B. Current Context

Dating back to 1848 when W.S. Peters brought 600 families into northeast Tarrant County, the North Richland Hills area remained a rural farming and ranching community for more than 100 years. Growth began to boom in 1953 when the city officially incorporated as the City of North Richland Hills (NRH) and subsequently annexed surrounding areas, such as Smithfield.

North Richland Hills, now home to nearly 70,000 residents, 1,200 businesses, and 30 major employers, is the third largest city in Tarrant County. Offering a neighborly atmosphere and family-friendly amenities, NRH is conveniently located with access to all of the Dallas-Fort Worth (DFW) region. This quality of life in the City was recognized in 2016 by *Dallas Morning News* by winning one of the 10 best neighborhoods in DFW, beating out over 300 other communities based on several factors including safety from crime, affordability of homes, good schools, well maintained and quiet neighborhoods, rising home values, pet-friendliness, places to shop and things to do, commute, walkability, trees and landscaping, and parks and greenspaces.

This rich history and culture as well as central location within the region has benefitted the City, supported by a reliable transportation system. Today, increasing demand on the roadways and continued aging of infrastructure are key concerns in the community. Additionally, the maturation of the community through redevelopment and intensifying land uses, such as the Transit Oriented Development (TOD) districts, reveals a need for multimodal mobility options which provide choice for residents and employees.

As an initial step in the transportation planning process, an assessment of the existing conditions and current context for mobility within NRH was conducted. This review, in tandem with stakeholder and public input, helps to provide an understanding of the specific issues and needs facing the community.

Key Development Influences

Three distinct districts within NRH provide significant potential impacts on the transportation system in the future. These include the HomeTown neighborhood, Smithfield TOD district, and Iron Horse TOD district. The development potential and intensity of those "urban villages" stands to influence the NRH transportation system with increased demand as well as unique modal characteristics which differ from the traditional auto-oriented development pattern.

HomeTown

HomeTown is a mixed-use community bound by Mid-Cities Boulevard on the north, Davis Boulevard on the west, and Boulevard 26 on the south. With many phases of the master planned development complete, Parker Boulevard, Bridge Street, and Winter Park Drive all traverse the interior of the neighborhood in addition to the Walker Creek water feature and trail bisecting it north-south. Marketed as a "live, work, play, shop and learn" community, HomeTown offers a diversity of land uses and housing types with easy access to the signature NRH2O Family Water Park, the NRH trail system, and major roadway corridors.

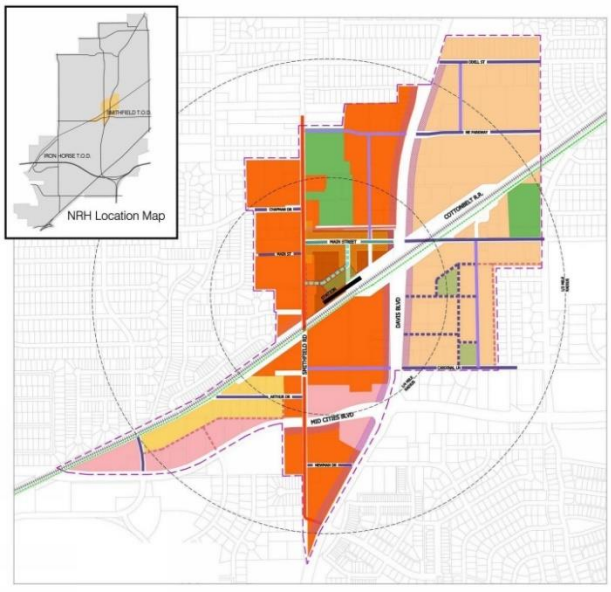
The Town Center Zoning & Regulating Plan, originally adopted in 1999 and updated in 2011, guides the development of the remaining acres within the neighborhood. Transportation components were considered through a Traffic Impact Analysis (TIA) in the adoption of the regulating plan to ensure adequate infrastructure exists to support the increased intensity of the development compared to surrounding neighborhoods. High pedestrian and vehicular activity, integral traffic calming (such as on-street parking, narrow streets, etc.) and high development density are major design factors. Additionally, a detailed roadway network providing connectivity internally and to the surrounding neighborhoods and major roadways is defined within the regulating plan. Right-of-way dimensions as well as roadway sections are described in the plan.

The regulating plan differs from the existing City Thoroughfare Plan in the roadway functional classification

terminology. The primary roadways within HomeTown have yet to be incorporated into the citywide Transportation Plan under equivalent functional classification. As the development nears buildout and the City takes over ownership of these facilities, it is important to incorporate these roadways into citywide documents for consistency in maintenance and operations.

Smithfield TOD

The Transit Oriented Mixed-Use Development Code governs future development around the proposed TEXRail station sites. Smithfield TOD is one of two NRH station sites for TEXRail, a 27-mile commuter rail project connecting downtown Fort Worth to Dallas-Fort Worth Airport. In anticipation of the rail project, NRH developed station area plans which regulate through a form-based code the land use and building aesthetics as well as defining street types.



Existing low-density development and vacant properties within the Smithfield TOD district are characterized under this plan to increase in intensity for mixed-use and transit-oriented style development. Located centrally within NRH away from freeways, the Smithfield TOD is expected to develop as a neighborhood centered on the rail station. These development patterns are conducive to increased active transportation and transit usage within the district which is exemplified by the rail station central to the district and Cotton Belt Trail paralleling the rail line. To produce this more walkable environment, roadway sections and typologies in the TOD district must be flexible and prioritize the vulnerable users

Transportation Benefits of Transit Oriented Development

- Creation of sustainable development with a variety of land uses for people to live, work, and play.
- Decreasing traffic congestion by allowing destinations to be reached from the station through active transportation.
- Reducing household spending on transportation by increasing use of transit thereby reducing amount of driving.
- Driving less by commuting via transit reduces vehicles emissions, therefore improving air quality.
- Providing choice for demographics that live car-free or car-light lifestyles.

to create a safe and inviting public realm along the streets.

The TOD development code differs from the existing City Thoroughfare Plan in the roadway functional classification terminology. Arterials and collectors, such as Smithfield Road and Main Street, are consistent but the context of the design must be considered for an ultimate section of these facilities. Accessibility to and from this TOD is vital to the success of the district and to benefit the surrounding neighborhoods with the potential retail and commercial amenities of the TOD.

Iron Horse TOD

Governed under the same Transit Oriented Mixed-Use Development Code as Smithfield TOD, the Iron Horse TOD will contain a different context to development than Smithfield. Located adjacent to Interstate Highway (IH) 820, Iron Horse TOD is envisioned as mixed use but with a heavier rate of park-and-ride usage and regional retail focus. Limited crossings of the rail line in the area also create an environment where development will be focused on the same side as the rail station.

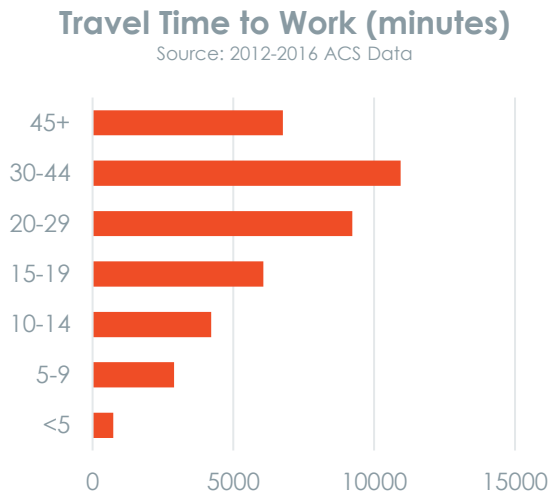
Existing vacant properties along Iron Horse Boulevard and big box retailers along the IH 820 frontage road are anticipated to develop or intensify in the future as the district grows and matures

The major corridors within the Iron Horse TOD are currently established and on the City Thoroughfare Plan, but the context of the design and intersection accommodations must be considered for the ultimate design of these facilities.

Current Travel Patterns

Understanding how people move within the City as well as how people move in and out of the City is important to evaluate the performance and needs of the transportation system. Both commute trips and total travel are considered to develop a comprehensive picture of dominant travel modes and regional travel needs.

Figure B-1. ACS Travel Time to Work

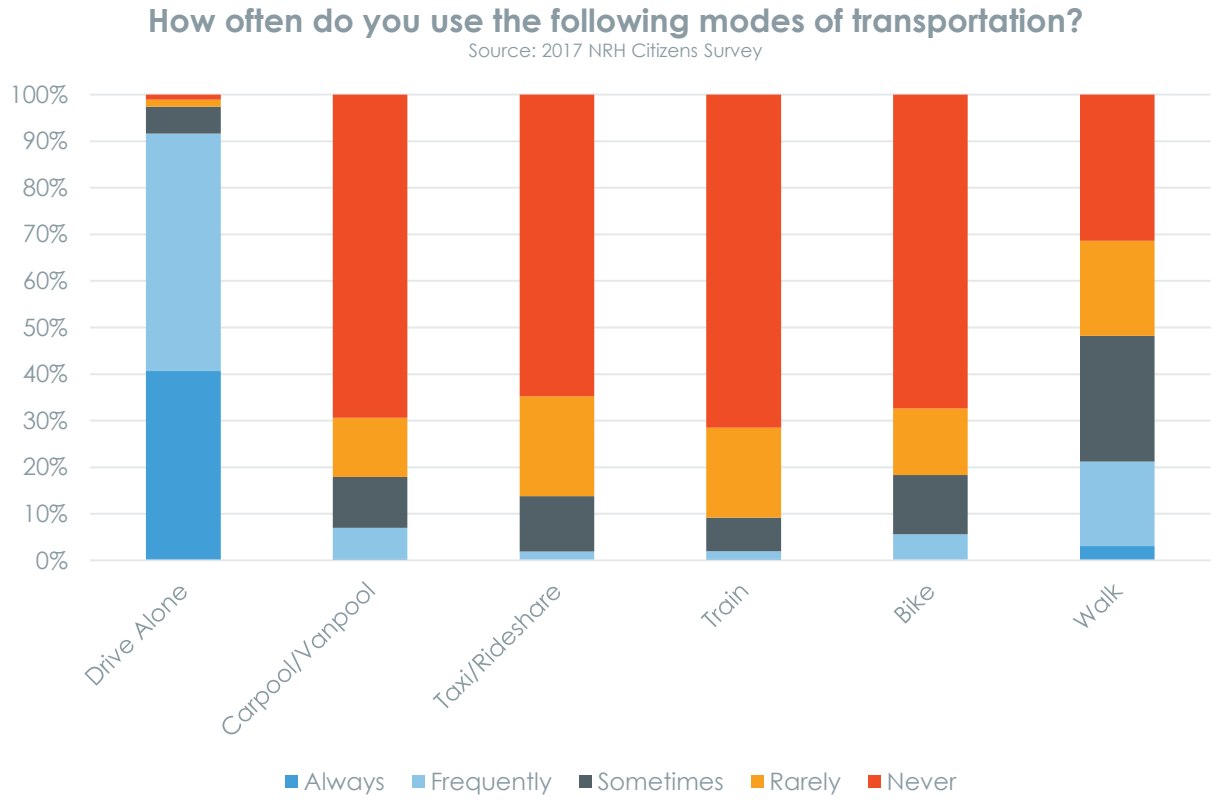


Data from the American Community Survey (ACS) describes commute travel times for residents within NRH. As expected in the region with many NRH residents commuting to other cities, approximately 43.4% of travel times are 30 minutes or longer. Under 15-minute commutes represents 19.2% of residents in NRH. The focus of long commute times, as well as commute lengths, signifies multiple considerations for NRH into the future:

1. Development of local employment to help residents both live and work in NRH;
2. Advocate for regional transportation initiatives to manage traffic congestion and alternatives, i.e. IH 820, SH 183, TEXRail;
3. Develop travel demand management initiatives, e.g. carpooling, staggered work hours.

The 2017 NRH Citizens Survey, supports the claim toward an auto-oriented

Figure B-2. Citizens Survey Transportation Mode Use



community. The dominant transportation mode is driving alone with carpool/vanpool and walking showing frequent use by some residents. These latter uses reflect citizens' use of alternative options for commuting and local trips, respectively.

Continued support and development of non-single-occupant-vehicular travel, including walking, biking, carpool, and transit, also effect the overall transportation patterns in the community. Emerging trends in sustainability and the intensification of development throughout Tarrant County, advancement of transit in the region, and NRH's strong trail system support future shifts in travel characteristics as average household vehicle-miles traveled (VMT) could decrease with urbanization. This is evident in NRH with the two TOD station areas and HomeTown neighborhood. The launch of TEXRail will bring new options to NRH with the potential to shift these travel patterns over the coming years.

While community-wide surveys point to the way most citizens use the transportation system, it is also important to plan for groups that may be underrepresented and have limited transportation options. This includes groups with vision or mobility impairments, populations below poverty, households without vehicles, populations with limited English proficiency, and populations above or below typical driving ages. From the 2012-2016 ACS data in Census Tracts within NRH, **Table B-1**, summarizes the presence of these populations within NRH.

Many of these groups have overlapping needs and limitations. The lack of vehicle ownership or operation covers many of these populations. Zero-vehicle households, children unable to drive, elderly people who can no longer safely drive, and people with vision impairments all lack easy access to personal vehicles and must find alternative means. It is important to note that children are completely unrepresented in traditional surveys but still have school and extracurricular activities that are often suitable for active transportation modes if it is available. Populations below poverty may own vehicles, but it is important the City consider the impact of this as housing and transportation costs are the

highest impact on these households. By supplying other effective options, the City can help serve the needs of these residents. Finally, residents with limited English proficiency often fall into some of these previous categories but may also need special consideration in transportation planning to ensure educational materials and meetings are translated. Approximately 10.0% of residents in NRH are foreign born persons, according to ACS data.

Table B-1. Underrepresented Transportation Populations in NRH

Group	Presence	Percent of Total
Population below Poverty	6,570 people	7.9%
Zero-Vehicle Households	1,013 households	3.3%
Limited English Proficiency	2,138 people	2.8%
Children (10-19 years old)	10,005 people	12.0%
Elderly (80+)	2,982 people	3.6%

Source: 2012-2016 ACS Data

Roadway Network

North Richland Hills' roadway network is nearly at a build-out condition. The previous plan adopted in 2007 has been steadily implemented to develop a full network of roads throughout the community. The network contains an array of arterial, collector, and local roadways in addition to IH 820 and SH 121.

Oriented in a north-south, east-west grid, with the exception of Boulevard 26, NRH has a wide arterial spacing at approximately 1.5-miles. This spacing is supplemented with a strong collector roadway network that serves the local mobility and access to destinations within the neighborhoods.

Table B-2. Major Roadways

Major North-South Roadways		
Name	Current Functional Classification	Travel Lanes
Rufe Snow Dr.	Arterial	4-6
Davis Blvd.	Arterial	6
Precinct Line Rd.	Arterial	6
Boulevard 26	Arterial	4
Smithfield Rd.	Collector	2-4
Holiday Ln.	Collector	2-4

Major East-West Roadways		
Name	Current Functional Classification	Travel Lanes
N Tarrant Pkwy.	Arterial	6
Mid-Cities Blvd.	Arterial	6
Harwood Rd.	Arterial	4-6
Glenview Dr.	Arterial	4
Bursey Rd.	Collector	2-4
Starnes Rd.	Collector	2
Rumfield Rd.	Collector	2-4
Hightower Dr.	Collector	2-4
Chapman Rd.	Collector	2
Amundson Dr.	Collector	2

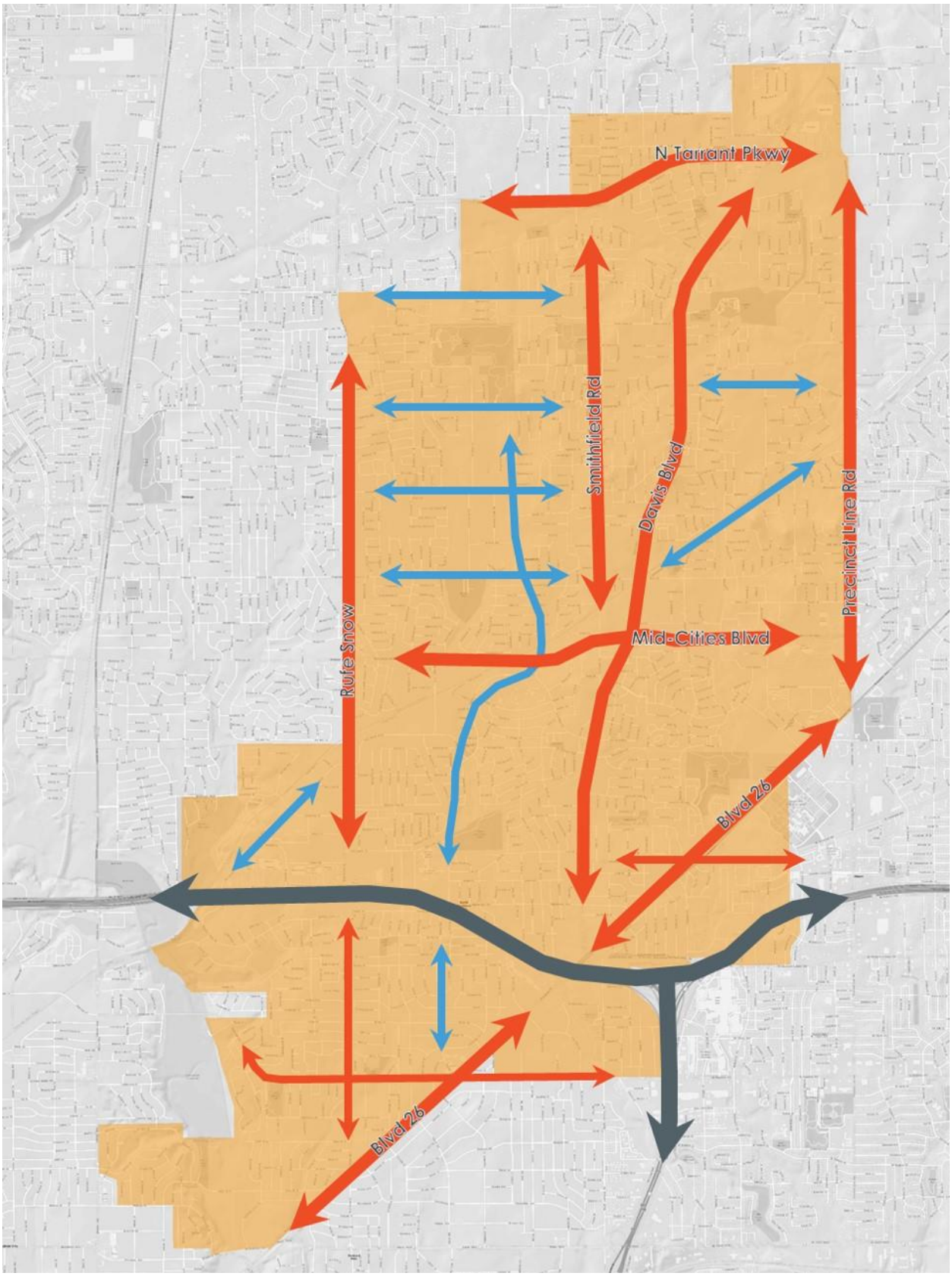


Figure B-3. Major Roadways

Safety – Crash Data

Vehicle crashes are a source of significant personal distress, disruption, loss of personal property and time, and in some cases, result in injury. In the worst cases, crashes can be fatal. Analysis of crashes recorded by TxDOT's Crash Records Information System (CRIS) was conducted to determine if patterns were prominent in the City.

Over the last five years (2013-2017), on average one quarter of crashes within the City have been on freeway facilities (IH 820 and SH 121) with the remaining located on local roadways. As TxDOT maintains control over these freeway facilities, the local, non-freeway roadways will be the focus for trends and guidance for City intervention.

Total crashes on local roadways have fluctuated since 2010 with an average annual growth rate of 1.3% but showing some individual years, such as 2011 and 2015, lower than this trend. This local growth rate reflects the population growth rate of 1.5% over this same time period. While it is anticipated that crash rates parallel demographic growth and overall vehicle-miles traveled (VMT), **crashes and traffic fatalities are avoidable** through proactive policies and infrastructure investments.

Figure B-4. Total Crashes, TxDOT CRIS 2013-2017

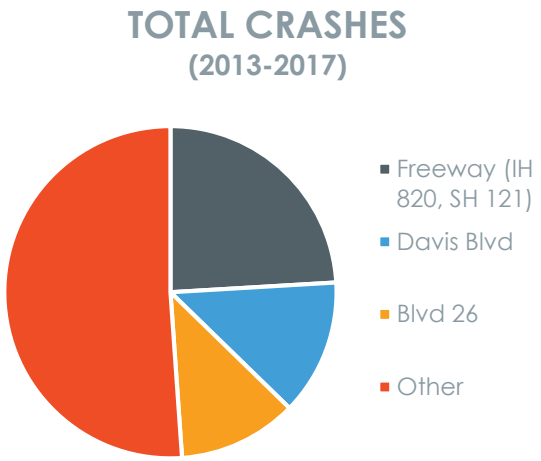
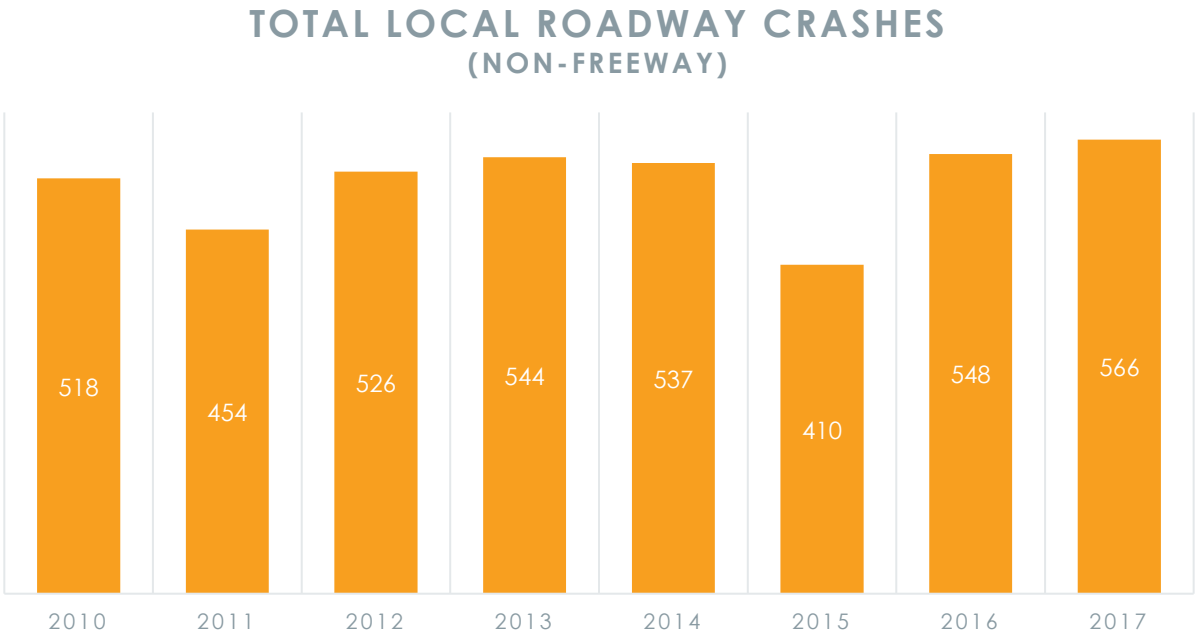


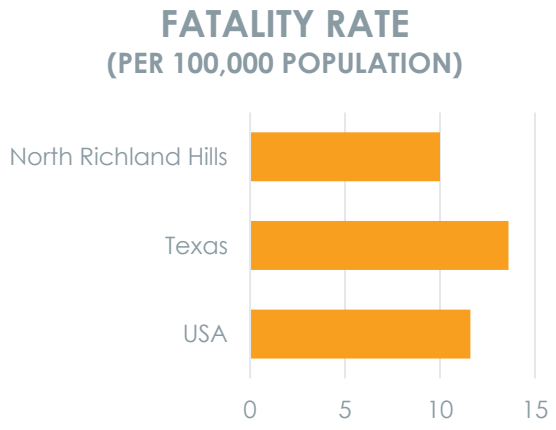
Figure B-5. Total Local Roadway Crashes, TxDOT CRIS



Analyzing the location of crashes, both local and freeway, the data reveals a near even split of crashes between intersection and non-intersection locations. For both total crashes and fatal crashes, approximately 45% are located at intersection locations. The crash frequency heat map, illustrated in **Figure B-8**, supports this assertion. Using CRIS data from 2013-2017, the warmer colored areas show spots of increasing frequency of crashes – significantly around freeway access points and major arterial/arterial intersections. This map also reflects the heavily traveled, high-speed corridors with numerous conflict points, such as Rufe Snow Drive, Davis Boulevard, and Boulevard 26.

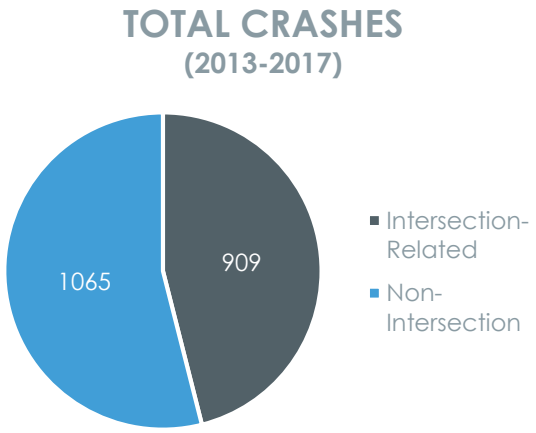
Overall on a per capita basis, North Richland Hills maintains a relatively low fatality rate for traffic crashes. Compared to national and state averages in 2016, the City has fewer fatalities per 100,000 population. This is a relative number though, as most other industrialized countries in the world maintain a lower crash rate. A strategic effort to increase safety and reduce crashes would be beneficial to the community.

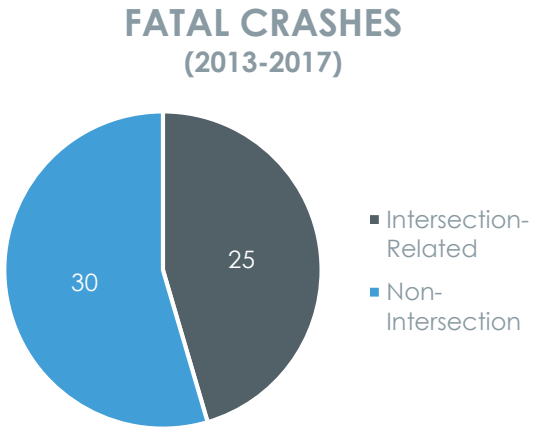
Figure B-6. Fatality Rate Comparison



The policy implications for the City are that high-speed, complex environments appear to be increasing crash frequency on the local roadway network. Access management may be warranted to reduce conflict points between intersections. Additionally, design speeds and posted speeds should be evaluated to ensure they consider the context of the corridors. Providing visual cues for appropriate speeds, in addition to possibly reducing posted speeds, may reduce crashes at intersections, but this must be reinforced with enforcement and education of speed risk.

Figure B-7. Intersection-Related Total and Fatal Crashes, TxDOT CRIS 2013-2017





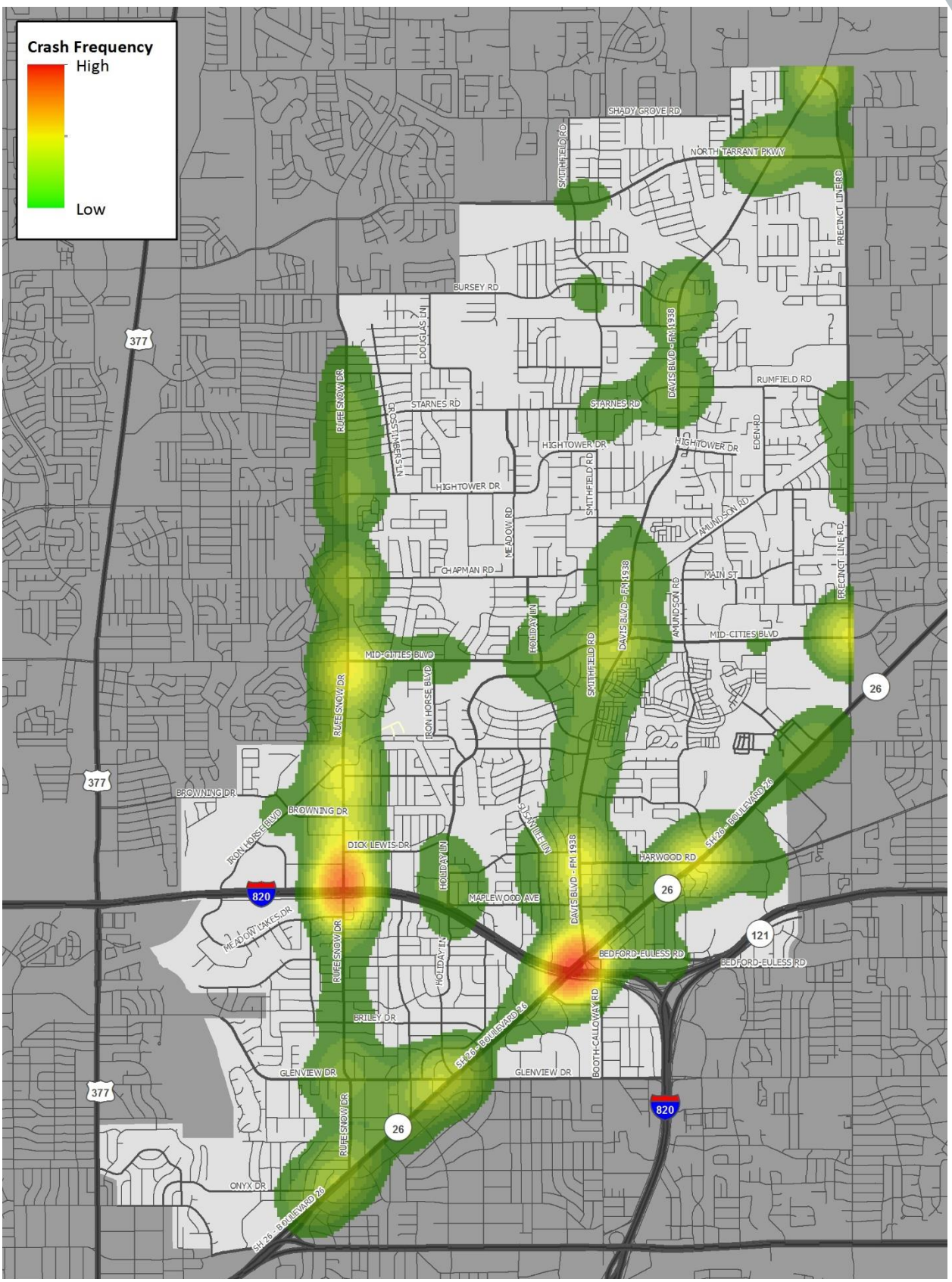


Figure B-8. Crash Hot Spots on Local Roadways

Pedestrians and Cyclists

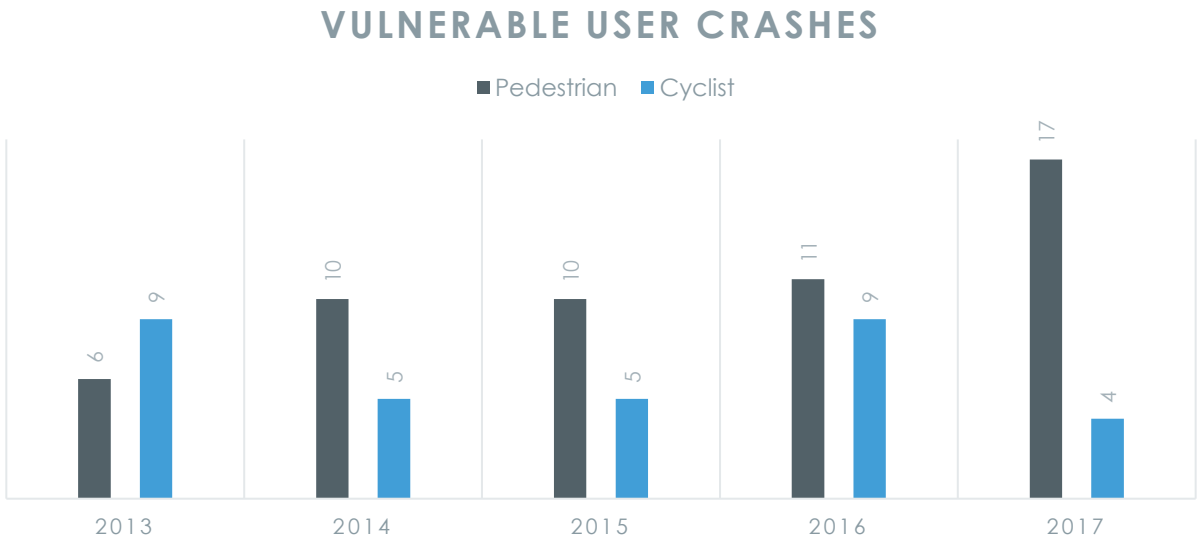
Rising pedestrian and cyclist crash rates nationwide bring special consideration to these users within the transportation system. As vulnerable users, any crash is likely to have a high severity, whether incapacitating or fatal.

Within NRH there has been a rise in crashes involving pedestrians in the last five years, continuously increasing from 6 in 2013 to 17 in 2017. These crashes have occurred in the southern sector of the City with clusters along Rufe Snow Drive between IH 820 and Mid-Cities Boulevard as well as other major arterials, such as Davis Boulevard, Boulevard 26, and Harwood Road. The high conflict areas provided by auto-oriented development surrounding these corridors with numerous driveways and limited pedestrian accommodations are reflected in the crash data.

Unlike pedestrian crash trends, traffic crashes involving cyclists has fluctuated over the last five years. These crashes are located throughout the City, but, similar to the overall traffic crashes, are typically at intersections and complex arterial locations where many driveways exist. The data reveals the crashes typically occur at intersections where there are no special bicycle facilities, such as bike lanes or trail crossings. There is also a cluster of crashes along Rufe Snow Drive between IH 820 and Mid-Cities Boulevard. The auto-oriented retail environment with numerous driveway conflict points combined with limited safe crossing locations can be attributed to this focus area of cyclist crashes.

The policy implications for the City are that roadway crossings for pedestrians and cyclists appear to be the main source of crashes for these vulnerable users. Intersection enhancements, such as lighting and crosswalks, should be considered to bring attention to these users. Safe Routes to School programs should also be continued to provide focused crossing locations as well as encourage education.

Figure B-9. Vulnerable User Crashes, TxDOT CRIS 2013-2017



Congestion

NRH is primarily an auto-oriented community with many residents commuting to employment outside the city. The management of traffic flow becomes paramount, specifically in the morning and evening peak hours, to ensure reliable commutes that help the quality of life for people living or working in NRH. Based on the 2017 NRH Citizens Survey, the majority of residents in NRH currently view this management of traffic flow favorably, but there are still issue areas.

Figure B-10. NRH Survey on Traffic Flow Quality

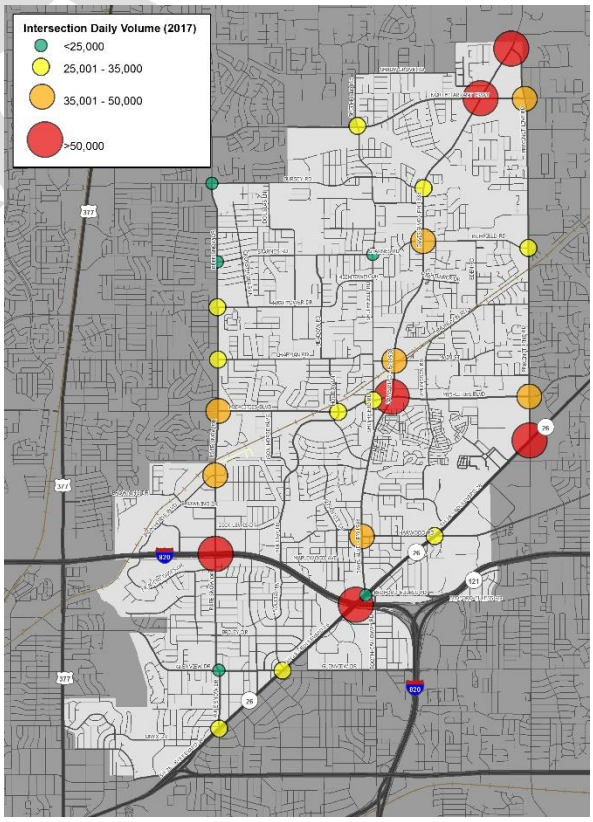
The limited capacity of a given roadway may be the most constrained at an intersection. Traffic flow is often impacted at intersections with geometric design for high traffic or signal timing. From the 2017 NRH Citizens Survey, the top five intersections where residents felt there was unnecessary delay are shown in the following table.

Table B-3. Top 5 Congested Intersections

Top 5 Congested Intersections (Identified by Citizens)
Davis Boulevard @ Mid-Cities Boulevard
Rufe Snow Drive @ Mid-Cities Boulevard
Davis Boulevard @ N. Tarrant Parkway
Davis Boulevard @ Boulevard 26
Rufe Snow Drive @ IH 820

This qualitative information from the Citizens Survey is supported by the analysis of critical intersections from the 2017 traffic volumes. **Figure B-11** illustrates these intersections and the sum of their daily approach volumes based on the NCTCOG Travel Demand Model data for 2017.

Figure B-11. 2017 Critical Intersections



The higher the volumes from all approaches combined, the larger the circle on the map. The higher the volume from every direction in the intersection the more important it is to make sure that traffic is moving in these locations. Intersection performance also influences factors such as travel time and air quality. Therefore, some priority must be given to improving operations at critical intersections.

It should be noted that there are five prominent high-volume intersection and corridor areas:

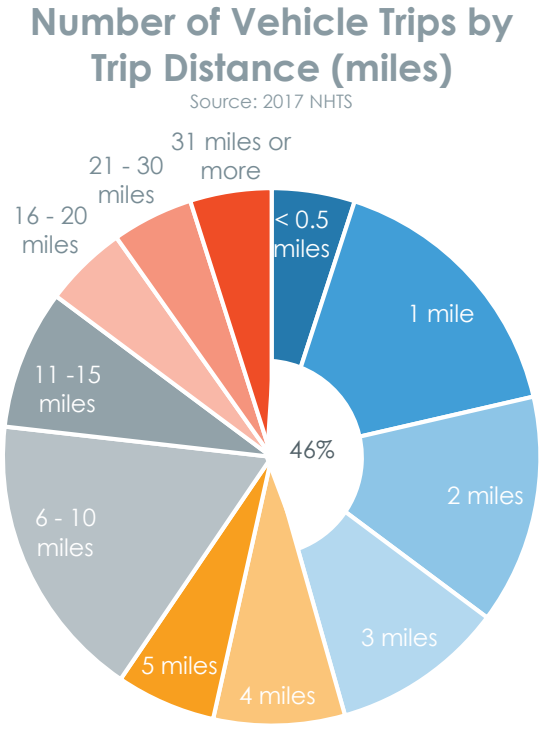
1. Rufe Snow Drive, from Mid-Cities Boulevard to IH 820
2. IH 820 at Boulevard 26 and Davis Boulevard
3. Boulevard 26 at Precinct Line Road
4. Davis Boulevard at Mid-Cities Boulevard
5. Davis Boulevard/North Tarrant Parkway/Precinct Line Road triangle

Two ongoing projects address corresponding critical areas. One is the widening of Rufe Snow Drive north of IH 820 to a six-lane divided roadway section. The other is capacity enhancements to the Davis Boulevard at Mid-Cities Boulevard intersection.

Active Transportation

Active transportation is considered as human-powered modes of transportation, such as walking and biking and is an essential element of a transportation network. From the 2017 National Household Travel Survey, shown in **Figure B-12**, 5.0% of trips are less than a 1/2-mile and 45.6% of trips are less than 3 miles. These trip lengths are ideal for non-motorized transportation or micromobility options, such as bicycles or electric scooters.

Figure B-12. 2017 NHTS Trip Distance Distribution



It is important to build a transportation network that not only accommodates active transportation but plans and prioritizes it. All trips, regardless of primary mode, begin and end with the pedestrian. Common elements of an active transportation network include on-street and off-street bike trails, signed bike routes, and sidewalks.

Bike Culture in NRH

A statistically valid survey was conducted in 2017 for the North Texas region by NCTCOG capturing the general public's view on bicycling. This survey included an analysis of cyclist types in the region, defined as follows:

- Strong & Fearless: Will ride a bicycle regardless of the roadway conditions. Riding is a strong part of their identity.
- Enthused & Confident: Somewhat comfortable sharing the road with vehicle traffic. Prefers dedicated bike facilities.
- Interested but Concerned: Like riding a bicycle and would ride more if they felt safer on the roadways.
- No Way No How: Not comfortable, not interested, or not physically able to ride a bicycle.

Figure B-13 outlines the proportion of users within North Texas's 12 county region, as well as a comparison to the national survey. Note that fewer people are interested in bicycling in North Texas than the national average, but half of people still prefer dedicated bike facilities that protect from mixing with vehicular traffic.

This is supported by the attitudinal survey conducted as part of this plan in NRH where 67% of respondents agreed that the city needs more off-street trails and sidewalks separated from the edge of traffic for walking and biking, with only 9% disagreeing with that statement.

While this attitudinal survey pointed toward a desire for more off-street active transportation facilities, cycling is still seen generally as recreational in NRH and secondary to the needs of vehicular travel as noted in **Figure B-14** and **Figure B-15**.

Figure B-13. Four Types of Cyclists

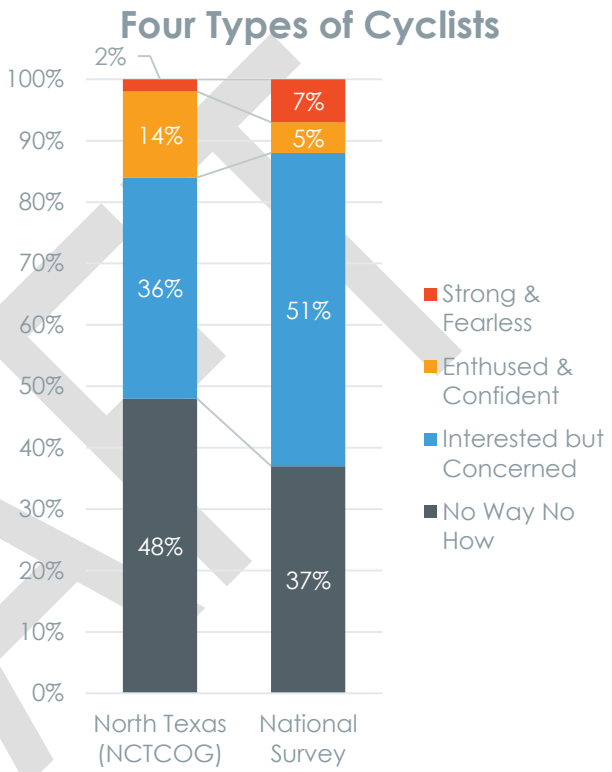


Figure B-14. NRH Survey Right-of-Way Allocation

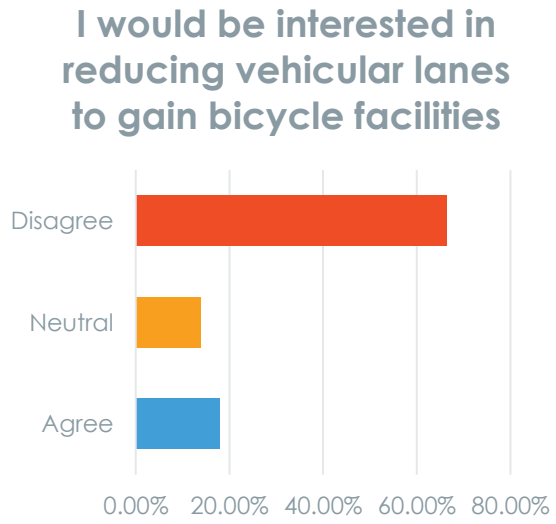
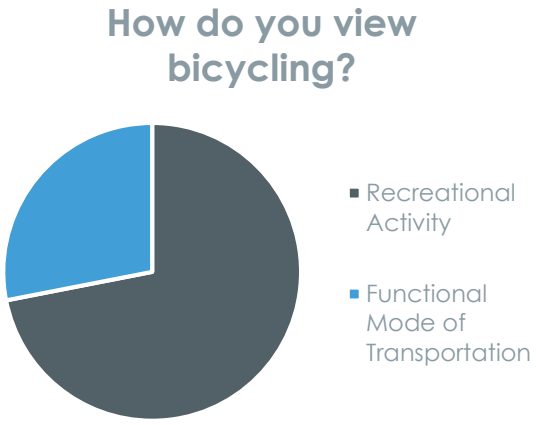


Figure B-15. NRH Survey Views on Bicycling



Existing Facilities

NRH has implemented an extensive system of concrete trails for off-street travel by people walking, biking, and other non-motorized uses. These paths create a safe, comfortable experience for users of all ages and abilities. A summary of these trails is in **Table B-4**.

These trails serve as the spine of NRH's bicycle and pedestrian network creating north-south and east-west connectivity. The development of bicycle paths from these trails to major destinations like parks, schools, and shopping centers will enhance the connectivity of bicycling in the city. The sidewalk network also extends the reach of these trails for people walking. A map of existing trails and bike facilities is shown in **Figure B-16**.

Table B-4. Existing Trails

Trail Name	Miles
JoAnn Johnson Trail	1.65
Randy Moresi Trail	0.60
North Electric Trail	2.55
Walker's Creek Trail	2.85
John Barfield Trail	3.95
Cotton Belt Trail	4.08
Calloway Branch Trail	4.68
Total	**20.28**

A 2016 Trail and Route System Plan was developed by the City providing a framework for future investments in walking and biking infrastructure. This included the identification of opportunities and constraints to developing an active transportation network. A summary of these is shown in **Table B-5** and **Table B-6**.

As the Iron Horse and Smithfield TEXRail stations begin their first years of operation, it is important to understand also the pedestrian routes in and around the transit stations. The urban development expected to occur in these areas supports the proximity of land uses and destinations to make walking the mode of choice. To encourage this, it is important for the city to note gaps and barriers that can be solved to make walking attractive around the TODs. As part of the station analysis, NCTCOG created maps in 2016 showing pedestrian routes and disconnected facilities surrounding the Iron Horse and Smithfield stations. Areas with gaps in the sidewalk network include older areas of development, when sidewalks may not have been required, or where undeveloped land currently exists. More complete sidewalk networks are found in newer development and subdivisions but need connections to the overall system and transit stations. **Figure B-17** and **Figure B-18** show these NCTCOG study maps.

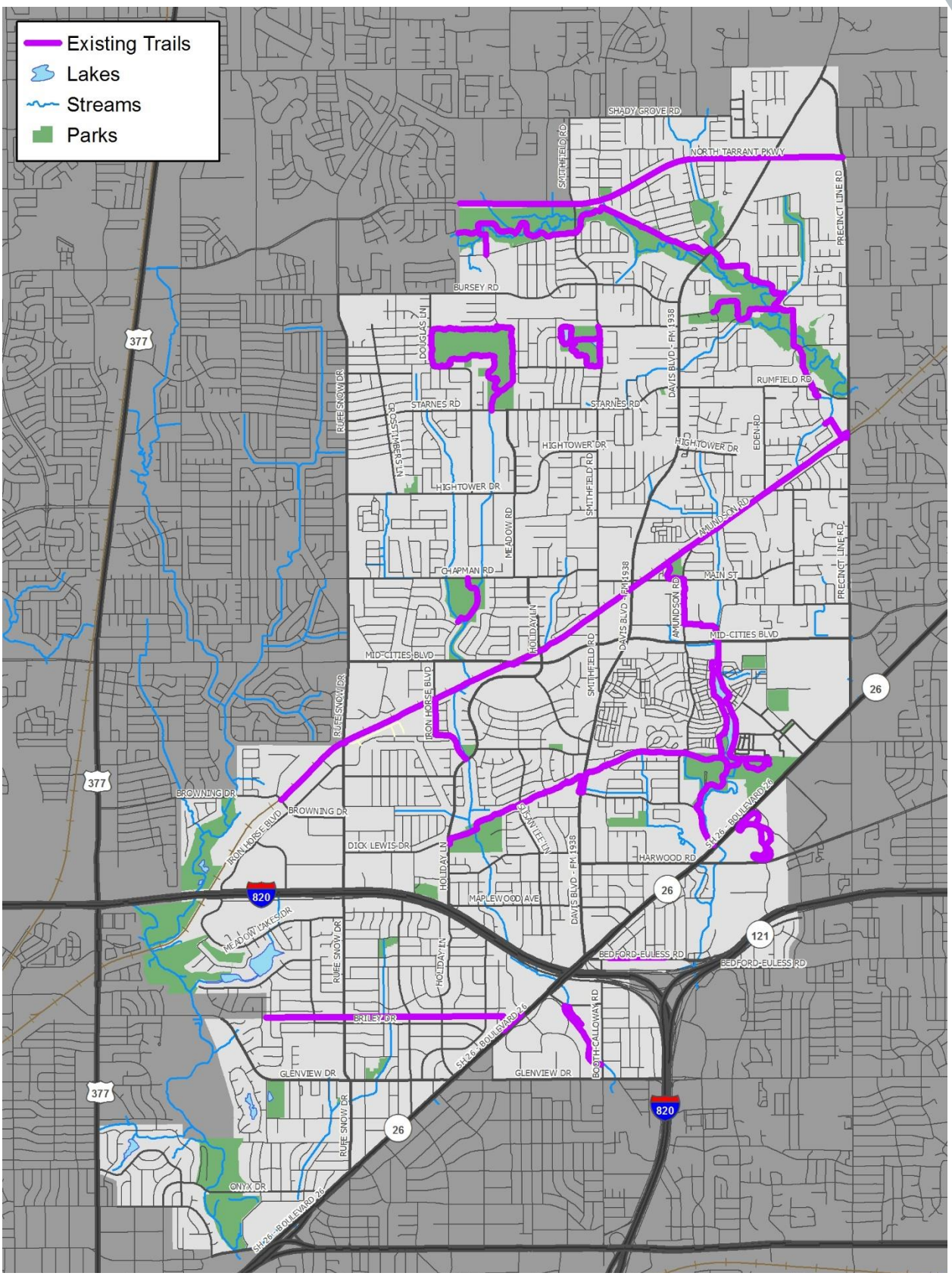


Figure B-16. Existing Active Transportation Network

Table B-5. 2016 Trail and Route System Plan Summary of Opportunities

Opportunities
The existing trail network are popular corridors for walking, bicycling, and jogging in NRH, serving as a backbone for system growth.
The existing off-street trail network is well signed with mile markers, maps and wayfinding.
Partnerships with neighboring municipalities and regional agencies offer opportunities to connect to the Veloweb Regional Trail System and adjacent trail systems.
Branded and coordinated wayfinding signs along shared use paths and on-street bikeways can lead bicyclists to community destinations and recommended corridors.
Wide collector and local roadways provide unique opportunities for on-street bikeways.
Two future TOD stations provide a scenario where bicycle access supports intermodal transportation options.
Some utility corridors, waterways and drainage ditches create opportunities for future trail development.
The summertime ride with the Mayor events integrate several departments of city staff with local elected officials and citizens. The amount of community and knowledge building at this event provides a significant contribution to the active transportation community.

Table B-6. 2016 Trail and Route System Plan Summary of Constraints

Constraints
Heavy volumes of vehicular traffic, wide pedestrian crossings, and auto-oriented retail and commercial development, along several major arterials present significant barriers to active transportation travel.
Several existing trail crossings are unprotected and unmarked. The crossings are often mid-block due to the nature of where utility and rail corridors exist.
The Interstate Highway and major arterials surrounding NRH limit regional connectivity to adjacent communities.
The current signage and wayfinding system for the on-street bicycle routes is not easy to follow and does not identify destinations. Signed roads are no more bicycle friendly or maintained than the unmarked roads.
A lack of on-street bikeways limits residents' ability to access bicycle destinations not accessible by shared use paths and trails, especially for riders that are not confident sharing a road with vehicles.

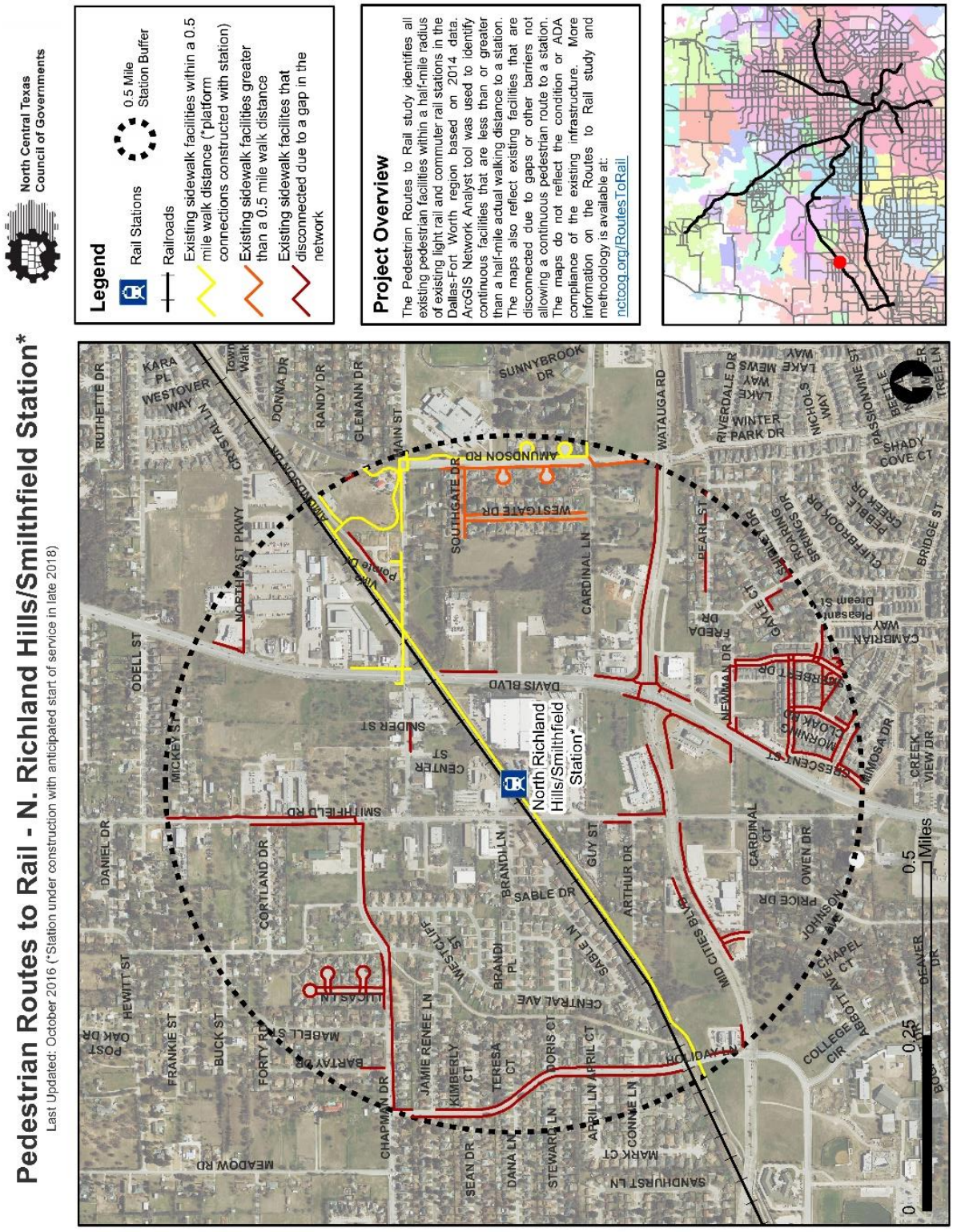


Figure B-17. NCTCOG Smithfield Station TOD Pedestrian Routes

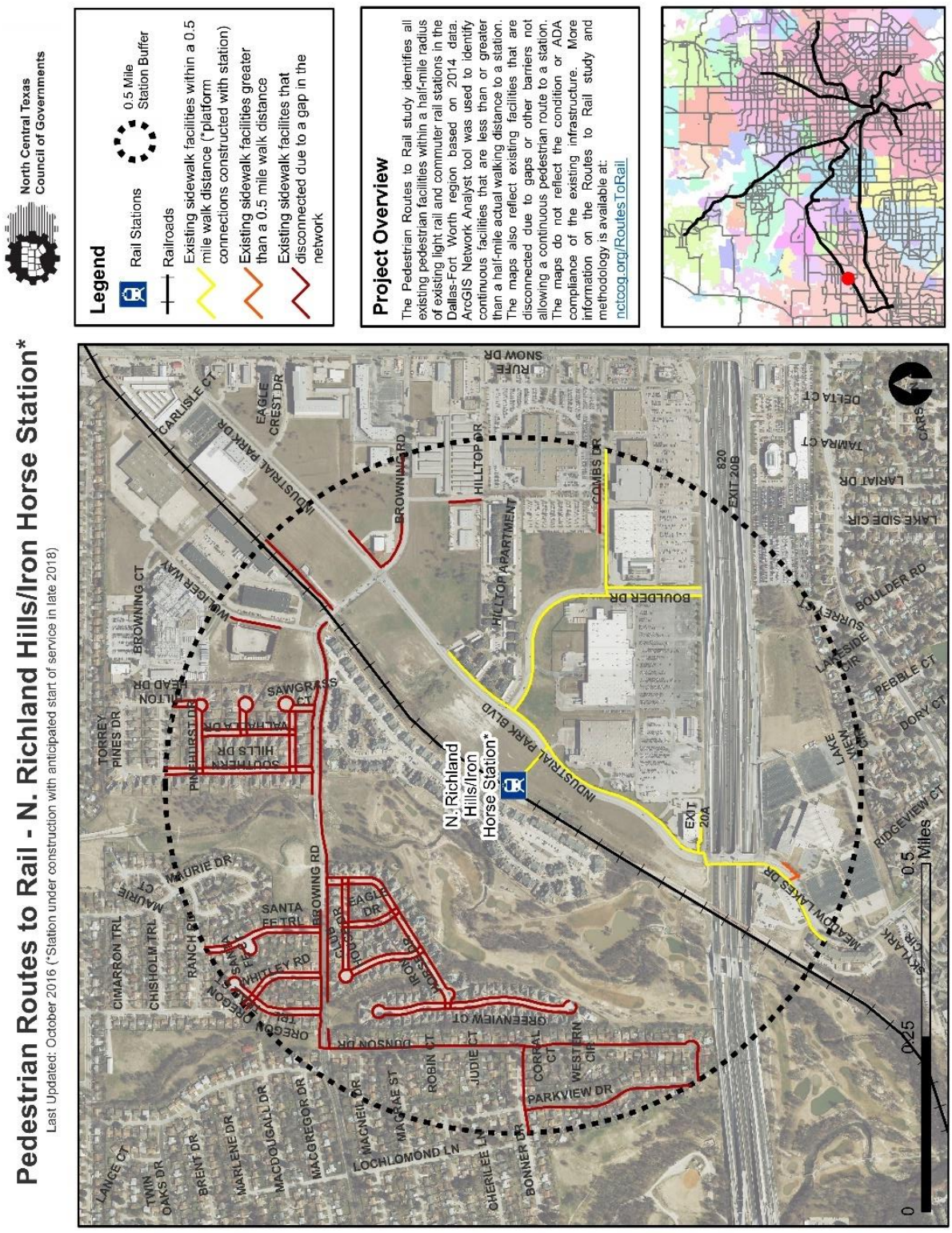


Figure B-18. NCTCOG Iron Horse Station TOD Pedestrian Routes