Houston-Galveston Area Council

Friendswood Active Transportation Plan

Appendix 1: Existing Conditions Assessment

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Executive Summary

This Existing Conditions Assessment provides a comprehensive review of the current state of active transportation in Friendswood, Texas. It establishes the foundational understanding necessary to inform the City's forthcoming Active Transportation Plan. Key findings reflect existing demographic, environmental, safety, and infrastructure conditions that influence how residents walk, bike, and roll in the community today. This assessment will serve as the basis for the next phase of the Active Transportation Plan, guiding opportunity identification, public engagement, and project prioritization.

The People of Friendswood

Friendswood's steady growth and suburban character influence the city's mobility needs. Most neighborhoods are single-family residential with limited mixed-use development. The population is diverse in age, with nearly 28% under 18 and 16% over 65, indicating strong demand for infrastructure that serves both youth and aging adults. Many residents commute by car, with average one-way commutes around 29 minutes. A small but notable portion (5.5%) of the population lacks access to a personal vehicle, highlighting the importance of non-driving transportation options. While most residents report good general health, disparities do exist, emphasizing the role of active transportation infrastructure in promoting healthier, more active lifestyles. The city's age diversity, household characteristics, and health disparities necessitate a comprehensive approach to active transportation. Children need safe routes to schools and parks, while older adults benefit from infrastructure that promotes aging in place.

Where People Live, Work, and Go

Key destinations, such as schools, parks, and commercial corridors, are concentrated along FM 528 and FM 518. The city hosts numerous parks, religious centers, and nine schools - key generators of active transportation trips. These thoroughfares are essential to connect via active transportation, especially with new developments underway and planned in the future. However, many neighborhoods remain disconnected from these areas.

Sidewalks, Trails, and Other Infrastructure Today

Friendswood has approximately 200 miles of sidewalks, 7.71 miles of off-street trails, and one marked bike lane, but active transportation infrastructure is fragmented. The sidewalk infrastructure is strongest in newer subdivisions and southeastern neighborhoods, but older central areas often lack basic sidewalk coverage. Neighborhood sidewalks rarely connect to commercial corridors or schools. Trails are well-maintained but primarily serve as recreational assets in parks or along neighborhood easements and are not well connected to key destinations. Gaps in the sidewalk and bike networks limit safe, continuous travel. However, wide road shoulders and underused easements present opportunities for cost-effective network expansion.

Friendswood's Natural and Built Environment

Environmental factors such as urban heat islands, limited shade, and flood-prone areas pose barriers to year-round active transportation. Friendswood's terrain and clay-rich soils affect drainage, and nearly 40% of the city lies within FEMA-designated flood zones. However, existing tree canopies, riparian corridors, and ecological zones present opportunities to integrate nature-based solutions for shading and trail development.

Safety Considerations

FM 528 and FM 518 are high-potential corridors for walking and biking but currently pose safety risks. Between 2020–2024, there were 34 reported pedestrian and bicyclist crashes, three of them fatal and five resulting in serious injuries. Over half occurred at non-intersection locations and nearly 85% happened near walkable destinations like schools, churches, and grocery stores. Lack of street lighting contributed to 15% of crashes. Failure to yield and driver inattention were leading contributing factors, emphasizing the need for traffic calming and visibility enhancements.

Walking and Rolling in Friendswood

Analysis of trip patterns shows most walking and biking trips originate and end within the same neighborhoods, particularly those with complete sidewalk networks. Trips are largely local and concentrated near destinations like downtown, parks, and schools. There is strong potential for mode shift if infrastructure gaps are addressed, particularly near schools, parks, and commercial centers.

Conclusion

The City of Friendswood has a strong foundation of community assets and public support for enhanced mobility. The existing conditions assessment reveals that while Friendswood has a strong foundation of sidewalk and trail infrastructure in some areas, the network is incomplete, disjointed, and inadequately connected to key destinations. By addressing infrastructure gaps, improving access to destinations, and prioritizing safety, Friendswood can create a resilient, safe, and connected active transportation network that improves mobility, supports public health, and enhances quality of life for all residents.

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Introduction

The City of Friendswood, in partnership with the Houston-Galveston Area Council (H-GAC), is developing a citywide active transportation plan focusing on connecting residents, workers, and visitors to community assets such as parks, schools, and other important destinations. Building on existing plans and completed, ongoing, and planned improvements to the multimodal network, the active transportation plan will focus on improving connectivity and safety of pedestrians and cyclists by conducting an existing conditions assessment, public involvement, opportunity analysis, and making recommendations on actionable strategies. The result will be an implementable plan that envisions Friendswood as safe, resilient, and multimodal with better access to parks, trails, commercial and retail centers, and homes.

Evaluating existing active transportation infrastructure assets will enable the City of Friendswood to develop a strategic roadmap for future active transportation investments in the community. This Existing Conditions Assessment contains a detailed analysis of existing active transportation conditions, land uses, demographics, natural and built environment, and previously completed planning efforts. This information is critical to analyze in order to create data-driven and feasible recommendations. By understanding current conditions and community context, the City of Friendswood, H-GAC, and other partners can ensure that future investments are grounded in local needs and positioned for successful implementation. For this study, "active transportation" refers to any human-powered mode of travel, primarily walking, biking, and the use of mobility devices such as e-scooters, wheelchairs, or skates. Active transportation infrastructure refers to the infrastructure supporting these modes, such as sidewalks, bike lanes, trails, and safe street crossings.

This memo is organized into the following sections:

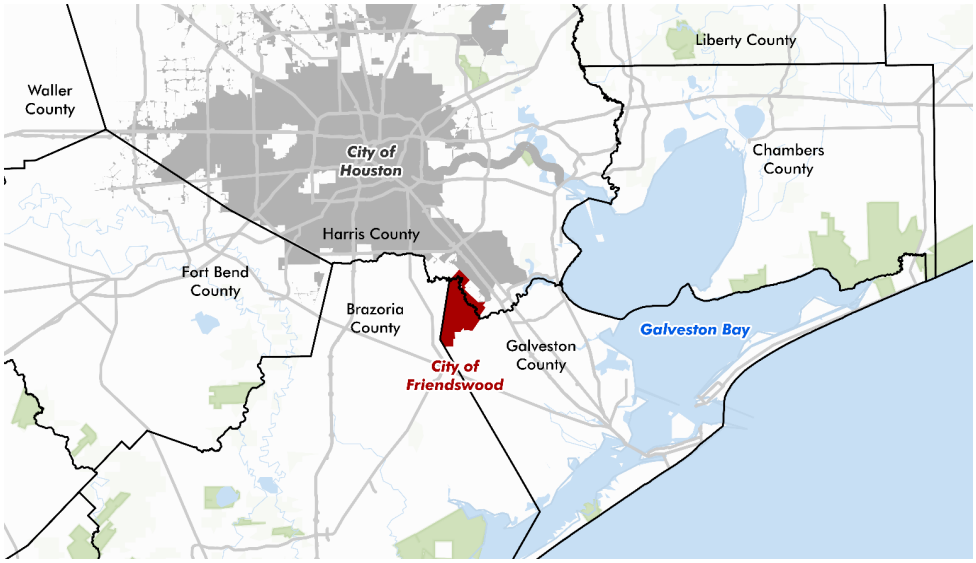
- **The People of Friendswood:** A review of existing demographic characteristics, such as median age, income, and public health considerations. This information provides context for understanding influences on current travel behaviors and will inform opportunity identification to improve access and mobility for all residents.
- **Sidewalks, Trails, and Other Infrastructure Today:** An analysis of existing active transportation and roadway infrastructure, including sidewalks, trails, bike lanes, and roadway infrastructure.
- **Friendswood's Natural and Built Environment:** An overview of the natural environment characteristics and built environment influences and how these conditions shape opportunities and challenges for active transportation, such as climate, air quality, drainage patterns, flood-prone areas, green spaces, tree canopy coverage, and ecological corridors.
- **Where People Live, Work, and Go:** An assessment of popular destinations, activity centers, and trip generators, such as schools, parks, and major employment areas, as well as existing and future land uses.

- **Safety Considerations:** An analysis of bicycle and pedestrian crashes in Friendswood between 2020- 2024, including crash location, severity, and contributing factors.
- **Walking and Rolling in Friendswood:** An analysis of existing bicycle and pedestrian trip patterns to understand who is currently using these modes and where.
- **Previous Planning Efforts Studies:** A review of relevant previous planning efforts and studies, highlighting recommendations and community input related to active transportation.

The People of Friendswood

The City of Friendswood is a suburban community located to the southeast of the City of Houston and is in both Harris and Galveston counties. The city is mostly within Galveston County and is just south of Interstate 45 (I-45). **Figure 1** displays Friendswood in relation to the broader Houston region.

Figure 1. Friendswood Location Map



The City of Friendswood was founded in 1895 by a modest agricultural settlement of Quakers, rooted in values of community, education, and faith – where the community's name originated.[1] The City was incorporated in 1960 and has evolved into a thriving suburban community over the decades. Growth spurred in the 60's around the time of incorporation due to nearby NASA developments.[1] According to the City's website, the community boasts well-maintained neighborhoods and a strong sense of civic pride that continues to attract families and professionals alike. Students in the community attend schools in Clear Creek Independent School District (ISD) and Friendswood ISD, both highly ranked schools in Texas, making it an attractive community for families of school-aged children.[1] **Figure 2** shows the

[1] City of Friendswood. (2025). *History of Friendswood.* Retrieved from: https://www.ci.friendswood.tx.us/402/History-of-Friendswood.

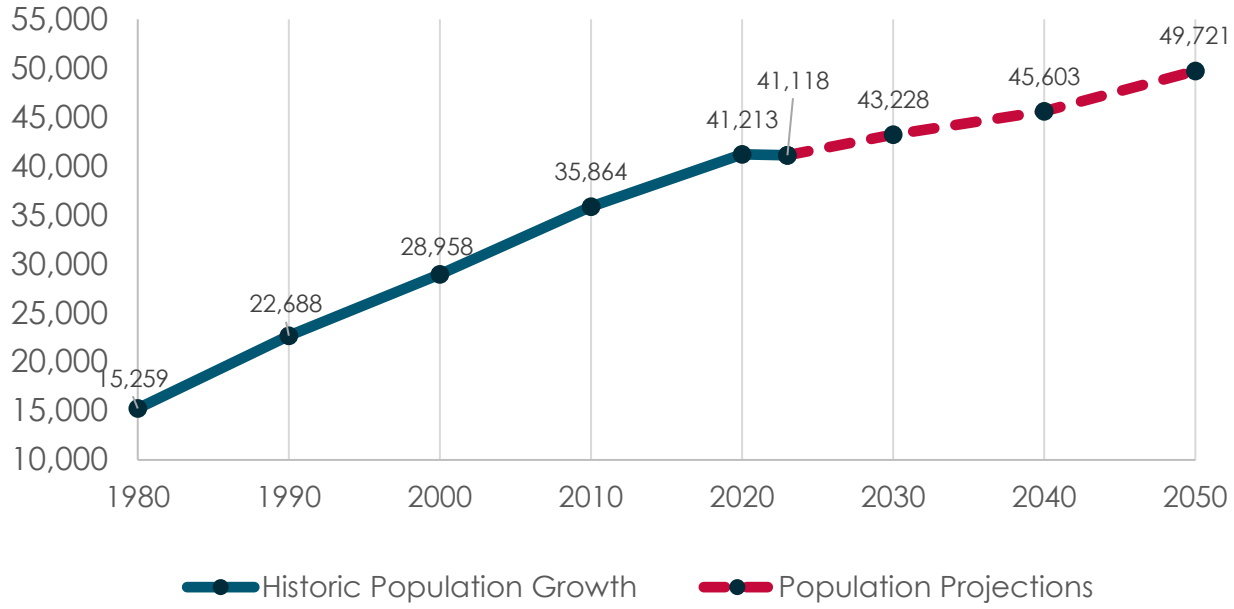
study area boundary, city limits of the City of Friendswood and surrounding communities, schools, and parks, both important local destinations to connect to via walking or rolling.

This section of this report provides a demographic overview of the community of Friendswood, highlighting key population characteristics such as age distribution, household composition, racial and ethnic makeup, and educational attainment. These demographic trends can play a significant role in shaping the way residents and visitors interact with the built environment through walking and biking. Understanding who lives in Friendswood will help to inform this plan's overall recommendations.

Figure 2. Friendswood City Limits

Friendswood Today

Today, Friendswood has a total population of 41,118.[2] Historic population trends show that Friendswood has experienced steady population growth since 1980 and is expected to continue to grow by 17% (between 2024-2050) to almost 50,000 by 2050, as shown in **Figure 3**.[3] The annual average growth rate of 1.72% per year is in line with the regional average annual growth rate of 1.4% year-over-year.[3] **Figure 3** combines historic Census data with H-GAC's Regional Growth Forecast to create a picture of the City's historic and projected growth indicators.



Data Source: Decennial Census, H-GAC Regional Growth Forecast

Figure 3. Historic Growth and Population Forecast

Table 1 provides a demographic snapshot of the City of Friendswood compared to neighboring cities, counties, and regional benchmarks. Friendswood has the highest median household income ($125,470) of the surrounding communities and the H-GAC region (e.g., League City is 4.5% less, Pearland is 10.4% less, H-GAC region is 28.9% less than Friendswood). Nearly 77% of houses in Friendswood are owner-occupied. The median age in Friendswood (39.7) and average household size (2.85) are higher than the surrounding communities. Along with Pearland, Friendswood's share of residents under 18 (27.8%) is the highest in the area. Its percentage of residents over 65 (15.8%) is also among the top, indicating a broad age range

[2] City of Friendswood. (2025). *Demographics.* Retrieved from: https://www.ci.friendswood.tx.us/399/Demographics.
[3] Houston-Galveston Area Council. (2024). *Regional Growth Forecast.* Retrieved from: https://www.h-gac.com/regional-growth-forecast.

that active transportation infrastructure must accommodate. The average commute time in Friendswood (28.8 minutes) is moderate compared to the region, shorter than Pearland (33.5 minutes or 16.3% higher than Friendswood) but slightly longer than the state average (26.7 minutes or 7.3% lower than Friendswood).

Table 1. Friendswood and Comparison Geography's Demographic Statistics

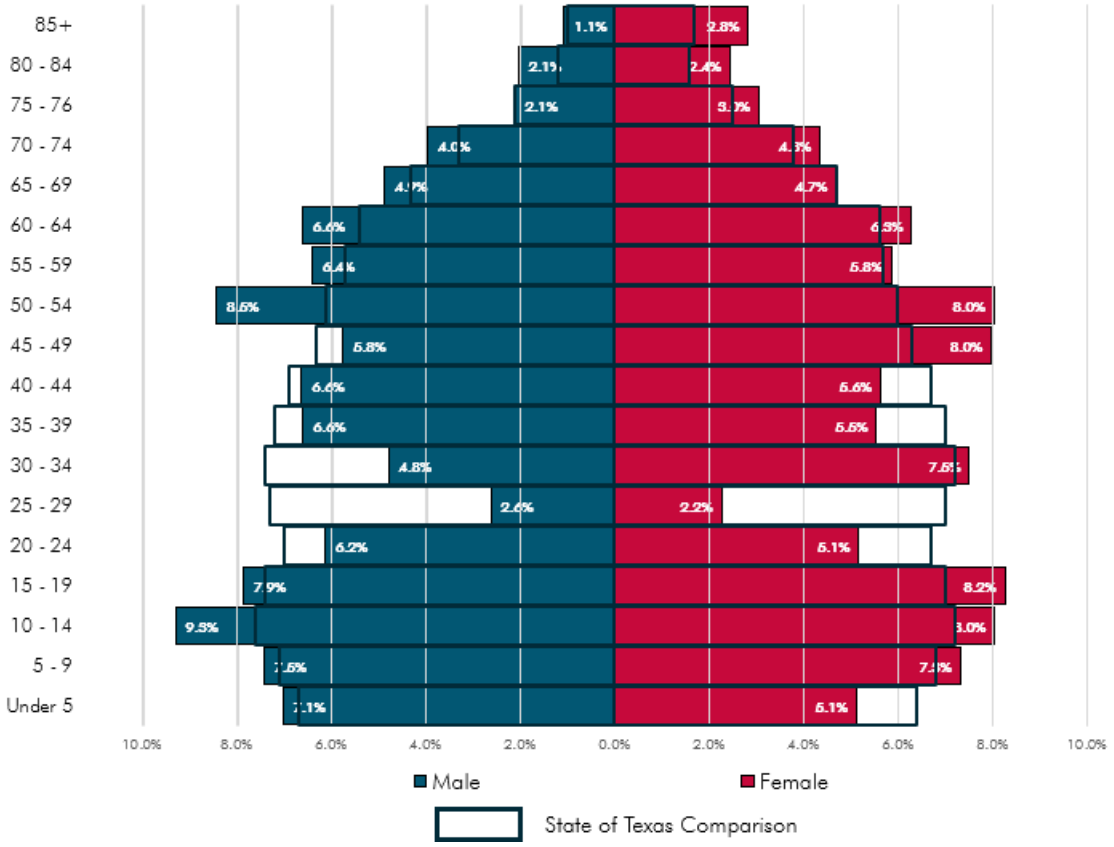
	Median Age	Average Household Size	Median Income	% of Population Under 18	% of Population over 65	% Owner-Occupied	Average Commute Times in Minutes (one Way)
City of Friendswood	**39.7**	**2.85**	**$125,470**	**27.8%**	**15.8%**	**76.9%**	**28.8**
City of Pearland	36.5	2.88	$112,470	27.8%	12.0%	76.6%	33.5
City of League City	37.7	2.67	$119,870	26.4%	12.4%	74.4%	29.8
Galveston County	38.5	2.52	$85,348	23.9%	15.3%	67.5%	27.7
Harris County	34.4	2.73	$73,104	26.1%	11.4%	54.8%	29
H-GAC Region	35.4	2.87	$89,163	26.2%	12.6%	61.0%	32
State of Texas	35.9	2.70	$76,292	24.7%	13.8%	63.0%	26.7

Data Source: ACS 2019 – 2023 Five Year Estimates

The age and gender distribution in Friendswood reflects a relatively balanced population across most of the age cohorts, with several notable differences when compared to the state (refer to **Figure 4**). Friendswood has a larger share of age 10 – 14 and age 50 – 54 (16.9% and 36.4% higher than the statewide average, respectively). The city also exhibits high levels of educational attainment, with over 80% of residents holding at least some college education, including 31% with a bachelor's degree and 19% with a graduate degree (refer to **Figure 5**).

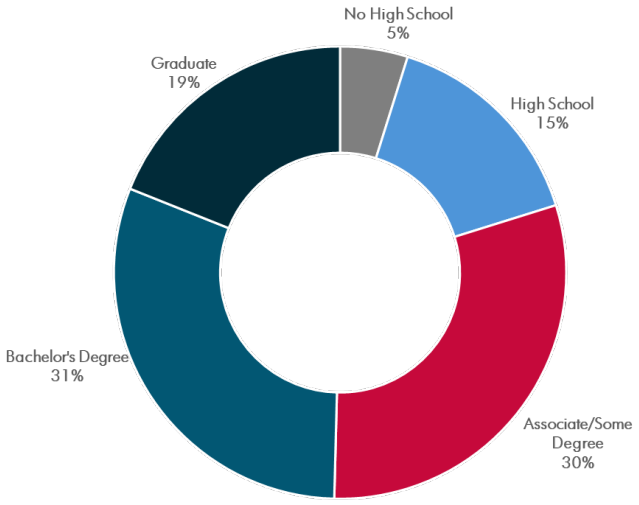
Friendswood is less diverse than the broader H-GAC region (**Figure 6**). Over 71% of the population identifies as White alone, compared to 38.5% in the region. The City has significantly smaller shares of Hispanic (13.1% compared to 37.9%), Black (1.6% compared to 17.0%), and Asian (4.9% compared to 8.1%) populations. The City does have a slightly higher share of "Two or More Races" than the region, making up 3.3% of the population in Friendswood.

Figure 4. Age Distribution of Friendswood



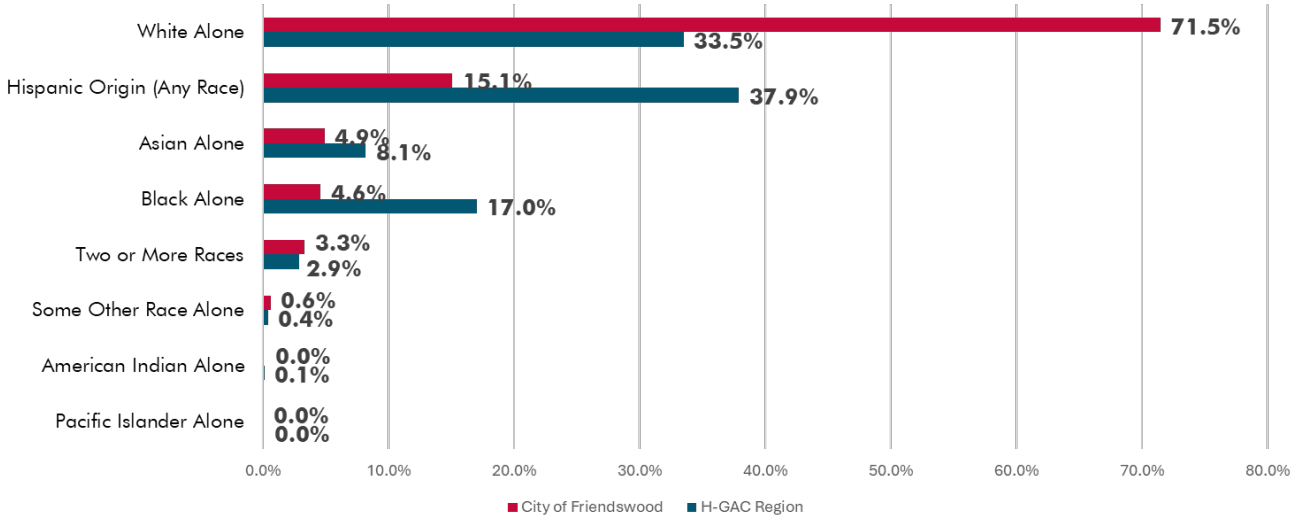
Data Source: ACS 2019 – 2023 Five Year Estimates

Figure 5. Education Distribution



Data Source: ACS 2019 – 2023 Five Year Estimates

Figure 6. Racial Distribution



Data Source: ACS 2019 – 2023 Five Year Estimates

Public Health Status

Several public health factors were evaluated, such as general health status, physical activity, mobility disability, and high cholesterol, to identify potential linkages for active transportation infrastructure investments. **Figure 7** displays the City's general health status by census block groups. Friendswood's residents generally report better overall health than those in surrounding communities, but disparities do exist across the city. Neighborhoods in northern and central Friendswood report worse general health and lower levels of physical activity (refer to **Figure 8**), which is an important consideration for an active transportation plan.

Figure 9 shows the mobility disability rates by block group across the community. The same areas that report lower general health status and lower levels of physical activity also have a higher prevalence of mobility-related disabilities, with the highest rates found in central Friendswood. Across the city, high cholesterol is common, as shown in **Figure 10**, reinforcing the need for environments that support heart-healthy lifestyles. For residents who use mobility aids or do not drive, accessible walking and rolling infrastructure, such as smooth sidewalks, curb ramps, and safe crossings, is essential to ensure everyone can benefit from a connected and inclusive transportation network.

Figure 7. General Health Status

Figure 8. Physical Inactivity

Figure 9. Mobility Disability

Figure 10. High Cholesterol

Demographic Impacts on Active Transportation

Long-term investments in pedestrian and bicycle infrastructure can improve the overall quality of life for residents and make the City even more desirable. The demographic profile of Friendswood can influence how active transportation will be utilized within the community and will be a factor in how recommendations and prioritization decisions are made in the implementation strategy. Nearly 28% of the population under 18 years of age and a higher-than-average share of households with children, indicating a need for safe, accessible routes to schools, parks, and other youth-oriented destinations. On the other hand, nearly 16% of the population is over 65 years of age, underscoring the importance of investing in public infrastructure and amenities that enable older adults to age-in-place comfortably, such as smooth, well-maintained sidewalks, clearly marked crosswalks, and accessible seating areas that promote safety, comfort, and independent mobility. The northern and eastern portions of Friendswood report a generally lower public health status compared to the remainder of the community with higher rates of mobility disabilities and physical inactivity.
Together, these highlight the importance of designing an active transportation network that accommodates residents of all ages and abilities.

Sidewalks, Trails, and Other Infrastructure Today

This section of the report discusses the existing conditions of Friendswood's sidewalk, trail, bicycle, roadway, and utility infrastructure, as well as active transportation connections in surrounding communities and planned or proposed active transportation projects. This foundational context will help identify both gaps in the current system and opportunities for strategic improvements so that recommendations, projects, and proposed policies can build upon what exists today.

Active Transportation Infrastructure

Existing active transportation infrastructure in Friendswood is illustrated in **Figure 13**. Several areas are well-connected with active transportation infrastructure, particularly in the southern and eastern parts of the city. Several off-street trails also provide recreational and active transportation options, primarily serving single-family neighborhoods. Sidewalk coverage is limited in older, more central parts of the community, where gaps in the network make it more difficult for people to walk or roll comfortably.

Existing Sidewalks

Today, the City of Friendswood has approximately 200 miles of existing sidewalks. Sidewalks in Friendswood are generally concentrated in residential neighborhoods, but vary in terms of conditions, design, and width. Sidewalks are present along TxDOT facilities, including FM 518

(Friendswood Drive) and FM 528 (Parkwood Drive). However, gaps in the network exist, both along TxDOT roadway facilities and within the community in general. **Figure 11** shows an example of a gap in the sidewalk network and condition of the sidewalk at the intersection of FM 528 and FM 518.

Newer subdivisions more consistently feature sidewalk infrastructure. In contrast, more established, gridded neighborhoods often lack basic sidewalk infrastructure. Examples of neighborhoods that have consistent sidewalk connections include The Forest, Wedgewood, Autumn Creek, and single-family residential developments constructed recently in the southeastern neighborhoods. The Wilderness Trails neighborhood is one of the only neighborhoods on the west side of Friendswood that has existing sidewalk connections. Existing sidewalks across the community are generally well-maintained and in good condition, especially in the southeastern neighborhoods where the sidewalk infrastructure is newer.

Figure 11. Gaps in the sidewalk network at the intersection of FM 528 and FM 518



Existing Bicycle Infrastructure

Friendswood has one marked on-street bicycle lane along FM 528/Parkwood Drive, shown in **Figure 12**. The width of this bicycle lane is 3 feet, which is the minimum width of a bike lane. Generally, the higher the roadway facility's speed and functional classification, the greater the separation that is needed for cyclists to feel safe and comfortable to utilize the bicycle lane facility. The TxDOT Bikeway Guidance states that bike lanes with higher speed limits need additional separation for cyclists to feel comfortable, especially for the general population to use.[4] This existing bicycle lane is narrow and has a low level of comfort for cyclists.

[4] Texas Department of Transportation. (2021). *TxDOT Bicycle Accommodation Design Guidance.* Retrieved from: https://ftp.txdot.gov/pub/txdot-info/des/guidance/bike-guidance.pdf.

This bicycle lane is marked with pavement markings and signage. However, just south of the intersection of Sunset Drive, the bicycle lane markings on FM 528 and signage disappears, but the road's shoulder increases from 3 to 12 feet. This wider shoulder is not marked as a bicycle facility as there is no signage or pavement markings. Opportunities exist to explore low-cost solutions for bicycle infrastructure, and simply marking a wide shoulder could be a cost-effective solution to enhance the City's bicycle network.

Figure 12. Existing Bike Lane on FM 518



Existing Trails

The City of Friendswood has approximately 7.71 miles of existing off-street trail facilities (refer to **Figure 13**). Trails in Friendswood largely serve recreational purposes, and do not connect to many destinations. The existing trail facilities in Friendswood are very well-maintained and in excellent condition, and can be categorized as:

1. Trails located in parks, such as Stevenson Park and Old Friendswood City Park.
2. Trails in single-family neighborhoods lining rights-of-way and easements. These trails typically run through neighborhoods, line backyards, connect cul-de-sacs, and are 'tucked away' for a seemingly private recreational experience. Examples of this include The Forrest and the Autumn Creek neighborhoods.

Figure 13. Existing Active Transportation Infrastructure

Planned and Surrounding Transportation Infrastructure

Friendswood shares a municipal boundary with the City of Pearland to the northwest, and the City of League City to the southeast. The city is also split between Harris and Galveston counties and is adjacent to Brazoria County to the west. It is important to understand adjacent city's planning efforts to make more informed recommendations that potentially can connect to adjacent city's facilities for a seamless walking or biking experience. Pearland and League City's existing and planned active transportation infrastructure are mapped in **Figure 14**, as well as H-GAC's planned trail network.[5, 6, 7, 8] Opportunities exist to explore ways to connect to planned and surrounding transportation infrastructure, and more broadly partner with adjacent communities to create a comprehensive and connected trail network.

[5] H-GAC's regional planned trail network file was last updated in 2016 and the origin of these planned trails in Friendswood is unknown. The planned trails shown in Figure 13 are a part of H-GAC's long range plans, including a regional trail crossing Clear Creek, spanning throughout multiple communities in the region, and a shared use path just south of Friendswood Parkway in the southeast portion of Friendswood traveling northbound along the creek, and connects north to the proposed Clear Creek trail.

[6] The neighborhood northeast of Friendswood's municipal boundary, Heritage Park, is entirely lined with sidewalks. Although this neighborhood is not part of this study, it is beneficial to tie in recommendations to existing sidewalk and trail networks.

[7] Adjacent neighborhoods in both Pearland and League City both a strong sidewalk networks.

[8] A planned, concrete trail in League City straddles the southern boundary of the City of Friendswood. This trail ends at the Lake at San Joaquin/Avalon at Friendswood neighborhoods in southern Friendswood.

Figure 14. Planned and Surrounding Active Transportation Infrastructure

Roadway and Street Infrastructure

Roadway and street infrastructure in Friendswood were reviewed as part of this existing conditions assessment, as well as traffic counts, transit information, and emergency evacuation routes for the community. Pavement conditions information was not available. To understand how active transportation infrastructure, policies, and priorities will be implemented in Friendswood, it is also important to know the community's larger roadway network, condition, and other aspects that can impact active transportation in the community.

Traffic Counts

TxDOT maintains a Statewide Planning Map that includes traffic counts throughout the state of Texas. Annual average daily traffic (AADT) counts were gathered in and around the Friendswood community and are displayed in **Figure 15**.[9] Individual traffic counts collected and displayed on the map are for the years 2021 – 2023. FM 528/Parkwood Drive shows an AADT of 20,000 – 24,000 vehicles. FM 518/Friendswood Drive has similar annual vehicle numbers, with and average of 20,000 – 26,000 vehicles per day.

There are three primary routes to access Friendswood from Interstate 45 (I-45): FM 518, FM 528, and El Dorado Boulevard/Friendswood Link Road. Both FM 518 and FM 528 are larger, TxDOT maintained thoroughfares that can handle significant levels of traffic. However, Friendswood Link Road/El Dorado Boulevard is listed as a Collector in the City's Throughfare Plan but can still be a primary route utilized when accessing Friendswood from I-45. This street carries an average of 6,000 – 10,000 vehicles a day within Friendswood and is an important community connector that transcends Friendswood's City limits.

[9] Texas Department of Transportation. (2024). Statewide Planning Map. Retrieved from: https://www.dot.state.tx.us/apps/statewide_mapping/StatewidePlanningMap.html

Figure 15. Traffic Counts

Transit Information

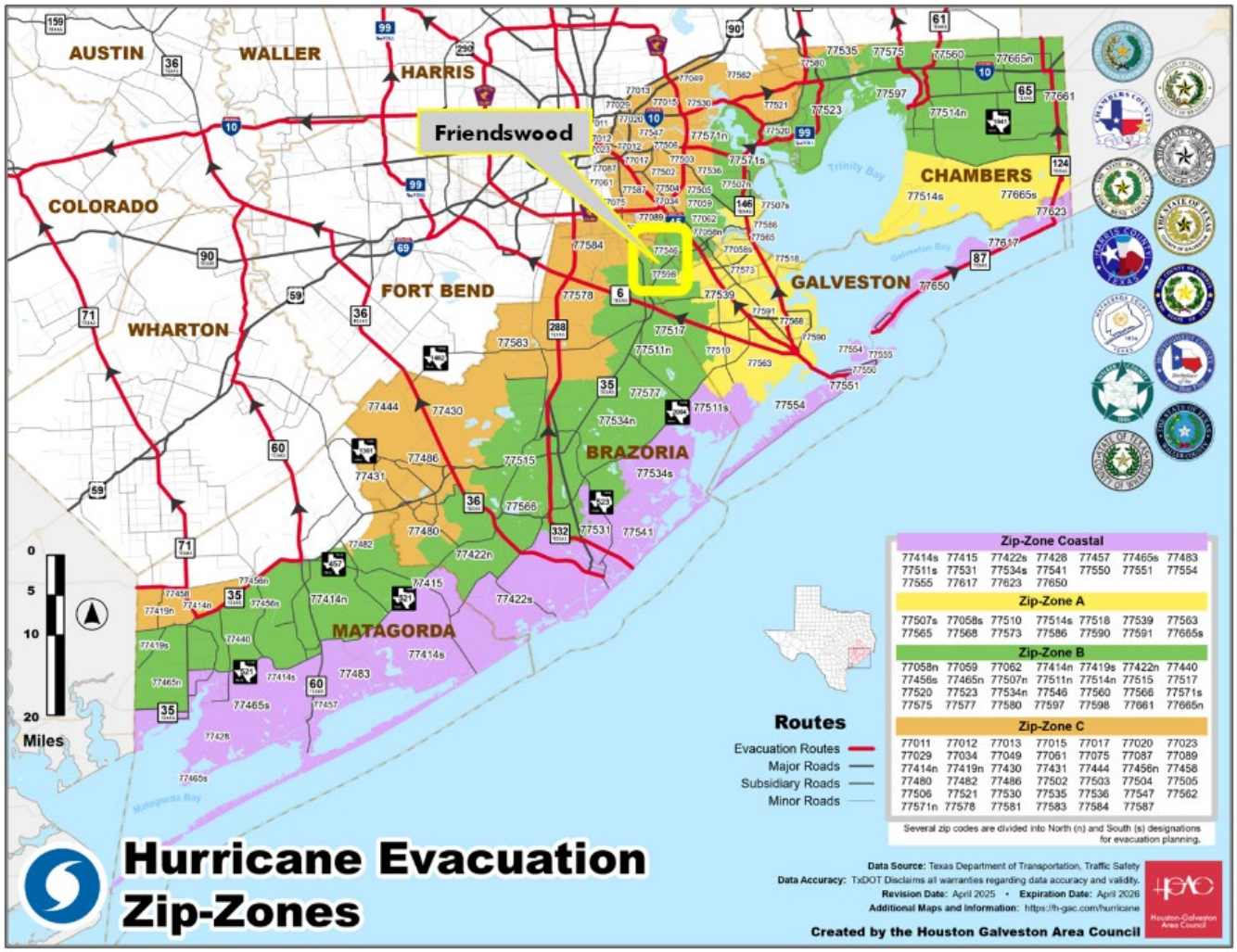
Friendswood currently does not have a fixed-route transit service. However, there are several nearby and regional transit options. METRO, Houston's primary transit provider, operates a park-and-ride facility just northeast of the city limits, near the Heritage Park neighborhood along I-45. Residents of Friendswood can also access shared-ride services through the Harris County RIDES program, which allows eligible customers to purchase transportation services at a significant discount. Additionally, the Gulf Coast Transit District (GCTD) offers demand response and microtransit rides for residents of Brazoria and Galveston counties. GCTD has fixed park-and-ride facilities in League City and Texas City, but microtransit and demand response services are the only transit services available in Friendswood. These services can help bridge the gap for Friendswood residents who lack access to fixed-route transit, offering critical mobility options for seniors, people with disabilities, and those without access to a vehicle.[10]

Emergency Evacuation Routes

In the event of a hurricane, several designated emergency evacuation routes are identified by H-GAC (refer to **Figure 16**). For Friendswood, key evacuation routes include FM 528 and FM 518, both of which connect to I-45, one of the main emergency evacuation routes in this area. State Highway 6 is also designated as an emergency evacuation route. Friendswood residents can access this route via FM 528 to SH 35, then to the SH 6 emergency evacuation route in Alvin.

[10] 5.5% of the community's population does not have access to a vehicle.

Figure 16. Emergency Evacuation Routes



Throughfare Plan

Figure 17 displays Friendswood's existing Thoroughfare Plan, adopted by the Friendswood City Council in 2018. Streets in Friendswood are divided into Major Roads, Boulevards, and Collectors. Major Roads include FM 518, FM 528, and Edgewood Drive/FM 2351, each owned and operated by TxDOT. There are four designated Boulevards in Friendswood: Blackhawk Boulevard, W Bay Area Boulevard, West Boulevard, and Friendswood Parkway.

It is important to note that an extension of Blackhawk Boulevard is planned to connect to W Bay Area Boulevard in eastern Friendswood. This street connection is part of the City Center development and will be constructed within the next year. More information about the City Center development is provided in the Activity Centers and Major Destinations section of this report.

Figure 17. Thoroughfare Plan

Utility Infrastructure

Utility infrastructure is an important aspect of active transportation planning because these elements can significantly impact the feasibility, location, and cost of implementing new sidewalks, trails, and other active transportation facilities. Various utility easements may offer opportunities for trail development along existing rights-of-way. Understanding where these easements are located, and who controls the easements, is critical information that can affect active transportation plans and projects. The City of Friendswood owns and supplies the community with both water and electricity. A Municipal Utility District (MUD) provides water and sewer services to the Heritage Park neighborhood, which is just outside of the Friendswood City limits. However, no additional providers besides the City are located in Friendswood.

Easements have been mapped and are displayed in **Figure 18**. Existing easements are divided into several categories, showing where access, drainage, pipeline, utility, multi-, and other easement sites are located within the community. There are multiple easements that transcend the community, and opportunities can be identified to evaluate if these easements could be utilized for the location of new active transportation infrastructure. The community's existing pipeline, utility, and drainage easements create a network of public land that potentially could be utilized for sidewalks and trails.

Rights-of-way and public easements are extremely limited along Clear Creek and the other creeks within the community. This can create challenges for identifying off-street trail opportunities since much of the land right up to the creekbed is privately owned. Without dedicated public access, trail development must either avoid these areas or rely on easement acquisition and property owner coordination, which can add complexity, cost, and time to project implementation.

Infrastructure Impacts on Active Transportation

Friendswood has a solid foundation of active transportation infrastructure, with strong sidewalk coverage in several neighborhoods. However, the existing infrastructure remains contained within the neighborhood, and remains largely disconnected from one another, highlighting the need for greater community-wide connectivity. Improving linkages between neighborhoods, schools, parks, and other local destinations will be a central focus of future recommendations.

Existing trails in Friendswood mostly serve a recreational function, with trail infrastructure meandering behind residential neighborhoods, instead of connecting residents to actual destinations. There is an opportunity to retrofit additional suburban neighborhoods with trail facilities, especially in areas with existing easements or rights-of-way. Although regional trail connections across Clear Creek are planned, limited public right-of-way in these areas may

constrain feasibility and will require further coordination and creative implementation strategies.

Bicycle infrastructure is very limited in Friendswood. However, many of the City's streets have wide rights-of-way, and often have wide, unused shoulders. This could be a low-cost opportunity to provide additional bicycle infrastructure, as wide shoulders along key corridors could be easily converted into designated bike lanes with pavement markings and signage.

Figure 18. Existing Easements

Friendswood's Natural and Built Environment

The natural and built environment is essential to understand for planning active transportation infrastructure that is safe, comfortable, and resilient. Friendswood's physical landscape, which is shaped by its geology, hydrology, and development patterns, offers both opportunities and constraints for walking, biking, and trail connectivity. Environmental factors like extreme heat, flooding, and limited shade directly affect how people use public spaces, while native ecosystems and natural features present unique assets to enhance trail design and community livability. This section explores the key environmental conditions that influence active transportation in Friendswood, including climate impacts, urban heat, flood risk, ecology, and biodiversity.

Climate and Environmental Factors

The Houston metropolitan area, including Friendswood, has a hot and humid climate, with regular periods of high temperatures, intense storms, and occasional hurricanes. These conditions are important to consider when planning infrastructure that supports comfort, safety, and year-round usability. Flooding, intensified by poor drainage in clay-rich soils like the Beaumont Formation found in Friendswood, remains a major concern. These climate conditions directly affect the comfort, safety, and usability of trails and active transportation networks. Thoughtful design and planning can help mitigate these impacts by improving trail resilience, ensuring user comfort, and enhancing year-round accessibility.

Urban Heat

Friendswood's pattern of development has created pockets of urban heat islands, as displayed in **Figure 19** with three areas experiencing particularly pronounced conditions. On the eastern edge of the city, two newer single-family housing developments register higher temperatures than surrounding neighborhoods, which is likely due to recent construction and a younger, less-established tree canopy. Elevated heat is also observed in commercial zones and denser development along Friendswood Drive, particularly between Whispering Pines Avenue and Edgewood Drive. Integrating green spaces, even small features like street trees, planted medians, or pocket prairies, can help cool these areas, making active transportation more comfortable and reducing the risk of heat-related illnesses.

Tree Canopy

Tree canopy and structural shade play a vital role in enhancing comfort and usability across Friendswood's active transportation network. The existing tree canopy has been mapped and is displayed in **Figure 20**. Canopy cover of 40% or more can significantly reduce ambient air temperatures, improving conditions for walking and biking. In Friendswood, tree canopy distribution generally reflects single-family development patterns and is relatively uniform

across residential areas. Canopy cover becomes denser near waterways like Clear Creek and its tributaries, where riparian forests provide natural shade. In contrast, southern parts of the city have less shade and are more exposed to heat.

Figure 19. Urban Heat Island Effect

Figure 20. Tree Canopy

Drainage and Flooding

As part of this effort, a drainage and flooding assessment was conducted to identify conditions that may affect the design and reliability of infrastructure supporting walking, bicycling, and other active transportation modes. **Figure 21** maps and summarizes the key drainage and flood-related findings based on FEMA flood mapping, hydrologic data, and local infrastructure inventories.

Friendswood is traversed by multiple natural waterways that form the city's primary drainage system. Major watercourses include Clear Creek, Cowarts Creek, Chigger Creek, Mary's Creek, and Cedar Gully. In total, more than 10 distinct streams and tributaries flow through the city, including primary and secondary branches of the Clear Creek watershed. These waterways provide essential drainage functions and also present opportunities and constraints for greenways, trails, and other active transportation infrastructure.

The region is prone to several types of flooding, including riverine flooding from creek and bayou overflows, sheet flow flooding caused by shallow overland runoff during intense rainfall, and urban (storm sewer) flooding due to undersized or overwhelmed drainage systems. Notable flood events in recent years include Hurricane Harvey (2017), Tropical Storm Imelda (2019), and various localized events over the past decade. These recurring events emphasize the need to consider flood-prone areas when planning long-term trail corridors and pedestrian connections.

FEMA Floodplain

FEMA designates flood risk zones based on statistical modeling of storm recurrence intervals:

- **Zone AE:** High-risk; subject to inundation by the 1% annual chance flood (100-year floodplain), with Base Flood Elevations (BFEs) specified.
- **Zone X (Shaded):** Moderate-risk; subject to the 0.2% annual chance flood (500-year floodplain).
- **Zone X (Unshaded):** Minimal flood risk; outside of both the 100-year and 500-year floodplains.

Estimated FEMA zone coverage in Friendswood, based on current FEMA floodplain mapping, is as follows:

- **Zone AE (100-year floodplain):** 24%
- **Zone X (Shaded, 500-year floodplain):** 14%
- **Zone X (Unshaded):** 62%

While FEMA zones indicate modeled flood risk, they do not fully reflect real-time drainage behavior or local topography. FEMA floodplain data and mapped information are provided in **Figure 21.**

Bridge and Culvert Crossings

There are approximately 27 main bridge and culvert crossings over Friendswood's stream network. These locations are critical for both vehicular movement and potential active transportation routes. In the project exhibits, bridges and culverts are marked with a common symbol due to their shared function as stream crossings. Although structurally distinct, both may serve as opportunities or barriers for pedestrian and bicycle access. Where feasible, crossings can be enhanced or supplemented with parallel active transportation infrastructure such as pedestrian bridges or underpasses.

In addition to its natural drainage system, Friendswood contains a limited number of stormwater detention basins, which help temporarily store runoff during large storm events. No major levee systems are located within the city limits, although adjacent jurisdictions may have regional flood infrastructure that indirectly benefits Friendswood.

Drainage and Flooding impact on Active Transportation

Flood risk significantly influences the design, alignment, and long-term viability of active transportation corridors. Key planning considerations include:

- Avoiding trail placement within designated floodways, due to the increased risk of erosion, structural undermining, and long-term maintenance challenges.
- Avoiding high-velocity areas and chronically flooded zones, which are especially vulnerable to repeated damage and costly repair cycles.
- Leverage stream corridors for greenways when feasible, ensuring that trail alignment supports natural drainage patterns and maintains long-term durability.
- Placing stream crossings strategically to enhance trail continuity, avoid high-risk washout zones, and reduce the likelihood of closures during flood events.
- Incorporating resilient design strategies, including flood-tolerant materials, elevated pathways, and adaptable alignments, to ensure long-term function and recovery following flood events.

Flooding is both a design constraint and a safety/equity concern, particularly in areas lacking redundant access routes. The drainage features and floodplain data shown in **Figure 21** helps identify both opportunities and constraints for future active transportation improvements.

Figure 21. Drainage and Flooding

Urban Ecology Assessment

Geology and Hydrology

Friendswood is built on the Beaumont Formation, a type of geologic formation and soil made mostly of clay with some sand mixed in. This soil tends to hold water, drain poorly, and shift easily, which creates flat or low-lying areas and requires special attention when designing trails to prevent erosion and manage stormwater. The city sits within two major watersheds, Clear Creek-Frontal Galveston Bay and Dickinson, which flow eastward into Galveston Bay. It also lies above the Gulf Coast Aquifer, a key source of drinking water for cities like Houston, Galveston, and Corpus Christi. Overuse of the aquifer has caused the land to slowly sink, a process called subsidence, which can damage roads, buildings, and utilities.

Ecoregion

Ecoregions are areas of land or water that contain geographically distinct climates, groups of plant and animal species. Friendswood is located in the Northern Humid Gulf Coastal Prairie, a flat region with poor drainage due to clay-heavy soils. Historically, this area supported tallgrass prairies and scattered oak mottes. Soil types vary between the higher, sandier Lissie Formation with mima mounds and the lower, clay-rich Beaumont Formation with gilgai features. These variations create diverse microhabitats that shape local plant communities. Friendswood's landcover types and vegetative communities are mapped in

Over time, fire suppression, grazing, agriculture, and urban development have drastically altered the landscape. Native grasses like Little Bluestem, Indiangrass, and Big Bluestem are now rare, as invasive species like Chinese Tallow dominate many areas, especially near Clear Creek Trail. Other woody species, both native and invasive, have spread due to reduced fire.

Pockets of remnant ecosystems like Post Oak Savanna and Pine–Hardwood Forest still exist throughout Friendswood, presenting valuable opportunities for both ecological restoration and community education. Some stretches of Coastal Prairie also remain, particularly in the northern and southern edges of the city. While much of this prairie has been developed into residential neighborhoods, restoring and maintaining these areas can provide important ecosystem services such as improved stormwater management, enhanced biodiversity, and urban cooling.

Figure 22. Landcover Types and Vegetative Communities

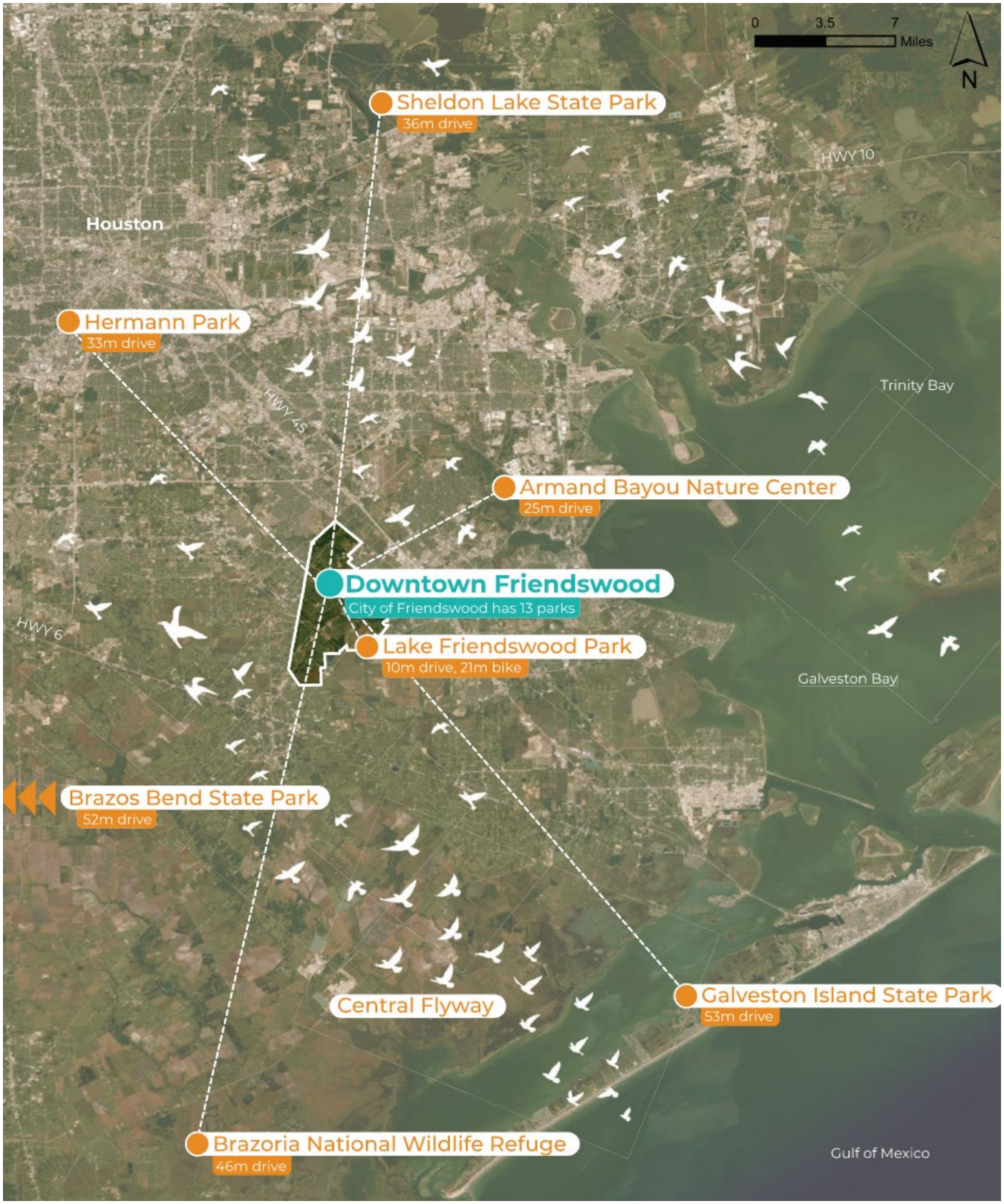
Biodiversity

Friendswood lies within the Northern Humid Gulf Coastal Prairies ecoregion, which was once a vast expanse of tallgrass prairie now largely altered by development. Despite these changes, the area remains ecologically important as part of the Central Flyway, a major migratory bird route. Each spring and fall, numerous bird species use the region's remaining wetlands, riparian zones, and even altered landscapes as crucial stopover habitat.

Although much of the coastal prairie has been lost, it remains one of North America's most diverse grassland ecosystems, historically home to over 1,000 plant species and 450 bird species. Native grasses like little bluestem and gulf muhly support monarch butterflies, grassland songbirds, and once even supported bison and red wolves. Today, invasive species such as Chinese tallow and imported fire ants threaten what remains. Restoring prairie landscapes and integrating trails can support both recreation and conservation, linking habitats, showcasing native species, and fostering deeper public appreciation for this endangered ecosystem.

Friendswood is home to 13 local parks and is located near major state parks, wildlife refuges, and nature centers, illustrated in **Figure 23**. The city offers easy access to nature for residents and serves as an important corridor for mobile wildlife. Local iNaturalist observations highlight parks like Friendswood Dogsafe Park, Stevenson Park, and Lake Friendswood Park as biodiversity hotspots.

Figure 23. Regional Nature Parks and Ecological Context



Natural and Built Environment Impacts on Active Transportation

The natural and built environment of Friendswood shape how people walk, bike, and use trails in the community. Conditions like heat, flooding, limited shade, and soil conditions can make it more difficult to get around comfortably and safely without a car. At the same time, the tree canopy, creeks, and remaining natural areas offer important opportunities to support active transportation.

Some parts of Friendswood are hotter than others, especially in areas of newer single-family suburban development, where there are fewer trees or more pavement. Floodplain areas present great opportunities for new trail development, as they often follow scenic creek corridors and traverse through the entire city. However, some creeks lack sufficient right-of-way to accommodate a trail and are vulnerable to flooding. Trails in these areas could be a feasible solution for active transportation in Friendswood, with careful planning, stakeholder engagement, and a context-sensitive approach. Additionally, bridges and culverts that cross over creeks and bayous are opportunity areas to help people safely move across the city, connect active transportation routes, and greatly improve connectivity.

Friendswood's natural ecosystems are a unique and beautiful part of the community and can be celebrated in the design of active transportation projects. Native plants and vegetation can be used in trail landscaping to highlight the area's natural character, support local wildlife, and create a more inviting and resilient network for walking and biking. Incorporating native landscaping also reduces maintenance needs and helps trails blend seamlessly into the surrounding environment.

Where People Live, Work, and Go

Active modes of transportation often occur adjacent to activity centers, commercial and retail districts, and other places where people would want to access via active transportation modes, including parks, schools, community and religious centers. This section of the report presents an analysis of several existing conditions pertinent to active transportation, including current zoning and future land use, activity centers and major destinations, infrastructure in existing neighborhoods.

Existing Zoning & Future Land Use

Friendswood's existing zoning is illustrated in **Figure 25**. Commercial and retail areas are generally along FM 528/Parkwood Drive and FM 518/Friendswood Drive. Although commercial zoning is present along a large portion of these two corridors, there are still many lots zoned as single family adjacent to these two thoroughfares. A portion of the northern area of Friendswood is zoned industrial, where a superfund site and golf course are located. Portions of the east and southeast of Friendswood are zoned Planned Unit Development (PUD).

Existing zoning provides a picture of Friendswood's current land use designations and makeup. Future land use plans drive decisions on where to add new active transportation infrastructure. These plans can provide insight into where new commercial and residential activity will be in the city. Friendswood's Future Land Use Plan is displayed in **Figure 26**. There is a planned mixed-use development site, City Center, located in the eastern portion of town, along FM 528. Additionally, the Future Land Use Plan indicates the location of future public or semi-public land, which includes government buildings and school facilities. These are important locations to connect to via active transportation infrastructure.

Activity Centers and Major Destinations

There are several major activity centers and points of interest located in Friendswood, shown in **Figure 27**. This map showcases the location of Friendswood's commercial areas, parks, schools, and religious centers. The following summarizes several existing and planned key activity centers and destinations Friendswood that are pertinent to active transportation infrastructure opportunities:

- The City's two main commercial corridors are also the City's two TxDOT facilities – FM 528 and FM 518. Friendswood's historic downtown area, and is also home to Stevenson Park, the park where many of the community's local events are held, are all located along FM 518.
- Friendswood features 14 parks within their City limits, as well as two Harris County Precinct 2 parks, Oxnard Park and Frankie Carter Randolph Park.
- There are 9 schools in Friendswood, including both public and private schools.
- The city also is home to many religious centers.
- The Friendswood Town Center development is a planned 106-acre development that will feature a hotel, retail, and other mixed-use buildings. The development is expected to bring in $700 million to the city, and will feature a new park with several miles of trail facilities. The development project will be located at the corner of FM 528 and Bay Area Boulevard. **Figure 24** displays a conceptual rendering of this project.

Figure 24. Friendswood Town Center (Courtesy Tannos Development Group via Community Impact)



Figure 25. Existing Zoning

Figure 26. Future Land Use

Figure 27. Points of Interest

Land Use Impacts on Active Transportation

Land use and transportation are inherently interconnected, each one shapes and reinforces the other. To effectively plan for active transportation, it is essential to understand the surrounding land use context. Where people live, work, and go directly influences how and where they walk, bike, or access trails. In Friendswood, existing zoning, activity centers, and destination locations play a major role in determining where active transportation infrastructure is needed most.

Most commercial and civic destinations are located along the city's two major commercial corridors – FM 528 and FM 518. Schools, parks, churches, and upcoming major developments like the Friendswood Town Center are all key destinations that benefit from strong pedestrian and bicycle connections. Keeping the community's destinations in mind is essential when developing active transportation recommendations, as these local destinations and activity centers need safe and accessible transportation connections to residential areas within the community.

Safety Considerations

This section of the report analyzes recent crash trends involving vulnerable roadway users, providing a better understanding of high-risk locations and safety concerns in the community.

The Texas Department of Transportation maintains a centralized database of all motor vehicle crashes reported by law enforcement agencies across the state. Data from this system, known as the Crash Records Information System (CRIS), was analyzed to identify pedestrian- and bicycle-related crashes within the City of Friendswood between 2020 and 2024. During this five-year period, the City of Friendswood recorded a total of 2,522 reported traffic crashes, of which 14 involved pedestrians and 20 involved bicyclists. Of these 34 crashes (pedestrian and bicyclist), three resulted in fatalities, five caused serious injuries, and nineteen led to minor injuries, highlighting the safety risks faced by pedestrians and cyclists.

While overall crash volumes remained relatively consistent year to year, the share involving vulnerable road users varied. The highest number of pedestrian crashes occurred in 2021, with five incidents, while bicycle-related crashes peaked in 2022 with eight reported collisions. **Table 2** shows the total City of Friendswood crashes by year, and crashes involving pedestrians and bicyclists.

Table 2. Friendswood Total and Active Transportation Crashes

Year	Total Crashes	Pedestrian	Bicycle
2020	405	1	5
2021	552	5	1
2022	542	4	8
2023	546	2	4
2024	477	2	2
Total	**2,522**	**14**	**20**

Data Source: TxDOT Crash Record Information System

Crash Locations

Of the 14 pedestrian crashes and 20 bicycle crashes, crash patterns for Friendswood indicate that 53% of all crashes happened at non-intersection locations, compared to 29% at intersections and 18% at driveway access points, pointing to the need for targeted improvements beyond standard intersection safety measures. Among pedestrian crashes, 36% occurred in parking lots, while 29% took place on city streets and 21% on Farm-to-Market roads. Bicycle crashes were heavily concentrated on Farm-to-Market roads (60%), followed by city streets (35%). The roadway with the highest number of crashes is along Farm-to-Market 528 and Farm-to-Market 518, both of which serve as key corridors with high vehicular volumes.

Figure 28. Active Transportation Crash Location Distribution

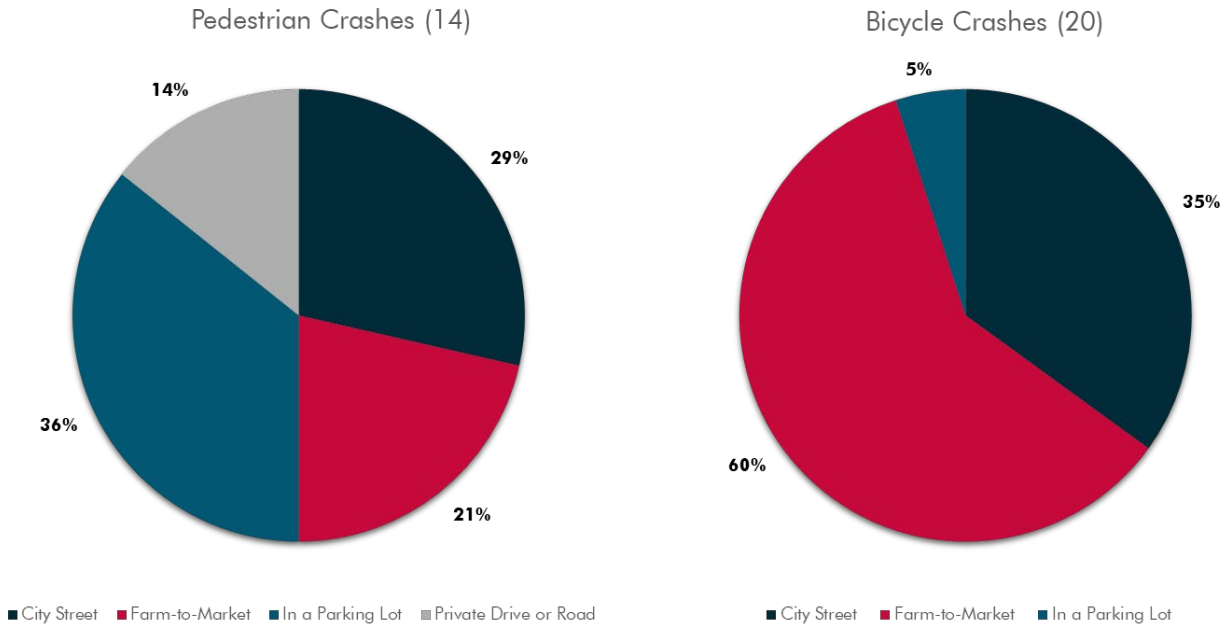


Figure 29 displays the location by severity of vulnerable roadway user crashes in Friendswood. It shows concentrations of crashes near commercial corridors, grocery store parking lots, and schools. These trends suggest that crashes are not only a function of street design but also land use and trip generators. Fifteen crashes (44%) occurred within 0.5 miles of schools and in areas where people frequently walk or bike for daily errands. In total, approximately 85% of crashes occurred near major walkable destinations, including schools, parks, grocery stores, and churches.

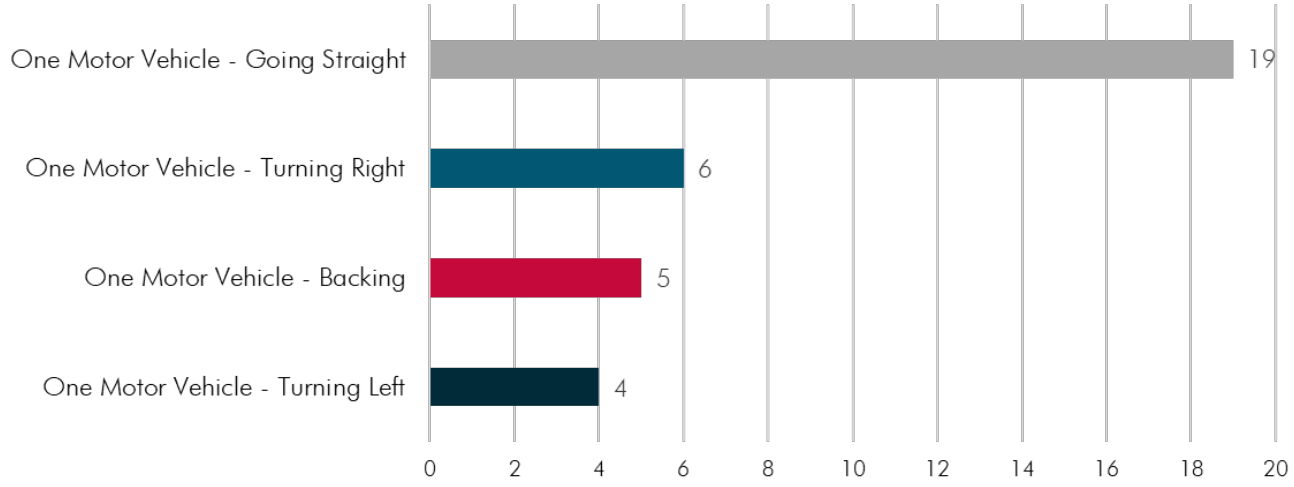
Figure 29. Bicycle and Pedestrian Crash Locations

Crash Characteristics

Manner of Collision

Table 3 describes the manner of collision for the 34 bicycle and pedestrian crashes that occurred in Friendswood. Of these 34 crashes, 56% of crashes resulted from one motor vehicle going straight.

Table 3. Manner of Collision for Active Transportation Crashes



Crash Severity

Most of the pedestrian and bicycle crashes were suspected minor injury crashes (19 or 56%). Of the total, three resulted in fatalities; one occurred on FM 518 and two others on a non-trafficway. **Table 4** displays Friendswood's crashes by year and by severity.

Table 4. Active Transportation Crashes by Severity, 2020 - 2024

Year	Fatal	Suspected Serious Injury Count	Suspected Minor Injury Count	Possible Injury	Unknown Severity
2020	1	0	3	1	1
2021	0	0	4	1	1
2022	2	2	7	0	1
2023	0	1	4	1	0
2024	0	2	1	0	1
Total	**3**	**5**	**19**	**3**	**4**

Data Source: TxDOT Crash Record Information System

Active Transportation-Related Crash Time and Occurrence

Crashes occurred throughout the week with no singular peak day, though Tuesday recorded the highest number of crashes (8), largely due to bicyclist incidents. For pedestrian crashes specifically, Monday, Wednesday, and Saturday each recorded three incidents, suggesting slightly increased pedestrian activity or exposure on those days. The afternoon period seems the most active time for crashes, with 38% of all incidents occurring between 3:00 PM and 6:00 PM. Bicycle crashes were more prevalent in the mid-afternoon and early evening. Late-night and early-morning crashes (between 9:00 PM and 6:00 AM) were comparatively rare.

Figure 30. Active Transportation Crashes by Day of the Week, 2020-2024

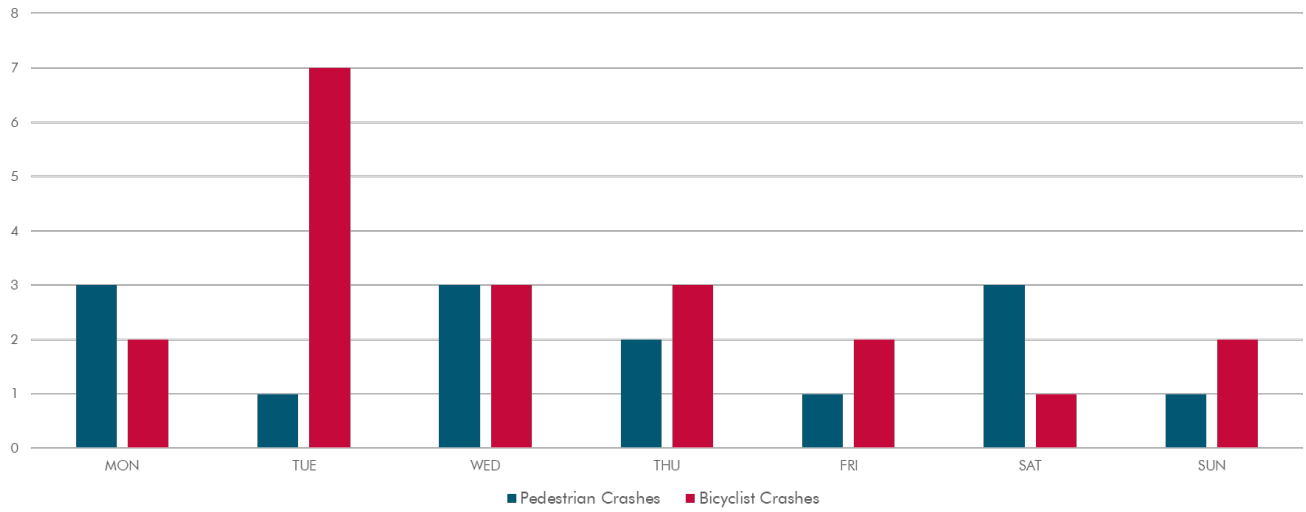
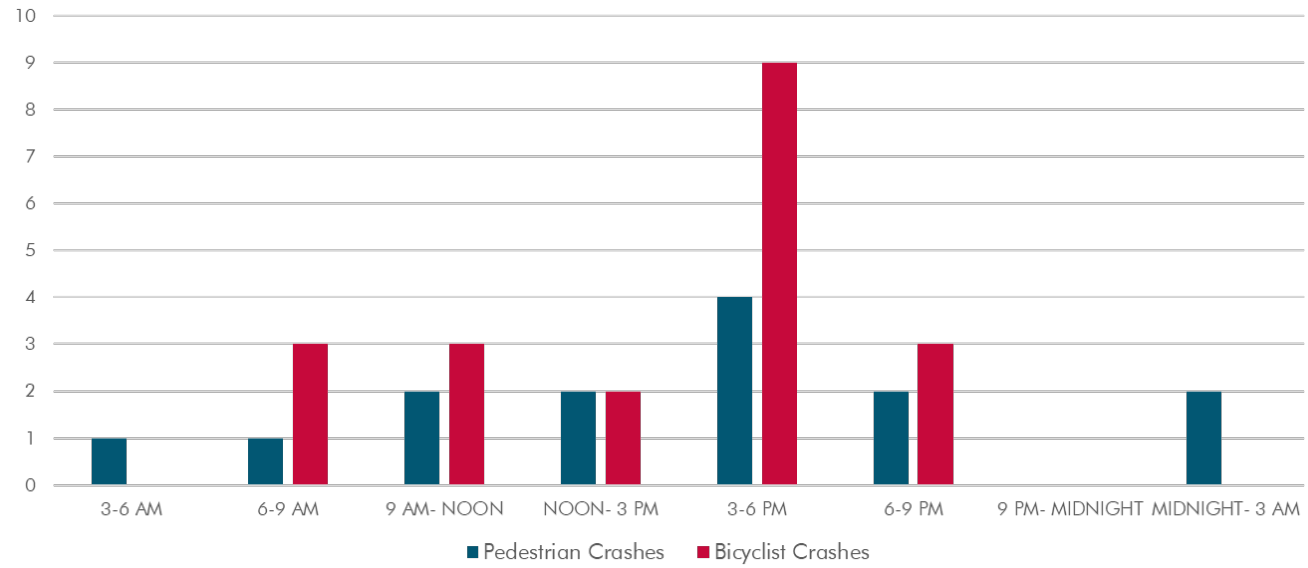


Figure 31. Active Transportation Crashes by Time of Day, 2020-2024



Most reported crashes in Friendswood occurred during normal driving conditions rather than as a result of adverse weather or road surface hazards; 74% occurred under daylight conditions (**Table 5**); 94% occurred on dry pavement (**Table 6**); and 76% happened during clear weather (**Table 7**). Five crashes (15%) occurred at night in areas without street lighting, pointing to opportunities for improving visibility infrastructure in key pedestrian and bicyclist corridors.

Table 5. Lighting Conditions During Active Transportation-Related Crashes, 2020-2024

Lighting	Pedestrian Crashes	Bicyclist Crashes	Total
Daylight	9	16	25 (74%)
Dark with Street Lights	2	1	3 (9%)
Dark with no Street Lights	3	2	5 (15%)
Dark with Unknown Lighting	0	1	1 (3%)
Total	**14**	**20**	**34**

Data Source: TxDOT Crash Record Information System

Table 6. Surface Conditions During Active Transportation Crashes, 2020-2024

Surface Condition	Pedestrian Crashes	Bicyclist Crashes	Total
Dry	14	18	32 (94%)
Wet	0	2	2 (6%)
Total	**14**	**20**	**34**

Data Source: TxDOT Crash Record Information System

Table 7. Weather Conditions During Active Transportation-Related Crashes, 2020-2024

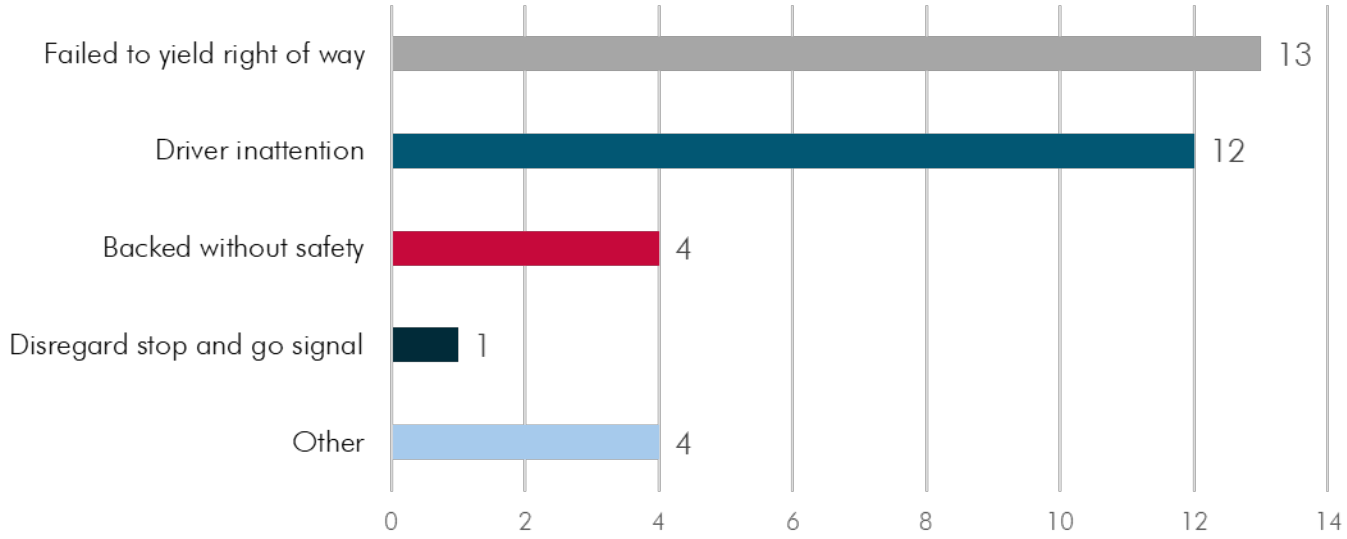
Surface Condition	Pedestrian Crashes	Bicyclist Crashes	Total
Clear	10	16	26 (76%)
Cloudy	4	3	7 (21%)
Rain	0	1	1 (3%)
Total	**14**	**20**	**34**

Data Source: TxDOT Crash Record Information System

Contributing Factors to Active Transportation-Related Crashes

Driver behavior is the most frequently cited contributing factor for pedestrian and bicycle crashes; 38% of crashes were due to the driver **failing to yield the right-of-way** and 35% due to **driver inattention**. Additional causes are listed in Figure 32, including backing without safety (12%), disregard for traffic control signals (3%), and other miscellaneous factors (12%).

Figure 32. Contributing Factors to Active Transportation-Related Crashes



Safety Impacts on Active Transportation

Understanding local crash trends is essential to planning safer walking and biking networks. Between 2020 and 2024, Friendswood experienced 34 reported pedestrian and bicycle crashes. While most resulted in minor injuries, nearly one-quarter led to serious or fatal outcomes, underscoring the importance of proactive safety measures.

A majority (53%) of pedestrian and bicycle crashes occurred at non-intersection locations. Pedestrian crashes were concentrated in parking lots (36%) and city streets (29%), while bicycle crashes were predominantly located along Farm-to-Market roads (60%). FM 528 and FM 518 emerged as corridors with the highest crash frequencies; both are high-volume vehicular routes. Nearly 85% of crashes occurred near major walkable destinations such as schools, parks, grocery stores, and churches, highlighting the role of land use in shaping crash risk.

Many of the recorded bicycle and pedestrian crashes (56%) resulted in suspected minor injuries, while 24% led to serious or fatal outcomes. Fatal crashes were not limited to high-traffic corridors—two of the three fatalities occurred on non-trafficways, indicating the need for broad-based safety interventions. Crashes were most frequent during the afternoon period between 3:00 PM and 6:00 PM, particularly for bicyclists. Most crashes (74%) occurred under daylight conditions, but 15% happened in dark areas without street lighting, revealing opportunities for lighting improvements. Environmental conditions were favorable in most

incidents: 94% of crashes took place on dry pavement, and 76% occurred during clear weather.

Walking and Rolling in Friendswood

Active transportation travel patterns were analyzed including bicycle and pedestrian commuter analysis, origin-destination analysis, and a walkshed analysis, to identify how people are using Friendswood's active transportation infrastructure today.

Bicycle and Pedestrian Commuter Analysis

A bicycle and pedestrian commuter analysis was performed on Friendswood's thoroughfare network using H-GAC's Activity-Connectivity Explorer (ACE) tool.[11] This tool utilizes available data sources including the Census, American Community Survey data, Longitudinal Employer-Household Dynamics (LEHD), and LEHD Origin-Destination Employment Statistics (LODES). The ACE tool identifies regions with untapped potential for bike and pedestrian commuting by analyzing short-distance work trips and current active-mode usage. The tool pinpoints trips of 1-3 miles, then compares these to actual bicycle and walking commutes from ACS data. By subtracting current active commuters from the pool of short distance commuters, the ACE tool highlights areas with potential demand for walking and biking. This approach reviews areas where active commuting could grow, though it does not include non-work trips or account for existing infrastructure. However, it provides a data-informed starting point for enhancing active transportation networks.

Table 8 provides the results of the bicycle and pedestrian commuter analysis. In total, 16 streets were included in this analysis, including Friendswood's Principal Arterials, Minor Arterials, and Major Collectors. The two TxDOT facilities show the greatest overall impact, with 116 potential new bicycle commuters and a combined vehicle miles traveled (VMT) reduction of nearly 548 miles a day, despite having gaps in existing sidewalk infrastructure. FM 518 also scores high in both potential pedestrian and bicycle commuting, with 70 potential new cyclists and a reduction of 263.2 vehicle miles traveled per day. Both corridors lack complete sidewalks, emphasizing the importance of addressing infrastructure gaps to unlock mode shift potential.

[11] Houston Galveston Area Council. (2025). Activity-Connectivity Explorer (ACE) Tool. Retrieved from: https://datalab.h-gac.com/ace/.

Table 8. Bicycle and Pedestrian Commuter Analysis

#	Road Class	Road Name	Start Limit	End Limit	Length (Mile)	Walking Commuter	Bicycle Commuter	Potential Walking Commuter	Potential Bicycle Commuter	Modal Shift New Walking Trips	Modal Shift new Biking Trips	Daily VMT Reduction by New Walking Commuters (Miles)	Daily VMT Reduction by New Biking Commuters (Miles)	Accessibility Score	Existing Sidewalk/Shared Use Path/Bike Lane
1	Major Collector	Melody Lane	Leroy Street	E Edgewood Drive	1.26	8	0	16	24	24	48	14	89.7	32.3	N/A
2	Major Collector	Mary Ann Drive	N Friendswood Drive	Stadium Lane	0.62	0	0	11	11	22	22	14.7	38.8	38	Sidewalk on one side (Northbound)
3	Major Collector	Stadium Lane	Mary Ann Drive	W Edgewood Drive	0.34	7	0	13	13	16	26	11.2	40	26.5	Partial sidewalk on one side (Westbound)
4	Major Collector	W Spreading Oaks Avenue	Sunset Drive	S Friendswood Drive	0.76	7	0	18	10	24	20	9.3	23	30.4	Sidewalk on one side (Southbound)
5	Major Collector	Falling Leaf Drive	Greenbriar Avenue	Sunset Drive	0.37	14	0	8	9	6	18	3.6	27.4	14.3	N/A
6	Major Collector	W Castlewood Avenue	Greenbriar Avenue	S Friendswood Drive	1.12	19	0	23	17	26	34	13.4	51.2	28.3	N/A
7	Major Collector	Greenbriar Avenue	Falling Leaf Drive	Briar Creek Drive	1.12	52	0	16	26	6	52	4.2	84.5	21.9	Sidewalk on one side (Eastbound)
8	Major Collector	Briar Creek Drive	Greenbriar Avenue	W Parkwood Avenue	0.3	27	0	8	12	2	24	0.2	37.7	27	N/A
9	Major Collector	Grissom Road	W Bay Area Boulevard	City Limits	0.02	3	0	3	6	0	12	0	30.4	21	Sidewalk on both side
10	Minor Arterial	Edgewood Drive/ FM 2351	County Road 125	Beamer Road	3.8	31	0	35	38	40	76	18.5	116.7	23.4	Partial sidewalk on one side (Northbound)

11	Minor Arterial	Blackhawk Boulevard	Edgewood Drive/ FM 2351	FM 528	2.22	6	0	26	85	44	170	43.9	395.2	38.5	Sidewalk on both sides with gaps
12	Minor Arterial	Friendswood Link Road/ Whispering Pines Avenue	S Friendswood Drive	Friendswood Link Road	1.21	11	0	17	40	26	80	25.1	181.1	39.1	Partial sidewalk on one side (Northbound)
13	Minor Arterial	W Bay Area Boulevard	FM 528	City Limits	1.57	13	0	20	52	22	104	19.3	248.3	27.5	Partial sidewalk on one side (Northbound)
14	Minor Arterial	Sunset Drive	W Edgewood Drive	W Parkwood Avenue	1.93	51	0	30	30	26	60	14.7	94.6	29.8	Sidewalk on one side (Eastbound)
15	Principal Arterial	FM 518/S Friendswood Drive/ N Friendswood Drive	Riverside Dr (City Limits)	City Limits	4.97	27	0	61	70	96	140	57.7	263.2	35.8	Sidewalk on both sides with gaps
16	Principal Arterial	FM 528/Parkwood Avenue/ W Parkwood Avenue	City Limits (Mandale Street)	City Limits	6.76	58	0	47	116	56	232	48	499.9	25	Sidewalk on both sides with gaps

Data Source: H-GAC Activity-Connectivity Explorer (ACE) Online Webmap

Origin-Destination Analysis

An origin-destination (O-D) analysis has been conducted in Friendswood to further understand where people are walking and biking within the community. The analysis utilized Replica data provided by H-GAC. Replica is an O-D online analysis tool that models travel behavior using aggregated and anonymized location data from mobile devices, GPS, and sources. Replica provides a detailed snapshot of trip patterns, including mode of travel, trip purpose, and time of day. These insights help identify heavily traveled corridors, active transportation circulation, and can assist with identifying opportunities to enhance the active transportation network.

The O-D analysis in Friendswood focused exclusively on walking and biking trips, excluding vehicle travel from the dataset. Replica, and origin-destination modeling programs in general, are meant to be looked at as a tool – something that is not prescriptive or absolute, but rather a way to visualize general travel patterns and identify potential opportunities or gaps in the transportation network. It provides a data-informed starting point to guide decision-making, rather than a precise measurement of every trip. Areas of Friendswood that have a well-connected sidewalk network are the areas that show the most foot traffic trips, which is of course expected. However, this does not necessarily mean that people do not want to walk to parts of the community showing a small number of walking or biking trips, it could mean they have trouble getting there on foot or bike. Conversely, an area showing a small number of walking or biking trips could also mean that the identified area is not a popular destination for active transportation users (e.g., an industrial park or warehousing area). The same is true for the other side of the spectrum, areas showing high numbers of active transportation trips may reflect the presence of key destinations like schools, parks, or retail centers – or they could be highlighted simply because sidewalk infrastructure exists in that Transportation Analysis Zone (TAZ). For that reason, the O-D analysis should be interpreted alongside local knowledge, on-the-ground observations, and community feedback to get a fuller picture of unmet mobility needs.

The Friendswood O-D analysis is displayed in a series of maps on the following pages. First, the community was divided into the different TAZs, which are geographic areas used in transportation planning to group trip origins and destinations together. These TAZ zones are displayed in **Figure 33**, and are established by the broader H-GAC regional travel demand model, and are typically determined based on a combination of factors, including population density, land use, roadway networks, and natural boundaries. The TAZs that were included as part of this O-D analysis include all TAZs located within the City limits or Friendswood, or those touching a boundary with the City limits.

Figure 33. Friendswood TAZs

Active transportation trips are grouped by the different TAZs in Friendswood. **Figure 34** shows the total number of walking trips by TAZ origin, meaning that walking trip started within that TAZ. Friendswood's existing active transportation infrastructure is overlayed with this analysis and shows that the areas of town with the highest amount of existing sidewalk infrastructure are also the areas that generate the highest number of walking trips. TAZ 2745, 2746, 2782, and 4644 have the highest amount of walking trip origins, which also happen to be the neighborhoods that are completely lined with existing sidewalk infrastructure. This is interesting to note and should be incorporated into the plan's recommendations.

Figure 35 displays walking trips by TAZ destination, meaning that recorded walking trips ended within that TAZ boundary. Walking trips are generally starting and ending in the same location, however, an additional TAZs is highlighted as a popular walking destination – TAZ 4369, which is Friendswood's downtown area and most popular commercial corridor. This means that people are traveling to downtown on foot, and connectivity opportunities should be further explored to make these routes more accessible and safer.

The top 10 O-D pairs are shown in **Figure 36**. These top 10 O-D pairs identify the highest number of trips between origin and destination, regardless of TAZ starting or ending point. All the top 10 pairs were within the same TAZ boundary indicating that most people start and end their walking trips within the same TAZ, not crossing TAZ boundaries.

Similarly to walking trips, biking trips are also organized by TAZ origin (**Figure 37**) and TAZ destination (**Figure 38**). Interestingly, TAZs 4641 and 4637 have higher biking trip origins. This could be because these TAZs are located along FM 528, where cycling is frequented in the wide shoulder or marked bicycle lane facility. **Figure 39** highlights the top 10 biking O-D pairs, with TAZ 2782 showing the highest number of biking trips, indicating that most of these trips both begin and end within that same zone.

These findings suggest that most active transportation trips in Friendswood are short in distance and remain within a single neighborhood or zone, reinforcing the importance of localized infrastructure improvements and last-mile connections. The data also highlights a connection between high-quality, existing infrastructure and increased walking and biking activity. Ultimately, this analysis can help guide targeted improvements that align with existing travel behaviors and community needs.

Figure 34. Walking Trips by TAZ Origin

Figure 35. Walking Trips by TAZ Destination

Figure 36. Top 10 Walking O-D Pairs

Figure 37. Biking Trips by TAZ Origin

Figure 38. Biking Trips by TAZ Destination

Figure 39. Top 10 Biking O-D Pairs

Walkshed Analysis

Walksheds help us understand how accessible key destinations are on foot. **Figure 42** show 5- and 10-minute walks from several schools in Friendswood, as well as from the intersection of Edgewood Drive and Friendswood Drive. While some schools are surrounded by homes and have sidewalk networks that support safe, direct walking routes, others lack even basic pedestrian infrastructure.

Figure 40 and **Figure 41** reveal how the experience of walking varies widely across the city. In some neighborhoods, a connected street grid allows for short, convenient walks. In other cases, disconnected street networks and cul-de-sacs force students to take longer, less direct routes—often along busy roads. Even where sidewalks exist, the absence of shade can make these short trips difficult, especially in the summer heat. Improving walkability near schools through better connections, shaded paths, and traffic-calming measures can support healthier, more active lifestyles for students and families.

Figure 40. Current Walking Route to Wedgewood Elementary School



Figure 41. Current Walking Conditions to Friendswood Junior High


Friendswood Junior High
1245 feet approx - 5 min
720 Timberstone Ln
6336 feet - approx 24 min

Figure 42. Walkshed Analysis Around Schools

Mobility Impacts to Active Transportation

This section analyzed current travel behaviors and identified where walking and biking are happening in Friendswood today, and where they could happen more often in the future with better infrastructure connections. Several tools were utilized to further analyze these travel patterns, including a Bicycle and Pedestrian Commuter Analysis, an Origin-Destination analysis, and a walkshed analysis. These tools all reveal that most active transportation trips are often short and localized and often begin and end within the same neighborhood or area of town.

The analyses also show a strong correlation between the presence of sidewalk or bicycle facilities and higher levels of walking or biking activity. This is to be expected; however, these tools cannot provide a full picture of active transportation needs, due to lack of existing infrastructure. Where the infrastructure is missing or disconnected, walking and biking trips are less frequent. These findings highlight how targeted improvements, especially around key destinations like schools, parks, or commercial corridors, can significantly expand Friendswood's active transportation potential and support healthier, more accessible mobility options in Friendswood.