Property Values, Transit, and the Recession: A Case Study of L.A. Metro's Gold Line in Pasadena, California

Adams Bernhardt

6/10/2014

Abstract:

Extensive literature has explored the connection between transit infrastructure, land use, and land values. While it is generally accepted that transit infrastructure generates land value premiums for parcels within close proximity to transit stations, little research has analyzed the resilience of these parcels in recessionary times. In light of the recent economic downturn, this paper will explore the pliability of tax lots in Pasadena along Metro's Gold Line, answering the questions:

1. Are land values of property surrounding transit resilient to recessionary trends?
2. Is land surrounding transit valued higher than land without transit infrastructure?
3. Is there a discrepancy in land values between individual station locations?

During the recession, December 2007 through June 2009, property values throughout the Pasadena area fell significantly. Transit infrastructure did not help properties maintain their land values during the recession, contrasting the findings of The Center for Neighborhood Technologies (2013). Furthermore, residential land within the transit shed was valued significantly lower than property ½ mile from transit stations. Conversely, commercial property with transit infrastructure is generally valued higher than comparable land throughout the region. Land values were also heavily influenced by geography. Clusters of significantly high land values were witnessed in the affluent South Pasadena and North Pasadena communities. Lower land values were concentrated within Pasadena's urban core and along highway infrastructure.

Executive Summary

Key Terms:

Transit shed – Tax lots within ½ mile of Pasadena's seven Gold Line Stations (Sierra Madre Villa, Allen, Lake, Memorial Park, Del Mar, Fillmore, and South Pasadena).

Non-transit area – Tax lots within the City of Pasadena, City of South Pasadena, and Census Designated Place East Pasadena, but not in the transit shed.

Extensive literature has explored the connection between transit infrastructure, land use, and land values. While it is generally accepted that transit infrastructure generates land value premiums for parcels within close proximity to transit stations, little research has analyzed the resilience of these parcels in recessionary times. In light of the recent economic downturn (December 2007 through June 2009), this paper will explore the pliability of tax lots in Pasadena along Metro's Gold Line, answering the questions:

1. Are land values of property surrounding transit resilient to recessionary trends?

Hyp1.1: Land values within ½ mile of transit fall at a slower pace during the recession

Finding 1.1: Somewhat True

During the recession residential land values fell 4% in the transit shed and 18% in the non-transit area. Similarly, commercial lots fell 8% in the transit shed and 16% in the non-transit area. While property values in the transit shed fell at a slower pace during the recession, they were more volatile pre and post-recession.

Hyp1.2: Land values within ½ mile of transit will recover quicker after the recession

Finding 1.2: False

Between July 2009 and June 2012, residential land values in the transit shed fell 8% while those in the non-transit area dropped 2%. In the same period, commercial land values in the transit shed plunged 52% while those in the non-transit area fell 12%.

2. Is land surrounding transit valued higher than land without transit infrastructure?

Hyp2: Land within ½ mile of transit stations is valued higher than land external to transit infrastructure.

Finding 2: Mixed

Residential land in the non-transit area is valued significantly higher than property in the transit shed. In July 2011/June 2012, land in the non-transit area was valued 25% greater than property in the transit shed. Conversely, commercial land in the transit shed is generally valued higher than land in the non-transit area. In July 2007/June 2008, land in the transit shed was valued 37% greater than land in the non-transit area. However, the recession had a substantial impact on commercial property values in the transit shed. By July 2011/June 2012, land in the non-transit area was valued 5% greater than land in the transit shed.

3. Is there a discrepancy in the land values between individual station locations?

Hyp3: Land surrounding the Del Mar station is valued higher than property within ½ mile of the South Pasadena and Sierra Madre Villa stations.

Finding 3: False

As of July 2011/June 2012 land values within the South Pasadena station area were valued the highest at $40.07/SF. Land in the Sierra Madre Villa and Del Mar station areas commanded $37.47/SF and $21.24/SF respectively.

Introduction

Los Angeles has long been recognized as a symbol of car culture and auto dependency. Since the end of WWII, Los Angeles has embraced the automobile as its main source of mobility, investing heavily in automobile infrastructure.[1] This investment has rendered a society that has historically perpetuated car use through the provision of countless highways, sprawled suburban developments, segregated land uses, and cheap parking. As a result, the county experiences prolific congestion (521,449 hours of delay at an estimated cost of $11 million)[2] and abysmal air quality that tops the nation.[3]

Figure 1 - Metro System Map

These pressing issues have ushered in a new era of transportation planning in Los Angeles. Half-cent sales tax increases for dedicated transportation funding in 1980 (Proposition A), 1990 (Proposition C), and 2009 (Measure R) were supported by county residents, attesting to the need to expand transit infrastructure and improve transit service. As a result, the Los Angeles County Metropolitan Transportation Authority (Metro) has become the third largest transit service provider in the nation carrying 4.6 million passengers in 2010 within a 1,433 square mile service area.[4] Comprised of two heavy rail (Red and Purple), four light rail (LRT) (Blue, Gold, Green, and Expo), and two bus rapid transit (BRT) (Orange and Silver) lines interconnected with a network of local, rapid, and express busses, Metro provides multimodal transportation options to approximately 9.6 million Los Angeles County residents (Figure 1 – Metro System Map).[5]

Headed by Metro's long range transportation plan and 30/10 Initiative (30 years of transit projects in 10 years), the system is poised to experience significant expansion within the coming years. Financed in large part by sales tax revenues and competitive grants, the projected 30 year, $300 billion investment, is primarily publicly funded. With transit fares currently covering just 29% of Metro's operational costs, the system is often critiqued for externalities imposed on neighborhoods, extensive public investment, and substantial operational deficits.[6] However, a body of literature has emerged attesting to the localized economic benefits of transit investment. A look at transit's impact on vacant, commercial, and residential property values is reviewed below.

[1] Wachs, M. (1984). Autos, Transit, and the Sprawl of Los Angeles: The 1920s. *Journal of the American Planning Association*, 297-310.

[2] Institute, T. T. (2011). *Urban Mobility Report* . College Station: Texas Transport Institute .

[3] American Lung Association. (2012). State of the Air. Washington D.C.: American Lung Association.

[4] American Public Transportaion Association. (2012). 2012 Public Transportation Fact Book. Washington D.C.: American Public Transportaion Association.

[5] Los Angeles County Metropolitan Transportation Authority. (2012, September 12). Overview. Retrieved May 27, 2013, from Metro: http://www.metro.net/about/agency/mission/

[6] Los Angeles County Metropolitan Transportation Authority. (2009). I Want a Mobile Future. 2009 Long Range Transportation Plan. Los Angeles: Metro.

Literature Review

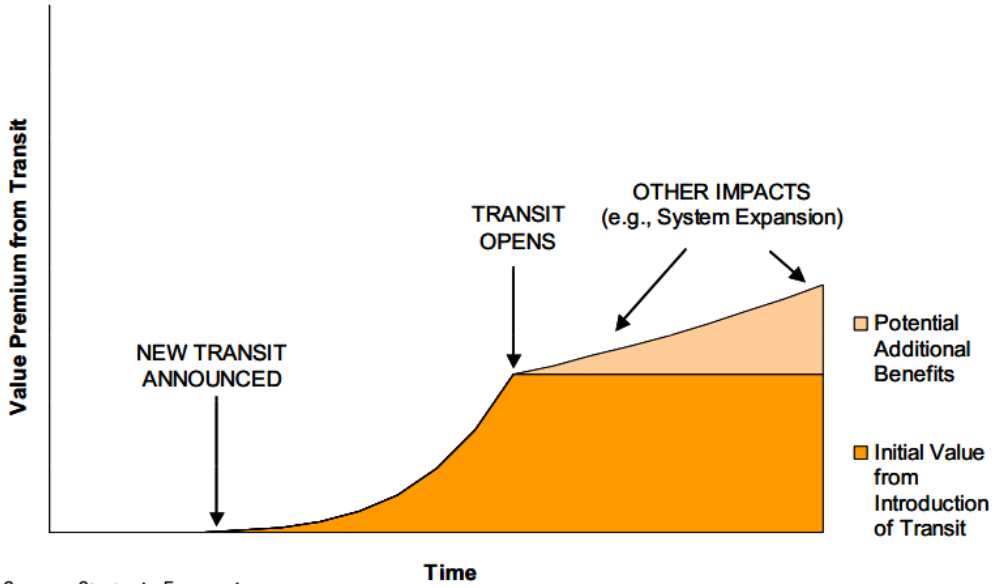
The Impact of Transit on Property Values

Transit-oriented development (TOD) is defined as, "…higher-density mixed-use development within walking distance – or a half mile – of transit stations."[7] While dependent on transit service, urban form, and neighborhood characteristics, property within TODs generally possess a land value premium. [8][9][10] Capitalizing on travel-time and travel-cost savings, increased neighborhood accessibility, and community amenities, property in close proximity to transit is highly desirable for commercial and residential uses.[11][12][13]

LRT System Development and Land Value Premiums

Aligned with LRT system development, land value premiums can manifest in a variety of ways. An initial stimulus is often witnessed with the announcement of station locations. Provided stations are located in areas ripe for development/redevelopment, this preliminary governmental commitment enables property owners and developers to react, frequently triggering a spike in land values within close proximity to the proposed stations.[14][15][16] Appreciation in property values can also be witnessed with the opening and subsequent operation of a line. This type of interaction typically occurs in transitioning communities (i.e. industrial to mixed use), where land uses and values respond slowly and organically to the influences of transit operation.[17][18][19] This theory is summarized in figure 2, which presents a stylized example of how property values might increase over time as a result of new transit service.[20]

Figure 2 - Transit's Value Curve, In Theory



[7] Center for Transit-Oriented Development . (2014). Center for Transit-Oriented Development. Retrieved April 14, 2014, from Center for Neighborhood Technology: http://www.cnt.org/tcd/projects/ctod/
[8] Cervero, R., & Kang, C. D. (2011). Bus Rapid Transit Impacts on Land Uses and Land Values in Seoul, Korea. Transport Policy , 102-116.
[9] Wardrip, K. (2011). Public Transit's Impact on Housing Costs: A Review of the Literature. Washington D.C.: Center for Housing Policy .
[10] Lewis-Workman, S., & Brod, D. (1997). Measuring the Neighborhood Benefits of Rail Transit Accessibility. Transportation Research Record, 147-153.
[11] Center for Transportation Studies. (2010). The Hiawatha Line: Impacts on Land Use and Residential Housing Value. Minneapolis: University of Minnesota.
[12] Lewis-Workman, S., & Brod, D. (1997). Measuring the Neighborhood Benefits of Rail Transit Accessibility. Transportation Research Record, 147-153.
[13] Cervero, R., & Landis, J. (1997). Twenty Years of the Bay Area Rapid Transit System: Land Use and Development Impacts. Transportation Research A, 309-333.
[14] Fejarang, R. (1993). Impact on Property Values: A Study of the Los Angeles Metro Rail. Los Angeles: Metropolitan Transportation Authority.
[15] Kittrell, K. (2012). Impacts of Vacant Land Values: Comparison of Metro Light Rail Station Areas in Phoenix, Arizona. Transportation Research Board, 138-145.
[16] Knaap, G., Ding, C., & Hopkins, L. (2001). Do Plans Matter? The Effects of Light Rail Plans on Land Values in Station Areas. Journal of Planning Education and Research , 32-39.
[17] Yan, S., Delmelle, E., & Duncan, M. (2012). The impact of a new light rail system on single-family property values in Charlotte, North Carolina. The Journal of Transport and Land Use, 60-67.
[18] Cervero, R., & Landis, J. (1997). Twenty Years of the Bay Area Rapid Transit System: Land Use and Development Impacts. Transportation Research A, 309-333.
[19] Cervero, R., & Kang, C. D. (2011). Bus Rapid Transit Impacts on Land Uses and Land Values in Seoul, Korea. Transport Policy , 102-116.
[20] Center for Transit-Oriented Development . (2008). Capturing the Value of Transit. Washington D.C.: United States Department of Transportation Federal Transit Administration.

Vacant Property Values

With a majority of LRT investment targeted in urbanized areas, studies assessing impacts on vacant land are rather limited. However, given the adaptability and flexibility of vacant land, premiums associated with transit investment are typically greater than previously developed parcels.[21] A study by Kittrell (2012) in Phoenix, Arizona researched the impacts of the region's light rail line on the unusually large availability of vacant land within the Phoenix area. The station area focused analysis indicated a land assembly phase, where sales volume of vacant parcels within ½ mile of station areas doubled in the first three years following the announcement of station locations. Accompanying the spike in vacant land sales, twenty-four of the line's twenty-six analyzed station areas experienced growth in median sales price per square foot of vacant parcels.[22] A study in Washington County, Oregon witnessed similar results. Despite limited observations (25 sales between 1992 and 1996, or 1.6% of the total sample), vacant residential land values within ½ mile of proposed stations were 70% higher in the first year following station area announcement (premium dropped to 20% two years after station area announcement).[23]

Commercial Property Values

Given the urban setting associated with a majority of transit systems, commercial uses are abundant in station areas. Commercial development is compatible with transit systems, benefitting from heightened visibility and increased accessibility, while largely unaffected by transit's externalities (noise and vibration). Not surprisingly, land use change studies throughout California and Seoul affirm the compatibility of transit and commercial development, indicating that non-residential uses account for a majority of station-area development.[2425]

While widely varied, a majority of commercial land studies indicate a measurable and significant impact associated with proximity to transit. [26] Studies in Seoul (2011: 3-26% within 500ft.),[27] Washington D.C. (2000: 12.3%-19.6% within 300ft.),[28]Los Angeles (1993: 43% within 2,640 ft.),[29] San Jose (2002: 120% within 1,320 ft.),[30] and San Diego (2004: 167% within 200ft.)[31] witnessed commercial property value gains ranging from 3% to 167%. Methodological differences, scope (station, line, region), time of study (recession), and analysis areas (200ft.-1,320ft.) may explain the varied results.

Residential Property Values

Homes located near public transit should command higher rents than those further away because it allows those living nearby to easily travel from destination to destination, spend less on transportation expenses (therefore afford to spend more on housing), and reflect the economic value of decreased time travel. However, in practice, transit's impact on home values is small to modest, dependent on a variety of factors including transit reliability, age and tenure of housing, nature of surrounding development, and externalities associated with system operation.[32] Land value premiums for residential property generally range from 0-10%.[33]

---

[21] The Brookings Institute. (2009). Value Capture and Tax Increment Financing Options for Steetcar Construction. Washington D.C.: DC Surface Transit, Inc. .
[22] Kittrell, K. (2012). Impacts of Vacant Land Values: Comparison of Metro Light Rail Station Areas in Phoenix, Arizona. Transportation Research Board, 138-145.
[23] Knaap, G., Ding, C., & Hopkins, L. (2001). Do Plans Matter? The Effects of Light Rail Plans on Land Values in Station Areas. Journal of Planning Education and Research , 32-39.
[24] Cervero, R., & Landis, J. (1997). Twenty Years of the Bay Area Rapid Transit System: Land Use and Development Impacts. Transportation Research A, 309-333.
[25] Cervero, R., & Kang, C. D. (2011). Bus Rapid Transit Impacts on Land Uses and Land Values in Seoul, Korea. Transport Policy , 102-116.
[26] Center for Transit-Oriented Development . (2008). Capturing the Value of Transit. Washington D.C.: United States Department of Transportation Federal Transit Administration.
[27] Cervero, R., & Kang, C. D. (2011). Bus Rapid Transit Impacts on Land Uses and Land Values in Seoul, Korea. Transport Policy , 102-116.
[28] Federal Transportation Authority. (2000). Transit Benefits 2000 Working Papers. Washington D.C.: U.S. Department of Transportation.
[29] Fejarang, R. (1993). Impact on Property Values: A Study of the Los Angeles Metro Rail. Los Angeles: Metropolitan Transportation Authority.
[30] Center for Transit-Oriented Development . (2008). Capturing the Value of Transit. Washington D.C.: United States Department of Transportation Federal Transit Administration.
[31] Center for Transit-Oriented Development . (2008). Capturing the Value of Transit. Washington D.C.: United States Department of Transportation Federal Transit Administration.
[32] Wardrip, K. (2011). Public Transit's Impact on Housing Costs: A Review of the Literature. Washington D.C.: Center for Housing Policy .
[33] Wardrip, K. (2011). Public Transit's Impact on Housing Costs: A Review of the Literature. Washington D.C.: Center for Housing Policy .

Single-Family Development

Research on single-family development is somewhat varied. Depreciation in home values (-10.9% within 900ft. of station) was witnessed in Santa Clara County along San Jose's Light Rail, a result of slow service, limited coverage, and lack of commuter based amenities.[34] Similarly, proximity to light rail was negatively associated with home values along the Blue Line in Charlotte, North Carolina (largely attributed to the pre-existing industrial nature of station areas).[35] Conversely, appreciation in home values was seen in Atlanta, Georgia and Minneapolis, Minnesota. Homes within ¼ mile of Atlanta's anticipated Beltline system sold at a 15-30% premium (witnessed in the pre-installment/pre-opening phase).[36] In Minneapolis, home values along Hiawatha Line were 4.2% greater than the surrounding region.[37]

Multifamily Development

Multifamily development is often associated with transit infrastructure. Dense urban environments coupled with quality transportation systems and supportive public policy facilitates multifamily development in station areas.[38] A study of the Hiawatha Line in Minneapolis, Minnesota noted a 183% increase in housing construction surrounding transit stations following the line's opening in 2004. In turn, multifamily properties within station areas sold for $15,755 more than comparable properties outside the transit shed, generating an aggregate benefit of $6.9 million for multifamily properties sold since 2004.[39] Similar research in San Diego, California found that multifamily development often experiences a premium greater than single-family properties. Condominiums within station areas experienced a 17% premium, 11% greater than single-family properties (6%).[40]

Other Studies

Research combining both single-family and multifamily development further depicts transit's impact on property values. Depreciation associated with the noise of transit operation was witnessed along the MAX Line in Portland, Oregon. While the MAX Line generated premiums of $0.76/ft. for properties between 2500ft. and 1 mile away, those within 2000ft. experienced depreciation. In Pleasant Hill, California, the Bay Area Rapid Transit System (BART) generated 9% premiums for residential properties within station areas, equating to $15.78/ft. Thirteen percent premiums were witnessed in Queens, New York, a result of proximity to the New York Subway System.[41] Research in Seoul, Korea found BRT enhancements to generate 5-10% premiums for properties within 984 feet of BRT stations.[42]

Conclusion

Transit infrastructure generally spawns significant economic benefits for surrounding properties. This benefit is maximized with a strong public transit system offering regional connectivity and frequent, reliable, and speedy service.[43][44][45] A strong economy and healthy real estate conditions, supportive public policy, and traffic congestion further strengthen transit's economic benefits, rendering premiums for vacant, commercial, and residential properties

---

[34] Landis, J., Guhathakurta, S., Huang, W., & Zhang, M. (1995). Rail Transit Investments, Real Estate Values, and Land Use Change: A Comparative Analysis of 5 California Rail Transit Systems. Berkeley: University of California Transportation Center.

[35] Yan, S., Delmelle, E., & Duncan, M. (2012). The impact of a new light rail system on single-family property values in Charlotte, North Carolina. The Journal of Transport and Land Use, 60-67.

[36] Immergluck, D. (2009). Large Redevelopment Initiatives, Housing Values and Gentrification: The Case of the Atlanta Beltline. Urban Studies, 1723-1745.

[37] Center for Transportation Studies. (2010). The Hiawatha Line: Impacts on Land Use and Residential Housing Value. Minneapolis: University of Minnesota.

[38] Cervero, R., & Landis, J. (1997). Twenty Years of the Bay Area Rapid Transit System: Land Use and Development Impacts. Transportation Research A, 309-333.

[39] Center for Transportation Studies. (2010). The Hiawatha Line: Impacts on Land Use and Residential Housing Value. Minneapolis: University of Minnesota.

[40] Duncan, M. (2008). Comparing Rail Transit Capitalization Benefits for Single-Family and Condominium Units in San Diego, California. Societal and Economic Factors, 120-130.

[41] Lewis-Workman, S., & Brod, D. (1997). Measuring the Neighborhood Benefits of Rail Transit Accessibility. Transportation Research Record, 147-153.

[42] Cervero, R., & Kang, C. D. (2011). Bus Rapid Transit Impacts on Land Uses and Land Values in Seoul, Korea. Transport Policy , 102-116.

[43] Cervero, R., & Kang, C. D. (2011). Bus Rapid Transit Impacts on Land Uses and Land Values in Seoul, Korea. Transport Policy , 102-116.

[44] Yan, S., Delmelle, E., & Duncan, M. (2012). The impact of a new light rail system on single-family property values in Charlotte, North Carolina. The Journal of Transport and Land Use, 60-67.

[45] Landis, J., Guhathakurta, S., Huang, W., & Zhang, M. (1995). Rail Transit Investments, Real Estate Values, and Land Use Change: A Comparative Analysis of 5 California Rail Transit Systems. Berkeley: University of California Transportation Center.

within close proximity to transit stations (Figure 3 – Summary of Property Value Premiums (Adapted from Center for Transit-Oriented Development, 2008).[46]

Figure 3 - Summary of Property Value Premiums (Adopted from Center for Transit-Oriented Development, 2008

Land Use	Range of Property Value Premium		
Vacant	+70% w/in 2640ft. of station (Westside MAX, 2001)		
Commercial	+3-26% w/in 500ft. of station (Seoul BRT System, 2009)	to	+167% w/in 200ft. of station (San Diego Trolley, 2004)
Single Family Residential	-10.9% w/in 900ft. of station (San Jose Light Rail, 1995)	to	+15-30% w/in 1320ft. of station (Atlanta Beltline, 2009)
Multifamily Residential	+17% w/in 2,640ft. of station (San Diego Trolley, 2008)		

Research Questions

Extensive literature has explored the connection between transit infrastructure, land use, and land values. While it is generally accepted that transit infrastructure generates land value premiums for parcels within close proximity to transit stations, little research has analyzed the resilience of these parcels in recessionary times. In light of the recent economic downturn, this paper will explore the pliability of tax lots in Pasadena along Metro's Gold Line, answering the questions:

Are land values of property surrounding transit resilient to recessionary trends?

My sub-research questions are:

Is land surrounding transit valued higher than land without transit infrastructure?

Is there a discrepancy in land values between individual station locations?

Study Area – The Metro Gold Line

Opening in 2003 (extended in 2009), the Gold Line encompasses 21 stations, extending from East Los Angeles to Pasadena (Figure 4 – Metro Gold Line). With over 40,000 daily boardings, the Gold Line is the third most popular LRT/BRT line in Metro's system (Figure 5 – Average Weekday Boardings (February 2012-February 2014)). Financed primarily by Measure R, the Gold Line is slated to extend eastward to the Ontario Airport via the Foothill Extension (Figure 6 – The Foothill Extension). The first of three phases is under construction, with the Pasadena to Azusa segment (7 stations; 11.5 miles) projected for completion in 2015.

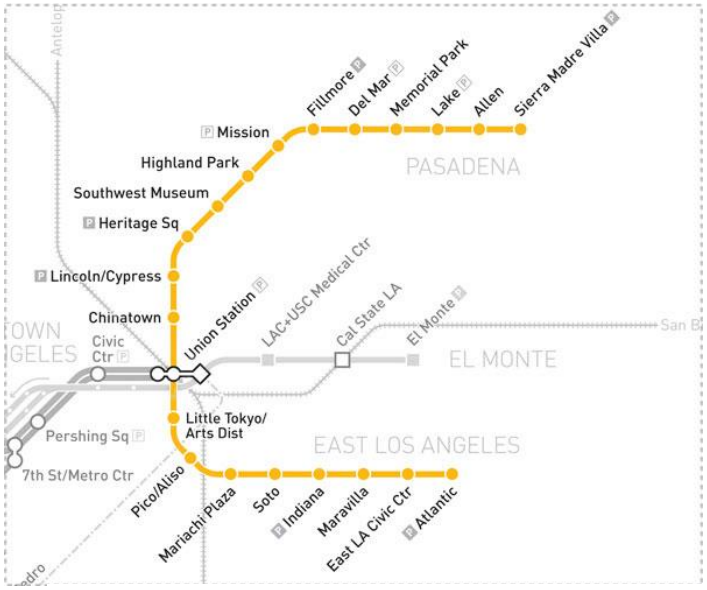


Figure 4 - Metro Gold Line

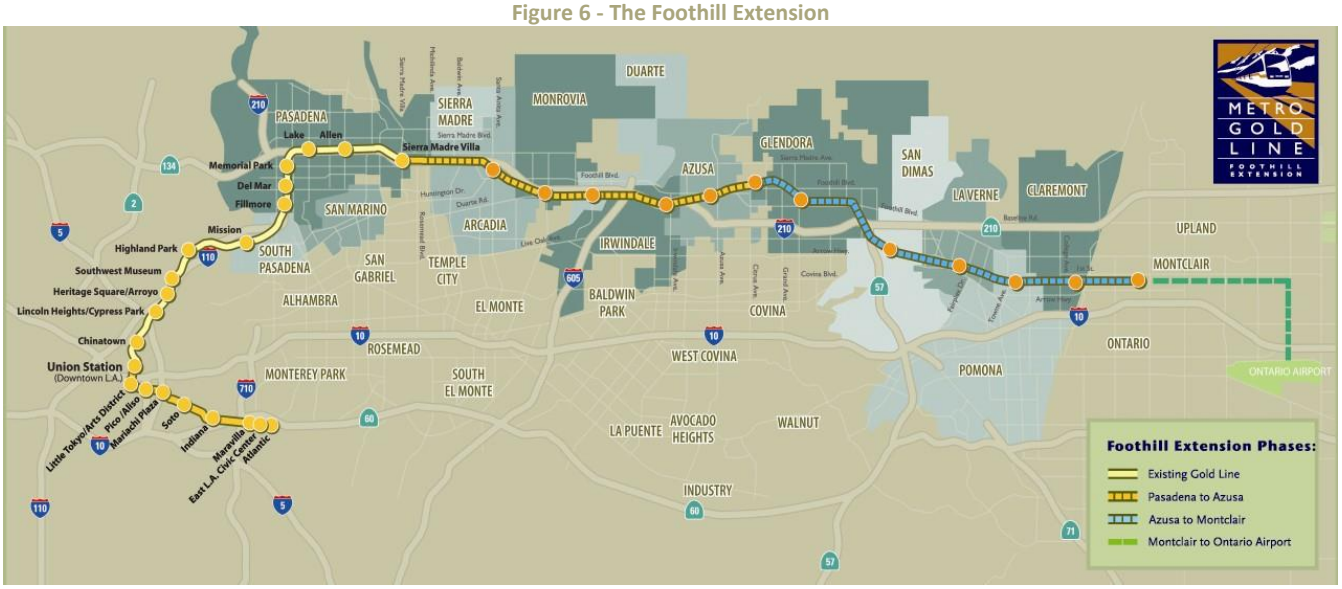
[46] Center for Transit-Oriented Development . (2008). Capturing the Value of Transit. Washington D.C.: United States Department of Transportation Federal Transit Administration.

Figure 5 - Average Weekday Boardings (February 2012-February 2014)

Average Weekday Boardings

	Feb. 2012	Feb. 2013	Feb. 2014
Gold Line	41,147	43,091	**41,624**
Green Line	43,712	44,317	**42,477**
Blue Line	83,397	88,023	**82,320**
Expo Line		25,295	**28,152**
Orange Line (BRT)	27,104	30,959	**30,164**

Figure 6 - The Foothill Extension

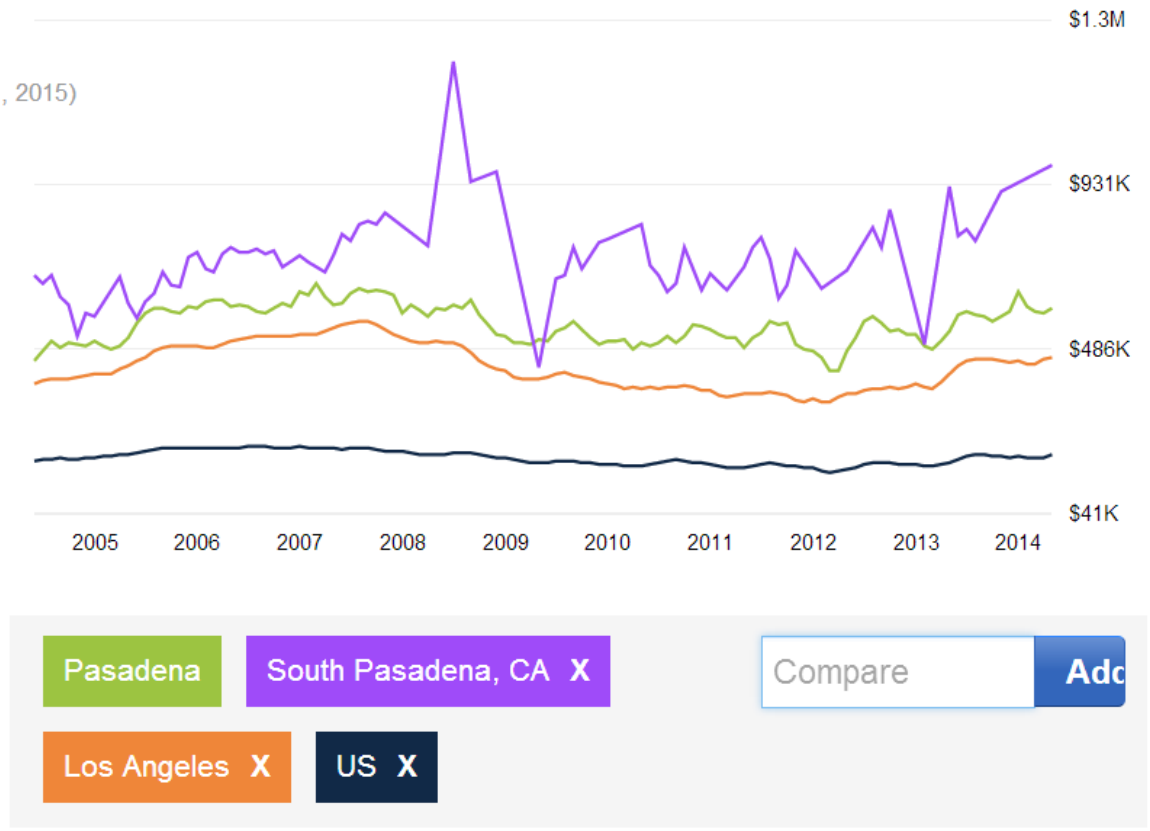


California and the Recession

The recent 'great recession' lasted 18 months, extending from December 2007 through June 2009. During this financial crisis the California housing market was hit especially hard. Possessing the largest and most unaffordable housing market in the nation, California borrowers became susceptible to mortgage overreach. As a result, California lenders accounted for 56% of the $1.38 trillion in subprime loans issued between 2005 and 2007. When the housing bubble burst, California's housing market imploded. Between 2007 and 2009 the state had over 500,000 repossessions, topping the nation. By 2009, median home prices dropped 35-40% from the height of the boom, second only to Nevada. The cities of South Pasadena and Pasadena experienced similar impacts. In South Pasadena the median home sale price dropped 60% between the market's peak in June 2008 and trough in April 2009. Similarly, the median home sale price in Pasadena fell 36% between February 2007 and March 2012(Figure 7 – Zillow Median Home Sales Prices; Los Angeles County, California, and the United States (2005-2014)).[47]

[47] Zillow. (2014, May 19). *Local Info: Los Angeles County Home Prices and Values*. Retrieved from Zillow: http://www.zillow.com/los-angeles-county-ca/home-values/

Figure 7 - Zillow Median Home Sales Prices; Pasadena, South Pasadena, Los Angeles County, and the United States (2005-2014)



Methodology

The Center for Neighborhood Technology released a report in 2013 titled, "The New Real Estate Mantra, Location Near Public Transportation." The agency analyzed Boston, Chicago, Minneapolis/St. Paul, Phoenix, and San Francisco, assessing residential properties during the recent recession (2006-2011). They found transit played a key role in the ability of residential properties to maintain their value during a recession. Despite region-wide declines, residential properties within the transit shed (½ mile from transit stations) outperformed their respective regions by 41.6%. Borrowing from the methodology of this report, this analysis will be centered on the Gold Line in Pasadena, California.

Study Area

The study area will be comprised of tax lots within three distinct zones.

Region

The region is comprised of the boundaries for the City of Pasadena, City of South Pasadena, and the Census Designated Place, East Pasadena. The three boundaries encompass 48,700 tax lots, spanning nearly 28 square miles (Figure 8 – Parcel Counts by Zone)(Figure 9 – Gold Line and the Pasadena Study Area)(Figure 10 – Gold Line Regional Context).

Figure 8 - Parcel Counts by Zone

Geography	2013 Parcels
Region	48,700
Transit Zone	11,525
Non-Transit Zone	37,175
L.A. County	2,386,050

Figure 9 - Gold Line and the Pasadena Study Area

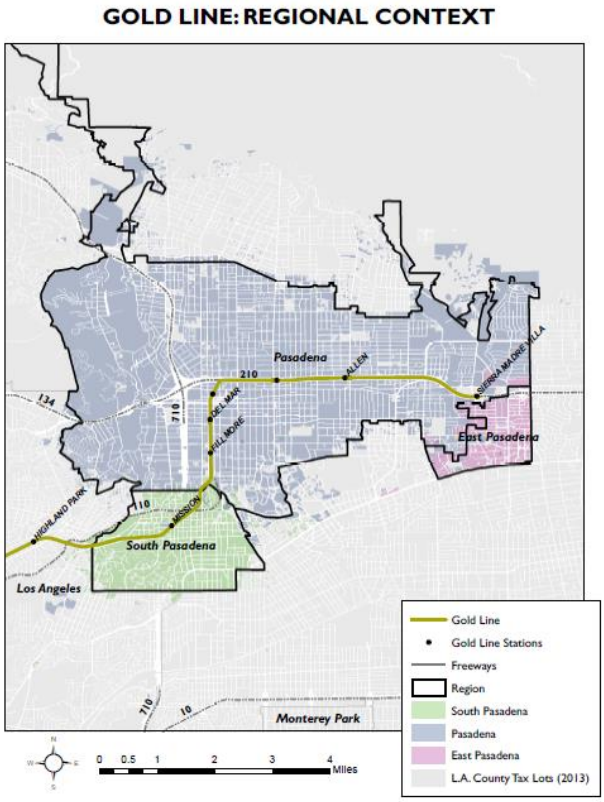
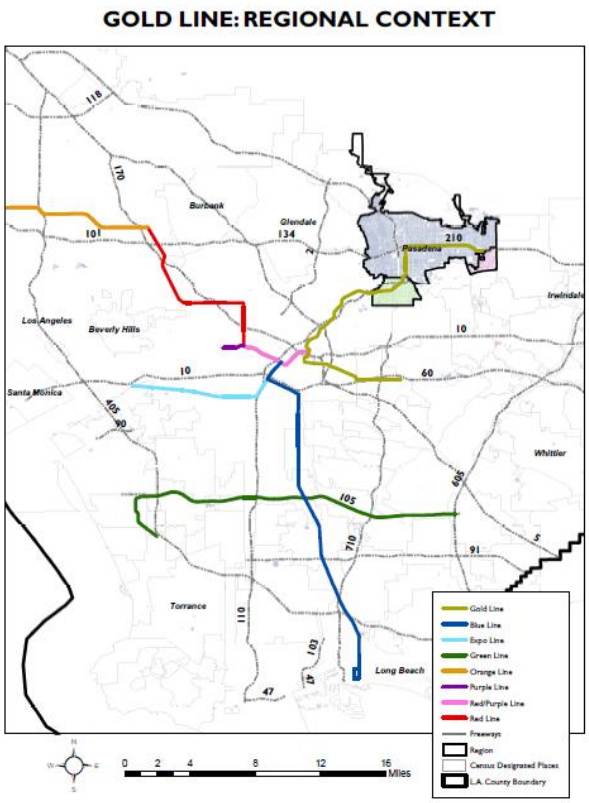


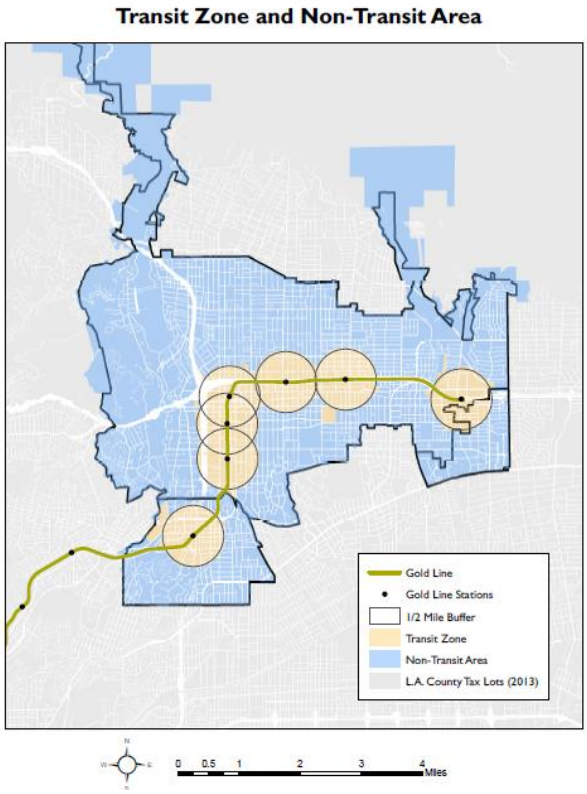
Figure 10 - Gold Line Regional Context



Transit Zone

The transit zone contains all parcels within a half-mile of each gold line station. Seven Gold Line stations are included in this analysis (Sierra Madre Villa, Allen, Lake, Memorial Park, Del Mar, Fillmore, and South Pasadena). The transit zone possesses 11,525 parcels (Figure 11 – Transit Zone and Non-Transit Area).

Figure 11 - Transit Zone and Non-Transit Area



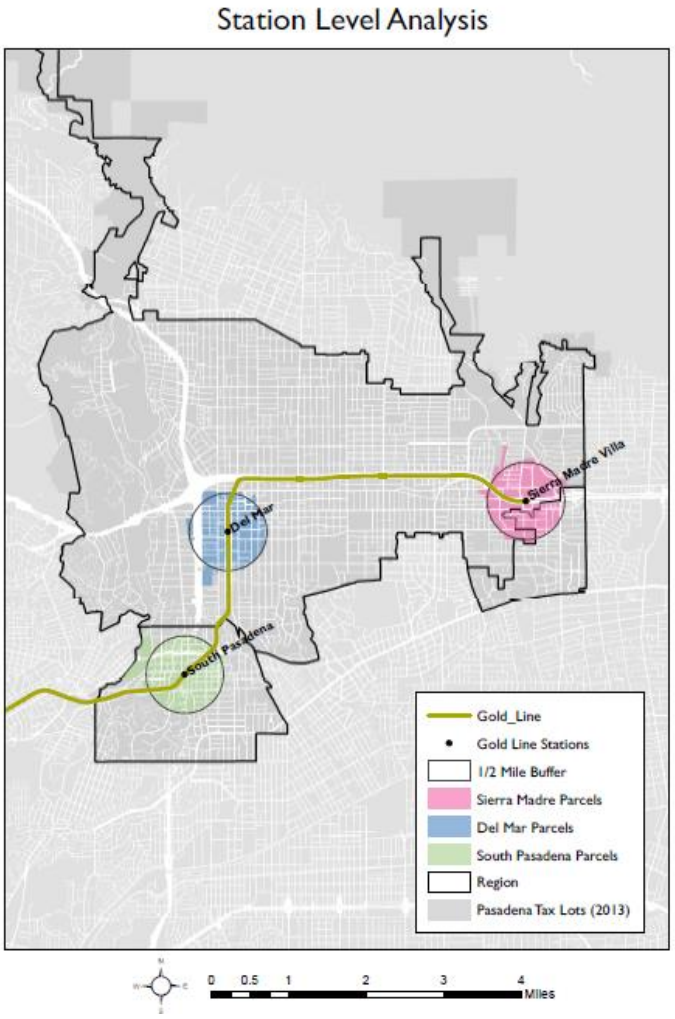
Non-Transit Area

The non-transit area includes all parcels within the region, but outside the transit zone. 37,175 parcels lie within the non-transit area (Figure 11 – Transit Zone and Non-Transit Area).

Station

Additional analysis will be conducted at the station level looking at the Sierra Madre Villa, Del Mar, and South Pasadena stations. The Sierra Madre station is the current eastbound terminus of the Gold Line. It is in close proximity to Pasadena's prevalent financial district and surrounded by commercial and office uses. The Del Mar station lies in Pasadena's urban core. Resting just east of the Old Town Pasadena retail district, the station is surrounded by a concentration of commercial, high density residential, and mixed use development. The South Pasadena station is the only Gold Line station in the City of South Pasadena. South Pasadena is one of the most affluent suburbs in the Los Angeles area. The station lies on Mission Street, the City's primary commercial corridor. It is surrounded by general commercial and medium density residential uses (Figure 12 – Gold Line Station Level Analysis).

Figure 12 - Gold Line Station Level Analysis



Data Collection

Los Angeles County Parcel Data:

Tax lot parcel data from Los Angeles County was collected yearly from July 2005 through June 2012. The dataset, accompanied with a geocoded map, includes recording dates, land use codes, and assessed values for all tax lots within Los Angeles County.

Assessed Values vs. Fair Market Values

The Assessor's office is responsible for determining a taxable value for all property subject to property taxation. In 1978, California constituents passed Proposition 13. The amendment capped increases in assessed values to 2% per trend year, based on a property's base year value. As a result, the assessed value differs substantially from the fair market value of the property. However, four events trigger a reappraisal and subsequent revaluation of a parcel's base year value[48]:

1. Change in ownership
2. Completed new construction
3. New construction partially completed on the lien date
4. A decline-in-value

When a property is reassessed, a new base year value is determined. "A property's base year value is its fair market value on the date of the change in ownership [or recording date].[49]"

Recording Dates

Recording dates provide an indication of when a parcel was last recorded with the Assessor. The Los Angeles County Assessor recording periods extend from July through June. Given the influence of proposition 13, only parcels recorded within an analysis year were considered as they reflect the fair market land value of the tax lot (Figure 15 – Recording Periods and Parcel Counts).

Figure 13 - Recording Periods and Parcel Counts

Region

Year	Recording Period	Analyzed Parcels (Region)	% of All Parcels (Region)
2005	July 2005 - June 2006	3,283	7%
2006	July 2006 - June 2007	2,753	6%
2007	July 2007 - June 2008	2,455	5%
2008 (Recession)	July 2008 - June 2009	6,268	13%
2009	July 2009 - June 2010	2,607	5%
2010	July 2010 - June 2011	2,498	5%
2011	July 2011 - June 2012	2,558	5%

Transit Shed

Year	Recording Period	Analyzed Parcels (Transit Shed)	% of All Parcels (Transit Shed)
2005	July 2005 - June 2006	780	7%
2006	July 2006 - June 2007	607	5%
2007	July 2007 - June 2008	668	6%
2008 (Recession)	July 2008 - June 2009	1,482	13%
2009	July 2009 - June 2010	663	6%
2010	July 2010 - June 2011	541	5%
2011	July 2011 - June 2012	606	5%

[48] Los Angeles County Office of the Assessor. (2014, June 11). Real Property Assessments . Retrieved from Los Angeles County Office of the Assessor: http://assessor.lacounty.gov/extranet/guides/realprop.aspx

[49] California State Board of Equalization. (2008). Los Angeles County Assessment Practices Survey. Sacremento: California State Board of Equalization.

Non-Transit Area

Year	Recording Period	Analyzed Parcels (Non-Transit)	% of All Parcels (Non-Transit)
2005	July 2005 - June 2006	2,536	7%
2006	July 2006 - June 2007	2,177	6%
2007	July 2007 - June 2008	1,811	5%
2008 (Recession)	July 2008 - June 2009	4,852	13%
2009	July 2009 - June 2010	1,964	5%
2010	July 2010 - June 2011	1,972	5%
2011	July 2011 - June 2012	1,979	5%

Assessed Values:

Assessed values are adjusted for inflation and reflected in 2014 dollars using the Bureau of Labor Statistics' inflation calculator (Figure 14 – Inflation Adjustment). Assessed values (in 2014 dollars) were divided by parcel's total square footage to determine price per square foot.

Figure 14 - Inflation Adjustment

Year	Inflation Factor
2005	1.21
2006	1.18
2007	1.14
2008	1.10
2009	1.11
2010	1.09
2011	1.05

Use Codes:

Use codes, published by the Los Angeles County Assessor, give a detailed indication of a parcel's use. Using these codes, parcels were identified as either residential or commercial (Figure 15 – Use Code Classifications). A detailed list of use codes can be found on the Assessor's website.[50]

Figure 15 - Use Code Classifications

Use Code	Designation
0000	Residential (including mixed use)
1000	Commercial
2000	Commercial

GIS Shapefiles:

Shapefiles including municipal and county boundaries, gold line station locations, and tax lot boundaries assist in spatially displaying and analyzing the aforementioned data sets.

Data Analysis

Statistical Interpretation

The average price per square foot of both commercial and residential uses was tracked between 2005 and 2012.

[50] http://www.parcelquest.com/use_codes/pdf/losangeles.pdf

Mean Comparison
Mean comparison tests assessing price per square foot (of both residential and commercial uses) within the transit and non-transit regions will be calculated.

Margin of Errors
Margin of errors will be determined, gauging the validity of the recorded statistics.

Percent Change
Percent change will be tabulated over the seven year period, giving insight to the performance of land values pre, during, and post-recession.

Station Level Analysis
Average price per square foot will be tracked over the seven year period within a ½ mile buffer of the Sierra Madre Villa, Del Mar, and Mission Gold Line Stations.

Hot Spot Analysis
Using ArcMap, hot spot analyses will be conducted for each year. Using a specified input (in this case price/sf), the tool indicates where features with significantly high and low values cluster. The program calculates a local sum for a feature (i.e. tax lot and its associated price/sf) and its neighbors then compares it proportionally to the sum of all features. Hot and cold spots are then determined by which areas have a statistically high concentration of either high or low values.

Hypotheses

RQ1: Are land values of property surrounding transit resilient to recessionary trends?

HYP1
I hypothesize the presence of transit will have a substantial impact on land values within the Pasadena area. Similar to the findings of the Center for Neighborhood Technologies, land values surrounding transit will be more resilient during the recession (December 2007 through June 2009). I assume land values within the transit zone will fall at a slower pace than those within the non-transit area. Additionally, I predict land values will recover faster within the transit zone.

Analysis Tool
This will be measured by tracking the percent change in average price per square foot over the seven year study period.

RQ2: Is land surrounding transit valued higher than land without transit infrastructure?

HYP2
Living in the Pasadena area, I've witnessed a substantial change with the arrival of the Gold Line in 2002. The area has embraced transit with a concentration of TOD surrounding station areas. Intensified residential, commercial, and mixed use development has transformed the urban core into a vibrant and lively community. I presume that this intensified development has rendered a land value bonus for parcels within ½ mile of the City's Gold Line stations.

Analysis Tool
Mean comparison tests and hot spot analyses will provide an indication of how land values perform with and without the presence of transit.

RQ3: Is there a discrepancy in land values between individual station locations?

HYP3

I predict station location will have a significant influence on land values. Given its urban nature, dense development, and proximity to Pasadena's key retail districts, I assume land values surrounding the Del Mar Station area are higher than those within ½ mile of the South Pasadena and Sierra Madre Villa stops.

Analysis Tool

This will be measured by tracking the percent change in price per square foot and comparison of means over the seven year study period.

Findings

RQ1: Are land values of property surrounding transit resilient to recessionary trends?

Residential

Residential land values throughout the Pasadena area were volatile throughout the seven year study period. However, during the recession, land values within the transit shed withheld initial economic impacts. Between July 2007 and June 2009, land values in the transit shed fell just 4%. In the same period land values in the region and non-transit area fell 15% and 18% respectively. Prior to the recession, land values in the region and non-transit area were more stable than those in the transit shed. Minimal and consistent declines between July 2005 and June 2008 contrasts the substantial fluctuations of land values within the transit shed. Post-recession, the transit shed experienced the impacts of the recession, falling 14% between June 2009 and July 2010. In the same period, land values in the region and non-transit area were recovering, with minimal, 4% and 1% declines respectively. Between July 2009 and June 2012, land values in the transit shed fell 8%, while those in the region and non-transit area fell 2% and 1% respectively.

Figure 16 - Residential % Change in $/SF

% Change (in $/SF)			Recession			
Year	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
Transit	9%	-26%	-4%	-14%	17%	-9%
Region	-2%	-8%	-15%	-4%	9%	-6%
Non-Transit	-4%	-2%	-18%	-1%	6%	-5%

Commercial

Commercial land values were also volatile throughout the seven year study period. During the recession, all three geographic regions experienced declines in land values. Parcels in the transit shed witnessed 8% declines, while those in the region and non-transit area fell 14% and 16% respectively. These recession-induced declines were prefaced by significant increases between June 2007 and July 2008. Forty-three percent gains in the transit shed outperformed both the region (35%) and non-transit area (11%). Post-recession, land values in all three regions failed to recover. Between July 2009 and June 2012, land values in the transit shed fell 52%, while those in the region and non-transit area fell 39% and 12% respectively.

Figure 17 - Commercial % Change in $/SF

% Change (in $/SF)						
Year	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
Transit	-20%	43%	-8%	-16%	-21%	-29%
Region	-11%	35%	-14%	-15%	-4%	-25%
Non-Transit	-4%	11%	-16%	-16%	31%	-21%

RQ2: Is land surrounding transit valued higher than land without transit infrastructure?

Residential

Residential land within the transit shed is valued lower than land in both the region and non-transit area. After June 2007, a significant difference in the average price per square foot was witnessed between the transit shed and non-transit area (Figure 19 – Mean Comparison (Transit Shed vs. Non-Transit Area)). The greatest difference was witnessed in July 2007/June 2008, where land in the non-transit area was valued $8.60/SF more than land in the transit shed. As of June 2012, land in the non-transit area was valued at $36.11/SF, while that in the transit shed commanded $28.95/SF.

Figure 18 - Residential $/SF (June 2005-July 2012)

Figure 19 - Mean Comparison (Transit Shed vs. Non-Transit Area)

Mean Comparrison (Transit vs. Non-Transit)							
	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
p-value	0.45	0.47	0	0.00003	0.00079	0.00008	0

Figure 20 - Residential 95% Confidence Intervals

Transit	**2005-2006**	**2006-2007**	**2007-2008**	**2008-2009**	**2009-2010**	**2010-2011**	**2011-2012**
Avg. $/SF	$ 40.94	$ 44.49	$ 32.88	$ 31.56	$ 27.13	$ 31.73	$ 28.95
95% CI (+/-)	$ 3.31	$ 4.17	$ 3.09	$ 2.20	$ 2.50	$ 2.91	$ 2.62
Region							
Avg. $/SF	$ 45.76	$ 45.00	$ 41.48	$ 35.43	$ 33.84	$ 36.78	$ 34.57
95% CI (+/-)	$ 1.53	$ 1.64	$ 1.67	$ 0.90	$ 1.25	$ 1.33	$ 1.19
Non-Transit							

Avg. $/SF	$ 47.13	$ 45.13	$ 44.27	$ 36.47	$ 35.94	$ 38.06	$ 36.11
95% CI (+/-)	$ 1.72	$ 1.76	$ 1.95	$ 0.98	$ 1.42	$ 1.49	$ 1.33

Commercial

Commercial land within the transit shed is generally valued higher than land in both the region and non-transit area. However after the recession, values in all three geographic regions fell significantly, most notably in the transit shed. By July 2012, the average price per square foot in the transit shed fell below that of the region and non-transit area, falling 56% from $109.44/SF in June 2008 to $48.10 in June 2012. In June 2012, land in the non-transit area and region were valued at $50.59/SF and $49.19/SF respectively.

Figure 21 - Commercial $/SF (July 2005-June 2012)

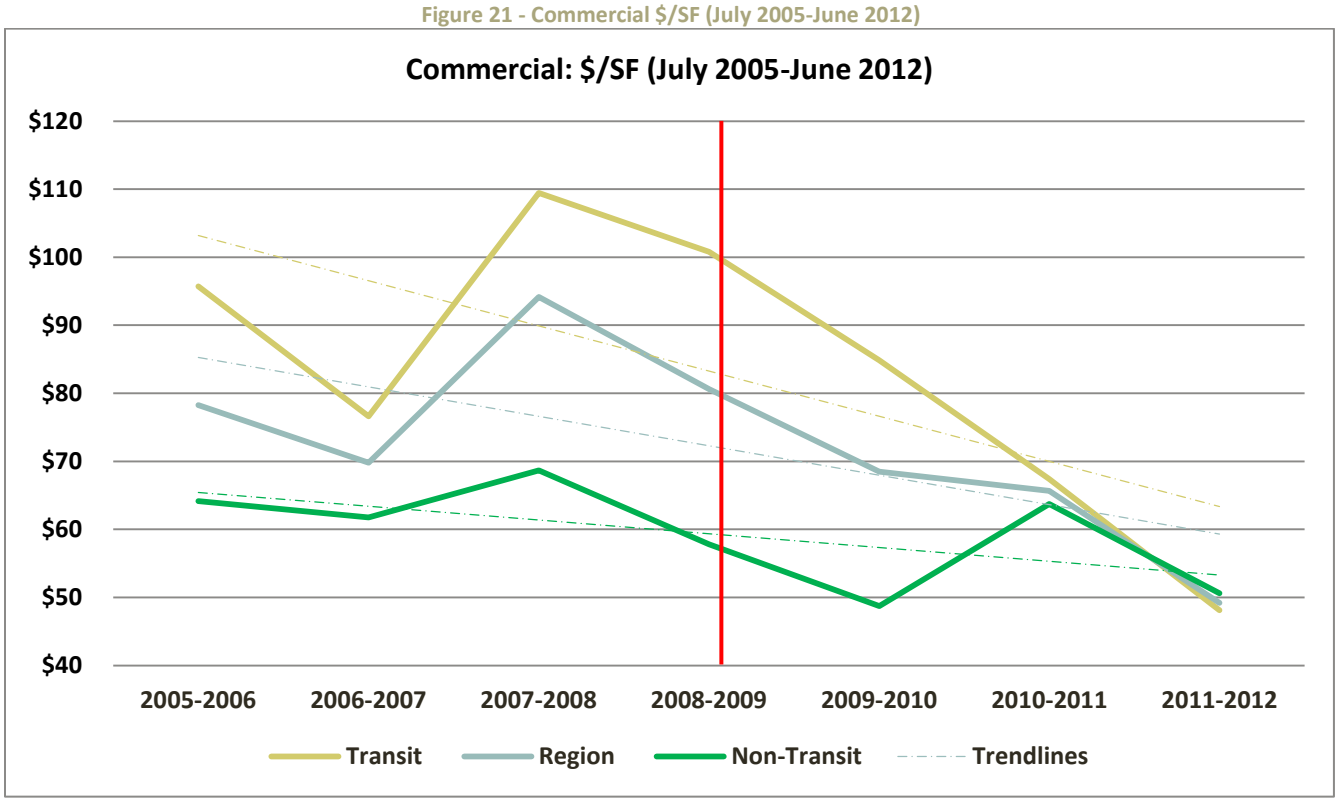


Figure 22 - Commercial 95% Confidence Intervals

Transit	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
Avg. $/SF	$ 95.69	$ 76.64	$ 109.44	$ 100.80	$ 84.84	$ 67.40	$ 48.10
95% CI (+/-)	$ 21.56	$ 28.91	$ 19.92	$ 12.61	$ 19.33	$ 16.98	$ 10.63
Region							
Avg. $/SF	$ 78.25	$ 69.78	$ 94.14	$ 80.60	$ 68.47	$ 65.68	$ 49.19
95% CI (+/-)	$ 11.39	$ 17.18	$ 14.07	$ 7.98	$ 12.07	$ 11.37	$ 7.63
Non-Transit							
Avg. $/SF	$ 64.17	$ 61.76	$ 68.65	$ 57.80	$ 48.75	$ 63.71	$ 50.59
95% CI (+/-)	$ 10.00	$ 15.42	$ 15.09	$ 7.90	$ 10.20	$ 14.72	$ 10.82

All Parcels

Hot Spots

Geography has a significant influence on property values. Hot pots are witnessed in the affluent South Pasadena and North Pasadena communities. The City of South Pasadena is recognized as one of the most affluent Los Angeles suburbs, possessing a median household income 50% greater than that of Los Angeles County (Figure 23 – 2012 ACS (5 Year Sample) Key Socioeconomic Characteristics). North Pasadena, while nestled in the City of Pasadena, rests in the foothills of the Angeles National Forest. A concentration of expensive homes and wealthy individuals reside in this community, capitalizing on stunning views and recreational amenities. These communities potentially skew the dataset, housing a number of parcels with elevated land values.

Figure 23 - 2012 ACS (5 Year Sample) Key Socioeconomic Characteristics

2012 ACS (5 Year Sample)	Los Angeles County	East Pasadena	South Pasadena	Pasadena
Total Population	9840024	5803	25603	137316
Median Household Income	$ 56,241	$ 71,198	$ 84,185	$ 68,310
White Alone	28%	35%	41%	40%
Black or African American Alone	8%	1%	2%	10%
Asian Alone	14%	25%	31%	13%
Hispanic or Latino (of any race)	48%	36%	22%	33%
Other	3%	3%	4%	3%

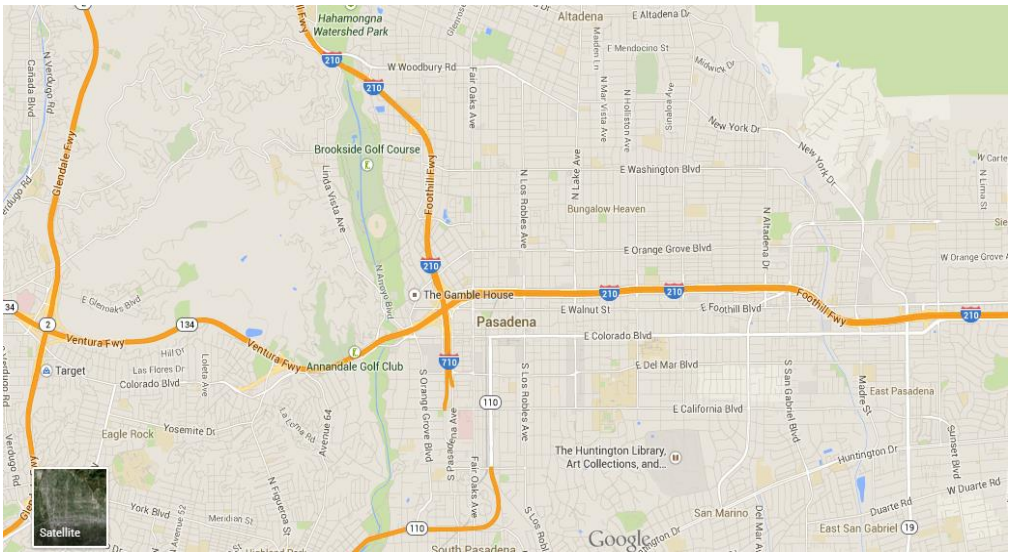
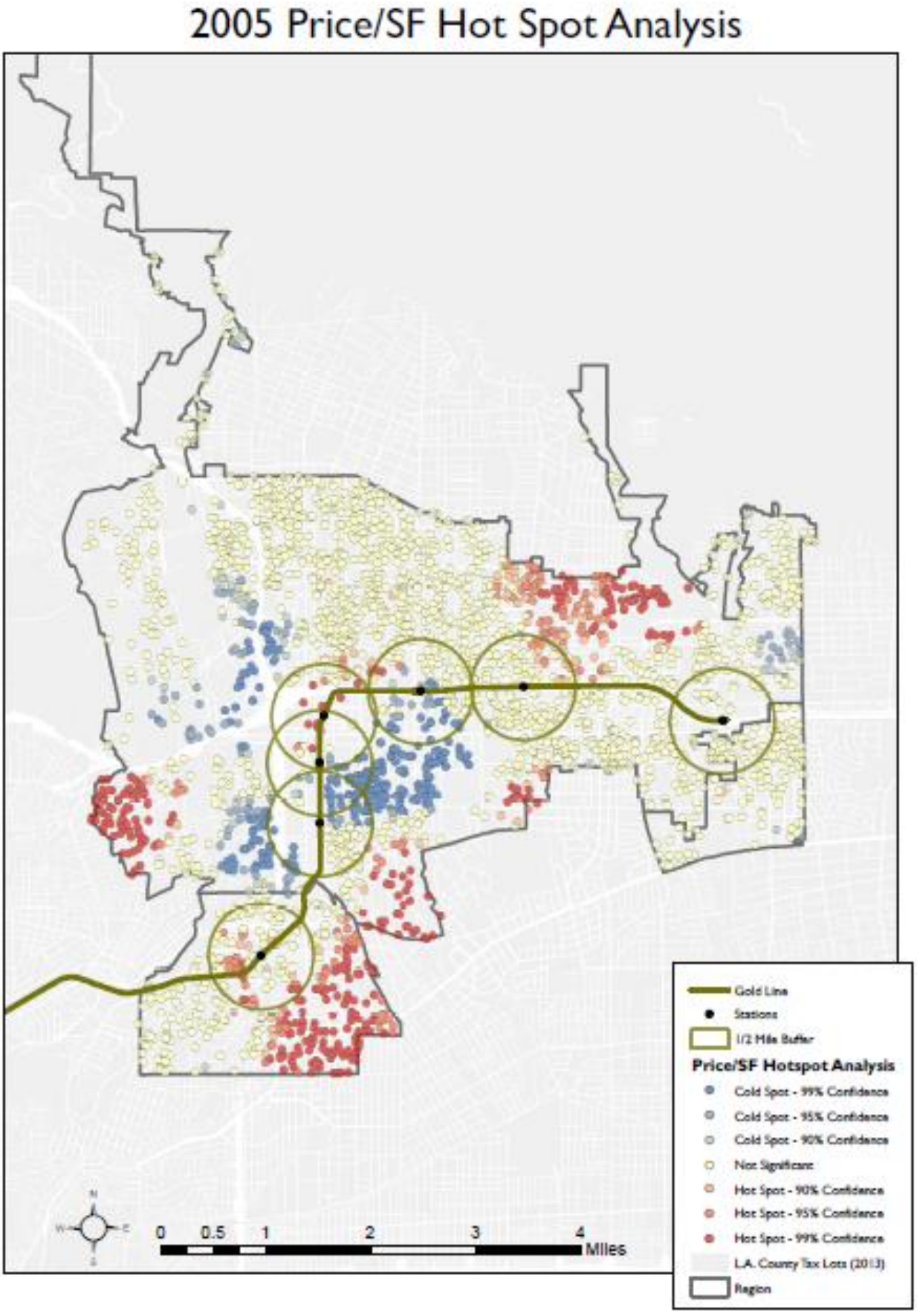


Figure 24 - Pasadena Freeway Map

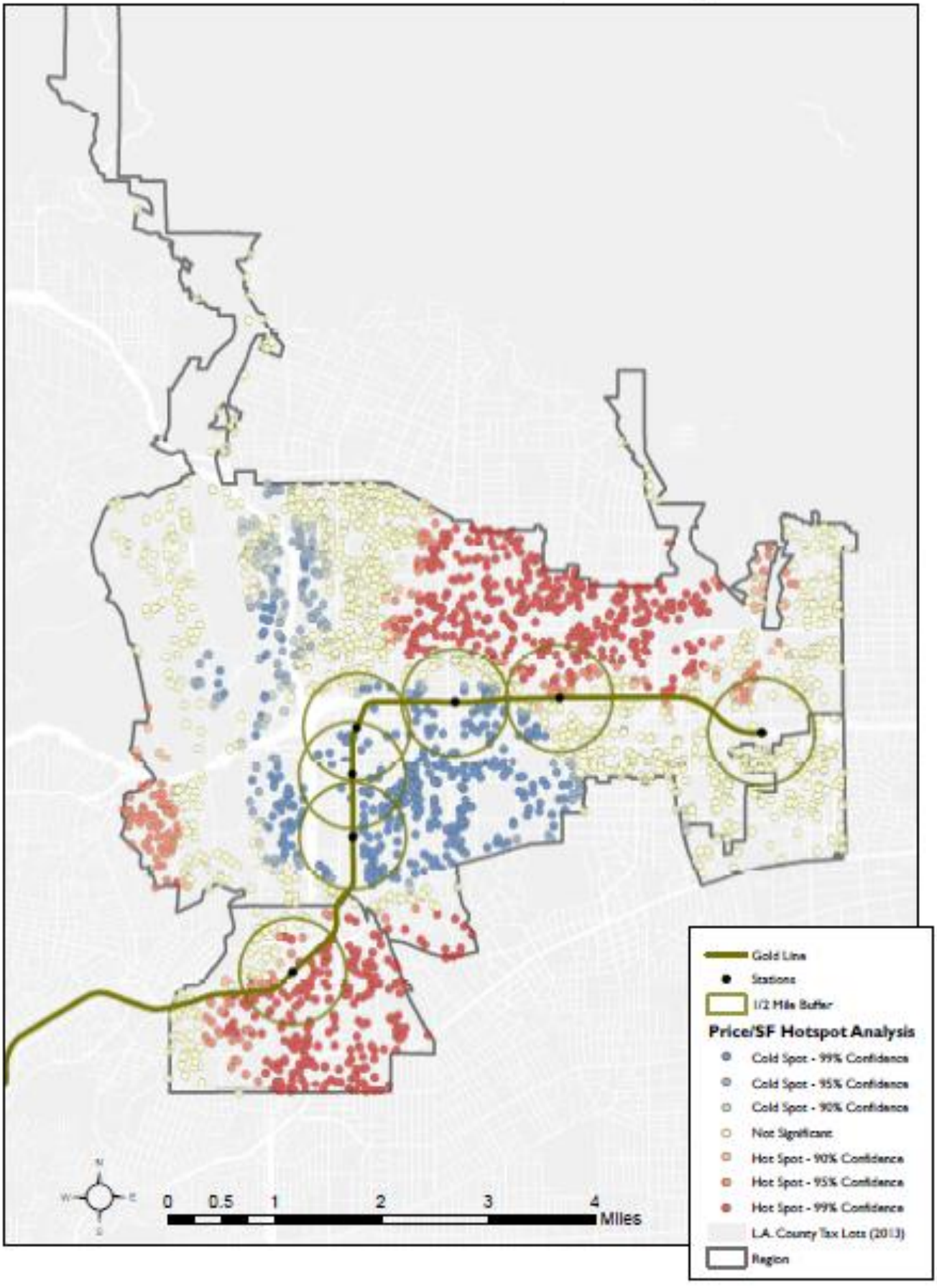
Cold Spots

Cold spots are seen within Pasadena's urban core and along highway infrastructure. Pasadena's urban core rests south and east of the Gold Line. While a concentration of dense residential, commercial, and office development exists in close proximity to the Gold Line corridor, this area possesses a cluster of significantly lower property values. Cold spots are also witnessed in close proximity to the 210 and 134 freeways (Figure 24 – Pasadena Freeway Map).

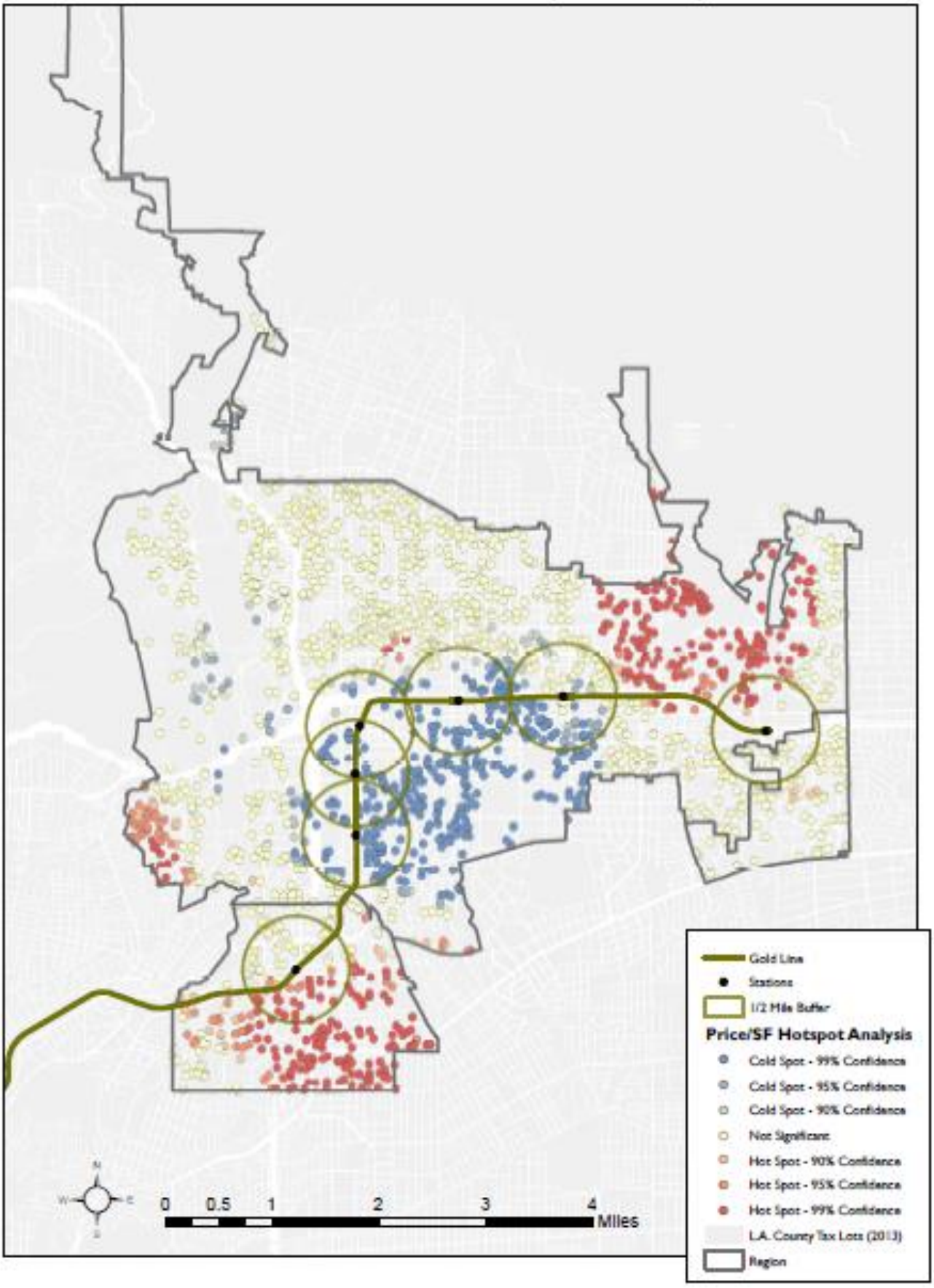
Figure 25 - Hot Spot Analyses (July 2005-June 2012)



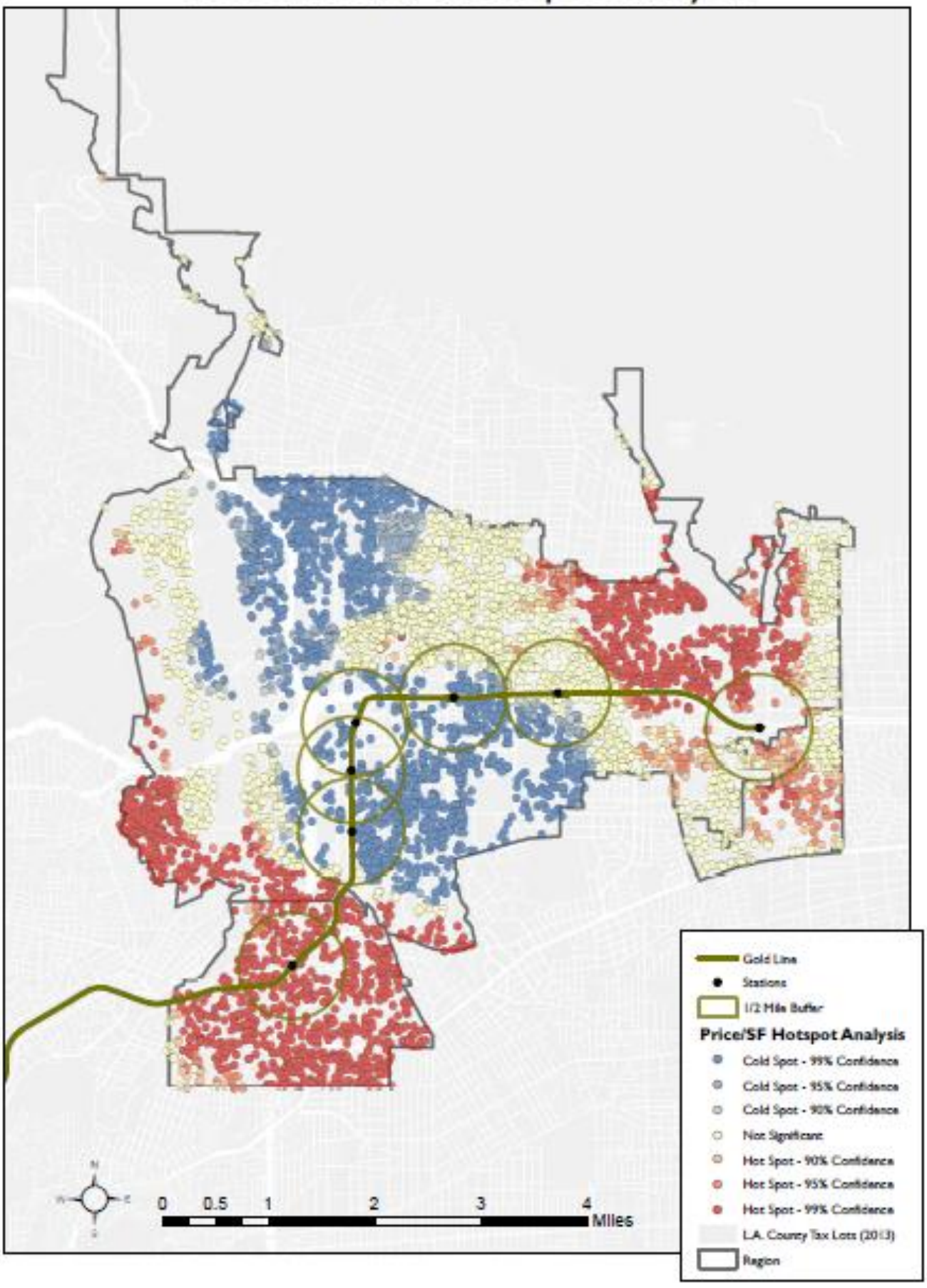
2006 Price/SF Hot Spot Analysis



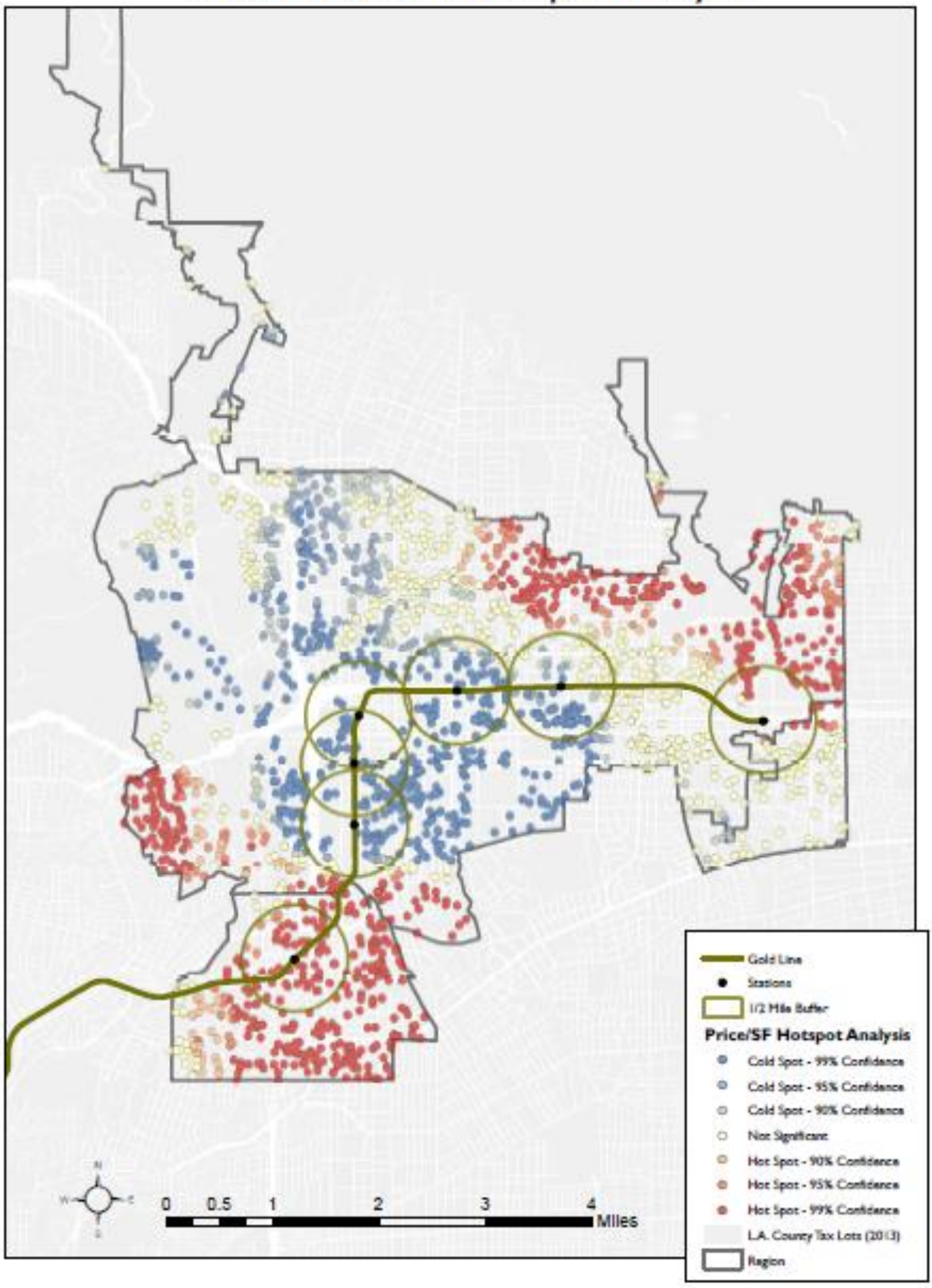
2007 Price/SF Hot Spot Analysis



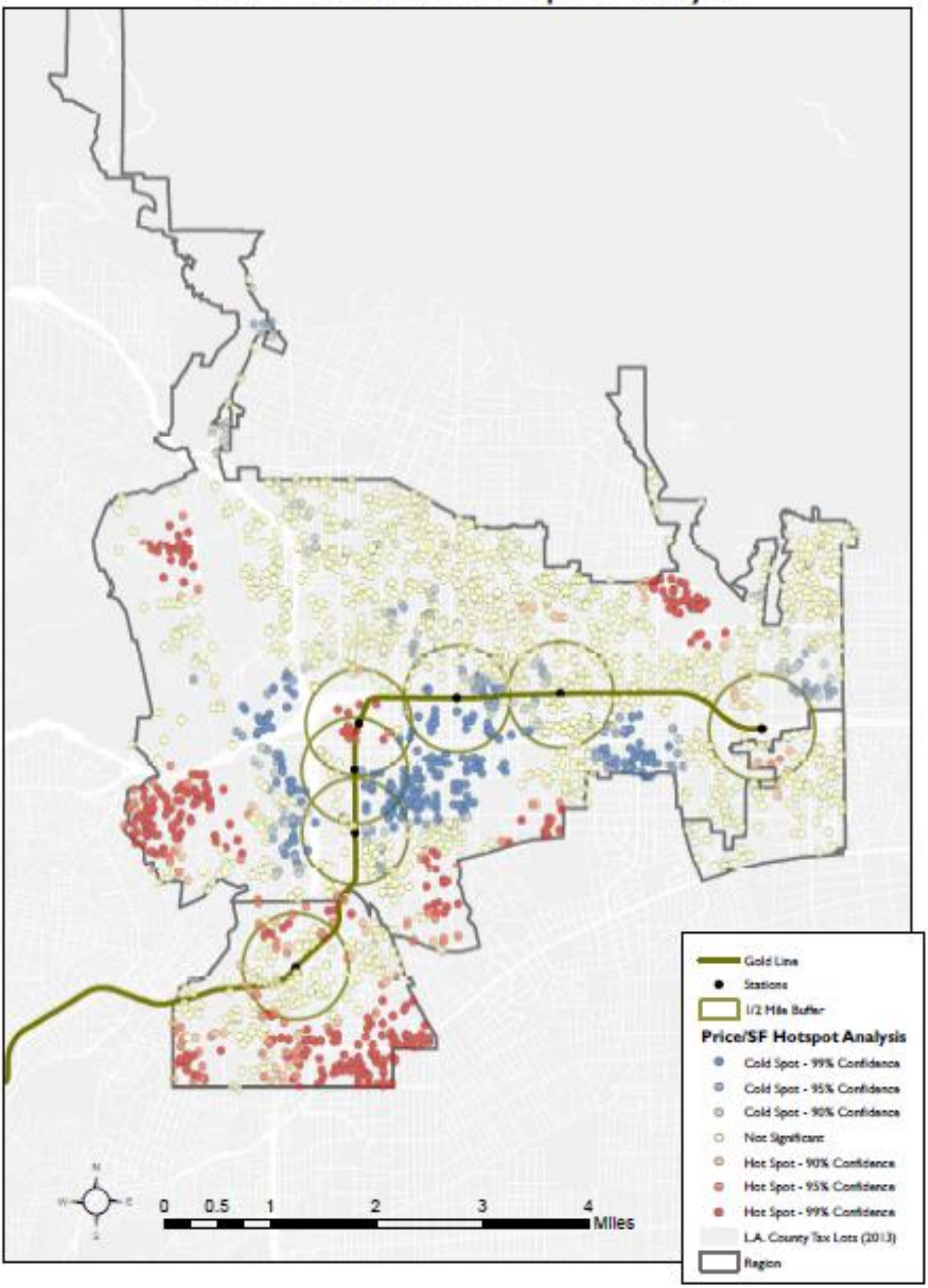
2008 Price/SF Hot Spot Analysis



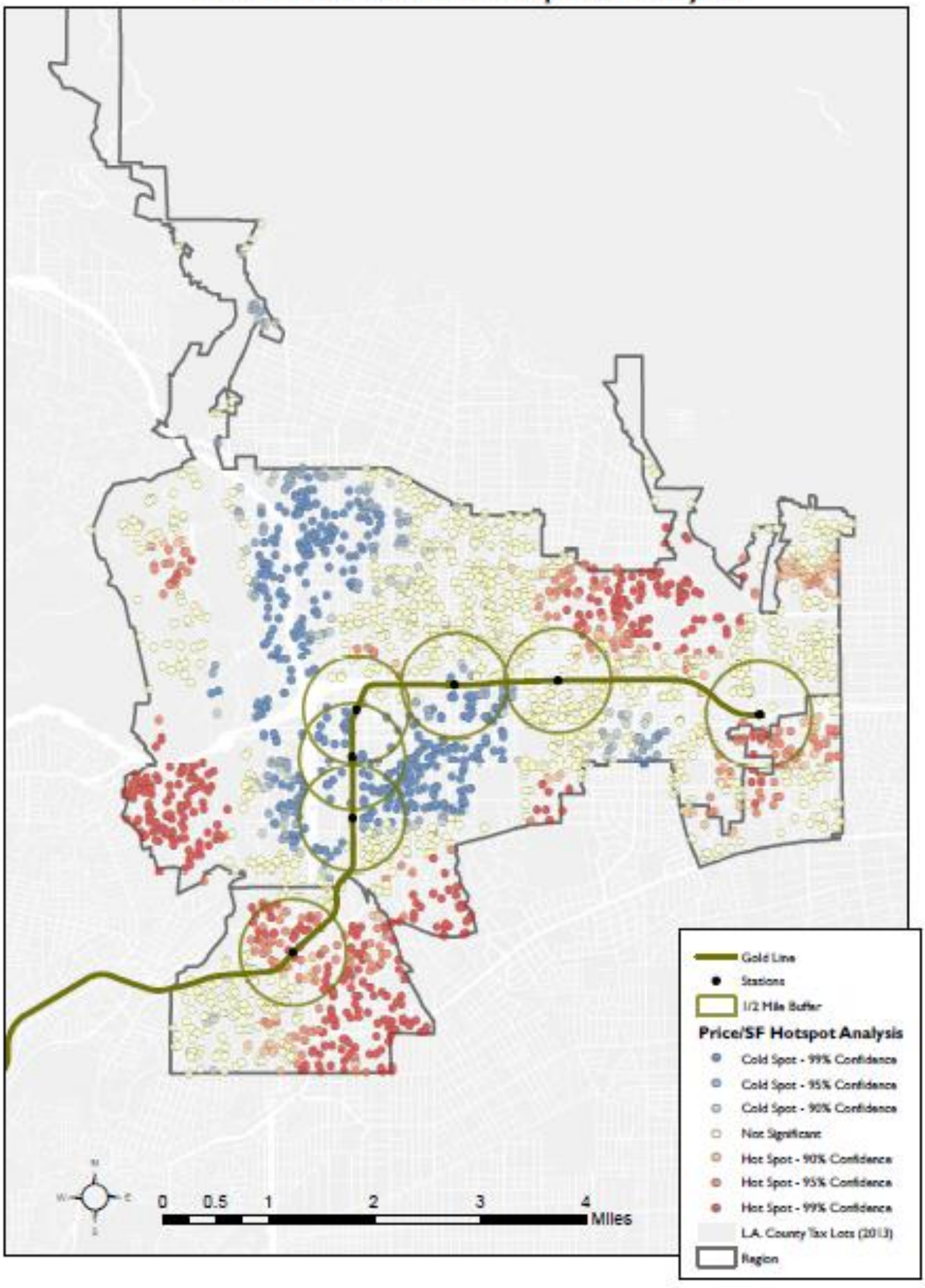
2009 Price/SF Hot Spot Analysis



2010 Price/SF Hot Spot Analysis



2011 Price/SF Hot Spot Analysis



RQ3: Is there a discrepancy in land values between individual station locations?

Land values in the South Pasadena station area are valued higher than those surrounding the Sierra Madre Villa and Del Mar stops. Prior to the recession it appeared that land values in the three station areas would meet around $50/SF. However, the recession's impacts were felt disproportionately by each station. The South Pasadena and Del Mar station areas have been most affected by the recession, experiencing 31% and 54% declines since its onset in 2007. While less severe, this trend was mirrored in the Sierra Madre Villa station area with a decline of 27%. As of June 2012, land values in the South Pasadena station area were $40.07/SF. Tax lots within the Sierra Madre Villa and Del Mar station areas sold at $37.47/SF and $21.24/SF respectively.

Figure 26 - $/SF (July 2005-June 2012)

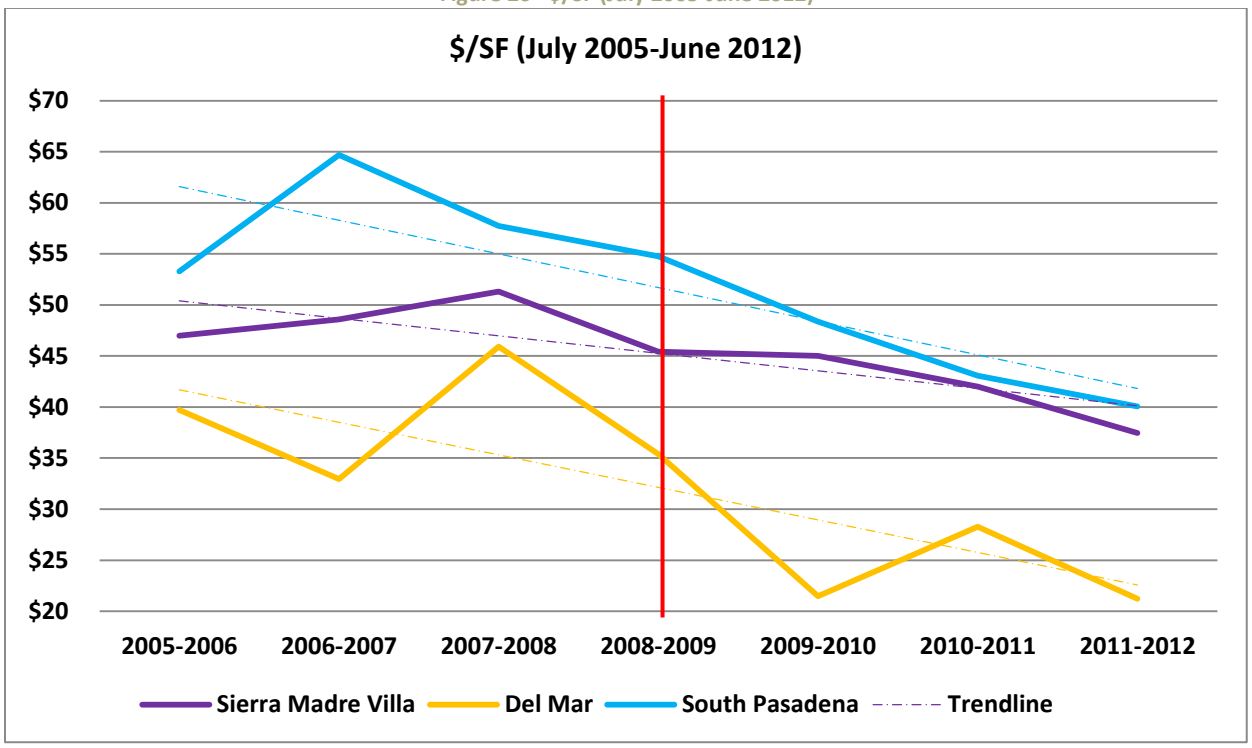


Figure 27 - Stations Areas % Change in $/SF

% Change (in $/SF)						
Year	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
Sierra Madre Villa	3%	6%	-11%	-1%	-7%	-11%
Del Mar	-17%	39%	-23%	-39%	32%	-25%
South Pasadena	21%	-11%	-5%	-12%	-11%	-7%

Figure 28 – Stations 95% Confidence Intervals (June 2005-July 2012)

Sierra Madre Villa	**2005-2006**	**2006-2007**	**2007-2008**	**2008-2009**	**2009-2010**	**2010-2011**	**2011-2012**
$/SF	$ 46.98	$ 48.58	$ 51.31	$ 45.41	$ 45.02	$ 42.01	$ 37.47
95% CI	$ 8.43	$ 9.82	$ 10.22	$ 6.59	$ 10.07	$ 7.75	$ 7.91
Del Mar							
$/SF	$ 39.73	$ 32.95	$ 45.93	$ 35.38	$ 21.49	$ 28.28	$ 21.24
95% CI	$ 13.81	$ 14.72	$ 12.26	$ 7.82	$ 4.98	$ 9.66	$ 4.97
South Pasadena							
$/SF	$ 53.29	$ 64.69	$ 57.74	$ 54.76	$ 48.38	$ 43.07	$ 40.07
95% CI	$ 8.42	$ 10.46	$ 11.88	$ 7.45	$ 10.28	$ 7.54	$ 6.83

Conclusion

In light of the recent recession and popularity of the TOD paradigm, this study analyzed assessed land values surrounding L.A. Metro's Gold Line in the Pasadena area between July 2005 and June 2012. During the recession, December 2007 through June 2009, property values throughout the Pasadena area fell significantly. Transit infrastructure did not help properties maintain their land values during the recession, contrasting the findings of The Center for Neighborhood Technologies, 2013. Furthermore, residential land within the transit shed was valued significantly lower than property ½ mile from transit stations. Conversely, commercial property with transit infrastructure is generally valued higher than comparable land throughout the region. Land values were also heavily influenced by geography. Clusters of significantly high land values were witnessed in the affluent South Pasadena and North Pasadena communities. Lower land values were concentrated within Pasadena's urban core and along highway infrastructure. These findings first suggest an opportunity for intensified development within station areas. Developers can capitalize on cheap land, supportive zoning, and transit infrastructure to produce TOD projects, ultimately driving land values up. Conversely, low residential land values in close proximity to transit could be attributed to noise and vibrations associated with transit operation. With L.A.'s transit system poised for significant expansion in the coming years, mitigating these externalities is imperative in spurring residential TOD.

Future Research

These findings present an opportunity for continued research. First, it would be interesting to assess the entire L.A. Metro transit system. The surprising results of this study (in that it contrasts the previous literature) may be attributed to the constrained regional focus. While this analysis was centered on Pasadena and its 7 Gold Line stations, it would be interesting to assess L.A. Metro's 4LRT lines, 2BRT lines, and 2 heavy rail lines and their influence on all tax lots within Los Angeles County. Second, expanding this analysis to include key census indicators could give some context to these findings. Given the density of the Pasadena area, a census block group analysis of rent prices, median incomes, housing tenure, and educational attainment would strengthen this research. Finally, capturing land values of the recent economic upturn would be insightful. With multifamily development gaining popularity, it would be interesting to see if urban land is beginning to generate a land value premium.

Limitations

1. Outliers were neither identified nor removed in this analysis. A look at the hot spot maps and recorded standard deviations indicates the presence of extreme data.
2. Other indicators of the real estate market, including improvement values, home values, and rents were not considered in this analysis.
3. External influences on the real estate market, including zoning and city-incentives were not considered in this analysis.
4. Due to the limited commercial data, residential and commercial differences could not be analyzed at the station level. Additionally, due to large standard deviations, mean comparisons of commercial data in the transit shed and non-transit areas were statistically insignificant.

Works Cited

American Lung Association. (2012). *State of the Air.* Washington D.C.: American Lung Association.

American Public Transportaion Association. (2012). *2012 Public Transportation Fact Book.* Washington D.C.: American Public Transportaion Association.

Association, A. L. (2012). *State of the Air.* Washington D.C.: American Lung Association.

Association, A. P. (2012). *2012 Public Transportation Fact Book.* Washington D.C.: American Public Transportaion Association.

Association, A. P., & Realtors, N. A. (2013). *The New Real Estate Mantra: Location Near Public Transportaion .* Dallas : The Center for Neighborhood Technology.

Authority, L. A. (2012, September 12). *Overview*. Retrieved May 27, 2013, from Metro: http://www.metro.net/about/agency/mission/

Bardhan, A., & Walker, R. (2011). California shrugged: fountainhead of the Great Recession. *Cambridge Journal of Regions, Economy and Society* , 303-322.

California State Board of Equalization. (2008). *Los Angeles County Assessment Practices Survey.* Sacremento: California State Board of Equalization.

Center for Transit-Oriented Development . (2008). *Capturing the Value of Transit.* Washington D.C.: United States Department of Transportation Federal Transit Administration.

Center for Transit-Oriented Development . (2014). *Center for Transit-Oriented Development*. Retrieved April 14, 2014, from Center for Neighborhood Technology: http://www.cnt.org/tcd/projects/ctod/

Center for Transportation Studies. (2010). *The Hiawatha Line: Impacts on Land Use and Residential Housing Value.* Minneapolis: University of Minnesota.

Cervero, R. (2007). Transit-oriented development's ridership bonus: a product of self-selection and public policies. *Environment and Planning A*, 2068-2085.

Cervero, R., & Kang, C. D. (2011). Bus Rapid Transit Impacts on Land Uses and Land Values in Seoul, Korea. *Transport Policy* , 102-116.

Cervero, R., & Landis, J. (1997). Twenty Years of the Bay Area Rapid Transit System: Land Use and Development Impacts. *Transportation Research A*, 309-333.

Cooper, D. (2012). *Assessing the Economic Benefits of Increased Investment in Los Angeles's Public Transit Infrastructure.* Washington D.C.: Economic Policy Institute.

Dill, J., Schlossberg, M., Ma, L., & Meyer, C. (2013). *Predicting Transit Ridership at the Stop Level: The Role of Service and Urban Form .* Washington D.C.: Transportation Research Board.

Duncan, M. (2008). Comparing Rail Transit Capitalization Benefits for Single-Family and Condominium Units in San Diego, California. *Societal and Economic Factors*, 120-130.

Federal Transportation Authority. (2000). *Transit Benefits 2000 Working Papers.* Washington D.C.: U.S. Department of Transporation.

Fejarang, R. (1993). *Impact on Propery Values: A Study of the Los Angeles Metro Rail.* Los Angeles: Metropolitan Transportation Authority.

Immergluck, D. (2009). Large Redevelopment Initiatives, Housing Values and Gentrification: The Case of the Atlanta Beltline. *Urban Studies*, 1723-1745.

Institute, T. T. (2011). *Urban Mobility Report .* College Station: Texas Transport Institute .

Kittrell, K. (2012). Impacts of Vacant Land Values: Comparison of Metro Light Rail Station Areas in Phoenix, Arizona. *Transportation Research Board*, 138-145.

Knaap, G., Ding, C., & Hopkins, L. (2001). Do Plans Matter? The Effects of Light Rail Plans on Land Values in Station Areas. *Journal of Planning Education and Research* , 32-39.

Landis, J., Guhathakurta, S., Huang, W., & Zhang, M. (1995). *Rail Transit Investments, Real Estate Values, and Land Use Change: A Comparative Analysis of 5 California Rail Transit Systems.* Berkeley: University of California Transportation Center.

Landis, J., Guhathakurta, S., Huang, W., Zhang, M., Fukuji, B., & Sen, S. (1995). *Rail Transit Investments, Real Estate Values, and Land Use Change: A Comparative Analysis of Five California Rail Transit Systems.* Berkeley: University of California at Berkeley.

Lewis-Workman, S., & Brod, D. (1997). Measuring the Neighborhood Benefits of Rail Transit Accessibility. *Transportation Research Record*, 147-153.

Lindsey, M., Schofer, J., Durango-Cohen, P., & Gray, K. (2010). Realtionship between proximity to transit and ridership for journey-to-work trips in Chicago. *Transportation Research Part A*, 697-709.

Los Angeles County Metropolitan Transportation Authority. (2009). *I Want a Mobile Future. 2009 Longe Range Transportation Plan.* Los Angeles: Metro.

Los Angeles County Metropolitan Transportation Authority. (2012, September 12). *Overview*. Retrieved May 27, 2013, from Metro: http://www.metro.net/about/agency/mission/

Los Angeles County Office of the Assessor. (2014, June 11). *Real Property Assessments* . Retrieved from Los Angeles County Office of the Assessor: http://assessor.lacounty.gov/extranet/guides/realprop.aspx

Metro. (2009). *I Want a Mobile Future. 2009 Longe Range Transportation Plan.* Los Angeles: Metro.

Parsons Brinckerhoff. (2001). *The Effect of Rail Transit on Property Values: A Summary of Studies.* Cleveland: NEORail II.

Texas Transport Institute. (2011). *Urban Mobility Report.* College Station: Texas Transport Institute.

The Brookings Institute. (2009). *Value Capture and Tax Increment Financing Options for Steetcar Construction.* Washington D.C.: DC Surface Transit, Inc. .

Tu, C., & Eppli, M. (2001). *An Empirical Examination of Traditional Neighborhood Development .* Milwaukee: Marquette University .

Wachs, M. (1984). Autos, Transit, and the Sprawl of Los Angeles: The 1920s. *Journal of the American Planning Association*, 297-310.

Wardrip, K. (2011). *Public Transit's Impact on Housing Costs: A Review of the Literature.* Washington D.C.: Center for Housing Policy .

Yan, S., Delmelle, E., & Duncan, M. (2012). The impact of a new light rail system on single-family property values in Charlotte, North Carolina. *The Journal of Transport and Land Use*, 60-67.

Zillow. (2014, May 19). *Local Info: Los Angeles County Home Prices and Values*. Retrieved from Zillow: http://www.zillow.com/los-angeles-county-ca/home-values/