

Collin County Transit Study

Final Report

PREPARED BY **HR**

2021

Collin County Transit Study



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Executive Summary

The remarkable rate of growth and development that is occurring and that is expected to continue to occur in Collin County creates substantial challenges and opportunities. As is the case with similar communities, mobility and access are near the top of the list, with governments challenged to create a mobility system that can accommodate increasing travel demands while balancing those needs with other priorities. Recognizing the issues at hand, local representatives from Collin County and the cities of Allen, Frisco, McKinney, Plano, Richardson, and Wylie requested that the North Central Texas Council of Governments (NCTCOG) undertake a countywide transit study to assess existing conditions and develop strategies for the future to ensure that public transportation is playing an appropriate role as part of the mobility solution for both the near and longer term.

Study Overview

To accomplish this evaluation, the project team worked through a coordinated planning and analysis process, including:

- Documenting and evaluating existing conditions for transit and related mobility services within Collin County, including prior studies and plans,
- Conducting a transit service needs and market analysis to gain an in-depth understanding of travel patterns, land use, population and employment densities and socio-economic characteristics, including use of Location-Based Services (LBS) data to understand the broader picture of travel patterns within and beyond the county,
- Developing service scenarios for future transit services in Collin County- this effort included the development of low, medium, and high intensity transit systems,
- Preparing service-level assumptions and associated estimates of capital and operating costs for enhanced transit in Collin County,
- Determining potential funding and governance approaches that could be used to develop enhanced transit in Collin County, and
- Developing implementation strategies and governance recommendations to move service plans towards development and service initiation.

As a planning-level evaluation, it should also be noted that this effort provides a relatively high level of service planning, with additional and more detailed service planning required to advance this program of transit services and facilities further towards implementation. The intent of this study effort is not to define the exact transit corridors and to develop operation plans to be implemented, but to reveal the varying transit needs throughout the county and explore the potential funding and governance strategies to address those differing needs in a cohesive and comprehensive manner.

Role of Project Advisory Committee (PAC)

The Collin County Transit Study leaned heavily on the input and engagement of a key group of stakeholders representing local jurisdictions across the county, Collin County, and area transit

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agencies Dallas Area Rapid Transit (DART) and Denton County Transportation Authority (DCTA). This group met collectively 11 times over the course of the study, and also participated individually or as smaller working groups with the project team on many occasions throughout the effort to provide input and guidance. The collective input from the PAC shaped the overall study effort and its outcomes; the project team greatly appreciates their time and efforts. A list of PAC members can be found in Appendix A.

Key Findings

As described in more detail in the report sections that follow, developing a program of integrated transit services and facilities to provide mobility within the context of a major metropolitan area like Dallas-Ft. Worth is very complex and requires leadership, funding, coordination, and other factors to come together to create momentum towards implementation. Of course, this critical mix has been achieved successfully before and can be achieved again as the need for improved mobility in one of the fastest growing areas in the country continues to expand. Below are the key findings from the analysis:

- Service:** Based on a thorough examination of travel patterns, transit markets, existing plans and studies, and input from the PAC, the project team identified three transit investment strategies that could be employed to enhance transit services and facilities in Collin County and to better meet growing mobility and access needs. As shown in **Table 1**, the quantity and quality of transit services increases significantly at each level, with the high intensity transit investment approach being the only one that offers a comprehensive system of transit likely to “move the needle” in terms of affecting travel choice.

Service Menu

	Paratransit	Microtransit zones	Autonomous Shuttle	P&Rs with Express Service	Local Fixed Route Bus	High-Intensity Bus	People Mover	Regional Rail	LRT
Low Investment								Phase I Phase II Phase III	
Moderate Investment									
High Investment									

- Ridership:** While land use patterns, demographics, and many other factors affect transit ridership, the largest factor by a significant margin is the quantity and quality of transit service provided. For this reason, it is not surprising that the high intensity transit



scenario, with a diverse and integrated network of transit services, would be the one with the potential to generate significant mode shift and produce substantially higher transit ridership.

- **Transit Propensity and Cost:** Three tiers – Basic Mobility; Emerging & High Growth; Developed & Mature – were used to characterize the diverse municipalities within Collin County and their corresponding levels of potential transit investment. Annual operating cost estimates were generated based on that methodology to be considered alongside the transit intensity scenarios.
- **Land Use:** While only limited portions of Collin County could be considered transit-supportive today, the ongoing rapid growth of the community offers an opportunity to shape the future of the county to be more transit-supportive with walkable, mixed-use development patterns, activity centers incorporating mobility hubs to facilitate multimodal connectivity, and concentrated development at station areas and along major transit corridors. Recommendations for creating more transit-supportive land uses are included in the **Collin County Transit Oriented Development Guidelines** document that is included in Appendix C of this report.
- **Funding:** Simply put, there is no “silver bullet” available to address the funding needs for enhanced transit in Collin County. Depending on the project approach and governance structure that is selected to manage implementation, funding sources are expected to include a mix of federal, limited state and significant local sources as well as both public and private contributions.
- **Governance:** The Regional Transportation Council (RTC) has long held the position that transit in the Dallas-Ft. Worth metropolitan areas should be operated by the existing public transportation providers, and that creating a new entity is not in the best interests of the region. This is because transit works best when it is designed and operated as an integrated system or network, not a collection of standalone services. This analysis supports the idea of coordination in terms of developing transit in Collin County while also providing details on several approaches to moving transit forward in the interim.

Next Steps

There appears to be a unique “window of opportunity” to plan and implement enhanced transit services in Collin County during the extended pandemic recovery period. Creating lasting change in terms of travel patterns is very difficult, yet it is during times of transition when that opportunity is greatest. Therefore, to move forward it is critical that momentum not be lost and based on that understanding and as confirmed with PAC input at their final meeting, three key actions are recommended, including:

- Continuing coordination among all stakeholders, potentially led by the county



- Advancing a phased approach to transit by initiating Phase 1 or on-demand microtransit service countywide, addressing the patchwork of implementation structures already in existence throughout county
- Updating NCTCOG's Metropolitan Transportation Plan (MTP) to include the county's interest in public transportation and this study's recommendations

While specific transit services can be implemented relatively quickly, developing an integrated mobility network of transit service requires substantial coordination and development time. More information is provided in the report study summary section at the end of this report.

Introduction

As one of the fastest growing counties nationwide, as well one that is an integral part of the Dallas-Fort Worth metropolitan area of more than 7.5 million inhabitants, the mobility needs of Collin County are continually increasing. In November 2017, the Collin County Commissioners Court, supported by resolutions from five cities and seven chambers of commerce, requested assistance from the North Central Texas Council of Government (NCTCOG) Regional Transportation Council (RTC) with developing a comprehensive approach to planning and implementing transit services outside of transit authority service areas. The RTC approved funding for a comprehensive transit study for Collin County ultimately resulting in this study.

Public transportation in Collin County today varies by individual jurisdiction, but overall is limited through much of the county to a patchwork of services primarily focused on meeting basic mobility needs, particularly for elderly and disabled populations.



Collin County: Moving Transit Further to the North

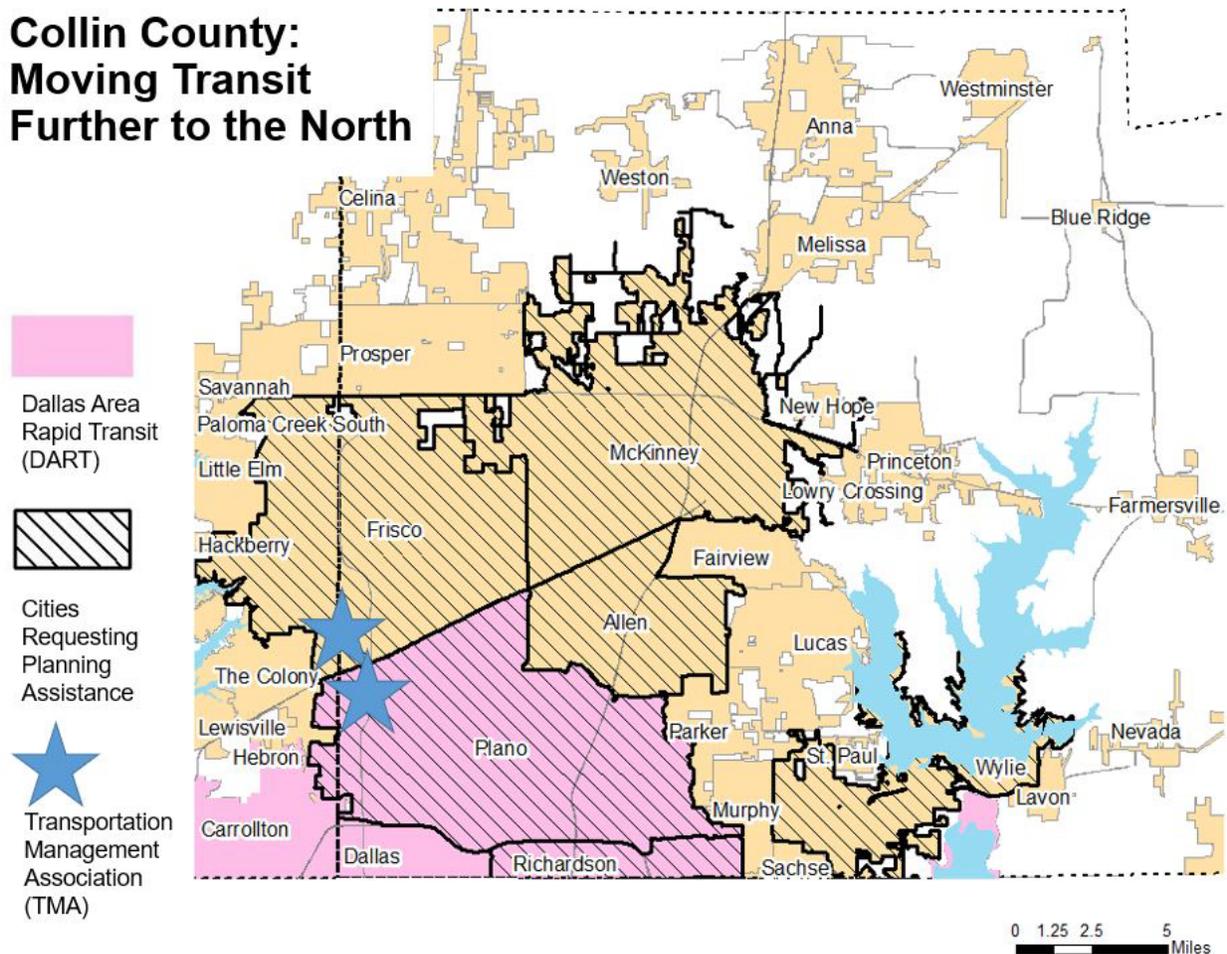


Figure 1: Project Study Area

Comprehensive Transit Needs Assessment

Section Overview- Existing Transit Services, Planned Improvement and Conditions

This section addresses two major elements: first, it provides an overview of the current state of public transportation in Collin County; second, it summarizes improvements planned by existing service providers and synthesizes a broad range of related studies, documents and associated materials that are relevant to any discussion of future transit service in the area. These elements will inform the balance of the study, providing a foundation for a deeper examination



of transit needs and opportunities in Collin County with the intent of developing an outcome-oriented plan that fosters new and improved public transportation for the community.

Transit Services Overview

Transit services are available in Collin County through various public entities such as DART, McKinney Urban Transit Direct (MUTD), and DCTA. This section studies the following types of transit services:

- a) **Fixed Route:** Fixed route transit system involves utilizing buses, light rail, and other vehicles to operate on a pre-determined route according to a pre-determined schedule. It is the most common and basic mode of transit system in United States.
- b) **Flex Route:** Flex route transit system is a hybrid of fixed-route and demand-response mode transit system. It operates on a predetermined schedule but may deviate from the pre-determined route.
- c) **Demand-Response:** Demand-response transit system operates on a flexible route with a flexible schedule. Passengers make advanced reservations to travel with this mode of transit system. Demand-response vehicles may be dispatched to pick up multiple passengers prior to reaching destination. Ridesharing is a type of demand-response transit system. It is the second largest type of public transit system in United States.

Transit Service Providers

DART

DART was created in 1983 with the development of its original 1983 Transit System Plan. DART updated their plan in 1995 and again in 2006, with a major update now in development. DART operates transit services through light rail and buses primarily, with complementary demand response, on-demand services, and partnership regional rail service in the form of the Trinity Railway Express (TRE). DART has a total fleet of 651 buses with over 11,000 bus stops and 64 light rail transit (LRT) stations. DART has designated different colors to each of its four LRT routes (blue, red, green, and orange).

Today there are 13 member cities with over 700 square miles, including Plano, portions of Richardson and Dallas in Collin County. DART total ridership exceeded 62 million passenger trips in FY 2018, with 30.2 million of bus trips and approximately 29 million LRT trips. DART had a total budget of a little over \$1 billion in FY 2019.

The following section provides an overview of DART services in Collin County.



Service Boundaries

DART provides transit services in Plano and portions of Richardson and Dallas in Collin County. DART also provides Riders Assistance Program for residents of over 65 years of age or with certified disability in City of Wylie, Allen, and Fairview. DART's service area within Collin County is shown in **Figure 2**.

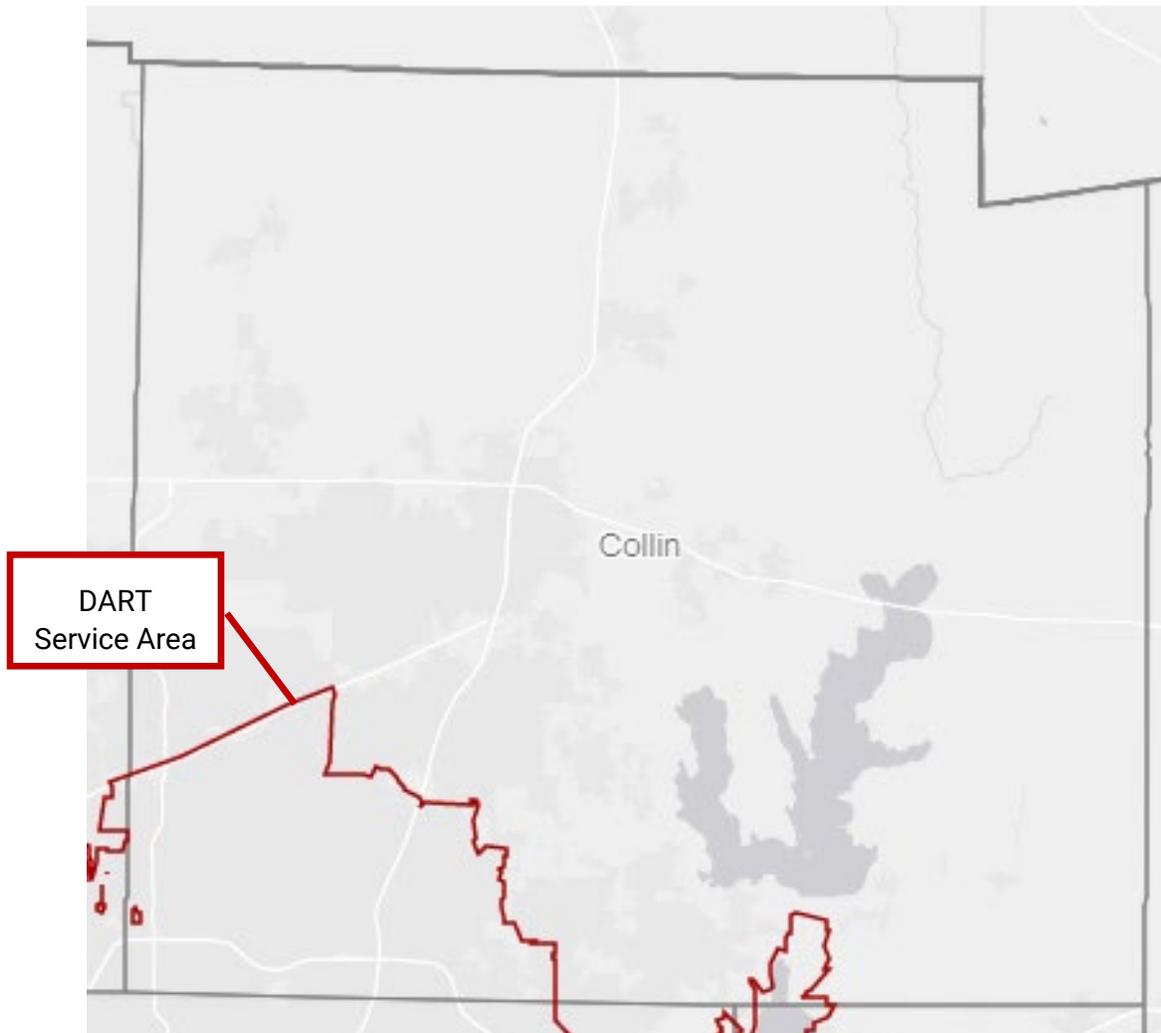


Figure 2: DART Service Area within Collin County

(Source: NCTCOG TAIT)

DART is partnering with Uber under a three-year agreement initiated in 2020 to provide North Texas riders greater flexibility and more options for their transportation needs. Using GoPass, customers can book an UberPool shared ride in each of DART's GoLink zones in

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DART's service area, including Far North Plano, Legacy West in Plano, and North Central Plano/Chase Oaks.

DART's mobility plan is divided into three zones for City of Plano: Legacy West, Far North Plano, and North Central Plano. Legacy West serves Northwest Plano Park & Ride for connections to DART buses. Far North Plano and North Central Plano serve Parker Road Station for connection to DART rail and buses. These three service area zones are shown in Figure 3.

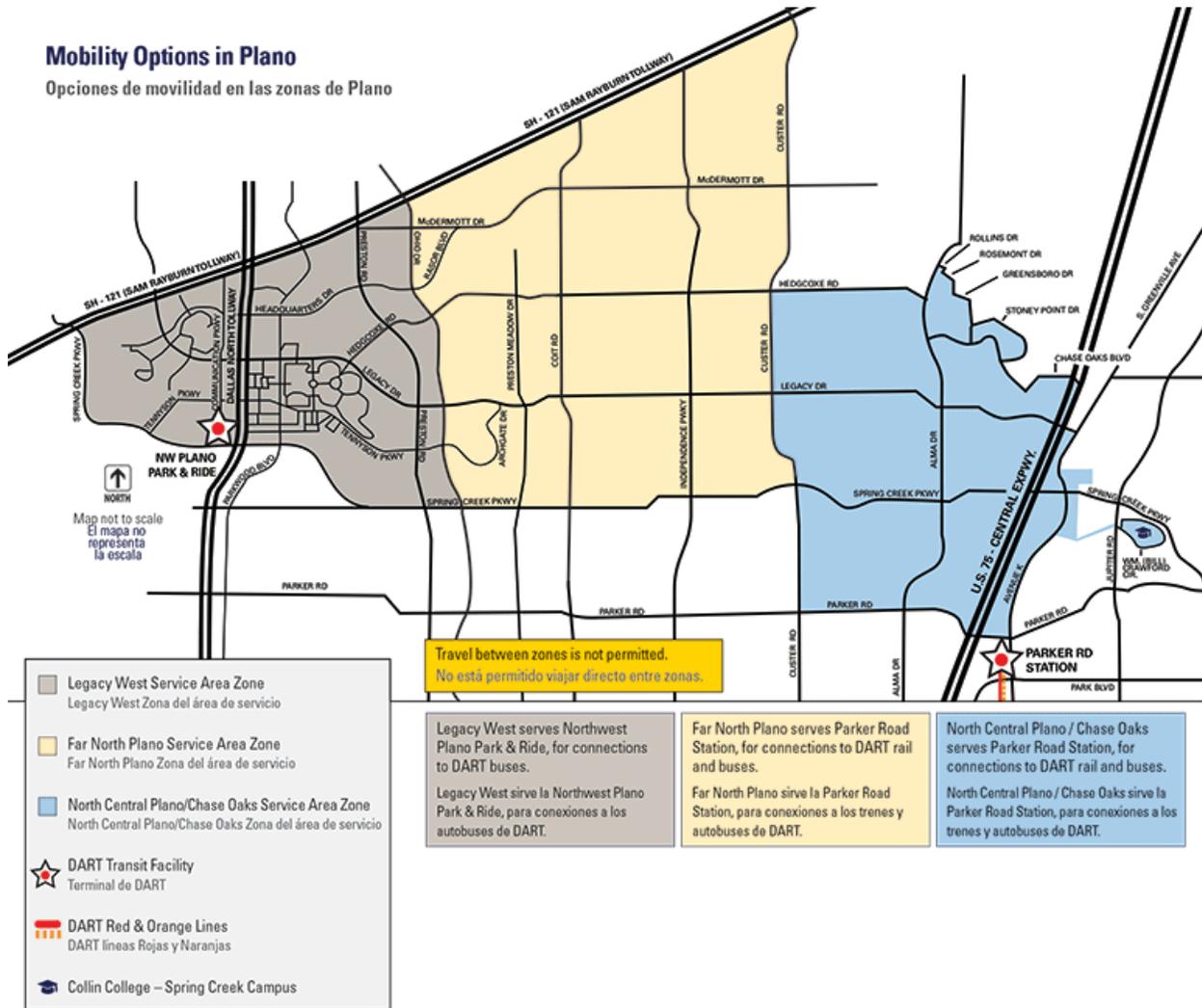


Figure 3: DART Service Zones in Collin County

(source: <https://www.dart.org/riding/golinkplano.asp>)



DART Collin County Rides Program

DART also operates the Collin County Rides program with service from 5 a.m. to 8 p.m. seven days per week. Collin County Rides is a rider assistance program offered by DART in Wylie, Allen, and Fairview. This service is for qualified residents of Wylie, Allen, and Fairview that are age 65 or over or have a certified disability. To become eligible to use this service, residents must go through an eligibility approval process. Once registered, riders can schedule subscription trips (repeating on regular intervals), book trips up to two days in advance of their intended travel, with no provision for same-day trip scheduling. Fares for the service are paid via a debit card, with fares starting at \$2.25 plus \$1.80 per mile. The debit card provides a subsidy of 3:1, with riders able to purchase up to \$400 of travel credit per month for a cost of \$100.

The service area for Collin County Rides is shown in **Figure 4**. Travel may include connecting to the DART service area in Plano, inside Collin County. Connections to the DART Downtown Rowlett train station are also permitted, even though that station is outside of Collin County. More information on this service is available at <https://www.dart.org/ccr/>.

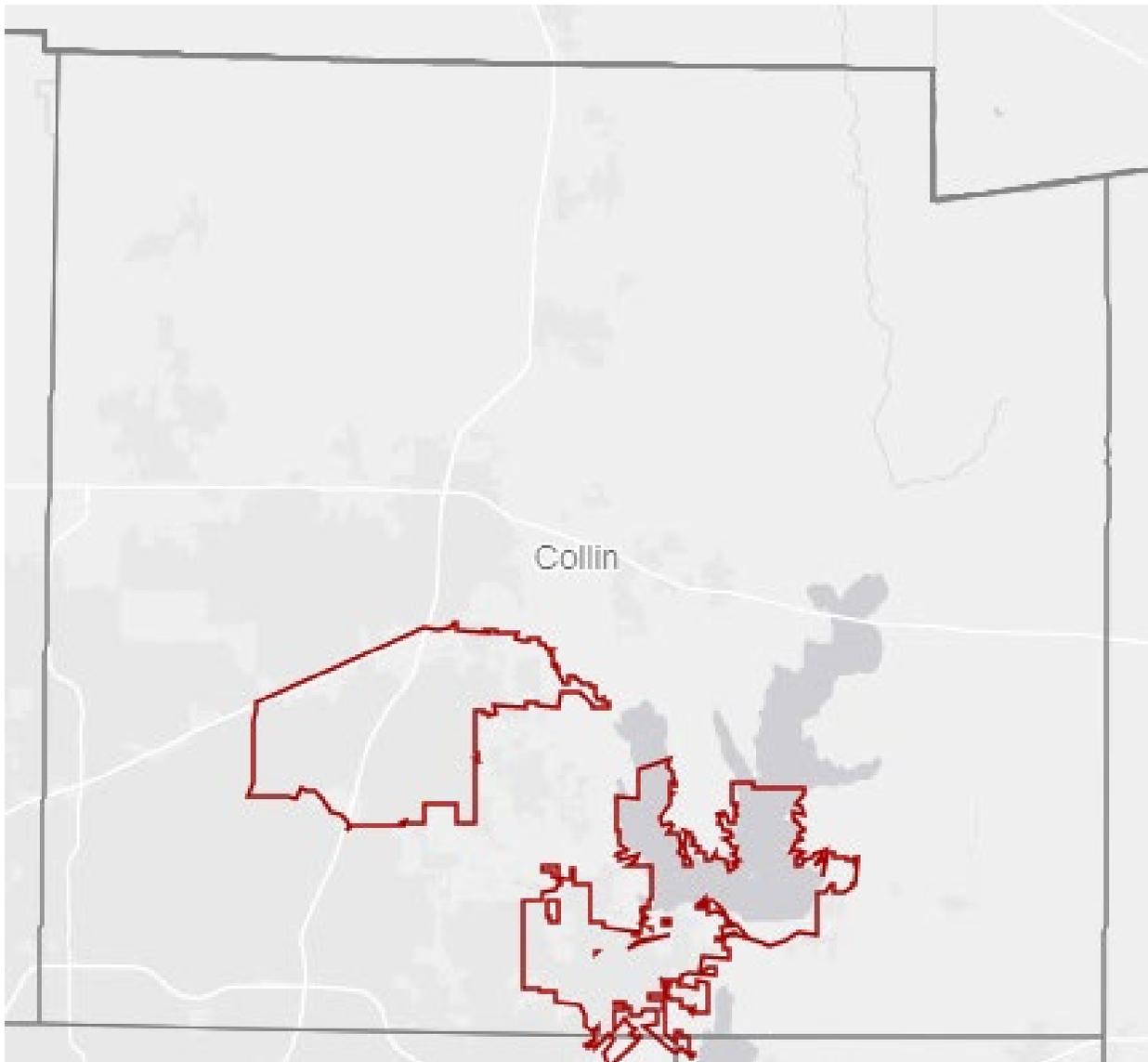


Figure 4: DART Collin County Rides Service Area

(Source: NCTCOG TAIT)

DART Light Rail

DART owns and operates five light rail transit stations/transit centers in Collin County. These five stations/transit centers are serviced by DART Red LRT and Orange LRT with Parker Road being the last station on the route. DART plans to construct another station in

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the City of Plano (Collin County) at 12th Street in the future¹. DART Services Map shown in **Figure 5** shows the existing rail service map in Dallas/Collin County, with Collin County stations/transit centers highlighted in yellow.

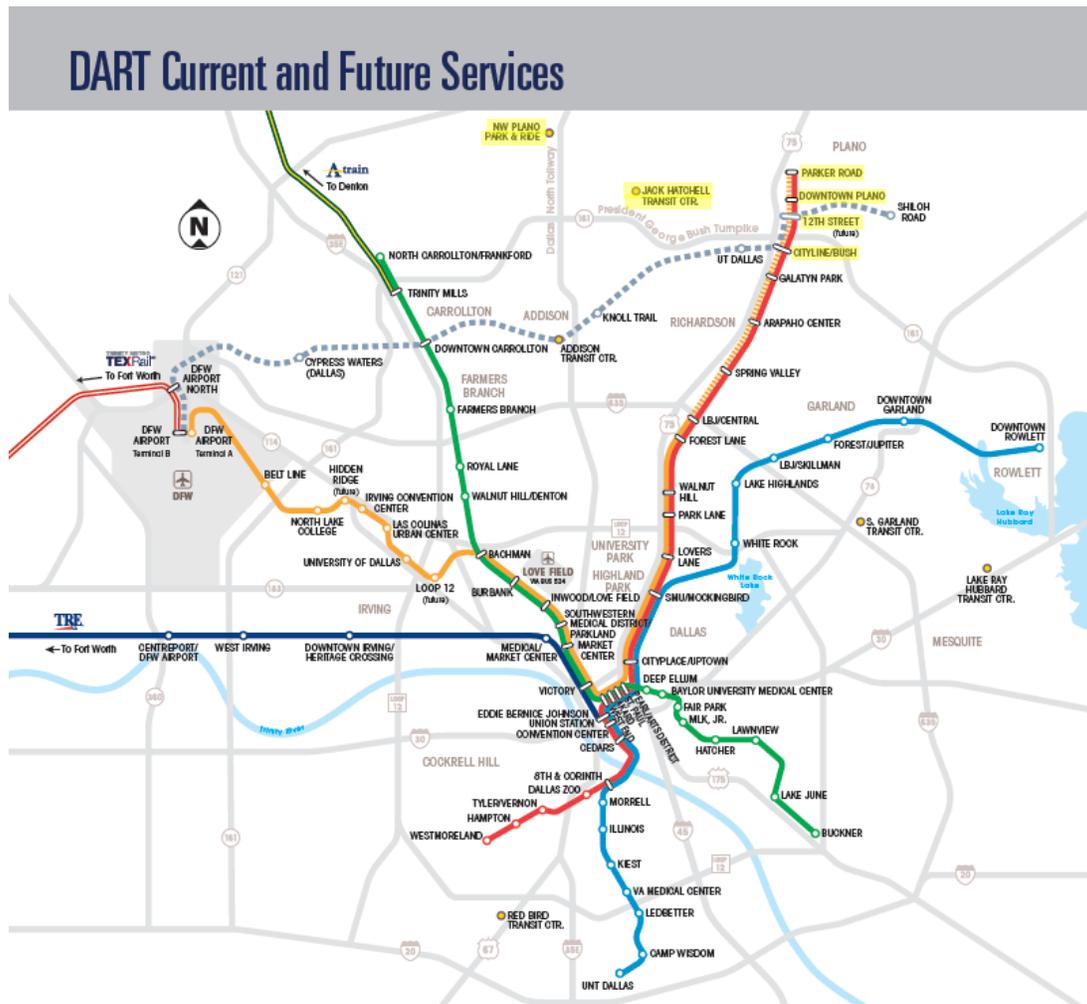


Figure 5: DART LRT System Map with Collin County services and facilities highlighted
(Source: <https://www.dart.org/maps/currentandfutureservicesmap.asp>)

¹ There is no information currently available on anticipated construction date of the 12th Street station.

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Parker Road Station

DART's Parker Road station is located at Park Boulevard and Archerwood Street, near US 75. It is served by DART Red and Orange LRT. This station serves several nearby retail and commercial destinations and is the last station on the North Central corridor. Connecting bus routes at this station include 211, 350, 410, 452, GoLink North Central Plano/Chase Oaks, and GoLink Far North Plano. (GoLink is a personalized, on-demand, curb-to-curb service by DART in Plano Zones).

Parker Road station has approximately 2,020 parking spaces. At Plano's Parker Road Station, DART has a reserved parking program limited to residents of the DART service area who display a valid resident parking permit on their vehicle, with vehicles without a valid permit subject to towing at owners' expense.



Figure 6: Parker Road Station

(source: <https://www.dart.org/riding/stations/parkerroadstation.asp>)

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Northwest Plano Park & Ride

Northwest Plano Park & Ride is located at the southeast corner of Communications Parkway and Tennyson Parkway. This facility serves commuters from West Plano, as well as points north, with a direct link to downtown Dallas. In addition, reverse commuters from the southern parts of the DART Service Area now have a direct link north from downtown to employment centers in Plano.

Bus Routes at this station include 183, 208, 211, 347, 451, 452, and GoLink Legacy West. Northwest Plano Park & Ride station has approximately 564 parking spaces.

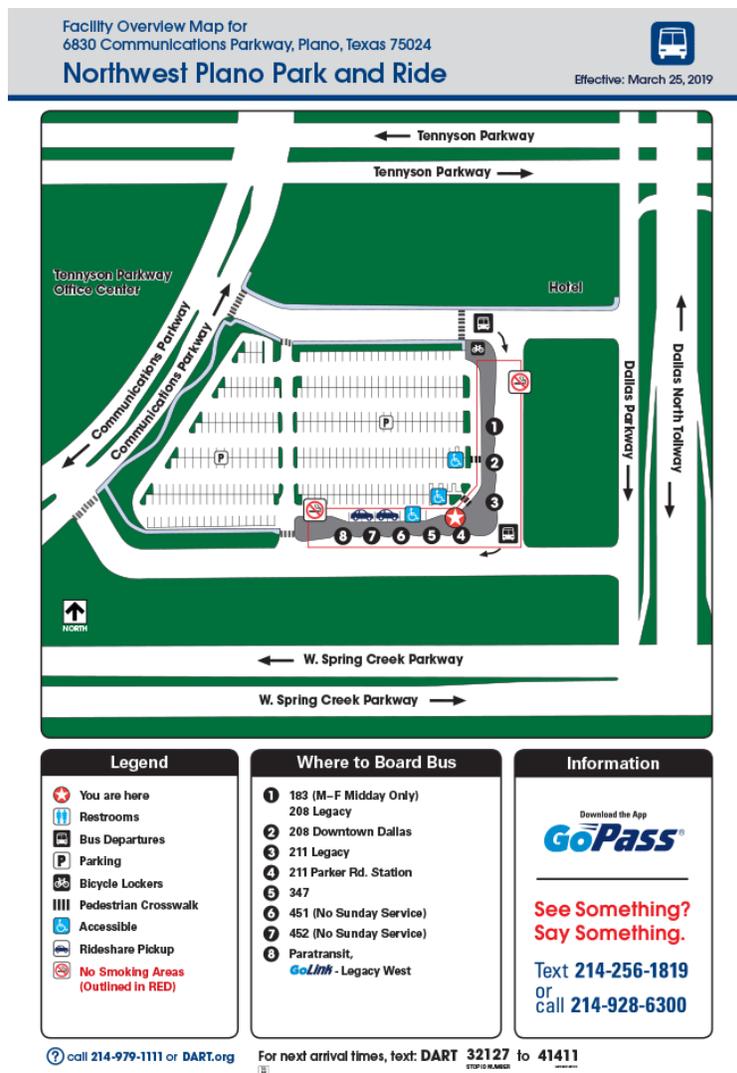


Figure 7: Northwest Plano Park and Ride

(source: <https://www.dart.org/riding/stations/northwestplanoparkandride.asp>)

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Jack Hatchell Transit Center

Jack Hatchell Transit Center is located on 15th Street, west of Coit Road. Bus routes at this Transit Center include 210, 350, 451, 452, and Telecom Corridor Flex Service. The Transit Center has approximately 815 parking spaces. This Center provides connections to the Medical Center of Plano via Route 451.

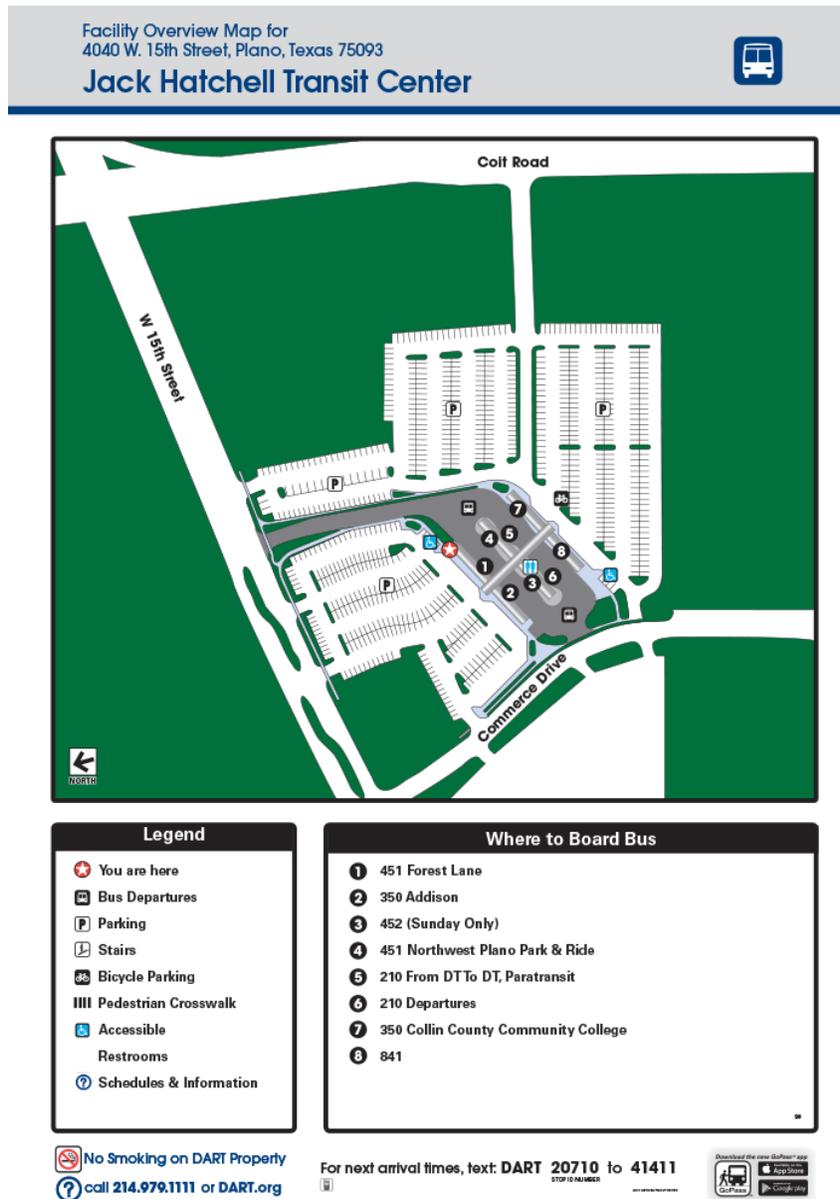


Figure 8: Jack Hatchell Transit Center

(source: <https://www.dart.org/riding/stations/jackhatchelltransitcenter.asp>)



Downtown Plano Station

The Downtown Plano Station located at 15th Street and Avenue J intersection. It is served by the DART Rail Red and Orange LRT lines. Downtown Plano Station provides access to the city's municipal center, courthouse, and business district. In addition to LRT, this station is served by East Plano Flex Service 870. There is no public parking available at the station.

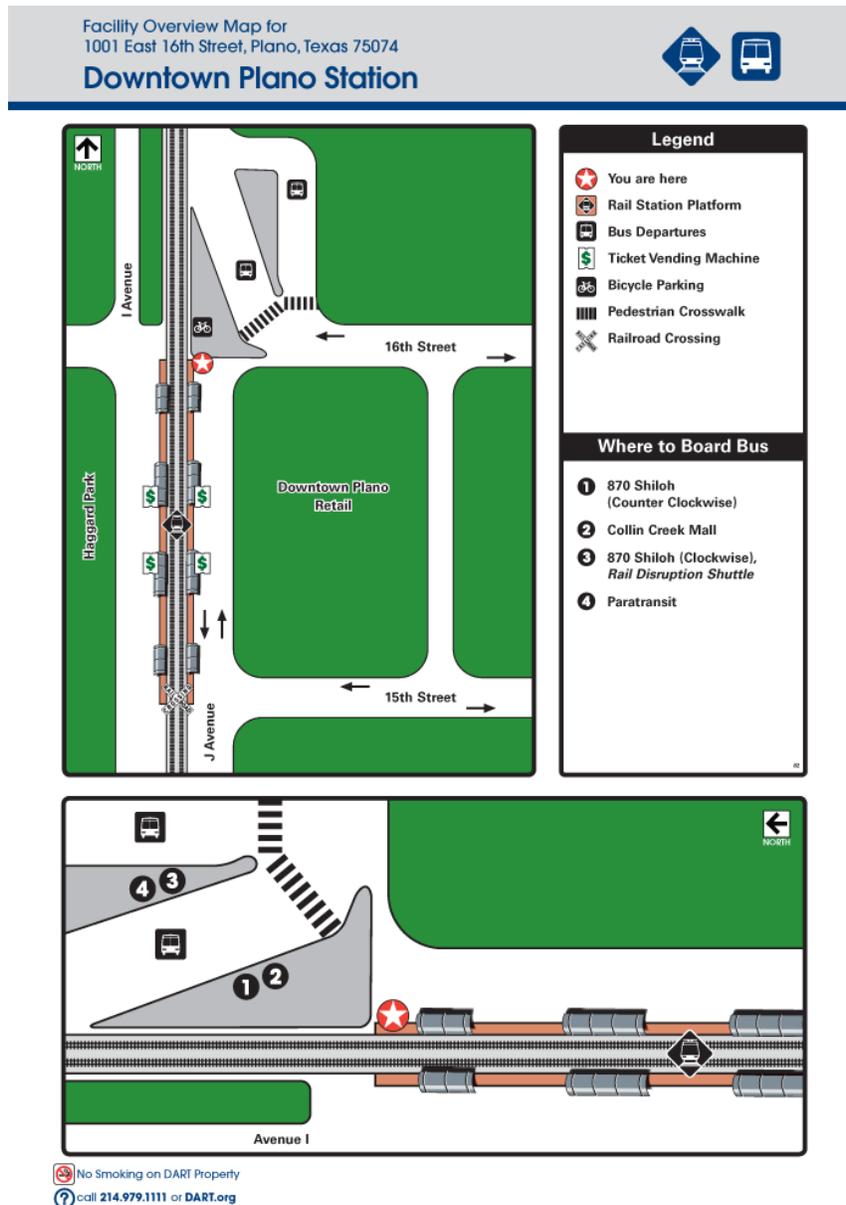


Figure 9: Downtown Plano Station

(source: <https://www.dart.org/riding/stations/downtownplanostation.asp>)



CityLine/Bush Turnpike Station

CityLine/Bush Turnpike Station is located east of US 75 and south of President George Bush Turnpike. Note: Parking is located under President George Bush Turnpike, north of the station platform.

It is served by DART Red and Orange LRT lines, Telecom Corridor FLEX Service (841), South Plano FLEX Service (843), and 883-UTD Shuttle. The station has approximately 1,193 parking spaces. Popular attractions near the station includes Aloft Richardson Hotel, Cisco, CityLine Development, University of Texas at Dallas (via bus route 883-UTD Shuttle) and more.

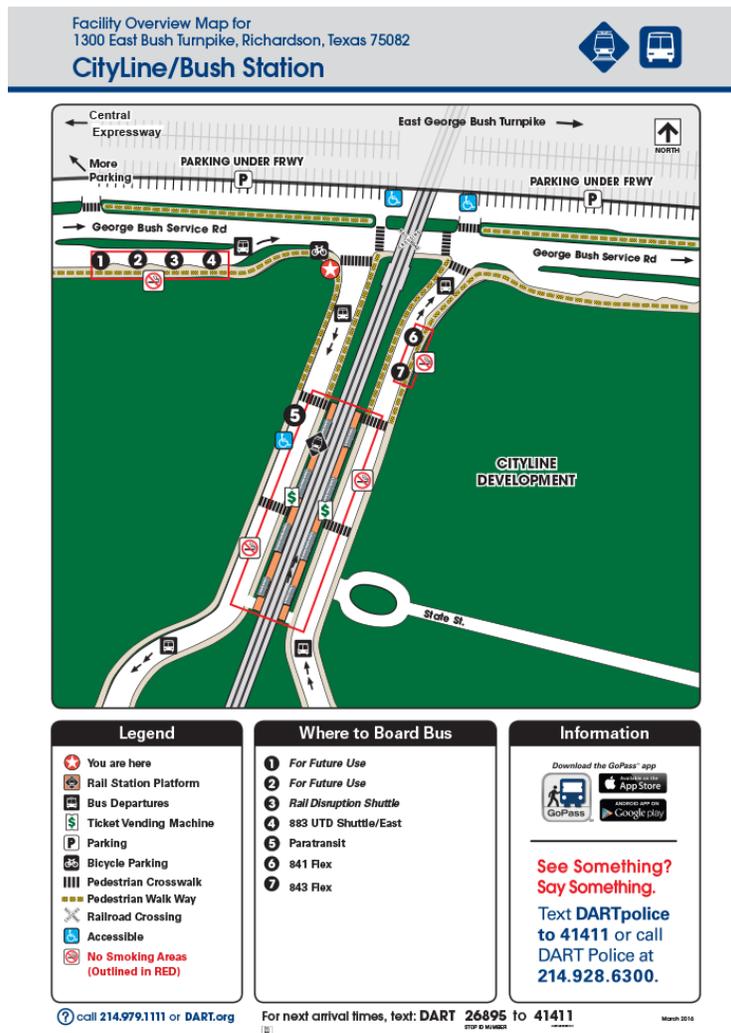


Figure 10: CityLine/Bush Turnpike Station

(source: <https://www.dart.org/riding/stations/citylinebushstation.asp>)

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Ridership & Performance

DART Bus Ridership varies by route. Per DART Reference Book (March 2020), in fiscal year 2019 DART buses had annual ridership of 38.7 million passenger trips on a total of 161 bus routes and an annual ridership of 28 million on light rail. DART transitioned to automatic passenger count (APC) based ridership reporting for buses and DART Light Rail in FY13.

Table 2 from DART Reference Book (March 2020) shows LRT ridership by station for the last three years. (With Collin County Stations highlighted in yellow).

LRT RIDERSHIP BY STATION

STATION	CORRIDOR	LINE SERVICE	FY18			FY19			FY20		
			AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE SUNDAY
Lovers Lane	NC	Red/Orange	1,186	970	558	1,143	817	458	765	616	431
Park Lane	NC	Red/Orange	2,133	1,650	1,190	2,070	1,358	1,000	1,353	1,082	868
Walnut Hill	NC	Red/Orange	980	444	296	944	383	274	632	332	244
Forest Lane	NC	Red/Orange	1,822	1,113	804	1,786	942	701	1,162	776	611
LBJ/Central	NC	Red/Orange	1,163	763	572	1,164	600	465	815	526	442
Spring Valley	NC	Red/Orange	1,206	628	442	1,227	576	428	801	440	346
Arapaho Center	NC	Red/Orange	1,016	376	222	990	336	206	628	234	158
Galatyn Park	NC	Red/Orange	348	158	103	386	148	98	257	105	74
CityLine/Bush	NC	Red/Orange	1,403	435	257	1,352	399	251	868	281	188
Downtown Plano	NC	Red/Orange	626	435	292	660	386	284	431	280	216
Parker Road	NC	Red/Orange	3,295	1,559	1,098	3,325	1,399	982	2,185	1,042	804

SOURCE: DART Planning and Development Department – Service Planning FY18, FY19, FY20 Average Daily LRT Station Ridership Report

Table 2: LRT Ridership by Station

Cost Per Trip

DART offers a basic fare of \$2.50 for a single ride (bus only), or \$3.00 local for an A.M. or P.M. pass good for travel on all DART buses and trains (including GoLink and FLEX service) and Trinity Railway Express trains between Union Station and CentrePort/DFW Airport Station. A midday pass of \$2.00 for local is also available and allows unlimited travel between 9:30 a.m. and 2:30 p.m. seven days a week. For those passengers using DART round trip needing a regional fare or for trips that go past noon, a day pass of \$6.00 for local and \$12.00 for regional is an option. Day passes are good for unlimited rides (including your return trip) until 3 a.m. the next day.

DART's GoPass® app, one of the first transit payment apps when it was launched in 2013, added new features including the option to load value with cash at hundreds of area retailers as

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well as the ability to track buses and trains in real-time. DART introduced fare capping to make riding easier and less expensive. By using the GoPass® mobile app or GoPass® Tap card, riders will never spend more than the total cost of a day pass (\$6.00) in a single day, or the total cost of a monthly pass (\$96.00) in a calendar month.

Funding Sources

Table 3 from DART FY 2020 Business Plan illustrates source and usage of DART funds, in millions, for FY 2019 & 2020.

20-Year Sources and Uses of Funds Comparison (FY 2020 – FY 2039, in Millions)

Line	Description	FY19 Plan	FY20 Plan	\$ Variance	% Variance
SOURCES OF FUNDS					
1	Sales Tax Revenues	\$18,894.7	\$18,894.7	\$0.0	0.0%
2	Operating Revenues	2,511.2	2,550.6	39.4	1.6%
3	Interest Income	397.0	384.7	(12.3)	(3.1%)
4	Formula Federal Funding	1,732.6	1,728.7	(3.9)	(0.2%)
5	Discretionary Federal Funding	579.2	720.1	141.0	24.3%
6	Long-term Debt Issuances	3,244.1	3,260.3	16.2	0.5%
7	Commercial Paper Issuances	600.0	627.0	27.0	4.5%
8	Other Operating Contributions	481.2	466.0	(15.2)	(3.2%)
9	Other Capital Contributions	256.2	270.4	14.2	5.6%
10	Total Sources of Funds:	\$28,696.2	\$28,902.6	\$206.3	0.7%
USES OF FUNDS					
Operating Expenses:					
11	Bus	\$7,050.3	\$7,112.0	\$61.7	0.9%
12	Light Rail Transit	4,493.8	4,517.8	24.0	0.5%
13	Streetcar	119.2	119.9	0.7	0.6%
14	Commuter Rail/RR Management	1,351.0	1,352.2	1.2	0.1%
15	Paratransit	1,255.4	1,260.3	4.9	0.4%
16	General Mobility - TDM	52.2	52.5	0.3	0.6%
17	Total Operating Expenses:	\$14,321.9	\$14,414.7	\$92.8	0.6%
Capital and Non-Operating:					
18	Agency-Wide	\$445.7	\$502.5	\$56.9	12.8%
19	Bus	1,207.5	1,197.1	(10.4)	(0.9%)
20	Light Rail Transit	2,975.5	2,985.6	10.1	0.3%
21	Streetcar	96.6	104.3	7.7	7.9%
22	Commuter Rail/RR Management	1,557.2	1,780.1	222.9	14.3%
23	Paratransit	5.7	5.9	0.2	3.0%
24	General Mobility - Road Impr./ITS	41.8	44.8	3.1	7.4%
25	Non-Operating	31.7	35.3	3.6	11.4%
26	Capital P & D, Start-Up	309.9	312.5	2.6	0.8%
27	Total Capital and Non-Operating:	\$6,671.5	\$6,968.2	\$296.7	4.4%
Debt Service					
28	Principal Payments - Long-term Debt	\$2,655.5	\$2,656.3	0.8	0.0%
29	Long-term Debt Interest Expense	4,032.0	4,012.4	(19.6)	(0.5%)
30	Commercial Paper Interest Expense	148.2	152.2	4.0	2.7%
31	Debt-Related Fees	11.9	12.1	0.2	1.9%
32	Total Debt Service:	\$6,847.6	\$6,833.0	(\$14.6)	(0.2%)
33	Commercial Paper Debt Repayment	707.0	786.2	79.2	11.2%
34	Total Uses of Funds:	\$28,548.0	\$29,002.1	\$454.1	1.6%

Table 3: DART 20-Year Sources and Uses Comparison

(source: <https://www.dart.org/ShareRoot/debtdocuments/FY20BusinessPlan.pdf>)



DART also acquires funds from sources such as cities, counties, U.S. Department of Transportation (USDOT), NCTCOG's Regional Transportation Council, Federal Transit Administration (FTA), and other funding sources for development purposes. For instance, in 2019, the USDOT/FTA announced a \$60.76 million grant agreement with DART for construction of the Red and Blue LRT line platform extensions, which will allow DART to accommodate more riders and longer trains. The project will lengthen platforms at 28 stations along the existing Red and Blue LRT lines that currently can accommodate only two-car trains. When the project is complete, all stations on these lines will be able to accommodate three-car trains. The total project cost is \$128.74 million.

The FY 2020 Financial Plan includes rail service along the Cotton Belt (now called the Silver Line) corridor in the northern part of the DART Service Area. The line will receive funding over the next 20 years from a variety of sources approved by the Regional Transportation Council (RTC), Dallas County, and the local communities in the corridor, some of which will help fund construction and some of which will be used to pay for annual operating and/or debt service costs.

Future Service Plans

In 2006, DART developed a 2030 Transit System Plan to identify future market needs and provide a system that is efficient, cost effective, and affordable.

In 2016, DART received a \$1 million grant from Toyota Motor North America, Inc. (TMNA) to support essential transportation assistance for residents in northern Collin County needing help getting to medical facilities and physician's visits. The grant supports the continuation of a 90-day interim service that had been funded by NCTCOG and several northern Collin County cities. The service was previously operated by Texoma Area Paratransit Service. The Toyota grant funds a taxi-type extension to the demand-response operation in Collin County provided by DART and NCTCOG.

Since introducing GoLink in two Plano areas early last year, DART continues to expand the personalized on-demand service. A citywide GoLink zone in Rowlett replaced DART On-Call bus service in June. New GoLink service began in Far North Plano (an area that previously had no bus routes) in August 2018.

On March 25, 2019, the agency converted all remaining DART On-Call routes to GoLink as part of the March 2019 bus service change. DART also is partnering with Uber for a one-year pilot program that enables customers to book an UberPool shared ride in the Plano zones.

In 2019, DART Board selected Stadler US for the contract to assemble and build eight FLIRTs (Fast Light Intercity and Regional Train) for the Cotton Belt Regional Rail Project scheduled to go into service in 2022. The DART Board of Directors approved a resolution to name future service running on the Cotton Belt Commuter Rail as the Silver Line. The Silver Line project's primary purpose is to provide passenger rail connections and service improving mobility,

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accessibility and system linkages to major employment, population, and activity centers in the northern part of the DART Service Area, and in time, along the 60-mile corridor connecting Plano to Ft. Worth. The Cotton Belt Corridor will provide City of Plano residents of Collin County a straight and fast access to Dallas-Fort Worth Airport and will reduce the transit travel time from CityLine Station to Dallas-Fort Worth Airport significantly.

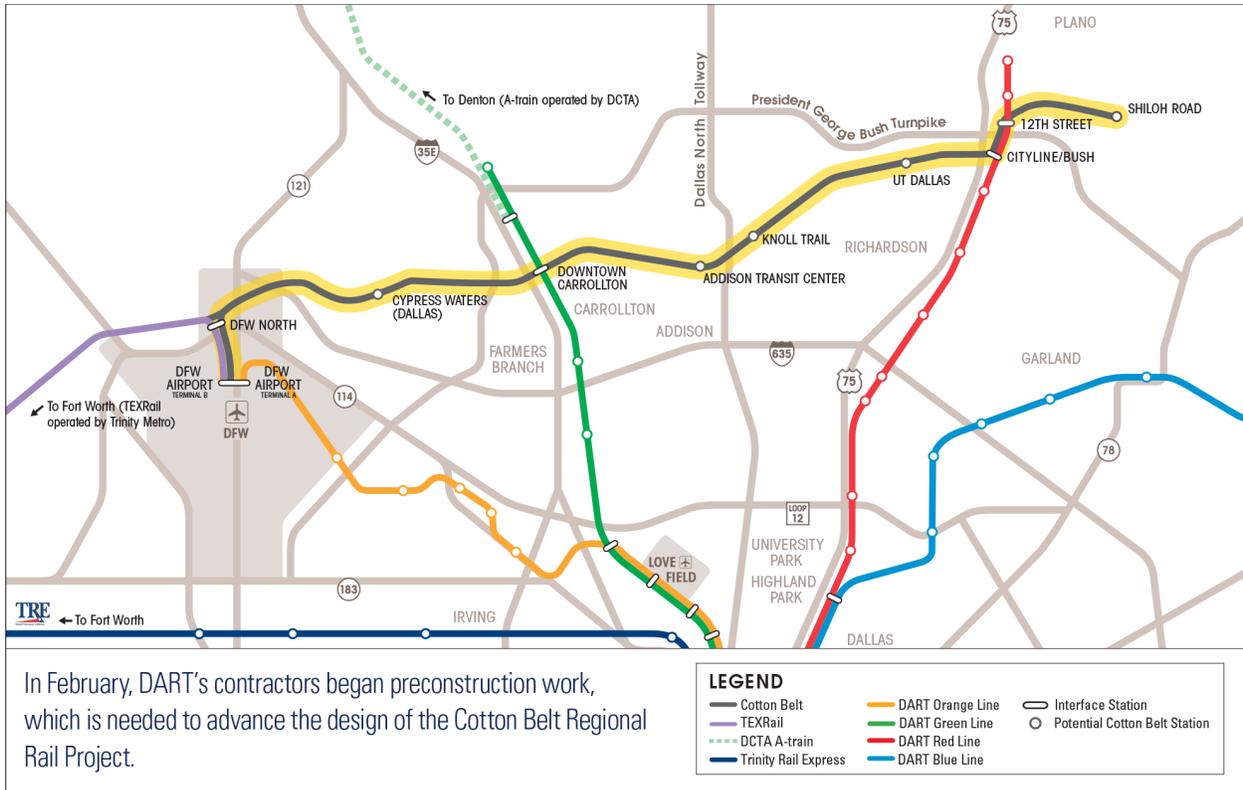


Figure 11: DART Silver Line Corridor

(source: <https://www.dart.org/about/expansion/silverline.asp>)



Collin County Transit (MUTD & DCTA)

The City of McKinney, MUTD and DCTA provide Collin County Transit service. The service consists of a subsidized taxi voucher program, which provides efficient transit options for participating MUTD cities of Collin County including McKinney, Lowry Crossing, Melissa, Princeton, Celina, and Prosper. A total of 8,876 trips have been completed with Collin County Transit from inception in June 2017 through February 2019. The program has steadily increased from the first month of service with less than 100 trips to more than 800 trips in February 2019. The service area within Collin County is shown in **Figure 12**.

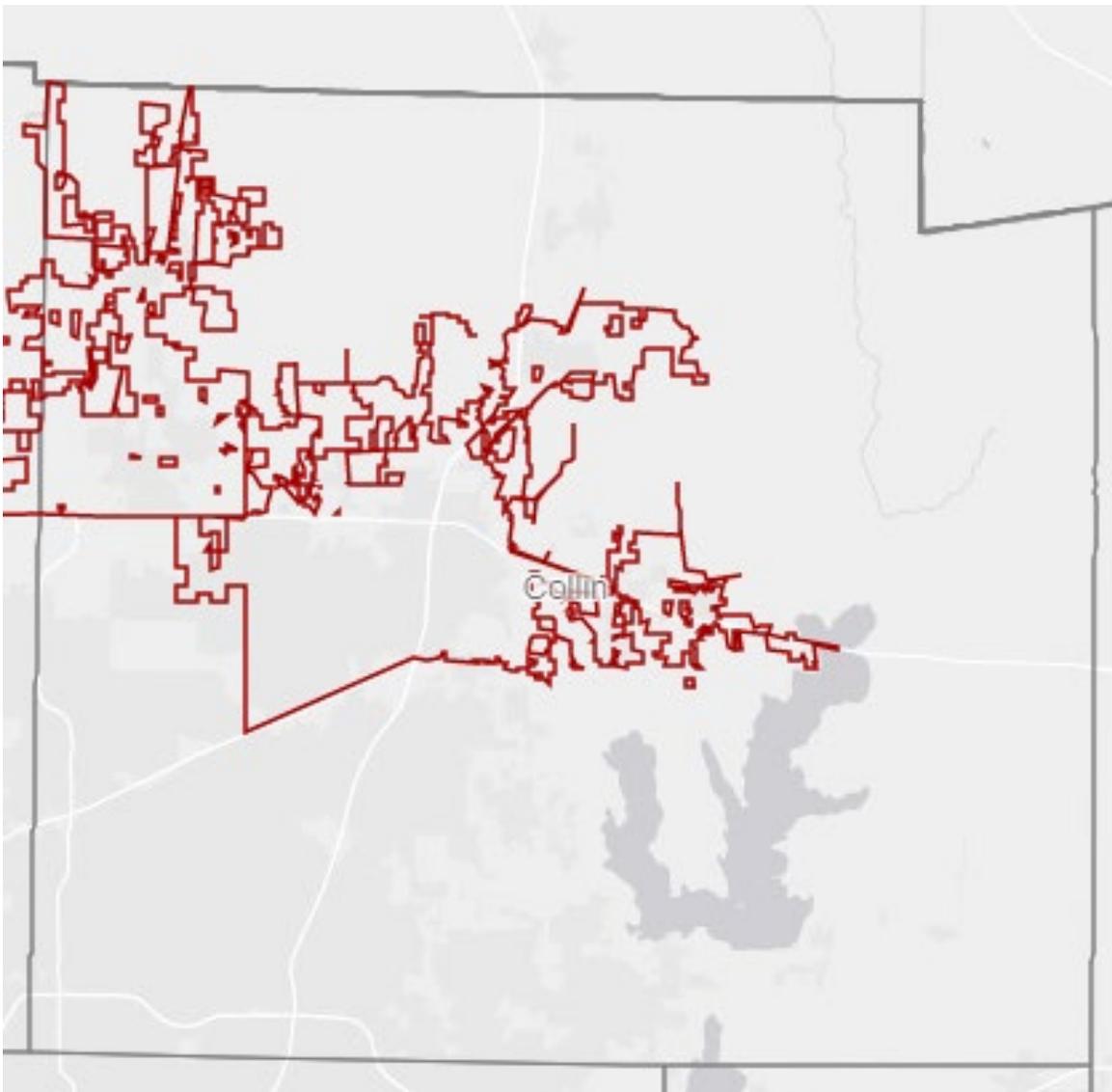


Figure 12: Collin County Transit Service Area

(Source: NCTCOG TAIT)



Collin County Transit Discount Programs

Collin County has three discounted programs for its residents: Older Adult Program, The Individuals with Disabilities Program, and Low-Income Transit Subsidy Program.

Older Adult Program

The Older Adult Program provides citizens age 65 years and older with mobility solutions within Collin County. This service consists of a subsidized taxi voucher program that provides transit options for participating MUTD cities including Celina, Lowry Crossing, McKinney, Melissa, Princeton and Prosper.

The Individuals with Disabilities program

The Individuals with Disabilities Program provides alternative mobility solutions within Collin County for persons with disabilities. This service consists of a subsidized taxi voucher program that provides transit options for participating MUTD cities including Celina, Lowry Crossing, McKinney, Melissa, Princeton and Prosper.

Low Income Transit Subsidy Program

The Low-Income Transit Subsidy Program (LITSP) provides low-income families and individuals with mobility solutions within Collin County. The program launched Monday, April 2, 2018. This service consists of a subsidized taxi voucher program that provides transit options for participating MUTD cities including Celina, Lowry Crossing, McKinney, Melissa, Princeton and Prosper.

Other Transportation Providers

When examining options for improving public transportation services, assessing the full range of mobility providers within the study area can help to identify partnership opportunities and enhanced coordination concepts for consideration. In the case of Collin County, there are several:

For Hire Vehicles

Collin County is served by traditional taxi service providers as well as Lyft and Uber. Service coverage varies by provider, as do rates and availability. While taxi service providers have faced significant challenges with the arrival of Transportation Network Companies (TNCs) such as Lyft and Uber over the past several years, approximately twenty taxi providers are reported to offer service to, from, or within Collin County based on an internet search. Lyft's service area map indicates that the majority of Collin County is within its service area. Uber also indicates that service is available throughout the county. There are also several companies offering service for the general public in the form of limousines and airport and hotel shuttles.

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Nonprofit, Public and Human Service Transportation Providers

The North Central Texas Area Agency on Aging is a part of NCTCOG and facilitates transit services for the elderly (60+) within the 14 counties surrounding Dallas and Tarrant counties. They coordinate transit services through subcontracts with public transit agencies and various county committees on aging, and they currently have a contract with Meals on Wheels of Collin County to provide transportation within the county. The primary trip purpose is to bring seniors to congregate meal sites; however, the service may also provide transportation to other venues when space is available.

Frisco Demand Response and Driverless Car Pilot Programs

The City of Frisco, similar to the Collin County Transit program described above, also contracts with DCTA for the provision of elderly and disabled person mobility services. This weekday only, call-ahead service also serves limited areas within the City of Plano to increase access for customers, with a base fare of \$3 per trip within Frisco and a \$5 fare for trips that extend into Plano.

Additionally, Frisco's North Platinum Corridor was host to the first autonomous vehicle pilot program in Texas beginning in 2018. The Frisco Transportation Management Association (TMA) conducted an eight month pilot program that operated more than 3,000 trips using a self-driving vehicle operating along a fixed route, and a summary report of the pilot was developed in coordination with the Texas A&M Transportation Institute in August 2019, available here: <https://www.friscotexas.gov/DocumentCenter/View/19826/Driveai-Frisco-Final-Briefing-2019>.

Autonomous vehicles hold significant potential for mobility enhancement in a wide range of environments. While there have been setbacks over the past several years as the initial hype of autonomous cars capable of functioning in mixed traffic has been replaced by a realization that such a vision remains elusive, the potential for shared-used autonomous vehicles as a key component of a multimodal system remains strong. Within Collin County, autonomous vehicles can and should be included in future planning efforts, with roles such as first/last mile connections, shuttle services, and people mover applications. Those that operate within a dedicated guideway hold potential to be early deployments. As technologies continue to evolve, broader deployments, such as fully autonomous buses, trains, and vans capable of operating without human intervention within the general roadway network will begin to emerge.



Key Findings and Recommendations from Previous Studies/Plans

As Michael Morris, Director of NCTCOG, indicated in the initial meeting of the study’s Project Advisory Committee meeting, the study of public transportation in Collin County has been ongoing for several decades. The proximity to a major U.S. city and one of the 30 largest transit systems in the U.S. in the form of DART, combined with explosive growth and increasing congestion that’s projected to continue into the foreseeable future, make such assessments nearly inevitable. However, as the prior section made clear, the level of transit service in the county today is low, with only a small percentage of the population having access to fixed route service, and with significant portions of the county lacking service of any kind. Following are snapshots of prior efforts to help provide a better understanding of work to date, the current situation, and to lay the groundwork for future transit plans.

NCTCOG Transit Accessibility Improvement Tool

NCTCOG maintains the Transit Accessibility Improvement Tool (TAIT). The TAIT highlights demographic groups who may be more likely than others to rely on public transit services to meet their daily needs, using GIS to analyze three primary data points:

1. Percent of the population below poverty (also referred to as low income)
2. Percent of the population with a disability
3. Percent of the population age 65 and over

The NCTCOG website also provides users with other data related to potential transit usage, including zero-car households; persons aged 14 and under; and veteran population. Population density, transit provider service areas and FTA Title VI information is also included for reference. The current version is based on 2018 American Community Survey (ACS) data, with **Figure 13** showing areas of Collin County with the highest transit need in darker colors.

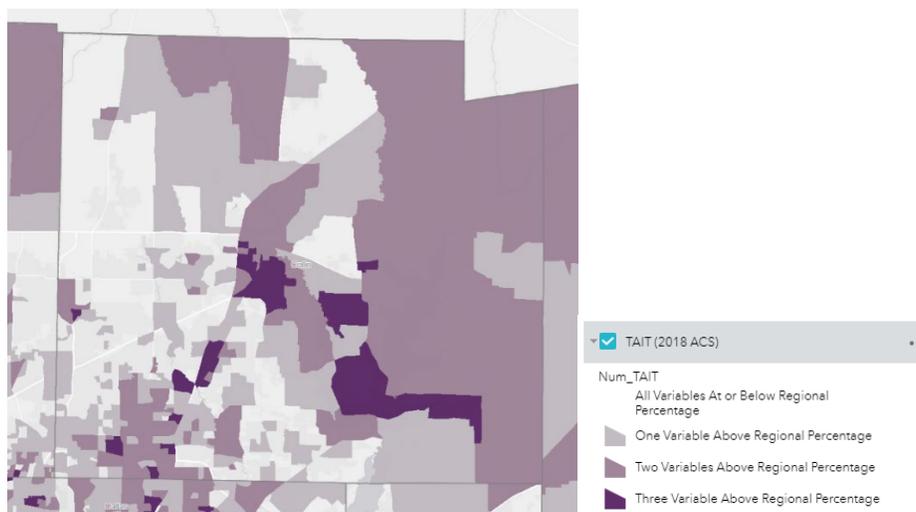


Figure 13: Collin County Transit Accessibility Improvement Tool

(Source: NCTCOG)



NCTCOG Mobility 2045 Plan

Mobility 2045, the current Metropolitan Transportation Plan, was adopted by the Regional Transportation Council on June 14, 2018. Mobility 2045 guides the expenditure of federal and state transportation funds based on regional goals and makes recommendations for all travel modes through a suite of policies, programs, and projects designed to improve regional mobility and increase efficiency, safety, and system capacity. Below are summaries of plan elements as they relate to transit in Collin County.

Transit Projects in Collin County

Mobility 2045 identified several potential transit projects in Collin County, including a possible People Mover system in the Legacy area at the intersection of the Sam Rayburn and Dallas North Tollways. The plan also identified four transit corridor projects as shown in **Figure 14**. These include Project 2- Cotton Belt East Extension; Project 6- Frisco Line; Project 8- McKinney Line; and Project 17- Spring Creek Parkway High Intensity Bus.

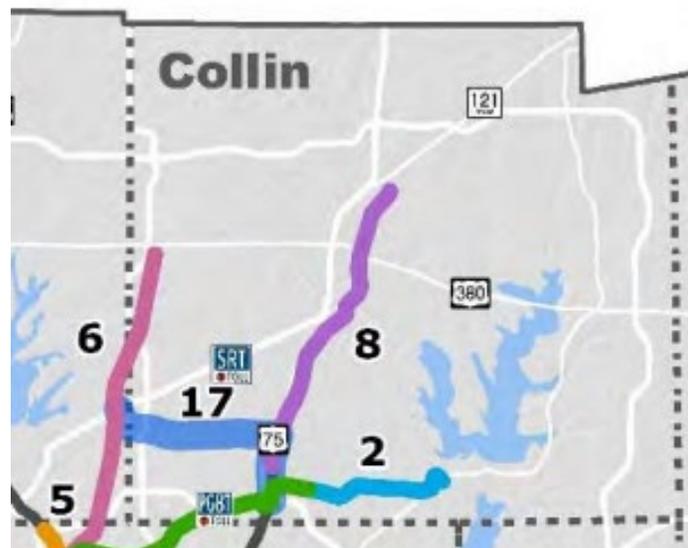


Figure 14: NCTCOG Mobility 2045 Transit Corridor Projects in Collin County

(source: <http://nctcoggis.maps.arcgis.com/apps/webappviewer/index.html?id=f0f61b945fe24a43ada903200e7d3463>)

Regionally Significant Arterial Improvements

NCTCOG’s Mobility 2045 Plan also identifies multiple regionally significant arterial improvements in Collin County for development. As shown in **Figure 15**, some of these corridors may represent potential opportunities for coordinated transit priority treatments, such as transit signal priority, transit stops or stations, or other possible treatments to facilitate higher quality, faster and more reliable transit services.

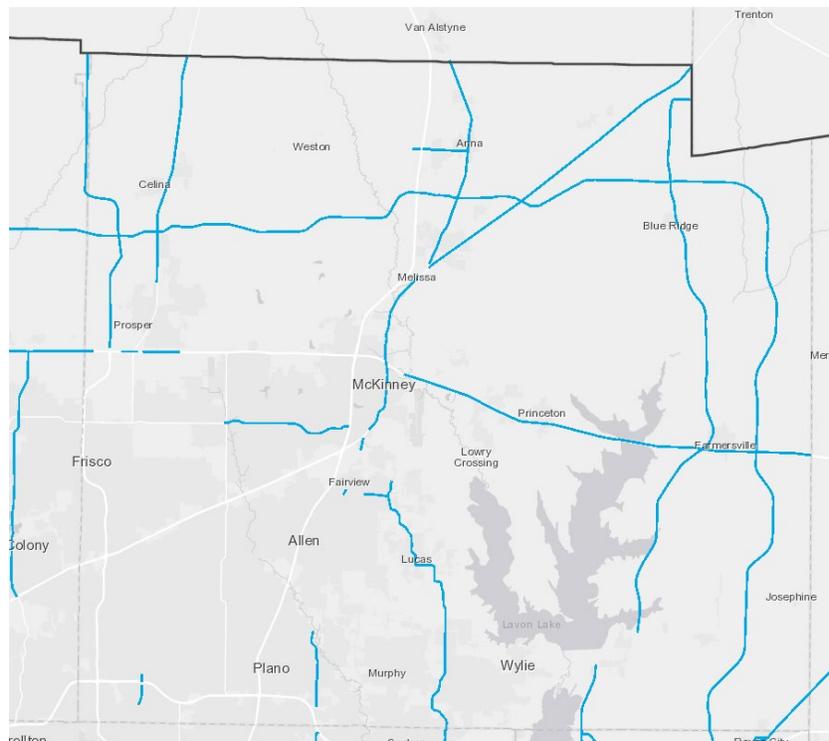


Figure 15: Regionally Significant Corridor Projects

(Source: NCTCOG Mobility 2045)

Denton County Transportation Authority Strategic Planning Guidance Report (March 2018)

The Denton County Transportation Authority (DCTA) updated its strategic plan in March 2018 when their Board of Directors adopted the Strategic Planning Guidance Report. While, as their name suggests, DCTA primarily provides public transportation services within Denton County, they also offer connecting regional service and on-demand service in the adjacent Collin County. The strategic plan document includes a total of 10 Goals and Objectives, several of which relate to Collin County, including the two shown below:

- *Expand DCTA's services into areas where mobility alternatives have a strong likelihood of success*
- *Coordinate regional service with other regional transportation providers*

Additionally, the strategic plan document provides a statement of board priorities, including statements pertaining to Collin County:

- *Sustain and grow Frisco and the McKinney Urban Transit District (MUTD) services (both locations where DCTA operates service via contractual arrangements)*
- *Expansion into Collin County*



- Grow relationships with communities along the Burlington Northern Santa Fe Railway (BNSF) corridor for future service
- Sustain relationship with the MUTD
- Growth within underserved areas
- As a “Long-Term Goal” (within next 2-5+ years), the board included the following statement: *Implement service on BNSF from Belt Line to Celina*

The document also includes a map (**Figure 16**) illustrating the Frisco/MUTD service area and the potential commuter rail corridor (actually shown extending beyond Celina to near the northern Collin County border).

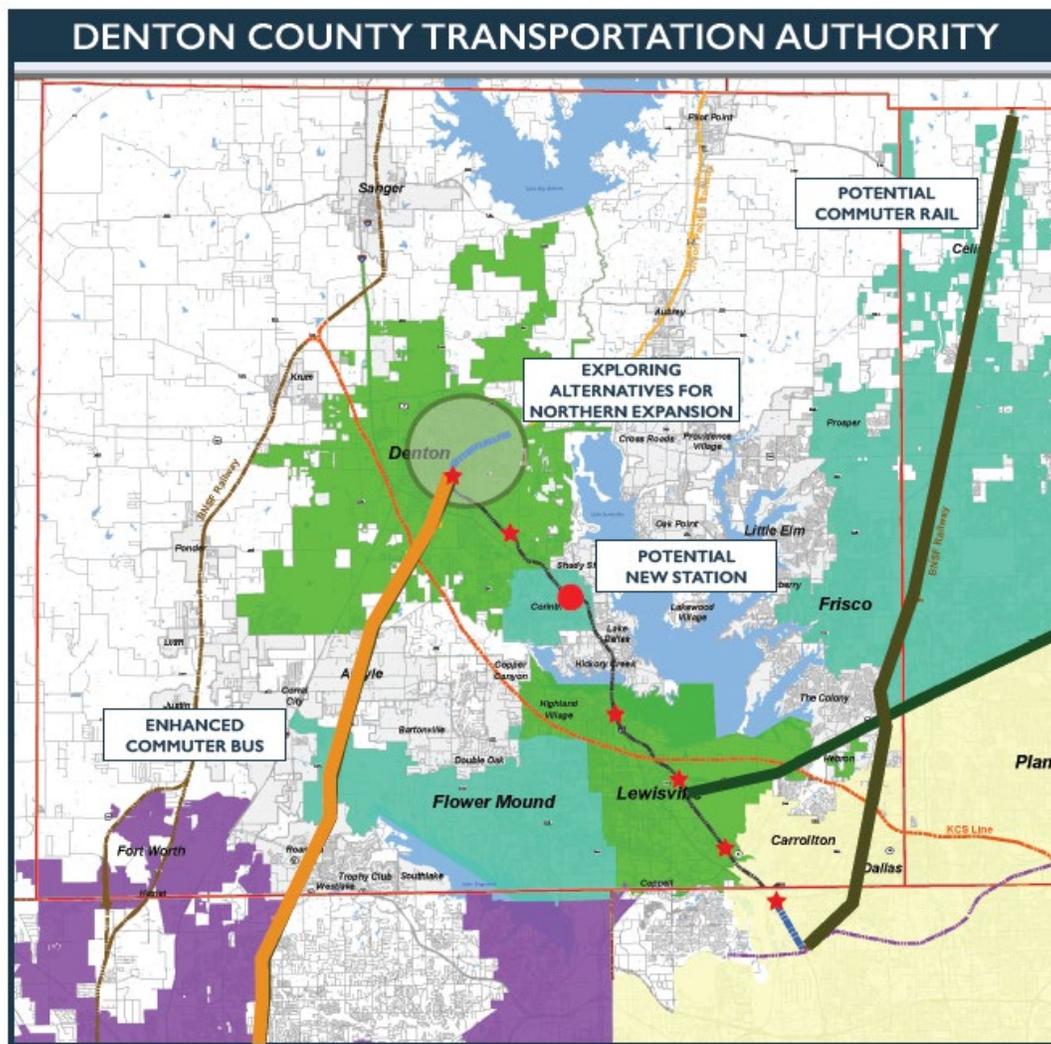


Figure 16: DCTA Strategic Planning Guidance Report
(source: <https://www.dcta.net/about-dcta/shaping-our-future/dcta-strategic-planning-guidance-report>)

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DART 2030 Transit System Plan (2006)

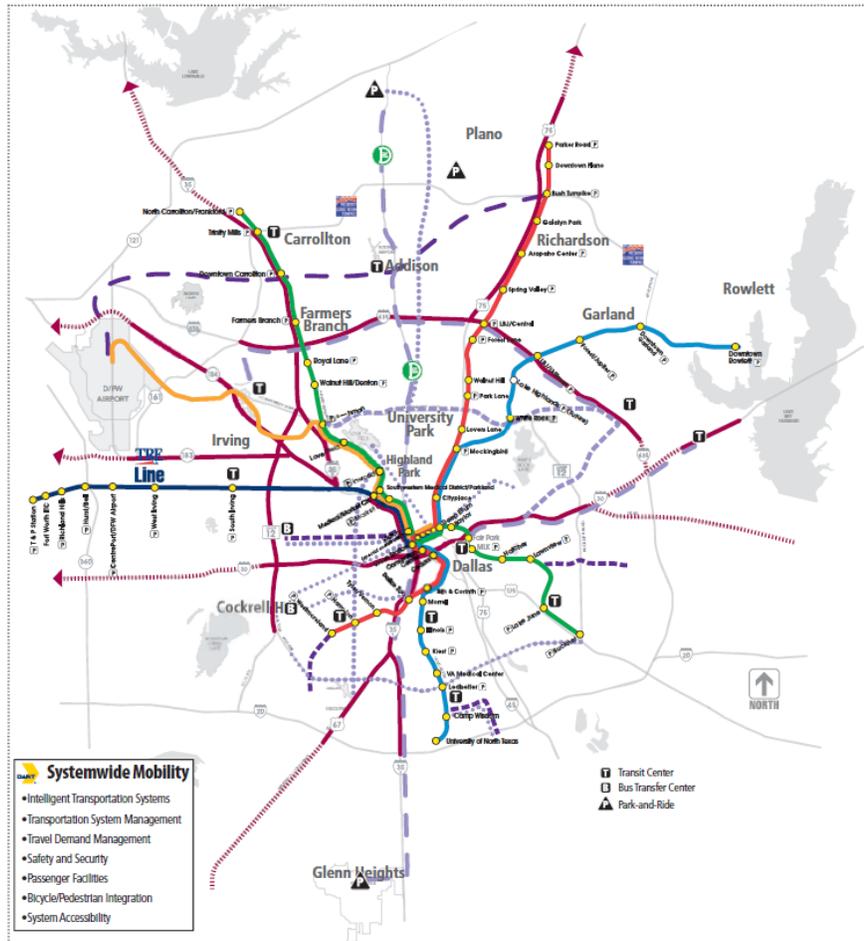
While the DART 2030 Transit System Plan is now almost 14 years old, it remains a “north star” document for the agency. With regard to Collin County, the plan includes a number of elements.

Chapter 6: Recommendations and Strategies



FIGURE 6-1
2030 Transit System Plan

- Light Rail Blue Line & Station (Existing)
- Light Rail Red Line & Station (Existing)
- Trinity Railway Express (TRE) Commuter Rail & Station (Existing)
- Light Rail Orange Line & Station (Committed)
- Light Rail Green Line & Station (Committed)
- 2030 Rail**
 - Express Rail
 - Rapid Rail
- 2030 Bus**
 - Express Bus
 - Enhanced Bus
 - Rapid Bus
- 2030 Managed HOV Lanes**
 - DART Participation
 - No DART Participation
- 2030 Paratransit** (service provided systemwide)
- 2030 Systemwide Mobility**

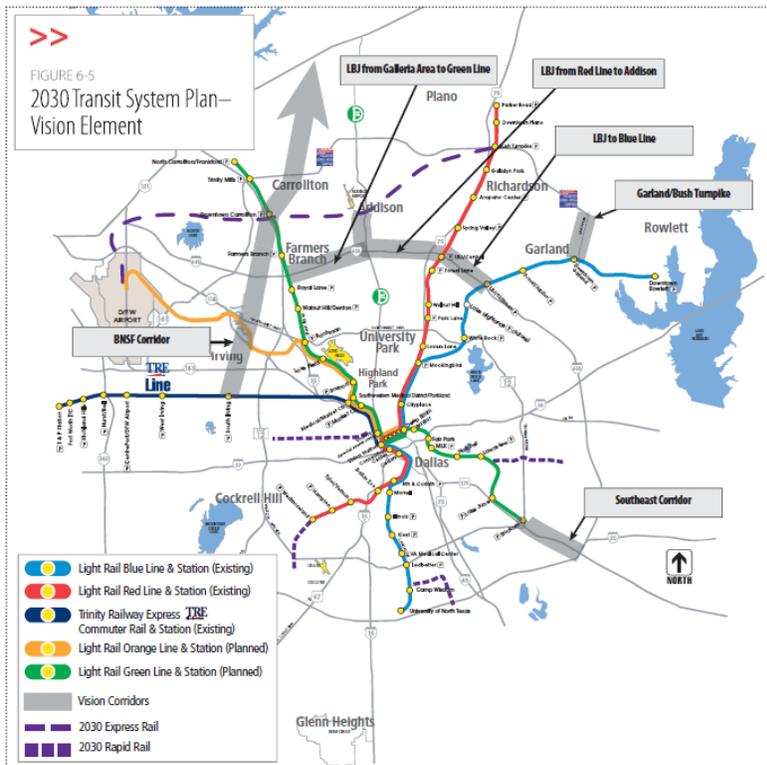


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October 2006

Figure 17: DART 2030 System Plan Map

(source: <https://www.dart.org/about/expansion/2030plan1995map.asp>)



BNSF Corridor

The BNSF Corridor extends from the South Irving Station on the TRE line to the future Downtown Carrollton Station, continuing north into Frisco. The TRE and the City of Dallas own the corridor from south Irving to downtown Carrollton. The BNSF Corridor has the potential to serve areas such as Mercer Crossing, Las Colinas and south Irving. NCTCOG evaluated passenger rail for the section north of downtown Carrollton in the Regional Rail Corridor Study (see section 6.4.8). Implementation of rail in this corridor is closely tied to regional rail needs and passenger demand south of Carrollton toward Irving and Dallas. Passenger service in this corridor will continue to be evaluated in future system plan updates and monitored as regional rail discussions continue. Connections to this potential rail corridor are reflected in both the Downtown Carrollton Master Plan and the DART Northwest Corridor Irving/DFW light rail expansion project.

Figure 18: DART 2030 System Plan Vision Element (source: <https://www.dart.org/about/expansion/2030plan1995map.asp>)

As the “vision element” (**Figure 18**) indicates, the BNSF corridor was identified by DART as an opportunity for future high-capacity transit in the 2030 Plan. The plan also identified Frisco (largely within Collin County) and McKinney (entirely within Collin County) in its “New Member City Potential” section (p. 45). In part due to the existence of freight operations in the corridor, the plan singles out “Regional Rail” as the preferred mode.

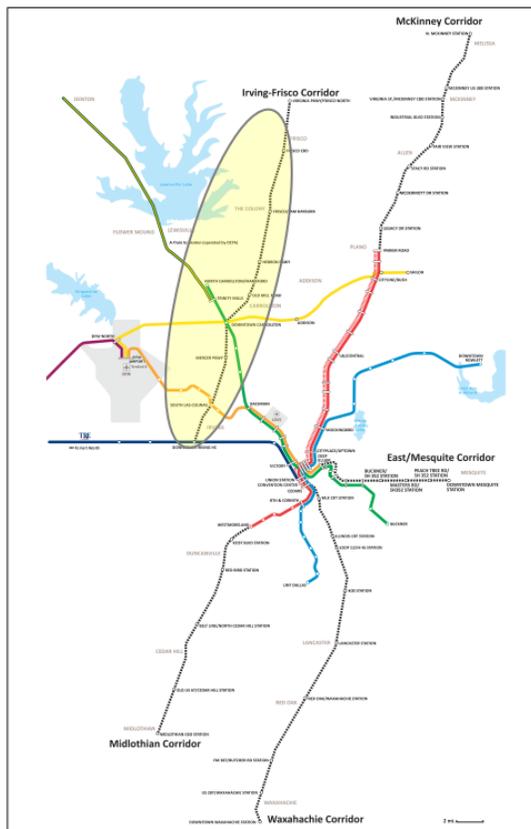
DART Frisco Area Transit Opportunities Summary (2017)

In July 2017, as a part of the development of DART’s 2040 Transit System Plan, the agency developed a white paper entitled “Frisco Area Transit Opportunities Summary.” DART’s concept, derived in part from NCTCOG’s Mobility 2040 document, evaluates at a high level the potential addition of a 29-mile regional rail corridor to the overall regional rail network, as indicated in the map below. DART reviewed current (2014) and future (2040) travel patterns in and along the corridor, including the use of AirSage data. The analysis identifies key future destinations as being along the Sam Rayburn Tollway and the Dallas North Tollway Corridor, with the rail corridor potentially providing connections to both. The analysis also utilized the Transit Competitiveness Index (TCI) to examine market potential. Importantly, the summary document includes the following statement:



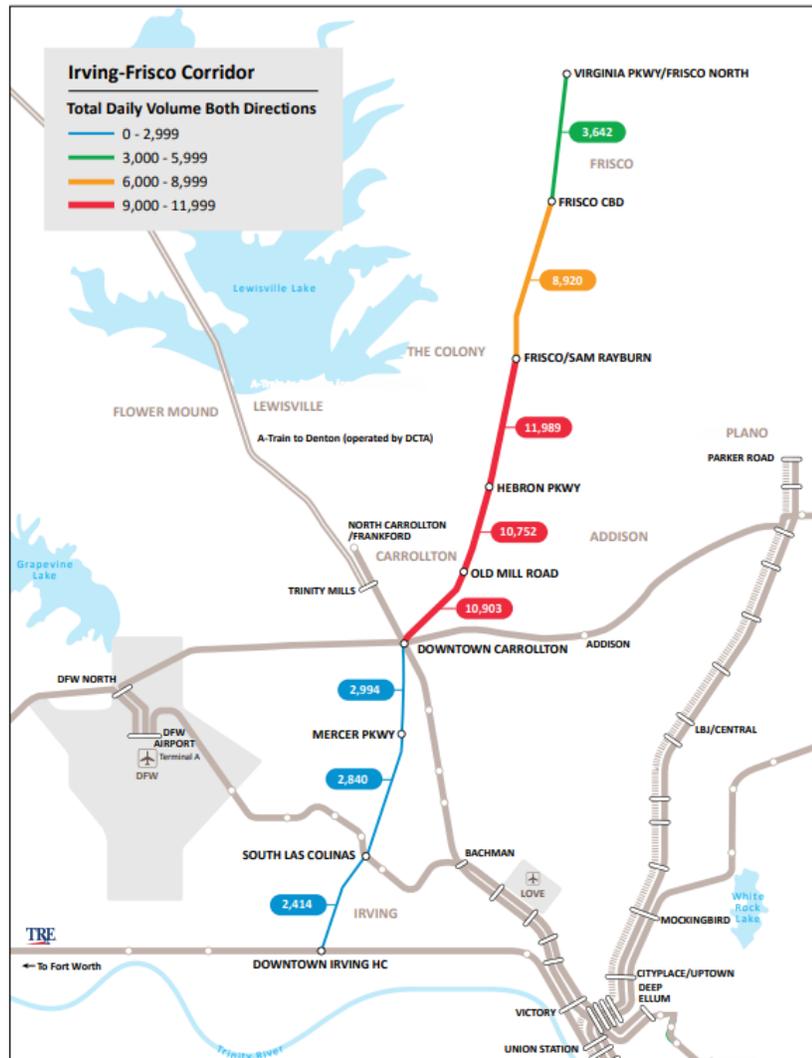
“The Irving-Frisco Regional Rail line is projected to carry nearly 16,000 daily riders in 2040. This is the highest ridership of all regional rail lines evaluated for the DART 2040 Transit System Plan and comparable to the ridership anticipated for TRE and Cotton Belt in the future. The Frisco portion of the line has three of the potential nine stations on the line: Virginia Parkway (North Frisco), Downtown Frisco and Sam Rayburn Tollway/SH121 (South Frisco). These three stations make up 43% of the daily total riders for the entire route in 2040.”

The summary report also estimates ridership by segment along the proposed corridor, with the section between a potential station at Frisco/Sam Rayburn and downtown Carrollton having the highest ridership; slightly lesser ridership between Frisco/Sam Rayburn and a potential Frisco CBD station; and a significant drop-off in potential ridership between Frisco CBD and a potential station at Virginia Parkway/Frisco North (see **Figures 19 & 20**). It also provides further analysis of ridership origins and destinations based on the 2040 model and includes the following sentence in its summary section: *“The growth anticipated for Frisco over the planning horizon (2040) is significant and the opportunity to provide transportation options to residents great.”*



Source: DART based on NCTCOG Mobility 2040: The Metropolitan Transportation Plan for North Central Texas

Figure 19: Irving - Frisco Regional Rail Corridor



Source: HNTB; DART COARR 2040 Forecast; Daily Link Flows both Directions Combined

Figure 20: Irving-Frisco Corridor Projected Ridership Volumes

DART Transit Choices Report (2020)

DART initiated a bus network redesign study to comprehensively examine their fixed route network across their service area, resulting in an April 2020 report. The study cited four primary reasons to undertake this effort: an outdated system; declining bus ridership (since 2004); better aligning transit values and goals; and the opportunity to reconsider the system with a “blank slate” approach. Because DART’s bus network only serves Plano within Collin County, the direct impacts are relatively limited, but the two “bookend” proposals (one focused on service



coverage and the other on ridership and productivity) both affect DART's service in the county, and many of the findings related to challenges and opportunities for fixed route bus service in the region are largely applicable to Collin County as well.

The initial plan was developed through 2019 and 2020 and went through a public review process, with an update provided to the DART Board in summer 2020. Work on a Draft Plan continued and was presented for public and stakeholder review in early 2021. In August 2021 the Board unanimously adopted the New Bus Network Plan, and implementation could begin as early as January 2022.

Access North Texas- Regional Public Transportation Plan for North Central Texas (2018)

NCTCOG prepared the Access North Texas Regional Public Transportation Plan, and it was adopted by the NCTCOG Board on March 22, 2018. The report addresses the full DFW region, with one chapter devoted to Collin County, and focused on public transit-human service coordination. The plan used research, analysis, and public input to identify the transportation needs of individuals with disabilities and lower incomes as well as senior adults. The plan identified eight regional strategies to improve public transportation along with specifics for each county. The effort also made use of the TAIT to identify areas with higher needs for public transportation services, with the resulting map for Collin County shown below.

Based on the TAIT, the following areas were identified with the greatest needs: east of US 75 in McKinney, north of US 380 in Princeton, along US 380 in eastern Farmersville, along US 75 in Plano, near the Dallas North Tollway in Frisco, and near the intersection of SH 5 and US 75 in Allen. Other highlights from the analysis include the continued rapid population growth within the county and the significant mismatch between jobs and labor within the county (350,000 jobs as of 2014 relative to only 146,000 employees), resulting in more than 200,000 commuters coming into the county each weekday to access jobs. Interestingly, more than 250,000 Collin County residents were found to leave the county for employment in the same time period.

The planning process included a public meeting and poll to gain community input, with primary issues including the "patchwork" of service providers; services primarily oriented to elderly and persons with disabilities; and very limited weekend service. Findings from the poll included a desire for additional local bus and/or dial-a-ride service within the county; connections to major activity centers within and beyond the county limits; and a call for a comprehensive, long-term approach to general transit for the citizens of the county.

The plan provides nine prioritized strategies for the public and policymakers to use to advance transit in the county, however, the strategies do not include specific action steps, assignments, or details on needed funding – all of which would be requirements to move towards implementation.

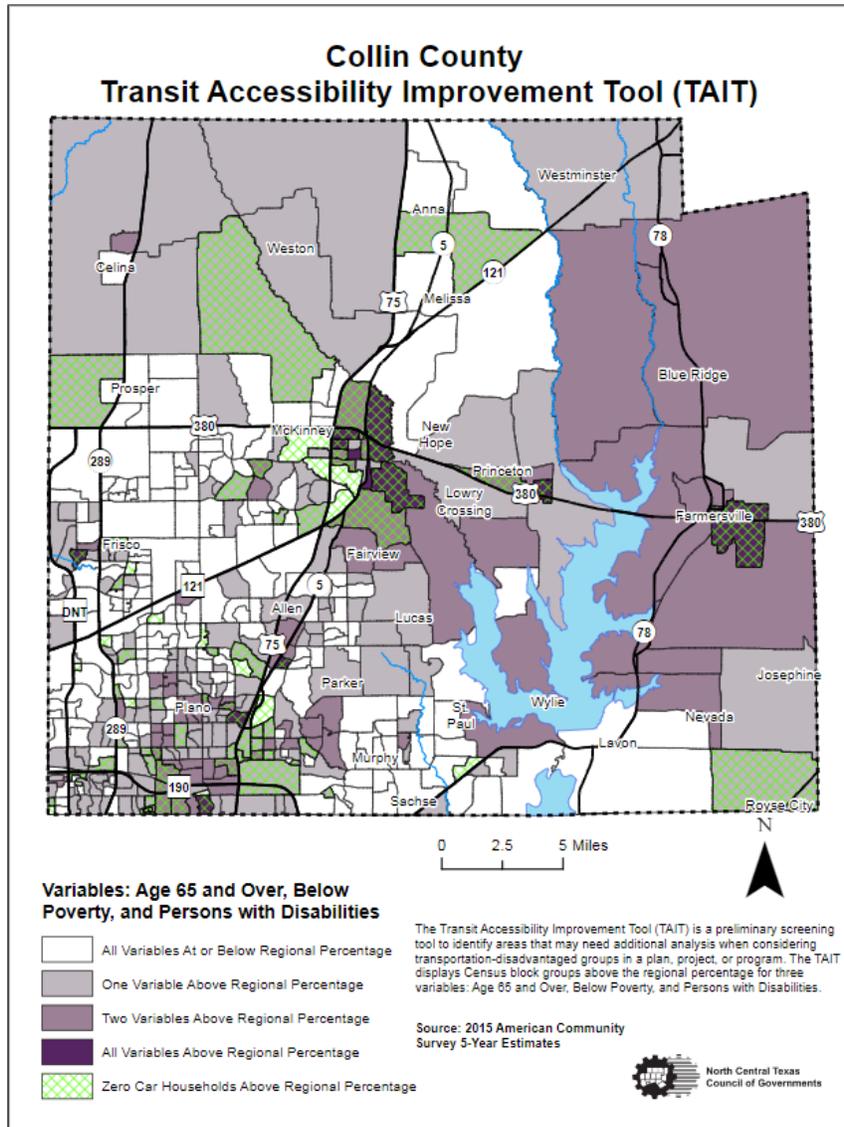


Figure 21: Collin County TAIT Map

(Source: NCTCOG TAIT)

Collin County Transit Needs Assessment and Planning Study (2013)

Likely the most detailed and complete assessment of transit needs in Collin County to date was this document, developed in 2013. While now eight years old, the plan’s statement “For a county with such a large population, Collin County has very few public transportation options, particularly outside of the Plano area which is relatively well served by DART services” remains generally as true in 2021 as it did at the time of publication. The Needs Assessment and Planning Study included the following main sections (plus an associated Executive Summary), each summarized briefly herein:

Collin County Transit Study

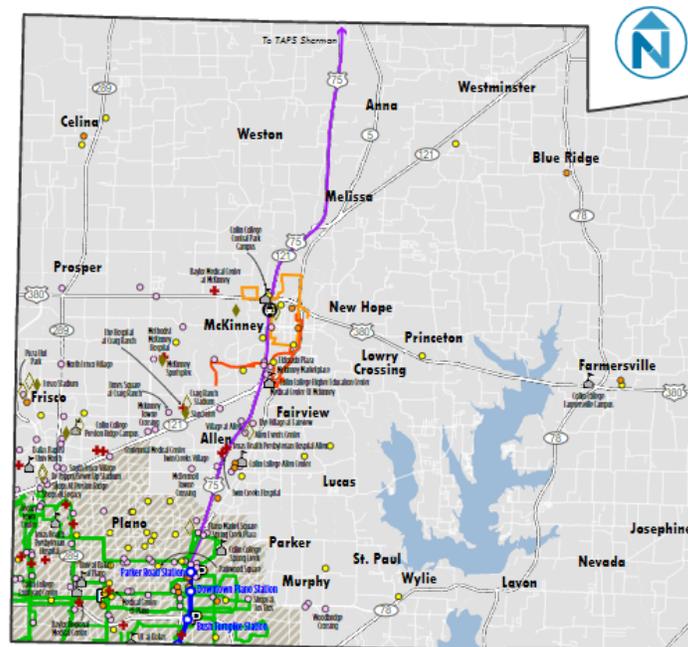


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- Introduction**- The report provides an overview of purpose and details relevant studies. For the sake of minimizing redundancy, the prior work cited in this document are not re-summarized here, and can be accessed instead here: https://www.nctcog.org/nctcog/media/Transportation/DocsMaps/Plan/FinalReport_for-website.pdf
- Demographics, Activity Centers and Travel Analysis**- This section of the report provides information on Collin County’s population, growth and demographic characteristics generally related to the likelihood of using public transportation. It also documents major employers and activity centers in the county, including the map in **Figure 22** (note that most of the items identified in the legend, with the notable exception of services formerly operated by TAPS, remain today).

Figure 2-14 Activity Centers in Collin County

COLLIN COUNTY



TRANSIT AND MAJOR DESTINATIONS

DART Rail	Arena/Stadium	Greyhound Station
DART Bus	Athletic	Park-and-Ride Lots
CCART Rte 100	Higher Education	
CCART Rte 300	Hospital	
CCART Paratransit	Senior Center	
DART Paratransit	Senior Living Facilities	
TexExpress (TAPS to DART)	Retail/Commercial	

Data Sources: Collin County, TX DOT, NCTCOG

Figure 22: Activity Centers in Collin County

(source: https://www.nctcog.org/nctcog/media/Transportation/DocsMaps/Plan/FinalReport_for-website.pdf)



The section concludes by assessing the travel patterns within, into, and out of the county, information that will be updated in the current effort.

- **Existing Transit Services-** Most notably, this report highlighted the role of TAPS and the fixed route within McKinney and countywide paratransit services (both ADA-required within $\frac{3}{4}$ miles of the two fixed routes and countywide door-to-door service) they offered at the time. These services were subsequently discontinued in late 2015 and for the most part not replaced. Additional information regarding the TAPS services ridership and productivity were recorded and, while now dated, will help inform the current study. DART services and facilities were also summarized and will be referenced for comparative purposes.
- **Stakeholder Interview-** Five issues were cited as being primary in the minds of those interviewed: traffic congestion; poor quality and availability of transit services within the county; limited options for seniors, persons with disabilities and low-income residents; auto-focused planning; and the fact that DART rail service does not extend beyond Plano. The study also gathered top perceived transit needs, with the following emerging as most commonly cited: service for transit-dependent populations; commuter transit; DART service improvements; improved service in McKinney; special event transit; and better coordination. There was significant input on the need to build support for more and better transit in the county as well.
- **Transportation Toolbox for Collin County-** A relatively comprehensive list of mobility options is detailed in this section, with an assessment of their applicability across five geographic groupings to reflect differing service needs, including countywide; rural communities; suburban/employment base; suburban/bedroom communities; and small urban community. Each mobility option is described across seven variables and which of the geographic groupings that could be appropriate.
- **Evaluation of Alternatives and Presentation of Preferred Strategies-** The consultant team recommended evaluating alternatives against four primary criteria: Community; Transportation Benefits; Financial; and Implementation. Top ranking service all-county alternatives included carpools; community shuttles; general public dial-a-ride (which with technological advances is now equivalent to on-demand shared ride); with other services being more appropriate to one or more of the geographic types. Local fixed routes were not well-ranked due to low population densities and relatively high cost. The assessment is summarized in **Figure 23**:

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Figure 8-1 Evaluation of Short-Term Transit Service Alternatives

Service Alternative	Countywide	Rural Communities	Suburban/ Employment Base	Suburban/ Bedroom Communities	Small Urban
Volunteer Driver Program	●	●	●	●	●
Mobility Management	●	○	○	●	●
Coordination/Cost Sharing Opportunities	○	○	●	●	●
Subsidized Taxi Program	○	○	●	●	●
Carpool	●	●	●	●	●
Vanpool	●	●	●	●	●
ADA Paratransit / Eligibility-Based Dial-A-Ride	●	●	●	●	●
General Public Dial-A-Ride	●	●	●	●	●
Community Shuttles	●	●	●	●	○
Express Bus / Park-and-Ride Service	●	○	●	●	●
Limited Bus Stop Service	●	●	●	●	●
Point Deviation Service	●	●	●	●	●
Route Deviation	●	●	●	●	●
Feeder/Connector Service to Fixed-Route	●	●	●	●	●
Site-Specific Shuttle	○	●	●	●	●
Local Fixed-Route Bus Service	○	○	●	○	●

*To be included among prioritized strategies based on input from the Project Review Committee.

● = High Ranking ● = Medium Ranking ○ = Low Ranking

Figure 23: Evaluation of Short-Term Transit Service Alternatives

(source: https://www.nctcog.org/nctcog/media/Transportation/DocsMaps/Plan/FinalReport_for-website.pdf)

- Implementation Considerations-** This section of the report cites some of the key challenges to developing a more robust transit system within Collin County, including this statement: *“Collin County’s cities view transportation as one of many services they could offer, but it is generally a low priority.”* An important part of the current study will be to determine the degree to which this finding has shifted over the eight plus years since this report. The report also identifies seven key considerations that will also be revisited herein to assess any changes over time and better understand the current state of transit in Collin County.
- Funding Strategies-** This section describes the current situation, noting presciently that *“...TAPS can rely on its available resources...but funding has not been generated within Collin County which suggests that ongoing transit operations, especially in rural and suburban bedroom communities, are uncertain”* (TAPS service was terminated approximately two years after this report was completed). The report goes on to outline currently available funding sources and then estimates the cost for the range of services described previously. Subsequent sections describe the range of potential funding sources from local, state, federal, and private sectors that could potentially be made available to support transit services in the county.

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North Central Texas Council of Governments Regional People Mover Initiative

As noted on the NCTCOG website (<https://www.nctcog.org/trans/plan/transit/emerging-transit-trends/people-mover>), “People movers circulate travelers across a geographically small area, typically using automated, electrically-powered vehicles operating on elevated guideways. People movers connect districts or single destinations to larger-scale regional transit. While these systems are similar to regional light rail, people movers typically operate smaller vehicles that serve small areas with stations spaced closer together and a more frequent level of service.” Within the DFW region, two people mover systems are currently in operation- the DFW International Airport Skylink and Las Colinas Area Personal Transit (APT) system. NCTCOG continues to explore the potential for additional people movers in the region, including several areas within Collin County, based on prior work including a concept study, a feasibility study, and a conceptual engineering study.

Transportation Equity and Access to Opportunity for Transit-Dependent Population in Dallas (October 2017)

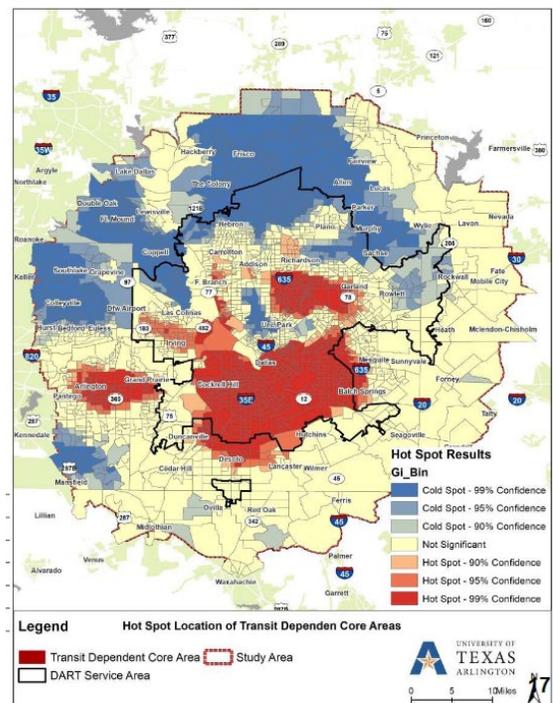
The City of Dallas in coordination with the University of Texas at Arlington produced a report in 2017 assessing transportation equity and access. While the report focused on the City of Dallas, some regional analysis was also conducted and has relevance for Collin County. By examining four characteristics commonly associated with transit dependency (minority population, senior population, low-income population, and persons with disabilities population), the study identified transit-dependent “hot spots”, or areas where the need for public transportation is greater. Notably, while only the southern portions of Collin County are included in the analysis, no areas within the county are considered to be “hot spots” for transit dependency.

Figure 24: Hot Spot Transit-Dependent Populations

(source: https://dallascityhall.com/government/Council%20Meeting%20Documents/msis_2_transportation-equity-and-access-to-opportunity-for-transit-dependent-population-in-dallas_combined_102317.pdf)

Another relevant part of the analysis completed by this effort relates to growth in low wage jobs relative to residential locations of low-wage

Hot Spot Transit Dependent Locations



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individuals. As **Figure 25** clearly indicates, Collin County and the area immediately east were, by far, the fastest growing locations for low-wage jobs in the region for the 2002-2014 time period. This has implications for the types of transit service to be provided and the apparent need for regional connectivity to address the spatial mismatch and better link jobs with housing.

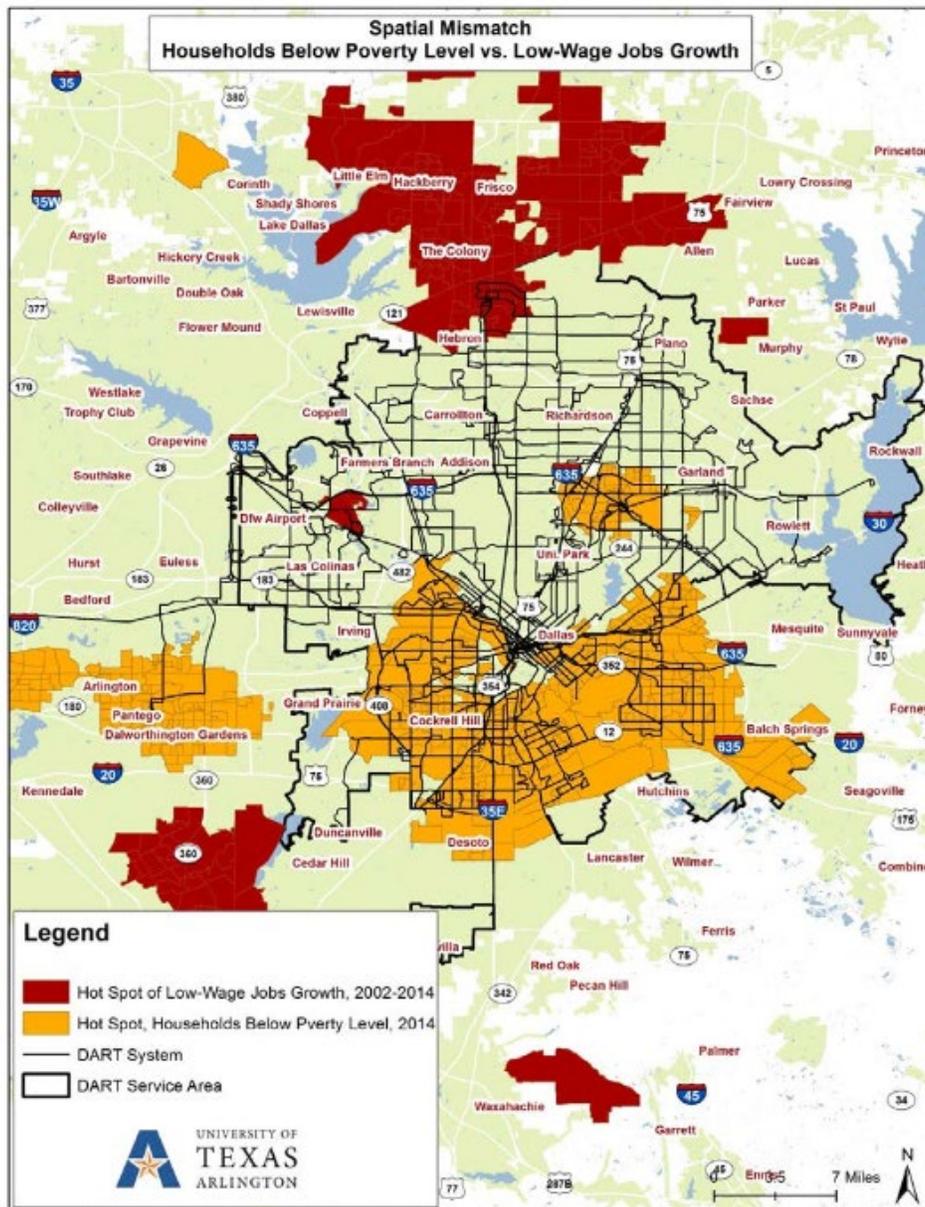


Figure 25: Spatial Mismatch of Jobs and Households

(source: https://dallascityhall.com/government/Council%20Meeting%20Documents/msis_2_transportation-equity-and-access-to-opportunity-for-transit-dependent-population-in-dallas_combined_102317.pdf)

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Collin County Mobility Plan (2014)

The Collin County Mobility Plan was developed by Collin County in 2014 with a comprehensive scope. Regarding public transportation, the plan identifies two primary findings in its recommendations section:

- *“The results of the travel demand modeling indicate that there are several major thoroughfares that will have demands far beyond their capacity by 2035 (some by 2020). Further study is needed to investigate opportunities for providing alternative forms of mobility that better matches the capacity with the demand. One of the options is the expansion of light rail or commuter rail transit, even though rail transit will not totally solve this problem.”*
- *“Another option for evaluation is the potential for Bus Rapid Transit (BRT), which connects terminals with express bus or rapid bus service operating in dedicated lanes or shared lanes with high occupancy vehicles. It is recommended that the further study examine the use of dedicated lanes within arterial medians, along power-line easements, or other express bus routes for cross-town movement. These BRT routes should connect to rail or bus transit stations and transfer centers.”*

Finally, the plan offers the following finding of relevance for public transportation and alternatives to auto travel: *“An observation that one can make when reviewing the elements of the CCMP is that there are many roadway segments in the 2035 Level of Service map that are projected to operate at a Level of Service F - basically “gridlock”. These projected deficiencies indicate it is not feasible to build enough roadway lane miles to relieve all future congestion.”*

Other Studies

There is no doubt that additional studies, including a very recent confidential assessment of microtransit services in the county, have been conducted for Collin County and surrounding areas in some form or fashion. Some may not have been identified, other studies have only a peripheral connection to the study topic and were therefore excluded, and others were excluded due to their proprietary nature. In the event that new or additional studies or analyses become available, the project team will consider those during the balance of the effort.

Summary

Collin County is ranked 20th among the 100 fastest growing U.S. counties with a population of 10,000 or more. Its population increased by approximately 33% in the last 10 years. It has an existing population of over one million with a growth rate of approximately 2.93%. Collin County has few and limited transit services with most of the resident’s commute on their personal cars, with the exception of the Plano area that is served by DART. DART offers relatively robust transit



with a mix of fixed route, paratransit, and light rail in the City of Plano only, while the remaining cities are serviced by DCTA and the MUTD-led transit programs.

This planning study is occurring during the COVID-19 pandemic and a time when public transportation systems nationwide (and globally) have experienced unprecedented ridership losses. Not surprisingly, this has led to discussions about the ongoing viability of transit, as well as cities and many other aspects of daily life. Researchers have begun investigating the impacts and their potential consequences as the world gradually recovers from the pandemic, yet it is simply too early to know the full effects. Nonetheless, fundamental conditions of human environments have not changed: the need and desire for social interaction; the need for travel to accomplish activities and to meet a wide range of needs; and the basic living/housing accommodations for the vast majority of people within the United States. Within major metropolitan areas, this implies that mobility needs will also continue to be significant, and that a substantial percentage of the population's mobility needs will not be able to be met by single-occupant vehicle travel. Seniors, persons with disabilities, children, and low-income communities that cannot afford the cost of automobile ownership all will continue to need mobility choices. Ongoing societal challenges such as sustainability, economic opportunity, equity, public health and other issues also will not disappear as a result of the pandemic, and here too the value of a diverse range of mobility choices other than dependence on the automobile should not be discounted. In summary, COVID-19's long-term impact on Collin County's mobility needs cannot be fully known at this point in time, but there is little cause to suggest that planning efforts towards a transportation system that is resilient, multimodal and that meets the needs of the entire community should not continue.

Despite the additional uncertainties imposed by the pandemic, there continues to be significant interest and continued focus on the potential for regional line along the BNSF corridor to Frisco and Celina within Collin County, something that this effort will expand upon. There is also a recognition by many stakeholders that the current, and relatively limited transit options beyond Plano are not adequate for future needs, yet reaching consensus on governance, funding and implementation remains a significant barrier to improvement. This is compounded by structural barriers at the state and local levels to both governance and funding, as will be detailed in the "Funding Plans" section of this study.



Transit Service Needs and Market Analysis

Section Overview

It should come as no surprise that in a county as large, diverse, and rapidly growing as Collin County that the needs for transit service also are substantial, that they vary by geography and market segment, and that they are changing along with the growth. This section will discuss service needs in Collin County and make use of three time periods (short term of 1-5 years; mid-term of 5-10 years; and longer term of 10 years and beyond) to help outline how they are likely to shift over time. Making this assessment more challenging is the rapid emergence of new forms of mobility and technology that are altering how transit service is delivered at the same time as the community is also changing. For that reason, and as is common in planning efforts of this nature, the level of specificity will decrease correspondent to the time into the future.

Transit Service Needs

As was documented in the Comprehensive Transit Needs Assessment section, numerous prior studies and analyses have examined transit service needs in Collin County. When thinking about the propensity for Collin County residents, workers, and visitors to use public transportation, it is important to understand that there is no single factor, or simple way to know, who will ride, when they will ride, or where they will ride. Many factors feed into individual decision-making about their choice of modes, and those choices will vary based on the conditions at the time a decision is made. Nonetheless, many decades of research have identified the components that go into that complex decision-making process, and they are summarized below.

In a 2015 technical paper entitled “The Factors Influencing Transit Ridership: A Review and Analysis of the Literature” Brian D. Taylor and Camille N.Y. Fink of the UCLA Department of Urban Planning reviewed and assessed a large body of research relating to the question of transit propensity.² They concluded that there are two main categories:

- Factors that are within the control of the transit provider
 - The amount of service provided
 - How often it runs
 - Where it operates
 - How reliable it is (which in reality is only partially within the control of the transit agency as congestion and roadway conditions are significant influencers of service reliability)
 - How much it costs to use
 - Overall service quality

² The Factors Influencing Transit Ridership: A Review and Analysis of the Literature. UCLA Department of Urban Planning Working Paper. Brian D. Taylor and Camille N.Y. Fink, 2015.



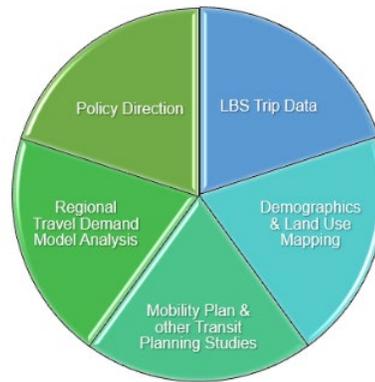
- Factors that are external to the transit provider
 - Automobile access
 - Parking costs
 - Unemployment levels
 - Job concentration in urban core (or lack thereof)
 - Income levels
 - Population and employment density
 - Land use and development patterns

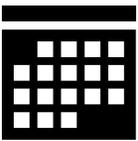
In Collin County, the Comprehensive Transit Needs Assessment section addressed the first set of factors at present and discussed future plans as identified by current transit providers.

Transit Needs

Understanding Transit Propensity in Collin County

Based on the project team’s efforts in evaluating existing conditions, leveraging NCTCOG’s knowledge of transit in the region and specifically in Collin County, and working with the Project Advisory Committee, five key components were identified for analysis. Each of these five contribute to transit propensity within the county and by working to synthesize all five, the project team developed an overall assessment as described in more detail below. In the case of Collin County, the project team sought to go beyond more common assessments of transit propensity that primarily focus on transit need among populations that historically have been found to be more likely to use the services. Instead, this evaluation sought to take a more comprehensive view that considered propensity along several different, but related spectrums.



 		
<p>Temporal (Today to 2045)</p>	<p>Spatial</p>	<p>Trip Purpose</p>



The temporal aspect is challenging due to the tremendous growth anticipated in the county through 2045. As the county continues to add more people, jobs, and activities, travel patterns will change. However, this change will be ‘lumpy’ in nature, with some areas and corridors seeing substantial, even dramatic, makeovers and other more outlying areas remain largely unchanged. As will be discussed in the forthcoming document “Best practices for transit-supportive economic development”, there are significant opportunities to help shape this coming wave of growth to be more transit supportive and less auto dependent. The other major consideration here is the continuing impact of technological change on mobility and travel patterns. Already the availability of app-based mobility on-demand services has had a major impact, and that is likely to be greatly accelerated in the coming years as autonomous technologies and related advancements become increasingly prominent.

Highly interrelated is the spatial component as travel behavior is heavily influenced by the location of goods, services, and other needs that people within Collin County need to access. While many trips will continue to be most conveniently served by the automobile, there are and will continue to be sizeable segments of the population for whom automobile ownership is not a viable or in some cases, preferred option. The spatial configuration of development also will be a major determinant for where transit can function effectively (with dense, walkable, mixed-use developments being most conducive) and where it is challenged to provide anything beyond a lifeline level of service.

Lastly, trip purpose is another variable in the transit propensity equation. Traditionally, work-based trips have been the “bread and butter” of public transportation. However, those trips represent less than 20% of all trip-making that occurs and that percentage continues to slowly decline over time (with the pandemic and its lasting impacts having a yet-to-be fully understood effect as well). Developing transit services that can meet the broadest possible array of trip purposes can increase ridership, improve access and mobility, and achieve other community benefits. Of course, the longer service hours, more days of service per week, and increased frequency typically required to offer transit services that are convenient and easy to use also depends on external factors including land use, economic conditions, and numerous other factors including perhaps the most vexing of all- the availability of funding.

Policy Direction

With extensive and long-standing experience with public transportation issues in Collin County, and supported by the existing conditions analysis, the project team evaluated policy direction as one important component of transit propensity in Collin County. During this part of the analysis, several questions were asked to determine how best to map this more subjective component, including the following:

- Are local jurisdictions part of an existing public transportation provider (both in terms of service area and funding)?

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- Cities of Plano, Dallas, and Richardson are members of DART
- Have local jurisdictions completed transit studies in the past 10 years or less?
 - Cities of Allen, Frisco, McKinney, Plano, Richardson, and Wylie requested NCTCOG to perform this transit planning study throughout the county; several chambers of commerce, including Allen/Fairview's also requested this study
- Is there a record of affirmative policy action supporting public transportation by governing bodies at local governments?
 - City staff from Anna, Celina, and Prosper have made known city planning efforts based on policy direction from their respective cities/towns towards preparing for rail and other transit modes, reaching out to NCTCOG to further these planning efforts

Based on the assessment of these factors, a map was developed to identify and document transit propensity from a policy direction aspect, as shown in **Figure 26**.

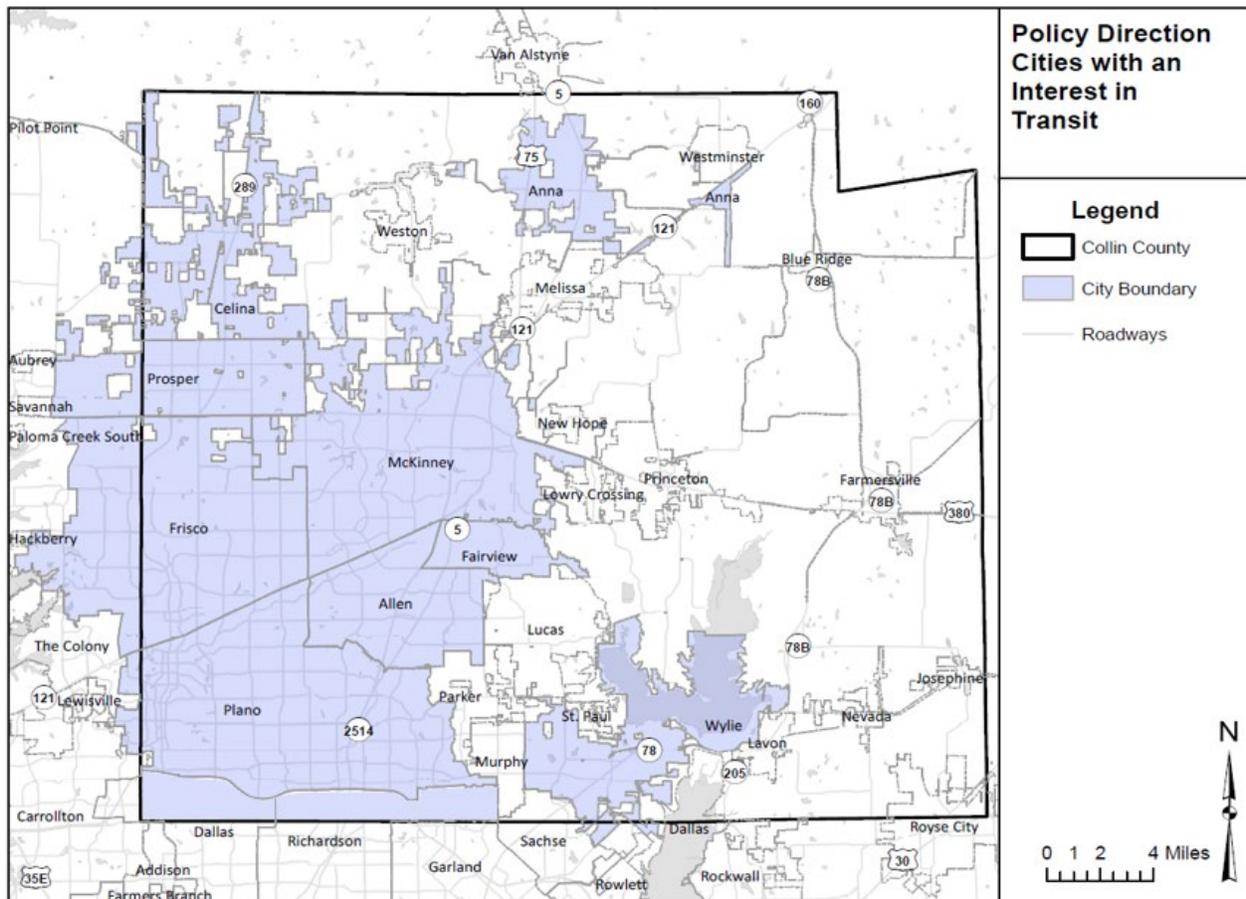


Figure 26: Policy Direction



Location-Based Services Trip Data

The emergence of location-based services trip data as a transportation planning tool provides another means of assessing transit propensity in Collin County. Location based services (LBS) data offers a virtually complete snapshot of person movement within, into, and out of Collin County for an average weekday, Saturday, and Sunday. Trip data is based on movements to and from Traffic Survey Zones (TSZs) regionwide, and can be sorted based on time of day, trip length, trip purpose, and trip volume. While the nature of the data collection process does not allow it to be assessed based on mode (i.e.- bus, auto, bike, pedestrian, etc.) it can still provide many insights into current travel patterns and people movement on a very large scale- more than three million discrete trips were recorded on a typical weekday. NCTCOG obtained the data for this analysis through a private provider, who in turn cleaned, expanded (i.e.- use algorithms to grow the sample size to be representative of all travel activity in the region) and formatted the data into a database. This data, collected during the first six months of 2019 (pre-pandemic), was then provided to the project team via Tableau Reader application.

For the purposes of this study, LBS data was used to supplement the other analyses conducted to develop a full picture of transit propensity, with this data providing a “snapshot in time” of near-term travel patterns. Trip activity was evaluated in several different ways to glean insights into the potential for transit activity. Below are some of the analyses performed and their rationale (note that on all maps below darker shading indicates higher trip activity):

- Trips into and within the county during peak a.m. travel times- As a significant potential market for transit services, a.m. peak period flows were reviewed to see where high volumes of trips are occurring. The area just northeast of the intersection of US 75 and the George Bush Turnpike showed the highest number of inbound trips, with the Legacy West area showing the second highest number of inbound travelers. Several other TSZs near Legacy West and further south along the Dallas North Tollway and a TSZ along US 75 in Allen also show high levels of activity in the a.m. peak. Areas with more than 1,000 average weekday inbound trips, and related data, are shown in **Figure 27**.

Destination Area

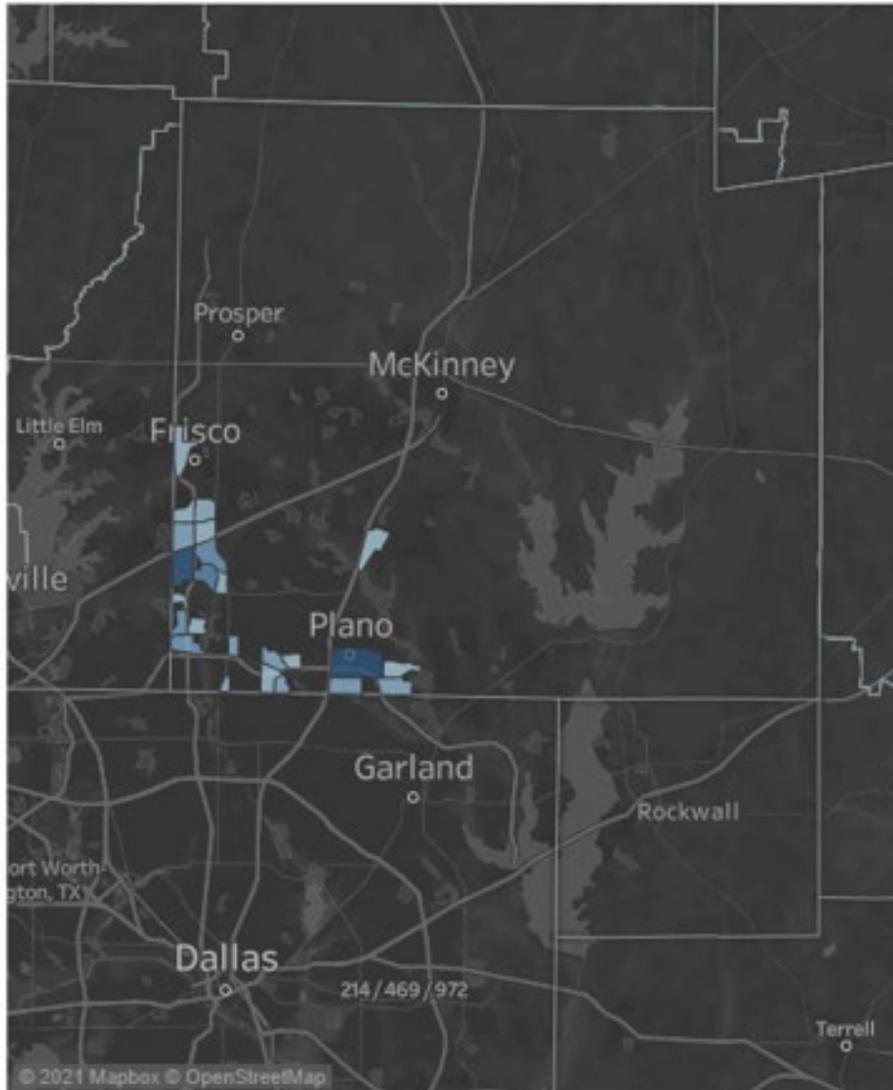


Figure 27: LOCUS LBS Data- Inbound Trip Destinations in A.M. Peak Period

- Trips originating within Collin County and ending beyond the county border- This analysis provides some indication of longer distance trips that could be served by transit and particularly connections to the existing and planned regional transit network, including the planned Irving to Frisco Line and DART's Silver Line and existing light rail network. Here the DFW airport area, an area centered around the junction of IH-35E and Highway 12, and the area southwest of Love Field all stood out as recipients of large volumes of Collin County originating trips (**Figure 28**).

Destination Area

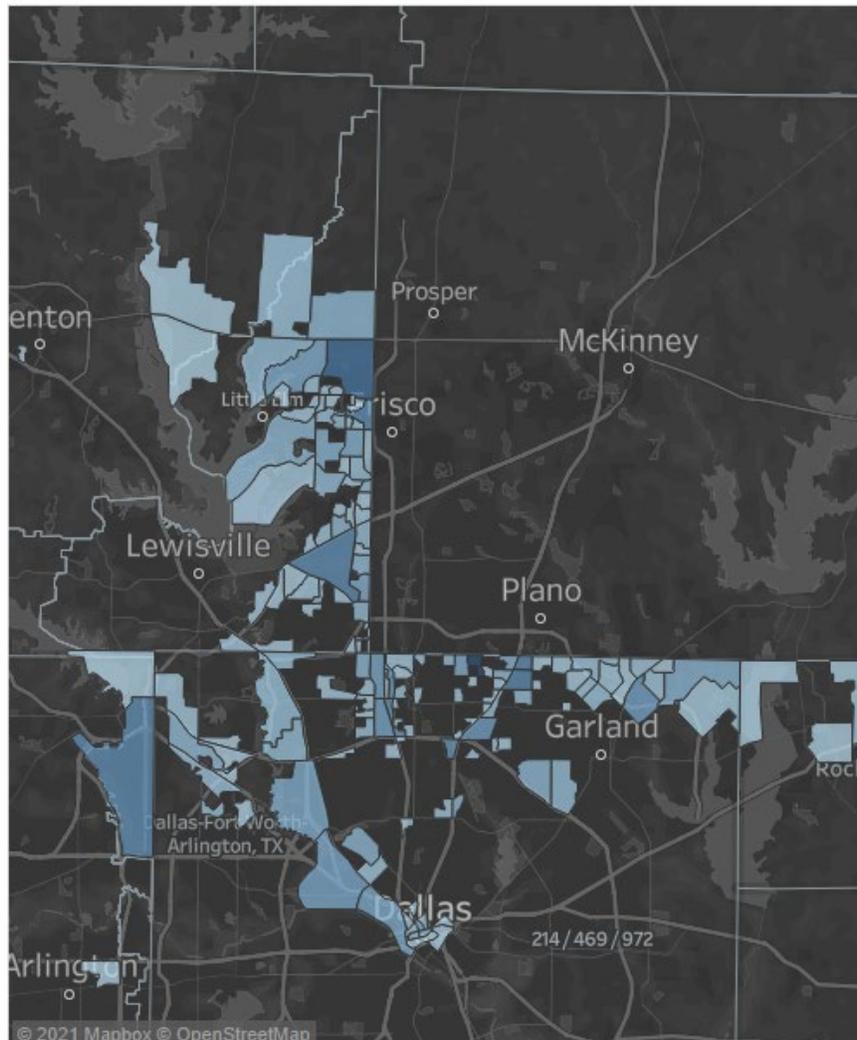


Figure 28: LOCUS LBS Data- Weekday Outbound Trip Destinations From Collin County

- Trips within the county of 2.5 miles or less in distance- These trips were selected because they may be particularly well-suited to be served by transit, and particularly demand-responsive, mobility on-demand type services that riders can summon using a phone-based application. High activity areas based on this analysis (shown in **Figure 29**) include several TSZs along the US 75 corridor including Allen and McKinney, in the Legacy West area and in southwest Plano. However, numerous TSZs including the northeast (Blue Ridge) and northwest (Celina and Prosper) sections, the Farmersville area, as well as Wylie, St. Paul, Lavon, Melissa and Anna all see more than 1,000 trips per weekday taking place.



Destination Area

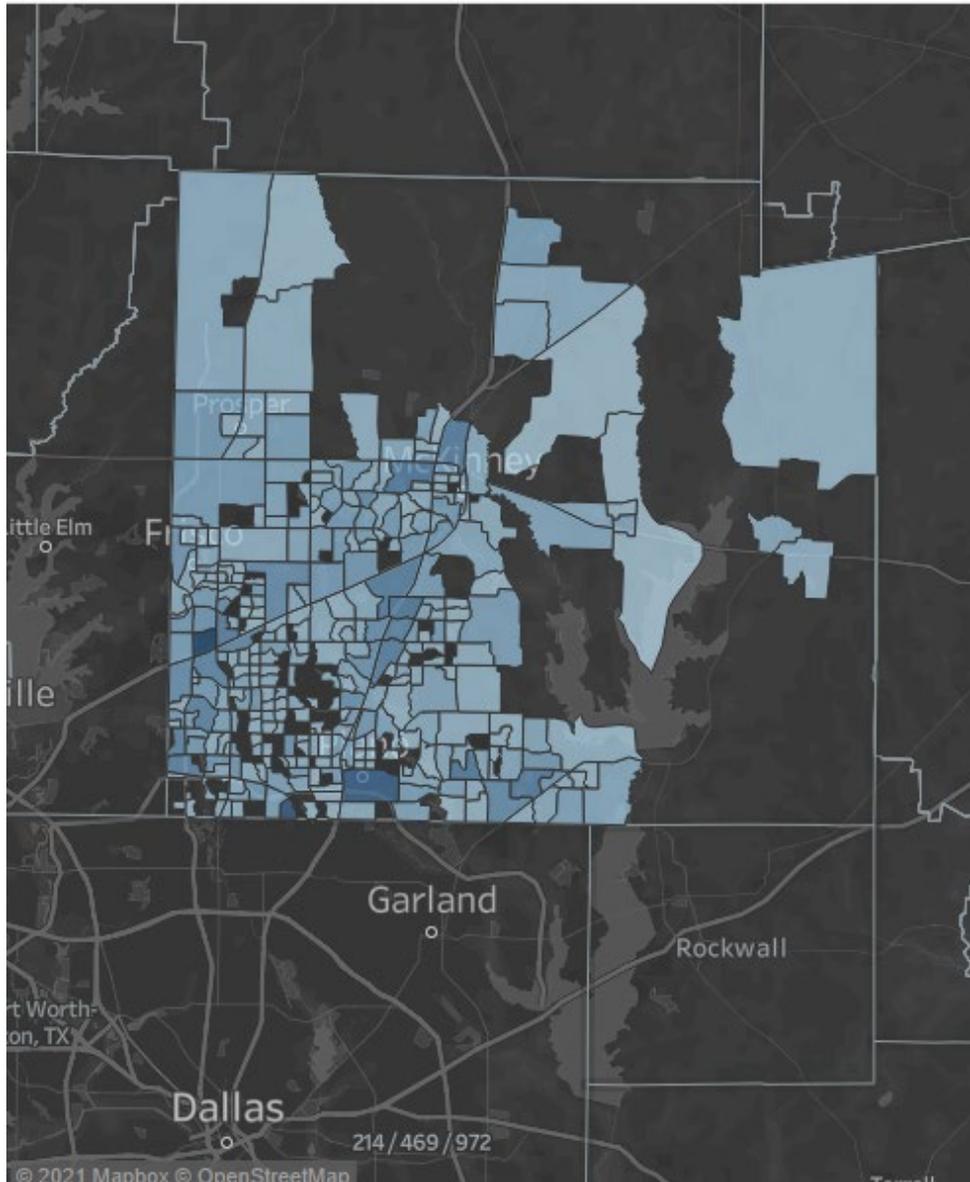


Figure 29: LOCUS LBS Data- Short (<2.5 miles) Trips Within Collin County

In sum, the LBS data serves as a useful complement to other forms of analysis, however, the lack of mode-specificity hinders its utility. Nonetheless, the very large volume of data available provides for valuable insights into overall travel patterns and important factors such as trip lengths, pairs of origins, and attractions (TSZs) with large volumes of travel, travel by time of day and day of week and more.



Demographics and Land Use Mapping

Whether evaluating household, person, or employment density, the concentration of people and activity is tremendously important when gauging transit propensity. Not only are there inherent efficiencies to be gained, but the nature of development patterns also tends to become much more transit supportive as density increases. This can be seen in many different ways- from more complete sidewalk networks, to the placement of buildings closer to the street for improved accessibility by pedestrians, to more shade along walkways and through other characteristics that make walking and using transit more attractive and viable. For this reason, density is generally recognized to have a very high correlation to transit propensity, and the household density data (**Figure 30**) was used to contribute to the overall transit propensity map for the county.

In addition to density, other attributes were mapped and evaluated to inform this analysis. The project team also examined geographic patterns of a range of demographic factors favoring transit propensity, including low-income households; households with zero automobiles; households with fewer automobiles than workers; minority households; households with seniors (over 64) and students (18 or younger); and more. Note that this analysis incorporated both the change in density between now and 2045 per NCTCOG's official demographic forecast as well as the spatial relationship between employment density and household density.

These maps and the corresponding analysis indicate that Collin County follows a pattern of auto-oriented development that is prevalent in suburban/exurban/rural areas on the outer edge of major metropolitan centers across the southern United States. Land uses are predicated on the assumption that most of the trip-making will occur in private automobiles, with limited accommodation for transit, biking, and walking trips. This varies by jurisdiction, by the time that development occurred and other factors with the southwest quadrant of the county showing more transit-supportive attributes. Other findings and observations include:

- Low-income households: Overall, Collin County is an affluent area with a relatively small percentage of households in poverty. In fact, the Transportation Equity and Access to Opportunity for Transit-Dependent Population in Dallas study (October 2017) did not identify any "Hot Spot Transit-Dependent Populations" within Collin County (see Existing Conditions Report for more information).
- Low-wage jobs: The same study cited above did identify that Collin County is an area experiencing very high growth rates of low-wage jobs, suggesting a trend towards a spatial mismatch between workers and jobs. This points to a need to strongly consider longer trips from Dallas County in planning for future transit services.

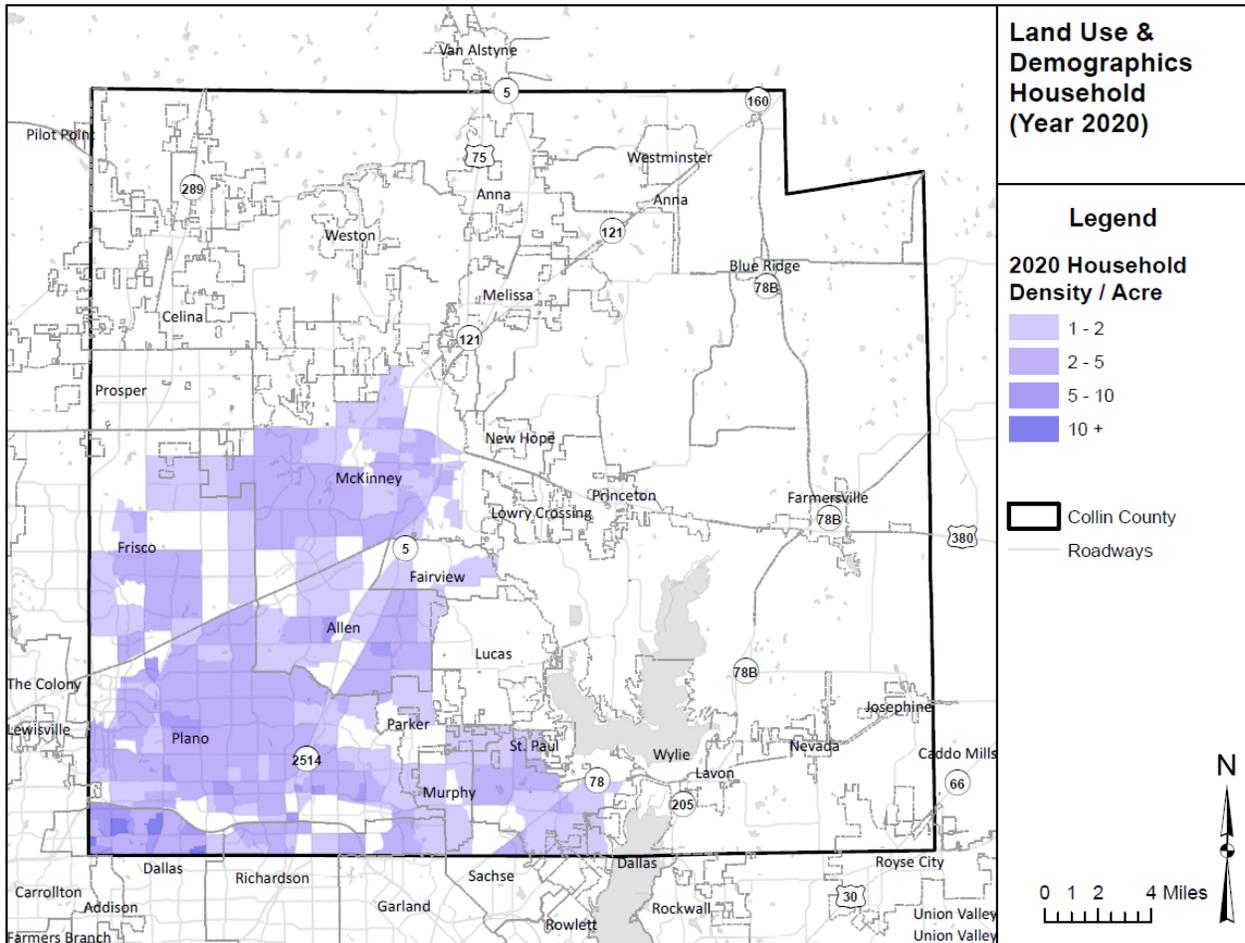


Figure 30: 2020 Household Density

(Source: NCTCOG)

Mobility Plan and Other Transit Planning Studies

As documented in the Comprehensive Transit Needs Assessment section, there have been several recent transit planning studies that considered transit in Collin County. These efforts, along with the NCTCOG Mobility Plan 2045 document, were again evaluated for the purposes of the transit propensity analysis. In this case, multiple studies were aggregated at the census block group level to yield a combined score, which was then mapped as shown in **Figure 31**.

The scoring methodology applied to each census block group is described here, beginning with the previously completed Transit Accessibility Improvement Tool (TAIT) developed by NCTCOG over the past several years.

- TAIT—0 to 3 points depending on how many transportation-disadvantaged populations are concentrated in each census block group



- DCTA Taxi Voucher/On Demand area—2 points
- DART Taxi Voucher area—1 point
- McKinney Urban Transit District—1 point (limited on-demand service)
- DART Fixed Route Bus—2 points if centroid is within ¼ mile
- NCTCOG Future Rail—2 points if centroid is within ½ mile
- NCTCOG Future High Intensity Bus—2 points if centroid is within ½ mile
- Transportation Management Areas—3 points (identified as high-density, trip-intense area needing special attention)
- Bicycle/Multiuse Density—0 to 3 points depending on density levels
- Sidewalk Density—0 to 3 points depending on density levels

The results are total scores in each census block group ranging from zero to nine. These scores were then translated into the shaded summary map shown in **Figure 31**. This input into the transit propensity analysis essentially ‘rolls up’ prior transit planning related efforts and related analyses within Collin County. Given the data feeding into this layer, the resulting shading is consistent with expectations- darker areas correspond to areas with existing transit, with transit-dependent populations, and with more dense parts of the county.

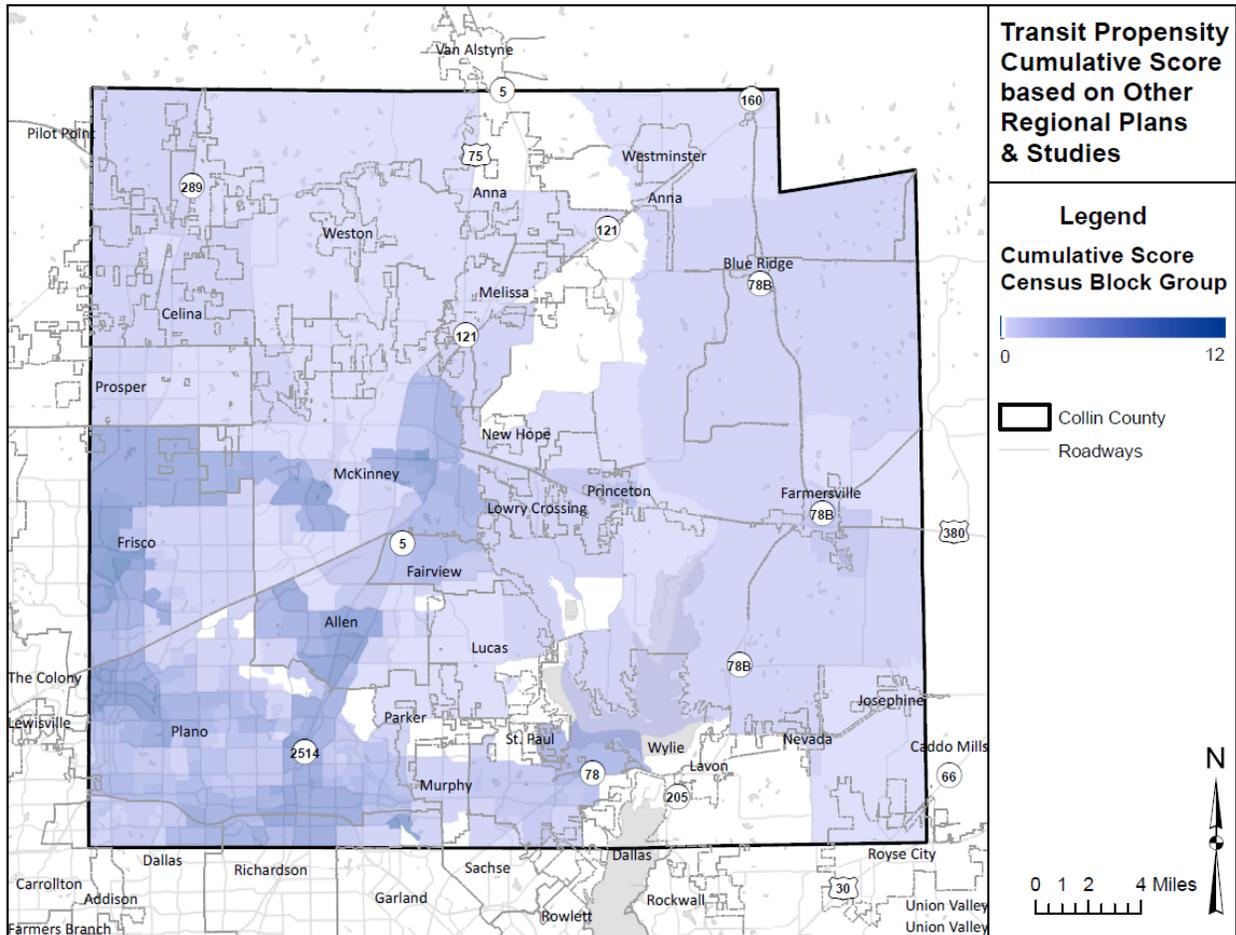


Figure 31: Mobility Plan and Other Transit Planning Studies

Regional Travel Demand Model Analysis

Another important contributor to understanding and estimating transit propensity is the outputs of NCTCOG’s regional travel demand model. This regional model is used to forecast travel demand based on regional growth through 2045, including trips within, into, and out of Collin County. Similar to the demographics and land use mapping section above, there is a wide range of outputs from the regional travel demand model that can inform this transit propensity analysis. For the purposes of mapping, the project team examined work and non-work trips by low-income households with zero vehicles and work trips by households where the number of workers exceeded the number of vehicles available. Together these trip types represent approximately 25% of transit trips regionwide and are the categories that are most likely to take transit when transit is available. Market areas, consisting of clusters of TSZs, were developed for the entirety of Collin County and those above a certain threshold were categorized and color-



coded. These are shown in **Figure 32**. Note that the travel demand model captures a longer-term perspective relative to the LBS data discussed previously as it is based on a model extending out to 2045. The prominence of McKinney and Plano in terms of trip-making is not unexpected given their population and employment patterns, however it is worth noting that the cluster of TSZs around Prosper, the cluster just north of McKinney in the US 75 corridor, and the clusters in the mid-central area of the county extending from St. Paul to Princeton also indicated higher volumes of trip-making for the demographic group evaluated in this part of the analysis.

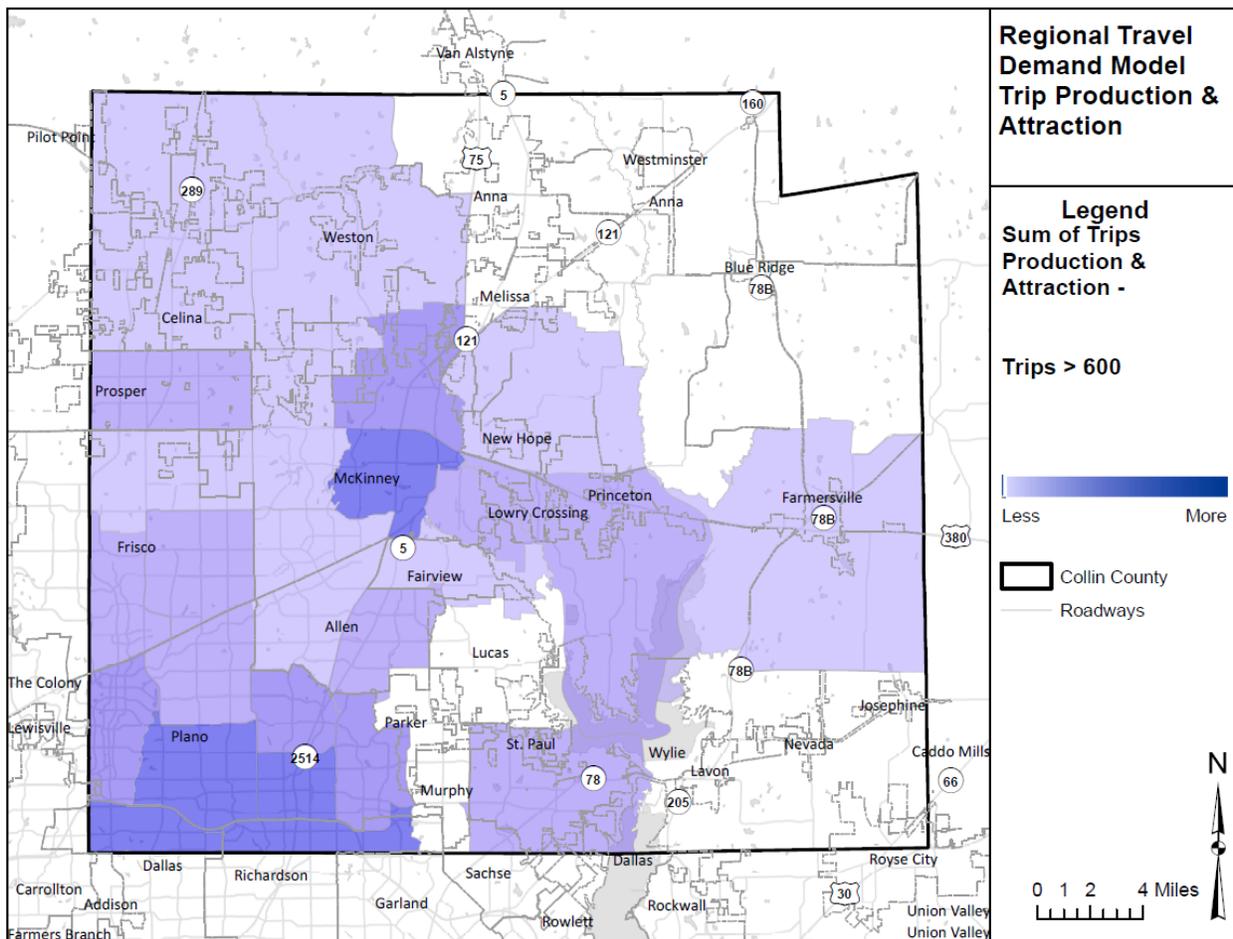


Figure 32: Regional Travel Demand Analysis

Collin County Transit Propensity Summary

Using GIS, each of the five maps described above were then overlaid upon one another to yield an overall transit propensity for the county. Recognizing that there is no exact answer and that local knowledge, unique considerations and other factors will ultimately contribute to decision-making regarding where transit services can and should be offered within Collin County, the



summary map (**Figure 33**) provides a very useful assessment of transit propensity both for the near term and for longer term planning.

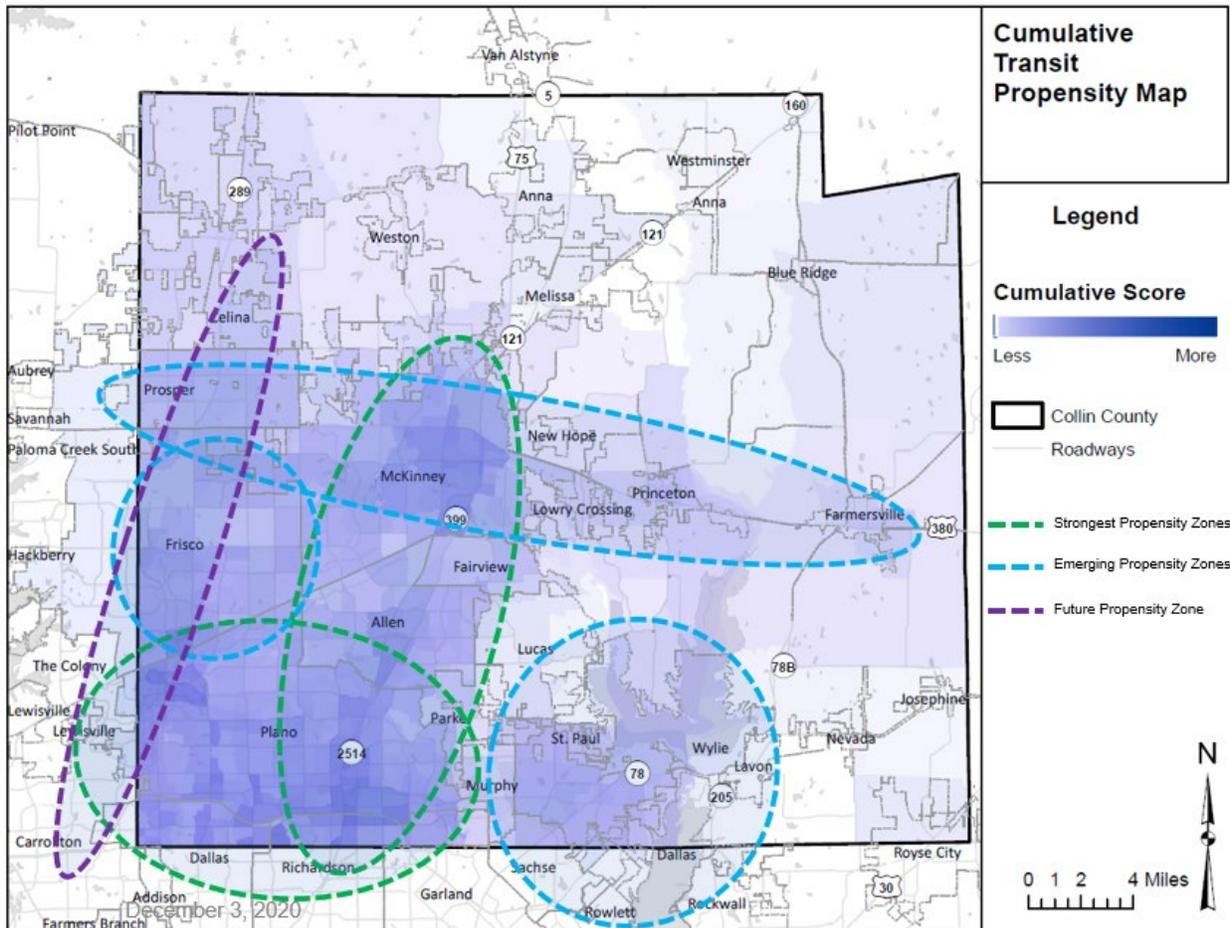


Figure 33: Cumulative Transit Propensity Map

By bringing together a broad range of information concerning factors that affect travel decisions in Collin County, the summary transit propensity map will serve as a foundational planning tool for the balance of the study. In general, the map supports the basic assumptions a transportation planner with knowledge of the county would be likely to conclude: the highest propensity for transit is in the southwest quadrant (primarily Plano) and along the US 75 major transportation corridor (including Allen and McKinney). Those areas do have the highest levels of transit propensity, and they are highlighted with green dashed lines in the map.

A second tier of transit propensity -emerging propensity zones- arose from the analysis, as indicated by the light blue dashed areas. These include the Frisco area near the Denton County line; the south-central portion of the county, including Murphy, St. Paul, and Wylie; and the east-



west corridor across the middle of the county anchored by US 380, stretching from Farmersville to Prosper and including Princeton, Lowry Crossing, and McKinney. The emergence of the US 380 corridor and the US 75 corridor demonstrate how Collin County’s development patterns have been shaped by, and interact with, the transportation network and in particular highway corridors.

The third transit propensity zone, -future propensity zone- highlighted with purple dashed lines, lies along the existing freight rail corridor now being evaluated for potential regional rail. Stretching from Irving to the south of the county through Frisco to Prosper and Celina, the corridor today shows varying levels of transit propensity generally strongest on the southern end. Not unlike the highway corridors referenced above, passenger rail corridors can also serve as development magnets, leading to more intense, mixed-use, walkable, and transit-supportive patterns that are by their very nature strong in terms of transit propensity.

One additional consideration related to governance is the breakout of transit propensity zones by whether or not they are in incorporated areas. As shown in **Figure 34**, just over half of the county is currently unincorporated Collin County, yet only 31% of the area identified as having transit propensity is unincorporated. This is not altogether surprising but does affect critical funding and governance decisions.

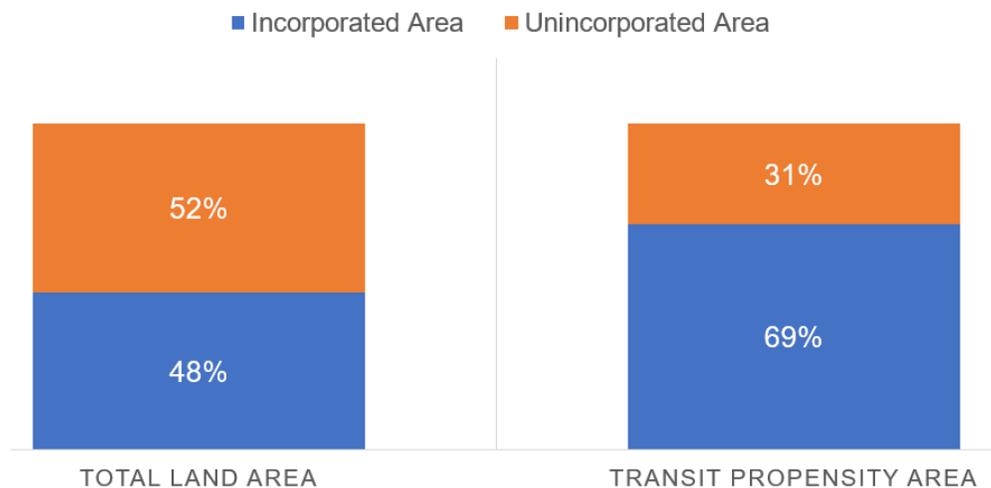


Figure 34: Transit Propensity by Incorporation Status

In summary, the transit propensity zones and the underlying data and analysis behind them match an intuitive understanding of the county’s land use and mobility characteristics, which is a positive. It should be noted that the analysis is only one input into the planning process. In other words, while some areas of the county demonstrate low transit propensity (those with light or no shading), that does not mean that there is no demand or no need for public transportation. Even in areas with very low transit propensity, there are still very likely people



and/or facilities that could and would use transit services if they were offered. Tradeoffs around issues including equity, cost, efficiency, and effectiveness all come into play in such cases.

Market Analysis

In addition to the transit propensity analysis, a market analysis was performed for the county to gain more insight into transit's potential to meet mobility needs.

Existing Population and Employment

Collin County's population exceeded the one million inhabitant mark in 2019, with an estimated 1,034,730 people living in the county per www.collincountytx.gov. With 848 square miles of land, that translates to 1,220 people/square mile. 27% are under the age of 18 and 11% are over 65 years of age, with an average household size of 2.83 in more than 320,000 housing units. An estimated 434,685 employees work in Collin County as of 2019.

Population and Employment Densities

Population and employment densities are shown in **Figure 35** and **Figure 36**. Even with the emergence of new forms of mobility, the geographic concentration of activity in mixed-use walkable environments will continue to be strongly correlated with successful and well-utilized transit service. With more people, jobs, and activities clustered together, the potential for efficient transit increases tremendously, and for this reason the darker areas on the maps below suggest greater transit potential.

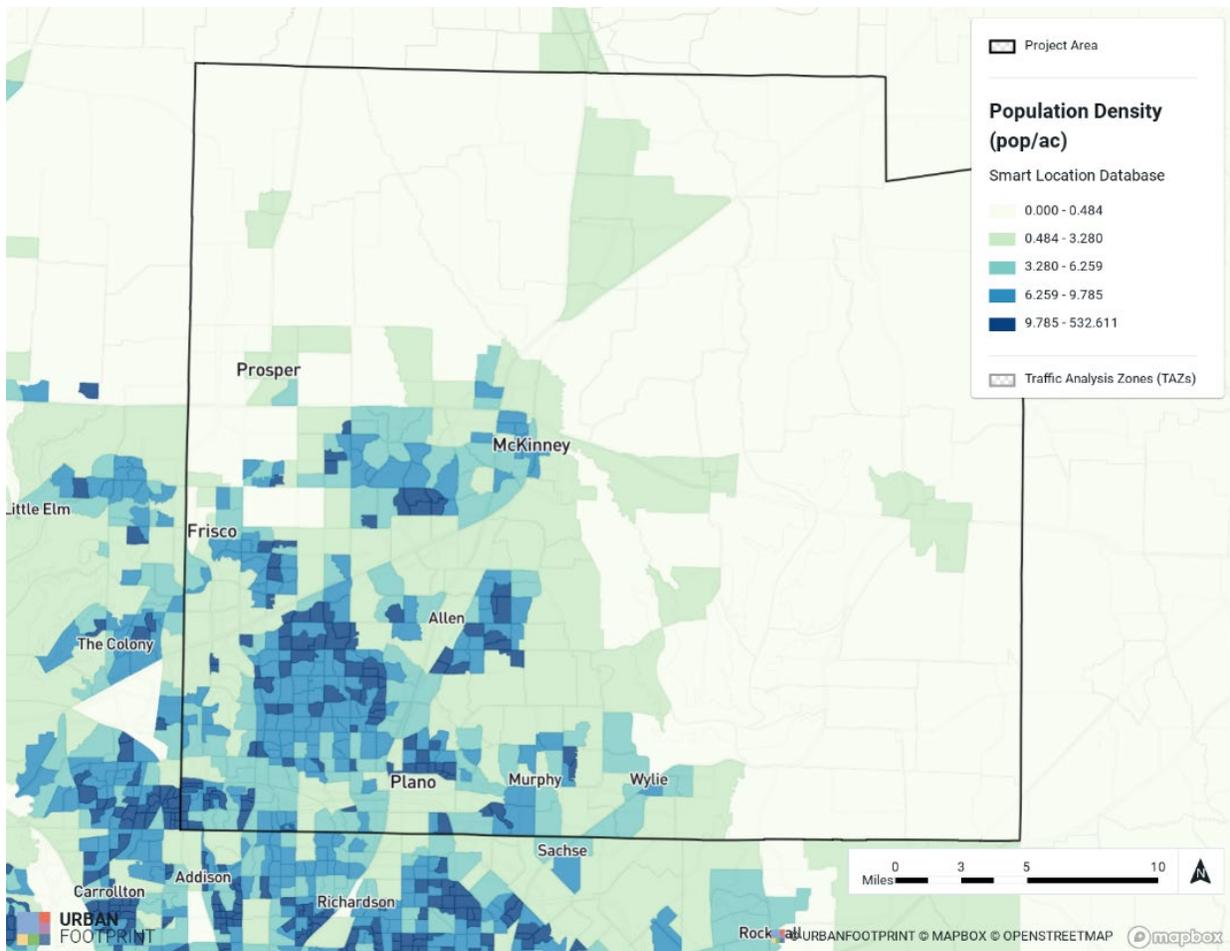


Figure 35: Collin County Population Density

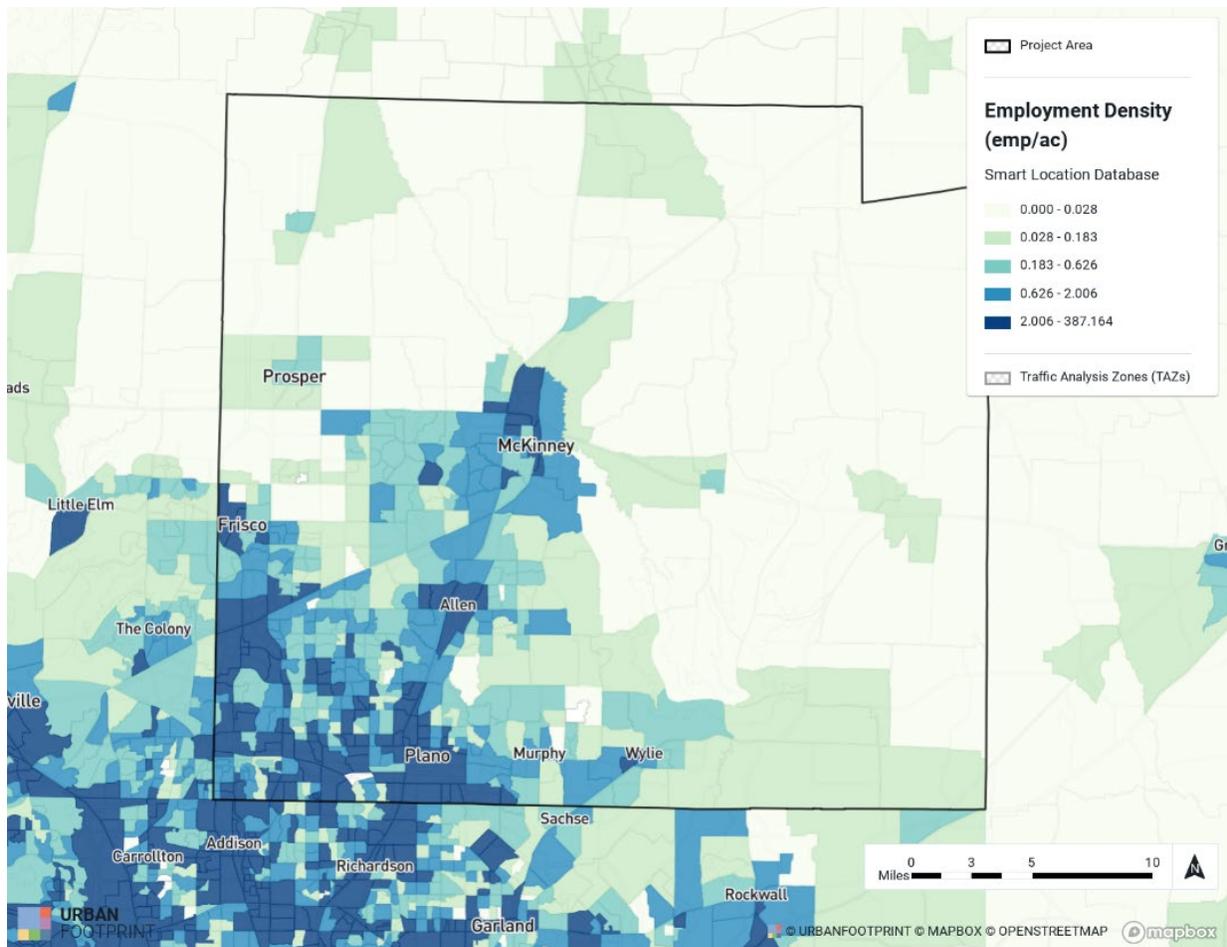


Figure 36: Collin County Employment Density

Population and Employment Growth

As one of the fastest growing counties in the U.S., Collin County has seen more than 200,000 additional jobs emerge over the past decade in the county, and more than 250,000 residents, with more than 80 new residents per day in 2019 (source: www.collincountytx.gov). How new developments are designed, and how existing areas are redeveloped as the county adapts to this influx will go far to shape the mobility outcomes. The cities of Frisco, McKinney and Allen all ranked in the top 50 nationwide for population growth between 2010-2019 (Source: <https://www2.census.gov/programs-surveys/popest/tables/2010-2019/cities/totals/SUB-IP-EST2019-CUMCH.xlsx>). Importantly, the growth occurring in the county is not equally distributed by race and ethnicity, with some population groups growing substantially faster than others.

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Figure 37 and **Figure 38** from the State of Texas Demographic Center provide information on the baseline conditions as they existed in 2018, and the projected growth through 2030.

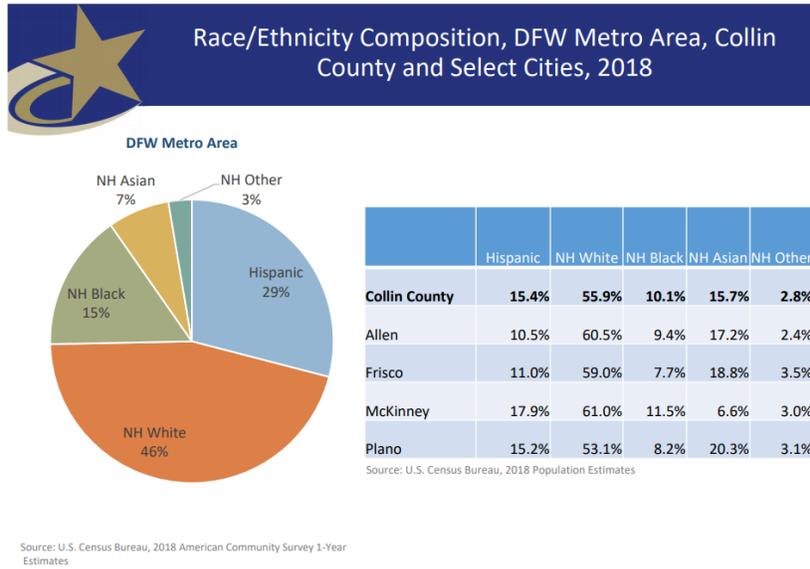


Figure 37: 2018 County Population by Race/Ethnicity

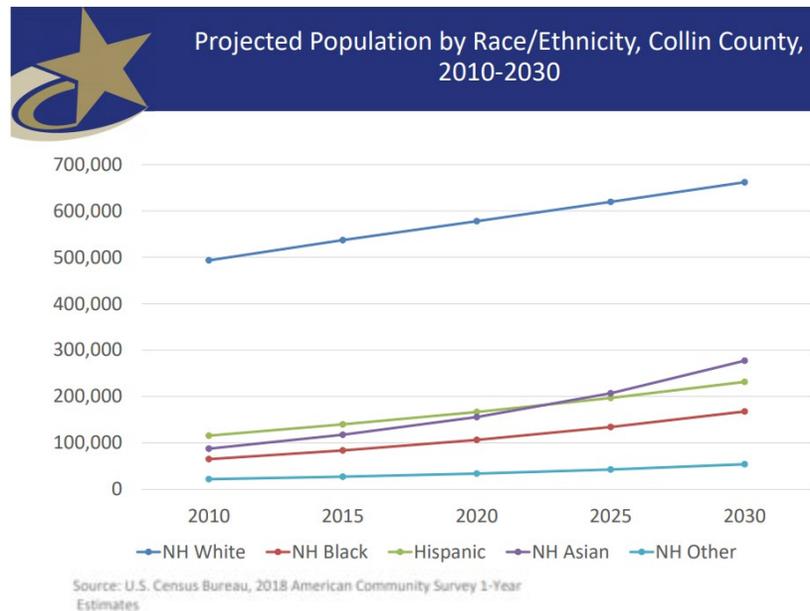
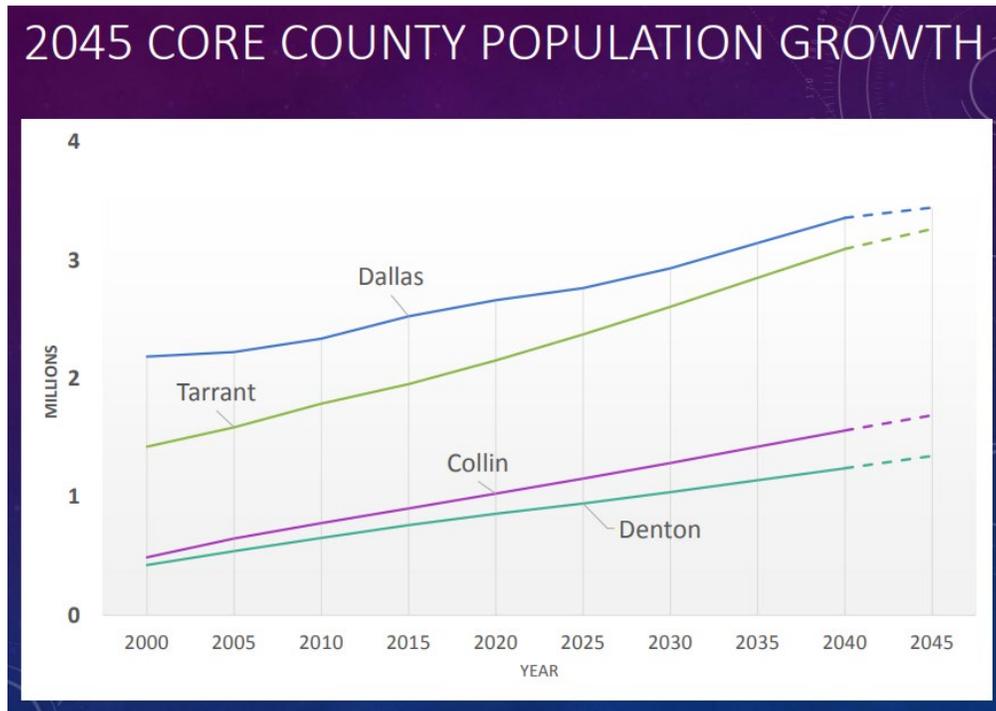


Figure 38: Projected Population by Race/Ethnicity

NCTCOG’s population forecasts mirror the strong growth discussed above, and project it will continue through the 2045 timeframe as shown in **Figure 39**. These projections indicate that in



the 2040-2045 time period, Collin County's growth will constitute 22.6% of the region's overall growth, second only to Tarrant County.



https://resources.nctcog.org/trans/committees/sttc/documents/Item_6.sttc042817.pdf

Figure 39: NCTCOG County Population Forecast through 2045

Traditionally Transit-Dependent Populations

The American Public Transportation Association (APTA) defines Transit-Dependent Population as people in the transit-dependent market that have no personal transportation, no access to such transportation, or are unable to drive. Included in this assessment are the following, all of which are at the census block level:

- households with zero automobiles
- the percentage of population over age 64
- the poverty index score
- the percentage of households with people under the age of 18
- the percentage of minority population

None of these maps can provide a complete picture of where transit service may be needed today or in the future. They can, however, provide context and support to the overall understanding of the public transportation market.



Households with Zero Automobiles

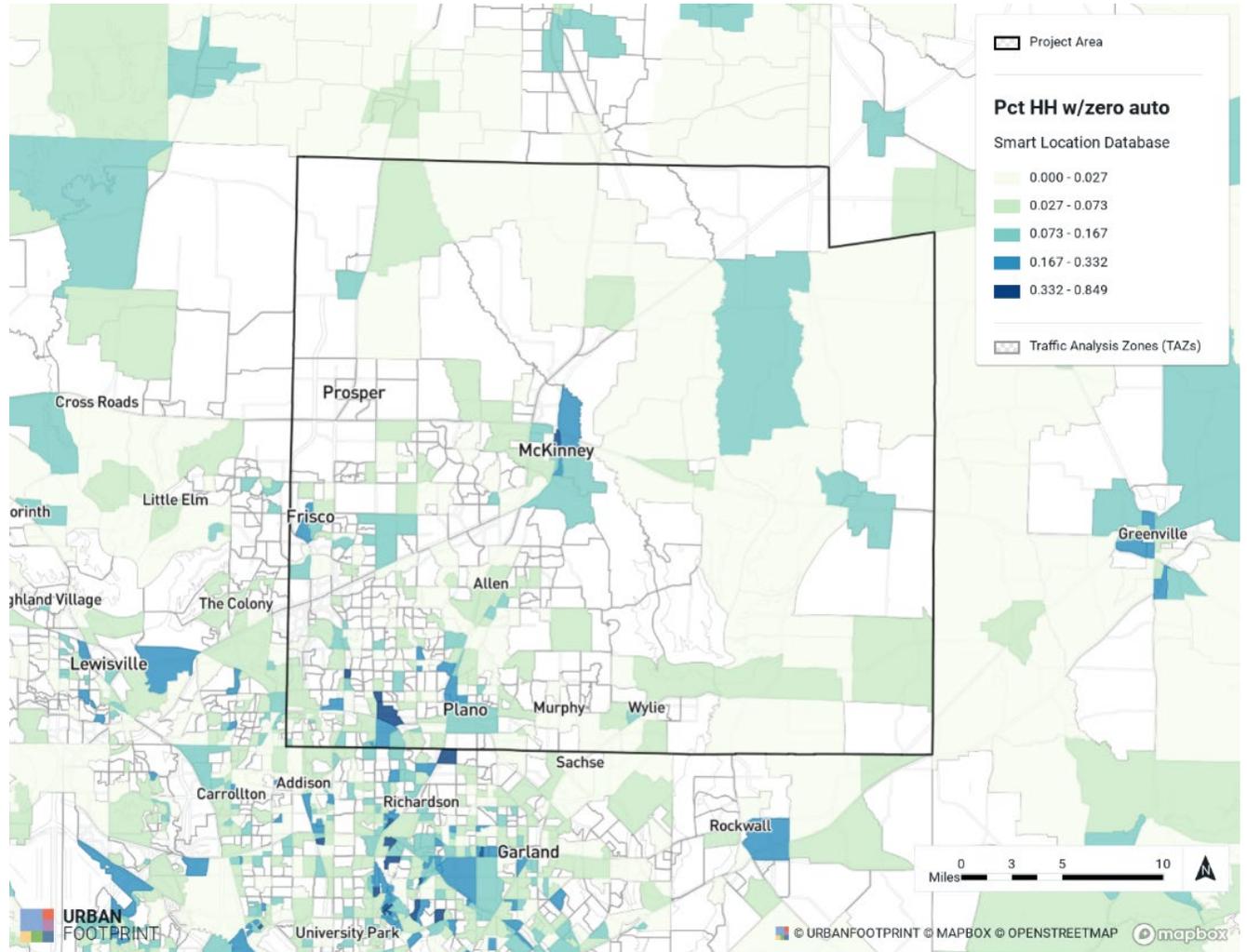


Figure 40: Households with Zero Automobiles



Older Adults (Over 64)

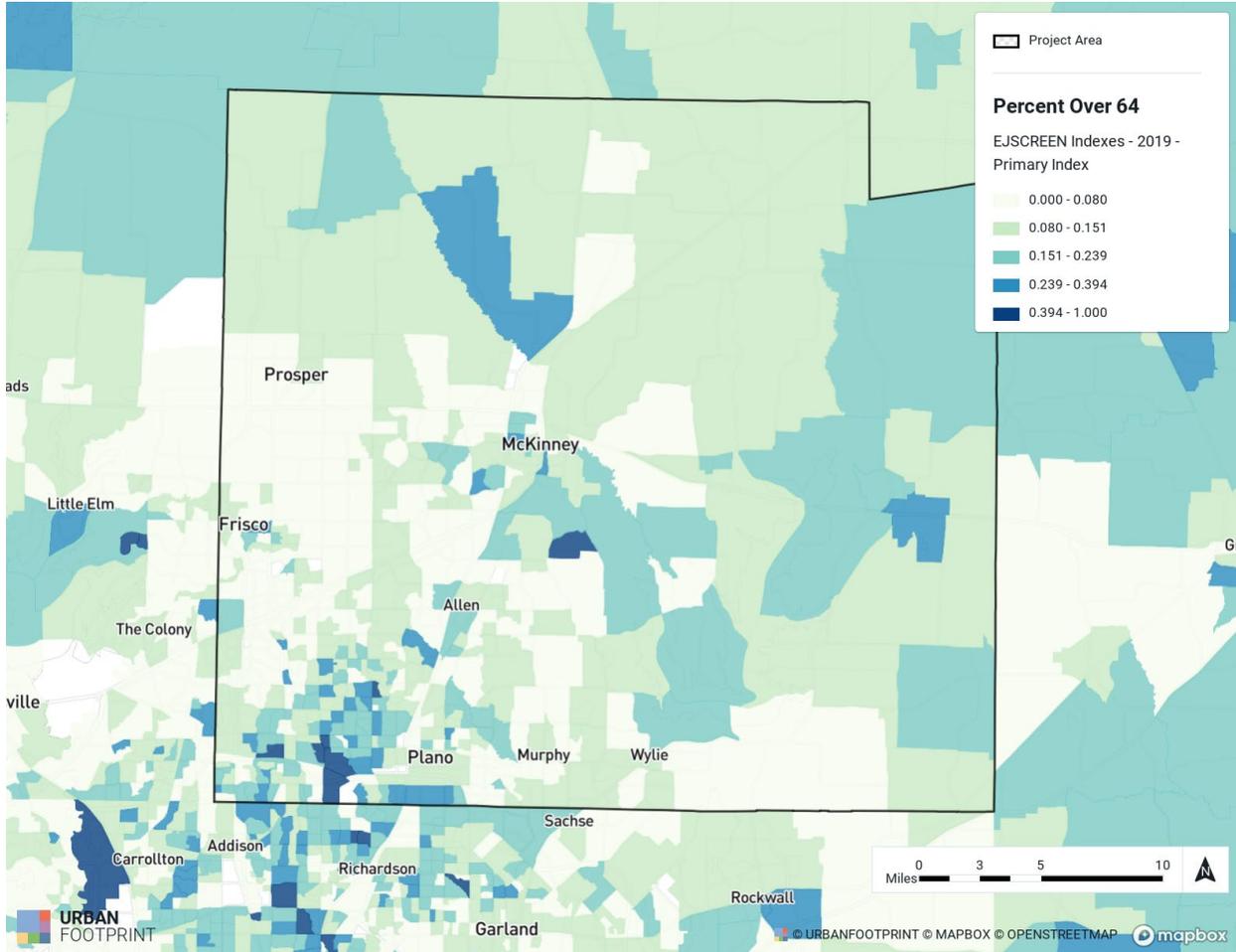


Figure 41: Percentage Over 64 Years of Age



Low Income Individuals

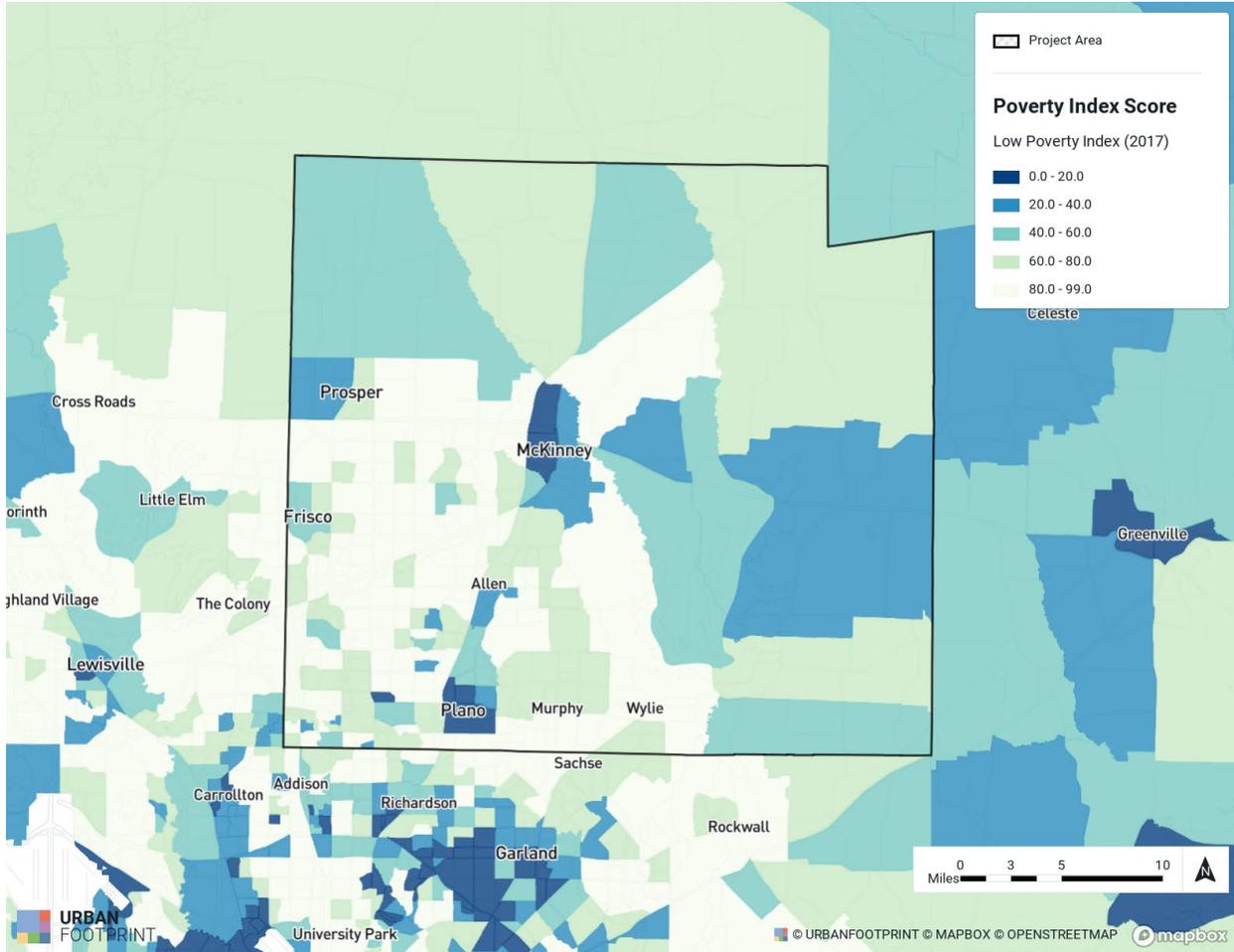


Figure 42: Poverty Index Score

The Low Poverty Index captures the depth and intensity of poverty in a given neighborhood. The index uses both family poverty rates and public assistance receipt, in the form of cash-welfare, such as Temporary Assistance for Needy Families (TANF). The index is a linear combination of two vectors, the family poverty rate (pv) and the percentage of households receiving public assistance (pa). Where means and standard errors are estimated over the national distribution, the poverty rate and public assistance for neighborhoods are determined at the census tract level. Interpretation Values are inverted, and percentile ranked nationally. The resulting values range from 0 to 100. The higher the score, the less exposure to poverty in a neighborhood (Source: <https://urbanfootprint.com/wp-content/uploads/2017/11/UrbanFootprint-Technical-Guide-v2-3.pdf>).



Youth

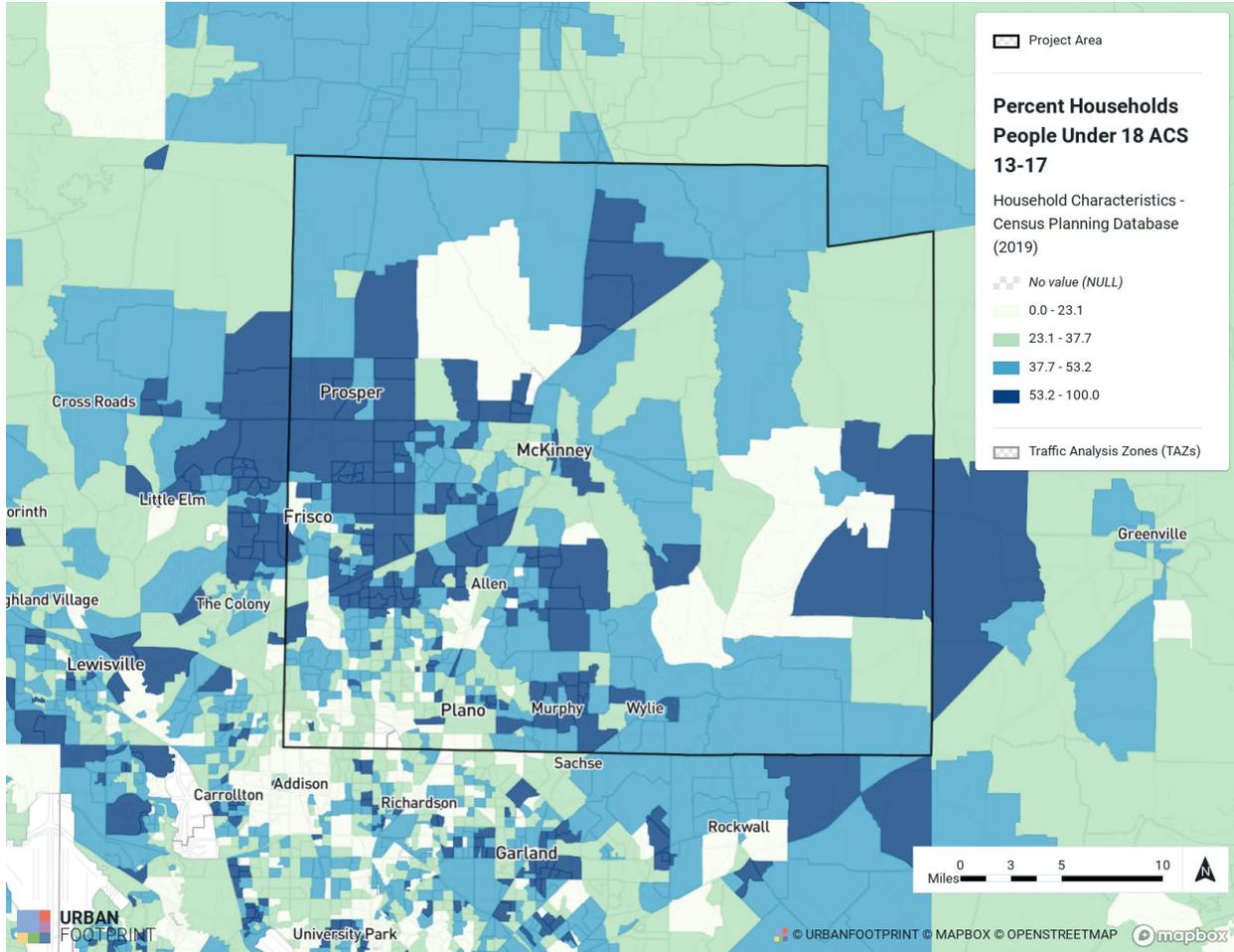


Figure 43: Percent Households w/People under 18



Minority Populations

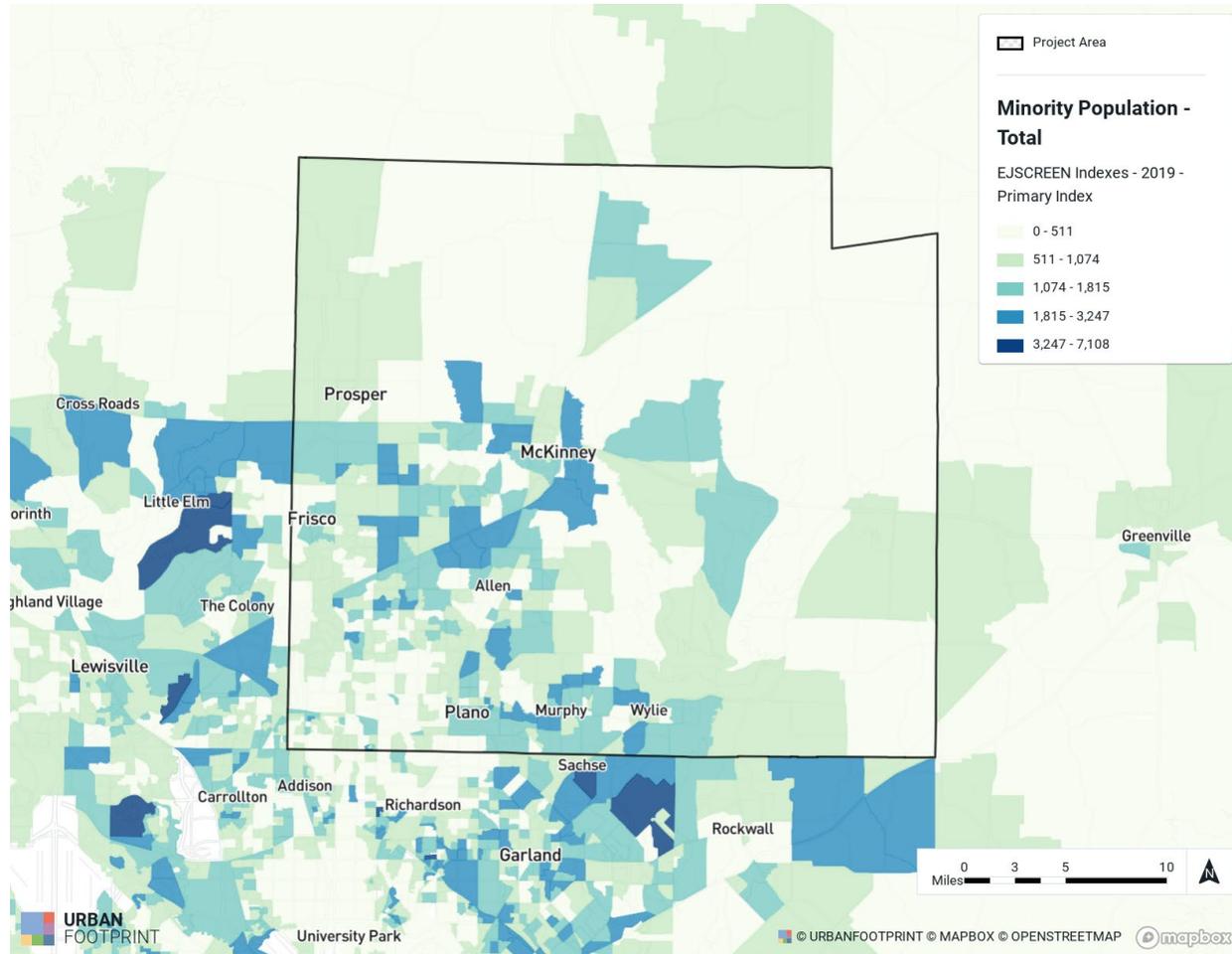


Figure 44: Minority Populations

Data for **Figure 44** are drawn from the Environmental Protection Agency (EPA) EJSCREEN tool (see <https://www.epa.gov/ejscreen/overview-demographic-indicators-ejscreen>). This map shows the total number of minority population residing in each zone as of 2019, which is one of the indices in the EJSCREEN tool.

Activity Centers

Land uses affect both the quantity of travel as well as decisions about which mode is used for access. Low-density, single-use development patterns are predominantly oriented to access by automobile, whereas more concentrated, mixed-use development patterns tend to facilitate access by a wide range of modes, including walking, bicycling and transit. The mix of uses in Collin County is shown in **Figure 45**. Not surprisingly, there is a pronounced correlation between

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areas with high transit propensity (**Figure 33**) and the areas in pink on the Land Use Summary map- primarily along the US 75 corridor, Frisco, and Plano.

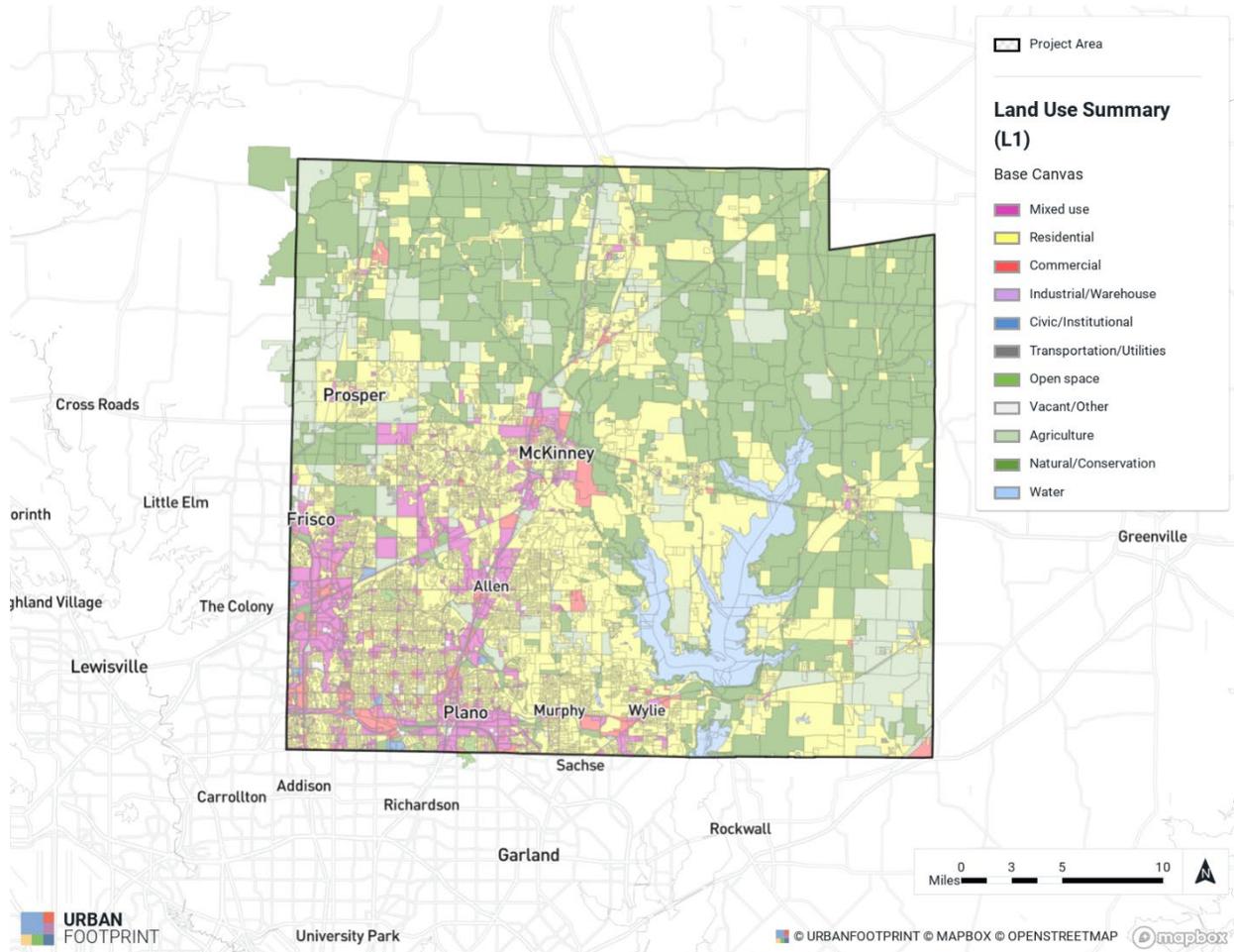


Figure 45: Collin County Land Uses

Another source of information for activity centers in Collin County is the Location Based Services data made available by NCTCOG for this study. **Figure 46** shows TSZs in the county that have more than 20,000 inbound trips each weekday, with darker shading indicating higher counts.

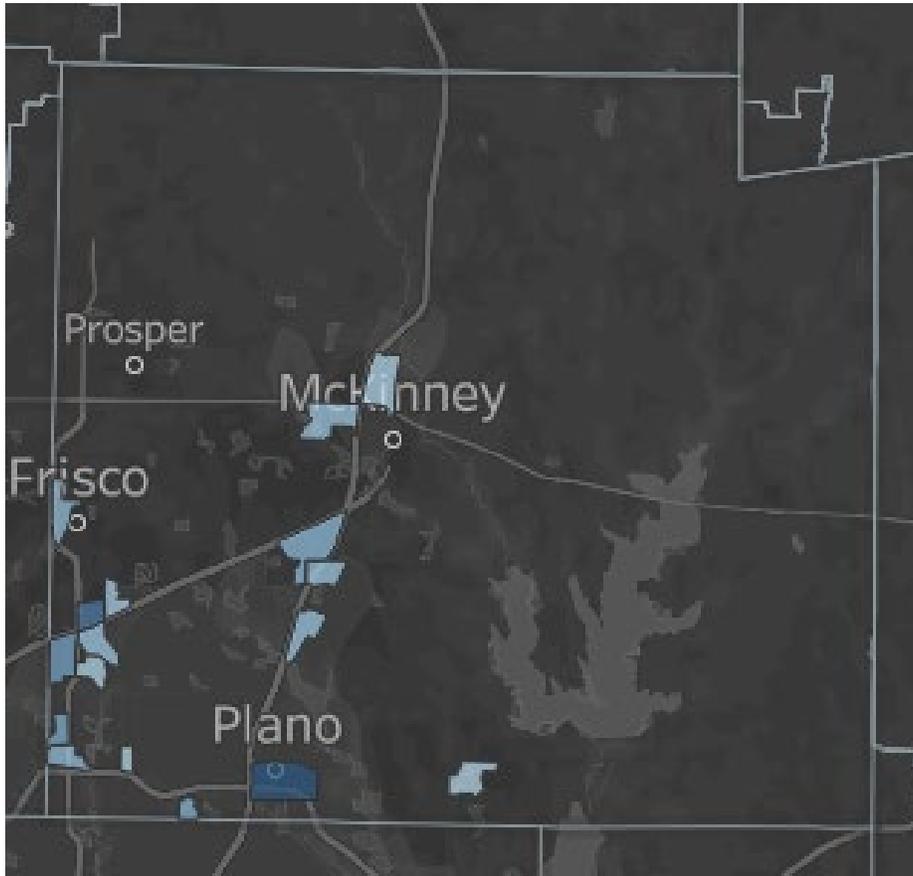


Figure 46: LBS Data- TSZs with >20K Trips/Weekday

Travel Patterns

Within Collin County

Based on the 2019 (pre-pandemic) LBS data referenced above, there were more than 3.3 million trips that originated from Collin County each weekday, with another 2.7 million on Saturdays and 2.4 million on Sundays. Of the weekday trips, 2.45 million also end within Collin County. The distribution of weekday trips by time of day is shown in **Figure 47**:

Trip Time of Day Distribution (Start Hour)

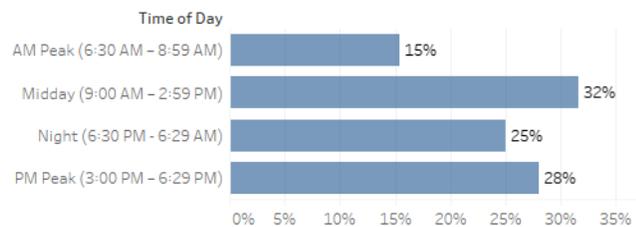


Figure 47: Collin County Weekday Internal Trips by Time of Day

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As is the case in almost all metropolitan areas in the country, fewer than 20% of these trips are to or from work each day.

Regional Travel Patterns

Collin County residents travel primarily within their own county, but there are still large volumes of trips that move across county lines within the greater DFW metroplex. According to the LBS data, and again based on pre-COVID data, more than 800,000 trips originate within Collin County each weekday but end in another county, and approximately the same number begin elsewhere but end in the county.

Homing in on job-related travel, **Figure 48** shows the census tracts within the region with the highest concentrations of jobs filled by residents of Collin County, with the darker shaded areas indicating higher job figures. As the map shows, jobs are concentrated in Plano, Frisco, Allen, and McKinney within Collin County, but also in multiple areas within Dallas County including a large concentration northwest of downtown Dallas along the I-35 corridor.

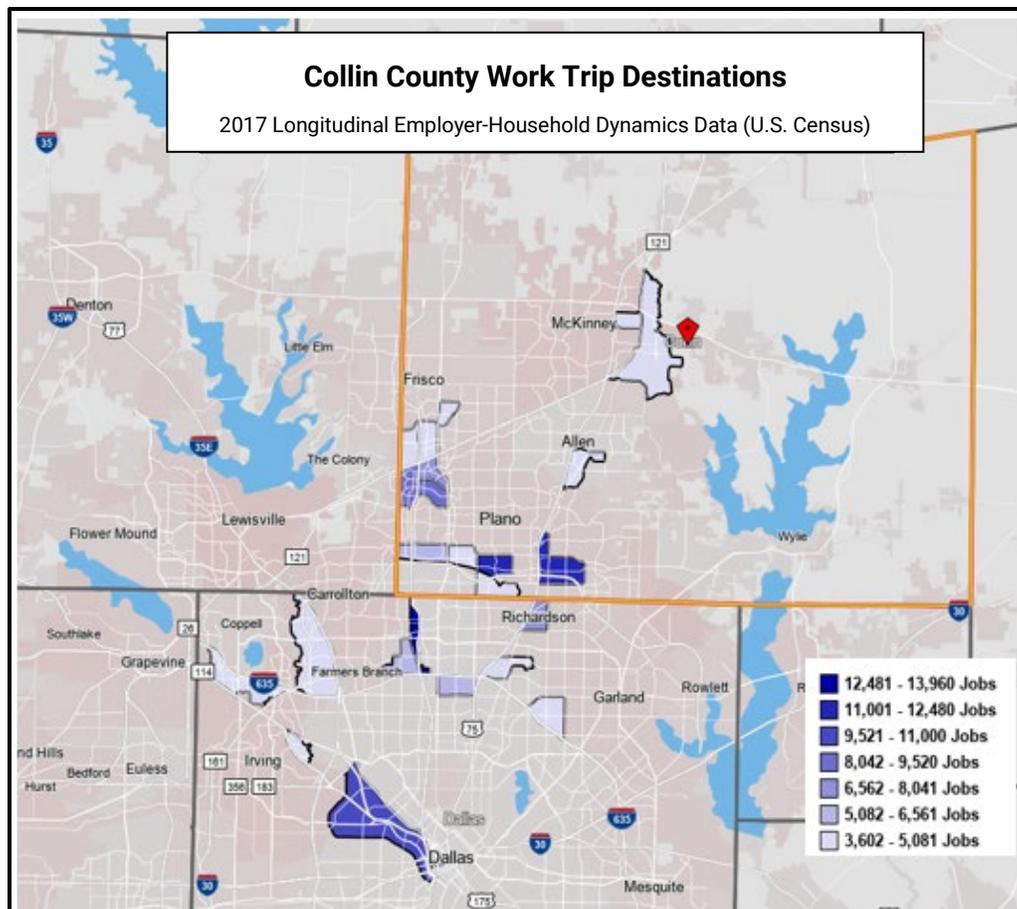


Figure 48: Collin County Work Trip Destination Concentrations

(source: <https://lehd.ces.census.gov/data/>)

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In addition to the concentration of worker locations identified above, the 2017 LEHD data also provides insights into the flow of workers across county lines, as shown in the maps in **Figure 49**, with the first showing the total figures and the second showing the counts for low-income workers. It is notable that those who both live and work within the county are outnumbered both by workers who leave the county to work and by workers who come into the county to work, suggesting that regional connectivity across county lines will be an important consideration for work-related transit services.

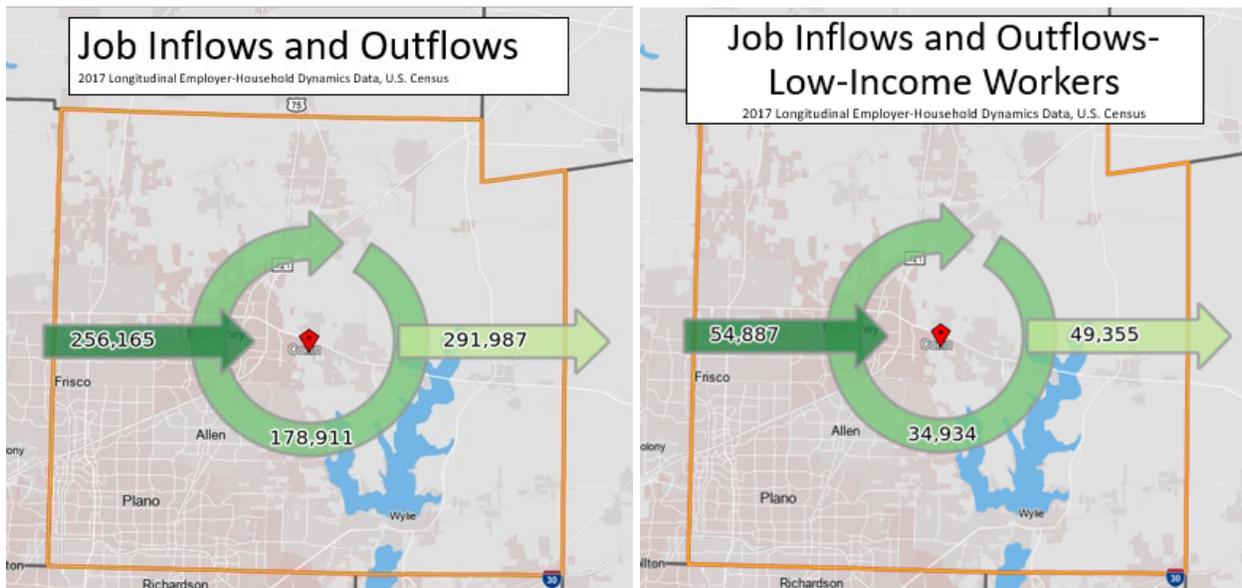


Figure 49: Job Inflows and Outflows

(source: <https://lehd.ces.census.gov/data/>)

The distance that workers must travel to access their jobs is another important consideration for transit planning, and **Figure 50** (also from the 2017 LEHD) provides some useful information in that regard. The dots on the map indicate job locations for Collin County workers, demonstrating a wide dispersion. There is also an indication of the direction of travel to get to work (top right) as well as information on distance traveled. While more than a third of workers commute less than 10 miles, 22.5% of workers experience commutes of more than 25 miles each direction. With this diversity in commuting habits and patterns, there is clearly no “one size fits all” solution for attracting work trips to public transportation in Collin County.

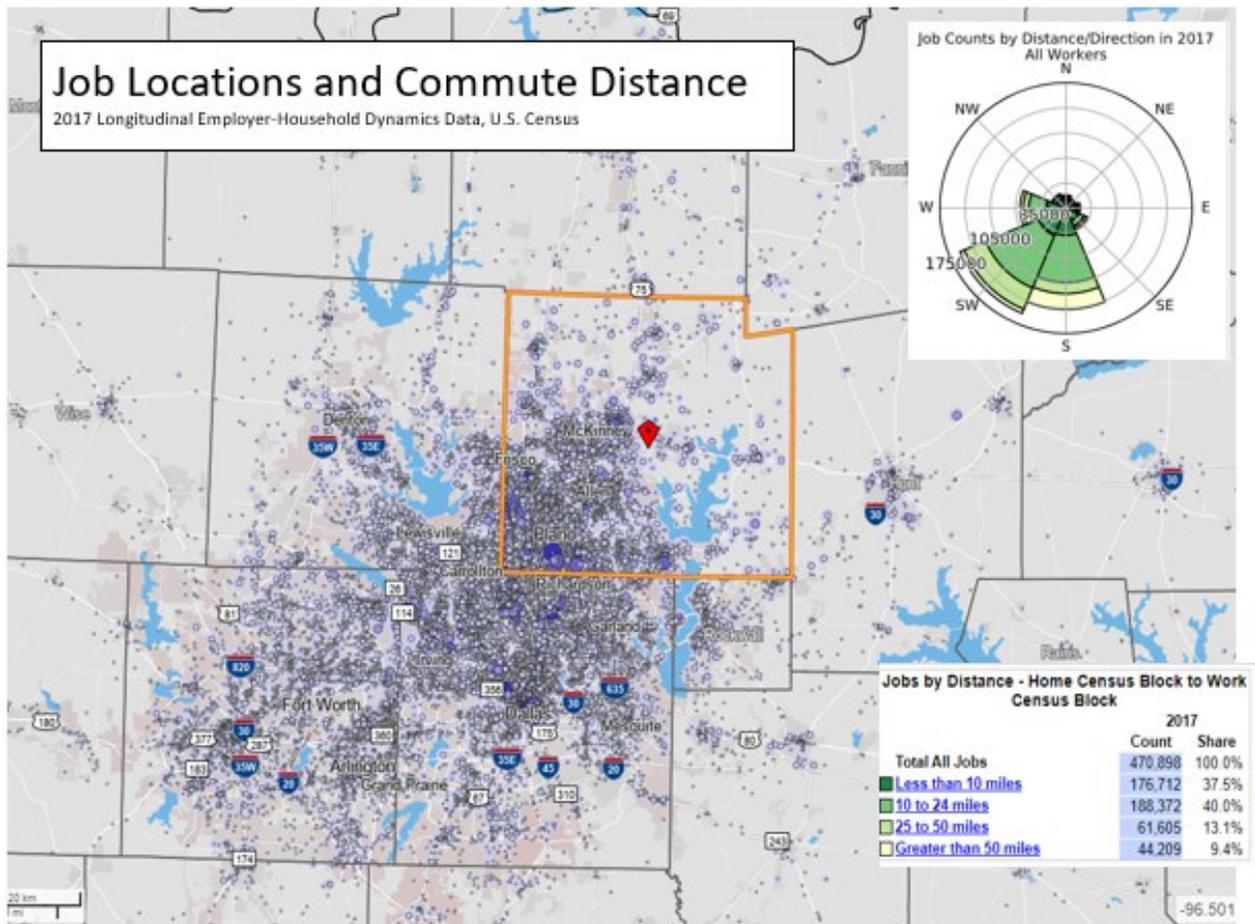


Figure 50: Collin County Job Locations and Commute Distance

(source: <https://lehd.ces.census.gov/data/>)

The final map (**Figure 51**) from the 2017 LEHD data shows the home locations of workers whose jobs are within Collin County. As the dots on the map indicate, just as workers from Collin County travel throughout the metroplex to access job opportunities, so too do workers from other counties travel into Collin County for employment.

The data presented in these maps highlights a significant challenge for mobility and access in Collin County- a distinct imbalance between job locations and workers for those jobs. This is a very complex issue with many influencing factors (zoning policies, consumer preferences, etc.) and lacks a straightforward solution. However, the provision of quality public transit and other mobility options can help to mitigate such imbalances and related challenges such as high levels of VMT (vehicle miles traveled).

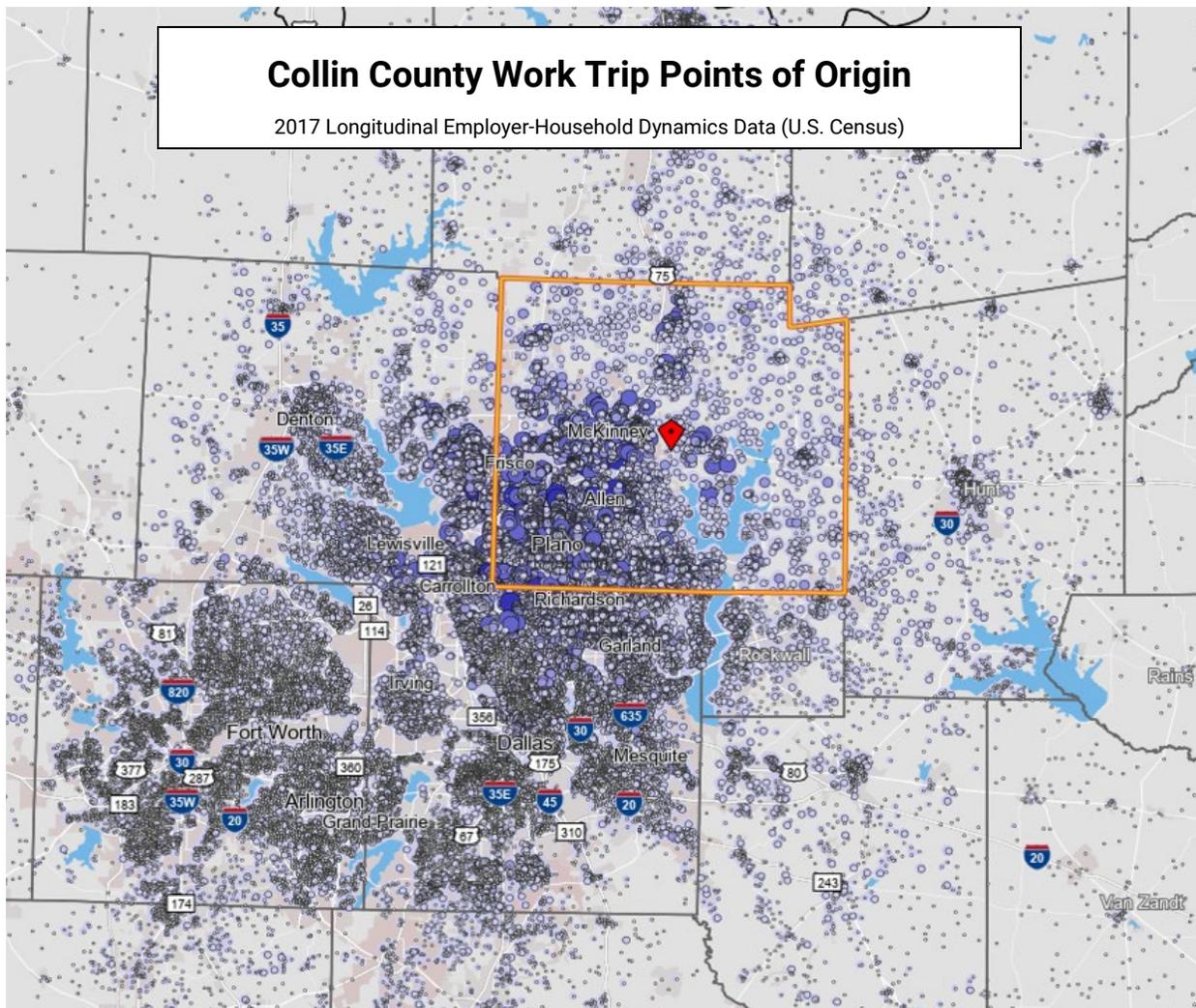


Figure 51: Collin County Work Trip Points of Origin

(source: <https://lehd.ces.census.gov/data/>)

Summary of Results

The sections above assess the transit service needs of Collin County and provide a market analysis based on recent travel data from multiple sources. Several factors stand out regarding the future of transit in Collin County:

- **There is no “one size fits all” transit solution for Collin County-** Traditional local bus service, historically the backbone of transit systems across the country, definitely has a role to play in the county, but it is unlikely to meet the diverse travel patterns and mobility needs alone. A combination of high-capacity transit “trunk” services (including DART LRT, Regional Rail and High-Intensity Bus corridors), traditional fixed routes, mobility on-



demand services and ultimately autonomous mobility solutions will be needed to work as a coordinated and coherent mobility system to be able to provide Collin County with viable alternatives to single-occupant vehicles.

- **Regional, not just intra-county mobility is needed-** Given the interconnectedness of the DFW metroplex as demonstrated by the wide-ranging worker and job locations, there is no escaping the fact that Collin County’s economy and mobility system is linked to the larger metropolitan area. Fortunately, a backbone of high-capacity transit is both in existence and under development, and it will take that system being strategically linked to a more comprehensive set of mobility options to meet transit needs within and beyond Collin County.
- **Only a small portion of Collin County is transit-supportive today and in the near term-** The analysis completed above confirms what is largely apparent to residents and visitors of Collin County: it is predominantly designed around auto-mobility. The low-density, sprawling and highway/arterial-focused development patterns that dominate Collin County simply make it difficult for transit to function effectively and efficiently, and will continue to do so for the foreseeable future. However, there are areas where traditional fixed route transit can and does function well, and many more areas where technology now makes mobility on-demand services viable.
- **How Collin County manages coming growth and development will go far in determining its mobility future-** The expected growth that is coming to Collin County offers both concerns and opportunities. As new housing is developed to accommodate the growth and new retail, job, and activity centers are built along with supporting infrastructure, the county and its municipalities have the potential to shape their mobility future in many ways. While the “build it and they will come” maxim is not completely accurate, there is a large grain of truth there when it comes to shaping development to be transit, bike, and walk friendly. More information on this subject, best practices, and peer community examples for future development can be found in Appendix C: *Collin County Transit Oriented Development Guidelines*.

With this information in hand, it is now possible to examine a range of potential transit futures for Collin County. The complexity of decision-making about modifying existing transit services, adding new services, and improving mobility and access suggest that the use of scenarios as a planning tool can provide a valuable framework for policymakers, community members and other stakeholders. Scenarios can provide a set of “alternative futures” that help make clear the different outcomes (and tradeoffs associated with each) that could occur, and they also can account for uncertainties that make a single-solution approach exceedingly difficult to realize. The pace of change, not only in terms of on-the-ground growth and development in fast-growing Collin County, but also in mobility, technology, and consumer preference also point to the use of scenario planning for the next phase in this study process.



People Mover/Automated Transit System

What is a People Mover?

The term people mover can be used to reference a variety of systems and technologies. In this study, we will be looking at smart vehicles (group-rapid transit) that are autonomous with rubber-tires, subsequently referred to as an ATS (Automated Transportation System). The preferred system would operate on a grade-separated guideway. This way vehicles can navigate within the guideways and avoid traffic altogether, removing short trips from the surface streets.

What is the Purpose of an ATS?

There are two primary functions of an ATS; to provide circulation to a development or to establish regional connections (most often to larger transit or rail systems). We will be looking at examples of both functions in our analysis. Depending on the location, an ATS facility can accomplish both functions, while other locations will be primed to accomplish one specific goal.

Considerations for Establishing an ATS

The first consideration for establishing an ATS is reviewing the current level of development for a given location. This analysis will look at a few greenfield developments, as well as retrofitting existing developments and ATS systems. A greenfield development, being an undeveloped site, allows for the development to establish itself around the preferred parameters of a people mover, maximizing land uses and minimizing parking structures. Retrofitting existing developments would require fitting the ATS guideway within and around existing structures, while retrofitting an existing ATS system might require repurposing existing guideways. Examples of potential ATS retrofits in the region are DFW (Dallas-Fort Worth) International Airport Skylink and the Las Colinas APT System.

The second consideration is how the ATS system interacts with traffic. As mentioned before, the preferred system would be grade-separated to avoid traffic. Additionally, a grade-separated system will pull trips from the roadway, alleviating congestion. Although the grade-separated system is preferred, there is value in developing an at-grade system with signal priority to pilot test the service before investing in infrastructure. Phasing in the at-grade system as such would generate demand for the eventual grade-separated system.

The third consideration is parking. The goal is to have minimal and consolidated parking, where the access to the arterial system is on the periphery of a development and that is where the parking garages are located. From there, the ATS system can provide pickup trips, then circulate throughout the development. Greenfield developments are especially favorable in this regard as consolidated parking structures can be planned where most optimal. Unfavorable conditions would be a development where each structure has its own parking. Current parking strategies separated by use and required by city code and lender requirements result in developments being pushed further apart, ultimately reducing walkability and access outside of vehicles. An



ATS can support a high-density development with a walkable environment, which is still easily accessible by vehicles on the periphery.

The fourth and final consideration is funding. The system can be privately funded, publicly funded (or subsidized), or funded through a public-private partnership. The goal is to have a plan for capital and ongoing operating costs. A development implementing an ATS would require less parking, freeing up land for potentially revenue-generating uses. Optimizing land uses and saving on parking costs allows the development to fund all, or a portion, of the ATS operating expenses.

These four considerations, along with the intended function of the ATS system, are major components which should guide the design leading to a successful system.

Planning for an ATS

In the wider vision of creating a standardized, easily replicable system for the region to stand the test of time; to capitalize on technology efficiencies between systems; and to facilitate separate but integrated systems in process and application, the North Central Texas Council of Governments is proceeding through a multi-effort process to standardize and gain economies of scale for automated transportation systems planned around the region.

Previous efforts center around developing demand and feasibility process standards for potential ATS locations. Current efforts, concurrent with this study, involve standardizing infrastructure and vehicle technology specifications. Future efforts will involve identifying how to implement these systems through funding and governance structures once the site is known and the ATS vehicle and infrastructure specifications are determined.

Planning for an ATS involves the following three-step process:

- The first step is the regional feasibility analysis. This includes the utilization of a Geographic Information System regional mapping tool to determine population and employment density, employment mix, land uses, short trip density, and proximity to regional transit stations. Mapping the region using these variables highlights areas that lend themselves toward supporting a people mover. From here, larger trends throughout the region are shown and a discussion can begin on where a people mover makes the most sense in conjunction with other goals throughout the region. Following this discussion is the identification of specific sites and developments in the areas deemed most optimal.
- Step two is the site-specific feasibility analysis, using a feasibility analysis tool to determine the size of the development/area served, population and employment density by type, parking strategy, and proximity to transit stations. Parking strategies and proximity to transit were among the two factors being weighed more heavily throughout this analysis. Population and employment densities throughout the region remain low, having a minor impact on feasibility results when comparing sites. This analysis uses



demographics from Mobility 2045, in conjunction with alternative demographics and development expectations provided by municipalities.

- Step three is operations analysis and ridership estimation. This uses a ridership estimation tool to determine site layout with a preferred ATS alignment and a detailed land use breakdown by the Institute of Transportation Engineers code for zonal analysis. This last step is not a part of this current study effort but is intended to give insight into future efforts for those potential locations deemed feasible.

People Mover Demand

Figure 52 shows the regional mapping tool included in Mobility 2045, highlighting areas of potential demand for people movers. This is a zoomed-in view on the southwest portion of Collin County and how it interacts with north Dallas and southeast Denton counties. Areas with a higher demand based on the various factors described above are shown in dark blue with a scale of lighter colors denoting less demand. Existing ATSs in the region are circled in red, those being DFW International Airport Skylink and the Las Colinas APT (Area Personal Transit) System. Looking at this map you will see that higher demand is primarily congregated around highways since denser residential and employment developments are located where convenient access is readily available. However, this analysis is too broad for this study effort and does not illustrate those feasible locations near planned rail transit stations that could benefit from an ATS connection.

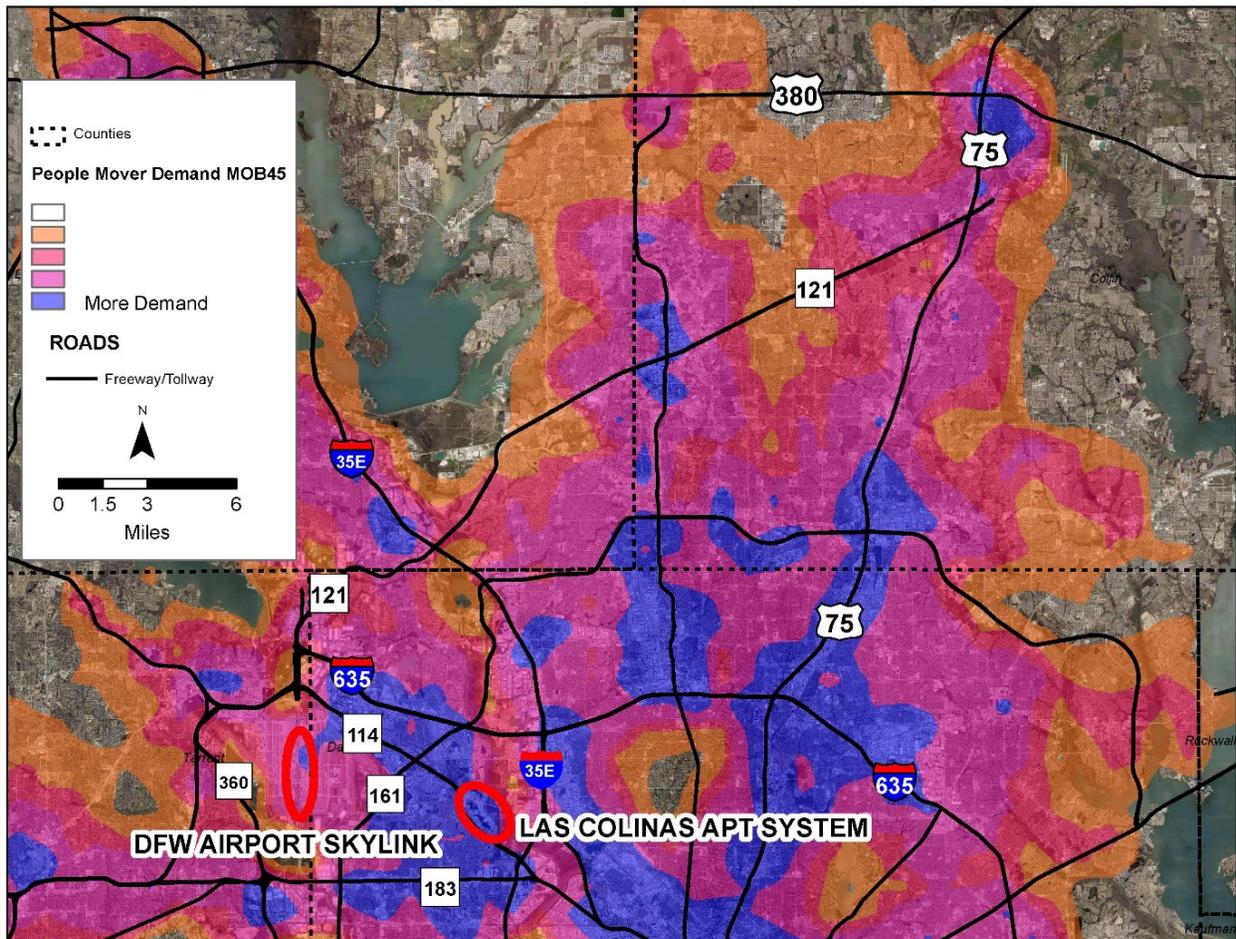


Figure 52: Mobility 2045 People Mover Demand

This analysis shows wider areas generating more demand along the US 75 corridor, Dallas North Tollway (between IH 635 and President George Bush Turnpike), and the larger part of Irving and Las Colinas.

Figure 53 shows a similar analysis as the previous one, with the added qualifier promoting locations within a certain distance of an existing or planned rail transit line station. With rail lines shown in green and adjusting the color scale to only highlight areas with higher demand, those potential higher demand areas along the rail corridors come into better focus.

This analysis shows more confined areas of demand along US 75, the Dallas Midtown area north of IH 635, downtown Frisco, and the Sam Rayburn Tollway Legacy Area.

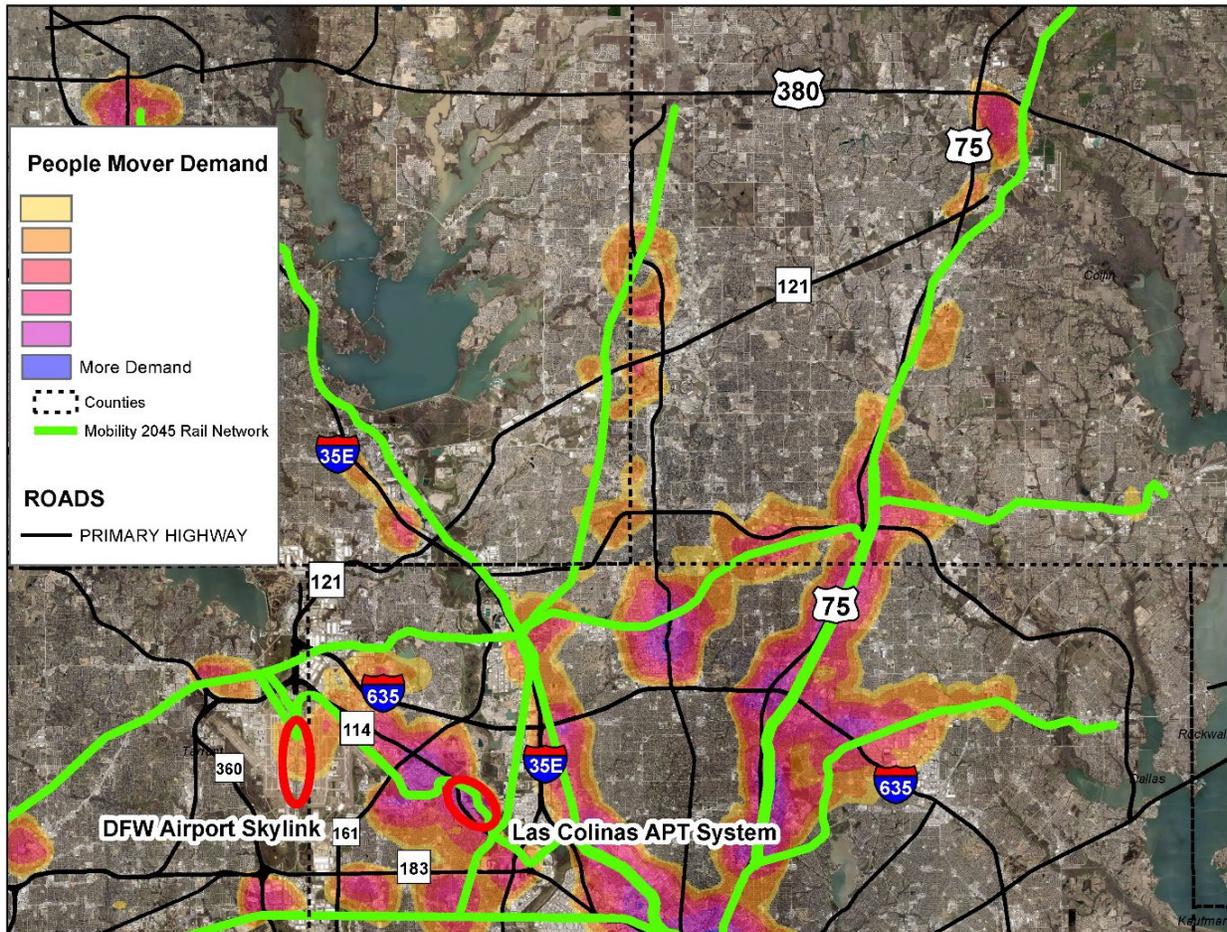


Figure 53: Mobility 2045 People Mover Demand Proximity to Transit Adjusted

In addition to the two existing ATS locations, the project team, in close coordination with the Project Advisory Committee, identified seven locations for further feasibility analysis. In **Figure 54**, these locations can be seen circled in red. All these locations were within a certain distance from existing or planned rail transit stations and exhibited certain characteristics, such as short trip density and population/employment densities that could be conducive for an ATS connection. For the Irving-to-Frisco Passenger Rail Corridor Study, the downtown Frisco Focus Area, the Legacy Focus Area, and the connection to the Las Colinas APT are reviewed in a more detailed feasibility analysis in the following section.

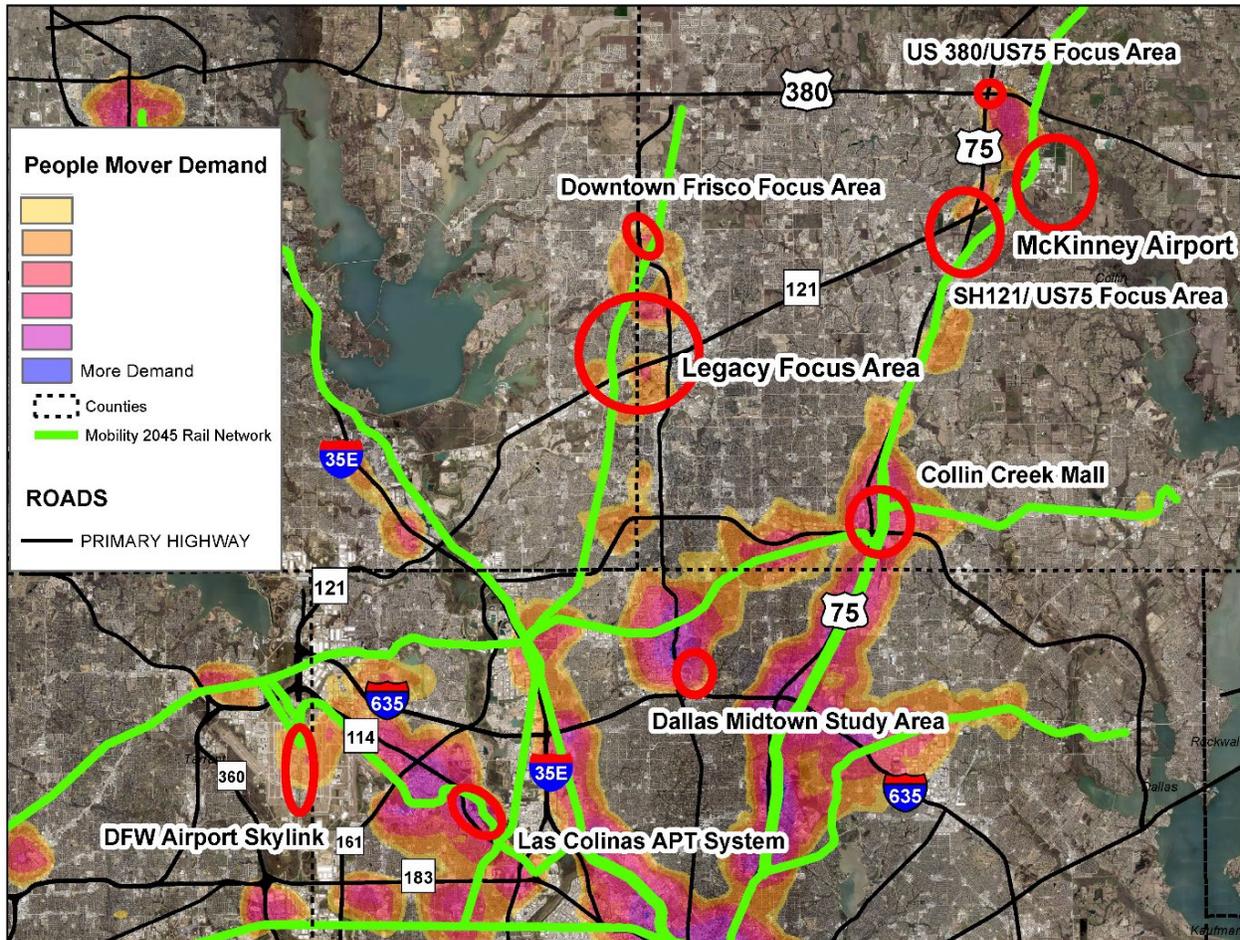


Figure 54: Identification of Potential Sites

Site and Feasibility Analysis

Sam Rayburn Tollway Legacy Area

Figure 55 pictures the Legacy/Star/Stonebriar area split into four different sites, with each site evaluated individually through a feasibility analysis based on its unique characteristics and demographics.

Together, these areas have a significant pull on trips from around the region. There is a need, not only to get commuters to and from work, but also to provide circulation between all various land uses within this focus area throughout the day. There is potential to create a couple connections to the planned Frisco corridor (in orange) via the Sam Rayburn Tollway (SRT) Station or Stonebrook Parkway Station.

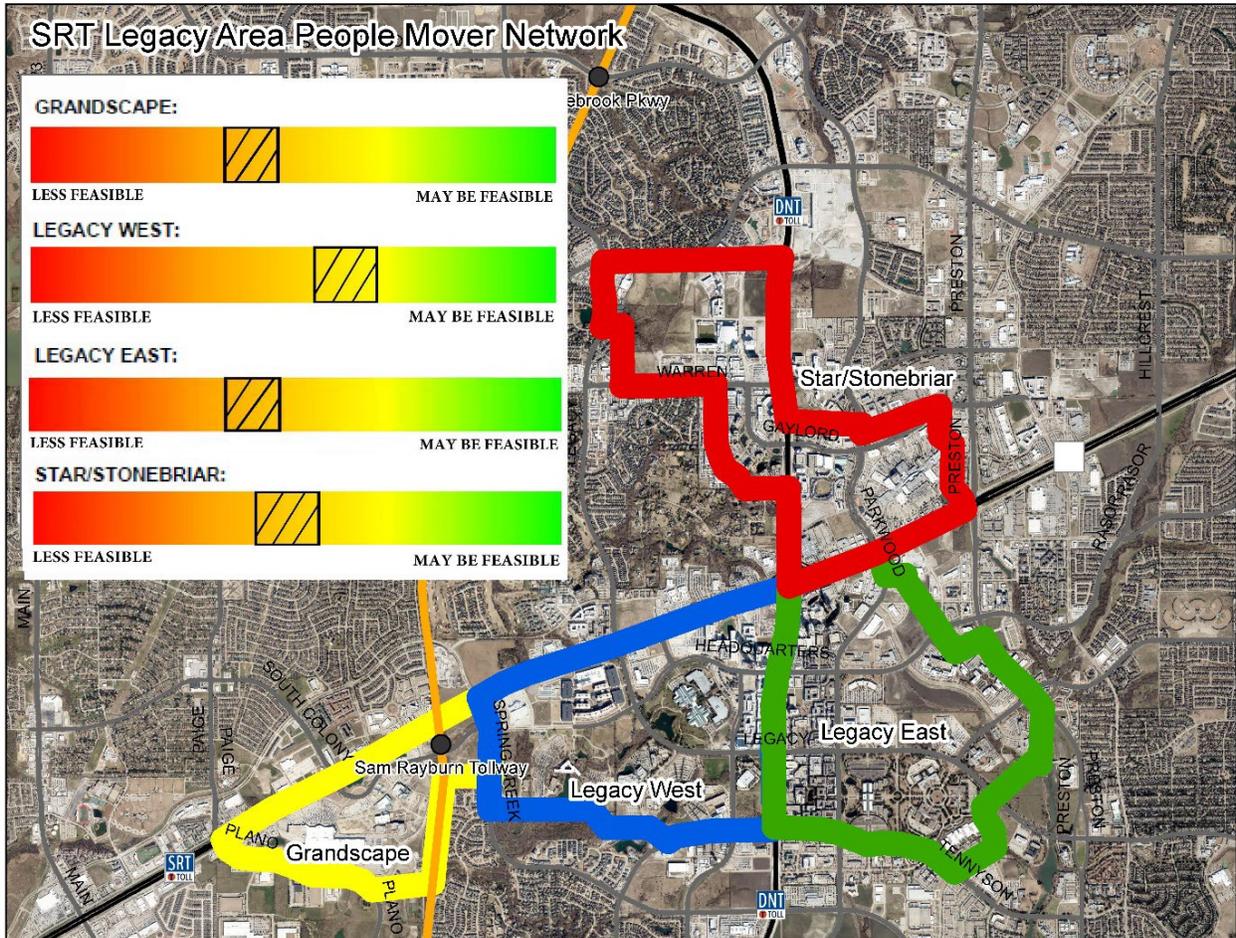


Figure 55: SRT Legacy Area Feasibility Results

Looking at the feasibility results, you will see a small variance between scores. Proximity to transit, as well as potential parking strategies, account for a majority of the variance. Parking strategy plays a big role in this location as there are currently many parking garages and a lack of consolidated parking. There is potential to repurpose existing garages and implement a development retrofit to include an ATS system. The ATS would circulate trips between consolidated garages and the surrounding land uses, as well as provide regional connections to the planned rail stations.

The scores, provided by the striped box on the bar of Less Feasible (red) to May Be Feasible (green), are a calculated range of values to provide context for understanding the feasibility of a site for an ATS. As previously stated, local jurisdictions provided helpful background data on population and employment densities, as well as existing and future land uses, to inform the analysis. The Legacy West and Star/Stonebriar areas seemed to fair the best throughout the



analysis. Of all the Legacy Focus Area sites, Legacy West demonstrated the highest densities and development pattern to be conducive with an ATS. Lower scores in general, which are found on all sites reviewed throughout this study, can largely be contributed due to lower population and employment densities region wide.

Collin Creek Mall

Figure 56 outlines three areas – downtown Plano, the redeveloped Collin Creek Mall site, and the CityLine development in Richardson – that could all be connected with an ATS system.

This site would provide circulation to a redeveloped mixed-use area, while also creating regional connections between Dallas Area Rapid Transit’s Red Line and Silver Line (currently under construction). This area proposed strong population and employment densities while also providing a good mix of land uses, serving both residential and employment needs.

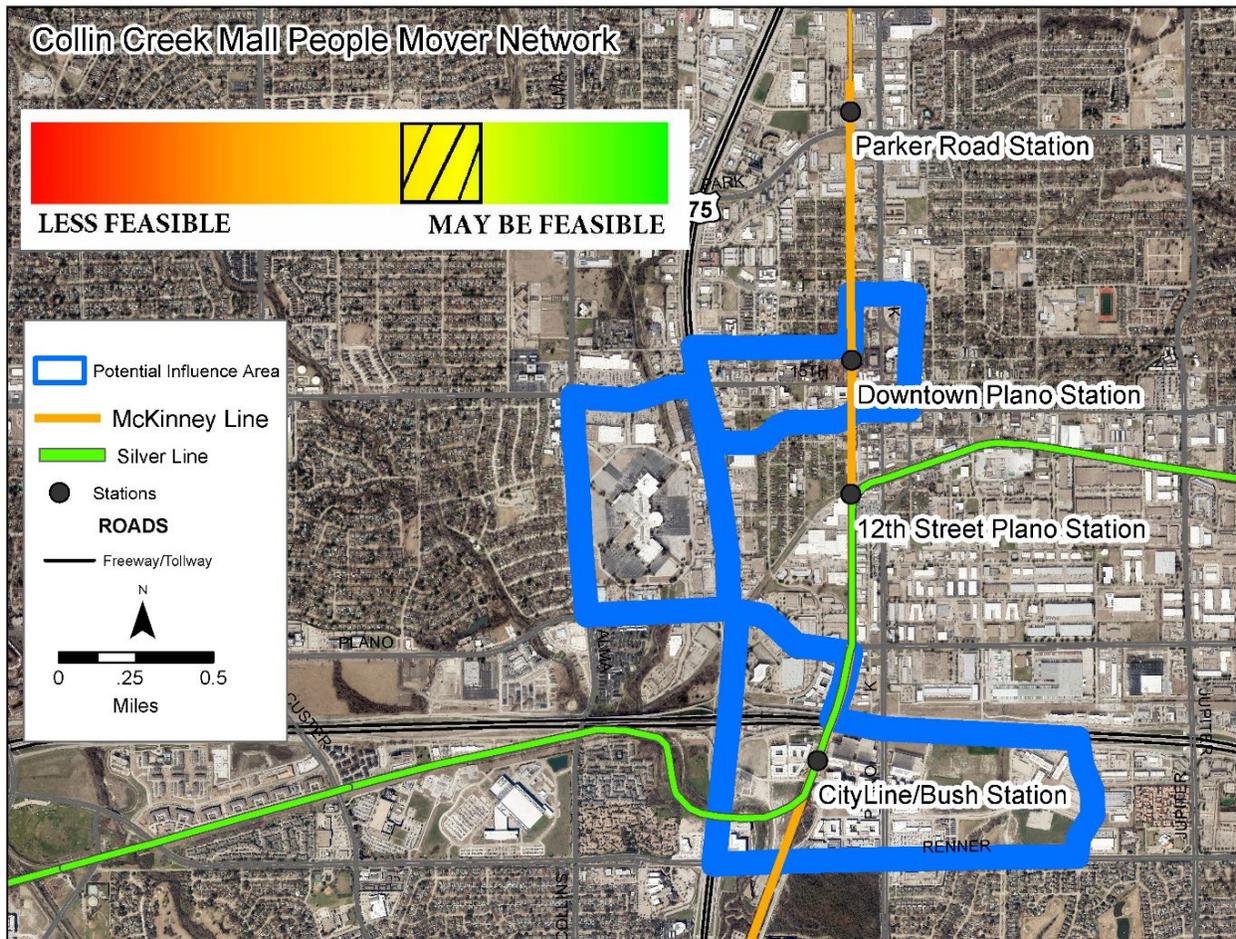


Figure 56: Collin Creek Mall Feasibility Results



To provide additional context, the Regional Transportation Council previously coordinated with the City of Plano on this redevelopment at Collin Creek Mall to further the use of consolidated parking for downtown, with three electric vehicles shuttling passengers back and forth. This potential ATS system could serve as the long-term solution for this connection while expanding the use of the CityLine Development.

Of all the potential sites reviewed in this study, this site favored among the best through the feasibility analysis as we see high densities combined with connection to transit and a consolidated parking strategy.

US 75/SH 121

Figure 57 shows a greenfield development, in blue, at the intersection of US 75 and SH 121 in the cities of Allen, Fairview, and McKinney. Several conceptual plans have placed dense mixed-use commercial and residential developments at this highway junction. While plans for this area are still evolving, this is just the sort of development potential that could fully integrate a successful ATS, removing short trips between uses from congesting the local streets and highways. This circulator/connector could connect developments on both sides of US 75 together and to the planned McKinney Line at the proposed Fairview Station.

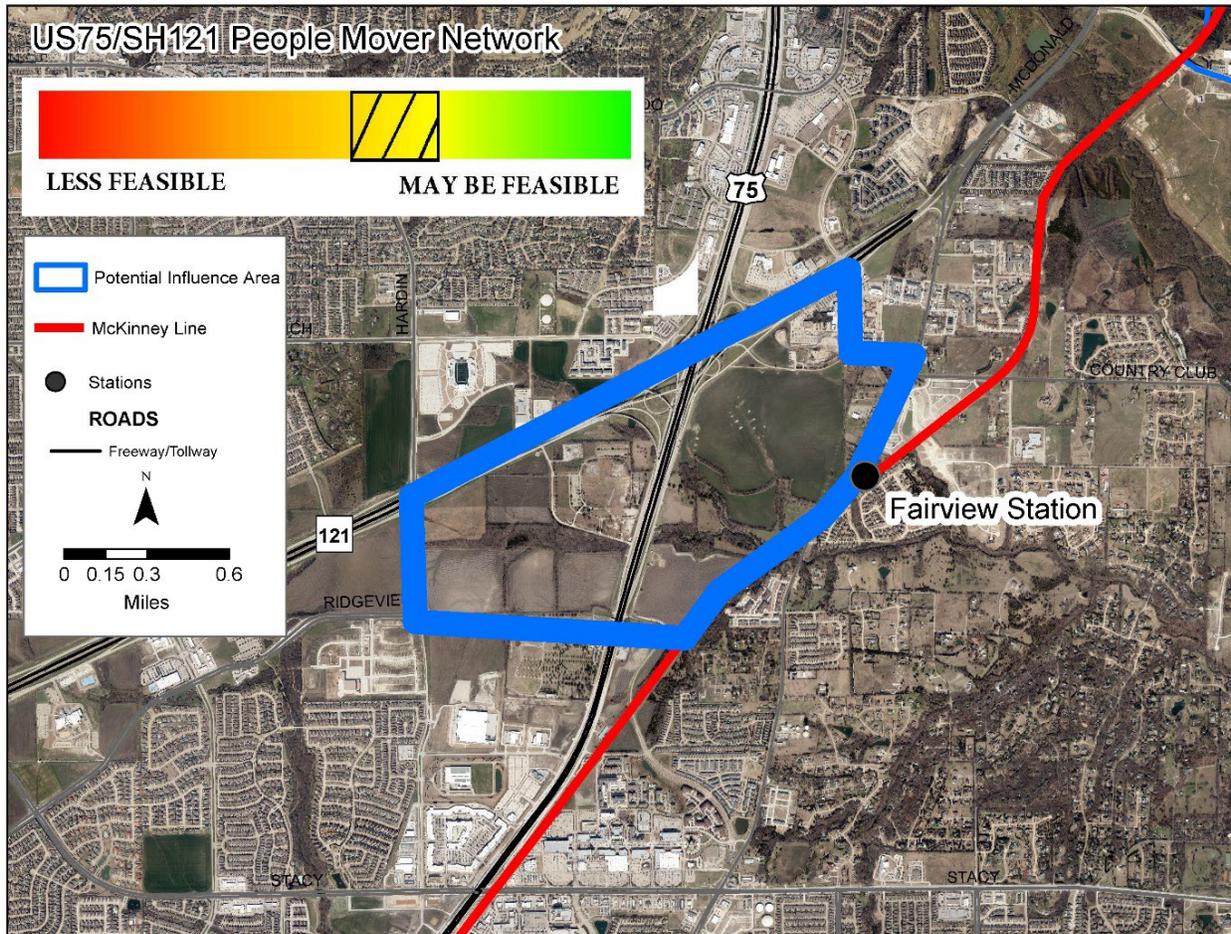


Figure 57: US 75/SH 121 Feasibility Results

The highlight of this site, in addition to the proposed dense developments of mixed uses, is its ability to include development wide consolidated ATS parking, where the system ferries people between parking areas and all the mixed uses throughout the development. This allows the development to implement more pedestrian and bike-friendly streets for the inner development with strategically placed parking facilities along the periphery, with easy access to the arterial system. This allows the development to minimize space required for parking, while maximizing potential revenue generating land uses.

This area scored well through the feasibility analysis as it provides a transit connection, a good mix of population and employment uses, fair population and employment densities, and the opportunity to implement a consolidated parking strategy with the area being a greenfield development.

US 380/US 75

Figure 58 shows the potential area served, in blue, by an ATS at the intersection of US 380 and US 75 in McKinney. This area was highlighted in our regional analysis map as it's an area of high activity. This site could be connected to the planned McKinney Line Station (not shown in view – about 1.5 miles to the east along US 380) by an ATS. Outside the outlined area shown in the figure, you see lower densities, single land uses, and open land that are not very conducive to a potential ATS.

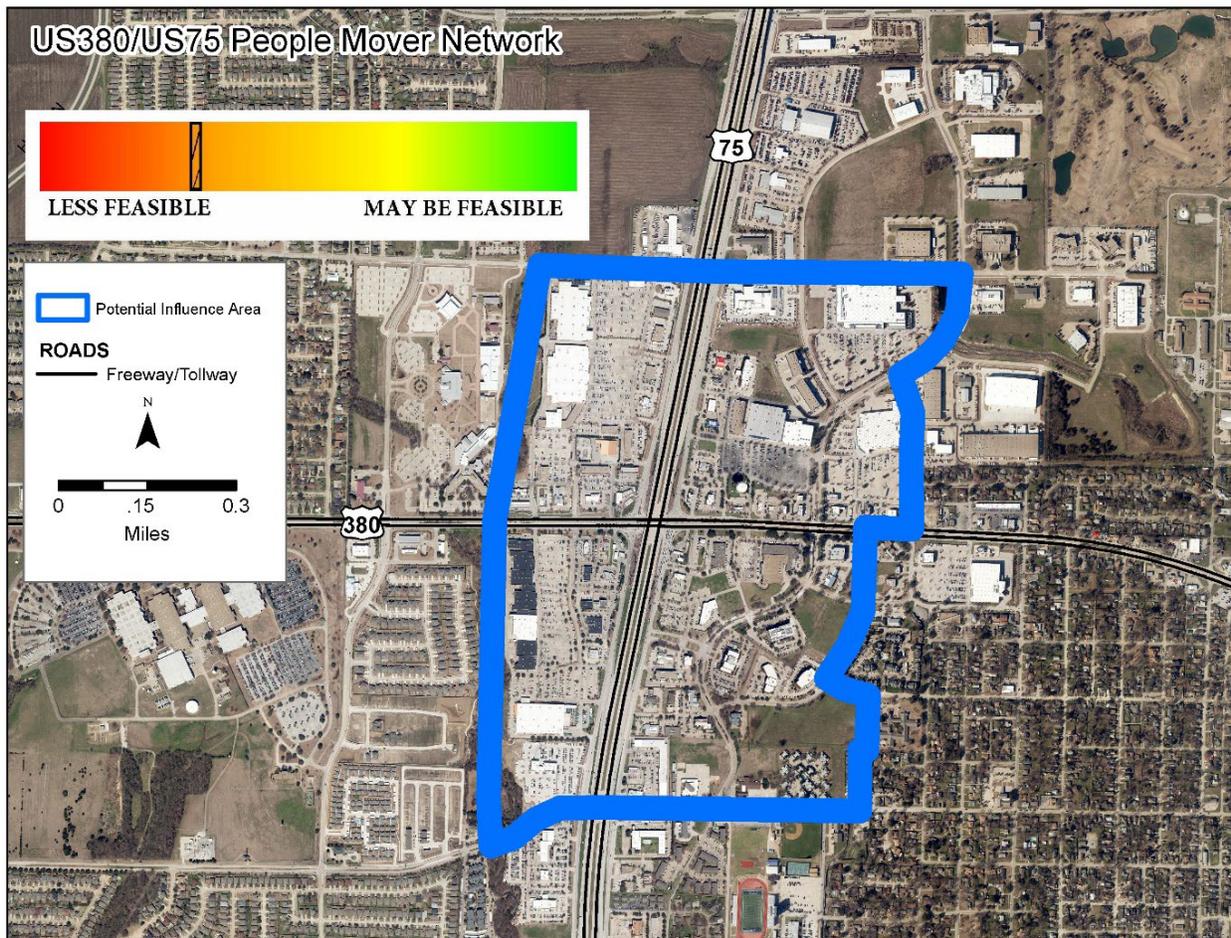


Figure 58: US 380/US 75 Feasibility Results

Due to the large parking lots, sprawl of development oriented for vehicular access only, and low density, single-use developments, this site did not fare well throughout our analysis, scoring the lowest. This site does not provide a good mix of land uses required for an ATS and plans for this area do not show the uses expanding. There are plenty of big box store types in this location

with large parking lots, narrowing parking strategy possibilities. Population and employment densities in the area, both existing and forecasted, also do not support an ATS system.

McKinney Airport

Figure 59 shows the potential area served, in blue, by an ATS connecting the McKinney Airport to the planned McKinney Line.

The purpose of this system would serve more as a rider transfer service between any future airport passenger trips and the planned McKinney regional rail line.

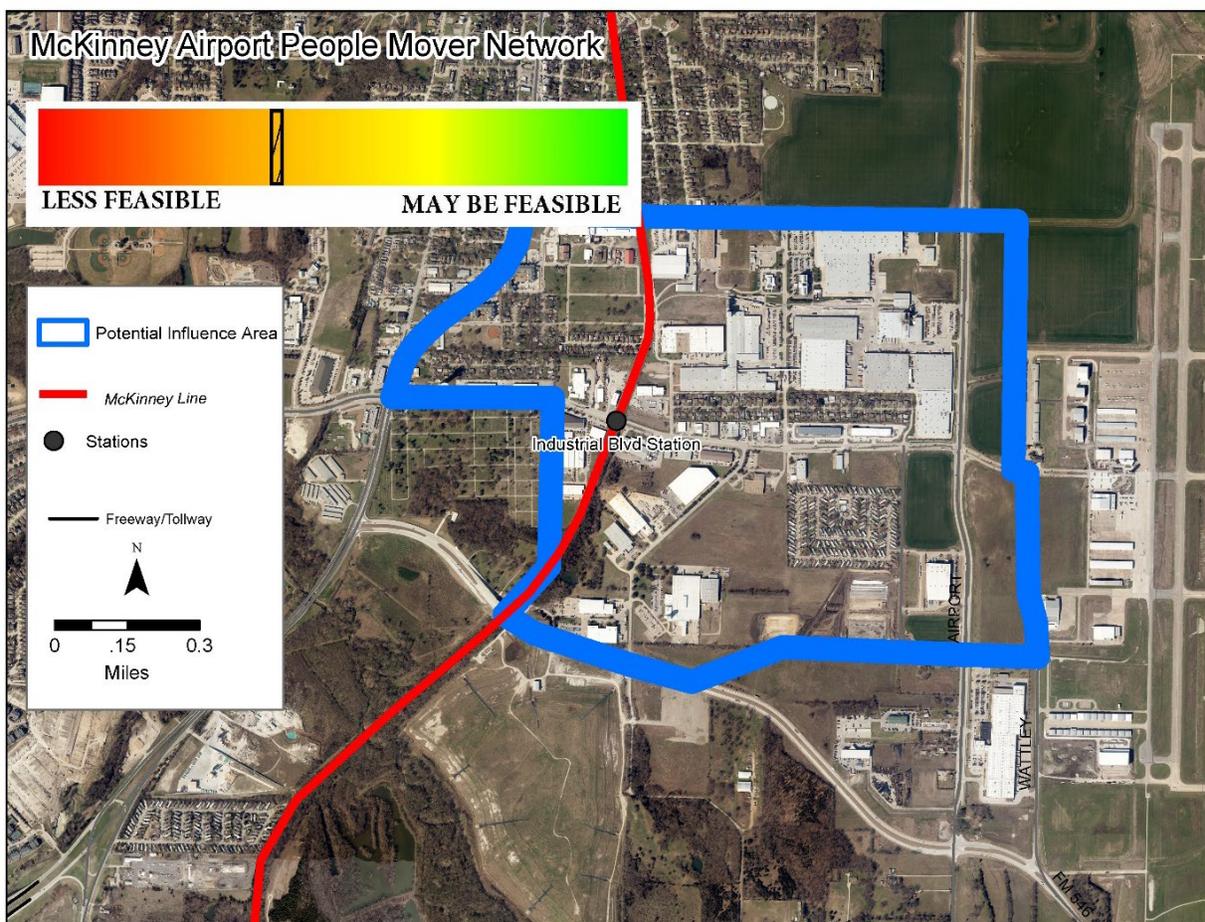


Figure 59: McKinney Airport Feasibility Results

While this site did not score as a highly feasible location based on surrounding land uses generating ridership, the purpose of this connection between airport activities and a planned transit corridor was not able to be analyzed by the project team given the parameters of the tools available. The focus of this feasibility analysis is on the potential ridership generated by the development around a potential ATS to see if the surrounding development would support

such system. With this use case primarily functioning as a connector between the airport and the planned McKinney Line, no enplanement forecasts for the airport or potential transfers to the planned McKinney Line were available at the time of this analysis to find if an ATS connection would be a feasible solution.

A closer look is required once more detailed information on future airport activities is known and operation planning for the McKinney Line takes place.

Downtown Frisco

In **Figure 60**, the downtown Frisco Area was outlined primarily with dense development in mind. This area offers access to sport events and close proximity to the Frisco CBD (Central Business District) Station on the Irving-to-Frisco line, in blue. A development retrofit with consolidated parking strategies would be necessary to provide a successful system to this area.

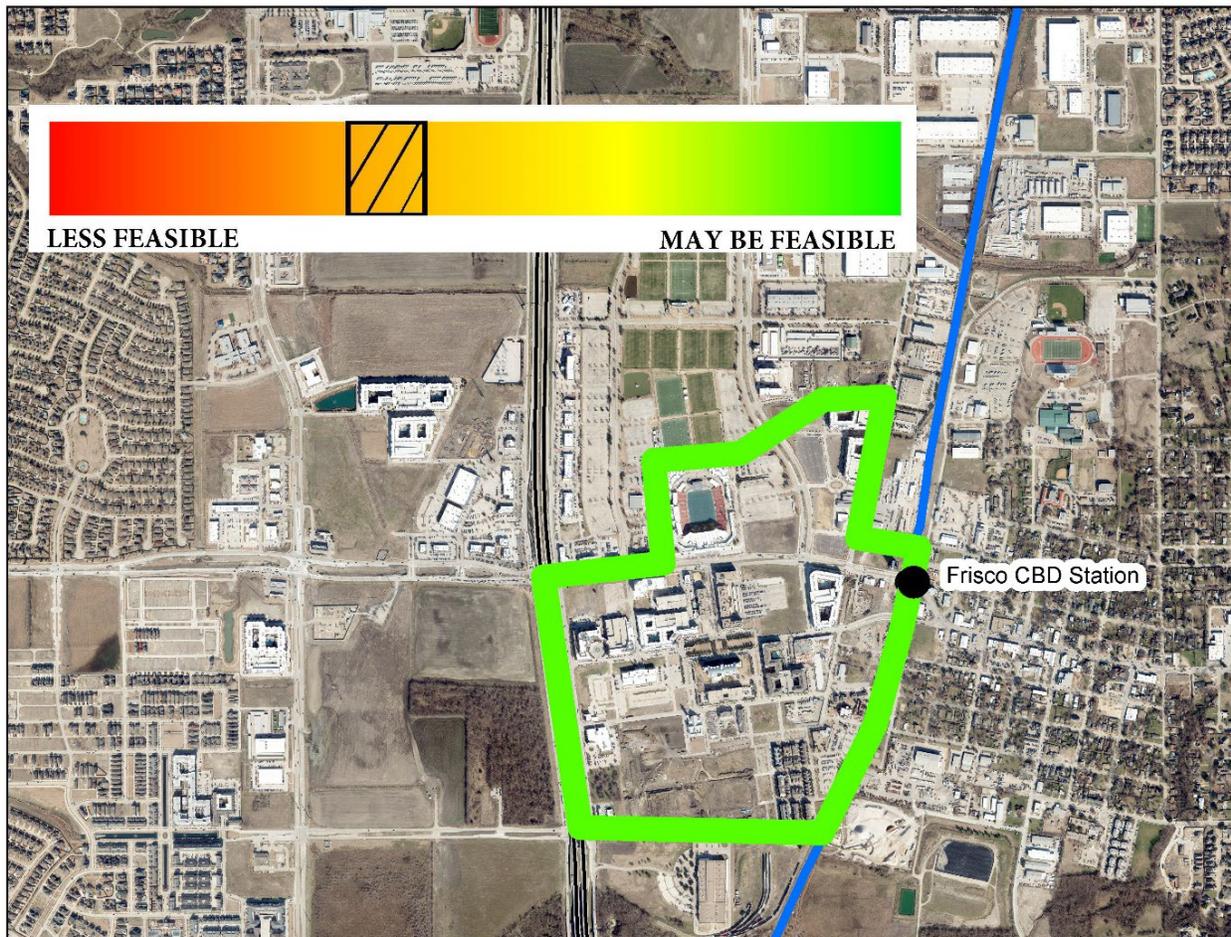


Figure 60: Downtown Frisco Feasibility Results



This site scored toward the lower end of all sites analyzed throughout the study, with population and employment densities being among the lowest reviewed. Although the Frisco CBD has good, planned connection to transit, it's not certain the currently projected lower population and employment densities would support an ATS.

People Mover/Automated Transit System Summary

Sites that the study deem more feasible are the Collin Creek Mall area, Legacy West, SH 121/US 75, and the Star/Stonebriar Center. Sites deemed less feasible are downtown Frisco, Legacy East, Grandscape, McKinney Airport Connection, and US 380/US 75.

It is important to keep in mind this evaluation is a high-level development-based analysis for the potential to attract ridership. While many of these sites may warrant some sort of transit circulator/connection service, the basis of this evaluation was to review areas with more intense levels of activity that would ultimately require grade-separated service. Capital and operating costs were not considered in this evaluation.

Without careful planning, strategic parking consolidation, availability of the right mix of development uses, and attraction of higher population and employment densities, a grade-separated ATS will not be very successful in terms of ridership. The sites deemed more feasible through this analysis still require additional planning to retrofit the existing infrastructure or development patterns to accommodate a successful ATS. Follow-up efforts from this analysis are recommended.



Scenario Development and Evaluation

Section Overview

Building upon the existing conditions assessment along with the transit service needs and market analysis, an evaluation of potential service scenarios is used to examine transit alternatives for Collin County. Working with the study PAC, a range of potential approaches were considered and reviewed, with the project team ultimately making use of a “low, medium, high” transit service level framework and the use of the transit propensity analysis to provide a range of alternative “transit futures” for local jurisdictions to consider as they determine how to move forward with improving mobility and access in Collin County.

Approach to Scenario Development

To begin, one might ask why use a scenario planning approach at all? As an article in the MIT Sloan Management Review notes: *“In short, scenario planning attempts to capture the richness and range of possibilities, stimulating decision-makers to consider changes they would otherwise ignore. At the same time, it organizes those possibilities into narratives that are easier to grasp and use than great volumes of data. Above all, however, scenarios are aimed at challenging the prevailing mind-set.”* (Schoemaker, 1995). Scenario planning also provides flexibility to explore ‘alternative futures’ and offers a way to assess how different assumptions about critical factors including funding levels, governance structures, and the mix of mobility options can affect the potential outcomes for local governments and the public.

To develop an approach to this part of the project, the project team proposed the use of an Objective Statement; an Approach; and an Outcome, as indicated in **Table 4**:

Objective	Identify potential future(s) for transit in Collin County
Approach	Develop and assess scenarios based on evaluation criteria
Outcome	Visualizations and other means to help stakeholders understand tradeoffs and pros/cons

Table 4: Scenario Planning Statements

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One important step is to create a list of potential transit options for Collin County, based on services currently being offered in the DFW metro area as well as emerging mobility options expected to become available in the next 5-10 years. A description of the types of service is provided in **Table 5**:

Transit Service Type	Description*
Paratransit (Elderly and Disabled)	A mode of transit service (also called dial-a-ride) characterized by the use of passenger automobiles, vans, or small buses operating in response to calls from passengers or their agents to the transit operator, who then dispatches a vehicle to pick up the passengers and transport them to their destinations. The vehicles do not operate over a fixed route or on a fixed schedule. The vehicle may be dispatched to pick up several passengers at different pick-up points before taking them to their respective destinations and may even be interrupted en-route to these destinations to pick up other passengers.
Microtransit (On-Demand)	Microtransit solutions improve the rider's experience by operating small-scale, on-demand public transit services that can offer fixed routes and schedules, as well as flexible routes and on-demand scheduling.
People Mover	A people mover or automated transportation system (ATS) is a type of small-scale automated guideway transit system. The term is generally used only to describe systems serving relatively small areas such as airports, downtown districts, or theme parks.
Autonomous Shuttles	A vehicle with rubber tires which—given its dimensions and its steering system—can be used in ordinary road traffic without geographical restriction, even if only in reduced power mode or at reduced speed.
Fixed Route Bus	A mode of transit service characterized by roadway vehicles powered by diesel, gasoline, battery, or alternative fuel engines contained within the vehicle. Vehicles have passenger-carrying capacities for 15 to 100+ people and operate on streets and roadways in fixed-route or other regular service with vehicles stopping every block or two along a route several miles long.
High-Intensity Bus (HIB)	A form of fixed-route bus service that features frequent service (typically every 15 minutes or better); higher capacity buses (including 60' articulated buses) to increase capacity; a broad span of service to increase access; fewer stops than local bus service to increase speed and reduce travel times; and the use of various transit priority treatments to minimize congestion and traffic related delays and improve service reliability.
Regional Rail (i.e. - Cotton Belt / Silver Line)	A mode of transit service (also called metropolitan rail, commuter rail, or suburban rail) characterized by an electric or diesel propelled railway for passenger train service consisting of travel operating between a central city and adjacent suburbs. Service must be operated on a regular basis by or under contract with a transit operator for the purpose of transporting passengers within urbanized areas, or between urbanized areas and outlying areas. Most service is provided on routes of current or former freight railroads.
Light Rail (i.e. - DART Red Line)	A mode of transit service (also called streetcar, tramway, or trolley) operating passenger rail cars singly (or in short, usually two-car or three-car trains) on fixed rails in right-of-way that is often separated from other traffic for part or much of the way. Light rail vehicles are typically driven electrically with power being drawn from an overhead electric line via a trolley or a pantograph; driven by an operator on board the vehicle; and may have either high platform loading or low-level boarding using steps.

Table 5: Transit Service Types

*Sources: <https://www.apta.com/wp-content/uploads/Resources/resources/statistics/Documents/Ridership/APTA-ridership-report-definitions.pdf>; <https://www.apta.com/research-technical-resources/mobility-innovation-hub/microtransit/>; https://en.wikipedia.org/wiki/People_mover;



These various forms of public transportation bring their own strengths and weaknesses, as well as costs both for initial capital investment as well as ongoing operations and maintenance requirements. Their benefits also vary and their “fit” within a complex metropolitan area like Collin County and the surrounding metroplex is a function of a range of factors including right-of-way availability, land use and demographic patterns, funding availability, mobility patterns such as average trip distances and other factors, and of course public preferences and willingness to support.

Scenario Development Considerations

The next step in the scenario development process is to develop a framework within which a set of scenarios can be determined. The project team examined comparable transit planning efforts and identified several different frameworks for consideration. Beginning with the transit propensity analysis, which represents a **functional** aspect, several other key considerations are described below.

- **Temporal:** When is service needed and how might it be expected to grow over time? This is obviously of paramount importance for both the community and for the local jurisdictions making decisions about the provision of transit services. On the one hand, new and improved transit can help improve access and mobility immediately upon implementation and pushing deployment into the future will mean that capital costs for things like new buses, transit centers, bus stops, and maintenance facilities will increase in cost due to inflation. On the other hand, some areas of the county may not be ‘transit-ready’ now, and therefore resistant to committing to ongoing expenses for transit service while the market is still developing (and ridership is low). There is no one answer, and the use of scenarios provides for service phasing, growth and change over time to be considered.
- **Spatial:** As the transit propensity analysis clearly demonstrated, transit needs differ across the county. To help clarify this challenge and make it simpler to evaluate options, the scenario development considered several different approaches as discussed in more detail below.
- **Financial:** With only a few exceptions worldwide, public transportation services, just like roadways, are subsidized by the government with some combination of local, state, and federal sources. Therefore, it is important to work towards services that are efficient and effective to the maximum degree possible to make the best possible use of taxpayer funds.
- **Organizational:** How transit should be organized in Collin County is a critically important determinant of long-term success. With existing transit providers in place both within the county and the metro area, leveraging their experience and ability to coordinate services across travel sheds has significant merit. At the same time, local municipalities also desire to control their own destinies.

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While there are certainly other dimensions to be considered, the four above comprise some of the most essential to develop reasonable scenarios for future transit services in Collin County.

To provide additional context, the following are different approaches to developing transit scenarios that were evaluated during the analysis. First among these is to evaluate transit service options based on a matrix that matches the type of transit service to the type of land use within Collin County (or spatial and functional using the classifications described above), as shown in **Figure 61**.

	Natural Zone	Rural Zone	Suburban Zone	General Urban Zone	Urban Center Zone	Urban Core Zone	Special District
Transit Service Type							
Paratransit (Elderly and Disabled)		X	X	X	X	X	X
Microtransit (On-Demand)			X	X	X	X	X
People Mover					X	X	X
Autonomous Shuttles		X	X	X	X	X	X
Fixed Route Bus				X	X	X	X
High-Intensity Bus				X	X	X	
Regional Rail (i.e. Cotton Belt/Silver Line)			X	X	X	X	
Light Rail (i.e. DART Red Line)			X	X	X	X	X

Figure 61: Transit Service Types by Land Use Transects

This approach pairs different land uses as defined by the Center for New Urbanism (see <https://transect.org/transect.html>) with the transit service types described above. Transects are a means of classifying land uses and can serve as a useful means of sorting out how different types of transit service can best fit within a metropolitan area. As indicated in the matrix, for example, the Suburban Zone (a common development pattern in Collin County) can be a good fit for paratransit, microtransit, autonomous shuttles, regional rail, and light rail (in some applications). However, modes such as people movers, fixed route bus and high-intensity bus are less likely to be effective in these types of areas. To be clear, these are not hard and fast categorizations – for example, light rail can (and often does) extend into suburban zones, and so an “X” is shown there. However, to maximize the value of the large capital investment required to develop light rail, best practice calls for the development of dense mixed-use in the area within a short walk of a light rail station to maximize ridership potential and access opportunities.

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A second framework that was considered is to match the **financial** (low, medium, and high) with **organizational** (or governance) aspects, as illustrated in **Table 6**. This suggests logical connections between the level of investment and the ways that transit can be organized and operated within Collin County.

Scenario	Service Profile
Low Investment (existing funding + local investment)	DART service area continues with DART service existing and planned service; microtransit / paratransit for remainder of Collin County either under existing governance structures
Moderate Investment (existing funding + local investment + new funding sources)	DART service area continues; select urbanized areas initiate new/upgraded service via a Transit Agency; microtransit / paratransit for remainder of Collin County either under existing governance structure OR consolidated under Collin County Transit
High Investment (join MTA or equivalent to secure ongoing, high-level capital and operating funding)	DART service area continues; majority of urbanized areas initiate service via a Transit Agency; regional services developed such as high-capacity/intensity bus corridors established with supporting people movers/autonomous shuttles, connecting local routes and new Park and Rides (P&Rs) with express service to connect outlying communities to major transit hubs and/or activity centers

Table 6: Collin County Investment Scenario Matrix

This matrix highlights one of the key organizational issues within the county: some municipalities are (and have been for many years) part of DART while most are not. This creates a challenging situation whereby DART member cities, which contribute a 1% sales tax to support a relatively robust level of transit service in their communities, have a very different financial picture than do the remaining cities and unincorporated areas of the county, most of which have elected to use that same sales tax for other purposes.

The matrix also indicates how differing levels of funding are likely to relate to organizational approaches for future transit. For example, in a “medium” scenario, it is reasonable to expect that DART member cities would continue their participation, while other areas may choose to consolidate their service through the existing Collin County Transit structure.

A third matrix matches the **Financial** element with the **Functional**, and also layers in the **Temporal** component by suggesting how a phased approach may be worth considering. It is shown in **Table 7**:

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Service Menu

	Paratransit	Microtransit zones	Autonomous Shuttle	P&Rs with Express Service	Local Fixed Route Bus	High-Intensity Bus	People Mover	Regional Rail	LRT
Low Investment								Phase I Phase II Phase III	
Moderate Investment									
High Investment									

Table 7: Phased Approach

Scenario Refinement

Guided by discussions with the Project Advisory Committee (PAC) in early 2021, the project team made use of the framework described above to further define the scenarios. This refinement resulted in an approach focusing on jurisdictional roles, phasing, and the mix of transit services, as shown in **Figure 62**:

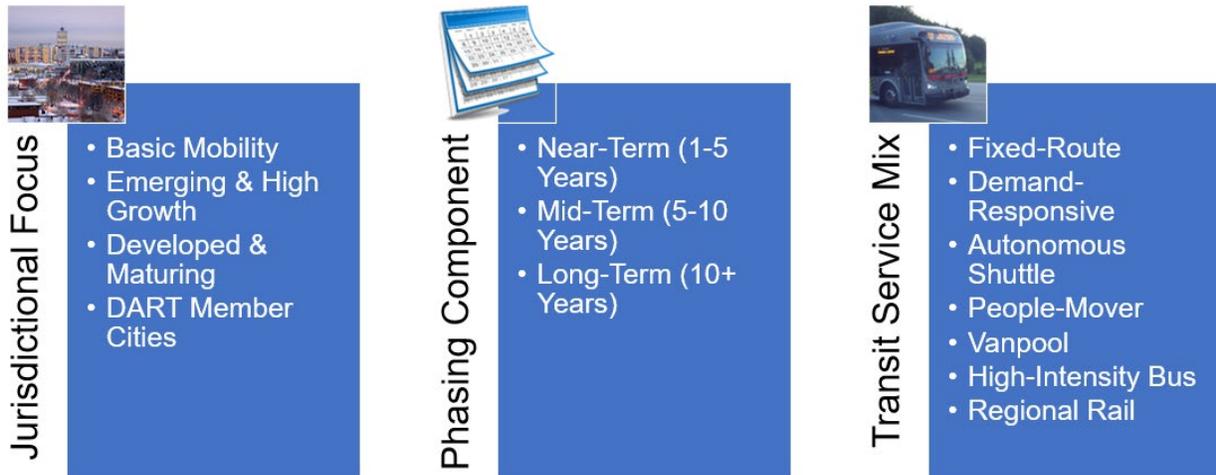


Figure 62: Refined Scenario Approach

The PAC also suggested refinements to an updated version of the Transit Propensity Zones for Collin County, and those changes were incorporated in the following map (**Figure 63**). To help



clarify how individual jurisdictions might fit within a transit development program, local jurisdictions were divided into four categories, including:

- **Basic Mobility-** In general, these areas are smaller and more rural in character, further removed from the denser urban center of the metropolitan area and have a less-developed mobility network.
- **Emerging and High Growth-** These areas are typified by their high growth rates today and into the foreseeable future, and their rapidly changing character as a result. They are more likely to be seeing and/or projecting a change in mobility patterns with more opportunities for an increased role for transit and other non-auto-based mobility types.
- **Developed and Maturing-** These areas are largely built-out or quickly heading in that direction, with less greenfield space remaining. They may be seeing infill development and an increasingly urban character with corresponding shifts in mobility needs.
- **DART Member-** Those jurisdictions that are already a part of the DART service area and recipients of DART service are classified separately since their funding allocation decision has already been confirmed.

While this breakout is not definitive or exact, the intent is to help guide local decision-makers as they plan for future transit services in the county. The mix of transit types, as well as the phasing approach, may be quite different for a basic mobility jurisdiction as compared to a developed and maturing one, and of course those entities that are already part of DART also have a much different situation. In other words, these categories represent a spectrum of *transit intensity*, from a low level for the Basic Mobility jurisdictions, to a high level for DART Member Cities.

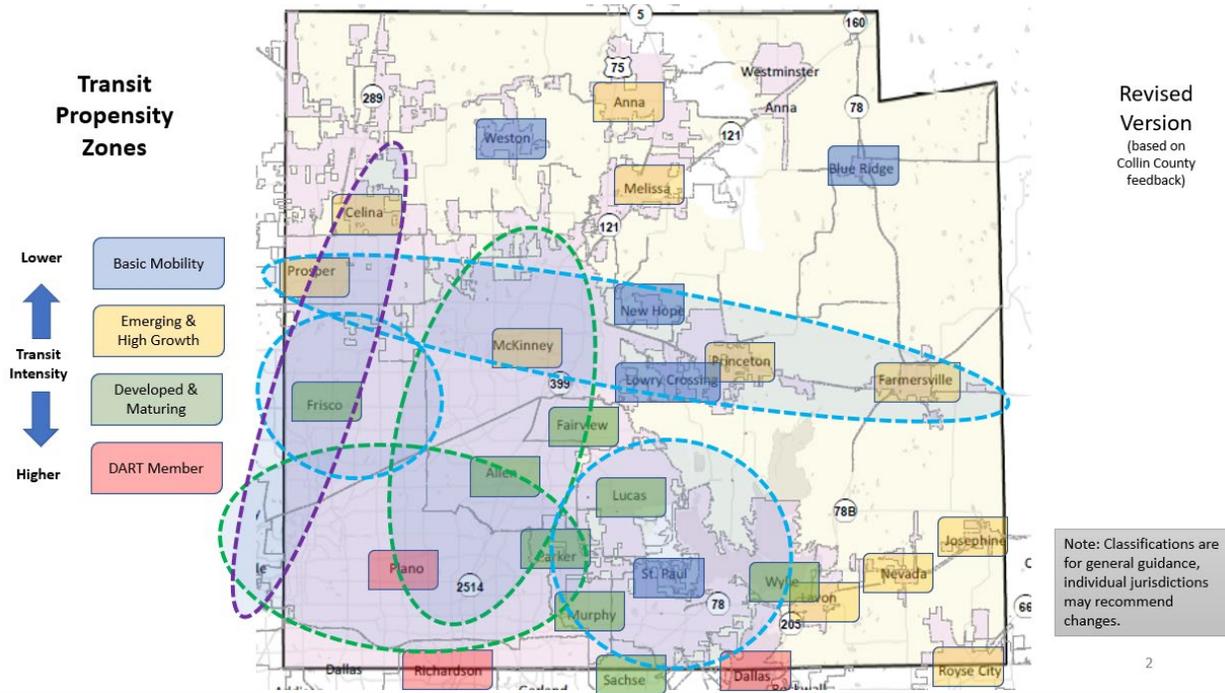


Figure 63: Transit Propensity Zones

Three Transit Intensity Scenarios

With the framework defined and reviewed by the PAC, the project team opted to use a three-tiered approach to finalize the service scenarios: low, medium, and high. This approach provides Collin County and local jurisdictions with a sense of what transit could look like in the future. While there is no requirement for mutual agreement as to which ‘transit future’ is most suitable, and there is certainly a pathway available to move from a low level of transit intensity initially to ultimately achieve a high level, experience elsewhere suggests that a shared vision for transit in Collin County can help achieve progress. As will be emphasized elsewhere in this report, there are significant benefits to a coordinated approach and multi-jurisdictional collaboration. The reason for the strong emphasis is found in the existing conditions travel analysis- people in Collin County do not confine their movements or live their lives by jurisdictional boundaries. Not only does the data show large intra-county movements each day, it also revealed how intertwined the economic activity and corresponding travel patterns of residents are with the broader DFW metroplex.



Low Intensity Scenario

The Low Intensity Scenario can be summarized as follows:

- Emphasis on basic mobility services
- Largely a continuation of current transit services
- Few new agreements or partnerships
- Beyond DART service area unlikely to attract new riders

This is strictly a 'status quo' scenario, but it does present a very basic approach to future transit in Collin County. Using the three components described above, the Low Intensity Scenario brief descriptions follow:

- **Jurisdictional Focus-** Governance mechanisms remain relatively basic and oriented towards continuation of existing partnership agreements such as those in place with DART and DCTA via Collin County Transit. DART member cities would be assumed to continue that participation and they would in turn continue to receive services based on DART's planning and development processes, including DART ZOOM, the agency's bus network redesign project that will be implemented in 2022.
- **Phasing Component-** While there is unlikely to be a single, coordinated approach to phasing of transit services in Collin County, for the purposes of the Low Intensity Scenario phasing would be relatively limited and constrained by funding levels. Beyond the DART service area, deployment of improved technologies such as more advanced app-based ride hailing and fare payment, improved logistics to optimize routing and help manage costs, and real-time tracking and shorter wait times for customers may be viable. Similarly, a progression from taxi-based on-demand service to autonomous shuttles may become viable in the mid to long term. However, without a shift to a higher level of investment and thus transit intensity, no new fixed route services, high-intensity bus, or passenger rail services would be possible.
- **Transit Service Mix-** Here the emphasis is on providing transit services as essentially a last resort for people who have no other viable mobility alternatives available. Trips are typically focused on healthcare and social service needs, basic shopping, and job access. Beyond DART's service area, service levels are not designed to be attractive or competitive with automobile trips, and the primary mode of service is demand-response using sedans or lift-equipped vans.

Figure 64 depicts the Low Intensity Transit Scenario overlaid on the Transit Propensity Map (providing paratransit and low levels of microtransit throughout the county with the exception of the current DART service area).

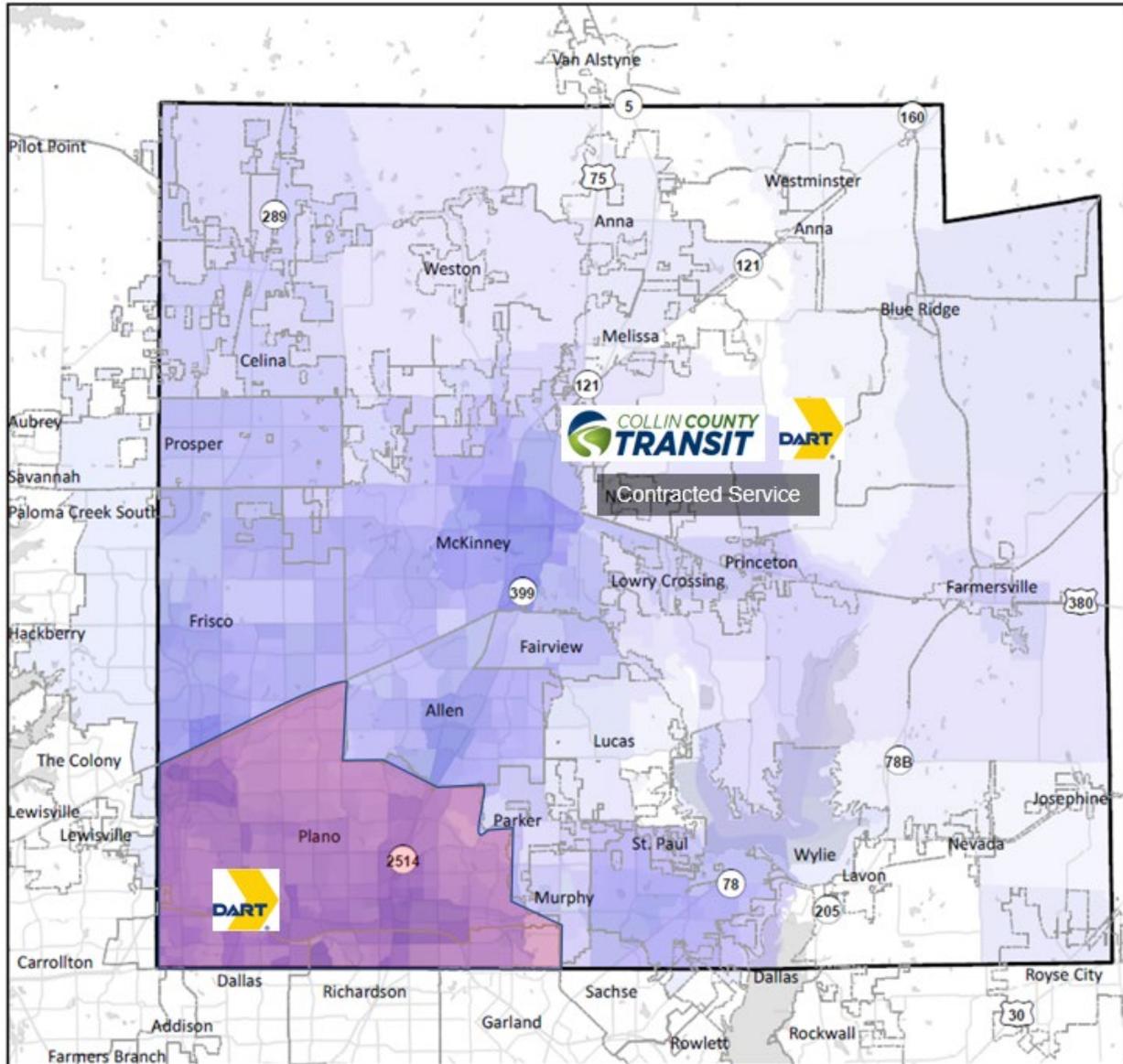


Figure 64: Low Intensity Transit Scenario

Medium Intensity Scenario

With the purpose of painting a picture of what the next level of transit intensity could look like in Collin County, the medium intensity scenario would ramp up the quantity and quality of service substantially relative to the low intensity scenario.

- **Jurisdictional Focus-** To move up to a medium transit intensity scenario, individual jurisdictions, or a collaborative group, would need to take action to support the



development and implementation of enhanced transit service levels. This could take the form of a Local Government Corporation (LGC), or services confined to a particular municipality could be implemented with independent action. For any of the regional connector services to advance, there would need to be intergovernmental coordination and formal agreements put into place. For those regional connectors that provide a link to existing transit service providers DCTA or DART, they would also need to be brought in for partnership agreements consistent with established policies.

- **Phasing Component-** A medium transit intensity scenario could be developed in the near term if desired by Collin County, or could be a second phase at some point in the future after deploying the low intensity level of service described above.
- **Transit Service Mix-** This scenario builds upon the low intensity scenario by layering in additional transit elements as follows:
 - Four areas (McKinney, Frisco, Allen, and Murphy/St. Paul) with high transit propensity and where the concentration of people and activities suggest that fixed route bus service can be effective and improve mobility.
 - Three regional corridors (east-west in the US 380 corridor; McKinney to Plano along the US 75 corridor; and possibly as a later phase in the Farmersville to St. Paul/Murphy corridor) where travel patterns suggest a need for regional connector service to be developed.
 - Development of mobility hubs at 4-6 strategic locations in the county to facilitate multimodal connectivity and increased access.

Figure 65 depicts the Medium Intensity Transit Scenario overlaid on the Transit Propensity Map.

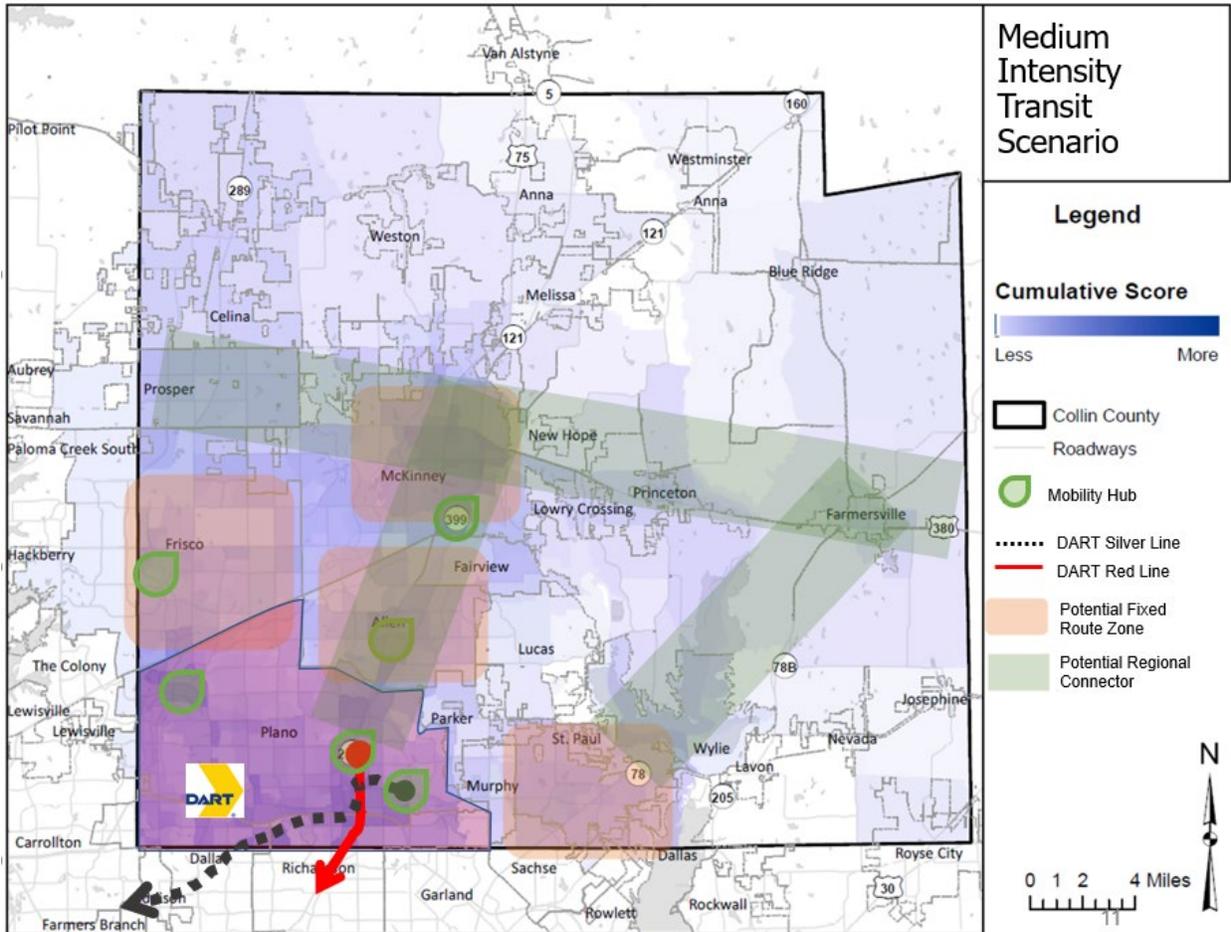


Figure 65: Medium Intensity Transit Scenario

High Intensity Scenario

Stepping up to a more robust transit future scenario, the high intensity scenario described here is almost certainly the only one that has the potential to “move the needle” in terms of creating a significant mode shift towards transit. In turn it would increase travel choices and access to opportunity, mitigate traffic congestion, and support reductions in vehicles miles traveled (and related carbon emissions) along with reducing per capita costs for mobility. Importantly, to truly unlock the potential benefits of this scenario, it must be accompanied by corresponding shifts in development patterns towards more transit-supportive, walkable, mixed-use development types. For a similarly situated county in a metropolitan area with slow or limited growth, a major shift of this sort may not be possible; however, in Collin County – the fastest growing county in the nation – there are opportunities to shape the county’s future land use and transportation.



- **Jurisdictional Focus-** The high intensity scenario requires a comparably high level of coordination and collaboration among Collin County governmental entities to be viable. With a mix of local, intra and inter-county services and associated capital investments in fleets and facilities, a robust and carefully crafted governance structure is essential. Under current state and local laws, and with consideration given to regional best practices and precedents, there appear to be several basic approaches by which a high transit intensity scenario could be developed and implemented, as discussed in more detail in the **Funding Plans** section of this report.
- **Phasing Component-** As noted above, the high intensity transit scenario is unique in its potential mobility impact. However, even if there were to be strong support to move in this direction, infrastructure investments take time and effort to develop and implement. Therefore, a phased approach to provide for a transition from today's transit conditions to a high transit intensity approach is needed, likely calling for a timeline of at least five and more realistically 10 years to fully implement.
- **Transit Service Mix-** This scenario builds upon the medium intensity scenario by layering in additional transit elements as follows:
 - Development of a comprehensive network of connected and coordinated transit services, centered around a 'backbone' of regional transit services using regional rail, light rail, and high-capacity transit (bus-based) services.
 - The addition of people movers (very frequent distributor/collector systems providing connectivity within dense job and activity centers) in areas with strong transit propensity and transit-supportive land uses
 - Development of the Irving to Frisco/Celina regional rail corridor
 - Countywide micromobility services to provide access and connectivity

Figure 66 depicts the High Intensity Transit Scenario overlaid on the Transit Propensity Map.

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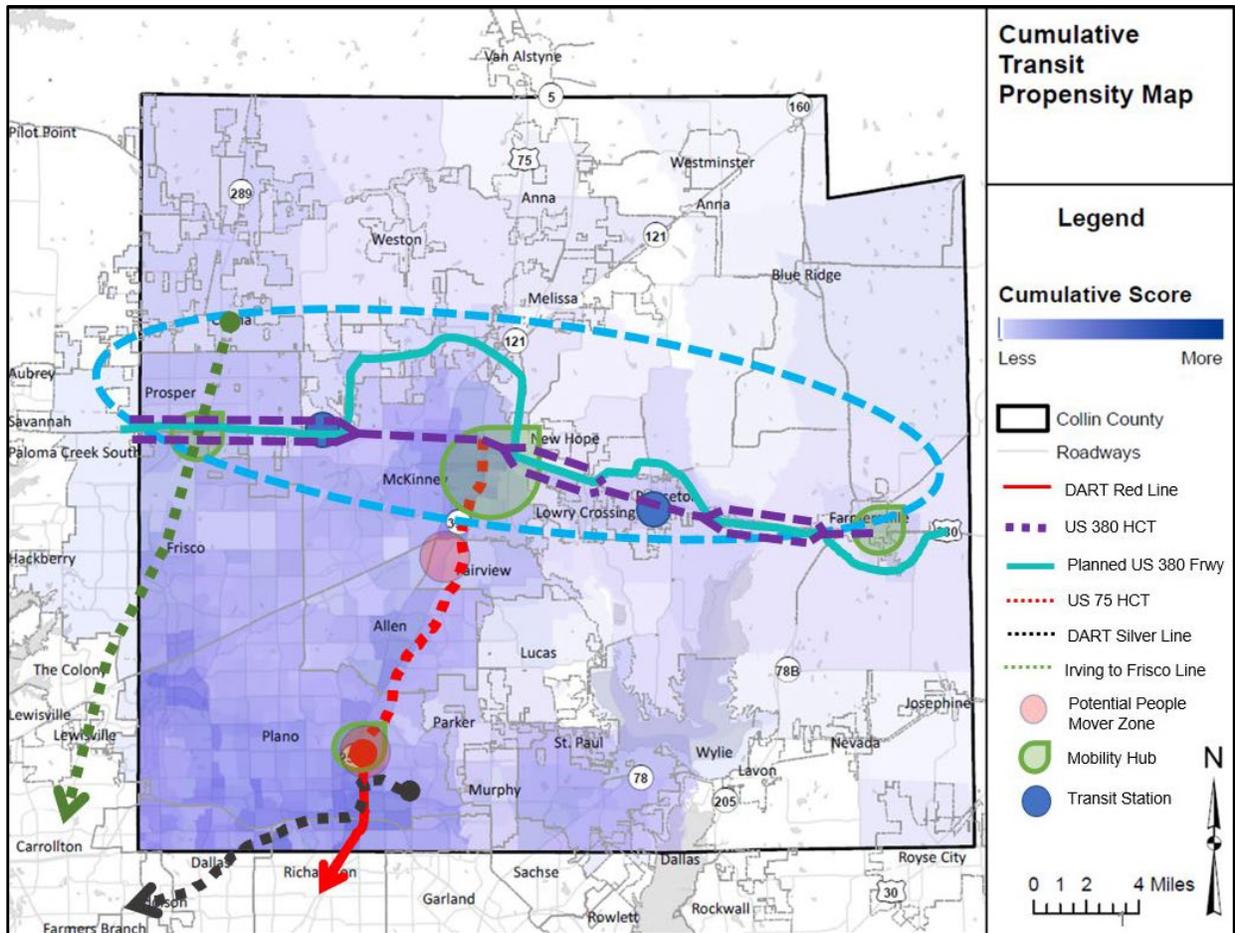


Figure 66: High Intensity Transit Scenario

While **Figure 66** is clearly a concept that will take significant time and resources to fully implement, it has the potential to become the basis for a comprehensive transit network to serve Collin County well into the future. The ‘backbone’ of high-capacity services can be leveraged with local bus service in denser, more transit-supportive areas; the stations can be focal points for mixed-use walkable TOD development; and the balance of the county can be served with on-demand mobility services. Importantly, this concept also facilitates the regional connections needed to support economic competitiveness and to increase access to jobs and other opportunities both for Collin County residents as well as others in the region.



Funding Plans

Section Overview

This section discusses funding strategies for transit in Collin County. The section will go into detail of various funding sources as well as estimated costs for transit in Collin County.

Transit funding comes from various sources from traditional funding to innovative financing. Traditional funding sources typically come from the federal government such as the Federal Transit Administration (FTA) in the form of formula grants, state funding from sources such as the Texas Department of Transportation, or local funding such as from sales tax.

Potential Revenue Sources

Federal Funding

Federal Transit funding is administered by the FTA through authorization bills passed by Congress. The current authorization bill is the Fixing America's Surface Transportation (FAST) Act. Most Federal Funding is distributed through formulas based on different assumptions such as population and/or ridership. Other Federal Funding is discretionary and competitive such as the Capital Investment Grant (CIG) funding or Congestion Mitigation and Air Quality (CMAQ) funding. FTA funding is distributed through a designated recipient. For the North Texas region there are various designated recipients of FTA funds that fall within three Urbanized Areas (UZA). The North Central Texas Council of Governments (NCTCOG), Dallas Area Rapid Transit (DART), and Trinity Metro are designated recipients in the Dallas-Fort Worth-Arlington UZA, Denton County Transportation Authority (DCTA) is the designated recipient in Denton-Lewisville UZA, and the Texas Department of Transportation (TxDOT) is the designated recipient in the McKinney UZA. In addition to FTA funds, the Federal Highway Administration (FHWA) can flex funding to programs that can benefit transit as well as other federal departments can make funds available to be used for public transit. The flexing of FHWA funds varies by region and dollar amount.

Four tables are provided below to show a range of funding sources potentially available from federal, state, local, and other sources. Each source has strengths (such as consistency, scale of revenue stream, stability during economic downturns, public support, etc.) and weaknesses (such as volatility, risk level, political or public controversy, etc.) that need to be carefully considered when developing a detailed funding program at a later phase of project development. Equally important is the eligibility of the source to be used for capital, operating and maintenance costs. Some of the funding sources will carry restrictions on their use, or be of a limited timeframe, and those considerations also factor into the development of funding program.

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Table 8 lists in greater detail Federal Funding options that may be viable for Collin County.

	Program	Description	Source of funds	Type of allocation	Allowable project types	Fiscal year (FY) 2019 funds available
Funding sources available for operating expenses <i>In general, the Federal Transit Administration (FTA) classifies operating expenses as costs necessary to operate, maintain, and manage a public transportation system to include driver salaries, fuel, and other items with a useful life of less than one year.</i>	FTA Urbanized Area Formula Grants (5307)	Funding for public transportation in urbanized areas (UZA) with populations of 50,000 or more. Distribution factors are more complex if population is less than 200,000. Eligible recipients are states or government authorities for one or more UZAs. Operating assistance for commuter rail is limited to: maintenance expenses; operating expenses in UZAs under 200,000 people; and security expenses (up to 1 percent of funds).	Highway Trust Fund	Formula	Capital, planning, job access and reverse commute, operations.	\$5.3 billion
	FTA Rural Area Formula Program (5311)	Funding to states and Indian tribes for public transportation outside of urbanized areas, specifically areas with populations less than 50,000. Eligible applicants include states and Indian tribes. Eligible sub-recipients include a state or local government authority, a nonprofit organization, an operator of public transportation, or intercity bus service that receives Federal transit program grant funds indirectly through a recipient.	Highway Trust Fund	Formula	Capital, planning, job access and reverse commute, operations	\$783 million (includes Rural Area Formula Grants, Tribal Transit Formula Grants, Tribal Transit Competitive Grants, and Appalachian Program Grants)
	Federal Highway Administration (FHWA) Congestion Mitigation and Air Quality Improvement (CMAQ) Program	Funding for transportation projects and other related efforts that contribute to air quality improvements and provide congestion relief in nonattainment or maintenance areas. Funds are distributed to states under the program. States that have no such designated areas still receive a minimum apportionment of funding for either air quality projects or other elements of flexible spending.	Highway Trust Fund	Formula	Capital, emissions reduction, operations, planning, and project development	\$2.4 billion
	FTA Emergency Relief Program	Funding provided to states, territories, and transit agencies after a federally-declared emergency or disaster. Funding is given to public transportation agencies that have experienced serious damage to transit assets.	General Fund	N/A	Capital, operations	Based on need
Other available funding sources	Department of Transportation (DOT) Better Utilizing Investments to Leverage Development (BUILD) Transportation Grants	Funding awarded for surface transportation projects that have a significant impact in local and regional communities. Not more than 50 percent of FY 2019 funds could be awarded to projects in rural areas. In 2020, eligible applicants include state, local, and tribal governments, including transit agencies and other subdivisions of state or local governments. Previously known as the DOT Transportation Investment Generating Economic Recovery (TIGER) discretionary grant program.	General Fund	Competitive	Capital, planning	\$900 million
	FHWA Surface Transportation Block Grant Program	Funding to states and localities for projects that preserve and improve conditions on any federal-aid highway, bridges and tunnels on any public road and transit capital projects, among other things.	Highway Trust Fund	Formula	Capital	\$11.9 billion

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	Program	Description	Source of funds	Type of allocation	Allowable project types	Fiscal year (FY) 2019 funds available
	FTA Capital Investment Grant Program (5309)	Funding to support the construction of new rail, bus rapid transit, and ferry systems, and to expand existing systems. Program includes four types of projects: New Starts, Small Starts, Core Capacity, and Interrelated Projects. States and local government authorities are eligible recipients.	General Fund	Competitive	Capital	\$2.5 billion
	FTA State of Good Repair Grant Program (5337)	High Intensity Fixed Guideway funding distributes approximately 97 percent of the funds in this program for maintaining rail, bus rapid transit, trolleybus, and ferry systems. High Intensity Motorbus funding distributes approximately 3 percent of the funds in this program for bus service operated in high-occupancy vehicle lanes. FTA distributes funds to designated recipients in UZAs according to a statutory formula. Eligible recipients are states and local government authorities in urbanized areas with fixed guideway and high intensity motorbus systems in revenue service for at least seven years.	Highway Trust Fund	Formula	Capital	\$2.9 billion

Source: GAO presentation of Congressional Research Service, DOT, FHWA, and FTA information. | GAO-21-355R

Table 8: Federal Funding Sources

State Funding

While historically the State of Texas has not played a major role in the funding of urban transit projects and programs in large metropolitan areas, there are several potential sources of funding that should be considered, including both grants and low-cost loans. Regional Mobility Authorities (RMAs), included in the list below, are created by the State of Texas and have the potential to be funding or financing partners for the development of a regional rail given their relatively broad legislative authority. However, given the existence of the North Texas Tollway Authority in the metroplex, any such partnership would need to be with that organization as the creation of a new RMA is not likely to occur. Other potential state-level options are shown below in **Table 9**.

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State Funding	
State Infrastructure Bank Loans	Revolving loan fund that allows borrowers to access capital funds
Transportation Reinvestment Zone	Captured ad valorem tax increments are set aside to finance transportation projects
Regional Mobility Authority	Political subdivision formed by one or more counties to finance, acquire, design, construct, operate, maintain, expand, or extend transportation projects
Transportation Development Credits	Federal funding tool that states can use to meet federal funding match requirements

Table 9: State Funding Sources

Local Funding

To supplement Federal funds and State funds, local funding must be available. All FTA funds require a local match from either state and/or local funds. The State of Texas created enabling legislation (<https://statutes.capitol.texas.gov/Docs/TN/htm/TN.452.htm> addressing DART and Trinity Metro, and <https://statutes.capitol.texas.gov/Docs/TN/htm/TN.460.htm> for DCTA) that provides for the creation and operation of transit systems. It also prescribes their authority to raise revenue.³ At present, DART collects a one cent sales tax while both Trinity Metro and DCTA collect a one-half cent sales tax within their respective service areas. In each case, local jurisdictions held a referendum to opt-in at the outset of each transit provider, and the legislation also allows local jurisdictions that are part of a transit system to hold a referendum to remove themselves from a transit authority, or conversely for a non-member jurisdiction to vote to join a transit authority. Importantly, the statutory language also places a ‘cap’ on the amount of sales tax that can be collected by all local taxing jurisdictions (including transit authorities), and this has proven to be a substantial constraint on transit systems seeking to fund capital improvements and increased funding levels.

³ For a detailed report of funding sources for transit in Texas, see <https://static.tti.tamu.edu/tti.tamu.edu/documents/PRC-15-11-2.pdf>.

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While the sales tax is a primary funding source for all three agencies, there are other revenue sources to provide local funding for both capital and operating expenses as shown in **Table 10** below.

Local Funding	
Transit Fare Revenue	Revenue earned from carrying passengers
Sales Tax	Legal authority of local governments to impose a dedicated tax
Local Contribution	Funds allocated to transit out of general revenue rather than a dedicated transit fund
In-Kind Contribution	Non-cash assets or services that have value that benefits those outside the contributor's organization
Non-Transit Related Revenue	Earnings received from investments, rental of buildings or property, parking fees, development fees
Local Motor Vehicle Registration Fees	Flat rate fee or fee based on the vehicle value

Table 10: Local Funding Sources



Other Revenue

In addition to Federal, State, and Local funding sources, there are other innovative ways in which transit can be funded. Some ways are from additional taxing sources while others rely on private funding options. **Table 11** lists some other and/or innovative funding sources.

Other Funding	
Auxiliary Transit Revenues	Advertisements on vehicles, fines for fare evasion
Air Quality Surcharge	One-time charge of new vehicle based on the vehicles estimated lifespan
Luxury Transportation Tax	Tax on yachts, private jets, and luxury vehicles that would help fund transportation
Transit for Livable Communities	Funding for local areas to create station plans
Value Capture	Capture future real estate values based on the enhancements from the project to fund construction
Special Fuel Tax	Tax per volume of fuel sold rather than the cost of fuel
Public Private Partnership	Collaboration between government and private sector that can be used to finance, build, and operate projects
Tax Rate Election	Taxes that increase property tax to fund other projects
University/Colleges	Partner with local university or college to fund transit

Table 11: Other Funding Sources

These funding sources are not sufficient on their own, and their applicability can vary based on local context, but they can represent a portion of a comprehensive funding package. One such source is value capture. Value capture strategies generate sustainable, long-term revenue streams that can help repay debt used to finance the upfront costs of building infrastructure, including transit projects. Revenue from value capture strategies can also be used to fund the operations and maintenance costs of transit systems. Value capture strategies are public



financing tools that recover a share of the value transit creates. Examples of value capture strategies used for transit include tax increment financing, special assessments, and joint development.⁴

Funding options were considered throughout the planning process. In fall 2020, NCTCOG evaluated the option of going to the State Legislature to request additional funding options such as allowing cities and or counties to bond or providing more sales tax flexibility under the state sales tax cap. After further discussion amongst NCTCOG and stakeholders it was decided to not bring transit forth to the legislature due to transit ridership decline during the COVID pandemic.

Potential Operating and Maintenance Costs

The following section is intended to prepare order of magnitude annual costs to implement transit in various communities throughout the county, depending on transit propensity and other factors as discussed above. While the following transit service assumptions are not intended to be taken as recommendations, these service assumptions are generally in line with the transit propensity analysis described in previous sections and provide the opportunity to review associated annual costs for each community. These costs provide a reference on the magnitude of funds needed to maintain transit; as the transit services intensify from on-demand to fixed route and premium bus, it is expected that some other governance entity beyond just the city would be involved in operating the service, which has implications on actual funding sources and amounts.

Building on the development of the three transit service scenarios, annual operating, and maintenance costs for each scenario are outlined here. The annual operating and maintenance costs are based on the three categories identified through scenario development. The three categories are:

1. Basic Mobility
2. Emerging & High Growth
3. Developed & Mature

Based on needs and growth potential, each city was placed into one of these three categories, with DART member cities Dallas, Plano, and Richardson being placed in a separate category as their revenue stream is already established. After further analysis and review of population, two tiers within each category based on population were developed. To develop operating costs, assumptions were developed for each 'use case', as described in Appendix D. These assumptions led to a set of baseline costs developed based on peer experience and data from the FTA's National Transit Database. Further analysis and planning will be required to refine the

⁴ Source: <https://www.transit.dot.gov/valuecapture>



transit services that would be most suited for each jurisdiction, leading to more refined cost estimates.

This analysis, then, should be considered as a starting point and is not a recommendation of what each community “should” have. As more detailed planning and implementation occur, the service types can and should be adjusted to fit the needs of the jurisdiction. In addition to the type of transit service, each jurisdiction will need to consider the operational characteristics of the service. This will include not only the type, i.e., demand response versus fixed route, but the hours of operation, days of the week the service operates, and the frequency of the service. The costs associated with the baseline transit service identified was developed using comparable costs from various Texas transit agencies.

Basic Mobility

Cities categorized in the Basic Mobility category are those cities who need transit to provide essential mobility services for individuals lacking access to reliable transportation for daily needs. This analysis assumes that Basic Mobility is served with a demand response form of transit and can take the form of dial-a-ride service wherein customers call in advance to schedule a ride, microtransit where customers either call or use a cell-phone-based app to schedule a ride (typically with a much shorter wait time) or a neighborhood connector that can vary its travel pattern based on rider origins and destinations. In the longer term, autonomous shuttle services can be expected to fill this niche in the mobility marketplace due to cost efficiency. Demand Response routes do not operate on a fixed route, they operate where passengers call in to ride, and the transit vehicle either picks them up at a major intersection close to their origin or at their door. The passenger is then transported to the intersection closest to their destination, the door of their destination or a transit center/park and ride to then transfer to other transit options. Jurisdictional classifications and assumptions are provided in Appendix D.

Emerging & High Growth

Cities categorized in the Emerging & High Growth category has a population that warrants both demand response and fixed route services. Demand response would function as in the Basic Mobility scenario providing more door-to-door type trips for passengers. Fixed route service would provide transit service that operates along a fixed route or corridor at a fixed frequency throughout the day, providing stops at various destinations along the route and not deviating from that route or corridor.

Developed & Mature

Cities in the Developed & Mature category have enough population for demand response, fixed route, and premium bus. Complementing demand response and fixed route services, premium bus service would operate as a high-capacity service along corridors with dense clusters of development, jobs, and housing likely to generate transit ridership, and to provide regional

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connections with linkages to fixed route and other mobility options at mobility hubs, transit centers, and park and rides.

Potential Operating Costs

This section and the tables below will discuss the costs associated with the suggested transit options. As defined in the above section the cities were categorized into four categories based on population and transit need. The categories are basic mobility, emerging and high growth, developed and mature and DART member city. **Table 12** outlines which cities fall into which categories.

City Type	Basic Mobility	Emerging & High Growth	Developed & Mature	DART Members
City Names	Blue Ridge	Anna	Allen	Dallas
	Lowry Crossing	Celina	Fairview*	Plano
	New Hope	Farmersville*	Frisco	Richardson
	St. Paul	Josephine*	Lucas*	
	Weston*	Lavon*	Murphy	
		McKinney	Parker*	
		Melissa	Sachse	
		Nevada*	Wylie	
		Princeton		
		Prosper		
	Royse City			
				*Tier 2 cities

Table 12: Cities by Typology

As previously discussed, the categories are suggestions for how to frame transit within each city as well as the level of transit need that was identified as part of the PAC meetings and scenario planning efforts.

Table 13 outlines the cost associated for each city based on the level of transit service. The cost was developed using the operating assumptions outlined in the section above. Note that while through scenario development it was identified that the following is the suggested level of transit service for each community, the phasing, layered transit service approach, and extent of service options provided in each community is at the discretion of each city for the level of transit they deem appropriate.

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City Type	Demand Response Tier 1	Demand Response Tier 2	Fixed Route Tier 1	Fixed Route Tier 2	Premium Bus Tier 1	Premium Bus Tier 2	Total Cost (Annual) Tier 1	Total Cost (Annual) Tier 2
Basic Mobility	\$1.9	\$0.9	-	-	-	-	\$1.9	\$0.9
Emerging & High Growth	\$1.9	-	\$2.0	\$1.0	-	-	\$3.9	\$2.9
Developed & Mature	\$1.9	-	\$2.0	\$1.0	\$1.3	\$0.7	\$5.2	\$3.5

Table 13: Preliminary Annual Service Cost Estimates by City Type (in millions)

Implementation Strategies

Section Overview

This section assesses a range of potential approaches to implementing transit in Collin County. While most of the county needs transit services, it is at the discretion of the cities to implement and fund transit for their residents.

Transit is a benefit to communities by providing other mobility options beyond the personal automobile. Through additional mobility options, communities become more attractive to residents and employers. Through transit propensity analysis and scenario planning, the project team was able to identify appropriate levels of transit for each community.

How transit should operate and be funded in a community that does not already have transit can be quite tricky. There are several ways to implement transit in communities to both garner ridership and make transit successful. This section will further outline implementation strategies as well as potential governance structures.

Governance

Collin County's location in a large metropolitan area where multiple transit agencies exist, local governments number in the dozens, travel patterns extend well beyond county boundaries, and rapid growth is an ongoing phenomenon. These issues create many complexities and challenges to developing a governance structure whereby transit service can function efficiently and effectively. Today Dallas, Plano, and Richardson (all of which lie at least partially within Collin County) are longstanding DART member cities, including the allocation of one cent of sales taxes collected in their communities to support DART's services. McKinney and several other cities have a contractual relationship with DCTA to provide on-demand response service in their jurisdictions (relying not on a dedicated revenue stream but rather annual appropriations).

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And other transit and human service transportation providers offer a patchwork of services across much of the county (as described in the Transit Services Overview section of this report), with a variety of funding sources. In an effort to identify a coherent approach moving forward that offers the best opportunity for transit services to better meet community needs, a range of potential governance options were examined.

Governance is how and who will provide transit for a community. For those cities that are part of DART, the situation is relatively straightforward. The vast majority of jurisdictions, however, have allocated their local sales tax for other purposes and as discussed previously, cannot join DART without first rescinding at least some portion of their existing tax structure. This creates an almost insurmountable challenge, as there is no option to participate at any level other than the full one cent. While there are many reasons why joining an existing transit agency is the approach preferred approach, other structures may provide for a means to transition from today's situation.

A literature review identified the 2011 Transportation Research Board Report: Regional Organizational Models for Public Transportation⁵, including **Figure 67**, which provides a framework to inform this study effort.

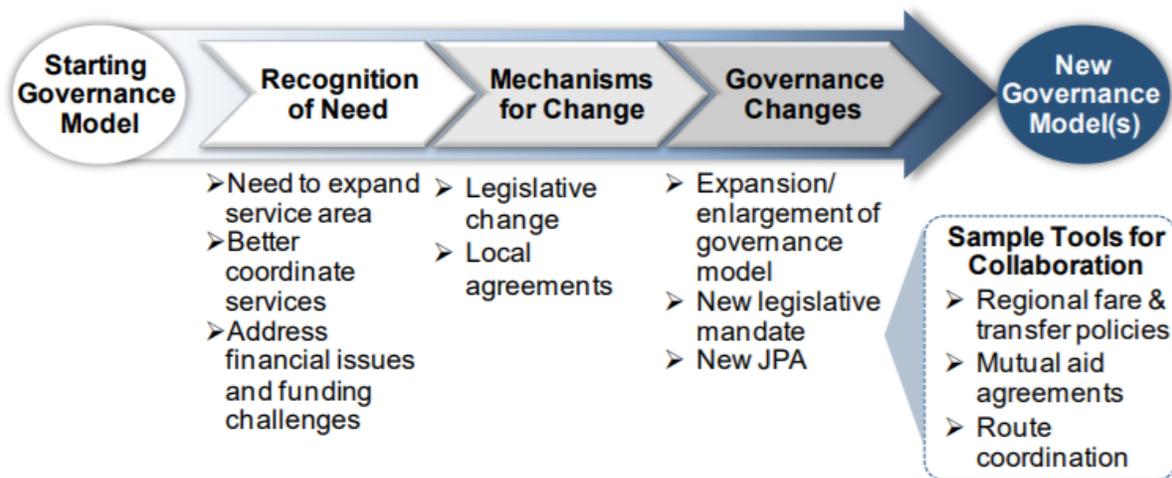


Figure 67: Transit Governance Models (Source: <http://onlinepubs.trb.org/onlinepubs/tcrp/docs/TCRPJ-11Task10-FR.pdf>)

As the graphic indicates, a starting point is the recognition of need, which this study effort has advanced. In terms of mechanisms for change, both ideas listed were initially considered, with the former, legislative change, ultimately being deferred for a variety of reasons. The latter, local

⁵ Regional Organizational Models for Public Transportation TCRP Project J-11 / Task 10 Transit Cooperative Research Program Final Report, 2011.



agreements, does offer some potential options, however, and these are explored in more detail below. By identifying alternatives and assessing their strengths and weaknesses, progress can be made toward the next steps as shown in **Figure 67-** Governance Changes and ultimately New Governance Model(s).

Local Government Corporation as Transit Facilitator

Two types of governance structures were identified for future transit within Collin County (**Table 14**). One option is for the city to join an existing transit agency as a member city. Existing agencies can include DART or DCTA.

Governance Structure	Pro	Con
Join an Existing Transit Agency (DART/DCTA)	<ul style="list-style-type: none"> •Solves gaps in service •Sustainable transit service 	<ul style="list-style-type: none"> •Requires dedicated funding source (i.e. sales tax) that is not currently available for affected jurisdictions
Interlocal Agreement (Local Government Corporation, LGC)	<ul style="list-style-type: none"> •Contracted service •City can opt out at any time 	<ul style="list-style-type: none"> •Requires strong cooperation between agencies •City can opt out at any time

Table 14: Governance Structure Pros and Cons

Due to the local precedent of DART creating a Local Government Corporation (LGC) to facilitate the provision of transit services beyond its service area; the City of Arlington using the mechanism to partner with Trinity Metro; and the more recent use of an LGC by Capital Metro in Austin as a governance model for the implementation of their \$7B transit program known as Project Connect, the use of an LGC for the development of enhanced transit in Collin County merits consideration. Creating an LGC could be accomplished by a city, a county and/or a transit agency. For the purposes of facilitating transit in Collin County, the suggested approach is to make use the knowledge and expertise of DART and/or DCTA’s LGC capabilities. Through this mechanism, agreements can be forged regarding how transit is to be provided and funded including governance mechanisms. LGCs can be formed relatively quickly and are not hindered by the sales tax restrictions that make directly joining a transit agency infeasible in the near term. For this reason, the use of an LGC may be advantageous for one or both conditions below:

1. Develop an LGC to provide a near-term transit governance and funding solution for one or more jurisdictions within Collin County, and/or
2. Develop an LGC as an interim solution while working towards a more sustainable and regionally coordinated approach (likely transit agency membership).

In either case, an LGC developed in coordination with a transit agency provides the benefit of not having to “reinvent the wheel” with regard to transit service planning, implementation and

ongoing operation and maintenance. There is a steep learning curve for local jurisdictions to take on transit development independently and the expertise required is typically not found internally. Accessing FTA funds, which come with significant legal, financial, and statutory obligations, can also be quite onerous for a local jurisdiction to take on independently, yet those funds are in almost every case an important part of the transit funding picture.

Roles and Responsibilities

This section began by outlining the somewhat complex myriad of governance functions within a large metropolitan area like Dallas-Ft. Worth. After assessing the ‘players’ and their potential roles in advance transit in Collin County, **Figure 68** summarizes the most logical and appropriate roles.

Potential Roles and Responsibilities

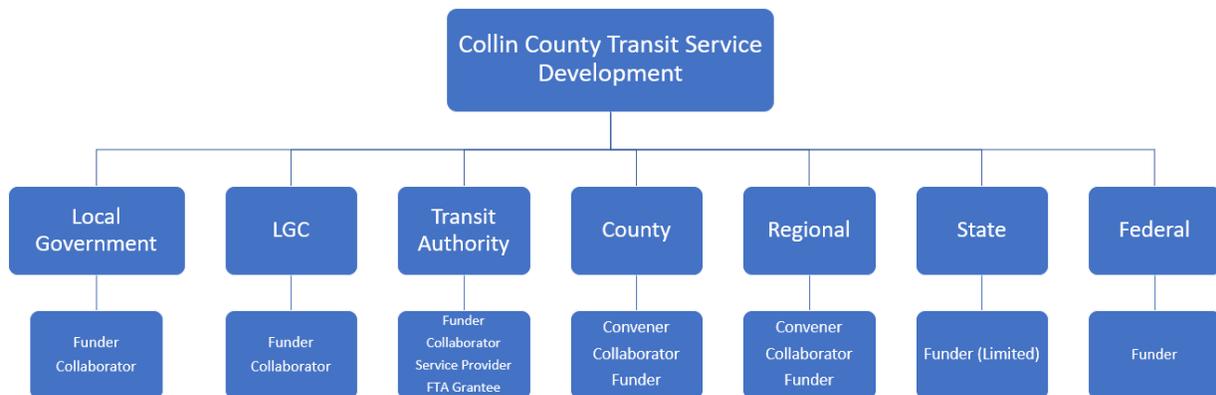


Figure 68: Roles and Responsibilities

As indicated, the levels of engagement vary by participant, and can change based on local conditions and ideally through continued collaboration.

Potential Implementation Approach and Investment Levels

Having defined a low, medium, and high intensity vision of future transit services in Collin County, identifying a wide range of potential funding sources, reviewing governance models and proposing potential roles and responsibilities, defining a possible implementation approach is a logical next step. As is likely evident at this point, considerable time and effort is required to advance a major transit program, and therefore a phased approach is suggested. **Figure 69** outlines how a potential implementation schedule could advance. As shown, implementation is broken out in five-year increments, with suggested transit service types and requisite funding levels indicated.

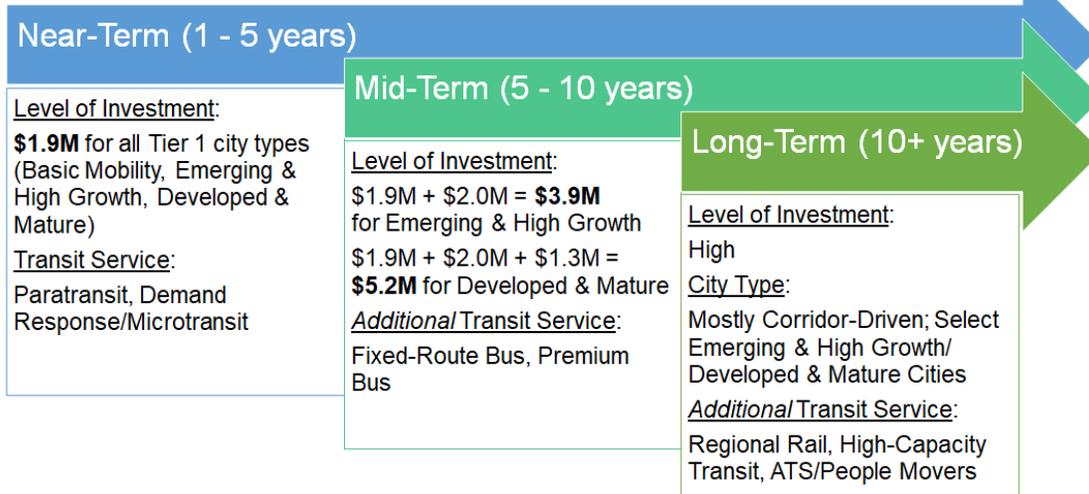


Figure 69: Potential Phasing Approach

Summary and Next Steps

Section Overview

Collin County’s ongoing growth and development along with corresponding increases in population, households, jobs, and activity centers all point to a need for increasing the range of mobility options and improving access for residents, workers, and visitors. As other large metropolitan communities have seen, continued dependence on automobile travel without corresponding options for travel by bike, on foot and on transit is not sustainable over the long term as congestion continues to overwhelm the roadway network. We can’t build our way out of congestion; how do we utilize our current transportation network to provide reliable mobility more efficiently? Worsening congestion negatively affects not only quality of life, but it also hampers economic development. Public transportation can play a much larger role in the future of Collin County with the right mix of planning, stakeholder and community leader support, and ultimately increased funding. This summary section emphasizes near-term actions that can support effective progress towards developing a more robust transit system that can better meet community needs.

Setting the Stage for More and Better Transit in Collin County

As discussed in detail in prior sections, public transportation already plays an important, but varied, role in Collin County. However, today the focus for most of the transit service in the county is on social service functions and providing lifeline type services. Only in Plano and along



current and future passenger rail corridors do transit levels of service approach what is needed to create sizeable shifts in travel behavior. These areas have the combination of transit-supportive land uses and corresponding levels of transit service that are necessary to unlock the benefits of increasing equity, providing access to opportunity (particularly important in a 'job-rich' environment as is found in much of the county), mitigating traffic congestion, lowering household transportation costs, and positioning the county for long-term economic success with the ability to attract the workforce of tomorrow that is increasingly seeking locations that don't require dependency on automobile travel. While it is not reasonable to expect that frequent, high-quality transit services can be expanded across the county in the near term, the scenarios developed in this study provide a solid starting point.

Based on lessons learned and best practices from comparable communities, there are several key short-term actions that the Collin County community and leadership can take to leverage the significant engagement of the PAC and this study effort. They include:

- **Extend the life of the PAC or create a new working group to maintain momentum and spearhead progress:** With pandemic recovery just one of many, many issues that elected officials in Collin County will be facing over the next several years, it will be all too easy to lose focus and revert to the status quo for public transportation. For that reason, the project team believes it is critical that the PAC, or a similar body primarily consisting of elected officials and key staff and stakeholders, be established and hold regular (quarterly at a minimum) meetings. Maintaining focus, building trust and facilitating collaboration and coordination are all highly correlated with positive outcomes and progress in advancing transit in communities like Collin County.
- **Expand upon existing relationships with transit service providers (DART and DCTA):** The Dallas-Fort Worth region has a long history of developing public transportation networks, highlighted by the largest LRT system in the country. Leveraging the region's expertise and experience can not only help avoid common pitfalls, but also is a key to establishing the fundamentals for new and improved transit service, including both capital and operating funding support.
- **Continue to engage at the state and federal levels in coordination with the RTC:** While historically the State of Texas has not provided significant transit funding in major metropolitan areas, maintaining an active presence, tracking legislation and positioning for future support whether in the form of statutory legislation, funding, or other areas is vital. The region has long enjoyed success in gaining crucial funding and other support for transportation programs and projects by coordinating through the RTC to make regional needs known at the federal level and building upon that success for Collin County only makes sense.
- **Facilitate public education and foster public engagement:** Establishing support for improved transit services requires a multi-pronged effort and a focus on incremental progress. Celebrating successes, sharing positive stories about the role transit can play



in improving quality of life and promoting the use of transit where it makes sense are among the many actions that can be taken to foster awareness and support. Similarly, maintaining a focus on the quality of existing and new services and being responsive to customer feedback also can go far to engender trust and confidence that is needed to support new and improved transit services.

- **Seek opportunities to create more transit-supportive development patterns:** As discussed in detail in the *Collin County Transit Oriented Development Guidelines* found in Appendix C, transit works best in mixed-use, walkable communities with well-connected street networks. Finding ways to facilitate these types of development patterns along major corridors and particularly around proposed station areas and mobility hubs can yield multiple benefits for the Collin County community.
- **Lastly, build on the consensus direction that emerged at the final Project Advisory Committee meeting, including:**
 - Start with Phase 1/near-term transit to solve the patchwork of transit services currently offered and build on the paratransit service to offer broader microtransit service, crossing jurisdictional boundaries;
 - Plan for a phased approach such that future service can build on this first layer of service; and
 - Work to ensure that NCTCOG's Mobility Plan update in 2022 includes Collin County's interests in regard to transit improvements, including updates to Access North Texas efforts.

Summary

The Collin County Transit Study comes at a fortuitous time given the county's rapid and ongoing growth and, at least until the pandemic, ever-increasing congestion levels and mobility challenges. Even during the midst of the pandemic, the Dallas-Fort Worth area continued to increase in population and employment at a rapid pace, with Collin County being no exception. While the outfall of the pandemic and the path to recovery has yet to be fully determined, there is little doubt that Collin County will continue to see rapid growth, that the need for access to jobs and opportunity will continue to grow, and that for equity, environmental and economic reasons the need to diversify the range of mobility choices available will become ever more important to ensure sustainable long-term success and quality of life. Transit will not become the predominant mode of transportation, and neither will bicycling or walking – the automobile almost certainly will maintain that role. Nonetheless, transit can play a much larger and more meaningful role as a critical piece of the mobility system in Collin County, and this study helps to lay the groundwork to move in that direction. By taking the first step in building a cohesive layer of microtransit throughout the county, the communities in Collin County will be better positioned to continue effective growth and creation of connected communities.



Appendices

- A. List of Project Advisory Committee (PAC) Members
- B. PAC Meeting Dates
- C. TOD Best Practices Report
- D. Jurisdictional Assumptions for Project Cost Estimates
- E. Cost of Not Implementing Transit Whitepaper
- F. Final PAC Survey Responses
- G. Collin County Colleges and University Survey Responses



APPENDIX A: LIST OF PAC MEMBERS

Agency	First Name	Last Name	Job Title
Allen	Chris	Flanigan	Director of Engineering
Allen	Chris	Schulmeister	Councilmember
Allen	Ken	Fulk	Mayor
Anna	Greg	Peters	Director of Public Works
Anna	Jim	Proce	City Manager
Celina	Andy	Glasgow	Assistant Director of Engineering
Celina	Dusty	McAfee	Development Services Director
Celina	Scott	Harper	Engineer
Celina Representative	Abra	Nusser	Kimley Horn Consultant
Collin County	Clarence	Daugherty	Director of Engineering
Collin County	Duncan	Webb	Commissioner (Precinct 4)
DART	Bonnie	Murphy	Vice President, Commuter Rail
DART	Jing	Xu	Interim Assistant Vice President, Service Planning
DART	John	Hoppie	Project Manager
DART	Linicha	Hunter	Service Planner
DCTA	Dennie	Franklin	Non-voting Board Member for Frisco
DCTA	Tim	Palermo	Senior Regional Planner
Fairview	Adam	Wilbourn	Assistant to the Town Manager
Fairview	Julie	Couch	Town Manager
Farmersville	Ben	White	City Manager
Farmersville	Randy	Rice	Mayor
Frisco	Brian	Moen	Assistant Director of Transportation
Frisco	Kerin	Smith	Senior Traffic Engineer
Frisco	Paul	Knippel	Director of Engineering
McKinney	Akia	Pichon	Transit Administrator
McKinney	Gary	Graham	Director of Engineering
McKinney	Janay	Tieken	McKinney Urban Transit District
McKinney	Pam	Alummootil	Civil Engineer II - Traffic

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McKinney Chamber of Commerce	Justin	Beller	Senior VP
Melissa	Jason	Little	City Manager
Melissa Representative	Nolan	Harvey	Engineer at EST, Inc.
Plano	Drew	Brawner	Senior Planner - Mobility
Plano	Rick	Grady	Councilmember
Plano	Robert	Saylor	Senior Transportation Engineer
Princeton	Derek	Borg	City Manager
Princeton	Lesia	Gronemeier	Assistant City Manager
Prosper	Alex	Glushko	Planning Manager
Prosper	David	Fenton	Civil Engineer
Richardson	Jessica	Shutt	Mobility and Special Projects Manager
Richardson	Mark	Nelson	Director of Transportation and Mobility
Richardson	Shawn	Poe	Director of Engineering
Richardson Chamber of Commerce	Bill	Sproull	President/CEO
Wylie	Brent	Parker	Assistant City Manager
Wylie	Tim	Porter	Public Works Director
Wylie	Chris	Holsted	City Manager

List of Temporary/Replaced Members on Committee

Agency	First Name	Last Name	Job Title
Allen	Gary	Caplinger	Mayor Pro Tem
Allen	Lauren	Doherty	Councilmember
Allen	Stephen	Terrell	Former Mayor
DCTA	Lindsey	Baker	
Wylie	Wes	Lawson	Project Engineer



APPENDIX B: PAC MEETING DATES

Collin County Transit Study
5/21/20
6/18/20
8/6/20
9/3/20
10/1/20
12/3/20
2/4/21
4/1/21
5/13/21
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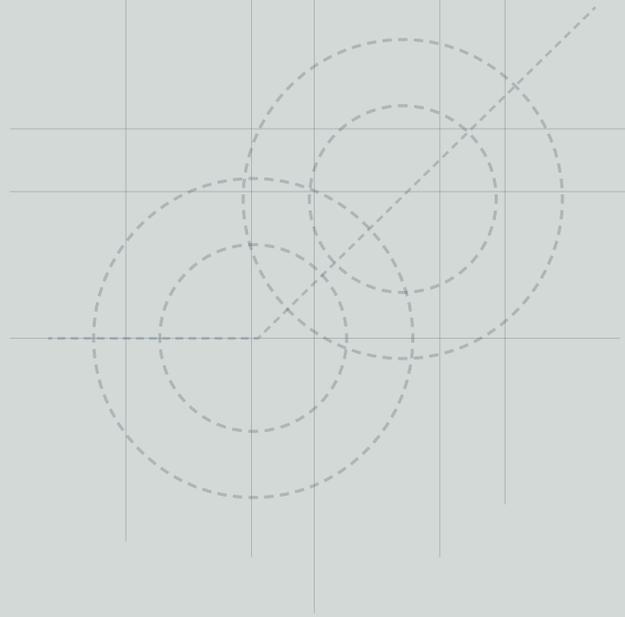


APPENDIX C: TOD BEST PRACTICES REPORT

NOTE: REPORT INCLUDED ON FOLLOWING PAGES



North Central Texas
Council of Governments



COLLIN COUNTY TRANSIT ORIENTED DEVELOPMENT GUIDELINES



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INTRODUCTION



Fruitvale Village - Oakland California

1.1 A Resource for TOD in North Texas

Transit-Oriented Development (TOD) is being embraced around the country as a way to leverage improved mobility, attract quality investment, and build more sustainable, livable, and competitive communities. The Dallas and North Texas region - with some of the country's best known and admired TOD examples - is a leader in providing meaningful growth and change around stations. Successful TOD is a win-win-win proposition providing transit service providers with improved ridership, providing cities and towns with new centers and districts that supply jobs and revenue, and, most importantly, providing the community with homes, services, amenities, and destinations that improve their quality of life and create more equitable and healthy places.

Expanding on the early success of TOD in the region, these Guidelines are designed to build greater understanding of TOD's benefits to North Texas communities, promote collaborative planning, and provide guidance to elevate the quality and performance of future projects. As a resource for area stakeholders, customers, developers, municipalities, and the general public, the Guidelines will help shape decision making about private development strategy, local land use and development policy, place making, and capital investment programming.

From early visioning and analysis through project design and implementation, the Guidelines serve as a tool to support collaboration among North Central Texas Council of Governments, Collin County, and cities and land use authorities, property owners and developers, and regional advocates for smart growth, equitable economic development, and improved livability.

1.2 Guidelines Organization

The Guidelines are organized in three major sections as follows:

- **Understanding Transit Oriented Development.** Defines TOD, describes the qualities of successful TODs, and reports the broad benefits of building transit supportive neighborhoods and districts.
- **Delivering TOD In North Texas.** Describes collaboration with municipalities, and identifies Station Area Contexts & Opportunities.
- **TOD Types & Design.** Defines TOD Typologies and provides guidance for the planning, design, and development of TOD places and projects.

RELATED RESOURCES

Organizations around the country provide strong guidance and information for using TOD as a resource for creating stronger and more connected communities. Several examples are included below:

National Resources and Technical Assistance For Transit-Oriented Development

<https://todresources.org/>

FTA Joint Development Brochure

<https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/funding/funding-finance-resources/joint-development/64731/joint-development-brochure.pdf>

NCTCOG Parking Study

www.nctcog.org/nctcg/media/Transportation/DocsMaps/Plan/Landuse/

The Economic and Fiscal Impacts of Development near DART Stations

www.dart.org/about/economicimpact.asp

Ten Principles for Successful Development around Transit

<http://www.reconnectingamerica.org/assets/Uploads/bestpractice086.pdf>



Phoenix Mobility Hub - Phoenix, Arizona



Healthline BRT - Cleveland, Ohio



2

UNDERSTANDING TRANSIT ORIENTED DEVELOPMENT

2.1 TOD Defined

TOD, an abbreviation of the phrase Transit Oriented Development, is used to describe a type of community or district designed to capitalize on transit accessibility. Planned as compact, walkable, mixed use places, TODs offer people greater transportation choices, reduce dependence on automobiles, support more sustainable and equitable development, and build demand for enhanced transit services.

Typically, TODs are medium- to high-density mixed use developments centered on a rail station or rapid transit stop. As all transit trips begin and end with a walking trip, pedestrian-friendliness is a key factor in TOD planning and design. Successful TODs are designed with walkable streets and public spaces, buildings with active ground floor uses and pedestrian-oriented entries and facades, and convenient connections to transit. With robust transit service and the right mix of uses, TODs have proven successful in expanding mobility options; reducing parking demand, auto dependence, and transportation costs; and increasing transit ridership.

TOD is taking root across the country, providing many examples of growth and change that is oriented towards a transit line but reflective of their contexts. Cities and regions like Portland, Denver, and the California Bay area provide many strong examples. However, excellent local TOD examples are available right in your backyard, including Mockingbird Station, Downtown Plano, and CityLine in Richardson. These local examples are nationally recognized as TOD success stories.

Successful TOD projects and places share a number of qualities setting them apart from more conventional forms of development. As highlighted below, successful TODs are walkable and connected, dense and diverse, and context-sensitive:

- **Walkable & Connected.** Access and mobility are key features of successful TODs. First and foremost, TODs are places that encourage walking—a critical factor shaping connectivity to transit. Successful TODs provide pedestrian-friendly streetscapes and public spaces, building frontages oriented to sidewalks, and high-quality urban design contributing to a distinct sense of place and community. TODs are also multi-modal places, providing accommodations for a variety of travel options, from local and regional transit, private cars and delivery vehicles, to last mile mobility options like bike share, car share, and

emerging forms of micro-mobility. TODs typically provide less vehicular parking than comparable developments not located near transit. Parking should not be the dominant land use in a TOD area and should be located and priced in a way that discourages unnecessary vehicle trips and promotes walkability, aesthetic cohesion, and reserves valuable real estate for higher uses.

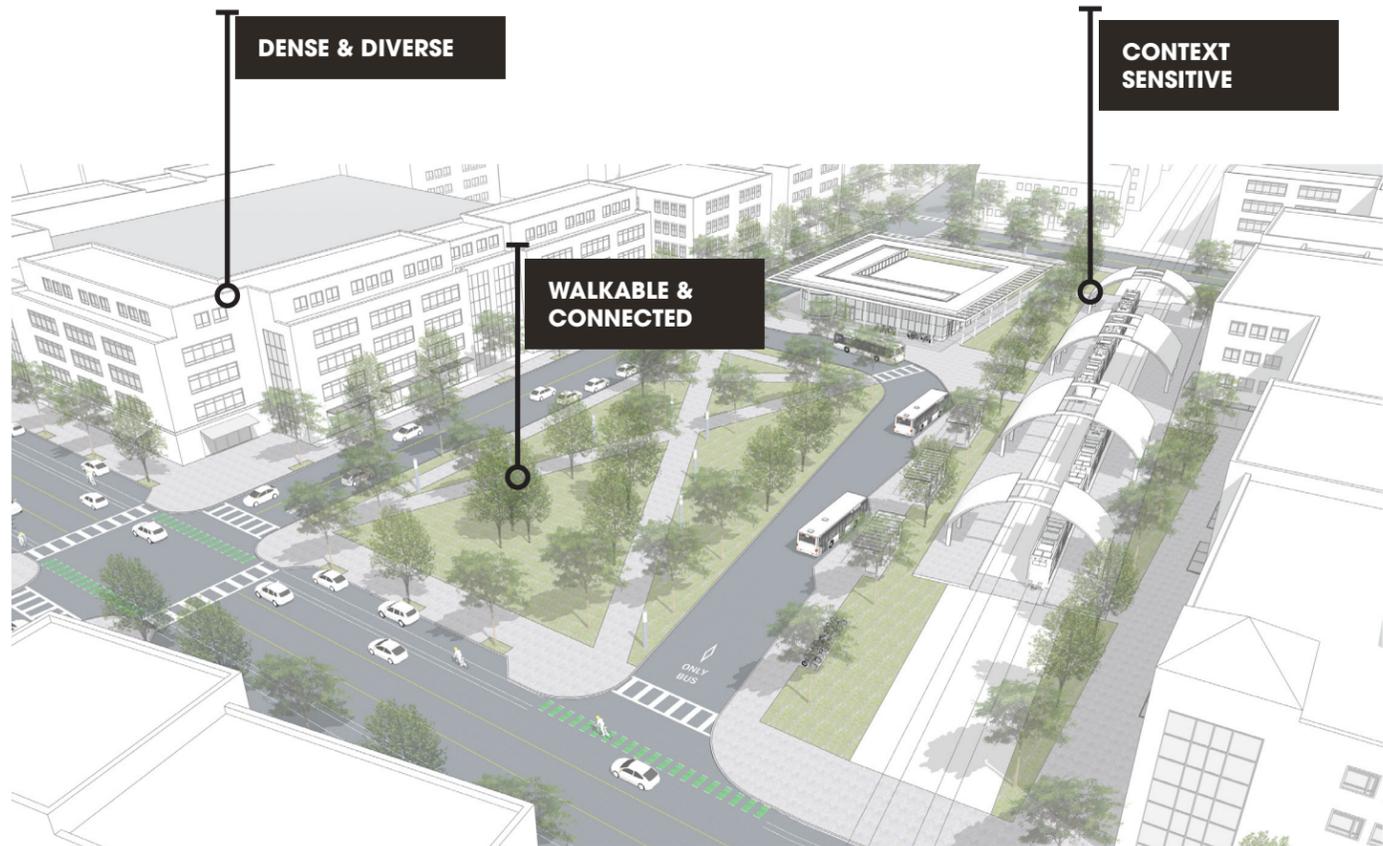
- **Dense & Diverse.** Successful TODs include a dense mix of complementary uses, including housing, retail and services, employment, entertainment, and civic uses. Diverse uses and demographics in a TOD help increase market resiliency, reduce auto dependence, and leverage public investment in transportation and transit infrastructure. Diverse housing choices—including options for lower income residents who rely on public transit—can accommodate households of various sizes, lifestyles, and income levels, help build market demand for a variety of goods and services, and deliver lower combined housing and transportation costs for TOD residents. Residential or employment density in a TOD should be commensurate with the transit infrastructure investment to generate ridership. The “right” density varies by context, but should be denser and more intensive than development not connected to transit. The density will vary widely in different contexts, but as a general rule can range

from 12 units per acre in lower scale districts to 30 units or more per acre in more urban districts.

- **Context Sensitive.** Transit oriented projects are not “one size fits all”—the scale, character, intensity, and use mix of projects can vary greatly depending on their location in the region and the needs of surrounding communities. TOD projects and places are designed to fit the scale of surrounding neighborhoods, offer uses to serve community needs, and advance local objectives for place-making, community building, economic development, and neighborhood improvement.

People within a half-mile radius are 5 times as likely to walk to a major transit stop than others.

—TRANSIT-ORIENTED DEVELOPMENT: FACTORS AND ELEMENTS OF SUCCESS, CENTER FOR TRANSIT ORIENTED DEVELOPMENT



Richmond Transit Center - Richmond, California



Downtown Rowlett - Rowlett, Texas

2.2 TOD Benefits Collin County and the Region

TOD projects and places improve the livability, competitiveness, and resilience of North Texas communities. As highlighted below, TODs provide a range of benefits to Collin County and North Texas communities. People living and working in TODs rely less on car travel to meet their daily needs, have access to a wider range of housing and shopping options, and are better connected to jobs, services, and other destinations across the region.

TOD, if approached correctly, can provide benefits to communities, cities and towns, and the transit agencies who serve them. Below are a few ways in which TOD can promote stronger communities that are more competitive, healthy, fiscally strong, and resilient.

- **Build Ridership.** TOD can improve Collin County’s ability to provide high quality transit service to North Texas communities. TOD development has an important and positive influence on transit use within a half mile. As TOD concentrates destinations and activity close to stations, ridership levels increase. As reported in a recent publication of the Urban Land Institute and American Planning Association, “...every shred of available evidence points to the significance of density in promoting walking and transit use. Higher densities mean more residents and employers within walking distance of transit stops and stations.”
- **Promote “Location Efficiency”.** With the right mix and intensity of uses clustered in walkable districts along transit corridors, people can take care of daily needs without having to drive from place to place. Lower auto dependence leads to reductions in automobile travel distances and lower demand for parking at both trip origins and destinations. With a wider range of housing choices and price points, TOD projects can help lower combined housing and transportation costs and expand alternatives for affordable living.
- **Create Walkable Destinations.** Pedestrian friendliness is a key characteristic of successful TODs. TODs with pedestrian-friendly design features—generously-scaled and continuous sidewalks, buffers between sidewalks and traffic, well-marked street crossings, and active storefronts

and prominent entries—generate high levels of pedestrian activity, and improve public health.

- **Deliver Higher Values and Fiscal Benefits.** Studies locally and from across the country demonstrate the economic benefits of TODs. As cited above, various UNT studies found significant economic and fiscal impacts of development projects, on transit-adjacent and publicly owned stations. TODs are shown to have higher commercial and residential property values than similar properties in auto-oriented locations, and they tend to generate higher local tax revenues on a per-square-foot basis— for example, a UNT studies show, that in Dallas, new development within a quarter mile of DART stations result in significantly higher property values and property tax contributions compared to control properties. TOD projects also place lesser demand on local infrastructure, build local tax base, and ease local government financial burdens.
- **Increase Safety for Pedestrians and Bicyclists.** Enhanced walkability and better bicycle infrastructure results in direct safety benefits for bicyclists and pedestrians. Improved traffic control and safety enhancements reduce the number and severity of collisions with automobiles. Pedestrian and cyclist safety increases as these modes of travel become more visible and well-established. In addition, increased pedestrian and bicycle activity produces more “eyes on the street” to enhance security.
- **Improve Air Quality and Reduce Energy Consumption.** Automobile use is one of the primary sources of air pollution, energy consumption, and greenhouse gas emissions in the United States. On a passenger-miles-traveled basis, pedestrian, bicycle, and transit trips result in lower levels of energy use and greenhouse gas emissions. As a result, TODs can help improve local and regional air quality and reduce energy consumption by facilitating transit use, pedestrian activity, and bicycling.

- **Serve Emerging Markets.** TOD projects and places expand the range of housing and lifestyle options available to meet changing market demands. Both millennials and empty nesters are prime target markets for TOD projects. According to recent research by the Urban Land Institute, 60 percent of millennials want to live and work in areas where they can use their cars less, and empty nesters exhibit similar desires. These demands are well understood by major corporations positioning to compete for talented workers.





3



DELIVERING TOD IN NORTH TEXAS

Farmers Branch

3.1 A Collaborative Effort

Supporting and encouraging TOD in North Texas takes intensive levels of collaboration and commitment. Local jurisdictions, the development community, transit providers, and regional planning advocates all play important roles in creating opportunities for living and working near transit stations and transfer centers.

3.1.1 Planning & Advocacy Organizations

North Central Texas Council of Governments (NCTCOG), along with other important planning and advocacy groups such as the North Texas Chamber of Commerce, ULI North Texas, American Public Transportation Association, Federal Transit Administration, and others, serve important educational, strategic, and advocacy roles. These organizations provide educational resources, advocacy, and assistance on a wide range of TOD and TOD-related projects, including development feasibility, housing affordability and

equity, parking strategy, urban design, and more. Through grants and technical support, they can also bring additional resources to the table to strengthen TOD initiatives and programs.

NCTCOG's recent report *Transportation and Gentrification: A Toolbox for Positive Neighborhood Change*, is an excellent source of information for local planning officials. The report, addressing the causes and concerns related to community change and gentrification, offers strategies focused on housing market affordability and includes suggestions about how equitable public engagement can lead to inclusive revitalization.

3.1.2 Transit Providers

Transit agencies, such as DART, can promote TOD through the provision of high quality, frequent, and reliable transit service. A transit station serving high-frequency and -capacity service generates immediate value to surrounding properties and creates a competitive advantage over places and communities that are not served by transit lines. In many cases, a transit station will own significant real estate

- including prime transit-adjacent locations - that can be leveraged for providing TOD. Joint Development, as defined by the FTA, can be a powerful tool in delivering TOD that is more equitable for the surrounding community, such as affordable housing, community services, and public amenities.

3.1.3 Local Jurisdiction Partnerships

TOD opportunities in North Texas are guided by the efforts of the municipalities served by transit-adjacent and publicly owned stations and transfer centers. For many of these communities, TOD has become a special focus of their planning, economic development, and capital investment programs. These communities have crafted detailed policy and regulatory programs to guide private investment, structured incentive programs, designed and built TOD supportive infrastructure, and worked with community partners to ensure understanding and acceptance of projects.

Planning for TOD at the local level starts with community visioning and long range planning followed by more detailed project and station area planning and design. Ultimately, communities influence TOD through the application of comprehensive land use plans, land use and development regulations, economic development and redevelopment programs, and capital projects.

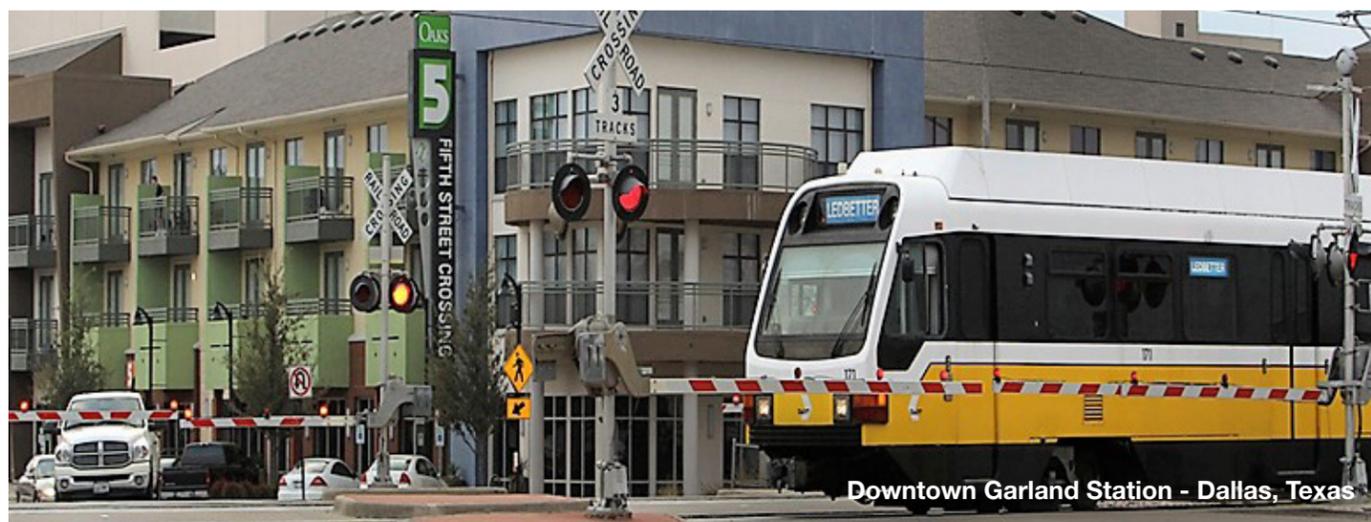
Beyond planning, municipalities can access a number of available tools to influence the feasibility and attractiveness of TOD investment. For example, municipalities may offer incentives such as financing infrastructure through Tax Increment Financing (TIF) revenue, discounting sale of publicly owned properties, or completing or supporting site remediation to create shovel-ready development opportunities. Aligning these local tools to support TOD has proven successful in cities across the region, and provide excellent local models to build upon.



Del Mar Station - Pasadena, California



McClintock-Apache Station - Tempe, Arizona



Downtown Garland Station - Dallas, Texas

3.1.4 Property Owners & Developers

Station area property owners and developers collaborate with Collin County and municipalities to identify and assess investment opportunities, draft project plans, attract private capital, and deliver individual TOD projects. Collectively, they play a critical role in helping ensure local plans and policies are sensitive to station area market conditions.

3.2 Station Area Context & Opportunities

3.2.1 Transit Stations & Property

At the heart of any station area is the transit station itself as well as transfer centers, and transit-supportive facilities including bus and shuttle stops, kiss-and-ride locations, and parking areas. In combination, these core facilities are designed to deliver unparalleled access to destinations across the transit network. These elements make up a network of invaluable access and connectivity that make TOD opportunities part of a larger ecosystem and set of destinations including services, amenities, homes, and jobs.

ROLES IN DELIVERING TOD



PLANNING & ADVOCACY ORGANIZATIONS

- Advocacy for TOD Projects & Investments
- Stakeholder and Community Education
- Technical Assistance for Planning and Projects
- Best Practices and Case Studies for Topics like Housing Affordability & Parking



TRANSIT PROVIDERS

- Transit Service, Transit Infrastructure, & Station/Transfer Center Improvements
- Development Opportunities for DART and other transit providers property, including. Underutilized Parking
- Project Selection & Oversight



MUNICIPALITIES

- TOD Visioning & Goal Setting Exercises
- Station Area & TOD Planning
- Transit-Supportive Land Use Policies and Codes
- TOD-Supportive Infrastructure and Mobility Investments



DEVELOPERS & PROPERTY OWNERS

- Collaboration with DART, other transit providers, and municipalities
- Identify and Assess Investment Opportunities
- Private Project Feasibility and Financing
- TOD Project Design and Construction

In addition to the service provided at these stations, public entities may own the land and infrastructure surrounding the station. These areas are potential opportunities for joint development that can lead to a transit agency or municipality taking a leadership role in delivering TOD. Using joint development as a tool to deliver TOD has the added benefit of removing certain barriers to providing uses that may not be provided through normal market activity such as affordable or attainable housing, community services, or other lower revenue uses that make TOD successful.

3.2.2 Station Area Conditions

Several factors influence the potential for TOD investment on transit-adjacent and publicly-owned sites and other properties within a one-half mile walking distance of transit stations and transfer centers. Conditions within these “walk sheds” varies widely.

Understanding how factors like land use, access, parcel configuration, ownership, and the presence of environmental and other constraints impact development potential is a critical early step in planning for TOD.

Development context is an important driver of opportunity. Urban locations and traditional downtowns, with street grids, block structures, supportive local transit, and the potential for shared parking or district-level parking management, naturally lend themselves to TOD investment. In locations without these conditions, including auto-oriented commercial areas and older industrial districts, attracting TOD may require municipalities to employ more targeted, location-specific strategies and actions.

Ownership patterns and parcel configurations also impact TOD potential and timing. Prime areas for TOD are often locations with larger parcel sizes, large blocks in common ownership, underutilized sites and buildings, and motivated owners interested in capitalizing on transit accessibility and market opportunities. But not all station areas are equally primed for investment. Many stations are in areas with small lot sizes, disjointed uses, and fragmented patterns of ownership. In these more challenged locations, municipalities may focus on encouraging transit-oriented infill development

and incremental change. Identifying catalyst sites and pilot projects, including underused parking, can lay the groundwork for longer term, station area wide changes.

3.2.3 Development Opportunities

Real estate market conditions are among the most powerful drivers of TOD projects. Although access to frequent, high capacity transit is proven to influence a project’s potential, a range of other factors drives investor decision making regional and local market conditions, locational and access advantages, competitive supply, capital availability, and regulatory entitlements certainty all play important roles in moving projects from early vision to implementation.

NCTCOG, local jurisdictions and land use authorities, and other planning entities can study key station areas in order to assess the market potential and market readiness of station sites sets the stage for initiatives designed to leverage competitive advantage of more attractive locations as well as improve the position of more challenged areas. Understanding the barriers to successful, high-quality TOD will help prioritize investments or partnerships that may help create opportunity where it currently does not exist. Planning and advocacy entities can highlight the attributes of a station and the community that surrounds it and work to solve for the challenges that keep it from meeting its potential.

3.2.4 First Mile/Last Mile Mobility

Planning for first mile/last mile access and connectivity in and around station areas is increasingly important as new technologies place new demands on roadways, streetscapes, and public spaces. New mobility options greatly improve

station area mobility and extend the benefits of transit access well beyond a short walking distance. Transportation network companies like Uber and Lyft, bikeshare and e-scooter services, car sharing services like Zip Car, and private shuttles and circulators all extend the range of benefits associated with proximity to transit. To fully utilize these first mile/last mile mobility services curbside access, parking strategy, and public space allocation are critical issues to address in station design and station area planning.

As all of these mobility options begun to connect to transit stations, they can be combined into more purposeful and cohesive “mobility hubs”. The purpose of a mobility hub is to provide a safe, comfortable, and intuitive connection from one mode of transportation to another within close proximity. Station areas make ideal locations for mobility hubs as riders using the high-capacity transit service can quickly connect to one of several other modes to make it to their final destination. These hubs will further promote a more walkable, bikeable, and active station and TOD area.

3.2.5 Expanded Housing Options

Communities across the region are struggling to find ways to meet the housing needs of North Texas families. Affordable housing shortages, a dwindling supply of homes for first-time buyers, and rising prices at all levels have sparked concerns among regional leaders. In a recently completed study, the City of Dallas estimates it has a shortage of 20,000 housing units and six of ten families in the City are paying more for housing each month than they can afford. Research also

shows housing affordability challenges are shared across the region, from very low income households to those with limited assets and lower wage jobs. Teachers, first responders, and other essential workers in a range of industries struggle to find affordable places to live and are increasingly impacted by neighborhood change, gentrification, and displacement.

The threat of being priced out of the market is a harsh reality for low-income residents in transitioning neighborhoods.

Workforce housing and low income housing are terms used to describe housing offered for sale or rent at prices affordable to moderate and lower income households. Communities typically define workforce housing as being affordable to households with incomes between 80% and 120% of the Area Median Income (AMI) and low income housing as being affordable to households with incomes less than 80% of AMI. (According to U.S. Department of Housing and Urban Development, the 2018 AMI for a four person household in the Dallas Metro Area was \$77,200.) Households in moderate and lower income categories face significant challenges finding affordable housing, especially options offering high levels of transit service and regional accessibility.

Recent research shows that almost one in two renters in the Dallas region pays 30 percent or more of their income on rent, and one in five pays 50 percent or more. As the region’s economy has expanded, an increasing number of households have fallen into these cost burdened categories, thus increasing the urgency to find solutions to meet the growing demand for affordable options.



Santana Row - San Jose, California

Successful TOD is a win-win-win proposition providing stronger and more equitable communities, improved and growing ridership, and economic strength and resiliency for cities and towns.

Strategic TOD investment within Collin County can help solve for these large challenges by providing affordable housing options connected to job centers and other daily needs. Transit Station Areas and TOD projects are great locations for workforce and affordable housing units. Low-income households are less likely to own a car and more likely to rely entirely on public transit to access a wide range of destinations—from work and shopping to daycare, education, and social services. By providing more affordable housing opportunities near transit, households who would otherwise be priced out of the market can live close to transit and have ready access to opportunities across the region.

The inclusion of workforce and low income housing in TODs can help address the region’s significant and intensifying housing affordability challenge. TODs that include diverse forms of workforce and low income housing can help accomplish the following:

- Increase economic self-sufficiency by providing accessible and reliable access to employment, education, healthcare, and support service destinations across the North Texas region;
- Increase access to jobs and educational opportunities for transit reliant residents, and lessens travel costs for those with lower and moderate incomes;
- Relieve economic stress on high cost burdened households;
- Build system-wide ridership by improving transit access for those most reliant on public transportation services;
- Provide for a wider range of housing choices and price points then may be found in auto-oriented communities.

3.2.6 Parking

TOD projects require significantly fewer parking spaces than conventional development for a variety of reasons. Transit access reduces reliance on automobile trips and leads to a lower rate of auto ownership by TOD residents. In addition, the overall walkability of TOD projects reduces

reliance on automobiles to access destinations such as retail, services, civic institutions, and places of employment, thus reducing parking demand. Micro mobility services provide for alternative modes to access transit and project destinations from beyond the walk shed, and may further reduce the necessity for personal auto trips and parking. Lastly, mixed use TODs are “park-once” destinations and provide opportunities for shared parking, which utilizes parking spaces for multiple uses with complementary peak periods and reduces the overall need for parking.

NCTCOG, in partnership with DART and the cities of Dallas, Richardson, Plano, and Garland studied parking use at TODs along the DART Red & Blue lines. The 2018 study evaluated conditions at 16 privately owned sites with structured and surface parking near 11 stations spread over the four municipalities. The study found that 13 of 16

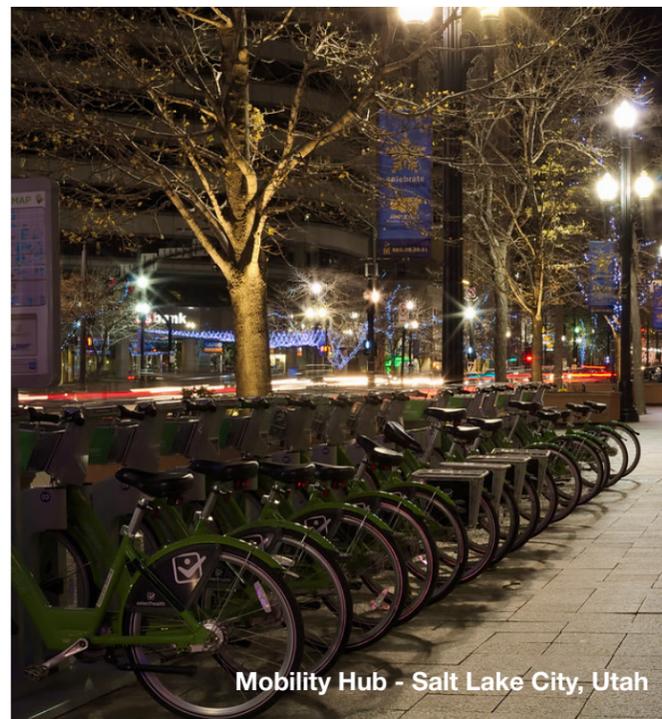
sites never peaked above 80% utilization, suggesting that required parking ratios resulted in excess spaces. Affordable housing TODs in the study used less parking (peak use 40-50%). Higher end market rate projects had higher peak use (90%+), cost burdening affordable units with excess parking. Furthermore, 10 of 16 sites provided more parking spaces than required by code, suggesting that lenders can have strong influence on amount of parking developers build.

Many recent studies have highlighted the link between affordable housing, lower parking utilizations, and increased ridership including a 2020 RTD – Denver’s transit agency – report entitled Residential Parking in Station Areas shows substantial data that income-restricted and affordable housing development at a transit station is much less likely to use the parking provided, even as many of these properties have lower parking provision per unit than market rate. In addition, these same income restricted properties are much more likely to house those likely to take transit. This reduced need for parking coupled with an increase of ridership can be a win-win for transit agencies, communities, and cities and towns housing transit stations.

In many ways, providing substantial parking at station area is a self-fulfilling prophecy. If you provide a lot of parking, those who rely on automobile travel are much more likely to live in the TOD area. If those who rely on automobile travel dominate a TOD area, ridership will likely not increase substantially and additional traffic may be created due to the density. Planning for users and development types requiring reduced parking is one of the most important elements of a successful TOD area.

These studies suggest a range of potential strategies to address excess parking at and around transit stations including adopting parking policies supporting the right-sizing of parking and implementation of district-wide parking

management programs for TOD projects and station areas. Transit providers could also explore the potential to reduce the size of or re-purpose underutilized agency-owned parking facilities. Municipalities have a host of possible strategies at their disposal. The study suggests municipalities could: right size parking requirements in TOD areas based on observed local utilization data and development context; unbundle cost of parking from cost of housing; incentivize shared parking, where multiple land uses with complementary peak times utilize the same parking facilities more efficiently, rather than providing individual parking lots that frequently remain underutilized (shared parking is often managed district-wide as a “park once” district, with facilities that are consolidated to maximize efficiency and include on-street parking in the supply calculation to further reduce the need for off-street parking); encourage the use of programs and technologies, e.g. district-wide parking pricing and management initiatives and use of automated space availability monitoring and guidance apps, to maximize the use of available spaces; and consider long term potential of conversion of parking facilities to other land-uses as increased non-automobile mode split and autonomous vehicles reduce demand for individual, on-site parking spaces—best achieved by designing parking lots as city blocks sized for future development and parking structures with minimal ramps, ceiling heights, and building depths that allow for future adaptive remodel as occupied space.



Mobility Hub - Salt Lake City, Utah



West Village, Dallas Texas

4

TOD TYPES & DESIGN



4.1 TOD Typologies

A TOD typology is an analytical tool that groups station areas into several “types” based on context and predominant mode of access. The typologies provide broad parameters for the scale and intensity of development, use mix, access, and market potential. As a starting point for collaboration between Collin County, municipalities, and key stakeholders, the typologies serve as a foundation for station area planning, design, and development initiatives.

The TOD typologies described below provide starting points for collaboration between Collin County, municipalities, TOD developers, and other stakeholders. Typologies may change as areas are transformed with improved access, connectivity, and private investment.

Next-generation projects will orient to infill, urbanizing suburbs, and transit-oriented development... People will seek greater convenience and want to reduce expenses.

—EMERGING TRENDS IN REAL ESTATE, URBAN LAND INSTITUTE

TPOLOGY CHARACTERISTICS



Plano Town Center - Eric Fredericks, CC BY-SA 2.0

● Downtowns & Town Centers

The region's traditional downtowns and newer town centers are irreplaceable assets that provide a unique character and setting perfectly suited to accommodate improved transit and TOD. With a mix of low and mid-rise buildings lining pedestrian friendly streets and public spaces, these districts serve as retail and entertainment destinations and tend to include a mix of moderate density residential, office, retail, and entertainment uses catering to the daily needs of residents and workers in surrounding suburban communities. The patterns and scale of development tends to support the potential for reduced parking requirements as well as shared parking and district-level parking management. Walking and bicycling are the predominant modes of transit access.



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● Community Centers

Community Centers are local activity centers in a suburban context with a mix of commercial and multifamily residential uses near a transit station. Smaller in scale than Downtowns or Town Centers, Community Centers transition quickly to abutting lower density residential or commercial areas. As a result, walkability beyond the core of Community Centers may be limited, and kiss and ride and/or park and ride amenities are often accommodated to facilitate car access to transit in addition to walking and bike access. Walking, bicycling, and personal vehicle are the predominant modes of transit access.

TPOLOGY CHARACTERISTICS



Celina – CC by 2.0

● Rural Centers

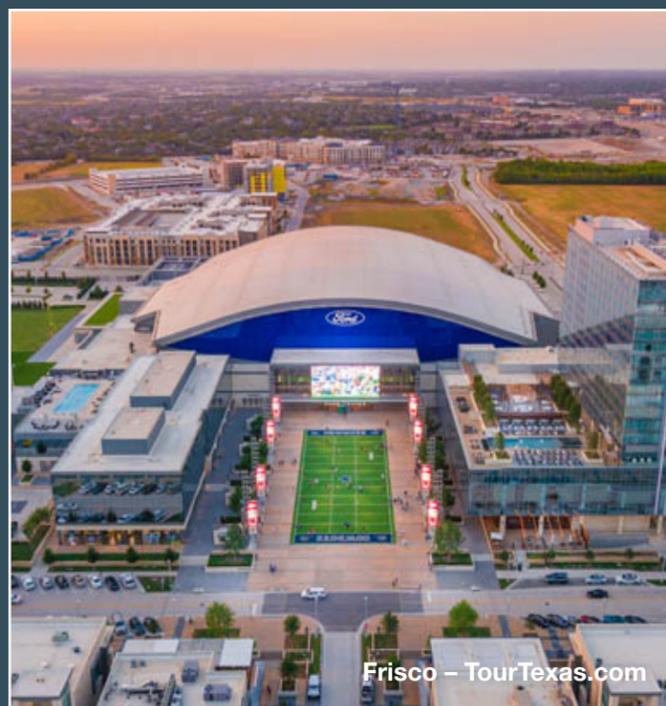
Rural Centers are smaller communities with traditional downtown cores on a smaller scale than the Downtowns or Community Centers. These centers have small retail cores or streets serving the local community primarily surrounded by lower density, single family homes. New development adds needed housing and other uses but preserves the character of the small town. Those within walking or biking distance may be limited by the smaller town size, therefore these stations may serve a larger region and will likely need park and ride facilities. Walking and biking continue to be primary connections for those nearby.



Farmers Branch – Google Earth

● Emerging Districts

Emerging districts are areas that currently do not exhibit TOD characteristics. These include areas that are industrial or dominated by uses accessible mainly or solely by personal vehicle. These areas may or may not have the infrastructure available to easily accommodate large scale new development. Planning and investment by the local jurisdictions and land use authorities may be necessary to unlock the potential of the areas as more walkable, bikeable, and connected places. Balancing existing jobs and uses with future residential, commercial, and retail uses is important to preserving the strength of the existing districts.



Destination Districts

Destination Districts are areas with an exclusive or predominant use, such as medical, employment, cultural, sporting or entertainment. Destination Districts typically include large structures (such as stadiums, hospitals, institutional buildings), often arranged in a campus setting, and require more flexibility on block size. Complementary secondary uses support transit users and may include retail, personal services, restaurants, and lodging, ideally located between the transit station and the primary use to facilitate walking access. Walking is the predominant mode of transit access, though often transit is a secondary mode of access to the district's destinations. Proper district planning that includes direct and interesting walking routes between the transit station and the destinations could make transit access more competitive.

Connected Communities

Connected Communities are defined by established residential areas with strengthened connections to high-quality transit. These places may have fewer opportunities for new TOD development but can gain new transit ridership by providing more, safer, and easy connections to a transit station. Strategic infill development may provide needed services, housing, and amenities for future and existing residents. These locations may have less available land and fewer vehicular connections to provide substantial park and ride facilities. Connected Communities rely heavily on improved multi-modal connections, in many cases, where they currently may not exist.

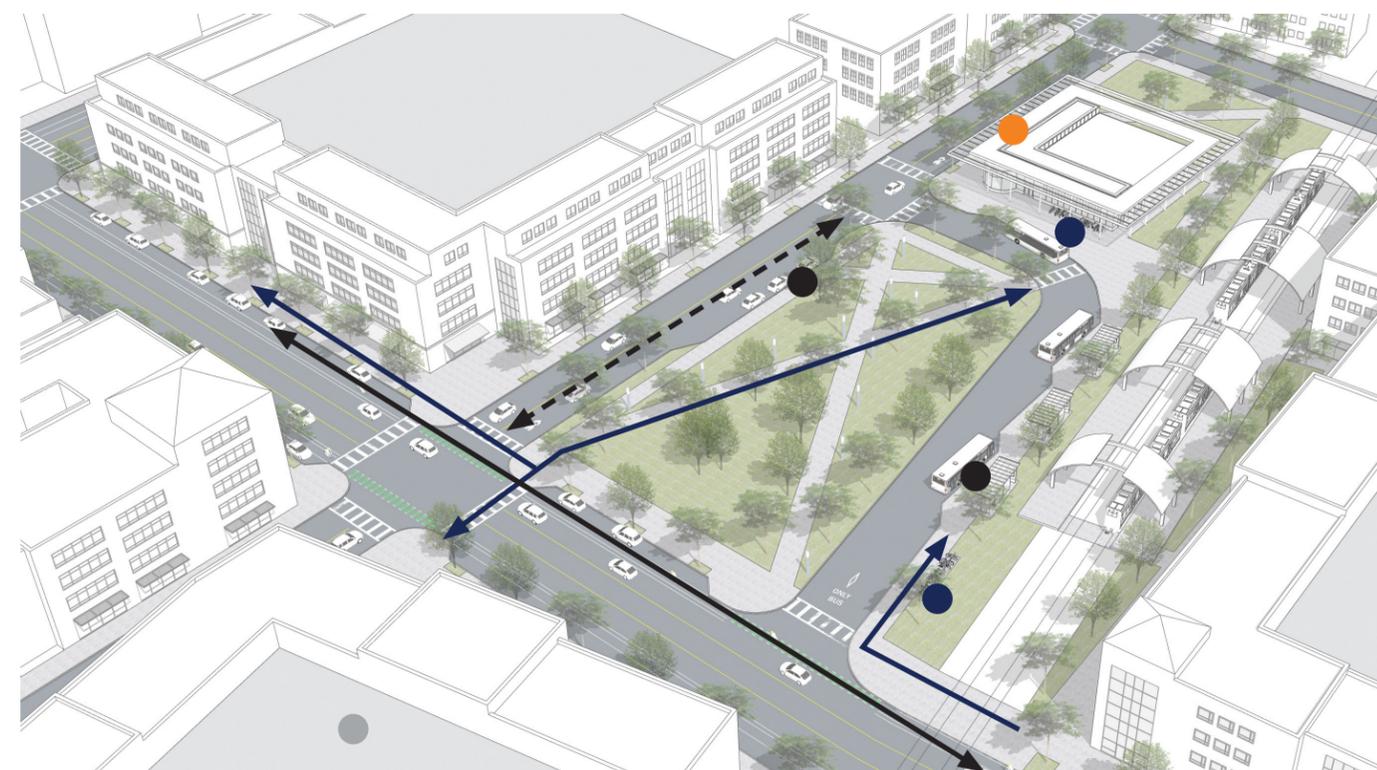
4.2 TOD Design

This section of the guidelines defines the preferred design character, form, and quality of development for successful TOD projects and places. The guidance below offers a reference for municipalities as they develop and refine local TOD plans and development regulations, and a reference for use by developers and property owners responding to TOD RFPs and planning for TOD projects.

4.2.1 Development Pattern

Street & Pathway Network

- TOD projects should include an interconnected, fine-grained grid of pedestrian- and bicycle-friendly streets and pathways that form development blocks and accommodate local circulation. Walking and bicycling should get preferential treatment over vehicular traffic.
- Street networks should serve as an extension of the existing street network in the surrounding area. TOD projects should provide street and pathway connections to the surrounding context wherever feasible. Street or pathway stub outs or set aside rights-of-way should be located strategically to accommodate future connections to undeveloped neighboring sites or developments that currently do not allow connections.
- Cul-de-sacs should be avoided except where topography or existing natural features prevent a feasible roadway connection, or as a temporary facility to provide future connections to an abutting site.
- TOD projects should contribute to a hierarchical bike network that provides uninterrupted access to the transit station with context-sensitive bike facilities. These may range from shared roadways on low traffic neighborhood streets to physically separated and protected bike lanes or cycle tracks on major thoroughfares.

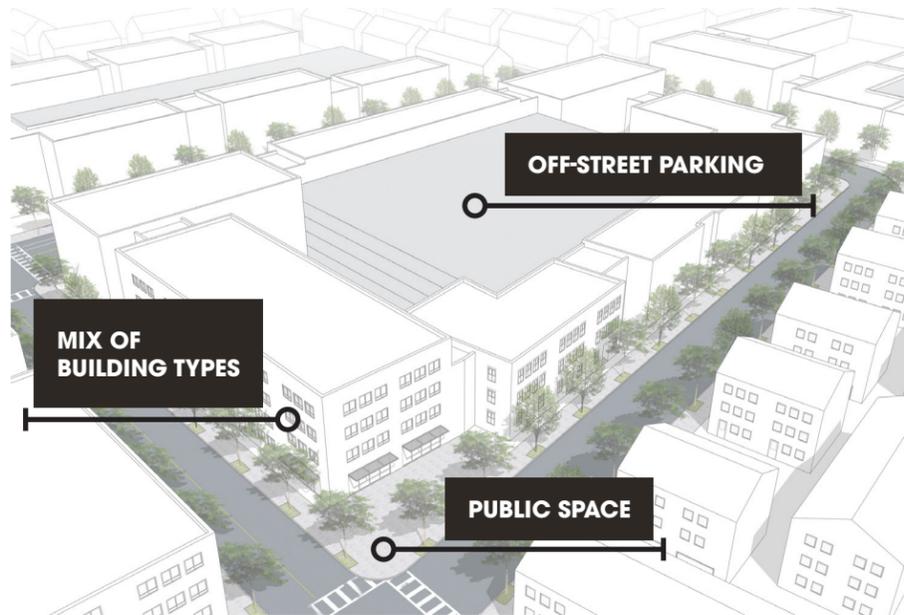


Block Size & Configuration

- TOD projects should consist of development blocks scaled to accommodate a mix of appropriate building types, public spaces, as well as required off-street parking and service areas.
- Overly large block sizes should be avoided to maintain a walkable scale.

Potential for Long Term Transformation

- Streets and blocks should be configured in a fashion that allows future intensification and transformation with minimal disruption to the network. For instance, parking lots should be laid out to accommodate footprints of anticipated future buildings or parking structures in their place.



4.2.2 Streets & Public Spaces

Street Types

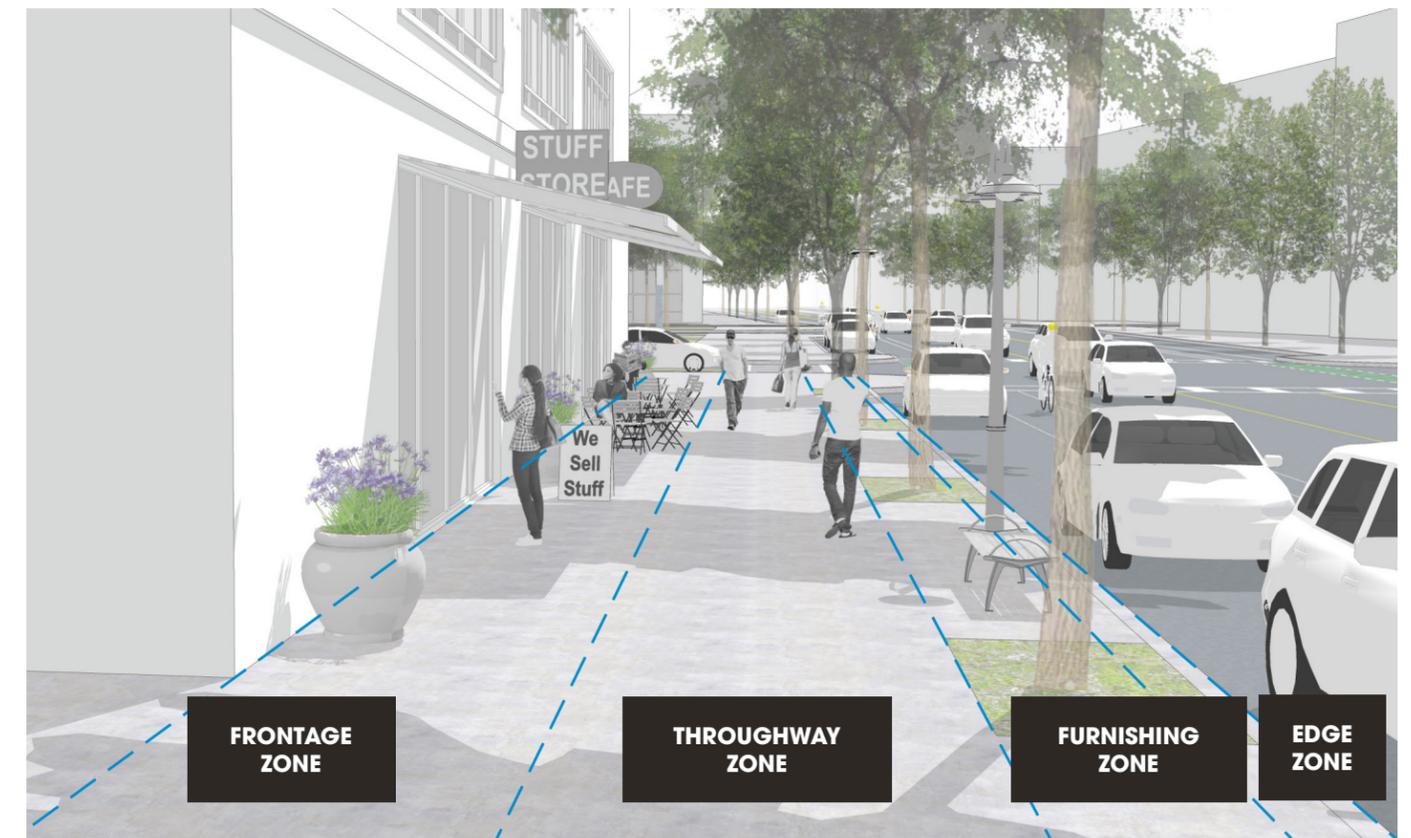
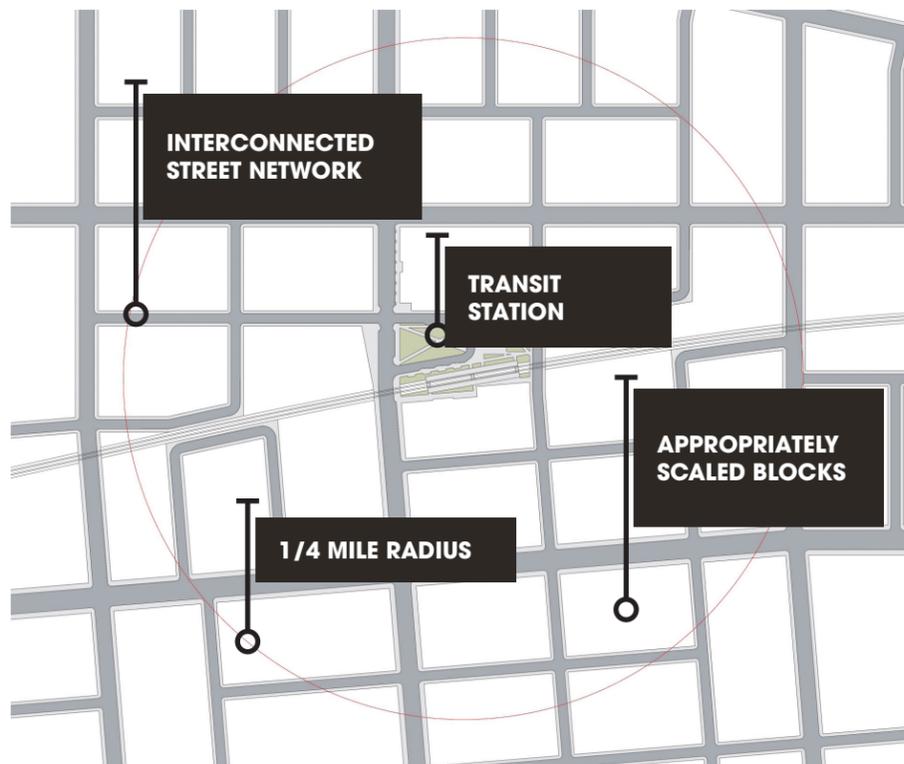
- Streets in TOD projects should be designed to encourage low speed vehicular traffic and the safe movement of pedestrians and bicyclists. Street widths should be minimal, with narrow travel lanes, to reduce crossing distances for pedestrians. Multi-lane roadways within TOD projects should be discouraged.
- Primary walking and cycling routes should accommodate those modes through adequate facilities, which may include protected bike lanes, cycle tracks, multi-use paths, and off-street walkways.
- Streets in TOD projects should be designed to accommodate emerging micro-mobility modes, including bike share programs and e-scooters.

Streetscape Design

- To create safe and attractive pedestrian environments, buildings should be placed along and oriented to public streets.
- Streets providing pedestrian connections between transit stations and major walking destinations should be lined with buildings designed to allow active ground floor uses.

- Streets in TOD projects should be reflective of their context and include a roadside design that invites walking. The roadside – the portion of the street between the curb and the right-of-way or building facade – consists of four zones:
 - » Edge Zone: Includes the curb and required clearances.
 - » Furnishing Zone: Provides a buffer between pedestrians and vehicles and may range in width to include a variety of elements, depending on context, such as street trees and other landscape features, pedestrian-scaled lighting, street furnishings, street signage, and utility elements.
 - » Throughway Zone: The walking zone free of obstacles, which may range in width subject to the context.
 - » Frontage Zone: The area between the building façade and the throughway zone, typical in urban context without private front yards. The frontage zone provides room for building entrances and allows for the placement of café seating and other private street furnishings, business signage, and merchandise display. The width of the frontage zone may vary depending on context and use and may be minimal in purely residential contexts.

- Bike Parking
- Bike Share/ E-Scooter Hub
- Transit Transfer
- Ride Share Drop Off/Pick Up
- Park & Ride
- ↔ Key Walking Route
- ↔ Bike Lane
- ↔ Shared Bike Route (Sharrow)



Public Spaces

- TOD projects should include public gathering spaces connected by pedestrian-friendly streets and pathways. Public spaces—such as parks, greens, squares and plazas—should be well defined and programmed appropriate to their location and context. Public spaces should include elements such as seating, shade trees, shade structures, play equipment, lighting, and other amenities to support their intended active and/or passive uses.
- Transit stations should be integrated into a well-designed and well-connected public space that serves both transit riders and the general population of the TOD.
- Public space design should consider accommodations for private bicycle parking, bicycle-share stations, e-scooter hubs, and other emerging micro mobility technologies.
- Bicycle parking should be provided near transit stations with easy access to and from bicycle routes. Bicycle parking should provide adequate amenities for secure storage of bicycles and may include open shelters, individual lockers, or fully enclosed and locked shelters.
- Micromobility stations and hubs, including bike share and e-scooters, should be accommodated near station locations to provide easy access. Facilities should be designed to minimize conflicts with pedestrian routes and provide for the orderly parking of bikes and scooters.



HUBS FOR BIKESHARE, E-SCOOTERS OR OTHER MICRO MOBILITY MODES

On-Street Parking & Curb-Side Uses

- On-street parking should be provided on all streets in TOD projects to provide a buffer between pedestrians and moving traffic, deliver high-turnover spots to support storefront retail uses, and to reduce the need for off-street parking.
- To avoid the use of street parking as informal park and ride parking, non-resident street parking should be short-term only through the use of parking time limits or pricing.
- Pick-up/drop-off zones for ride share services and kiss & ride should be provided in a manner that avoids conflicts with transit vehicles, pedestrians or bicyclists. Pick-up/drop-off zones should be located to reduce out of direction travel for vehicles and discourage risky maneuvers. To give priority to non-motorized modes pick-up/drop-off zones should be located at some distance from the transit station.
- Paratransit access should be provided near station locations to adequately serve transit riders with limited mobility.



SECURE & CONVENIENT BICYCLE PARKING

With compact development, people drive 20-40 percent less, at minimal or reduced costs, while reaping other fiscal and health benefits.

—GROWING COOLER, URBAN LAND INSTITUTE

4.2.3 Density/Intensity

Use Mix

- TOD projects should be designed to include primary transit-trip generators plus supportive uses to serve for daily needs to reduce car dependency for non-commute trips. Primary trip generators may be high-density residential uses with complementary retail and service uses, or may be employment uses with supporting residential, retail and service uses.
- A mix of uses is critical at the core of a TOD project, surrounding the transit station, and should include high activity uses such as retail. Beyond the core area the use mix is less critical and predominantly residential or employment uses may be acceptable.
- Single-use developments are generally incompatible with TOD. The exception may be destination districts such as large sports or entertainment venues, or educational or medical campuses.



Eastern Urban Village, Dallas Texas

Development Intensity

- TOD projects should provide an average development density and intensity sufficient to generate the ridership that supports the existing or desired transit service.
- The allocation of density/intensity in a TOD project may vary, depending on the location or context. A larger area with consistent density/intensity may be appropriate in urban locations, whereas a more confined core of high density/intensity development that transitions to lower density/intensity away from the station may be appropriate in a lower density context.

Equitable Housing

- TOD projects should provide a range of housing types for households of varying ages, demographics, and income levels. Housing options for people relying on transit should be provided near stations.
- Inclusion of affordable housing is preferred, and should be incorporated in projects. North Central Texas Council of Governments encourages service areas cities to adopt targeted policy, regulatory, and incentive programs to promote workforce and affordable housing options. Localities should explore the following as methods to promote equity and



ACTIVE USES ALONG SIDEWALKS

MIX OF HOUSING TYPES CLOSE TO TRANSIT

affordability in TOD projects:

- » Adoption of equitable TOD policies by municipalities to support the creation and promotion of mixed-income and mixed-use communities around transit;
- » Development of policy, regulatory, and financial incentives to include workforce and affordable housing in projects on Transit-adjacent and publicly-owned sites.
- » Reduction or removal of project requirements with the potential to increase the cost of individual housing units, including parking

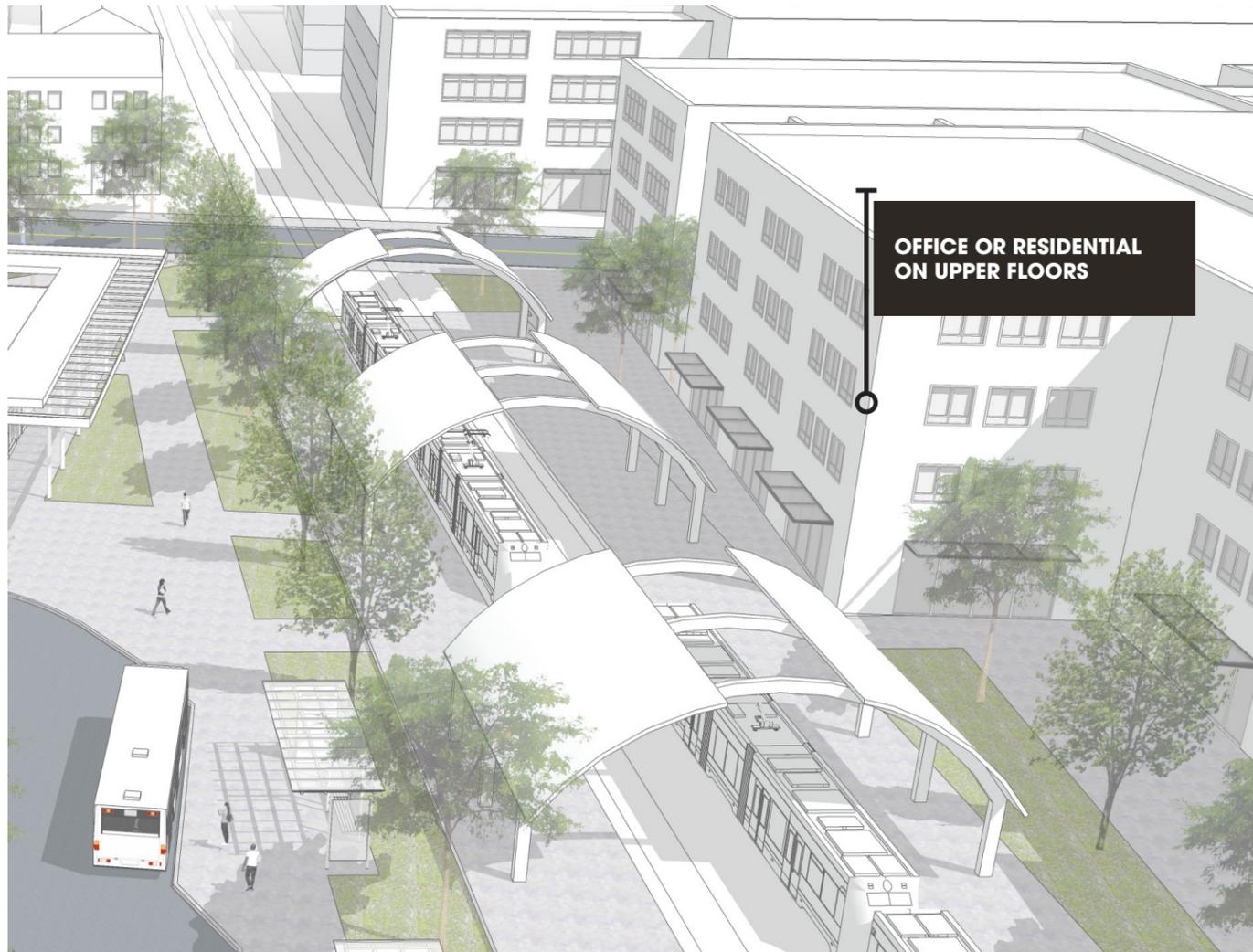
minimums, impact fees, permit fees, etc.

- » Implementation of programs and initiatives at the local level designed to create or maintain affordability, limit project and per unit costs, and provide long term maintenance of cost restrictions, including low interest loans and grants for rehabilitation, reconstructed, and long term rent restrictions; incremental or wholesale densification of station areas through regulatory change or bonus provisions; inclusionary policies or requirements; regulatory, project review, and fee relief; and parking reductions

and parking cost unbundling.

Limits on Incompatible Uses

- Primarily auto-oriented uses (such as strip commercial or office park uses) or uses generating little to no pedestrian activity (such as warehousing or mini storage) are not compatible with TOD projects.
- Drive-thru restaurants or banks should not be permitted in TOD projects. If they are present, such uses should be located in the rear of buildings and designed to minimize their visibility from public streets and



spaces.

4.2.4 Site & Building Design

Building Scale

- Building heights within TOD projects should be the tallest near transit stations. A transition of building heights may be appropriate where a TOD project abuts a lower density/intensity development.

Building Frontages

- Buildings should be placed along and oriented to public streets and public spaces. To maintain building continuity a significant percentage of the lot width should be occupied by a building located at the setback or

build-to line.

- Primary building entries should be located along the street frontage with direct access from a public street or public space.
- Active ground floor uses such as retail and service establishments are encouraged, particularly on primary walking and cycling routes. To allow flexibility, ground floor ceiling heights that allow for commercial use should be encouraged irrespective of initial use.

Facades

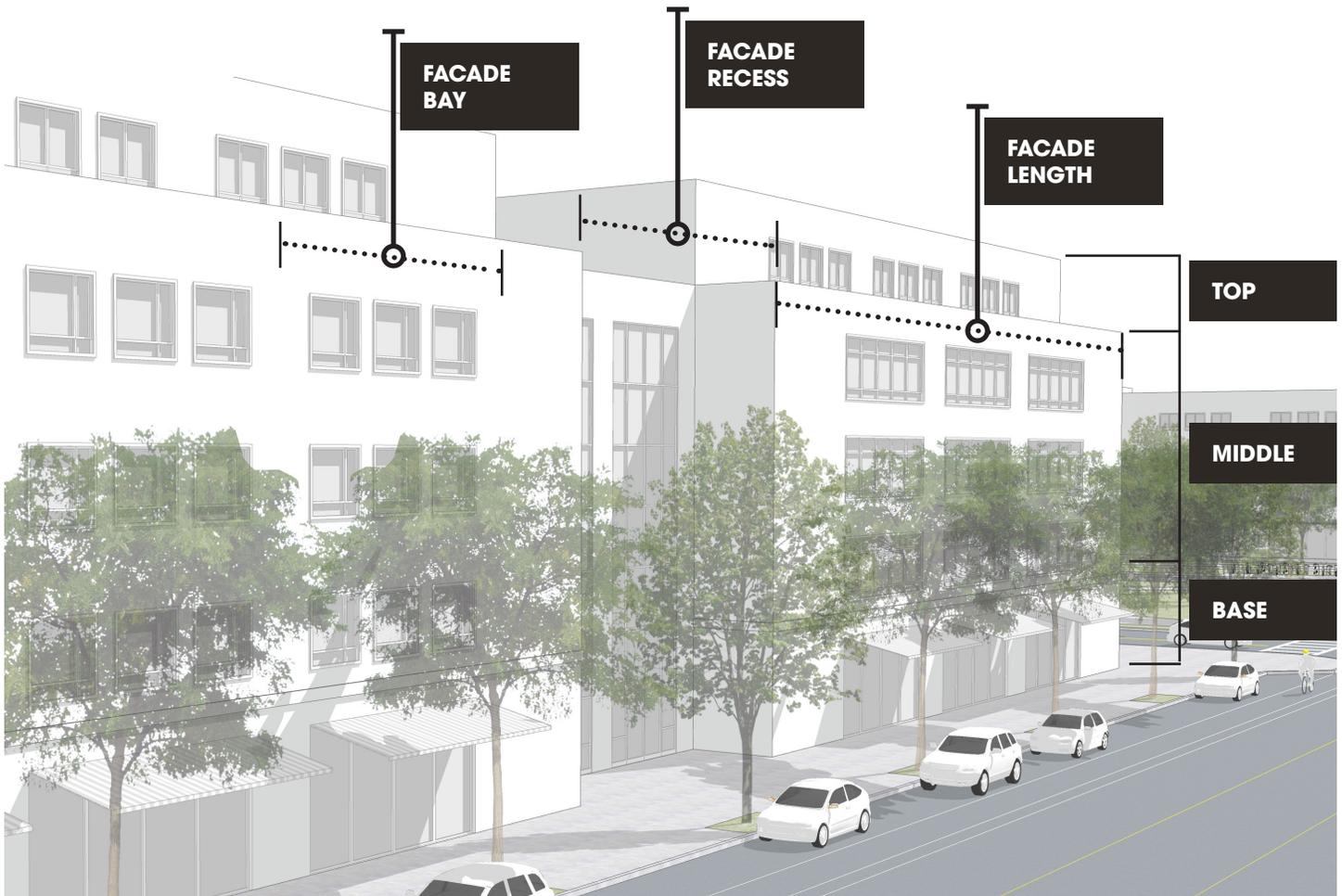
- Building facades should generally be designed with a distinct base, middle, and top. Long building facades should be composed of façade bays and intermittent recesses.
- Building facades along streets and public spaces should be designed with attractive ground floor facades, well-defined building entries, and quality building materials.
- Ground floor facades of buildings with ground floor retail, restaurant, office, professional service, and personal service uses should be designed with a high percentage on transparent windows and doors.



- Ground floor facades of buildings with residential uses should provide vertical separation and enhance privacy by slightly elevating the finished floor elevation of ground floor residential space along pedestrian walkways.
- Blank façade walls should be discouraged and limited in size to maintain an interesting streetscape.

Off-Street Parking

- Off-street parking should be placed behind buildings and out of sight from public spaces.
- Transit park and ride lots or structures should be located with sufficient distance from transit stations to encourage pedestrian flow along streets lined with businesses.
- TOD projects should provide a limited supply of parking to encourage the use of transit, walking and bicycling. A reduction of required parking should be considered. Shared parking strategies should be considered to reduce the overall parking supply and increase the efficiency of use of available land.
- Long-term parking intended for park-and-ride service and kiss-and-rides (drop-off locations) and rideshare pickup areas are located some distance from the stop (approximately 1/8 of a mile) to encourage transit users to frequent local businesses and services along the way.





APPENDIX D: JURISDICTIONAL ASSUMPTIONS FOR PRELIMINARY OPERATING COST ESTIMATES

Basic Mobility

The following cities are classified as Tier 1 fixed route. Assumptions are listed in **Table 15**.

- Blue Ridge
- Crossing
- Lowry
- New Hope
- St. Paul

Based on population the City of Weston is the only city in the Basic Mobility category to be classified as Tier 2. Assumptions are listed in **Table 16**.

Tier 1 City	Days of Operation	Hours of Operation per Day	Number of Vehicles
Blue Ridge	7	12	4
Lowry Crossing	7	12	4
New Hope	7	12	4
St. Paul	7	12	4

Table 15: Basic Mobility - Assumptions for Tier 1 Cities

Tier 2 City	Days of Operation	Hours of Operation per Day	Number of Vehicles
Weston	7	12	2

Table 16: Basic Mobility – Assumptions for Tier 2 Cities



Emerging & High Growth

The following cities are classified as Tier 1 Emerging & High Growth. Assumptions are listed in **Table 17**.

- Anna
- Celina
- McKinney
- Melissa
- Princeton
- Prosper
- Royse City

The following cities are classified as Tier 2. Assumptions are listed in **Table 18**.

- Farmersville
- Josephine
- Lavon
- Nevada

Collin County Transit Study



2021

Tier 1 City	Days of Operation	Hours of Operation per Day	Number of Vehicles for Demand Response	Number of Fixed Routes
Anna	7	12	4	4
Celina	7	12	4	4
McKinney	7	12	4	4
Melissa	7	12	4	4
Princeton	7	12	4	4
Prosper	7	12	4	4
Royse City	7	12	4	4

Table 17: Emerging & High Growth - Assumptions for Tier 1 Cities

The days of operation and the hours of operation per day were assumed to be the same for both demand response and fixed route services.

Collin County Transit Study



2021

Tier 2 City	Days of Operation	Hours of Operation per Day	Number of Vehicles for Demand Response	Number of Fixed Routes
Farmersville	7	12	4	2
Josephine	7	12	4	2
Lavon	7	12	4	2
Nevada	7	12	4	2

Table 18: Emerging & High Growth - Assumptions for Tier 2 Cities

Developed and Mature

The following cities are categorized as Tier 1 for Developed & Mature. Assumptions are listed in **Table 19**.

- Allen
- Frisco
- Murphy
- Sachse
- Wyle

The following cities are Tier 2. Assumptions are listed in **Table 20**.

- Fairview
- Lucas
- Parker

Collin County Transit Study



2021

Tier 1 City	Days of Operation	Hours of Operation per Day	Number of Vehicles for Demand Response	Number of Fixed Routes	Number of Premium Bus Routes
Allen	7	12	4	4	2
Frisco	7	12	4	4	2
Murphy	7	12	4	4	2
Sachse	7	12	4	4	2
Wyle	7	12	4	4	2

Table 19: Developed & Mature - Assumptions for Tier 1 Cities

Tier 1 City	Days of Operation	Hours of Operation per Day	Number of Vehicles for Demand Response	Number of Fixed Routes	Number of Premium Bus Routes
Fairview	7	12	4	2	0
Lucas	7	12	4	2	0
Parker	7	12	4	2	0

Table 20: Developed & Mature - Assumptions for Tier 2 Cities



APPENDIX E: COST OF NOT IMPLEMENTING TRANSIT WHITEPAPER

NOTE: REPORT INCLUDED ON FOLLOWING PAGES

The Costs of Not Investing in Transit

Introduction

Municipal governments are constantly faced with the challenge of meeting demands on the local infrastructure with limited budgets. As a result, municipal leadership must sometimes defer some items in favor of other needs. Transit services can be one casualty of such decision-making, especially where transit may be needed but not currently provided. Indeed, developing the political will to cover the cost of a capital-intensive transit project can be a challenge. It is easy for decision-makers to see the projected capital and operating costs and be put off by the prospect of uncertain long-term benefits in the face of immediate needs and competing funding priorities.

This paper examines some of the costs of foregoing an investment in transit service. While it is impossible to accurately quantify the potential costs and benefits without a specific transit system in mind—and even when a specific transit system has been proposed, some of the costs and benefits do not lend themselves to a quantitative economic analysis—the question can be addressed qualitatively.

Cost of Car Ownership

One of the defining differences between public and private transportation is that, whereas in public transportation, the right-of-way, the vehicles, and the driving responsibilities are publicly provided, in private transportation the individual must purchase and operate a vehicle to use the transportation network, or else depend for transportation on someone else. In some households, the purchase, registration, insurance, and maintenance of a vehicle can represent a significant expense, especially for an object that will spend the majority of its time not being used. Even in multi-car households, the perceived need for an additional car can represent a strain on the household economy. The American Public Transportation Association (APTA) estimates that eliminating the costs of a car can save about \$6,202 annually. These savings could then be deployed elsewhere in the economy. Such savings, however, are likely unattainable in areas where transit is limited or not provided at all: a car becomes necessary to provide access to work, shopping, medical facilities, leisure activities, and other opportunities.

Cost of Congestion

As an area grows, there are simply more people who need to travel to jobs, shops, and other destinations. In the absence of a comprehensive transit system, these potential travelers must compete for space on the roadway, leading to the loss of time due to congestion delays. The exact value of the time lost is a matter of some discussion in the planning field, since people may value time differently. The Texas A&M Transportation Institute's *2019 Urban Mobility Report* estimated the 2017 value of delay time to be \$18.12 per hour for passenger vehicles, based on the median hourly wage rate for all occupations, though other calculations may be used. In any event, the time lost represents an opportunity missed for some activity other than sitting in traffic, whether that activity is employment, family time, recreation, or shopping. This can represent a significant impact on quality of life, especially aggregated across a large metropolitan area.

In addition to the value of time, operating costs can be higher in congestion, as fuel efficiency goes down and the vehicle experiences greater wear and tear on parts such as brakes and cooling systems.

These costs are borne by the vehicle owners and represent a cost that could be reduced by replacing personal trips with transit trips. The APTA estimates operating costs for cars to be 6 cents per mile higher in congested conditions than in free flow conditions.

Moreover, congestion produces environmental effects such as the pollution generated by idling vehicles. This factor may be mitigated as the overall fleet transitions to hybrid or electric vehicles. However, the energy wasted by sitting in traffic represent personal costs that could be reduced through transit. While the operation of larger transit vehicles may also have an environmental impact, this impact is offset by the potential for such vehicles to carry more people, reducing the overall number of vehicles on the road. Additionally, the transit industry has demonstrated a trend toward adoption of electric power that has been faster than the aggregate fleet of personal vehicles, resulting in less of an air quality impact due to vehicular emissions.¹

Space requirements for private vehicles

In the attempt to mitigate congestion, one frequent strategy is to increase the number of lanes on a particular roadway. In practice, this strategy has limitations. While increasing the capacity of part of a road may succeed in removing the bottleneck at a particular location, the bottleneck may re-form at a new location as the demand exceeds the capacity further down the road. Also, practice has shown that increasing the capacity on a roadway can have the effect of inducing additional demand until the roadway is as congested as it was before, especially in a rapidly growing area like Dallas-Fort Worth. The notion of a region building its way out of congestion is thus as illusory as it is expensive, as more and more right-of-way must be acquired, constructed, and maintained in pursuit of an ever-elusive goal. Moreover, increasing roadway capacity to meet peak-hour demand may result in long periods where the facility is underutilized.

The issue of widening roads to accommodate increasing numbers of vehicles is part of the broader question of the amount of real estate that must be devoted to personal vehicles in a transit-less transportation system. Dependence on private vehicles also requires the supply of ample parking, driving up development costs and occupying space that could be used for other, more profitable purposes. While the issues caused by surface parking lots can be mitigated somewhat by using parking structures, this solution still imposes significant design, construction, and maintenance costs that must be either borne by the public or passed on to the users of the development.

Public transit vehicles, on the other hand, have a larger carrying capacity that can make better use of road space and reduce the need for parking real estate in valuable city centers. Also, a public transit system can, in general, be more easily scaled to meet demand, avoiding wasted investment.

Cost of Lost Opportunities for Higher-Density Development

The allocation of a large amount of real estate to accommodate private vehicles tends to reduce the overall population density of an area. Adding additional travel lanes and parking spaces not only

¹ Assumptions about the positive impact on climate change of conversion to electric vehicles inevitably depends on an increase in the share of renewable sources to feed the overall electric grid; otherwise, the source of the energy merely shifts from gasoline to coal or natural gas. While even in this contingency, the conversion to electric vehicles can improve the air quality in a metropolitan area by removing a source of ozone, it does little to reduce carbon emissions overall.

occupies space that could be used for human-scale activities, but increases the space between the activities that remain, encouraging further vehicle trips and driving demand for more transportation infrastructure. Moreover, the additional travel lanes enable development further away from the city centers—perhaps not even in the community itself. This reduces the potential economic benefits associated with greater density, requiring the residents of the community to support an increasing amount of physical infrastructure while foregoing a higher tax base.

A sufficient public transit system, on the other hand, could enable the development of transit-oriented developments (TOD). Such developments are characterized by higher density and accommodations for forms of transportation other than cars. This reduces the per capita infrastructure burden by concentrating economic activities, presenting economies of scale not only in streets but also power, water, and sewer lines. TODs also tend to be mixed-use developments, potentially eliminating some street trips by placing origins and destinations within walking or cycling distance and increasing the potential customer base of the transit system. This concentration of economic activity provides a potentially higher tax base than can be achieved with traditional suburban low-density development.

The placement of permanent transportation infrastructure such as a rail, streetcar, or bus rapid transit line can also help focus development by signaling a long-term infrastructure investment in station areas. This benefit can manifest itself as a higher-density and higher-value development pattern. A study performed for Dallas Area Rapid Transit (DART) by the University of North Texas' Economics Research Group in May 2020 found \$5.138 billion worth of property investment had occurred within a quarter of a mile of DART light rail stations (exclusive of the four downtown Dallas stations) from 2016-2018, creating a \$10.27 billion economic impact to the region. The study found that the projects generated \$286.4 million in state and local tax revenue. Not only does such development provide direct revenue for local budgets, but some of the value may be captured through tools such as tax-increment financing districts or tax increment reinvestment zones to help recover the costs of other infrastructure needed by the increased development.

Finally, by mixing land uses, TODs can enable shared parking, in which land uses whose parking needs peak in one part of the day coexist with land uses whose parking demand peaks at other times. For example, a set of restaurants, whose peak parking requirements tend to occur in the evening, could share a parking lot or structure with an adjacent office tower, whose peak demand would occur during the day. This reduces the need for parking areas even before transit ridership is considered.

Examples of TODs in the Dallas-Fort Worth area include the developments around Mockingbird Station in Dallas and CityLine Station near the State Farm development in Richardson.

Cost of Lack of Job Access

Economic activity depends on the successful connection of employees to job locations. The ability to travel to a place of work in a reasonable amount of time is something that many people may take for granted. However, when transit is not available, the ability to reach a job depends on access to private transportation in some form. This requirement can present a significant or prohibitive barrier to employment, especially in the lower-income sector or among persons who may not be able to operate a vehicle. One potential solution is the location of housing near the employment locations; however, this may not be an option for low-income jobs in an area of relatively high property values.

The VTPI's report *Evaluating Public Transit Costs and Benefits* highlights several studies citing the availability of transit as a significant factor in job accessibility, especially among students and adults with disabilities.

From the perspective of the employer, the unavailability of workers represents an operating challenge. Employers must either raise the wage offered for the unfilled job until it is attractive to nearby job seekers or must cover the transportation costs of workers farther afield; the alternative is to allow positions to remain unfilled. Either option potentially makes the business less competitive as the higher cost of labor may be passed on in the form of higher prices or reduced quality. In an extreme case, the business may become untenable, forcing it to close and reducing the market choice of local residents, who may have to drive further to reach a similar business.

By establishing a comprehensive transit network, a community can assist in the connection of employees to jobs, increasing economic opportunities, as well as market choices. In this case, transit provides the solution to land use decisions and an imbalance in the job/housing market.

Additional Costs of Driving

Besides the costs of acquisition and operations, car ownership generates a number of other costs that may fall either on the owner or on society at large. For example, the Victoria Transport Policy Institute's report *Transportation Cost and Benefit Analysis* cites many costs that are associated with vehicle travel but not explicitly covered in the preceding discussion and attempts to express them in terms of their public cost. For example, the cost of crashes includes not just the cost of damage to the vehicles and potential medical care to those involved, but the cost of police support and other clean-up activities, potentially the cost of repairs to the roadway, the cost of delay to other motorists, and the cost of higher insurance premiums. The report attempts to aggregate these costs and reduce them to a per-mile rate that can be used to evaluate the costs and benefits of transportation projects.

Other costs examined in the report include air pollution, taking into account the health and climate change impacts of various car exhaust products; noise, based on the impact on local property values; and water pollution, based on the cost and environmental impact of stormwater runoff from roads, herbicides, spilled petroleum products, etc. While this paper does not attempt to provide a comprehensive benefit-cost analysis for a particular project, the point remains that all of these factors are aggravated by pursuing a cars-only transportation strategy and result in an often-overlooked public cost.

Conclusions

While the capital and operations costs associated with a public transit system can be substantial, they are offset by other costs associated with a transportation network solely dependent on private vehicles. In addition to mitigating quality-of-life issues associated with not having (or being able) to drive, a public transit system can make a more efficient use of physical infrastructure devoted to the transportation system, reducing such costs and diverting space to more beneficial purposes.

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APPENDIX F: FINAL PAC SURVEY RESPONSES

NOTE: RESPONSES INCLUDED ON FOLLOWING PAGES

ID	Start time	Completion time	Please provide your name and organization.	Given the higher level of investment for more mature transit service throughout the county as shown by the transit propensity results of this study, are you interested in a more phased approach de...	To create a cohesive transit network across city and county boundaries, should neighboring cities identify a champion(s) to represent common interests and goals, pushing transit service forward?	Of the governance models presented at the last committee meeting by the project team, which option makes the most sense for your community and the county?	All things considered (service, cost/funding, governance), what do you see as the preferred path forward for your community? What are the biggest barriers that you believe would need to be overcome?	Would you be interested in maintaining momentum on this project? If so, what do you see as next steps/level of participation for the cities and the county?
1	7/9/21 11:02:26	7/9/21 11:07:39	Tim Porter, City of Wylie Public Works Director	Yes. On-demand service.	Yes.	Local Government Annual Operating Budget	On-demand service, possible fixed-route bus. Funding barrier.	
2	7/12/21 9:31:24	7/12/21 9:53:13	Ben White City of Farmersville	Yes, phased approach is acceptable. Next level of service for my area is on-demand service.	Absolutely we need neighboring cities to work together to allow the regional system to develop more robustly. Identifying a champion or point of contact would be a good move.	A local government corporation might be doable	Local government corporation. Funding is biggest barrier. How do we work with DART/DCTA as mechanism for mutual cooperation	Yes. Don't want this to sit on the shelf. We need to work the details of how to fund and set up local government corporation mechanism.
3	7/27/21 9:31:47	7/27/21 9:33:59	Drew Brawner, Robert Saylor (City of Plano)	As a mature city in the county with existing transit service, we both see the benefit of expanding transit service to communities to the north, as well as expanding transit options within Plano. There are corridors and transit service types that could have significant impacts to our city's mobility choices. These include a Legacy area circulator, Collin Creek redevelopment connectivity, Red Line extension, etc. It would be worth further exploring the cost/benefit and projected ridership of these types of enhanced transit investments.	Please provide more information on what this champion's role would be and how this could be a successful model to move service forward. We currently have individuals representing our regional transit interests (RTC, DART, etc.)	This is not as applicable to Plano, since we are an existing DART member city. Our city's regional transportation policies have included that the City "Advocate with Dallas Area Rapid Transit (DART) member cities for a financially equitable means for nonmember cities to enter service agreements that benefit the overall transportation system."	The biggest barrier to transit expansion beyond Plano is the unknown interest/funding level from adjacent communities who are not current members of a transit authority. Plano will continue to support exploring options to expand transit service beyond our city limits. We understand the demand for transit exists to our north and is exemplified with the high ridership at the Parker Road station.	Plano will continue support county transit planning efforts. We know there are particular corridors and transit service types that could have direct impacts to our city's (and neighboring cities') mobility choices. These include a Legacy area circulator, Collin Creek redevelopment connectivity, Red Line extension, etc. It would be worth further exploring the cost/benefit and projected ridership of various specific transit investments and county transit network scenarios.
4	7/27/21 9:34:03	7/27/21 9:43:07	Duncan Webb, Collin County	On demand for persons w/ disability or elderly.	The cities and counties must work together to develop and coordinate a cohesive and effect transit service for residents and visitors to Collin County. I am not sure what a champion is.	At this time, on demand for persons w/ disability or elderly. The cities will be the leaders.		Unsure.
5	7/28/21 15:39:19	7/28/21 16:10:31	Akia Pichon, City of McKinney. Answers provided by McKinney City Manager's Office.	Yes - McK interested in phased approach. Considering expansion to general public ridership (using on-demand service) most immediately, and based on ridership in certain areas would be open to adopting some limited fixed route service in the future.	Yes - RTC/COG is best situated to take that on; McKinney could offer a liaison to that end.	City Manager prefers to continue interlocal agreements because the City could opt out at any time.	Demand driven transit is the best path forward, with a blend of service offerings like TNC/on-demand service and limited fixed route.	Presentation to the MUTD Board and meetings with upper-level staff as necessary
6	8/2/21 8:48:49	8/2/21 8:55:48	Mark Nelson City of Richardson	Last mile connectivity and more frequency with existing DART fixed route service.	Yes	Uncommitted at this time	Largest challenge will be coordination with DART services and/or expansion of DART Service area/member cities should that be the path forward.	Yes would like to remain engaged.
7	8/4/21 22:00:30	8/4/21 22:02:44	Chris Flanigan, Director of Engineering, City of Allen	Yes. For instance, use of the DART rail corridor through the City of Allen seems like a natural extension of existing service from DART service areas. Given cost barriers that exist for new service extension of light rail, it seems that BRT within the existing ROW would be worth exploring in more detail.	Each city should represent its interests as it deems appropriate (staff, appointed, or elected officials), similar to what has been done within this study group, and continue the conversation and collaborate with our neighbors and regional partners (Collin County) about coordinated next steps.	In the absence of more information, Local Government Annual Operating Budget (Independent Action) seems to be the best fit for the City of Allen, as we may not desire all the elements (or costs) associated with Tier 1 service for our community. Independent action would allow some control over expenses and choice of service. However, more information and further discussion is needed to fully address this question.	Cost is the biggest barrier.	Implementation of service in Allen will likely need to be a gradual/phased approach. For instance, next steps would likely include research and development of specific and realistic options for the use of DART ROW through Allen, station somewhere in our community, how interface with Parker Station would work, etc. In the meantime/simultaneously, specific research and analysis can be undertaken to establish definitive O/M costs and engage communities on how those costs would be shared on a regional level, who would own the asset, and how/when the initial capital outlay will be derived.
8	8/5/21 10:31:15	8/5/21 10:36:33	David Fenton - Town of Prosper	Prosper does not anticipate the need for public transit service within Town limits due to lower density, smaller population, auto centric nature of the built environment and alternative private modes of transportation. However Prosper is interested in public transit options along the U.S. 380 corridor for major employment center locations.	Yes based on the overlapping transit needs of the region.	Demand response tier 2.	Refer to question 2 response (i.e. no need for transit).	Anticipate re-evaluating following establishment of basic infrastructure.



APPENDIX G: COLLIN COUNTY COLLEGES AND UNIVERSITY SURVEY RESPONSES

NOTE: RESPONSES INCLUDED ON FOLLOWING PAGES

ID	Start time	Completion time	Name2	Organization	Email2	Do you currently have transit service for your staff and students to/from your campus?	What organization, company, or entity is currently operating the transit service for your staff and students?	Do you have a need currently or foresee a future need for transit service for your staff and students?	Do you currently have a non-campus shuttle service? If not, do you have a need for an on-campus shuttle service?	What are the top needs for staff or student body when it comes to transit (i.e. service to regional transit hubs to connect campus with city/region, circulation within campus, frequency of service...	Would you be willing to be a financial partner with your city/county/local transit authority in any future transit planning efforts studying needs and opportunities for potential transit service t...	Would you be willing to be a financial partner with your city/county/local transit authority in the implementation of providing service to/within your campus?	Other comments related to transit:
2	7/19/21 17:56:44	7/19/21 18:01:26	Neil Matkin	Collin College	nmatkin@collin.edu	No		Students - yes.		Number one need is to transport students to unique and expensive programs not located county-wide.	Perhaps. Specific proposal would require staff recommendation and board approval.	Perhaps. Specific proposal would require staff recommendation and board approval.	I helped set up a bus service in another area with federal grants with mixed success
3	7/20/21 9:30:31	7/20/21 9:36:15	Candace Woods	Paul Quinn College	cwoods@pqc.edu	No		Yes	We do not. Yes, we have a need for both!	On/Off campus shuttle service from living residents (Local apartments) to and from campus regularly.	It's possible.	It's possible.	
4	7/27/21 8:48:48	7/27/21 8:49:47	Brent Bradshaw	Amberton University	bbradshaw@amberton.edu	No		Not at this time	No				
5	8/6/21 10:29:53	8/6/21 10:55:55	Cris Aquino	University of Texas at Dallas	caa095020@utdallas.edu	Yes	Our shuttle is operated as a partnership between UT Dallas, DART and Echo Transportation.		Yes	Our students, faculty and staff use our shuttle to commute to school from nearby apartment complexes. They also use the shuttle to connect to local DART hubs.	Yes	We are currently a financial partner with DART to provide transportation service to and from our campus.	UT Dallas contentiously evaluate the changing need of our campus when it comes to transportation. We welcome any partnership or assistance that helps us continue to expand service to our campus community.