Land Value Impacts of Rail Transit Services in Los Angeles County

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ABSTRACT

Los Angeles County has the worst traffic congestion in country, which on the surface could be expected to increase the value of parcels near major transit stops. This report empirically investigates this proposition using hedonic price models. While some instances of land-value premiums were found, overall impacts were uneven and inconsistent. In the case of the Red Line, multi-family housing near subway stations accrued benefits; for other uses, nearby properties tended to sell for less. Stronger premiums were found for the Metrolink commuter rail system, with the exception of the Orange and Ventura corridors. Light-rail transit services conferred the largest benefits to multi-family housing and commercial uses. Residential properties near Bus Rapid Transit stops generally sold for less whereas commercial properties generally sold for more. One possible explanation for lower land value is that many major transit stops in the County lie within redevelopment districts.

1. INTRODUCTION

If transit investments create benefits, real-estate markets tell us. Location theory holds that land prices rise in synch with travel-time savings, thus to the degree transit expedites travel, properties near stations should sell for more. Transit's "capitalization benefits" are thought to be especially pronounced in highly congested areas.

This report presents research results on the land-value impacts of high-performance transit services – heavy rail, commuter rail, light rail, and bus rapid transit (BRT) – in Los Angeles County, the nation's most populated county (9.8 million inhabitants in 2002). All three rail services operate on dedicated rights-of-way while the BRT system, called Metro Rapid, runs in mixed-traffic conditions along freeways and major arteries. The term "high performance" is used in this report to denote relatively speedy transit services, either due to fixed-guideway operations or, in the case of BRT, signal prioritization and other service enhancements.

This report is a companion to recent work conducted on transit's land-value impacts in two other California settings – Santa Clara County and San Diego County.[1] The interested reader is referred to those studies for discussions on the policy context and methodological issues related to studying land-value impacts.

[1] R. Cervero and M. Duncan, *Rail Transit's Value-Added: Effects of Proximity to Light and Commuter Rail Transit on Commercial Land Values in Santa Clara County, California*, report prepared for the National Association of Realtors and the Urban Land Institute, June 2001; R. Cervero and M. Duncan, *Land Value Impacts of Rail Transit Services in San Diego County*, report prepared for the National Association of Realtors and the Urban Land Institute, June 2002.

Metropolitan Los Angeles has the dubious distinction of being the nation's most traffic-congested region according to the Texas Transportation Institute (TTI). In fact, it has held this rank every year since 1982 when TTI began measuring regional traffic congestion. In 1999, 59 hours per capita were lost due to freeway delays and half of the region's freeway lane-miles operated at "extreme" congestion levels (up from 4 percent in 1982).[2] Los Angeles also has the nation's most polluted air and own classification by the U.S. Environmental Protection Agency (EPA) – "extreme non-attainment area" -- for non-compliance with national clean air standards. Traffic snarls and air pollution have long been attributed to the region's car-dependent landscape, however curiously it had the nation's second highest residential densities in 2000, just behind Oahu County (Honolulu). From a mobility standpoint, Los Angeles densities appear to be "dysfunctional": uniformly high enough to create widespread traffic congestion but not peaked enough along linear corridors to draw sufficient numbers of customers into trains and buses. The region hopes to change this through aggressively building rail lines, expanding BRT, and pursuing transit-oriented development.

Los Angeles County provides a particularly rich setting for studying the land-value impacts of high-performance transit investments. Four different forms of transit exist as alternatives to traditional fixed-route, fixed-schedule bus services: a heavy-rail subway line (Metro Red Line); six commuter rail lines (Metrolink); two light-rail lines (Metro Green and Blue lines); and two bus rapid transit lines (Wilshire-Whittier Boulevards and Ventura Boulevard BRT lines). In principle, one expects that the largest capitalization benefits accrue to the high-speed, exclusively grade-separated service, the Red Line subway. As conduits to affordable housing, commuter rail might be expected to confer benefits to residential properties – especially apartments and condos – situated within walking distance of stations. Benefits from light-rail and BRT services, theory would suggest, are generally less because these services operate either in mixed-traffic conditions or at slower operating speeds. Also, unlike the County's three rail services, BRT lines do not have dedicated right-of-ways. In contrast to celebrated BRT systems in Ottawa (Canada), Curitiba (Brazil), Bogata (Columbia), and Nagoya (Japan), Los Angeles County's BRT services achieve their speed advantages solely through operational and design strategies: signal prioritization, lengthening of bus stops, queue-jumper lanes, far-side bus stops, and low-floor buses that expedite boarding and alighting. Because there are no fixed guideways, it might be the case that real-estate markets do not positively respond to BRT since there are no guarantees that services will be in place in future years or that routing or schedule frequencies will not be modified.

This report is divided as follows. First, recent investments in transit and development activities around transit nodes in Los Angeles County are reviewed. Second, the methodologies and data sources used in this study are discussed.

[2] Texas Transportation Institute, *2001 Urban Mobility Report*, College Station, Texas A&M University, 2002; See: http://mobility.tamu.edu/ums/study/cities/tables/los_angeles.pdf

Third, descriptive statistics and research results are presented. Lastly, the policy implications of these findings are elaborated upon.

2. TRANSIT AND DEVELOPMENT IN LOS ANGELES COUNTY

Los Angeles County has a century-long legacy of transit oriented development (TOD). The County was originally built around the streetcar. In the 1920s, the Pacific Electric Railway was the nation's largest electric trolley system, featuring 6,000 trains, 144 routes, and some 1,200 track miles.[3] Inter-city rail lines defined Southern California's cityscape, forming the radial spines that channeled growth throughout the first half of the 20th century. As in most American cities, the post Second World War period saw the dismantling of Los Angeles's passenger rail services and an entirely different urban landscape – one governed by cars and freeways – take shape.

In recent times, deteriorating traffic conditions and air quality have prompted shifts in how Southern California's public officials view transportation and land use. Smart growth principles have been embraced with seemingly open arms. Flush with Federal and State funds, the region laid more track-miles of rail transit than anywhere in the country over the past decade and has emerged as a national leader on the BRT front. The city of Los Angeles has adopted *A Transportation/Land Use Policy for Los Angeles* to guide TOD planning. The region has also operationalized the value capture concept through a benefit assessment program. Other policy innovations, like Location Efficient Mortgages, are also being pursued.

2.1 High-Performance Transit in Los Angeles County

The Los Angeles County Metropolitan Transportation Authority (MTA) serves as planner, designer, builder, and operator of a 1,900 coach Metro Bus fleet and 60 miles of Metro Rail services that presently interconnect 50 stations in the County (Map 1). An additional 12 rail transit stations are under construction and 29 are in various stages of planning and design (including a long-anticipated Gold LRT Line to Pasadena). The Blue LRT Line connects 22 stations along a 22-mile corridor between downtown Los Angeles and downtown Long Beach in both aerial and at-surface alignments. The 20-mile Green LRT Line connects 14 predominantly elevated stations between Norwalk and the El Segundo coastal area. The 17.4-mile Red Line from Union Station to North Hollywood operates solely underground, and at a price tag of $4.5 billion, has been by far the County's priciest rail investment to date.

[3] M. Bernick and R. Cervero, *Transit Villages for the 21st Century*, New York, McGraw-Hill, 1997, Chapter 2.

Map 1. Metro Rail Services in Los Angeles County, 2002

Much larger in size is the 416-mile, 49-station Metrolink commuter-rail system, operated by the Southern California Regional Rail Authority (SCRRA).[4] The five routes, shown in Map 2, operating in Los Angeles County are the: Antelope Valley Line (Lancaster to Los Angeles); Riverside Line (Riverside to Los Angeles); San Bernardino Line (San Bernardino to Los Angeles); Orange County Link (Oceanside to Los Angeles); and Ventura Line (Oxnard to Los Angeles). In early 2002, some 32,000 riders patronized Metrolink each weekday, up from around 2,000 a day a decade earlier. Around two-thirds of Metrolink riders previously drove-alone to work.[5]

The Metro Rapid presently consists of two demonstration BRT routes: the 26-mile Wilshire-Whittier Boulevards corridor (between Santa Monica and East Los Angeles) and the 16-mile Ventura Boulevard corridor (from University City to the edge city of Warner Center) (Map 3). Current (Phase II) plans call for an ambitious expansion of BRT services to many corners of the County as well as the introduction of exclusive lanes and by-pass lanes.

Los Angeles County has reaped ridership dividends from the rapid expansion of transit services. Average weekday boardings on the Red Line more than doubled from 63,000 in April 2000 to more than 137,000 in April 2002. Patronage on light-rail lines has also steadily grown; in April 2002, daily ridership reached 68,000 on the Blue Line and 27,000 on the Green Line. The BRT demonstration program is widely viewed as a huge success: one year into the program, ridership on the Wilshire/Whittier corridor jumped 42 percent, and along the Ventura corridor, 27 percent.[6]

2.2 Transit Oriented Development

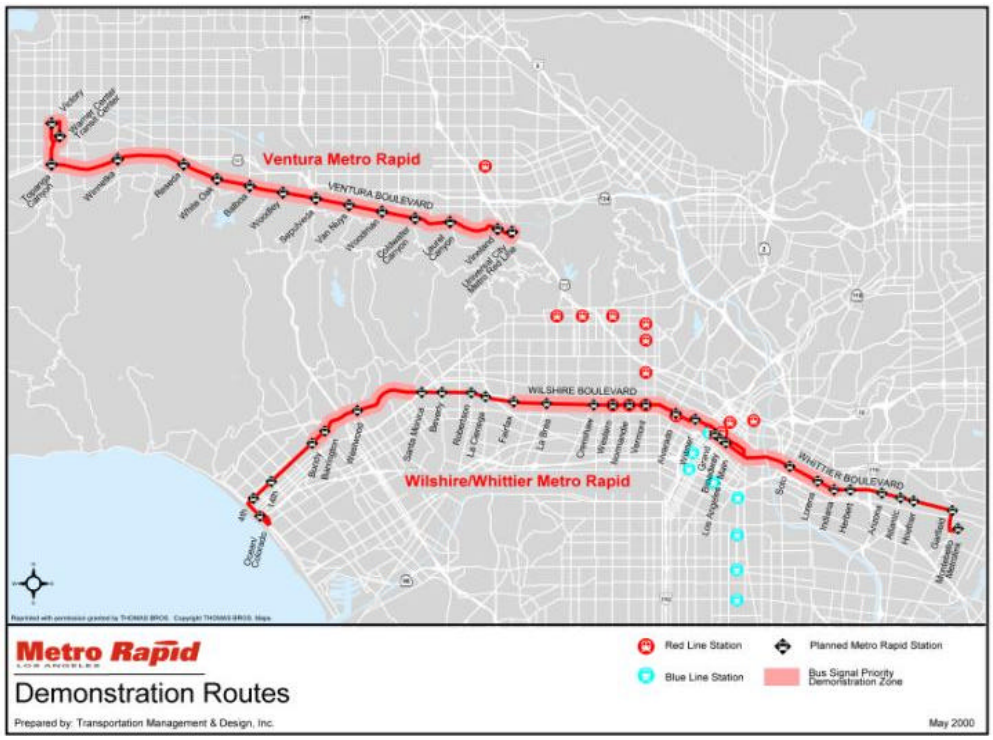
Over the past decade, development has gravitated to transit corridors in Los Angeles County, in most instances ushered along with the help of public redevelopment funding. The first wave of modern-day TOD activity concentrated in downtown Los Angeles and several outlying urban districts. The refurbished Union Station – where five Metrolink lines and the subway converge, along with six inter-city Amtrak runs -- has become the centerpiece of downtown TOD. On a parcel next to the station, MTA entered into a design-build turnkey arrangement with Catellus Development Corporation to construct the agency's towering headquarters. Also anchoring Union station is the built-to-suit high-rise headquarters of the Metropolitan Water District. Grant Central Market, a newly

[4] SCRRA is a public joint-powers authority comprised of five collaborating member agencies: the Los Angeles County Metropolitan Transportation Authority, the Orange County Transportation Authority, San Bernardino Association of Governments, the Riverside County Transportation Commission, and the Ventura County Transportation Commission.

[5] Source: http://www.metrolinktrains.com/about/fastfacts.html.

[6] Transportation Management & Design, Inc., *Final Report: Los Angeles Metro Rapid Demonstration Program*, report prepared for the Los Angeles County Metropolitan Transportation Authority, 2002.

Map 2. Metrolink Commuter Train System, 2002



Map 3. Metro Rapid BRT Demonstration Routes, 2002

renovated landmark building in downtown Los Angeles, lies across the street from the Pershing Square Red Line station. The project was leveraged by the County redevelopment agency and transit authority fully backing $13.5 million of taxable bonds and $26.5 million of tax-exempt bonds.

Two notable mixed housing-commercial TODs in second-tier downtowns are Pacific Court one block from the Blue Line terminus in downtown Long Beach and Holly Street Village, built in anticipation of the eventual extension of light rail services to downtown Pasadena. Both were redevelopment-driven projects funded through land-cost write-downs and the issuance of tax-exempt finance bonds.

More recently, mixed-use developments atop Los Angeles subway stations are dramatically transforming what only a decade ago was a fairly ticky-tack stretch of Hollywood Boulevard. Projects range from affordable apartments and neighborhood retail at Western Avenue to a 640,000 square-foot mega-entertainment-retail complex and 640-room hotel at Highland Avenue. In the latter case, MTA nets over a half million dollars annually under a 99-year ground lease.[7]

Perhaps the most impressive recent land-use change is the NoHo Commons project, a multi-phased mixed-use complex several blocks east of the North Hollywood Metro Rail Station. NoHo Commons features 220,000 square feet of office space, 228,000 square feet of shops and restaurants, 810 units of housing, a community health center, and a child-care center. Recently, MTA approved a second mixed-use project that will occupy space at the transit station itself.

2.3 Public Policies

While market forces partly account for land-use changes around Los Angeles County's rail stations, public policies have played at least as big of a role. As noted, most large-scale mixed-use projects mushrooming around transit nodes have been leveraged, and more bluntly, "subsidized", through redevelopment assistance. Many of the County's transit nodes enjoy a privileged status, beneficiaries of tax credits, tax-increment financed neighborhood improvements, pre-assembled land, and other perquisites.

Another inducement to TOD has been Location Efficient Mortgages (LEMs), co-sponsored by the city of Los Angeles, the Southern California Association of Governments, and a private lender, Countrywide Home Loans, Inc. The LEM program makes it easier to qualify for a home mortgage under the principle that those living near transit stations are likely to own fewer cars and log fewer miles on road systems, thus freeing up income for home purchases. In Southern California's pricey housing market, proponents argue this can be an effective lure for encouraging households to buy into station areas. Research shows that

[7] N. Holt, Transit Villages are Making a Comeback, *Wall Street Journal*, May 9, 2001, p. B1-3.

families living in parts of Central Los Angeles save, on average, more than $200 a month in vehicle ownership and usage costs compared to the average suburban family.[8]

Montage at Village Green is one of the first projects built under the LEM model. The 109-home development is located across from the Sylmar/San Fernando Metrolink train station midway along the Antelope Valley Line, offering among the most affordable prices for detached single-family homes in the San Fernando Valley. To make the project work, the developer, American City Visa, joined forces with Fannie Mae and the Southern California Regional Rail Authority. Down payment requirements as low as one percent make home ownership within reach of many low-to-moderate income households. Fannie Mae is also an equity investor in Montage at Village Green, providing $1.5 million from its American Communities Fund. Those purchasing a home at Montage at Village Green receive up to two free Metrolink monthly passes.

Another effective public-policy tool used in Los Angeles County is benefit assessment financing. Offices, retail shops, hotels, and other benefiting commercial properties along the Red Line are levied an assessment that to date has generated some $130 million, or 9 percent of the Red Line's construction cost. Monies have also gone toward ancillary improvements, including landscaping and passageways.

One ancillary "add-on" whose value should not be under-estimated is the colorful artwork found at all rail stops in Southern California. Each Metrorail station features unique works of art commissioned from local artists. The MTA Board set aside a percentage of the construction budget for public art. Artwork found at Metrorail stations include recycled film reels, bright murals, cavernous rock sculptures, and even archeological artifacts uncovered during construction. Described by the *New York Times* as "one of the most imaginative public art programs in the country", Metro Art has received several coveted arts awards.[9] While to some such add-ons might be written off as "frills", in truth studies tell us transit riders are keenly sensitive to the quality of environment while waiting for a train. Indeed, mode-choice studies reveal that the disutility transit riders assign to waiting is three times longer than that assigned to in-vehicle travel – it is as if the body clock slows down by a factor of three when waiting for a train.[10] Making the transfer and waiting experience more exciting and visually stimulating can translate into more riders and farebox income.

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[8] J. Holtzclaw, R. Clear, H. Dittmar, D. Goldstein, and P. Hass, Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use, *Transportation Planning and Technology,* Vol. 25, 2002, pp. 1-27.

[9] R. Snoble, Bringing a Touch of Humanity to the Trip: The Art of Transit in Los Angeles, *Rail*, Edition 4, 2002, pp. 10-11.

[10] M. Wachs, Consumer Attitudes Toward Transit Service: An Interpretative Review, *Journal of the American Institute of Planners*, Vol. 42, No. 1, 1976, pp. 96-104.

3. DATA AND METHODOLOGY

Has the collective energies put into making transit nodes in Los Angeles County viable places to live, work, and do business paid off in terms of real-estate market performance? As nodes that function as windows to the region at-large, transit stops – particularly those embellished by infill, mixed-use development and site enhancements – should absorb these benefits. This section presents the data sources and methodologies used to address this very question.

3.1 Data Sources

The primary data source used to carry out this research was *Metroscan*, a proprietary data base maintained by and available from First American Real Estate Solutions, headquartered in Sacramento, California. *Metroscan* contains monthly information on all real-estate sales transactions recorded in county assessor offices. For purposes of this study, data observations for commercial and residential properties were selected – in the case of commercial parcels, data were acquired for calendar years 1999, 2000, and 2001 (in order to create a sufficient size data base); for residential parcels, there were enough year-2000 observations to support the analysis.[11]

Hedonic price models that gauged the land-value premiums associated with transit were estimated for four types of land uses: Residential – multi-family housing; Residential – condominiums; Residential – single-family housing; and Commercial.[12] Since capitalization effects are thought to vary across these land-use categories, separate analyses were conducted for each.

To ensure assessed values reflected transacted sales prices, records were only selected for parcels that sold in the year of analysis: 2000 for residential and 1999-2001 for commercial properties. The following numbers of records were available across each of the land uses:

- Residential – multi-family housing: 3,803 parcel records
- Residential – condominiums: 13,462 parcel records
- Residential – single-family housing: 40,966 parcel records
- Commercial: 1,241 parcel records.

For year-2000 commercial properties, the following land uses (and shares of year-2000 sales transactions) were examined:

- Office-Professional (31.1%)

[11] While data were available for the year-2001, the residential analysis was conducted using year-2000 sales data since this time point matched the date of many of the control variables used in the analysis, such as demographic variables from the census.

[12] For multi-family units (multi-family housing and condominiums), analyses were conducted for entire properties, not individual units.

- Commercial Restaurant (8.1%)
- Commercial Retail (37.9%)
- Commercial: Other (22.9%)

Besides price information, *Metroscan* provided various data on parcels, including structure and lot sizes, year built, numbers of bedrooms and bathrooms (for residential parcels), types of use (for commercial parcels), dates of sale, and address information. Address data were used to pinpoint the longitudinal-latitudinal coordinates of parcels, from which various metrics of location, including the municipality or census designated place (CDP) of a parcel, were computed.

Other key data used in the analysis came from the Southern California Associations of Governments (SCAG) and the year-2000 U.S. census (from summary table file 1A). The primary SCAG data used in the analysis were 1997 peak-period travel times for a matrix of traffic analysis zones (TAZs). Travel-time estimates were available for both highway and transit networks. Data on population, housing units, and various socio-demographic attributes of census blocks were obtained from the year-2000 census.

3.2 Methodology: Hedonic Price Modeling

To gauge impacts – i.e., values-added or values-subtracted -- associated with being near light, heavy, commuter rail transit or BRT in Los Angeles County, hedonic price models were estimated.[13] Models took the form: $P_i = f(T, A, S, C)$, where: P_i equals the estimated price of parcel i; T is a vector of transportation services, including proximity to transit and highways and accessibility via highway and transit networks; A is a vector of property (e.g., structure size and age) and land-use (e.g., type of commercial) attributes; S is a vector of neighborhood socio-demographic characteristics (e.g., mean household income); and C is a vector of controls (e.g., municipality and time-series fixed effects). Municipality fixed-effect (dummy) variables were used to statistically capture the unique attributes of communities, such as quality of schools and degree of regulatory restrictiveness.

The Appendix presents the full array of variables that were candidate inputs into the analysis. Many of the variables related to location, proximity to transit,

[13] Hedonic price models are widely considered to be the most rigorous and accurate basis for, in general, apportioning factors that influence land values, and more specifically for estimating the land-value premium associated with transportation infrastructure. Hedonic price theory assumes that most consumer goods comprise a bundle of attributes, and that the overall transaction price can be decomposed into the component (or "hedonic") prices of each attribute. See: S. Rosen, Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition, *Journal of Political Economics*, Vol. 82, 1974, pp. 34-55.

neighborhood attributes, and accessibility were measured using Geographic Information System (GIS) tools. One-quarter and one-half mile buffers were created around all rail stations and BRT stops in Los Angeles County as well as all freeway and grade-separated interchanges. The one-quarter to one-half mile range is generally considered to be an acceptable walking distance to major transit stops. Whichever radius yielded the best statistical fit, regardless of the direction of a coefficient's sign, was used for each of the dummy variables used to denote walking access to transit. For purposes of gauging neighborhood attributes (such as neighborhood median household income and racial composition), one-mile buffers around parcels were digitally overlaid onto census blocks. This allowed neighborhood attributes to be gauged for areas of consistent size (around 2,010 acres) for each parcel

One of the key control variables that accounted for the relative location of parcels was accessibility indices. For residential properties, accessibility to jobs was estimated. Isochronic measures of accessibility gauged the number of jobs within designated travel-time intervals of 15 minutes, 30 minutes, 45 minutes, and one-hour over the highway and transit networks. Thus, separate accessibility indicators were computed for auto-highway and transit access to jobs. For commercial properties, accessibility to households (as indicators of relative proximity to consumers and workers) was measured. Accessibility analyses were conducted at the Traffic Analysis Zone (TAZ) level using year-1997 travel-time estimates provided by the Southern California Association of Governments (SCAG). Thus, indices gauged levels of accessibility for the TAZ that a particular parcel lies within.

Because capitalization effects were thought to vary by transit corridors, the analyses were stratified to measure differences in land-value impacts for each of the major transit lines. Across the four modes (heavy rail, light rail, commuter rail, and BRT) are 10 separate high-capacity/high-performance transit lines. Since real-estate transactions did not always occur near each line for each of the land-use types, in some instances no land-value impacts could be measured for particular lines.

4. DESCRIPTIVE STATISTICS

Table 1 presents summary statistics for some of key variables used in the hedonic price models, broken down by the four land-use types. On average, the most expensive properties were for commercial uses, followed by, in order, multi-family housing, single-family residences, and condominiums. Among land uses, the largest share of condominium sales were within a half-mile of a transit stop – 16.9 percent; for other land uses, the shares of sales near rail stations or BRT stops were: commercial – 12.6 percent; multi-family housing – 12 percent; and single-family homes – 5.7 percent. Also, multi-family housing units and commercial establishments tended to be closest to freeway interchanges and

Table 1. Descriptive Statistics of Key Variables Used in Hedonic Price Model for Residential Uses

	Mean or Proportion			
	Multi-Family Housing	Condo-miniums	Single-Family Housing	Com-mercial
Sales Price ($, 2000)	342,564	188,396	277,507	439,919
Transportation Proximity Measures				
Subway (Red Line); within ½ mile of LRT station	.013	.024	.001	.012
Metra Antelope Valley Line: within ½ mile of station	.001	.015	.001	.012
Metra Orange Line: within ½ mile of station	.000	.001	.001	.002
Metra Riverside Line: within ½ mile of station	.001	.001	.002	.013
Metra San Bernardino Line: within ½ mile of station	.001	.001	.001	.002
Metra Ventura Line: within ½ mile of station	.001	.011	.001	.002
LRT Blue Line: within ½ mile of rail station	.042	.027	.013	.022
LRT Green Line: within ½ mile of rail station	.011	.002	.011	.014
BRT Ventura Line: within ½ mile of bus stop	.014	.042	.014	.024
BRT Wilshire-Whittier Line: within ½ mile of bus stop	.026	.047	.012	.023
Interchange Ramp: network distance, in miles, to nearest freeway ramp	1.42	1.59	1.84	1.45
Transportation Proximity Measures				
Regional Job Accessibility: No. jobs within 45-minute peak-period auto travel time on highway network	3,247,053	2,644,769	2,619,745	--
Regional Household Accessibility: No. employed residents within 45-minute peak-period travel time on highway network	--	--	--	2,570,455
Property and Location Attributes				
Structure Size (feet)	3,597	1,221	1,547	4,403
Lot Size (feet)	9,187	3,803	8.646	10,526
Structure Age (years)	55.5	23.3	50.0	50.4
Population Density: Persons per gross acre within one mile radius of parcel, 2000	20.1	15.3	13.1	17.6
Employment Density: Workers per gross acre within one mile radius of parcel, 2000	6.8	8.2	4.6	6.8
Household Income: Annual, $, 2000	29,715	39,045	38,860	32,708
City of Los Angeles Location: proportion	.17	.40	.35	.19

single-family housing tended to be farthest away. Multi-family housing parcels were generally closer to jobs via highway networks than other residential uses – e.g., on average, nearly 3.25 million jobs were within 45 minutes highway travel time of multi-family properties, versus about 2.6 million for condominiums and single-family housing.

In terms of property and location attributes, commercial and apartment buildings tended to be the largest in size and condominiums were generally the smallest. Condominiums were also usually on the smallest lots and commercial structures on the largest. The typical condominium was around half the age of the typical apartment or single-family residence that was sold. Multi-family projects tended to be in the densest settings and, predictably, single-family properties in the sparsest. Owner-occupied housing – condominiums and single-family parcels – were generally in the highest income neighborhoods, and multi-family structures tended to be in lower-income settings. Lastly, higher shares of condominiums and single-family properties that were sold during the study period were in the City of Los Angeles than multi-family housing or commercial parcels.

5. HEDONIC PRICE MODEL RESULTS

This section presents the hedonic price model results for the four land uses, along with graphs that summarize measured land-value premiums or discounts. Land-value impacts were gauged using sensitivity-analysis techniques. For each corridor, this involved inputting mean or modal (i.e., most frequently occurring) values in the corridor (defined as five-mile radii of rail or BRT lines) into the explanatory variables of hedonic price models to come up with price estimates for the "typical" property. In all instance, base-case estimates assumed properties were not within one-half mile of a rail station or BRT stop. Holding other factors constant, the price estimates were then revised based on the assumption that the property was within one-half mile of a station on each rail line or BRT stop. Statistically, this amounted to converting the dummy variable for the rail or BRT line of interest from a value of 0 to a value of 1. The percentage change in estimated land value under this sensitivity analysis represented the premium, or discount, associated with being near a transit stop.

5.1 Multi-Family Housing Model

The effects of being near transit stops on the sales prices of apartments and other multi-family units were uneven. Table 2 reveals that both positive and negative impacts were recorded. None of the associations with proximity to transit were statistically significant at the 5 percent probability level, however. This is a red flag, signaling that it is difficult to draw any firm inferences from these results. All one can comfortably say that, so far, there is no evidence of large and appreciable premiums having accrued to multi-family housing from the

Table 2. Multi-Family Housing Properties: Hedonic Price Model Results — Factors Influencing Year 2000 Multi-Family Housing Sales Price in Los Angeles County; Year 2000 data, unless otherwise noted

Variable	Coeffi-cient	Standard Error	Prob. Value
Rail/Highway Proximity			
Subway (Red Line); within ½ mile of rail station (1=yes; 0=no)	21,707.4	21,129.6	.304
Metrolink Antelope Valley Line: within ½ mile of station (1=yes; 0=no)	-12,554.8	24.732.9	.612
Metrolink Riverside Line: within ½ mile of station (1=yes; 0=no)	13,168.8	23,269.3	.571
Metrolink San Bernardino Line: within ½ mile of station (1=yes; 0=no)	-12,309.4	25,678.5	.632
Metrolink Ventura Line: within ½ mile of station (1=yes; 0=no)	1,888.7	29,661.8	.950
LRT Blue Line: within ½ mile of rail station (1=yes; 0=no)	4,349.9	7,501.7	.562
LRT Green Line: within ½ mile of rail station (1=yes; 0=no)	12,228.9	11,815.3	.301
BRT Ventura Line: within ½ mile of bus stop (1=yes; 0=no)	-21,386.8	21,803.6	.329
BRT Wilshire-Whittier Line: within ½ mile of bus stop (1=yes; 0=no)	-5,574.2	10,128.2	.582
Highway/Freeway: within ¼ mile of grade-separated highway or freeway	-3,673.5	4,812.4	.445
Interchange Ramp: network distance, in miles, to nearest freeway ramp	10,585.3	2,236.7	.000
Accessibility and Location			
Regional Job Accessibility by Auto: No. jobs (in 1,000s, 1995) within 45 minutes peak-period auto travel time on highway network	43.5	5.1	.000
Regional Job Accessibility by Transit: No. jobs (in 1,000s, 1995) within 30 minutes peak-period transit travel time, walk access	104.1	47.2	.000
Distance to Downtown, in straightline miles	1,376.5	836.1	.100
Pacific coastline: within ½ straightline miles	85,215.9	10,007.3	.000
Property Attributes			
Structure Size: Square feet	48.4	2.2	.000
Lot Size: Square feet of Usable Space	0.95	0.10	.000
Units, total number on parcel	-3,087.0	1,755.1	.079
Bathrooms, total number on parcel	28,938.6	4,523.3	.000
Neighborhood Attributes			
Population Density: Persons per gross acre within one mile radius of parcel	552.0	315.6	.080
Mean Household Income within one mile radius of parcel, $, 2000	2.01	0.47	.000
White Households: proportion of households within one mile radius of parcel of white race	132,025.5	18,246.9	.000
Youth: proportion of population residing within one mile radius of parcel that is age 18 or less	-466,665.0	58,244.2	.053
Seniors: proportion of population residing within one mile radius of parcel that is age 65 or more	-173,022.1	89,455.9	.000
City (or CDP) Fixed Effects (1=yes, 0=no)			
Arcadia	88,980.2	24,797.0	.000
Artesia	-47,881.8	29,376.5	.103
Azusa	45,353.8	21,284.9	.033
Baldwin Park	51,328.2	26,490.9	.053
Bell	15,015.1	13,197.7	.255
Bell Gardens	18,128.9	12,623.6	.151
Beverly Hills	427,562.3	29,701.1	.000
Carson	-47,896.5	23,618.9	.043
Claremont	46,948.9	38,522.2	.223
Cudahy	11,789.1	21,663.1	.586

Table 2 (continued)			
Culver City	22,330.9	16,412.7	.174
Duarte	-54,715.3	85,280.9	.521
El Monte	30,559.6	10,526.6	.004
El Segundo	58,749.7	22,542.0	.009
Gardena	-27,618.1	14,921.9	.064
Hawaiian Gardens	-63,611.3	22,430.2	.005
Hawthorne	-16,671.7	10,551.4	.114
Hermosa Beach	197,722.1	19,362.6	.000
Inglewood	-29,424.2	8,835.1	.001
La Canada	117,030.5	42,995.3	.007
La Mirada	-86,345.2	84,986.4	.310
La Puente	30,558.5	49,354.4	.536
La Verne	-42,211.5	39,545.4	.286
Lakewood	-60,625.5	23,656.1	.010
Lancaster	-132,796.9	46,939.9	.005
Lawndale	-27,596.6	14,489.4	.057
Lomita	12,319.5	21,835.2	.573
Long Beach	-31,638.4	7,702.9	.000
Los Angeles	-12,927.4	4,969.4	.009
Malibu	443,727.5	63,717.8	.000
Manhattan Beach	457,592.9	22,490.9	.000
Monrovia	20,946.2	14,319.8	.144
Monterey Park	22,744.8	16,069.7	.157
Norwalk	-31,293.8	23,395.4	.181
Palmdale	-85,197.8	8,6021.1	.322
Pomona	17,330.5	14,388.8	.228
Redondo Beach	36,303.2	14,182.9	.011
Rosemead	28,883.7	14,077.5	.040
San Dimas	-31,802.9	35,601.7	.372
San Fernando	56,125.4	35,458.5	.114
San Gabriel	48,158.8	18,128.2	.008
Santa Monica	195,927.6	14,717.5	.000
South El Monte	27,186.3	23,895.8	.255
South Gate	13,315.0	9,658.4	.168
South Pasadena	66,367.9	19,607.7	.001
Temple City	30,695.3	17,210.8	.075
Torrance	11,497.3	12,488.8	.357
West Hollywood	39,344.3	16,649.3	.018
Whittier	-18,913.4	11,209.3	.092
Month Fixed Effects (1=yes, 0=no)			
February	-6,686.6	7,918.7	.399
March	1,572.6	7,298.5	.829
April	10,426.6	7,674.6	.174
May	9,065.2	7,268.0	.212
June	16,183.0	7,307.4	.027
July	9,800.0	7,570.4	.196
August	21,051.4	7,121.0	.003
September	16,632.4	7,183.2	.021
October	16,840.9	7,660.6	.028
November	12,937.7	7,294.5	.076
December	2,3441.2	7,196.6	.001
Constant	-31,768.6	39,781.8	.425

Table 2 (continued)

Summary Statistics

No. observations = 3,803
F Statistic (prob.) = 111.3 (.000)
R-Squared = .715

presence of high-performance transit in Los Angeles County.

Table 2 indicates that multi-family parcels near the Red Line subway stations reaped the largest value-added benefits – all else being equal, they sold for over $20,000 more if they were within a half mile of a station. (For multi-family housing, the half-mile versus quarter-mile ring provided the best statistical fits for all corridors.) Multi-family parcels near MTA's light rail stations similarly accrued positive, though smaller, benefits. With respect to commuter-rail services, impacts were inconsistent – moderately positive in the case of the Riverside Line, moderately negative for the Antelope Valley and San Bernardino Lines, and inconsequential in the case of the Ventura Line. In that none of these relationships were statistically significant, the most one can say is that in the year-2000, there was no evidence of commuter-rail services having exerted any notable impacts on the sales prices of apartments, duplexes, triplexes, or other multi-family rental units. In the case of BRT, land prices for multi-family projects tended to be lower in both corridors, however again poor statistical fits muddy any interpretations. With respect to highways and freeways, parcels that were within a quarter-mile tended to sale for less, ostensibly because of the nuisance effect, and values generally increased with distance from interchanges. While one might expect values would be higher near interchanges, the thicket of freeways that criss-cross Southern California likely meant most multi-family parcels had "good enough" freeway access.

The other variables in the hedonic price model entered as statistical controls, to remove the influences of other factors shaping multi-family housing prices. Consistent with residential location theory, access to jobs via both highway and transit networks positively influenced values. Larger complexes on big lots with plentiful bathrooms also tended to sell for more. In addition, apartments in dense settings generally fetched higher prices, possibly because of the premium attached to being in more urban and mixed-use settings. Multi-family units also tended to sell for more in higher income, non-minority neighborhoods made up of families at the middle stages of the lifecycle. Based on the fixed effects variables, Table 2 shows that multi-family parcels in some cities, like Beverly Hills and Poway, commanded huge premiums, and also prices generally rose throughout calendar-year 2000 (based on the positive signs of the monthly dummy variables relative to the suppressed category of January).[14]

[14] For all models presented, coefficients on the fixed-effect variables should be interpreted with respect to the suppressed (i.e., non-presented) category. For municipality fixed effects, the

Figure 1 summarizes findings on the value-added versus value-subtracted impacts of proximity to major transit nodes in Los Angeles County. As noted, these premiums or discounts were estimated by inputting mean or modal statistics for all variables in predictive models, and through sensitivity analysis, gauging the percentage change in mean price given a change in each transit-proximity variable, holding all other factors constant.[15]

Figure 1 reveals that in percentage terms, apartments and other multi-family units near the Metro Red subway line reaped the large value-added premium – more than 6 percent. Other premiums were in the 0.5 to 4 percent range. The largest "dis-value" was the -6 percent registered for multi-family units along the Ventura BRT corridor. While one might argue this is due to negative impacts of

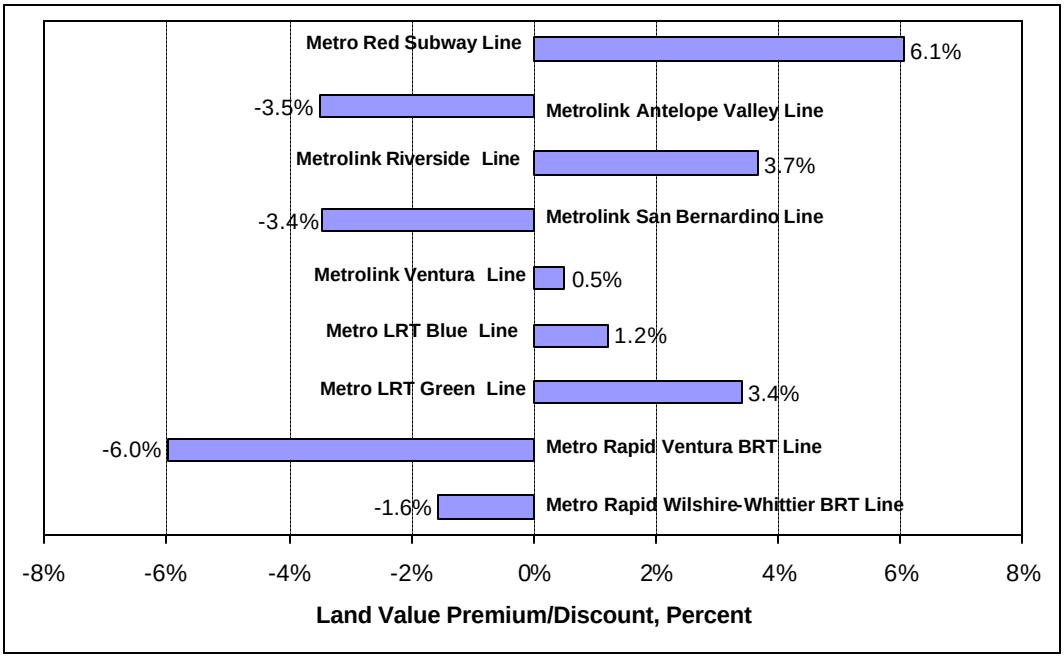

Figure 1. Multi-Family Housing Land-Value Premiums or Discounts in Los Angeles County, by Rail Line

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suppressed category was unincorporated portions of Los Angeles County as well as other (usually smaller) municipalities and census designated places (CDP) not included in the model. For the monthly fixed-effect variables, the suppressed category is January – thus all premiums or discounts are with respect to the first month of the calendar year.

[15] In the sensitivity analysis, mean values (from Table 1) were inputted into the model based on attributes of parcels within a five-mile radius of each transit corridor. The dummy variable for each "transit proximity" variable was "turned on" to gauge land-value impacts, holding all other input values constant. Table 1 shows typical input values for predictor variables based on all cases in the data base that were used for some of the variables in the sensitivity analyses.

being near the busy Ventura Freeway, we note that proximity to freeways was a control variable entered into the analysis, as was road-network distance to the nearest freeway interchange. As of a year or so into the BRT experiment, there was no evidence of benefits having accrued to nearby multi-family parcels.

5.2 Condominiums

Did for-sale higher density housing perform any better than multi-family rental properties? Table 3 shows only with respect to Metrolink commuter-rail stops, excluding the Ventura Line. In terms of heavy-rail subway and LRT services, properties tended to be worth less near stations, in contrast to multi-family housing where premiums were registered. Condominiums near BRT stops generally sold for less, as was the case with rental multi-family housing properties. These relationships were generally far more statistically significant than in the case of multi-family models, partly because of the considerably larger sample size.

Overall, inconsistent and not easily interpretable results were produced. As often-times affordable for-sale units, condominiums near commuter rail stops generally capitalized accessibility benefits. Why this did not hold for the Ventura Line and other rail services is unclear. It could be that capitalization benefits only accrued to commuter-rail stops targeted at serving journeys-to-work from suburban residential locales. Because they serve many non-work trips as well, light and heavy rail services might not have produced the same degree of market pressures as commuter rail lines.

Many of the control variables shown in Table 3 produced results that were similar to those from the multi-family housing model. Being too close to a freeway depressed condominium prices, and being accessible to jobs or near the coastline raised them. In the latter case, being within a half-mile of the Pacific Ocean bumped up condominium prices by an average of $117,000. Sales prices also generally increased with nearby population and employment densities. Condominiums sold in cities like Manhattan Beach and Rolling Hills Estate enjoyed premiums of well over $100,000. From the monthly fixed effects variables, prices generally rose during calendar-year 2000.

In percentage terms, Figure 2 shows the premiums accruing to condominiums sold within a half-mile of Metrolink stations along the San Bernardino and Antelope Valley lines exceeded 12 percent and for the Riverside line, the value-added was nearly 9 percent.[16] Fairly substantial dis-benefits were recorded for condominiums sold near Red Line subway stations, Ventura Metrolink stations, and Wilshire-Whittier BRT Line. One possibility is that lying near transit stops, especially along the Wilshire corridor of the Red Line and BRT line,

[16] Again, mean or modal statistics for explanatory variables shown in Table 3 were computed from data for all parcels within five miles of each corridor. These values were used in the sensitivity test of each corridor.

Table 3. Condominium Properties: Hedonic Price Model Results — Factors Influencing Year 2000 Condominium Sales Price in Los Angeles County; Year 2000 data, unless otherwise noted

Variable	Coeffi-cient	Standard Error	Prob. Value
Rail/Highway Proximity			
Subway (Red Line); within ½ mile of rail station (1=yes; 0=no)	-38,192.1	5,830.0	.000
Metrolink Antelope Valley Line: within ½ mile of station (1=yes; 0=no)	28,683.8	9,100.5	.002
Metrolink Orange County Line: within ½ mile of station (1=yes; 0=no)	3,019.2	19,548.5	.877
Metrolink Riverside Line: within ½ mile of station (1=yes; 0=no)	19,555.5	26,078.7	.453
Metrolink San Bernardino Line: within ½ mile of station (1=yes; 0=no)	32,381.9	15,575.8	.037
Metrolink Ventura Line: within ½ mile of station (1=yes; 0=no)	-28,903.7	7,237.6	.000
LRT Blue Line: within ½ mile of rail station (1=yes; 0=no)	-14,174.0	7,654.3	.064
BRT Ventura Line: within ¼ mile of bus stop (1=yes; 0=no)	-11,541.9	7,830.0	.140
BRT Wilshire-Whittier Line: within ½ mile of bus stop (1=yes; 0=no)	-19,239.1	7,323.5	.009
Highway/Freeway: within ½ mile of grade-separated highway or freeway	-5,281.5	2,035.0	.009
Interchange Ramp: network distance, in miles, to nearest freeway ramp	7,043.3	858.7	.000
Accessibility and Location			
Regional Job Accessibility by Auto: No. jobs (in 1,000s, 1995) within 45 minutes peak-period auto travel time on highway network	35.1	2.2	.000
Regional Job Accessibility by Transit: No. jobs (in 1,000s, 1995) within 30 minutes peak-period transit travel time, walk access	47.3	28.3	.096
Distance to Downtown, in straightline miles	1,307.8	352.7	.000
Pacific coastline: within ½ straightline miles	117,209.5	4,620.5	.000
Property Attributes			
Structure Age, Years	-1,097.0	100.4	.000
Structure Size, Square feet	228.4	3.0	.000
Bathrooms, total number	-3,980.5	1,669.3	.017
Bedrooms, total number	-18,246.0	1,648.3	.000
Condo Conversion Parcel, from apartments (1=yes, 0=no)	-2,168.0	2,515.1	.389
Neighborhood Attributes			
Population Density: Persons per gross acre within one mile radius of parcel	470.1	172.8	.007
Employment Density: Workers per gross acre within one mile radius of parcel	2,058.6	161.2	.000
Mean Household Income within one mile radius of parcel, $, 2000	2.82	0.14	.000
White Household: proportion of households within one mile radius of parcel of white race	31,279.3	7,883.7	.000
Youth: proportion of population residing within one mile radius of parcel that is age 18 or less	-136,287.0	26,315.0	.000
City (or CDP) Fixed Effects (1=yes, 0=no)			
Agoura Hills	24,706.1	9,185.5	.007
Artesia	-40,564.9	23,829.3	.089
Azusa	50,175.3	9,716.7	.000
Bellflower	-36,155.8	11,524.9	.002
Beverly Hills	55,269.7	11,237.8	.000
Carson	-29,282.3	8,822.4	.001
Cerritos	12,099.8	11,479.6	.292
Compton	-16,713.4	21,786.7	.443

Culver City	-21,396.6	6,064.6	.000
Table 3 (continued)			
Diamond Bar	-20,748.6	6,309.4	.001
Downey	-56,392.5	11,398.4	.000
Duarte	39,932.4	16,612.1	.016
El Segundo	9,816.0	13,826.8	.478
Gardena	-37,013.8	11,953.8	.002
Hawthorne	-83,720.0	17,271.8	.000
Hermosa Beach	26,103.8	12,070.8	.031
Huntington Park	-30,990.5	14,424.8	.032
Inglewood	-21,544.7	7,149.2	.003
Irwindale	62,272.3	28,062.3	.026
La Canada	30,819.0	44,259.0	.486
La Verne	48,099.9	29,670.8	.105
Lakewood	-37,394.8	25,674.2	.145
Lawndale	-25,211.0	18,212.6	.166
Lomita	12,763.8	12,478.8	.306
Long Beach	-20,733.1	5,482.9	.000
Los Angeles	9,060.2	2,345.2	.000
Manhattan Beach	176,362.4	15,229.2	.000
Monrovia	33,328.8	12,324.5	.007
Montebello	-10,971.8	12,042.2	.362
Norwalk	-28,857.6	11,960.7	.016
Palmdale	-41,476.9	16,840.9	.014
Palos Verdes	-40,948.7	34,201.7	.231
Paramount	-17,771.4	9,052.3	.050
Pasadena	21,836.8	5,233.2	.000
Pico Rivera	-27,046.7	19,517.6	.166
Rancho Palos Verdes	-27,147.1	8,977.6	.003
Redondo Beach	-7,627.0	5,052.7	.131
Rolling Hills Estates	113,704.2	88,463.4	.199
San Fernando	13,237.1	23,730.2	.577
San Clarita	20,350.4	5,142.6	.000
Santa Monica	97,034.6	5,627.0	.000
Signal Hill	-10,815.8	11,818.8	.360
South Gate	-34,657.7	44,311.6	.434
Temple City	-19,180.8	15,540.1	.217
West Covina	-6,905.1	7,422.7	.352
West Hollywood	32,670.4	6,312.7	.000
Whittier	-19,006.4	14,945.4	.203
Month Fixed Effects (1=yes, 0=no)			
February	4,540.2	4,864.1	.351
March	9,147.5	4,465.3	.041
April	11,530.2	4,480.4	.010
May	15,290.8	4,467.0	.001
June	16,336.4	4,407.3	.000
July	18,335.9	4,473.3	.000
August	15,838.8	4,417.6	.000
September	21,396.3	4,450.2	.000
October	24,765.9	4,510.3	.000
November	27,298.4	4,386.7	.000
December	24,597.5	4,387.6	.000
Constant	-28,758.2	7,045.4	.000

Table 3 (continued)

Summary Statistics

No. observations = 13,462
F Statistic (prob.) = 309.2 (.000)
R-Squared = .657

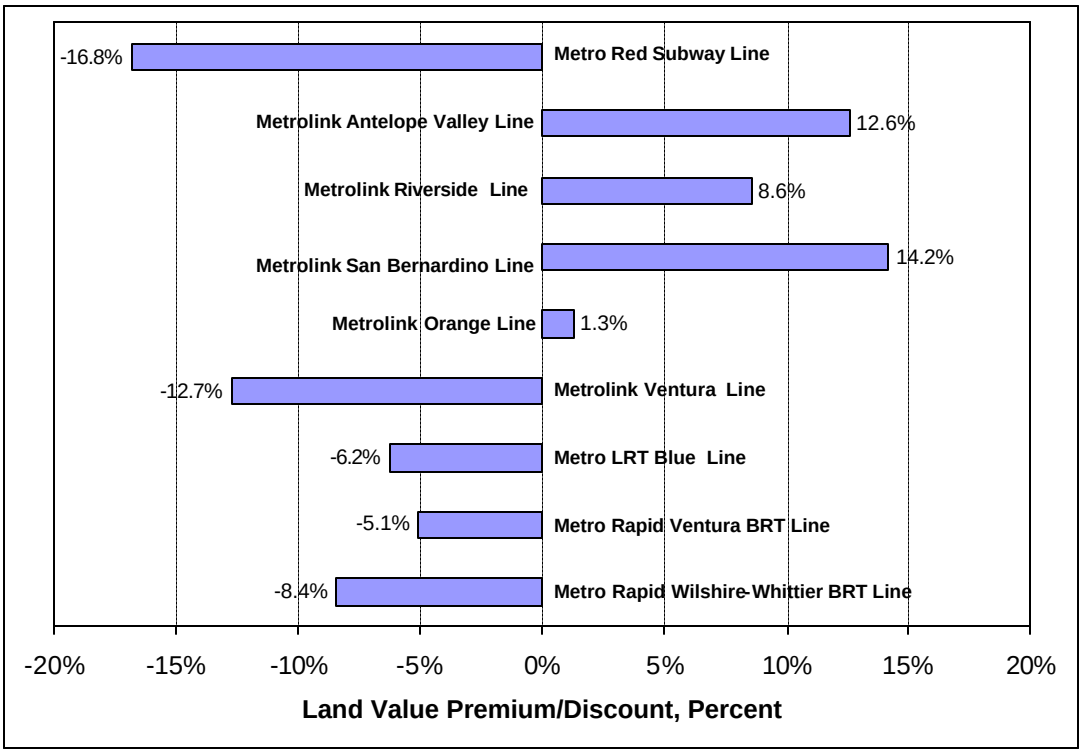

Figure 2. Condominium Land-Value Premiums or Discounts in Los Angeles County, by Rail Line

corresponded with lying within a redevelopment district. This latter association could have very well depressed condominium sales prices. These findings suggest that for-sale housing units, like condominiums, that lie in built-up urban districts suffer from the association of being in "blighted" districts, the very definition used to designate redevelopment zones.

5.3 Single-Family Housing

How about detached for-sale housing units? Did their experiences mirror those of condominiums? Table 4 suggests "yes", with a few exceptions. Again, residential parcels near Antelope Valley and Riverside Metrolink stations accrued benefits, as reflected by single-family home prices. Premiums for other

Table 4. Single-Family Housing Properties: Hedonic Price Model Results — Factors Influencing Year 2000 Condominium Sales Price in Los Angeles County; Year 2000 data, unless otherwise noted

Variable	Coeffi-cient	Standard Error	Prob. Value
Rail/Highway Proximity			
Subway (Red Line); within ½ mile of rail station (1=yes; 0=no)	-18,469.4	12,960.0	.154
Metrolink Antelope Valley Line: within ½ mile of station (1=yes; 0=no)	25,675.3	12,608.3	.059
Metrolink Orange County Line: within ½ mile of station (1=yes; 0=no)	2,273.3	31,402.7	..942
Metrolink Riverside Line: within ½ mile of station (1=yes; 0=no)	27,770.7	27,037.8	.304
Metrolink San Bernardino Line: within ½ mile of station (1=yes; 0=no)	6,164.2	10,480.1	.556
Metrolink Ventura Line: within ½ mile of station (1=yes; 0=no)	-1,591.7	14,410.3	.912
LRT Blue Line: within ½ mile of rail station (1=yes; 0=no)	13,351.5	7,654.0	.081
LRT Green Line: within ½ mile of rail station (1=yes; 0=no)	-7,073.6	7,419.1	.340
BRT Ventura Line: within ¼ mile of bus stop (1=yes; 0=no)	-23,810.7	12,900.0	.065
BRT Wilshire-Whittier Line: within ¼ mile of bus stop (1=yes; 0=no)	-59,053.2	8,372.1	.000
Highway/Freeway: within ½ mile of grade-separated highway or freeway	-10,831.5	1,561.7	.000
Accessibility and Location			
Regional Job Accessibility by Auto: No. jobs (in 1,000s, 1995) within 45 minutes peak-period auto travel time on highway network	53.6	1.4	.000
Pacific coastline: within ½ straightline miles	146,082.2	7,328.3	.000
Property Attributes			
Structure Age, Years	558.2	55.8	.000
Structure Size, Square feet	190.9	1.9	.000
Bathrooms, total number	21,481.7	1,490.7	.000
Bedrooms, total number	-22,788.0	1,077.9	.000
No. Stories	-21,830.3	2,366.6	.000
Neighborhood Attributes			
Population Density: Persons per gross acre within one mile radius of parcel	-1,187.8	160.5	.000
Employment Density: Workers per gross acre within one mile radius of parcel	-1,509.8	219.5	.000
Mean Household Income within one mile radius of parcel, $, 2000	3.14	0.23	.000
White Household: proportion of households within one mile radius of parcel of white race	231,957.6	5,999.1	.000
Youth: proportion of population residing within one mile radius of parcel that is age 18 or less	-529,605.0	21,696.8	.000
Seniors: proportion of population residing within one mile radius of parcel that is age 65 or more	-542,444.3	31,369.5	.000

Table 4 (continued)

City (or CDP) Fixed Effects (1=yes, 0=no)			
Arcadia	46,249.7	7,243.4	.000
Artesia	-30,231.0	14,398.3	.036
Azusa	63,577.3	11,716.4	.000
Baldwin Hills	57,314.7	7,603.1	.000
Bell	8,753.1	16,416.9	.594
Bellflower	-63,619.9	8,006.4	.000
Beverly Hills	660,717.7	12,888.1	.000
Bradbury	85,021.2	36,763.6	.021
Carson	-24,131.0	6,544.7	.000
Claremont	-31,124.3	9,549.4	.001
Diamond Bar	-32,235.8	8,658.0	.000
Downey	-63,185.6	5,284.9	.000
Duarte	35,821.3	13,189.4	.007
El Monte	22,042.3	7,886.7	.005
El Segundo	-25,289.9	15,653.6	.106
Gardena	-14,084.5	10,502.4	.180
Glendale	-17,948.5	5,121.5	.000
Glendora	-23,382.6	7,399.1	.002
Hawaiian Gardens	-15,106.0	20,918.3	.470
Hermosa Beach	75,952.2	13,602.6	.000
Hidden Hills	522,375.3	35,488.2	.000
Industry	99,715.8	65,955.7	.131
Inglewood	-8,753.1	7,928.3	.270
Irwindale	58,071.0	59,001.7	.325
La Canada	192,713.8	9,206.5	.000
La Habra Heights	-72,492.8	20,251.1	.000
La Mirada	-59,053.3	7,426.6	.000
La Puente	63,937.5	9,770.0	.000
La Verne	-31,995.8	10,112.3	.002
Lakewood	-61,823.3	4,994.7	.000
Long Beach	-45,893.8	3,467.3	.000
Los Angeles	6,992.0	1,868.9	.000
Malibu	1,094,412.4	24,382.8	.000
Manhattan Beach	225,129.2	8,560.3	.000
Norwalk	-23,247.7	4,892.8	.000
Palos Verdes	421,009.0	21,153.8	.000
Paramount	-13,191.1	11,933.0	.269
Pasadena	47,930.5	5,130..2	.000
Pico Rivera	-4,506.1	8,181.9	.582
Pomona	37,788.5	4,926.9	.000
Rancho Palos Verdes	21,581.6	8,483.3	.000
Rolling Hills	495,602.7	93,338.7	.000
Rolling Hills Estates	265,969.5	18,095.5	.000
Rosemead	11,440.0	10,427.6	.273
San Dimas	-38,898.6	12,271.8	.002
San Fernando	78,907.1	12,561.5	.000
San Marino	262,225.6	101,54.5	.000
San Clarita	-8,280.7	6,381.1	.194
Santa Monica	396,385.9	10,427.2	.000
Sierra Madre	-14,036.7	16,025.8	.381
South El Monte	25,174.9	18,204.1	.167
South Pasadena	51,109.5	13,275.7	.000

Table 4 (continued)			
Torrance	54,033.7	5,440.2	.000
West Covina	13,607.9	5,415.6	.012
Westlake	87,173.8	93,292.7	.350
Whittier	-39,348.8	5,965.6	.000
Month Fixed Effects (1=yes, 0=no)			
February	3,817.3	3,939.0	.333
March	9,980.1	3,607.9	.006
April	9,888.6	3,684.8	.007
May	16,358.3	3,552.5	.000
June	15,150.2	3,562.7	.000
July	18,808.1	3,639.6	.000
August	20,827.9	3,528.0	.000
September	26,080.9	3,593.5	.000
October	20,947.0	3,779.6	.000
November	23,646.1	3,633.7	.000
December	23,267.5	3,606.7	.000
Constant	-35,355.0	11,770.7	.003
Summary Statistics			
No. observations = 40,966			
F Statistic (prob.) = 1,048.9 (.000)			
R-Squared = .698			

commuter-rail lines were more modest, and again, the Ventura Line yielded negative effects. Discounts were also registered for single-family homes within a half-mile of Red Line subway stations, although there were relatively few such records in the data base. The only instance where a coefficient sign flip-flopped was for the Blue LRT line – single-family homes sold within a half-mile of stations on the Blue line reaped a modest benefit of around $13,000. Negative impacts were recorded for single-family housing sold near the Green LRT line. And as before, prices were lower for properties near BRT stops. In general, the relationships for single-family home prices were statistically less robust than in the case of condominium prices.

Control variables shown in Table 4 matched *a priori* expectations. All else being equal, single-family home prices generally rose with: job accessibility via highways; structure size; unit age; number of bathrooms; neighborhood income; and non-minority neighborhood composition. In contrast to previous findings, being in dense settings – reflected by building heights as well as neighborhood population and employment densities – generally lowered single-family home prices. Being within a half-mile of a freeway also lowered values whereas being within a half mile of the Pacific coastline raised them, on average by nearly $150,000. Having a prestigious address, like Beverly Hills or Malibu, also dramatically increased single-family home prices, by well over a million dollars in the latter case.

Expressing the hedonic price results in relative terms, Figure 3 shows the largest premiums were in the neighborhood of 7 percent. Single-family homes near both BRT corridors had the largest "value-losses", as high as 15 percent in the case of the Wilshire-Whittier BRT corridor. While BRT services had generally been in existence for less than one year at the time of these sales transactions, nevertheless the marketplace appeared to be attaching negative values to homes sold near Metro Rapid stops. Whether this is due to other factors associated with BRT stops that were not explicitly controlled for in the analysis is unclear, as is whether these relationships will hold over the long run.

5.4 Commercial Properties

Commercial real estate should reap benefits from being near transit stops to the degree that proximity increases job access and retail sales. Table 5 shows that offices, shops, hotels, and other commercial properties benefited from being near transit in the cases of two Metrolink lines, both LRT lines, and both BRT lines. Relationships were not statistically significant, however, except in the case of the

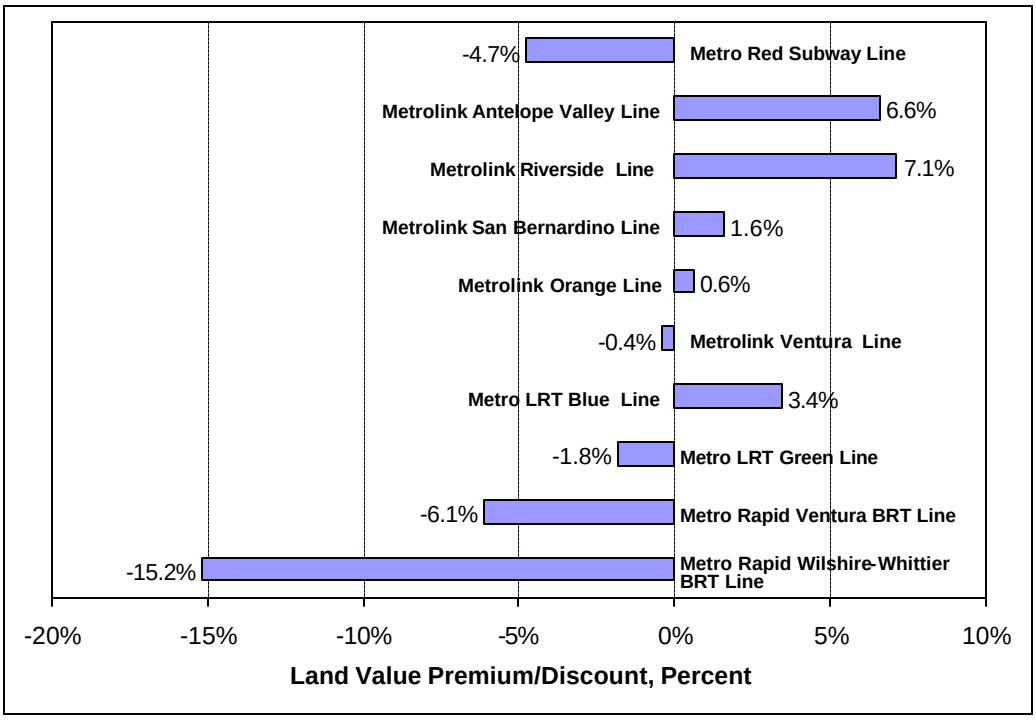

Figure 3. Single-Family Housing Land-Value Premiums or Discounts in Los Angeles County, by Rail Line

Table 5. Commercial Properties: Hedonic Price Model Results — Factors Influencing Commercial Sales Price in Los Angeles County; Year 2000 data, unless otherwise noted

Variable	Coeffi-Cient	Standard Error	Prob. Value
Rail/Highway Proximity			
Subway (Red Line); within ½ mile of rail station (1=yes; 0=no)	-272,451.7	99,635.6	.000
Metrolink Antelope Valley Line: within ¼ mile of station (1=yes; 0=no)	136,928.6	259,948.7	.598
Metrolink Riverside Line: within ¼ mile of station (1=yes; 0=no)	-594,334.0	252,741.0	.019
Metrolink San Bernardino Line: within ¼ mile of station (1=yes; 0=no)	217,779.0	199,371.5	.275
Metrolink Ventura Line: within ¼ mile of station (1=yes; 0=no)	-45,640.8	158,225.0	.773
LRT Blue Line: within ¼ mile of rail station (1=yes; 0=no)	14,876.6	45,055.5	.532
LRT Green Line: within ¼ mile of rail station (1=yes; 0=no)	2,573.6	8,422.3	.766
BRT Ventura Line: within ¼ mile of bus stop (1=yes; 0=no)	46,411.9	72,158.6	.520
BRT Wilshire-Whittier Line: within ¼ mile of bus stop (1=yes; 0=no)	176,044.7	74,672.3	.019
Interchange Ramp: network distance, in miles, to nearest freeway ramp	-22,761.4	10,066.4	.024
Accessibility and Location			
Regional Labor Force Accessibility by Auto: No. employed residents (in 1,000s, 1995) within 45 minutes peak-period auto travel time on highway network	148.1	70.4	.034
Regional Labor Force Accessibility by Transit: No. employed residents (in 1,000s, 1995) within 30 minutes peak-period transit travel time, automobile access (park-and-ride)	435.2	120.0	.000
Distance to Downtown, in straightline miles	-15,122.1	3,073.2	.000
Pacific coastline: within ½ straightline miles	180,576.5	61,607.7	.003
Property Attributes			
Structure Age, Years	-2,510.9	596.9	.000
Structure Size, Square feet	75.6	2.4	.000
Lot Size, Square feet	5.9	0.9	.000
Land Use Attributes			
Office (1=yes; 0=no)	-138,908.2	80,887.3	.086
Bank (1=yes; 0=no)	510,244.6	161,552.3	.002
Professional Building (1=yes; 0=no)	-147,030.4	87,638.1	.094
Restaurant (1=yes; 0=no)	-48,288.9	84,965.8	.570
Neighborhood Shopping Center (1=yes; 0=no)	-376,545.7	125,633.2	.003
Retail Store	-80,380.2	78,715.7	.307
Store and Office Combined (1=yes; 0=no)	-117,047.9	88,351.5	.185
Store and Residence Combined (1=yes; 0=no)	-130,085.0	79,716.7	.103
City (or CDP) Fixed Effects (1=yes, 0=no)			
Agoura Hills	16,659.9	205,270.1	.417
Alhambra	245,333.0	77,017.7	.001
Arcadia	78,522.1	104,172.6	.451
Artesia	281,666.7	174,222.0	.106
Beverly Hills	917,715.9	248,707.5	.000
Carson	239,982.1	123,242.5	.052
Cerritos	462,424.2	246,345.1	.061
Compton	144,164.3	78,534.0	.067
El Monte	122,568.0	74,163.9	.099
Glendora	-170,210.4	96,857.5	.079
Hawaiian Gardens	-108,931.5	201,003.6	.588
Los Angeles	97,125.6	28,476.9	.001

Table 5 (continued)			
Malibu	696,685.5	229,366.7	.002
Manhattan Beach	244,516.7	133,586.8	.067
Monterey Park	181,744.0	15,5242.5	.242
Palmdale	334,743.1	34,7917.0	.336
Palos Verdes	508,162.4	254,516.2	.046
Paramount	83,806.3	111,319.8	.452
Pasadena	73,836.7	62,576.4	.238
Pico Rivera	-296,923.4	116,676.2	.011
Pomona	183,495.9	79,525.6	.021
Rosemead	233,681.0	154,524.0	.131
San Gabriel	175,062.3	87,895.9	.047
San Marino	198,510.7	154,821.6	.200
Santa Clarita	-109,242.6	186,558.8	.558
Santa Monica	329,676.9	97,029.2	.001
Signal Hill	240,600.0	243,062.1	.322
South Gate	60,283.8	72,450.6	.406
West Covina	-111,349.4	124,563.5	.372
West Hollywood	163,203.7	176,998.4	.357
Annual Fixed Effects (1=yes, 0=no)			
2000	35,176.9	30,210.5	.245
2001	5,946.8	47,532.9	.211
Constant	397,686.4	168,209.9	.018
Summary Statistics			
No. observations = 1,241			
F Statistic (prob.) = 47.58 (.000)			
R-Squared = .700			

Wilshire-Whittier Metro Rapid bus corridor. Also, in the case of the Red Line subway and two of the commuter rail lines, negative price effects were recorded. Again, an uneven and unclear picture emerges, with commercial properties appearing to benefit from the presence of high-performance transit in some corridors and worse off in others. Because most relationships were not statistically significant, perhaps the most one can say is the link between proximity to high-performance transit and commercial land values in recent years was weak in Los Angeles County.

Control variables shown in Table 5 align with expectations. Offices, restaurants, retail shops, and other commercial uses were worth more as the numbers of households that could be reached within 45 minutes travel-time by car or 30-minutes by transit increased. The land-rent gradient as a function of distance from downtown Los Angeles was downward sloping. Being within a half-mile of the coast increased commercial land prices by, on average, $180,000. Values also rose with structure and lot sizes. Holding other factors constant (including structure size), properties used for banks tended to go for more than those used for offices, retail, and other commercial uses. The largest municipal premiums were in Bevery Hills, Malibu, and Palos Verdes, all over a half million dollars. Lastly, commercial values generally increased after 1999 (the suppressed time-

series category).

In relative terms, Figure 4 reveals that, among all land uses, the largest land-value premiums and discounts associated with being near transit were for commercial properties. The San Bernardino and Antelope Valley Metrolink lines and the Wilshire-Whittier BRT corridor reaped the largest percentage gains, while the Metrolink Riverside line and Metro Red subway corridor experienced the largest value-losses. Why this particular pattern emerged is unclear, however local contextual factors (e.g., zoning policies) could have played a role, despite the many statistical controls introduced in the analysis. The presence of large premiums for commercial properties along the Wilshire-Whittier BRT corridor also stand out, in contrast to the discounts registered for commercial properties along the Red Line subway. Because the Wilshire Boulevard corridor contains some of Southern California's most prestigious office and retail addresses, parcels sold near BRT could have reflected this association. In that some of the control variables, like city of sale, picked up the influences of locational factors, there would appear to be some value-added to commercial properties well-served by Metro Rapid buses.

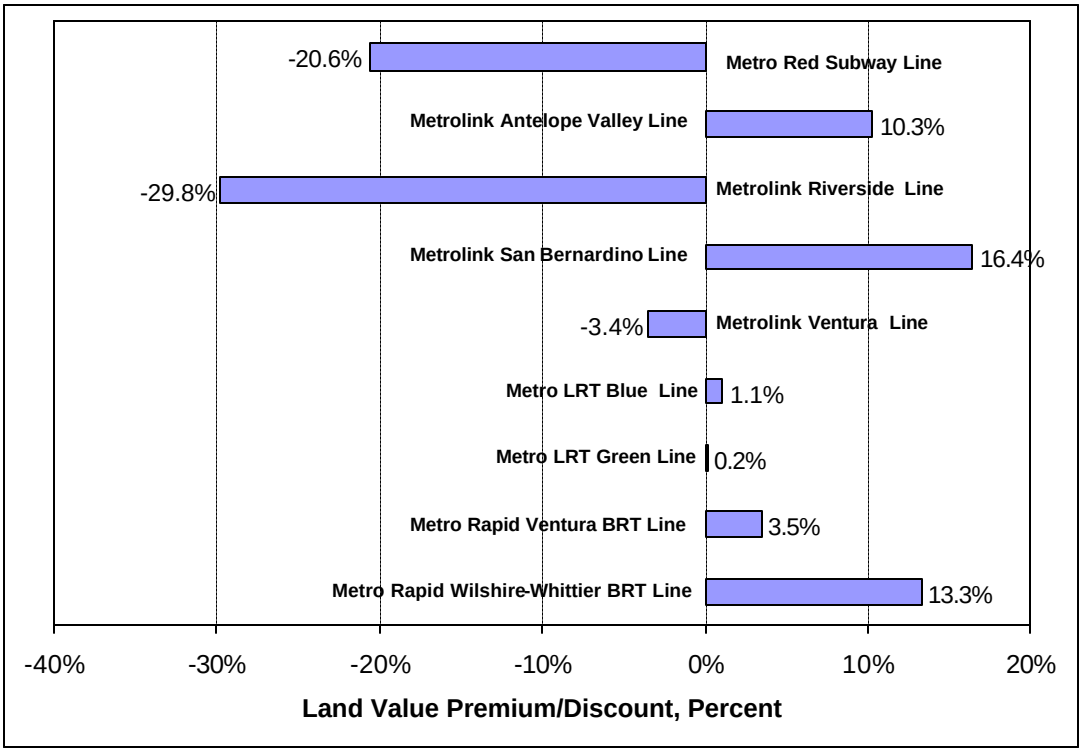

Figure 4. Commercial Land-Value Premiums or Discounts in Los Angeles County, by Rail Line

6. CONCLUSION

Compared to experiences in Santa Clara County and San Diego County, land-value impacts of high-performance transit in Los Angeles County were uneven and inconsistent. In the case of the Red Line subway, premiums were recorded only for multi-family rental housing; for other uses, properties within half-mile rings of stations tended to sell for less. The least consistent pattern was for Metrolink stations. For the Antelope Valley and San Bernardino corridors, premiums were measured for condominiums, single-family homes, and commercial uses; discounts were found for multi-family housing. For the Metrolink Riverside line, premiums were measured for all but commercial properties. Impacts along the short segments of the Orange line that lies within Los Angeles County were inconsequential and for the Ventura line, they were generally negative. In the case of LRT lines, premiums were found for multi-family housing and commercial uses as well as single-family properties in the case of the Blue Line; discounts were found for condominiums and single-family properties in the case of the Green Line. Lastly, residential properties near BRT stops generally sold for less whereas commercial properties generally sold for more.

Why impacts were uneven and inconsistent is unclear, however one explanation for the absence of premiums and in instances the ostensible presence of discounts is that the half-mile rings around many of the County's rail and BRT stops correspond to redevelopment districts. Lying in distressed inner-city settings apparently lowers land values in many instances despite transit's presence. Los Angeles County's Community Redevelopment Agency today operates 31 redevelopment projects covering 21,065 acres, many of which are situated near rail and BRT stops. Map 4 shows the locations of various enterprise, empowerment zones, and revitalization zones -- collectively defined as redevelopment districts – that lie in the County. Many align along the Red Line, the LRT corridors, the Wilshire-Whittier BRT line, and central-city portions of Metrolink lines. Other corridors, like the Ventura BRT line, are substantially outside of the redevelopment zones, thus other factors, including proximity to transit itself, are explaining value-losses. Because some of the County's high-performance transit services are relatively new, land value trends should be monitored in order to gauge longer term impacts.

Map 4. Locations of Redevelopment Districts in Los Angeles County

APPENDIX

Variable	Description
parcel	parcel id number / from metroscan
price	sales price / from most recent sale as recorded in metroscan
assdland	assesed value of land recorded in metroscan
assdstr	assessed value of structure recorded in metroscan
assdtot	total assessed value of parcel recorde in metrocan
str_age	age of structure (2002 - year built) / from metroscan
sqft_str	structure square footage / from metroscan
sqft_lot	lot square footage / from metroscan
sqft_use	usable lot square footage / from metroscan
totunits	number of units on parcel / from metroscan
bathroom	number of bathrooms on parcel / from metroscan
bathunit	average bathrooms per unit
bedroom	number of bedrooms on parcel / from metroscan
bedunit	average bedrooms per unit
garagesp	number of garage spaces on parcel / from metroscan
stories	building stories form metroscan
improved	percent of parcel that is improved / from metroscan, scale 0 -100
class	building class / from metroscan
bus_v	distance (miles) from nearest ventura rapid bus stop
bus_w	distance (miles) from nearest wilshire-whittier rapid bus stop
blueline	distance (miles) from nearest blue line station
grnline	distance (miles) from nearest green line station
redline	distance (miles) from nearest red line station
cr_av	distance (miles) from nearest metrolink station on the antelope valley line
cr_or	distance (miles) from nearest metrolink station on the orange line
cr_ri	distance (miles) from nearest metrolink station on the riverside line
cr_sb	distance (miles) from nearest metrolink station on the san bernadino line
cr_ve	distance (miles) from nearest metrolink station on the ventura line
shore	distance (miles) from the pacific shore line
kern	distance (miles) from kern county boundary
orange	distance (miles) from orange county boundary
sb	distance (miles) from san bernadino county boundary
ventura	distance (miles) from ventura county boundary
hwy_sl	straight line distance from the nearest limited access road
ramp_sl	straight line distance from the nearest limited access road ramp
ramp_net	network distance from the nearest limited access road ramp
dt_sl	straight line distance from downtown LA (7th St/Metro Center Station)
dt_net	network distance from downtown LA (7th St/Metro Center Station) without using limited access roads
vbus_q	within 1/4 mile of ventura rapid bus stop
vbus_h	within 1/2 mile of ventura rapid bus stop
wbus_q	within 1/4 mile of wilshire-whittier rapid bus stop
wbus_h	within 1/2 mile of wilshire-whittier rapid bus stop
blue_q	within 1/4 mile of blue line station

blue_h	within 1/2 mile of blue line station
green_q	within 1/4 mile of green line station
green_h	within 1/2 mile of green line station
red_q	within 1/4 mile of red line station
red_h	within 1/2 mile of red line station
av_q	within 1/4 mile of antelop valley Metrolink station
av_h	within 1/2 mile of antelop valley Metrolink station
or_q	within 1/4 mile of orange Metrolink station
or_h	within 1/2 mile of orange Metrolink station
ri_q	within 1/4 mile of riverside Metrolink station
ri_h	within 1/2 mile of riverside Metrolink station
sb_q	within 1/4 mile of san bernardino Metrolink station
sb_h	within 1/2 mile of san bernardino Metrolink station
ve_q	within 1/4 mile of ventura Metrolink station
ve_h	within 1/2 mile of ventura Metrolink station
hwy_q	within 1/4 mile of grade separated road
hwy_h	within 1/2 mile of grade separated road
hwy_1	within 1 mile of grade separated road
shore_q	within 1/4 mile of shoreline
shore_h	within 1/2 mile of shoreline
shore_1	within 1 mile of shoreline
income	average houshold income within 1 mile of parcel / from 2000 SCAG TAZ data
pop_cen	population within 1 mile radius / from 2000 census block data
pop_fem	female population within 1 mile radius / from 2000 census block data
pop_wht	white population within 1 mile radius / from 2000 census block data
pop_blk	black population within 1 mile radius / from 2000 census block data
pop_his	hispanic (all races) population within 1 mile radius / from 2000 census block data
pop_asn	asian population within 1 mile radius / from 2000 census block data
pop_ain	american indian population within 1 mile radius / from 2000 census block data
pop_pac	pacific islander population within 1 mile radius / from 2000 census block data
pop_18	population under age 18 within 1 mile radius / from 2000 census block data
pop_65	population age 65 and over within 1 mile radius / from 2000 census block data
pop_age	average age of population within 1 mile radius / from 2000 census block data
unit_tot	housing units within 1 mile radius / from 2000 census block data
unit_occ	occupied housing units within 1 mile radius / from 2000 census block data
unit_own	owner occupied housing units within 1 mile radius / from 2000 census block data
pop_taz	population within 1 mile radius / from 2000 SCAG TAZ data
pop_res	residential population within 1 mile radius / from 2000 SCAG TAZ data
pop_work	civilian workers living within 1 mile radius / from 2000 SCAG TAZ data
hh_tot	households living within 1 mile radius / from 2000 SCAG TAZ data
hh_sing	single unit households within 1 mile radius / from 2000 SCAG TAZ data
emp_tot	total jobs within 1 mile radius / from 2000 SCAG TAZ data
emp_ret	retail jobs within 1 mile radius / from 2000 SCAG TAZ data
emp_ser	service jobs within 1 mile radius / from 2000 SCAG TAZ data
p_white	proportion white population within 1 mile radius / from 2000 census block data
p_black	proportion black population within 1 mile radius / from 2000 census block data
p_hisp	proportion hispanic (all races) population within 1 mile radius /2000 census block data
p_asian	proportion asian population within 1 mile radius / from 2000 census block data

p_aind	proportion american indian population within 1 mile radius / 2000 census block data
p_pacf	proportion pacific islander population within 1 mile radius / 2000 census block data
p_18	proportion population under age 18 within 1 mile radius / 2000 census block data
p_65	proportion population age 65 and over within 1 mile radius / 2000 census block data
p_vacant	proportion housing units that are vacant within 1 mile radius / 2000 census block data
p_own	prop. of housing units that are owner occupied within 1 mile radius / 2000 census block data
p_work	prop.of residential population that are civilian workers within 1 mile radius / 2000 SCAG TAZ data
p_hhsing	prop.of households that are single unit households within 1 mile radius / 2000 SCAG a TAZ data
p_retail	proportion of jobs that are retail within 1 mile radius / from 2000 SCAG TAZ data
p_ser	proportion of jobs that are service within 1 mile radius / from 2000 SCAG TAZ data
acre_wat	water acreage within 1 mile radius / from 2000 census block data
acre_lnd	land acreage within 1 mile radius / from 2000 census block data
den_pop	population per acre within 1 mile / from 2000 census block data
den_unit	units per acre within 1 mile / from 2000 census block data
den_emp	jobs per acre within 1 mile / from 2000 SCAG TAZ data
a60er	no. of civilian workers (2000) living within 60 minutes (1997 SCAG travel times) by auto
a45er	no. of civilian workers (2000) living within 45 minutes (1997 SCAG travel times) by auto
a30er	no. of civilian workers (2000) living within 30 minutes (1997 SCAG travel times) by auto
a15er	no. of civilian workers (2000) living within 15 minutes (1997 SCAG travel times) by auto
tw60er	no. of civilian workers (2000) living within 60 minutes by transit-walking access
tw45er	no. of civilian workers (2000) living within 45 minutes by transit-walking access
tw30er	no. of civilian workers (2000) living within 30 minutes by transit-walking access
tw15er	no. of civilian workers (2000) living within 15 minutes by transit-walking access
ta60er	no. of civilian workers (2000) living within 60 minutes by transit-auto access
ta45er	no. of civilian workers (2000) living within 45 minutes by transit-auto access
ta30er	no. of civilian workers (2000) living within 30 minutes by transit-auto access
ta15er	no. of civilian workers (2000) living within 15 minutes by transit-auto access
a60job	number of jobs (2000) living within 60 minutes (1997 SCAG travel times) by auto
a45job	number of jobs (2000) living within 45 minutes (1997 SCAG travel times) by auto
a30job	number of jobs (2000) living within 30 minutes (1997 SCAG travel times) by auto
a15job	number of jobs (2000) living within 15 minutes (1997 SCAG travel times) by auto
tw60job	no. of jobs (2000) living within 60 minutes by transit-walking access
tw45job	no. of jobs (2000) living within 45 minutes by transit-walking access
tw30job	no. of jobs (2000) living within 30 minutes by transit-walking access
tw15job	no. of jobs (2000) living within 15 minutes by transit-walking access
ta60job	no. of jobs (2000) living within 60 minutes by transit-auto access
ta45job	no. of jobs (2000) living within 45 minutes by transit-auto access
ta30job	no. of jobs (2000) living within 30 minutes by transit-auto access
ta15job	no. of jobs (2000) living within 15 minutes by transit-auto access
city_met	city where the parcel is located, as defined in the metroscan database, including unincorporated Census Designated Places (CDPs)
incorp	parcel is in incorporated area / from census places (dummy)
agoura_h	in incorported city of agoura hills / from census places (dummy)
alhambra	in incorported city of alhambra / from census places (dummy)
arcadia	in incorported city of arcadia / from census places (dummy)

artesia	in incorported city of artesia / from census places (dummy)
azusa	in incorported city of azusa / from census places (dummy)
baldwin_	in incorported city of baldwin park / from census places (dummy)
bell	in incorported city of bell / from census places (dummy)
bell_gar	in incorported city of bell gardens / from census places (dummy)
bellflow	in incorported city of bellflower / from census places (dummy)
beverly_	in incorported city of beverly hills / from census places (dummy)
bradbury	in incorported city of bradbury / from census places (dummy)
burbank	in incorported city of burbank / from census places (dummy)
calbasa	in incorported city of calabasas / from census places (dummy)
carson	in incorported city of carson / from census places (dummy)
cerritos	in incorported city of cerritos / from census places (dummy)
claremon	in incorported city of claremont / from census places (dummy)
commerce	in incorported city of commerce / from census places (dummy)
compton	in incorported city of compton / from census places (dummy)
covina	in incorported city of covina / from census places (dummy)
cudahy	in incorported city of cudahy / from census places (dummy)
culver_c	in incorported city of culver city / from census places (dummy)
diamond_	in incorported city of diamond bar / from census places (dummy)
downey	in incorported city of downey / from census places (dummy)
duarte	in incorported city of duarte / from census places (dummy)
el_monte	in incorported city of el monte / from census places (dummy)
el_segun	in incorported city of el segundo / from census places (dummy)
gardena	in incorported city of gardena / from census places (dummy)
glendale	in incorported city of glendale / from census places (dummy)
glendora	in incorported city of glendora / from census places (dummy)
hawaii_g	in incorported city of hawaii gardens / from census places (dummy)
hawthorn	in incorported city of hawthorne / from census places (dummy)
hermosa_	in incorported city of hermosa beach / from census places (dummy)
hidden_h	in incorported city of hidden hills / from census places (dummy)
huntingt	in incorported city of huntington park / from census places (dummy)
industry	in incorported city of industry / from census places (dummy)
inglewoo	in incorported city of inglewood / from census places (dummy)
inwindal	in incorported city of irwindale / from census places (dummy)
la_canad	in incorported city of la canada-flintridge / from census places (dummy)
la_habra	in incorported city of la habra heights / from census places (dummy)
la_mirad	in incorported city of la mirada / from census places (dummy)
la_puent	in incorported city of la puente / from census places (dummy)
la_verne	in incorported city of la verne / from census places (dummy)
lakewood	in incorported city of lakewood / from census places (dummy)
lancaste	in incorported city of lancaster / from census places (dummy)
lawndale	in incorported city of lawndale / from census places (dummy)
lomita	in incorported city of lomita / from census places (dummy)
long_bea	in incorported city of long beach / from census places (dummy)
los_ange	in incorported city of los angeles / from census places (dummy)
lynwood	in incorported city of lynwood / from census places (dummy)
malibu	in incorported city of malibu / from census places (dummy)
manhatta	in incorported city of manhattan beach / from census places (dummy)

maywood	in incorported city of maywood / from census places (dummy)
monrovia	in incorported city of monrovia / from census places (dummy)
montebel	in incorported city of montebello / from census places (dummy)
monterey	in incorported city of monterey park / from census places (dummy)
norwalk	in incorported city of norwalk / from census places (dummy)
palmdale	in incorported city of palmdale / from census places (dummy)
palos_ve	in incorported city of palos verdes estates / from census places (dummy)
paramoun	in incorported city of paramount / from census places (dummy)
pasedena	in incorported city of pasadena / from census places (dummy)
pico_riv	in incorported city of pico rivera / from census places (dummy)
pomona	in incorported city of pomona / from census places (dummy)
rancho_p	in incorported city of rancho palos verdes / from census places (dummy)
redondo_	in incorported city of redondo beach / from census places (dummy)
roll_h	in incorported city of rolling hills / from census places (dummy)
roll_h_e	in incorported city of rolling hills estates / from census places (dummy)
rosemead	in incorported city of rosemead / from census places (dummy)
san_dima	in incorported city of san dimas / from census places (dummy)
san_fern	in incorported city of san fernando / from census places (dummy)
san_gabr	in incorported city of san gabriel / from census places (dummy)
san_mari	in incorported city of san marino / from census places (dummy)
santa_cl	in incorported city of santa clarita / from census places (dummy)
santa_fe	in incorported city of santa fe springs / from census places (dummy)
santa_mo	in incorported city of santa monica / from census places (dummy)
sierra_m	in incorported city of sierra madre / from census places (dummy)
signal_h	in incorported city of signal hill / from census places (dummy)
south_el	in incorported city of south el monte / from census places (dummy)
south_ga	in incorported city of south gate / from census places (dummy)
south_pa	in incorported city of south pasedena / from census places (dummy)
temple_c	in incorported city of temple city / from census places (dummy)
torrance	in incorported city of torrance / from census places (dummy)
walnut	in incorported city of walnut / from census places (dummy)
west_cov	in incorported city of west covina / from census places (dummy)
west_hol	in incorported city of west hollywood / from census places (dummy)
westlake	in incorported city of westlake village / from census places (dummy)
whittier	in incorported city of whittier / from census places (dummy)
jan	sold in january / from metroscan (dummy)
feb	sold in february / from metroscan (dummy)
mar	sold in march / from metroscan (dummy)
apr	sold in april / from metroscan (dummy)
may	sold in may / from metroscan (dummy)
jun	sold in june / from metroscan (dummy)
jul	sold in july / from metroscan (dummy)
aug	sold in august / from metroscan (dummy)
sep	sold in september / from metroscan (dummy)
oct	sold in october / from metroscan (dummy)
nov	sold in november / from metroscan (dummy)
dec	sold in december / from metroscan (dummy)
y98	sold in 1998 / from metroscan (dummy)

y99	sold in 1999 / from metroscan (dummy)
y00	sold in 2000 / from metroscan (dummy)
y01	sold in 2001 / from metroscan (dummy)
landuse	land use description / from metroscan
convert	parcel is condo conversion / from metroscan (dummy)
unit_2	parcel is 2 unit complex / from metrocan (dummy)
unit_3	parcel is 3 unit complex / from metrocan (dummy)
unit_4	parcel is 4 unit complex / from metrocan (dummy)
unit_5up	parcel is 5+ unit complex / from metrocan (dummy)
unit_bad	the number of units in the "totunits" variable does not match the number of units described in the "land use" variable (dummy)
pool	complex has a pool / from metrocan (dummy)
bank	parcel is "bank, savings and loans" / from metrocan (dummy)
off_res	parcel is "office building, with residence" / from metrocan (dummy)
office	parcel is "office building" / from metrocan (dummy)
prof	parcel is "professional building" / from metrocan (dummy)
restrnt	parcel is "resaurant, cocktail lounge" / from metrocan (dummy)
shop_nbr	parcel is "shopping center, neighborhood" / from metrocan (dummy)
shop_reg	parcel is "shopping center, regional" / from metrocan (dummy)
str_off	parcel is "store and office combination" / from metrocan (dummy)
str_res	parcel is "store and residence combination" / from metrocan (dummy)
store	parcel is "store" / from metrocan (dummy)
loft	parcel is "loft type building" / from metrocan (dummy)
story_2	parcel is "2 story building" / from metrocan (dummy)
story_3	parcel is "3 story building" / from metrocan (dummy)
story_5	parcel is "5 story building" / from metrocan (dummy)