOD projects have been pursued most aggressively in cases where those barriers are less severe or do not apply. Overall, we argue that each city, while being sympathetic to regional rail goals, works within a framework of local goals and constraints. The net result is regional TOD implementation which resembles the incremental model of policy-making first popularized by Lindblom (1959). One implication of this is that a comprehensive reshaping of station-area land use will, at best, take years to be realized.

## I. Introduction

There has been a boom in American rail transit construction in the past two decades. This investment has been accompanied by a growing discussion of how to best leverage the new rail systems. One idea which has become especially popular is transit-oriented development (TOD). While proponents have offered many justifications for TOD policies, a common one is the idea that rail transit ridership can be increased by supportive land use policies near stations (Bernick and Hall 1990; Cervero 1993; Cervero 1994c).

Yet the goal of using land use policies to boost rail ridership represents a major shift in American transportation planning. Prior to the mid-1980s, transportation planners rarely sought to influence travel behavior by manipulating land use patterns. Furthermore, since rail systems by their nature involve several stations, often in multiple jurisdictions, TOD requires a somewhat broad reach across potentially numerous locations and land use authorities. This level of inter-governmental land use policy coordination, while found in other nations, is not typical of American planning. Thus both in intellectual disposition and in the required amount of coordination, TOD is a departure for transportation planning in the United States. Given that, it is important to understand the progress made in implementing TOD policies.

By examining the case of San Diego County, we argue that TOD is most likely to be implemented slowly and incrementally. Several potential barriers stand in the way of TOD implementation, and while those have been overcome in certain instances in San Diego County, existing developments represent more of a niche market than a comprehensive reshaping of transit-proximate land use.

Overall, we conclude that while the concept of TOD represents a broad, comprehensive shift in American transportation planning, it is only being incrementally implemented. This provides an interesting juxtaposition between the rational/comprehensive model of planning, as discussed in, e.g., Kaiser, Godschalk, and Chapin (1995, pp. 37-40), and the incremental model popularized by Lindblom (1959). To understand TOD, one must recognize how the idea and actual planning practice have characteristics of both rational and incremental models. We expand on this in the concluding section, where we discuss how an understanding of TOD implementation can help clarify the prospects for TOD as a transportation planning tool. First, some background on the TOD idea is necessary.

## II. Background: The Idea of Transit-Oriented Development

Transit-oriented development is an umbrella term which includes projects with several different elements. Some authors have proposed building medium to high-density residential development near rail transit stations (Beimborn, et. al. 1991; Bernick and Hall 1990; Bernick and Hall 1992; Bernick 1993; Bernick, Hall, and Shaevitz 1992; Cervero 1994c; Cervero 1994d; Glick 1992). Others have advocated commercial and office development near stations (Cervero 1994a; Cervero 1994b). Still other articles have proposed concentrations of both commercial and residential development, suggesting the possibility that rail systems could serve an optimal combination of worktrip origin and destination nodes (Cervero 1994c; Cervero 1995). TOD proposals have included pedestrian-oriented design elements and mixed land uses which borrow from currently popular neotraditional design concepts. Examples include the proposed Otay Ranch in San Diego County (Calavita, 1993; City of Chula Vista, 1994, esp. pp. 16-18) and the Laguna West development south of the City of Sacramento (U.S. News and World Report, 1990).<sup>1</sup>

The common element in all TOD is the notion that coordinated land use policies near rail transit stations can enhance system performance, most notably by increasing rail transit ridership. This is based largely on survey evidence that residents of transit-based developments are as much as five times more likely to commute to work by rail than persons who live elsewhere in the same metropolitan area (Cervero, 1994c).<sup>2</sup> Several reports have stated that ridership improvements are one reason, and in some reports *the* reason, to pursue TOD projects (e.g. Bernick 1990; Bernick and Hall 1990).<sup>3</sup> As such, TOD is a revolutionary departure for American transportation planning.

This point might not be obvious, and we suspect that some of the appeal of the TOD concept is that it seems, at first glance, to be based on commonly accepted transportation planning ideas. In its simplest form, TOD proposes changing land uses near stations to enhance rail transit ridership. The idea that land use is linked to travel behavior is a common one in transportation planning. Travel demand estimation models have for decades been based on a four-step method which assumes that the number of trips originating from a location (or zone) is a function of nearby land uses, and that the number of trips terminating at a location is also a function of land use. (See, e.g., Domencich and McFadden, 1975, pp. 17-45 or Ortuzar and Willumsen, 1994 for a description of the four-step method of travel demand estimation.) That there is a link between land use and travel behavior is commonly accepted among many transportation

planners and scholars.<sup>4</sup> Pushkarev and Zupan (1977), for example, discussed the importance of population density for rail transit travel demand.

Yet travel-demand models usually assume that land use is exogenous, and then predict travel demand based on pre-existing land use.<sup>5</sup> TOD proposes to make land use a policy tool. TOD proponents suggest that land uses near stations be changed, often by adding an element of medium to high-density residential. They suggest that these changes will increase rail transit travel demand.

This is a considerable departure from traditional transportation planning, especially as it involves travel demand estimation.<sup>6</sup> Travel demand estimation has traditionally been somewhat reactive; planners observe existing land uses, propose particular projects, and then predict travel behavior. The idea that land use can be a transportation policy tool was not prominent until the jobs-housing balance debate which began in the mid-1980s (e.g. Cervero 1986 and Cervero 1989).<sup>7</sup> Given the relative lack of experience with using land use policy as a transportation planning tool in this country, two questions are important. First, can land use changes of the sort advocated by TOD policies really increase rail transit demand? Second, can TOD policies be implemented on a scale that can achieve their policy goals?

While this paper focuses on the second question, namely implementation, some discussion of the first question is appropriate. The evidence on TOD and rail ridership is largely based on survey evidence that persons living in transit-based housing developments are as much as five times more likely to commute to work by rail than persons in the surrounding community (Cervero 1994c). Yet Cervero (1994c) also notes that 42.5% of rail commuters living in transit-based housing commuted by public transit *before* they moved into their current residences.

More generally, it is difficult to determine how land use affects individual travel behavior because location choice is endogenous. For example, persons who prefer rail transit might choose to live near rail stations. Thus it is unclear how much of the benefit of transit-based housing is more convenient residences for current transit users, as opposed to encouraging automobile commuters to use transit.<sup>8</sup> Overall, the most cautious approach is to concede that TOD might have the potential to boost transit ridership, but to acknowledge that we have insufficient information to predict the magnitude of any such increase, or the extent to which TOD can decrease automobile use.

Yet even if TOD increases rail transit ridership, can it be implemented on a broad enough scale to affect system-wide rail transit travel demand? This is a relatively overlooked question. Some authors have discussed potential barriers to TOD implementation (e.g., Boarnet and Crane 1995 and 1997; Cervero, Bernick and Gilbert

1994; Deakin and Chang 1992), but these barriers have not been explicitly linked to a view of the implementation process. We use a case study of development near existing San Diego Trolley stations to illuminate both the opportunities for and barriers to TOD projects, and the nature of TOD implementation in San Diego County.

### III. TOD Implementation

Previous authors have noted that TOD has not proceeded as far or as fast as proponents would like. Bernick (1990) noted the slow pace of TOD development around San Francisco area BART stations, and suggested that government intervention would be necessary to facilitate coordinated land use near rail transit stations. Cervero, Bernick, and Gilbert (1994) studied opportunities for and barriers to TOD development in the San Francisco Bay Area. They cited the Pleasant Hill BART station as an example of successful TOD implementation. In the case of that station, effective inter-agency cooperation led to a specific plan with strong TOD elements. Once the specific plan had been approved, powerful political advocates helped ensure that the plan was implemented. By 1993, there were 1,600 housing units and 1.5 million square feet of office space within a quarter mile of the Pleasant Hill station (Cervero, Bernick, and Gilbert, 1994, pp. 15-16).

Yet Cervero, Bernick, and Gilbert note that the success of TOD implementation in Pleasant Hill has been more the exception than the rule. Elsewhere, TOD projects are moving ahead much more slowly, and housing growth in the San Francisco Bay Area has been much stronger outside BART corridors than near the stations (Cervero, Bernick, and Gilbert, 1994, p. 18).

Boarnet and Crane (1995 and 1997), Cervero, Bernick, and Gilbert (1994) and Deakin and Chang (1992) have all studied barriers to implementing TOD. Consolidating the results of those studies, the most important barriers are as follows:

1. Existing land use patterns near rail transit stations constrain the opportunities for TOD.
2. Difficulties in assembling large parcels of land limit TOD opportunities.
3. The private land market is at times unable to sustain new development projects.
4. The local economic and fiscal impacts of TOD projects might discourage localities from pursuing such projects.
5. Local officials might not be adequately educated in both the regional advantages and local impacts of TOD.<sup>9</sup>

We evaluate the importance of each barrier in the context of TOD implementation in San Diego County. The results, and especially information from interviews with local planning directors, illuminate the nature of the barriers listed above and also several other issues related to TOD implementation.

#### IV. San Diego Case Study

##### *A. The San Diego Trolley*

The development of the San Diego Trolley began with legislation introduced into the California State Senate by James R. Mills in 1975. Mills' bill required that a percentage of highway funds be allocated to rail projects in Los Angeles, Orange, and San Diego Counties. After Los Angeles and Orange Counties objected to certain provisions in the bill, they were dropped from the legislation. The bill, which then applied only to San Diego, contained two major stipulations. First, funds must be spent within five years or the money would be returned to the state. Second, only off-the-shelf technology which was already operating successfully elsewhere could be selected for the rail transit project (Demoro and Harder, 1989, p. 6).

Once the legislation passed, and the San Diego Metropolitan Transit Development Board (MTDB) was created to implement the rail plan, there was little time to choose a route and build the project. An established route to the north of the city, part of the San Diego and Arizona Eastern Railroad (SD&AE), was the logical choice, since that was where most new development in the County was occurring. Yet in 1976 Hurricane Kathleen washed out major sections of the northern route. The MTDB settled for a southern route, beginning in downtown and terminating in San Ysidro, near Tijuana and the Mexican border. The Southern Pacific Railroad, which owned the SD&AE, then decided that as a result of the extensive damage to the SD&AE railroad, they would close the entire line rather than repair it, and put the railroad up for sale (Demoro and Harder, 1989, p. 6). The MTDB bought the entire line for \$18.1 million, contracted out the freight operations, and began construction on a 15.9 mile light-rail line to San Ysidro. On July 26, 1981 the San Diego Trolley began service on the South Line.

Today the Trolley's South Line provides service to 20 stations on 16.5 miles of track. The line was expanded 0.6 miles northward in July of 1992 to include the original Santa Fe Depot and the County Center/Little Italy station.

Revenue service on the initial 4.5 mile segment of the Trolley's East Line, to Euclid Avenue, began in March of 1986. Extension of the East Line has continued since 1986. Revenue service began on the first extension, 11.3 miles east to the El Cajon

Transit Center, on June 25th 1989. The second extension, 1.5 miles of the Bayside segment in the Centre City area, opened on June 30, 1990. The third extension, 3.6 miles north from the El Cajon Transit Center to the Santee station, began service on August 27, 1995. The Trolley's East Line currently provides service to 24 stations on 22.4 miles of track, with 1.7 miles and six stations shared with the South Line in the Centre City area of downtown San Diego.

The most recent addition to the San Diego Trolley is an extension 3.2 miles northward from County Center/Little Italy to Taylor Street in Old Town. Revenue service along this segment is scheduled to begin in July of 1996. This new segment is known as the Trolley's North Line, and is scheduled for future extension a total of 14 miles northward from the Centre City to North University City, near the campus of the University of California, San Diego.<sup>10</sup>

***[Insert: Figure #1 – Map of San Diego Trolley System]***

*B. Land use Patterns Near Trolley Stations*

Counting the three North Line stations scheduled to open in July of 1996, the San Diego Trolley currently serves 41 stations. For each of those stations, we gathered zoning data for quarter-mile radius circles centered on the station. The quarter-mile distance was chosen both because that is often considered to be a feasible distance for walking trips in urban areas (Untermann 1984) and because this is the most common distance used when studying TOD (e.g. Bernick and Carroll 1991; Bernick and Hall 1992; Cervero 1994c). The zoning data are discussed in more detail in the Appendix of Boarnet and Crane (1997).

For each station, Table 1 lists the percent of land within a quarter mile that is in each of six different zoning categories – single family residential (SING), multi-family residential (MULT), total residential (T-RES), commercial (COMM), mixed use (MIX), and industrial (IND).<sup>11</sup> The percentages in Table 1 do not sum to 100% for any station because the six categories do not include all possible uses. The largest omitted categories are government/institutional, roads, and vacant land.

**Table 1: Zoning Patterns Within One-Quarter Mile of Each Station<sup>12</sup>**

Location	Station	Linename	SING	MULT	T-RES	COMM	MIX	IND
San Diego City	Taylor St. (Old Town )	North	0%	0%	0%	0%	2.90%	2.80%
San Diego City	Washington	North	3.40%	0%	3.40%	22.40%	6.50%	7.60%
San Diego City	Airport and Palm	North	12.60%	0%	12.60%	0%	3.60%	13%
San Diego City	County Center/ Little Italy	Centre City	0%	0%	0%	23%	0%	15.20%
San Diego City	Santa Fe Depot	Centre City	3.60%	0%	3.60%	24.10%	5.10%	52%
San Diego City	Seaport Village	Centre City	3.60%	0%	3.60%	3%	20.40%	9.20%
San Diego City	Convention Center West	Centre City	0%	0%	0%	0%	28.10%	0%
San Diego City	Gaslamp/Convention Center	Centre City	0%	0%	0%	0%	12.50%	19.20%
San Diego City	American Plaza Trans. Sta.	Centre City	3.6%	0%	3.6%	30.30%	2.10%	15.50%
San Diego City	Civic Center	Centre City	0%	0%	0%	59.90%	2%	12.20%
San Diego City	Fifth Avenue	Centre City	0%	0%	0%	57.40%	7.20%	8.20%
San Diego City	City College	Centre City	0%	2%	2%	39.90%	0.80%	9.90%
San Diego City	Market & 12th	Centre City	0%	0%	0%	1.40%	0%	67.60%
San Diego City	Imperial & 12th Trans. Sta.	Centre City	0%	0%	0%	0%	17.30%	48.20%
San Diego City	Barrio Logan	South	0%	0%	0%	0%	63.60%	0%
San Diego	Harborside	South	0%	0%	0%	0%	19.70%	0%
/Naval Reserve	Pacific Fleet	South	0%	0%	0%	0%	0%	0%
Naval Reserve	8th Street	South	0%	0%	0%	0.60%	0%	15.40%
National City	24th Street	South	0%	0%	0%	10.20%	0%	41.70%
/Naval Reserve	Bayfront/ E. Street	South	0%	15.30%	15.30%	48.20%	0%	4.90%
National City	H. Street	South	4.90%	30%	34.40%	33%	0%	0%
Chula Vista	Palomar Street	South	22.90%	2.90%	25.80%	33%	0%	22.10%
San Diego City	Palm Avenue	South	55.60%	0%	55.60%	0%	7%	6.10%
San Diego City	Iris Avenue	South	41.60%	0%	41.60%	0%	1.80%	24.40%
San Diego City	Beyer Blvd.	South	53.40%	0%	53.40%	10.30%	0%	0%
San Diego City	San Ysidro/ Intl. Border	South	0%	0%	0%	10.50%	0%	8.80%
San Diego City	25th & Commercial	East	0%	43.70%	43.70%	0%	13.60%	9.50%
San Diego City	32nd & Commercial	East	0%	51.20%	51.20%	0%	6.30%	10.50%
San Diego City	47th Street	East	0.20%	44.80%	45%	0%	7.60%	6%
San Diego City	Euclid Avenue	East	12.20%	16.20%	28.50%	8.20%	0.60%	29.70%
San Diego City	Encanto/ 62nd Street	East	48.90%	22.70%	71.60%	5.60%	6.10%	0%
Lemon Grove	Massachusetts Avenue	East	82.10%	0%	82.10%	3.50%	0%	0%
Lemon Grove	Lemon Grove Depot	East	7.90%	8.40%	16.20%	60.80%	3.20%	0%
La Mesa	Spring Street	East	70.60%	11.40%	82%	6.90%	5.10%	0%
/U.S. Navy	La Mesa Blvd.	East	21%	7.50%	28.40%	47.30%	5.50%	0%
La Mesa	Grossmont	East	4.10%	4.50%	8.60%	78%	2.40%	1.40%
La Mesa	Amaya Drive	East	48.30%	23.90%	72.20%	14.60%	3.20%	0%
El Cajon	El Cajon Transit Center	East	16.50%	10.40%	26.90%	6.50%	6.40%	20.30%
El Cajon	Arnele Avenue	East	15.60%	5.80%	21.30%	26.10%	0%	11.80%
El Cajon	Weld Blvd.	East	0%	0%	0%	1.50%	0%	5%
Santee	Santee Town Center	East	10.30%	0.50%	10.80%	23%	0%	0%

Note that the zoning near stations clearly varies by line. The Centre City Line has almost no nearby residential zoning, reflecting the predominantly office and commercial character of the downtown. Some stations along the South Line have sizable amounts of residential zoning within a quarter mile. The largest concentration of residential near stations is along the East Line, which travels through the eastern suburbs of San Diego.

To the extent that transit-based residential is an important part of TOD, the data in Table 1 give a potentially optimistic assessment of TOD progress and prospects. Of the 41 stations, sixteen have more than 20% of the nearby (quarter-mile radius) land zoned residential. Yet focusing only on the zoning data can give an incomplete picture for at least two reasons. First, for a variety of reasons, land use patterns in most urban areas do not necessarily conform precisely to zoning codes. Second, much of the development near San Diego Trolley stations, residential development included, was built before the Trolley began service and thus was not constructed with the goal of supporting rail transit.

Tables 2 and 3 gives some insight into both these issues. Table 2 gives information on actual land use patterns near stations. For each station, Table 2 shows the dominant nearby land use and the major nearby projects. This information was obtained by the authors' visual inspection of all 41 stations.

**Table 2: Rail Transit Stations, Dominant Land Uses, and Major Projects**

<b>Municipality /Jurisdiction</b>	<b>Line</b>	<b>Station</b>	<b>Dominant Nearby Land Use</b>	<b>Major Nearby Projects</b>
San Diego City	North	Taylor St. (Old Town Station)	Presidio Park	Old Town San Diego - historic district
San Diego City	North	Washington	Industrial	San Diego International Airport /US Marine Corps. (MCRD)
San Diego City	North	Airport and Palm	Industrial	SD International Airport
San Diego City	Centre City	County Center / Little Italy	Office/commercial	San Diego County Administration Center
San Diego City	Centre City	Santa Fe Depot	Office/commercial	Santa Fe Depot - historical site
San Diego City	Centre City	Seaport Village	Office/commercial /multi-family res.	Four story, up-scale condominiums
San Diego City	Centre City	Convention Center West	Convention Center /hotels/multi-family res.	San Diego Convention Center
San Diego City	Centre City	Gaslamp Convention Center	Convention Center /commercial	San Diego Convention Center
San Diego City	Centre City	American Plaza Transfer Station	Office/commercial /rail stations	Transfer Station - Santa Fe Depot
San Diego City	Centre City	Civic Center	Government offices/jail/hotel	Civic Center
San Diego City	Centre City	Fifth Avenue	Office/multi-family res./parking	Multi-story - city center
San Diego City	Centre City	City College	Institutional/commercial	San Diego City College
San Diego City	Centre City	Market & 12th	Multi-family res./commercial	Multi-story SRO hotel/city center
San Diego City	Centre City	Imperial & 12th Transfer Station	Commercial office /light industrial	Metropolitan Transit System Rail Yard
San Diego City	South	Barrio Logan	Industrial	Coronado Toll Bridge
San Diego City /Naval Reserve	South	Harborside	Heavy industrial/commercial	Naval Reserve/Steel Works
Naval Reserve	South	Pacific Fleet	Heavy industrial	Naval Reserve/Steel Works
National City	South	8th Street	Commercial/industrial	Naval Reserve/Warehouses
National City	South	24th Street	I-5 corridor Auto-oriented commercial	Strip commercial
Chula Vista	South	Bayfront/ E. Street	I-5 corridor Auto-oriented commercial	Strip commercial
Chula Vista	South	H. Street	Commercial/mobile home park I-5 corridor	Strip commercial
Chula Vista	South	Palomar Street	Auto-oriented commercial I-5 corridor	Palomar Center - shopping center
San Diego City	South	Palm Avenue	Commercial/single-family residential/mobile homes	Mix of uses
San Diego City	South	Iris Avenue	Multi-family res./industrial	Mobile home/industrial parks
San Diego City	South	Beyer Blvd.	Multi-family res.	Two-story apartments
San Diego City	South	San Ysidro/Intl. Border	Border commercial	Mexican Border - shopping center
San Diego City	East	25th & Commercial	Light industrial/commercial /single-family residential	Mix of uses
San Diego City	East	32nd & Commercial	Heavy industrial /single-family residential	Mix of uses
San Diego City	East	47th Street	Multi-family res./commercial	Harbor View and Creekside Villas Apts.
San Diego City	East	Euclid Avenue	Single-family res./commercial	Mix of uses
San Diego City	East	Encanto/ 62nd Street	Multi/single-family residential /commercial	Apartments /single-family homes
Lemon Grove	East	Massachusetts Avenue	Single-family res./commercial	Mix of uses
Lemon Grove	East	Lemon Grove Depot	Commercial/retail /light manufacturing	Town Center
La Mesa	East	Spring Street	Multi-family res.	US Navy housing/Spring Hill Apts.
La Mesa	East	La Mesa Blvd.	Multi-story mixed-use	La Mesa Village Plaza - TOD
La Mesa	East	Grossmont	Commercial/retail and hospital	Grossmont Center and Hospital
La Mesa	East	Amaya Drive	Three story/multi-family res.	Villages of La Mesa - TOD
El Cajon	East	El Cajon Transit Center	Industrial	El Cajon Transit Center
El Cajon	East	Arnele Avenue	Retail/auto dealership /light industrial	Parkway Plaza
El Cajon	East	Weld Blvd.	Undeveloped/industrial/airport	Gillespie Field
Santee	East	Santee Town Center	Undeveloped/power retail	Santee Town Center

Note that, of the sixteen stations with more than 20% residential zoning within a quarter mile, only thirteen have residential listed as the dominant land use in Table 2. (The stations at Palomar Street, the El Cajon Transit Center, and Arnele Avenue have dominant nearby land uses which do not include residential despite having more than 20% residential zoning within a quarter mile.) More importantly, 37 of the 41 stations have dominant nearby uses that include a commercial or industrial component. Only the stations at Beyer Boulevard, Spring Street, and Amaya Drive have no notable nearby commercial or industrial development.<sup>13</sup> This reflects a pronounced tendency toward commercial and industrial land uses near stations, which is consistent with previous studies of Southern California rail transit (Boarnet and Crane 1995 and 1997).

In Table 3, we restrict our attention to projects which were built or have been planned specifically to leverage rail transit. These projects fit the definition of TOD given in Section II. The top half of Table 3 is a list of existing TOD projects. The middle section is a list of TOD projects that are planned for stations that have not yet opened. The bottom section is a list of transit-based commercial projects near stations currently in operation. As is clear from Table 3, a large portion of the land uses near the San Diego Trolley were developed before the Trolley began service, and thus were not designed specifically to enhance or leverage the rail transit system.

**Table 3: Transit-Focused Developments in San Diego County<sup>14</sup>**

Project Name	Station	City	Year Completed	Residential Units	Description
<b>Existing TODs near San Diego Trolley Stations</b>					
La Mesa Village Plaza	La Mesa Blvd.	La Mesa	1991	95	Four story; mixed-use - condos & retail/office
Villages of La Mesa	Amaya	La Mesa	1989	384	Two & Three story apartments
Creekside Villas	47th St.	San Diego	1989	144	Two story apartments
<b>Proposed TODs near San Diego Trolley Stations</b>					
Rio Vista West	Friars Rd.	San Diego	N/A	679 - 1,070	Mixed-use transit-oriented development
Otay Ranch	Villages 1&5	Chula Vista	N/A	< 5,000	Mixed-use transit-oriented development
<b>Transit-Based Commercial Developments near San Diego Trolley Stations</b>					
Grossmont	Grossmont	La Mesa	1989	none	Auto-oriented commercial
Trolley Center					
Santee	Santee	Santee	N/A	none	Auto-oriented commercial
Town Center					

Table 3 illustrates two themes which will be the focus of our analysis. First, if one restricts attention to projects that were specifically designed to leverage rail transit, there are relatively few TODs either existing or being planned near San Diego Trolley stations. In other words, the San Diego experience is consistent with the experience

elsewhere; TOD projects are built in some places, but they appear to fill a market niche rather than becoming a major trend. We will examine each barrier to TOD cited in Section III, and discuss how those barriers help explain the limited implementation of TOD projects near the San Diego Trolley. Second, the City of La Mesa is somewhat of an exception. Of the three existing TOD projects, two are in La Mesa. Furthermore, interviews with city planning directors revealed a generally greater willingness to pursue TOD in La Mesa as compared with other cities in San Diego County. It is thus important to understand why La Mesa’s experience has been different. As we analyze each barrier below, we will see that what were typically constraints to TOD implementation in other cities were not so problematic in La Mesa because of unique circumstances for development near rail stations in that city.

## V. Barriers to TOD Implementation

In this section, we consider each of the five barriers listed in Section III, and the role they play in TOD implementation in San Diego County. The analysis below draws heavily on interviews with the planning directors in each city that has an existing Trolley station. Table 4 contains a list of the seven directors interviewed, their positions with their respective cities, the total number of years they have been employed with the city and in planning, and the date of the interview. The interview methodology is described in the Appendix of this paper.

**Table 4: Planning Directors for Cities Along the San Diego Trolley**

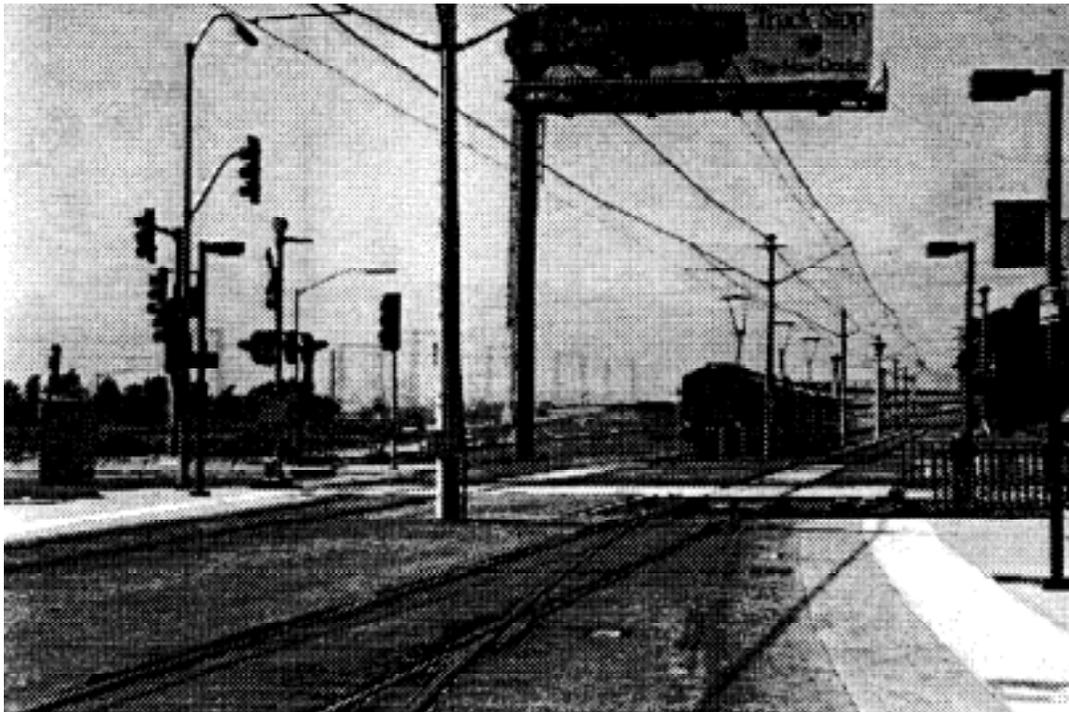
City	Name	Director	Yrs. w/City	Yrs. in Planning	Interview Date
Chula Vista	Robert Leiter	Planning	6	21	8/30/95
El Cajon	James Griffin	Community Development	23	23	8/28/95
La Mesa	David Witt	Community Development	10	18	9/7/95
Lemon Grove	James Butler	Planning	17	25	8/28/95
National City	Roger Post	Planning	14	17	8/29/95
San Diego	Ernest Freeman	Planning	2	16	9/7/95
Santee	Niall Fritz	Development Services	10	13	8/30/95

## A. Constraints Imposed by Using Existing Right-of-Way

All stations currently served by the San Diego Trolley, except for the Santee station, were sited along existing right-of-way. Thus virtually all the stations were sited in areas with existing development, which has constrained the scope for transit-oriented projects.

The planning directors in Chula Vista and National City stated that they do not expect any substantial land use change near the stations sited along the Trolley's South Line in their cities. Similarly, the planning directors in El Cajon and Lemon Grove noted that the stations in their cities are in areas that are almost fully developed. For that reason, both the El Cajon and Lemon Grove planning directors stated that changes in land use to reflect proximity to rail transit stations, while possible, are not a priority in their city.

**Figure 2: South Line near Interstate 5 Corridor in Chula Vista  
(Looking north from Bayfront–E Street Station)**



The comments from Robert Leiter, planning director for Chula Vista, were typical of the views of five of the directors in whose cities stations were sited along existing right-of-way.<sup>15</sup> Mr. Leiter noted that the South Line parallels the Interstate-5 corridor in

his city. Land uses along that corridor were, in Leiter's view, influenced much more by the pre-existing freeway than the rail transit line. Mr. Leiter stated,

"I would say probably if you went back in history, I would think that I-5 and even before that, Broadway, which was the previous main North/South arterial that went through Chula Vista, had a lot more to do with determining the land use patterns in that area than the transit stations per se....If this line along I-5 [South Line] had been in an area where there was less development and a little bit more vacant land there would be more opportunities to direct land uses around the stations. And if it [the line] hadn't been along a major freeway corridor where there were pressures to put uses that were more compatible, economically, with the freeway, then that would have probably also had some effect."

Mr. Leiter's comments are consistent with the information in Table 2, which corroborates the existence of auto-oriented, commercial development near all of the existing Chula Vista stations.

**Figure 3: View from Harborside Station, looking west toward National Steel and Shipbuilding**



In some cases, the character of existing land use near stations was cited as not being conducive to residential development. Roger Post, of National City, stated,

“I don’t know if it [areas near stations] would be all that great of a residential environment to live in. There are a lot of manufacturing uses and commercial uses nearby. I mean, you could physically build something, but would somebody really want to live there? That would be a major negative on the residential side.”

While most planning directors agreed that siting rail lines on existing right-of-way was a constraint to developing land near stations, Dave Witt, the planning director for La Mesa, viewed the use of an existing right-of-way as an advantage. According to Mr. Witt,

“All of these projects represent redevelopment for La Mesa. We have not been in the mode of a growing community in trying to get out to development. ...And again, that’s one of the advantages of having the Trolley line go on the [existing] railroad line, is some of these land use patterns were well-established. They were already lending itself [sic] or leaning towards something that would take advantage of that. We weren’t having to climb a hill that was quite as high as you do when you’re going out to an undeveloped area. ...We just happened to have had the railroad line which ran through the full spectrum of land uses.”

Mr. Witt continued by stating that the Grossmont station is on a site that was previously in a flood plain, and that, “Part of our redevelopment effort was to put that storm drain underground, eliminate the property from the flood plain, [sic] justifies our redevelopment effort in addition to removing the blight.” Also according to Mr. Witt, the Amaya site, “... was also kind of the headwaters of that flood area, [sic] had been an old dump site. Not in terms of toxics, but just people would use it for landfill, for dirt and vegetation and those types of things.” Overall, Mr. Witt was of the opinion that the utilization of an existing railroad line that passed through the town center and through other areas that were targeted for redevelopment facilitated land use planning that not only focused development near stations, but also allowed the city to pursue previously established planning goals.

## B. TOD Implementation and the Availability of Undeveloped Land

Given that many San Diego Trolley stations are in already developed areas, land assembly is an important issue for TOD projects in San Diego County. Table 5 illustrates that point. For each transit-based development identified in Table 3, Table 5 shows

whether or not that project was built on undeveloped land and whether or not the site was included in a redevelopment area.

**Table 5: Land Assembly Characteristics for Trolley-Based Development Projects**

City	Station /Project	Project Area Size in Acres	Undeveloped Land?	Redevelopment Area?
La Mesa	La Mesa Blvd. /La Mesa Village Plaza	5.5	no	yes
La Mesa	Amaya /Villages of La Mesa	200	yes	yes
Chula Vista	Otay Ranch	23,000	yes	no
San Diego	Rio Vista West	94.5	yes	no
San Diego	47th St. /Creekside Villas	288	no	yes
La Mesa	Grossmont /Grossmont Center	103	yes	yes
Santee	Santee /Santee Town Center	50.14	yes	yes

California’s Community Redevelopment Act allows cities to use the power of eminent domain to acquire property for private development on the site. The Redevelopment Act also allows communities to create tax-increment financing districts which can issue bonds against future property tax increases (Fulton, 1991, pp. 243-244). Thus redevelopment zones are both land assembly and financing tools. Table 5 shows that all TOD projects except those proposed at Rio Vista West and Otay Ranch are in redevelopment areas.

Furthermore, with the exception of the Downtown Redevelopment Area adjacent to the La Mesa Boulevard station in La Mesa and the Central/Imperial Redevelopment Area adjacent to the 47th Street station in San Diego, all transit-based development that exists or is currently being planned in San Diego County is located on previously undeveloped land. Even in largely built-out areas, existing and planned TODs are often on parcels that were previously undeveloped. In La Mesa, the Grossmont Center development was previously part of a flood control channel, and the project at the Amaya station was an unofficial dump site. In San Diego, Rio Vista West is a fully mixed-use project that will be built on approximately 95 acres (36 acres of which is to remain open space) that has historically been a sand and gravel operation (City of San Diego 1993).

Nearer the periphery of the urban area, the City of Santee is currently developing a transit-based commercial site, the Santee Civic Square, on 50 acres owned by the city redevelopment agency. The site is located on what was previously open land and is abutted by undeveloped property that is owned both by the City of Santee and the County of San Diego (City of Santee 1992).

**Figure 4: View from Santee Town Center, looking south  
(Station is to left of view in photograph)**



The City of Chula Vista is planning to develop urban villages in its Otay Ranch Project which is located on an approximately 23,000 acre parcel east of the City. The parcel is owned by the Baldwin Company and will not be served by rail transit in the near future.<sup>16</sup> Historically the site has been used for dry farming and cattle grazing (City of Chula Vista 1994).

Taken collectively, these projects verify the importance of available, undeveloped land in TOD implementation. These projects further suggest the difficulty of building TOD projects in already developed areas, which is consistent with the interview results that were summarized in the previous sub-section.

### C. The Role of Market Forces

During the 1990s, TOD projects have had to compete in a very tight California land market. All of the planners, except Dave Witt from La Mesa, referred to the importance of market conditions when discussing the prospects for high-density uses near their stations. Roger Post of National City made remarks which best represent six of the planners' viewpoints regarding the effects of market forces on high-density development in their cities.

"We talked about a couple of typical high-density uses. One being office buildings for which there is no market. Another being hotel, for which there is no market. And so these vertical types of uses are a little bit hard to think of. ...So once again the private market is really playing a big factor here."

Those same six planners' concerns regarding the marketability of high-density developments in the San Diego Region are typified by those expressed by Ernest Freeman of San Diego,

"...that's one issue that's probably a factor: density. And the importance of concentrating development around transit nodes is important, but in an area like San Diego where you don't have a lot of experience with density, dense development, you've got to; I don't want to say go slow, but you've got to be reasonable in your expectations so that you build up a head of steam."

Dave Witt of La Mesa responded differently to the question. His answer centered on the idea that no one factor determined the development of station areas within the City of La Mesa. Mr. Witt stated,

"...I think that may have been partly why some of these projects [in the City of La Mesa] are probably in the ground, because they weren't being driven, even for the most part, by the Trolley. ...Or the market either. We had our own agenda. Our own redevelopment plans. And where we were able to maximize coordination efforts, you can see the benefits."

#### D. Fiscal Impacts of TOD

Boarnet and Crane (1995, 1997) have suggested that residential development near rail transit stations might bring adverse fiscal impacts for localities. There are two main reasons for this. First, in California, a portion of the sales tax revenues that are generated within each city are returned to the cities, such that land uses that create taxable transactions (i.e. commercial) are attractive from a fiscal perspective. Second, many cities perceive that medium and high density residential developments create service and spending obligations that exceed the tax revenue generated from those projects. Two statements best represent the responses on this subject made by all of the planners except, again, Dave Witt from La Mesa. When asked what type of land use he thought the City of El Cajon would pursue near its rail transit stations, James Griffin of El Cajon answered,

"The commercial has the advantage certainly of generating sales tax which is something that the city [sic] basically drives the engine. Property taxes were important in the past, but the State has taken a lot of that away from us. And so now we're almost totally reliant on sales tax. So there's a lot of political pressure to support those kinds of projects."

When questioned about the possibility for residential uses being included in the City of Santee's Town Center Plan, Niall Fritz responded in a manner similar to Mr. Griffin.

"This other discussion that goes on statewide, the fiscalization of land use. [sic] State's taking an awful lot of money from all the cities and the counties. We have our budget problems. We need to market the property. ...We need to get the highest and best return in order to continue to provide other services to the people who live here. And that means today; not tomorrow. So today we're going for retail uses. We do not have the luxury to wait for tomorrow."

Dave Witt of La Mesa did not perceive the addition of high-density residential development near the stations in his city as an economic problem or a lost opportunity to generate sales taxes from commercial development. Rather, he emphasized the opportunity to pursue redevelopment projects that included residential uses. When asked about possible fiscal impacts from the project, Mr. Witt said, "We were going to want to

do redevelopment in that area anyway. We had the idea that we wanted to build, for example, the redevelopment project that had multiple-family there anyway."

#### E. Education about Regional TOD Goals

Our interviews suggest that the education of planning directors about transit-oriented development is not a problem in San Diego County. Both the San Diego Metropolitan Transit Development Board (MTDB) and San Diego Association of Governments (SANDAG) have taken an aggressive, but conciliatory, role with respect to station siting and development in the San Diego Region. The MTDB, although primarily concerned with the siting of stations and operation of the Trolley, has put together a strong public relations campaign in support of TOD. The campaign, which consists of a film, brochures and informational meetings with local government officials and local general plan advisory committees, has been successful in providing information about TOD to planning directors. All of the planning directors interviewed showed in-depth knowledge of even the finer points relating to TOD. They used terms freely and generally without error and at times discussed the theoretical basis for TOD.<sup>17</sup>

While all planning directors stated that they agreed with the regional goals for rail transit put forth by MTDB and SANDAG, each also made it clear that local goals came first with respect to land use. Our interviews further suggest that the barriers listed above are often (but not always) impediments to TOD implementation, and that education, by itself, will not overcome structural factors such as pre-existing development, land availability, and market forces which are often not conducive to widespread TOD implementation.

#### F. Why La Mesa is Unique

If structural barriers to TOD are the rule in San Diego County, La Mesa seems to certainly be the exception. Understanding why TOD has gone farther and faster in La Mesa than elsewhere is thus crucial to understanding TOD along San Diego Trolley lines.

In La Mesa, many of the barriers to TOD implementation either did not constrain development or, in some cases, were actually opportunities. Starting with the use of existing right-of-way for Trolley lines, it is important to note that La Mesa had planned redevelopment projects for three of the station sites before the extension of the East Line began operation. If anything, the San Diego Trolley might have facilitated those plans.

**Figure 5: La Mesa Village Plaza mixed-use development, as seen from La Mesa Boulevard station**



**Figure 6: Villages of La Mesa residential development, as seen from Amaya Drive station**



La Mesa officials perceived a need for more multi-family housing in their largely built-out city. This provided an opportunity to cooperate with the MTDB. As Dave Witt stated,

"We wanted to build multiple-family as a redevelopment project. The Trolley had already purchased some land. The land that they bought wasn't adjacent to the tracks. Our land was. We swapped land. We built a project which included multiple-family and a city park renovation. The MTDB wound up with the station."

The MTDB received land for its station and the City of La Mesa saved money on construction – a very practical arrangement according to Mr. Witt.

"Our project could be built more economically. There were some very practical things in terms of grading costs. We could reduce our costs and the Trolley Agency's costs in terms of earth moving and concrete. These are very practical things..."

In terms of land assembly, the city was able to control the development of large pieces of undeveloped property near its rail stations because they were included in redevelopment areas. Furthermore, the projects at Amaya and Grossmont both used previously undesirable and undeveloped areas. These projects were possibly made more attractive by the Trolley, but developing the flood control channel (Grossmont) and the unofficial dump (Amaya) were local priorities regardless of anything that the MTDB did. The redevelopment zones at all three La Mesa TOD sites both helped facilitate land assembly and provided at least some insulation from market and fiscal concerns. That, coupled with the importance of those projects to local officials, helps explain why Community Development Director Dave Witt stated that market and fiscal concerns were not major issues for the La Mesa TOD projects.

Overall, circumstances in La Mesa created opportunities to cooperate closely with the MTDB. Both parties viewed station development as being consistent with their own goals. The result is not only San Diego County's largest concentration of TOD projects, but also a somewhat different view of the TOD planning and implementation process as compared with the other planning directors interviewed. While nearly all of the cities along the lines of the San Diego Trolley have the perception that barriers often block the

development of TODs, what were typically barriers in other cities were viewed as opportunities in La Mesa.

## VI. Interpretation and Conclusion

Two decades ago, Knight and Trygg (1977) concluded that development will occur near rail stations only when other factors, such as strong market demand, supportive land use policies, and low cost available land at attractive sites, are in place. Those lessons apply equally well to TOD in San Diego County.

The dilemma of TOD is that the requirements for a successful light rail line are, in some cases, at odds with what is needed for successful station-oriented development. The densities needed to support light rail usually require that the lines be placed in developed areas. Using existing right-of-way can save money during system construction. Yet those two factors mean that many light-rail lines run through corridors that contain land uses that are not conducive to the high-density residential elements of TOD. In those corridors, finding available land at attractive sites becomes problematic. Add to that the issues of market conditions and local fiscal impacts and TOD can often face an uphill battle.

Progress toward TOD implementation is most easily made in those situations when factors that are commonly barriers become opportunities. The use of an existing right-of-way in La Mesa meshed well with the city's redevelopment plans. Stations were sited at locations near property that the city already planned to develop, and TOD projects were aggressively pursued. Such situations can occur, but the experience in San Diego suggests that it is more common to find barriers than opportunities.

Certainly, TODs have been built in San Diego County and elsewhere, more are being planned, and planning directors and departments are very familiar with the concept. Yet the progress toward TOD has been incremental, measured one or two projects at a time. While for any station or even city, each project is a significant effort, the character of station-proximate land throughout the system is, at best, adapting slowly. Hence the revolutionary prospect that land use can boost rail transit ridership faces a long, incremental implementation process.

Given that, there are two issues which must be discussed. One is theoretical, and concerns the ongoing debate about whether planning is a rational/comprehensive or an incremental policy process. This research was not designed to shed light on that question, and there are many nuances of interpretation that are beyond the scope of our

case study. For example, one might characterize each TOD project in San Diego County as the rational outcome of a process of setting goals, analyzing alternatives, and then designing and implementing a plan. Nothing in this study suggests that the cities behaved in a way that is inconsistent with that model. Our point is not to debate whether each plan was rational, incremental, or best characterized by some other competing planning theory. We simply wish to note that even processes that look rational for any one project can proceed slowly on a regional basis. The aggregate behavior of several different municipalities, at least in the cases studied here, resembles the “science of muddling through” discussed by Lindblom (1959). Each city exploits its opportunities. Where those opportunities are most apparent, as in La Mesa, progress is relatively rapid. Elsewhere barriers and competing local concerns carry the day. On the whole, TOD is being implemented incrementally in the San Diego region.

The second issue is more practical, and has to do with the appropriate role for TOD given the implementation issues discussed above. TOD proponents range from those who advocate transit-based projects as niche markets to leverage existing rail systems to those who suggest that otherwise infeasible rail systems can be made viable by supportive land use policies. Even ignoring the issue of whether land use policy can increase rail transit ridership, the implementation process studied here suggests that TOD is not likely to have systemwide ridership impacts in the short-term. TOD implementation is, by its nature, slow and incremental. The light-rail lines in San Diego County are almost all more than five years old, and many lines are ten years old or older. Yet TOD is still best characterized as a niche market in San Diego County, even if it is a niche that is possibly growing. If TOD can bring system-wide increases in rail ridership, the slow pace of implementation suggests that those benefits will be long-term ones.

Thus the most cautious TOD policies are those which view TODs as a way to exploit the benefits of rail systems that either already exist or that are viable without any projected ridership increases from TOD. To count on ridership impacts from a policy which, based on the evidence here, might take decades to implement would be risky at best. TOD has promise, but that promise is of a slow, incremental process that can affect land uses at those sites where the barriers to implementation can be overcome. Yet for many years, these are more likely to be local improvements rather than system-wide changes. Planners should be aware of that when they consider how TOD projects might be used to enhance rail transit system performance.

## Appendix: Case Study Methodology

### *A. Choice of Study Area*

We chose to study the San Diego light-rail system for several reasons. First, the San Diego light-rail system is the oldest of the current generation of light-rail projects in the United States. Unlike many newer systems, the age of San Diego's rail system (the South Line opened in 1981) allows time for land use planning to respond to the fixed investment. This is especially important given the durability of residential and commercial structures and the often slow process of changing and implementing land use plans.

Second, the San Diego system is no stranger to modern transit-based planning ideas. The San Diego City Council approved a land use plan for their stations that included many of the ideas promoted by TOD advocates (City of San Diego, 1992). The plan was developed with input from Peter Calthorpe, one of the most prominent advocates of both neotraditional neighborhood design and coordinated land use planning near rail transit stations.

Third, the light-rail transit authority in San Diego County, the Metropolitan Transit Development Board (MTDB), is often regarded as one of the more successful municipal light-rail transit agencies. The initial parts of the MTDB rail transit system were constructed strictly with state and local funds, using readily available, relatively low-cost technology (Demoro and Harder, 1989, p. 6). Portions of San Diego's system have very high fare-box recovery rates, including the South Line, which in its early years recovered as much as 90% of operating costs at the fare-box (Gomez-Ibanez 1985).

These factors make San Diego County possibly a "best case" study of land use planning near rail transit stations. Barriers that are typical of San Diego County might apply, and possibly be even more severe, in places where factors are less conducive to successful rail-oriented land use planning.

### *B. Choice of Interview Subjects*

We contacted each city's planning director to ask their advice on who would be best able to provide the information that we sought. In two cities, the community development department performs planning functions. We contacted the Director of Community Development in those cities. In one city, it is the department of development services that performs planning functions. We contacted the Director of Development

Services in that city. In talking with each director, we described the basic outline of the study and noted that the research results would potentially be submitted for publication. In all cases, the planning, community development, or development services directors agreed to be interviewed.<sup>18</sup>

Given the small number of cities (seven) and the unique characteristics of each station and nearby projects, we considered it unrealistic to believe that the interview subjects could remain anonymous. Since we could not grant subject anonymity, we were ethically bound to inform the participants of the possibility for later publication or similar dissemination of the results. As mentioned above, each interview subject was informed of that possibility before the interview. Yet that does raise issues about whether the subjects' responses were influenced by their knowledge that the results would be disseminated. To minimize this concern, we used archival research when possible to cross-check the planning directors' comments with other accounts of the same process. We also took care not to bias the interview. We pre-tested the interview outline, did not use terms which might elicit certain answers (for example, the phrase "transit-oriented development" was never used in the interviews), and we were careful not to signal any motives or a desire to reach any particular conclusions.

### *C. Interview Procedure*

The outline for the interviews was developed in Spring of 1995. This outline was pre-tested on city planners in two jurisdictions outside of the study area. The entire interview process was followed in the pre-test, including transcribing the interview verbatim and evaluating the results. The outline was then updated by clarifying potentially confusing questions.

Prior to each interview, each planning director was told that we sought descriptive information on the decision-making process for land use regulation near rail transit stations in cities along the San Diego Trolley line. To avoid eliciting opinions that deferred to recent writings on the topic, the term "transit-oriented development" was not used at any time prior to or during the interview.<sup>19</sup>

Interviews typically lasted from 45 minutes to one hour. The interviewer followed an outline to be certain that the same questions were discussed in each interview. Initially, each respondent was asked a series of background questions concerning their position with the city, job description, time of employment with the city, and previous positions in planning. The interviewer then asked questions that were designed to illuminate each city's goals for development near its rail transit stations, the

steps taken toward those goals, and any opportunities or barriers in the development process. The format was open-ended; the respondents were allowed to elaborate on each question as they saw fit. When a respondent did not address a specific point, the interviewer would either ask the question at the most opportune time or wait until the end of the interview to ask the question. Respondents were never, at any time, allowed to read the interview outline. Each interview was taped using an audio-cassette recorder. The interviews were then transcribed verbatim. Following transcription, responses were analyzed both for their uniqueness and for general patterns.

#### *D. Archival and Other Research*

The information from the interviews was supplemented by archival research, zoning data for land near each rail transit station, and visual inspection of the development near each station. One of the co-authors visited and characterized the development near each San Diego Trolley station. We also used zoning data for land within one-quarter mile of each station. See Boarnet and Crane (1997, Appendix) for a discussion of the methods used to collect the zoning data. We also obtained general and specific plans, minutes of local planning board and city council meetings, and local news articles to supplement the other case study information.

## Endnotes

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<sup>1</sup> An extension of existing light-rail lines has been proposed for both the Otay Ranch and Laguna West projects. While both projects include many elements of transit-oriented design, neither is served by rail transit at this time.

<sup>2</sup> Cervero (1994c) calculated modal splits for residents in San Francisco Bay Area transit-based housing developments. He found that, for many of the residential developments surveyed, residents were two to five times more likely to commute by rail than the average for persons in the surrounding counties. This is consistent with earlier survey research, reported in Bernick and Carroll (1991, pp. 31-37, 40), which found that 37.5% of residents in East San Francisco Bay transit-based housing commuted to work on BART. The overall BART mode split for the entire East San Francisco Bay area was 8%.

<sup>3</sup> While most TOD projects share the goal of increasing ridership, and while most have some element of transit-based residential development, there are exceptions. Most notably, proposals for joint public-private development near rail transit stations (e.g. Landis, Cervero, and Hall, 1991) are commonly rail transit financing schemes. Since the financing goal is, at least in some instances, the major motivation for discussing and pursuing joint development, we exclude such proposals from our definition of TOD. For purposes of this paper, we focus on projects which have the goal of increasing rail transit ridership, often by including some element of transit-based residential development in the land use plan.

<sup>4</sup> Some authors have argued that the link between land use and transportation is weakening. See, e.g., Giuliano and Small (1993). Part of this argument is the claim that travel costs are not the sole or possibly even the most important determinant of land use patterns in modern American metropolitan areas (Giuliano, 1995). For our purposes, we simply note that since we focus on *implementing* transit-oriented land use plans, rather than the travel behavior effects of those plans, the strength of the land use-transportation link is of secondary importance for this paper.

<sup>5</sup> More complicated models essentially have a feedback loop which allows for some land use change based on predicted travel patterns. See, e.g., Putman (1983). Yet even though land use is at least partially endogenous in those models, in practice land use is rarely manipulated as a transportation policy tool. It is TOD's proposal to use land use as a policy tool which is a departure from previous practice.

<sup>6</sup> We do not suggest that the idea of promoting *any* land use near rail transit stations is new. Cervero (1984, p. 141) notes that, even in the early 1980s, several cities were promoting private investment and/or joint development of land near light rail stations. The most popular policy being considered was parking restrictions, followed by public

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investments and leasing or selling public land near rail stations. While all of these are attempts to leverage the rail transit investment, none reflect the more ambitious TOD goal of changing land use patterns near stations with the explicit purpose of enhancing rail transit travel demand.

<sup>7</sup> Note that other countries have had more experience with coordinated land use/transportation policies. Some authors have suggested that Toronto's high levels of transit ridership are due in part to planning policies which channeled post-World War II growth to transit corridors (Pill, 1988). Others have noted that coordinated land use and transportation planning in Sweden has created nodes of "new towns" around Stockholm which are linked by rail transit (Cervero, 1995). Yet while the idea that land use can be manipulated to serve transportation goals has been pursued elsewhere, it is a considerable departure in the context of post-World War II U.S. transportation planning.

<sup>8</sup> Other aspects of the idea that land use can affect travel behavior have also been questioned. See, e.g., Giuliano (1991) and Gordon, Richardson, and Jun (1991) for a criticism of using jobs/housing balancing as a transportation policy tool. Also see, e.g., Crane (1996) for a discussion of the ambiguous nature of the evidence on the travel demand impacts of neotraditional neighborhood design.

<sup>9</sup> Some authors have suggested that opposition from current residents is also an obstacle in the development of high-density residential projects near stations (Deakin and Chang 1992). Planners in this study were not asked about their perception of the public's reaction to high-density residential development in their cities. That is an issue that is best left to a specific study of public attitudes toward different types of development. Yet it is noteworthy that none of the seven planning directors interviewed in this study cited public opposition to residential development as a factor that influenced their station-area development plans. This does not prove that resident opposition was unimportant, but it at least suggests that it was not an important factor in the viewpoints of the planning directors interviewed.

<sup>10</sup> The San Diego Trolley's North Line includes the Santa Fe Depot and the County Center/Little Italy stations which were initially constructed as an extension of the Trolley's South Line. The North County Transit District (NCTD) is the lead agency for both the Trolley's North line and the San Diego Coaster, which is a heavy-rail commuter service that operates between the City of Oceanside and the Centre City in San Diego. The Coaster is excluded from this study both because it is commuter rail, and thus differs in character from the Trolley, and because it only recently opened.

<sup>11</sup> Many commercial zoning categories in the City of San Diego allow some types of residential development. Those commercial zones that allow any residential are reported as mixed use in Table 1. Yet our visual inspection of all station areas leads us to question

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whether those commercial zones are truly mixed use, since many do not appear to include any residential development. Thus the mixed use shares reported in Table 1 might overstate the extent to which uses are actually mixed near Trolley stations in the City of San Diego.

<sup>12</sup> The land near the Pacific Fleet station is owned by the U.S. Navy, and comparable zoning information was not readily available for this station. For the quarter-mile circle around the Harborside station, 47% of the land is in the City of San Diego and 53% is owned by the Navy. The percentages in Table 1 only include the land in the City of San Diego. Similarly, 54% of the quarter-mile around the 8th Street station is owned by the Navy. The percentages for that station are based on the 46% of the land that is in National City. For the quarter-mile area around the San Ysidro station, 43% of the land is in Mexico. The zoning data in Table 1 reflect only the 57% of the land in the San Ysidro station's quarter-mile area that is in San Diego.

<sup>13</sup> The Taylor Street station is near the Old Town San Diego historic district, which can include commercial but which was not classified as commercial for purposes of Table 2.

<sup>14</sup> Stations are considered to have characteristics of TOD if nearby development contains multi-family residential uses alone or in combination with other uses and has been constructed with a Trolley station as a focal point for development. Cervero, Bernick and Gilbert (1994) classified Park Grossmont (La Mesa – Amaya station) and Bernick and Hall (1992) also classified Park Grossmont (La Mesa – Amaya station) and Harbor View Apts. – 47th St. station) as transit-based residential developments. We did not include either development in Table 3 because both appear to have been built before the nearby stations opened. While exact records were not available, for Harbor View the available information indicated that it opened before 1987. The management company at the Park Grossmont apartments stated that their complex opened in the 1960s.

<sup>15</sup> This response is not representative of the response made by either Niall Fritz, City of Santee (the station in that city is not on an existing right-of-way), or Dave Witt, City of La Mesa.

<sup>16</sup> The Otay Ranch Project is included in the MTDB's proposal for a South Bay LRT Extension of the Trolley.

<sup>17</sup> Planner's responses and discussion involving TOD were completely without prompting from the interviewer. We did not use the term TOD, nor did we discuss the idea in any other than the most limited sense.

<sup>18</sup> The term "planning director" is used for all directors interviewed for this study.

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<sup>19</sup> Although the interviewer did not use the term “transit-oriented development” each planning director was familiar with the concept and used the term in their discussions. This raises the possibility that the directors had been influenced by writing and discussion on the subject. Yet we did not wish to add to that influence or possibly signal any agenda by mentioning TOD by name.

## BIBLIOGRAPHY

- Beimborn, Edward, Harvey Rabinowitz, Peter Gugliotta, Charles Mrotek, and Shuming Yan. 1991. *The New Suburb: Guidelines for Transit Sensitive Suburban Land Use Design*. Center for Urban Transportation Studies, University of Wisconsin - Milwaukee.
- Bernick, Michael. 1990. *The Promise of California's Rail Transit Lines in the Siting of New Housing*. Report to the California Senate Transportation Committee and the Senate Housing and Urban Affairs Committee.
- Bernick, Michael. 1993. *The Bay Area's Emerging Transit-Based Housing*. *Urban Land* 52: 38-41.
- Bernick, Michael and Peter Hall. 1990. *Land Use Law and Policy for Maximizing Use of California's New Inter-Regional Rail Lines*. IURD Working Paper number 523. Berkeley, California: University of California IURD.
- Bernick, Michael and Michael Carroll. 1991. *A Study of Housing Built Near Rail Transit Stations: Northern California*. IURD Working Paper number 582. Berkeley, California: University of California IURD.
- Bernick, Michael and Peter Hall. 1992. *The New Emphasis on Transit-Based Housing throughout the United States*. IURD Working Paper number 580. Berkeley, California: University of California IURD.
- Bernick, Michael, Peter Hall, and R. Shaevitz. 1992. *New Planning Strategies for Transit-Based Housing in Northern California*. IURD Working Paper number 582. Berkeley, California: University of California IURD.
- Boarnet, Marlon G. and Randall Crane. 1995. *Public Finance and Transit-Oriented Planning: New Evidence from Southern California*. Working Paper number 1995-36. Irvine, California: University of California at Irvine, Department of Urban and Regional Planning.
- Boarnet, Marlon G. and Randall Crane. 1997. *L.A. Story: A Reality Check for Transit-Based Housing*. *Journal of the American Planning Association*. Forthcoming.
- Calavita, Nico. 1993. *A Little Bit of Seaside Comes to Southern California*. *Planning* 59, 9: 24-25.

- Cervero, Robert. 1984. Light Rail Transit and Urban Development. *Journal of the American Planning Association* 50,2: 133-147.
- Cervero, Robert. 1986. *Suburban Gridlock*. New Brunswick, New Jersey: Center for Urban Policy Research.
- Cervero, Robert. 1989. *America's Suburban Centers: The Land Use - Transportation Link*. Boston: Unwin Hyman.
- Cervero, Robert. 1993. Transit Supportive Development in the United States: Experiences and Prospects. Report to the Federal Transit Administration and IURD monograph number 46. Berkeley, California: University of California IURD.
- Cervero, Robert. 1994a. Rail-Oriented Office Development in California: How Successful? *Transportation Quarterly* 48: 33-44.
- Cervero, Robert. 1994b. Rail Transit and Joint Development: Land Market Impacts in Washington, D.C. and Atlanta. *Journal of the American Planning Association* 60: 83-94.
- Cervero, Robert. 1994c. Transit-Based Housing in California: Evidence on Ridership Impacts. *Transport Policy* 3: 174-183.
- Cervero, Robert. 1994d. Transit Villages: From Idea to Implementation. *ACCESS* number 5. Berkeley, California: University of California Transportation Center.
- Cervero, Robert. 1995. Sustainable New Towns: Stockholm's Rail-Served Satellites. *Cities* 12: 41-51.
- Cervero, Robert, Michael Bernick and Jill Gilbert. 1994. Market Opportunities and Barriers to Transit-Based Development in California. Working Paper number 223. Berkeley, CA: University of California Transportation Center.
- City of Chula Vista. 1994. *General Development Plan and Specific Plan and Process for the Otay Ranch Project: Executive Summary*. January, 1994.
- City of San Diego. 1992. *Transit-Oriented Development Guidelines*. Prepared by Calthorpe Associates, October, 1992.
- City of San Diego. 1993. *Rio Vista West Amendment to the First San Diego River Improvement Project Specific Plan Design Guidelines and Development Standards*. December 7, 1993.

- City of Santee. 1992. *Santee Civic Square Master Plan*. July 8, 1992.
- Crane, Randall. 1996. Cars and Drivers in the New Suburbs: Linking Access to Travel in Neotraditional Planning. *Journal of the American Planning Association* 62: 51-65.
- Deakin, Elizabeth and Tilly Chang. 1992. Barriers to Residential Development at Rail Transit Stations. Berkeley, CA: University of California Department of City and Regional Planning, mimeo.
- Demoro, Harre W. and John N. Harder. 1989. *Light Rail Transit on the West Coast*, New York: Quadrant Press.
- Domencich, Thomas A. and Daniel McFadden. 1975. *Urban Travel Demand: A Behavioral Analysis*. Amsterdam and New York: North-Holland Publishing Company and American Elsevier Publishing Company.
- Fulton, William. 1991. *Guide to California Planning*. Point Arena, CA: Solano Press Books.
- Glick, Fred. 1992. Light Rail Transit and Effective Land Use Planning: Portland, Sacramento, and San Diego. *Transportation Research Record* number 1361.
- Giuliano, Genevieve. 1991. Is Jobs-Housing Balance a Transportation Issue? *Transportation Research Record* 1305: 305-312.
- Giuliano, Genevieve. 1995. The Weakening Transportation-Land Use Connection. *Access* number 6. Berkeley CA: University of California Transportation Center.
- Giuliano, Genevieve and Kenneth A. Small. 1993. Is the Journey to Work Explained by Urban Structure? *Urban Studies* 30,9: 1485-1500.
- Gomez-Ibanez, Jose A. 1985. A Dark Side to Light Rail? The Experience of Three New Transit Systems. *Journal of the American Planning Association* 51: 337-351.
- Gordon, Peter, Harry W. Richardson and Myung-Jin Jun. 1991. The Commuting Paradox: Evidence from the Top Twenty. *Journal of the American Planning Association* 57: 416-420.
- Kaiser, Edward J., David R. Godschalk and F. Stuart Chapin, Jr. 1995. *Urban Land Use Planning*. Urbana and Chicago, Illinois: University of Illinois Press.
- Knight, Robert and Lisa Trygg. 1977. Evidence of Land Use Impacts of Rapid Transit Systems. *Transportation* 6: 231-247.

- Landis, John, Robert Cervero and Peter Hall. 1991. Transit Joint Development in the USA: An Inventory and Policy Assessment. *Environment and Planning C: Government and Policy* 9: 431-452.
- Lindblom, Charles E. 1959. The Science of "Muddling Through." *Public Administration Review* 19: 79-88.
- Pushkarev, Boris S. and Jeffrey M. Zupan. 1977. *Public Transportation and Land Use Policy*. Bloomington, IN: Indiana University Press.
- Putman, Stephen H. 1983. *Integrated Urban Models: Policy Analysis of Transportation and Land Use*. London: Pion Limited.
- Ortuzar, Juan de D. and Luis G. Willumsen. 1994. *Modeling Transport*. New York: John Wiley and Sons.
- Pill, Juri. 1988. Toronto: Thirty Years of Transit Development. In *Transit, Land Use, and Urban Form*. Wayne Attoe, ed. Austin, Texas: School of Architecture, University of Texas at Austin.
- Untermann, Richard K. 1984. *Accommodating the Pedestrian: Adapting Towns and Neighborhoods for Walking and Bicycling*. New York: Van Nostrand Reinhold.
- U.S. News and World Report*. 1990. Can a New Suburb Be Like a Small Town? *U.S. News and World Report*, March 5, 1990: 32.