

DRAFT

DALLAS BIKE PLAN EXISTING CONDITIONS ANALYSIS REPORT

October 2022



DALLAS
BIKE PLAN
UPDATE

Introduction

The following report provides a summary of existing conditions for bicycling in the City of Dallas. This assessment includes evaluation of existing network characteristics, level of traffic stress, and safety. It also includes an evaluation of topics such as equity, public health outcomes, and community assets that drive demand for bicycling to provide additional context for the existing network and future opportunities. The analysis presented here includes discussion of existing conditions and trends at the City level, but it also includes review of existing conditions based on Connect Dallas planning areas. The Connect Dallas planning areas segment the city into seven distinct geographic regions to provide more detailed review of existing conditions as well as provide consistency among mobility planning efforts in Dallas. For each analysis, the memorandum includes a summary map for the City of Dallas; maps by Connect Dallas planning areas can be found in the appendices for additional detail. The information presented in this report will inform network opportunities and the identification of existing system gaps.

Existing Network

As shown in **Figure 1**, the existing Dallas bicycle network includes 67 miles of on street bikeways and 146 miles of off-street paved trails (**Table 1**). While there is currently a range of facility types, the majority of Dallas's bikeways are comprised of shared lane markings (21%) or off-street trails (68%). Further, existing bikeways are primarily located in Central, North-Central, and Northeast Dallas. In fact, more than 59% of the on-street bikeway network is located in these areas. Only about 30% of existing on-street bikeways are located in southern areas of Dallas (include Southcentral, Southeast, and Southwest, with few connections to major destinations and the rest of the bikeway system.

Table 1. Existing Bicycle Facilities

Facility Type	Mileage
Shared Roadway (Sharrow)	59.23
Bike Lane	8.03
Buffered Bike Lane	9.99
Cycle Track	6.5
Trail	146

In addition to being primarily located in Central, North-Central, and Northeast Dallas, the existing bikeway system is disconnected, with limited options for continuous travel between facilities and to many community destinations. The disconnected bikeway network is further divided by highways, which serve as barriers to active travel. A major highway runs through every planning area in Dallas, making it difficult to bike between them due to limited low-stress crossing opportunities. For example, Downtown and Central Dallas, despite containing the majority of the existing bikeway network, are surrounded by highways, effectively isolating these areas from other locations in the city. Opportunities to provide low stress bikeway connections across highway barriers will be critical for a connected network.

Paved Trails

The City's trail network has been primarily built through parks and along creeks and rivers, utility corridors, and former railroad right-of-way. Trails form an important part of the active transportation network, providing a low-stress (i.e., limited-to-no exposure to motor vehicles) route that supports a variety of trip types; however, as they are generally co-located with parks, Dallas's existing trail network largely supports recreation with limited transportation functions. Examples include the Trinity Skyline Trail along the Trinity Greenbelt, the White Rock Lake Trail at White Rock Lake Park, and the Trinity Forest Trails. A few major trails—including the Katy Trail, Santa Fe Trail, Sopac Trail, Northaven Trail, and Preston Ridge Trail—however serve as useful transportation corridors with connections to housing, jobs, light rail stations, and other bicycle facilities. The Katy Trail, for example, connects to downtown near the Victory light rail station and to Southern Methodist University (SMU) via the SMU/Mockingbird light rail station.

Shared Roadways

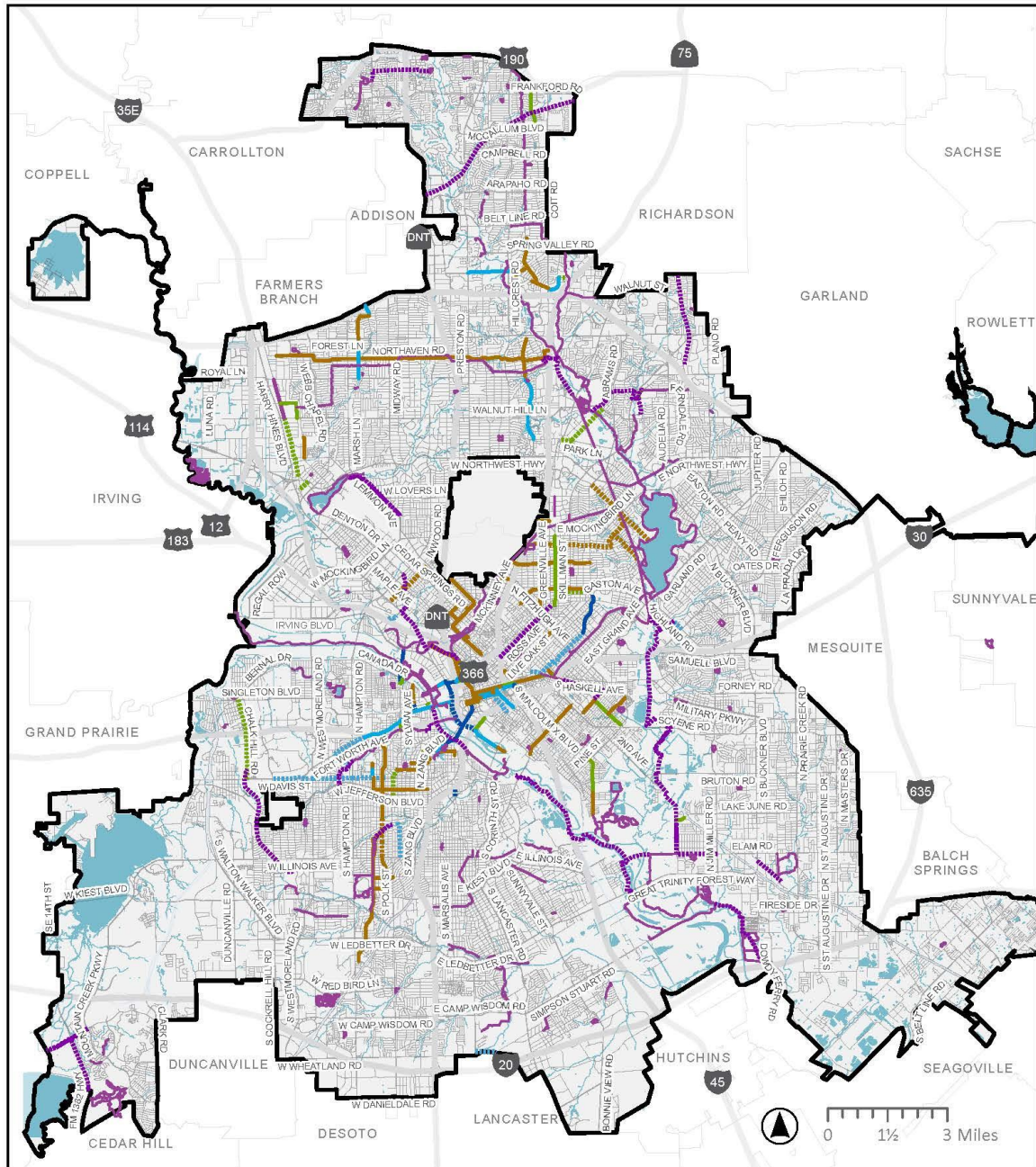
While many on-street bikeways provide connections to paved trails, parks, schools, and commercial corridors, they are often short and disconnected segments. While a bike facility, for example, may connect to a destination within a neighborhood, it often ends abruptly without providing a continuous route for bicycle travel. The majority of on-street bikeways are shared roadways, which are primarily located along two-lane residential streets parallel to commercial corridors. These roadways generally do not include traffic calming elements. A few notable exceptions include Martin Luther King Jr. Boulevard in Southeast Dallas and North Lamar Street in Downtown, both of which are along major roadways with 5 lanes and 4 lanes respectively.

Bike Lanes, Buffered Bike Lanes, and Cycle Tracks

Only a few streets currently have bike lanes, buffered bike lanes, or cycle tracks. Bike lanes are often along two-lane neighborhood collector streets, while buffered bike lanes and cycle tracks are primarily located along major roadways connected to paved trails, shared roadways, transit, and to more central downtown and commercial areas. Compared to other on-street facilities, buffered bike lanes and cycle tracks are considered low stress, providing extra separation between people driving and people on bicycles. Although many of these facilities connect to paved trails and shared roadways, they are short segments connected to another facility only on one end, contributing to a disconnected bicycle network overall. A two-way cycle track, for example, along Denton Drive provides a low stress connection between the Royal Lane light rail station and the Walnut Hill/Denton station; however, no facilities exist on either end.

While there are currently 213 miles of bikeways in Dallas, this represents only a fraction of Dallas's transportation system. Considering on-street bike facilities, the existing network is located along only 2% of the road network. Overall, the existing network represents a highly fragmented bikeway system. Existing facilities are due to significant efforts by the City and should form the basis for future network development. Network recommendations and prioritization should seek to create a more complete, connected system building from existing routes and minimize disconnected facilities. Opportunities include connecting between existing facilities, improving comfort along existing routes, connecting to destinations, and exploring a system of bicycle boulevards along residential roadways.

Figure 1: Existing & Funded Bikeways in Dallas



Dallas Bicycle Master Plan

Existing and Funded Facilities Confirmation Map

Existing Bike Facilities

- Bike Lane
- Buffered Bike Lane
- Cycle Track
- Sharrows
- Trail

Funded Bike Facilities

- - - Bike Lane
- - - Buffered Bike Lane
- - - Cycle Track
- - - Sharrows
- - - Trail

Dallas City Limits



Level of Traffic Stress (LTS)

LTS describes the expected experience traveling by bicycle along a roadway. At its foundation, LTS relates to the speed of the roadway, the width of the roadway, and provision of space for bicycles. A roadway with fewer lanes for motor vehicles, lower posted speeds, and greater separation from motor vehicles is considered more comfortable, while high speeds and mixed traffic conditions are least comfortable. LTS scores also provide insight into what type of rider might travel along a corridor; for example, an LTS 1 is considered to be an all ages and abilities facility, support travel for all people, while an LTS 4 is high stress and may only be traveled by the most confident bicyclists. To better understand existing network gaps and opportunities to advance a low-stress network, an LTS analysis for Dallas was conducted.

Figure 2 below depicts the LTS scores for roadways within Dallas¹. Neighborhood and local roadways, are typically low stress (LTS 1 or LTS 2) and make up most of the network. Although many of these routes require a person bicycling to share the road with motor vehicles, the route's lower speed limits and fewer lanes support more comfortable travel by bicycle. Where present in the city, bike lanes, buffered bike lanes, and cycle tracks frequently contribute to lower stress routes

However, there are also more than 1,500 miles of high stress (LTS 3 or LTS 4) roadways across the city, representing nearly 35% of roadways in Dallas (Table 2). These roadways typically represent higher travel speeds, a greater number of travel lanes, and limited or no bicycle infrastructure. In some instances, these routes also include locations with existing bicycle facilities. For example, buffered bike lanes along Fort Worth Avenue, South Riverfront Boulevard, and the short segment along North Zang Boulevard, are high stress routes. This is due to high travel speeds and use of visual separation—as opposed to physical separation. The LTS would suggest that facilities in this condition would need to be upgraded with physical separation to achieve a more comfortable condition.

Table 2: Level of Traffic Stress Distribution in Dallas

Level of Traffic Stress	Percent of Roadway Network
LTS 4 – Highest Stress	34%
LTS 3	1%
LTS 2	5%
LTS 1 – Lowest Stress	60%

High stress routes not only represent less comfortable travel along a corridor, they are often also a barrier to travel across the corridor. This limits the effectiveness of lower stress routes and results in a disconnected network for people traveling by bicycle. For example, in many areas of Dallas destinations within neighborhoods, including neighborhood parks and schools, are

¹ The LTS analysis utilizes data provided by the City of Dallas and relies on the accuracy of attributes within the available dataset. Given the complexity of a city-wide dataset, the results of this analysis should be used a framework to guide further review and provide insight into recommended facilities. As this data is used to develop recommendations in subsequent stages of the Plan, further review may be required to confirm that roadway attributes are accurate.

accessible via low stress local streets within that neighborhood. However, access to these destinations from outside of the neighborhood, including regional destinations, is limited due to the barrier created by high stress corridors that require crossing.

Low stress travel is possible across some high stress roadways where there are protected crossings. Protected crossings are places where dedicated signals exist or where the crossing is separated from the roadway. Many locations where existing paved trails, bike lanes, buffered bike lanes, and cycle tracks cross high stress roadways do have protected crossings. Examples include:

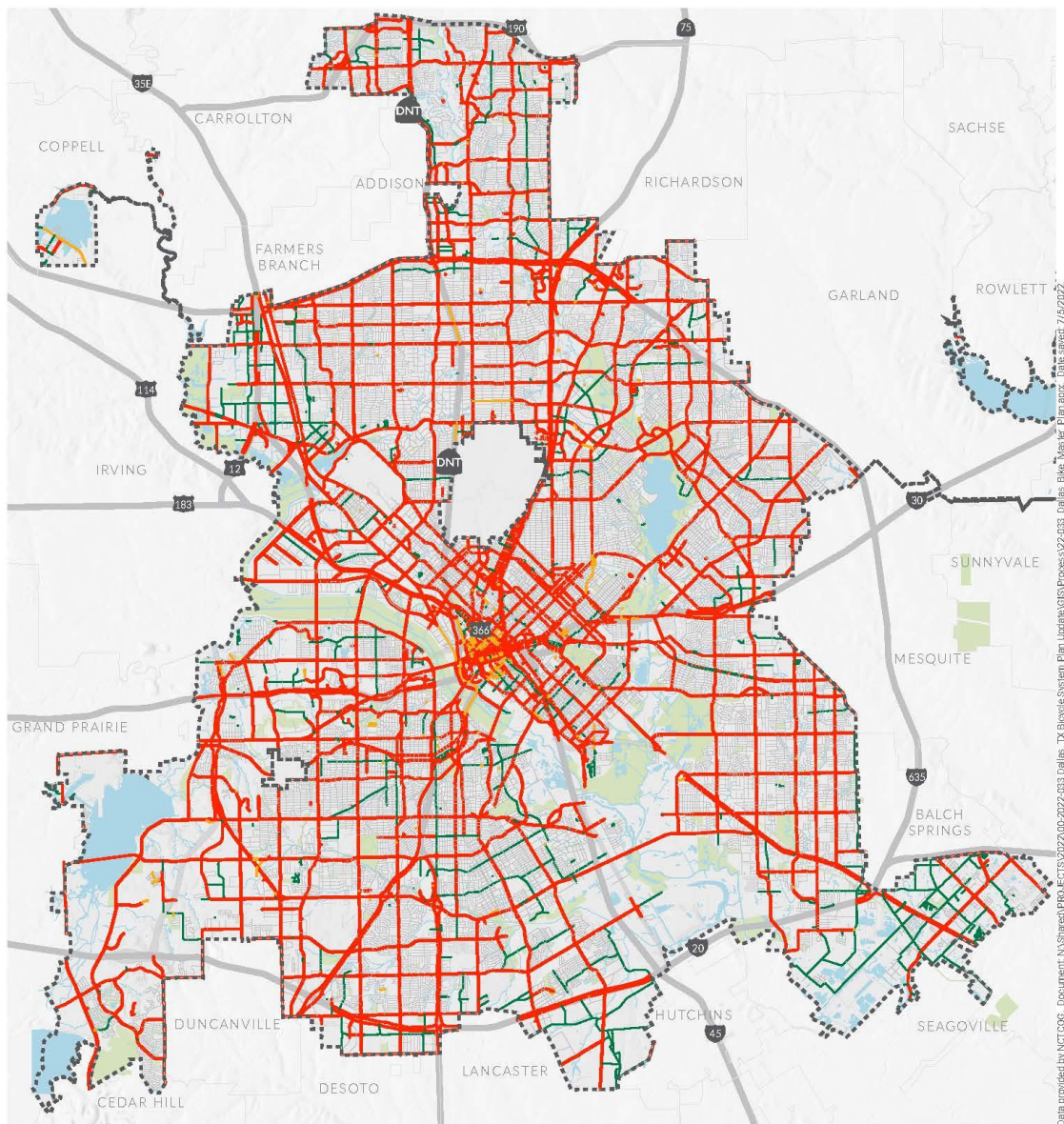
- The signal crossing of the Santa Fe Trail and South Munger Boulevard, which borders the Central Area and Southeast Area of Dallas
- The signal crossing of the Northaven Trail and Cox Lane in the Northwest Area

More typically, however, low stress travel—particularly along neighborhood streets—is not possible across high stress roadways because of unprotected crossings where no dedicated signals or separated crossings exist. Examples include:

- The shared roadway along Bowser Avenue across Oak Lawn Avenue in Central Dallas
- The Kiestwood Trail where it crosses S Westmoreland Road in Southwest Dallas
- The shared roadway along Monticello Avenue across Skillman Street in Northeast Dallas

There is significant opportunity to support a complete, connected system of low stress routes to support local travel in the city, while connections to trails and protected facilities along collectors can support travel across the city or to more regional destinations. Recommendations should place an equally-important emphasis on improving high stress arterial crossings through use of signals and other treatments as prioritizing route improvements along key corridors.

Figure 2: Level of Traffic Stress



LEVEL OF STRESS (LTS) ANALYSIS
DALLAS BICYCLE PLAN UPDATE

alta **Gresham Smith**

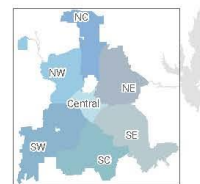
Bicycle LTS Score

- 4
- 3
- 2
- 1

Dallas City Limits

- Water
- Parks

0 2 4 MILES



Data provided by NCTCOG. Document: N:\Shared\PROJECTS\2022\00-2022-033 Dallas, TX Bicycle System Plan Update\GIS\Process\22-033 Dallas, TX Bicycle System Plan Update_7/5/2022

Safety

The Safety Analysis considers the locations of bicycle- and pedestrian-involved collisions throughout Dallas, focusing on locations with a higher frequency of collisions as well as collisions resulting in a severe injury or fatality. Using data provided by the North Central Texas Council of Governments (NCTCOG), this analysis evaluates reported collisions occurring between 2014 and 2019 (**Figure 3**). The review of collisions will not only help identify locations for new or improved bike facilities but also can inform priority projects for implementation.

In addition to collision data, this analysis also includes considerations for the City's existing Bicycle High Injury Network (HIN). Identified in the City's Vision Zero Action Plan (2022), the HIN are streets where the highest percentage of bicycle-involved fatalities and severe injuries have occurred. As reported in the Vision Zero Action Plan, just 1% of City streets account for 38% of fatal or severe injury collisions involving a person bicycling. The HIN is concentrated along major roadways, with approximately 60% along major arterials and 32% along minor arterials. The majority of the HIN, as shown in **Table 3** below, is located in Northeast Dallas, closely followed by Northcentral and Central.

Table 3. Mileage of HIN by Planning Area

Planning Area	Mileage of HIN
Northwest	15.55
Northcentral	34.1
Northeast	43.62
Central	27.11
Southwest	6.55
Southcentral	15.35
Southeast	31.3

Overall, the data between 2014 and 2019 shows 661 bicycle-involved collisions, including 14 fatalities and 108 severe injuries. Bicycle-involved collisions, including fatalities and severe injuries, were more frequent in Central Dallas and along major arterials throughout the city, consistent with the HIN. **s** below shows the number of bicycle-involved fatalities and severe injuries across Dallas by planning area. Over half of the bicycle-involved fatalities and severe injuries, however, were located *outside* of the High Injury Network. The fatalities located outside of the HIN were all located in south Dallas, including Southwest, Southcentral, and Southeast Dallas planning areas; severe injuries located outside of the HIN were located throughout the city, but also more concentrated in Southwest and Southeast Dallas.

Table 4. Number of Bicycle-Involved Fatalities and Severe Injuries by Planning Area

Planning Area	Number of Fatalities	Number of Severe Injuries
Northwest	2	9
Northcentral	0	7
Northeast	0	24
Central	3	22
Southwest	1	18
Southcentral	3	6
Southeast	5	22

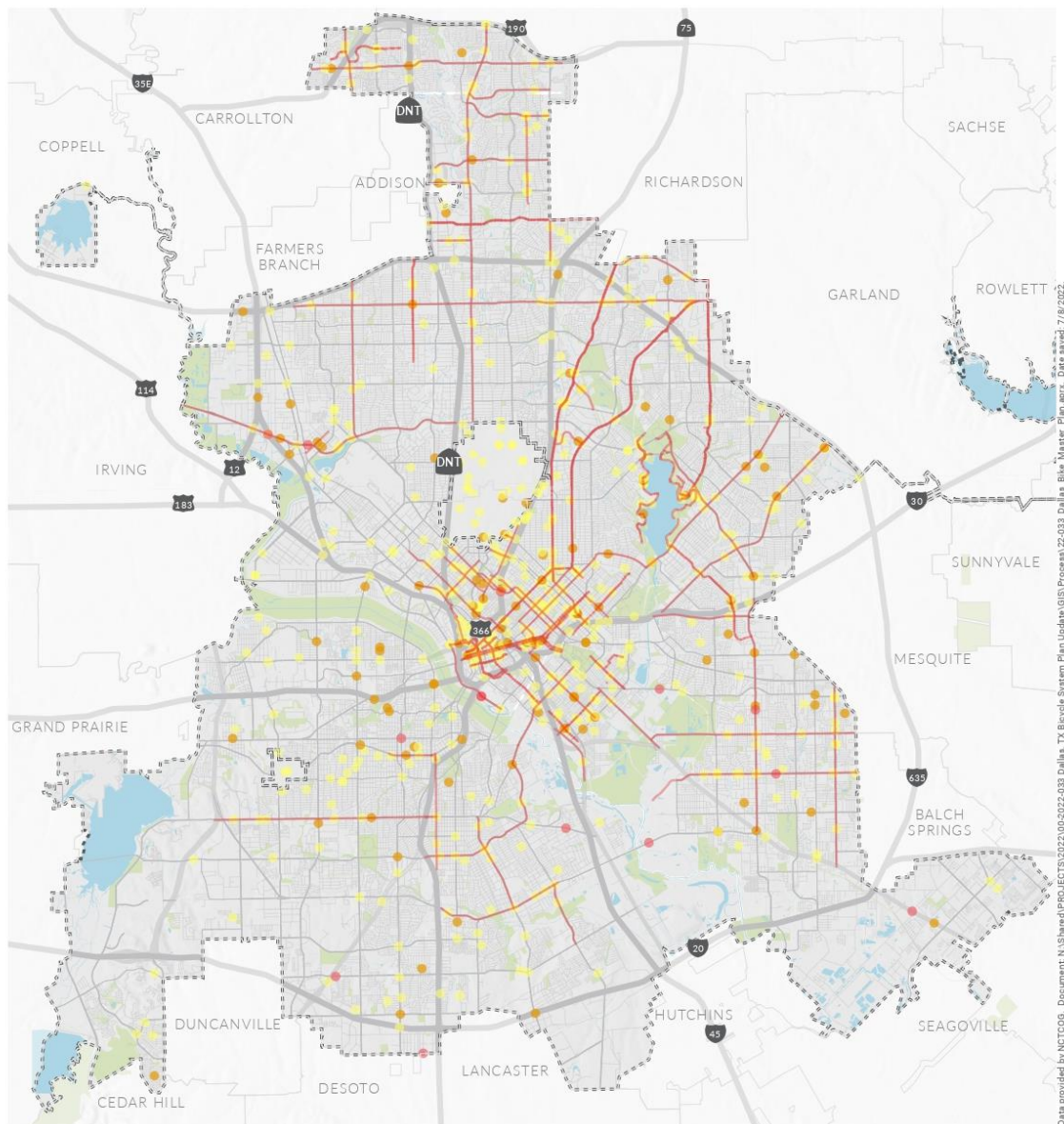
Existing bicycle facilities are generally not located along the HIN; however, there are routes located in Central and Southeast Dallas where the HIN is coincident with existing bikeways. For example, in Central Dallas, shared lane markings exist along the HIN on segments of Main Street, Victory Avenue, Continental Avenue, North Lamar Street, and Young Street. In Southeast Dallas, shared lane markings are located along Martin Luther King Jr. Boulevard. Finally, in Southeast Dallas, bike lanes are located along Lagow Street, part of the HIN.

Although routes with more comfortable facility types, such as buffered bike lanes, may provide a lower stress route, there are locations in the city where these facilities are co-located with segments in the HIN. Examples include: North Lamar Street and South Riverfront Boulevard. Additionally, many existing facilities intersect with the HIN; recommendations should identify opportunities to not only improve safety along existing bicycle facilities but also improve safety at major crossings

Bicyclist-involved fatal or severe injuries during this time period more often occurred along routes without existing facilities. However, there are a few exceptions in both Central Dallas and Southwest Dallas. In Central Dallas, severe injuries have occurred along streets with shared lane markings, such as Main Street, North Lamar Street, and Fairmount Street. A fatality also occurred along South Riverfront Boulevard, which has a buffered bike lane. In Southwest Dallas, two severe injuries have occurred along North Edgefield Avenue, which has existing shared lane markings. These facilities should be considered for an upgrade to a lower stress facility. Overall, most severe or fatal bicycle-involved collisions have occurred on streets without bicycle facilities. Opportunities should be explored to provide more connections to and between the existing low stress bicycle facilities, particularly along high stress corridors with a high number of severe or fatal bicycle-involved collisions.

In addition to understanding where crashes are occurring today in relation to existing facilities, it's also important to understand the distribution of these crashes in regard to where people are traveling and how safety trends may be impacting populations differently. More information about each of these can be found in the following sections.

Figure 3: Safety



BICYCLE COLLISIONS 2014-2019
DALLAS BICYCLE PLAN UPDATE

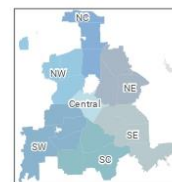
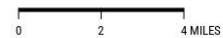


Collisions

- Fatal
- Suspected Serious Injury
- Other Collisions

Other Features

- Bicycle High Injury Network
- - - Dallas City Limits



Active Trip Demand

Understanding potential demand for active transportation can help the City of Dallas identify locations where bike facilities may have the greatest impact. For the purposes of this analysis, high potential active trip demand includes consideration for areas where there are a high number of short trips (trips less than 3 miles long) as well as where key destinations and activity centers are located in the city.

Short trips are important to consider because they can be good candidates for replacing a motor vehicle trip with an active trip, such as by walking, biking, or rolling. Studies have shown that nearly 50% of all car trips in the United States are three miles or less,² a distance that could be supported by bicycling. Connecting local destinations with high quality bicycle infrastructure can provide more options for how people travel in their neighborhoods and beyond. Data from Replica Places provides insight into areas of Dallas with higher proportions of short-distance trips.³

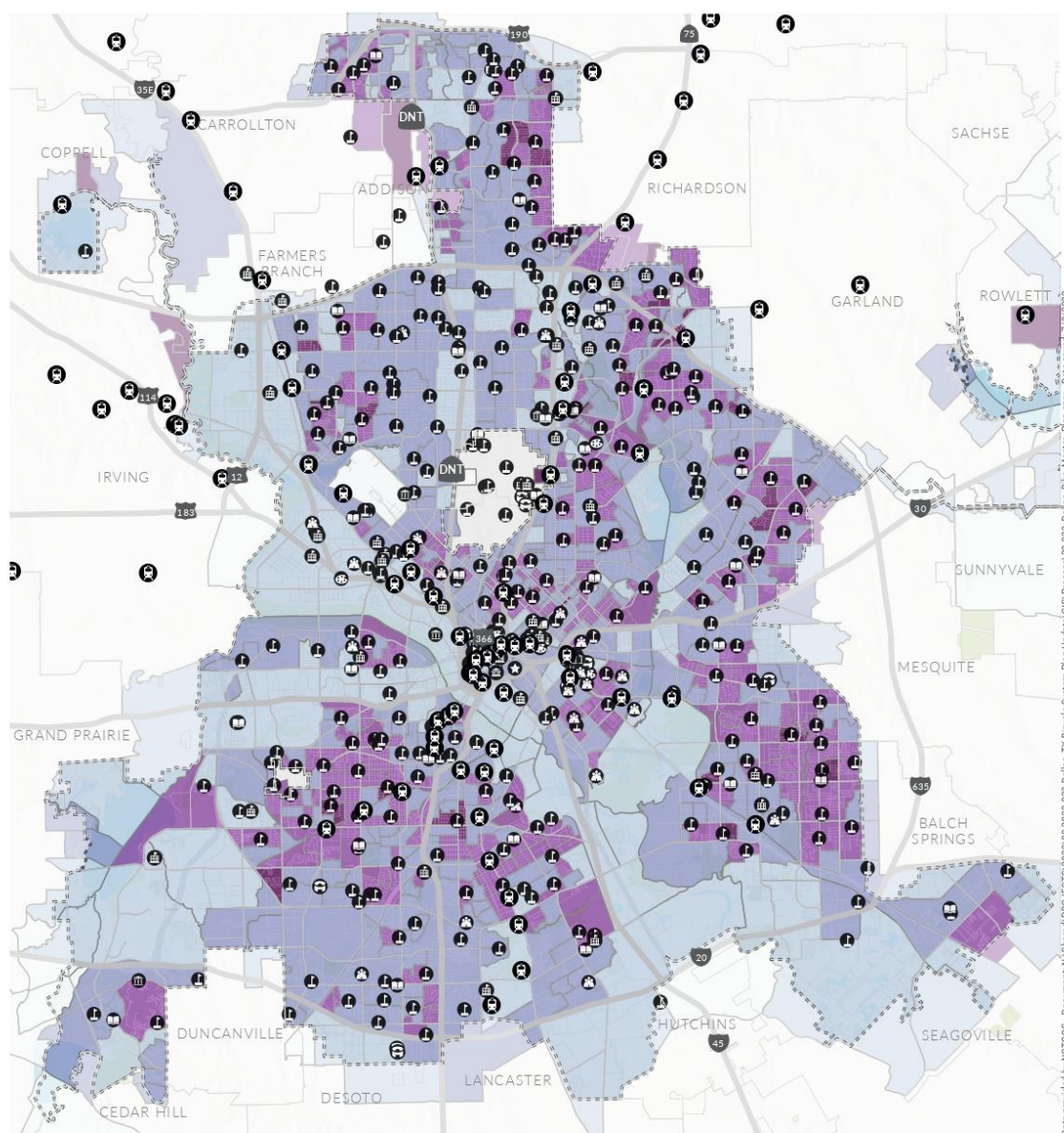
Shown in **Figure 4**, significant areas of Dallas have high relative percentages of short trips. In fact, short trips make up at least 40% of trips in most areas of the city. Areas with lower proportion of short trips are typically areas with limited residential use (such as areas water, parks, or highway right-of-way) or represent single family residential areas with few community destinations and disconnected street patterns.

Areas with the highest proportion of short trips are located in close to proximity to commercial uses, cultural districts, employment centers, parks, high density housing, schools and light rail stations. For example, the areas with the highest active trip potential are co-located with or adjacent to a public school, a destination that most frequently serves local neighborhood populations or are locations with an existing activity center, such as the Greenville Corridor, Deep Ellum/Uptown, Bishop Arts, and West Dallas, among others. However, the areas with the highest active trip potential also often have limited existing bicycle infrastructure and are located along or near highways and high stress major roadways. Highways and high stress roadways act as barriers to active travel but are also where many commercial uses are located outside of the downtown core, which is consistent with many land use patterns across the U.S. Similarly, many of the light rail stations in Dallas are close to highways such as U.S. Highway 75. As a result, these areas represent significant opportunity to expand local bicycle networks that provide complete low-stress connections to local destinations, with consideration for connections to nearby activity centers, regional routes, and multimodal trip opportunities. Connections across major roadways and barriers, such as highways, will be key to supporting a complete and connected network that facilitates access to schools, transit, parks, jobs, and community services.

² Curry, Melanie, et al. "Bikes and Scooters Could Replace a Lot of Car Trips in U.S. Cities." Streetsblog California, 17 Sept. 2019, <https://cal.streetsblog.org/2019/09/16/bikes-and-scooters-could-replace-a-lot-of-car-trips-in-u-s-cities/>. Accessed 5 July 2022.

³ Results of this analysis were compared to data provided by NCTCOG. The NCTCOG analysis utilized LOCUS data from the first half of 2019. In general, the results of both analyses reflect similar trip patterns in Dallas.

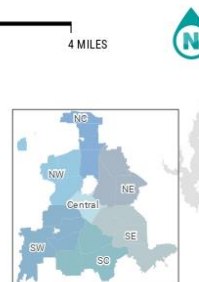
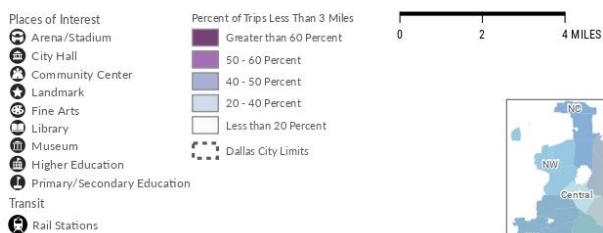
Figure 4: Active Trip Potential



ACTIVE TRIP POTENTIAL
(ATP)

DALLAS BICYCLE PLAN UPDATE

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Smith**



Equity + Public Health

Defining equity is a context-dependent exercise and disadvantaged populations will vary from community to community. To establish a baseline, the Equity Analysis considers variables related to:

- Opportunity + Accessibility
- Environmental Justice
- Health
- Affordability
- Vulnerability

The equity analysis seeks to discover where people with the highest need for transportation options live within the City of Dallas. Understanding where these communities are most densely located help prioritize improvements and ensure that the benefits of future investments reach everyone. Working towards a more equitable transportation system may mean prioritizing active and public transportation funding in areas with a greater concentration of disadvantaged populations instead of distributing funding equally based on geography.

The equity analysis relies on large-scale, publicly available, and spatially-attributable data at the Census Block Group level. Each factor was assessed relative to Dallas County and combined into a composite score. These results are mapped to identify areas of higher need (higher scores). These results are shown in **Figure 5**. While Health and Safety was factored into the larger equity composite score and analysis, public health—indicated by the percent prevalence of coronary heart disease among adults and the location of medical facilities—was also included as a separate analysis as shown in **Figure 6**. While there may be overlapping areas and populations shown as higher need in both the equity analysis and the public health analysis, public health outcomes in relation to the transportation system may be unique to different areas of the city.

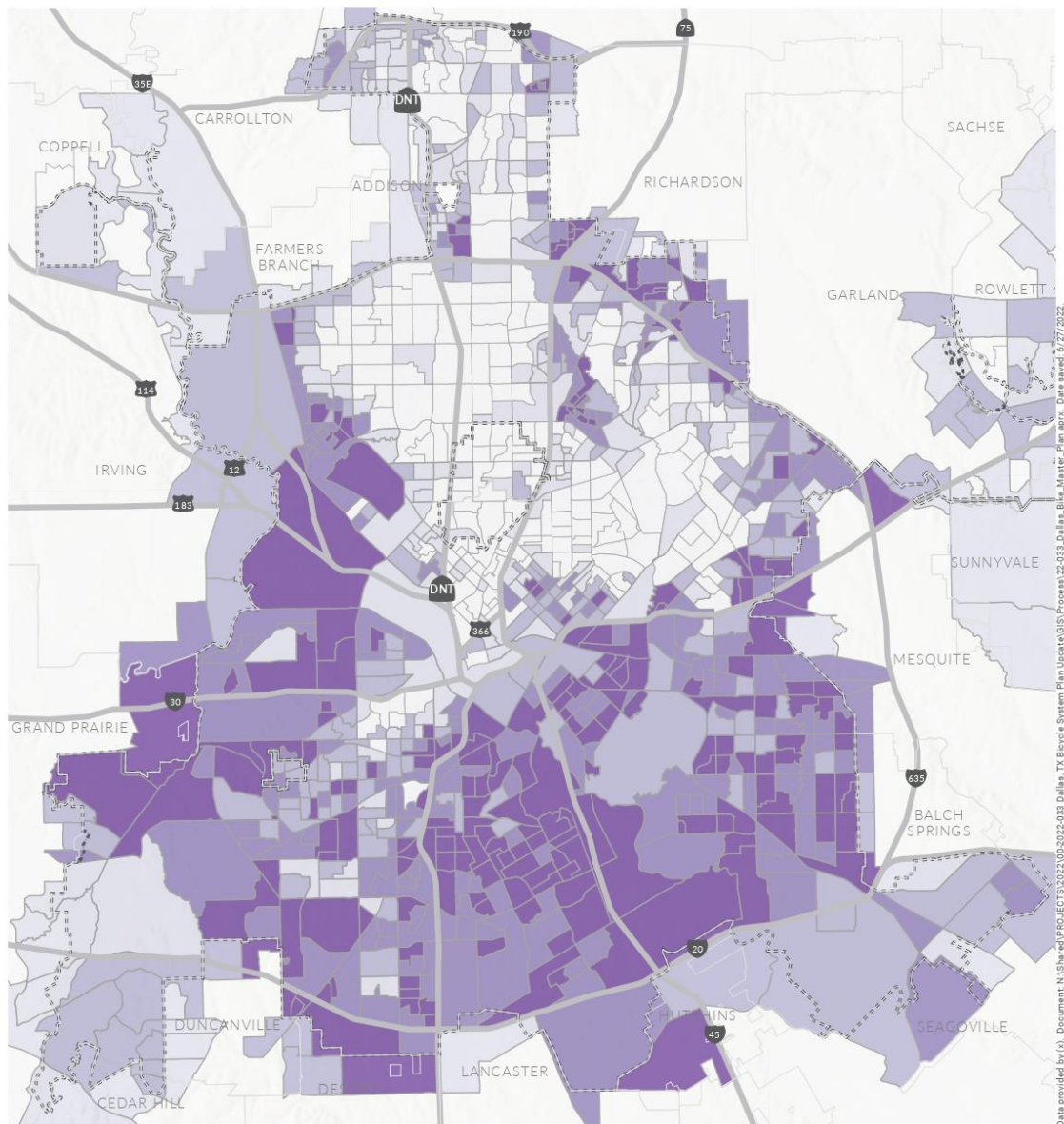
Based on the results of the equity analysis and public health analysis, the key takeaways include:

- High need areas are located in southern areas of the city, with additional areas located most often in close proximity to highways and other physical barriers. Similar to the equity analysis, the areas with the poorest health outcomes are located primarily in south Dallas. One significant difference, however, shows the poorest health outcomes are even more concentrated in Southcentral Dallas and the area of Southeast Dallas closest to Downtown.
- Over 17% of Dallas's population resides in areas identified as highest need. These same areas contain 15% of Dallas's overall roadway network.
- However, when compared in relation to the results of the safety analysis a disproportionate number of bicycle-involved fatalities and severe injuries occurred in the highest need areas and areas with the poorest health outcomes. Over a third of bicycle-involved fatalities (29%) and severe injuries (31%) occurred in the highest need areas. Over a fifth of bicycle-involved fatalities (21%) and a quarter of severe injuries (25%) occurred in areas with the poorest health outcomes.

- When compared in relation to the results of the LTS analysis, many of the high need areas and areas with the poorest health outcomes also have multiple high stress roadways and/or highways running through them, acting as a barrier for active travel along and across these roadways.
- Areas that are identified as high need are typically located in locations with fewer short trips (lower active trip potential). These areas have fewer destinations, and while some areas have opportunities to connect to the light rail network, the lack of existing bicycle infrastructure limits active transportation connections to transit. Trails are often located at the periphery of these areas and offer an opportunity to provide low-stress connections to other areas of the city. Examples includes along I-45 south of downtown and areas south of I-30 west of Fort Worth Avenue.

Overall, a disproportionate number of bicycle-involved fatalities and severe injuries occurred in the highest need areas in terms of both equity and public health. Although the highest need areas represent 17% of the city's population, these areas have experienced 31% of all serious injury collision involving a person bicycling and 29% of fatal crashes involving a person bicycling. The majority of these areas are located in South Dallas, which also has the fewest existing bicycle facilities. Opportunities should be explored to provide low stress bicycle facilities in the highest need areas and connect these facilities to the rest of the existing bicycle network. Improvements should be prioritized along high stress roadways—or where a parallel alternative exists—with connections to community destinations such as parks, schools, health facilities, light rail stations, and other community services.

Figure 5: Equity Analysis



EQUITY ANALYSIS DALLAS BICYCLE PLAN UPDATE

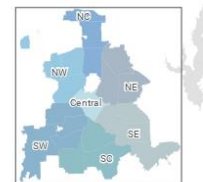
Equity Composite Score

Highest Need

Lowest Need

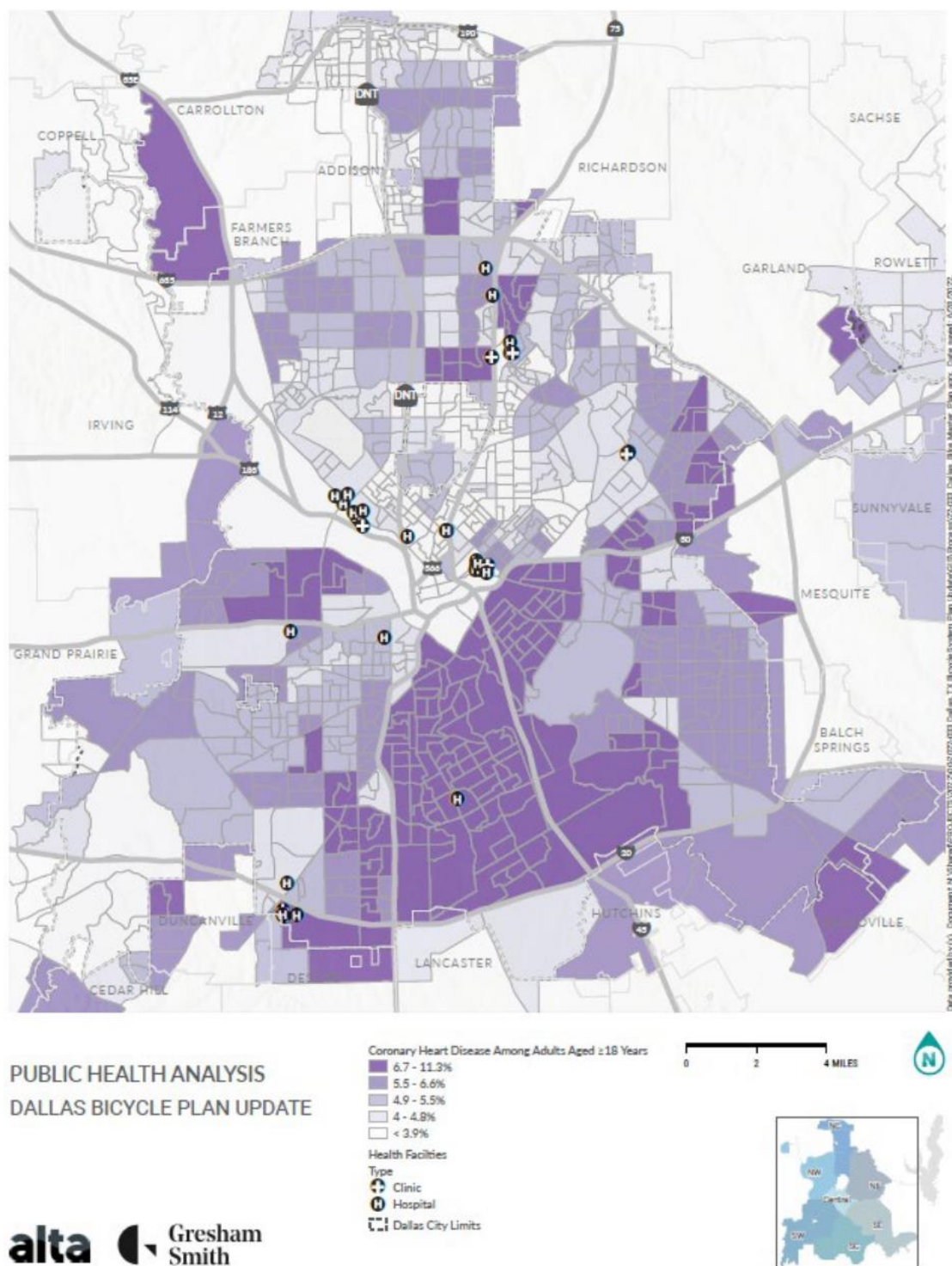
Dallas City Limits

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Figure 6: Public Health Analysis



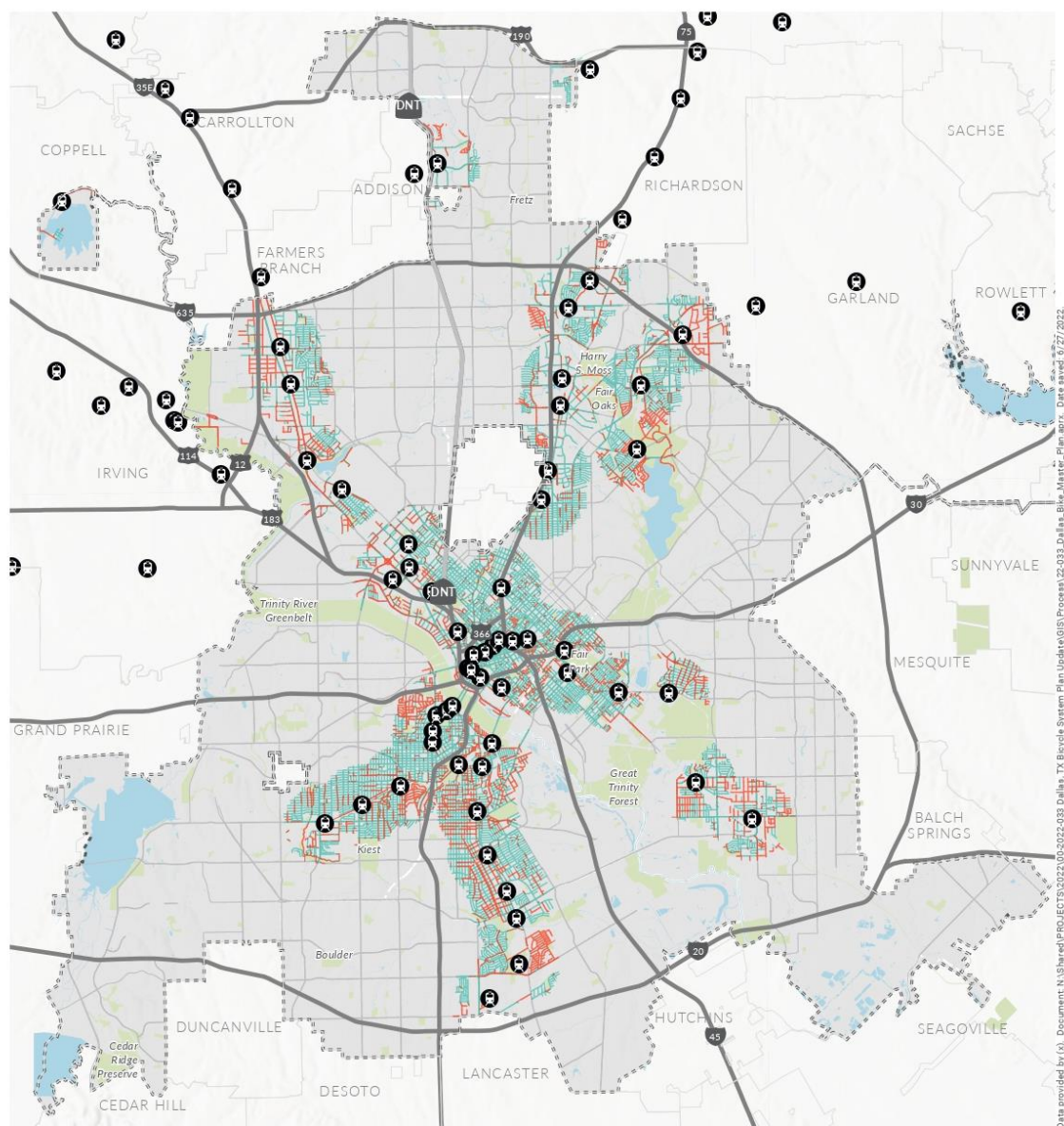
Multimodal Facilities Analysis

While the Dallas Bike Plan will focus on the on- and off-street bicycle networks within the city, it's also important to understand how the bicycle network may interact with the existing pedestrian and transit networks. Transit stops are an important destination, as described in the Demand section above, and direct connections to these locations may require sidewalk-based connections for those traveling by bicycle. **Figure 7** displays the existing sidewalk network within 3 miles of transit stops. Although this plan will not include specific recommendations for pedestrian improvements, the results of this analysis can be used to inform facility type and alignment; opportunities for developing trail or sidepath facilities that can accommodate both bicycle and pedestrians; specific consideration for end-of-trip facilities, such as bike repair stations or bike parking; and/or network prioritization.

The sidewalk network near transit is relatively complete in Central Dallas, especially in Downtown. The sidewalk network near transit, however, is relatively incomplete across the rest of the city. While transit stations across Dallas are connected to sidewalks immediately surrounding the station, many sidewalks are incomplete just within a block or two away from the station, making it difficult for people to access transit. While the majority of missing sidewalks are along residential streets, there are many examples of missing sidewalks along major high stress roadways near transit as well. Sidewalks are missing along large portions of S Corinth St Rd, for example, which parallels the Illinois Station in Southcentral Dallas. Sidewalks are missing along large portions of S Vernon Ave approaching the Tyler/Vernon Station in Southwest Dallas.

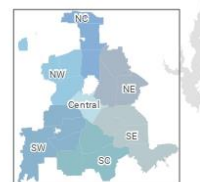
In addition to missing sidewalks near transit stations, the existing bikeway network has few connections to transit. While this is true across the city, transit stations are more often without connecting bikeways across South Dallas, which has fewer existing bikeways overall. The City should explore opportunities to enhance connections to transit, especially transit stations with limited bikeways and sidewalk connections. Where existing trails connect to transit stations, the City should explore opportunities to enhance connections to these trails as well.

Figure 7: Multi-modal Facilities



MULTI MODAL FACILITIES
DALLAS BICYCLE PLAN UPDATE

-  Rail Stations
Sidewalk Presence within 1 mile of Transit
- Missing Sidewalk
 Existing Sidewalk



Summary

The results of the existing conditions analysis suggest that there are both many challenges to and significant opportunities for expanding and improving Dallas's bicycle network. These include:

- Existing facilities are concentrated in Central areas of Dallas, while areas including South Dallas have limited on-street facilities today. The disparities between the Central/Northern areas of Dallas and southern areas of Dallas are further demonstrated through the existing crash patterns, access to destinations, and equity/public health outcomes. Future phases of this plan should consider opportunities to not only support safe and comfortable networks within southern areas of Dallas but also to prioritize investment in areas that have experienced historic disinvestment.
- Dallas has a significant number of paved trails that provide a separated, low-stress path of travel. Recommendations should explore opportunities to not only expand the trail network but to also support connections between on-street and off-street facilities. In particular, trails present an opportunity to create a low-stress backbone for the network.
- However, recommendations must also provide connections to places people want to go. With commercial and transit uses often located along major, high-stress roadways, it is important that the recommended network identifies connections to these destinations via new low-stress connections.
- Highways and the extensive network of high stress major roadways act as a barrier for active travel within and across neighborhoods. Recommendations must consider both opportunities to provide safer intersections where low-stress networks cross major roadways, as well as identify opportunities to comfortably and safely navigate physical barriers, like highways.
- Residential streets, including those with existing shared roadways (sharrows), are good candidates for low stress bicycle boulevards. With improved intersections at major roadways, traffic calming infrastructure, and support for bicycle priority along the route, neighborhood roadways can support access to local destinations and connections among neighborhoods.
- Where facilities do exist, it is important to evaluate opportunities to upgrade the existing facility to support more comfortable, safer travel. Particularly for segments with existing bikeways that are located along the HIN, opportunities should be explored to enhance the existing route.