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Working Paper
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**Public Finance and Transit-Oriented Planning:
New Evidence from Southern California**

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Abstract

Local governments seem to be continually strapped for funds. While the role of their planners in generating revenue is often discussed, it is also rarely investigated in any detail. We address this research gap by considering the fiscal nature of land use policy vis-à-vis a specific planning opportunity, namely “transit-oriented development”

A massive and influential literature has explored the potential for leveraging rail system investments by locating high density residential developments near commuter rail stations. The feasibility and focus of these strategies have been questioned, however, in the face of evidence that local government support for these projects is mixed at best. To explain this behavior, we examine the role basic fiscal conditions play in the decision to zone land near all existing and proposed commuter rail stations in Southern California. The analysis indicates that station-area zoning depends significantly on community public finances. The importance of sales taxation in financing local services is consistently important in explaining the concentration of commercial zoning near rail stations, even when controlling for the amount of commercial activity in each city, associated revenue mix and tax base trends, and many other features differentiating communities. The results underscore how the practice of transit-oriented development must account not only for travel behavior and the broader goals of any given urban design, but also for the parochial and self-interested nature of municipal planning.

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1. Introduction

American cities are building rail transit systems again. After half a century of neglect and retrenchment, new rail transit systems have opened in urban areas that include San Francisco/Oakland, Washington D C, Atlanta, San Diego, Miami, and Portland. These and other new lines have contributed to a more than 100% increase in the number of operational urban rail systems in the U S since 1970 (Cervero, Landis and Hall, 1992). Even Los Angeles, notorious for its reliance on the automobile, is investing heavily in rail transit (Phillips 1990, Los Angeles 1993).

The renewed interest in rail transit raises important questions about the land-use transportation link in the context of urban rail. A considerable body of recent research has advocated building medium and high density residential development near rail transit stations (Beimborn, et al, 1991, Bernick and Hall, 1990, 1992, Bernick, 1993, Bernick and Carroll, 1991, Bernick, Hall and Shaevitz, 1992, Bernick and Munkres, 1992, Glick, 1992). This work has influenced some localities to incorporate residential development into their transit-oriented land use plans (San Diego, 1993, Los Angeles, 1993).

Yet the flurry of academic and policy statements on residential development linked to rail transit has dwarfed the level of actual development activity. The consequence is that some authors now regard the lack of residential development near rail stations as a policy problem that needs to be both explained and solved (Bernick, 1990, Bernick and Hall, 1992, Calthorpe, 1993, Deakin, Bernick and Chang, 1992).

This phenomenon may be more widespread than initially believed. In a thorough examination of land use near rail stations in Southern California, Boarnet and Crane (1995) provide evidence that residential development is typically less prevalent near stations than in the surrounding community. The overwhelming trend is one of commercial and industrial zoning in station areas, a pattern that holds across community and commuter rail system characteristics. One explanation is that while transit-based housing is possibly consistent with regional ridership goals, it may well be at odds with

local development goals. If conflicts between municipal and regional goals exist, it would seem useful for transit planning purposes to understand the motives of all the governments that have land use jurisdiction near rail transit lines.

This paper examines these motives. The main thrust of this research is a careful empirical test of the hypothesis that local governments in California face behavioral constraints that regional transit authorities have neglected in their plans. We argue that local jurisdictions, particularly in growing areas, have fiscal incentives to increasingly zone land near rail stations as commercial or office space, and will avoid mixed-use and residential zoning. Our interest is thus also with the question of the extent to which communities actually *plan* toward fiscal ends. Although municipalities can clearly be expected to act in their own interest, the manner in which their public finances affect municipal zoning behavior remains little studied. Most research on "fiscal zoning" concerns the behavioral incentives to enact exclusionary tactics such as minimum lot size restrictions that keep residential development out that does not pay its own way (Altshuler and Gómez-Ibáñez, 1993, Ellickson and Tarlock, 1981, Fischel 1985, 1992, Mieszkowski and Zodrow, 1989, Rolleston 1987). However, these considerations may apply to a broader class of zoning incentives as well. A clearer picture of fiscal motivations in local planning is a secondary goal of this research.

We test our hypothesis by examining the zoning patterns of municipalities along the new and proposed rail lines in Southern California. Southern California provides an ideal setting for these tests. Several rail transit lines are currently either operating or are in the planning and development stages in that region. Some of those lines span several suburban municipalities, while others are contained largely within one large city. Those rail lines are the Blue, Red, and Green lines being constructed by the Los Angeles County Metropolitan Transportation Authority (MTA), the interurban rail lines operated by the Southern California Regional Rail Authority (SCRRA), the light rail lines operated by the Metropolitan Transit Development Board (MTDB) in San Diego, the light rail lines

planned by the North County Transit District (NCTD) in northern San Diego County, and the urban rail plan being studied by the Orange County Transportation Authority (OCTA)

The paper proceeds by examining the concept of transit oriented development, as a prelude to the empirical analysis that follows. Section 3 discusses the incentives that local governments have to zone land near rail transit in ways that enhance their fiscal position. Section 4 provides some background on the Southern California rail lines that are the basis of this study. Section 5 describes the zoning patterns near all existing and proposed Southern California rail transit stations. Section 6 formally tests the hypothesis that zoning near rail stations is affected by fiscal policy. Some concluding comments offer perspective on our results.

2. Transit-Oriented Development

Transit oriented development (TOD), for purposes of this paper, simply means the practice of increasing residential land uses near rail stations. Often, but not necessarily, this implies an increase in densities for the land immediately surrounding the station. The TOD concept has been advocated in a large number of scholarly reports, including Bernick (1990), Bernick (1993), Bernick and Carroll (1991), Bernick and Hall (1992), Calthorpe (1994), Cervero (1992, 1993, 1994), Cervero, Landis, and Hall (1992). The concept often advocates residential development within walking distance of rail transit stations, typically assumed to be 1/4 mile.

The TOD literature follows on, and in some ways is a response to, a large body of research on the land use impacts of transportation. By the late 1970s, a number of studies had examined the land use impacts of transportation. Those studies typically found that transportation improvements often created relatively small land use responses. This was true both of highway projects (Payne-Maxie 1980) and of rail transit (Knight and Trygg 1977, Meyer and Gomez-Ibanez 1981). Giuliano (1989), in a review of that literature, concluded that modern highway projects often have only small impacts on

regional accessibility, and thus create only a small land use response. Rail transit, because ridership levels are almost always small compared to the total regional transportation network, would thus have an even smaller land use impact than highways (Meyer and Gómez-Ibáñez 1981).

For many years, this was the experience with the Bay Area Rapid Transit (BART) system in San Francisco. When BART was opened in the early 1970s, planners assumed that the new rail transit stations would become centers for economic development or (more often) redevelopment. The presence of the heavy rail transit system would encourage medium and high density development, and presumably some of that development would be residential units offering easy walking access to a BART station (Bernick 1990). Yet early evaluations suggested that BART created at best only a small land use impact (Webber 1979), and later studies still found only small impacts (Cervero and Landis 1995).

By the late 1980s, it was clear that the redevelopment near many BART stations had proceeded at a slower pace than expected. Planners began to conclude that the land market, if left to its own devices, would not fully exploit the development opportunities near stations. Some practitioners and scholars began to conclude that government would have to intervene. Suggested policies included rezoning land near stations for residential uses, offering density bonuses or subsidies, or otherwise facilitating development (especially residential development) near rail transit. This policy activity meshed with academic thought that advocated a return to more dense pedestrian and transit-oriented communities (e.g. Calthorpe, 1993) and the TOD idea was born (Bernick 1990).

The TOD concept hinges not on exploiting the impact of the transportation system on land use, but rather on reversing the direction of the causal link. Instead of suggesting that land use near transit stations does not change because ridership levels are low, TOD proposes to change land use (through policy initiatives) to facilitate increased rail transit

ridership Whether this can work, or more specifically whether land use is the appropriate policy instrument, is still unclear

Traditional travel demand studies are based on the idea that there is a link between land use patterns and travel demand (See, e g , Domencich and McFadden 1975, Kam 1990) Yet it is not clear if altering land use will affect travel demand, or if land use patterns reflect, in part, underlying preferences about accessibility and travel Recent studies of residents living within walking distance of rail transit stations have found that a large proportion of those residents had used public transit before moving near the rail station (Cervero 1994) If TOD merely allows persons who use public transit to shift from one public mode to another (e g from bus to rail), then it is unclear if the congestion and air quality goals of public transit can be enhanced by TOD

Having said that, TOD still has some appeal In the absence of convincing evidence to the contrary, one would expect that as more persons live near rail stations, there will be an increase in rail transit ridership Furthermore, densification and coordinated development of rail transit stations can make sense for reasons beyond transit ridership In many communities, a rail transit station is a natural focus for development Coordinating efforts around stations can leverage the public funds already invested in the area (Landis, Cervero, and Hall 1991) When done well, the creation of "urban villages" integrating rail stations with shopping, entertainment, and employment could enhance the quality of life of local residents

3. The Fiscal Incentives of Local Government

While TOD strategies may have shortcomings, both they and the more general idea of transit-oriented *planning* certainly warrant further study Our interest here centers on understanding how local incentives influence the decisions that municipalities make regarding land-use regulation near rail stations We hypothesize that while regional transit authorities care primarily about system-wide success, municipal

governments care primarily about the impact of rail transit on their community. One implication is that local and regional goals for rail transit can potentially diverge. One possible reason for such a divergence is due to fiscal incentives. In particular, we argue that localities have fiscal reasons to promote commercial land use, rather than residential land use, in areas near rail stations.

Recent research has documented that Southern California municipalities tend to favor commercial zoning near rail transit stations (Boarnet and Crane 1995). This result held when controlling for the land use character of the surrounding city and for virtually all the many rail lines currently in existence or being planned for the region. It also applied whether the station was newly sited or the station had been in place long enough for municipalities to adjust their zoning code in response. Either way, that evidence strongly suggests that zoning near rail transit stations neither reflects the zoning in the surrounding community nor, typically, residential uses.

The question is why? We provide evidence in this paper that these patterns are consistent with the view that localities attempt to use rail transit stations as a means to enhance their fiscal position. To the extent that rail transit stations are an opportunity to focus either new development or redevelopment, a municipality might choose to emphasize land uses that have the most favorable impact on the city's tax base.

For a system of property tax finance, many authors have suggested that local governments will favor commercial over residential uses, since commercial properties often bring tax revenue without the service requirements of new residents (e.g., Fisher 1988, Schneider 1989, Ladd 1975). California presents in many ways an extreme example of these incentives. The propensity to use fiscal zoning was arguably exacerbated there after the property tax limitation Proposition 13 was passed in 1978. That act fixed the typical property tax rate at near 1% of assessed value, and set assessed property value at the higher of (a) its 1978 market value plus a maximum of 1% appreciation per year, or (b) its last sales price since 1978 plus a maximum of 1% appreciation per year. (Since the

early 1980s communities have also been permitted an additional property — or “Mello-Roos” — tax of up to 1% explicitly for the purpose of financing infrastructure associated with new land developments)

Proposition 13 changed the face of state and local finance in California, dramatically decreasing the relative importance of the property tax and increasing the relative importance of the sales tax statewide as local revenue sources (A share of locally generated sales tax collections is rebated by the state back to that jurisdiction) Localities no longer have much direct control over either tax rates or the use of alternative tax instruments ¹ Their influence over the fiscal environment is, rather, mainly indirect via their control over the revenue generating ability of alternative land uses ²

The broader trends are by no means unique to California however A general pattern of decreased federal funding for municipal operations over the past two decades, and the labor intensive nature of many local services, have led to growing state and municipal fiscal stress nationwide (Ladd and Yinger 1989, Gold and Zelho 1990) Municipal responses have ranged from service cutbacks, on the spending side, to increased use of debt (Crane and Green 1989) and impact and application fees aimed at getting development to “pay its own way” (e g , Nelson 1988, Altshuler and Gómez-Ibáñez 1993) Planners have long incorporated fiscal impact analysis as either a formal or informal element of the development evaluation process (Wheaton 1959, Burchell and Listokin 1980), and both common sense and anecdotal evidence suggests that, if anything, this will continue as fiscal pressures rise

¹ Fischel (1989) argues that voter support for Proposition 13 can be traced back to an earlier court ordered separation of local property wealth and school spending, i e , the pivotal *Serrano* case Thus, higher local property tax rates or collections did not necessarily translate into more local spending, those dollars were in effect spent elsewhere The consequence of reducing the direct role property taxation played in financing local services was to reduce support for property taxation generally

² There is the local option at the county level to vary the sales tax rate, but in addition to the limited influence individual municipalities have over the county tax structure, voter support for such increases has lately been limited to funds earmarked for transportation infrastructure

Thus while municipalities everywhere scramble for funds, the lack of direct control over revenue sources coupled with its rapid growth rate make California an ideal environment to examine how fiscal conditions influence planning outcomes. In particular, we argue that municipalities face strong incentives to enhance their fiscal position by generating sales tax revenue. To the extent that this does not conflict with other community goals we expect to see these incentives reflected in local zoning behavior. Interjurisdictional competition for and accommodation of auto malls and “big-box” retailers, such as Wal-Mart and Price Club, may be the most visible example of how planning can deliver cash-cows.

Other opportunities exist, however. We do not attempt any kind of comprehensive review in this study but rather focus our attention on a land use that in principle generates somewhat comparable development opportunities across communities, namely, commuter rail station areas. The great interest in rail line investment in Southern California is such that more than 200 commuter rail station areas are either in operation or planned over the next decade throughout the region. These represent significant connections to the remainder of the regional economy, and land use regulations in those areas ought to reflect municipal attitudes toward the associated land development opportunities. To the degree that municipal fiscal incentives discussed above favor commercial over residential zoning, for example, this suggests that local governments might favor commercial rather than residential development near rail stations. In other words, local land use policies might not exploit the station-oriented residential opportunities featured in TOD strategies because they were never intended to. Instead, cities are looking out for their parochial interests.

We test that hypothesis with a statistical analysis of the determinants of land use patterns within a quarter-mile of the 232 existing or proposed rail transit stations in

Southern California. Those stations are in sixty-five local jurisdictions.³ For each station, land use data were gathered for a quarter-mile radius circle centered on the station. In addition, demographic and fiscal data for the local governments with land use jurisdiction within the quarter-mile circles were also gathered. This allows a comparison of land use variables and city characteristics. It also allows us to construct and test a statistical model of local land use policy near rail transit stations. Before doing so, the next section briefly describes the current and proposed rail systems under examination and the zoning patterns near their stations.

4. Rail Transit in Southern California

By way of background, the most recent rail transit era in Southern California began with the opening of the San Diego Trolley in 1981. That line, which ran from downtown San Diego to the Mexican border, used relatively low cost light rail, running either on city streets or existing right-of-way (Phillips 1990, Trombley 1986). A second line opened in San Diego in 1986 and a third in 1995. All those lines are operated by the Metropolitan Transit Development Board (MTDB).

Rail transit resumed in Los Angeles, after a 29-year hiatus, when the Blue Line opened in July of 1990. That line runs from Long Beach to downtown Los Angeles, at times paralleling old Pacific Electric routes. The Los Angeles rail transit system also includes the Red Line, opened in 1993, and the Green Line which opened in 1995. The Red Line is Los Angeles' first subway, while the Green Line runs down the median of the Century Freeway. All three lines are now operated by the Los Angeles County Metropolitan Transportation Authority (MTA).

In 1990, California voters approved Propositions 108 and 116, funding commuter

³ Some of the stations are in unincorporated county land. For some purposes, it is more meaningful to consider those stations relative to the nearest incorporated city, while in other instances they are listed as being in unincorporated land.

rail projects in metropolitan Los Angeles. This led to the heavy rail system MetroLink, which opened in 1992. Operated by the Southern California Regional Rail Authority, MetroLink is the system that most closely approximates the old Pacific Electric. Its lines often use existing right-of-way, some of which was originally owned by Pacific Electric. Furthermore, MetroLink is the region's modern interurban system, with trains running from downtown Los Angeles into Ventura County to the West, Orange County to the South, Riverside and San Bernardino to the east, and Lancaster to the North.

The North County Transit District (NCTD), in San Diego county, began service in 1995 with a light rail system linking the rapidly growing northern suburbs of San Diego. The Orange County Transportation Authority (OCTA) is planning an urban rail plan that, if built, will likely run through the central and northern parts of the county. Table 1 summarizes the breakdown of stations by rail line, operating authority, and operating status. Table 2 provides additional descriptive data, including demographic information about the cities in which the stations are located.

[Table 1 about here]

[Table 2 about here]

In total, five operating authorities have either started or plan systems in Southern California. Rail transit already has a presence in Southern California, and it is a rapidly expanding presence. As of late 1994, 108 stations were open for business in the region. Another 25 stations were scheduled to begin operations in 1995, and 99 stations have projected opening dates later than 1995.

5. Characterizing Transit Area Plans Relative to Community Plans

Basic descriptive data for zoning near all 232 existing or proposed stations are provided below. These data include information on zoning within one-quarter mile of the station, and land use, demographic and fiscal characteristics of the city. Zoning data for the land around stations are reported for six categories: Low density residential, high density residential, all residential, commercial, industrial, and mixed use. “Low” and “high” density residential correspond approximately to “single family” and “multifamily” designations. However, not all cities provided a breakdown of residential land use by density. Even where they did, there may be differences in how these categories are defined. (Boarnet and Crane (1995) contains a discussion of the procedures followed in collecting these data.) “Mixed use” is also a problematic category for the similar reason that cities defined it a number of different ways.

Having said that, a simple comparison of the means by rail line, station status, and rail type does provide an interesting look at how the patterns of land use zoning near stations are related to station characteristics. The land use data in these tables are provided in two forms. Table 3 shows the share of land in a circle of quarter mile radius in each land use category (“station share”), and Table 4 shows the ratio of the station’s land in any use divided by the share of the surrounding city’s land in any use (“station/city ratio”). Both measures capture a different aspect of the relationship between land use near a station and the community which contains the station.

A few examples will help clarify these two land use measures. As shown in Table 3, the average “station share” of land zoned for low density residential use for all stations is 15%. Thus, the quarter mile circles around the stations in this dataset are, on average, 15% low density residential. *This simply describes the station areas.* Alternatively, the “station/city ratio” for low density residential shown in Table 4 is 0.76. A ratio of 1.0 would mean that the share of the station area land in this use is the same as the city share. If the ratio is less than 1.0, as in this case, the station area has a smaller share of its land in that use than the city as a whole. Hence, stations are less “low density residential” on

average than the cities in which they are found. Thus the station ratio measures how *similar the station is to its city*. The results for each of these measures are examined in turn below, by alternative station groupings.

Station Share

Looking at the “station share” measure for other land use categories in Table 3, and as illustrated by transit authority in Chart 1, on average 9.5% of the station area land is high density residential, 24.5% is residential, 22.5% is commercial, 6.0% is mixed use, and 14.9% is industrial. Residential is the highest single category, most of which appears to be low density. This pattern differs substantially by rail line, however. By line, the “low density” share varies from 1% for MTDB Center, in downtown San Diego, to 26% for the two MetroLink lines to Moorpark and Hemet -- each peripheral suburban communities. On average, the NCTD stations are the most “low density” and the MTA stations the least. These figures accurately reflect the range one expects when comparing residential communities with major central employment centers.

[Table 3 about here]

[Chart 1 about here]

Interestingly, the pattern of “high density” residential is quite different, with MTA stations having the highest share at 17% and OCTA and MetroLink stations the least at about 5%. This suggests that the distinction between low and high density residential development in station areas is an important one, that may vary critically with the residential character of the community. This point will be made clearer when we discuss city characteristics in more detail in the next section.

The range of share of station area land zoned commercial across rail lines is from 1% in MTDB North stations, to 46% for the main OCTA stations. Most lines are in

the 15% to 30% range, however. The most commercial station areas are on the OCTA lines, on average, and the least commercial are the MTDB stations. Though less station area land is commercial than residential, on average, the difference is not great. Again, much of the story is in the differences among lines representing the particular mix of stations in Southern California. Combining commercial land with the land zoned for industrial use, more land in the station area would appear to generally be for either shopping or employment generation purposes than residential. Moreover, this last fact appears to hold in suburban as well as central city areas.

In summarizing these descriptive results on land use zoning near rail stations in Southern California, three main points emerge. First, there is a good deal of variation by line. The patterns seem to follow from the geography of the urban area, as expected, with suburban communities having considerably more residential station areas than major employment centers. The second result is that station area "high" and "low" density residential land patterns are different. Low density suburban areas have the most low density residential land near stations, while central city areas have the most high density. Third, for most lines, more land is devoted to residential uses near stations than commercial -- although the sum of commercial plus industrial nearly always exceeds residential.

These results are difficult to expand on further without knowing more about the communities in which the stations are located, and the relationship between land use in the station area to the city overall. Are stations the same as or different from their cities, with respect to land use, and how does the extent to which they are similar depend on the nature of the community or the rail system? One other measure of land use near stations was constructed to shed light on these questions.

Station/City Ratio

The "Station/City Ratio" presented in Table 4, and summarized in Chart 2, is the ratio of the share of land in a particular use within 1/4 mile of a station divided by the share of land in that use in the city as a whole. That is,

$$\text{STATION/CITY RATIO}_i = \text{station share}_i / \text{city share}_i$$

where "station share_i" is the fraction of land in a particular use within 1/4 mile of station "i" and "city share_i" is the fraction of land in the same use in the city that contains station "i"

For example, if the station share of residential land is 25% (i.e., 25% of the land within 1/4 mile of the station is residential) and the city share of residential land is 50%, the "Station/City Ratio" is 1/2. Another interpretation for the "Station/City Ratio" is that, for any given city character, it measures the extent to which the station area zoning resembles that in the rest of the city.

[Table 4 about here]

[Chart 2 about here]

The "high density" score for this measure is 1.47. Thus, stations tend to have about 47% more high density residential land than the city generally. As the literature has often stated, station areas are more likely to be high density residential than elsewhere in the city. This does not, by itself, support the argument that station areas in Southern California either *should or will be* substantially more high density residential than other areas -- as the literature appears to suggest. That point is brought out by the ratio score for commercial land in station areas: 4.41. Stations are over 4 times more likely to be commercially zoned than the rest of their city, on average, no matter how residential or commercial that city may be.

For the main line of the "suburban" Orange County LRT system, the commercial ratio score is over 14. Again, this means that the main stations are proposed to be located

in areas which are 14 times more commercial than the communities they span. To some extent this represents the future more than the present, in more ways than one. First, the system is only proposed. Second, the land uses we report here are based on current zoning and general plans, reflecting expectations as much as actual uses in some instances. For example, the City of Santa Ana has no high density housing in its general plan, though the city is in fact a relatively densely built city. Still, our data do represent a sense of how these communities are looking ahead with respect to transit planning, and the Orange County data simply do not support the conclusion that high density housing near rail stations is a major part of that vision. Moreover, this pattern holds consistently for nearly all rail lines in our dataset. A notable exception is the North San Diego County NCTD line, which shows a nearly equal station/city ratio for high density residential and commercial development in this rapidly growing area.

6. Explaining Transit-Area Plans: The Role of Public Finances

Land use zoning near rail stations is of course the outcome of municipal and county regulatory policies in the jurisdiction in which they are located. To some extent, extragovernmental agencies or state agencies have the power to guide or even dictate local land use plans and decisions, particularly regarding major transportation routes. At the same time, these decisions are most often made in agreement and negotiation with local planning authorities. The motivation for the empirical test presented in this section is that cities may pursue land use strategies, either before or after the station location decision, that have as much or more to do with their own economic and development circumstances than with regional transportation goals.

Assigning each station to the city, or sphere of influence, in which it is located gives us 65 municipal jurisdictions in the dataset, spanning 6 counties. As demonstrated in Table 5, they represent a diverse array with respect to size, rates of population growth, residential character, and demographics. They are certainly all from Southern California,

though, as shown especially by the generally high population growth rates over the 1980s. Densities and median house values increased across the board. These communities are overwhelmingly residential in character, and mainly low density single family at that. The average city population growth rate during the 1980s was 53.8% and just under 53% percent of the average city 1990 population was white.

[Table 5 about here]

Municipal Fiscal Patterns

Various fiscal data were collected for these communities, and several measures of fiscal character were in turn calculated. The raw data included sales tax collections, property tax collections, total revenues, and total expenditures for the period 1980 through 1991. These were then put into per resident terms for each year, adjusted for inflation, and the rates of change over the period were determined. In addition to having total tax collections and per capita collections for both the sales and property tax, as well as the percentage real change in those numbers, the share of each tax's contribution to total revenues was also calculated as a measure of the community's "dependence" on each tax base. Tax base levels and trends were also examined.

The summary data are displayed in Tables 6, 7 and 8. Table 6 provides summary expenditure data for fiscal year 1991/92 for all 65 communities containing an existing or proposed rail transit station. It also shows the real changes these figures represent from 1980/81. On average, city current expenditures rose nearly 1 1/2 times over the prior decade, and over 2/3rds on a per capita basis. The rapid growth of this region is also suggested by the increase in capital expenditures of nearly 4 times during that period.

Several aggregate revenue patterns are evident in Table 7. The average city saw its property tax collections increase twice as fast as sales tax collections over the 1980s, such that they now comprise about a quarter of the average city revenue pie. This partly

reflects the great drop in property tax collections in 1980 as Proposition 13 rolled both property tax rates and property assessments substantially, which then steadily grew through the great California housing market rebound of the 1980s. Sales tax collections grew but by less, especially as a share of all revenues. The average per capita growth of sales tax collections was flat. Both taxes increased their importance in local revenues, but the property tax by more. Again, this reflects the small property tax base left in the wake of Proposition 13. These trends are also illustrated by the changes in each tax base shown in Table 8. Thus the main source of fiscal growth through this period was population growth and associated land development.

[Table 6 about here]

[Table 7 about here]

[Table 8 about here]

Testing the Fiscal Basis for Transit-Oriented Planning

Our discussion suggests that cities have incentives to use rail transit stations for their own fiscal benefit. We hypothesize that this will help explain the tendency toward station-oriented commercial zoning documented in Tables 3 and 4. We test this hypothesis by examining how zoning near stations is associated with municipal fiscal variables in a family of regression models.

The dependent variable for the regression model is the station ratio for commercial zoning, as defined earlier. We use the station ratio since that measures commercial zoning within one-quarter mile of a station *relative to* commercial zoning in the surrounding municipality. It thus controls for the existing land use character of the municipality. The key independent variables measure the extent to which the municipality that contains the station depends on local sales and property tax revenues, controlling for total budget size. The basic regression model is shown below.

$$\text{station ratio for commercial zoning} = \alpha_0 + \alpha_1 \text{stxdep} + \alpha_2 \text{ptxdep} + \alpha_3 \text{expcap} + \varepsilon$$

where,

stxdep = 1991 sales tax revenues divided by 1991 total municipal revenues,

ptxdep = 1991 property tax revenues divided by 1991 total municipal revenues,

expcap = 1991 municipal expenditures per 1990 resident,

ε is the error term, and

the α 's are the parameters to be estimated

Note that, for each station, the independent variables measure characteristics of the city that contains the station. Since there are 65 municipalities that contain stations in Southern California, that allows considerable variation. (Later in this section, we also show that the results are not proxying for the effects of the region's two largest cities, Los Angeles and San Diego.) The first two variables in our model measure dependence on sales and property taxes, respectively. Expenditures per capita (*expcap*) is included to control for the "size" of the local government — which might be correlated both with reliance on particular tax instruments and with zoning patterns near major infrastructure investments such as rail transit stations.

Cities with a higher revenue share from a particular tax are considered more dependent on that tax. Note that, for most cities in our dataset, those two tax instruments provide much less than the total revenue in the municipality. On average, sales and property taxes provide 56% of local revenues for the cities in our dataset. Only three cities get more than 75% of their tax revenues from sales and property taxes combined.⁴ Thus a greater reliance on one tax instrument (e.g. the sales tax) does not necessarily imply a reduced reliance on the other (e.g. the property tax).

⁴ The largest part of this gap between sales and property taxes and total revenues is grants from the state government to municipalities. In 1991, such grants comprise, on average, 18% of the local revenue for the 65 cities in our database.

Our hypothesis suggests that cities depending more heavily on local tax revenues will have a greater propensity to "fiscally zone" near rail transit stations in search of net fiscal surplus. Those cities that rely heavily on local tax revenues will have greater incentives to use the rail stations to generate more local revenues. This suggests that both *stxdep* and *ptxdep* should be positively correlated with fiscally-driven development plans. Having said that, we expect there to be a stronger link between sales tax dependence and station-oriented commercial zoning both because commercial development can generate taxable sales and because the sales tax has become more important for local governments since Proposition 13. The property tax has also become more important since its dramatic rollback in 1979, but this tax is not specifically associated with commercial development per se. Thus we expect that *stxdep* will be significantly positive more often than *ptxdep* in the regressions reported below.

Column 1 of Table 9 reports the results of estimating the basic model on all existing and proposed stations in the Southern California study area.⁵ One additional control variable is included here to capture the potential differences in how fiscal considerations affect zoning near stations before versus after the siting decision. That is a dummy variable identifying each station as either in operation or proposed at the time the zoning map was produced. A positive estimated coefficient for this variable, for example, would suggest that land near proposed stations is more likely to have a high station ratio for commercial zoning than stations now in service.

Note that, as expected, the share of revenues from sales taxation, *stxdep*, is significantly positive in model 1. Stations in municipalities relying more heavily on the sales tax tend to be more commercial, even controlling for the amount of commercial in the surrounding city, as the station ratio dependent variable does.⁶ The dummy

⁵ Sixteen stations are omitted from this regression since, for those stations, we do not have data for all the variables in the model.

⁶ Stated differently, stations in cities that rely more heavily on the sales tax display a stronger

identifying proposed stations is not significant. One interpretation for this result is that fiscal considerations of the sort we are emphasizing here are just as important in current siting decisions as in the past.

Column 2 of Table 9 extends the basic model to include two other sorts of important control variables: tax base trends and population density. In the first case, the current revenue mix is likely influenced not only by current circumstances, but by historical trends in each tax base. Such trends might also influence a city's propensity to zone for revenue. Total taxable sales and total property wealth are measured in per capita terms to control for community size, and their rate of change over the prior 11 year period is then entered to capture overall tax base trends. Both variables are insignificant in the regression specification in Model 2 of Table 9. The rationale for including density is that land use patterns often depend on the density of the surrounding area. The Model 2 results show that more densely populated communities have significantly lower station/city ratios for commercial zoning. This could reflect the fact that the dense cities tend to be central employment centers, and thus the commercial zoning near station areas in dense municipalities is more like the rest of the city. Most importantly, including these additional independent variables does not change the result that *stxdep* is significantly positive.

Column 3 of Table 9 represents our effort to better measure local fiscal "tastes" and household resources. These should influence local fiscal policy and might also be correlated with zoning policy. The idea is to be certain that *stxdep* and *ptxdep* are not proxying for characteristics that are correlated both with fiscal and land use policy. Unfortunately, the available data offer only crude measures, namely median household income, the percent of the municipal population that was white in 1990, and the share of revenues from state grants. Median income has a strong positive association with the likelihood of zoning a station area commercial, controlling for all these other factors. One explanation is that

tendency to be "more commercial" than the surrounding city

higher incomes are associated with a higher capacity to spend, and the expected returns to capturing the associated tax revenues by developing more commercial activity are higher as well. In any case, the coefficient on *stxdep* remains significantly positive.

Model 3b of Table 9 estimates Model 3a while excluding stations in Los Angeles and San Diego. This shows that the positive coefficient on *stxdep* is not linked to any unique characteristics of the region's two largest cities. Model 3c fits Model 3a on all stations except those in Orange County. Orange County stations are excluded since those showed an especially pronounced tendency toward commercial. (Recall that the station ratio for commercial for all OCTA stations was 8.4.) This is the only specification in which *stxdep* is not significantly positive. Yet note that *ptxdep* is significantly positive in Model 3c, giving some evidence that local fiscal policy affects zoning near stations.

Lastly, Model 4 combines Model 3a with the model from an earlier study of these data (Boarnet and Crane 1995). In that paper stations in municipalities that contained larger shares of a line had a larger station ratio for commercial zoning. Similarly, stations in municipalities with more employment growth from 1980 to 1990 also had a larger station ratio for commercial zoning. Both results suggested that localities were using commercial zoning near stations to enhance either their fiscal or broader economic development position, or both.

In Model 4, we combine the fiscal variables *stxdep* and *ptxdep* with the variable that measures the share of the line in each municipality (*lineshare*) and employment growth (*emp90-80*). These are defined formally as

LINESHARE = the number of stations on the line located in the municipality that contains that particular station, divided by the total number of stations on the line. For example, if a station is located in a municipality that contains 3 other stations on the same line, and the line has a total of 10 stations, the **LINESHARE** variable for that station is 4/10.⁷

EMP90-80 = employment change from 1980 to 1990 in the municipality that contains the station.

⁷ See Boarnet and Crane (1995) for a more extensive discussion of this variable.

The results show that both *stxdep* and *lineshare* are significantly positive. This suggests that local governments press for commercial zoning near stations for fiscal reasons (measured by *stxdep*) and for other reasons (measured by *lineshare*). It is possible that those other reasons include broader economic development concerns not strictly related to local fiscal policy.

Overall, the results are very robust. In all but one specification we find a greater tendency toward commercial zoning near stations located in municipalities that depend more heavily on the sales tax.

Also note that, due to the way the dependent variable was measured, the relationship between *stxdep* and increased commercial station/city ratios does not follow by definition. Granted, cities with more sales taxes (and thus possibly more sales tax dependence) will likely have more sales tax generating land uses (i.e., commercial), but that does not imply the coefficient on *stxdep* must be positive. First, note that sales tax generating land uses could be anywhere in the municipality, while our dependent variable specifically measures the extent to which commercial zoning is located near a rail transit station. Second, and more importantly, the dependent variable is a station/city ratio, and thus measures the extent to which the station area has more commercial zoning than the surrounding municipality. This is not a measure of the amount of commercial zoning in the city, but rather a measure of how municipalities concentrate their commercial zoning near stations. If that was not the case we would expect to see a significant relationship between property tax dependence and station area planning as well.

Both of these points suggest that the generally positive coefficient on the *stxdep* variable indicates some behavioral response. Having said that, it would be ideal to measure the interaction between the station siting decision and the pre-existence or later intensification of commercial centers. Since our zoning data are only available at one point in time, this is not fully possible. Some stations might have been sited near existing commercial centers (as suggested by the high commercial station/city ratio for the proposed

Orange County system) while others might have experienced increased commercial activity after some time in operation. While our data do not allow us to disentangle the dynamic nature of this process, note that either explanation is consistent both with the empirical evidence and with the fiscal zoning hypothesis presented in this paper.

7. Conclusion

A fundamental quality of modern municipal finances is change. Much as government at all levels continually rethinks its role in the market economy — what services it should provide and how those should be paid for — local government is expected to deliver labor intensive and thus increasingly costly services with more creative means of finance. While the role of their planners in generating this revenue is often discussed, it is also rarely investigated in any detail. The use of impact assessments, for example, is on the rise and cities increasingly charge on a fee-for-service basis for planning services, but the extent to which they actually plan toward fiscal ends has been relayed only anecdotally. Though the “public finances” of planning are likely of growing influence, they remain obscure.

This paper explored this research gap in preliminary fashion by considering the fiscal nature of land use policy vis-à-vis a specific planning opportunity, namely “transit-oriented development.” A massive and influential literature has examined the potential for leveraging rail system investments, relieving traffic congestion, and even reducing housing costs by locating high density residential and mixed-use developments near commuter rail stations. The feasibility and focus of these strategies has been questioned, however, in the face of evidence that local government support for these projects may be weak. Our empirical studies of zoning trends near commuter rail stations consistently find that municipalities appear to favor commercial development near rail stations of all types and ages over high density residential development. This pattern is remarkably robust with respect to fiscal conditions within the community, the per capita expenditures in the community, and the size and demographic character of the community. The

question, then, is why?

The partial explanation offered by this paper is local public finance. Using newly collected data on all existing and proposed commuter rail stations in Southern California, we examined the relationship of simple fiscal indicators to zoning patterns in station areas. Our results support the argument that communities see station areas as opportunities to improve their fiscal position. The analysis indicates that jurisdictions depending more heavily on sales taxes generally have more commercial zoning near their rail transit station, *even after controlling for the amount of commercial zoning in the surrounding community* and other revenue and tax base trends. The result is robust across community types and model specifications.

The generality of these results is unclear. The public finances of California are somewhat unique, for example. Communities there now have very little control over their revenues, they can change neither tax rates nor their tax base by fiat. Rather, they are constrained to act only indirectly to expand their tax base through development, thus generating additional tax revenue at effectively fixed property and sales tax rates. Tremendous growth in recent years has taken some of the sting out of this situation until quite recently, however, and we believe the overall fiscal pressures faced by the cities in our sample are likely quite similar in many respects to those in other metropolitan areas. In addition, it is uncertain what the planning motives surrounding rail station area zoning have in common with other land use planning activities. Whether other communities zone and plan their development in a manner consistent with their own economic and fiscal health thus remains to be established. However, our results do underscore how the actual practice of transit-oriented development must account for the parochial nature of the local planning process, in addition to travel behavior and the broader goals of any given urban design. Regional transit authorities especially should be much more aware of the pressures and incentives facing the municipalities that control land use near rail transit stations.

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Table 1: Operating Status of Stations in Dataset

Operating Authority & Line	#Stations in Dataset	In Operation*	Proposed Start Date		
			late 1995	Later	No start date
<i>MTA</i>	70	26	13	26	5
Blue	35	22	0	13	0
Red	18	4	0	13	1
Green	17	0	13	0	4
<i>MTDB</i>	41	35	6	0	0
East	15	12	3	0	0
North	3	0	3	0	0
Center	11	11	0	0	0
South	12	12	0	0	0
<i>NCTD</i>	22	0	6	16	0
<i>OCTA</i>	44	0	0	0	44
<i>SCRRA</i>	55	47	0	8	0
Total	232	108	25	50	49

*This number includes some MetroLink stations on operating lines planning to open in late 1995

**Table 2: Station Ridership and Community Characteristics
(Averages)**

Rail Line	1990 Average Population of Cities where Stations are Located	1990 Average Population Density of Cities (Residents per Acre)	Average Rate of Population Growth, 1980-1990	Average % of City Population that is White	Average City Median household income
MetroLink total (SCCRA)	363,735	5.8	61.0%	56.1	37,246
Hemet - Riverside	153,272	3.2	62.5%	65.2	30,423
Moorpark - L A	1,774,127	6.4	193.1%	44.3	38,778
Oceanside - L A	112,889	6.4	61.0%	59.8	43,454
Redlands - San Bernardino	94,984	3.1	38.4%	63.7	33,226
Riverside - L A	160,918	4.7	47.7%	54.4	36,483
San Bernardino - L A	365,473	7.2	50.1%	51.5	37,456
Santa Clarita - L A	933,381	10.2	26.9%	50.2	37,996
San Bernardino - Riverside	133,359	4.6	32.8%	61.4	34,801
MTA total	2,211,452	11.6	15.6%	43.7	33,856
Blue	1,919,058	11.7	16.2%	42.4	32,435
Green	1,464,555	11.2	12.3%	54.1	39,885
Red	3,485,398	11.8	17.4%	36.3	
MTDB total	737,238	6.4	25.9%	61.5	32,589
Centre	408,761	7.6	17.2%	72.4	32,014
East	1,110,549	5.2	26.8%	58.1	33,686
North	1,110,549	5.2	26.8%	58.1	33,686
South	712,303	6.1	35.5%	52.0	32,028
NCTD	226,902	4.7	86.3%	68.4	35,631
OCTA total	170,885	9.9	36.2%	55.5	44,623
Main	191,274	9.6	50.0%	52.5	45,325
Alternate	219,078	13.4	34.4%	41.1	39,090
Extension	93,345	7.5	12.5%	73.0	47,947
All	943,053	8.2	39.1%	54.8	36,700

**Table 3: Land Use Zoning Near Rail Stations,
as Share of Land Within 1/4 Mile of Station**

— Station Share —

Rail Line	Low Density Residential	High Density Residential	All Residential	Commercial	Mixed Use	Industrial
MetroLink total (SCCRA)	15.7%	5.1%	20.9%	20.0%	2.7%	25.4%
Hemet - Riverside	26.2%	4.6%	30.8%	16.5%	-	16.2%
Moorpark - L A	26.5%	10.4%	36.9%	12.4%	-	25.9%
Oceanside - L A	4.2%	6.9%	11.1%	19.6%	8.3%	25.6%
Redlands - San Bernardino	4.2%	0.0%	4.2%	41.8%	4.4%	3.3%
Riverside - L A	15.0%	1.0%	16.0%	19.3%	-	39.0%
San Bernardino - L A	19.3%	6.3%	25.6%	19.0%	2.2%	26.7%
Santa Clarita - L A	20.6%	3.2%	23.7%	26.1%	5.1%	16.7%
San Bernardino - Riverside	5.0%	14.7%	19.7%	16.2%	-	27.2%
MTA total	12.4%	16.8%	29.1%	21.1%	7.1%	11.6%
Blue	11.9%	17.3%	29.2%	14.9%	9.3%	14.2%
Green	18.3%	10.2%	28.5%	16.2%	9.4%	16.5%
Red	6.7%	21.3%	28.0%	38.1%	-	3.3%
MTDB total	14.5%	7.3%	21.9%	16.3%	7.0%	11.0%
Centre	1.0%	0.2%	1.2%	21.7%	8.7%	19.1%
East	22.5%	16.7%	39.2%	18.8%	4.0%	6.3%
North	5.3%	0.0%	5.3%	0.7%	13.2%	7.8%
South	19.3%	4.0%	23.3%	12.1%	7.7%	10.3%
NCTD	23.1%	9.1%	32.2%	19.1%	12.5%	13.4%
OCTA total	14.6%	5.4%	20.1%	35.1%	4.3%	11.3%
Main	10.2%	4.7%	14.9%	46.4%	2.0%	3.8%
Alternate	24.2%	6.8%	31.0%	18.3%	7.9%	11.9%
Extension	14.8%	5.6%	20.4%	28.5%	5.4%	24.7%
All	15.0%	9.5%	24.5%	22.5%	6.0%	14.9%

Table 4: Land Use Zoning Near Rail Stations, as the Ratio of the Share of Land in each Use Within 1/4 Mile of Station Divided by the Share of City Land in that Use

— Station/City Ratio —

Rail Line	Low Density Residential	High Density Residential	All Residential	Commercial	Industrial
MetroLink total (SCCRA)	1.67	1.97	0.57	4.37	5.23
Hemet - Riverside	0 83	2 20	1 07	5 16	8 49
Moorpark - L A	0 86	4 52	0 98	9 21	4 06
Oceanside - L A	0 18	1 73	0 30	5 30	4 44
Redlands - San Bernardino	0 10	0 00	0 10	5 03	0 29
Riverside - L A	0 48	0 11	0 45	3 27	7 23
San Bernardino - L A	6 23	2 68	0 56	2 18	3 99
Santa Clarita - L A	0 55	0 00	0 52	4 73	2 34
San Bernardino - Riverside	0 07	13 61	0 96	3 82	5 64
MTA total	0.44	0.87	0.56	1.95	1.78
Blue	0 47	0 97	0 62	1 28	2 17
Green	0 63	0 53	0 44	1 86	0 89
Red	0 21	0 89	0 51	3 14	1 72
MTDB total	0.62	1.38	0.72	3.56	2.96
Centre	0 06	0 02	0 05	5 57	5 37
East	0 66	3 51	1 08	3 00	1 73
North	0 31	0 00	0 21	0 19	2 19
South	1 29	1 15	1 05	3 19	2 38
NCTD	0.68	4.29	0.83	4.72	4.26
OCTA total	0.31	0.88	0.40	8.37	1.35
Main	0 22	0 48	0 31	14 11	0 33
Alternate	0 45	0 72	0 56	1 32	1 33
Extension	0 35	1 39	0 43	3 71	3 22
All	0.76	1.47	0.59	4.41	2.93

Table 5: City Characteristics

	Land Area (Acres)	Density (Residents / Acre)	1990 Population	Population Growth Rate 1980- 1990	% White	Median Household Income	Median House Value
city mean	20,925	7.5	146,046	53.8%	52.8	\$36,678	\$193,452
city median	10,641	5.9	70,340	28.8%	59.7	\$35,103	\$185,400
standard deviation	43,377	5.0	422,748	85.8%	25.6	\$13,322	\$82,458

Table 6: City Expenditure Levels and Trends

	1991/92 Levels		% Real Change, 1980/81 - 1991/92	
	City Average	(Standard Deviation)	City Average	(Standard Deviation)
Current Expenditures	\$151,361,055	(643 million)	149.2%	(154.9)
Capital Expenditures	\$31,133,530	(140 million)	397.1%	(802.6)
Current Expenditures per capita	\$743	(513)	68.4%	(51.3)
Capital Expenditures per capita	\$123	(113)	137.8%	(300.6)

Table 7: City Revenue Levels and Trends

	1991/92 Levels		% Real Change, 1980/81 - 1991/92	
	City Average	(Standard Deviation)	City Average	(Standard Deviation)
Property Taxes	\$17,304,402	(71,108)	87.9%	(71.8)
Sales Taxes	\$13,927,614	(33,621)	38.0%	(80.5)
Property Taxes per capita	\$87	(51)	46.8%	(89.7)
Sales Taxes per capita	\$128	(150)	0.5%	(59.6)
Share of Property Taxes in General Revenues	24.5%	(12.2)	111.8%	(132.8)
Share of Sales Taxes in General Revenues	30.7%	(13.4)	33.8%	(42.7)

Table 8: City Tax Base Levels and Trends

	1991/92 Levels (in 1,000s)		% Real Change, 1980/81 - 1991/92	
	City Average	(Standard Deviation)	City Average	(Standard Deviation)
Total Net Assessed Property Value	\$7,970,528	(22,968)	994.2%	(385.2)
Taxable Sales	\$1,254,480	(2,958)	43.8%	(63.1)
Net Assessed Property Value per capita	\$64.1	(49.5)	446.0%	(244.5)
Taxable Sales per capita	\$11.7	(13.5)	4.3%	(39.9)

Table 3: Regression Results for Alternative Specifications Explaining the "Station Ratio" for Commercial Zoning

Independent variable	(Model 1) Does ratio of station area commercial zoning to city average depend on revenue mix?	(Model 2) Also controlling for per capita tax base trends & population density	(Model 3a) Also controlling for household resources and race	(Model 3b) Same as Model 3a but excluding L.A. and San Diego observations	(Model 3c) Same as Model 3a but excluding Orange County observations	(Model 4) Same as Model 3a but also controlling for rail line share, employment base growth, and city size
CONSTANT	-1.11 (.60)	3.51 (1.62)	-6.13 (1.66)	-7.85 (1.54)	2.54 (1.04)	-21.32 (5.63)
Share of revenues from sales taxes in 1991 (<i>strdep</i>)	26.13 (4.12)	24.07 (3.41)	15.11 (2.12)	19.69 (2.24)	1.03 (0.24)	23.52 (3.02)
Share of revenues from property taxes in 1991 (<i>ptcrdep</i>)	8.05 (0.65)	5.90 (0.47)	-6.11 (0.48)	-0.64 (0.04)	18.54 (2.49)	-1.27 (0.09)
Current expenditures per capita in 1991 (<i>expcap</i>)	1.85x10 ⁻⁴ (0.94)	2.22x10 ⁻⁴ (1.16)	1.64x10 ⁻⁴ (0.89)	1.77x10 ⁻⁴ (0.82)	1.94x10 ⁻⁴ (1.96)	1.86x10 ⁻⁴ (1.00)
Dummy = 1 if station not in operation yet (proposed)	1.93 (1.80)	2.45 (2.29)	1.01 (0.95)	1.05 (0.67)	0.66 (1.05)	0.05 (0.05)
% change in property value per capita (1980-1991)	-	-0.06 (1.61)	-0.08 (2.14)	-0.08 (1.80)	-0.02 (0.70)	-0.07 (1.90)
% change in taxable sales per capita (1980-1991)	-	-0.19 (0.13)	-1.07 (0.77)	-1.13 (0.69)	-0.02 (0.02)	-1.30 (0.93)
1990 Population density	-	-0.48 (3.81)	-0.45 (2.62)	-0.51 (2.33)	-0.25 (2.44)	-
Share of revenues from state grants in 1991	-	-	25.14 (0.82)	35.52 (0.91)	25.81 (1.54)	25.14 (0.82)
1990 Median household Income	-	-	4.30x10 ⁻⁴ (5.08)	4.25x10 ⁻⁴ (4.21)	9.36x10 ⁻⁶ (0.16)	4.81x10 ⁻⁴ (5.31)
Share of 1990 population that is White	-	-	-0.04 (0.99)	-0.03 (0.60)	1.29x10 ⁻³ (0.05)	-0.02 (0.51)
Share of rail line located in this city (<i>lineshare</i>)	-	-	-	-	-	8.10 (2.86)
Number of stations located in this city	-	-	-	-	-	0.18 (2.47)
Employment growth from 1980 to 1990 (<i>emp90-80</i>)	-	-	-	-	-	-7.13x10 ⁻⁵ (1.78)
1990 Population	-	-	-	-	-	-5.53x10 ⁻⁶ (1.56)
Land Area	-	-	-	-	-	-7.54x10 ⁻⁵ (1.56)
R ²	0.09	0.17	0.27	0.27	0.14	0.29
R ² _{adjusted}	0.07	0.14	0.23	0.22	0.08	0.24
N	216	207	207	143	163	207

The absolute values of the T-statistics are shown in parentheses. Coefficients significantly different from zero with 95% confidence are in boldface.

Chart 1: Average Station Area Residential, Commercial and Industrial Zoning Shares,
by Transit Authority ("Station Share")

Chart 2 Ratio of Station Area Zoning to City Average,
by Use and by Rail Authority ("Station/City Ratio")