

Livable Centers

Healthy Pasadena

Final Report

September 2023



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Project Overview

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Project Overview

Background

The Houston-Galveston Area Council (H-GAC) is a regional organization that focuses on programs and developments that promote the wellbeing and safety of its residents. H-GAC has created a program called Livable Centers with a goal of designing areas where people can live, work, and play with less reliance on their vehicles. The strategies from this study will encourage walkability, community activity, economic growth, and wellness.

The Livable Centers Program is designed to address several components that contribute to creating safe, convenient, and desirable communities. The livability principles are highlighted below.

LIVABILITY PRINCIPLES •



Design walkable **connecting streets**



Implement **Healthy Parks Plan** by adding thriving parks



Encourage a **destination for health & wellness**



Improve the connection to **nodes of community activity**



Promote **local economic development** and employment

Purpose

The primary goal of Healthy Pasadena Livable Centers is to envision a vibrant locality that prioritizes the requirements of its elderly population, the medical district, and urban renewal. By placing emphasis on these aspects during the planning process, the Livable Centers Program aims to generate practical and actionable concepts that leverage the community's current advantages while effectively tackling longstanding issues.

Funding

Livable Centers are part of H-GAC's 2040 Regional Transportation Plan's strategy to improve multi-modal mobility in the region. The Transportation Policy Council (TPC) allocates funding through the Transportation Improvement Program (TIP) for a variety of transportation plans, including the Livable Centers Program. To date, 37 projects are identified in the Regional Transportation Plan, and \$575.7 million is allocated for multi-modal transportation improvement, such as sidewalks, bikeways, transit, and intersection /bridge / underpass treatments. Funding for this Livable Centers Study was part of H-GAC's TIP program, the study is funded through a partnership with the Texas Department of Transportation (TxDOT) and H-GAC covering 80% of the project cost through federal funding and 20% of the project cost covered by a contribution from the Local Sponsor, in this case, the Pasadena Economic Development Corporation (EDC).

Regional Context

Pasadena, Texas, is a city located in Harris County, within the Houston metropolitan area. It is a diverse and growing community known for its industrial base, as well as its rich history and cultural offerings. As the 17th most populous city in Texas, the City of Pasadena is home to approximately 152,000 residents.

It is the second largest municipality in the H-GAC region and has a land area of roughly 1 square mile. With a focus on continued development and improvement, Pasadena seeks to enhance the quality of life for its residents and promote a thriving and livable environment for everyone.

Study Area

The Study Area for this Livable Centers study is approximately 620 acres and includes an estimated 830 parcels. The key corridors in the study area include Spencer Highway, Tulip Street, Fairmont Parkway, and Strawberry Road as shown in Figure 01

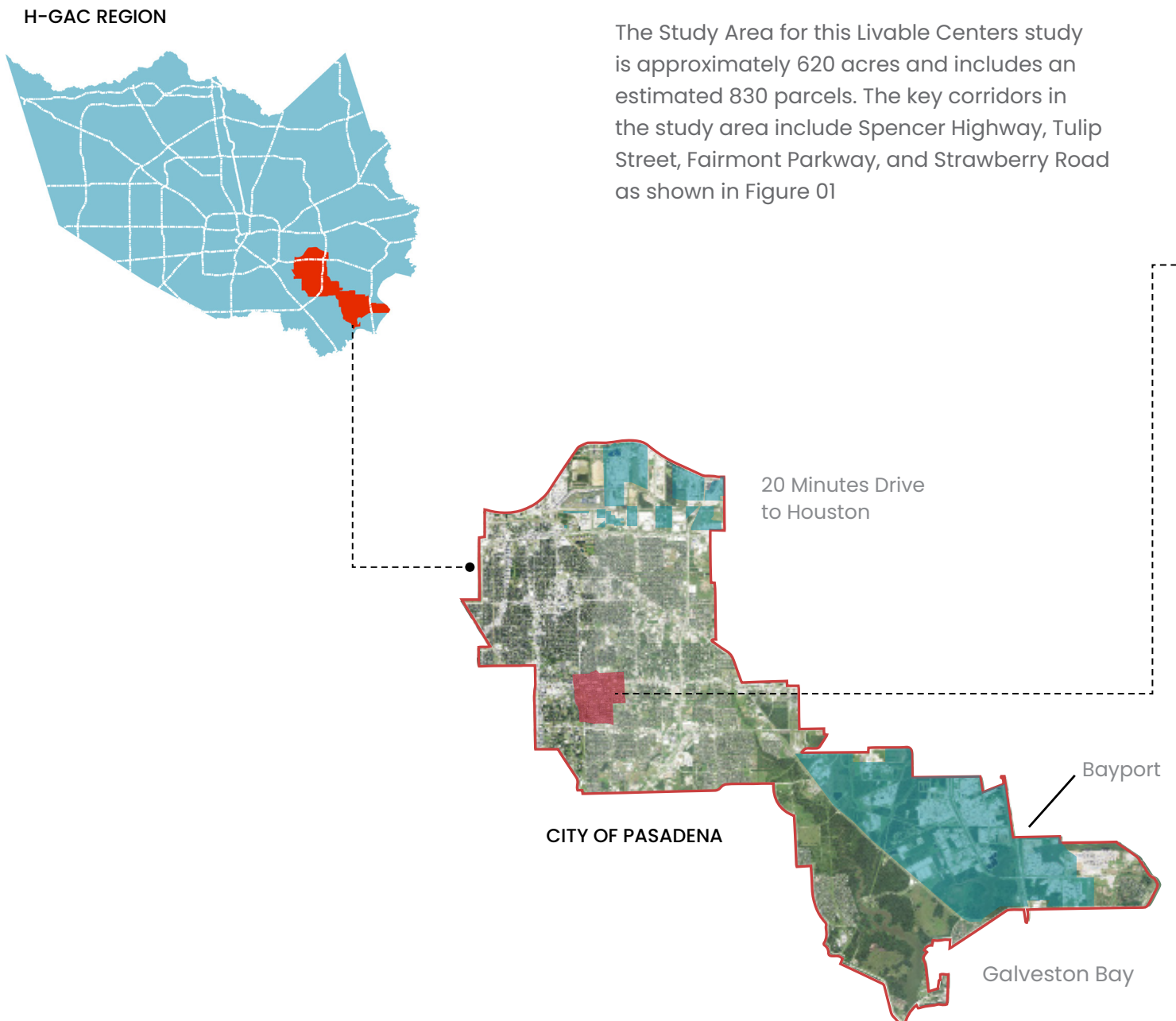


Figure 01: Location of City of Pasadena and Study Area within H-GAC Region

STUDY AREA



Project Goals

The study aims to generate catalyst projects for City of Pasadena, fostering equitable investment outcomes for the community. These outcomes will revolve around enhancing community assets along specific corridors, implementing significant infrastructure improvements, and adding amenities to support pedestrian activities. The central focus is on promoting community vitality and wellness to create a more prosperous city.

Through achieving more equitable outcomes, enhancing safety, and overall quality of life improvements, the city can experience substantial growth and help enable economic development, attracting both current and new residents with enticing opportunities. To identify these broader goals, community residents and the Steering Committee members collaborated in developing a highly actionable plan, adopting the following project goals within the site for this study.



Spur strategic planning for future growth in the region's second largest municipality



Engage the public and community stakeholders to establish community needs and prioritize projects within the study area



Create a quality place that incorporates Pasadena's rich heritage and culture while instilling a strong identity for the area.



Establish long-term economic development priorities and foster economic competitiveness



Create and promote an environment conducive to alternative transportation modes that lessen vehicular use and traffic



Implement creative initiatives and collaborative partnerships to establish supplementary parks and green spaces

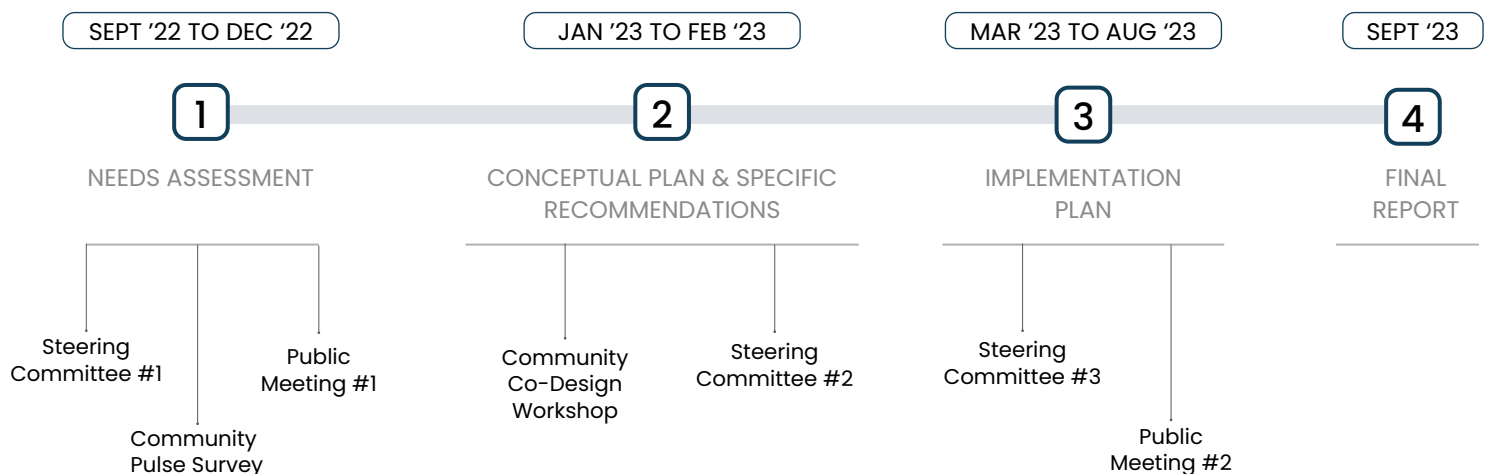


Create safer places and infrastructure for walking and biking with proximity to amenities such as green spaces, school, retail, and employment centers

Project Timeline

The plan was a 12 month study including analysis of existing conditions to developing implementation plan based on various public

engagement activities. The figure below outlines the project timeline and major milestones that were conducted.



Project Partners

The invaluable support and dedication of the following project partners played a crucial role in the success of this Livable Centers Study. Their active involvement helped steer the project team in developing practical and implementable recommendations.

Project Team:



Agency Partners:

- Department of Parks and Recreation, City of Pasadena
- Department of Planning, City of Pasadena
- Department of Public Works, City of Pasadena
- Harris County Precinct Two
- Hospital Corporation of America (HCA)
- Jensen Elementary School
- Marshall Kendrick Middle School
- Pasadena Economic Development Corporation
- Texas Department of Transportation (TxDOT)

Steering Committee Members:

- Baker Ripley Community Development
- Focused Care
- Hospital Corporation of America (HCA) Houston Healthcare
- Jensen Elementary School
- Morales Engineering
- Marshall Kendrick Middle School
- Pasadena Chamber of Commerce
- Pasadena Health Center
- Pasadena Independent School District
- Pasadena Realtor
- Project Joy and Hope
- San Jacinto College
- Serrano Insurance Agency



Public Engagement

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Public Engagement Overview

From the beginning, the project team recognized the importance of having a well thought out public engagement plan to ensure the final project was realistic, implementable and a true reflection of the community's needs. In order to ensure the consulting team had direction

As previously noted, the City of Pasadena and particularly the study area, have many non-English speaking residents. Therefore, it was important that the project team deploy strategies that reached these specific households and that the team was prepared to communicate with residents in their preferred language. Not only was all material created in English and Spanish, but all events equipped with project members that were bilingual.

When in-person events were schedule, Baker Ripley Campus was the facility of choice. Not only did the facility provide the perfect configuration to host public meetings, but this location is already a landmark within the community. Thus hosting meetings there allowed for the project team to capture residents and community members that already feel safe in the environment.



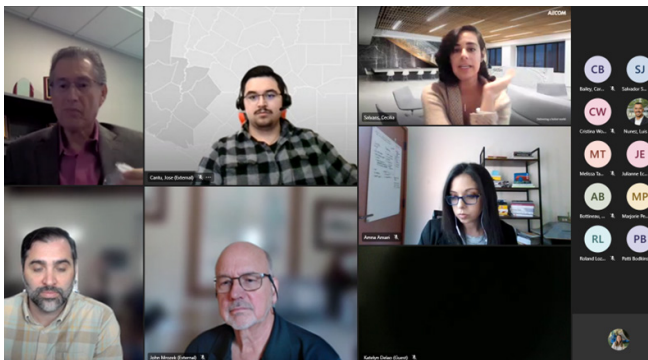
Steering Committee

The Economic Development Corporation (EDC) played a pivotal role in ensuring the members of the Steering Committee were a true representation of the study area community, thus the establishment of this committee occurred very early in the project. The EDC hand selected local business, residents, and local leaders (all who either work or live within the study area) to form the study's Steering Committee as soon as the project was officially kicked off. The main role of the Steering Committee was to:

- Ensure project development was a true reflection of the community
- Help provide direction as recommendations were being developed
- Be the trusted voice to the community and help spread the word when public input was needed

The Steering Committee formally met three times; of which two were in person and one was virtual.

In one word, describe your role within the community and for how long?



Agency Meeting

Agency meetings were crucial during the Concept Development Phase (Chapter 5). This process originated by using the input collected during the co-design workshop to identifying initial recommendations that were then vetted and refined with the potential agencies and/or organizations that would be in the best position to lead the recommendation once the project was finalized. The project team anywhere from two to four agency meetings to ensure that updates to the recommendations were aligned with their ultimate vision and corrected the needs at hand.

- The viability of implementing the draft recommendations
- How the recommendation can be improved
- Whether agencies should be part of the development and/or implementation of the recommendations.

Recommendations were not considered pre-final until all parties agreed that recommendations were feasible to implement.



Community Co-Design Workshop

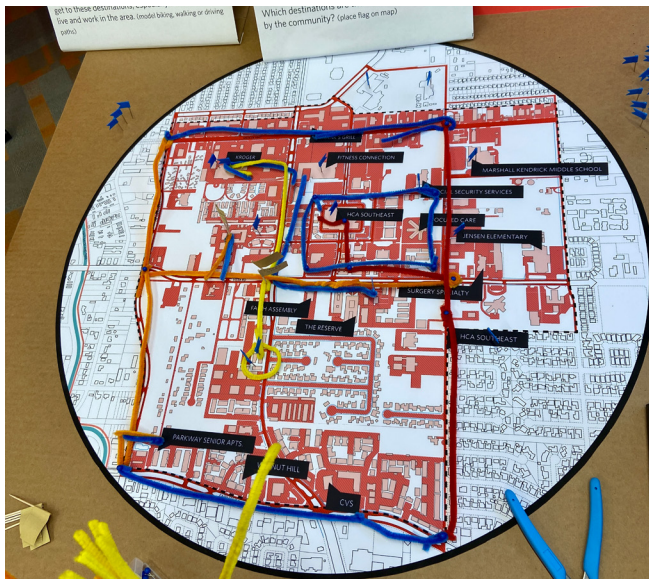
The Co-Design workshop aimed at getting inputs from residents and businesses within the study area to identify solutions that could help improve the community. The workshop focused on receiving inputs on three themes of Healthy Pasadena: Healthy Spaces, Healthy Mobility and Healthy Community

Healthy Spaces saw that more participants wanted seating, lighting, improved sidewalks, bikeways, restaurants, and better use of the underutilized utility corridor. The study area has

potential for a 3-mile green loop with amenities and activities across various connections.

Healthy Mobility focused on participant's input towards street improvements along Spencer Hwy and Burke Rd. The main concerns were motorized vehicle access when traveling for everyday services and student safety in school zones due to congested traffic.

Healthy Communities concluded with an intergenerational corridor that prioritized senior resident needs and economic development.



Public Participation

Public Meetings

Public Meeting #1 – 06 December'22

The meeting was the first of a two-part public meeting timeline, which consisted of an open house walk-through of the study area demographics and three major topics that highlighted the information that is presented in the Livable Centers Study. The purpose of the meeting was to encourage the community to provide visionary thoughts and perspectives that would assist in developing the proposed needs and recommendations for the Livable Centers.

OUTCOME: There were common thoughts that were discussed from the three categories of Healthy Communities, Healthy Mobility, and Healthy Spaces. For Healthy Communities, activities and outdoor spaces for senior residents were picked the most in options that would improve lifestyles within the study area. For Healthy Spaces, many participants voted on their concern for safety regarding the lighting within the study area. For Healthy Mobility, destinations were also difficult to travel to without a car according to the participants.



Public Meeting #2 – 25 July'23

The primary objective of the meeting was to facilitate a transparent and inclusive dialogue, allowing community members to express their thoughts, concerns, and suggestions regarding the six recommendations that have been meticulously developed for the project.

The format of the meeting was designed as an open-house walk-through, which provided attendees with the flexibility to explore and engage with the proposed recommendations at their own pace. This approach encouraged meaningful interactions, enabling participants to delve deeper into the details of each recommendation and gain a comprehensive understanding of how they could potentially impact the local community.



Public Surveys

Public Survey #1 – 12/13

By actively engaging with residents and stakeholders, the project team developed survey to gain a deeper understanding of the community’s concerns and aspirations, thus ensuring that the project aligns closely with the needs and desires of the local population. This survey aimed at focused on receiving early feedback on what improvements they would like to see within the study area.

Figure 02: Results of Survey #1



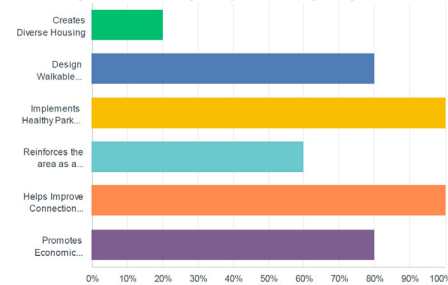
Public Survey #2 – 07/25 to 08/11

The second public survey aimed at receiving feedback on the six recommendations developed for the study area. The objective behind these six projects is to foster the creation of a safe, convenient, and appealing community environment. Participants were encouraged to identify which project(s) they believe would yield the most beneficial outcomes for the community.

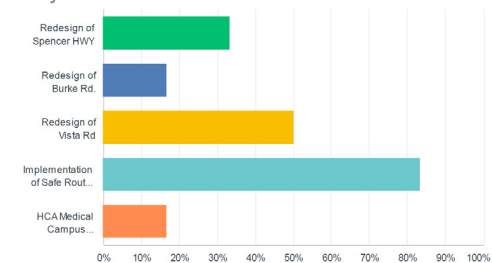
OUTCOME: While the community found most of the recommendations very likely to take place, they believed adding open spaces, improving connectivity and designing walkable and safe streets will be the most beneficial to everyone. Hence recommendations like Safe Routes to School and Redesigning received highest votes in terms of preferred project that can be implemented. Some of these results are shown in Figure 03

Figure 03: Results of Survey #2

Principles that proposed projects help address



Projects that will be most beneficial to the community





Existing Conditions

Final Report

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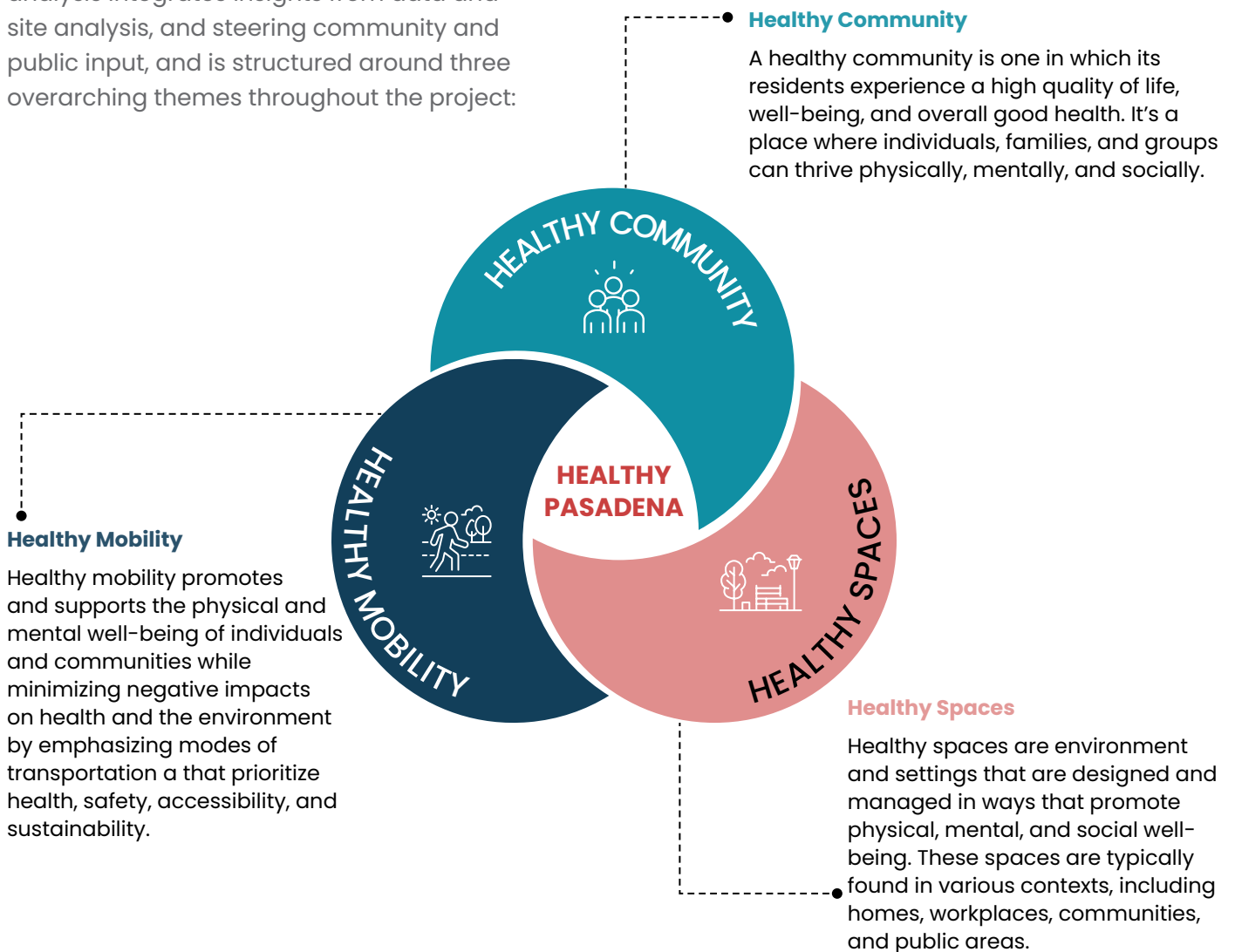


03

Existing Conditions

Overview

The purpose of the existing conditions analysis is to identify opportunities and challenges that could be addressed in the conceptual plan and final recommendations to create a healthy livable community. The existing conditions analysis integrates insights from data and site analysis, and steering community and public input, and is structured around three overarching themes throughout the project:





Healthy Communities

Healthy Communities topic is understood as the social, economic and land use make-up of the study area, including population age and ethnicity factors, housing type and tenure mix, local economic development, employment profile, commercial real estate market outlook, and aged building stock.

Population and Household Characteristics

Population

The Study Area has a population of nearly 5,200 while the City of Pasadena has a population of more than 153,000 (Table 01). Between 2000 and 2022, the Study Area’s population grew at an average rate of 1.1% per year, while the City of Pasadena’s population grew at an average rate of 0.3% per year – these numbers are lower than Countywide and Statewide growth rates (both 1.7% per year). Other key demographic

characteristics (Table 02) indicate that residents are generally older (median age of 40) and of lower median income (\$45,215) compared to Pasadena average. Educational attainment is also poorer with only 3.2% residents that graduated college or higher than within Harris County (32.3%) and the U.S. (32.9%). However there are relatively fewer residents living below the poverty level than in Pasadena on average (11.8% compared to 18.1%).

Table 01: Study Area Population

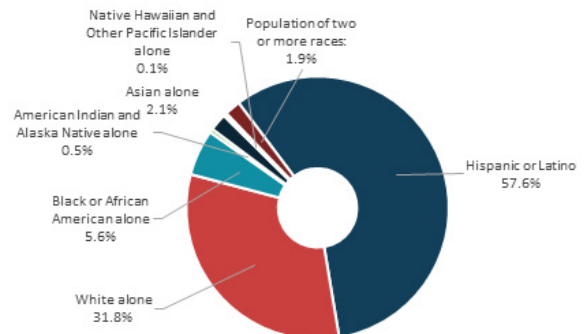
City	2000	2010	2020	2022	2000–2022 CAGR
Study Area	4,044	4,794	5,058	5,178	1.1%
Pasadena	142,405	149,902	151,950	153,356	0.3%
Harris County	3,400,631	4,092,333	4,731,145	4,875,969	1.7%
Texas	20,851,820	25,145,561	29,145,505	30,157,100	1.7%
United States	281,421,906	308,745,538	331,449,281	335,707,897	0.8%

Source: U.S. Census Bureau (2000 – 2020), Esri (2022)

Population Ethnicity

The Study Area has a majority minority population including Hispanics or Latinos (56.3%). This is in line with the city’s predominantly minority population (70.7%), and greater than the county and the U.S. average (respectively 43.1% and 18.2%). However, only 10.2% of residents speak English “less than very well”, far lower than Pasadena’s average of 44.9%, and of a similar trend to the U.S. as whole (8.3%).

Figure 04: Study Area Race Demographics, 2020



Source: USCB, ACS 2020 – 5-year Estimates

Table 02: Study Area Ethnicity

City	Median per capita income (\$)	Median age (years)	Minority (non-white identified) population (%)	Hispanic or Latino (%)	Speak English less than "very well" (%)	Below federal poverty level (%)	Graduated college or higher (%)
Study Area	45,215	40	66.3	57.6	10.2	11.8	3.2
Pasadena	57,781	31	70.7	70.7	44.9	18.1	15.9
Harris County	63,022	34	43.1	44.4	3.6	15.9	32.3
United States	64,994	38	18.2	18.9	8.3	11.6	32.9

Source: ACS 5-year Estimates (2020)

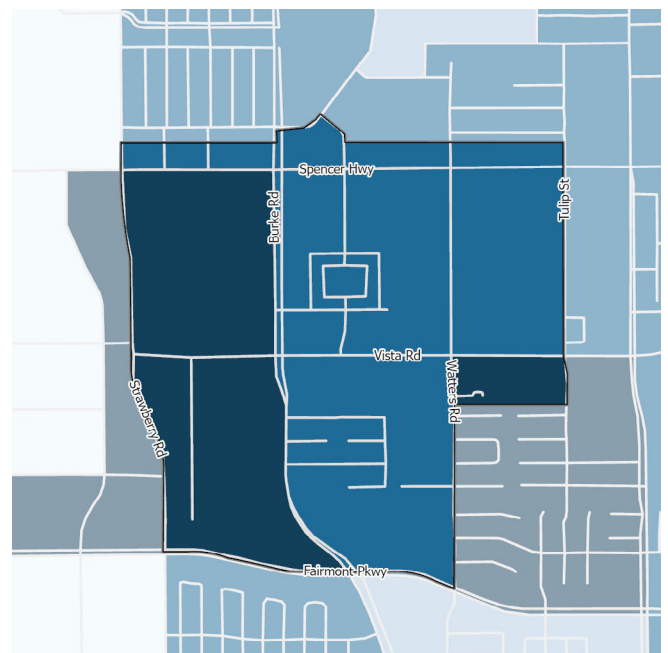
Population Age

The resident population is marginally older than the average City of Pasadena (18% are 65 and over compared to 13% - Figure 04). The younger residents aged 19 years and under in the Study Area and the city follow a similar trend and consists of roughly a quarter of the population (respectively 24% and 29%).

A higher concentration of senior residents (more than 20% of total residents) live west of Burke Road in senior living multi-family complex. The eastern portion of the study area shows a slightly lower concentration of senior

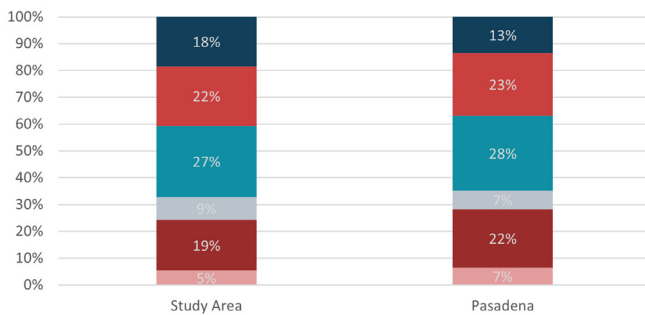
residents (10 to 20%) living in assisted living or nursing facilities. The goals of this study include addressing the needs of the aging population to access health-oriented facilities in the community safely.

Figure 06: Percentage of Population over 65 years old



Source: ACS 2020; AECOM

Figure 05: Population Age Group



Source: USCB, ACS 2020 – 5-year Estimates

Age Group Distribution

- Under 5
- 5-15 yrs
- 20-24 yrs
- 25-44 yrs
- 45-64 yrs
- 65 or over

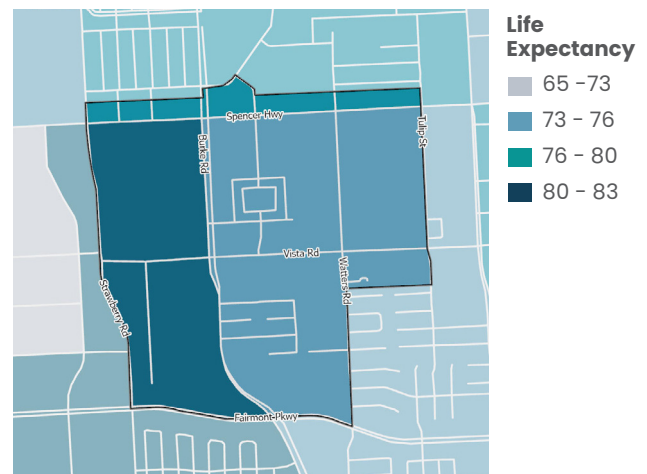
Population Over 65

- Less than 5%
- 5-10%
- 10-20%
- Greater than 20%

Life Expectancy

The CDC defines life expectancy as the average time people are expected to live, which provides insight into a population's health and mortality rate. The life expectancy of those 65 and over within the Study Area ranges from 73–83 years old. The area where single-family homes and the senior assisted living has an average life expectancy of 73–76 years of age. The location of more multifamily housing shows that the average life expectancy is from 80–83 years old. More access to medical services can lower the mortality rate.

Figure 07: Life Expectancy



Source: CDC; AECOM

Household Characteristics

There are nearly 2,600 households in the Study Area and over 52,000 households within the City of Pasadena (Table 03). These numbers have grown at an average rate of 1.0% and 0.4% per year, respectively, which is slower than growth rates seen in Harris County (1.7% per year) and Texas (1.8% per year) during this same period.

The average household size is not considerably larger than the city overall (2.35 people per household - Table 04). The households within the Study Area have a smaller percentage of one or more people under 18 (21.6%) but more households have people over 60 (39%) due to the senior population in the location.

Table 03: Total Households

City	2000	2010	2020	2022	2000–2022 CAGR
Study Area	2,073	2,422	2,505	2,573	1.0%
Pasadena	47,413	48,921	51,284	52,009	0.4%
Harris County	1,205,530	1,435,105	1,692,730	1,747,682	1.7%
Texas	7,393,354	8,922,933	10,491,147	10,870,372	1.8%
United States	105,480,101	116,716,292	126,817,580	128,657,669	0.9%

Source: U.S. Census Bureau (2000 – 2020), Esri (2022)

Table 04: Study Area Household

City	Average household size (no. of people)	Households with 1 or more people under 18	Households with 1 or more people over 60 (%)	Householders living alone (%)	Householders living alone (65+) (%)
Study Area	2.35	21.6	38.9	23.6	8.1
Pasadena	3.15	44.2	30.2	20.0	6.5
Harris County	2.84	37.6	30.9	26.3	30.9
United States	2.6	30.7	40.2	28.0	11.3

Source: ACS 5-year Estimates (2020)

Social Vulnerability Index

The Center for Disease Control's (CDC) Social Vulnerability Index (SVI) identifies socially vulnerable communities who will most likely need support before, during, and after an extreme event. Effectively addressing social vulnerability decreases both human suffering and the economic loss related to providing social services and public assistance after a disaster.

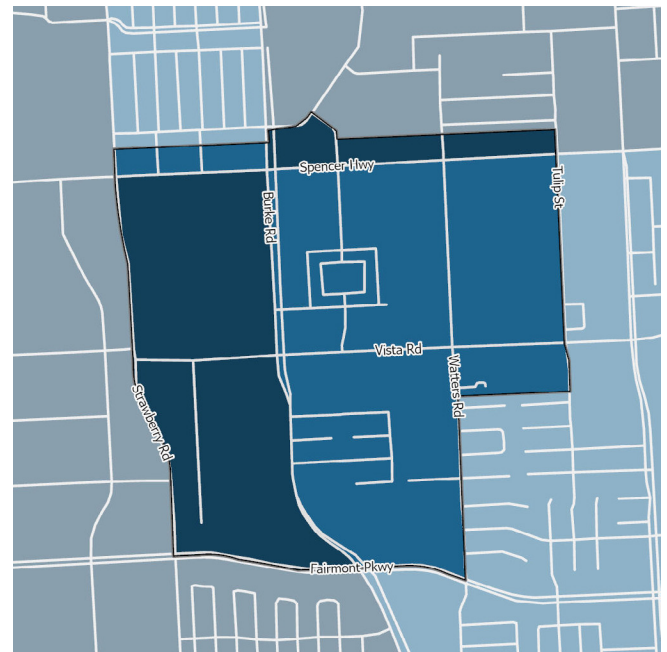
The SVI assesses vulnerability of every US Census Tract across 15 social factors including unemployment, minority status, and disability. The SVI provides data that indicates how much more vulnerable a community is than their neighbors.

A SVI ranking above 0.5 means a census tract is less likely to recover from a hazardous event than lower ranked communities.

The Study Area shown in Figure 08 depicts that the east side, where the single-family residential and much of the senior assistance living is located has a SVI of 0.5-0.75. The population that lives in this area has little access to any transportation other than a personal vehicle. Those living on the west side where most of

the multifamily residential is located with an SVI greater than 0.75, may face poverty, lack of access to transportation, and crowded housing. High SVI can weaken a community's ability to prevent human suffering and financial loss in a disaster.

Figure 08: Social Vulnerability Index



Source: CDC; AECOM

Social Vulnerability Index

■ 0.5 - 0.75

■ Greater than 0.75

Land Use

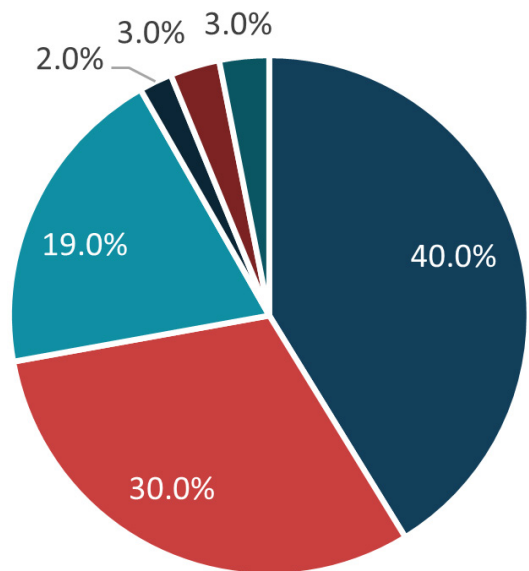
The primary land use found along the south side of the Study Area is residential housing, which consists of single-family, multifamily, condos, and mobile homes (40%). Most of the residential land use is comprised of either multifamily or single-family homes. The multifamily housing ranges from apartments to townhomes housing, indicating higher density lifestyle than single-family homes and a greater tendency to support transit and alternative modes of transport than vehicles.

As second largest, commercial, civic/institutional, and office spaces (33%) occur mostly along Spencer Highway and South Burke Road.

Vacant land represents 19% of land, the third largest land use in the study area. Some of the vacant parcels near HCA Houston Healthcare are owned by the hospital and have not yet been developed. Other vacant plots are distributed across the Study Area.

There is a notable number of churches or religious establishments near the residential areas, despite only accounting for 3% of land area. Government services, like Social Security Administration and medical rehabilitation services, are located near the churches and represent 2% of the area.

Figure 09: Study Area Land Use Breakdown

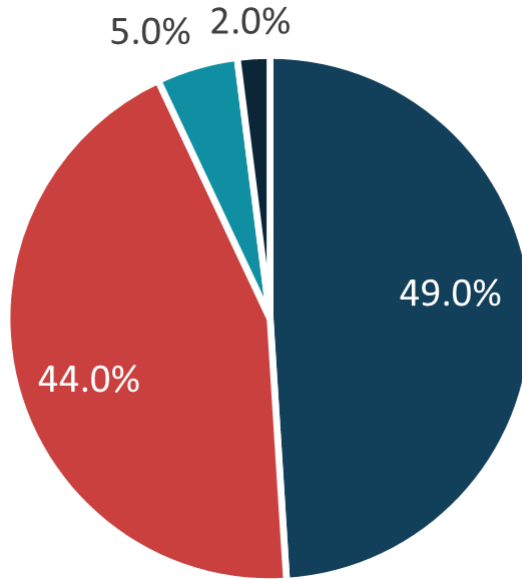


Source: ACS 5-year Estimates (2020)

Land Use Breakdown

- Residential
- Commercial
- Vacant
- Government
- Church
- Other

Figure 10: Study Area Residential Land Uses

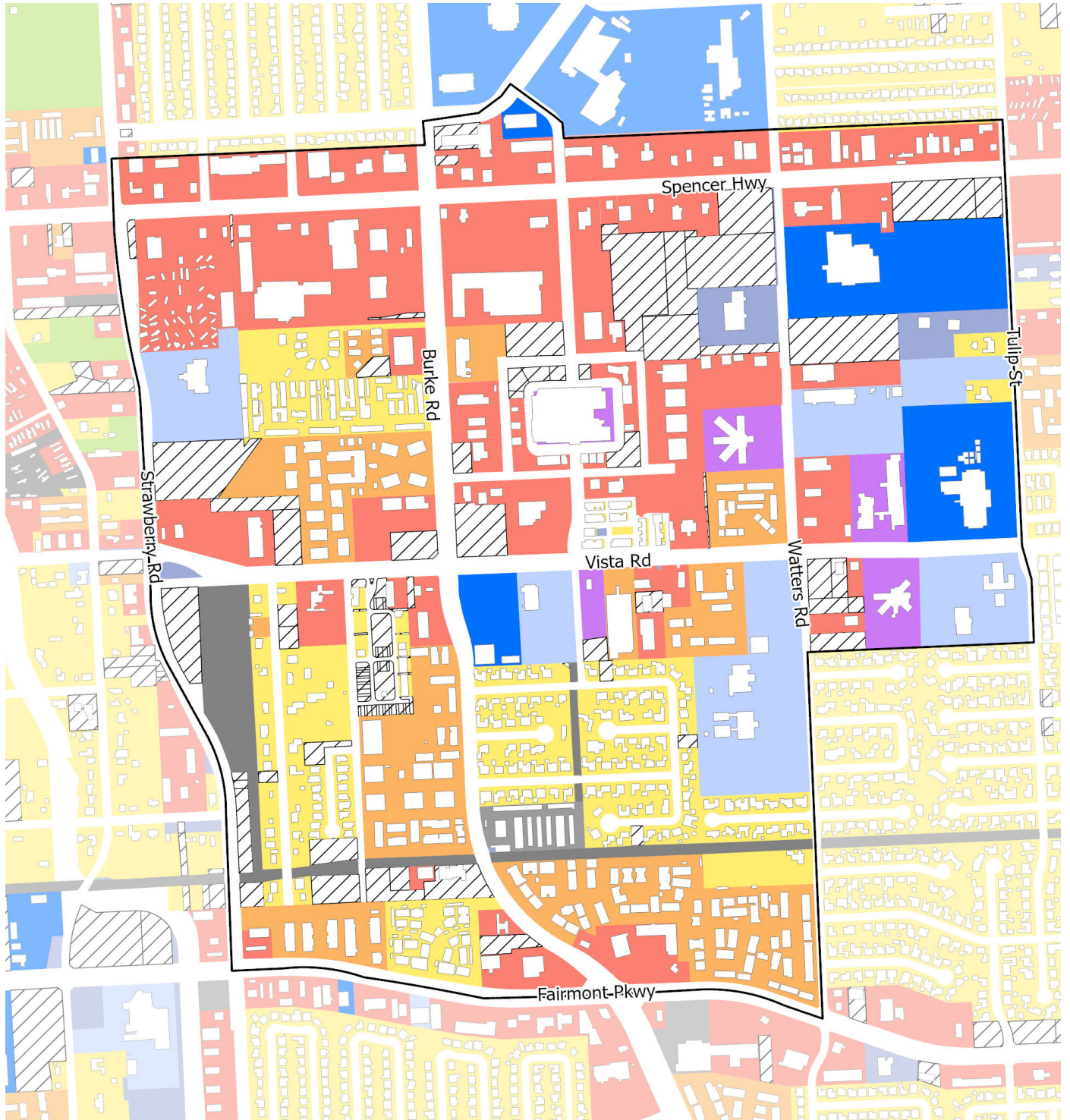


Source: ACS 5-year Estimates (2020)

Types of Residential

- Single-Family
- Condo
- Multi-Family
- Mobile

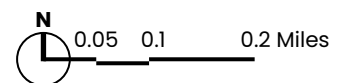
Figure 11: Existing Land Use



Source: Urban Footprint; AECOM; City of Pasadena GIS Map Viewer

Existing Land Use

- | | | |
|--|---|---|
| ■ Civic/ Institutional | ■ Retail/ Commercial/ Office | ■ Transportation/ Utilities |
| ■ Healthcare; Care | ■ Warehousing | ■ Parks & Open Spaces |
| ■ Religious Institution | ■ Single Family | Vacant |
| ■ Healthcare/ Nursing Home | ■ Multi-Family | |



Housing

Housing Stock

Table 05 below details the total number of housing units in the Study Area (just over 2,800) and City of Pasadena (just over 56,000), as well as recent growth rates for each. The growth rates for total housing units closely mirror that of population and households, with 1.0% growth per year in the Study Area and 0.5% growth per year in the City of Pasadena during this period.

Housing Character

Figure 12 illustrates that the Study Area contains a variety of affordable housing types that cater to the intergenerational community that resides there. This includes mobile homes, single-family homes, multi-family apartments, and senior living.

The Holiday Park for Mobile homes is a mobile homes community located on the corner of Spencer Hwy and Strawberry Rd. The Study Area includes single-family detached homes, such as the Vista Villa on Burke Rd, that attribute to the suburban identity within the Study Area.

Townhomes and condos, another single-family typology, are being developed inside the Study Area, indicating the residential fabric is urbanizing.



Multi-family apartment complexes predominately line Burke Rd and Fairmont Pwky also attribute to the more higher density urban residential fabric.

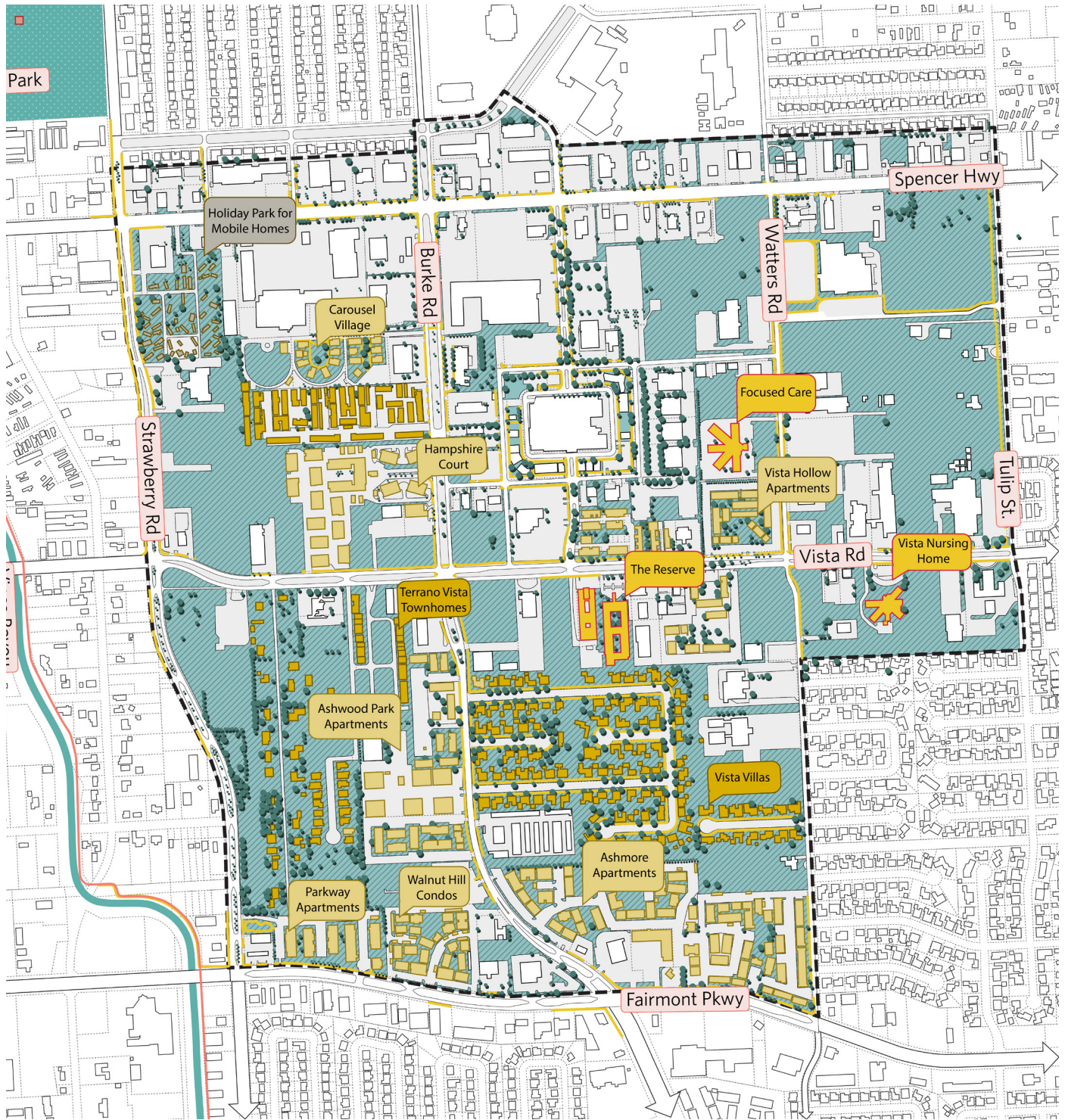
There are also assisted senior living communities and nursing homes in the Study Area, allocated around the outer perimeter of HCA Southeast and in proximity to neighboring medical amenities. Within the medical corridor, streets form concentrically from HCA Southeast at its origin and parcels oriented on a grid. The medical campus, at large, is oriented on a grid with the hospital at its center.

Table 05: Housing Tenure

City	2000	2010	2020	2022	2000–2022 CAGR
Study Area	2,261	2,673	2,736	2,807	1.0%
Pasadena	50,774	54,285	55,994	56,807	0.5%
Harris County	1,298,145	1,598,638	1,842,683	1,907,221	1.8%
Texas	8,157,575	9,977,436	11,589,324	12,036,094	1.8%
United States	115,904,641	131,704,730	140,498,736	142,933,286	1.0%

Source: U.S. Census Bureau (2000 – 2020), Esri (2022)

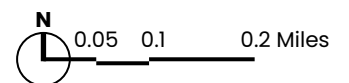
Figure 12: Housing Character



Source: Ultra Barrio

Housing Character

- Mobile Homes
- Multi-Family
- Single Family
- Senior Living
- Tree Canopy



Housing Tenure

Table 06 presents housing tenure metrics, including the split between owner and renter-occupied units as well as the vacancy rate. As shown, 25% of units in the Study Area are owner-occupied while 75% are renter-occupied. Comparatively, the City of Pasadena has more owners (53%) and fewer renters (47%), a split that more closely mirrors that of Harris County.



Table 06: Housing Tenure

City	Owner Occupied			Renter Occupied		
	2000	2010	2022	2000	2010	2022
Study Area	26%	23%	25%	74%	77%	75%
Pasadena	57%	57%	53%	43%	43%	47%
Harris County	55%	57%	54%	45%	43%	46%
Texas	64%	64%	63%	36%	36%	37%
United States	66%	65%	65%	34%	35%	35%

Source: U.S. Census Bureau (2000 – 2020), Esri (2022)

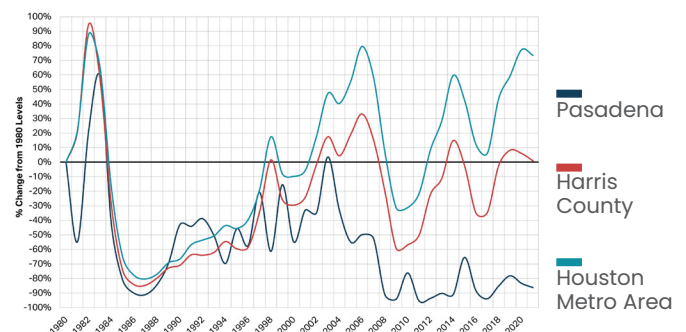
Residential Building Permits

Figure 13 illustrates the volume of residential building permits in terms of the total number of units permitted in each year relative to 1980 levels for Pasadena, Harris County, and the Houston Metro Area overall. As shown, the Harris County and Houston Metro Area volumes track closely given that Harris County comprises a large share of the Metrowide total.

Permit volume dips across all 3 geographies in the mid-1980s and then slowly climbs to peaks in the late 1990s and again just before the financial crisis in 2008. Since 2008, Pasadena has seen a relatively low amount of residential development, while Harris County and the Houston Metro have largely matched their pre-2008 pace. This is largely because Pasadena has little developable land remaining for “horizontal” growth, so it will need to increase density with infill and grow “vertically” in order to grow.

Table 07 sheds light on the age of the housing stock by sorting the housing units by decade of construction. As shown, 83% of the Study Area’s housing was built between 1970 and 1999. Both the Study Area and Pasadena are relatively built out, so it is no surprise that just 6% and 3% of their housing stock has been built since 2010, despite 11% and 12% of Harris County and the State of Texas’s housing having been built since 2010.

Figure 13: Residential Building Permits – Total Unit Volume



Source: CoStar

Table 07: Housing Units per Year Built

	1950 or Earlier	1960–1969	1970–1979	1980–1989	1990–1999	2000–2009	2010 or Later
Study Area	3%	4%	36%	28%	18%	4%	6%
Pasadena	25%	15%	21%	14%	13%	9%	3%
Harris County	13%	10%	18%	16%	13%	18%	11%
Texas	14%	9%	15%	16%	15%	19%	12%
United States	27%	10%	15%	13%	14%	14%	6%

Source: U.S. Census Bureau (2000 – 2020)

Housing Costs

As of 2020, median gross rent was \$990 per month in the Study Area and \$993 per month in Pasadena, which are both lower than costs in Harris County (\$1,115), Texas (\$1,082), and the U.S. overall (\$1,096). The same is true for median home values, which were just over \$158,500 in the Study Area and \$132,300 in the City of Pasadena – both lower than countywide (\$189,400), statewide (\$187,200) and nationwide (\$229,800) averages.

Housing Affordability

Table 09 contextualizes the housing costs presented in the previous section by comparing them to household incomes within each respective geography. The U.S. Department of Housing & Urban Development defines housing cost burden as housing costs that exceed 30% of a household's gross income. As of 2020, 45% of renters and 7% of owners in the Study Area were cost-burdened.

In the City of Pasadena, these numbers were 43% and 12%, respectively. These metrics are slightly below rates seen in Harris County (48% of renters, 16% of owners), Texas (45% of renters, 15% of owners), and throughout the U.S. (46% of renters, 17% of owners).

Table 08: Housing Costs

	Median Gross Rent	Median Home Value
Study Area	\$990	\$158,505
Pasadena	\$993	\$132,300
Harris County	\$1,115	\$189,400
Texas	\$1,082	\$187,200
United States	\$1,096	\$229,800

Source: U.S. Census Bureau (2000 – 2020)

Table 09: Housing Affordability

	Cost Burdened Renters	Cost Burdened Owners
Study Area	45%	7%
Pasadena	43%	12%
Harris County	48%	16%
Texas	45%	15%
United States	46%	17%

Source: U.S. Census Bureau (2000 – 2020)

Employment

Table 10 presents an employment profile of the Study Area, representing the total number of jobs based in the area as well as a breakdown by NAICS industry sector. As shown, the number of jobs increased from about 4,100 in 2002 to nearly 5,300 in 2015, before falling back to just over 4,600 jobs as of 2019. This seems to be primarily due to the loss of around 1,000 jobs in the Transportation & Warehousing industry between 2015 and 2019. The top 5 industries

account for 93% of total jobs in the Study Area. Of these, the top three industries in terms of employment are Healthcare & Social Assistance (50%), Accommodations & Food Service (20%), and Retail Trade (9%). Notably, the following industries have seen a fast growth rate between 2002 and 2019 in terms of total jobs provided: Professional, Scientific, & Technical Services increased fourfold, Accommodation & Food Services, and Administration & Support both doubled.

Table 10: Employment Profile

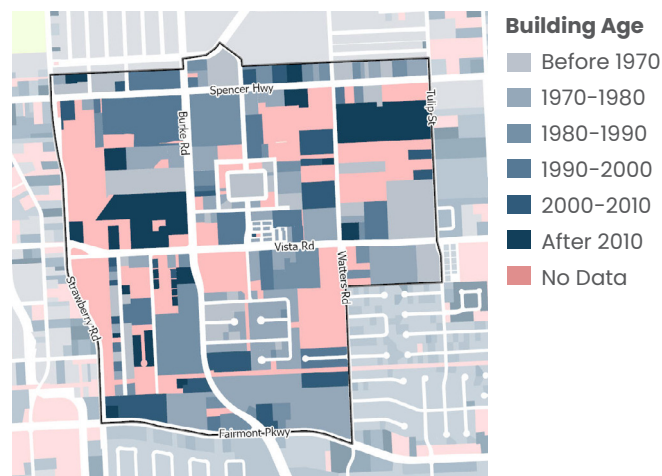
Year / Total Jobs	2002 / 4,101	2010 / 4,594	2015 / 5,277	2019 / 4,627
Health Care & Social Assistance	57%	54%	47%	50%
Accommodation & Food Services	10%	9%	11%	20%
Retail Trade	10%	8%	8%	9%
Administration & Support (Professional, Scientific, & Technical Services)	3% (2%)	9% (2%)	2% (6%)	7% (7%)
Finance and Insurance	2%	2%	2%	2%
Other Services (excluding Public Admin)	2%	1%	1%	1%
Educational Services	4%	4%	0%	1%
Transportation & Warehousing	3%	6%	19%	0%
Construction	2%	2%	2%	0%

Source: Sources: U.S. Census Bureau On the Map (2002 – 2019)

Building Age

The age of buildings is shown in Figure 14. Most of the buildings are built around 1968-1978, of which a significant number of residential buildings have not been updated. The newer buildings that have been built from 2008-2018 are mostly multifamily residential, commercial, and one large governmental building. Most of the single-family housing are dated back 50+ years.

Figure 14: Study Area Land Use Breakdown



Source: AECOM

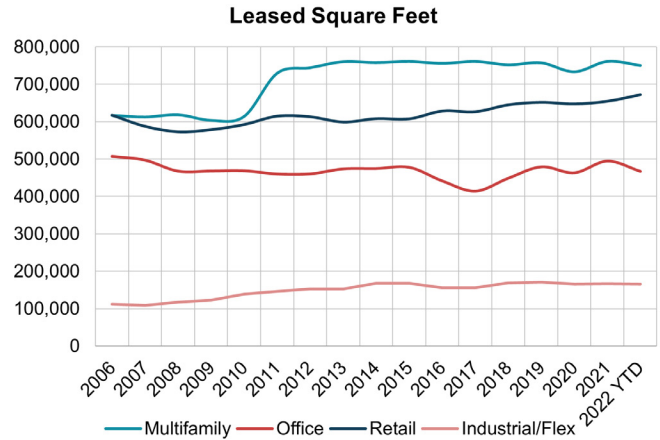
Commercial Real Estate Market & Character Analysis

Commercial Market Analysis

Figure 15 illustrates the total leased square footage of space for various types of commercial real estate within the Study Area, including multifamily residential, office, retail, and industrial/flex properties. As shown, multifamily residential comprises the largest share of commercial real estate in the Study Area with over 750,000 square feet of leased units, followed by retail (672,000), office (467,000), and industrial (166,000). Although it has the smallest footprint, the industrial segment has grown the fastest, at an average rate of 3% per year since 2002, followed by multifamily residential (1.5% per year), retail (0.4% per year) and office (-0.4% per year).

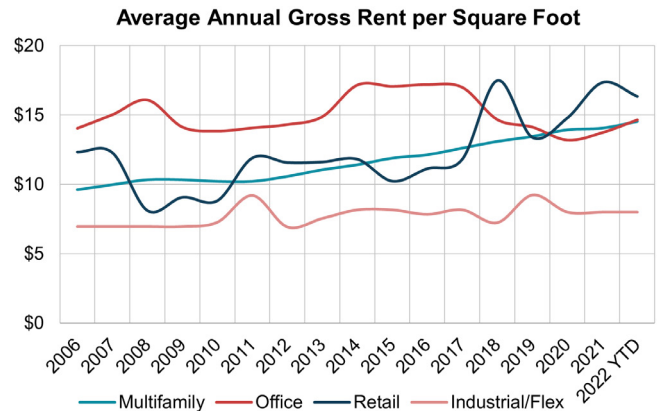
Figure 16 depicts the average annual rent per square foot for each of the commercial real estate segments within the Study Area. Office space historically garnered the highest rental rates until 2018 when rent growth in the retail and multifamily residential segments surpassed declining office rents. Office rents have recovered modestly since to an average of \$14-15 per square foot. Since 2006, multifamily rental rates have grown the fastest at an average rate of 2.5% per year, followed by retail (1.7% per year), industrial (0.8% per year), and office (0.3% per year).

Figure 15: Leased Square Feet of Space



Source: CoStar

Figure 16: Average Annual Rent per Square Foot



Source: CoStar

Commercial Real Estate Character

Figure 18 illustrates properties available for leasing in commercial buildings. Retail vacancy in commercial plazas is concentrated along Spencer Hwy with availability in a smaller commercial area on Fairmont Pwky. The vacancies inside the retail strip centers cause gaps of inactivity in areas where there are empty spaces, as people tend to park closer to the area of destination.

The parking lots for these vacant retail spaces feel emptier as they do not reach its capacity of users visiting these areas. Other vacancies along Spencer Hwy include standalone, small commercial spaces that is often shared between 1-2 businesses.

Commercial Vacancies

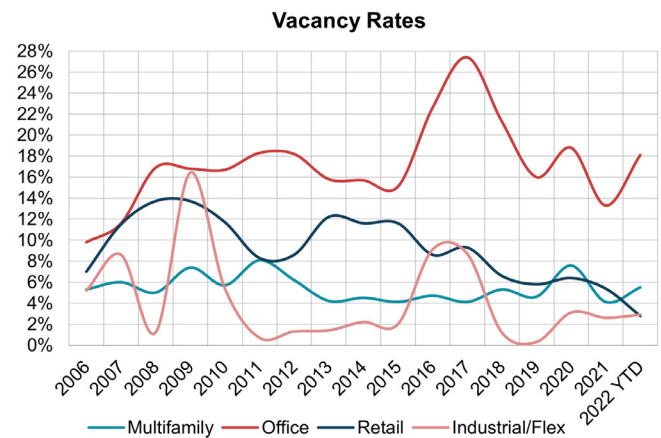
Figure 17 shows the vacancy rate for each segment of the commercial real estate market within the Study Area. As shown, the multifamily residential, industrial, and retail segments currently enjoy healthy vacancy rates of less than 6% while the office segment has a higher 18% vacancy rate. The multifamily segment has remained the steadiest over time, never exceeding its peak of 8.1% in 2011.

The industrial segment had a couple of peaks in 2009 and 2016/2017, but has generally remained below 4%. The retail market's vacancy has generally trended downward since the financial crisis of 2008, bucking broader e-commerce headwinds. The office segment's vacancy peaked in 2017 at nearly 28% before rebounding to the mid to high teens since, facing headwinds to trends toward remote work.

As mentioned previously, the commercial block along Spencer Hwy and Burke Rd consists of fast-food restaurants, big-box grocery stores, and retail plazas, on larger pad sites. Typically building storefronts are setback approximately 40 feet or more to allow for additional parking and clearing for cars. Building storefronts are oriented to face the most proximate road for higher visibility. The block is paved for parking lots and vehicular accessibility.

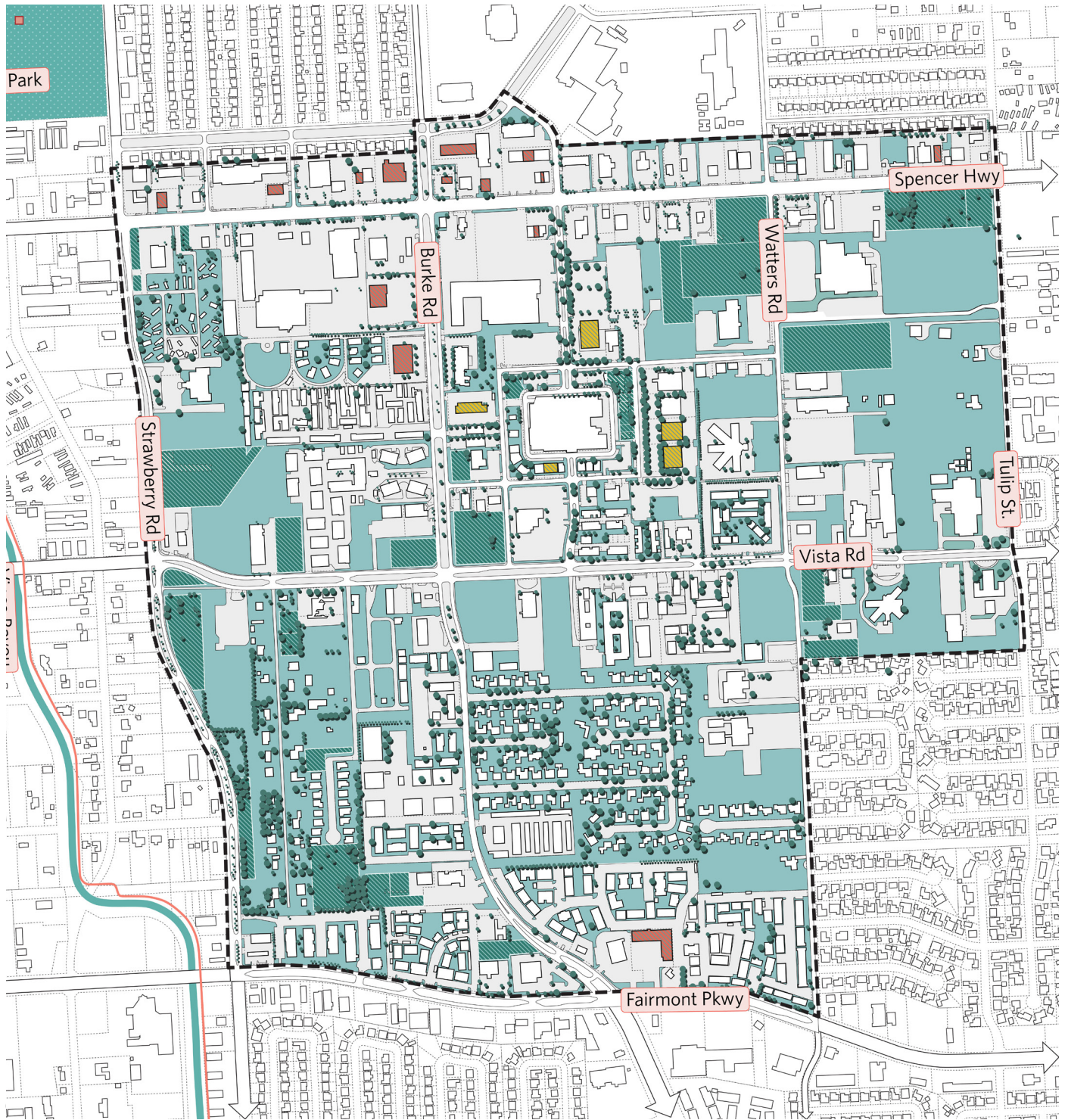
The study shows potential for investment toward programming vacant lots as gateway opportunities, especially the vacant land on Vista Rd and Burke Rd, or public amenities that can enhance connection to the community.

Figure 17: Vacancy Rate



Source: CoStar

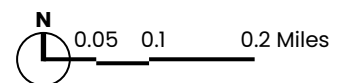
Figure 18: Commercial Real Estate Character



Source: Ultra Barrio

Commercial Estate Character

- Lot Vacant
- Medical Vacant
- Retail Vacant
- Tree Canopy





Healthy Spaces

Healthy Spaces topic is the overview of the physical characteristics analysis and site conditions observations of the study area such as provision of and accessibility to parks and open spaces, tree canopy and heat island effect, lighting analysis, access to healthy food, urban and street character, including sidewalk, services and utility corridor character analysis.

Parks and Open Space Accessibility

Figure 19 indicates that the Study Area lacks provision of and access to public or neighborhood parks within walking distance, including the surrounding neighborhoods to the east and south. The closest park is Strawberry Park, located to the north-west corner of the Study Area and approximately 1-mile walking distance from the center of the Study Area – or a 20-minute walk with poor pedestrian amenities. There are also no existing dedicated trails within the Study Area. The only open space can be found at the Veterans Memorial Stadium, located by Dabney Drive and is only open for planned events.

The Pasadena Healthy Parks plan defines the priority of parks based on a few factors: ease of access, park amenities, and active transit – characteristics that define the overall environmental and economic health of community resiliency. The ranking is based on the index of need for park investments in the area. Even with most of the Study Area being moderate priority and some high priority in the residential spaces, it is notable to observe that there are no parks within the area.



North-South, Park to Park: Strawberry to Burke/Crenshaw Park



On Spencer Looking East: Bayou Trail at Grade Crossing

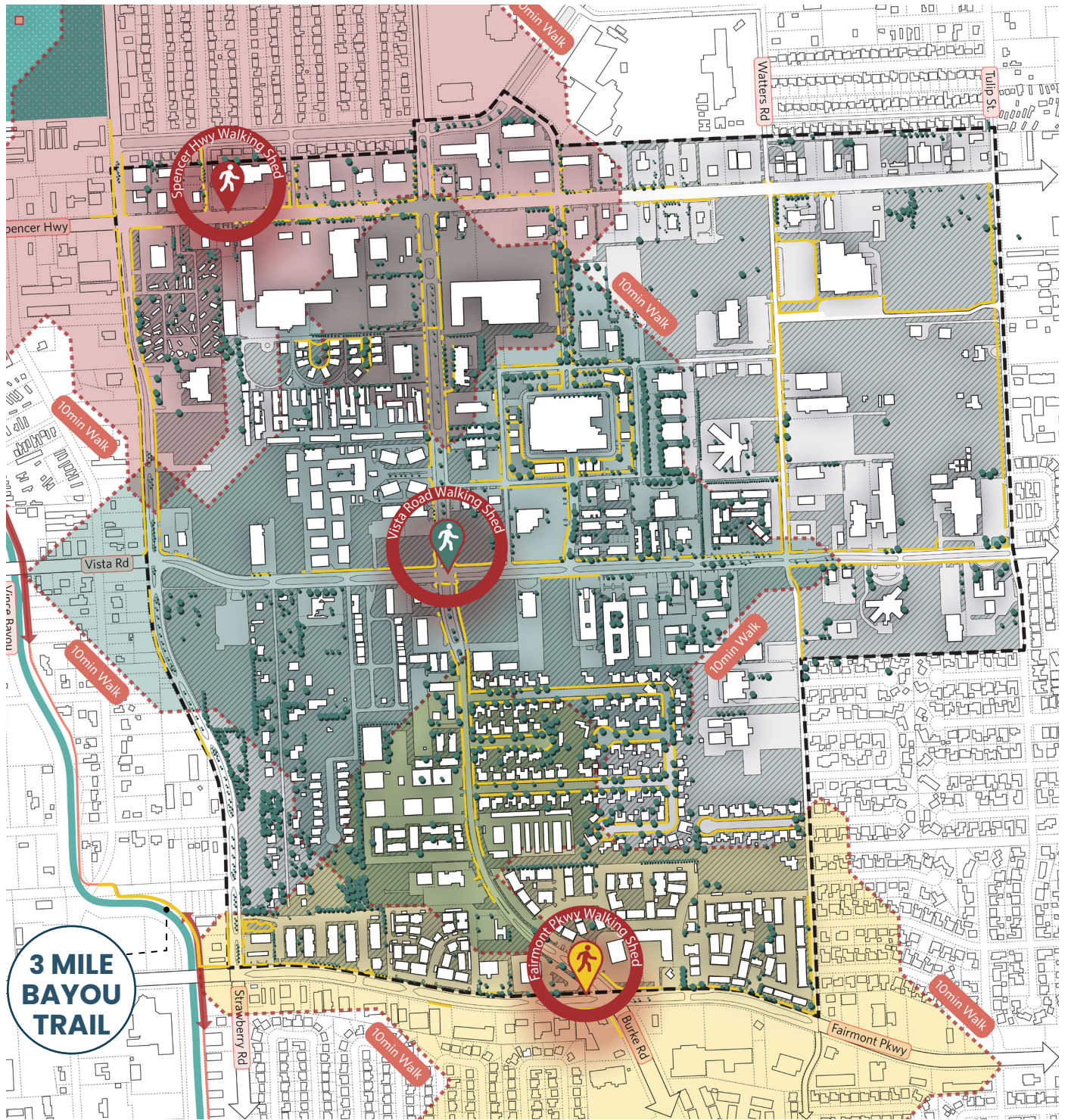


On Fairmont Looking East: Bayou Trail at Grade Crossing



On Vista Looking East: Bayou Trail at Grade Crossing

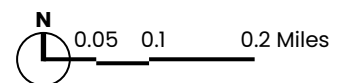
Figure 19: Walking Shed



Source: Ultra Barrio

Walking Shed

- Sidewalk
- Bikeway
- Trail
- Tree Canopy



Tree Canopy

Identified in Healthy Pasadena Parks Plan, the benefits of trees include reducing air temperature through evaporative cooling and provide cooling and shade from direct heat. Trees also improve air quality, which can worsen as temperatures increase. Trees canopies are a powerful tool to mitigate environmental inequalities, promote public health, and promote social equity.

American Forests developed the Tree Equity Score (TES) as metric that calculates scores derived with existing tree canopy cover, climate, demographic and socioeconomic data. According to the study, the Study Area scored an average of 70 out of 100. Figure 22 illustrates the Study Area's sparse tree coverage along major thoroughfares such as Spencer Highway, Burke Road, and Vista Road. The figure also shows a lack of shaded pedestrian paths and tree canopies for multi-family neighborhoods.

Figure 21 shows two studies that compare the Study Area's total square footage with tree coverage and undeveloped land with thermal heat sinks, which include building footprints, streets, and parking lots. As shown, only 3% of the total site is covered by the tree canopy. Most of the Study Area's land use is paved land, which acts as thermal sinks. Comparatively, the undeveloped land, which mostly constitutes empty parcels with grassy groundcover, can be opportunities for cooling and habitat capacities to mitigate the urban heat sinks from developed areas.

Figure 20: Cooling and Habitat Capacity

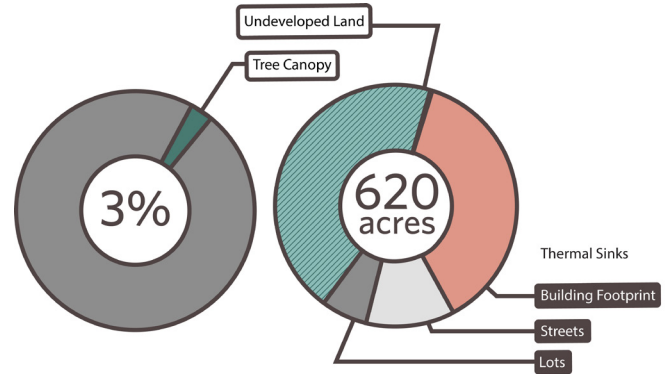
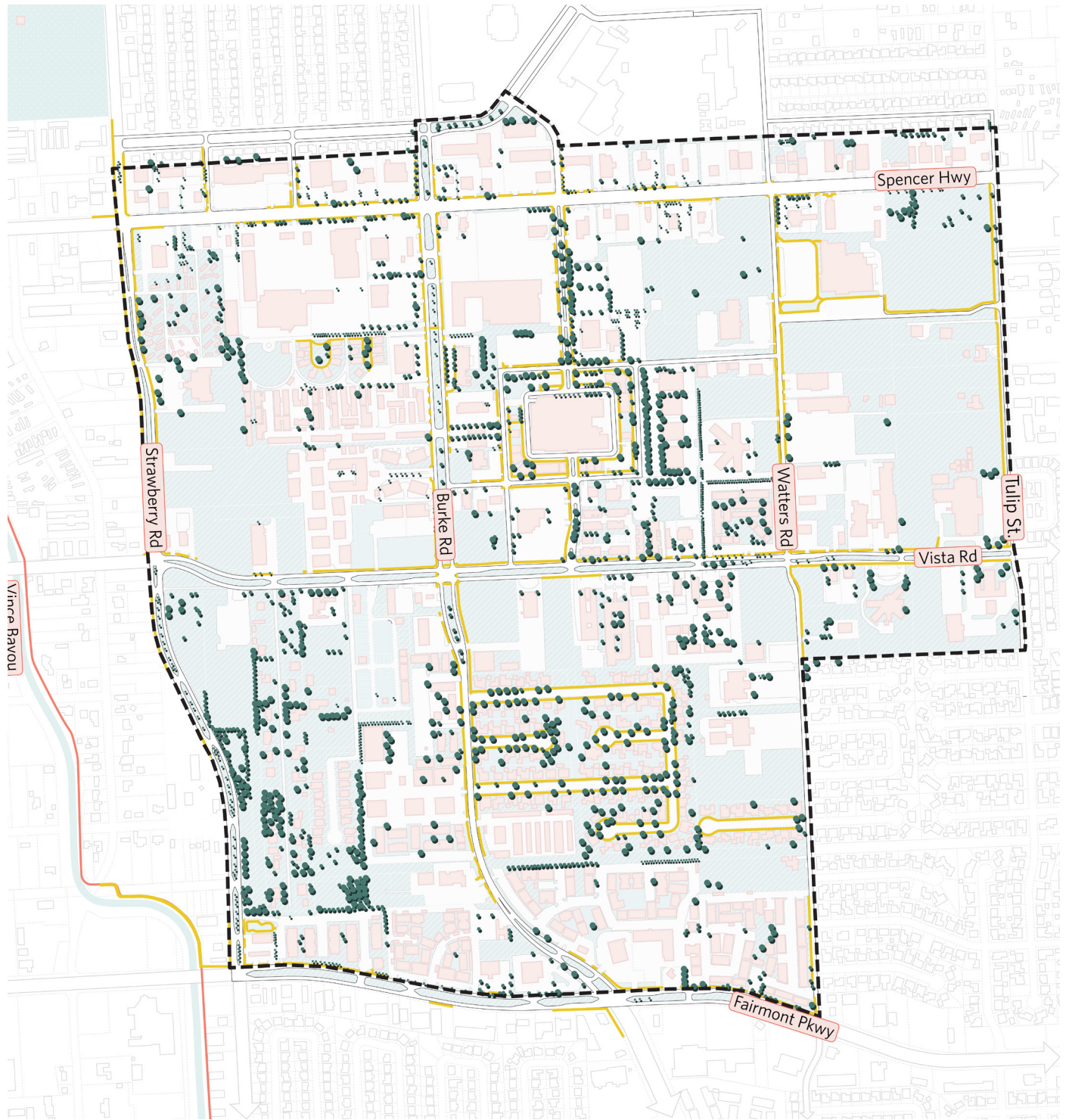


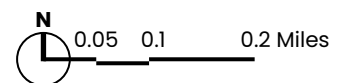
Figure 21: Tree Canopy



Source: Ultra Barrio

Tree Canopy

- Sidewalk
- Trail
- Bikeway
- Tree Canopy



Heat Island

Urban heat islands occur when developments replace natural land cover with surfaces, such as pavement and buildings, that absorb and retain heat. Highly developed sites with little to no shade can increase the ambient temperatures up to 15-20 degrees.

Figure 24 studies temperatures of various surfaces, such as rooftops, paved lots, unpaved lots, tree canopies, and shade in the Study Area. The average surface temperature of developed areas, which include rooftops and paved lots, absorb and retain high heat and can range from 80-95 degrees. While the average surface temperatures of unpaved lots with natural

ground cover absorb less heat and can range from 75-80 degrees. It is evident that shaded areas from tree canopies can greatly reduce and cool surface temperatures.



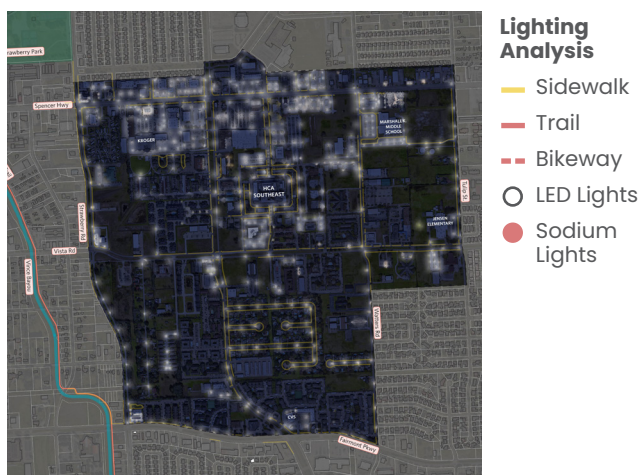
Source: treeequityscore.org

Lighting Analysis

Figure 22 plots night-time lighting conditions in the Study Area that registers with commonly used walking areas. Adequately lit spaces can encourage walkability and promote a sense of safety by increasing visibility, connectivity to destinations, and facilitate participation in using public amenities after dark. The study highlights zones in the Study Area, such as commercial retail parking lots, medical facilities around the hospital, and main thoroughfares, that are fairly lit with updated LED lighting. Several

older facilities have dimmer sodium lights, typically placed back-of-house or in loading zones. However, internal streets and pedestrian pathways have little to no illumination at night that can deter ease of walkability and non-vehicular access to these destinations. Figure 23 shows how the sparsely placed lighting generates several dark “pockets” in between lighting fixtures, ranging from as little as 0.2-1.0 footcandles that can be unwelcoming for pedestrian access and foster unsafe walking conditions.

Figure 22: Lighting Analysis

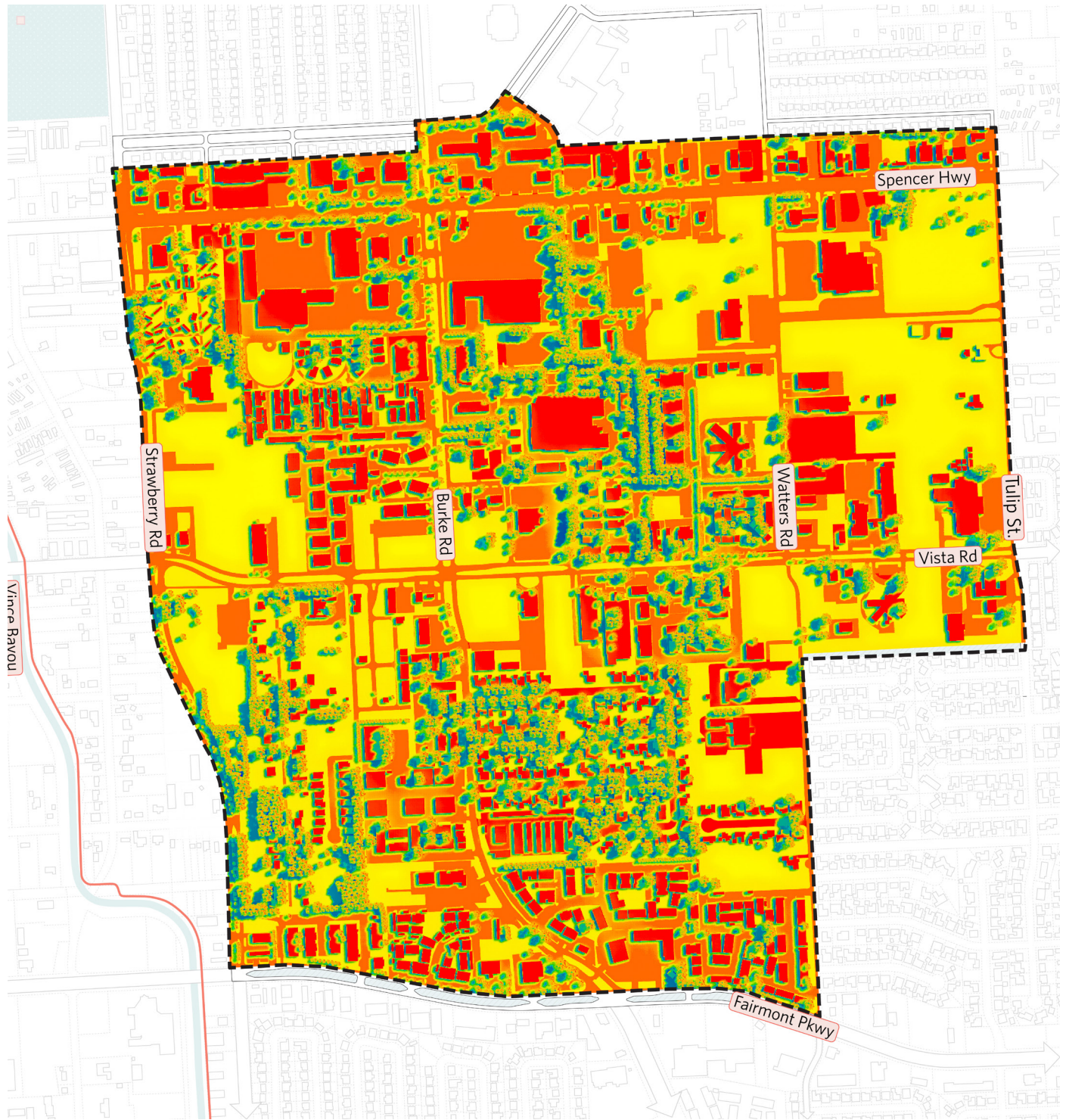


Source: Ultra Barrio

Figure 23: Footcandle Measurements



Figure 24: Heat Island

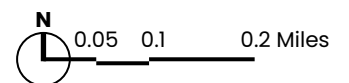


Source: Ultra Barrio

Surface Temperature



Rooftops (88°-95°F)	Paved Lots (80°-88°F)	Unpaved Lots (75°-80°F)	Tree Tops / Partial Shade (73°-75°F)	Shade (70°-73°F)
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Infrastructure Corridors

The images displays a network of existing infrastructure corridors that exist within and through Study Area. By highlighting these areas, we can investigate spatial opportunities for potential land use for these easements that can enhance a network of greener infrastructure and connectivity within and beyond the Study Area.

Pipeline Utility Easement

In the Study Area, a gas-pipeline runs underneath the 55' wide median on Burke Road. A row of Texas Sabal Palm Trees is planted in the pipeline right-of-way. The Texas Sabal Palm is a native plant with a shallow root bulb that would not interfere with the pipeline's depth and cover. It is evident that the median on Burke Road has capacities for low-profile planting that can benefit the approachability of destinations within the Study Area. The powerline easement and drainage ditch stretch through the Study Area and beyond- passing through the Vince Bayou Trail. These corridors can provide connections that link the Study Area to the Vince Bayou Trail, creating an overall network of greener infrastructure that can enhance the environmental and public health of the community.



Easement (Located between Storage Corral Pasadena and Ashmore Apartments)



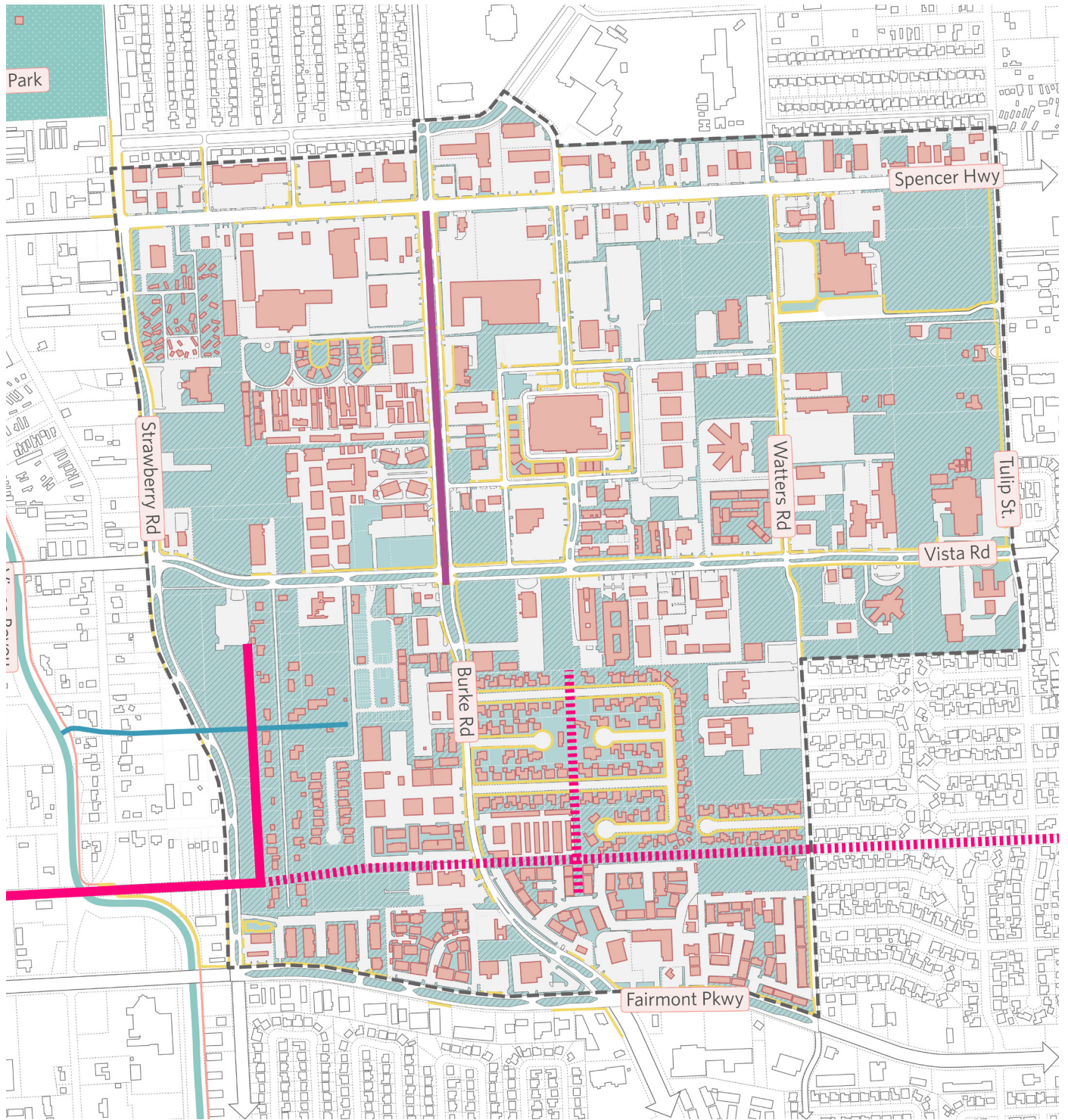
Drainage Ditch (Located South of Vista Rd)



Pipeline Easement (Located on Burke Rd)



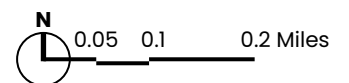
Figure 25: Infrastructure Corridors



Source: Ultra Barrio

Infrastructure Corridors

- Drainage Ditch
- Powerline Easement
- - - Easement
- Pipeline



Urban Character

The Study Area has characteristics of both an urban and vehicular dependent environment. The site contains element, such as single-family detached homes, big-box retail areas, schools, and vehicular centric accessibility that promote

a vehicular dependent lifestyle. However, the Study Area also consists of more urban typologies- such as townhomes, multi-family apartments, and a medical campus.



Commercial Corridor: Spencer Hwy

Spencer Hwy is a major arterial road passing through the Study Area. Spencer Hwy performs as a commercial corridor, as multiple commercial plazas, big-box and grocery stores reside on both sides of the highway. Monumental signage, that dictate destination, can be seen along Spencer Hwy. These signages are scaled up, often up to 20' tall, according to the scale of the car in order to have higher visibility and legibility.



Commercial Corridor: Spencer Hwy

Neighborhood Corridor: Burke Rd

Burke Rd is a major thoroughfare that connects several neighborhoods, such as Carousel Village, Hampshire Court, and Vista Village, housing both detached single-family homes and multi-family apartment complexes. North of Vista Rd, Burke Rd shares an edge condition with the medical campus, hosting several medical amenities that are accessed through Burke. There are little to no shading with sparsely planted trees and sidewalks are fragmented according to land use. South of Vista Rd, the residential areas are well-shaded by trees with continuous sidewalks. The only crossing path for pedestrians on Burke exists at the intersections, with only one painted crossing.



Mixed Use



Residential

Mary Street

Mary St. is an access road to HCA Southeast, often used by emergency vehicles use to enter the hospital. Mary St. has gateways for the Bayshore Medical Tower and the entrance to a cluster of townhomes. Sidewalks run along the left edge along Bayshore Medical Tower, while there are no sidewalks on the side for pedestrian access to the townhomes. The street is well-shaded with trees and has ample street-lighting on the median leading up to the hospital.



Medical Campus Corridor: Mary St.

Vista Road and Tulip Street

At the intersection of Vista Rd and Tulip St., is a gateway that announces the school zone for Jensen Elementary. Along Tulip St. are wide sidewalks set back 14' from the street, allowing safe routes for children to the school. However, along Vista there is only a 3' setback for sidewalks from the street.



School Zone Corridor: Vista Rd/ Tulip St.

Urban Block Structure

Figure 26 are a series of diagrams analyzing the urban block structure within the Study Area and the composition of typologies within the block.

The commercial block along Spencer Hwy and Burke Rd consists of fast-food restaurants, big-box grocery stores, and retail plazas, on larger pad sites. The outer perimeter is lined with trees and sidewalks, segmented by curb cuts for vehicular access. Typically building storefronts are setback 40 feet to allow for additional parking and clearing for cars. Building storefronts are oriented to face the most proximate road for higher visibility. The block is paved for parking lots and vehicular accessibility.

The medical campus block consists of HCA Southeast with surrounding medical facilities, and a multi-family apartment complex.

Figure 26: Urban Block Structure



Commercial



Medical Campus



Residential Block Structure

Figure 27 consists of a series of diagrams that study the residential blocks within the study area and its composition.

Mobile Homes

The mobile home block within the study area has narrow streets that form a loose grid. Trees line the outer perimeter of the block, creating a threshold between other adjacent land uses. The parcel in which the mobile park resides has little pavement, aside from driveways, as mobile homes can sit above grade on natural ground cover. The block is shared with commercial use for CVS Pharmacy whose parcel is mostly paved over for parking lot and service access.

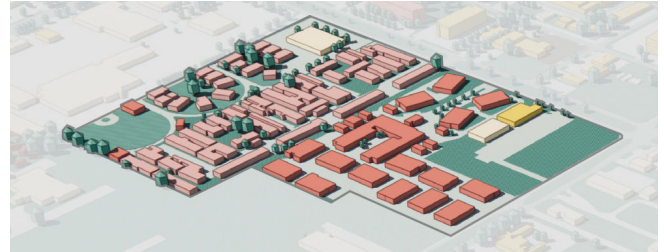
Detached Single-Family

Within a typical detached single-family home block, the streets are organized in a common residential grid with cul-de-sacs capped at the end of each road. A condition represented at Vista Village where the block has less paved areas, aside from streets and driveways. Natural land cover is preserved to allow front-yard and back-yard green spaces. For this condition, the block is shared by a storage facility, whose parcel is mostly paved over for vehicular access.

Multi-Family Homes

The multi-family apartment blocks consists of a series of complexes, such as the Ashmore Apartments that are organized in clusters with interior “streets” creating its own internal block structure. The complexes are organized to allow inner courtyards with public amenities, such as pools, dog parks, and tennis courts. The block is also comprised of a small commercial center and CVS Pharmacy giving residents close access to these services.

Figure 27: Block Structure- Residential



Single-Family/ Multi-Family Homes



Mobile Homes



Detached Single-Family Homes



Multi-Family Homes

Services and Access

In the Study Area, the main thoroughfares for service and emergency vehicle access in the Study Area are boxed by Spencer Hwy, Burke Rd, and Vista Rd. Figure 29 shows Burke Rd as a service access spine for commercial areas that reside on that street. Bayshore Blvd/ Mary St. also performs as a primary axis for service and emergency vehicles to funnel in from Spencer Hwy and Vista Rd into HCA Southeast through Bayshore Blvd and Mary St.

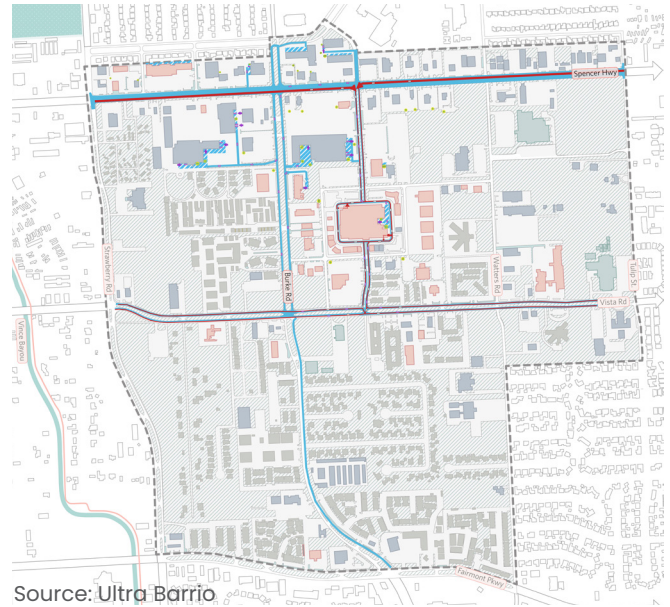
Loading zones for service vehicles are typically back-of-house for commercial buildings. In the Study Area, the arrangement of building orientation often allows loading zones to face the front of residential neighborhoods, creating unwelcoming corridors and views for the residents. Waste bins are often placed in the service zones of large retail facilities. However, for smaller retail spaces, waste bins are often scattered in parking lots without a designated space for waste.

Access to Food

Consumer choices about food spending are influenced by the accessibility and affordability of food options, travel time to shopping, and availability to healthy foods.

In the Study Area, food availability and accessibility is concentrated along Spencer Hwy. Figure 30 depicts the variety of food choices that are present within the study area. Most of the options are fast food and restaurants, with sparse healthy options. The only grocery store in the Study Area is the Kroger on Spencer Hwy. Figure 28 shows that there are other existing grocery stores outside the study area, however only a portion of the residents in the study area live inside the serviceable radius. It is clear that senior residents from the assisted living facilities do not live in the serviceable areas and do not have an ease of access to other food options.

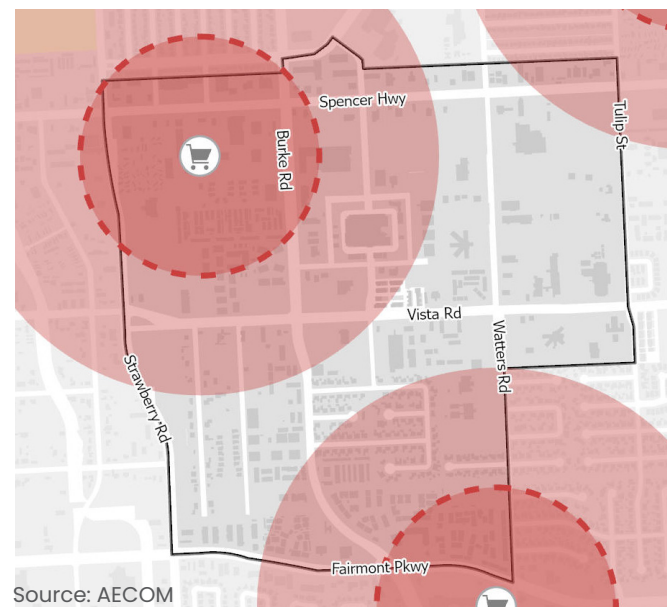
Figure 29: Services and Access



Walk Shed

- Emergency Access
- Loading Zones
- Service Access
- Waste Bins

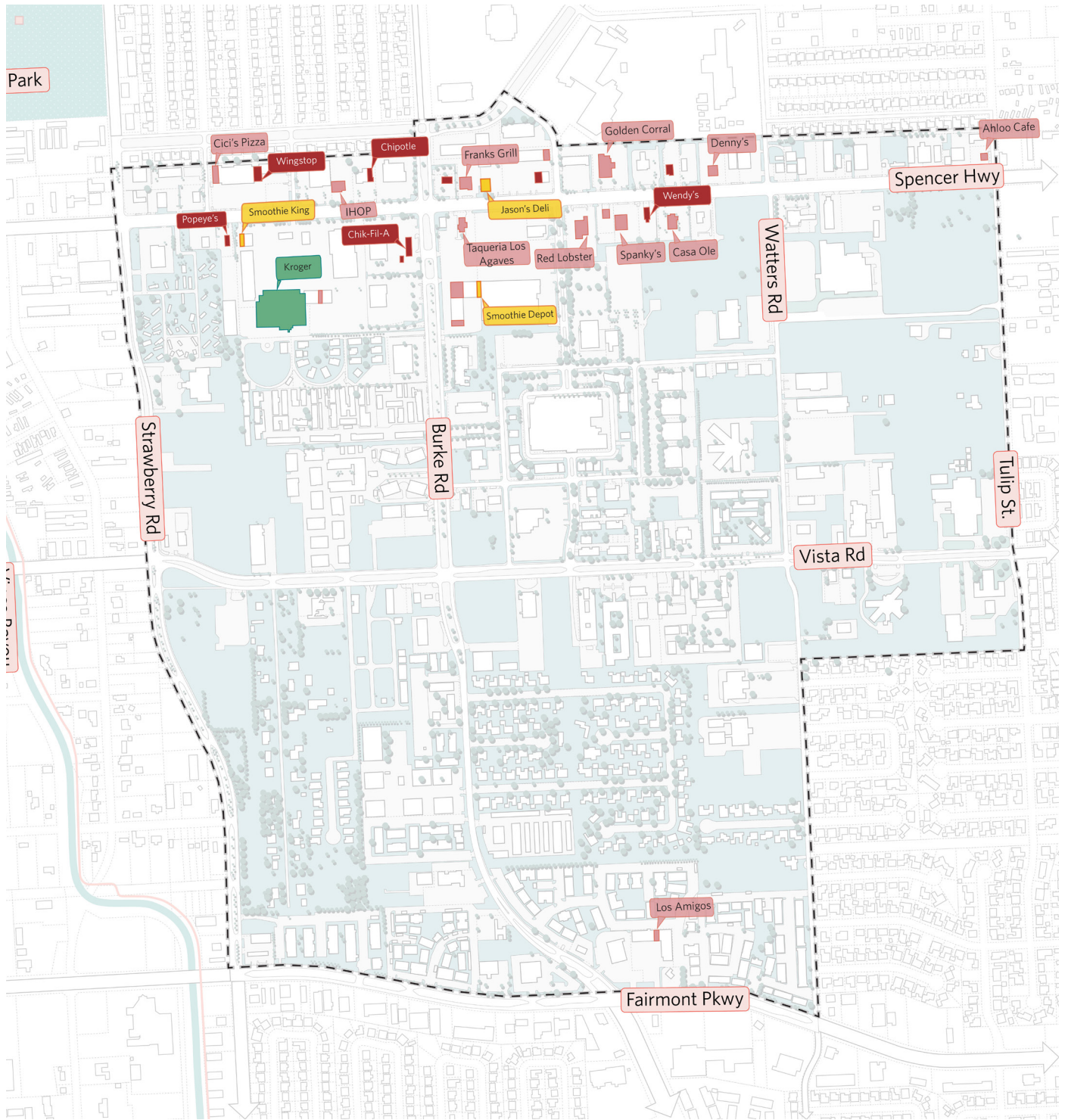
Figure 28: Grocery Access



Walk Shed

- Grocery Store
- 1/4 Mile Service Area
- 1/2 Mile Service Area

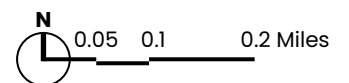
Figure 30: Food Availability



Source: Ultra Barrio

Walking Shed

- Grocery
- Healthy Options
- Restaurants
- Fast Food



Other Site Observations

Three other specific site conditions to the Study Area have been observed that present opportunities for enhanced connectivity between assets.

Shared Linkages

The existing easements from the drainage and powerlines share linkages to each other and Vince Bayou Trail. These existing linkages can contribute to overall network of green infrastructure that can enhance connectivity to the Study Area at large.

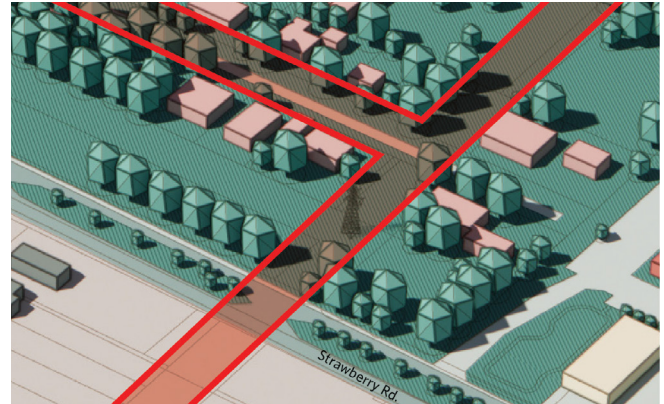
A common program typology that is unique to the Study Area are the senior assisted living communities that reside outside the perimeter of the medical campus.

With the neighboring schools that are also located within the Study Area, there is a strong intergenerational community that resides here.

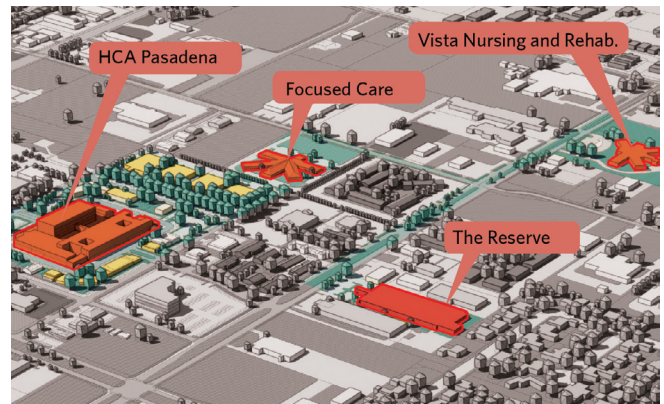
Shared Conditions

Another observation on existing conditions in Study Area are the shared environments between commercial areas and the land uses adjacent to them. Due to the building orientation, the back-of-house for these retail plazas often are in immediate sight or access for the front of other facilities. In the example shown in Figure 31 the shared condition between the back-of-house of the big-box retail building and the parking lot for HCA Southeast create these “challenge zones” that can be unwelcoming for users parking in the medical campus.

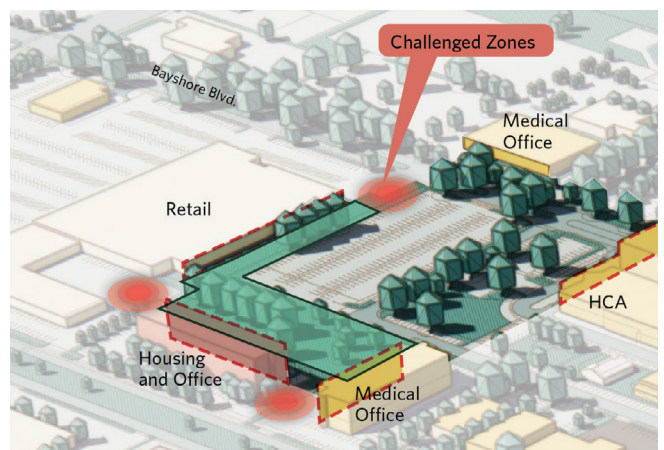
Figure 31: Site Conditions



Shared Linkages



Common Program Types



Shared Conditions



Healthy Mobility

Healthy Mobility topics provide insight into the safety and land use connectivity within the Existing Conditions analysis. The means of transportation within the study area, traffic safety, high crash intersections, traffic volumes and behaviors studied indicate the high dependency on personal vehicles for mobility, unsafe intersections, and senior safety needs.

Means of Transportation

Table 11 provides information on the means of transportation to work in the Study Area compared to the City and County average. Majority of residents in the Study Area drive alone to work (81.4%), and very few use public transport, walk, or bike (2.7%). This commuter behavior is generally aligned with trends observed across the city (78.9% and 2.4% respectively). Only 5.2% of people carpool in the area, which is half less than the city average (11.4%).

The lack of accessibility to public transportation (see Section 2.6.5) and poor pedestrian- and bike-friendly amenities (Section 2.6.6) may be related to residents' options to use alternative modes of transportation for commuting.

Based on 2020 Census data, there is a notable number of people that work from home (8.3%), more than the City and County averages (6.7% and 6.2% respectively). Following the impact of Covid-19 on commuter patterns, this group is possibly larger in 2022.

Table 11: Means of Transportation

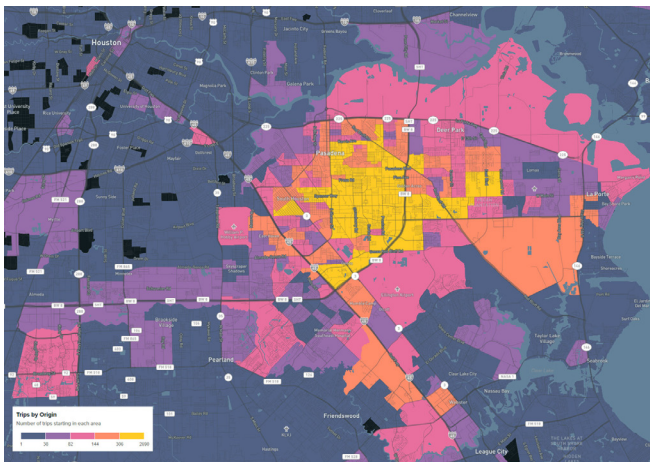
	Work from home (no Commute) (%)	Drive alone to work (%)	Carpool (2 people or greater) (%)	Use public Transit (%)	Walk to Work (%)	Bike to Work (%)	Taxicab motorcycle, or other (%)
Study Area	8.3	81.4	5.2	0.3	2.2	0.2	0.4
Pasadena	6.7	78.9	11.4	0.3	1.6	0.5	0.6
Harris County	6.2	78.0	10.1	2.4	1.4	0.3	1.6
United States	7.3	74.9	8.9	4.6	2.6	0.5	1.3

Source: ACS 5-year Estimates (2020)

Travel Behavior

The following Figure 32 and Figure 33 illustrate trip origins and destinations for the Study Area. Travel behavior can be based on travel choice, travel time, travel cost, and other factors. On an average weekday, approximately 45,000 trips are taken by around 9,900. The trips are mostly taken by people travelling within Pasadena

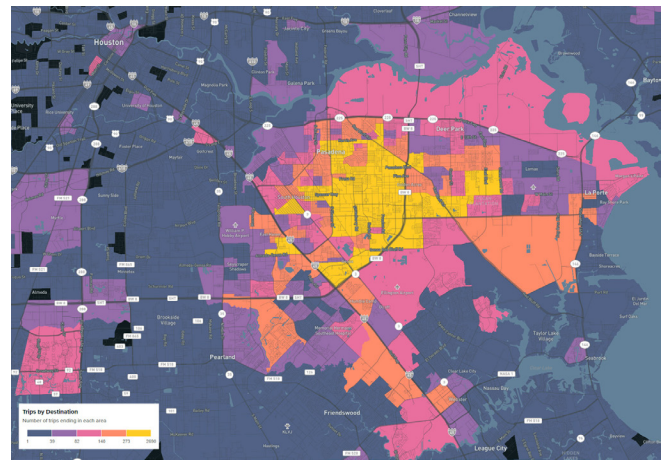
Figure 32: Study Area Trip Origins



Source: Replica, AECOM

as the density of the trips remained within the Study Area and city. There are roughly 190-8,700 trips made within the Study Area. There is some travel east towards Deer Park and Ellington Airport. The other regional attractions are Hobby Airport and University of Houston.

Figure 33: Study Area Trip Destinations



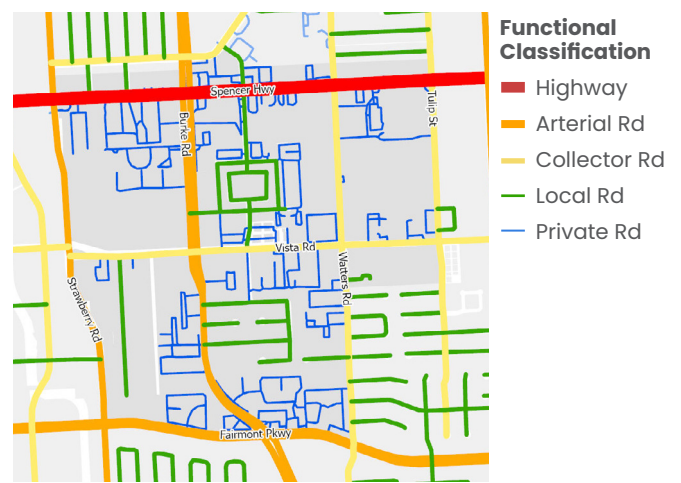
Source: Replica, AECOM

Functional Classification

As shown in Figure 34, the collector roads run through the center of the Study Area near the civic/institutional or office locations. The local roads stretch through all the residential areas and have lower-capacity and slower speeds.

The multiple medium- to high-capacity roads in the Study Area are designed to prioritize vehicular movement over transit, pedestrian or bike travel needs. There is one main highway, Spencer highway, that runs east-west. There are multiple collector roads in the Study Area that travel north-south and east-west. Generally located north and south, there are two arterial roads with many smaller local roads that run through neighborhoods and commercial spaces.

Figure 34: Functional Classification



Source: Pasadena Online Tool, AECOM

Traffic Volumes

Table 12 provides data relating to vehicular capacity at different times of the day. The Annual Average Daily Traffic inform the daily capacity at operating hours and how levels of congestion can be mitigated based on the hierarchy and function of the road. It calculates the number of vehicles that travel through a transportation system over a 24-hour period. Fairmont Parkway and Spencer Highway are the two busiest corridors in the Study Area with

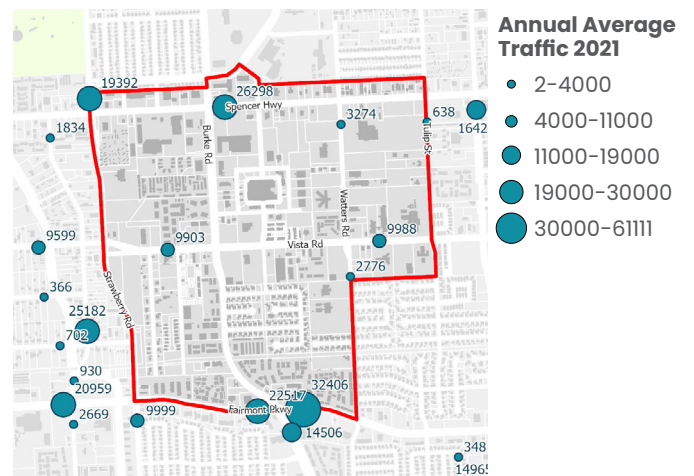
approximately 55,000 vehicles per day (vpd) and 54,000 vpd respectively. Strawberry Road and Vista Road are the second high-volume corridors group supporting approximately 30,000 vpd and 20,000 vpd. Finally, Burke Road is the third busiest corridor in the Study Area with only 14,500 vpd, despite it being an arterial road.

Table 12: Traffic Volumes

Street Name	Vehicles per Day (VPD)
Spencer Highway	54,435
Fairmont Parkway	54,923
Strawberry Road	29,391
Vista Road	19,891
Burke Road	14,506
Watters Road	6,050
Tulip Street	638

Source: TxDOT 2021

Figure 35: Annual Average Daily Traffic

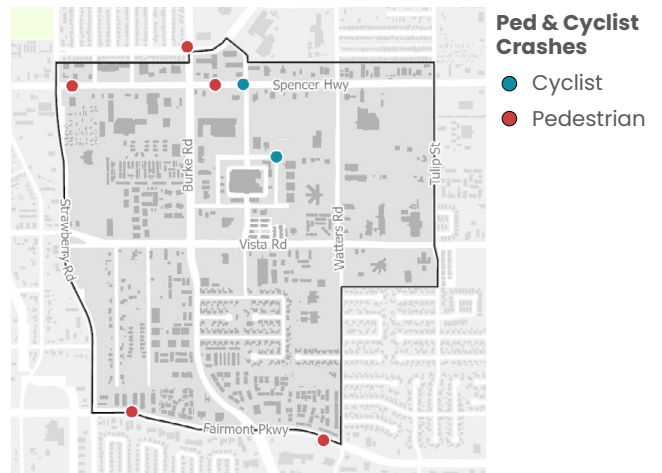


Source: TxDOT 2021, AECOM

Traffic Safety

The safety of streets where the greatest number of fatalities from collisions occur. Collisions can be caused due to traffic signals or high volume of traffic during certain times. Most collisions occur from vehicular crashes and injuries to bikers or pedestrians. When vehicular or pedestrian injuries occur frequently at a certain street, it becomes a high-risk area for safety. There are two (2) cyclist crashes and four (4) pedestrian crashes as seen in Figure 36. The cyclist crashes are located on Spencer Highway and a local road near HCA. The pedestrian crashes are located mainly on fast-moving traffic of Spencer Highway and Fairmont Parkway.

Figure 36: Pedestrian and Cyclist Crashes



Source: H-GAC Crash Data Tool; AECOM

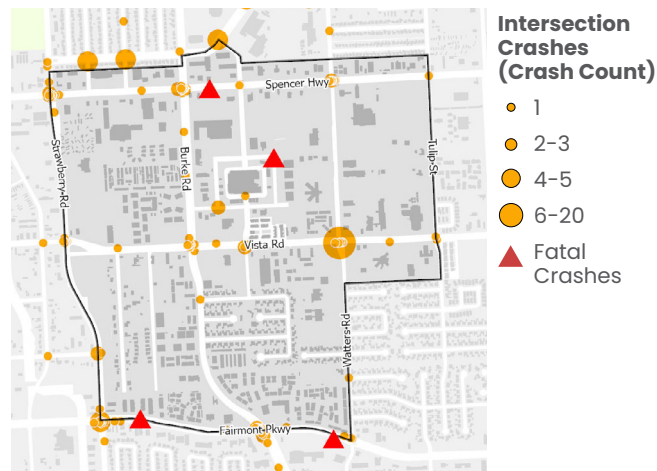
High Crash Intersections

The safety of streets where the greatest number of fatalities from collisions occur. Collisions can be caused due to traffic signals or high volume of traffic during certain times. Most collisions occur from vehicular crashes and injuries to bikers or pedestrians. When vehicular or pedestrian injuries occur frequently at a certain street, it becomes a high-risk area for safety. There are two (2) cyclist crashes and four (4) pedestrian crashes as seen in Figure 37. The cyclist crashes are located on Spencer Highway and a local road near HCA.

The pedestrian crashes are located mainly on fast-moving traffic of Spencer Highway and Fairmont Parkway.

- Spencer Hwy and Strawberry Road – Looking east on Spencer Hwy with Strawberry Road running north to south.
- Burke Road and Spencer Hwy – Looking west on Spencer Hwy with Burke Road running north to south.
- Strawberry Road and Fairmont Parkway – Looking west on Fairmont Parkway with Strawberry Road running north to south.
- Vista Road – Looking east on Vista Road with Burke Road running north to south.

Figure 37: Intersection Crashes



Source: H-GAC Crash Data Tool; AECOM

Figure 38: Four Major Intersections



Spencer Hwy and Strawberry Road



Burke Road and Spencer Hwy



Burke Road and Fairmont Parkway



Vista Road

Public Transportation

Public transit in the City of Pasadena is provided by Harris County Transit. The Baytown/La Porte Shuttle #7 is the only transit line serving the Study Area, with a stop at the Social Security Office location. The shuttle route provides an east-west connection between Gulfgate Commercial Center (I-610 & I-45 interchange), through Strawberry Clinic and the Study Area in Pasadena, and to LaPorte neighborhood center and Baytown Park Transfer to the East. The service runs from 6 a.m. to 6 p.m with 2-hours headway. Other destinations along the route may be provided upon advance request and subject to time availability. There is no bus sign that marks the bus stop and only stops during the building’s operating hours.

The standing area is the sidewalk in front of the Social Security Services building. It is located near the school zone and posted speed is 35 MPH.

Transportation RIDES Program

The RIDES program is non-emergency transportation service for low to moderate income senior residents over the age of 65 and/or people with permanent disabilities from 18–64 years of age. The program is delivered in partnership with City of Pasadena’s Community Development team and Parks and Recreation Department and federally funded through the HUD Community Development Block Grant. It supplies qualified members \$75/month through the government funded subsidy program to be used for essential travel. The travel needs may include trips to medical appointments, pharmacy for RXs, grocery shopping, social activities, and other essential needs. This transportation service supports those that do not own a vehicle or unable to medically/physically drive.

Figure 39: Baytown/ La Porte Shuttle Route



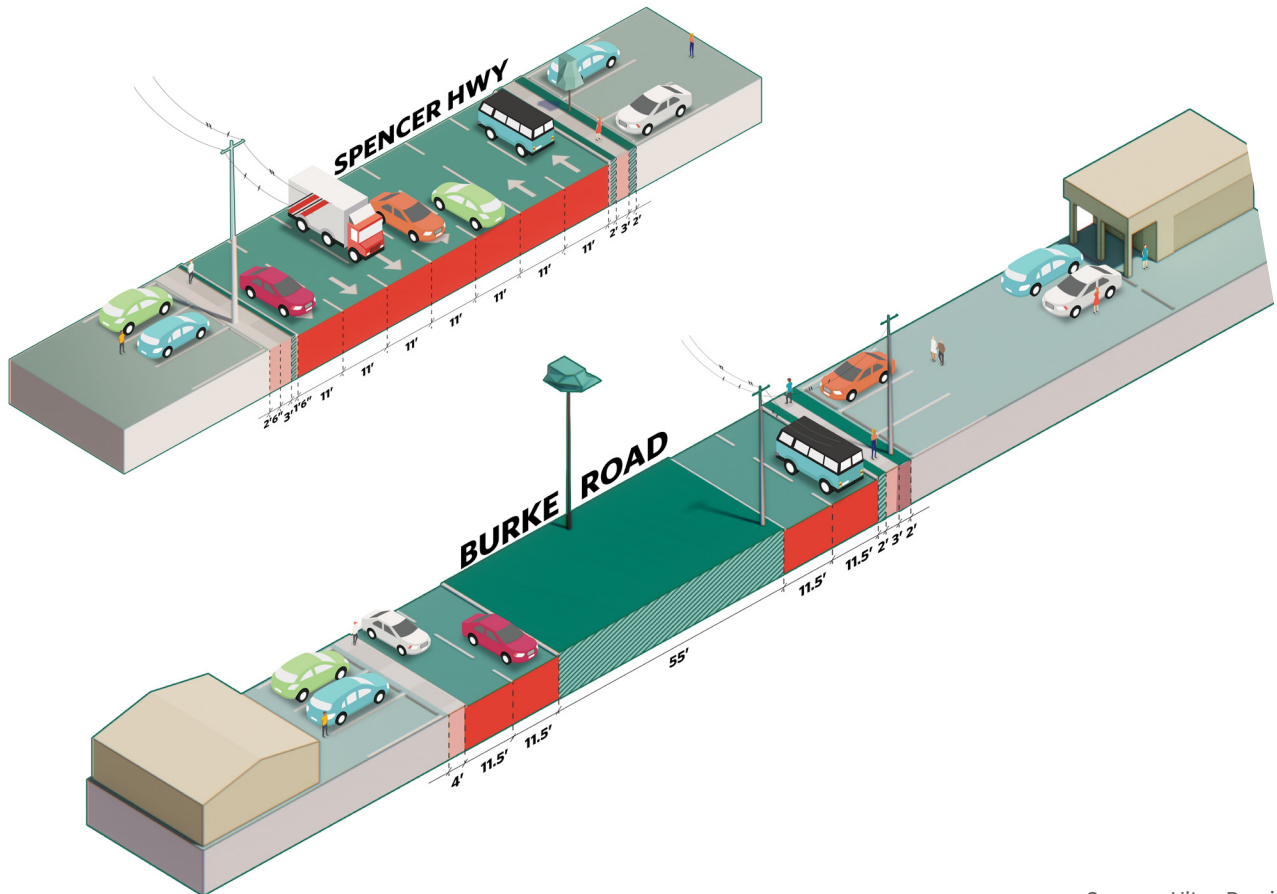
Streetscape

Figure 40 studies the existing streetscape of two major thoroughfares in the Study Area, Spencer Hwy and Burke Rd.

Spencer Hwy is a six-lane arterial roadway with a turning lane at each signalized intersection. On both sides of Spencer Hwy, are primarily retail and commercial land uses. Scattered trees line certain retail areas but are sparse and far in between to provide ample shade for pedestrians. Narrow sidewalks line both sides of Spencer Hwy and is segmented by curb cuts from adjacent land use. The sidewalks are not continuous, discontinuing in certain areas often stretching several blocks. The sidewalks are typically set-back 2-3 feet from the street that offers little protection from high traffic volumes and speeds.

Burke Road is a major four-lane thoroughfare with a large 55' wide median breaking at intersections. The wide median performs as a gas pipeline right-of-way running underneath Burke Rd. Along the center of the median, there are sparsely planted Texas Sabal Palm trees- a native tree with a shallow root that does not interfere with the depth and cover of the buried gas pipeline. Burke Rd have varied land use conditions on both sides, from residential, to commercial, to medical facilities. There is only one pedestrian crossing on Burke Rd. Sidewalks are discontinuous and exist only in front of commercial areas. There are little to no trees that line the sidewalks.

Figure 40: Streetscape



Sidewalk Conditions

Figure 41 shows the continuity/discontinuity of sidewalks along the major street corridors and at the medical service core, boxed in by Spencer

Hwy, Vista Rd, Watters Rd, and Burke Rd. Also showing continuity of connection to nearby trails and bikeways.

Spencer Highway

Spencer Highway - Walkability is low in this area. Spencer Highway (1.0 mi) is a six-lane arterial roadway with turning lane at the light. The road has multiple signalized intersections with crosswalk striping, but it is still a wide lane to cross. A narrow sidewalk runs along both

sides of the street is segmented at different locations depending on the adjacent land use. The sidewalk provides little protection from the traffic volumes and vehicle speeds, there is insufficient tree coverage to provide ample shade.

Burke Drive

Burke Drive - Burke Road (1.15 mi) is a major four-lane thoroughfare with a large median at intersections and a double yellow line through residential areas. There are only sidewalks in front of commercial areas. The sidewalks are

not wide and are hardly covered by any trees. Although most intersections have crossing signals and striping, Burke Road and Fairmont does not have a crossing signal or a sidewalk leading up to it.

Bayshore Blvd

Bayshore Blvd (0.25) is a two-lane ancillary street with a median that connects Spencer Hwy to HCA Southeast. This street is mainly used by emergency vehicles to enter HCA Southeast from Spencer Hwy, as well as patients entering the medical campus. Sidewalks run along both sides of the street and provide a

small buffer between street and pedestrian. The paths are well-shaded with a dense tree canopy and well-lit with street lighting at night. However, sidewalks are segmented by curb cuts and several are discontinued by changes in elevation, as shown in Figure 41, that are not ADA accessible.

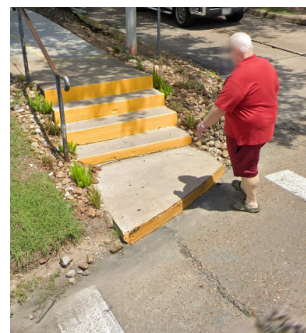
Figure 41: Sidewalk Conditions



Sidewalk Curb Cut Interruptions at Commercial Streets



Discontinuous Sidewalks at Commercial Streets



Sidewalks without ADA accessibility



Sidewalks next to parking lots with no shade

Tulip Street

Tulip Street (0.5 mi) is a small two-lane local road that covers part of a school zone and intersects Spencer Highway. There is no crosswalk or traffic light at the intersection of Spencer Highway and Tulip Street.

The vehicular speed is decreased along this road since it is low capacity. Although this road runs through residential areas, there is little to no sidewalks. There are swales to manage run-offs.

Vista Road

Vista Road (0.3 mi) is a four-lane collector road with a median buffer through the center. Long sidewalks run through this street with a small grass barrier between the pedestrian and vehicular traffic. There is sparse tree cover and

shade in this area. The sidewalk ends at the intersection of Vista Road and Watters Road, which makes it difficult to cross. There is also no space to cross through the center median of the intersection.

Watters Road

Watters Road (1.0 mi) is a two-lane local road that extends from Vista Road to Fairmont Parkway. It has narrow sidewalk with some space away from the road. There are small trees to offer some shade and if there is vegetation,

they are small shrubs. This road is also adjacent to residential areas; however, the sidewalk is not continuous and consistent on both sides. The sidewalk conditions also vary.

Fairmont Parkway

Fairmont Parkway - Fairmont Parkway (0.7 mi) is a major four-lane thoroughfare with a buffer median and turning lane at the intersections. The sidewalk is narrow and provides small buffer between fast-moving traffic. The conditions of the sidewalk vary on by intersection, which

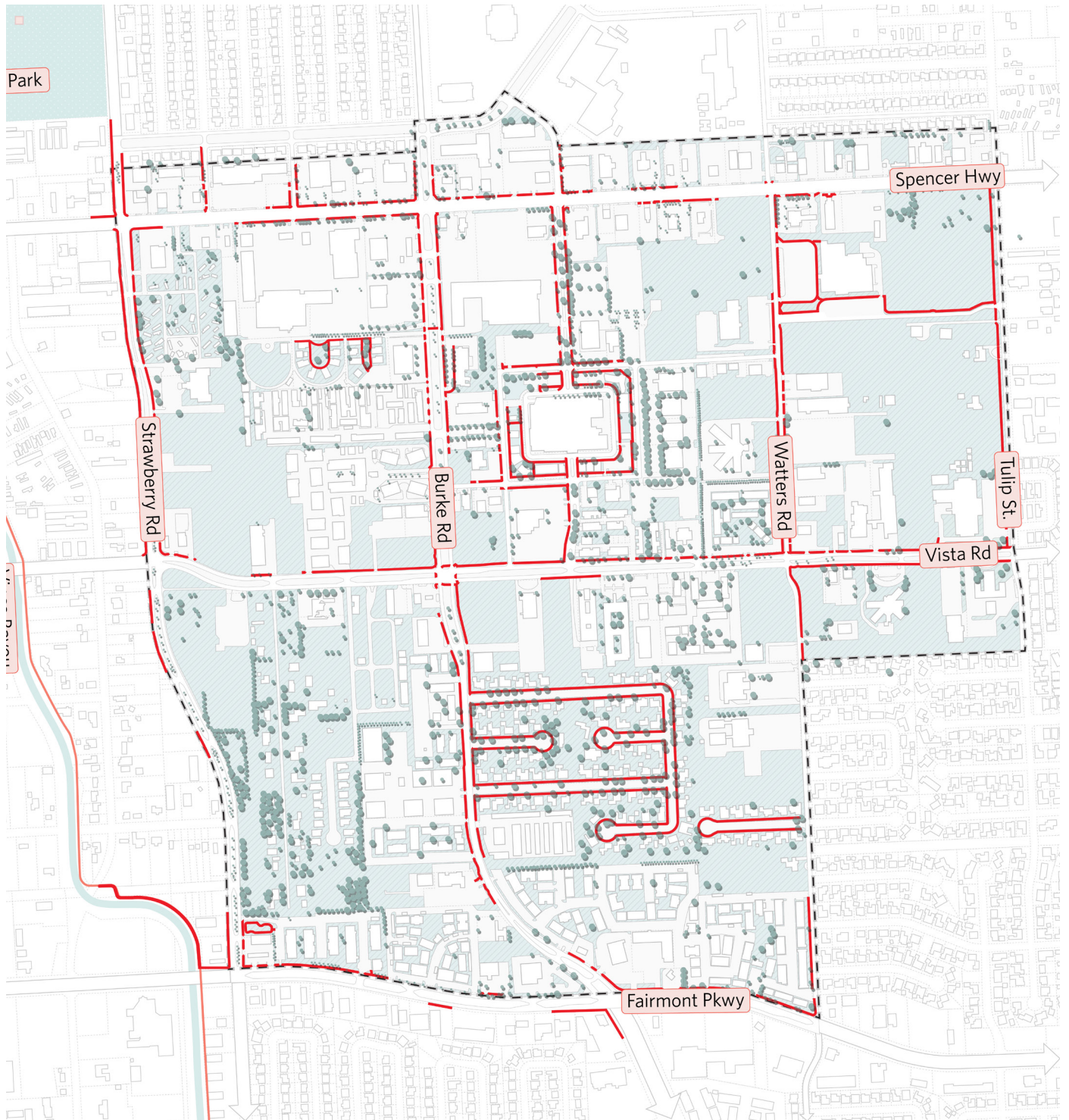
makes any walking difficult. Most of the buildings along this road are commercial corridors. The intersections do not have complete crosswalk striping and pedestrians must partially enter the street when crossing through the center median.

Strawberry Street

Strawberry Street - Strawberry Street (0.9 mi) is a major four-lane arterial road with a median and turning lane at the intersections. At medium capacity, the speed limit is 40mph. There are largely fragmented sidewalks and overgrown

vegetation that cover other walking spaces. Strawberry Street and Fairmont Parkway have no crosswalk signals, no clear striping, and no cut through the center for pedestrians to cross safely without walking into a busy street.

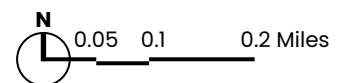
Figure 42: Sidewalk Conditions



Source: Ultra Barrio

Sidewalk Conditions

- Sidewalk
- Tree Canopy





Needs Assessment

Final Report

04



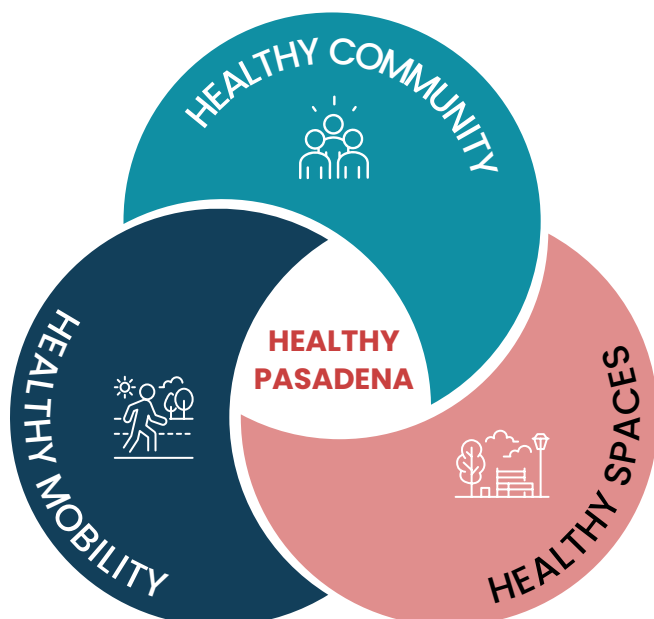
04

Needs Assessment

The needs assessment phase of this project was a curated from the issues heard from the community (public meeting, agency co-design workshop, and public survey), major takeaways from the existing conditions, and analysis from the project team. Based on feedback received, the project team identified 46 issues that were grouped in 11 overarching themes or needs.

Individual needs relate to one or more overarching theme of this Healthy Pasadena Livable Centers project: Healthy Communities, Healthy Spaces, Healthy Mobility.

The following section (Recommendations) will demonstrate how these needs are addressed through project and policy recommendations as an outcome of this study.



Grouped Issues and Needs

- 1 Aging in Place
- 2 Nighttime Safety
- 3 Safe Routes to School
- 4 Accessible Medical Campus
- 5 Sidewalk/Pedestrian Crossing
- 6 Economic Activity
- 7 Housing
- 8 Transportation
- 9 Urban Form
- 10 Traffic Management
- 11 Recreation and Environment



Aging in Place

1.1 ● ●

Senior resident living pockets are isolated, no places to walk places for population that has lower access to private vehicles.

1.2 ● ●

Need more distributed small commercial uses along key corridor well connected with walkable route especially for senior residents, to improve their access to everyday services such as food, pharmacy, bank etc.

1.3 ● ●

Need for improved walkable routes for senior residents to access everyday services, support active mobility and health. Routes need to include options for rest, shade and accessible sidewalks.

1.4 ●

Population with low / no access to private vehicles have increased issues of being isolated with insufficient access to services beyond walking distance.



Night-time Safety

2.1 ● ●

Conflict between walking desire lines and commercial lots logistic spaces (parking / loading) + safety issues in these spaces have been observed. / Sense of safety in key commercial lots on Spencer Hw, due to opaque walls, few openings, poor lighting, homeless population, police presence etc.

2.2 ●

Plasma collection center brings in unhoused people without transporting them back. They stay in the study area with no temporary housing options or care services. Contributing to a poor sense of safety in underlit and underutilized spaces for people accessing services and stores.



Safe Routes to School

3.1 ●

Lack of walking to school basic options for local families within walking distance with issues of lighting, unsafe crossings and no sidewalks.

3.2 ●

School zone queuing and back-up on 2-lane roads create safety issues with drivers going against traffic to bypass queues.

3.3 ●

Neighborhoods within a 2-mi radius to schools have no access to school buses.

3.4 ●

Families will drop off/pick up students at empty commercial lots or easy access travel points due to the backed up traffic from school areas.



Traffic Management

4.1 ●

Traffic speeding on Burke Road “a race track” which is used a backbone for local residents to/ from key destinations, even walking to school - but feeling unsafe due to speeding traffic and sidewalk conditions.

4.2 ●

18-wheeler truck traffic on Watters Road, a 2-lane collector road in school zone.

4.3 ●

HCA emergency vehicles access can create conflicts and safety issues with other users, in particular pedestrian movements. Higher density of vehicular crashed with a fatality instance have been observed in the campus.

4.4 ●

Pedestrian lighting timing too short to allow safe and comfortable crossing, more so for senior residents or people with children or disabilities.



Urban Form

5.1 ●

Large block structure approximately 1/2 mile square with few / insufficient local roads to support walkable subdivision of the mega block structure. Majority of local roads - with the exception of the medical center - are dead-ends. Private roads provide local access to multi-family development but are usually gated and do not provide public access or connection to the rest of the network. Access roads to commercial surface lots contribute to a sense of openness but provide very poor orientation throughout the study area.

5.2 ● ●

Lack of continuous street frontage due to setbacks from street edge and surface parking in front and side of buildings create an urban form of standalone buildings and access prioritizing vehicular access over pedestrian access and safety.

5.3 ● ●

Urban form pattern creates conditions where building frontage faces onto the back and service areas of nearby commercial buildings. This condition tends to create under-utilized spaces for what could otherwise provide opportunities for prime placemaking interventions to enhance the arrival experience of the former.



Economic Activity

6.1 ●

Vacant undeveloped lots contribute to disconnected fabric of uses and discontinued infrastructure otherwise private landowners responsibility such as lighting.

6.2 ●

Vacant commercial units create underutilized spaces that tend to feel unsafe and towards derelict; however market analysis does not support a market demand for more brick and mortar retail in the study area.

6.3 ●

Social Security site attracts foot traffic volumes that isn't capitalized for local business benefit in the area.



Housing

7.1 ●

Proximity to range of services and uses, including healthcare services, could support more residential development in the study area, in particular for senior living tied to themes of 'ageing in place'.

7.2 ●

Over-populated, low quality and low maintained single family homes tend to be overpopulated west of Burke Road. The area is also showing a high social vulnerability index of population over 65 years old, indicating they are are greater risk of human suffering and financial loss in a disaster.

7.3 ●

Majority of renter-occupied units, multi-family and older housing stock subject to higher susceptibility to change can mean residents are at risk of increased housing costs as the attractiveness of the area improves and market prices align.

7.4 ●

Multi-family older housing blocks are of low quality with delayed maintenance of both buidings and exterior amenities such as lighting, create underlit and underutilized spaces prone to crime or poor sense of safety for residents.

7.5 ●

Community preference for the following types of new residential development in the study area: largely single family detached is preferred, with some support for townhome and mixed-use / midrise developments.



Transportation

8.1 ●

Lack of bus signage and bus stop at the Social Security building does not support use of public transportation service through the Study Area.

8.2 ●

The Study Area is only serviced by Harris County Baytown / Laport shuttle route with 2-hour headway. There are no plans currently at the City of County levels to expand public transit options in or near the study area. Residents expressed wish to have access to public transportation options to access local destinations within Pasadena should it be provided.

8.3 ●

Driving was noted as a preferred mode of transportation in the public meeting an survey to access local services and destinations both for residents in or near the study area and beyond - even with alternative modes were available. The project needs to maintain an appropriate level of service on major thoroughfares and access routes to key destinations, while balancing needs and safety of other road users, and providing alternative modes.



Sidewalk & Pedestrian Crossing

9.1 ●

Discontinued and inconsistent treatment of sidewalks in the Study Area does not support walking in between local destinations push people on the street or on unpaved curb when walking. Significant ADA issues across the study area.

9.2 ●

Issue with vacant lots that have no requirement to provide sidewalks when land is undeveloped. Issue particularly dangerous at major intersections where pedestrian crossings do not connect to accessible sidewalks.

9.3 ●●

Unsafe and insufficient pedestrian crossings with lack of markings, lighting, pedestrian sidewalk landings in some locations, such as on Burke Road between senior apartments and medical campus.

9.4 ●●

Street drainage issues pushes people out on street during heavy storms.

9.5 ●●

Sidewalk quality issue for those traveling in and out within the medical district.



Accessible Medical Campus

10.1 ●●

Pedestrian access to the medical services, in particular from senior housing and adjacent key corridors, that leverages the mature tree canopy and cooler temperatures of the medical campus, improves pedestrian safety and supports active mobility for patients.

10.2 ●

Medical campus : Recent closures in healthcare services in the campus created gaps in healthcare needs that can make Kelsey Seybold center more attractive for some local residents. Loss of patients and attractiveness of hub.

10.3 ●●

Stormwater runoff drainage and flooding on near HCA hospital that create pooling and prevents pedestrian access.

10.4 ●●

Medical workers typically have a 30-45 minute break during shift and have little access to close proximity food locations. Walking overall is not preferred for other visitors due to the distance and inconvenience of the local medical buildings.



Recreation & Environment

11.1 ●

Large surface parking along Spencer Highway with little to no shade increases urban heat island effect and local temperatures does not contribute to walkability.

11.2 ● ●

Need active mobility options to improve access to parks and open spaces in the vicinity, as well as local and nearby destinations. Strawberry Park and Vince Bayou trail area nearby but beyond easy walking distance from residential areas with no supportive access infrastructure for walking or biking to these amenities.

11.3 ●

Need for improved legibility for proximity and access to nearby Bayou trail, Strawberry Park, and wider trail and park system in Pasadena.

11.4 ●

Need more parks or public open space to complement Strawberry Park, especially for residential communities and elderly communities beyond walking distance from Strawberry Park. Preference noted in the public survey for multiple smaller spaces rather than a larger park.

11.5 ●

Powerline corridors easement that ends at the Utility site on Strawberry Road (Cadena Dr) creates a no-man's land condition does not support mobility infrastructure or other temporary development on the corridor. Potential missed opportunity to better connect Cadena Dr residential area to Burke Road and the rest of the network.

11.6 ●

Large medians serve as utility corridor have multiple signs to keep people off the medians create underutilized open spaces.

11.7 ●

Outdoor exercising : a lot of people run around stadium Veterans Memorial Stadium streets.

11.8 ●

Generally little shade and poor tree canopy coverage.



Recommendations

05

05

Recommendations




Conceptual Plan Framework

With the collaborative input of the community, we formulated a conceptual blueprint encompassing seven key suggestions. These proposals revolve around the principles of placemaking, improving accessibility and safety across various transportation modes, promoting economic growth, and safeguarding the vital health and wellness aspects of the designated study area.

It's worth noting that not the communities needs, identified in Chapter 4 have been addressed within the proposed seven recommendations. The seven recommendations outlined in this chapter are ones that the City and the EDC felt are feasible for implementation in the next 10 years.

The diagram on the right serves as a guide to define the type of recommendation that is being proposed, what project goals and livability principles are being met if the recommendation was to be implemented as well as what overarching theme the recommendation helps address within the community.

OVERARCHING THEME

-  Healthy Spaces
-  Healthy Community
-  Healthy Mobility

PROJECT TYPE

-  Project
-  Study
-  Partnership

PROJECT GOALS

- PG1** Spur strategic planning for future growth
- PG2** Establish an environment of high quality
- PG3** Engage the public and community stakeholders
- PG4** Create safety through infrastructure
- PG5** Promote alternative transportation modes
- PG6** Create additional green spaces through creative initiative
- PG7** Promote economic development

LIVABILITY PRINCIPLES

- LP1** Design walkable connecting streets
- LP2** Implement Healthy Parks Plan by adding thriving parks
- LP3** Encourage a destination for health & wellness
- LP4** Improve the connection to nodes of community activity
- LP5** Promote local economic development and employment

01

Rethinking the Design of Spencer Highway

OVERVIEW

OVERARCHING THEME

-  Healthy Spaces
-  Healthy Community
-  **Healthy Mobility**

PROJECT TYPE

-  Project
-  **Study**
-  Partnership

PROJECT GOALS

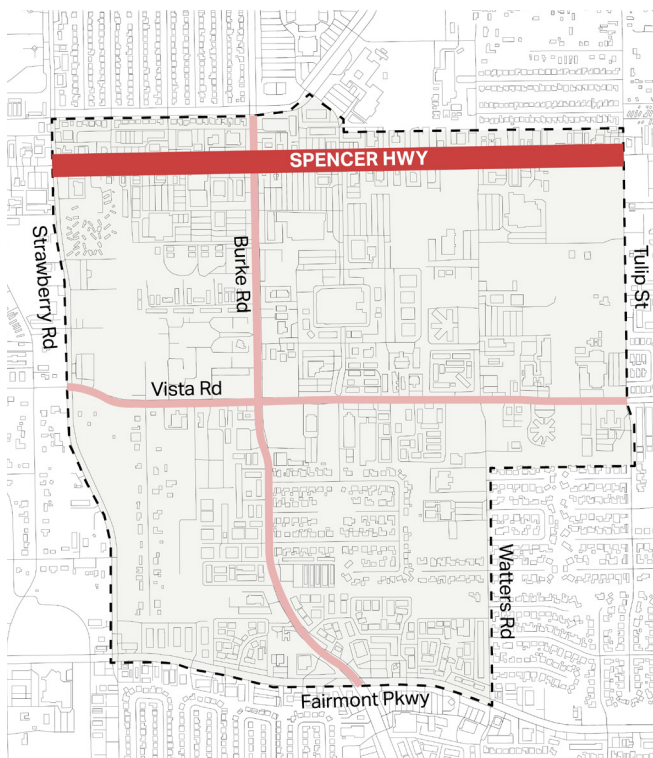
- PG1** Spur strategic planning for future growth
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LIVABILITY PRINCIPLES

- LP1** Design walkable connecting streets
- LP3** Encourage a destination for health & wellness
- LP4** Improve the connection to nodes of community activity
- LP5** Promote local economic development and employment

PROJECT PARTNER

- City of Pasadena
- Harris County: Precinct II



Desired Outcomes

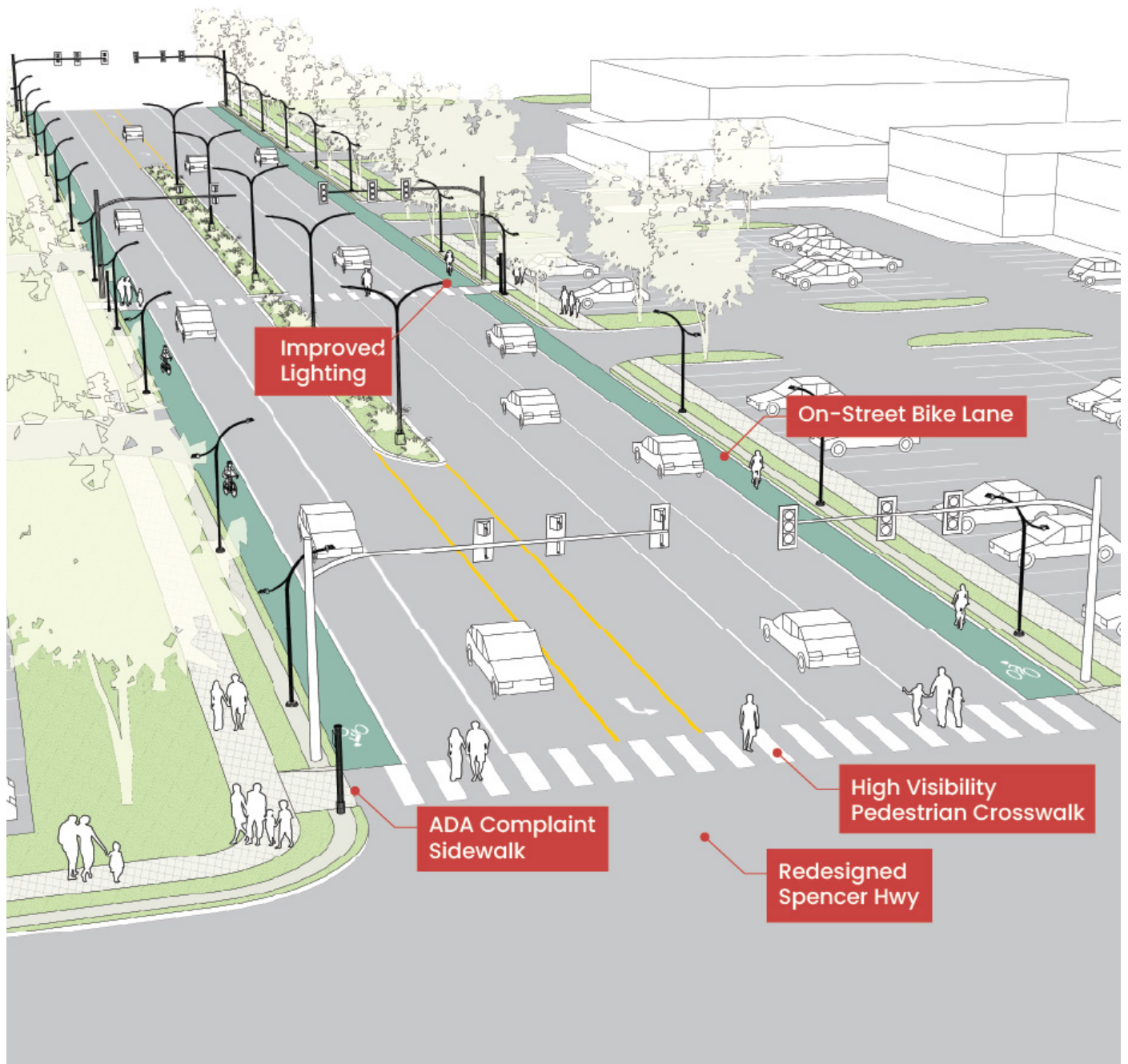
The goal of this recommendation is centered on addressing the safety and mobility issues that all users are currently experiencing along Spencer Highway. Spencer Highway serves as a crucial road within the study area and serves as a major access point for both HCA and various schools. Therefore, during the co-design workshop it was important that strategies which addressed the lack of bike paths, improved the areas lighting, and prioritized the safety of pedestrian crossing where explored.

Ownership and maintenance of Spencer Highway belongs to Harris County Precinct II, however due to the high profile of this arterial road within the City of Pasadena and because all city owned roads connect with this arterial

road; this recommendation is proposed as a collaboration between the City. Through agency discussions with Precedent II, instead of just addressing Spencer Highway from Strawberry Road to Tulip Street, Precedent II would like to understand the entire corridors need before a

desired outcome can be defined. Based upon discussions the goal of the proposed corridor wide study is to determine the most effective street design and multi-modal strategies that would greatly benefit the community.

Figure 43: Elements to consider during Spencer Highway Corridor Study



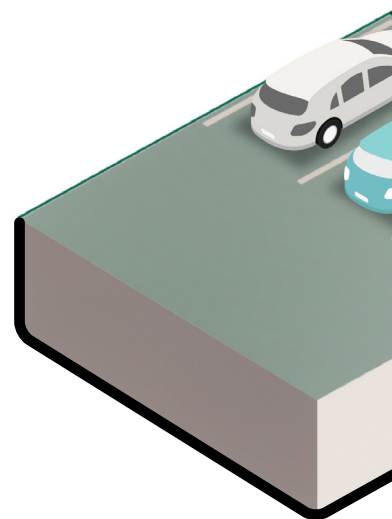
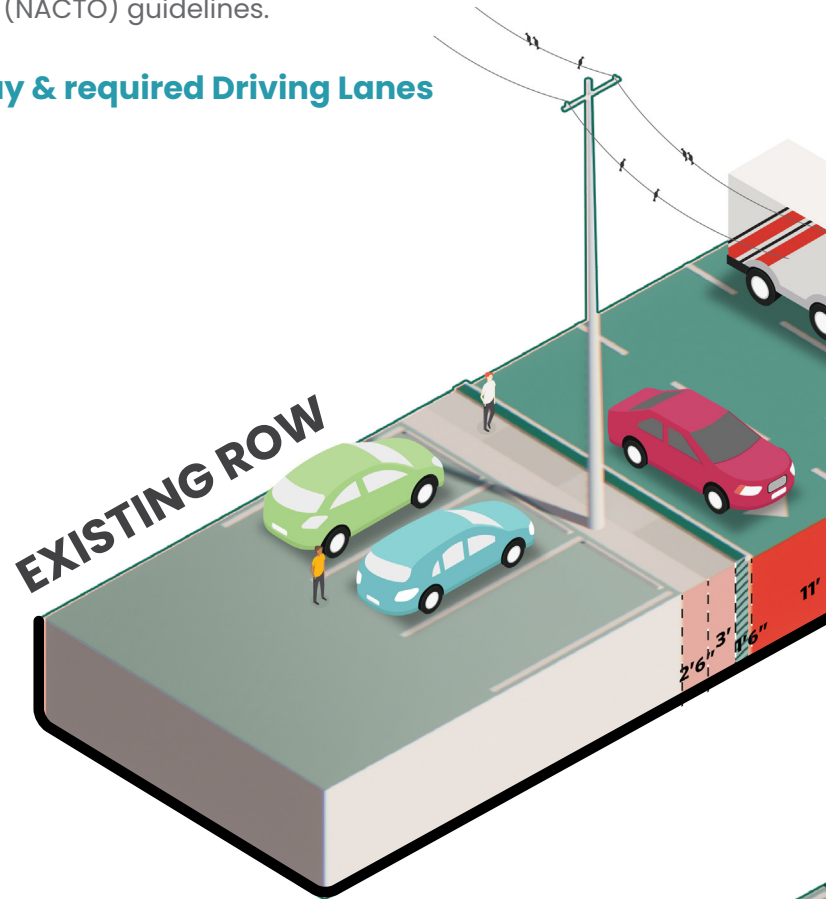
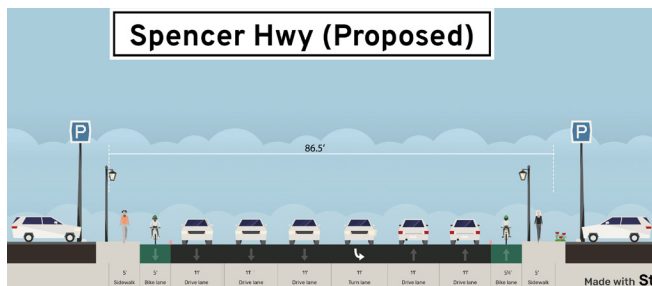
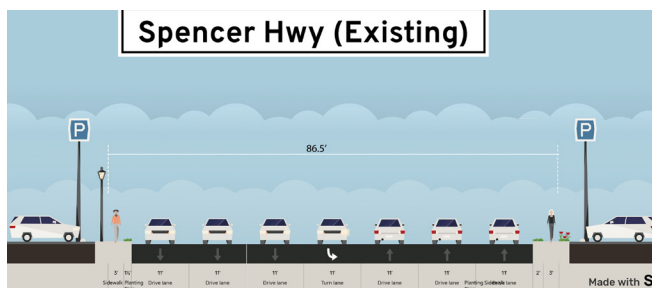
Strategies to consider in the Corridor Study

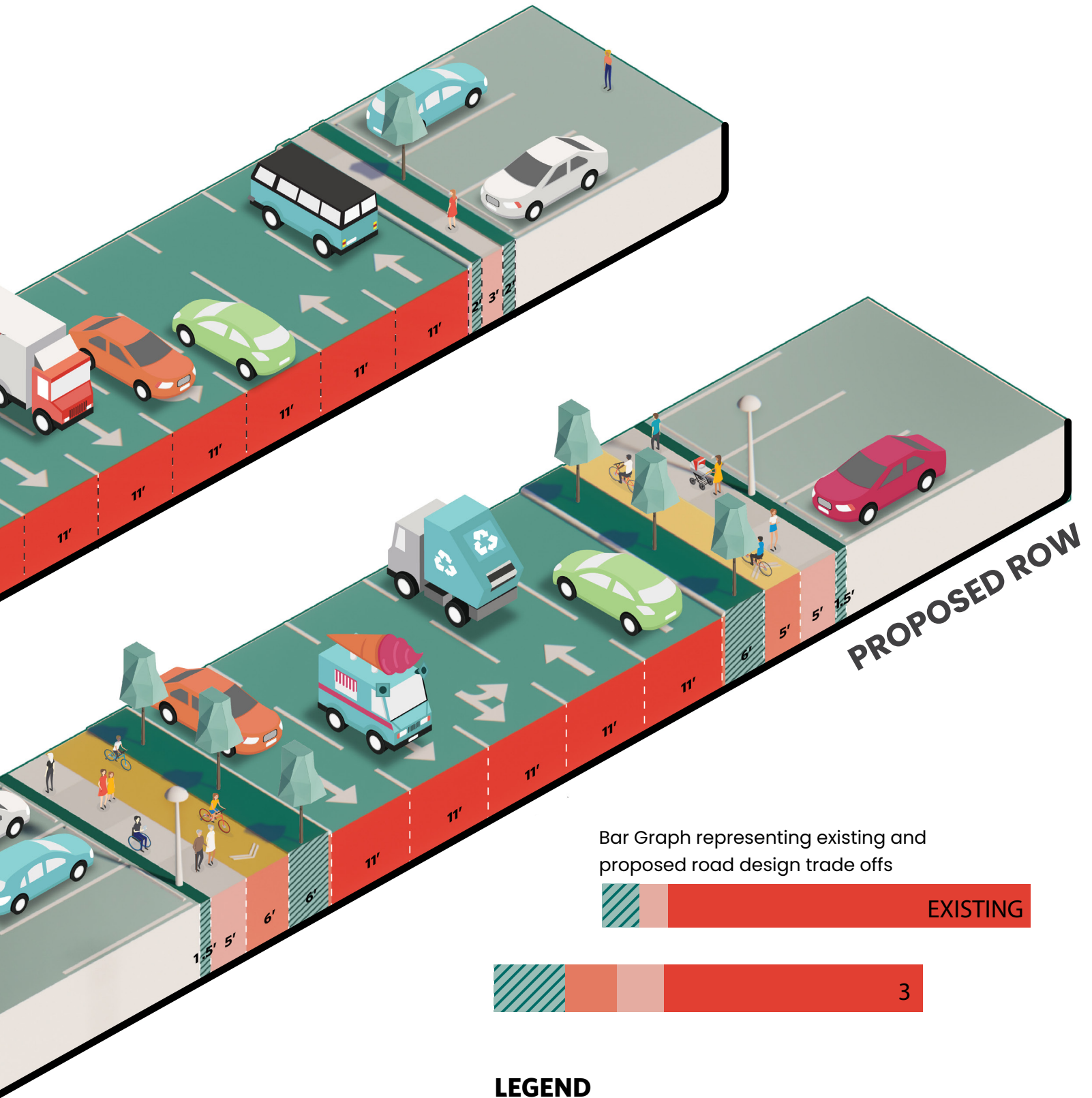
Based on the discussions with community and stakeholders, the strategies outlined below are strategies that should be considered while corridor redesign study takes place. These strategies are not an all-inclusive list but suggestions from the stakeholders and review of Complete Street Policy as well as National Association of City Transportation Officials (NACTO) guidelines.

1 Evaluate the design of Spencer Highway & required Driving Lanes

As Precinct II conducts its corridor study, the community has requested a traffic analysis to ascertain the required number of driving lanes to accommodate both current and future traffic patterns. Taking community feedback into consideration, it has been observed that the excess number of lanes leads to vehicles driving at speeds higher than the recommended limit, thus causing safety issues within study area. Few things to consider when rethinking design of Spencer Highway:

- Reduction of lanes to accommodate on-street project bike lanes
- Reduction of lanes to accommodate dedicated bus lane
- Inclusion of median





Bar Graph representing existing and proposed road design trade offs



LEGEND

- PEDESTRIAN / PEDESTRE
- BIKEWAY / CICLOVIA
- NATURE / NATURALEZA
- VEHICULAR / VEHÍCULOS
- STREET PARKING ESTACIONAMIENTO EN LA CALLE
- SHARED BIKE/VEHICLE CUOTA BICICLETA/ VEHÍCULO

2 Redesigning Highway to accommodate On-Bike Lanes

Redesigning the corridor to accommodate bike lanes involves a comprehensive process aimed at enhancing the safety and accessibility of the roadway for bicyclists. Because Spencer Highway is located next to high utilized medical campus and schools in vicinity, protected on-street bike lanes are a priority for the community. The existing Spencer Highway is made up of six drive lanes which can be reconfigured to include bike lanes on each side of the road. An example of this is illustrated on the previous page.



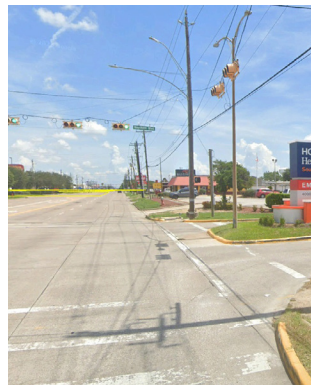
No existing bike lane



Proposed Onstreet Bike lane

3 High Visibility Pedestrian Crosswalk

Based on our needs assessment in Chapter 4, unsafe and insufficient pedestrian crossings have been identified that lack markings, lighting, and clear crosswalk signages. This strategy aims at incorporating a high visibility pedestrian crosswalk that is an essential safety feature designed to enhance pedestrian safety at intersections and road crossings. Such a crosswalk may include bold and contrasting pavement markings, ladder-style markings, zebra stripes, or other patterns.



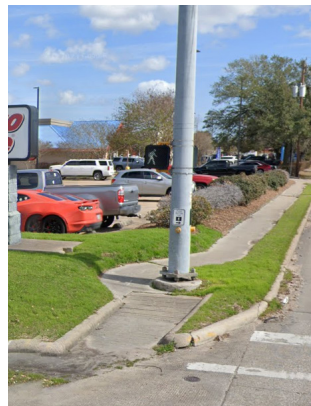
Existing pedestrian crossing



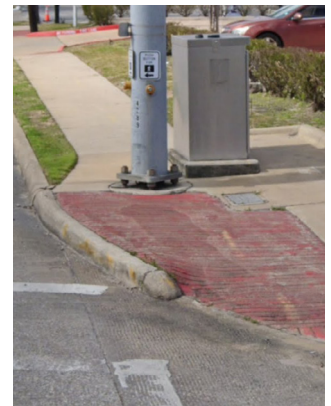
Proposed painted pedestrian crossing

4 Upgrade Sidewalk to accommodate ADA needs

Upgrading sidewalks to accommodate ADA needs involves making necessary modifications to ensure that these pedestrian pathways are accessible and usable by all individuals, including those with disabilities. To make Spencer highway inclusive for broader community, we recommend evaluation of entire corridor within study area, to identify stretches of sidewalk network that need to be upgraded.



Existing sidewalks



Proposed sidewalks with ADA markings

5 Improved Lighting

We recommend adding additional lighting to promote safety in parking lots and areas identified in needs assessment. Adequate lighting cultivates feelings of safety, security, comfort, and enhances the attractiveness of the area.



Reduced street lighting



Proposed improved lighting

6 Branded Intersection at Spencer Highway & HCA Campus

Based on this recommendation, there is an opportunity for Precinct II & HCA medical campus to partner and establish “sense of arrival” through incorporating branded intersection and the potential opportunity of renaming Bayshore Blvd. to reflect the HCA campus, which could enhance the pedestrian entrance and overall sense of arrival. Going beyond the functional aspects of a traffic junction, a branded intersection aims to establish a distinct sense of place and elevate the overall experience for pedestrians, cyclists, and motorists.



Existing intersection





Suggested painted intersection

02

Rethinking the Design of Burke Road

OVERVIEW

OVERARCHING THEME

-  Healthy Spaces
-  Healthy Community
-  **Healthy Mobility**

PROJECT TYPE

-  Project
-  Study
-  **Partnership**

PROJECT GOALS

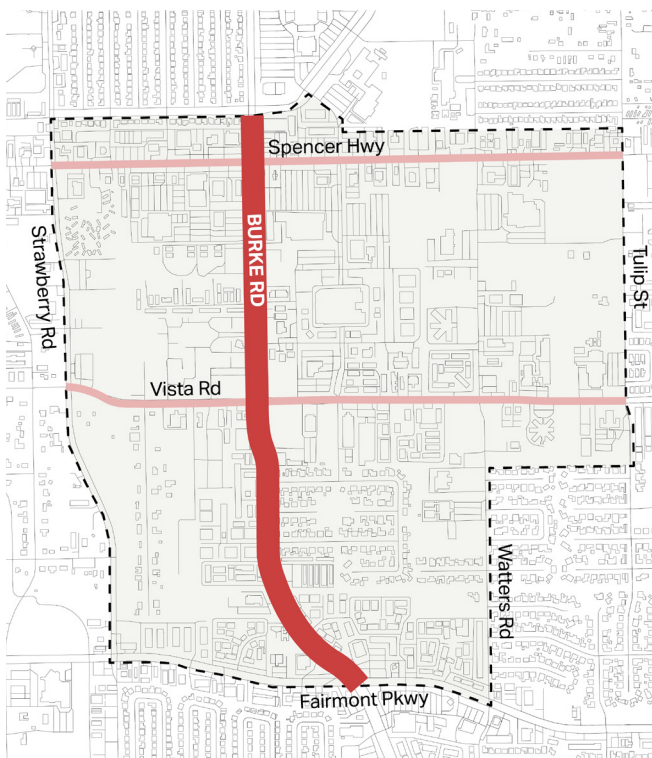
- PG1** Spur strategic planning for future growth
- PG2** Establish an environment of high quality
- PG4** Create safety through infrastructure

PROJECT PARTNER

- City of Pasadena

LIVABILITY PRINCIPLES

- LP1** Design walkable connecting streets
- LP2** Implement Healthy Parks Plan by adding thriving parks
- LP4** Improve the connection to nodes of community activity



Desired Outcomes

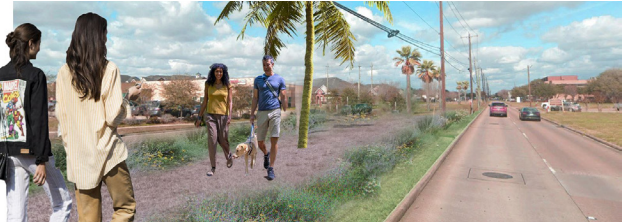
Burke Road, a significant corridor within the study area, that serves a diverse multi-generational community residing alongside it. The community comprises a substantial number of mobility-impaired residents, requiring well-designed pedestrian infrastructure accessible to everyone. The primary proposed intervention on Burke Road involves transforming the existing wide median into a potential pedestrian walkway/ trail. Achieving this transformation will require coordination between the City of Pasadena and Philips Power, as the median currently acts as utility easement. Development restrictions were unaware of, on behalf of the City during agency discussions. Thus the following strategies are only proposed and thorough coordination will need to take place.

Strategies for Consideration

Recommendation for redesigning the Burke Road consists of following strategies that focus on improving overall safety and mobility of pedestrians, as recommended by the community and stakeholders.

1 Redesigning Roadway

Residents frequently use Burke Highway to access important destinations, but the road’s current design often leads to traffic speeding issues. To improve pedestrian safety, it is suggested that a redesign of the right of way be undertaken.



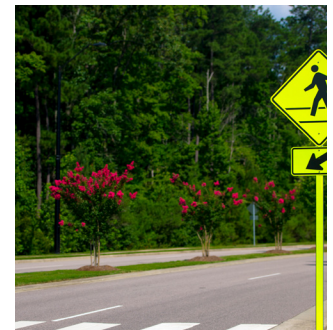
Proposed Trail on Median (to be coordinated with Phillips Utilities)

2 Enhanced Pedestrian Crosswalk

The needs assessment reveals the presence of unsafe and inadequate pedestrian crossings, which lack proper markings, lighting, and pedestrian sidewalk landings. These deficiencies are particularly concerning between the senior apartments and HCA Medical Campus. Implementing visible crosswalks for all road users enhances communication between pedestrians and drivers, enabling them to anticipate each other’s movements and prevent potential conflicts effectively.



Existing pedestrian crossing



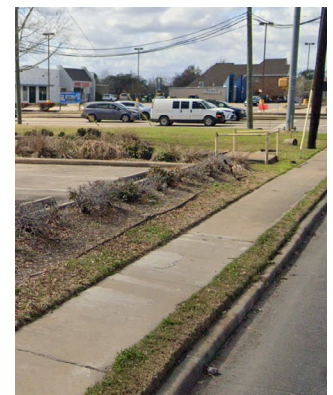
Proposed painted pedestrian crossing

3 Establish Sidewalk Prioritization to create Pedestrian Network

Upgrading sidewalks to accommodate ADA needs involves making necessary modifications to ensure that these pedestrian pathways are accessible and usable by all individuals, including those with disabilities. The City of Pasadena should conduct a comprehensive evaluation of all sidewalks along Burke Road to pinpoint sections that require upgrading, with the goal of establishing a continuous accessible network. To optimize expenditure, it is recommended to plan for a wider sidewalk on one side of the road rather than both sides.



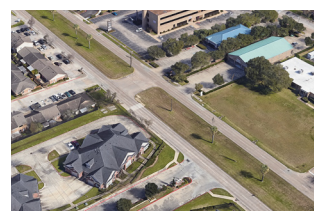
Existing sidewalks



Proposed sidewalks

4 Adding Mid-Block crossing to establish entrance to future HCA Campus

The objective of this strategy is to create a pedestrian entrance for the future HCA Campus along Burke Road by improving pedestrian crosswalks and access. By implementing a mid-block crossing at the marked intersection shown in adjacent images, pedestrian activity will be encouraged.

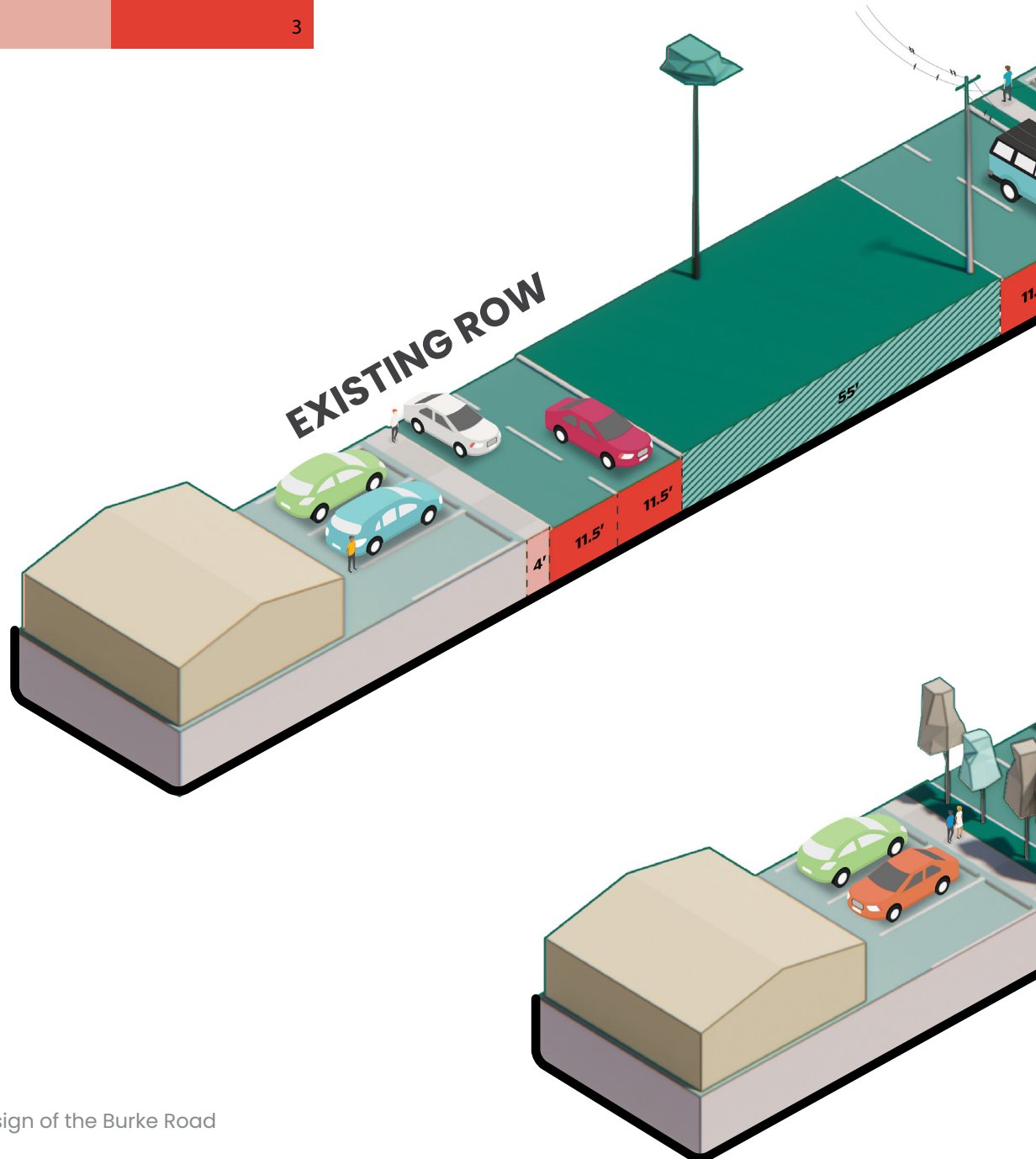


Lack of mid-block crossing in existing ROW

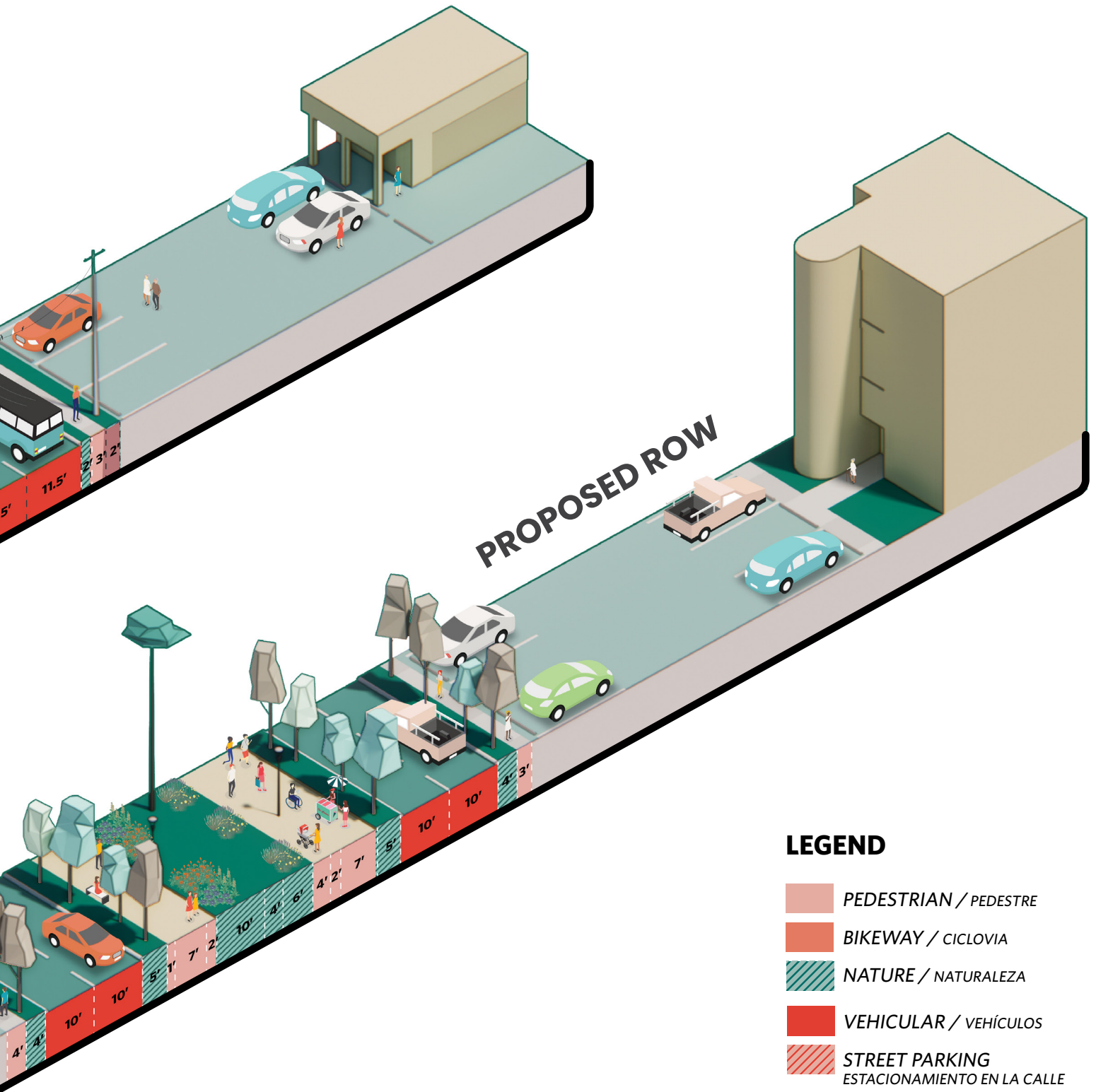


Suggested mid-block crossing

Bar Graph representing existing and proposed road design trade offs



Existing & Proposed Design of the Burke Road



PROPOSED ROW

LEGEND

- PEDESTRIAN / PEDESTRE
- BIKEWAY / CICLOVIA
- NATURE / NATURALEZA
- VEHICULAR / VEHÍCULOS
- STREET PARKING
ESTACIONAMIENTO EN LA CALLE
- SHARED BIKE/VEHICLE
CUOTA BICICLETA/ VEHÍCULO

03

Rethinking the Design of Vista Road

OVERVIEW

OVERARCHING THEME

-  Healthy Spaces
-  Healthy Community
-  **Healthy Mobility**

PROJECT TYPE

-  **Project**
-  Study
-  Partnership

PROJECT GOALS

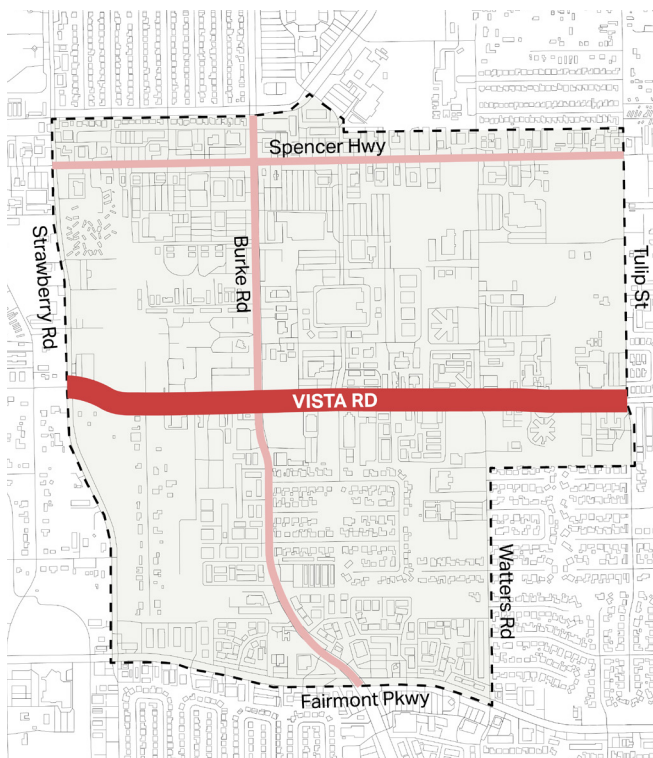
- PG1** Spur strategic planning for future growth
- PG2** Establish an environment of high quality
- PG3** Engage the public and community stakeholders
- PG4** Create safety through infrastructure
- PG5** Promote alternative transportation modes

LIVABILITY PRINCIPLES

- LP1** Design walkable connecting streets
- LP3** Encourage a destination for health & wellness
- LP4** Improve the connection to nodes of community activity

PROJECT PARTNER

- City of Pasadena



Desired Outcomes

Vista Road has been recognized as a significant corridor that, if redesigned, could effectively address the mobility challenges faced by the study area's residents. The presence of wide existing medians on Vista Road offers an excellent opportunity to create a spacious trail, facilitating the establishment of a secure pedestrian route.

Strategies for Consideration

The recommendation for the rethinking of design of Vista Road comprises a set of strategies aimed at enhancing the safety and mobility of pedestrians. These strategies have been suggested by the community and stakeholders and are geared towards overall improvement.

Figure 44: Proposed Shared use Trail on the median



1 Redesigning Roadway to Include Shared use Median

The Vista Road currently features a broad median in its center, which can be reconfigured to accommodate a pedestrian walkway and cycling lane, thereby expanding the range of mobility options available to users.

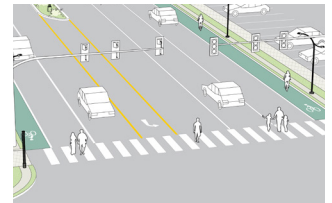


2 High Visibility Pedestrian Crosswalk

High visibility pedestrian crosswalks are a cost-effective measure to enhance pedestrian safety without significant infrastructure changes. Several pedestrian crossings along Vista Road can be upgraded with contrast markings or zebra stripes to highlight them.



Existing pedestrian crossing



Proposed pedestrian crossing

3 Adding Mid-Block crossing at HCA Entrance

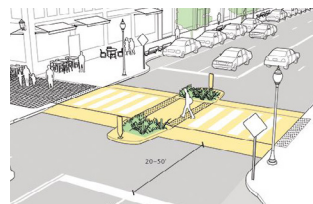
Vista Road serves as the route to access the HCA Medical Campus, from south. This offers an excellent opportunity to improve pedestrian access by implementing a mid-block crossing, thus facilitating safer and more efficient pedestrian mobility.



Existing Intersection

4 Branded Intersection at HCA Entrance

There is an opportunity to establish “sense of arrival” to HCA Medical Campus from Vista Road, by incorporating branded intersection at the marked location in adjacent image.



Source: National Association of City Transportation Officials (NACTO)

Proposed Mid-Block Crossing



Image of Butterfly mural in Asheville, NC, by Sound Mind Creative, photo by Justin Mitchell

Proposed Branded Intersection

04

Safe Route to School

OVERVIEW

OVERARCHING THEME

-  Healthy Spaces
-  **Healthy Community**
-  Healthy Mobility

PROJECT TYPE

-  **Project**
-  Study
-  Partnership

PROJECT GOALS

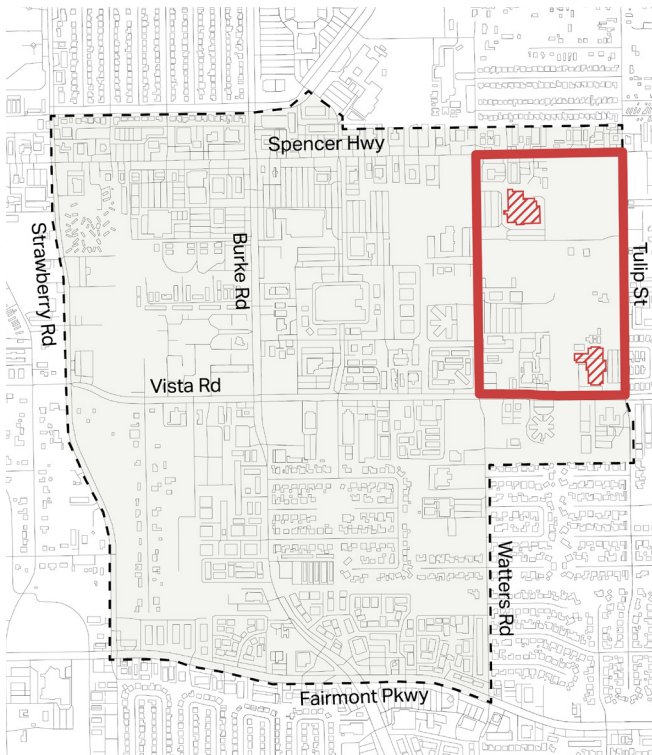
- PG1** Spur strategic planning for future growth
- PG3** Engage the public and community stakeholders
- PG4** Create safety through infrastructure

LIVABILITY PRINCIPLES

- LP1** Design walkable connecting streets
- LP4** Improve the connection to nodes of community activity

PROJECT PARTNER

- **City of Pasadena**
- **Pasadena School District**



Desired Outcomes

The Safe Routes to School program is a Federal Initiative aimed at emphasizing the significance of improving the safety of walking, biking, and rolling experiences for students traveling to and from school on commonly used routes. This recommendation focuses on exploring measures that the City of Pasadena could adopt to establish a safer multi-modal environment around the existing schools in the study area.

The proposed project suggests making right-of-way improvements along immediate access routes to the two schools in the study area (Watters, Tulip, Vista Road, and Spencer Highway). These improvements aim to address issues such as backed-up queueing, distant drop-off points, and inadequate walkability facilities within a one-mile radius of the schools.

Strategies to consider in the Corridor Study

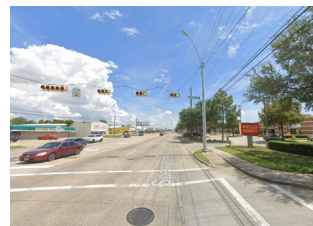
Following strategies will help improved pedestrian access and vehicular mobility around two schools within the study are:

Figure 45: Overview of Safe Route to School Strategies



1 Adding Mid-Block Pedestrian crossing at Spencer Highway & Tulip Road

Due to the traffic congestion that exists during student pick-up times, it was noted that students cross Spencer Highway (not using the crosswalks) to get to the north side of the corridor. Thus it is recommended that a mid-block crossing equipped with signals and a pedestrian refuge island be considered.



Existing Crossing



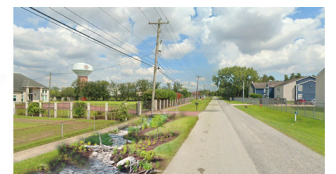
Proposed mid-block crossing

2 Road Design Improvements

Tulip Road and Watters Road are local neighborhood roads that are the main roads to provide access to both schools within the study area. However both roads have very limited sidewalk space, thus looking into creative stormwater solutions that can double up as pedestrian paths are highly encouraged along these two roads.



Existing Landscape



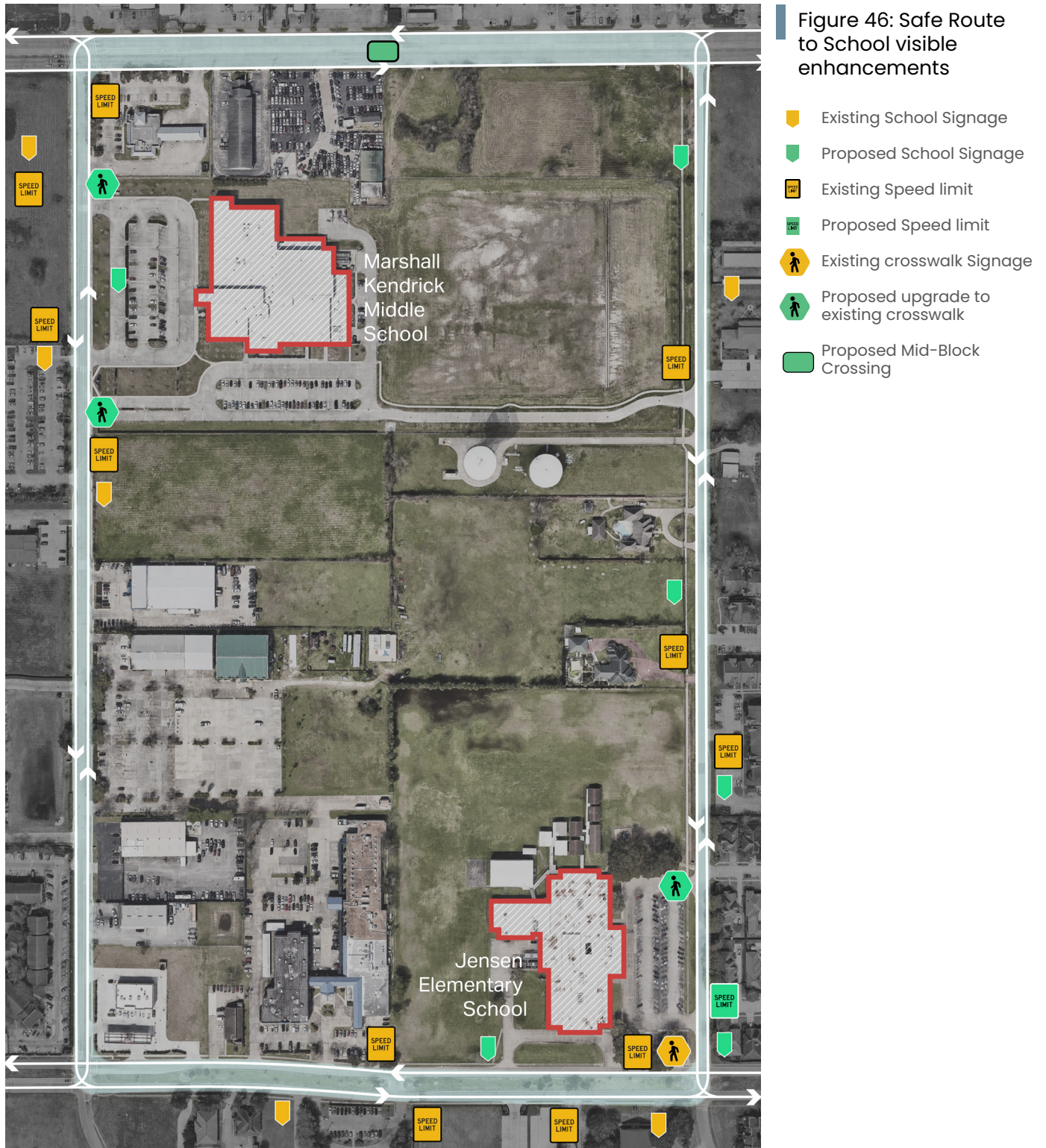
Proposed Rain Garden



Rain Garden after Rain

3 Increased "Safe Route to School" Strategies

Figure 46 illustrates the proposed enhancements that are being recommended to solidify the Safe Routes to School concept within this specific area of the study area.

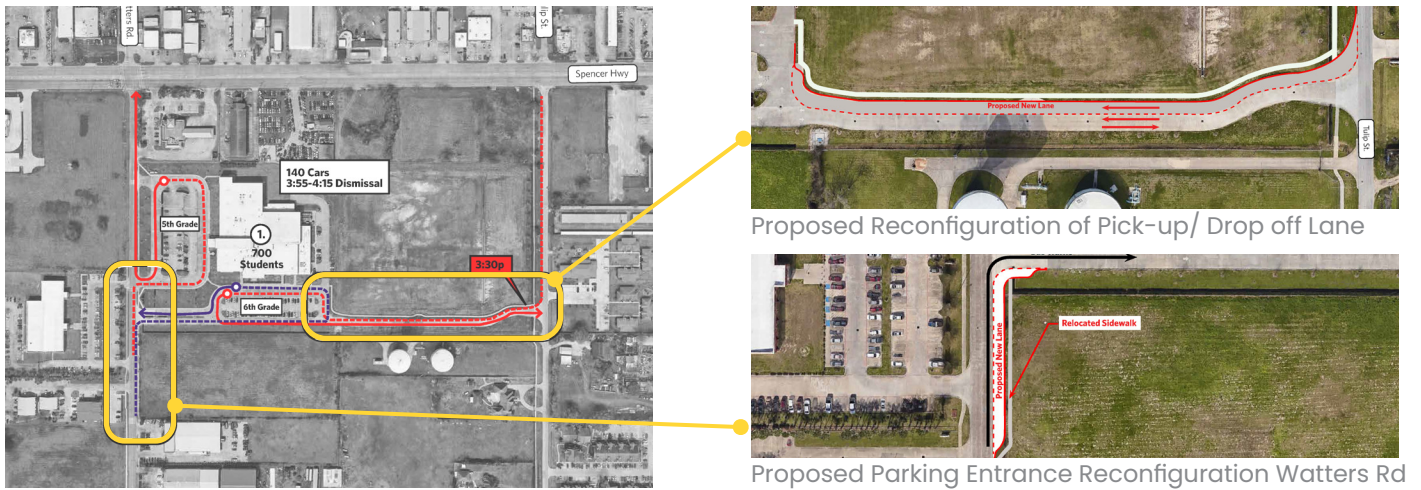


5 Establishing New parking lot at Jensen Elementary School

Based on community feedback, traffic congestion issues were identified during drop-off and pick-up hours. During agency calls with Jensen Elementary school, it was revealed that the traffic congestion on Vista Rd. is primarily caused by the absence of a

dedicated area for parents to drop off and pick up their children. Figure 47, illustrates the proposed recommendation that was developed in collaboration with Jensen’s leadership.

Figure 47: Road Configurations for Jensen Elementary School



4 Reconfiguration of Marshal Kendrick Middle School Drop-off/ Pick up Traffic Management

Based on community feedback, traffic congestion issues were identified during drop-off and pick-up hours. Following discussions with Marshall Kendrick Middle School, it was revealed that a dedicated turn lane for northbound traffic on Watters Rd. and an additional lane for accessing the middle school

while traveling south on Tulip St. would effectively resolve the traffic issues. The team collaborated with Marshall Kendrick’s leadership to develop the following two diagrams based on their input.

Figure 48: Proposed new parking at Marshal Kendrick Middle School



05

HCA Medical Campus Redevelopment Opportunity

OVERVIEW

OVERARCHING THEME

-  **Healthy Spaces**
-  **Healthy Community**
-  **Healthy Mobility**

PROJECT TYPE

-  **Project**
-  **Study**
-  **Partnership**

PROJECT GOALS

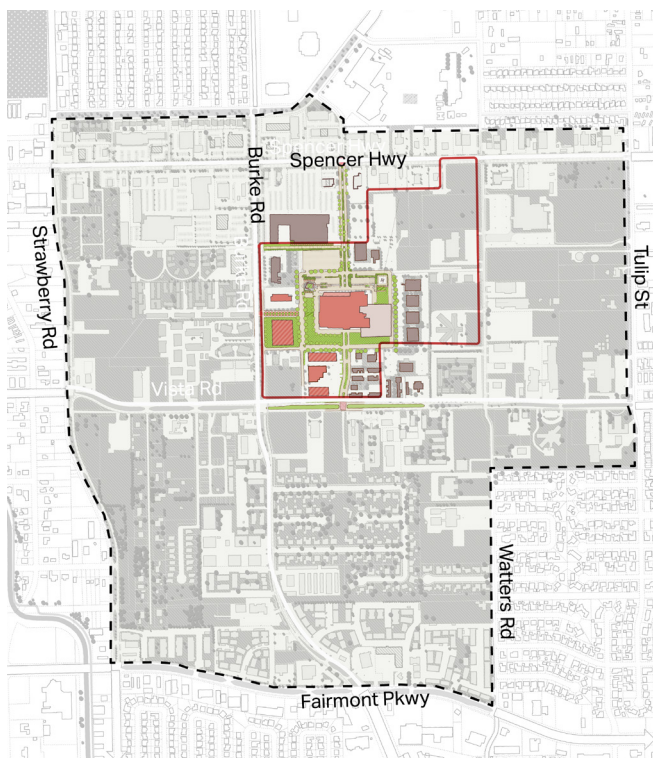
- PG1** Spur strategic planning for future growth
- PG2** Establish an environment of high quality
- PG4** Create safety through infrastructure
- PG6** Create additional green spaces through creative initiative
- PG7** Promote economic development

PROJECT PARTNER

- **HCA Medical Campus,**
- **City of Pasadena: Economic Development Cooperation**
- **City of Pasadena**

LIVABILITY PRINCIPLES

- LP1** Design walkable connecting streets
- LP2** Implement Healthy Parks Plan by adding thriving parks
- LP3** Encourage a destination for health & wellness
- LP4** Improve the connection to nodes of community activity
- LP5** Promote local economic development and employment



Desired Outcomes

HCA Medical District focuses on placemaking recommendations and development opportunities for the Medical District, aiming to establish a compelling destination that appeals to patrons in the region and serves as an attractive workplace for employees. The plan is designed to foster a strong connection with the local community and uphold values related to health, wellbeing, and safety. Developed in harmony with the medical campus masterplan, the placemaking conceptual plan comprises three core projects:

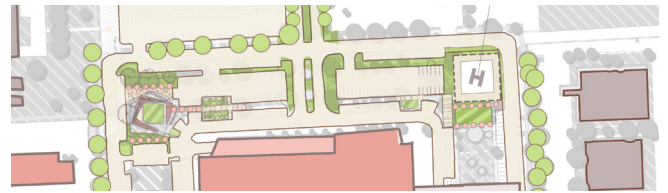
- Activation of pilot project – utilizing a vacant lot for temporary use generating interest, foot traffic, and addressing medical staff and visitors' immediate needs.
- A Pocket Park, connected to the Green Loop system

Near Term Strategies for Consideration

While the HCA medical campus will be developed in future, the immediate strategies prioritize enhancing connectivity, access, and green open spaces. One of these strategies involves establishing a branded intersection on Spencer Highway to create a distinct “sense of arrival” to the campus. Additionally, there are plans to collaborate with creative partnerships to transform various open spaces into functional parks for public use.

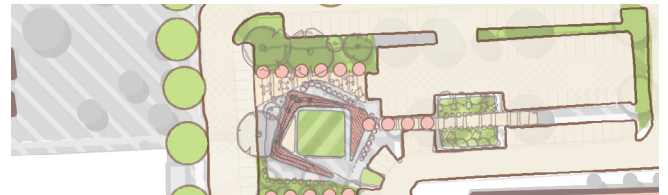
1 Green Space Network

The existing vacant areas can be transformed into primary and supporting green spaces, offering moments of relaxation and relief to both families of patients at the HCA medical campus and its staff.



2 North-West Park

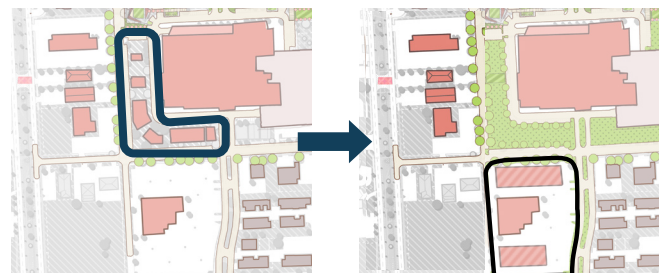
The suggested primary green open space is a pocket park situated to the northwest of the HCA building. This park will offer HCA employees, medical visitors, and patients a shaded sanctuary for moments of mental respite.



Long Term Strategies for Consideration

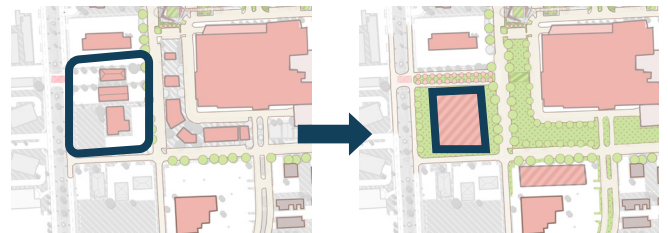
1 Opportunity to consolidate facilities in the Southwest Corner

The current facilities along the southwest edge of the HCA building can be combined into a single facility, situated at the designated location in adjacent image. Consequently, the existing site can be transformed into a functional green open space for utilization.



2 Consolidate Facilities on the west side of campus to establish a West Entrance

To create a pedestrian entrance from Burke Road, the facilities situated on the west of the campus can be consolidated into a single facility. This change is particularly beneficial since numerous residents in the surrounding area access the campus by walking.



06

Potential Development of Pedestrian Network

OVERVIEW

OVERARCHING THEME

-  **Healthy Spaces**
-  **Healthy Community**
-  **Healthy Mobility**

PROJECT TYPE

-  **Project**
-  **Study**
-  **Partnership**

PROJECT GOALS

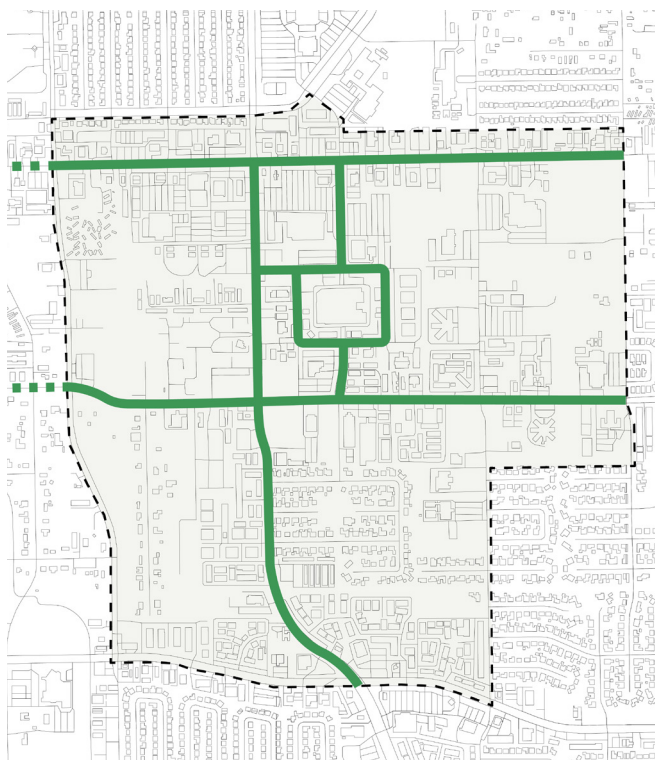
- PG1** Spur strategic planning for future growth
- PG3** Engage the public and community stakeholders
- PG4** Create safety through infrastructure
- PG5** Promote alternative transportation modes

LIVABILITY PRINCIPLES

- LP1** Design walkable connecting streets
- LP2** Implement Healthy Parks Plan by adding thriving parks
- LP3** Encourage a destination for health & wellness

PROJECT PARTNER

- HCA Medical Campus
- City of Pasadena: Economic Development Cooperation
- City of Pasadena



Desired Outcomes

The realization of a future green loop trail and pedestrian network will be possible upon the completion of the three roadway redesign projects and the redevelopment of the HCA Campus. This trail system is intended to facilitate connections within the diverse aging and generational community, offering walkable routes that open the area to various open spaces and convenient destinations. Figure 49 outlines key strategies that will help achieve a green and connected network.

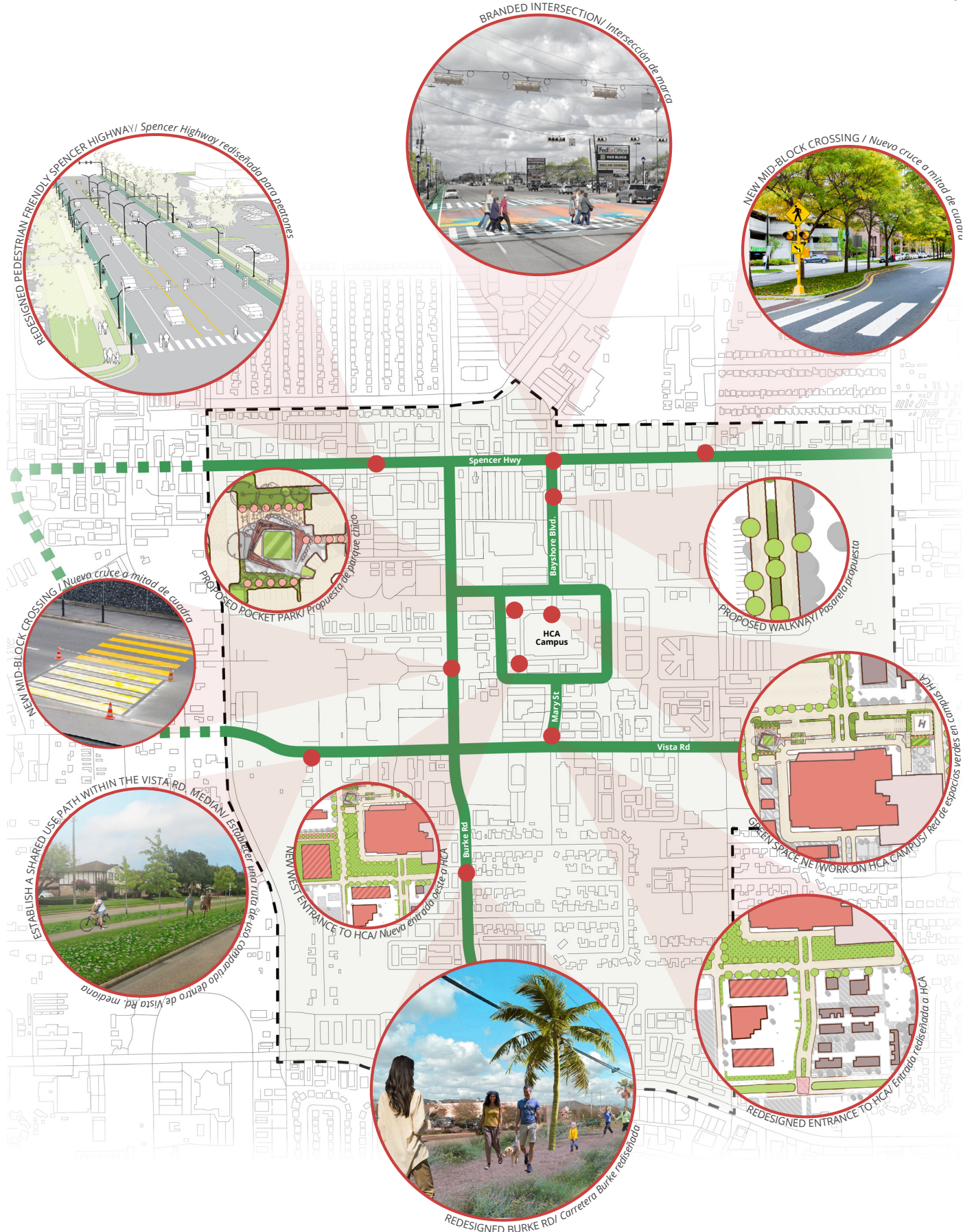


Figure 49: Proposed pedestrian network & key elements throughout study area

07

Enhancing Economic Development

OVERVIEW

OVERARCHING THEME



Healthy Spaces



Healthy Community



Healthy Mobility

PROJECT TYPE



Project



Study



Partnership

PROJECT GOALS



Spur strategic planning for future growth



Establish an environment of high quality



Promote economic development

LIVABILITY PRINCIPLES



Encourage a destination for health & wellness



Promote local economic development and employment

PROJECT PARTNER

- **City of Pasadena: Economic Development Cooperation**

Desired Outcomes

Initially, the aim of this recommendation was to transform Spencer Highway into a commercial district, making it an attractive destination for all commuters passing through. However, considering the recent Strategic Plan Five-Year Update, this recommendation has been broadened, and the strategies outlined below are now relevant to all business owners within the study area and the entire city:

1 Marketing and Image

SHARE SMALL BUSINESS WINS

Tell success stories about local small businesses with pride.

- Work with the Chamber to identify local businesses (both high-growth startups and mom-and-pop businesses) that have operated successfully in Pasadena.
- Interview the founders/owners of the identified businesses and distribute the results widely via social media.
- Leverage the Pasadena Loves Local campaign to gather relevant information from the community about the highest-performing small businesses.

2 Business Development

PROMOTE SMALL BUSINESS TOOLS

Continue investing in tools such as SizeUp Pasadena and other business intelligence tools and platforms that enhance the competitiveness of local businesses and support their growth.

- Increase awareness of the SizeUp Pasadena business intelligence tool and optimize its user-friendliness.
- Ensure that 100 percent of the tool's functionality is available in Spanish.
- Market the tool more aggressively to local small businesses.

3 Tourism and Retail

EXPAND PASADENA LOVES LOCAL

Fully fund and expand the Pasadena Loves Local initiative to grow small businesses.

- Secure the necessary funds to continue the Pasadena Cares Financial Assistance Grant Program.
- Increase the frequency and promotion of citywide events showcasing local businesses (e.g., a bar crawl).
- Advertise all Pasadena Loves Local events in the broader Houston metro area.

4 Tourism and Retail

PROMOTE SMALL BUSINESS TOOLS

Continue investing in tools such as SizeUp Pasadena and other business intelligence tools and platforms that enhance the competitiveness of local businesses and support their growth.

- Increase awareness of the SizeUp Pasadena business intelligence tool and optimize its user-friendliness.
- Ensure that 100 percent of the tool's functionality is available in Spanish.
- Market the tool more aggressively to local small businesses.

5 Support Structures

REVAMP PERMITTING

Revamp the City's permitting processes and policies to facilitate high-quality development, while maintaining community objectives and standards.

- Complete the planned transition to fully online permitting in conjunction with Tyler Technologies.
- Conduct a comprehensive review of the City's current ordinances that impact real estate developments, including those highlighted in the Appendix.

- Invite relevant City department staff responsible for permitting and development review to EDC business prospect meetings for retention/expansion opportunities and recruitment projects.

6 Support Structures

CREATE SMALL BUSINESS LIAISON

Create a new business liaison position (or potentially multiple positions), which would serve as the point person and designated advocate for local small business owners' needs.

7 Support Structures

MANAGE CAPACITY

Manage capacity by reviewing all economic development organizational resources and increasing funding where necessary

- Expand EDC staff capacity to meet the needs of existing and potential businesses, facilitate redevelopment projects, and align with staffing levels of competitor and peer EDCs across Texas. Full staffing for the EDC would require at least two (and up to four) additional staff, including a dedicated role for business development and a dedicated role for redevelopment and catalyst projects. Additional roles that would help the EDC deliver on its mission would include deputy director and an additional role focused on tourism and retail.
- Work with the City, the Chamber, and other partners to identify and communicate the need for additional professional staff at City departments responsible for planning, permitting, development review, code enforcement, public works, and other related functions.
- Work with the Chamber to ensure adequate staff capacity for its key supporting role as a partner in the EDC's strategic plan



Implementation Plan

06

06

Implementation Plan

Based on public survey and input from community, each recommendation was assessed to determine the social value the implemented project could have to the community. Table 13, indicates the communities perception on how they would like the recommendations implemented.

Table 14: Priority Scores

Priority Level	Score
High	18-23
Medium	13-18
Low	7 & Below

Table 13: Prioritization Factors

Creation of Local Jobs – Does the recommendation help induce the creation of new jobs within the study area?	1 Point
Bike and Pedestrian Accessibility – Does the recommendation help improve bike and pedestrian amenities? Does it help encourage the use of multi-modal travel?	3 Points
Area Beautification – Does the recommendation help beautify the study area?	2 Points
Ability to Leverage Non-Traditional Funding Mechanisms – Does the recommendation leverage additional funding sources, other than city funding?	2 Points
Implementation Feasibility – How easily can the recommendation be implemented?	3 Points
Improves Access to Open Space – Does the recommendation result in additional open space for the community? Is the open space accessible by multi-modal options?	2 Points
Promotes Walkability & Pedestrian Safety – Does the recommendation promotes overall safety for pedestrians and reduce conflicts between other modes?	3 Points
Positive Impact on City Tax Revenues – Does the recommendation help improve the value of parcels and assets?	1 Point
Positive Public Health Impact – Does the recommendation have a positive impact on the overall public health of the community? Does the recommendation help physically activate the community?	3 Points
Improves Congestion and Overall Traffic Safety – Does the recommendation help improve traffic and congestion within the study area?	3 Points

Table 15 indicates how projects ranked based on priority and time frame. Time frame indicates a general timeline as to how long it may take for a project to be fully implemented.

Table 15: Project Priority Table and Implementation Timeline

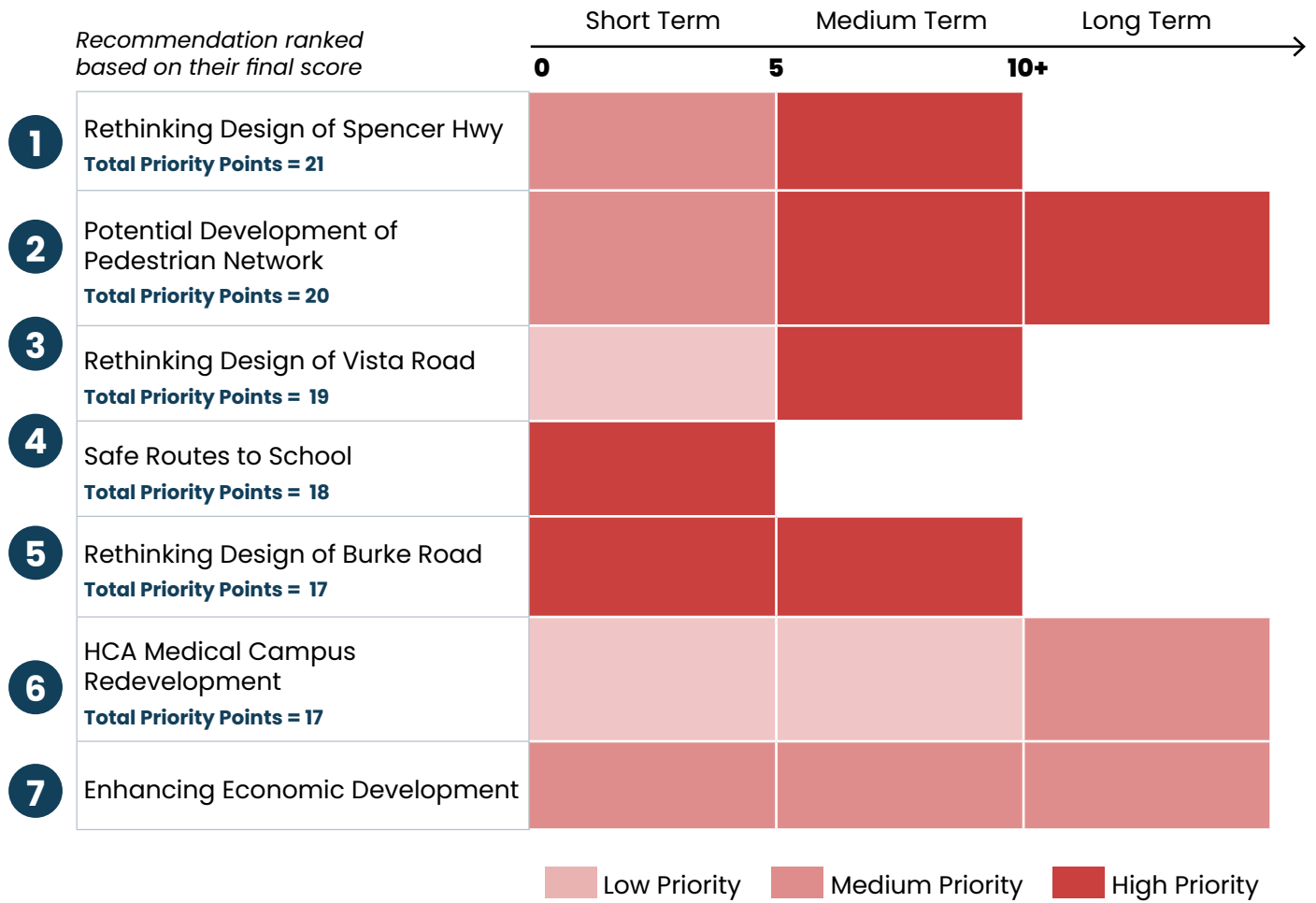


Table 16 summarizes an approximate rough order magnitude cost estimate for each of the recommendations that had actions requiring a budget. Recommendations 6 and 7 do not have associated costs, thus they have been excluded

from Table 16. Appendix A contains detailed planning level order of magnitude cost for every recommendation.

Table 16: Project Priority Table and Implementation Timeline

	RECOMMENDATION	COST	LOCAL FUNDING	TXDOT	STATE GRANTS	PRIVATE FUNDING
1	Rethinking Design of Spencer Highway	N/A				
2	Rethinking Design of Vista Road	\$2,206,471				
3	Safe Routes to School	\$ 972,288				
4	Rethinking Design of Burke Road	\$705,640				
5	HCA Medical Campus Redevelopment	\$6,151,226				
6	Potential Development of Pedestrian Network	N/A				
7	Enhancing Economic Development	N/A				

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Appendix

Final Report

Appendix A

Proposed Cost Estimation

01

Rethinking the Design of Spencer Highway

Overall Project Cost
N/A

There are no cost estimates for this recommendation as this recommendation is a study

02

Rethinking the Design of Burke Road

Overall Project Cost
\$705,640

ESTIMATED COST

Item	Qty	Unit	Unit Price	Cost	Assumptions
Repaint existing & New Crosswalks	6	EA	\$1,000	\$ 6,000	Assume Ladder Crosswalk Pavement Marking at Each Drive/ Street Crossing
Pedestrian Crosswalk Signage	36	SF	\$50	\$ 1,800	"Stop for Pedestrian" Signage, 10 in each direction
Standard Mid-Block Crossing	1	EA	\$4,000	\$ 4,000	Excludes Flashing Pedestrian Lights
Concrete Sidewalk	6072	LF	\$75	\$ 455,400	Assume 10' Wide Sidewalk Commercial Areas (1140 LF), 6' Sidewalk at Residential Areas (1400 LF)
ADA Curb Ramps	4	EA	\$1,200	\$ 4,800	2 curb ramps per crosswalk
General Conditions (15%)	1	LS	\$69,030	\$ 70,800	Assume 15% of Project Construction. Includes Permitting, Insurance, Fees, Mobilization, Etc.
Subtotal				\$542,800	
Design/Engineering & Construction Contingency (30%)				\$162,840	
TOTAL				\$705,640	

03

Rethinking the Design of Vista Road

Overall Project Cost
\$2,206,471

ESTIMATED COST

Item	Qty	Unit	Unit Price	Cost	Assumptions
Repaint existing & New Crosswalks	8	EA	\$1,000	\$ 8,000	Assume Ladder Crosswalk Pavement Marking at Each Drive/ Street Crossing
Pedestrian Crosswalk Signage	48	SF	\$50	\$ 2,400	"Stop for Pedestrian" Signage, 10 in each direction
Standard Mid-Block Crossing	1	EA	\$4,000	\$ 4,000	Excludes Flashing Pedestrian Lights
Branded Intersection (for branding the intersection and entrance)	6500	SF	\$7	\$ 45,500	
Shared Use Path on Median	5000	LF	\$150	\$750,000	10' wide, Asphalt Surface w/ DGA base
Pedestrian Light Pole	100	EA	\$4,500	\$450,000	Assume 60' Spacing
Shared Use Path Intersection Crossing synchronization (Crosswalk at intersections)				\$ 8,000	
Shared Use Path Intersection Crossing synchronization (Flashing Pedestrian sign)	16	EA	\$13,000	\$208,000	2 signs per pedestrian crossing, one posted in each direction
General Conditions (15%)	1	LS	\$180,000	\$221,385	Assume 15% of Project Construction. Includes Permitting, Insurance, Fees, Mobilization, Etc.
Subtotal				\$1,697,285	
Design/Engineering & Construction Contingency (30%)				\$509,186	
TOTAL				\$2,206,471	

04

Safe Routes to School

Overall Project Cost
\$972,288

ESTIMATED COST

Item	Qty	Unit	Unit Price	Cost	Assumptions
Concrete Sidewalks	25000	SF	\$6	150,000	Assume 2500 LF of Walks at 10' Wide.
Pedestrian Crosswalk Signage	9	SF	\$50	\$450	"Stop for Pedestrian" Signage
Standard Mid-Block Crossing	1	EA	\$4,000	\$4,000	Excludes Flashing Pedestrian Lights
School Signage	18	SF	\$50	\$900	"School Zone" Signage
Speed Limit Signage	1	EA	\$5,500	\$5,500	Driver Speed Feedback Signs - Fixed on pole
Removal of concrete curb for pick up lane reconfiguration	800	Linear Foot	\$ 15.00	\$ 12,000	Length of configuration times cost of removal of existing curbs
Construction of new pavement for reconfigured parking lane	1000	Sq Yard	\$ 72	\$ 72,000	Area of configuration times cost of constructing new pavement
Removal of concrete curb for road reconfiguration	250	Linear Foot	\$ 15	\$ 3,750	Length of configuration times cost of removal of existing curbs
Construction of new pavement for reconfigured parking entrance	330	Sq Yard	\$ 72	\$ 23,760	Area of configuration times cost of constructing new pavement
New Parking Lot	1500	Sq Yard	\$72.	\$108,000	Area times asphalt cost per unit
Lighting - Safety	60	EA	\$4,500	270,000	Pedestrian light poles.
General Conditions (15%)	1	LS	\$64,627	\$97,554	Assume 15% of Project Construction. Includes Permitting, Insurance, Fees, Mobilization, Etc.
Subtotal				\$747,914	
Design/Engineering & Construction Contingency (30%)				\$224,374	
TOTAL				\$ 972,288	

05

HCA Medical Campus Redevelopment Opportunity

Overall Project Cost

\$6,151,226

ESTIMATED COST

Item	Qty	Unit	Unit Price	Cost	Assumptions
SWPPP and Tree Protection	1	LS	\$20,000	\$ 20,000	
Concrete Sidewalk	18000	SF	\$6	\$ 108,000	Assume 10' Sidewalks in 4x3 Grid Covering Side
Special Paving	3000	SF	\$15	\$ 45,000	Assume Unit Pavers in Focal Point Areas
Seating/Planter Walls	1320	LF	\$100	\$132,000	Assume 18" Height. Cast in Place Concrete. 6 Planters at 100'x10'
Benches	16	EA	\$1,500	\$ 24,000	
Trash receptacles	8	EA	\$1,200	\$ 9,600	
Drinking Fountain	1	EA	\$8,000	\$ 8,000	
Bike Racks	8	EA	\$650	\$ 5,200	
Furnish and Place Topsoil	2200	CY	\$60	\$ 132,000	Assume 6" Average Topsoil
Ornamental Planting	20000	SF	\$4	\$ 80,000	Assume all planters plus 10' along building edge
Trees	110	EA	\$500	\$ 55,000	Assume 40 Trees Per Acre
Seeded Turf	12100	SY	\$2.25	\$ 27,225	
Safety Lighting	30	EA	\$4,500	\$ 135,000	Pedestrian Light Poles
Decorative Lighting	1	ALLOW	\$50,000	\$ 50,000	Tree Uplights, Collard Lights, or Other Decorative Lighting
Site Electrical Service	1	LS	\$20,000	\$ 20,000	
Technology	1	Allow	\$30,000	\$ 30,000	Device Charging Stations, Public Wifi Service
Irrigation System	2.75	AC	\$15,000	\$ 41,250	Assume turf areas and planters to be irrigated
Site Improvements		SF	\$20	\$ 3,779,437	
Misc Site Utilities	1	LS	\$50,000	\$ 30,000	Water Line and Other Miscellaneous Utility Costs
General Conditions (15%)	1	LS	\$142,841	\$ 709,757	Assume 15% of Project Construction. Includes Permitting, Insurance, Fees, Mobilization, Etc.
Subtotal				\$ 4,731,712	
Design/Engineering & Construction Contingency (30%)				\$ 1,419,514	
TOTAL				\$ 6,151,226	

06

Potential Development of Pedestrian Network

Overall Project Cost

N/A

There are no cost estimates for this recommendation as the pedestrian network would be an outcome if all recommendations listed are implemented.

07

Enhancing Economic Development

Overall Project Cost

N/A

There are no cost estimates for this recommendation as these actions are policies and/or grants made available for all small business.

Appendix B

Air Quality Benefits Estimate

Background

The ultimate goal of the recommendations in this report is to improve livability within the study area. One of the factors that contributes to livability is air quality. Many of the project recommendations, such as street improvements, green connections, safe routes to school, have positive implications for improved air quality, as they aim at reducing or eliminating the number of car-based trips that are made. This will also result in a reduction of toxic emissions from cars, such as Nitric Oxides (NO_x), Volatile Organic Compounds (VOC), and Carbon Monoxide (CO).to creating safe, convenient, and desirable communities.

Methodology

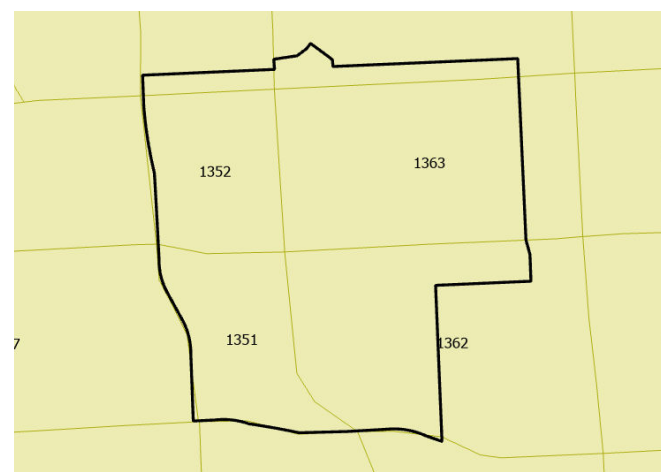
The calculations below projected a simplified estimate of the potential emissions reductions and air quality benefits derived by implementing recommendations within the study area.

Primary inputs include Traffic Analysis Zone (TAZ) level socio-economic data such as households and population and related Auto Origin-Destination (O-D) trip rates. The methodology provides guidance for incorporating the impacts of trip generators, mode shift rates, and trip lengths as well as account for land use changes, increased densities, and other mode shift benefits.

STEP 1 Catchment Area

The Healthy Pasadena study boundary was defined as the catchment area to determine the number of trips that would potentially be affected by project recommendations. The data used for our emissions calculations are derived from 7 Traffic Analysis Zones (TAZs) that constitute our study area as per H-GAC's Travel Demand Forecast Model (See Figure 50).

Figure 50: Catchment Area



Source: AECOM

Catchment Area

- Study Area
- Traffic Analysis Zones (TAZs)

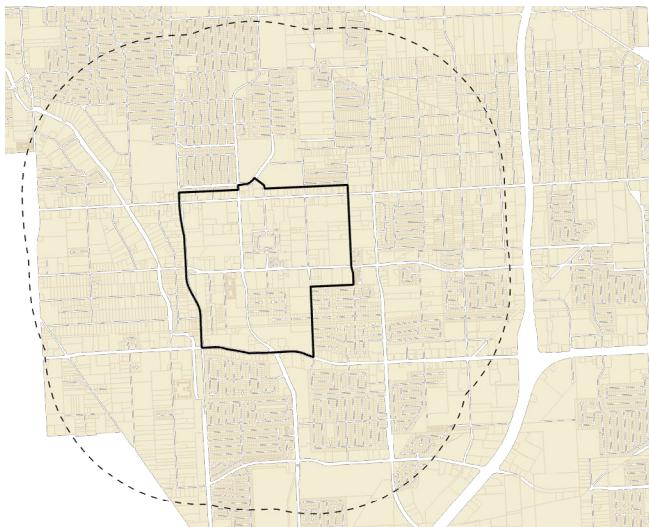
STEP 2 Trip Flows

Regional trip generation rates, based on Houston Galveston Area Council 2018- Travel Demand Forecast Model Auto O-D All Trips Tables, were used to estimate the total trips produced in and around the catchment area, for years 2018 to 2045. Following types of trips were considered in calculation:

- Trips that take place within the designated study area (Internal to Internal) trips only.
- Trips that originate from 1 mile buffer around the catchment area to the inside of the study area (External to Internal trips).
- Trips that are destined to zones outside from the catchment area (Internal to External trips) are also calculated to incorporate the effects of bicycle infrastructure such as bike lanes that may pass through the study area.

Table 17 summarizes the trip generation and flows from 2018-2045.

Figure 51: Trip Calculation Buffer Area



Source: AECOM

Catchment Area

- Study Area
- 1 mile Buffer

Table 17: Trip Generation & Flows

Year	Auto LC Internal Daily Trips	Bike Buffer Zone to LC Zone Daily Trips	LC Center to Bike Buffer Zone Daily Trips
2018	2461.0	5391.1	5967.8
2019	2445.6	5359.7	5937.2
2020	2430.4	5328.4	5906.7
2021	2415.2	5297.3	5876.5
2022	2400.2	5266.4	5846.3
2023	2385.2	5235.6	5816.3
2024	2370.3	5205.1	5786.5
2025	2355.5	5174.7	5756.8
2026	2353.8	5178.9	5761.8
2027	2352.0	5183.2	5766.8
2028	2350.3	5187.4	5771.7
2029	2348.5	5191.7	5776.7
2030	2346.8	5195.9	5781.7
2031	2345.0	5200.2	5786.7
2032	2343.3	5204.4	5791.7
2033	2341.5	5208.7	5796.7
2034	2339.8	5213.0	5801.7
2035	2338.0	5217.2	5806.7
2036	2336.3	5221.5	5811.7
2037	2334.5	5225.8	5816.7
2038	2332.8	5230.1	5821.8
2039	2331.0	5234.4	5826.8
2040	2329.3	5238.6	5831.8
2041	2327.6	5242.9	5836.8
2042	2325.8	5247.2	5841.9
2043	2324.1	5251.5	5846.9
2044	2322.4	5255.8	5852.0
2045	2320.6	5260.1	5857.0

Source: Houston Galveston Area Council 2018- Travel Demand Forecast Model Auto O-D All Trips Tables

STEP 3

Mode Shift Rate

The mode shift rate is the percent change from car trips to non-car trips such as walking, biking or use of Transit. This is the primary factor assumed in trip reduction. In order to estimate the modal shift based on site recommendations, following factors were considered:

PEDESTRIAN MODE SHIFT: The mode shift to pedestrian activities is based on the proportion of new sidewalk coverage relative to the maximum possible sidewalk coverage with the study area:

- New Sidewalks Coverage (A) = 31,019 ft
- Total Max. Sidewalk Coverage (B) = 101,486 ft
- Share of New Sidewalk Coverage (C-A/B) = 31%
- Pedestrian Modal Shift (PedMS = C*0.27 = 8.3%)

BIKE MODE SHIFT: New bike riders are calculated separately for trips within the study area and trips originating from or destined to areas outside the study area. Based on various studies, mode shift rates of 1.72% and 1% were used for internal and external Auto O-D trips, respectively.

TRANSIT MODE SHIFT: No new transit routes or stops were recommended and hence there were no modal shifts from car to transit calculated here.

INFRASTRUCTURE MODE SHIFT: This shift constitutes share of mode shift due to infrastructure improvements, such as accessible sidewalks, continuous pedestrian movement, etc. With respect to the proposed pedestrian connections within the study area, **56.3% of total modal shift will be pedestrian trips** and remaining **43.7% will be bike trips**.

Table 18 summarizes modal shifts from 2018 to 2045

Table 18: Daily Mode Shift

Year	Auto LC Internal Daily Trips	New Pedestrian Daily Trips	New Bike Daily Trips
2018	2461.0	203	156
2019	2445.6	202	155
2020	2430.4	201	154
2021	2415.2	199	153
2022	2400.2	198	152
2023	2385.2	197	152
2024	2370.3	196	151
2025	2355.5	194	150
2026	2353.8	194	150
2027	2352.0	194	150
2028	2350.3	194	150
2029	2348.5	194	150
2030	2346.8	194	150
2031	2345.0	194	150
2032	2343.3	193	150
2033	2341.5	193	150
2034	2339.8	193	150
2035	2338.0	193	150
2036	2336.3	193	151
2037	2334.5	193	151
2038	2332.8	193	151
2039	2331.0	192	151
2040	2329.3	192	151
2041	2327.6	192	151
2042	2325.8	192	151
2043	2324.1	192	151
2044	2322.4	192	151
2045	2320.6	192	151

Source: Lasley, P. et al. (2017). Estimating Congestion Benefits of Transportation Projects with FIXiT 2.0: Updating and Improving the Sketch Planning Tool. Texas A&M Transportation Institute.

STEP 4 VMT Reduction

In this step, daily trip reductions from mode-shift to walking, biking or transit is calculated taking into account the Average Trip Distance (from 2017 National Household Travel Survey). Trip reductions as a result of Built-environment or Land-use mix are also calculated.

Table 20 shows average trip distance values considered for VMT calculations

Table 20: Average Trip Distance

	Equation	Trip Distance (Miles)
Average Pedestrian Trip Distance	New Ped Trips * Ave. Trip Distance	0.87
Average Bike Trip Distance	New Bike Trips * Ave. Trip Distance	2.38
Average Transit Trip Distance	New Transit Trips * Ave. Trip Distance	6.42

Source: 2017 National Household Travel Survey

Table 19 summarizes VMT Calculation for years 2018 to 2045

Based on new pedestrian and new bike daily trips obtained in previous steps, following total VMT reductions were calculated:

169

Average Pedestrian
Daily VMT Reduction
(2018 - 2045)

360

Average Bike Daily
VMT Reduction
(2018 - 2045)

Table 19: Daily VMT Reduction

Year	Pedestrian Daily VMT Reduction	Bike Daily VMT Reduction	Transit Daily VMT Reduction
2018	177	371	0
2019	176	369	0
2020	174	367	0
2021	173	365	0
2022	172	363	0
2023	171	361	0
2024	170	359	0
2025	169	357	0
2026	169	357	0
2027	169	357	0
2028	169	357	0
2029	169	357	0
2030	168	357	0
2031	168	357	0
2032	168	358	0
2033	168	358	0
2034	168	358	0
2035	168	358	0
2036	168	358	0
2037	168	358	0
2038	167	359	0
2039	167	359	0
2040	167	359	0
2041	167	359	0
2042	167	359	0
2043	167	359	0
2044	167	359	0
2045	167	360	0

Source: Houston Galveston Area Council 2018- Travel Demand Forecast Model Auto O-D All Trips Tables

STEP 5 Air Quality Benefits

In the final step, the Emissions reductions from the VMT reduction are calculated using emissions factors- specific to Houston- Galveston-Brazoria area- from Texas A&M Transportation Institute’s (TTI) Mobile Source Emissions Reduction Strategies (MOSERS) reference tool. The total annual emissions (ton/year) are calculated separately for each pollutant and includes emission outputs from Engine Starts and Running.

Table 21 shows overall VMT calculation for year 2018 to 2045, in order to calculate emissions.

Key emission takeaways are:

0.66

Carbon Monoxide
(Ton/Year)

0.03

Nitrogen Oxides
(Ton/Year)

0.04

Volatile Organic
Compounds
(Ton/Year)

56

Carbon Dioxide
(Ton/Year)

Table 21: Daily VMT Reduction

Year	Total Daily VMT Reduction	Total Annual VMT Reduction
2018	548	199,938
2019	545	198,767
2020	541	197,603
2021	538	196,446
2022	539	196,729
2023	536	195,577
2024	533	194,431
2025	530	193,292
2026	533	194,704
2027	533	194,710
2028	533	194,715
2029	533	194,721
2030	537	196,128
2031	537	196,133
2032	537	196,138
2033	537	196,144
2034	537	196,149
2035	541	197,550
2036	541	197,555
2037	541	197,560
2038	541	197,565
2039	541	197,570
2040	541	197,575
2041	541	197,580
2042	541	197,586
2043	541	197,591
2044	541	197,597
2045	541	197,603

Source: 2020 Mobile Source Emissions Reduction Strategies (MOSERS)

Summary

Table 22: Summary of Emission Calculations

Year	Auto LC Internal Daily Trips	New Pedestrian Daily Trips	New Bike Daily Trips "	New Daily Transit Trips	General Auto Trip Reduction Due to Density Daily Trip	Total Daily Trip Reduction
2021	2062.636037	199	153	0	0	53
2022	2047.120534	198	152	0	3	53
2023	2034.267304	197	152	0	3	53
2024	2021.494691	196	151	0	3	53
2025	2008.80219	194	150	0	3	53
2026	2004.613473	194	150	0	5	53
2027	2002.943211	194	150	0	5	53
2028	2001.274049	194	150	0	5	53
2029	1999.605987	194	150	0	5	53
2030	1995.431051	194	150	0	8	53
2031	1993.767057	194	150	0	8	53
2032	1992.104159	193	150	0	8	53
2033	1990.442355	193	150	0	8	53
2034	1988.781644	193	150	0	8	53
2035	1984.6234	193	150	0	10	54
2036	1982.966738	193	151	0	10	54
2037	1981.311166	193	151	0	10	54
2038	1979.656681	193	151	0	10	54
2039	1978.003284	192	151	0	10	54
2040	1976.350973	192	151	0	10	54
2041	1974.699748	192	151	0	10	54
2042	1973.049607	192	151	0	10	54
2043	1971.40055	192	151	0	10	54
2044	1969.752575	192	151	0	10	54
2045	1968.105682	192	151	0	10	54
Planning Horizon Totals		4,842	3,767	0	177	13,4
Planning Horizon Averages		194	151	0	7	53

Family VMT Reduction	Total Annual VMT Reduction	CO (ton/year)	NOx (ton/year)	VOC (ton/year)	CO2 (ton/year)	PM10 (ton/year)
8	196,446	1.28	0.07	0.08	77	0.00
9	196,729	1.22	0.07	0.08	75	0.00
6	195,577	1.15	0.06	0.07	72	0.00
3	194,431	1.07	0.06	0.07	69	0.00
0	193,292	1.00	0.05	0.07	66	0.00
3	194,704	0.92	0.05	0.06	64	0.00
3	194,710	0.86	0.04	0.06	62	0.00
3	194,715	0.79	0.04	0.05	60	0.00
3	194,721	0.73	0.04	0.05	59	0.00
7	196,128	0.68	0.03	0.04	58	0.00
7	196,133	0.63	0.03	0.04	56	0.00
7	196,138	0.58	0.03	0.04	55	0.00
7	196,144	0.55	0.03	0.03	54	0.00
7	196,149	0.51	0.02	0.03	53	0.00
1	197,550	0.49	0.02	0.03	53	0.00
1	197,555	0.47	0.02	0.03	52	0.00
1	197,560	0.45	0.02	0.03	52	0.00
1	197,565	0.44	0.02	0.02	51	0.00
1	197,570	0.42	0.02	0.02	51	0.00
1	197,575	0.42	0.02	0.02	51	0.00
1	197,580	0.39	0.02	0.02	48	0.00
1	197,586	0.37	0.02	0.02	45	0.00
1	197,591	0.35	0.02	0.02	43	0.00
1	197,597	0.33	0.01	0.02	40	0.00
1	197,603	0.31	0.01	0.02	38	0.00
50	4,909,352	16.41	0.81	1.02	1,403	0.03
8	196,374	0.66	0.03	0.04	56	0.00