TRANSIT STATION AREA MARKET STUDY

Prepared for

Capital Metropolitan Transportation Authority

by

Economics Research Associates
Spitzer & Associates
ERA Project No. 16339
Table of Content

**Introduction**  
1

**Highlights of Literature Review**  
3

**Literature Review**  
6

- The Initial Economic Impacts of the DART LRT System  
  6

- Figure 3 Average Percent Price Premium for Study Properties  
  7

- An Assessment of the DART LRT on Taxable Property Valuations and Transit Oriented Development  
  8

- Figure 4 Changes in Median Property Valuations, 1997–2001  
  9

- "Land Value Impacts of Rail Transit Services in San Diego County"  
  9

- Figure 1 Price Premium by Parcel Type  
  11

- Commercial Rents and Transportation Improvements: Case of Santa Clara County’s Light Rail  
  13

- Figure 2 Distribution Distance of Parcels  
  14

- Transit’s Value-Added: Effects of Light and Commuter Rail Services on Commercial Land Values  
  15

- Benefits of Proximity to Rail on Housing Markets: Experiences in Santa Clara County  
  17

  18

- Light-Rail Transit in America: Policy Issues and Prospects for Economic Development  
  19

  21

**Bibliography**  
31
Introduction

Ask any real estate professional what has the greatest effect on property value and development and they will respond simply with “Location, Location, Location.” Influences on location can be attributed to a number of factors including strength of the local economy and public policies, accessibility to valued amenities, characteristics of the property’s improvement and market area demographics. Access to public transit can be considered a valued amenity. In theory, properties located near transit stations enjoy increased regional accessibility, more mobility options and reduced transportation costs; and thus, if appreciated the amenity would be reflected in the value of the property and the intensity of development near the transit access point.

Economics Research Associates (ERA) was retained by Capital Metro to conduct Transit Oriented Development Market Studies for the anticipated commuter rail and bus rapid transit expansions. Task I of the project is to deliver a brief summary of literature and case studies which discuss land value increases and development impact in other regions that have introduced similar rail projects within the last decade. ERA searched the databases of libraries and transit research institutes in the United State to gather relevant information on the effect rail based transit has had on property value and real estate development. In all over 30 academic studies were reviewed. For this literature review, ERA selected only those studies that were most significant and relevant to Austin. The following literature review consists of academic studies covering five metropolitan areas. The studies address transit’s effect on both property value and real estate development.

There is a plethora of academic research on the relationship between proximity to a transit access point and property value; however, there is only a limited amount of research quantifying transit’s effect on real estate development. This report includes a literature review of nine academic studies, all conducted within the last decade.

The included studies reviewed the following metropolitan areas: Dallas, Texas, San Diego, California, San Jose, California, Portland, Oregon and St. Louis, Missouri. These metropolitan regions were selected because of their similarity with Austin.
with respect to recent population growth, downtown revitalization, status as non-traditional transit hubs and strong historical relationship with the automobile. Like Austin, these regions have experienced rapid population growth over the last decade and are trying to reconcile how to expand and absorb the growth in order to increase density and preserve the region’s unique identity; while developing and growing during the age of the automobile and the popularity of low-density development. Furthermore, all of these cities are participating in the national trend of downtown revitalization. All of these regions have rail transit systems; some like San Diego and San Jose have both commuter and light rail systems. While the age of the system, the local economies and public policies vary greatly among the selected metropolitan regions all of the studies found that rail can have a positive effect on property value and real estate development. However, the intensity of the effect varies depending on the region’s public policy, market demand and quality of transit service.
Highlights of Literature Review

All of the studies included in this literature review confirmed that for properties located within walking distance (up to a half a mile in most cases) of a transit access point, the introduction of a rail-based transit system will ultimately have a positive influence on property value and development. However, as confirmed in Robert Cervero’s extensive study on Transit Oriented Development, supportive local policies and demographics, well designed stations, efficient and effective transit systems, and a strong real estate market must exist for transit to have a significant effect on property value and development.¹ Benefits associated with a close proximity to transit are thought to be greatest and development typically most profitable, as found in the studies of Dallas, San Jose, and San Diego, in fast-growing, congested areas with a buoyant economy and transit supportive public policies.²

With the introduction of rail-based transit, residents and property owners have increased mobility. While this increased mobility can be viewed as an amenity, a negative nuisance effect can also occur. Rail transit systems, particularly heavy or commuter rail lines can produce excessive noise, air pollution, increased bus and automobile traffic. These nuisances can particularly affect properties located adjacent to the rail line itself. However, with thoughtful system design and careful vehicle selection, the negative nuisance effect can be minimized.³ As concluded in all of the reviewed studies, access to rail is valued and there is little evidence to suggest that proximity to rail actually decreases property value.⁴ Overall the accessibility effect negates the nuisance effect creating a net positive effect on property value for properties within walking distance of a rail station.

Residential and commercial properties value transit for different reasons. For residential properties improved access to transit can ease the commute to work and reduce travel cost. For commercial properties transit access gives them greater exposure to the rest of the community by increasing the number of citizens who can access the businesses, as employees or clients, and services located on the property.⁵ The majority of the academic studies evaluated rail’s effect on residential rather than commercial properties. When studies evaluated both commercial and
residential properties, as was the case in the San Diego, San Jose and Dallas
studies, researchers found rail transit to have a greater effect on commercial rather
than residential property value. Furthermore, as was identified in the studies of San
Diego and San Jose, if both commuter and light rail systems service the area,
researchers determined that commuter rail had a stronger effect on property value.\(^6\)
Thus, one can conclude that a commercial property located within walking distance
of a commuter rail station will experience the greatest price premium as a result of
the introduction of a rail based transit system.

However, simply building a rail based transit system will not automatically
increase property value and stimulate development. As discussed Cervero’s 2004
study of Transit Oriented Development, a number of other factors must also exist
for the transit system to have a positive effect on property value. These factors
include the existence of public policy that encourages transit oriented development;
a community whose demographics indicate that they will be highly inclined to
utilize transit; a transit system that is reliable and effective in both service and
design; a strong real estate market; and station design that encourages transit use
and decreases potential nuisance effects.\(^7\) As Robert Cervero noted “transit guides
rather than creates growth, and by itself rarely affects significant land use
changes.”\(^8\)

Furthermore, as the studies of San Diego, San Jose and Portland concluded,
transit’s positive effect on property value increases with system maturity. As a
transit system ages, the residents of the area begin to incorporate the use of the
system into their every day activities. In addition, as a system matures, it typically,
as was the case in all of the regions included in this study, increases its service area
and frequency of service. The residents of the community place a greater value on
transit access as they experience increased access due to the expanded service area
and increase in service frequency.

The majority of these studies utilized hedonic price modeling to quantify rail’s
effect on property value. Hedonic modeling is a regression model that is used to
explain how consumers value the different attributes that comprise real property.
The methodology attempts to control the different attributes of real property to
determine if the study variable has an effect on the overall price of the property. In the case of these studies the study variable is the property’s distance to a rail station or track. Only Weinstein’s 2002 study of Dallas and Cervero’s 2004 study of Transit Oriented Development utilized interviews in addition to other research methodologies.

While the strength of transit’s effect on property value and development varies among the regions, all of the academic studies agree on the following:

- Rail-based transit can have a positive effect on property value.
- Properties within walking distance of a rail station experience the greatest benefit.
- Transit’s positive accessibility effect increases with system maturity.
- Properties located in densely populated settings experience greater price premiums.
- TOD can be financially successful if there is supportive public policy and market demand.
Literature Review

The Initial Economic Impacts of the DART LRT System

Prepared by Professors Bernard L. Weinstein and Terry Clower. 1999

Bernard L Weinstein and Terry Clower, professors of applied economics at the University of North Texas, have conducted several studies of the Dallas Area Rapid Transit (DART) light rail transit system’s effect on surrounding property value and prospective development. In this initial study they focused solely on rail’s effect on surrounding property value by examining four indicators taxable: property values, commercial occupancy rates, rental rates and retail sales. Using the four indicators, the study found light rail to have a positive economic impact; specifically it found there to be about a 25 percent increase in value for properties located within a quarter mile of a DART light rail station.

In 2005, DART transported over 200,000 passengers per day across its 700-square-mile service area. The rail system is comprised of both commuter and light rail service. The light rail system commenced operations in 1996 and is currently comprised of 35 stations over 45 miles of track. Currently average weekly rider ship is about 55,000; however, by 2014, the system is projected to double in track miles significantly increasing its service area.

To determine the light rail system’s effect on total property and land value, the study reviewed, over the period of 1994 to 1998, the change in value of 700 properties within a quarter mile of 15 DART stations. Each light rail station represented a specific neighborhood. The Dallas Central Business District was treated as a single station. Samples of 160 properties located in eight comparable neighborhoods not served by DART were used as comparison for the study. The properties were grouped into five land-use categories: retail, office, residential, industrial and vacant. While some types of property did not experienced a gain, Weinstein et. al. concluded that the substantial increase in both total property and land values for properties located within a quarter mile of a DART station suggested that the system was having a positive effect. In addition, the study noted that recently announced real estate projects indicate a continued growth around DART stations.
The study found that total property value increased in 11 of the 15 neighborhoods examined. Weinstein et al. attributed the drop in the other four neighborhoods to characteristics unrelated to the introduction of the light rail line. As an example, the study inferred that the drop in property valued for the central business district, was attributed to a high level of office vacancies and the removal of some older buildings from the tax rolls. Even though the central business district experienced a drop in value, the office land-use category experienced the sharpest gain of the five land-use groups, with an average 22.6 percent gain in property value, as compared to the control group.

In addition to total property value, the study also examined the change in land value of the study group. The results for land value were similar to total property value, with an overall net gain for properties located within a quarter mile of a DART station. However, with respect to land value the greatest gain in land value occurred for the retail land-use group, with an average gain in value of 26.7 percent. The following table contains the average gain for the five land-use groups for both total property value and land value.

Figure 3
Average Percent Price Premium for Study Properties

<table>
<thead>
<tr>
<th>Value Type</th>
<th>Retail</th>
<th>Office</th>
<th>Residential</th>
<th>Industrial</th>
<th>Vacant</th>
<th>All Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Property Value</td>
<td>4.6%</td>
<td>22.7%</td>
<td>-5.2%</td>
<td>3.8%</td>
<td>-31.5%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Land Value</td>
<td>26.7%</td>
<td>10.1%</td>
<td>7.7%</td>
<td>7.7%</td>
<td>-22.6%</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

Source: Bernard L. Weinstein and Terry Clower – “The Initial Economic Impacts of the DART LRT System”

In examining occupancy and rental rates of commercial properties, Weinstein et al. also found that the introduction of light rail had a positive economic impact. For this analysis, the study looked at 200 office buildings, retail properties and industrial sites within a quarter mile of existing DART stations. The study included rates from two years prior to the start of service because Weinstein et al. surmised that rates would rise in the anticipation of the new light rail service. For the duration of the study, Class A, Class B, Class C, industrial and strip retail had an increase in occupancy and rental rates. Class A experienced the greatest increase in occupancy rates with properties within the study area experiencing an
80 to 88 percent increase in occupancy rates while the rest of Dallas only rose one percent. Community retail properties (defined as properties with at least one major retail anchor) experienced a slight decrease in occupancy rates and a 29 percent increase in rental rates; meanwhile, occupancy and rental rates for neighborhood retail establishments experienced a minimal positive effect. Regional mall occupancy remained at 100 percent over the course of the study however rental rates increased by 20 percent.

An Assessment of the DART LRT on Taxable Property Valuations and Transit Oriented Development


This study is a follow up to Weinstein and Clower’s 1999 study of DART’s economic impact. While a slightly different methodology was utilized, the study found that DART continued to have a positive influence on property value within a quarter mile of the station. In addition to analyzing property value with respect to proximity to a DART station, this study also discussed how DART influenced Transit Oriented Development in the Dallas suburbs. In general, the report concluded that DART continues to have a positive effect on property value and economic development in the Dallas, Texas metropolitan region.

The study analyzed property value for all properties located within a quarter mile radius of 23 rail stations for the time frame of 1997 to 2001. Unlike the initial study, this study did not include properties within the central business district because they felt that the extensive use of tax increment financing would skew analysis of DART’s impact on property value. Residential and office buildings experienced the greatest positive impact, with property values increasing by 12.6 and 13.2 percent respectively, as compared to the control group. However, retail and industrial did not experience a significant increase in property value as a result of their proximity to the light rail station. Similar to Weinstein’s previous study, the properties were grouped by land-use: residential, office, retail and industrial. Residential properties were divided into two groups: those with improvements and those that were vacant. This study utilized data from the Dallas County Central...
Appraisal District. The study focused on median property value for each land-use group. The following table contains the percent change in property values for the five land-use groups from 1997 to 2001.

**Figure 4**

**Changes in Median Property Valuations, 1997-2001**

<table>
<thead>
<tr>
<th>Data Set</th>
<th>Office</th>
<th>Residential</th>
<th>Residential-Vacant</th>
<th>Retail</th>
<th>Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>DART Properties</td>
<td>24.7%</td>
<td>32.1%</td>
<td>11.1%</td>
<td>28.3%</td>
<td>13.0%</td>
</tr>
<tr>
<td>Control Group</td>
<td>11.5%</td>
<td>19.5%</td>
<td>0.0%</td>
<td>30.4%</td>
<td>21.5%</td>
</tr>
</tbody>
</table>

Source: Bernard L. Weinstein and Terry Clower – “An Assessment of the DART LRT on Taxable Property Valuations and Transit Oriented Development”

With respect to transit oriented development, Weinstein et al. conducted interviews with leaders of 15 suburban communities within the Dallas metropolitan area. The interviews consisted of five questions constructed to gauge how the communities viewed the light rail system and its influence on economic development. The study found that all of the cities had positive views regarding the light rail system and that most were planning or constructing mixed use projects around the station. In addition, six of the non-DART cities expressed a desire to have their city integrated into the DART system. These same cities also acknowledged that the new system had become a driver for regional economic development. Overall the study found the light rail system to be welcomed and integrated into the economic development plans for the communities included in the study.

“Land Value Impacts of Rail Transit Services in San Diego County”

*Prepared by Professor Robert Cervero and Michael Duncan, 2002*

Commissioned by the National Association of Realtors and the Urban Land Institute, Professor Robert Cervero with the assistance of graduate student Michael Duncan examined rail’s effect on property value in three California communities San Diego, Santa Clara County and Los Angles County. Professor Robert Cervero is director of the Institute of Urban and Regional Development at the University of California at Berkeley and one of the most prolific academic researchers on transit
and land use. For the study of San Diego, Cervero et al. focused on both residential and commercial properties and found that properties experienced an accessibility benefit when located near either a rail line or rail station. Residential properties experienced the greatest increase when located near a commuter rail station and commercial properties experienced a 91 percent premium if located within a commercial business district near a commuter rail station.

This report utilized hedonic price modeling to determine both the commuter rail and light rail system’s impact on land values within San Diego County. Cervero et al. examined the two rail based transit systems that service San Diego County: San Diego Trolley and the Coaster. The San Diego Trolley, a light rail system, began revenue service in 1981 and has increased its service area several of times over its 24-year history, with its most recent expansion occurring in 2005 with the opening of the Green Line. The Coaster, a commuter rail line, operated by North County Transit District, began revenue service in 1995. North County Transit District is also expanding its rail service with the introduction of the Sprinter, a light rail line scheduled to begin revenue service in late 2007.

Cervero et al. focused on land-value premiums as they “offer an objective, transparent, and tractable means of placing a monetary value on the benefits of being near transit stations.” The study utilized data from Metroscan, a proprietary database of all real-estate sales transactions, the 2000 Census, and data collected by the San Diego Association of Governments. Included in the study were commercial parcels sold between 1999 and 2001 and residential parcels sold in 2000. The study utilized a multiple year date range for commercial properties in order to obtain a sufficient size data set. Cervero et al. believed that a system must mature before a capitalization effect can be detected. Thus the study’s date range was significant, as it constituted a substantial time lapse from when the rail services were introduced. Records were only included if they were within a half-mile of a rail station (either Coaster or Trolley) and if the sale price was within 10 percent of the assessed value.

The data parcels were broken into four property types: multi-family (rentals), condominiums, single-family and commercial under the assumption that
capitalization effects can vary across different land uses. For the majority of property types the study found that there were appreciable land-value premiums if the parcel was located near a rail station. Commercial properties experienced the greatest premium of the four property types. Residential properties also experienced a price premium; however, premiums varied greatly by property type and rail corridor. The following is a summation of the results of the study on the four property types.

**Single-family:** Single-family properties experienced the greatest price premium when located near non-downtown Coaster stations and a negative or nominal premium when located near a light rail station. The study assumed that these properties were comprised of higher income residents who value transit only when it improves their commute to work.

**Condominiums:** Condominiums experienced a price premium when located near either a commuter rail or light rail station; however the premium was greater when located near a commuter rail station.

**Multi-family (rentals):** Multi-family (rental) properties, in comparison to the other residential properties, experienced the opposite effects. Properties actually decreased in value when located in proximity to a Coaster station. However, multi-family (rental) properties benefit when in close proximity to all light rail stations.

**Commercial:** Commercial properties experienced substantial premiums if located near downtown Coaster station or the Mission Valley commercial corridor indicating that commercial properties reap benefits if the rail station is located within an existing commercial district.

Following the summary is a table depicting the actual price premiums/discounts for each property type.

Figure 1
Price Premium by Parcel Type

<table>
<thead>
<tr>
<th>Condominiums</th>
<th>Multi-Family (rentals)</th>
</tr>
</thead>
</table>

Economics Research Associates
Draft Report. 01.10.06
Capital Metro: Transit Oriented Development Market Analysis
Task 1 – Literature Review
**San Jose, California**

The following three studies all evaluated rail-based transit’s effect on land value in the San Jose metropolitan region. Both commuter and light rail transit systems exist in the San Jose metropolitan region. The commuter system, provided by the Joint Powers Peninsula Board under the service name of Caltrain, runs along the San Francisco peninsula connecting the cities of San Jose, San Francisco and numerous smaller cities in between. The light rail system is operated by Santa Clara Valley Transit Authority (VTA), which services the entire San Jose metropolitan region. Commuter rail service between San Jose and San Francisco has been in existence since the region was initially developed. Light rail service was introduced to Santa Clara County in 1987 with 20 miles of track. Over the years VTA’s light rail system has expanded to include 62 stations located over 42 miles of track.  

When utilizing the San Jose market as a case study one must take into account that the San Jose economy has been one of the most volatile in the United States over

<table>
<thead>
<tr>
<th>Rail Line</th>
<th>Premium</th>
<th>Rail Line</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trolley: South Line</td>
<td>4%</td>
<td>Trolley: South Line</td>
<td>10%</td>
</tr>
<tr>
<td>Trolley: East Line</td>
<td>6%</td>
<td>Trolley: East Line</td>
<td>17%</td>
</tr>
<tr>
<td>Trolley: North Line</td>
<td>3%</td>
<td>Trolley: North Line</td>
<td>4%</td>
</tr>
<tr>
<td>Trolley: Downtown</td>
<td>2%</td>
<td>Trolley: Downtown</td>
<td>5%</td>
</tr>
<tr>
<td>Coaster</td>
<td>46%</td>
<td>Coaster</td>
<td>-7%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>12%</strong></td>
<td><strong>Average</strong></td>
<td><strong>6%</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rail Line</th>
<th>Premium</th>
<th>Rail Line</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trolley: South Line</td>
<td>1%</td>
<td>Trolley: South Line</td>
<td>-9%</td>
</tr>
<tr>
<td>Trolley: East Line</td>
<td>-1.5%</td>
<td>Trolley: East Line</td>
<td>-1%</td>
</tr>
<tr>
<td>Trolley: North Line</td>
<td>-4.2%</td>
<td>Trolley: North Line</td>
<td>72%</td>
</tr>
<tr>
<td>Trolley: Downtown</td>
<td>N/A</td>
<td>Trolley: Downtown</td>
<td>4%</td>
</tr>
<tr>
<td>Coaster</td>
<td>17%</td>
<td>Coaster: Downtown</td>
<td>91%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>4%</strong></td>
<td><strong>Average</strong></td>
<td><strong>25%</strong></td>
</tr>
</tbody>
</table>

Source: Robert Cervero and Michael Duncan Land Value Impacts of Rail Transit Services in San Diego.
the last decade. In the 1990s, the San Jose metropolitan area, also referred to as Silicon Valley, was home to the information technology revolution. Real Estate, both commercial and residential, was in great demand. However, with the burst of the “dot com” bubble, the region’s economy suffered greatly. Entire office parks stood vacant and commercial development essentially stopped within the region. All of the academic studies reviewed in this paper were conducted prior to the economy’s downturn and are thus excellent references for regions with strong economies; however, they are not reflective of San Jose’s current economy.

The following three studies all evaluated rail based transit’s effect on land value in the San Jose metropolitan region. Academics from the University of California at Berkeley conducted the three studies. Funded by the Lincoln Institute of Land Policy, Professor Rachel Weinberger, currently assistant professor of transportation planning at the University of Pennsylvania School of Design examined rail’s effect on commercial rents within Santa Clara County. Professor Robert Cervero and Michael Duncan, both of the University of California at Berkeley, conducted two studies: one focusing on commercial properties and another focusing solely on residential properties. Cervero and Duncan’s study of commercial properties was prepared for the National Association of Realtors and the Urban Land Institute. All three studies found rail to have a positive effect on property located within a quarter mile of a rail station.

**Commercial Rents and Transportation Improvements: Case of Santa Clara County’s Light Rail**

*Prepared by Professor Rachel Weinberger, 2000*

Professor Rachel Weinberger, in 2000, evaluated the Santa Clara Valley Transportation Authority (VTA) light rail system’s effect on commercial property. The study utilizes hedonic price modeling to evaluate transit’s effect over a time frame of 16 years. Weinberger’s central research question was “What is the effect of proximity to light rail on commercial property values?” with the hypothesis that proximity to rail has no effect on rents. However, results of the study indicated that her hypothesis was false. The study found that properties within a half-mile of
light rail stations command higher rents than comparable properties in the region. In addition, since the study spanned over two decades, Ms. Weinberger was definitively able to determine that “as the transit system matured, greater benefits accrued to the proximate properties, but in times of more intense general market pressure, the rent premium dampened.”

Data for the study was extracted from a large private real estate brokerage firm’s database that contained information on over 5,000 lease contracts beginning in 1984. Of the available data, the study included 3,400 leases transaction records, which occurred from 1984 to 2000. The distance variable for the study was defined as the distance to the nearest light rail station. Overall the records were located in 10 of the 15 cities within Santa Clara County, with the city of San Jose constituting over a third of the records. With respect to the distribution of leases over the date range of the study, the majority of the records occurred in 1999. The study noted that the real estate market was extremely strong in 1999. Since the records span over 16 years, periods of recession were included in the study. However, in general, Weinberger determined that commercial real estate trended upward over the time frame of the data set. The data records were separated into five distinct groups based on distance to the nearest light rail station. The following figure delineates the distance distribution of the properties.

<table>
<thead>
<tr>
<th>Distance</th>
<th>Parcels</th>
<th>Distribution</th>
<th>Cumulative Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within a quarter of a mile</td>
<td>508</td>
<td>13.8%</td>
<td>13.8%</td>
</tr>
<tr>
<td>Quarter to half mile</td>
<td>322</td>
<td>8.8%</td>
<td>22.6%</td>
</tr>
<tr>
<td>Half to three quarter mile</td>
<td>197</td>
<td>5.4%</td>
<td>27.9%</td>
</tr>
<tr>
<td>Three-quarter to 1 mile</td>
<td>78</td>
<td>2.1%</td>
<td>30.1%</td>
</tr>
<tr>
<td>Beyond 1 mile</td>
<td>2,570</td>
<td>69.9%</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>3,675</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Rachel Weinberger “Commercial Rents and Transportation Improvements: Case of Santa Clara County’s Light Rail”

Utilizing hedonic price modeling, Weinberger was able to determine that there is a distinct premium associated with proximity to rail and the premium decreased as
distance increased. Properties within a quarter mile of a light rail station experienced the highest premiums. A slightly lower premium existed for properties located a quarter to a half a mile from a light rail station. Weinberger could not establish a relationship between parcel location and distance to station for parcels located beyond a half mile in distance of a light rail station. However, she surmised that rail had no effect after a half a mile, as a half a mile is the typical maximum distance a pedestrian is willing to walk to access a transit station.

*Transit’s Value-Added: Effects of Light and Commuter Rail Services on Commercial Land Values*

*Prepared by Professor Robert Cervero and Michael Duncan. 2002*

Professor Robert Cervero and Michael Duncan also conducted a study of rail’s effect on commercial land value within Santa Clara County. This study, published a year after Weinberger’s, examined both the commuter and light rail systems. In accordance with Weinberger’s study, Cervero et al determined there to be a premium for parcels located within walking distance of a rail station. Commuter rail appeared to have a stronger effect on land value than light rail. Furthermore commercial land located within a central business district experienced an even greater premium. As Cervero et al. states “in a landscape of campus-style offices, auto-oriented retail strips, free and plentiful parking and super-block development, only those commercial parcels that are within walking and often visual distance of stations are worth more per square foot.”

Utilizing a hedonic price model, Cervero et al. limited their study to only those commercial transitions that occurred between 1998 and 1999. Furthermore only transactions for commercial, office and light industrial properties were included in the study. The study utilized data from Metroscan, a proprietary database of all real-estate sales transactions. Cervero et al. believed that a system must mature before capitalization will be reflected in the value of land; thus the study’s date range was significant as it constituted a substantial time lapse from introduction of the rail services were introduced. In addition the years 1998 and 1999 represented a period of rapid growth and escalating land prices. Cervero et al. only focused on
the estimated value of the land parcel, excluding the value of the improvements. The study included 1,197 parcels that were grouped into the following specific land-use categories:

- Commercial: Business District, San Jose Central
- Commercial: Business District, Local
- Commercial: Retail not in Shopping Center
- Commercial: Community Shopping Center
- Commercial: Neighborhood Shopping Center
- Commercial: Regional or Specialty Shopping Center
- Industrial or Manufacturing: Research and Development
- Professional: Offices, Banks, and Clinics

Professional offices, banks, clinics and retail not in a shopping center constituted over 80 percent of the data set.

The study found that commercial land located in a business district and within a quarter mile of a Caltrain commuter rail station experienced a 120 percent price premium (about $25 per square foot more than comparable properties.) Cervero et al surmised that the great premium for commercial property near commuter rail stations reflected the affordable housing crisis that was present in the region during the time of the study. “To many employers, commuter rail lines function as conduits to affordable housing, helping not only to temper wages but also recruit and retain workers.”

Proximity to light rail stations conferred a 23 percent price premium, about four dollars per square foot more than comparable properties. Unlike commuter rail, this premium for proximity to light rail appeared regardless of whether the land was within a central business district. However, non-residential parcels located in downtown San Jose were worth on average $19 more per square foot than other non-residential parcels located within a quarter mile of a light rail station. Because a premium occurred regardless of the existence of a central business district, Cervero et. al. noted that even a stand-alone office campus located in a single-use environment benefited by its proximity to a light rail station.
Benefits of Proximity to Rail on Housing Markets: Experiences in Santa Clara County

Prepared by Professor Robert Cervero and Michael Duncan. 2002

Cervero and Duncan also conducted a separated study of rail’s effect on residential properties within Santa Clara County. The data sampling included single family, multi-family (rentals) and condominium parcels. Utilizing hedonic price modeling, Cervero et al. found that like the commercial properties, residential properties also experienced a price premium if located within a quarter mile of a rail station. With respect to light rail, only multi-family (rental) properties, defined as land zoned for apartments with five units or greater, experience a price premium. While commuter rail benefited all residential properties regardless of property type.

The data consisted of land value records for 7,100 residential parcels sold during the year 1999. The study utilized data from Metroscan, a proprietary database of all real-estate sales transactions. Cervero et al. selected the year 1999 because it was a buoyant economic period and substantial time had lapsed for the system to mature and thus enable the proximity benefits to be reflected in the property value. Cervero et al. only focused on the estimated value of the land parcel, excluding the value of the improvements. With respect to the condominium parcels, Cervero et al. prorated the share of the total land area to each unit based on a unit’s share of total structure area. Of the data set it was determined that the average residential parcel was valued at over $20 per square foot while vacancy rates for rental properties was at a mere one percent. Cervero et al. inferred that the high unit value and low vacancy rate indicated a great demand for affordable housing during the year 1999.

The study found that all residential properties experienced a price premium of 20 percent when situated near a Caltrain commuter rail line. Only multi-family (rental) parcels experienced a 45 percent price premium (or nine dollars more per square foot) when located within a quarter mile of a light rail station. Furthermore it was determined that accessibility of residential parcels to jobs also increased land values, with a greater benefit occurring for jobs accessible via the transit network.
rather than the highway network. In addition, Cervero et al. inferred from the model that residential land value increased by almost $30 per square foot for every 100,000 additional jobs that were accessible via public transit in 15 minutes or less. Overall, the study indicates that residential properties in Santa Clara County experience a substantial price premium if located within walking distance of a rail station.

**Measuring the Impact of Light Rail Systems on Single Family Home Values: A Hedonic Approach with GIS Application**

*Prepared by Professor Kenneth J. Dueker, Hong Chen and Anthony Rufolo. 1998*

Professor Kenneth Dueker of the Center for Urban Studies at Portland State University, assisted by Anthony Rufolo and Hong Chen, evaluated the effect of Portland's light rail system, MAX, on single-family property value. MAX commenced service in 1986, covering 15 miles of track with 27 stations, 5 park-and-ride facilities, and 5 transit centers. The system expanded a number of times and currently includes 64 stations located along 44 miles of track.\(^{15}\) The study used distance to rail stations to determine rail’s accessibility effect and distance to the track to determine rail’s nuisance effect. Results from hedonic price modeling found that as distance from the station increased property value decreased. The study also found a negative nuisance effect. The accessibility effect dominated the negative nuisance effect creating a price premium for single-family homes located in close proximity to a rail station. However, the study found that the price premium only applied to homes within a quarter mile of a rail station.

The study was a replication and extension of a 1993 study conducted by Al-Mosaind et al. Both studies found that property value decreased as distance from a rail station increased. The 1997 study was conducted on a much larger data set and used data from 1992-1994 (six to eight years after the system commenced operation). Chen et al. determined that property value per parcel decreased at the rate of $32.30 per meter a way from the station while the 1993 study found the decrease to be only $21.75 per meter. Chen et al. noted, when taking inflation into
account, the difference in the decrease was significant as it demonstrated that as a transit system matured the market places a greater value on transit access.

Light-Rail Transit in America: Policy Issues and Prospects for Economic Development


In 2004, Thomas Garrett, a Research Officer at the Federal Reserve Bank of St. Louis examined light rail’s effect on economic development by providing a history of light rail, examining five key issues concerning the benefits of light rail, reviewing the academic literature on the subject and conducting an empirical analysis of light rail’s effect on property value in St. Louis. The historical section provides a basic understanding of the history and development of rail transit systems by distinguishing the various types of rail and describing rail transit evolution from heavy commuter rail systems to modern day light rail networks. Following the history review, the report discusses the five key economic policy issues that encapsulate the light rail development debate. The issues were identified as job creation, car vs. rail preference, air pollution, traffic congestion and cost efficiency and solvency.

After the background information and literature review were provided, Garrett presented his empirical analysis of MetroLink, the light rail system in St. Louis, effect on property value. MetroLink commenced service in 1993 with an initial line comprised of 16 stations stretching over 17 miles of track. Since its inception the service area was expanded several times, in 1994, 1998, 2001 and 2003. Currently, the system has 38 miles of track and 28 stations (16 of which have park-and-ride lots and is planning an eight mile, nine station expansion to open in 2006.)

The empirical analysis focused on residential properties sold between 1998 and 2001. The study comprised of 1,516 homes located within a mile of a MetroLink station or track in St. Louis County. Utilizing a hedonic price method, Garrett considered both the positive accessibility effect and the negative nuisance effect that rail transit is traditionally believed to have on property value. The study found
that distance from a MetroLink station has a significant influence on property values. An accessibility effect occurred for homes located within a quarter mile of a MetroLink station. For every 10 feet closer to a station, property value increase on average by $139.92. Thus a home located within a 100 feet of a station had a price premium of $19,029 compared to a home located a quarter mile away from a station; which results in a 32 percent increase in property value. However, after a quarter of a mile property value actually increased as distance from the station increased. Thus, the study inferred that the positive accessibility effect only applied to homes located within a quarter mile distance of a MetroLink station.

With respect to the negative nuisance effect, the report found that proximity to the rail track did not have a negative effect on homes located less than a half mile from a MetroLink station. In fact property values of homes located within 2,300 feet and 2,800 feet (about a half a mile) of the track experienced a slight increase. After the 2,300 feet mark, for every ten feet away from the track property value increased by $12.14, cresting for homes located at 2,800 feet. Beyond 2,800 feet, the study found that sale prices decreased at a much greater rate; on average, for every 10 feet increase in distance the price decreased by $54.38. Thus, on average, a home located one mile from the track will be valued 15.5 percent lower than if it was located just a half a mile from the track. Garrett surmised “the relatively large decrease in property value beyond 2,800 feet compared with the small gain in value for homes located over 2,300 to 2,800 feet suggests that, for the entire sample of homes, property value decreases with distance from a MetroLink track.” Thus, Garrett inferred that the proximity to the track does not have a negative effect on property value.

From the results of Garrett’s study, one can determine that residential property owner’s value access to MetroLink services when they are located within a five-minute walking distance (a quarter of a mile) of the station. Thus, Garrett inferred that St. Louis residents will overlook potential negative nuisance effect to have easy pedestrian access to a MetroLink station. Since the study was conducted when the system was relatively new, Garrett called for further analysis to be conducted when the system is at the 15 and 20-year mark of service.
Transit Oriented Development Case Studies

The following review focuses solely on Transit Oriented Development case studies. While there is a plethora of academic research on the proximity of transit effect on property value, less research exists that quantifies transit’s effect on development. This study does not attempt to quantify transit’s effect on development; instead it paints a reasonably comprehensive picture of the state of transit oriented development in the United States.

**TCRP Report 102: Transit-Oriented Development in the United States: Experiences, Challenges and Prospects**

Principal Author: Professor Robert Cervero for the Transit Cooperative Research Program, 2004

Targeted to transit agencies, the development community, and local decision makers considering transit oriented development (TOD), this report provides a comprehensive overview of the current state of TOD. The report focuses on TOD and joint development and practice; the level of collaboration between various partners (e.g., the development community, financial partners, planning and land-use agencies, and government entities); the impacts of TOD and joint development on land values; the potential benefits of TOD; successful TOD design principles and characteristics illustrated through ten case studies; and overall policy conclusions and suggestions for further research. Professor Robert Cervero, director of the Urban and Regional Development at the University of California at Berkeley, was the report's principal author. Both primary research, in the form of surveys and interviews, and secondary research of existing literature were utilized in the formation of the report.

The report concluded that transit oriented development was gaining popularity within the United States. Through its research, the report identified over 100 TOD projects and more than 110 joint development projects. Most of the projects were in large rail oriented communities. However, the study found that in the smaller communities with less than a half a million in population, TOD was more of a concept than a reality. Interestingly among the large cities with rail-based transit the study noted that 20 percent of the transit agencies surveyed reported
conversation of existing park and ride lots into mixed-use infill development, typically consisting of moderately dense housing. The study identified five political and institutional factors that are vital to the success of a TOD project, including: strong leadership, inclusion of public input, institutional coordination and entitlement streamlining, permissive and enabling legislation encouraging smart growth and TOD projects. With respect to planning and land-use strategies, the study concluded that a shared vision among all parties; progressive and flexible zoning; bold policies that are sensitive to the market; and detailed station-area planning that pays great attention to the pedestrian environment are essential to the projects success.

The study illustrated a range of TOD designs and practices through ten case studies: Boston, New Jersey, the Washington (D.C.) Metropolitan Area, Miami, Chicago, Dallas, Colorado, Portland, the San Francisco Bay Area, and Southern California. The following are reviews of the case studies for Dallas, Texas and Portland, Oregon. The two following case studies serve as excellent references for Austin, Texas as they represent opposite scenarios for the cultivation of transit oriented development. Dallas, Texas illustrates how the market can be the primary factor in driving the development. While Portland, Oregon services as an example of how progressive public policy can stimulate and groom transit oriented development.

Dallas, Texas

The Dallas, Texas case study discussed regional TOD policies and tools and presented four significant TOD projects. DART initially led the initiative for transit oriented development; however with the success of Mockingbird Station, first generation suburbs are proactively planning and working with developers to promote transit oriented development projects. The study noted that over a billion dollars in new commercial and residential investment has been constructed within walking distance of a DART station since 1999.

The study concluded that DART does not have a formal TOD policy; instead it has utilized property ownership, station design advocacy and tax incentives to promote transit oriented development. With its board’s approval, the study indicated that
DART can sell and acquire surplus property for affordable housing and other ventures; including leasing air rights and surplus parking to local developers and proactively acquiring property with the intention of exchanging ownership for transit oriented development. With respect to station design, the study found that DART focused on station placement and particularly bus and pedestrian access in order to promote transit oriented development. In terms of tax incentives, the study reported that DART returns 15 percent of sales taxes it collects from cities serviced by the system to help the cities fund a variety of transit and congestion mitigation projects.

The study concluded that with a combination of market forces and supportive public policy, a number of successful transit oriented projects were developed in association with the DART service area. The projects discussed in the case study were Mockingbird Station, The Cedars, Eastside Village, Addison Circle and Richardson.

**Mockingbird Station:** Mockingbird Station is the most famous and successful of the selected projects. The project is comprised of office, retail, residential, entertainment and hotel. Driven entirely by market demand, Mockingbird Station was 100 percent privately financed and cost $145 million. It includes 211 upscale loft residences, 140,000 square feet of office space and 180,000 square feet of retail, restaurants and a cinema complex. The study noted that the residential tenants tend to be 30 to 45 years old professionals who work in the Telecom Corridor but want to live close to
downtown and take the train to work. The proximity of transit was significant in the developer’s site selection and is attributed to the 35 percent premiums that the loft apartments can command.

In addition to investing in the construction of the project, the developer Ken Hughes also spent over $600,000 for improvements to the pedestrian environment and $500,000 to bury existing aboveground utilities. The developer had minimal coordination with either the City of Dallas or DART during the construction of the project. There were no zoning obstacles and the developer was able to assemble the site independently. The only public interaction was with respect to accessing the rail platform. Hughes had no control over the location of the platform it was built in a below-grade trench prior to the project kickoff. In order to incorporate the station into the project, Hughes constructed a pedestrian bridge that connected the development to the station, which as the study noted became a gateway entrance to the project.

**The Cedars:** The Cedars neighborhood is located south of downtown Dallas with two rail stations in a primarily industrial and commercial area. With four major projects, the study concluded that public leadership utilized transit-oriented principles to revive the area. The projects include the Arts Walk, a planned entertainment corridor; Lamar on South, a 10-story mixed use live work center; Gilley’s, a western themed entertainment complex and the Dallas Police Headquarters. Unlike Mockingbird station, various public funding tools were utilized including tax increment financing, 5-year tax abatement, historic tax credit and other public grants to encourage private development and improve the pedestrian environment.

**Eastside Village:** Eastside Village was instrumental in the revival of downtown Plano, Texas. Built in two phases by Amicus Partners, Eastside Village is a medium-density mixed-use development that fronts the Plano light rail station. The entire project is located on almost five acres that were assembled by DART and the City of Plano through a combination of eminent domain and acquisition. Phase I cost $17.7 million to construct and contains 245,000 square feet comprised of 234 apartments and 15,000 square feet of ground floor retail. The building
wraps around a five-story parking garage, hiding the majority of the parking from the public view. The report indicated that the rental units command $600 to $1,200 per month in rent. The retail space includes two restaurants, small offices and a community room leased by the city.

Phase II of the project consisted of 229 loft apartments and 25,000 square feet of ground floor retail. The report noted that most residents of the project are singles and childless young professionals and that Amicus Partners attributed the success of the project to the presence of light rail and believed that “25 percent to 50 percent of the new leases are DART-driven.”

The study noted that the Eastside Village project would not have happened without the City of Plano’s commitment to transit oriented development. Prior to assemblage of the site, the city recognized the powerful role that the DART light rail station could play in reviving its downtown. The city was proactive in convincing DART to locate the station such that the entire business district was within a quarter mile of the station. In terms of public improvements, the city paid for new streets and pedestrian amenities, including brick sidewalks, street furniture, plaza and ornamental lights. The report attributed the project’s success to the city of Plano and the developer’s strong commit to transit oriented development and the great cooperation that occurred between the city and the developer.

**Addison Circle:** Addison, Texas is located 20 miles north of downtown Dallas. Unlike the other three profiled projects, Addison Circle was not presently served (at the time the report was published) by light rail transit. Rather it is a bus based TOD project with the vision of transforming into a project serviced by rail. The Addison Circle project is a walk able 80-acre high-density town center that closely...
adheres to the principles of New Urbanism. The project represents a true public-private partnership where the town agreed to provide $4 million in public improvements in exchange for 1,500 residences in the first five years. A TIF was created to pay for the public infrastructure. Projected to be completed in 2010, the project will include 4,000 residential units and 4 million square feet of office/commercial space and 250,000 square feet of ground floor retail. The study noted that the residential units, which range from one bedroom to penthouse lofts, rent for $700 to $2,600 per month. Most residents are either: singles, empty nesters or young professionals with no children. The study estimates that public investment will likely reach $9 million with more than $300 million matched by private funds.

**Richardson:** Galatyn Park Station is located 35 minutes north of downtown Dallas in Richardson, Texas. The project is slated to be the first high-density, mixed-use project within the city of Richardson. Located on a 27 acre site, the project includes no commuter parking as it was designed as a destination station. At completion the project will feature a 336-room hotel, a performing arts center, eight acres of mixed-use retail and office and four acres of residential space with a density of 35 to 90 dwellings per net acre. At build out it is projected that the new development will consist of $300 million in private investment, with $75 million in public investments.

**Portland, Oregon**

The Portland, Oregon case study examines the regions extensive regulatory TOD “tool box” and illustrates its effect by presenting two projects. The study claims that the Portland region has the most aggressive TOD program in the United States and as such TOD activity has occurred at nearly every station within the light rail system. The case study attributes this prolific amount of TOD projects to the region’s proactive and progressive “tool box” of regulations that are available at the state, regional and local levels. The study concludes that Portland has undergone two phases of transit oriented development. The initial phase was to construct an institutional system to encourage TOD projects. While the second phase is the education and training of the development community and lenders as to the benefits of TOD projects. According to the study the second phase is producing impressive
results as Tri-Met estimates that $3 billion in new development has occurred within walking distance of a transit station. The study concludes that TOD principals and new urbanism philosophy is greatly imbedded in the region’s development culture; such that the 2040 Growth Management Strategy goal is to have two thirds of regional jobs and 40 percent of households located in and around transit centers and corridors.

While a number of other studies have focused on Portland’s most successful projects (eg. Orenco Station) this case study focused on two of the lesser known projects: Center Commons and The Round. Both projects experienced difficulties as a result of the public sector’s high expectations. As such the study noted that since the Portland, Oregon region is unique with respect to extensive institutional support of TODs, these case studies provide practical lessons for other regions who do not possess a similar TOD regulatory “tool box.” While, according to the study, both projects have met their expectations they have also experienced financial challenges and construction delays.

**Center Commons**: Center Commons is located 19 minutes east of downtown Portland via the light rail transit system. Bordered by a busy freeway, the site is located a quarter mile from a light rail station and a third of a mile from three bus routes. The project contains a mix of for sale town homes, and market-rate and affordable rentals. A total of 314 units sit on the 4.9-acre site. The project is considered significant by the study for two reasons: it is the first major infill project along the section of the light rail line that parallels the freeway and it has pushed the envelope in terms of combining mixed-income rental properties and for-sale housing.

The development process commenced in 1994, however construction was not completed until 2001. Final cost of the project reached $30 million and funding sources included a mix of tax credits, state issues bonds, federal and regional loans, private equity and a Federal Transit Administration TOD grant. While the project received a number of tax credits and was awarded a 10-year property tax exemption, the study claimed that the project failed to meet financial expectations. After one year on the market only 14 of the 26 town homes had been sold.
Furthermore when the last homes were eventually sold they went for $25,000 to $35,000 below the $200,000 initial asking price. The study attributed the poor absorption of the homes to a number of factors including location, market demand, residential design, price and project management. However, the lease-up for the market-rate apartments was rather quick and the study indicated that many of the new residents indicated that they selected the development because of its new construction and design and the sites proximity to transit. In fact the proximity to transit appears to be the leading desirability factor, as the study indicated that the residents utilize transit for over 46 percent of work trips and 32 percent of non-work trips while citywide transit use only constituted 12.3 percent of work trips. Overall the study claims the project as a success but believes that other regions may not be able to achieve the high level of residential mixed use similar to Center Commons without large public subsidies.

The Round: The Round, located in the city of Beaverton, Oregon, is a high-density town center with the light rail station as its focal point. Located only five miles from downtown Portland and 23 minutes via transit, the case study indicates that the goal of the project is for the location to become “the heart of downtown Beaverton.” While not completed, the study anticipates the project to have 240 market rate housing units, upscale restaurants, 125,000 square feet of retail, 375,000 square feet of Class A office, a 860 space parking garage and a large public plaza anchored by the light rail station.

Like Center Commons, the Round also experienced financial difficulties. However, instead of experiencing poor absorption, the case study indicated that the Round’s difficulties were the result of the inexperience of the original developer and the city, in addition to the developer’s poor execution with respect to planning and financing. While the development process started in 1997 the project was still under construction (as of publication of the study). In 1998 the original developer declared bankruptcy and the site lay partially constructed for three years. However, despite these initial financial difficulties the study projects the Round to be a success. As of publication of the study in 2004, the following has been built: 120,000 square feet of office building with 21,000 square feet of retail of which 90 percent has been leased; two buildings with 10,000 square feet of ground floor.
retail and 65 condominiums priced at $170-200 per square foot; in addition to enhanced pedestrian access throughout the site. The study noted that an additional residential building with a ground floor fitness center; two buildings with a mix of residential and office; and two buildings with ground floor retail are to be included in the project. At full build out the development is projected to cost between $80 and $100 million.
Notes


5 Cervero 2002. ‘Transit’s Value-Added’ p 44


7 Cervero, et al. TCRP Report 102, p455-463.


14 Cervero 2002. ‘Transit’s Value-Added’ p 46


Bibliography


Cockerill, L and D. Stanley, 2002. “ How Will the Centerline Affect Property Values in Orange County: A Review of The Literature and Methodological Approaches for Future Consideration” Institute of Economic and Environmental Studies, California State University-Fullerton, Fullerton CA.


