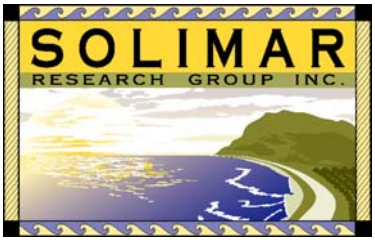

South Bay Cities Mixed-Use Centers Study

Year 3 Technical Background Report

Version 1.0
July 1, 2007

Prepared for the South Bay Cities Council of Governments with funding from the Southern California Association of Governments.

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Year 3 Technical Background Report
Introduction

Over the past three years, the South Bay Cities Council of Governments has been engaged in an effort to understand how mixed-use districts in the South Bay really work.

The purpose of the project was to identify strategies for dealing with additional growth and density that are tailored to the South Bay and its cities, rather than just adopting a cookie-cutter formula derived from principles of "smart growth" or "New Urbanism". Our focus is on finding strategies that will allow additional housing to be accommodated while minimizing the traffic impact.

The "lessons learned" and practical advise to South Bay cities is contained in a separate document, the *South Bay Cities Mixed-Use Guidebook.* This document contains several technical background reports that provided

The South Bay subregion of Los Angeles County – an area including 16 cities plus unincorporated Los Angeles County, stretching from Los Angeles International, Airport on the north, past Palos Verdes Peninsula to the Wilmington and San Pedro sections of the City of Los Angeles on the south, and from approximately the 110 Freeway on the East all the way to the Pacific Ocean on the West.

Between 2004 and 2007, the South Bay Cities COG conducted extensive research on eight different horizontal mixed-use districts throughout the South Bay. Four districts were classified by the research team as "centers" and four were classified as "corridors".

The four centers were Riviera Village in Redondo Beach, Downtown Torrance, Downtown El Segundo, and Downtown Inglewood.

The four corridors were Hawthorne Boulevard in Hawthorne, the area around Hawthorne Boulevard and Pacific Coast Highway in Torrance, Artesia Boulevard in Redondo Beach, and Gardena Boulevard in Gardena.

In each study area, the research team collected a large amount of objective data, including demographic and housing data, parcel and building data from the Los Angeles County Assessor, business data, and traffic, bus ridership, and pedestrian data.

The research team also conducted three different types of surveys: a survey of residents, a survey of employees, and a "sidewalk survey". The responses to these surveys provide the "performance" part of the puzzle in this report.

Research results regarding Riviera Village, Downtown Torrance, Downtown Inglewood, and the Pacific Coast Highway area were contained in the Year 1 report in 2005.

Research results regarding Downtown El Segundo and Hawthorne Boulevard were contained in the Year 2 report in 2006.

This background report includes research results for the two final study areas – Gardena Boulevard in Gardena and Artesia Boulevard in Redondo Beach – as well as three background reports providing qualitative observations, statistical summaries and quantitative analyses on which the research results and the Guidebook recommendations are based.

The sections of this Technical Background Report are:

Section 2: Gardena Corridor Study Area Characteristics

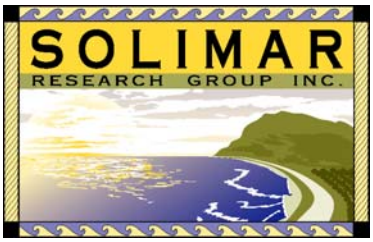
Section 3: Artesia Corridor Study Area Characteristics

Section 4: Year 3 Survey Results: Gardena Corridor and Artesia Corridor

Section 5: Corridors & Centers Performance Report

Section 6: Quantitative Travel Behavior Analysis

Section 7: Mixed-Use District Case Studies



Technical Background Report Section 2:

Gardena Corridor Study Area Characteristics

South Bay Phase III Mixed Use Centers Study
Version 1.0
July 1, 2007

2. Year 3 Study Area Characteristics

2.1 Gardena Corridor Study Area

2.1.1 Geographical definition

The City of Gardena is an approximately six square-mile community situated five miles from the Pacific coast, seven miles south Los Angeles International Airport and 15 miles southwest of downtown Los Angeles. Though Gardena is now officially nicknamed the "City of Opportunity," it is not surprising that until 2006 Gardena's moniker was the "Freeway City," as it is bordered by the 405, 101 and 91 Freeways. These regionally significant routes provide ample connectivity to other Los Angeles subregions. Gardena is bounded by El Segundo Boulevard to the north, Vermont Avenue to the east, Crenshaw Boulevard and Western Avenue to the west, and Artesia Boulevard and Redondo Beach Boulevard to the south.

Gardena is significantly smaller than neighboring Torrance and Carson. However, the City's population has increased at a steady, moderate pace over the last 30 years, and as a result its growth rate has exceeded that of its neighbors. Like so much the South Bay, the land of Gardena is, for all intents and purposes, totally developed. According to the City's 2006 General Plan, the 60,000-person community is almost completely built out, containing just 44 acres of vacant land.

For this study, the Gardena Corridor is defined by Gardena Boulevard from South Vermont Avenue on the east to Western Avenue to the west (see Figure 2.1.1). Although not on one of the city's major arterials, the corridor connects multiple major north-south arterials and is approximately 0.5 miles south of the traditional city center, located at the intersection of Vermont Avenue & 166th Street. It is a largely walkable strip that, according to local city officials, is identifiable by residents due its pedestrian vitality and small, family-operated businesses.

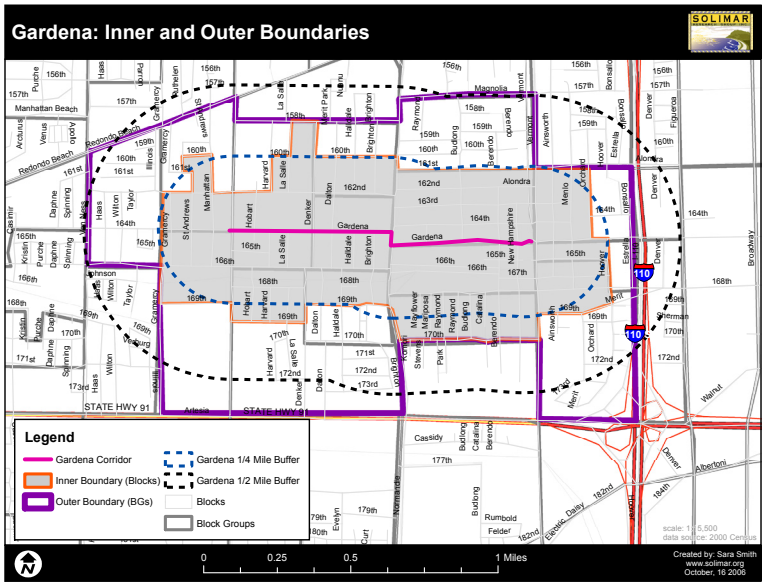


Figure 2.1.1: Gardena Corridor Study Area

The 1,036-acre corridor study area is home to the Gardena Valley Chamber of Commerce and two Los Angeles Unified School District public institutions.

The approximately 495-acre, ¼-mile "inner buffer" study area surrounding the corridor is loosely prescribed by 158th, 170th, Gramercy and South Hoover Streets. The ½-mile "outer buffer," at about 541 acres, is bounded by 157th Street to the north and 91 Freeway to the south; Van Ness Avenue to the west and the Harbor Freeway to the east.

2.1.2 History

The history of Gardena traces back to the 1880s, with a small settlement in the fertile valley of a 43,000-acre Spanish land grant. Fed by the waters of a natural channel, this green stretch of land contrasted the surrounding coastal scrub. The settlement was dubbed "Garden Spot," and by the early twentieth century, a small but industrious farming community had solidified there.

The coming of the railroads in the early twentieth century prompted a new era of land speculation and subdivision. By 1912, both the California Pacific Railway and Pacific Electric Railway Companies had built lines that intersected the Gardena area. Before long, a trio of rural communities was established around these rail corridors. In 1930, the three communities were combined into a Municipal Corporation and the City of Gardena was officially incorporated. At that time, the small berry farming community had about 20,000 residents.

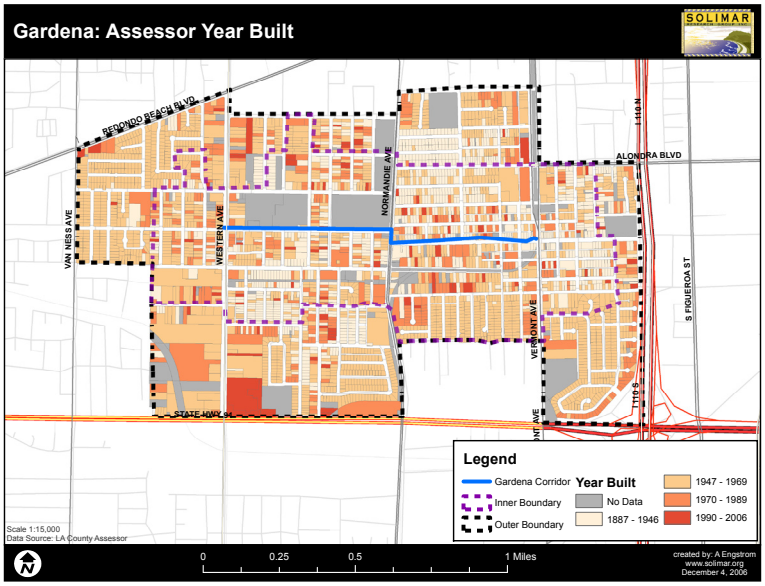


Figure 2.1.2: Year Built map of Gardena Corridor buildings

Gardena's development progressed in earnest following World War I. Since then, the City's physical boundaries have undergone two major changes, including the 1975 annexation of the Rosecrans Corridor and the 1995 annexation of West Gardena. The latter, an addition of unincorporated land from the County of Los Angeles, resulted in 861 housing units to the City.

2.1.3 Recent Development

Recent development on and near the Gardena Corridor can be best described as a slow start to an area of high potential. Lined with personal services, grocery stores and sidewalk eateries, it is a popular corridor. Proximity to residences, schools and municipal buildings imbue it with the potential to host density-driven development. Over the last decade, Community Development Block Grant (CDBG) funding has been directed toward the completion of new design/streetscape guidelines for the area. In addition, Gardena's proposed Artesia Corridor Specific Plan, which targets the area just blocks north, has a strong focus on mixed-use development.

Despite these efforts, the direct environs of the Gardena Corridor study area have seen little significant developmental change over the last 5 years. Three city parking lots were recently developed to accommodate local businesses. Just east of Vermont Avenue, in the Los Angeles City area, revitalization money was expended in an attempt to mimic previous streetscape efforts on the Gardena side. Finally, according to Gardena city staff,

a single mixed-use development is under consideration for the corridor area. Unfortunately, the effort appears to be languishing due to financial restrictions on the part of the development group.

2.1.4 Land Use Patterns

Unlike the mixed-use centers of planned industrial suburbs such as El Segundo, where retail and industrial land uses are clustered downtown, land use along Gardena Corridor is largely determined by the arterials that bisect it. As Figure 2.1.3 reveals, the total corridor area is dominated by medium-density residential land. Yet this is interrupted by three considerable "pockets" of commercial use at the intersections of Vermont Ave., Western Ave. and South Normandie with Gardena Boulevard. These commercial zones are distinct in space and character, resulting in an extended commercial spread that is quite different from the mixed-use centers of this study.

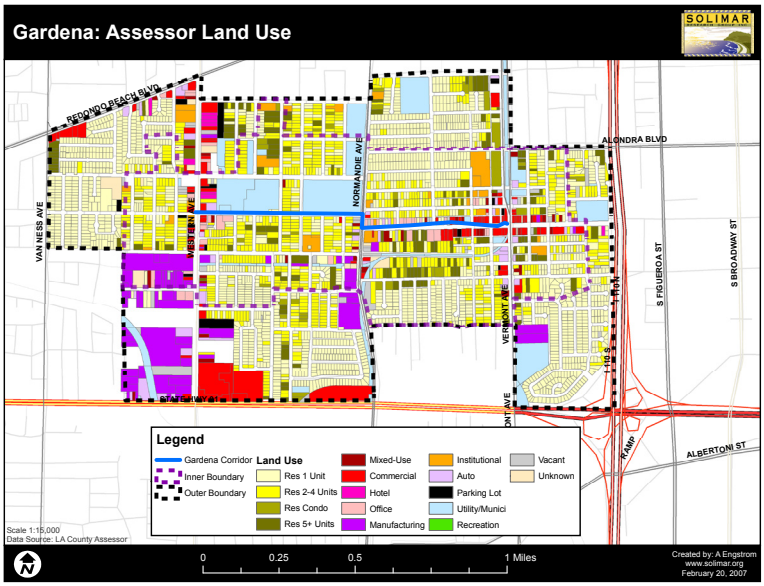


Figure 2.1.3: Land use map of Gardena Corridor

Lining much of the eastern side of the Corridor, just to the north, is a large swath of public/ institutional land use. This area includes City Hall, schools and a community center. Industrial land is limited to an approximately ½-mile by ¼-mile rectangular area in the southwest corner of the study area.

There are notable differences in the land uses of the inner and outer study areas, as revealed by Figures 2.1.4 and 2.1.5. First and foremost is the difference in residential densities. The total amount of land devoted to residential uses is quite similar in both areas—86% in the inner and 92% in the outer. However, the amount of land devoted to low-density, single family homes is drastically different, increasing from 39% in inner area to 67% in the outer. Not surprisingly, the portion of land devoted to higher density homes drops from 29% in the inner to 13% in outer area.

A second considerable difference between the inner and outer buffer zones is one of commercial land use, which decreases from 4% of the total inner area to 1% of the total outer area. This is certainly a result of the "pockets" described earlier. Finally, within the inner area of Gardena a small (2% of the total) but prominent section of land is zoned mixed-use. There is no such mix of land uses in the outer buffer zone of the study area.

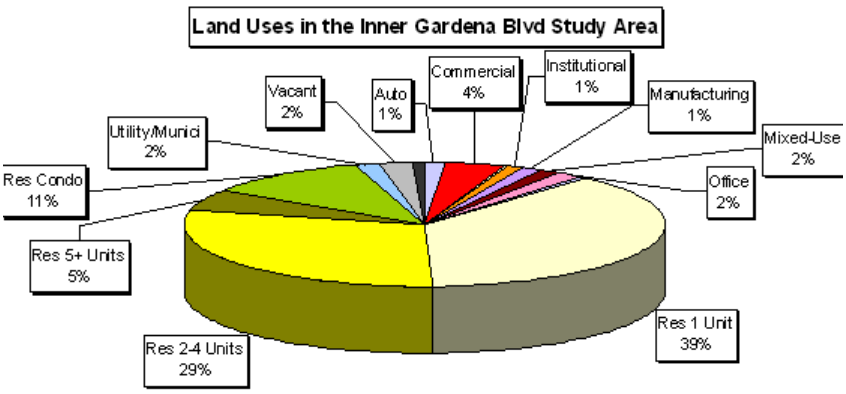


Figure 2.1.4: Land Use Breakdown, Inner Gardena Corridor

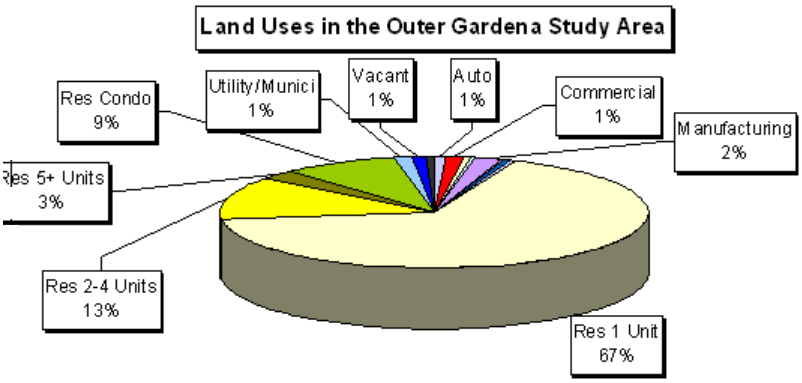


Figure 2.1.5: Land Use Breakdown, Outer Gardena Corridor

2.1.5 Traffic and Parking Patterns

Gardena Boulevard is a collector street with just 2 lanes of travel along the entire corridor and a speed limit of 30 mph. Not surprisingly, its traffic volume is on the very low end of mixed-use districts in this study. For example, while the previously-studied Hawthorne Corridor averaged between 36,000 and 40,000 vehicles per day, a 2005 traffic analysis by Katz, Okitsu and Associates revealed that only 6,200 cars use Gardena Boulevard between Vermont and Normandie daily, with an additional 4,800 counted in one day between Normandie and Western.

These low volumes indicate that, unlike Hawthorne and other mixed-use corridors, Gardena does not operate on the scale of the "arterial downtown" that we have used to describe previous study areas. From a traffic perspective, Gardena Corridor more resembles the "village downtown" model of the Downtown Torrance and Downtown El Segundo. Mixed-use centers studied in Years 1 and 2.

The volume of traffic that turns from the larger arterials that bisect the Gardena Corridor onto Gardena Boulevard is minimal. During weekday morning peak hours in 2005, only 122 cars turned from high-volume Vermont Avenue onto the corridor. These numbers were similar during the evening commute, indicative of the localized, "non-destination" nature of the Gardena Corridor.

As evidenced by our survey, there is a sufficient supply of public on- and off-street parking along the Gardena Corridor. The current number of public spaces along both sides of the entire length of the corridor is 272, a number facilitated by the fact that along most sections, on-street parking is at a 90-degree angle to the roadway. Only 164 of these spaces were filled on a recent weekday afternoon, or 60% of total. During midday on a Saturday, the rate of filled spaces dropped to 52%.

2.1.6 Demographic Profile

The City of Gardena has a resident population distinguished from most Southern California cities: It is one of few communities in the region to maintain a "four way split"—defined by each of the four main ethnic groups composing over 10% of the population. That distinction is an illuminating backdrop to the demographics of the Gardena Corridor study area.

The total population of the corridor is 19,077, with a population density of about 11,775 persons per square mile. This figure increases in the inner study area to 14,426 and decreases in the outer study are to 9,351.

The ethnic composition of the corridor varies slightly from that of the city itself, as Figure 2.1.6 illustrates. Although the non-black population is fairly evenly distributed at 28% White, 37% Asian and 39% Hispanic, the rate of Black residents is only 9%. These figures remain largely consistent through the inner and outer study areas, although the percentage of Hispanic residents rises significantly from the outer ring to inner —from just under 30% to 45 percent.

	Inner	Outer	Total
# Census Blocks	105.00	68.00	173.00
Acres	495.23	541.64	1,036.86
Square Miles	0.77	0.85	1.62
Population			
Total Population	11,166	7,911	19,077
Persons/Square Mile	14,426.36	9,351.06	11,775.93
Racial/Ethnic Breakdown			
White	3,014	2,254	5,268
	26.99%	28.49%	27.61%
Black	1,005	699	1,704
	9.00%	8.84%	8.93%
Asian	3,820	3,163	6,983
	34.21%	39.98%	36.60%
Hispanic	5,090	2,368	7,458
	45.58%	29.93%	39.09%
Gender Breakdown			
Males	5,644	3,939	9,583
	50.55%	49.79%	50.23%
Females	5,522	3,972	9,494
	49.45%	50.21%	49.77%
Housing Tenure			
Owner	1,105	1,522	2,627
	30.24%	50.07%	39.24%
Renter	2,549	1,518	4,067
	69.76%	49.93%	60.76%

Figure 2.1.6: Demographic Profile, Gardena

Housing density in the Gardena Corridor is a relatively low 9 housing units/acre at the gross level (a figure that accounts for total land area). However, housing density increases greatly at the net level (accounting only for residential acreage). Net housing density is approximately 14.2 houses per acre, a figure that increases slightly in the inner study area to 16 units per acre and decreases to about 12 units per acre in the outer study area (see Figure 2.1.7), a result of the increase in single family zoning from inner to outer described earlier.

There is a unique relationship of home ownership and family density in the Gardena Study Area. While it is predominantly a renter community (61% renters), the rate of renters slips from 70% to 50% from the inner to outer study area, and home ownership increases from 30% to 50%. While this pattern is not outstanding among mixed-use districts, in the Gardena Corridor the percentage of families decreases from 73% to 63% from the inner to outer rings. This, combined with the 50% increase in Hispanic residents from outer to inner rings, suggest that lower-income Hispanic families make a large renter population of the inner study area.

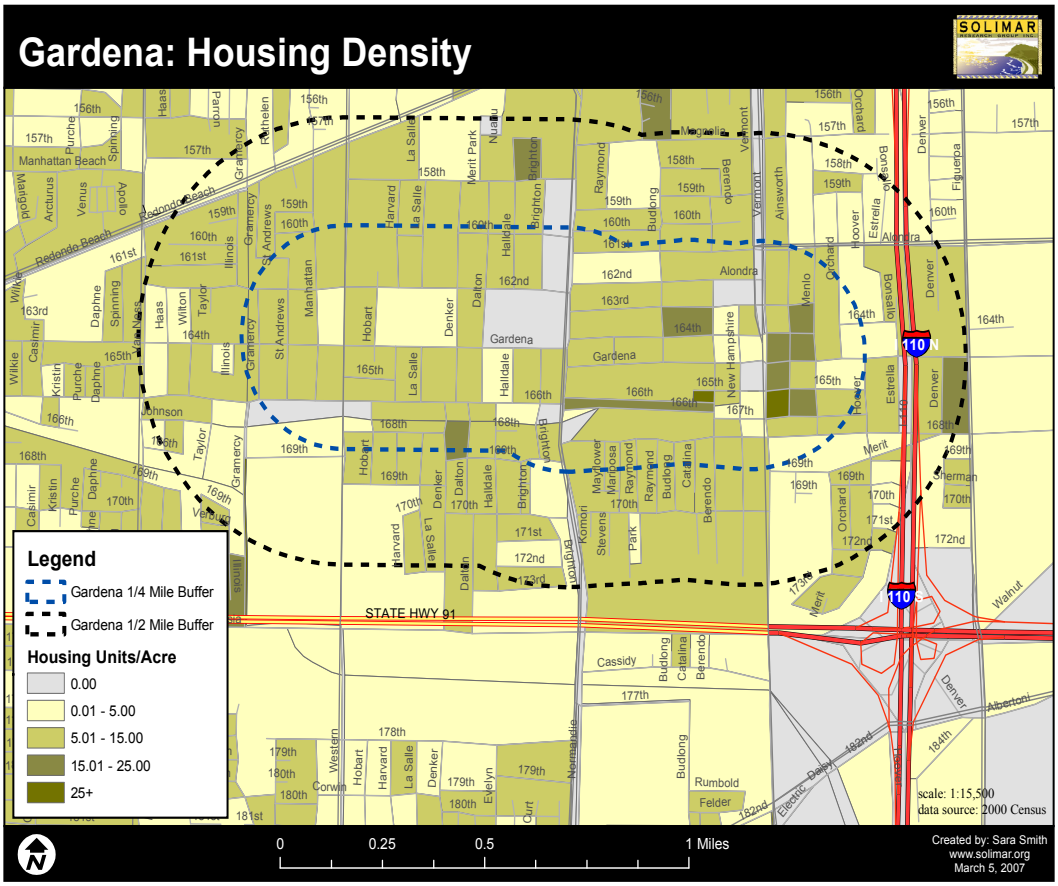


Figure 2.1.7: Housing Density Map, Gardena Corridor

Gardena			
	Inner	Outer	Total
Residential Acreage	238	252	490
Housing Units	3,779	3,171	6,950
Units/Acre	16	13	14

Figure 2.1.8: Housing Density Table, Gardena Corridor

2.1.7 Business Functions Profile

According to InfoUSA, there are 779 businesses in the Gardena Corridor. 453, or 58% of them, are located within the inner study area; 326 are at addresses in the outer ring. In total, these corridor businesses employ 5,326 people and generate approximately $758 million in sales. While the number of businesses and employees in the inner area is greater than the outer area, it is the latter that generates a slight majority of revenue, or 52% of the total.

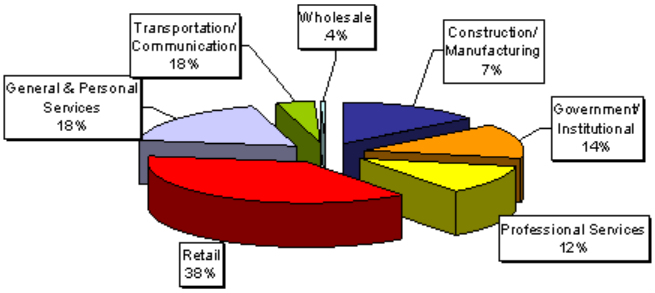


Figure 2.1.10: Business Sector Breakdown, Inner Gardena Corridor Study Area

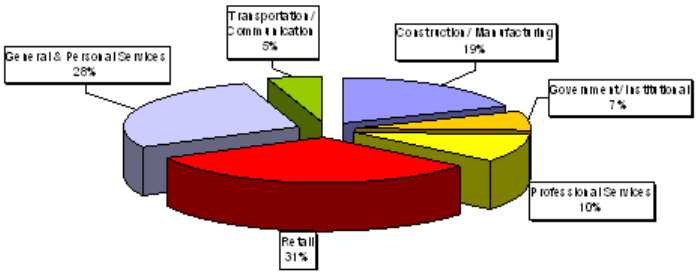


Figure 2.1.11: Business Sector Breakdown, Outer Gardena Corridor Study Area

As is the case with all mixed-use districts in this study, the retail and service sectors play a powerful role in the economy of Gardena Corridor. Retail businesses account for 35% of total business operations here, as well as 28% of total employees and 32% of total sales. The retail sector is stronger in the inner area than the outer, generating 35% of total sales in former and only 28% of total sales in the latter. The service industry generates approximately 24% of total corridor sales. This sector leans heavily toward retail services, which accounts for 22% of total businesses and further solidifies the corridor as a retail-oriented environment. Professional services account for only 11% of the total number of businesses.

There are three other sectors that stand out among the economy of the corridor: Construction, Manufacturing and Government/ Institutional. The Construction industry accounts for 62 total business in the corridor area, or 8% of the total. While both the inner and outer areas contain 31 such businesses, key performers are located in the inner area, where the construction sector comprises 12% of total

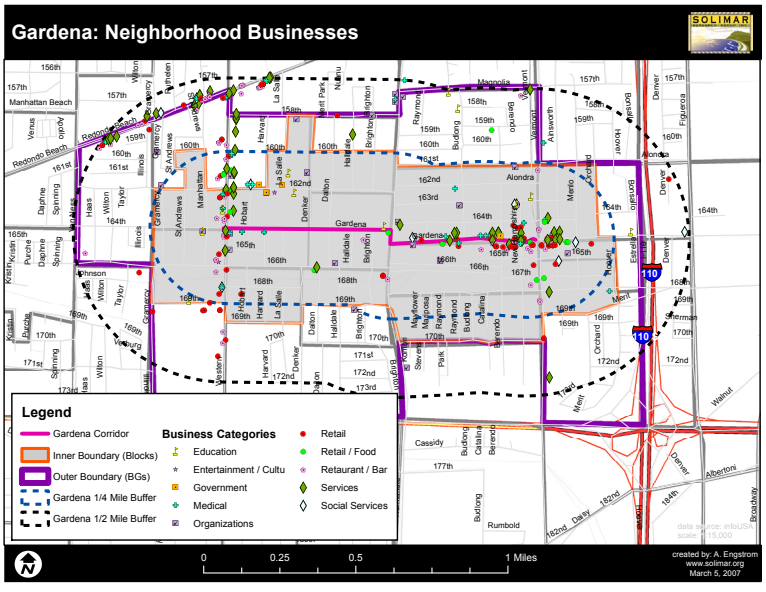


Figure 2.1.12: Gardena Corridor Neighborhood Business

sales. In the outer area, the same number of businesses accounts for only 6% of total sales.

The Manufacturing sector also comprises approximately 8% of the total businesses and employees, although the presence of this sector is much stronger in the outer study area. There, manufacturing generates 26% of total sales, while in the inner study area, that figure drops to 14%.

Finally, the government/institutional sector is a major contributor to the local job base. While not a traditional generator of sales, the schools, municipal offices and community centers on the western end of the corridor account for 43% of jobs in the inner study area. The same sector accounts for only 13% of jobs in the outer area of the corridor.

In earlier phases of this study, we identified and defined a subset of businesses titled "Neighborhood businesses." These businesses are likely to serve a neighborhood customer base as opposed to a regional clientele, and are useful indicators of the character of local economies. The Gardena Corridor has 322 such businesses, or 40% of total business tally. 202 of these are in the inner area and 120 in the outer (see Figure 2.1.12). This concentration of neighborhood-serving entities in the inner area supports the "localized" feel and identity of the corridor that was repeatedly described by city staff.

2.1.8 Employment Density

Employment density in the Gardena Corridor, an area with 5,326 total jobs, is significantly higher than net housing density of 14.2 units per acre. Using non-residential acreage and employee data from InfoUSA, we found that the job density of the total area is approximately 19jobs per acre. This figure increases in the inner area to 23 jobs per acre, compared to a housing density of 15.9 units per acre. It decreases in the outer area to 17 jobs per acre (housing density in the outer is approximately 12.6 units per acre).

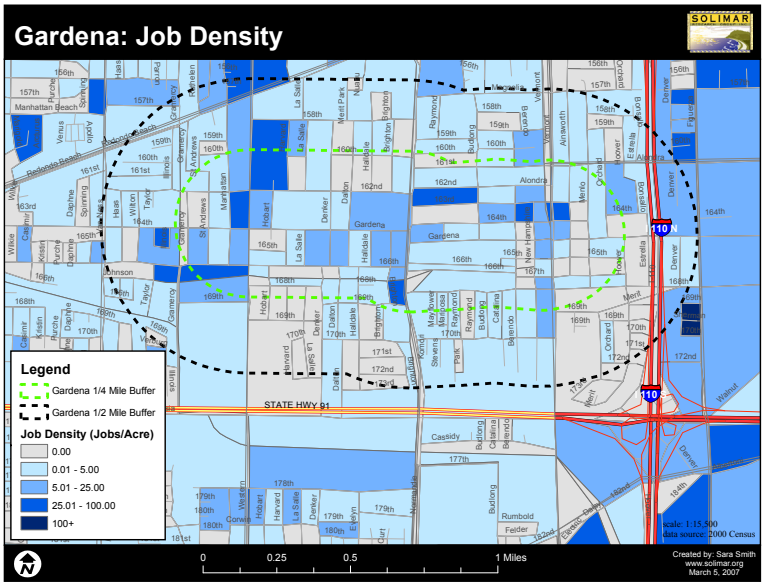


Figure 2.1.13: Map of Gardena Job Density

2.1.9 Bus Ridership and Pedestrian Activity

The Gardena Corridor is well-serviced by three routes of local agency Gardena Municipal Bus Lines (GMBL). GMBL Lines 1, 2, and 4 serve the eastern span of the corridor, between Vermont and Normandie. Providing connection to regional transit lines and to downtown Los Angeles, these routes are clearly weighted toward outbound ridership. There are no routes that serve less commercial, western span of the corridor (that west of Normandie) which, as previously discussed is a focal area for schools and government institutions.

GMBL Line 1 travels between Normandie and Western on 166th Street, just one block south of Gardena Blvd. It is in service seven days a week and its easternmost terminus is downtown Los Angeles. On weekdays from 4:00 a.m. to midnight, the line has a frequency of 30 minutes. Frequency increases to 15-minute intervals during peak hours. On Saturdays, Sundays, and holidays, the line has an average frequency of 40-60 minutes. According to the agency, the northbound (eastbound in the study corridor) stop at Gardena Blvd. & Vermont is the busiest on the entire route. There, boardings exceed alightings by a ratio of 3 to 1, a clear sign that the route is a vital local option for leaving the corridor area.

GMBL Line 2 runs seven days of the week at an average weekday frequency of 30 minutes, again increasing to 15 minutes during commute peaks. The agency stressed that the Gardena Blvd. & Vermont stop is one of the busiest on the route, with about 25% of total on/off activity on the route. According to the Agency, there are plans to increase both peak and non-peak frequencies on Line 2 in the near future.

Ridership on Line 4 is lighter than Lines 1 & 2, although two stops on the Gardena Corridor—at Berendo Street and Vermont—are among the busier stops on the route. Like Line 2, Line 4 provides service seven days of the week.

Pedestrian activity is extremely strong on the corridor. Pedestrian counts were taken at both end intersections and one internal intersection of the corridor, at weekday commute hours and on midday Saturday.

Counts at the corridor's westernmost intersection of Gardena Blvd and Denker Street reveal the contribution of schools and municipal buildings to pedestrian activity. At that intersection, 599 pedestrians walking along Gardena Blvd were counted on a Wednesday morning from 7:00 am to 9:00 am. However, during the evening of the same day, from 4:00 pm to 6:00 pm, this figures dropped dramatically to 88 pedestrians, suggesting that pedestrian activity is largely the result of the children who are absent in the hours after schools have let out. At the other end of the corridor, at Vermont Avenue, 355 morning commute pedestrians were counted, and 654 in the evening commute. With the popularity of the Vermont stops of the GMBL bus lines, these numbers are not surprising. Weekday peak hour counts at the interior intersection were 249 in the morning and 381 in the evening, bringing the corridor total 1203 pedestrians in the morning and 1123 in the evening.

During the weekend, pockets of pedestrian activity move from the Western end of the corridor to the more retail-oriented eastern end and interior. On Saturday from noon to 2:00 pm, low pedestrian counts at the Denker/ Gardena intersection reveal that the closing of schools and public buildings drastically cuts activity. There, only 33 walkers were counted, while 633 were counted in the interior and 910 at the eastern end. The midday Saturday total is 1576, an indicator of the commercial and retail strength of the corridor.

Technical Background Report Section 3:

Year 3 Survey Results: Gardena Corridor and Artesia Corridor

South Bay Phase III Mixed Use Centers Study
Version 1.0
July 1, 2007

3.1 Artesia Corridor, City of Redondo Beach

3.1.1 Geographical Definition

The City of Redondo Beach is a medium-size community located 12 miles north of the Ports of Los Angeles and Long Beach and 22 miles southwest of downtown Los Angeles. Totaling 6.35 square miles, the city constitutes a strip of land separating two other South Bay beach cities—Manhattan Beach and Hermosa Beach—from the inland city of Torrance.

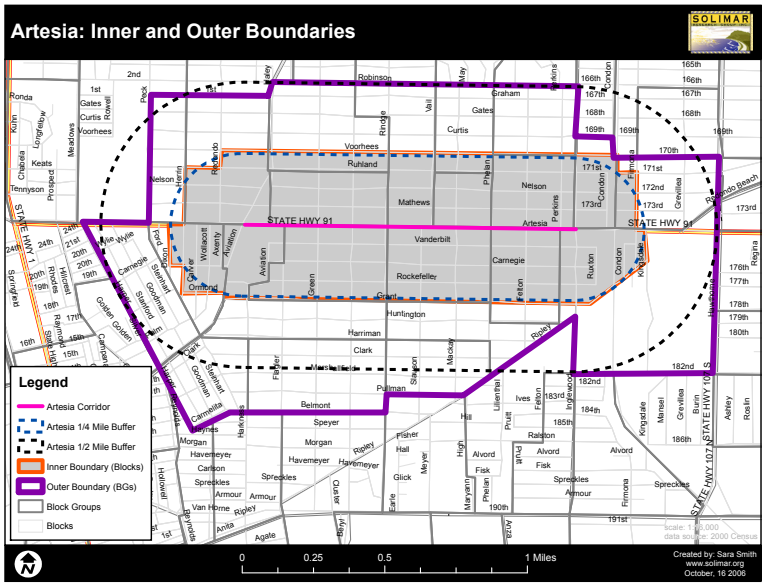


Figure 2.2.1: Artesia Corridor Study Area

Redondo Beach has approximately 63,000 residents, a number that is expected to increase by 14,000 individuals in the next twenty years. Historically, economic and employment activity has been concentrated in the northern portion of the City, anchored by the campuses of aerospace behemoths such as TRW. The western terminus of the Los Angeles Metro Rail Green Line is also located in the part of the City. Additional retail activity is centered in the east side of Redondo Beach, a result of a regional shopping destination, the Galleria at South Bay.

The 1,309-acre Artesia Boulevard study area is in the northern section of city, between State Highways 1 and 107. The corridor itself is defined by east-west running Artesia Boulevard (State Route 91), between Aviation Boulevard and Inglewood Avenue. It is approximately 1.5 miles south of the Metro terminus. The ¼-mile inner area surrounding the corridor is 522 acres, while the ½-mile outer area is 787 acres. The corridor is served by three municipal bus agencies, with the MTA's South Bay Galleria Transit Center just blocks away.

3.1.2 History

The community of what is now Redondo Beach had solidified into a destination for both tourism and industry by 1890, boosted by the opening of the huge Hotel Redondo. At that time, Redondo was also the first port of Los Angeles County, and ships carrying coal, lumber and tourists would dock at its three piers regularly. Steamers from the Pacific Steamship Company stopped at Redondo four times a week, as part of regular runs between San Francisco and San Diego. The 225-room hotel anchored the community as a seaside resort, and in 1892 Redondo voters adopted cityhood.

The development of San Pedro Harbor meant a temporary decline in Redondo's popularity during the first half of the 20th Century, when steamship and railroad companies pulled out of the city in favor of the new facility just to the South. However, with the construction of a new Edison Company facility, the completion of King Harbor marina by 1963, and the coming of the aerospace industry, Redondo's population boomed throughout the 1950s and 1960s. It is at this time—harking the arrival of aerospace giants such as TRW—that the large majority of the built environment within the corridor study area was developed.

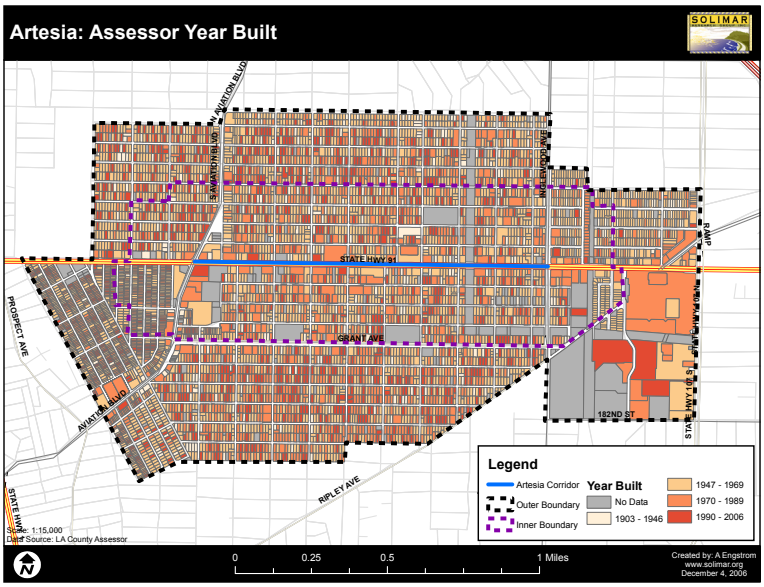


Figure 3.1.2: Year Built map of Artesia Corridor buildings

3.1.3 Recent Development

Recent development along the Artesia Corridor indicates an increasing adoption, by the City of Redondo Beach, of higher density residential and mixed-use development for the area. In 2001, a mixed-use project was completed a 215 Avenue I. It is a three-story building consisting of about 12,000 square feet of ground floor retail and restaurants, topped by 12 apartment units on the 2nd and 3rd floors.

At 2001 Artesia Boulevard, a permit has been officially issued for a mixed-use project of approximately 6,125 square feet of commercial space topped by three stories of residential units for senior citizens. In addition, a 192-unit residential project for seniors is under construction on the 2.89 acre lot that is 2750 Artesia, at far eastern end of corridor.

Finally, the planning of the new $4 million North Branch Library at 2000 Artesia Boulevard is indicative of expectations of increased population density in the future. Although the process of local fund raising continues, full approval of the project has been granted for the site, which is at the intersection of Artesia Boulevard and Greene Lane.

3.1.4 Land Use Patterns

As Figure 3.1.3 reveals, the land use pattern of the Artesia Corridor can be best described as a thin "spine" of commercial land penetrating an area of mostly low and medium-density residential land. Unlike Gardena Corridor, commercial land use in the Artesia Corridor area adheres tightly to corridor itself, contained, for the most part, to the blocks lining it. It is not distributed along perpendicular streets. One exception to this pattern is the very significant area of commercial land that is the Galleria at South Bay shopping center, a regional consumer destination located at the far eastern end of the study area. While there is some high density housing surrounding Artesia Boulevard, residential land use is largely devoted to medium and low density housing.

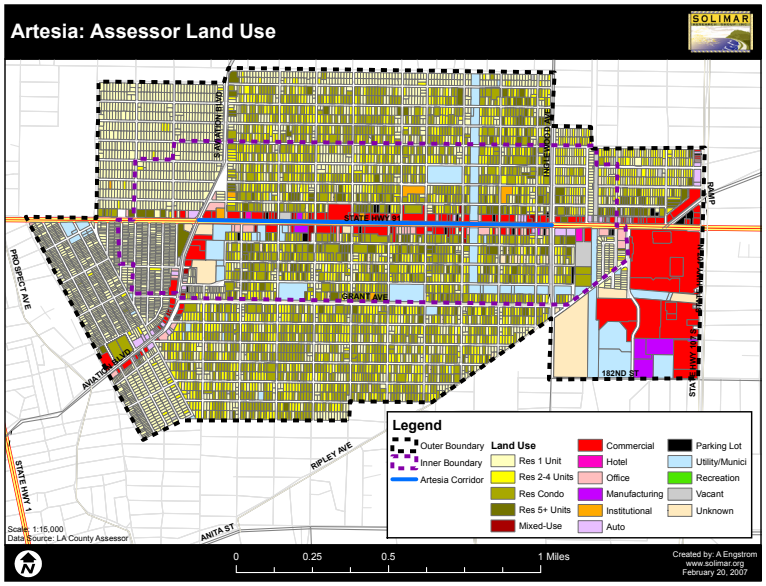


Figure 3.1.3: Land use map of Artesia Corridor

The restricted nature of the corridor's commercial zone is reflected in the land use breakdown of the inner study area, where 93% of the total land is devoted to residential use. 25% is zoned for

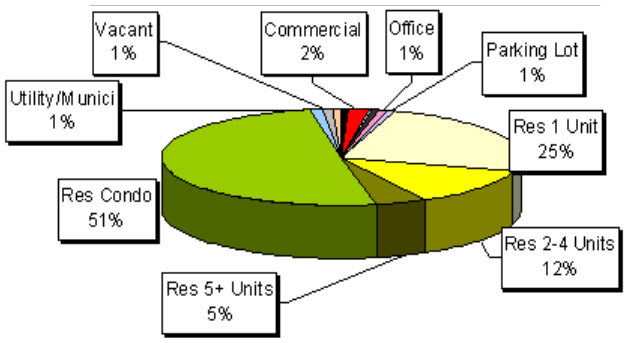


Figure 3.1.4: Land Use Breakdown, Inner Artesia Corridor

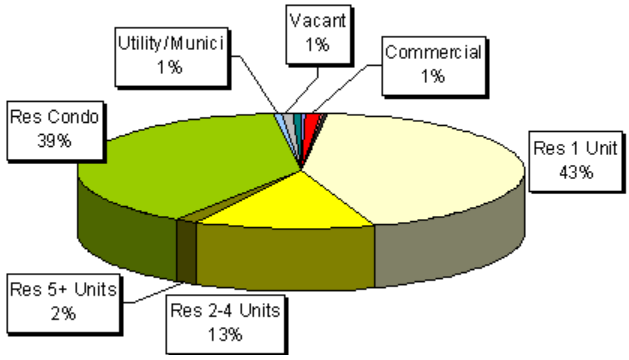


Figure 3.1.5: Land Use Breakdown, Outer Artesia Corridor

single family housing, while 51% is zoned for condominiums. Medium density residential accounts for 12% of the land, and high density housing for only 5%. Finally, 2% of inner area land is devoted to commercial use (see Figure 3.1.4).

While the outer study area has only a slightly greater proportion of residential land (97%), the amount of land devoted to single family housing is 43% of the total. Additionally, 39% is zoned for condo uses, 13% devoted to medium density housing and just 2% to high density housing. Only 1% of the land is devoted to commercial use (see Figure 3.1.5).

3.1.5 Traffic and Parking Patterns

Detailed traffic counts are being performed by the City of Redondo Beach during the month of March. As of 3/5, Randy Berler has agreed to provide updated numbers to Solimar Research Group upon completion of those counts.

Public parking supply is a vital aspect of any vital, mixed-use corridor or center, even more so in a district in which commercial frontage adheres so tightly to an arterial strip. There are 207 on-street public spaces in the Artesia Corridor, a supply that seems to satisfy demand throughout the week. 109 of these spaces were filled on a recent Wednesday afternoon, or 53% of available supply. These numbers increased only slightly during midday on Saturday, to 120 filled spaces, or 58% of available supply.

3.1.6 Demographic Profile

The total population of the Artesia Corridor study areas is 27,962, with a population density of about 13,673 persons per square mile. This figure increases in the inner study area to14, 975 persons per square mile and decreases in the outer study are to 12,800 persons per square mile.

The ethnic composition of the corridor is much less evenly distributed as that of the Gardena Corridor, as displayed in Figure 2.1.6. The composition of the entire study area is 67% White, 19% Hispanic, 10% Asian and 4% Black. These figures remain extremely consistent across the inner and outer study areas**.**

Gross housing density in the Artesia Corridor is approximately 14 housing units per acre. The more accurate net density figure (accounting for residential acreage only) is approximately 21 units per acre for the total area. This figure increases to 27 units per acre in the inner area and decreases to18 units per acre in the outer ring.

	Inner	Outer	Total
# Census Blocks	105.00	68.00	173.00
Acres	495.23	541.64	1,036.86
Square Miles	0.77	0.85	1.62
Population			
Total Population	11,166	7,911	19,077
Persons/Square Mile	14,426.36	9,351.06	11,775.93
Racial/Ethnic Breakdown			
White	3,014	2,254	5,268
	26.99%	28.49%	27.61%
Black	1,005	699	1,704
	9.00%	8.84%	8.93%
Asian	3,820	3,163	6,983
	34.21%	39.98%	36.60%
Hispanic	5,090	2,368	7,458
	45.58%	29.93%	39.09%
Gender Breakdown			
Males	5,644	3,939	9,583
	50.55%	49.79%	50.23%
Females	5,522	3,972	9,494
	49.45%	50.21%	49.77%
Housing Tenure			
Owner	1,105	1,522	2,627
	30.24%	50.07%	39.24%
Renter	2,549	1,518	4,067
	69.76%	49.93%	60.76%

Figure 3.1.6: Demographic Profile

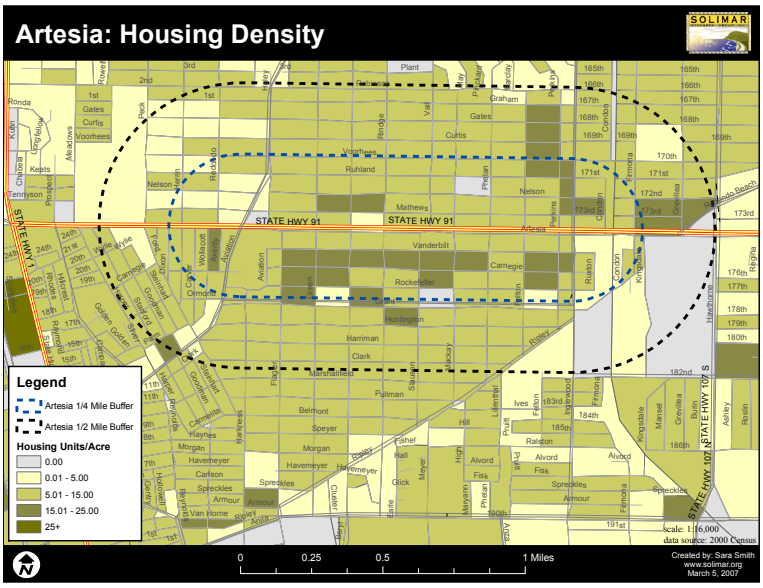


Figure 3.1.7: Housing Density Map, Artesia Corridor

Gardena			
	Inner	Outer	Total
Residential Acreage	238	252	490
Housing Units	3,779	3,171	6,950
Units/Acre	16	13	14

Figure 3.1.8: Housing Density Table, Artesia Corridor

3.1.7 Business Functions Profile

The Artesia Boulevard Study Area contains 598 different businesses, with 388 in the inner area and 210 in the outer area. In total, this local economy employs approximately 3,347 individuals, 60% of whom work in the inner area. Artesia Corridor businesses generate approximately $487 million in yearly sales, or $303 million by inner area businesses and $184 million by operations in the outer ring.

A breakdown of businesses by sector reveals patterns similar to mixed-corridors previously studied. 35% of businesses are in the retail sector, and these employee 39% of total workforce. They generate $216 million annually, accounting for 44% of total corridor revenues. Service industry businesses—both retail and professional—comprise approximately 38% of total businesses. However, they employ only 19% of the total workforce and generate only 27% of total sales. The 48 construction operations in the study area comprise 8% of total businesses, and 43 governments/institutional businesses comprise 7%. The latter group employs 22% of total workforce.

While the proportion of retail businesses is consistent across the inner and outer study areas, services-retail is a much stronger sector in the inner area—30% of total—than the outer, at 18%. Professional services show a

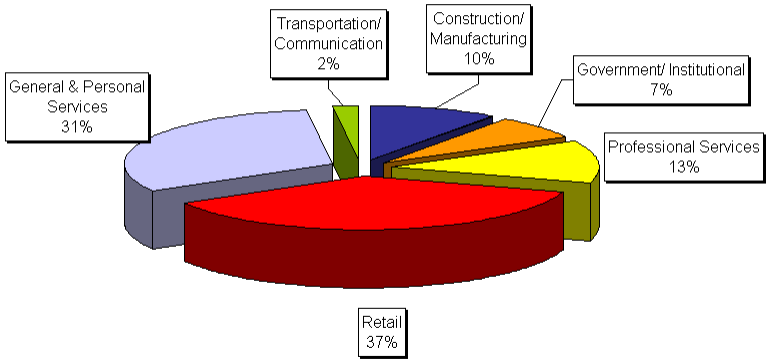


Figure 3.1.10: Business Sector Breakdown, Inner Artesia Corridor Study Area

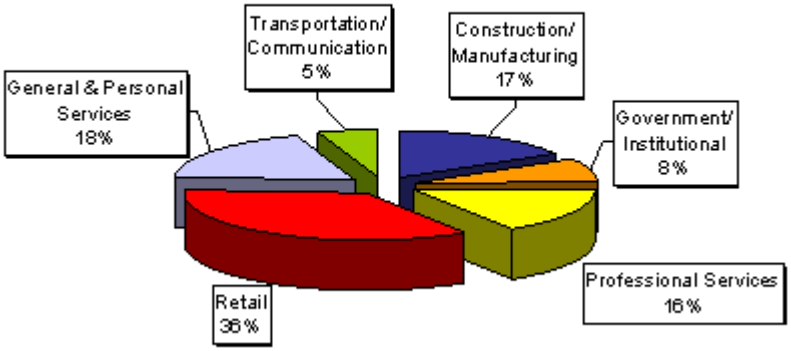


Figure 3.1.11: Business Sector Breakdown, Outer Artesia Corridor Study Area

reverse trend from inner to outer, increasing from 12% in the inner to 16% in the outer. The construction sector is significantly stronger in the outer area, where it accounts for 12% of total sales, as opposed to 6% in the inner area. Finally, the few large government institutions in the outer ring command a large portion of employees. The 17 government sector operations in the outer ring account for 37% of employees there.

In the Artesia Corridor, 225 of the 598 total businesses are neighborhood businesses, or 38% of all operations. These are heavily weighted to the inner study area, where 157, or 70%, are located. As evidenced by Figure 3.2.12, a variety of neighborhood businesses, dominated by services, extend the length of the corridor itself. The few remaining neighborhood businesses are sprinkled throughout the residential land of the inner and outer areas. These are dominated by retail sector businesses, with one exception of the mix of neighborhood businesses that reach into the outer area along arterial Aviation Boulevard.

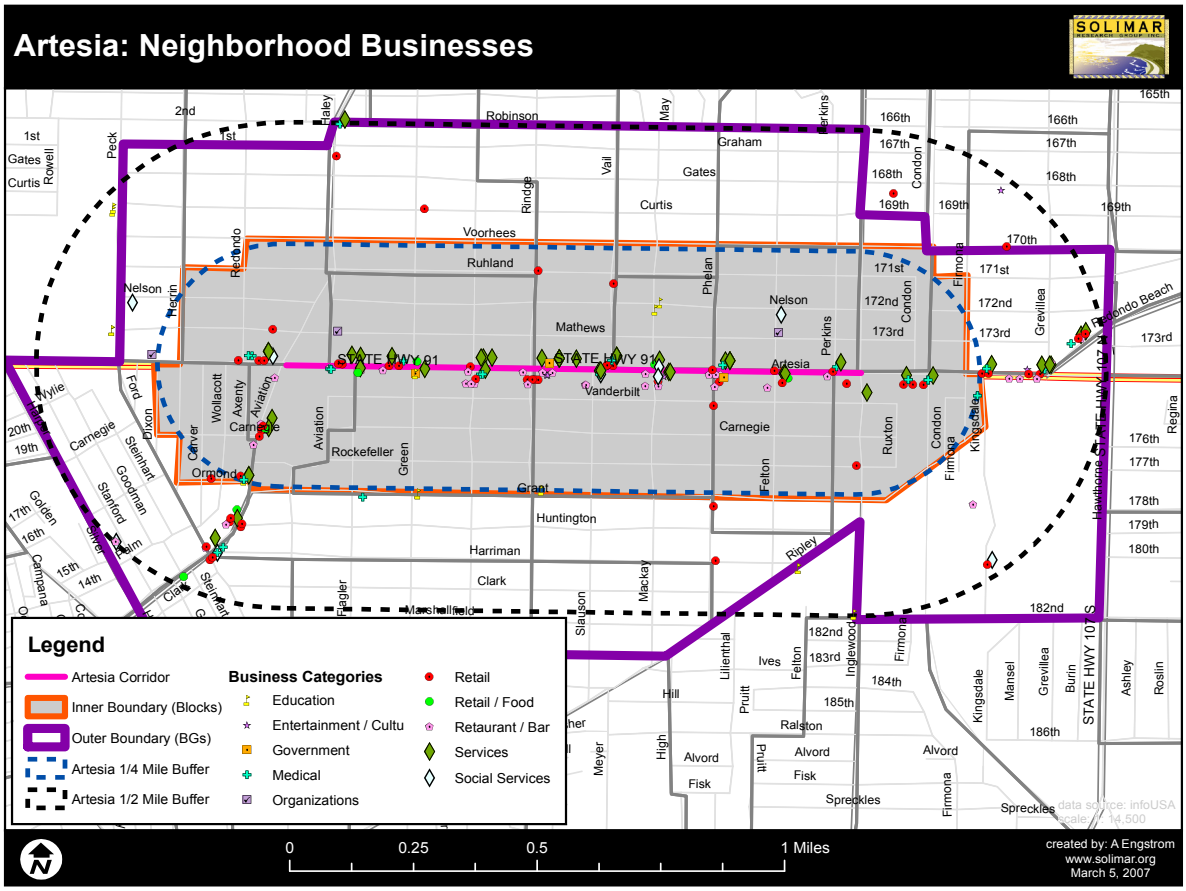


Figure 3.1.12: Artesia Corridor Neighborhood Business

3.1.8 Employment Density

With its 3,347 jobs, the Artesia Corridor has an employment density rate (residential acreage only) of about13 jobs per acre. This is similar to the previously-calculated net housing density of 14.2 units per acre. Like housing density, employment density increases in the inner area and decreases in the outer. Artesia's inner area employment density is about 19 jobs per acre; it is only 9 jobs per acre in the outer area (Figure 3.1.13).

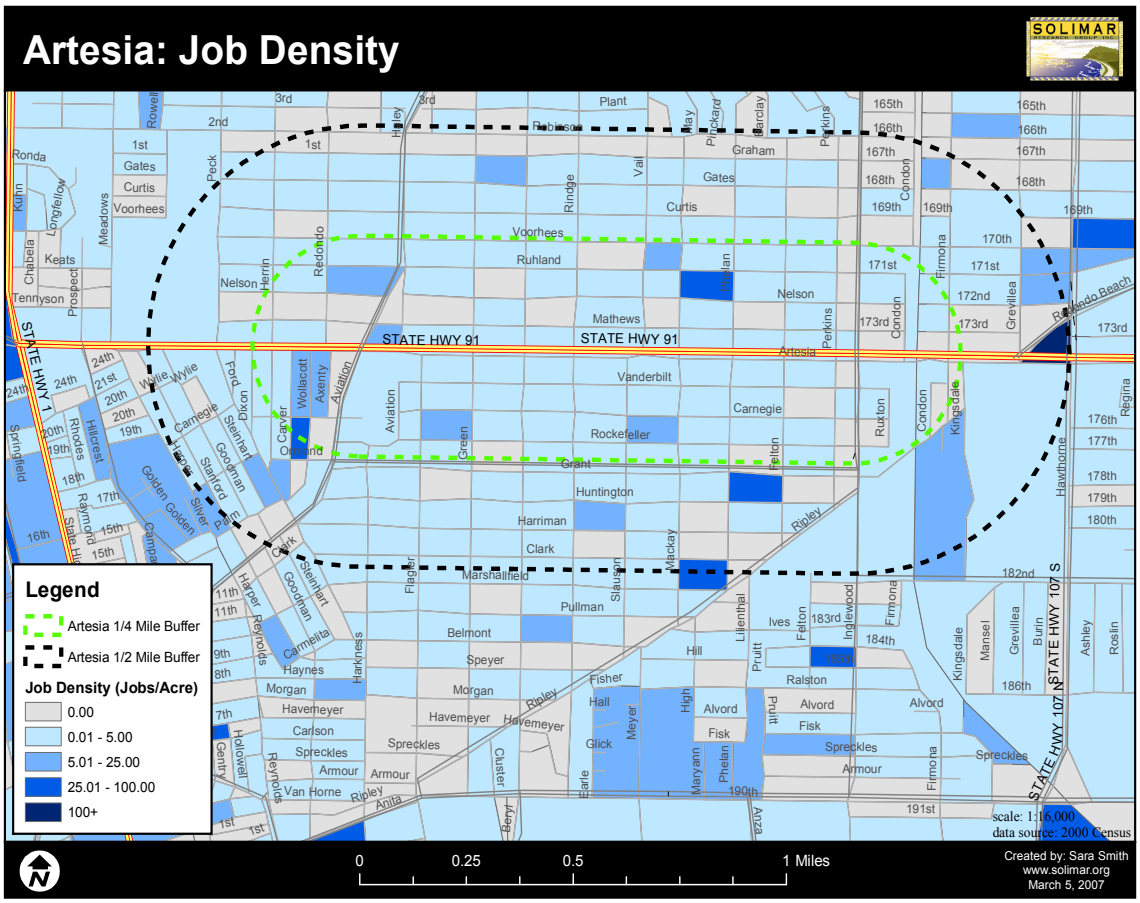


Figure 3.1.13: Map of Artesia Job Density

3.1.9 Bus Ridership and Pedestrian Activity

Three separate agencies service the Artesia Corridor: Local transit agencies Beach Cities Transit and Torrance Transit, as well as Los Angeles' regional MTA bus lines.

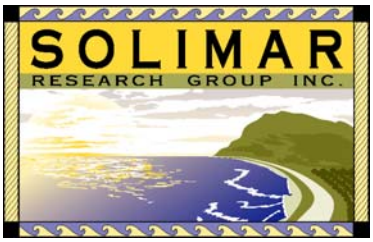
Beach Cities Transit line 102 operates at 30-minute intervals, and is heavily weighted to commuters. According to the Agency, the route has a daily ridership of 300-360 on weekdays, 55 to 60 on Saturdays and approximately 25 on Sunday.

Torrance Transit Line 8 runs the Artesia Corridor on its route between Pacific Coast Highway and Los Angeles International Airport. The line runs at 20-minute intervals on Monday through Friday and 30 minute intervals on Saturdays. It runs at 1-hour intervals on Sunday.

Metro 130 connects the coast with Los Cerritos Center in Artesia. It runs with 15 minute frequency during peak hours and 30 minute off peak, and hourly on weekends and holidays. According to MTA passenger counts, 77 weekday passengers boarded the eastbound bus at stops along the Artesia corridor, 70 alighted. On the westbound bus, 65 passengers boarded and 106 alighted. Total weekday counts were 142 boardings and 176 alightings. On Saturday, 45 passengers boarded the eastbound bus and 11 got off; westbound, 18 got on and 33 off.

Pedestrian activity on Artesia Corridor remains consistently strong throughout the week. Counts were taken at the intersections of Aviation, Vail and Inglewood with Artesia Boulevard, during peak hours on Thursday and from noon to 2 pm on Saturday. During the morning commute from 7:00 am to 9:00 am, 130 pedestrians were counted across the three intersections. That figure rose to 174 during evening peak hours. On Saturday, 158 pedestrians were counted at the three intersections.

Figure 3.1.14: Artesia Corridor bus routes



Technical Background Report Section 4:

Year 3 Survey Results: Gardena Corridor and Artesia Corridor

South Bay Phase III Mixed Use Centers Study
Version 1.0
July 1, 2007

4. Year 3 Survey Results

Just as in the two previous phases ("Year 1" and "Year 2") of this study, we conducted a series of travel behavior surveys targeting different "user groups" of our two study areas, the Artesia Boulevard Corridor and the Gardena Boulevard Corridor. First, an exhaustive, on-line residential survey included a detailed trip diary and was administered to residents of both the inner and outer areas of the corridors. The less rigorous, but still informative employee survey was distributed to a variety of businesses in and around the corridors. Finally, our visitor survey was delivered "on the spot" to pedestrians of each corridor at three different times of the day and week.

4.1 Resident Survey Results

The Year 3 resident survey response results are shown below (Figure 4.1.1). In order to elicit more responses, we increased the number of addresses in our mailing lists this year. As a result, while our response rates are slightly lower than in previous years, the actual number of completed surveys in all study areas is similar, and certainly sufficient to allow statistical analysis within and across study areas. Between this year's study areas, response rates were much better in the Artesia Corridor area than in Gardena.

	Mailed	Responses	Response rate
Artesia			
Inner	2903	244	8.40%
Outer	3120	284	9.10%
Total	6023	528	8.80%
Gardena			
Inner	2829	140	4.90%
Outer	2623	147	5.60%
Total	5452	287	5.30%

Figure 4.1.1: Survey Responses

Throughout this section of the report, the following abbreviations are used for the study areas:

GI: Gardena Inner Ring
GO: Gardena Outer Ring
AI: Artesia Inner Ring
AO: Artesia Outer Ring

4.1.1 Respondent Characteristics

In Years 1 and 2, survey respondents were not consistently representative of the study areas in terms of race and gender. Neither did this year's respondents compose a perfect "demographic match" to reality. Among the pool of Artesia Corridor respondents, the strong Latino populations of both the inner and outer areas were significantly underrepresented. The Artesia group was also slightly "male heavy." While the Gardena respondents were representative of the very strong Asian-American presence in the study area, the African American and Latino populations were not represented by the pool of respondents from either the inner or outer areas. Interestingly, while our survey respondents have typically leaned toward "white," the opposite was true in inner Gardena: The rate of white respondents was about half of the census rate of whites for the same area.

	Artesia Inner		**Artesia Outer**		**Gardena Inner**		**Gardena Outer**	
	Survey	Census	Survey	Census	Survey	Census	Survey	Census
African American	0.8%	4.9%	1.1%	3.7%	2.2%	9.0%	6.8%	8.40%
Asian/ Pacific Islander	7.9%	10.6%	9.5%	10.9%	35.5%	34.2%	40.4%	39.90%
White	62.0%	68.8%	61.6%	72.3%	14.5%	26.9%	25.3%	28.50%
Hispanic	6.6%	21.70%	3.5%	18.60%	15.2%	45.6%	6.8%	29.90%
Do not wish to state	8.7%		6.7%		4.3%		3.4%	

Figure 4.1.2 Racial composition of Respondents V. Census

4.1.2 Travel Behavior Comparisons—Travel to Work

As in Years 1 and 2, the resident travel survey asked respondents about their typical mode of transportation to work. Results revealed that in Gardena, the rate of residents that work at home is insignificant. Many more Artesia residents—about 5% of inner ring respondents and over 6% of outer rings respondents—work from their homes. This is comparable to our El Segundo study area, a mixed-use center, of Year 2.

For those residents who report traveling to work outside of the home, the population of neither corridor relies very heavily on alternative modes of transportation (see figure 4.1.3). In none of the four areas of the two corridors do more than 3% of residents report taking the bus to work; no more than 1% report walking. However, the Artesia study area is slightly more dependent on the automobile. In Artesia's inner ring, about 74% of residents report driving to work; 72% in the outer. These figures for the Gardena corridor do not exceed 65%.

	Artesia Inner	Artesia Outer	Gardena Inner	Gardena Outer
Bicycling	0.8%	0.7%	1%	0%
Bus	1.7%	0.4%	1%	3%
Car	74.4%	71.5%	65%	62%
Employee vanpool	0.0%	0.7%	1%	1%
I work at home	5.0%	6.3%	1%	2%
Other	0.8%	1.4%	2%	2%
Walking	0.8%	0.4%	1%	1%
[no answer]	16.5%	18.7%	27%	29%

Figure 4.1.3 Commute mode to work, by corridor

The slightly higher car mode shares in Artesia can be explained, at least in part, by the slightly longer distances that Artesia residents travel to work. Self-reported distance to work for the corridor survey respondents is shown below, in figure 4.1.4.

	< ¼ mile	¼ to ½ mile	1 to 2 miles	more than 2 miles
AI	0.8%	0.8%	7.0%	68.2%
AO	0.4%	0.7%	7.4%	63.7%
GI	2.2%	1.4%	6.5%	58.7%
GO	2.7%	0.7%	3.4%	56.2%

Figure 4.1.4 Distance to work, by corridor

As evident in the above table, the percentage of Artesia residents who live more than a mile from their place of work is significantly higher than that of Gardena residents. Likewise, very few respondents in either study area live less than .5 miles from work, offering an explanation for why so few residents in either area typically walk to work.

4.1.3 Non-Work Travel

From the onset of Year 1 of this study, we have assumed that travel differences between mixed-use districts will be more noticeable in non-work trips than they will in routine commute to the workplace. As suggested by both intuition and previous research, the clustering of land uses that characterizes mixed-use districts impacts multi-purpose non-work travel more heavily than the singular destination associated with travel to work.

In order to asses how travel patterns differ among mixed-use centers and corridors, we developed three metrics to measure transportation performance early on in this study. We established the following metrics in Year 1n and have continued to rely on them in Year 3:

1) Trip generation rates, per person, per day;
2) Trip capture, or travel to the district, measured by the proportion of all trips to the district;
3) Travel mode

As was the case in previous phases, we derived these metrics from responses to different sections of the residential survey.

4.1.4 Trip Generation Comparison

Driving and walking trip rates, per person, per day, for each Phase 3 corridors are shown in the table below (figure 4.1.5). Note that these are averages across the survey respondents in each corridor.

The Artesia study area as a whole generates more driving trips than Gardena, at 2.47 trips per day per person, versus 2.17 trips per day per person overall in Gardena. This is not surprising, given previous indications that Gardena acts more as a "neighborhood serving" corridor than does Artesia. However, walking trip generation rates do not conform to this pattern, as both the inner and outer areas of Artesia generate more walk trip than do their counterparts in Gardena. In addition, the reduction in walk trips farther from the center of the corridor, a pattern shown in both study areas, conforms to the pattern exhibited in our in previously-studied mixed-use *centers* rather than in Year 2's Hawthorne *corridor*..

Study Area	Drive Trips	Walk Trips
AI	2.38	0.12
AO	2.55	0.06
GI	2.17	0.04
GO	2.17	0.02

Figure 4.1.5 Driving and walking trips; per person per day by study area

Further comparison of Year 3 study areas with those of previous years yields interesting conclusions. There was evidence in Year 1 that mixed-use centers both reduce driving trips and increase walking trips, as compared to our Pacific Coast Highway (PCH) control area. In Year 2, low drive rates in the Hawthorne Corridor showed that mixed-use corridors may also have the same effect. However, the corridor underperformed in terms of walking, not surprising given the extended urban form of corridor.

This year, Artesia and Gardena also exhibited less driving trips than the PCH rate of about 2.8 trips per person per day, continuing the trend of reduced auto use in mixed-use districts. However, in comparison to other study areas, the drive rates of Artesia and Gardena corridors are much closer to traditional centers such as Riviera Village and Downtown Torrance than they are to the Hawthorne Corridor. As deduced in last year's study, this is probably the result of reduced income levels in Hawthorne that affect

driving trip generation. We probe this predictor of transportation performance further in the following section.

Finally, this year's corridors generate far fewer walking trips than do the traditional centers. Riviera Village and Downtown Torrance exhibited overall walk rates of about .37 and .27, respectively. This is in line with our expectation that compact centers with a diversity of business functions will promote walking more than linear corridors.

4.1.5 Income Level Comparison

Previous research has demonstrated that income is strong predictor of driving trip generation. The table below (figure 4.1.6) shows income distribution in the two corridors studied in Year 3. In both the inner and outer areas of the Artesia Corridor, approximately half of respondents report earning over $100,000 in yearly income. In Gardena, income levels are much more evenly distributed among residents, with no earning group comprising more than 21% of the population, and the largest group earning $35,000 to $75,000 annually. This income disparity is a likely explanation for the increase in driving rates in the Artesia study area.

	Artesia Inner	Artesia Outer	Gardena Inner	Gardena Outer
< $15K	0.8%	1.1%	2.2%	2.1%
$15 - $35K	4.5%	1.1%	8.7%	8.2%
$35 - $55K	6.2%	4.9%	17.4%	17.8%
$55 - $75K	12.8%	9.2%	20.3%	19.2%
$75 - $100K	14.9%	16.2%	14.5%	0.7%
> $100K	49.2%	51.8%	10.1%	18.5%
[no answer]	11.6%	15.8%	26.8%	15.1%

Figure 4.1.6 Income distribution by study area

Neither study area exhibits significant disparity between its inner and outer buffer zones, which conforms to the lack of difference in drive trip generation between iner and outer in both Gardena and Artesia.

4.1.6 Trip Capture by Corridors and Mode of Travel to Corridors

The table below (figure 4.1.7) shows a measure of trip capture derived from the Year 3 survey. This is another of the metrics we use to gauge the transportation performance of mixed-use districts. The measure is the percentage of resident survey respondents who say that more than 40 percent of their trips are trips to the mixed-use district in which they live.

Study Area	% Residents who take at

	least 40% of all trips to study area
Artesia Inner	31%
Artesia Outer	15%
Gardena Inner	11%
Gardena Outer	6%

Figure 4.1.7 Trip capture rates by study area: Percent of respondents for whom trips to study comprise at least 40% of all trips taken

Comparing the inner and outer rings of the two study areas yields expected results: In both cases, the inner ring performs at a much higher level than the outer ring. Although a higher-performing inner ring is a consistent phenomenon across all the mixed-use centers studied previously, both Artesia and Gardena exhibit an inner/outer difference that surpasses those mixed-use centers. This is an indication that the "pull" of concentrated, diverse centers such as Riviera Village or Downtown Torrance is maintained throughout the outlying neighborhoods that surround them, whereas the attraction of corridors, however strong among immediate communities, quickly diminishes as one moves outward. That attraction does not overcome distance in the manner of a mixed-use center.

The above table also reveals that the Artesia corridor outperforms the Gardena Corridor by about 100% in terms of trip capture. This is consistent with our previous findings from various survey responses, many of which indicate that Gardena serves a more limited array of functions than Artesia. Not surprisingly, one result of that lack of diversity is that Gardena residents are forced to visit elsewhere in order to take care of everyday needs.

The table below (figure 4.1.8) gives information about the usual mode of travel to the corridors. The percentages of respondents who say that they usually travel to the corridor by car are shown next to the percentage of respondents who say that they usually travel to the corridor on foot. Travel mode differences are not very evident between Artesia and Gardena. As was the case in Year 2's El Segundo and Hawthorne study areas, residents of the inner rings are statistically significantly less likely to say their usual mode to the corridor is the car, and statistically significantly more likely to say their usual mode is walking.

Study Area	Car Usual	Walk Usual
Artesia Inner	84.85%	12.55%
Artesia Outer	94.44%	4.44%
Gardena Inner	83.47%	14.88%
Gardena Outer	92.81%	3.60%

Figure 4.1.8 Mode to the study area: Percent of respondents who say that driving/walking is usual

Comparisons between study areas reveal significant, but expected, differences between corridors and centers. In our Year 1 centers, the percentage of inner ring residents who claimed that walking is their usual mode to the center hovered near 60-70%, that figure was about 30% in the center outer rings. This further indication of the “walkability’ of compact, diverse mixed-use centers.

4.2 Employee Survey Results

The travel survey we administered to employees in each mixed-use district was very similar to that distributed in Years 1 and 2. As was the case in previous years, the distribution of these surveys was less rigorous than that of the residential surveys. While the total number of completed employee surveys—205 for the two study areas—surpassed that of the previous two years, the responses per corridor are disproportionate. We received 149 surveys from Gardena Corridor employees and 56 from Artesia Corridor employees. The large number of respondents in Gardena came from few employers, with two public school and Gardena City Hall located adjacent to one another just off the corridor. On the other hand, the small number of Artesia Corridor surveys came from a wide range of employers in the study area. The effects of these differences should be kept in mind in the following report.

Overall, 22% of employees in the two study areas said they live within one mile of the corridor in which they work. In Gardena this figure was 19% and in Artesia 31% (see figure 4.2.1). Interestingly, these figures are more comparable to the mixed-use centers studied in earlier phases of this project than previously-studied Hawthorne Corridor, where only 10% of employees claimed to live and work in the same neighborhood. This is a hint that Gardena and Artesia act as "neighborhood serving" corridors.

Gardena

	Frequency	Percent
Less than 1/4 mile	8	5%
1/4 to 1/2 mile	10	7%
1/2 to 1 mile	10	7%
1 to 2 miles	9	6%
Over 2 miles	109	73%
no answer	3	2%
Total	149	100%

Artesia

	Frequency	Percent
Less than 1/4 mile	2	4%
1/4 to 1/2 mile	8	14%
1/2 to 1 mile	7	13%
1 to 2 miles	5	9%
Over 2 miles	33	59%
no answer	1	2%
Total	56	100%

Figure 4.2.1 Distance from place of work to home, corridor employees

Regardless of this live-work proximity, in the Gardena study area, nearly all employees—94 percent—drive to work. This is consistent with past employee surveys in all study areas as well as the Gardena resident surveys. Yet only 73% of respondents in the Artesia Corridor drive to work; 19% take the bus. This may partly reflect the younger, retail-oriented employees who responded to the survey, as compared to the large group of more established, public employees who took the survey in Gardena. The small number of total surveys in Artesia should also be accounted for in this statistic.

The travel behavior of employees while they are at work is also quite different between the two study areas, and it differs overall from the travel behavior of employees in mixed-use centers. When asked what percentage of all trips during a typical workweek are trips to and in the neighborhood, only 23% of employees in both corridors said that the neighborhood was their destination at least 60% of the time. In the mixed-use centers previously studied, this figure is about 40%. This is certainly a reflection of the more compressed nature of urban design and business mix in mixed-use centers. Differences between the two corridors were also evident, with 17% of Gardena employees claiming at least 60% of their workweek trips are to/within the neighborhood, and 40% Artesia employees stating the same thing. However, given the singular location of most Gardena respondents and the fewer drivers in Artesia, this not surprising.

With corridor employees making so few trips to the immediate neighborhood during the week, it is not surprising that their typical mode of workday travel is the automobile. Overall, 77% of employees stated the car as their usual means of travel during the workday. In Gardena, this figure is 85%, but the overall figure is skewed by the low drive-to-work of Artesia respondents: As a result of fewer employee drivers there, only 54% of employees use their car on workday trips.

Neither corridor promotes very much walking to and in the neighborhood. In Gardena, only 3% of workers typically walk on trips within the neighborhood; in Artesia this figure jumps to 27%. These figures are drastically different than employee walking rates in mixed-use centers. In Riviera Village and Downtown Torrance, for example, walking rates are 85% and 34%, respectively. Again, this reflects the spread-out nature of uses inherent to the long, linear form of mixed-use corridors.

In both corridors, employees overwhelmingly expressed that the neighborhood change most likely to encourage more walk trips was crime reduction (see figures 4.2.1 and 4.2.2). Gardena employees would also be encouraged by more eateries and shopping establishments, as well as traffic and sidewalk improvements. In Artesia corridor, employees would walk more if public plazas and spaces were improved.

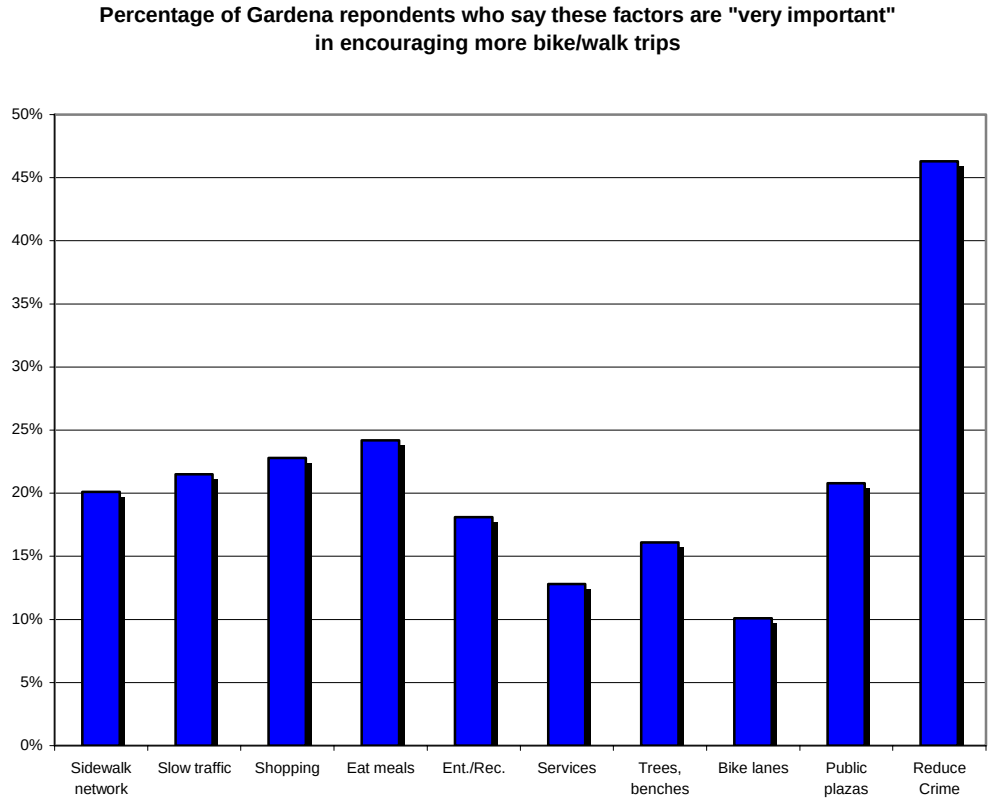


Figure 4.2.1: Factors that would encourage Gardena Corridor employees to walk corridor more often

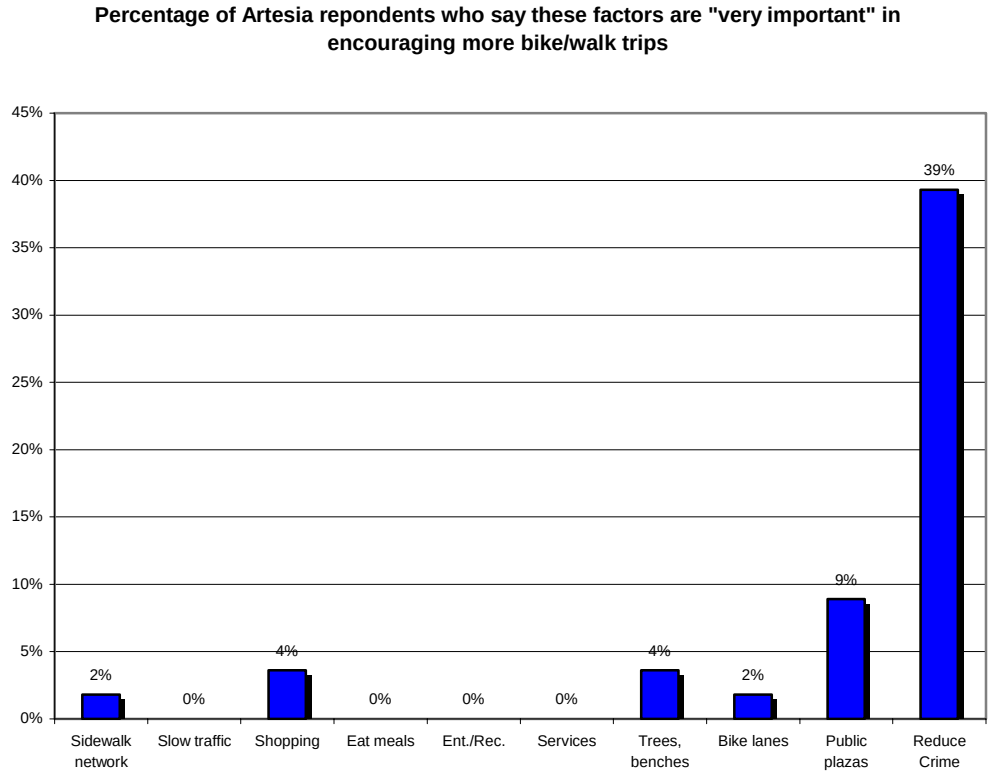


Figure 4.2.2: Factors that would encourage Artesia Corridor employees to walk corridor more often

We also queried corridor employees as to their car trip reduction priorities; we were interested in finding out what types of driving trips individuals would most like to reduce. In Gardena, most respondents—over 60 percent in all categories—said it was "not important" to reduce any type of driving trips. However, those drives that employees were most interested in reducing were work and work related—just under 10% said it was "very important" to reduce such car trips. Artesia employees were also only minimally interested in reducing car trips. 11% thought it very important to reduce the number of car trips to drop-off/pick-up family and friends from school or day care and 5% wished to reduce work-related auto trips.

4.3 Pedestrian/Visitor Survey Results

Members of our consulting team conducted approximately 500 sidewalk interviews in the two study areas. These were delivered at three different times of the day and week: Midmorning weekday, PM rush weekday and Midday Saturday. As in Years 1 and 2, these short surveys consisted of eight questions asking pedestrians about the purpose of their visit, their mode of travel, the frequency of their visits to the study area and where they live. Again, the intent was to learn more about who uses each study area, why they use it, and modes of transportation used within it. The visitor survey also allowed us to estimate the "catchment" area of each corridor.

4.3.1 Purpose of Visits to the Corridors

In general, the difference in trip purpose between weekday visitors (see figures 4.3.1 and 4.3.2) to the two study areas is the result of two large schools in the Gardena Corridor area. While the most common trip purpose in Artesia during the workweek was "work," in Gardena, "school" was more commonly cited as the purpose for weekday visits. In addition, there are signs that uses of the Gardena Corridor are more restricted than Artesia: In Gardena, 32% of weekday evening pedestrians were there to grocery shop, and nearly all others either for work or school. Yet in Artesia, 68% of pedestrian respondents not on work-related trips were there for a wide variety of reasons, from personal and grocery shopping, eating, walking around, entertainment and school.

Purpose: Weekday Mid		
Q2:Why come?	Total	Percent
Work	33	46.5%
Eat Meal	4	5.6%
Grocery Shopping	5	7.0%
Just Walk Around	5	7.0%
School	17	23.9%
Medical	2	2.8%
Other Purpose	5	7.0%

Purpose: Weekday PM		
Q2:Why come?	Total	Percent
Work	27	31.8%
Eat Meal	9	10.6%
Grocery Shopping	8	9.4%
Other Personal Shopping	8	9.4%
Personal Services	4	4.7%
Just Walk Around	7	8.2%
Entertainment	4	4.7%
School	8	9.4%
Medical	1	1.2%
Other Purpose	5	5.9%

Figure 4.3.1: Major Weekday Trip Purposes in Artesia Corridor (not including unanswered)

Purpose: Weekday Mid		
Q2:Why come?	Total	Percent
Work	39	34.2%
Eat Meal	1	0.9%
Grocery Shopping	6	5.3%
Other Personal Shopping	13	11.4%
Personal Services	4	3.5%
School	49	43.0%
Medical	1	0.9%

Purpose: Weekday PM		
Q2:Why come?	Total	Percent
Work	20	23.5%
Eat Meal	2	2.4%
Grocery Shopping	27	31.8%
Other Personal Shopping	5	5.9%
Personal Services	6	7.1%
School	21	24.7%
Medical	3	3.5%

Figure 4.3.2: Major Weekday Trip Purposes in Gardena Corridor (not including unanswered)

On Saturday in both corridors, the purpose of most visits shifted to grocery shopping and personal services. This is evident in figure 4.3.3. In both study areas, about 30% of weekend visitors were there to shop for groceries. However, 20% of Saturday visitors to Artesia were there for work; only 9% of pedestrians on the Gardena Corridor were making work trips. This is probably a reflection of the larger variety of business types, each with different operating hours, on Artesia Boulevard.

Purpose of Visit: Artesia Saturday		
Q2:Why come?	Total	Percent
Work	16	20.5%
Eat Meal	8	10.3%
Grocery Shopping	22	28.2%
Other Personal Shopping	6	7.7%
Personal Services	11	14.1%
Just Walk Around	5	6.4%
Entertainment	4	5.1%
School	1	1.3%
Other Purpose	5	6.4%
Purpose: Gardena Saturday		
Q2:Why come?	Total	Percent
Work	5	9.1%
Eat Meal	7	12.7%
Grocery Shopping	16	29.1%
Other Personal Shopping	11	20.0%
Personal Services	8	14.5%
School	1	1.8%
Other Purpose	3	5.5%

Figure 4.3.3 Purpose of Saturday Visits to Corridors (not including unanswered)

4.3.2 Where Had Respondents Come From?

As was the case with our pedestrian interviews in previous mixed-use districts, the vast majority of respondents in the Artesia and Gardena Corridors said that they had just traveled to the study area from home. In both study areas, at midday during the week and

on Saturday, over 80% of respondents had come from home. However, during the weekday evening commute the origin of pedestrians shifted slightly. In Gardena at this time, only 58% of pedestrians had come from home; the figure dropped to 67% in Artesia. In both places, about 17% of respondents had come from work, and in Gardena, 17% came from school. These results make clear that both corridors play a significant "after work, before home" destination role for local employees and, in the case of Gardena, local students.

4.3.3 How Did They Travel?

Our survey also queried respondents as to their mode of travel to the study areas. At nearly all times in both corridors, the most common mode—used by about half of respondents—was the car. The next most common modes were walking and the bus. Again, the presence of schools and a large municipal job base adjacent to the Gardena Corridor seemed to affect mode: There, during the weekday morning, more respondents (almost 50%) had walked than had drove. Also at this time, the rate of bus riders was the highest among any group of visitors, at about 30%. This is certainly attributable students that had taken school buses.

As was the case with trip purpose, mode trends to both corridors saw a decided shift on Saturdays (see figure 4.3.4). In Artesia, the percentage of respondents who drove to the corridor increased to almost 70%, while bus riding and walking decreased slightly. This trend was even more pronounced in Gardena, where the percentage of visitors who drove to the study area also increased to about 70%, and walking and busing rates decreased by nearly half. Certainly, Saturday visits to corridors are breaks in typical commute patterns, patterns that typically rely more heavily on alternative modes. This Saturday mode trend also fits trip-purpose trends on Saturday: a wider variety of purposes on the weekend indicates that visitors are running multiple errands, demanding greater mobile flexibility.

Saturday mode: Artesia		
Q4:Mode	Total	Percent
Car	53	67.9%
Bus	7	9.0%
Walking	16	20.5%
Other	2	2.6%
(blank)		0.0%
Grand Total	78	100.0%

Saturday mode: Gardena		
Q4:Mode	Total	Percent
Car	38	69.1%
Bus	8	14.5%
Walking	8	14.5%
Bicycling	1	1.8%
(blank)		0.0%
Grand Total	55	100.0%

4.3.4 Mode of travel to Corridors on Saturday

4.4.4 Where Did Visitors Come From?

Finally, we wanted to find out where visitors to the two corridors live. In order to determine this, we asked respondents for their home zip codes. This allowed us to determine the approximate "catchment area" of the study areas. This is loosely defined as the geographical reach of each corridor in attracting visitors to work or shop there.

These geographical spreads are mapped in figures 4.3.5 and 4.3.6. In order to present the results in a straightforward manner, data from all survey times has been aggregated into a single map for each corridor.

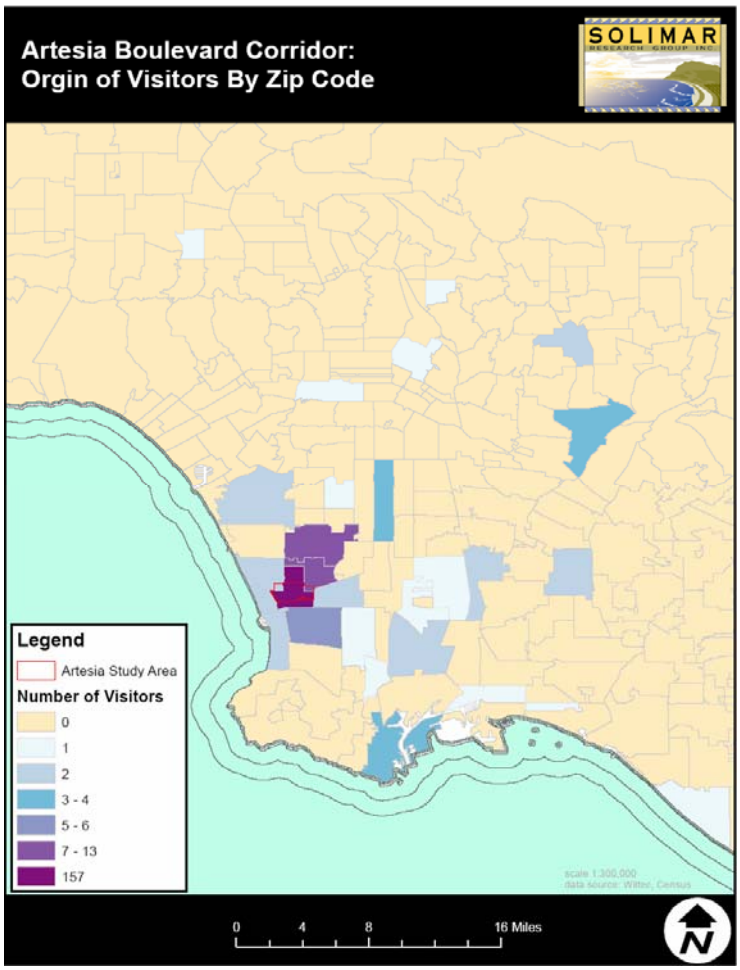


Figure 4.3.5 Origins of Artesia Corridor visitors, by zip code

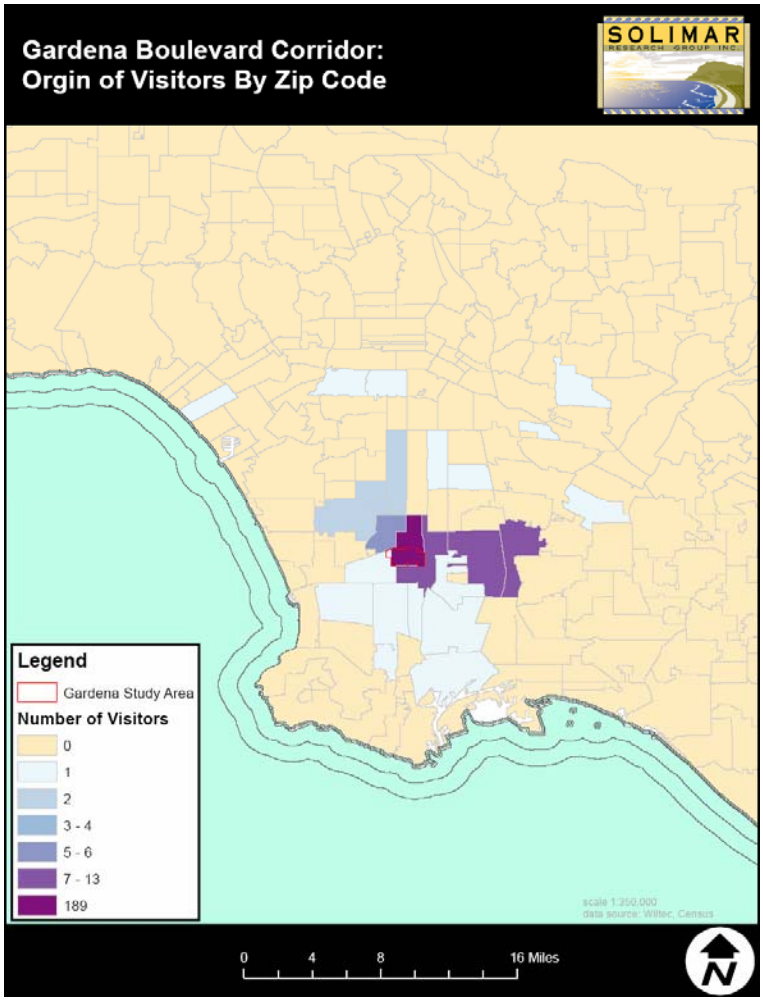
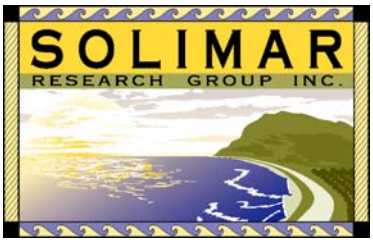


Figure 4.3.6 Origins of Gardena Corridor visitors, by zip code

These maps reveal that the Artesia Corridor attracts visitors from a significantly wider area than Gardena. In the latter study area, only the five zip code areas immediately east and northwest of the corridor were the origin of more than one visitor. None of these is more than about 5 miles from the corridor. Artesia, on the other hand, attracted multiple visitors from multiple outlying zip code areas, some over 10 miles away.

Artesia's better performance in terms of trip capture is likely partly attributable to its location in Redondo Beach, a coastal city of greater regional renown than the City of Gardena. In addition, we have seen that the Gardena Corridor, with multiple schools, a community center and City Hall, contains a much more localized employment base than does Artesia. While the latter attracts employees from farther away with a diversity of regional employers such as AT&T, Gardena employers are less likely to attract employees from further away.



Technical Background Report Section 5:

Corridors & Centers Performance Report

South Bay Phase III Mixed Use Centers Study
Version 1.0
July 1, 2007

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1. Introduction

For the past three years, the South Bay Cities Council of Governments, aided by a research team headed by Solimar Research Group, has conducted an extensive study of travel behavior patterns in and around mixed-use districts in the South Bay area of Los Angeles. The intent of this study is to gain new insight into how these districts function, especially in terms of travel behavior, and to help the South Bay cities craft policies that might allow them to accommodate additional growth – especially additional residential density – while minimizing the additional traffic impact of that growth.

The final work product of this study will be a "guidebook" for South Bay cities laying out possible strategies that could be used in creating more or denser mixed-use areas in the future. This report is one of two research reports designed to assess and analyze the underlying data. A second report will provide the results of statistical regression analyses and create a "model" of how mixed-use districts affect travel behavior; and also will provide case studies that will dig deeper into the trends suggested by the data in both this report and the regressions report.

This report is based on the notion that the transportation "performance" of each mixed-use district can be attributed to the characteristics of these districts, including possibly demographic, economic, and physical characteristics. Both this report and the regressions and modeling report seek to find these linkages; the guidebook will seek to use this knowledge to provide cities with strategies.

The research commissioned by the South Bay Cities COG seeks to understand the urban context specifically in the context of the South Bay – a series of older suburban cities characterized by low-rise, auto-oriented development that is fairly dense by suburban standards but poorly served by transit. The COG's hope is that this understanding will inform a specific set of strategies and recommendations for creating mixed-use development and districts in the future. These strategies and recommendations will be contained in a Guidebook to be published later this spring.

Although the literature associated with mixed-use development, traffic, and parking is growing, there is relatively little literature directly on point, especially in the context of an auto-oriented but densifying older suburban area with poor transit. There is a general assumption in much "smart growth" literature – and in SCAG's 2% strategy policies – that higher residential densities and mixed-use districts will create transportation efficiencies and generate less travel, but the research is decidedly mixed on these points.

2. Methodology

Eight different horizontal mixed-use districts were selected for analysis. In all but one case, these study areas were divided into "inner" and "outer" study areas based on ¼-mile and ½-mile distances from the centerpoint of the study area. Four districts were classified by the research team as "centers" and four were classified as "corridors". The "centers" are generally older downtowns with commercial and mixed-use areas that stretch several blocks deep. The "corridors" are generally older strip commercial areas along an arterial boulevard with commercial areas located only on the arterial frontage.

The four centers were Riviera Village in Redondo Beach, Downtown Torrance, Downtown El Segundo, and Downtown Inglewood.

The four corridors were Hawthorne Boulevard in Hawthorne, the area around Hawthorne Boulevard and Pacific Coast Highway in Torrance, Artesia Boulevard in Redondo Beach, and Gardena Boulevard in Gardena.

It is important to note that, while these study areas are characteristic of areas in the South Bay that combine high housing density and lots of commercial activity in a small area, they do not include the South Bay's largest commercial centers. Most of the study areas cater to relatively small market areas and do not include department stores or movie theaters. However, the large commercial centers such as Del Amo Fashion Plaza and South Bay Galleria are so large that they are not really mixed-use. (The South Bay Galleria is approximately the same size as the inner area of many of our study areas.)

The corridors were geographically much larger than the centers. The centers were focused on a ½-mile radius around a center point (for example, Main and Grand in El Segundo) and were generally approximately 400 acres in size. The corridors were focused on a ½-mile radius around an arterial strip (for example, Hawthorne Boulevard from El Segundo Boulevard to Rosecrans Boulevard in Hawthorne) and were generally approximately 1,000 acres in size.[1] It is also worth noting that, as we defined them, the corridor study areas are really a slice of the South Bay's prevailing arterial grid morphology. A half-mile distance from the main arterial in the corridor usually touched an adjacent arterial, though usually not one as intensely developed or used (for example, the Hawthorne study area touches Inglewood and Prairie.)

In each study area, the research team collected a large amount of objective data, including demographic and housing data from the Census, parcel and building data from the Los Angeles County Assessor, business data from the private vendor InfoUSA, and traffic, bus ridership, and pedestrian data from a variety of sources, including the cities themselves and field research. This data provides the "characteristics" part of the puzzle in this report.

[1] The precise size of the study areas varied because of the need to align the boundaries with Census boundaries.

The research team also conducted three different types of surveys: a survey of residents, a survey of employees, and a "sidewalk survey". The responses to these surveys provide the "performance" part of the puzzle in this report.

The surveys covered a broad array of travel behavior questions. Of the three, the residential survey was by far the most rigorous and widely administered. More than 2,500 resident surveys in the eight study areas were completed and coded by the research team.

The characteristics and the survey results for each study area have been written up separately in the Year 1 and Year 2 reports and in a companion document as part of the Year 3 report.

In this report, the residential survey provides the primary basis for our analysis. Similar responses in the visitor and employee surveys will be used in a supporting role but these were not collected in as rigorous and scientific a fashion.

There are some limitations to the data. Residential respondents answered the survey mostly online and therefore they are sometimes skewed to a higher level of educational attainment and income than the population at large as described in the Census. This is not a problem in most of our study areas, such as Torrance, Riviera Village, and Artesia Boulevard, where the overall demographics skew toward the high end anyway. There is more of a discrepancy in Inglewood, Hawthorne, and Gardena, where the Hispanic population and lower-income populations in particular are underrepresented. We believe this may explain some discrepancies in the data and we call those out when appropriate. Overall, however, we believe there was enough representation from all groups to create a valid survey.

Throughout this report, 14 and occasionally 15 data points are used. These include "inner" and "outer" areas for six of the eight study areas, as well as the outer area for Inglewood, an additional study area in El Segundo, and a combined study area for the Pacific Coast Highway location.

In the inner Inglewood area, the resident survey yielded fewer than 10 responses and so we removed inner Inglewood from almost all analyses.

In El Segundo, we surveyed residents in a third area, beyond the ½-mile buffer used elsewhere. We did not conduct a study of the characteristics of this area. However, we have occasionally used the survey data where appropriate.

The Pacific Coast Highway study area was originally used as a "control" area for residential survey purposes in Year 1. It was not among the original study areas. We did not create "inner" and "outer" areas and we did not collect all data. We have used the PCH data where appropriate.

Also, occasionally, we have where appropriate used only characteristics from the inner study areas. This is because in some cases – restaurants and retail businesses, for example – the characteristics from the inner area appeared to be the driving force for the entire study area.

In this report, we have characterized these data using two different methods.

First, we conducted a statistical correlation analysis between the characteristics and the performance.

We ran two sets of correlations. One set of correlations involved the 14 study areas identified above, including 6 pairs of inner and outer study areas. However, because of the way study areas were drawn, we could not break all data into inner and outer areas, which were determined by using Census blocks. Some Census data, available only at the block group level, had to remain aggregated at the level of the overall study area. Hence, for those variables, we ran a second set of correlations using the 8 study areas without dividing them into inner and outer. We did not use the additional El Segundo data in this analysis, but we did use the inner Inglewood data.

In this way we identified, at least for statistical purposes, characteristics that seemed to be related to better transportation performance of the study areas. We have focused on positive, rather than negative, correlations. A rule of thumb in correlation analysis is that a correlation is in the range of 0.3 to 0.5 (out of a possible 1.0) suggests a medium correlation and a correlation of 0.5 and above suggests a strong correlation.

However, a correlation is just that – a statically proven connection. It does not prove a *causal* relationship between a characteristic and performance.

In addition, it is important to note that the correlations in this report represent rough approximations because there are only 14 data points – and in some cases only 8 data points – for each performance measurement and each characteristic. With so few data points, we can expect a large margin of error and therefore the correlations provide only a general idea of the strength of the relationship between a performance measure and a characteristic.

Concerned that “centers” and “corridors” may cancel each other out statistically, we also ran a set of correlations between performance measurements and characteristics just for the centers and just for the corridors. In general, we found that these two types of study areas did *not* cancel each other out. In most cases we find similar correlations – though the coefficients were often much larger. However, the number of study areas in this analysis is so small (7 or 8 for some factors, only 4 for others) that the possibility for skewed results based on one anomalous study area was high. Therefore, we used these results only as a guide and we do not publish them here.

However, a correlation coefficient alone does not depict the variation between study areas. And with such a small sample size, understanding this variation becomes especially important. Therefore, in addition to the correlation coefficients, we have used a side-by-side analysis of performance measurements and characteristics. We typically use a chart with a primary and secondary axis, thus allowing us to compare the relationship of a performance measurement and a characteristic across all 14 study areas at a glance.

In some cases, we have used two different scales on the two axes even though both are depicting a percentage. For example, we may chart the percentage of persons walking and the percentage of neighborhood businesses in a study area, but we created two different percentage scales, one on each side of the chart. Although this may be confusing at first, we believe this approach actually makes it easier to visually understand the relationship between the characteristic and the performance measure.

3. Performance Measurements

Our study areas were horizontal mixed-use districts, some in the "center" form and some in the "corridor" form, that meet certain statistical criteria. Our goal was to identify those measures of "performance" that would be most useful in identifying strategies that cities could use in strengthening mixed-use districts in the future.

After considerable internal debate, we concluded that the two most useful performance measures are ***trip capture*** – that is, how frequently nearby residents use the study area – and ***mode split*** – that is, how these nearby residents get to the study area.

Trip Capture Rate

The key measure that we will use is the trip capture rate as revealed in the residential surveys. The specific question used to ascertain this measure was, "What percentage of all trips that you take are taken to the study area?" Respondents were asked to estimate in 10-percentage-point intervals: 0%, 10%, 20%, and so forth. Our specific measurement is the average of all responses for each study area.

We augmented the trip capture analysis as well with results from a set of questions asking respondents how many times per week they go to the study area for particular types of activities.

The activities covered in the survey for all study areas were:

- Meals
- Groceries
- Personal Shopping
- Entertainment
- Schools
- Medical or Dental Appointments
- "Just to Walk Around"
-

In Years 2 and 3 only (El Segundo, Hawthorne, Artesia, and Gardena), we also asked about two other activities:

- Personal Services (such as hair salons)
- Community Meetings (including church services)

Mode Split

The key measure that we will use is the mode split as revealed in the residential surveys. The specific question was, "What is your typical mode of travel to the study area?" Virtually no respondents used public transit or bicycles, so our specific measurement will be the percentage of residents who say their primary mode of travel to the study area is walking.

Relationship Between Two Performance Measures

There is a strong relationship between the two performance measures – that is, they appear to be related to each other. The correlation coefficient between the two measures was strong: +0.593. However, there is enough variation to suggest that some different factors are also at play.

Figure 3-1 depicts the relationship between mode split and trip capture. In general, centers performed better according to both measures than did corridors, but there were some exceptions. El Segundo, a center, performed surprisingly poorly in trip capture, whereas Hawthorne, a corridor, performed surprisingly well.

Figure 3-1: Mode Split v. Trip Capture