



North Central Texas
Council of Governments



CAMPUS MOBILITY TRENDS

NCTCOG Intermodal Transportation Hubs for Colleges and Universities Study

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01 Introduction

University and college campuses represent a convergence of professionals, students, local residents, and commuters. These campus affiliates face a range of mobility needs that are not easily addressed by traditional mobility planning. Campuses experience unique travel behaviors that mirror class schedules, extracurricular campus activities, and daily living at and near campus facilities. Campus affiliates throughout the Dallas-Fort Worth metroplex—including students, faculty, staff, and visitors—build their lives around their campuses and need a diverse mix of solutions and travel information to satisfy their need for quick, regional, and intra-campus mobility. As such, transportation planners and campus officials in the metroplex cannot take a one-size fits all approach to campus mobility. The region must also consider the unique behaviors, demographics, land use environments, and policy contexts present when creating multimodal policy and investing in transit connectivity and mobility-rich campus environments.

Mobility hubs uniquely address key transportation barriers that campus affiliates experience, such as transit connectivity, first- and last-mile gaps to and from campus, access to mobility options, and awareness of real-time travel conditions through the co-location of multiple transportation modes. While mobility hubs can be found throughout the region's urban and suburban land use environments, the North Central Texas Council of Governments (NCTCOG) has identified a need for better coordination and expanded investment in mobility hubs at or near college and university campuses in the North Central Texas region.

To demonstrate the complexity of campus life and accessing campus facilities, as well as the need for better mobility and transit connections at and near campuses, the project team investigated existing transportation conditions at campuses and the evolving policy and planning environment around multimodal transportation, transit and mobility, and first- and last-mile connections. This document delivers a summary of existing conditions, a comprehensive market analysis and synthesis of mobility needs, and demands for public transit, shared passenger mobility, and shared micromobility at campuses throughout the metroplex.



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Early in the project process, the project team facilitated a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis to identify potential risks and opportunities for success. This exercise also illuminates existing conditions, travel trends, and unique governance and service delivery issues that impact campus affiliates. Table 1 below summarizes the results of that analysis and contextualizes the analysis findings in the chapters that follow.

Table 1: SWOT Analysis of Existing Campus Conditions, Needs, and Transportation Realities

Strengths	Weaknesses	Opportunities	Threats
Supporting and leveraging relationships (e.g., University of North Texas (UNT Denton) and Denton County Transportation Authority (DCTA)).	Regional connectivity between modes can be confusing to users.	Integrated payment system for ease of transfers.	It can be easy to overengineer hub implementation. The end product must be straightforward enough for the general public.
Multiple resources and partners to draw from (local govts, transit agencies, shared mobility services, etc.), which can help streamline efforts while simultaneously making collaboration easier.	Lack of consistent mobility options across the region/gaps in mobility services.	Opportunity for agency partnership/collaboration well into the future.	Trying to serve everybody can lead to failure – be intentional and acknowledge patrons, start with what’s most viable first, understand users’ needs, and then expand.
Transit providers and other mode providers don’t compete – are complementary, which creates additive effect.	Lack of funding targeted at improving campus density and mobility.	Density, or lack thereof at some campuses. More land means more transformation opportunities. Texas Christian University (TCU) has used available land to satisfy needs like housing, amenities, etc.	Each campus comes with their own unique opportunities and operating environments. Guidance must be flexible enough to account for diverse campus contexts.
Data tracking through transit agencies and shared mobility providers (where offered).	Land use planning across the region has led to automobile dependency for a majority of households.	On campus outreach can help improve the general public’s understanding of proposals, while building the momentum and support needed to execute plans.	A shift towards multimodal growth may reduce critical parking revenue that universities rely on. This may create some pushback from the universities if alternative funding methods are not realized
Ability to modify on-demand service based on usage, flexibility, unmet demand/new connections needed.	Density, or lack thereof, at some campuses.	Opportunity to scale or expand mobility services run by transit agencies (e.g., universities have funded Via Rideshare) or permitted by City governments (e.g., scooter programs..	Major world events have brought about significant cultural changes when it comes to virtual learning and work from home policies. Future plans must take this into account.
Public desire to create multimodal environments.	--	--	--
Buy-in can be created through technology co-opting at hubs (esp. for Gen Z).	--	--	--

02 Existing Conditions Analysis Summary

Based on a detailed review of transportation plans and existing campus infrastructure in the North Central Texas region (see Appendix A for the full analysis), university and college campuses, cities, and transit agencies present varying degrees of policy direction and targeted strategies to better integrate mobility and information at campus mobility hubs. Similarly, multimodal transportation networks and mobility infrastructure supply ranges from poor to robust, which in turn impacts the ability for campus affiliates to live car-lite and connected lifestyles. All told, the North Central Texas region clearly understands the need for greater diversity of travel choices, as well as an examination of context-sensitive mobility hub implementation. The following key takeaways summarize the results of the existing conditions analysis:

Mobility hubs vary in definition and prominence throughout the region’s plans. While transportation and mobility plans generally lack specific mention of mobility hubs, their goals and policies are aligned with the intent and objectives of mobility hub development (i.e., improving multimodal access and innovation in transportation choice). However, there is a need for a holistic approach to and guidance for mobility hub planning and implementation.

Infrastructure and connectivity suitable for multimodal affiliate travel and mobility hub implementation varies by campus. Efforts to create intermodal connectivity and last mile connections are siloed with no comprehensive partnership or coordination between campuses, transit agencies, and private transportation services. Campuses also lack quality and connected bicycle and pedestrian infrastructure to and from campuses and off-campus mobility hub locations. On the other hand, North Central Texas also boasts one of the largest networks of microtransit zones in the country which could help with mobility hub implementation.

Hub networks are viable and needed. Depending on campus size and existing infrastructure, there is an opportunity to develop a regional and local mobility hub network. While the need for better coordinated mobility planning and design at hubs is well understood, the region’s plans and policies generally lack guidance or vision for digitally-integrated mobility and other customer technology supports that are layered alongside mobility hub investments in other regions across the country. This includes plan-book-pay platforms and target investments in real-time information access.

Funding opportunities abound in North Central Texas, but require strategic coordination and stakeholder alignment. Mobility hub projects may qualify for state/federal funding under TxDOT’s Unified Transportation Program funding categories 2, 4, and 9 (Metropolitan and Urban Corridors, Connectivity Corridors, and Transportation Alternatives, respectively). Recent plans, however, do not account for the significant increase in federal funding that could support physical and digital mobility hub initiatives.

Campuses and public agencies understand the value of mobility hub investment. Mobility hub development can help colleges and universities improve campus experience for students with increased transportation access and associated transit-oriented development.

Mobility Hubs

The plan includes the development of eight Regional Mobility hubs and 10 Community Mobility Hubs. In the short-term, Trinity Metro will upgrade two of its existing transfer centers to Regional Mobility Hubs and the city will develop the first two Community Mobility Hubs. A major focus of these hubs will be to provide better transit connections. They will also provide connections between transit and other modes such as rideshare and bikeshare, and some will provide parking and other services.



One of the specific recommended directions for mobility hub development in Transit Moves | Fort Worth (completed in 2020).

03 COMPREHENSIVE NEEDS ASSESSMENT

The Comprehensive Needs Assessment illustrates the movement of university and college campus affiliates to, from, and within campuses, and compares these movements with the availability of mobility options as the basis for a gap analysis. The assessment will support policy and planning guidelines for campus mobility hubs across the North Central Texas region.

The Comprehensive Needs Assessment is organized into three sections:

- The **Travel Activity** section uses data from cellular location-based services and the NCTCOG travel demand model to characterize travel behavior.
- The **Student and Employee Market Analysis** section examines student/employee travel behavior, especially in the context of transit and shared mobility.
- The **Service Access & Analysis** section refines the mobility access information provided in the *Existing Conditions Report* to support its comparison with trip activity data, and synthesizes the information contained within the Market and Trip analyses as case studies for key campuses to provide conclusions based on this comparison.

Detailed block group data and metadata associated with each campus are found in the Tableau tool linked [here](#).

Mobility Stories

Campus affiliates traveling to college and university campuses have a wide array of mobility needs. In many ways, campus affiliate mobility trends are a microcosm of broader transportation needs in the DFW metroplex. Their behaviors are also a reflection of the need for flexibility and freedom on a semester-by-semester, or even day-to-day basis. Campus affiliates make mobility choices driven by sensitivities related to convenience (mobility supply and infrastructure, travel time, and distance), individual cost and other price signals, ability, and values (e.g., environmental and societal cost of driving).

Key campus mobility markets include:

- **All-day, all-purpose travel around campuses of major universities** is characterized by a mix of modes and non-peaked travel distribution.
- **On-campus or near-campus travel** is characterized by shorter travel distances, substantially higher active mode share, and use of specialized transportation products like campus circulators and shuttle services.
- **Commuter-based travel patterns** to community colleges and technical schools are characterized by longer travel distances, motorized modes, and higher intensity during peak travel periods.
- **Institutionally unique travel patterns** that reflect diverse demographics, urban forms, transportation networks, and other campus characteristics.

The data shown here can help to address the following **problem statements**:

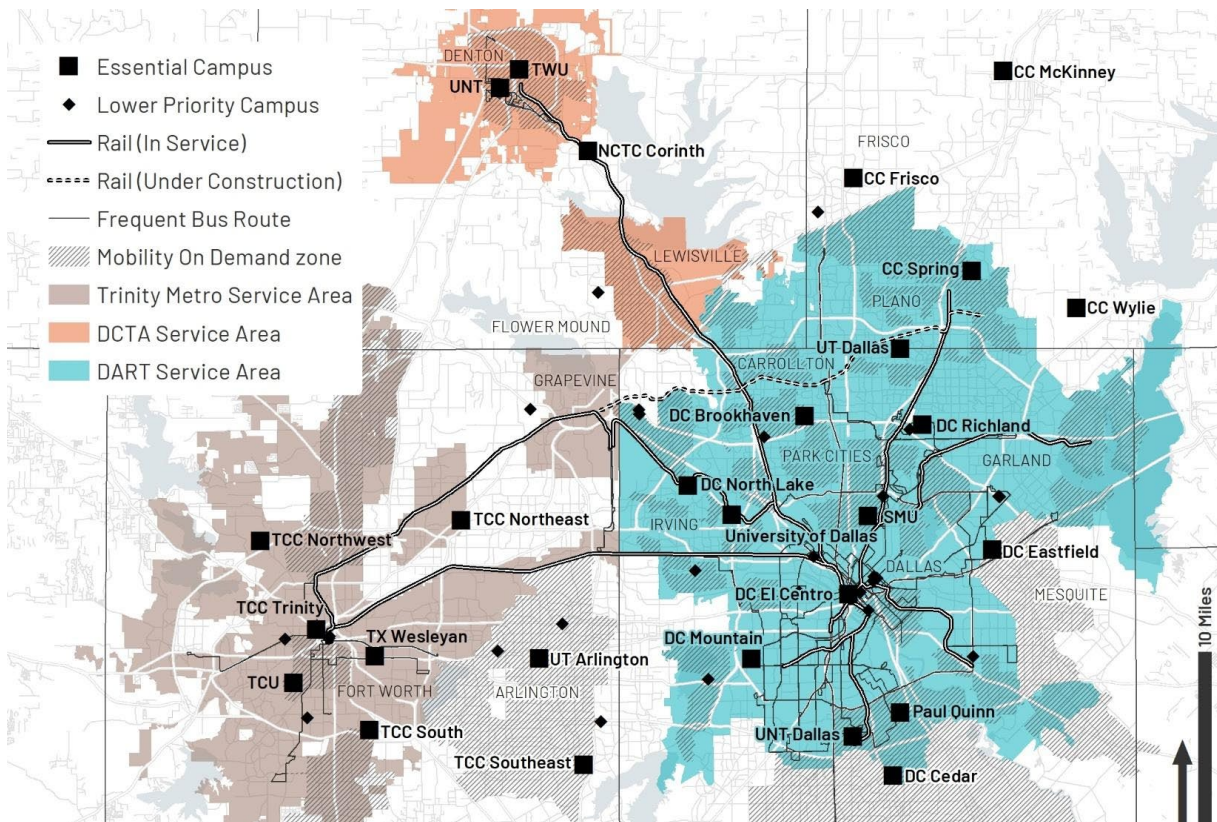
- **Which campuses require first mile/last mile service** to connect to regional and high-capacity transit facilities?
- **How should hub service and amenities reflect differences in access** over distance, time, and mode?
- **How do travel patterns for commuter and residential campuses differ**, and what options are currently available?
- **Which campuses have higher proportions of low income and/or minority visitors**, and how should this be reflected in mobility hub design and future mobility options?

Travel Activity

The 63 campuses identified in the Dallas-Fort Worth metroplex vary dramatically in size, type of institution, and location within the diverse urban, suburban, and rural environments of the NCTCOG region (Figure 1). This variability results in vastly different travel patterns, transit needs, and experiences connecting to and from mobility options. As pictured below, twenty-nine of the region’s campuses are identified as **Essential Campuses** based on their location, size, and accessibility.

Of the essential campuses, the “key” institutions of the University of North Texas (UNT), Southern Methodist University (SMU), the University of Texas at Dallas (UT Dallas), Texas Christian University (TCU), the University of Texas at Arlington (UT Arlington), and Texas Woman’s University (TWU) represent especially large and/or critical facilities.

Figure 1: Campus Locations and Transit Service¹



2022 data courtesy NCTCOG

This document uses two primary mobility data sources: observed location-based services (LBS) data and model inputs derived from survey data used in NCTCOG’s regional travel demand model.

Location-based Services Data

The use of location-based services data allows the analysis of “travelsheds”— the geographic regions between which people move over the course of the day. Census block groups containing the most prominent campus area were designated as “campus” block groups. To facilitate analysis, only block group pairs with more than 100 total daily trips are included.

¹ Not shown: **Texas A&M University** (Commerce, Hunt County, TX); **Trinity Valley Community College** (Terrell, Kaufman County, TX); **Navarro College** (Waxahachie, Ellis County, TX); and **Weatherford College** (Weatherford, Parker County, TX).

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Equity and education-specific trips are weighted by the concentration of demographics in a device's home location rather than absolute trip origin, allowing identification of travel patterns beyond commutes.

Trips may be between any combination of the following locations:

- **Home**, the place where a person stays overnight;
- **Regular**, the place where a person typically travels at least once per day—typically work or school; and
- **Other**, any other location visited less frequently than the regular commute destination, such as shopping, medical, social, or for other purposes.

A trip is said to be “home-based” if either the start or end location is designated as home. “Home-based regular” trips represent commutes. This work focuses on weekday travel conducted in 2019.

Demand Model

The NCTCOG travel demand model serves as the basis for travel analysis across the region. Travel demand models are constructed using a mixture of data sources including surveys, counts, and demographic data; for important trip generators—like campuses—special care is taken to capture travel activity using more detailed data sources. As with the LOCUS data, only the travel analysis zone (TAZ) containing the most prominent area of a university are designated as “attractors” for college trips.

The demand model also allows detailed analysis of the length of trips between given locations on a variety of modes, based on both transit schedules and the level of congestion between origin and destination.

In this work, model inputs for production and attraction of college trips are used as a calibration check on the use of LBS data.

Travel Behavior

LOCUS Origin-Destination data were used to characterize travel patterns to, from, and within block groups containing campus locations.

Total weekday travel to, from, and within each campus is shown in Figure 2.

LOCATION-BASED SERVICES

Location-based services data (and in particular, the LOCUS data used in this work) consist of aggregated, anonymized movement data from cell phones. Using a substantial sample of all cell phone geolocation activity and calibrating to localized travel count statistics, LOCUS data can provide movement data at a much higher geographic and temporal resolution than those achieved by using traditional count-and-survey methods.

In this document, block groups containing campuses are used as the unit of analysis. While this does not guarantee that every movement in a block group containing a campus is associated with that institution, it does provide an extremely clear picture of travel to, from, and within a neighborhood-scale region that is very useful in travel planning.

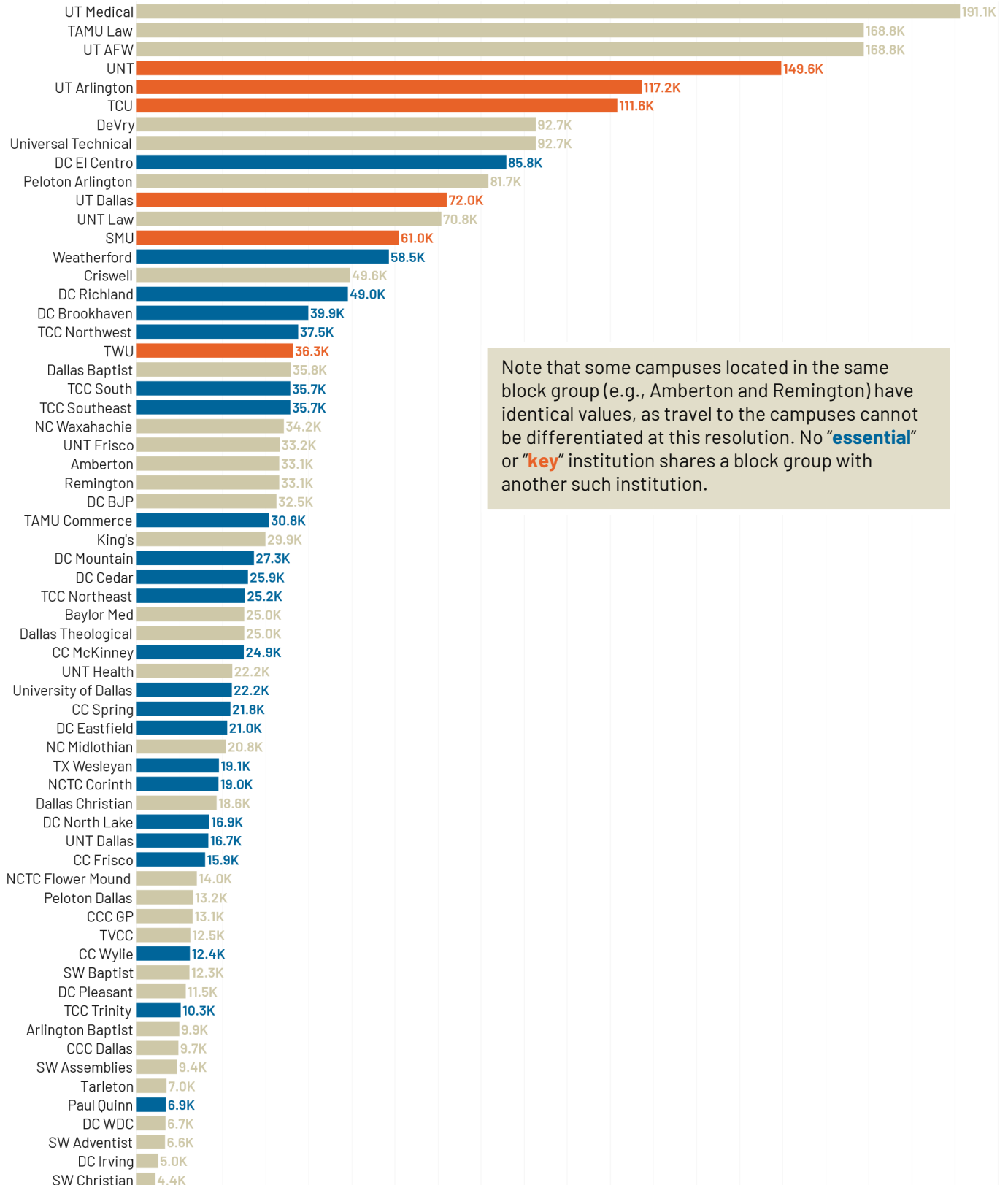
In LOCUS data, a trip is considered to have ended when the user has not moved outside of a small geographic area for 10 minutes. In the campus context, a person walking between classes in the same building would not be considered a trip, whereas someone walking across would. Trips are not multimodal – the dominant mode is reported by the LOCUS data. The data are processed to identify both home and regular (work or school) locations at the block group level, allowing trip purpose to be inferred (e.g., commuting vs errands). Using data from the American Community Survey, LOCUS data are probabilistically associated with demographic characteristics including race, ethnicity, income, and educational affiliation data from a device's home block group, allowing targeted equity and market analysis.

Of particular concern here, “education trips” are identified as corresponding to the proportion of trip activity made by either college students, grad students, or those employed in the educational sector in a device's home block group. While this number is not a perfect proxy for those making trips to and from campuses, in conjunction with total travel activity it provides great insight into this group's travel behavior and mobility needs.

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Figure 2: Total Weekday Travel Activity



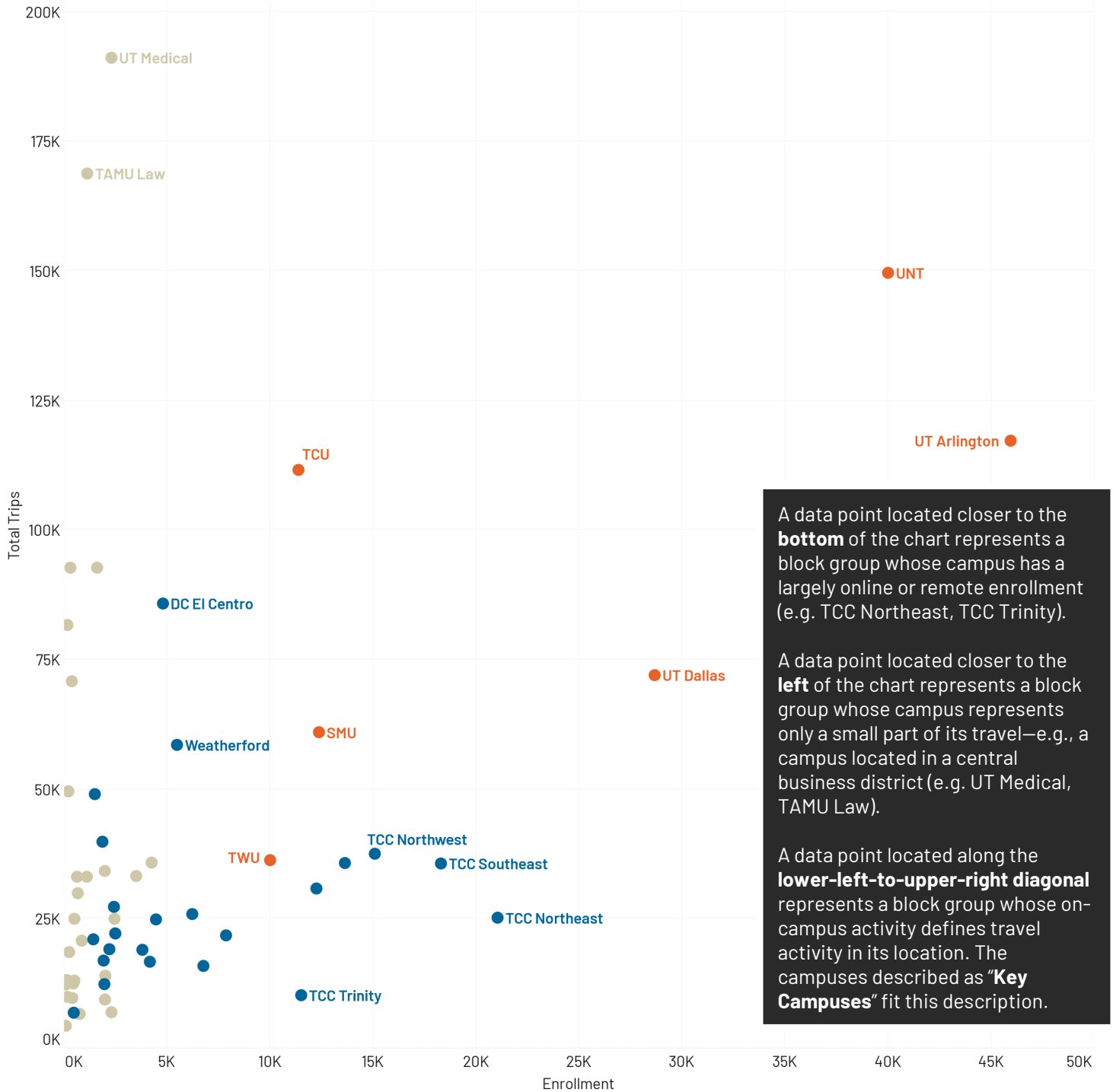
Note that some campuses located in the same block group (e.g., Amberton and Remington) have identical values, as travel to the campuses cannot be differentiated at this resolution. No "essential" or "key" institution shares a block group with another such institution.

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Comparing total travel activity to campus enrollment provides another differentiating quality between campuses. In Figure 3, key campuses show a fairly consistent relationship between enrollment and travel activity, while professional institutions (like TAMU Law or UT Medical) have a weaker relationship between enrollment and travel.

Figure 3: Total Travel Activity by Campus Enrollment



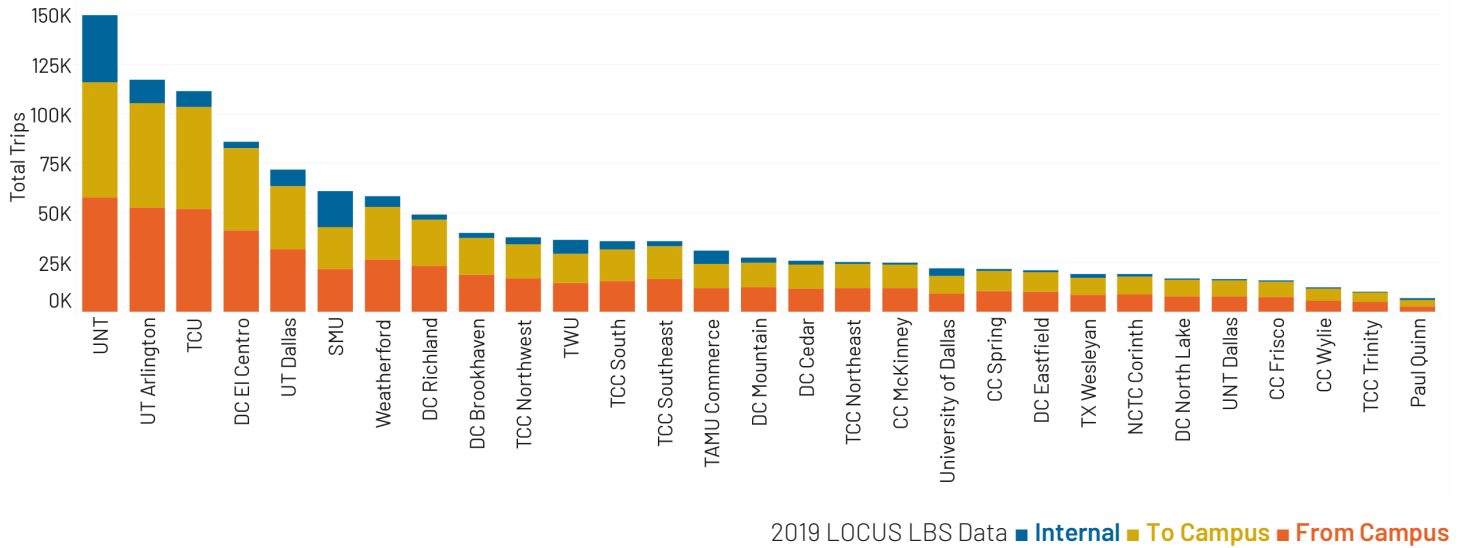
The remainder of this work focuses on **key** and **essential** campuses. Figure 4 shows campus activity by direction (i.e., whether a trip starts and/or ends within a block group containing the campus). The remainder of this work focuses on trips ending on campus (i.e., the sum of **internal** and **inbound** trips). This is because 1) **inbound** and

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outbound trips tend to balance over the course of a day, 2) it is easier to conceptualize the journey of a person by their commute plus their “chained” daily trips, and 3) this approach facilitates analysis of campuses spanning multiple block groups.

Figure 4: Total Trip Activity by Direction

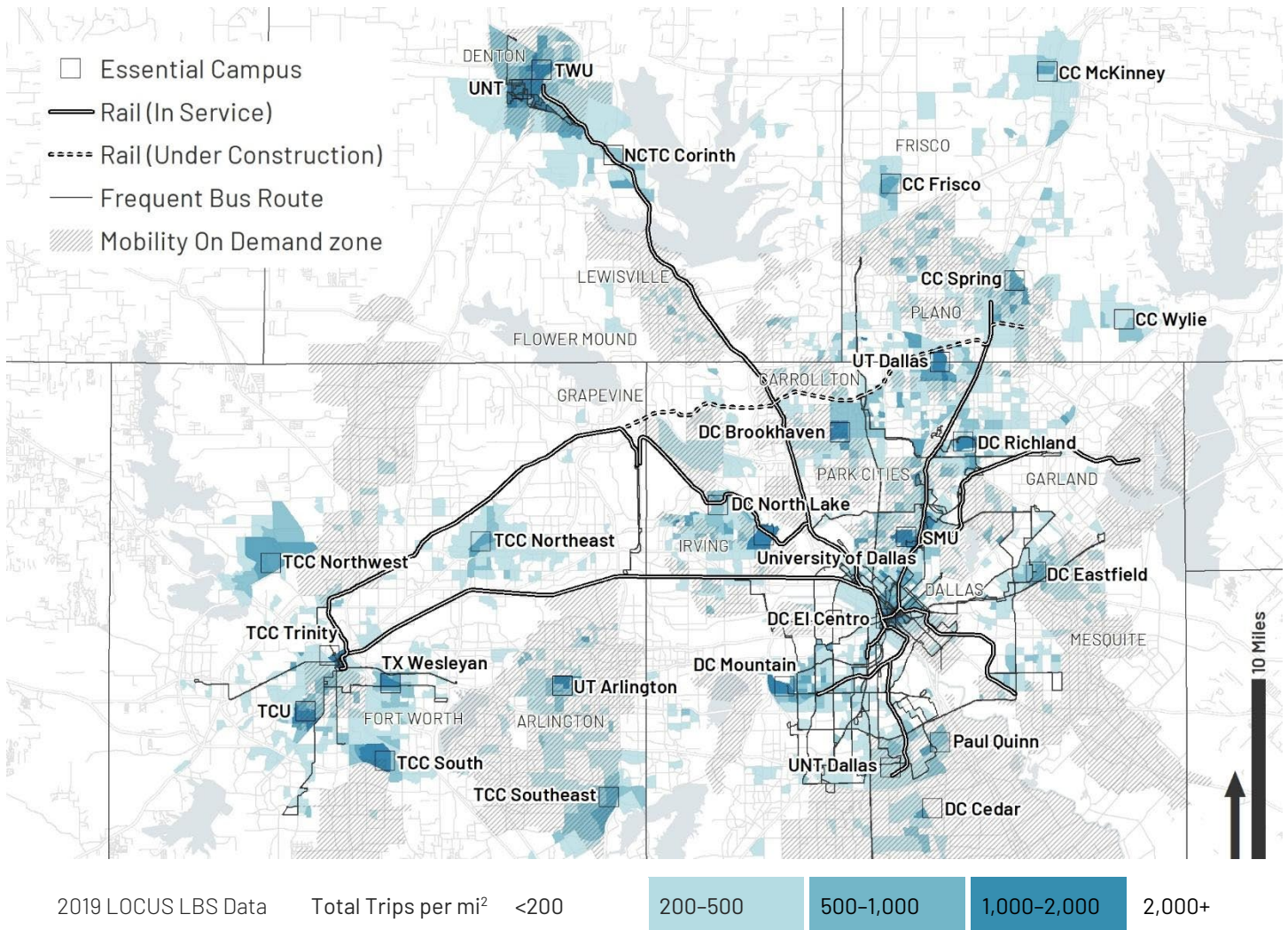


Total travel to essential campus locations is shown in Figure 5. Block groups with a higher concentration of travel to essential campuses are shown in darker shades of **blue**.

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Figure 5: Total Travel to Essential Campuses



A few patterns emerge at the regional level.

- The heavily polycentric nature of travel is clear. Campuses are located in urban centers (Dallas, Fort Worth, and Denton) as well as suburban areas (Arlington, Richardson, Plano, Frisco, and the connective suburbs across the region).
- The DART light rail network is much more accessible to campuses than the commuter rail lines connecting the city to Fort Worth (the TRE and TEXRail) and Denton (the A-Train).
- The opposite is true of frequent bus networks. Fort Worth and Denton both have high frequency routes designed at least in part around connecting campuses (especially the latter—DCTA’s fixed-route network is devoted to this purpose). In Dallas and other DART member cities, fixed-route bus networks are focused on the low-income and minority populations to the south and east of the service area.
- The region’s heavy investment in Mobility on Demand (MoD) zones is clear, with large swaths of geography covered by this style of service.
- For the most part, campus travelsheds do not overlap significantly. The notable exceptions are UNT Denton and TWU.

This figure reveals a recurring conclusion in transportation planning—that **trips under five miles are an enormous part of travel**. Typically, trips of less than five miles are excellent markets for fixed-route bus; trips less than one

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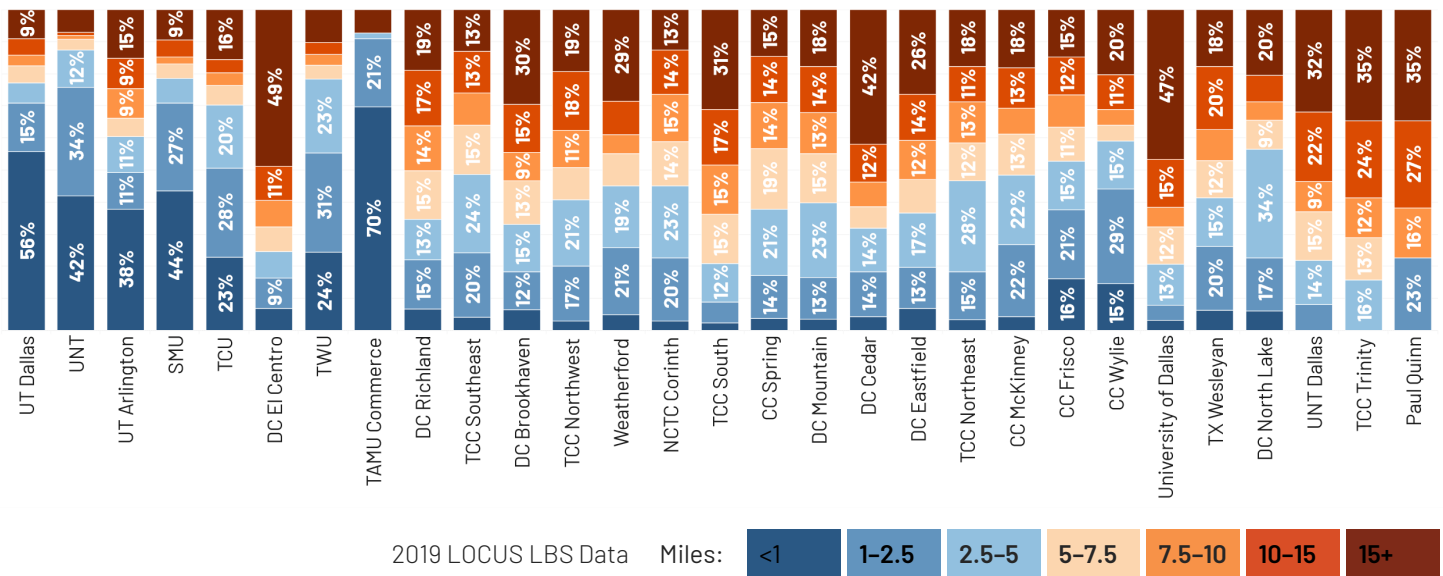
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mile for active transportation; and the remainder of trips are only competitive with high-investment bus or rail service.

Travel distance to campus—especially for home-based “commute” trips—allows an understanding of how many trips might be well-served by active transportation or micromobility. The chart in Figure 6 is sorted by total educational commute activity; note the difference in short-distance trips between university-dominated areas like UNT, UT Dallas, and SMU and campuses located in highly-mixed districts such as DC El Centro and Weatherford. “Middle-ground” campuses such as UT Arlington, TX Wesleyan, CC Frisco, and Paul Quinn might benefit from infrastructure making trip distances between 0 and 2.5 miles safer, faster, or more reliable.

This chart omits **internal** travel (between two locations within the block group containing the campus, or between two block groups containing the same campus).

Figure 6: Percent External/Home-Based Educational Trip Activity by Distance



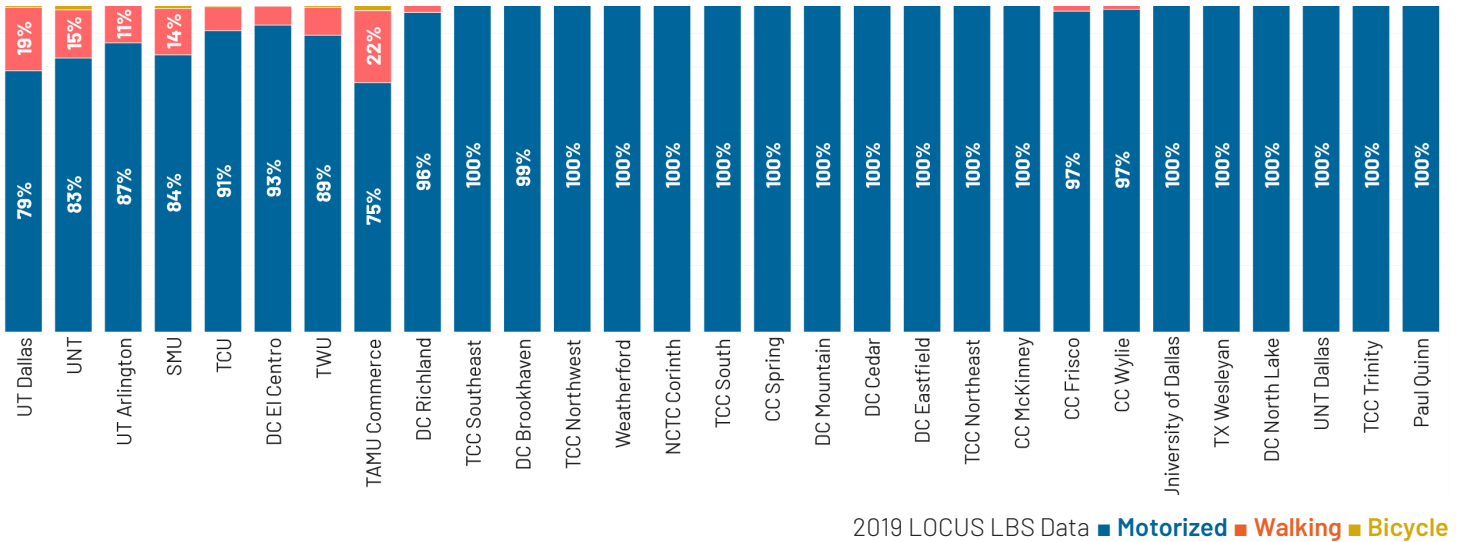
As in Figure 6, Figure 7 shows the strong—though not completely explanatory—relationship between trip distance and mode choice (again, sorted by total home-based education-weighted trips). Transit access falls within the “**motorized**” category.

Walking and **biking** trips represent an opportunity to leverage existing or planned infrastructure described in the Existing Conditions Report, such as elements of the *City of Dallas Strategic Mobility Plan* and the *Dallas County Mobility Plan*. While most campuses with a high proportion of active trips are located in major urban areas, a notable exception is TAMU Commerce—located in a Texas Main Street town relatively far from the Dallas–Fort Worth metroplex, but having the highest proportion of external home-based trips to campus.

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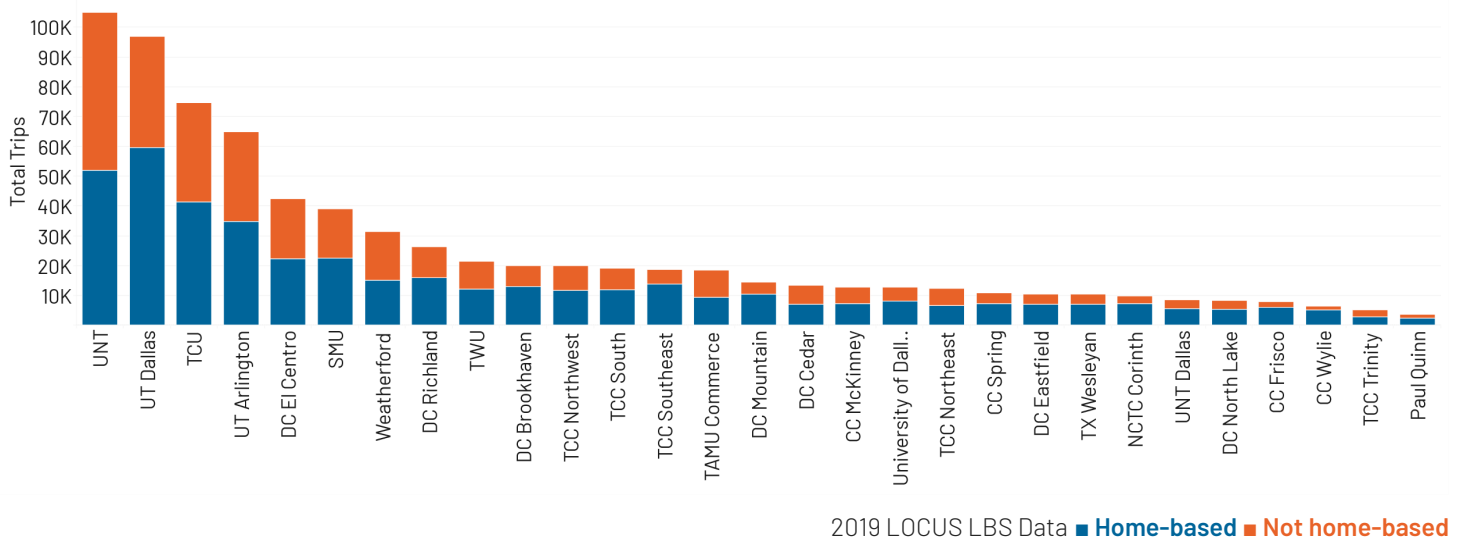
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Figure 7: Percent External/Home-Based Educational Trip Activity by Mode



Trip activity—roughly, commutes (**Home-based**) and all other activity (**Not home-based**)—is shown in Figure 8. Commuter campuses have a much higher proportion of home-based trips than residential campuses (or campuses located nearby other trip generators), where much travel activity is spread over a smaller geographic area (and a longer period of time).

Figure 8: Total Trip Activity by Purpose

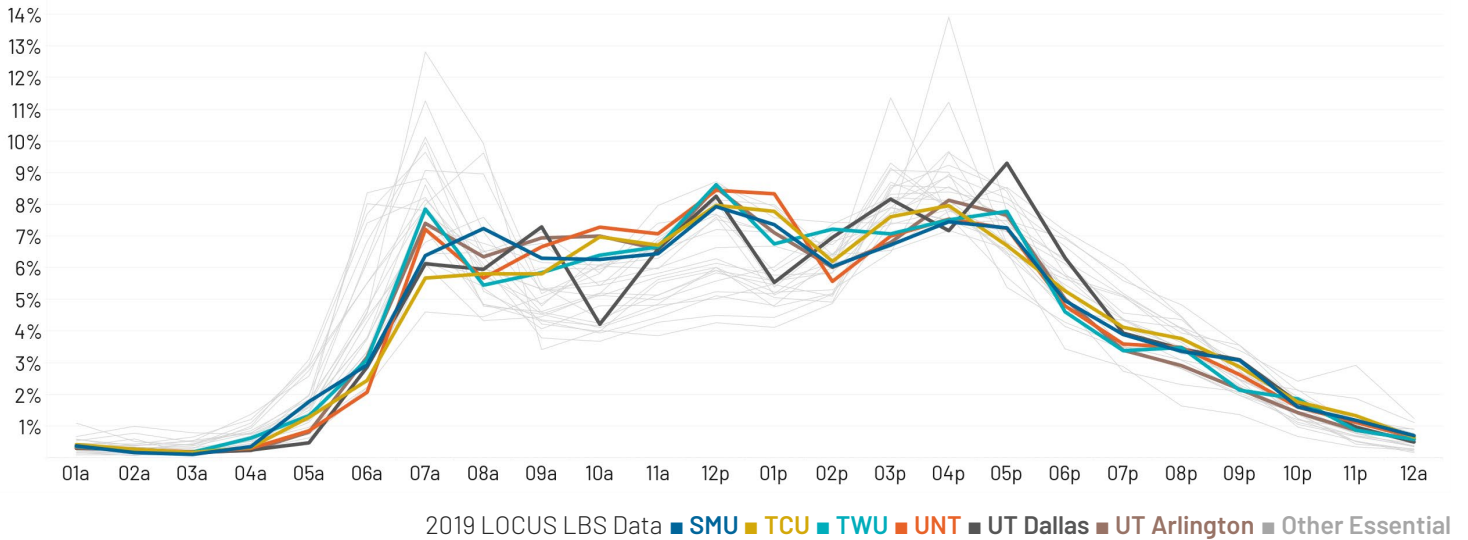


In general, on-campus travel behavior—especially at key institutions, whose activities are much more dominated by educational trip purposes—represents a much more evenly distributed travel pattern than other campuses (Figure 9). Trips tend to start later, and do not see the strong bimodal “peak” travel patterns typical of regional travel.

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Figure 9: Total Trip Activity by Time of Day



This pattern of activity underscores the need for all-day mobility options as opposed to service oriented around “pulsed” or peak period travel, especially at major universities. Note also the slow trail-off of travel activity over the course of the evening; night classes and shift-oriented work represent opportunities to 1) provide additional safer and more convenient travel options and 2) reduce the need for shuttle operations to off-campus parking facilities.

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COVID-19

The COVID-19 pandemic had a profound and multidimensional impact on travel behavior. Trip behavior changed dramatically as travel was restricted to critical tripmaking only, and early guidance suggested that public transportation be avoided due to the potential for infection. The ongoing nature of the pandemic presents a challenge for data analysis. While much travel activity—both overall and within the context of public transit—has reversed the majority of its decline, it spurs the dilemma between using pre-pandemic data versus more current data.

The advantage of the use of 2019 data is its representation of “normal” travel behavior: an upper bound. However, there is no guarantee that either the volume or the nature of future travel will resemble that of 2019. On the other hand, use of contemporary data—late 2021 and early 2022—runs the risk of capturing transient depressed or altered patterns, especially in the context of campuses, whose return-to-classroom policies vary over time. **Unless otherwise noted, the data in this document represent 2019 travel patterns.**

An analysis of 63 campus-associated block groups showed that in the fall of 2021, total travel remained at about 60% of 2019 levels. However, there was substantial variation in this figure at the campus level. Block groups containing campuses located in downtown districts of Dallas and Fort Worth are still at about one-third of pre-pandemic levels. More rural locations are much closer to full recovery.



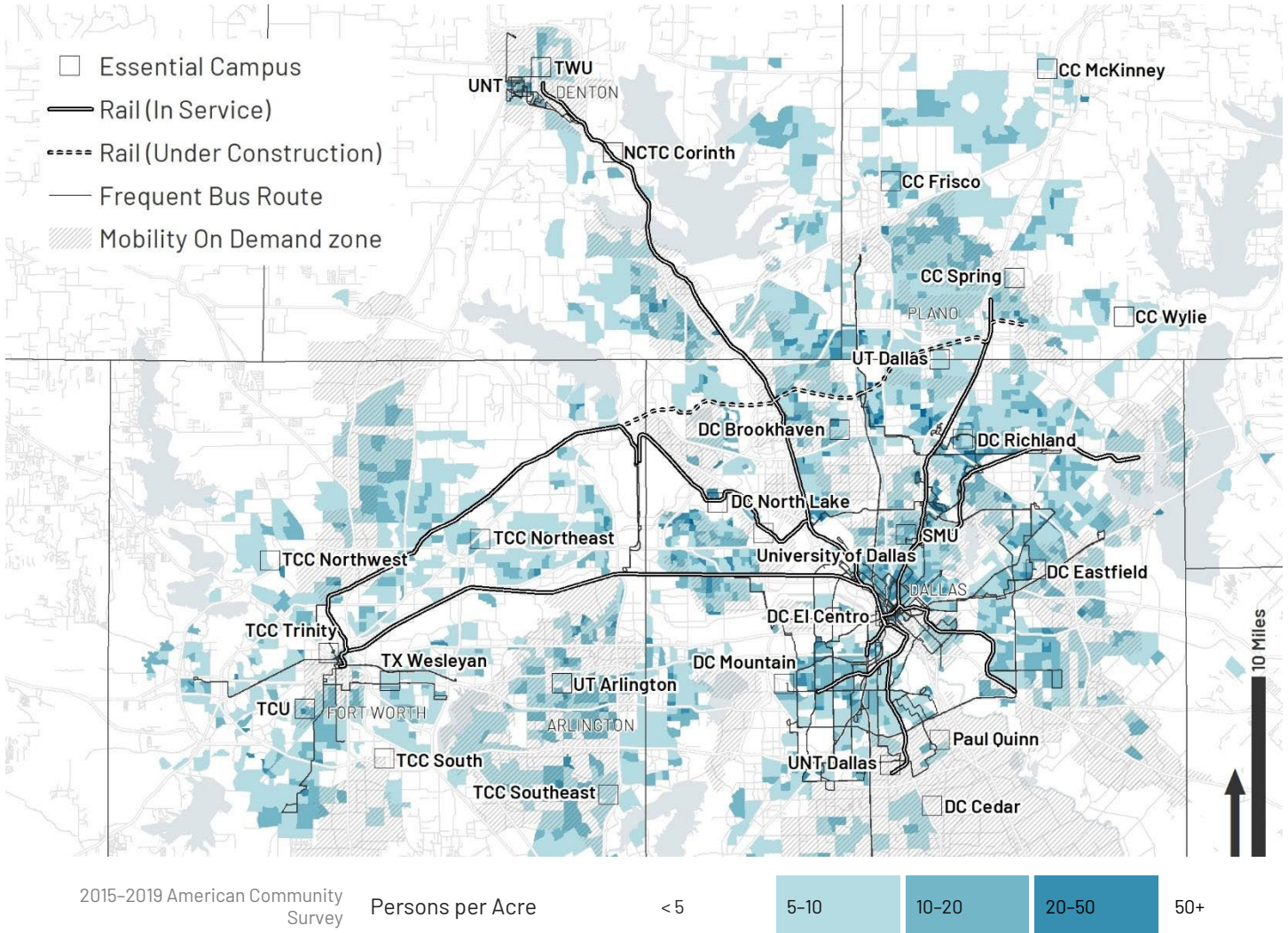
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Market Analysis

Population density surrounding university and college campuses in Figure 10 looks similar to the map of trip origins destined for essential campuses (shown in Figure 2). Again, the polycentric nature of the region is evident. Note again the difference between the Dallas-based light rail network and commuter networks connecting Dallas to Fort Worth and Denton; the latter are located on current or former freight rights-of-way and therefore tend to skirt rather than traverse population-dense areas.

Figure 10: Population Density



Education

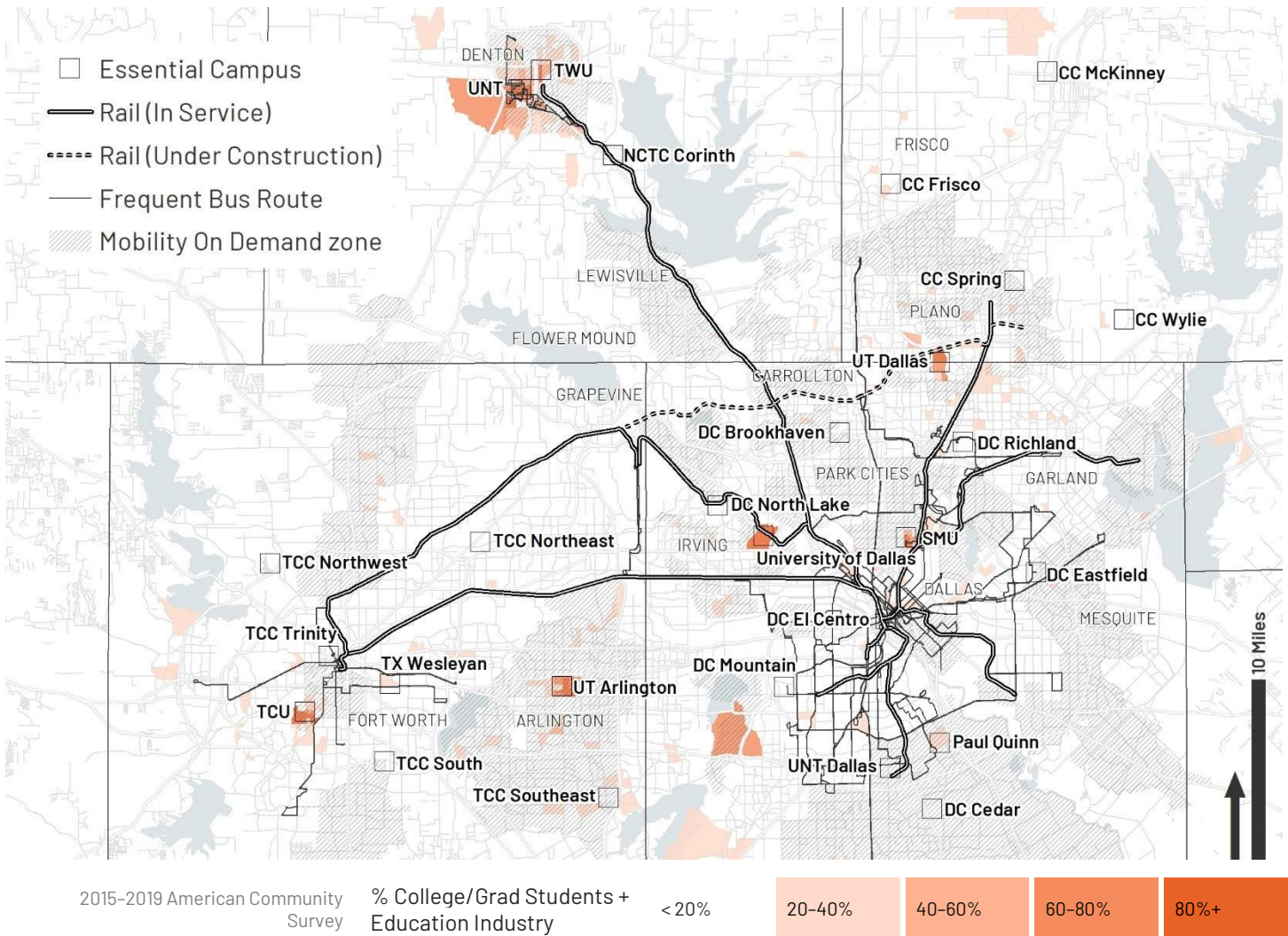
Of special interest are concentrations of college and graduate students and employees involved in educational services. In this work, trip activity is “discounted” where indicated to reflect only the proportion of residents of a device’s home block group who are college students, graduate students, or employed in educational fields. This approach does not specify educational jobs with enough specificity to limit them to college and university travel, nor does it account for people who are simultaneously enrolled in college or graduate school and employed in an educational field. However, the approach does give a reasonable approximation of educational travel.

Education-affiliated residents tend to be located near campuses (Figure 11). Only the truly large, residential campuses dominate their neighborhoods—UNT/TWU, TCU, UT Arlington, University of Dallas, UT Dallas, SMU.

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Figure 11: Education-related Residents



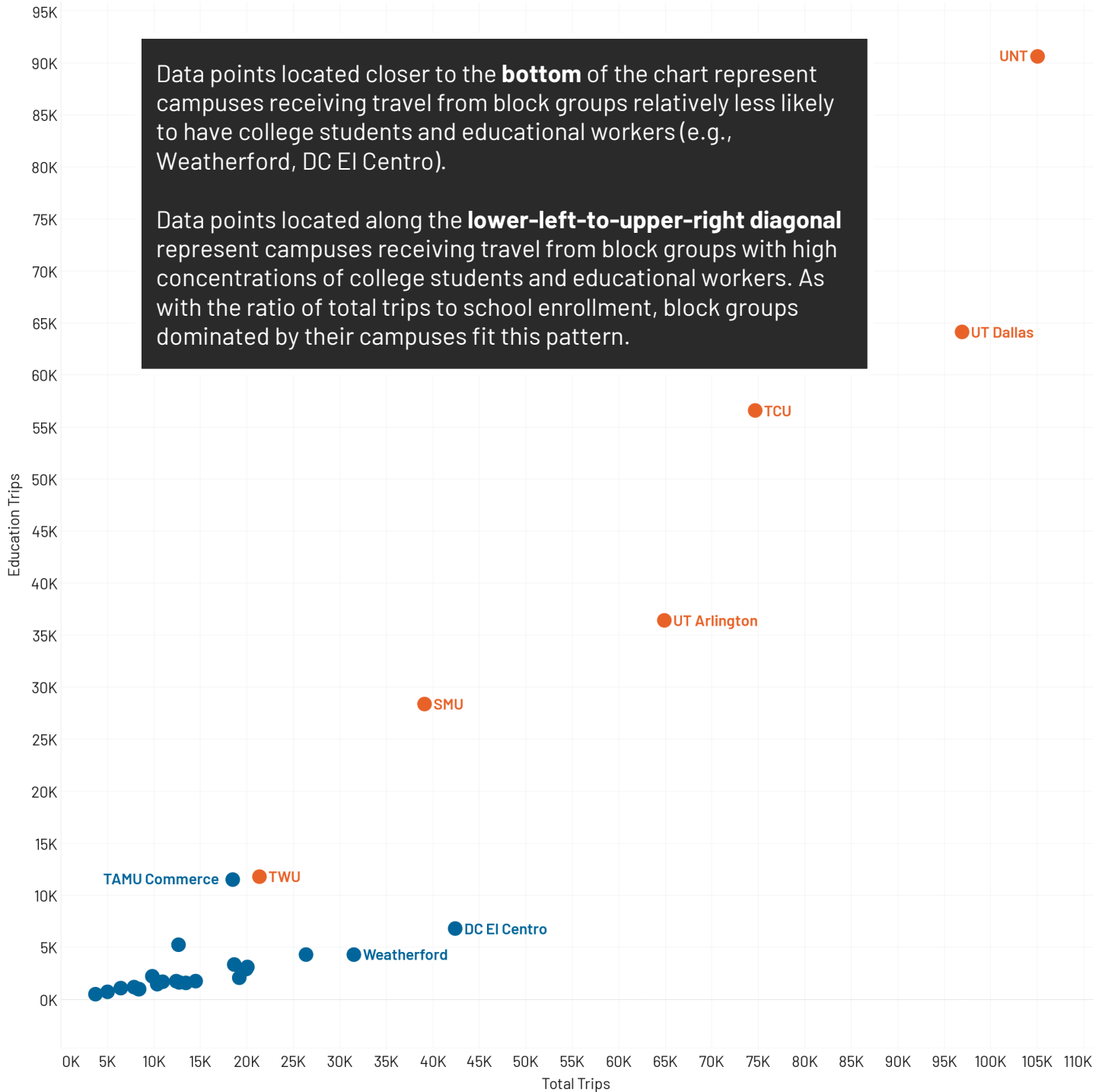
Discounting observed LBS trips by educational affiliation of block group residence gives a conservative estimate of the number of trips actually destined for the campus itself, as opposed to simply the coincident block group. This metric is used elsewhere in this work to more precisely identify educational travel in block groups where the campus is not the dominant feature, such as institutions in central business districts.

Figure 12 compares educational travel to essential campuses against total travel using this approach. **“Key Campuses”** stand out as having the majority of their travel explained by educational affiliation.

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Figure 12: Educational Travel by Total Travel



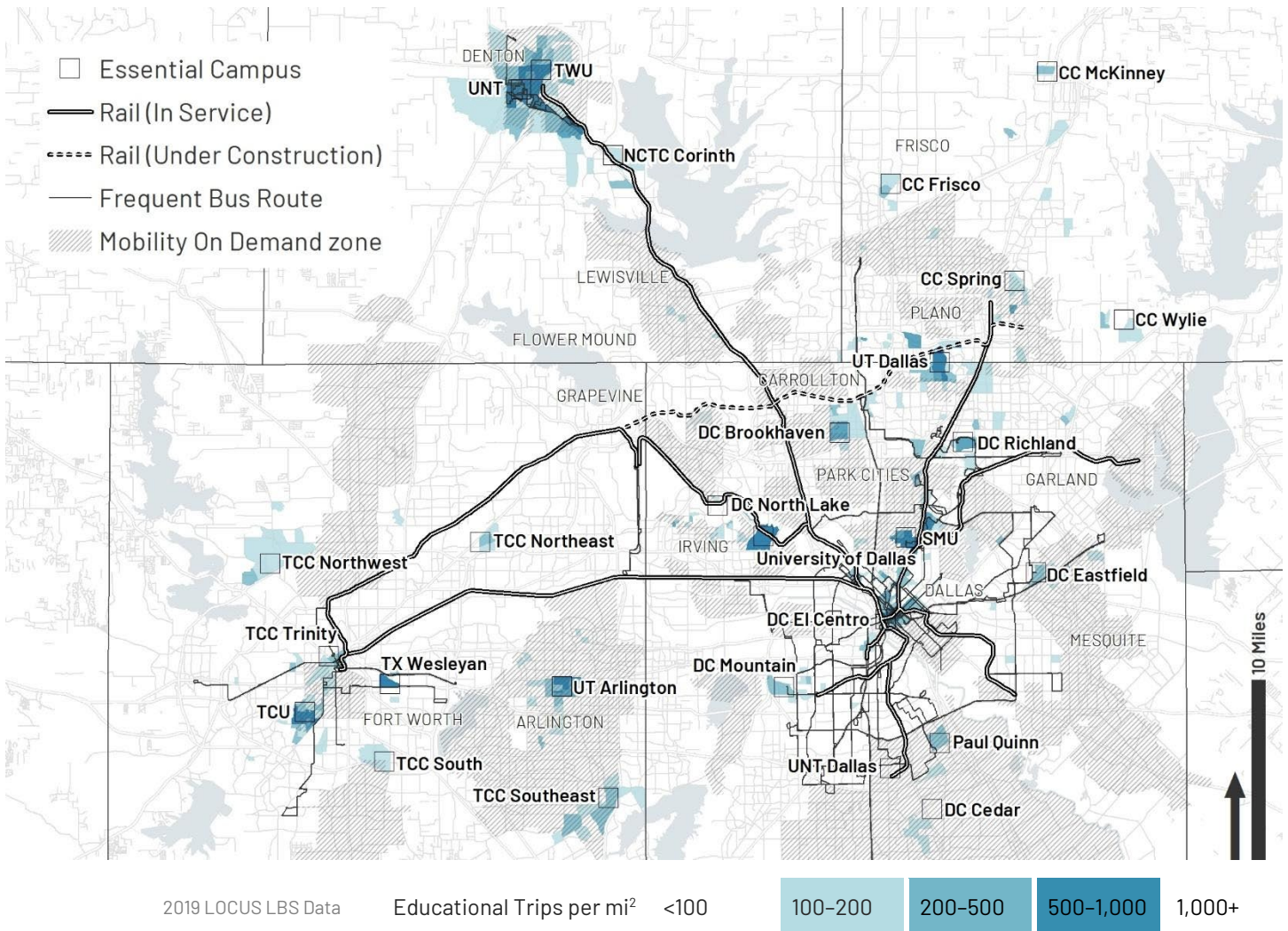
2019 LOCUS LBS Data

Figure 13 shows this relationship geographically. The prominent educational travelsheds of UNT/TWU, TCU, UT Dallas, and UT Arlington are clearly visible.

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Figure 13: Educational Travel to Essential Campuses



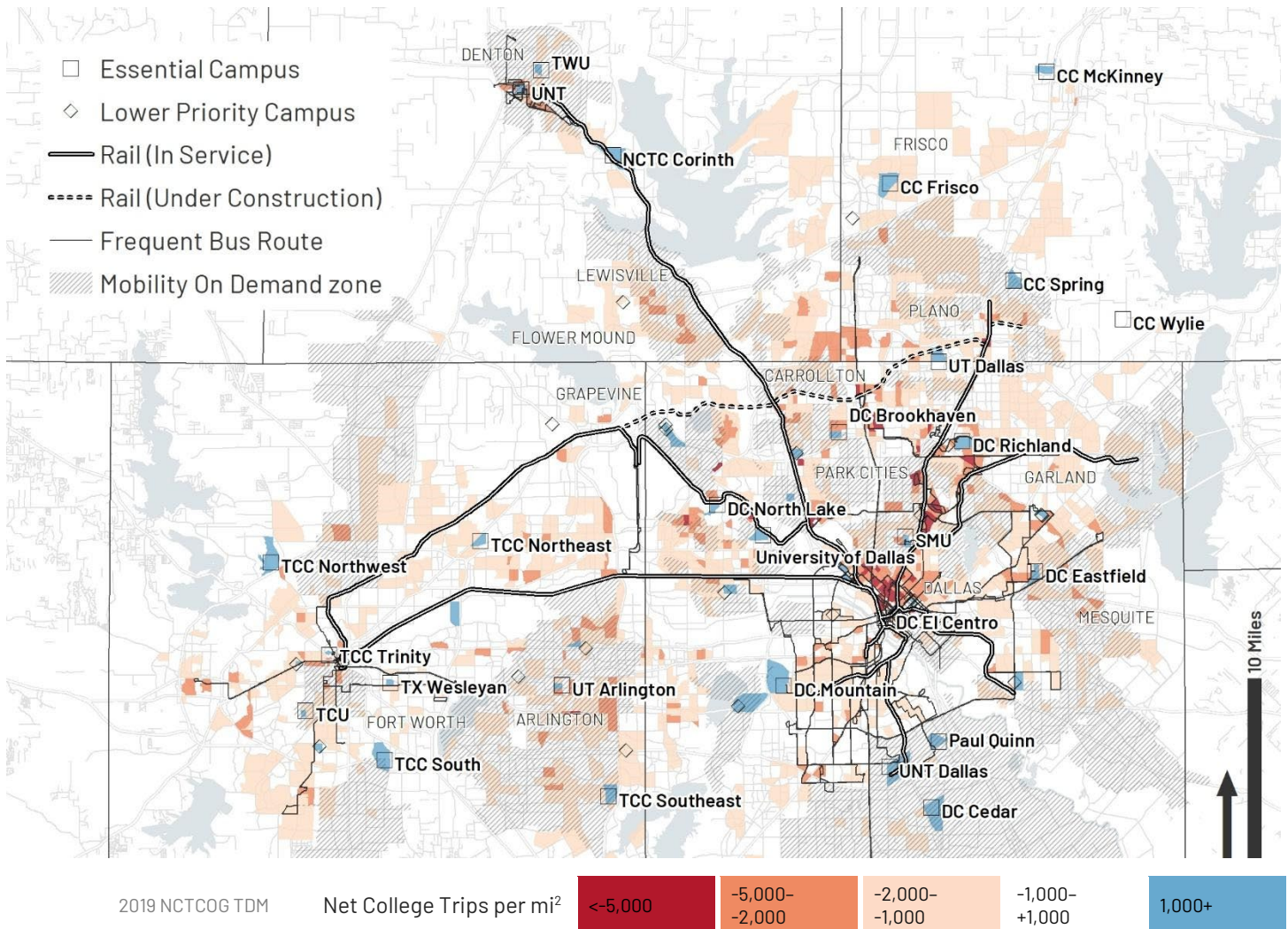
A good validation of this approach is to use the regional travel demand model’s special generator data. These data are compiled from local sources and reflect a survey- and count-based approach to identifying travel patterns. The regional travel demand model identifies college “productions” and “attractions” (Figure 14). Unlike the origin-destination information shown in the LBS map, this data reflects locations of students/employees and possible destinations, but does not pair the two together into a later step in the modeling process. Trip density at origin is shown in shades of **red**; their possible destinations in **blue**.

Note that the regional demand model has a much larger set of destination campuses than this work. At the regional level, the “campus-sheds” are still visible, but co-located institutions—like UNT/TWU or TCU and Southeastern Baptist Theological Seminary to the southeast—are more difficult to separate out.

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Figure 14: Demand Model - College Net Trip Attractions



Equity Groups

Trips made by populations in one of three categories are tagged as equity travel within the location-based services dataset if they exceed the regional average of a given demographic by 10 percentage points. The categories are:

- Low Income, corresponding to zones with 23% or more residents at or below the poverty line (vs a regional average of 13%);
- Minority, corresponding to 63% or more residents identifying as any race other than white OR Hispanic/Latino and any race (vs a regional average of 53%).

Figure 15 shows the distribution of poverty across the region (here, using a slightly-more-expansive definition of 150% of the poverty line). Dallas and Fort Worth's north-south divide is evident. Note also the concentration of poverty in Denton.

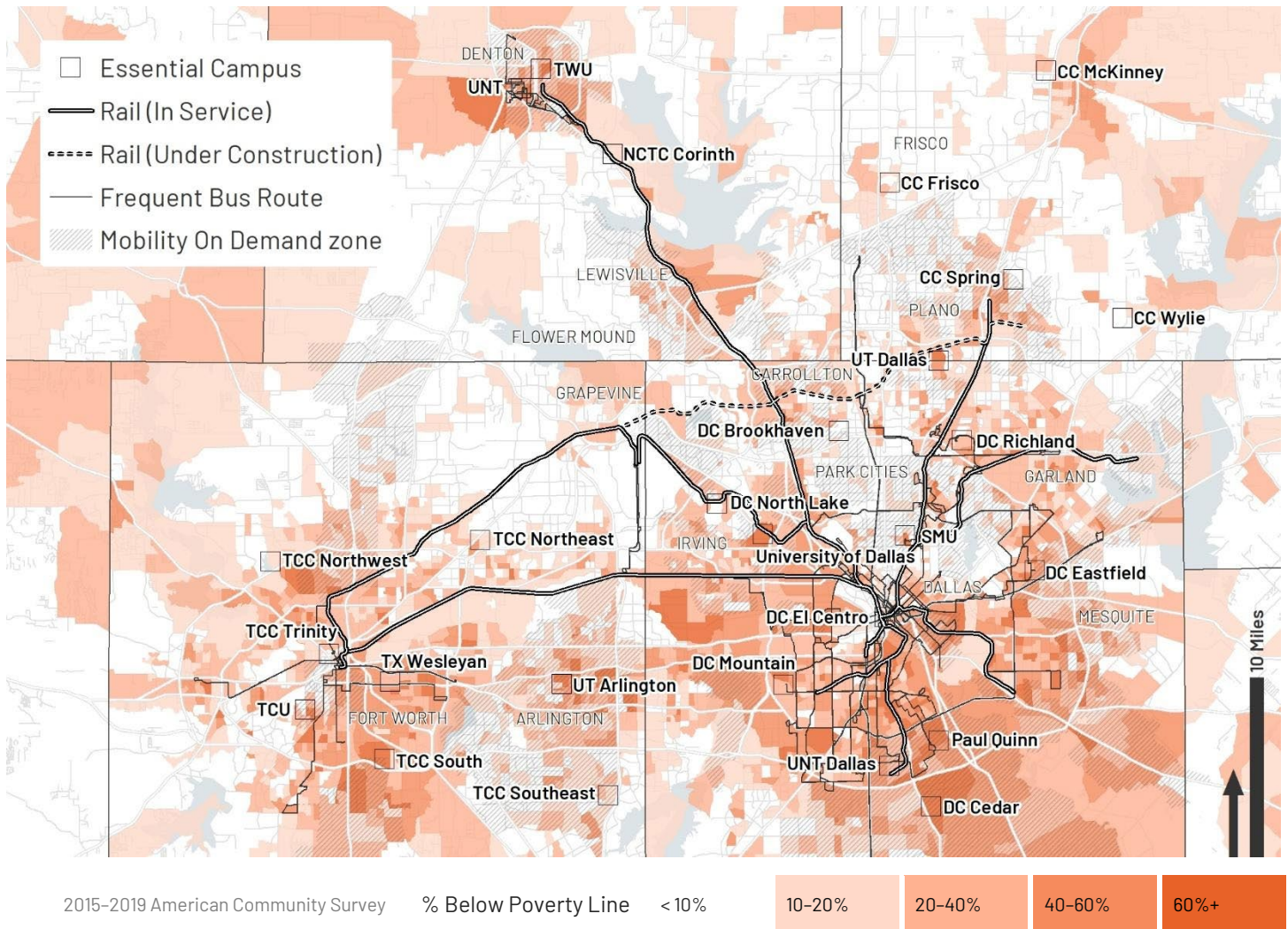
The connection between lack of poverty and on-demand zones is evident, as the region shifts towards focusing fixed-route service on riders more likely to use it and supplementing with on-demand zones in areas less likely to use fixed-route services. In particular, the relationship between fixed-route and on-demand service and poverty in the DART service area is particularly stark.

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Of course, exceptions abound—UNT is served by on-demand service that temporally complements its fixed route service, DCTA on-demand service connects the A-Train to jobs in Lewisville, and STAR Transit on-demand service provides access to low-density regions in south/east Dallas County.

Figure 15: Percent Households below 150% of Federal Poverty Line



Racial and ethnic diversity follows a similar, but not identical pattern, with the southern portions of Dallas and Fort Worth showing higher concentrations of non-white residents (Figure 16).

However, other clusters emerge, demonstrating the non-homogeneous nature of demographic groups across racial and ethnic lines. Key equity patterns include:

- Diverse student populations, especially near residential campuses of UNT, UT Dallas, UT Arlington, and most Community Colleges; relative integration to the north of Dallas and Fort Worth
- Stark segregation to the south and East of Dallas and Fort Worth and the immediate north of Dallas, affecting the TCU and SMU campuses (and for that matter, Paul Quinn College, the most prominent HBCU in the dataset).
- Significant numbers of institutions with majority minority travel (DC Mountain, TCC Southeast), majority low-income travel (TAMU Commerce, University of Dallas), or majority both (TX Wesleyan, UNT Dallas, Paul Quinn).

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Figure 16: Race and Ethnicity

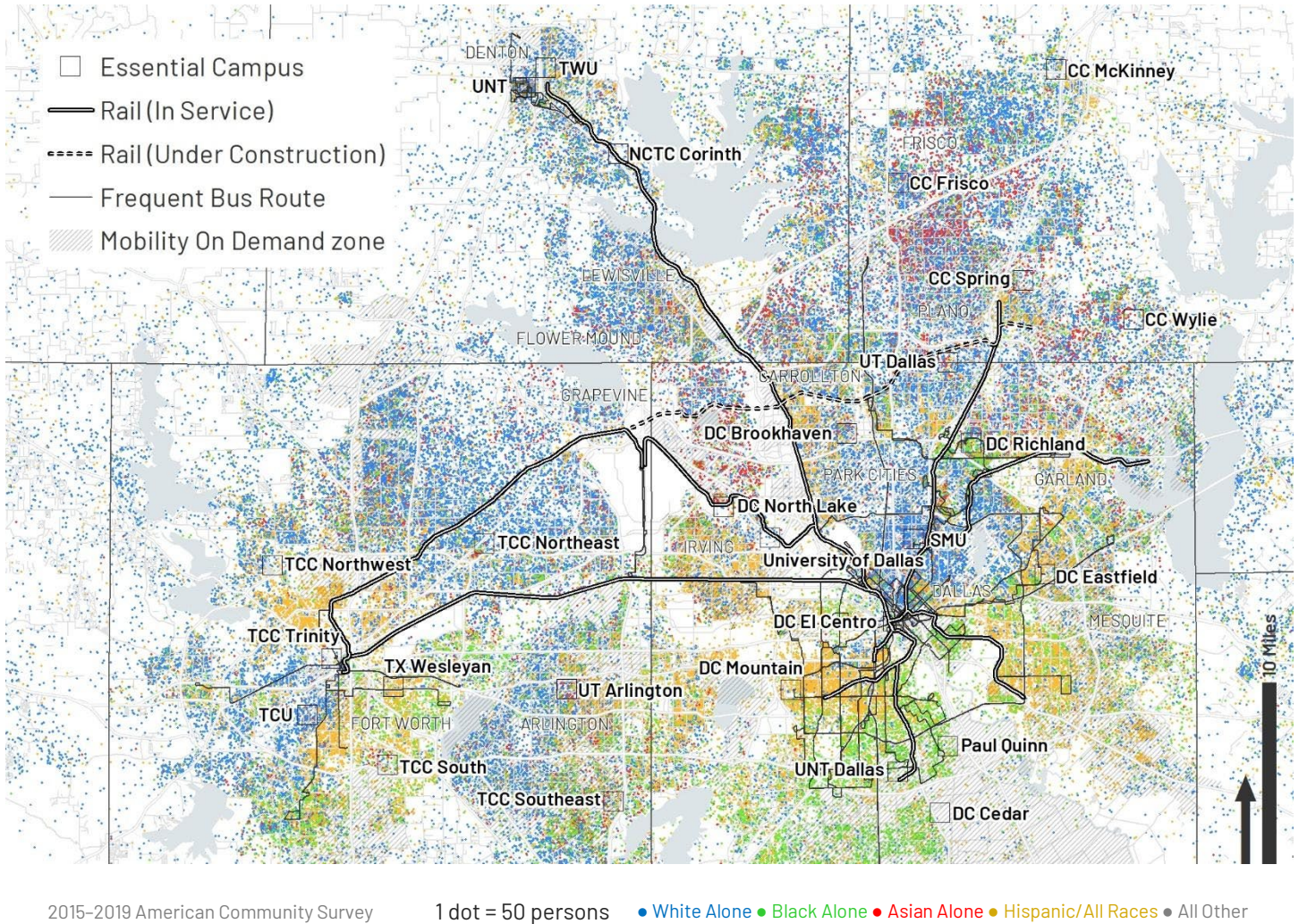
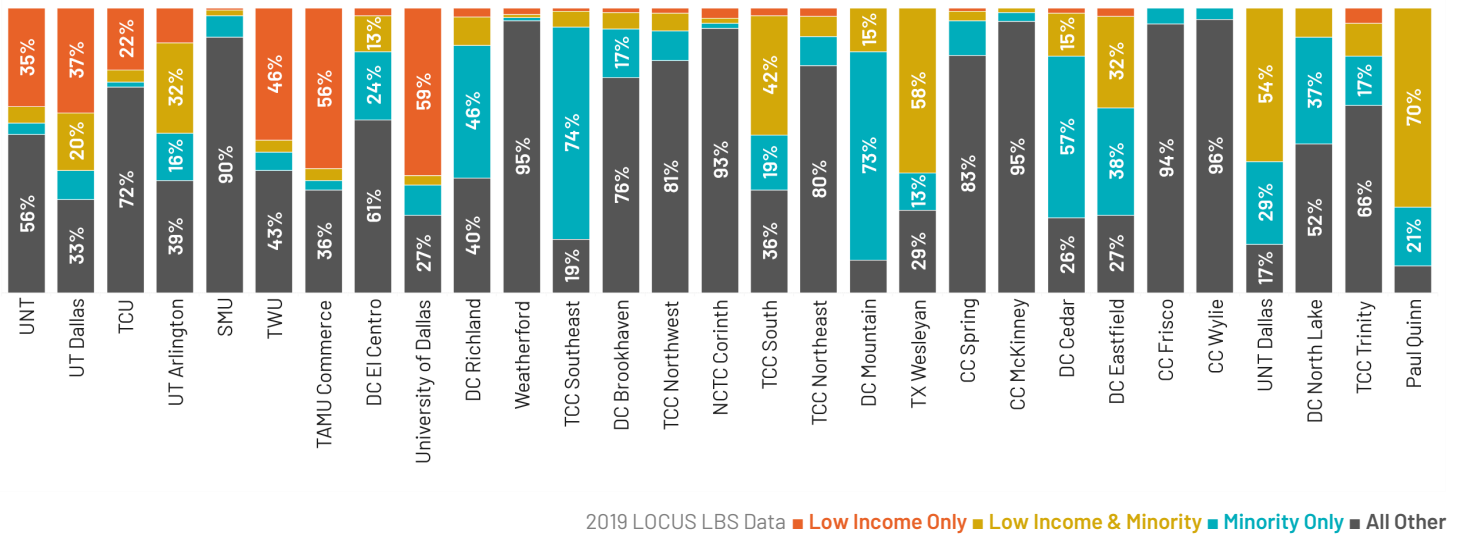


Figure 17: Total Educational Travel by Equity Group



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Service Access & Analysis

Access to mobility services, including both institutional transit and shared passenger mobility services (SPM, also known as Mobility On-Demand [MOD]), varies widely across the region.

Mobility Access

Shared mobility services are defined here as some combination of rail (commuter, light rail, or streetcar), frequent and infrequent bus, and SPM/MOD services.

In general, the relatively reliable on-time performance, ease of wayfinding/trip planning, and other features make rail an attractive option despite relatively low regional frequencies outside of DART’s downtown operations.

The definition of “frequent” bus service can vary dramatically, and enhanced bus attributes such as bus rapid transit (BRT) or “BRT-lite” features including level boarding, offboard ticketing, dedicated lanes, and other features all provide value to customers above and beyond simple frequency. Twenty-minute bus service represents a conservative, reasonable definition of service that can be relied upon for daily use without requiring planning one’s day around the schedule.

Likewise, the usefulness of on-demand service varies substantially. In general, DART’s MoD services are built around facilitating access to the light rail and fixed-route bus network, serving a first mile/last mile purpose. In contrast, DCTA’s services are typically spatiotemporal complements to fixed-route service—providing options when or where fixed-route service is not available—while Arlington’s service replaces fixed-route service entirely.

Access to mobility services was codified using the criteria in Table 2. Essential campuses are grouped into four categories: **good service**, representing transit-accessible campuses that may have options for improved service; **fair service**, where a few well-placed projects might improve access to nearby facilities; **low service**, where a bare minimum of transit service exists, or **no service**.

Table 2: Transit Service Rating Criteria

	Rail	Frequent Bus (<=20m)	Bus (>20m)	MoD
Good Service	Rail or Frequent within ½ mile.		Optional	
Fair Service	No Service within ½ mile.		Bus stop within ½ mile.	Optional
Low Service	No Service within ½ mile.			Inside MoD zone.
No Service	No transit access within ½ mile.			

Within these categories, many options for first mile/last mile (FM/LM) service to nearby facilities exist; nearby [frequent] bus service or SPM/MOD zones could also be rerouted or expanded to serve campuses, though this comes at an operational cost.

The overall rankings, along with commentary on potential future mobility hub access options, are shown in Table 2.

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Table 3: Transit Service by Essential Campus

Level of Service	Campus	Agency	Rail	Frequent Bus	Bus	SPM/MOD	Opportunity/Note
Good	DC Eastfield	DART	■	■	■	■	Out of service area but has a contracted bus route service.
	DC El Centro	DART	■	■	■	■	About ½ mile from MoD zone.
	DC Mountain	DART	■	■	■	■	About 1 ½ mile from MoD zone.
	DC North Lake	DART	■	■	■	■	About ½ mile from MoD zone.
	DC Richland	DART	■	■	■	■	About 1 ½ miles from rail. Good FM/LM candidate.
	Paul Quinn	DART	■	■	■	■	About 2 miles from rail. Good FM/LM candidate.
	SMU	DART	■	■	■	■	
	TCC Trinity	Trinity Metro	■	■	■	■	About 1 mile from TRE station. Good FM/LM candidate.
	TX Wesleyan	Trinity Metro	■	■	■	■	About 1 ½ miles from MoD zone.
	University of Dallas	DART	■	■	■	■	About 1 mile from MoD zone.
	UNT Denton	DCTA	■	■	■	■	About 1 ½ miles from A-Train. Good FM/LM candidate.
	UNT Dallas	DART	■	■	■	■	
Fair	DC Brookhaven	DART	■	■	■	■	About 1 ½ miles from frequent route. Good FM/LM candidate.
	DC Cedar	DART	■	■	■	■	About 2 miles from frequent route. Good FM/LM candidate.
	TCC Northeast	Trinity Metro	■	■	■	■	
	TCC Northwest	Trinity Metro	■	■	■	■	About 1 ½ miles from MoD zone.
	TCC South	Trinity Metro	■	■	■	■	
	TCC Southeast	Trinity Metro	■	■	■	■	Out of service area but now is an extension of the Trinity Metro Southeast ZipZone and receives Arlington Via service.
	TCU	Trinity Metro	■	■	■	■	About 1 mile from frequent route. Good FM/LM candidate.
	TWU	DCTA	■	■	■	■	About 1 mile from A-Train. Good FM/LM candidate.
	UT Arlington	City of Arlington	■	■	■	■	On-campus shuttle + City of Arlington Via Service.
	UT Dallas	DART	■	■	■	■	About 1 mile from MoD zone. Note: There will be a Silver Line station adjacent to campus
Low	CC Spring	DART	■	■	■	■	
None	CC Frisco	None	■	■	■	■	About 2 miles from MoD zone.
	CC McKinney	None	■	■	■	■	
	CC Wylie	None	■	■	■	■	
	NCTC Corinth	None	■	■	■	■	Close to A-Train route (but not stop). Good FM/LM candidate.
	TAMU Commerce	None	■	■	■	■	
	Weatherford	None	■	■	■	■	

2019 LOCUS LBS Data • Key Campuses in **Bold** ■ Service within ½ mile ■ Service nearby ■ Service not available

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Case Study 1: University of North Texas/Texas Woman's University

UNT Denton and TWU are both located within the City of Denton. While UNT Denton lacks direct and frequent connections to the A-Train station in downtown Denton, it does have good connections to nearby MedPark station along with a frequent fixed route network designed nearly entirely around serving the campus.

TWU lacks the strong rapid bus network serving UNT, but the campus does have foundational bus routes serving all directions from campus; critical paths between the two universities and downtown are currently limited.

Both campuses are also served by on-demand zones that complement fixed-route bus service schedules, and have a robust network of planned pedestrian and bicycle infrastructure.

UNT Denton/TWU's travelsheds are marked by:

- An education-focused region with multiple destinations.
- A compact travelshed, though with some highway barriers.
- A moderate post-COVID activity return.

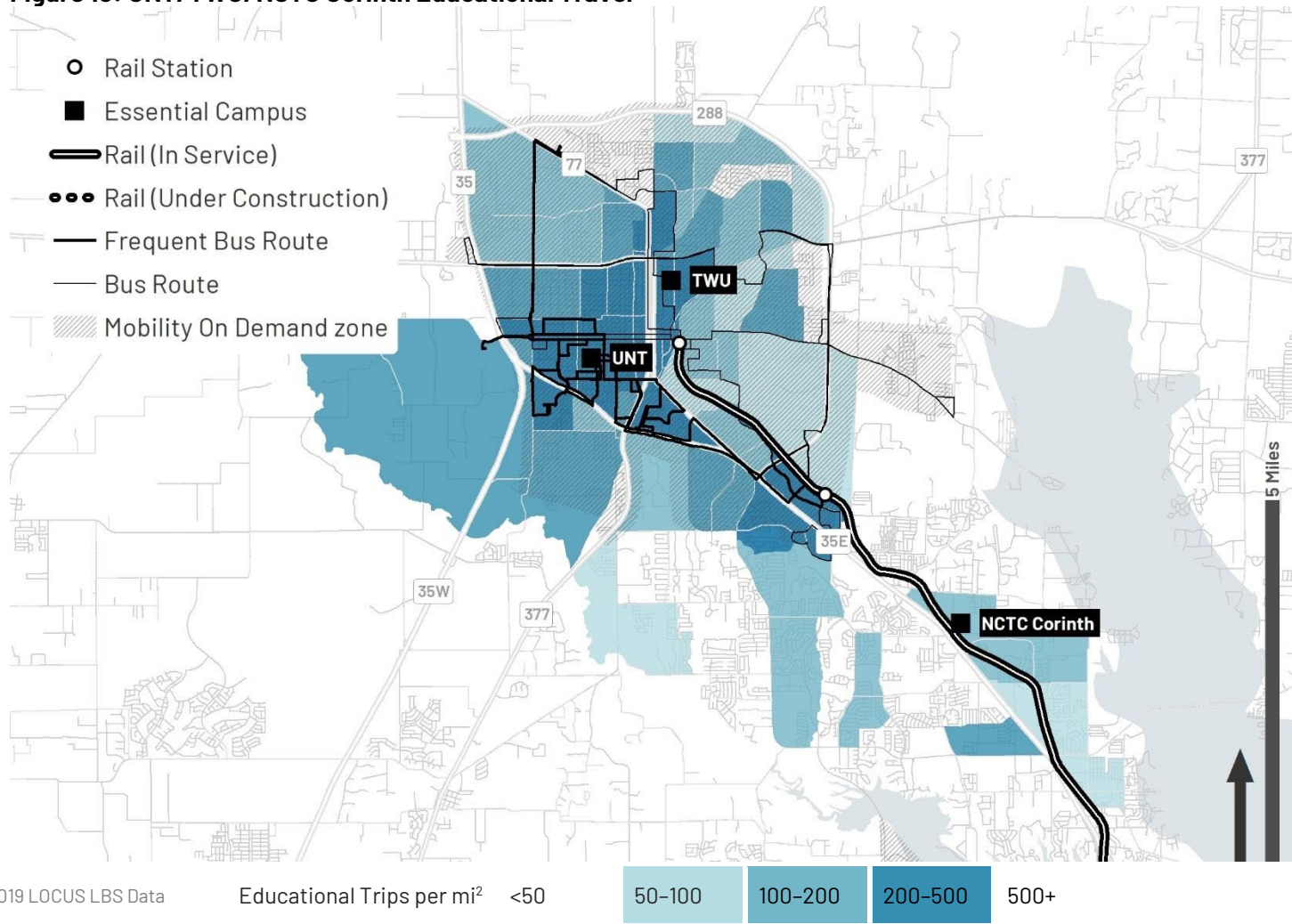
Opportunities for the universities include:

- Connecting the universities to the Downtown A-Train station should be a priority.
- Of note is nearby NCTC Corinth, located along the A-Train corridor but lacking a nearby stop.
- Connections south and west of Interstates 35E and 35W should also be examined, along with circulation within the City of Denton.

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Figure 18: UNT/TWU/NCTC Corinth Educational Travel



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Case Study 2: Southern Methodist University

SMU is located just north of downtown Dallas. Nearby neighborhoods to the northwest of campus are not large generators of campus-bound travel; rather, the apartment-filled neighborhoods across Highway 75 to the east of campus and to the north near Walnut Hill Lane represent a far larger share of travel—as evidenced by the frequent bus service connecting them. The university's strong connection to transit facilities—both DART's light rail network and a frequent bus network—work to overcome its lack of nearby student housing.

SMU's travelshed is marked by:

- Limited travel from immediate neighborhoods and a travelshed bifurcated by highway and rail lines to the east.
- A substantially wealthier travelshed than other major universities.
- A moderate post-COVID activity return.

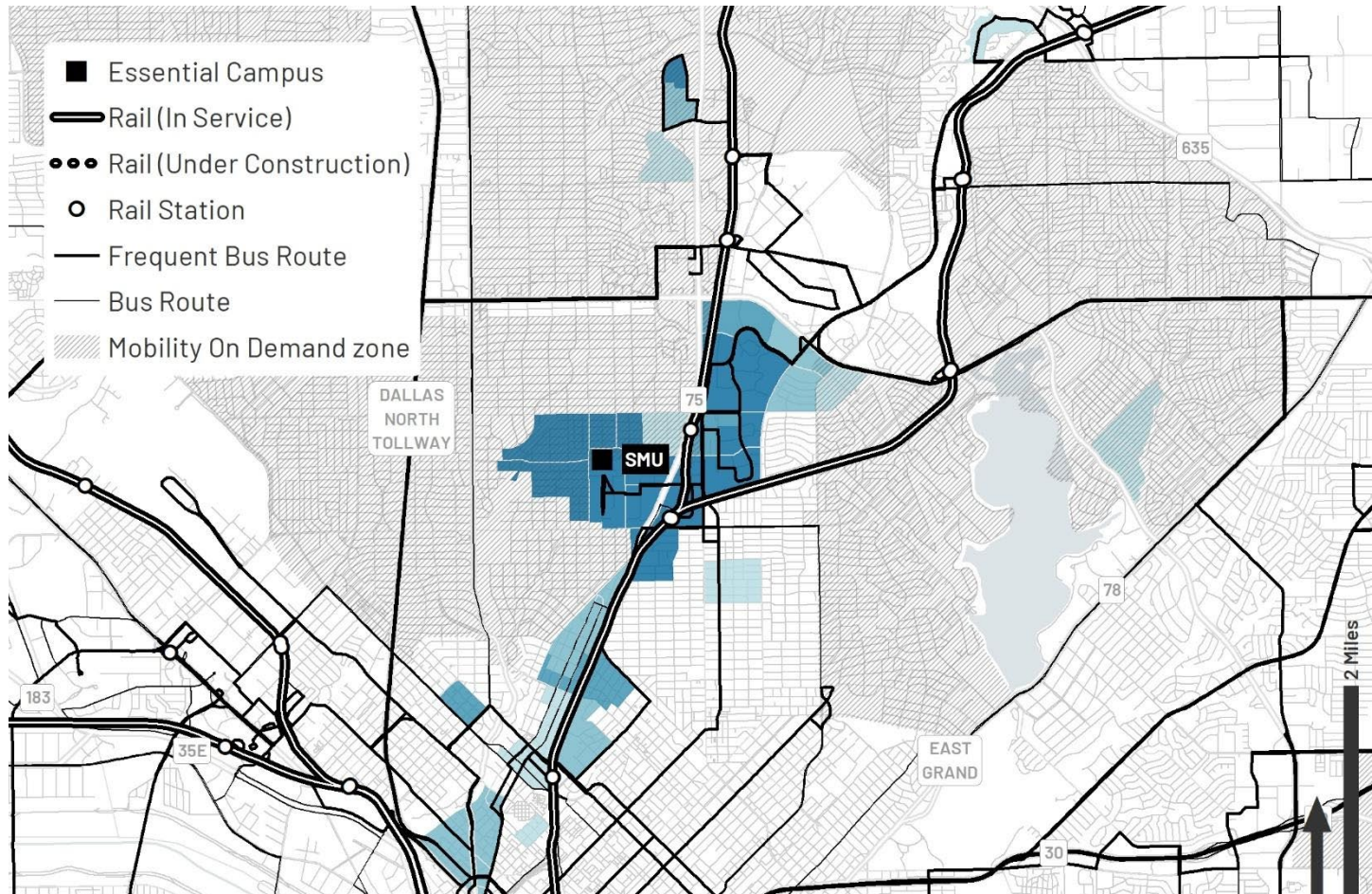
Opportunities for TCU include:

- Targeted improvements between the campus and nearby high-capacity transit facilities, especially those crossing the limited-access Highway 75. As noted in the Existing Conditions report, this link is currently served by carsharing services and some degree of micromobility access, but lacks the infrastructure required for accessible and safe connection.
- Improved access to the south might support more multimodal access.

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Figure 19: SMU Educational Travel



2019 LOCUS LBS Data

Educational Trips per mi² <50

50-100

100-200

200-500

500+

Case Study 3: Texas Christian University

TCU is located to the southwest of Fort Worth's central business district. Though it is served by multiple bus routes, the closest frequent bus route is along Cleburne Road. Many nearby neighborhoods characterized by large amounts of student travel to TCU do not have direct bus connections, though the university is served by an on-demand service zone.

TCU's travelshed is marked by:

- Stark demographic boundaries to the south and east.
- A travelshed bifurcated by rail lines to the north.
- A strong post-COVID activity return.

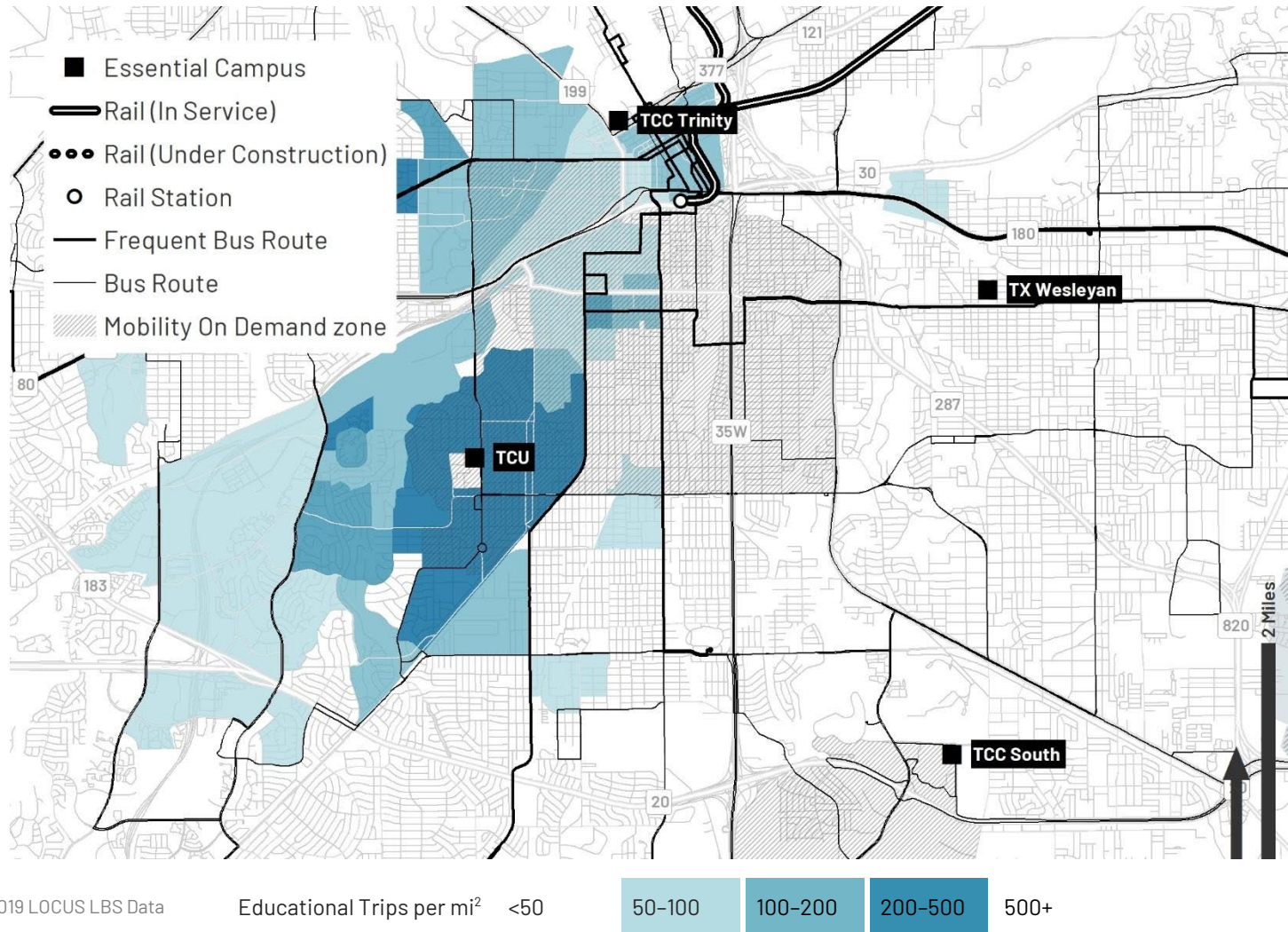
Opportunities for TCU include:

- Potential extension of the TEXRail lines to the south or east of downtown Fort Worth would enhance access to the university, as detailed in the *Mobility 2045 Long Range Plan*.
- Improved frequency on North-South transit routes.

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Figure 20: TCU Educational Travel



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Case Study 4: UT Dallas

UT Dallas is located roughly 20 miles north of downtown Dallas. Notably, while somewhat close to the Arapaho and Galatyn Park DART Orange/Blue light rail stations, the campus does not enjoy any direct connection to those facilities. The under-construction DART Silver Line will provide a station near campus. The campus does have several low-frequency bus routes. Bicycle infrastructure around the UT Dallas campus is well-developed, with on- and off-road bike lanes surrounding the campus. An off-road bike/ped trail connects DART rail to the campus along Renner Road, and the Silver Line will also feature a bike path along its tracks.

UT Dallas's travelshed is marked by:

- A compact travelshed along with distributed "pockets" in all directions.
- A relatively diverse community.
- A very weak post-COVID activity return.

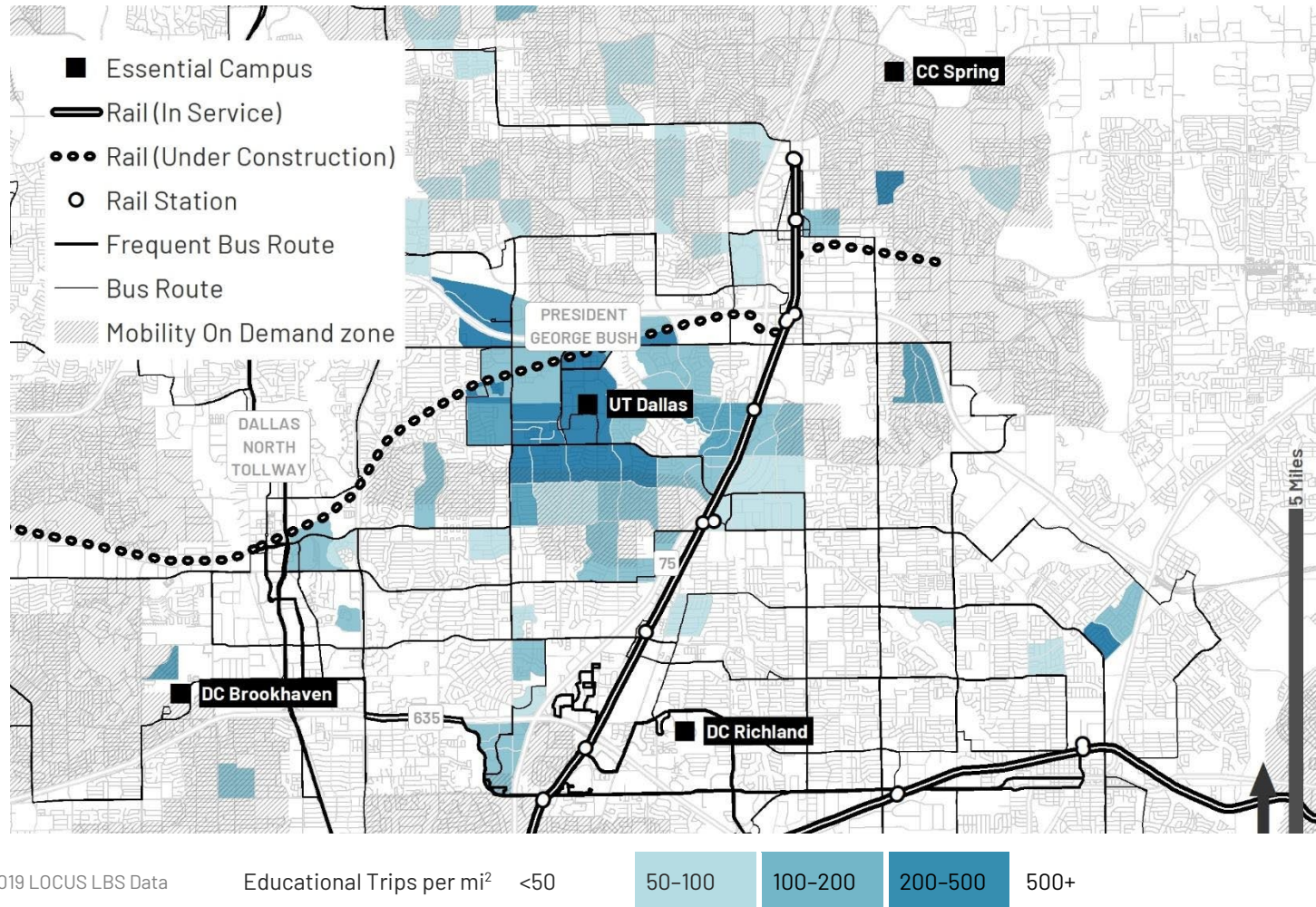
Opportunities for UT Dallas include:

- Better connections to DART light rail lines to the east.
- Future connection to the DART silver line to the north.
- Expansion of on-demand service and/or frequent bus service.
- A compact travelshed offers opportunities for continued investment in pedestrian and bicycle infrastructure.

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Figure 21: UT Dallas Educational Travel



Case Study 5: University of Texas - Arlington

UT Arlington is located in downtown Arlington. Arlington is one of the largest communities in the region without bus service, though the campus itself has a circulator shuttle service. The city's on-demand service serves the entire city limits. As of March 18th, 2022, the Arlington RAPID autonomous vehicle pilot program has provided 28,000 trips to residents, university students and visitors around downtown Arlington and UT Arlington's campus.

UT Arlington's travelshed is marked by:

- A relatively compact travelshed along with a general north-south "spine" of travel activity.
- A relatively homogenous educational travel pattern despite a nearby diverse community (though nearby, noneducational trip generators may skew these results).
- A relatively weak post-COVID activity return.
- Citywide on-demand service access and a robust on-campus shuttle service.

Opportunities for UT Arlington include:

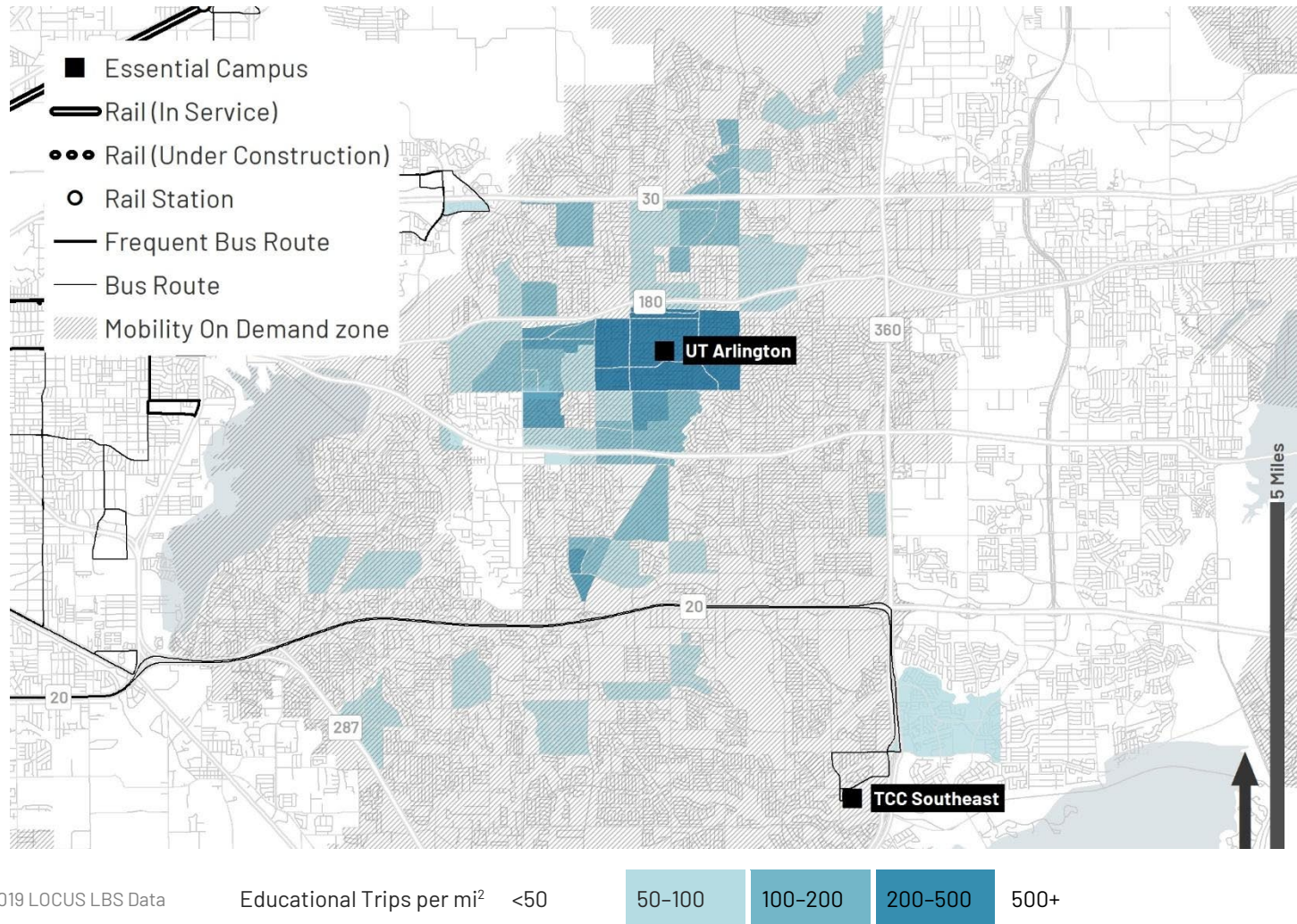
- Better connections to regional destinations.

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- A compact travelshed offers opportunities for pedestrian and bicycle infrastructure.
- A distinct opportunity to develop a mobility hub which prominently utilizes autonomous vehicles.

Figure 22: UT Arlington Educational Travel



04 Shared Mobility Propensity

Connecting the dots between the existing policy and planning conditions, infrastructure supply, and demographic and travel profiles of campuses, university and college campuses across the North Central Texas region experience varying degrees of mobility demand. The analyses below

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reveal where there is potential demand for different types of shared mobility and public transit services (e.g., bike share and scooter share, as well as car sharing and microtransit services). The following shared micromobility, shared passenger mobility (or MOD), and transit propensity mapping tools indicate where mobility services are most viable at all campuses, but more specifically at mobility hub locations across the region. Implementers can use these maps to understand which services can thrive at their hub location(s) and which services might not work without subsidy or other targeted policy and programmatic interventions that ensure sustainable operations.

This [interactive dashboard](#) presents the results of the three mobility propensity indices.

Shared Passenger Mobility Propensity Results

The results of the shared passenger mobility propensity analysis indicate that overall concentrations of high shared passenger mobility propensity are located in city centers and areas of higher population and employment density. This is consistent with the inputs to the index, which favors areas with higher proportions of all trips that are 3 to 7 miles long as well as single people, middle income families without children, and employed people who have obtained higher education. Many of the larger universities in the study area are outside of areas of high population and employment density, and as a result, smaller colleges and universities are those that tend to be found in areas with a higher shared passenger mobility propensity. Figure 23 shows the entire study area with shared passenger mobility propensity displayed.

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Figure 23: Shared Passenger Mobility Propensity Results

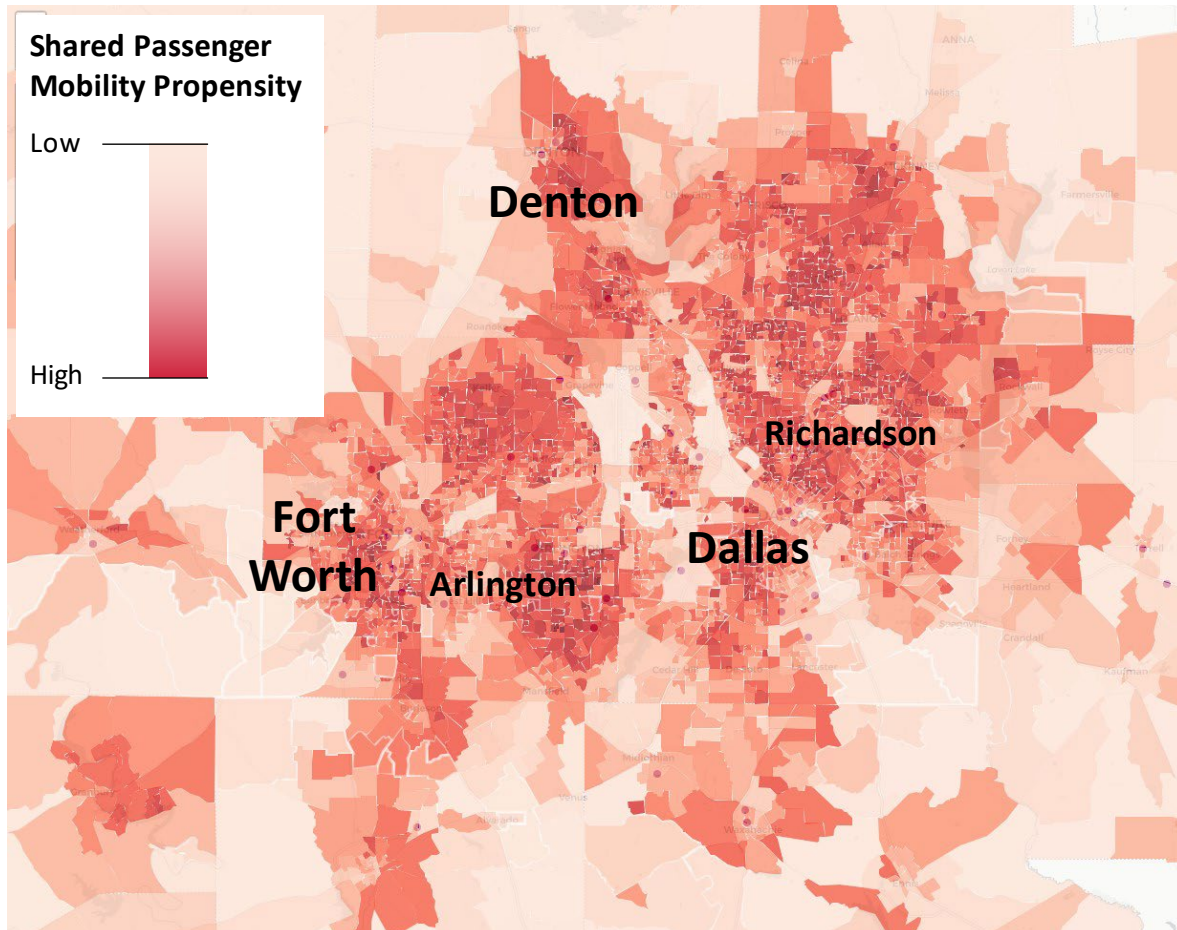


Table 3 below summarizes the composite shared passenger mobility propensity in the half-mile vicinity of colleges and universities within the study area that represent a range of propensities. Many colleges and universities in the analysis find themselves in the middle of the propensity distribution, except for some universities in more rural settings such as Tarleton State University – Fort Worth. The universities and colleges at the higher end of the propensity range tend to be located closer to urban, downtown settings.

Table 3: Shared Passenger Mobility Propensity Select College/University Results

College or University	Propensity (scale: 1-10)
Tarleton State University – Fort Worth	1.2
UNT Frisco	4.1
UT Dallas	5.7
UT Arlington	5.8
UNT Denton	6.6
SMU	6.8
UT Arlington, Fort Worth Campus	7.4

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Dallas College (El Centro Campus)	7.8
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The Dallas College El Centro Campus and UTA Fort Worth campus are located within the downtown context of Dallas and Fort Worth, respectively. The high level of shared passenger mobility propensity for these locations suggests means that supportive infrastructure should be considered for these campuses when considering investment. This includes dedicated spaces for passenger pickup and dropoff, a public space activated with tables and seating that allow for shared passenger mobility users to wait comfortably, and wayfinding signage to help users locate areas for shared passenger pickup and dropoff zones.

Shared Micromobility Propensity Results

While the shared passenger mobility propensity only considers demographic factors, the shared micromobility propensity considers the same demographic factors, as well as availability of micromobility-supportive infrastructure (such as the number of non-auto-oriented intersections and bicycle network facilities) and areas that experience a higher proportion of trips under three miles. The tendency of the shared passenger mobility propensity results to favor dense, urban areas is further seen in the results of the shared micromobility propensity results, because micromobility-supportive infrastructure tends to be located most prominently in areas of high population and employment density. Figure 24 shows the entire study area with shared micromobility propensity displayed.

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Figure 24: Shared Micromobility Propensity Results

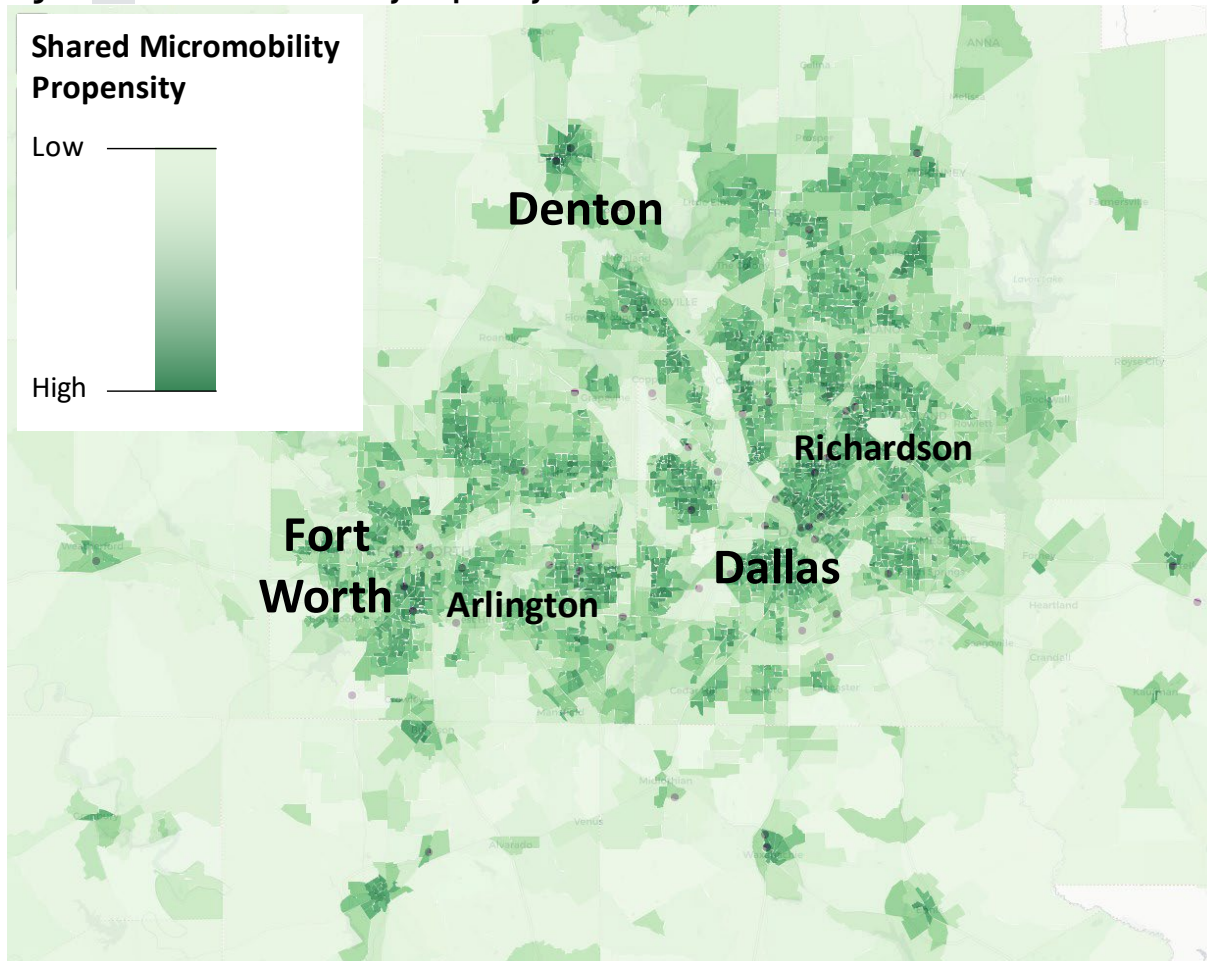


Table 4 displays the shared micromobility propensity results at eight colleges and universities. The overall trend is similar - however the presence of micromobility-supportive infrastructure or lack thereof impacts some university areas more than others. The Dallas College El Centro campus, for example, sees a boost in propensity results due to the abundant pedestrian- and bike-oriented infrastructure present there.

Table 4: Shared Micromobility Propensity Select College/University Results

College or University	Propensity (scale: 1-10)
Tarleton State University - Fort Worth	1.1
UNT Frisco	4.2
UT Dallas	6.6
UT Arlington	7.3
UNT Denton	7.7
SMU	7.4
UT Arlington, Fort Worth Campus	7.0
Tarleton State University - Fort Worth	8.5

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The UNT campus has high demand for shared micromobility, and therefore has a need for an organized micromobility investment. This investment should include a greater emphasis on creating connected active transportation networks, and concentrated, easily accessed operations at mobility hubs so users can connect to and from the UNT campus and other local demand generators.

Transit Propensity Results

Unlike the previous indices, the transit propensity index gives more weight to non-white people, people who are either under 24 years old or older than 65 years old, low-income populations, people with disabilities, and zero-car households. The index is also adjusted using demographic insights from recent transit rider surveys administered by NCTCOG. The transit propensity index does not consider infrastructure availability. Despite this, the overall trend of the results is similar to the previous two indices at a regional level. Propensity is higher in denser, more populated areas, and lower in more sparsely populated areas. Traditional rubber-tired transit service might not be marketable in all places within the NCTCOG region, signaling the need for more tailored mobility products that can engender mode shift. Figure 25 shows the entire study area with shared passenger mobility propensity displayed.

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Figure 25: Transit Propensity Results

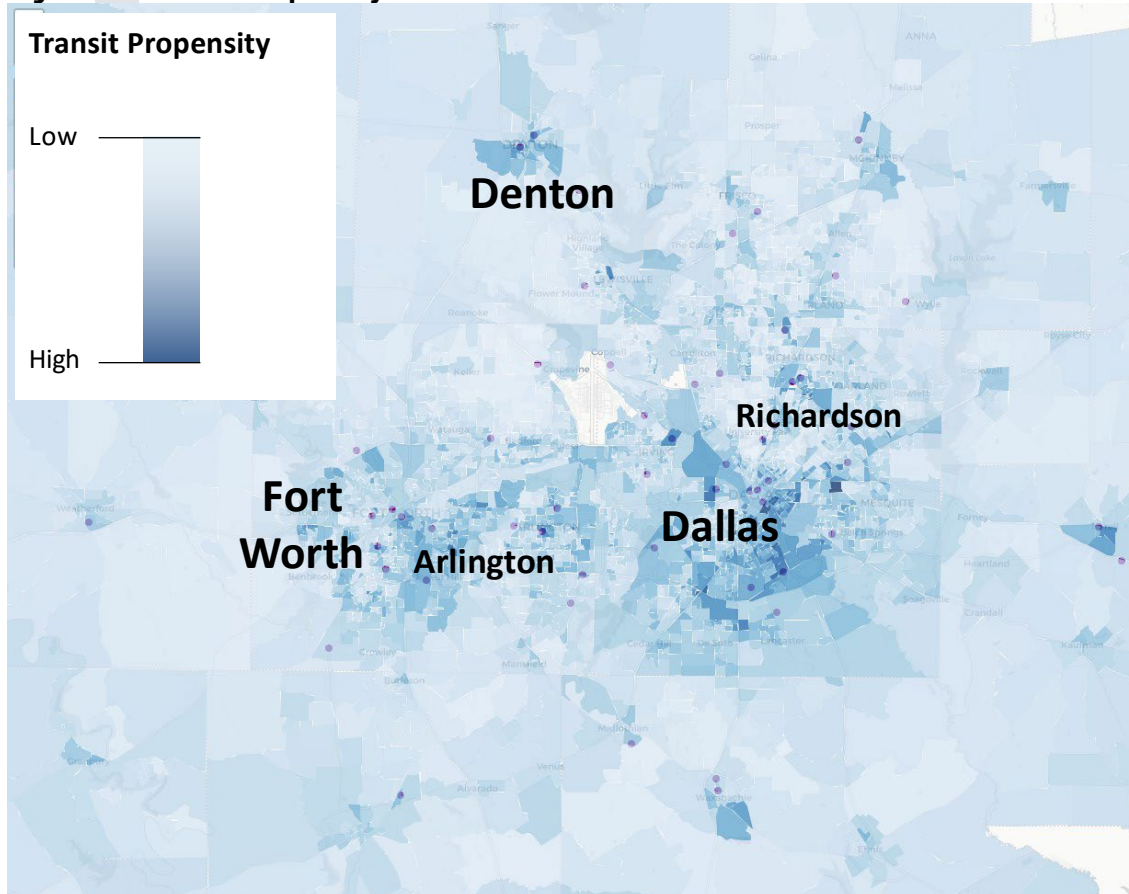


Table 5 summarizes transit propensity at eight select universities and colleges. While the overall trend is similar to the results of the previous indices, there are notable differences. For example, the propensity result for SMU is lower in comparison to the other universities – this is likely because the area where SMU is located tends to be more affluent than that of the universities.

Table 5: Transit Propensity Select College/University Results

College or University	Propensity (scale: 1-10)
Tarleton State University – Fort Worth	2.0
UNT Frisco	4.2
UT Dallas	5.4
UT Arlington	7.1
UNT Denton	7.7
SMU	5.1
UT Arlington, Fort Worth Campus	6.7
Tarleton State University – Fort Worth	7.9

The campus-by-campus transit propensity results are varied across the board, but investment in transit infrastructure and amenities should be concentrated in campus locations that have a higher propensity – such as UNT, UTA, and the El Centro Campus of Dallas College. Investment in

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transit could relate to improving the transit system itself to provide more frequent and higher-capacity transit, but could also involve investment towards transit information displays, wayfinding, or shuttles.

Appendix A: Detailed Existing Conditions Analysis

The existing conditions technical memorandum serves as a baseline of policy, previous and ongoing planning, infrastructure, and mobility services that relate to campus mobility, mobility hubs, and support for first-/last-mile connections to and from university and college campuses throughout the Dallas/Fort Worth (DFW) metroplex. This appendix will inform study recommendations and assist the project team with identification of gaps and opportunities associated with the implementation of intermodal transportation hubs on college campuses (mobility hubs) throughout the NCTCOG jurisdictional area. The report will also focus on the University of North Texas – Denton and adjacent neighborhoods as a model for other campuses throughout the region. Additionally, the appendix spotlights additional campuses of various environments (urban, suburban, and small urban) for consideration of campus mobility hub locations.

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Overview

The following memorandum provides the NCTCOG campus mobility hub team with summaries of adopted plans and reports associated with aspirational goals and the development of a community vision for the DFW region, in addition to existing conditions and best practices associated with the implementation of mobility hubs. The information presented will assist the project team with plan development and recommendations for implementation.

The NCTCOG is a voluntary association of local governments serving the 16-county North Central Texas region centered around the Dallas and Fort Worth urban centers. Within the NCTCOG service area, there are a total 63 higher education institutions, sorted by the project team as either Essential or Lower Priority locations for mobility hubs due to location, size, and access. The locations of the 63 campuses are shown in Figure 1 below; a full list can be found in **Appendix A.1** of this report.

In addition to supporting educational opportunities throughout the region, the 64 colleges and universities serve as major economic drivers through employment of professors, support staff, and other operations services like janitors and meal preparation. As such, access to and from these community anchors are key to a successful and thriving region; further, analysis of the existing conditions surrounding these areas will help to implement and support mobility hubs for the integration of multimodal connectivity.

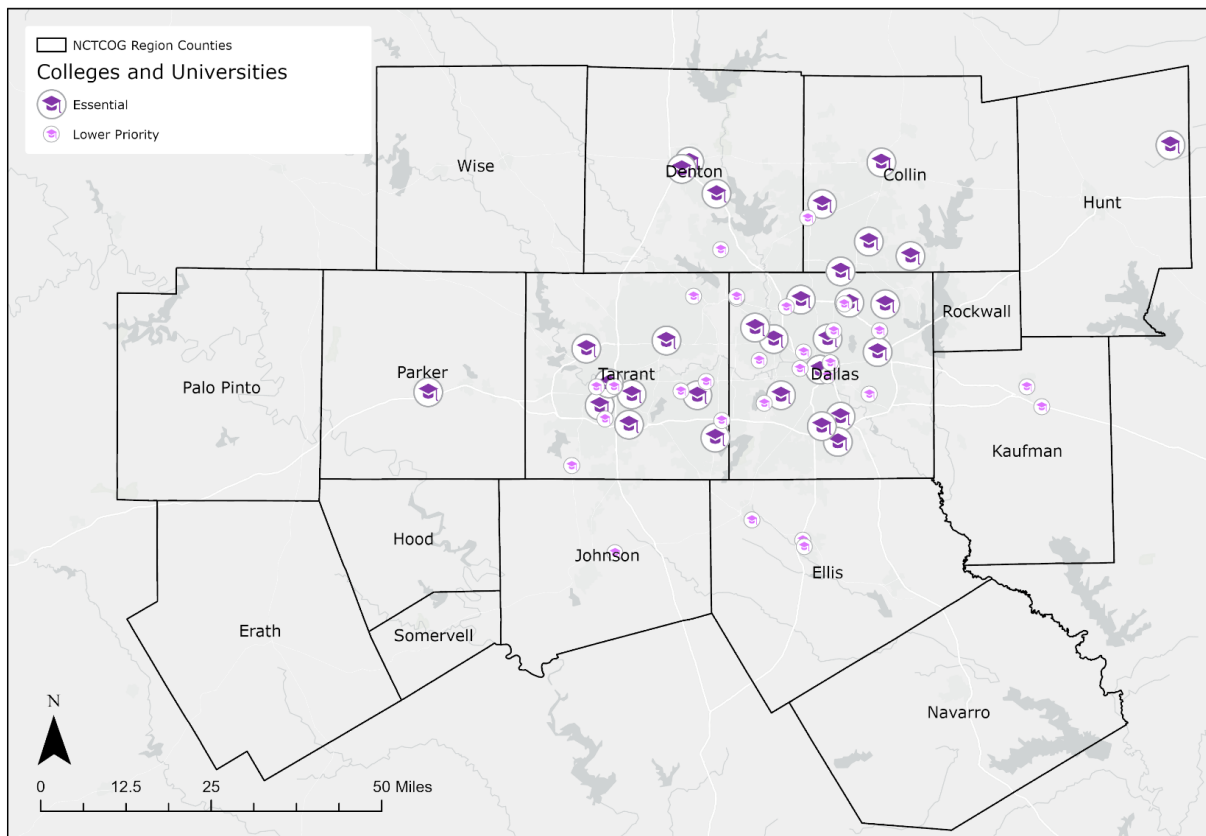


Figure 1: Colleges and Universities in the NCTCOG Jurisdictional Area

Key Takeaways

Following this review of transportation plans and existing campus infrastructure in the DFW region, there appears to be consensus around the need for diversification of travel choices, as well as opportunity for creative mobility hub implementation. Mobility hubs present an opportunity to achieve many of the transportation, land use, equity, and sustainability goals of the region's plans and coordinate existing transportation choices to bring about efficiency in service delivery. Through mobility hubs' ability to connect people between regional and local transit, effective implementation will further stitch together this dynamic and growing region. Moreover, effective implementation would allow universities the opportunity to become strong partners in the development of their respective communities.

Mobility hub development is supported by regional and local plans.

Nearly all the plans reviewed in the DFW region include goals to implement mobility hubs, or goals that could be achieved with the implementation of mobility hubs. This remains the case across the various planning levels reviewed. Regional plans like NCTCOG's Mobility 2045 include a TOD development program and mobility, sustainability, and equity goals that would support mobility hub development. Mobility hubs were included explicitly in municipal and campus-level plans like Transit Moves Fort Worth and the UNT Denton Campus Master Plan, both of which include the development of Mobility hubs as a goal or implementation strategy.

Depending on campus size and existing infrastructure, there is an opportunity to develop a regional and local mobility hub network throughout the region. Mobility hub development can help colleges and universities improve campus experience for students with increased transportation access and associated transit-oriented development.

Mobility hub projects may qualify for state/federal funding under TxDOT's Unified Transportation Program funding categories 2, 4, and 9 (Metropolitan and Urban Corridors, Connectivity Corridors, and Transportation Alternatives, respectively).

Mobility hubs vary in definition and prominence throughout the region's plans.

When plans lack specific mention of mobility hubs, their goals and objectives are aligned with mobility hub development, i.e., improving multimodal access and innovation in transportation choice. There is a need for a holistic approach to mobility hub planning and implementation.

College and university campuses generally follow TOD design practices.

Transit-oriented development guidelines and best practices can be found in the Dallas Area Rapid Transit Red & Blue Line Corridors Transit-Oriented Development Study, and in the Collin County Transit Oriented Development Guidelines, included as an appendix to the Irving to Frisco Corridor Study Final Report. Both documents describe TOD-supportive environments as dense and mixed-use, offering a variety of destinations and activities in a small area, safe and accessible for pedestrians and bicyclists, with nearby public spaces that are comfortable and inviting. College campuses, through their pedestrian-oriented nature, mix of classrooms, commercial and social spaces, naturally lend themselves to TOD and Mobility Hub development. Mobility Hub/TOD

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development also provides the opportunity for colleges to attract students who desire a more 'urban' lifestyle, a growing trend among young people.²

Regional Campuses Vary in Their Degree of Connectivity and Multimodal Access

Existing infrastructure suitable for mobility hub implementation varies by campus. Intermodal connectivity and last mile connections are siloed with no comprehensive partnership for efficient coordination of transportation services. Bicycle and pedestrian infrastructure to and from campuses lacks in quality and connectivity. However, this region has one of the largest networks of microtransit zones in the country which could help with mobility hub implementation.

While each campus varies in size, environment and access to current transportation networks, creative partnership and collaboration can help to maximize the efficiency of resources. Mobility hubs are most successful when they capitalize off existing assets in the transportation network and adapt to local needs. An urban mobility hub adjacent to UNT Denton's student union may include a greater share of parking for bicycles and micromobility devices, than a rural hub, which may devote that space to parking for paratransit vehicles. The partnerships and collaboration of implementation should prioritize local input and design considerations.

² "One Thing Millennials Aren't Killing? Public Transportation", NPR. February 2nd, 2021.
<https://www.npr.org/2021/02/01/962755834/one-thing-millennials-arent-killing-public-transportation>

Planning Studies in Support of Mobility Hubs

The following section provides an outline of both regional and Denton-specific existing plans relating to campus mobility or the implementation of mobility hubs. The goals presented in this section will be used to develop a comprehensive strategy for multimodal campus connectivity consistent with the needs and wants of campus affiliates.

REGIONAL PLANS

Mobility 2045 (2018)

As the Metropolitan Transportation Plan for North Central Texas, Mobility 2045 guides the expenditure of federal and state transportation funds in the region. The plan identifies four main goals:

- *Mobility*: Improve transportation options, support travel efficiency strategies, ensure community access to the transportation system;
- *Quality of Life*: Enhance environment and lifestyles, encourage sustainable development;
- *System Sustainability*: Ensure adequate maintenance, safety, and reliability, and pursue long-term, sustainable financial resources; and
- *Implementation*: Provide timely planning and implementation; develop cost effective projects and programs.

The plan follows with policies to support all modes of transportation and includes a transit-oriented development (TOD) program. However, it stops short of specific references to mobility hubs. The goals and programs within Mobility 2045 would likely qualify mobility hub projects for state/federal funding under Texas's Category 2, 4, and 9 programs. These funding categories refer to Metropolitan and Urban Corridor projects, Connectivity Corridor projects, and Transportation Alternatives, respectively. Applicability of mobility hub projects to these funding programs will depend on the project's stated purpose or charter and partnership frameworks.³

Dallas County Mobility Plan (2020)

The Dallas County Mobility Plan is primarily a thoroughfare planning document that traces its own history back to the first Dallas County Thoroughfare Plan in 1966. The plan lists and proposes projects for funding through the county's Major Capital Improvement Program which includes four project funding categories: Roadway Capacity and Connectivity, Bicycle and Pedestrian, Safety, and Innovative & Mobility Solutions. The majority of the plan is dedicated to automobile thoroughfare planning, with some sections that reference the importance of other modes of transportation. There are passing mentions of "transit hubs" and "transportation hubs," but no definition is provided.

³ *Unified Transportation Program, Texas Department of Transportation. 2022.*
<https://ftp.txdot.gov/pub/txdot/tpp/utp/utp-2022.pdf>

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Connect Dallas Strategic Mobility Plan (2021)

Connect Dallas is the city's first ever strategic mobility vision. The plan differentiates itself from traditional transportation plans, which focus heavily on automobile travel and congestion relief through road building, and instead takes a holistic mobility approach acknowledging all impacts of transportation decisions and all forms of transportation available. The plan is guided by six driving principles:

- *Safety*: improving safety for all modes of transportation;
- *Environmental Sustainability*: Reduce VMT and single occupancy vehicle mode share and provide a variety of travel options to encourage residents to travel by transit, biking, or walking, to reduce greenhouse gas emissions;
- *Equity*: Provide safe, affordable access to opportunities for all city residents;
- *Economic vitality*: Integrate transportation investments with land use and economic priorities to improve quality of life;
- *Housing*: Support the creation of affordable housing and varied housing options that meet the city's growing needs; and
- *Innovation*: Leverage existing and emerging technologies to meet 21st century challenges.

The plan's policy recommendations regarding transit service improvements include the city taking a "proactive role in improving access to transit, such as through the establishment of a 'Mobility Hub' program." This action is also included in the City's Comprehensive Environmental and Climate Action Plan (CECAP), action T13.

South Dallas County Transit Study

The South Dallas County Transit Study analyzes existing gaps in transit service within four communities: Duncanville, Cedar Hill, DeSoto, and Lancaster. The goal of the study was to develop a strategic implementation strategy of mobility services to occur in three phases over a 20-year period. The plan includes scenario recommendations, a financial plan, a freight and goods movement plan, future mobility enhancements, and an implementation plan. The plan also includes some station area planning with transit-conducive development from the Duncanville Master Plan.

Section 5.3.2 highlights mobility hubs, their benefits, and an action plan for implementing mobility hubs in Southern Dallas County. Three possible mobility hub locations were identified: Cedar Hill City Hall, the Walmart on the Belt Line in DeSoto, and the Duncanville City Hall. All three locations serve as activity centers for their surrounding communities. It should be noted that University of North Texas – Dallas is located just outside the study area.

DART Red and Blue Line TOD Study (2021)

This planning study examines existing development character, performance, and function to identify opportunities for furthering Transit-Oriented Development and increasing transit ridership along Dallas's Red and Blue Light Rail corridors. Since their construction 20+ years ago, these light rail lines "have been responsible for a billion-dollar property value stimulus" of high-density development adjacent to their stations. The purpose of the FTA-awarded transit-oriented development planning grant to NCTCOG was to "help the region enhance accessibility and

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development around 28 Dallas Area Rapid Transit (DART) stations". Further, the study identified the following objectives:

- Address substantial barriers to TOD in the corridors to increase rail ridership;
- Identify infrastructure needs to increase pedestrian and bicycle connectivity to rail stations; and
- Further enable dense mixed-use development, and advance economic development of the station areas.

One helpful piece of this study is the identification of existing TOD sites near DART stations, one of which is adjacent to the Southern Methodist University campus, as seen below.



Figure 2: Mockingbird Station Retail at SMU (excerpt from plan)

The study also identified a number of barriers to increasing ridership and TOD development, including: a dominance of non-TOD supportive zoning, pedestrian infrastructure gaps, excessive parking supply, a lack of affordable housing, and limited complementary transit reach and service. Plan recommendations address these barriers, respectively. The study's final recommendation includes expanding and updating station area plans and providing an opportunity for mobility hub planning. As the project team moves forward with an implementation strategy for mobility hubs regionwide, removal of these barriers will be key to their success long-term.

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Transit Moves | Fort Worth (2020)

Transit Moves | Fort Worth recognizes that Fort Worth's transit services have not kept pace with its rapid growth. It outlines improvements to Trinity Metro that will improve services to meet current and future needs of the Greater Fort Worth area. The plan has four major transit-related goals:

- Make transit attractive and compelling;
- Connect people to life's activities;
- Improve Fort Worth's quality of life; and
- Ensure financial and environmental sustainability.

Mobility hubs are featured prominently in the plan, from the summary to chapters seven and eight, and the long-term action plan. The plan differentiates between large, regional mobility hubs, and smaller community hubs. The former are located at the ends of major transit lines, downtown, and at major activity centers. Community hubs are generally located in village centers or activity centers in lower-density suburban areas, providing mobility services for their immediate surrounding neighborhoods. The plan provides possible locations for both types of mobility hubs and includes the development of three regional and four community mobility hubs in the long-term action plan. Texas Christian University is included as a possible regional mobility hub location, while Forest Hill, adjacent to Tarrant County Community College's South Campus, is a possible smaller community mobility hub.

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services can evolve based on the Council's implementation of TAC recommendations. The TAC focused their recommendations on six corridors, four major hubs, and nine minor hubs. In addition to corridor-specific recommendations, the committee recommended the incorporation of a multi-modal center as part of Arlington's future transportation system. This multi-modal center would be a place where passengers "can transfer between a variety of modes, such as trains, shuttles, circulators, taxis and more." This multi-modal center recommendation presents a clear opportunity for mobility hub development.

Arlington Comprehensive Plan, "99 Square Miles" (2015)

The City of Arlington's Comprehensive Plan is its most recent comprehensive strategic planning document. Some of the plan's aims include the management of growth, maintenance of quality of life, creation of more walkable neighborhoods through pedestrian-friendly land use, and the construction of high-quality, affordable housing. The plan seeks to accomplish this through its five goals:

- Value our neighborhoods through embracing diversity, and create places people want to be while maintaining quality of life and appearance;
- Get around, through a roadway system that provides efficient access to all parts of the city and provides a variety of transportation options;
- Grow our businesses, by rejuvenating and transforming key economic centers into vibrant destinations, and creating amenities that are assets;
- Protect our resources, through preservation of natural areas and public open spaces; and
- Develop our land by promoting land use patterns that reflect a mix of integrated community uses.

The plan asserts that roadways are the main mode of transportation in Arlington, but there is a growing need to accommodate alternative modes of transportation. Transit is included as an important transportation option connecting Arlington to the region. The most recent transit project, Metro ArlingtonXpress (MAX), provided direct bus services between the Trinity Railway Express (TRE) commuter rail line, CentrePort/DFW Airport Station, and Downtown Arlington. The program was funded through a partnership with University of Texas at Arlington, private sector businesses, and an FTA grant. However, in 2017, the program was discontinued in favor of an on-demand rideshare service contract with provider Via which is in place today. Fares for the rideshare service are subsidized by the city.

Tarrant County Transit Study (2021)

The Tarrant County Transit Study explores the shared mobility needs of those who reside in areas without fixed-route or general-purpose, demand-response transit services. The study examines the demographic trends, travel patterns, transit service, and planning efforts across the county and region. Within Step 5 of the implementation process, the development of transit hubs for enhancement of connectivity is noted as a strategy for infrastructure improvement.

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Collin County Transit Study (2021)

Recognizing the important role of public transportation in addressing transportation needs brought by substantial growth, Collin County commissioned this countywide transit study. The study incorporates an evaluation of existing and future conditions, a transit service needs and market analysis, service scenarios for future transit services, estimations of capital and operating costs, identification of potential funding sources, and development of implementation strategies.

There are several key short-term actions identified in the study to leverage its planning efforts towards growing transit's role in county transportation. One recommendation is to seek opportunities to create more transit-supportive development patterns. Facilitating transit-oriented development patterns around mobility hubs is also included in the summary. The appendix, "Collin County Transit Oriented Development Guidelines," provides guidelines, best practices, and opportunities for TOD development in the county. While not included in the TOD guidelines, many college campuses within the study area follow the development patterns and urban designs of best practice TOD developments. However, they often lack the high-frequency transit required for TOD.

Irving to Frisco Passenger Rail Corridor Study (2022)

This evaluation of potential regional rail development along the Irving to Frisco/Celina corridor was an effort paired with the Collin County Transit Study but released as a standalone report. The study included its own extensive community engagement, alternatives analyses, ridership level modeling, and evaluations of existing and proposed land uses and development patterns in potential station areas with recommendations for promoting transit-supportive development. The study recognizes that intermodal bicycle and pedestrian connections to the potential rail are not the focus of the study but notes their centrality to the success or failure of any regional transit development. Similar to the Collin County Transit Study, the corridor study includes NCTCOG's Collin County Transit Oriented Development Guidelines in its appendix.

UNIVERSITY OF NORTH TEXAS – DENTON PLANS

City of Denton: Mobility Plan (2022)

The City of Denton Mobility Plan (2022) combines the Thoroughfare Plan, the Bicycle and Pedestrian Linkage Component, and other similar master plans into one. The goals fall under four categories listed below:

- *Deliver an Effective Network for Travel*
 - Identify transportation needs that are supportive of existing and future infrastructure;
 - Prioritize transit and transportation alternatives to reduce demand for existing transportation resources;
 - Maintain a state of good repair on Denton Streets; and
 - Fund critical transportation infrastructure.
- *Prioritize Safe Travel*
 - Utilize “Complete Streets” approach when improving Denton Streets;
 - Establish a Vision Zero Action Plan; and
 - Acknowledge Vulnerability.
- *Facilitate Alternative Travel Opportunities*
 - Prioritize travel needs of pedestrians, cyclists and transit users in every project; and
 - Provide comfortable and low-stress opportunities to walk and bike.
- *Leverage Innovation*
 - Improve operations using innovative transportation solutions; and
 - Utilize transportation demand management strategies to reduce demand for existing transportation resources

The remainder of the plan does not include explicit references to mobility hubs; however, these are an effective tool that can be used to achieve many of the plan’s goals.

Downtown Denton Master Plan (2002)

The downtown master plan recognizes that the historic core of the city has not shared in the prosperity brought by decades of growth and provides tools, strategies, and partnerships that will encourage investments crucial to downtown’s vitality. The plan developed a vision for downtown that includes the desire for concentrated development that connects activities within the neighborhood with pedestrian friendly infrastructure. The area’s potential as a local and regional transit hub is mentioned throughout the document, with potential locations just off the town square and at the Denton Passenger Rail Station.

Oak Area Gateway Plan (2018)

In 2018 the City of Denton began the Oak Area Gateway Plan to guide growth and investment in the neighborhoods surrounding UNT Denton over the next 20 years. The purpose of the plan is to:

- Enhance Neighborhoods;
- Preserve Historic Assets;
- Guide Appropriate Infill Development;

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- Accommodate Traffic-Vehicles, Bike, and Pedestrian-to and Through the Area; and
- Address Parking Needs.

In February of 2018 a workshop was held to gather public input and form a community vision for the Oak Area Gateway. The public were asked to provide their preferences regarding mobility, parking, compatible infill, housing types, and new development.

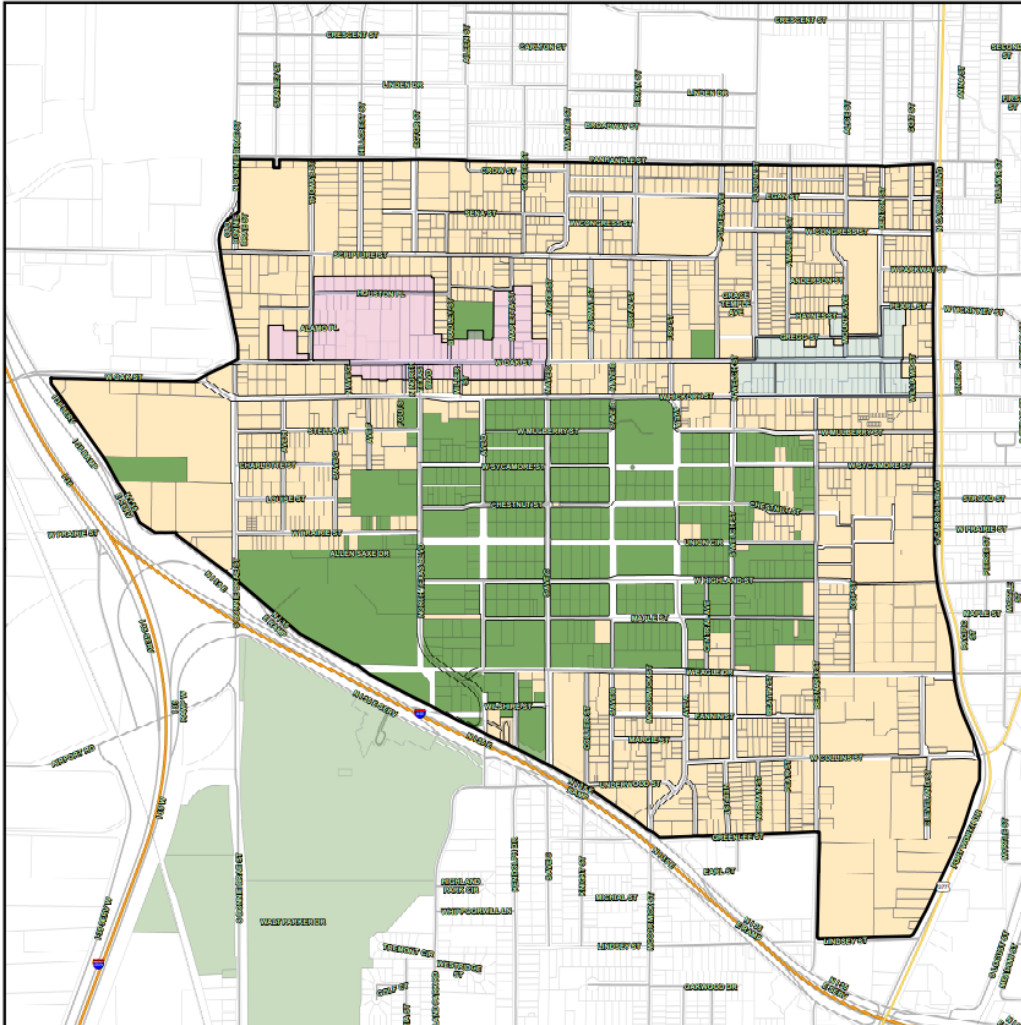


Figure 4: Oak Area Gateway Plan Study Area (excerpt from plan)

Note: Dark Green: UNT Campus; Light Green / Pink: Historic Districts; Light Brown: Study Area

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UNT Campus Master Plan (2005)

The UNT Denton Master Plan was completed in 2005. It includes a chapter on “Integrated Transportation and Parking,” with a subsection of the “Environmental Recommendations” chapter devoted to traffic and parking demand management. The implementation strategy includes a subsection on the proposed Highland Street Transit Mall which is composed of two bus-only lanes, bicycle lanes, and sidewalks suggesting an excellent, central location for mobility hub development.

Goals and objectives of the plan:

- *Sustainable Design Principles:* Develop a master plan based on sustainable design principles that encourage stewardship and efficient use of campus and university resources;
- *Vision:* Develop a vision for the campus that supports the academic and research mission or the University;
- *Development Framework:* Develop an open space, landscape and circulation framework for the campus that will enable the orderly accommodation of future growth;
- *Community Engagement:* Engage the Denia Neighborhood and the City of Denton in the development of the master plan and transform the campus into a unique district within the City;
- *Integrated Transportation:* Develop an integrated strategy that provides for a variety of transportation options including walking, cycling, transit, and private vehicles;
- *Campus Unity:* Develop design and operational strategies to integrate the Eagle Point and Research Park activities with those of the main campus;
- *Campus Identity:* Establish clear and memorable campus boundaries and consistent guidelines for architecture, landscape, and signage; and
- *Campus Life:* Provide the services and amenities to support the various population groups of the University including resident students, commuters, faculty, staff, and the general public.

In Chapter 6, the plan examines methods for improving the existing pedestrianized core of campus. It explores ways to coordinate pedestrian facilities with convenient and safe access to bicycle route networks and the transit system. The chapter explicitly states the aim of decreasing current (2005) reliance on personal automobiles and fostering a safer environment for pedestrians and cyclists.

“Commuters will also need locations on campus that can be utilized for extended periods of time for study, accessing technology, socializing and recreation. In response, the master plan includes recommendations for improved commuter lounges in the University Union and along the Highland Transit Mall; and amenities and services these users need.”

Five transit hubs are identified as central, multimodal access points for the transit system located near activity centers: the Highland Street Transit Mall, the Fouts transit hub, the University Union Transit Hub, Mulberry / Avenue B transit hub, and Eagle Point transit hub.

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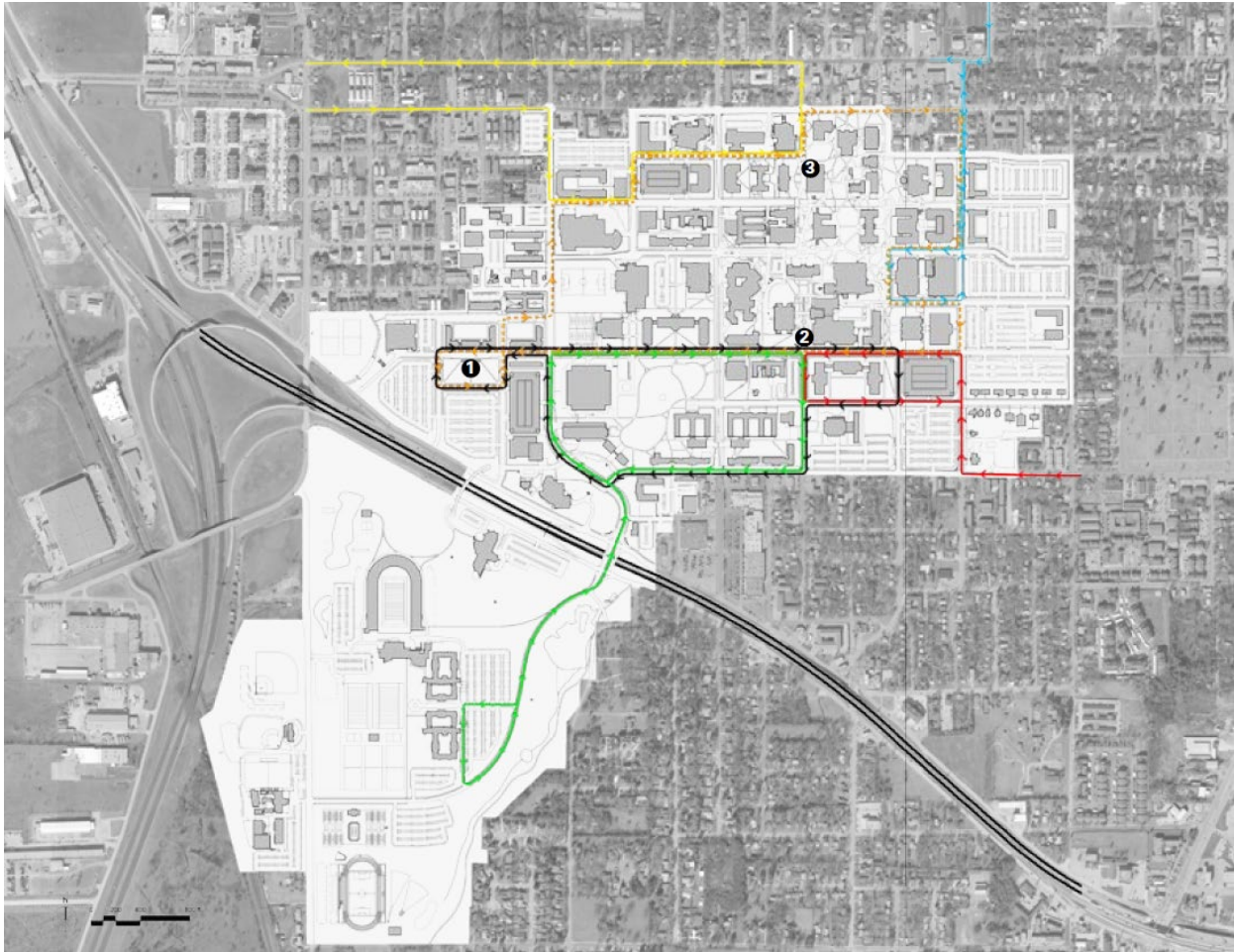


Figure 5: UNT Denton Campus Master Plan Proposed Transit Map

*In Map: 1 = Fouts Field Transit Hub, 2 = University Union Transit Hub on the Highland Street Transit Mall, 3 = Mulberry / Ave B Transit Hub, All proposed and not existing at time of plan.

Summary

These plans local to Denton demonstrate an awareness of the value of mobility hubs and clear goals to establish one in both downtown Denton and within the UNT campus. Although the most recent Denton Mobility Plan does not specifically include mobility hubs, all four of the plan's overarching goals support their development. Further, the identified transit hubs provide university identified locations for co-location of services (i.e., mobility hub development).

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Existing Conditions – Dallas-Fort Worth Metropolitan Area

The below is a summary of existing and planned alternative modes of transportation and their respective service providers in the Dallas-Fort Worth area. Analysis of existing services and improvements will allow the project team to assess gaps and identify strategies for successful implementation of mobility hubs.

INTERCITY RAIL

In addition to regional commuter rail transit operating within the DFW area described further in this report, two Amtrak lines connect the region to other major urban areas. The Texas Eagle line has stops in Dallas, Fort Worth, and Cleburne on its daily journey between Chicago and San Antonio. Also daily, the Heartland Flyer connects the city of Fort Worth to Oklahoma City.

Mobility 2045 also recommends upgrading existing rail between Dallas and Fort Worth to high-speed rail, as well as the same upgrade for the intercity lines south to Waco and north to Oklahoma City. Lastly, the plan proposes a high-speed rail line from Dallas to Shreveport. Consideration of these larger, interurban rail connections should be made when designing plans for larger, regional mobility hubs to ensure the highest and best access possible to all forms of transit.

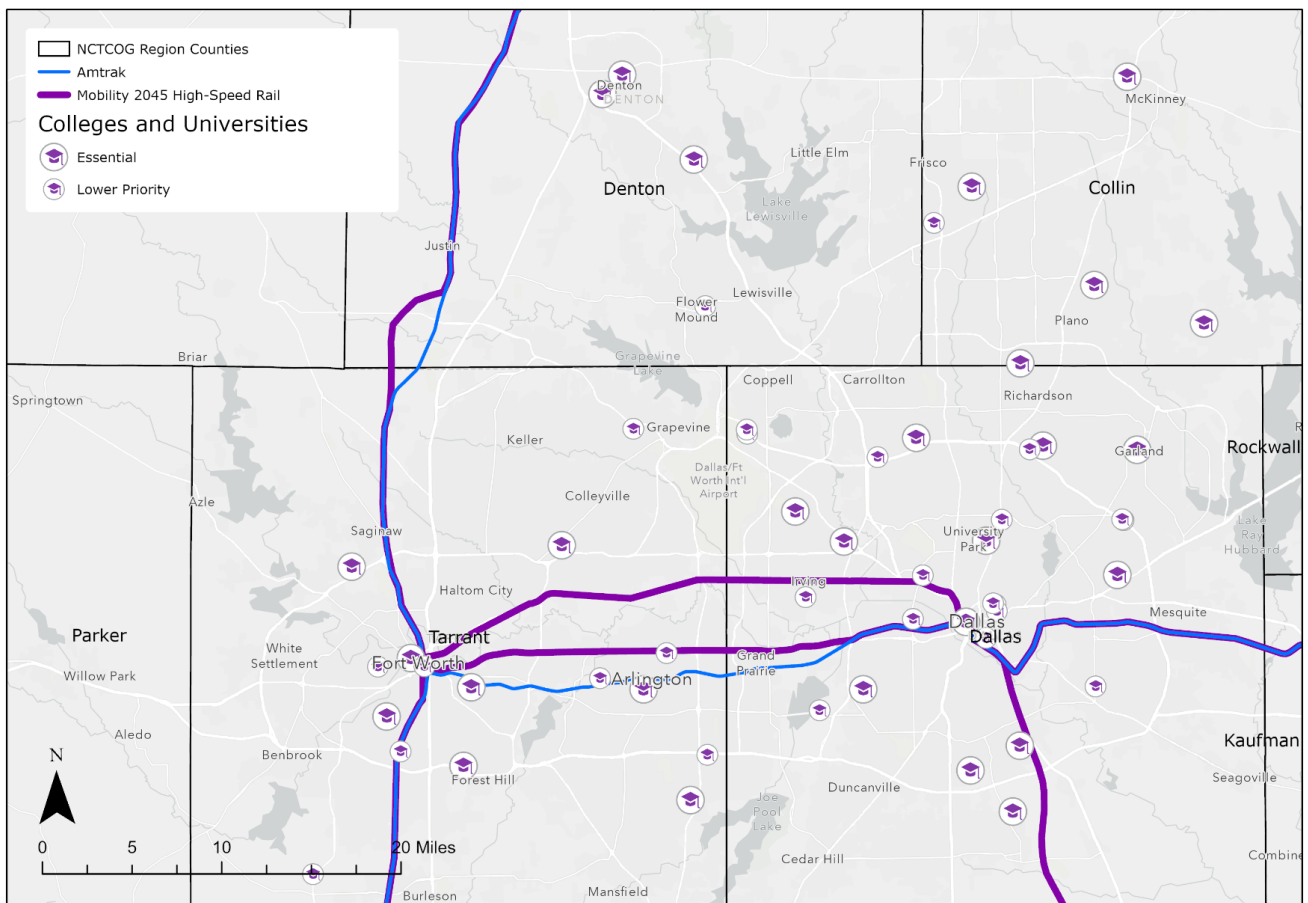


Figure 6: Existing and Recommended Intercity Rail in the DFW Area

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LIGHT RAIL

Dallas Area Rapid Transit (DART) operates a four-line light rail system as the spine of its regional transit network. Connecting DART's constituents between central Dallas and outer suburbs, three lines run north to Carrollton (Green), Plano (Red), and Rowlett (Blue), as well as the Orange Line's northern terminus at DFW Airport. The Green line runs through east Dallas; the Red and Blue Lines terminate in south Dallas, at Westmoreland Station in Oak Cliff and at UNT Dallas respectively. That last station, at UNT Dallas in the far south of Dallas, was the latest funded expansion of DART light rail to open in October 2016.

Each DART light rail line operates on 20-minute frequencies, with segments that carry multiple lines (such as the Red and Orange Line corridor along US-75 through northern Dallas) running at higher combined frequencies. Frequency on each line is limited by the fact that all four lines must pass through the at-grade line through Downtown Dallas, such that none can increase their frequency. In the future, the D2 subway, currently in planning, is proposed to build a second line, parallel to the first and underground, to carry one or two of the four lines and bypass the bottleneck, thus increasing overall system capacity. Though the planning process is still in progress at the time of this report, plans exist to route the Orange and Blue lines through the subway and switch the Blue and Green Lines such that the Blue Line will run north to Carrollton (the current route of the Green Line) while Green Line runs south to UNT Dallas (the current route of the Blue Line).

DART currently has stops nearby several major universities in the DFW area beyond the conglomeration of institutions downtown, including:

- Mockingbird Station at Southern Methodist University;
- UNT Dallas Station at University of North Texas Dallas;
- University of Dallas Station at University of Dallas; and
- North Lake College Station at Dallas College North Lake.

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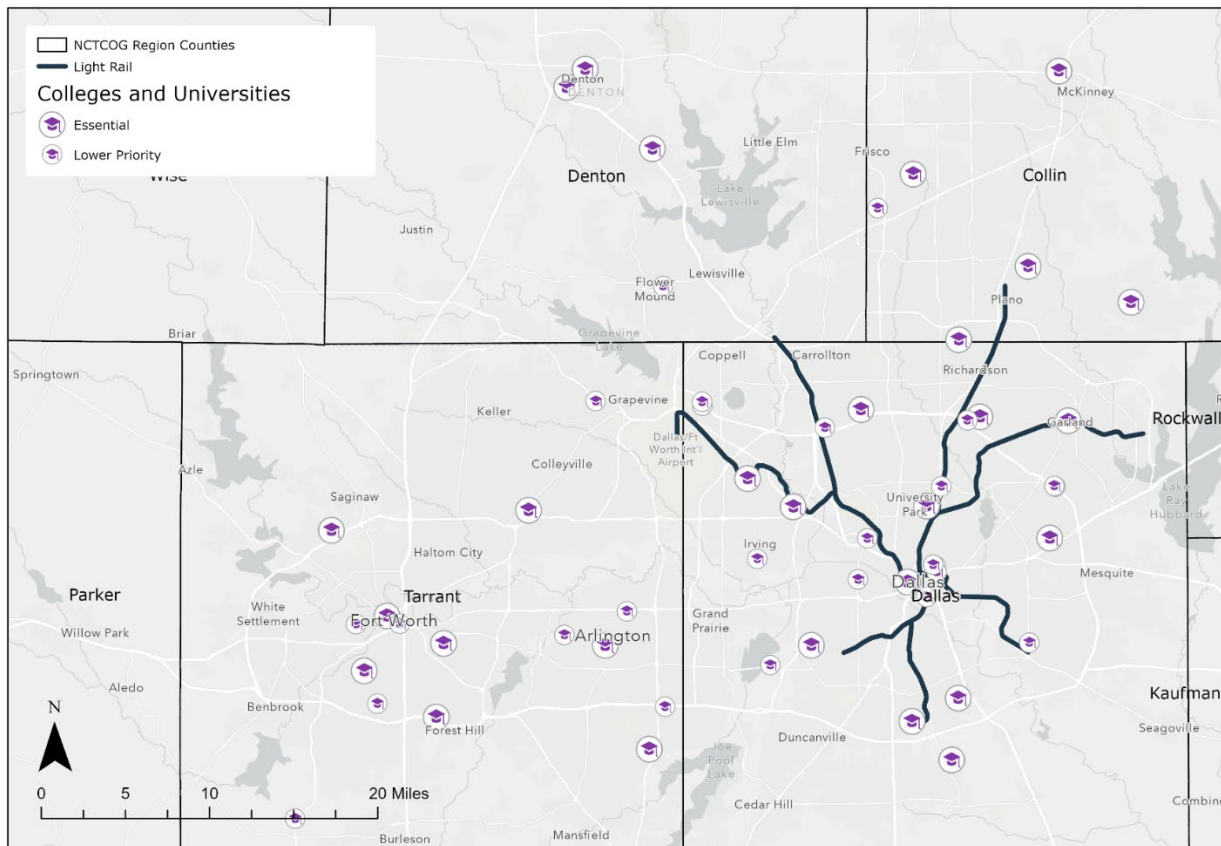


Figure 7: Existing DART Light Rail System

COMMUTER RAIL

There are currently three commuter rail lines in the DFW area with a fourth under construction. The A-Train, operated by Denton County Transit Authority, connects Denton to the DART Green Line light rail from Trinity Mills Station to the Downtown Denton Transit Center, which is located a short distance through downtown from the university. Trinity Railway Express, jointly owned by DART and Trinity Metro, connects the downtown transit centers of Dallas and Fort Worth. Further, Trinity Metro owns and operates TexRail that connects downtown Fort Worth to DFW Airport. The under-construction DART Silver Line will start at the DFW Airport and extend through Downtown Carrollton to Plano.

The commuter rail system has stops at or near the following major universities in the area:

- Downtown Transit Center near UNT Denton;
- Eddie Bernice Johnson Union Station near Dallas College El Centro Campus and UNT Dallas College of Law;
- Fort Worth T&P near Tarrant County College - Trinity River; and
- Future Silver Line Station near UT Dallas.

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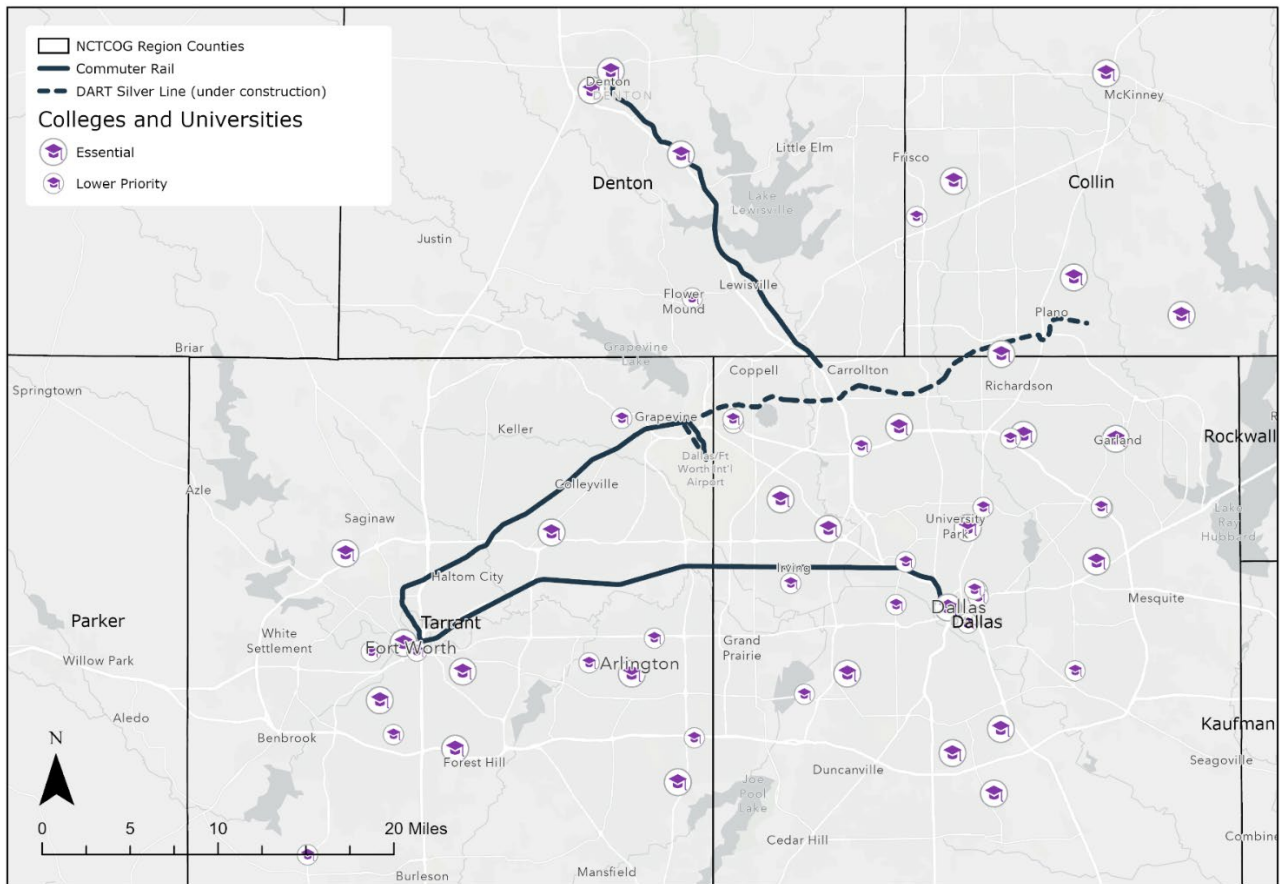


Figure 8: Existing Commuter Rail in the DFW Area

In addition to existing commuter rail, Mobility 2045 recommends eleven additional commuter rail lines. Of the eleven recommended commuter rail lines, the following four new lines would connect existing DART lines to outer suburbs:

- The Midlothian Line from Midlothian to the Red Line terminus at Westmoreland Station;
- The Green Line Extension from Kleburg to the Green Line terminus at Buckner Station;
- The Scyene Line from Mesquite to the Green Line's Lawnview Station (partly following the current route of STAR Transit's COMPASS route, an acronym for City of Mesquite PASSenger Shuttle); and
- The McKinney Line from Melissa through McKinney and Allen to the Red Line terminus at Parker Road Station in Plano.

Another three proposed commuter rail lines are extensions of current or under-construction commuter rail lines:

- An A-Train extension from Trinity Mills to Downtown Carrollton to directly connect to the DART Silver Line;
- A Silver Line extension from Plano east to Wylie; and

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- A TexRail southwestern extension from downtown Fort Worth to Texas Christian University and the Medical District.

Two proposed commuter rail lines would connect Fort Worth to suburbs:

- The Cleburne Line to Cleburne; and
- The Mansfield Line to Mansfield and Midlothian.

Finally, Mobility 2045 recommends a Frisco Line between Frisco and downtown Irving by way of Carrollton, Farmers Branch, and Las Colinas. These recommended commuter rail lines, along with the existing and proposed rail network are shown in Figure 9 below.

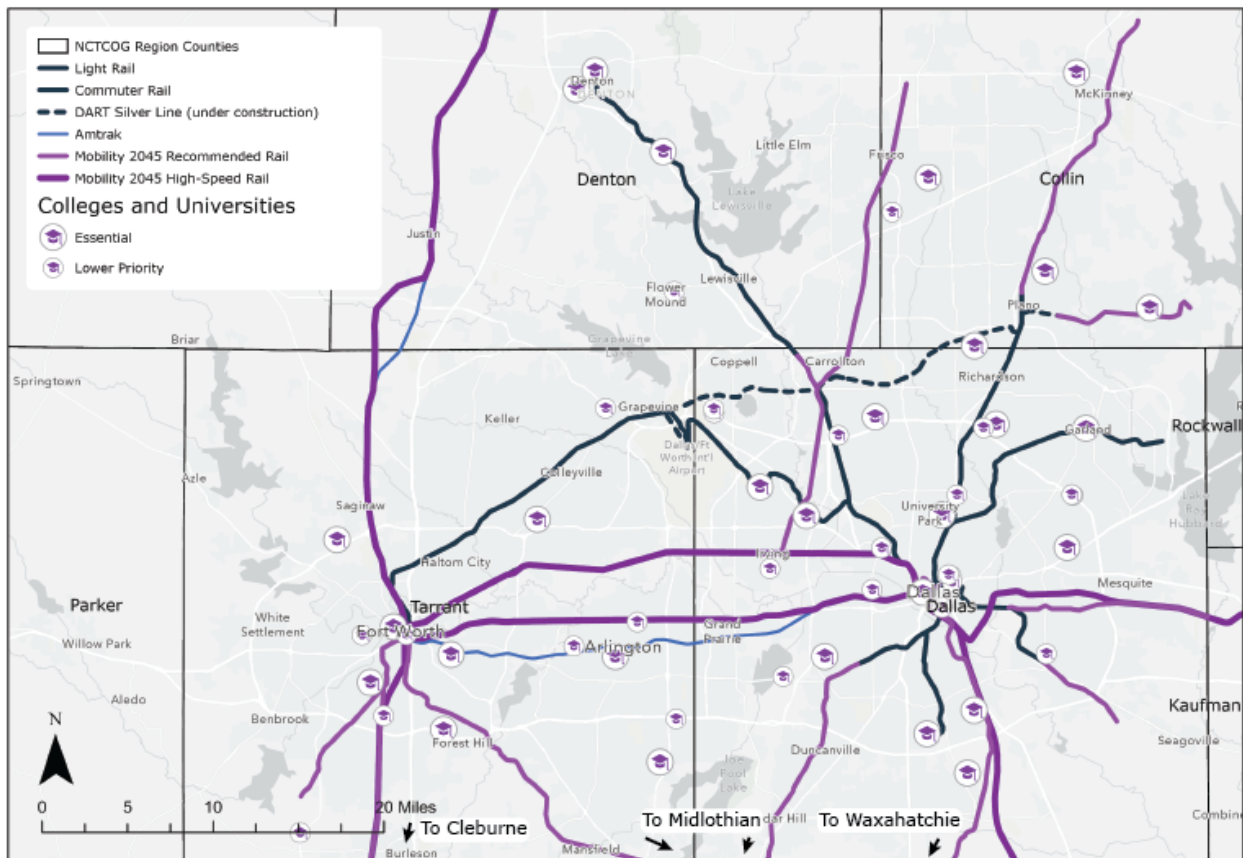


Figure 9: Existing and Proposed Rail System in the DFW Area

STREETCAR

Two streetcar services operate in Dallas: the M-Line Trolley, a heritage streetcar service that connects the Downtown and Uptown neighborhoods, operated by the McKinney Avenue Transit Authority; and the Dallas Streetcar, a modern streetcar that connects Union Station to the fast-growing Bishop Arts District, operated by DART. Plans are in progress to connect the two systems

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through downtown, known as the Dallas Streetcar Central Link, providing additional connections between the two services and to DART.^{4, 5}

EXPRESS BUS

Several express bus services connect the downtowns of Dallas and Fort Worth to suburban park-and-rides, and one connects Trinity Metro's North Park and Ride to Denton, including UNT and downtown. These services operate on rush hour schedules to serve commuters. In addition, the TCC Southeast Campus Xpress travels between the South and Southeast campuses of Tarrant Community College every 90 minutes on weekdays.

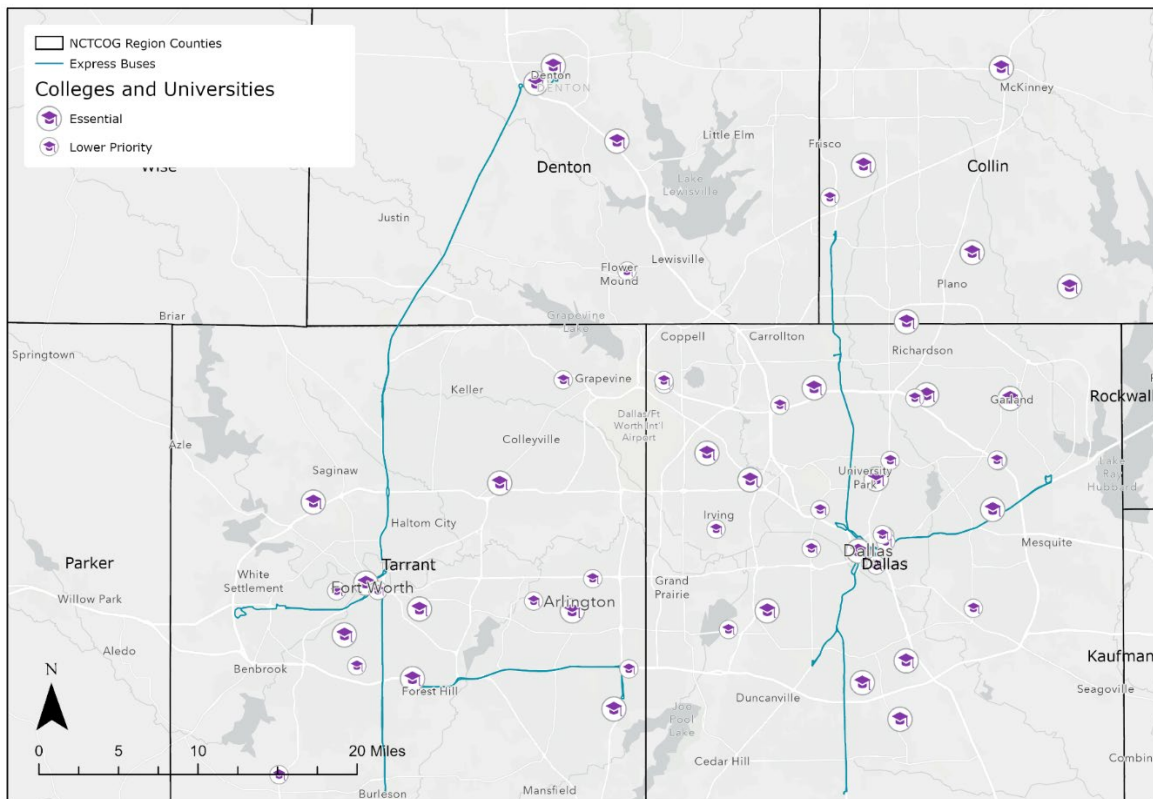


Figure 10: Existing Express Bus Service in the DFW Area

LOCAL AND HIGH INTENSITY BUS SERVICES

Local buses, the foundation of any transit network, permeate the service areas of the region's transit providers. DART has recently completed an update of its own bus network (Dart Zoom) with an aim to increase service frequency in the urban core, to make routes less circuitous, and to improve accessibility to transit customers.

Certain college campuses, such as the University of Texas at Arlington and Texas Christian University, also operate their own shuttles for transportation across their campuses. In other cases, a local transit agency operates buses that specially serve student transportation to, from,

⁴ [Dallas Streetcar Central Link](#)

⁵ [NCTCOG Fact Sheet](#)

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and within a campus, such as DART-operated shuttles that serve Southern Methodist University and the University of Texas at Dallas or DCTA's shuttles to the University of North Texas.

Mobility 2045 recommends four new "High-Intensity Bus" routes, defined by Transit Cooperative Research Program Report 166 as bus service with premium operating characteristics designed to enhance service quality and improve on-time performance to attract choice riders. Such characteristics include real-time arrival information, comfortable seating, tolled managed lanes, transit signal priority. Figure 11 below shows all these local bus routes, including the recommendations from Mobility 2045.

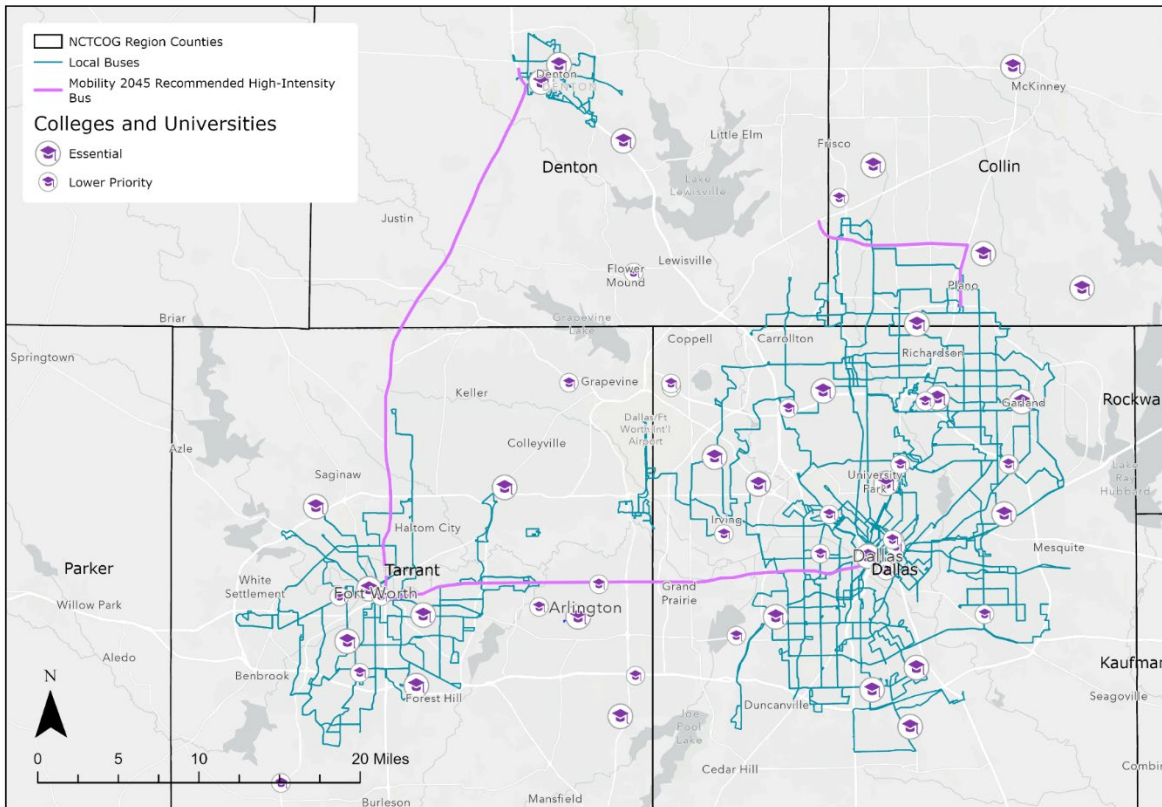


Figure 11: Existing Local Bus Service in the DFW Area

MICROTRANSIT

Microtransit has emerged in recent years as a cost-effective means of leveraging telecommunications technology to route transit vehicles along routes within a fixed area to serve customers on an as-needed basis – essentially, a subsidized or partially subsidized rideshare service that partners with public transportation providers. In sprawling, low-density areas such as those in much of the DFW area, microtransit can provide an effective first or last-mile solution to supplement fixed-route transit, and the technology has quickly spread throughout the region.

DART currently operates 31 microtransit zones (called "GoLink" zones); Trinity Metro operates five ("ZIPZONES"), while STAR operates three zones and DCTA operates seven ("STARNow" and "GoZone" respectively). Further, notable areas served by microtransit in the DFW area include the entire Cities of Arlington and Grand Prairie (both served by the private Via Transportation

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company), the International Inland Port of Dallas in southern Dallas County; most of the City of Plano, north Fort Worth, and much of central Denton.

Figure 12 shows microtransit zones by operator, within the context of the regional fixed-route services to which they often provide first- and last-mile connections.

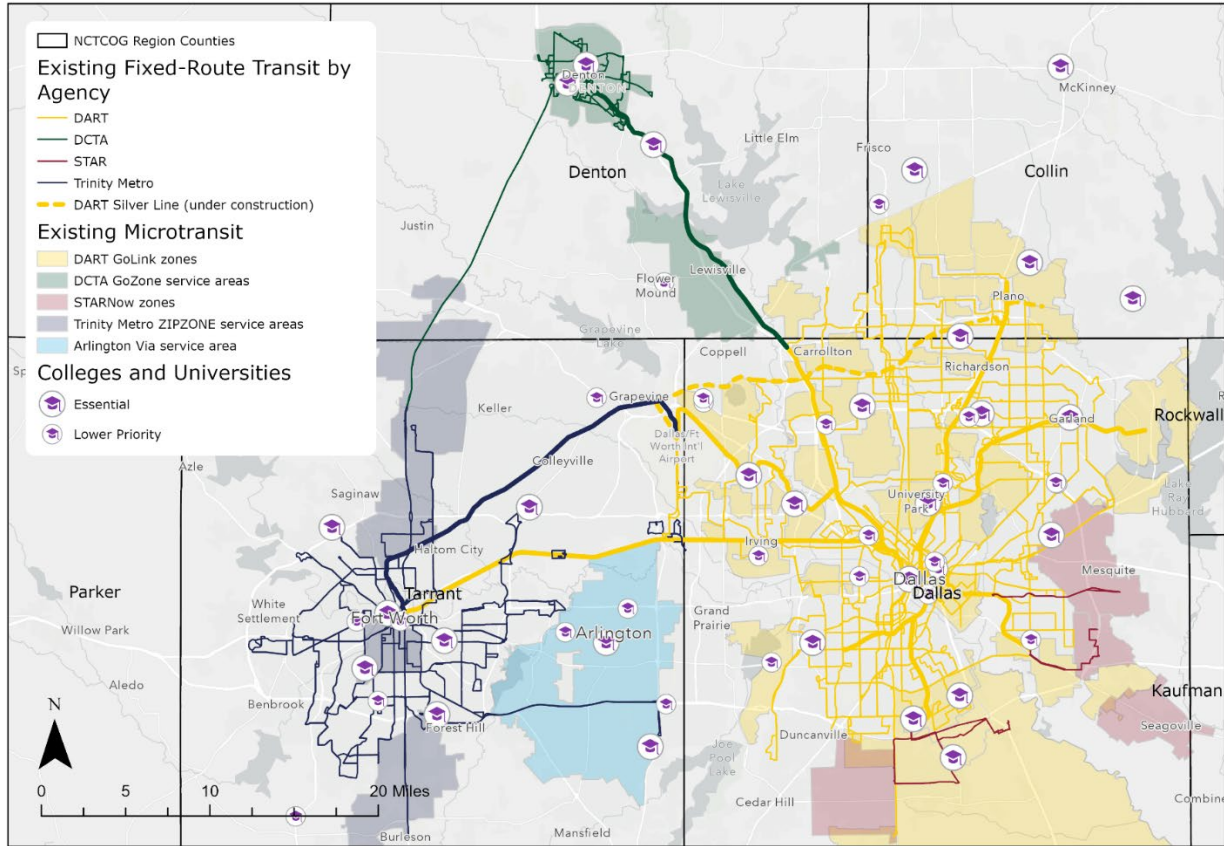


Figure 12: Existing Microtransit and Fixed Route Transit in the DFW Area
Note: Data layer representing the Via service area for Grand Prairie was not available

BICYCLE AND PEDESTRIAN INFRASTRUCTURE

The Dallas-Fort Worth area has a large and growing network of off-street bicycle and pedestrian trails. On-street infrastructure is being developed per local plans in various municipalities. Figure 13 shows bike/ped infrastructure as it currently exists, while Figure 14 shows planned infrastructure, and Figure 15 shows both.

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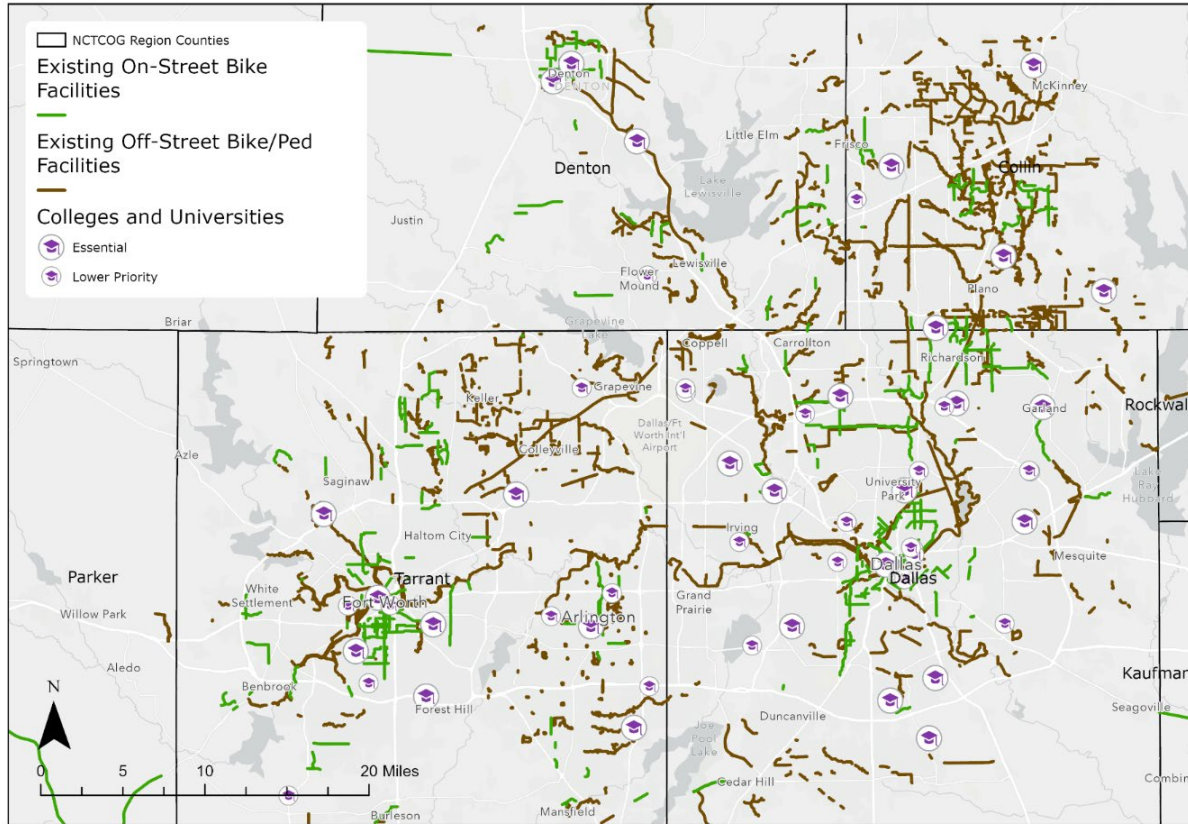


Figure 13: Existing Bicycle and Pedestrian Infrastructure in the DFW Area

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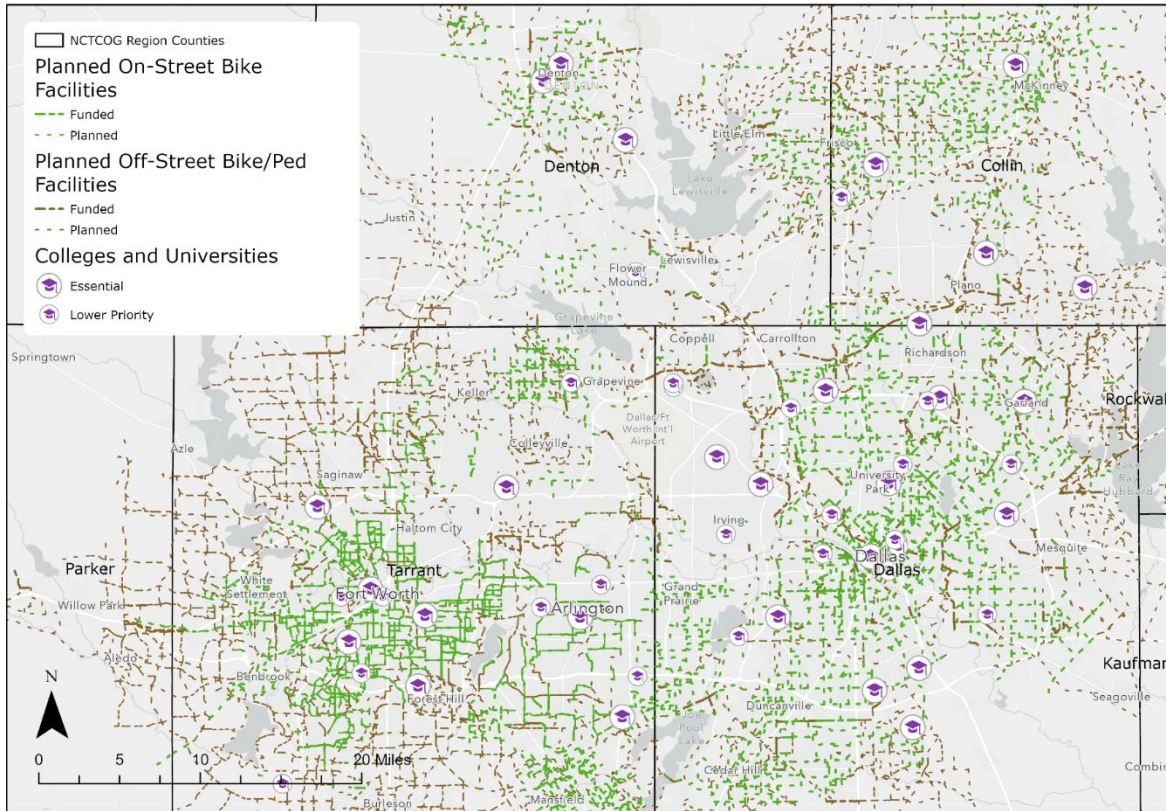


Figure 14: Planned Bicycle and Pedestrian Infrastructure

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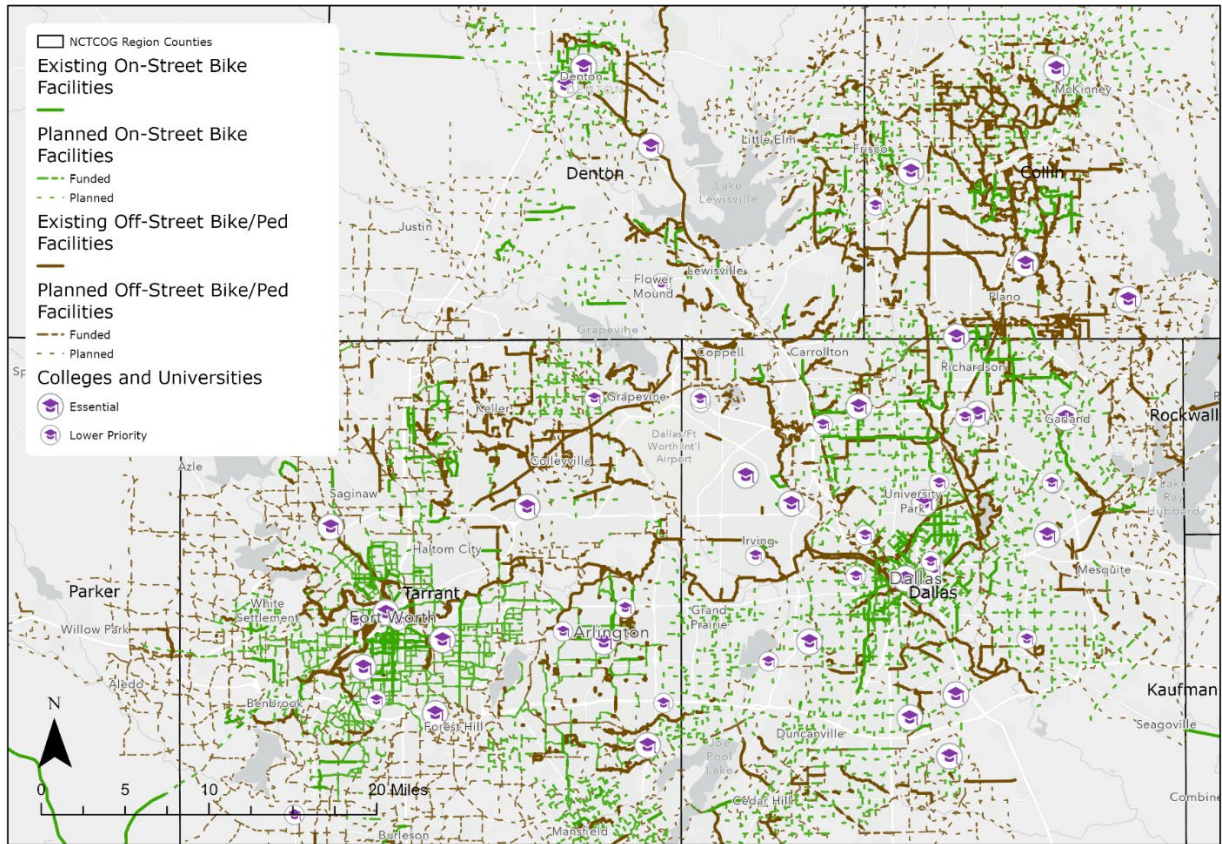


Figure 15: Existing and Future Planned Bicycle and Pedestrian Network

Existing Conditions – University of North Texas Denton

Mobility hubs provide a central location where people can transition between modes of transportation as seamlessly as possible. They often include amenities to increase comfort and can be a destination in themselves. As trends in technology and behavioral change have emerged, decreasing barriers to traditional public transport through trip planning apps, micro and shared-mobility, hubs have gained in popularity across the country. As an evolving concept which incorporates many new technologies, college campuses represent an ideal space for mobility hubs. In addition, many of the colleges in the Dallas-Fort Worth region already employ many characteristics of mobility hubs today.

The University of North Texas Denton, one of the DFW area's largest universities by enrollment, has a variety of non-car mobility options available to its students, faculty, staff, and visitors, including fixed-route transit, microtransit, and bicycle/pedestrian infrastructure.

The UNT Denton bus system operates 14 fixed-route lines, 13 of which stop at the union transfer station. This station, conveniently located in the center of campus across from the student union, already incorporates aspects of a mobility hub. The bus stop is covered and offers ample seating with some wayfinding. Behind is a parking lot with ZipCar car-sharing services, and bicycle racks. The student union across the street offers shopping, dining, and comfortable indoor space, amenities that are expensive to build from scratch for a mobility hub.

Beyond the student union transfer station, UNT Transportation Services partners with the DCTA to coordinate service schedules and publish both city and campus bus routes and timetables on the Transit app. DCTA also uses the GoPass app, a trip planning app that is also used by DART, Trinity Metro, and STAR Transit. Trip planning services and apps like Transit are eliminating barriers to alternative forms of transportation and changing the way people decide how to travel. Full details on available services are described below.

TRANSIT SERVICES: FIXED-ROUTE

A-Train

The A-Train is a commuter rail line that connects Downtown Denton to the DART Green Line at the Trinity Mills station, furthest south on the A-Train and second-furthest north on the DART Green Line, thus providing a connection to the broader regional rail network. The service, which runs parallel to IH-35E and has six stations, operates Monday through Saturday on half-hour headways from around 5:00 AM until 10:00 PM, with additional runs on Friday evening departing both terminals at 10:00 PM. The station near UNT Denton is a short distance through downtown from the university.

Denton Connect Buses

Six fixed routes run by DCTA in the City of Denton connect popular destinations within the city. Most lines travel between the Downtown Denton Transit Center (DDTC) and outlying areas of the city, with the exception of Route 4 that traverses University Avenue between the Rayzor Ranch

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Marketplace and Texas Woman’s University. Service is provided from Monday through Saturday between about 8:00 AM and 7:00 PM.

UNT Campus Shuttles

In addition to Denton Connect, DCTA also operates campus shuttles to serve the transit needs of university students by connecting campus areas to each other and to areas where many students live. The availability of shuttle routes varies seasonally, such that less service is available outside of normal semesters and varies by day of the week. Of the 16 shuttle routes, 13 are regular weekday routes (of which 3 are evening routes and 2 are shuttles to and from a parking garage) and the other 3 are weekend routes.

Most routes stop at the Union Transfer Station (one of the locations identified in the UNT Denton campus plan as a transit hub). Conveniently located in the center of campus across from the student union, the station already incorporates aspects of a mobility hub. The bus stop is covered and offers ample seating with some wayfinding. Behind the bus stop is a parking lot with ZipCar car-sharing services, and bicycle racks. The student union across the street offers shopping, dining, and comfortable indoor space, amenities that are expensive to build from scratch for a mobility hub.



Figure 16: Union Transfer Center at UNT Denton (Google Maps)

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North Texas Xpress

DCTA collaborates with Trinity Metro to provide a Monday-Friday express bus between Denton and the Trinity Metro North Park and Ride in Fort Worth. The bus runs once per direction in the morning (departing from Denton at 6:02 AM, then starting the return trip from Fort Worth at 6:50 AM) and again in the afternoon (departing from Denton at 4:27 PM, then starting the return trip from Fort Worth at 5:20 PM).

Mobility 2045 recommends the corridor from Denton to Downtown Fort Worth for High-Intensity Bus, defined by Transit Cooperative Research Program Report 166 as bus service with premium operating characteristics designed to enhance service quality and improve on-time performance to attract choice riders. Such characteristics include real-time arrival information, comfortable seating, tolled managed lanes, transit signal priority.

TRANSIT SERVICES: MICROTRANSIT

GoZones

DCTA operates on-demand microtransit services in three main GoZones: one in the City of Denton, one in Highland Village and most of the city of Lewisville, and one in eastern Lewisville along State Highway 121 Business. All GoZones provide transportation within that zone at all hours of operation, and in addition, certain options exist for travel between GoZones. First, on weekdays the Lewisville/Highland Village zone provides rides to and from the Trinity Mills or North Carrollton/Frankford stations of the DART Green Line or the State Highway 121 Business zone; second, on late nights from Monday to Saturday, DCTA provides a Guaranteed Ride Home service that takes travelers from the Trinity Mills DART station to any one location in any GoZone.⁶

UNT - Lyft

UNT Denton sponsors late-night Lyft rides for students, faculty, and staff within the Main Campus, Oak Street Hall, and Victory Hall/Mean Green Village. Tickets are offered for the length of a semester, during which credits are available for redemption 7 days a week between 2 AM and 7 AM.

TRANSIT SERVICES: INTERACTIONS WITH THE REGIONAL NETWORK

DCTA's A-Train currently connects to DART rail at the Trinity Mills station, furthest south on the A-Train and second-furthest north on the DART Green Line, thus providing a connection to the broader regional rail network.

Mobility 2045 recommends that the A-Train be extended one station further to Downtown Carrollton station, which would provide a direct connection to DART's under-construction Silver Line commuter rail line between Plano and DFW Airport. Current estimates show this extension could be opened by 2037.⁷ The extension would also connect directly with Mobility 2045's proposed Frisco Line regional rail, connecting Downtown Irving and Las Colinas north to Frisco.⁸

⁶ <https://www.dcta.net/getting-around/gozone-demand>

⁷ https://www.nctcog.org/nctcg/media/Transportation/DocsMaps/Plan/MTP/Transit_FactSheets_5.pdf

⁸ https://www.nctcog.org/nctcg/media/Transportation/DocsMaps/Plan/MTP/Transit_FactSheets_6.pdf

CAMPUS MOBILITY TRENDS

North Central Texas Council of Governments

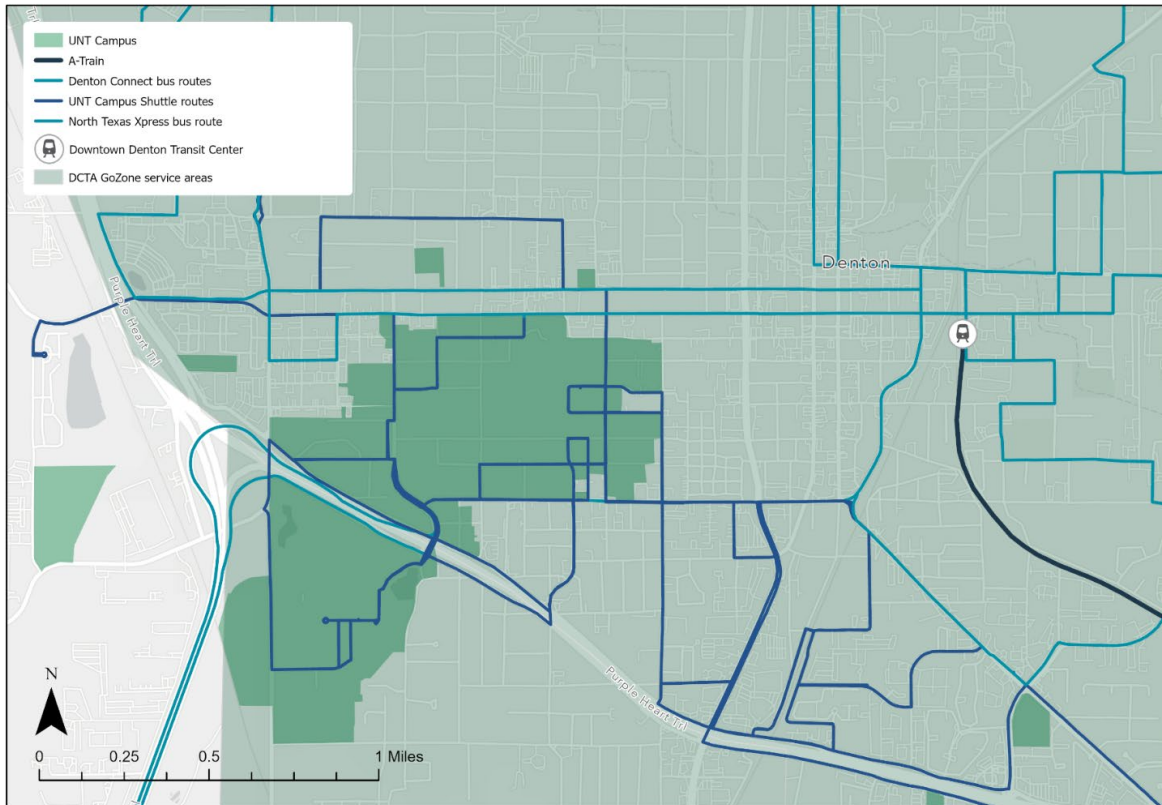


Figure 17: Transit Services in Denton

BICYCLE AND PEDESTRIAN INFRASTRUCTURE

Several main roads in Denton, as well as on the UNT campus, include on-road bicycle infrastructure with several more planned. Off-road infrastructure exists on the A-Train Rail Trail, with an extension planned to connect the Downtown Denton Transit Center and UNT. A bicycle and pedestrian crossing of IH-35E connects the main part of the UNT campus to Apogee Stadium and other nearby athletic areas. UNT provides data on locations of bike parking on campus, shown on Figure 18.

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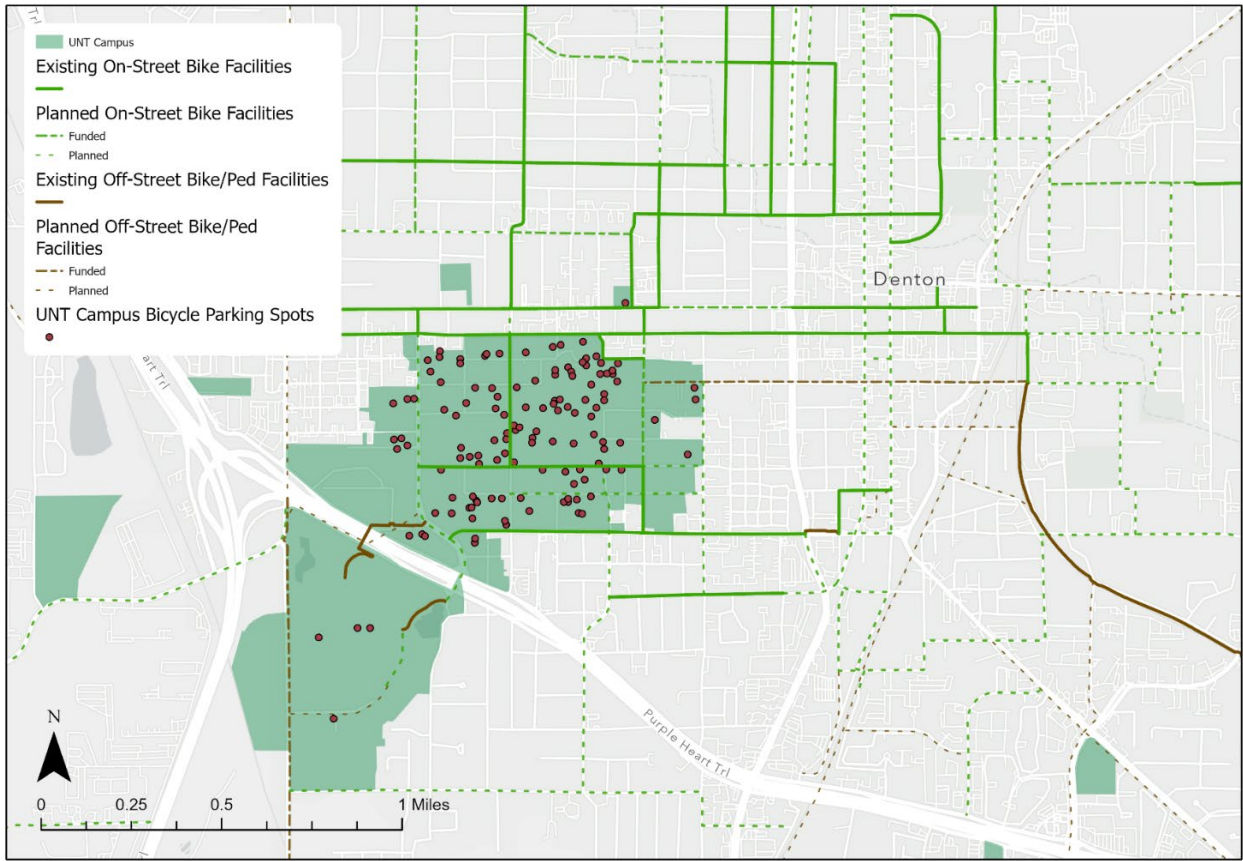


Figure 18: Existing and Planned Bicycle and Pedestrian Infrastructure (Denton)

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Existing Conditions – Case Study Colleges and Universities

Seven other colleges and universities in the DFW area were selected as case studies for existing conditions analysis based on their size and campus characteristics. All are characterized by the project team as “essential” to help develop a model mobility hub implementation strategy for the region.

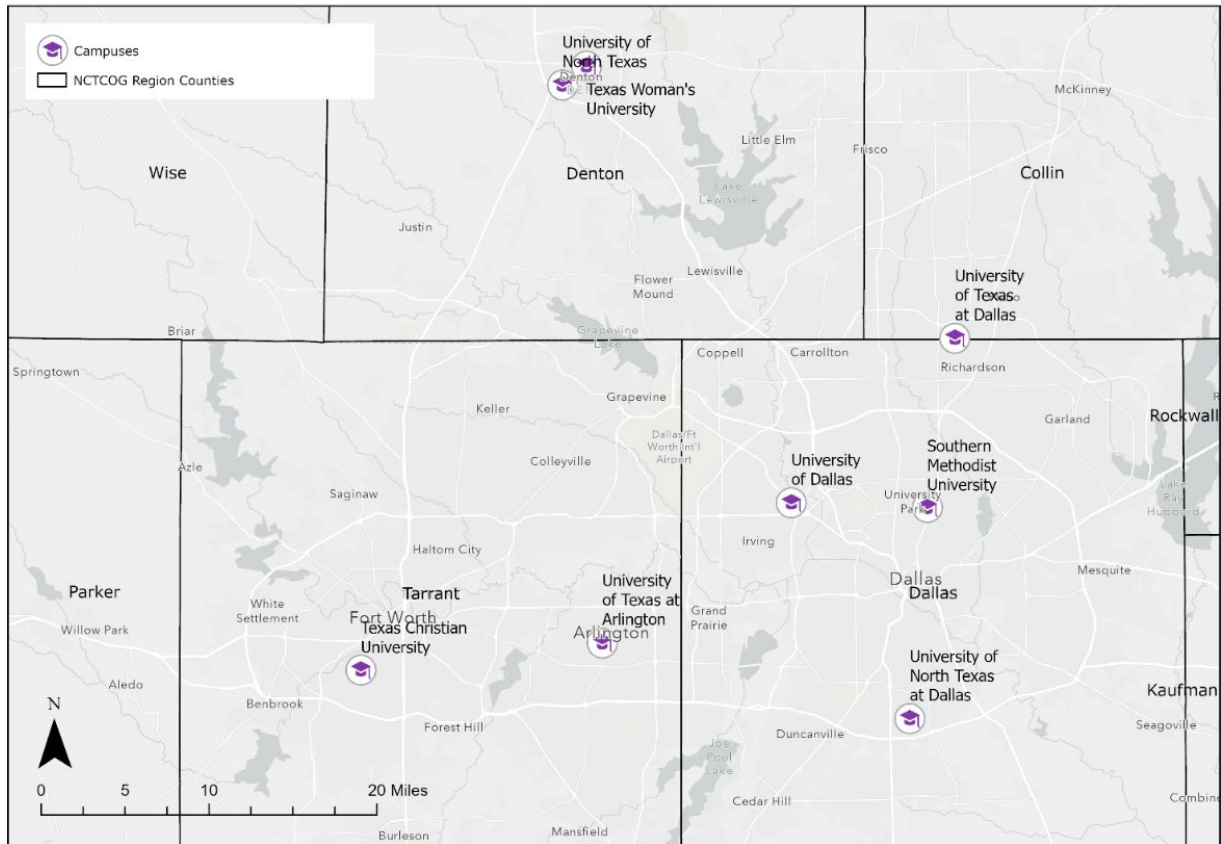


Figure 19: Case Study Campuses

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TEXAS WOMAN'S UNIVERSITY

Across Denton from UNT, Texas Woman's University is the fourth-largest university by enrollment in the DFW area and shares many of the same transportation amenities available to UNT. Being roughly as close to the Downtown Denton Transit Center and connected to it by about as many Denton Connect routes and bike infrastructure, TWU may be about as well-placed as UNT to build intermodal hubs.

Transit Services

While TWU does not operate its own shuttles except for shuttles to remote parking lots, it is well served by Denton Connect routes 4, 5, and 6, which together nearly encircle the campus and link it to downtown Denton and the Rayzor Ranch shopping center.

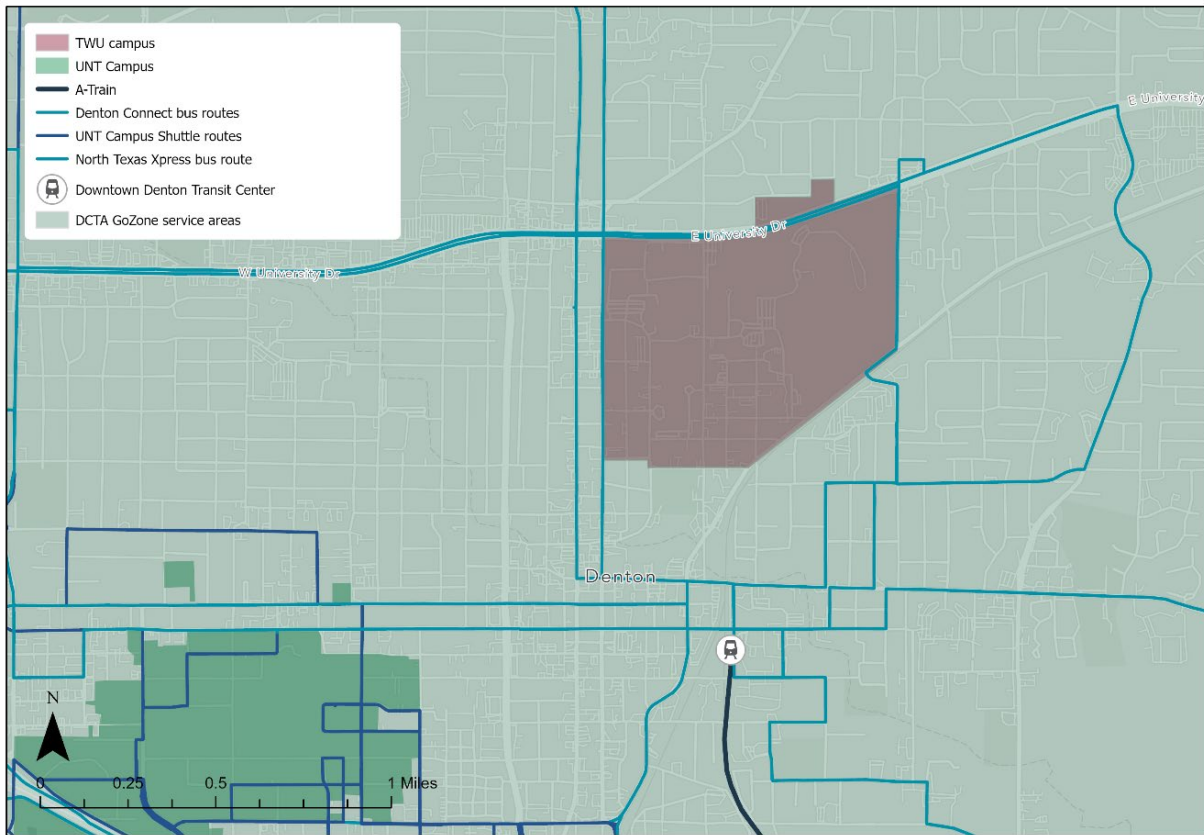


Figure 20: Existing Bus Service (TWU)

Bicycle and Pedestrian Infrastructure

North-south on-street bike lanes connect TWU to downtown Denton with more planned for the future.

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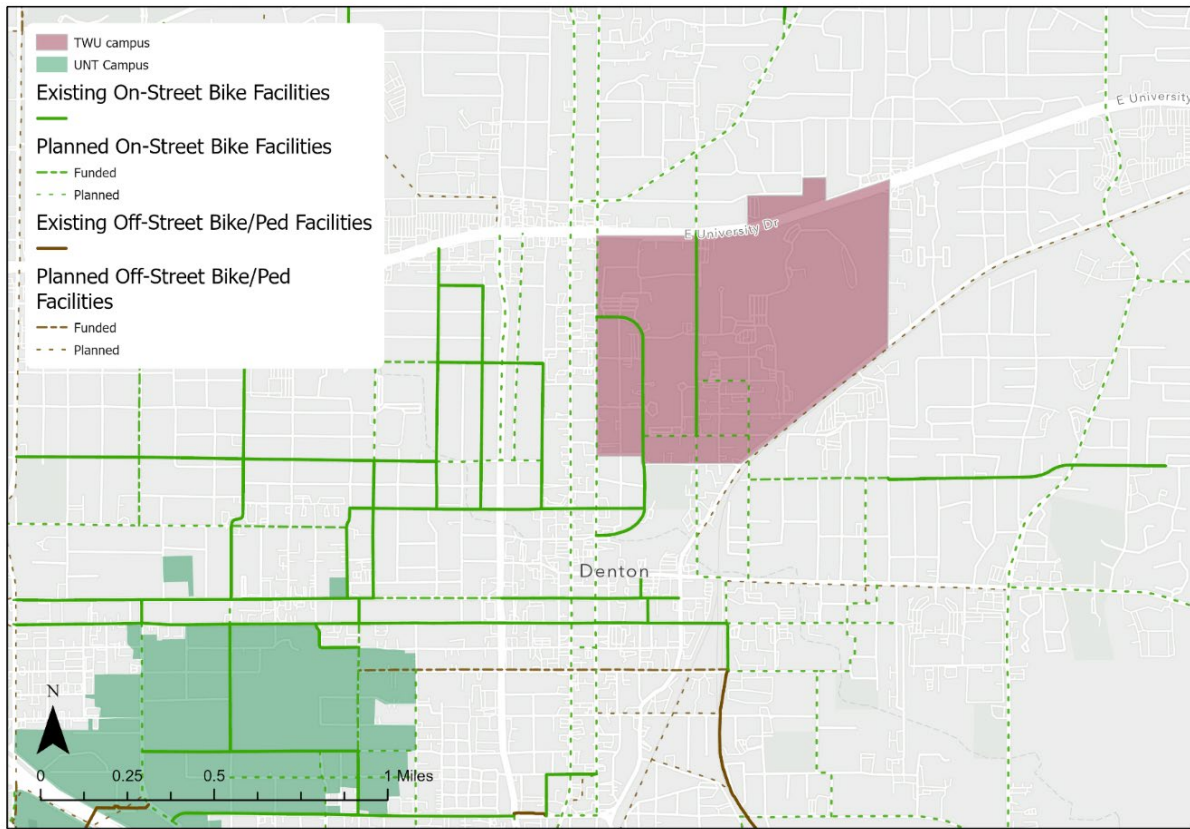


Figure 21: Existing and Planned Bicycle and Pedestrian Infrastructure (TWU)

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TEXAS CHRISTIAN UNIVERSITY

Texas Christian University is nestled within the southern suburbs of Fort Worth. It currently operates a high-frequency campus shuttle service for its over 10,000 students. Two Trinity Metro bus routes connect to campus, the 53, which runs north and west of downtown every 60 minutes, and the 24, running east every 30 minutes. While there are plans for a well-connected bicycle network and a rail service connection through the Mobility 2045 plan, campus transportation today is automobile-centric.

Transit Services

TCU is served by Trinity Metro buses and a campus circulator shuttle.⁹ As for microtransit, a ZIPZONE extends from downtown Fort Worth to most of the campus, only excluding outlying athletic fields to the southwest. Mobility 2045 recommends two commuter rail lines that would travel along Cleburne Avenue close to TCU.

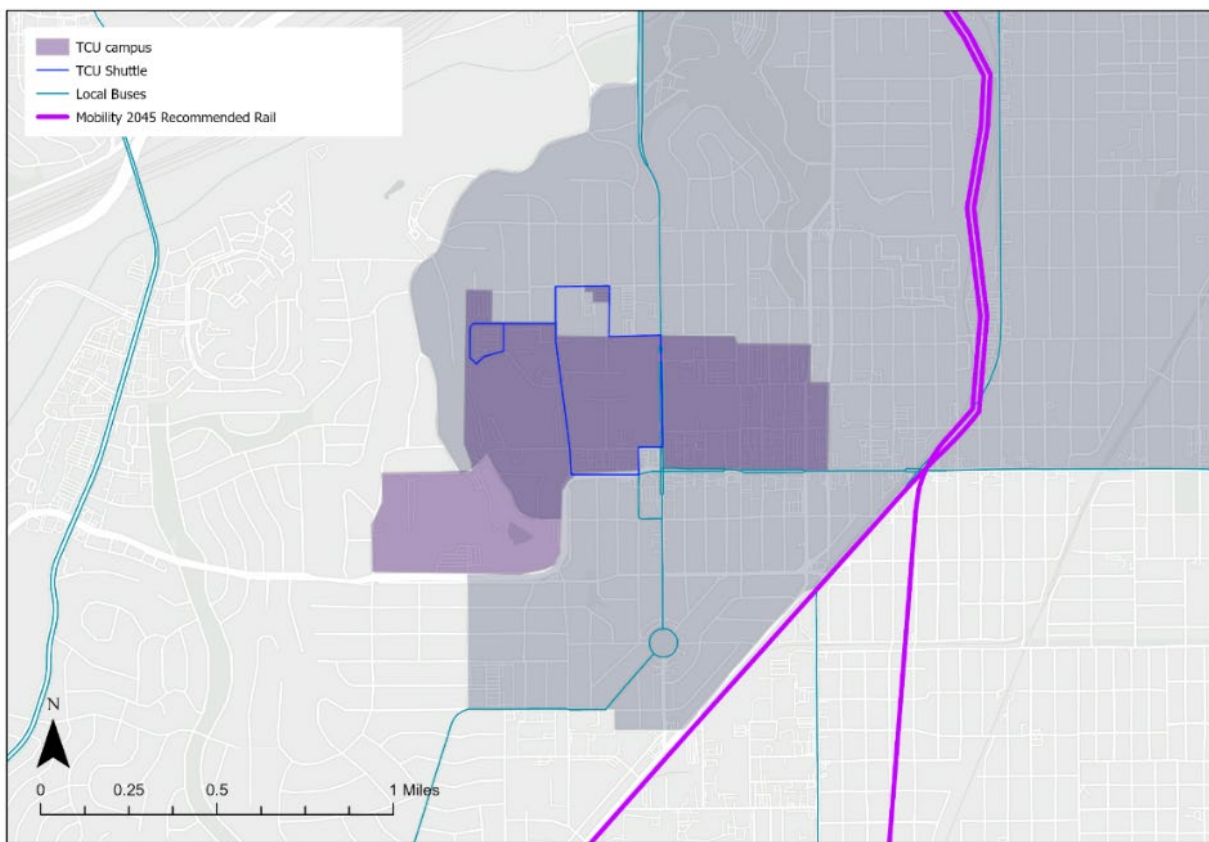


Figure 22: Existing and Recommended Transit (TCU)

Bicycle and Pedestrian Infrastructure

Although on-street bicycle infrastructure connecting the TCU campus area to surrounding neighborhoods and downtown Fort Worth is currently somewhat sparse, far more work is planned to improve connectivity. Off-street bike/ped routes within Fort Worth's considerable trail network are also within reach of campus, with further connections planned.

⁹TCU Circulator Shuttle

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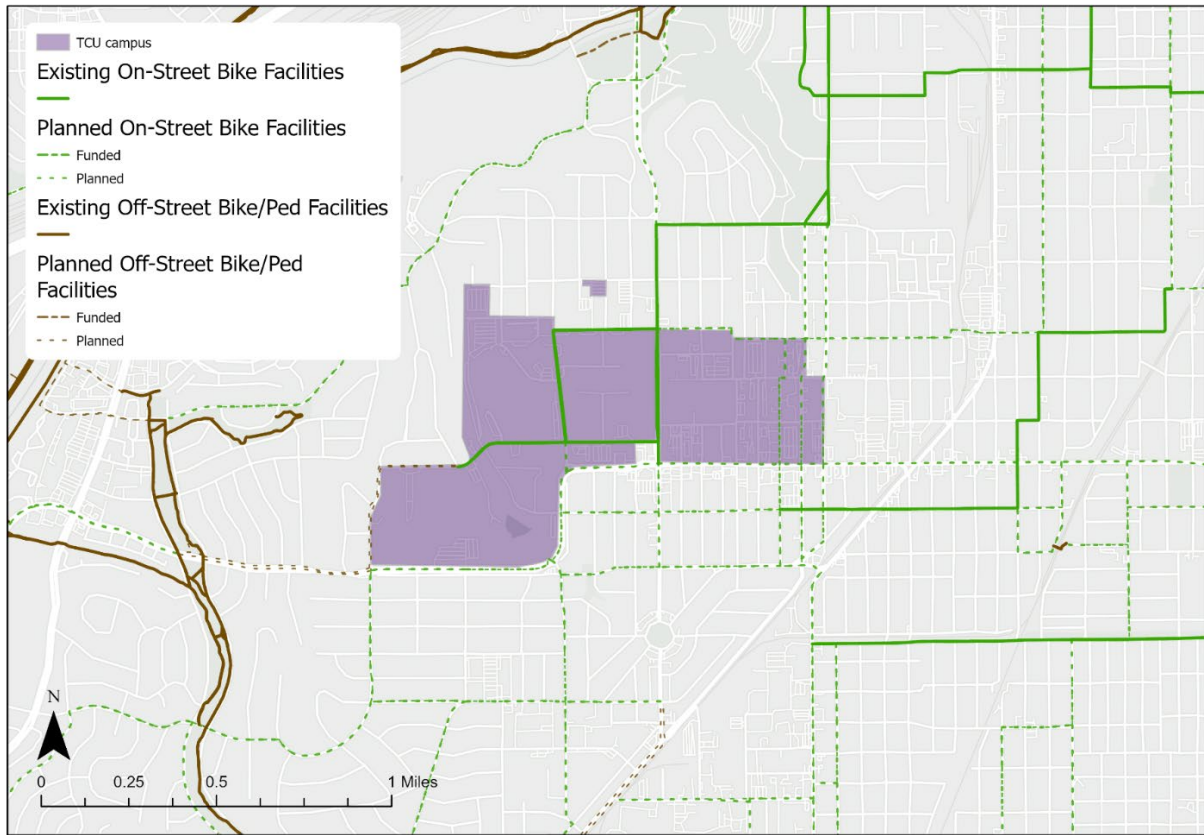


Figure 23: Existing and Planned Bicycle and Pedestrian Infrastructure (TCU)

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UNIVERSITY OF TEXAS AT ARLINGTON

University of Texas at Arlington is a large, public institution with an undergraduate enrollment of 35,064 students. The university offers students a bikeshare program with a handful of dedicated lanes connecting campus to surrounding neighborhoods. Rather than a traditional, fixed-route public transit network, both the university and the city contract with the on-demand transportation networking company Via. As of March 2022, the Arlington RAPID pilot program with Via has provided 28,000 trips to residents, university students and visitors around downtown Arlington and UT Arlington’s campus. All 28,000 trips were provided by an autonomous vehicle, the first such AV transit program in the US. With continued success, UT Arlington represents a one-of-a-kind opportunity to develop a mobility hub which prominently utilizes autonomous vehicles, but the university and city must work to further diversify the transportation options available for students.

Transit Services

Until 2013, Arlington was the largest city in the United States with no public transit service whatsoever. Since then, Arlington has eagerly embraced microtransit. As described previously, the city contracts with Via Transportation, Inc. to provide service to the entire city and to the CentrePort Trinity Railway Express station.

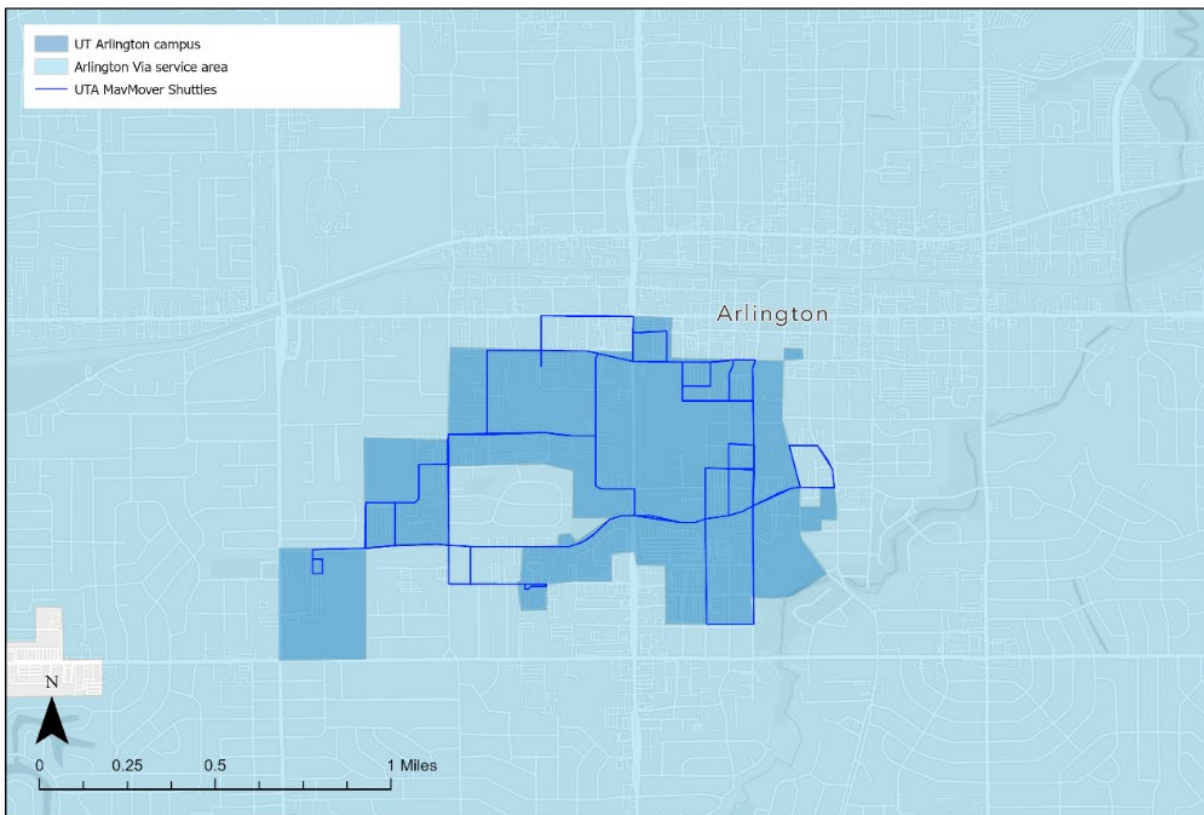


Figure 24: Existing Bus Service (UTA)

Bicycle and Pedestrian Infrastructure

Bike infrastructure mostly surrounds the UTA campus with more planned. Off-street trails are largely recreational, existing within local parks rather than connecting different areas.

CAMPUS MOBILITY TRENDS

North Central Texas Council of Governments

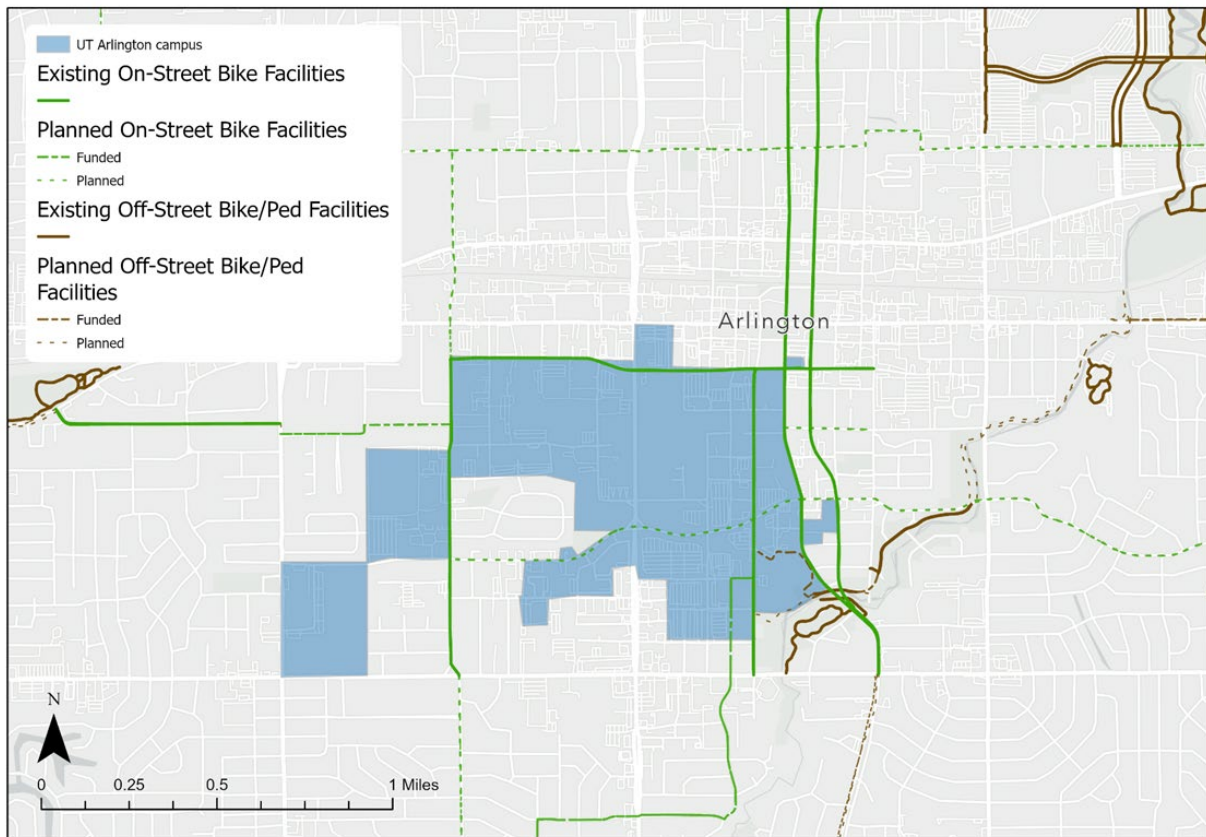


Figure 25: Existing and Planned Bicycle and Pedestrian Infrastructure (UTA)

UNIVERSITY OF DALLAS

The University of Dallas is a private Catholic university located in Irving. Connections to current and future rail may provide some opportunities for multimodal hubs, though a lack of bicycle infrastructure could hamper these efforts.

Transit Services

The University of Dallas station on the DART Orange Line serves the campus, with connections to campus via a sidewalk that crosses the John W. Carpenter Freeway. The local bus 225 also serves the campus, connecting the DART station to downtown Irving where commuters can connect to the Trinity Railway Express commuter rail (not shown in Figure 26; downtown Irving is south of the map extent). The proposed Frisco Line commuter rail will also pass near the campus and may feature a stop.

CAMPUS MOBILITY TRENDS

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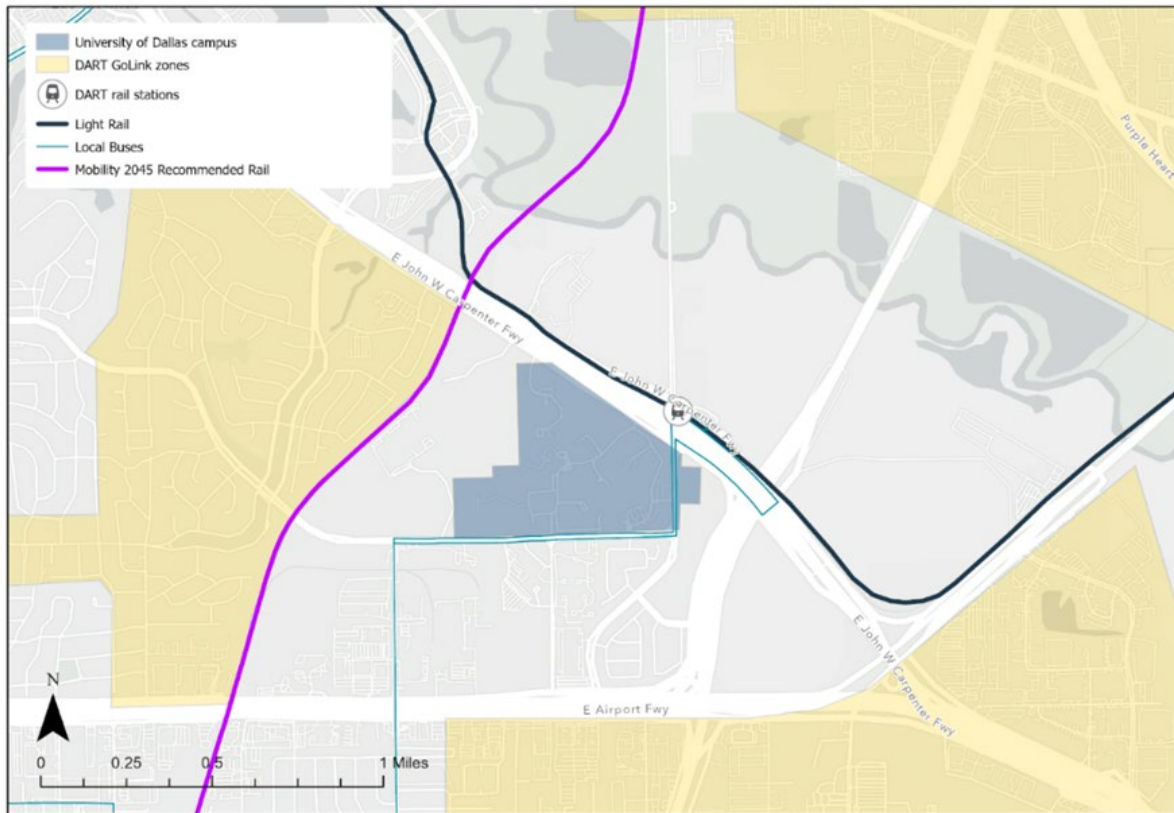


Figure 26: Existing and Planned Transit Services (University of Dallas)

Bicycle and Pedestrian Infrastructure

Besides the walkway to the DART Orange Line station, bicycle and pedestrian infrastructure near the University of Dallas station is somewhat underdeveloped, with the only dedicated bike infrastructure a bike lane along Northgate Drive.

CAMPUS MOBILITY TRENDS

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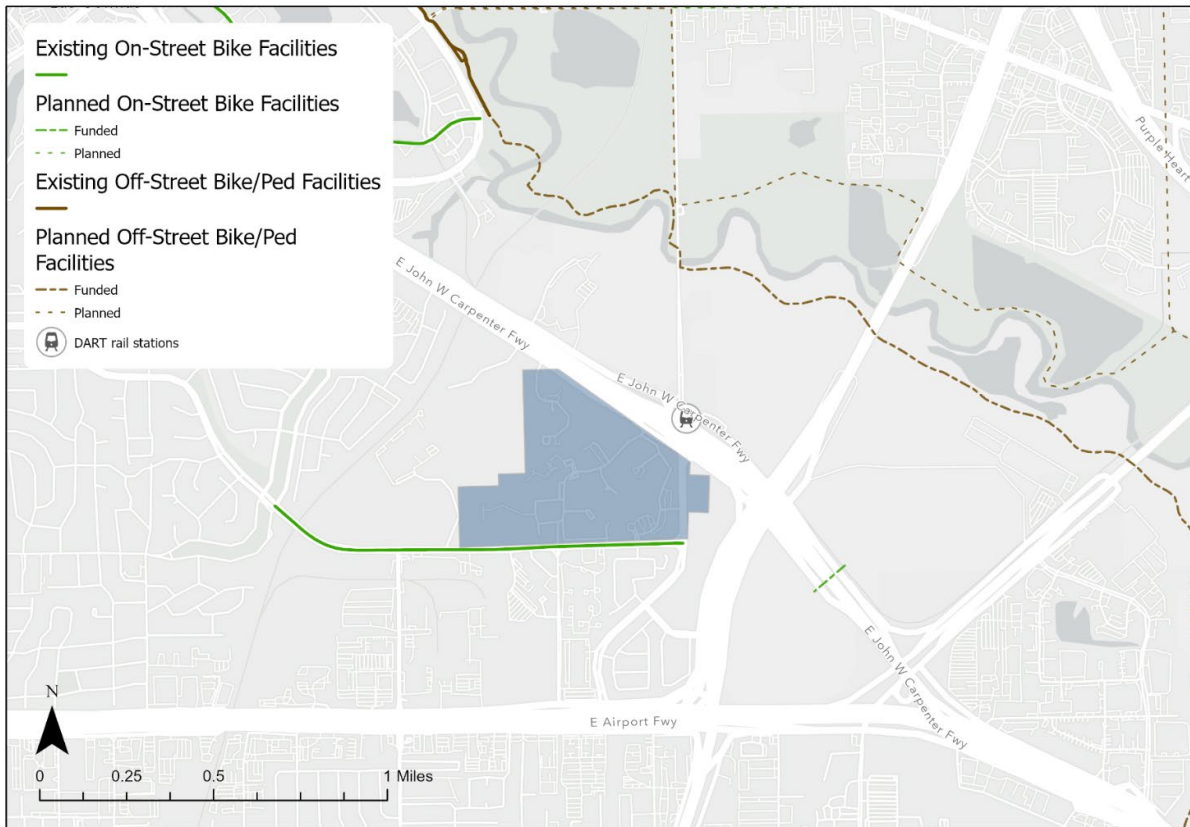


Figure 27: Existing and Planned Bicycle Service (University of Dallas)

CAMPUS MOBILITY TRENDS

North Central Texas Council of Governments

UNIVERSITY OF TEXAS AT DALLAS

UT Dallas is a large public university with 29,000 students across eight schools. The campus is just southwest of downtown Plano with multiple transportation options for students living close to campus, as well as those commuting from farther away. The Comet Cruiser bus service, free to students, runs four routes with frequencies ranging from 9 – 30 minutes, and connects to the DART Red Line. The DART Silver Line project, currently under construction, will provide a rail station on the UT Dallas campus. The existing campus transit center and the future Silver Line station present potential opportunities for mobility hubs.

Transit Services

UTD is not directly connected to DART light rail. While the under-construction Silver Line commuter rail will address this shortfall with a station at the north end of campus, some of DART’s busiest and most frequent bus lines run between the CityLine/Bush DART station and the campus.

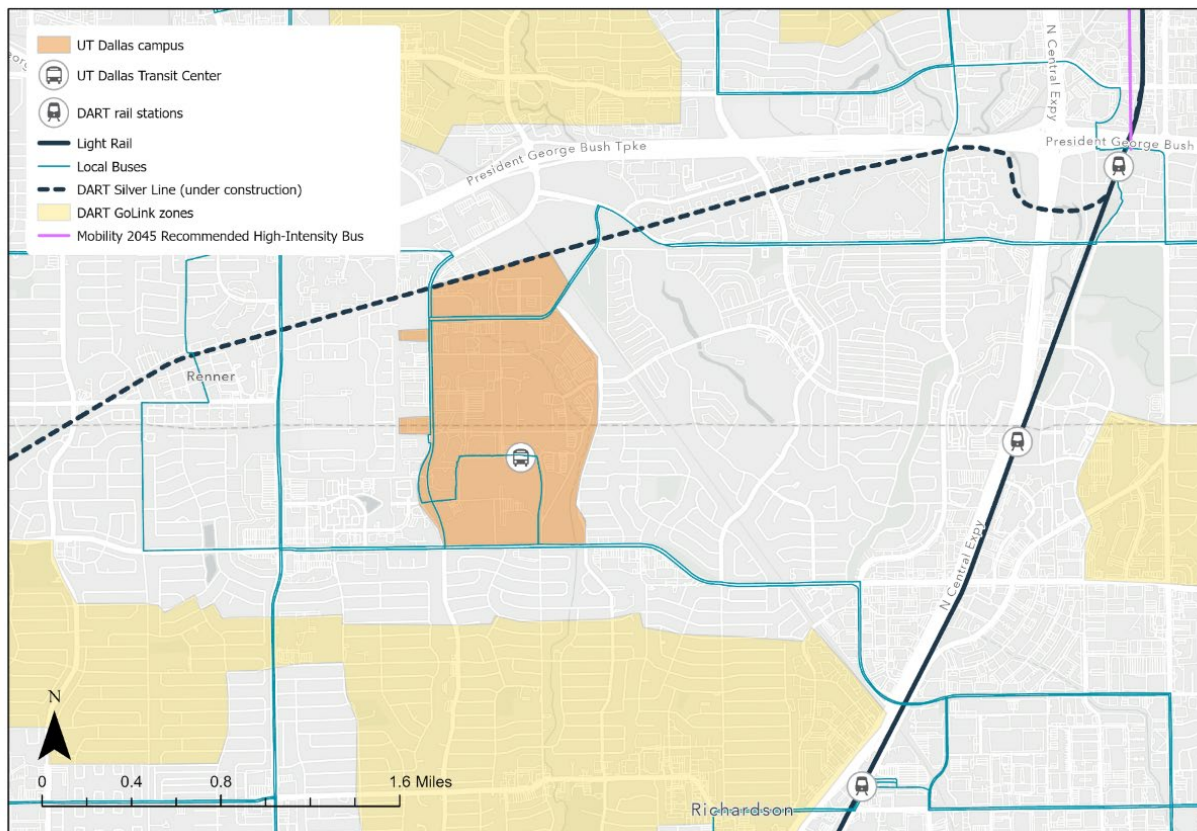


Figure 28: Existing and Planned Transit Service (UTD)

Bicycle and Pedestrian Infrastructure

Bicycle infrastructure around the UTD campus is well-developed, with on- and off-road bike lanes surrounding the campus. An off-road bike/ped trail connects DART rail to the campus along Renner Road, and the Silver Line will also feature a bike path along its tracks.

CAMPUS MOBILITY TRENDS

North Central Texas Council of Governments

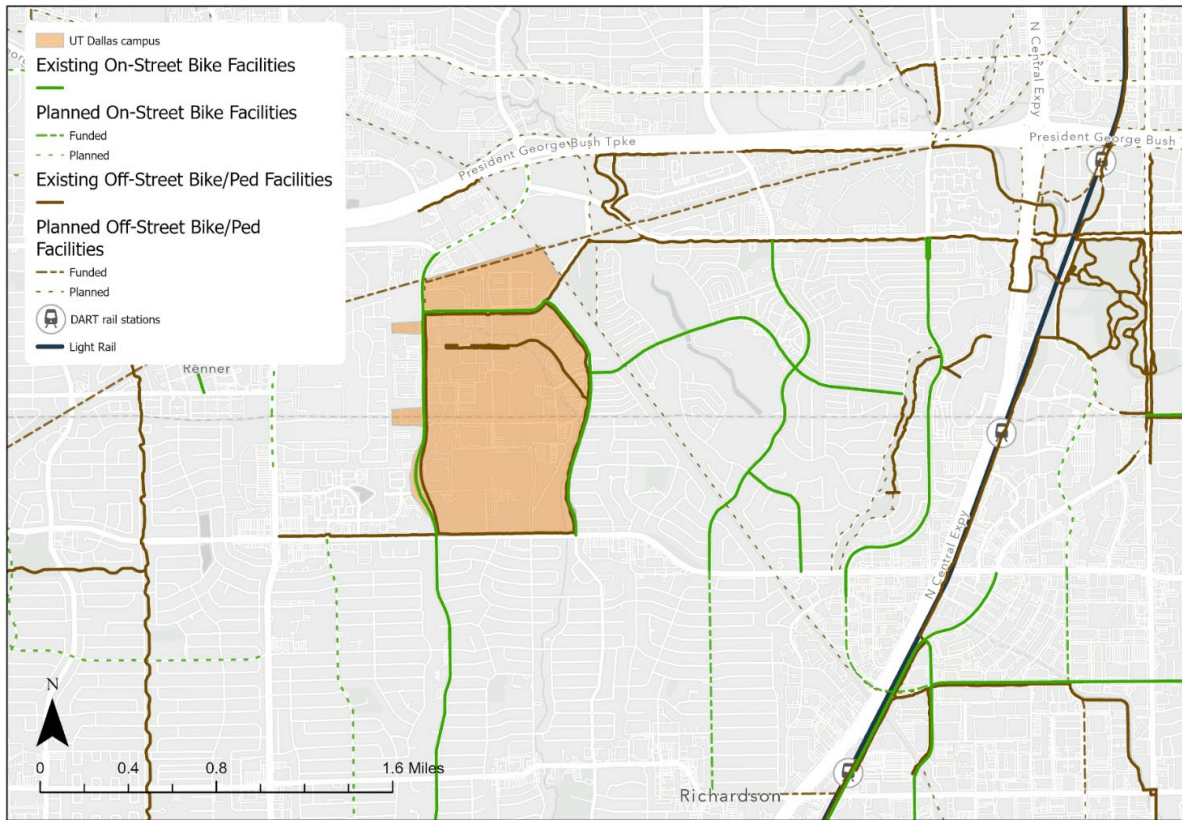


Figure 29: Existing and Planned Bicycle and Planned Infrastructure (UTD)

CAMPUS MOBILITY TRENDS

North Central Texas Council of Governments

SOUTHERN METHODIST UNIVERSITY

Southern Methodist University has 6,827 students within an urban setting just north of uptown Dallas. While the surrounding street network does not have an extensive bicycle infrastructure, the campus is just 2 blocks from the SMU/Mockingbird light rail station. The campus also offers ZipCar services to students and e-scooter micromobility. SMU's challenge in developing a successful mobility hub is creating a safe and comfortable connection to the SMU/Mockingbird station for bicyclists, scooters, and pedestrians. Mockingbird Lane bridges US 75, connecting the two, but it lacks the infrastructure required for a safe and comfortable experience for bicyclists and pedestrians.

Transit Services

Adjacent to the DART Red, Orange, and Blue Lines at Mockingbird Station across the North Central Expressway, SMU is well-connected to frequent high-capacity transit. Local DART bus services connect the campus to nearby neighborhoods.

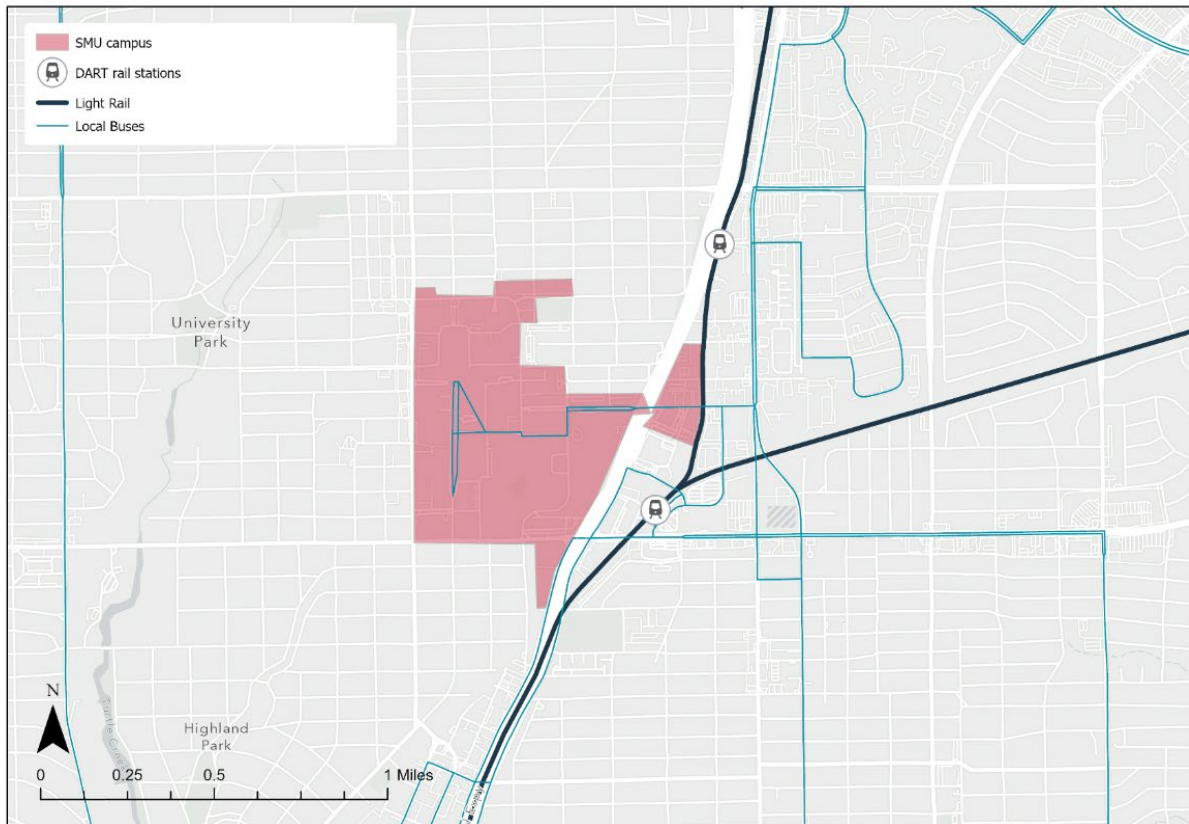


Figure 30: Existing and Planned Transit Service (SMU)

Bicycle and Pedestrian Infrastructure

Though dedicated bike and pedestrian infrastructure on the campus itself is largely absent, SMU is located near the popular Katy Trail, which crosses the North Central Expressway and Mockingbird Lane close to the campus and continues east alongside the DART Blue Line tracks. SMU Boulevard east of the expressway has painted sharrows. Better access across the existing Highway US 75 would be key to improved mobility.

CAMPUS MOBILITY TRENDS

North Central Texas Council of Governments

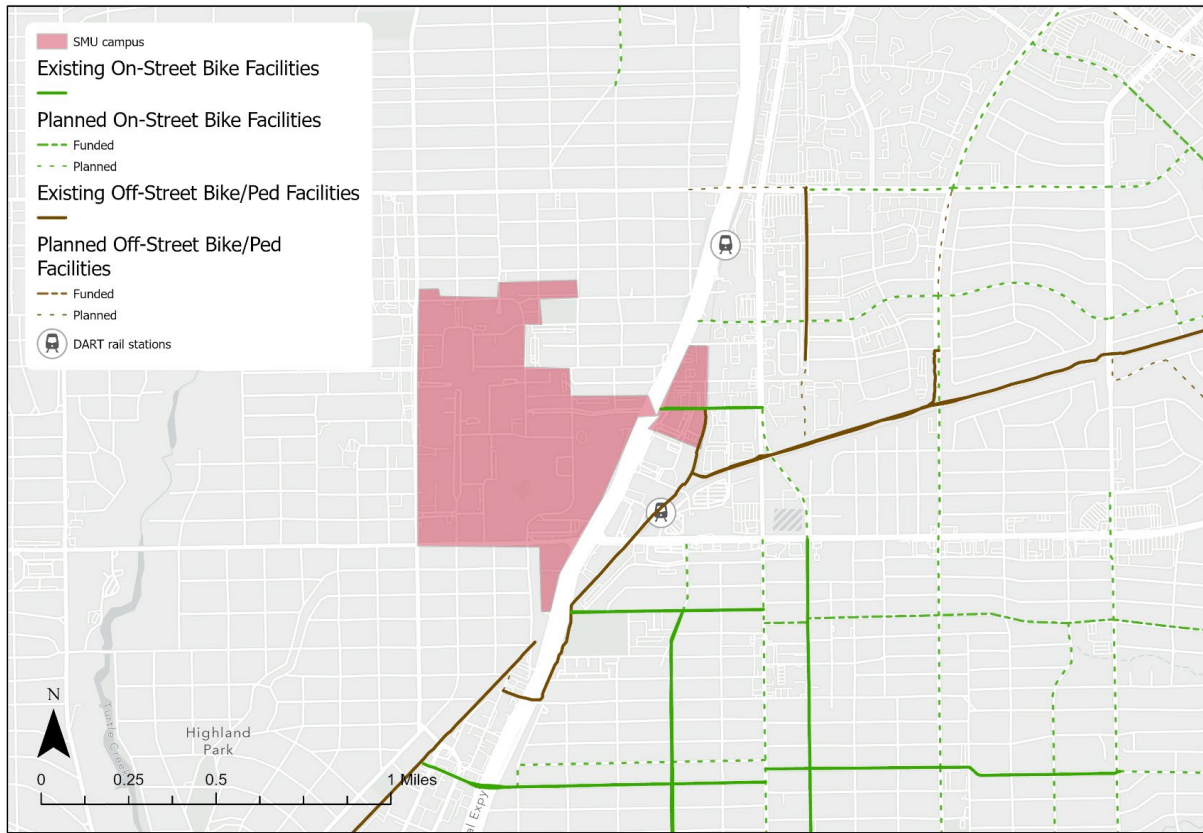


Figure 31: Existing and Planned Bicycle and Pedestrian Infrastructure (SMU)

CAMPUS MOBILITY TRENDS

North Central Texas Council of Governments

UNIVERSITY OF NORTH TEXAS AT DALLAS

UNT Dallas is a small campus with three main buildings for students, but it also lies at the terminus of Dallas Area Rapid Transit's Blue Line, a light rail station with direct connection to downtown Dallas. The station is a park & ride with room to expand for additional facilities and amenities. The Blue Line currently operates at 20-minute frequencies off-peak and 15-minute frequencies on-peak from 4:15 AM to 12:45 AM during weekdays. The campus' connection to rapid transit is an asset, but otherwise its geographic isolation may present a challenge to building multimodal hubs.

Transit Services

UNT-Dallas is at the southern terminus of the DART Blue Line at the station of the same name. The campus also falls within a GoLink zone that serves the major employment center of the Inland Port. Local buses connect to the Blue Line station, though not directly to the campus.

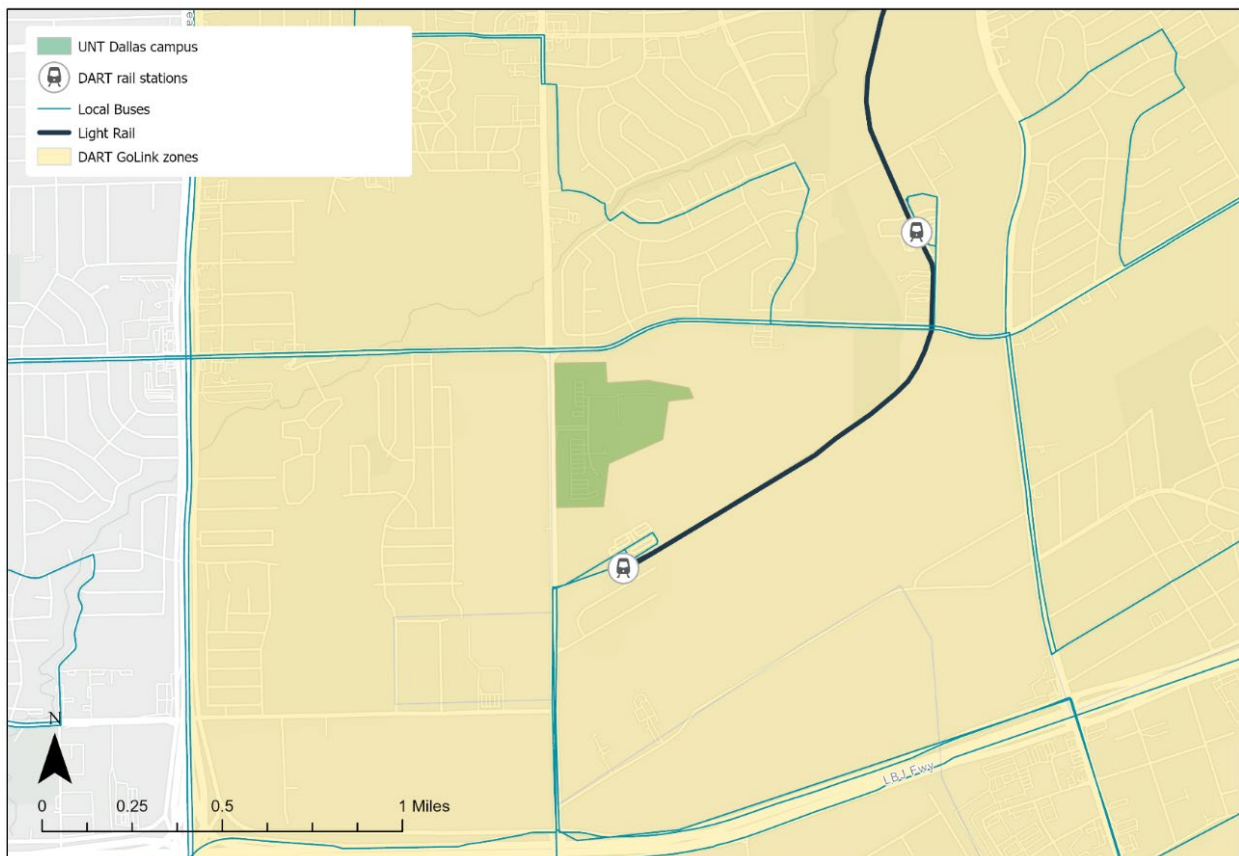


Figure 32: Existing and Planned Bicycle and Pedestrian Infrastructure (UNT-Dallas)

Bicycle and Pedestrian Infrastructure

Off-street paved trails connect UNT-Dallas to both the UNT-Dallas and Camp Wisdom DART Blue Line stations. Both University Hills Blvd and Camp Wisdom Road are planned to receive on-street bike infrastructure.

CAMPUS MOBILITY TRENDS

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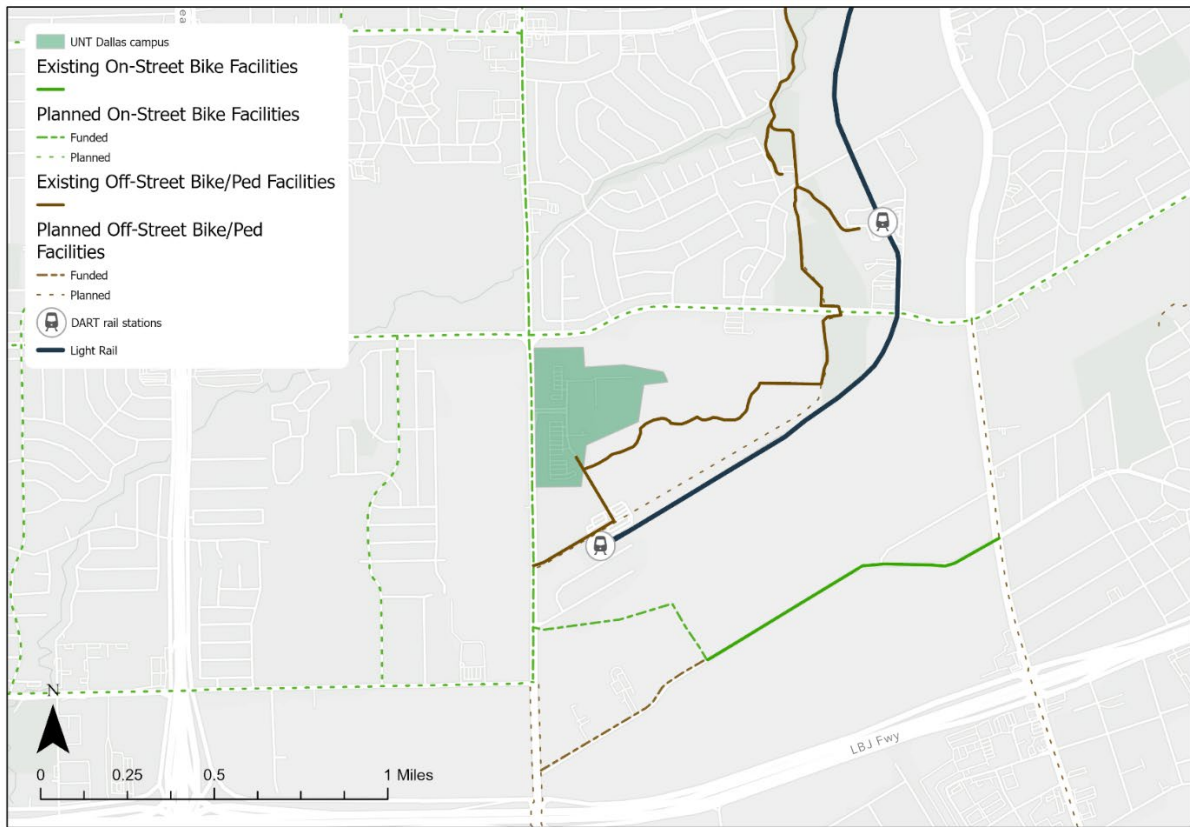


Figure 33: Existing and Planned Bicycle and Pedestrian Infrastructure (UNT-Dallas)

CAMPUS MOBILITY TRENDS

North Central Texas Council of Governments

Appendix A.1

NCTCOG Intermodal Transportation Hubs for Colleges and Universities Study		
Essential College and University Campuses	Address	City
University of North Texas (UNT) Denton	1155 Union Circle	Denton
UNT Dallas	7300 University Hills Blvd	Dallas
University of Texas at Arlington (UTA)	701 S Nedderman Dr	Arlington
University of Texas at Dallas (UTD)	800 W Campbell Rd	Richardson
Southern Methodist University (SMU)	3225 University Blvd	Dallas
Texas Women's University (TWU)	304 Administration Dr	Denton
Texas Christian University (TCU)	2800 S University Dr	Fort Worth
Dallas College El Centro	801 Main St	Dallas
Dallas College Eastfield	3737 Motley Dr	Mesquite
Dallas College Richland	12800 Abrams Rd	Dallas
Dallas College Brookhaven	3939 Valley View Ln	Farmers Branch
Dallas College North Lake	5001 N MacArthur Blvd	Irving
Dallas College Mountain View	4849 W Illinois Ave	Dallas
Dallas College Cedar Valley	3030 N Dallas Ave	Lancaster
Tarrant County College (TCC) Trinity River	300 Trinity Campus Circle	Fort Worth
TCC Northwest	4801 Marine Creek Pkwy	Fort Worth
TCC South	5301 Campus Dr	Fort Worth
TCC Southeast	2100 Southeast Pkwy	Arlington
TCC Northeast	828 W Harwood Rd	Hurst
Collin College Frisco	9700 Wade Blvd	Frisco
Collin College McKinney	2200 W University Dr	McKinney
Collin College Spring Creek Campus	2800 E Spring Creek Pkwy	Plano
Collin College Wylie	391 Country Club Rd	Wylie
North Central Texas College Corinth	1500 N Corinth St	Corinth
Paul Quinn College	3837 Simpson Stuart Rd	Dallas
Texas A&M University Commerce	2200 Campbell St	Commerce
Weatherford College	225 College Park Dr	Weatherford
University of Dallas	1845 E Northgate Dr	Irving
Texas Wesleyan University	1201 Wesleyan St	Fort Worth
Lower Priority College and University Campuses		
UNT Frisco	2811 Internet Blvd #100	Frisco
UNT Health Science Center	3500 Camp Bowie Blvd	Fort Worth
UNT Dallas College of Law	106 S. Harwood St	Dallas
UTA Fort Worth	1401 Jones St	Fort Worth
UT Southwestern Medical Center	5323 Harry Hines Blvd	Dallas
Baylor University Medical Center	3500 Gaston Ave	Dallas
Texas A&M University School of Law	1515 Commerce St	Fort Worth
Dallas College Irving Center	1081 West Shady Grove Rd	Irving
Dallas College Pleasant Grove Center	802 S Buckner Blvd	Dallas
Dallas College Bill J. Priest Center	1402 Corinth St	Dallas
Dallas College West Dallas Center	3330 N Hampton Rd	Dallas
Dallas Baptist University	3000 Mountain Creek Pkwy	Dallas
Southwestern Christian College	200 Bowser Circle	Terrell
Southwestern Assemblies of God University	1200 Sycamore St	Waxahachie
Southwestern Baptist Theological Seminary	2001 W Seminary Dr	Fort Worth
Southwestern Adventist University	100 W Hillcrest St	Keene
Tarleton State University Fort Worth	10850 Texan Rider Dr	Crowley
North Central Texas College Flower Mound	1200 Cross Timbers Rd	Flower Mound
Dallas Theological Seminary	3909 Swiss Ave	Dallas
Arlington Baptist University	3001 W Division St	Arlington
DeVry University Irving	4800 Regent Blvd Ste 200	Irving
Amberton University	1700 Eastgate Dr	Garland
Remington College Dallas Campus	1800 Eastgate Dr	Garland
Concorde Career College Grand Prairie	3015 W. Interstate 20	Grand Prairie
Concorde Career College Dallas	12606 Greenville Ave #130	Dallas
Peloton College Arlington	1200 E. Copeland Rd Suite 200	Arlington
Peloton College Dallas	8150 N. Central Expy Suite M-2240	Dallas
Trinity Valley Community College Terrell Campus	1200 E I-20	Terrell
Navarro College Waxahachie Campus	1900 John Arden Dr	Waxahachie
Navarro College Midlothian Campus	899 Mt Zion Rd	Midlothian
Universal Technical Institute of Texas	5151 Regent Blvd	Irving
Criswell College	4010 Gaston	Dallas
The King's University	2121 E Southlake Blvd	Southlake
Dallas Christian College	2700 Christian Pkwy	Dallas