

July 2021

SOUTHERN DALLAS COUNTY
TRANSIT STUDY

SOUTHERN DALLAS COUNTY **Transit Planning Study Report**

APPENDICES



North Central Texas
Council of Governments

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STRATEGIES

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Appendix A - Project Advisory Committee Members

First Name	Last Name	Company	Job Title
Majed	Al-Ghafry	Dallas	Assistant City Manager
Chasidy	Allen-Benson	Duncanville	City Planner
Tennell	Atkins	Dallas	Dallas City Council District 8
Micah	Baker	Dallas County	Senior Transportation Planner (STTC)
Ashley	Berryhill	STAR	Grant Director
Alberta	Blair	Dallas County	Public Works Director
Kim	Britton	STAR	VP, Planning and Development
Kim	Britton	STAR	Chief Communications Officer
Alicia	Brossette	UNT Dallas	Special Projects Director
Derwin	Broughton	KAI (Architects)	Principal
Randall	Chase	Cedar Hill Chamber of Commerce	Executive Director
Paul	Cristina	BNSF Railway	Director, Public Private Partnerships
Jacqueline	Culton	Duncanville	Assistant Director of Public Works
Paul	Frederiksen	Duncanville	Interim City Manager
Clyde	Hairston	Lancaster	Mayor
Antonio	Harris	STAR	Transportation Manager
Tony	Irvin	DeSoto	City Engineer
Jessica	James	Duncanville	Director of Economic Development
Tom	Johnson	Cedar Hill	Public Works Director
Fabrice	Kabona	Lancaster	Assistant City Manager
Barry	L. Gordon	Duncanville	Mayor
Eron	Linn	DART	Federal Relations (STTC member)
Marjorie	Maldonado	DeSoto Chamber of Commerce	Office Manager
Stephen	Mason	Cedar Hill	Mayor
Opal	Mauldin-Jones	Lancaster	City Manager
Lauren	Mish	Dallas County	Chief of Staff for Judge Jenkins
Tyson	Moeller	Union Pacific RR	General Director, Capacity Planning
Kenzie	Moore III	DeSoto	Mayor Pro Tem
Robyn	Mota	Duncanville Chamber of Commerce	Chair of the Board
Lucious	Newhouse	DART	Service Planner II
Todd	Plesko	DART	VP of Service Planning
Greg	Porter	Cedar Hill	City Manager
John Wiley	Price	Dallas County	Commissioner District 3
Greg	Ramey	Duncanville	Director of Public Works
Mike	Rogers	Dallas	Director of Transportation
Joseph	Seabrooks (PhD)	Cedar Valley College	President
Grady	Smithy	Duncanville	
Lashondra	Stringfellow	Cedar Hill	Planning Director
Bridgette	Taylor	Lancaster Chamber of Commerce	Chair of the Board
Joe	Veracruz	Duncanville	Councilmember
Andrew	Waits	Lancaster	Public Works Director
Cynthia	Williams	Duncanville	Economic Development
Robert	Woodbury	Cedar Hill	City Engineer
Candace	Woods	Paul Quinn College	Transportation Coordinator
Brandon	Wright	DeSoto	City Manager
Richard	Zientek	Union Pacific RR	Sr. Director, Public Affairs

Appendix B - Financial Plans

Cost and revenue estimates for each city are shown in **Tables B-1** through **4** below. These estimates are based on cost allocation assumptions from this project, and are subject to service contract or MOU as part of project implementation.

The Cedar Transit Hill Financial Plan (**Table B-1**) assumes costs associated with US-67 Express service and a dedicated microtransit zone. Costs associated with one shelter stop are assumed along the US-67 corridor. Revenue sources for Cedar Hill include advertising at the sheltered stop as well as transportation development credits and federal revenue. Cedar Hill's local share could be offset through leveraging Cedar Hill's existing TIF district, which would be well served by the proposed microtransit and express service.

The DeSoto Transit Financial Plan (**Table B-2**) assumes costs associated with the Hampton East fixed route, a dedicated microtransit zone and a share zone with the city of Lancaster. Capital costs assume two bench stops at higher volume locations as well as nine pole and sign stops and approximately two locations for ADA curb improvements. Revenue sources for DeSoto include transportation development credits, federal revenue, and reinvestment of current transit service budget, leaving less than a 5% increase in existing transportation budget needed to fund improvements.

The Duncanville Transit Financial Plan (**Table B-3**) assumes costs associated with US-67 Express service, the Wheatland I-20 Route and a dedicated microtransit zone. Capital costs include one shelter stop along the US-67 as well as one bench stop, 4 pole and sign stops and 1 ADA curb enhancement along the Hampton corridor. Revenue sources for Duncanville include advertising at the sheltered stop as well as transportation development credits and federal revenue.

The Lancaster Transit Financial Plan (**Table B-4**) assumes single-stop costs associated with the Hampton East and Wheatland I-20 fixed routes, a dedicated microtransit zone and a share zone with the city of DeSoto. Capital costs assume two pole and sign locations (one in each direction) and a one-half probabilistic cost for potential ADA curb improvements. Primary revenue sources for Lancaster include transportation development credits and federal revenue.

Year	2021	2022	2023	2024	2025
Phase1 Infrastructure Costs	\$(13,150)	-	-	-	-
Phase 1 Service Costs	-	\$(198,842)	\$(204,807)	\$(210,951)	\$(217,279)
Total Cost of Service	\$(13,150)	\$(198,842)	\$(204,807)	\$(210,951)	\$(217,279)
Federal Revenue ⁽¹⁾	\$10,520	\$99,421	\$102,403	\$105,475	\$108,640
Advertising Revenue ⁽²⁾	-	\$5,150	\$5,305	\$5,464	\$5,628
Transportation Development Credits ⁽³⁾	-	\$19,884	\$20,481	\$21,095	\$21,728
Cedar Hill Local Share	\$2,630	\$74,387	\$76,618	\$78,917	\$81,284
Total Revenue Sources	\$13,150	\$198,842	\$204,807	\$210,951	\$217,279

Table B-1: Cedar Transit Hill Financial Plan

(1) Assumes 80% federal match for capital and 50% match for service costs

(2) Assumes \$500 ad sales per month x 12 months, less 20% marketing and maintenance

(3) Requires adoption of NCTCOG policy bundle, assumes 20% of Federal share

Year	2021	2022	2023	2024	2025
Existing Service Costs	\$(139,000)	-	-	-	-
Phase1 Infrastructure Costs	\$(18,550)	-	-	-	-
Phase 1 Service Costs	-	\$(374,958)	\$(386,207)	\$(397,793)	\$(409,727)
Total Cost of Service	\$(157,550)	\$(374,958)	\$(386,207)	\$(397,793)	\$(409,727)
Federal Revenue ⁽¹⁾	\$14,840	\$187,479	\$193,104	\$198,897	\$204,864
Transportation Development Credits ⁽²⁾	-	\$37,496	\$38,621	\$39,779	\$40,973
Current Transit Budget ⁽³⁾	\$139,000	\$143,170	\$147,465	\$151,889	\$156,446
Additional DeSoto Local Share	\$3,710	\$6,813	\$7,018	\$7,228	\$7,445
Total Revenue Sources	\$157,550	\$374,958	\$386,207	\$397,793	\$409,727

Table B-2: DeSoto Transit Financial Plan

- (1) Assumes 80% federal match for capital and 50% match for service costs
 (2) Requires adoption of NCTCOG policy bundle, assumes 20% of Federal share
 (3) Assumes current STAR Transit budget would be reallocated for proposed services

Year	2021	2022	2023	2024	2025
Phase1 Infrastructure Costs	\$(21,250)	-	-	-	-
Phase 1 Service Costs	-	\$(318,146)	\$(327,691)	\$(337,522)	\$(347,647)
Total Cost of Service	\$(21,250)	\$(318,146)	\$(327,691)	\$(337,522)	\$(347,647)
Federal Revenue ⁽¹⁾	\$17,000	\$159,073	\$163,845	\$168,761	\$173,824
Advertising Revenue ⁽²⁾	-	\$5,150	\$5,305	\$5,464	\$5,628
Transportation Development Credits ⁽³⁾	-	\$31,815	\$32,769	\$33,752	\$34,765
Duncanville Local Share	\$4,250	\$122,109	\$125,772	\$129,545	\$133,431
Total Revenue Sources	\$21,250	\$318,146	\$327,691	\$337,522	\$347,647

Table B-3: Duncanville Transit Financial Plan

- (1) Assumes 80% federal match for capital and 50% match for service costs
 (2) Assumes \$500 ad sales per month x 12 months, less 20% marketing and maintenance
 (3) Requires adoption of NCTCOG policy bundle, assumes 20% of Federal share

Year	2021	2022	2023	2024	2025
Phase1 Infrastructure Costs	\$(1,550)	-	-	-	-
Phase 1 Service Costs	-	\$(301,103)	\$(310,136)	\$(319,440)	\$(329,023)
Total Cost of Service	\$(1,550)	\$(301,103)	\$(310,136)	\$(319,440)	\$(329,023)
Federal Revenue ⁽¹⁾	\$1,240	\$150,551	\$155,068	\$159,720	\$164,512
Transportation Development Credits ⁽²⁾	-	\$30,110	\$31,014	\$31,944	\$32,902
Duncanville Local Share	\$310	\$120,441	\$124,054	\$127,776	\$131,609
Total Revenue Sources	\$1,550	\$301,103	\$310,136	\$319,440	\$329,023

Table B-4: Lancaster Transit Financial Plan

- (1) Assumes 80% federal match for capital and 50% match for service costs
 (2) Requires adoption of NCTCOG policy bundle, assumes 20% of Federal share

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Appendix C

SOUTHERN DALLAS COUNTY

Transit Existing Conditions and Needs Assessment Report



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Introduction

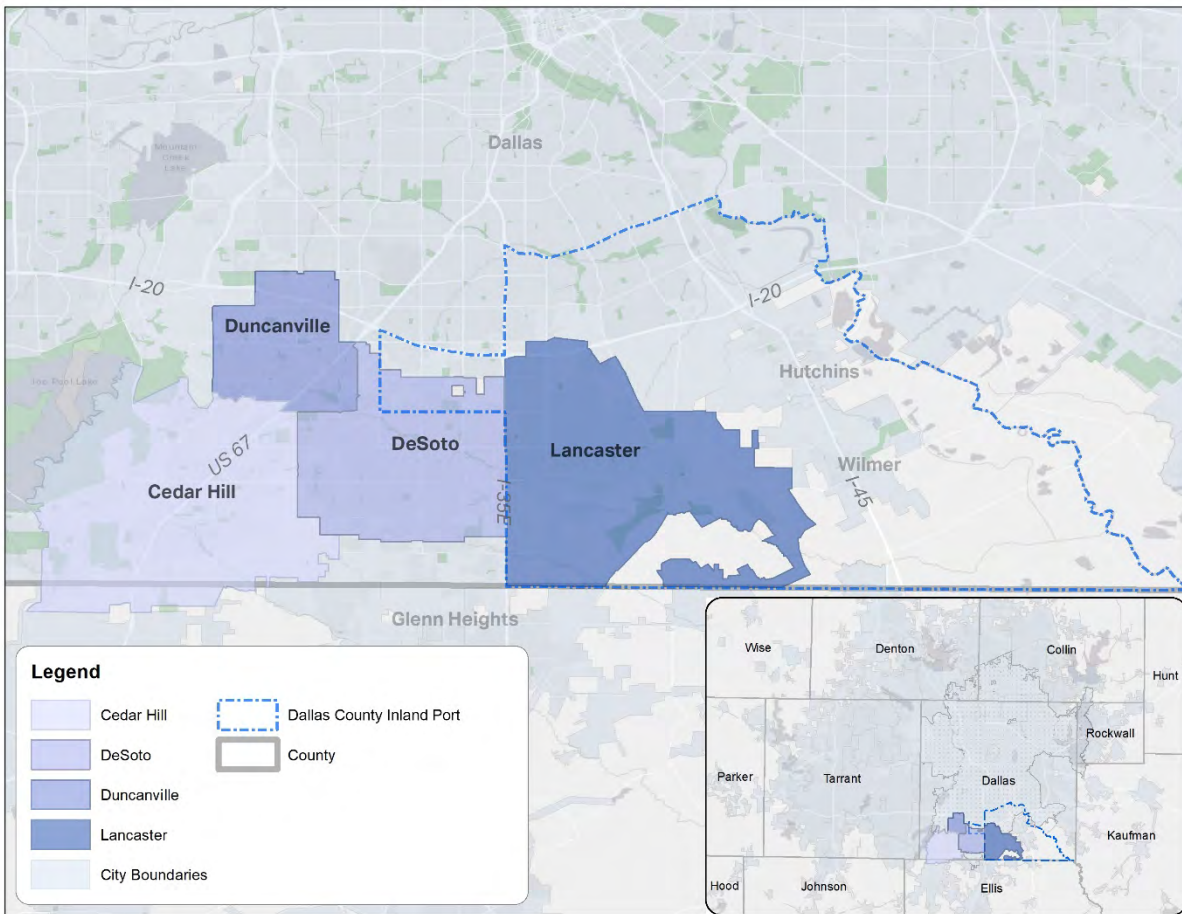
The Existing Conditions and Needs Assessment has been completed to gather data, assess the current planning environment for transit and other forms of mobility within the study area. In addition, the task analyzes current transit operations, plans and trends. This report includes a document review of relevant planning studies, demographics assessment and a transit services and mobility review.

1 Existing Conditions and Needs Assessment

1.1 Study Area

As shown in Figure 1, the study area includes the four city boundaries of Cedar Hill, DeSoto, Duncanville, and Lancaster, and the Southern Dallas County Inland Port (Inland Port) boundary containing the cities of Hutchins and Wilmer. The cities are not currently member cities of Dallas Area Rapid Transit (DART), however STAR Transit provides limited fixed route and demand response coverage to the cities of DeSoto and Lancaster with connections to the DART Blue Line light rail service at the UNT-Dallas station. Additionally, the Inland Port boundary extends into the DART service area in the City of Dallas and has fixed route and demand response service.

Figure 1: Southern Dallas County Study Area



Source: AECOM, 2020

The following section describes the types of transit located in the area and how they are operated.

- **Fixed-route:** this type of transit service operates along a predetermined and specific route and is the most common type of transit service in the United States. DART and STAR Transit both provide fixed-route bus service within the study area. Sections 1.4 and 1.5 provide more detail on the existing conditions of fixed-route transit.
- **Demand-response / on-demand:** this type of transit service typically involves small and medium vehicles operating on flexible routes and flexible schedules which are based on passenger requests. Some types of demand-response may offer curb-to-curb service and do not use any fixed stops. Other types of service may include a smaller number of fixed stops at popular destinations, such as transit centers or light-rail stations. This is the second most common type of transit service in the United States. DART operates two **GoLink zones** adjacent to the study area. These zones operate as demand response/on-demand service. Sections 1.4 and 1.5 provide more detail on the existing conditions of demand-response/on-demand transit.
- **Paratransit:** this type of service operates with small to medium vehicles, or can even use taxi-cabs or Transit Network Company (TNC) vehicles; however, all vehicles must be able to accommodate ADA and/or wheelchair passengers. Paratransit must be provided within ¾-mile from any fixed-route service. The primary purpose of this transit service is to transport passengers who would have difficulty accessing destinations using fixed-route transit. For this reason, all passengers must receive curb-to-curb or door-to-door service. Passengers usually schedule trips ahead of time (typically one business day ahead and up to two weeks in advance).
- **Vanpool:** this type of service is similar to demand-response using shared-rides and smaller vehicles. The main difference is this type of transit service only operates from a workplace not served by public transit. Typically, the workplace will enter into an agreement with the transit provider to acquire a set number of vehicles and recruitment of drivers and passengers. Passengers share the total cost of the service. DART provides Vanpool service anywhere within Dallas County

1.2 Document Review

This section reviews existing local and regional planning efforts undertaken by the study area cities, the Inland Port, NCTCOG and transit service providers. The document review provides a brief summary of each plan and recommendations related to transit and economic development within the study area. The review provides a baseline of potential capital investment into mobility service and infrastructure and insight into potential mobility gaps and shortfalls.

1.2.1 Cedar Hill

Cedar Hill Next, 2019-Ongoing

Cedar Hill is currently updating their comprehensive plan with anticipated completion in Fall of 2020. The initial public involvement effort has focused on multimodal transportation including micromobility, transit, TOD, cycling and placemaking. Preliminary plans include a walkable Wellness District and an Innovation Hub along Loop 9 and a focus on a pedestrian oriented downtown. When the plan is complete it will include detailed future scenarios and cost projections.

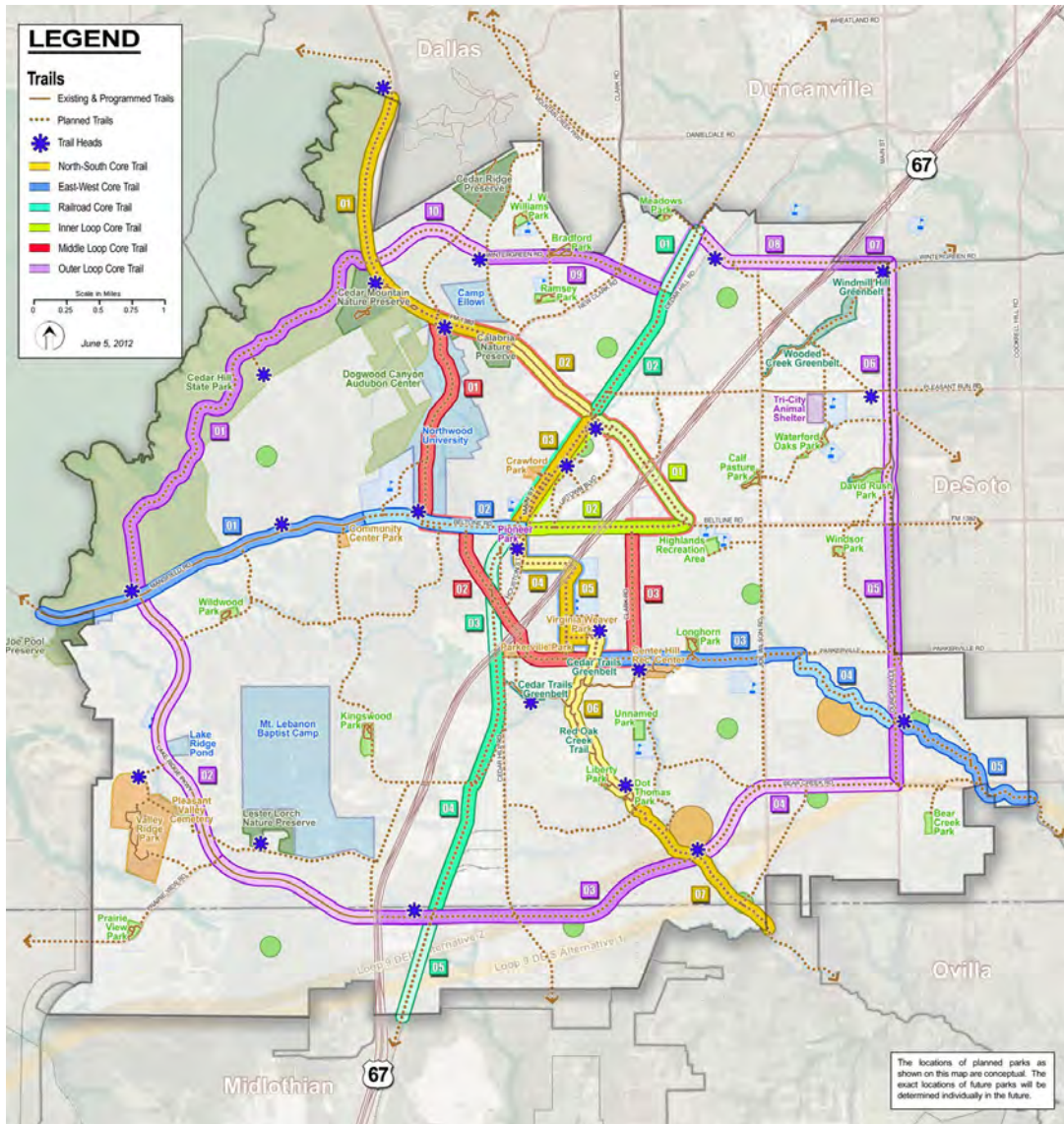
Parks, Recreation, Trails & Open Space Master Plan, 2019 Update

Priorities of the plan include development and implementation of a city-wide trail network that would “provide pedestrian access and connectivity to points of interest such as parks, retail and dining centers, and the Government Center”. The planned trails map is shown in **Figure 2**.

Trails identified in the plan could provide connectivity from the city center to its outskirts and beyond. The North-South Core trail and Railroad core trail identified in the plan, would travel through the center of Cedar Hill and link potential transit recommendations identified in the *City Center Development Plan, 2010*.

The trail system outlined in the master plan update is a key strength of Cedar Hill and should be leveraged as a strength for potential transit recommendations to be identified within this planning study.

Figure 2. Cedar Hill Trail Master Plan



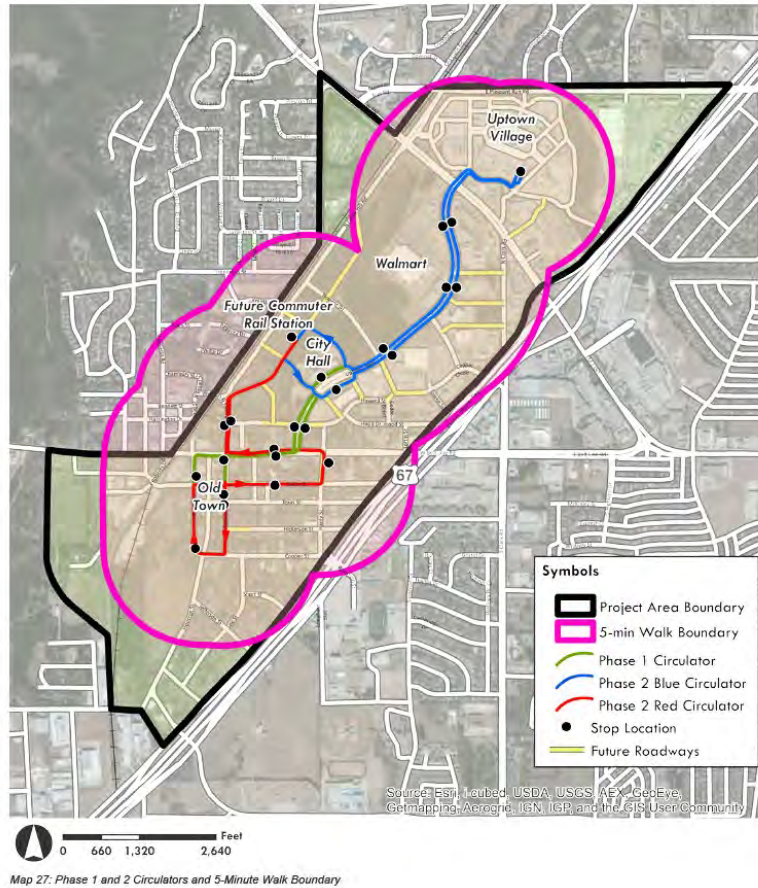
Source: City of Cedar Hill Parks, Recreation, Trails & Open Space Master Plan, 2019 Update

City Center Development Plan, 2010

The City Center Development Plan is a small area master plan focusing on three subdistricts in Cedar Hill: Uptown Village Square, Midtown Plaza, and Historic Downtown Village. The plan emphasizes Transit Oriented Development, walkability, and compact development as tools for economic development in the master plan. The plan envisions a

new commuter rail station utilizing the BNSF rail corridor from the DART Red Line terminus to Midlothian, and the potential to develop an “active transportation” system that provides multimodal connectivity and complete streets.

Figure 3. City Center Circulator and Walkability



Source: Cedar Hill City Center Development Plan, 2010

Additionally, the plan outlines the potential for a fixed route circulator that would provide transit service from the potential commuter rail station near City Hall. The circulator would help solve first/last mile issues for commuters and local transit riders taking trips within the district, as shown in **Figure 3**. Transit recommendations outlined in the master plan show that Cedar Hill is aware of the potential for commuter and local transit within their boundaries.

Cedar Hill Comprehensive Plan, 2008

Cedar Hill's last comprehensive plan was completed in 2008 and provided several key principles related to future transportation-related decisions within the City, including:

- Convenient internal circulation between neighborhoods, core community assets, and special districts
- Transportation facilities should define rather than split residential areas in order to preserve neighborhood integrity
- Safe pedestrian/bikeway systems that provide connectivity between homes, community facilities, and retail areas
- Address multimodal needs within the City and smart growth planning including transit-oriented development

- Proactively address mobility and accessibility issues from a regional growth prospective

The transportation section of the comprehensive plan highlights the potential for regional rail to travel through Cedar Hill with a station in the central business district based on the NCTCOG Regional Rail Plan in 2005. The commuter rail line would be an extension of DART's Red Line from Westmoreland Road in Dallas using an existing BNSF freight rail corridor. The plan emphasizes the potential of transit-oriented development opportunities associated with commuter rail. Goals include context sensitive design of streets and thoroughfares that include safe facilities for pedestrian and bicycle connectivity.

1.2.2 DeSoto

City of DeSoto Comprehensive Plan, 2015

This 2015 plan was an update to the city's 2003 plan. The plan establishes land use, transportation, streetscape, housing, and urban design goals for DeSoto. Since the 1980's, Desoto has been growing steadily, with 97 percent growth from 1980 to 1990, and more moderate growth of approximately 30 percent between 2000 and 2010. In 2014, the population was over 50,000 residents. The most common land use in DeSoto is single family homes at approximately 51 percent of parcels. However, the comprehensive plan highlights opportunity for infill development as an economic development strategy in the plan. Key aspects of the plan include providing diverse housing stock, encouraging development and job creation, as well as providing proactive planning for growth and traffic along key thoroughfares, including Hampton Road and Cockrell Hill Road. Additionally, the plan outlines that DeSoto is interested in public transit options for the city as outlined in the *City of DeSoto Strategic Public Transportation Planning Study, 2011*.

City of DeSoto Strategic Public Transportation Planning Study, 2011

DeSoto is not a member of the DART system, but has four DART light-rail stations and park-and-ride facilities nearby: Red Line stations at Westmoreland Road and Hampton Road in Dallas, the Blue Line station at UNT-Dallas, and the park-and-ride west of IH-35 in Glenn Heights. The city has opted to research and develop public transit solutions outside of joining DART. In 2011, the city conducted a public transportation study. Overall, the study found that there was strong interest in public transportation in the City. The study recommended three phases to support public transit:

- Near Term Measures (2 years):
 - Provide carpool matching assistance to DeSoto residents
 - Provide vanpool matching
 - Initiate a taxi subsidy program
 - Expand the volunteer driver program
 - Begin coordination with DART
- Intermediate Term Measures (3-8 years):
 - Begin a startup shuttle service
 - Construct a park-and-ride in DeSoto
 - Expand the City's role in coordinating local transportation
- Long Term Measures (>8 years):
 - Services introduced earlier will be evaluated and enhanced, if needed
 - Developing dense mixed-use nodes may improve the viability of fixed-route transit options

For north-south corridors, Duncanville Road and Hampton Road are key arterials in DeSoto that could be used as potential transit supportive corridors. Additionally, the Public Transit Study provides an overview of DeSoto east-west

linkages with other cities in the Best Southwest Cities Partnership (Duncanville, Lancaster, Cedar Hill) that could provide high potential for transit use:

- Wheatland Road – DeSoto’s northern boundary but serves as major travel corridor
- Danieldale Road
- Wintergreen Road
- Pleasant Run Road – has been considered for widening to four lanes
- Belt Line Road – Significant retail development especially in Cedar Hill; Walmart located at I-35E in Lancaster

1.2.3 Duncanville

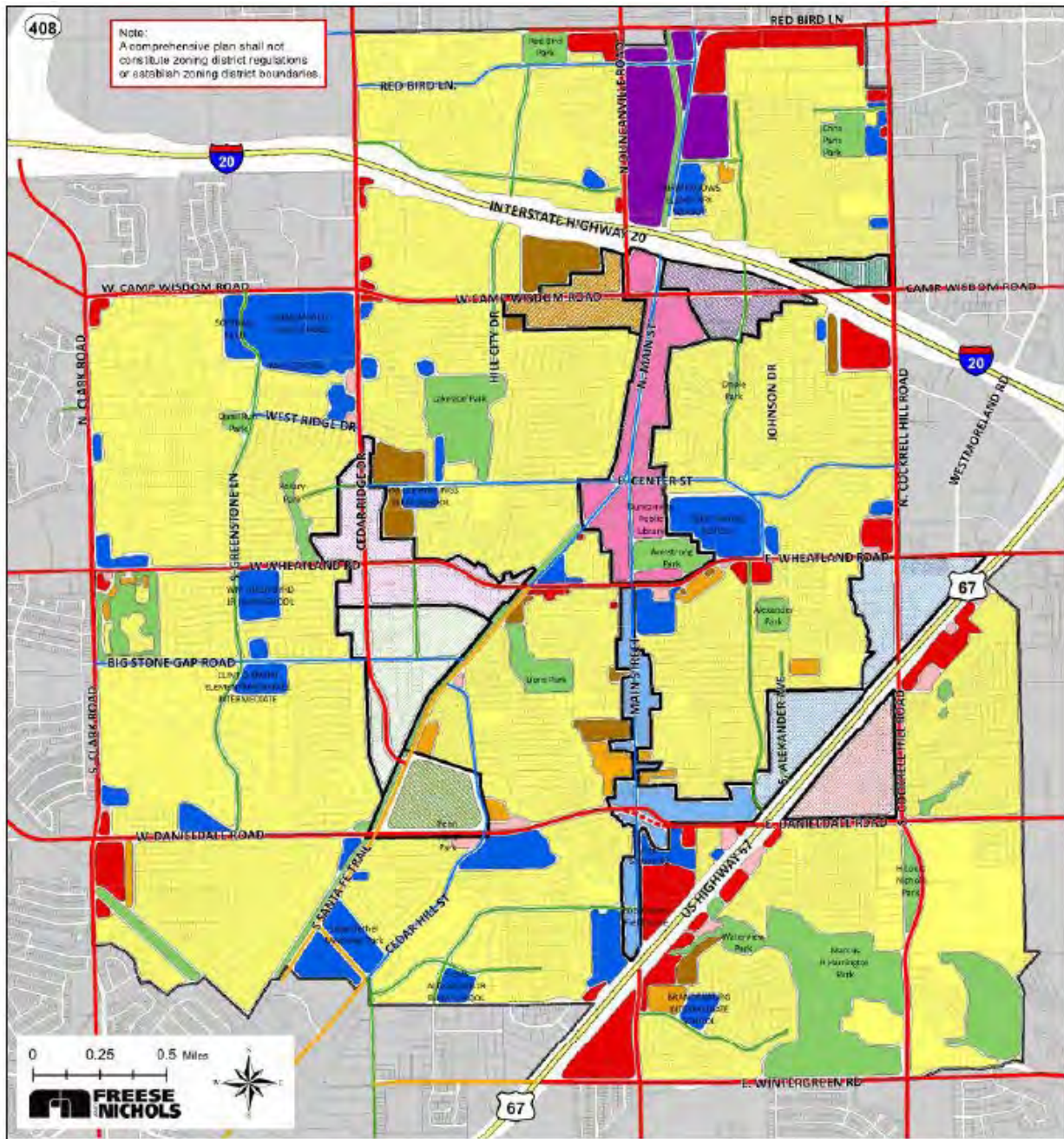
Destination Duncanville: Comprehensive Plan, 2017

Destination Duncanville is the city’s first ever comprehensive plan and provides vision and strategies for the next 20 years. The plan seeks to build Duncanville’s collective identity, understand issues, and provide recommendations while growing and planning for the future. The plan addresses economic development, transportation, community character, neighborhoods, downtown, and development/redevelopment. A guiding principle of the plan is to provide “safe, multi-modal transportation options that connect people to employment, amenities, and neighborhoods both locally and regionally.”

A majority of the Duncanville comprehensive plan is dedicated to discussing existing and future land use, and the potential of designated catalyst locations. Approximately 80 percent of land use within the city is occupied by residential, parks and recreation, public/semipublic, institutional, and rights-of-ways. These land uses are anticipated to remain the same over time therefore leaving limited opportunities for redevelopment. The plan breaks remaining land down into Opportunity Areas primarily adjacent to major thoroughfares, such as Camp Wisdom Road, Main Street, and US 67. **Figure 4** shows the Duncanville Future Land Use Plan.

Currently, Duncanville does not participate in the DART system. The plan seeks to identify multi-modal amenities that could enhance the transportation network and review the possibility of a commuter rail station near downtown.

Figure 4. Destination Duncanville Future Land Use Plan



Source: Destination Duncanville, 2017

Main Street: Duncanville, Texas Plan, 2008

The Main Street plan focuses on establishing a district near downtown that uses form-based code, urban design, and emphasizes transit oriented development as a catalyst for economic activity. The plan identifies the southwest corner of Center Street and Main Street as the potential location for a potential commuter rail station. The 5.46-acre site would be able to accommodate a station, associated facilities, and parking. Nearby commercial uses would include mixed-use developments, restaurants and retail.

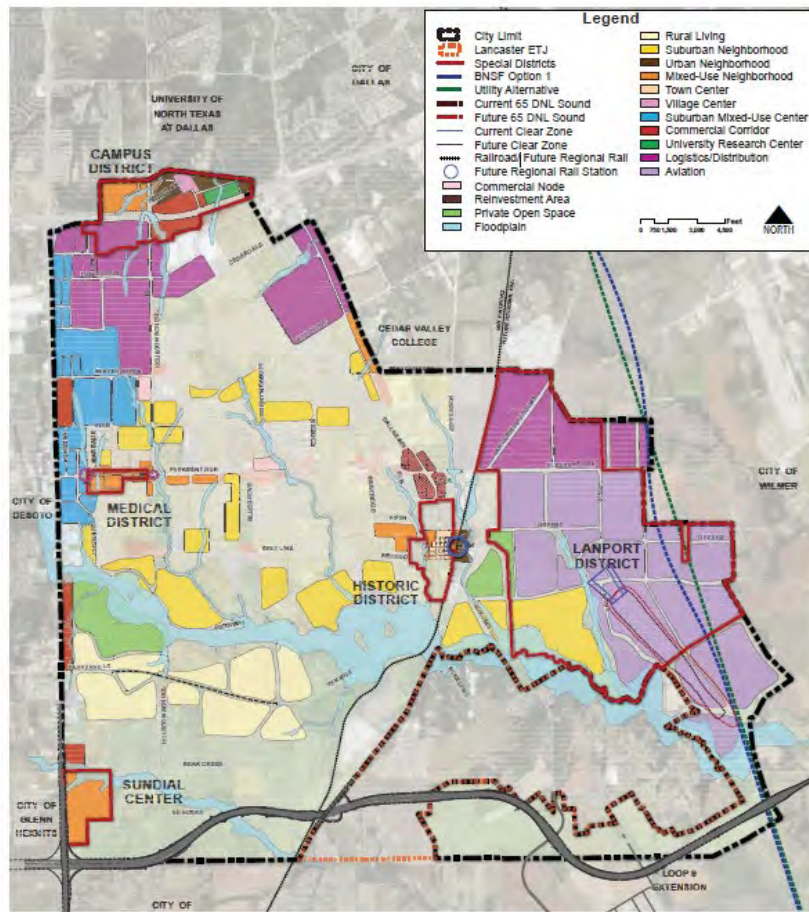
1.2.4 Lancaster

Lancaster Comprehensive Plan, 2016

The comprehensive plan is an update to the 2002 Lancaster comprehensive plan. Within the comprehensive plan, a Preferred Future Land Use Scenario is presented that would help direct growth to areas within the city, providing efficient transportation systems including multimodal and potential transit options, and capitalizing on strong employment and natural features to establish Lancaster as a destination in Southern Dallas.

The plan establishes place types to capitalize on existing infrastructure, or plan for future investment. A potential commuter rail station is identified in the “Historic District” as shown in Figure 5.

Figure 5. Lancaster Comprehensive Plan Preferred Future Land Use Scenario



Source: Lancaster Comprehensive Plan 2016

The Transportation section of the plan shows the benefit from potential commuter rail and plan development that is “transit-ready” around Lancaster’s desired stations. Connectivity through mode choice and context sensitive design is emphasized through recommendations that would reconnect street grids, add bicycle and pedestrian enhancements, and exploring future potential to become a DART member city. Lancaster is slightly different from the other cities in this study as they benefit from DART bus routes that travel into their city limits to serve the Cedar Valley College.

Lancaster Airport Sector Plan and LanPort Zoning District and Development Standards, 2008

The master plan provides principles and recommendations for the east side of the City of Lancaster near the Lancaster Regional Airport. The airport is within the Southern Dallas County Inland Port boundary. Guiding principles include:

- Promoting the airport as an economic engine
- Taking advantage of the airport’s proximity to the BNSF intermodal facility
- Utilizing greenfield land in proximity to the airport
- Recommend compatible uses for the area
- Assure an attractive transition for Lancaster’s downtown to the airport
- Take advantage of the location in the southern part of the Metroplex and the freight routes that exist

The Lancaster Regional Airport is a significant economic driver for the city and should be considered when identifying multimodal or economic develop opportunities within the city.

1.2.5 Southern Dallas County Inland Port

Southern Dallas County Infrastructure Analysis (SDCIA), 2012 (currently being updated)

The cities of Dallas, Ferris, Hutchins, Lancaster and Wilmer joined Dallas County and NCTCOG to assess current transportation, utility, stormwater, and private/franchise infrastructure needs and recommend strategies for commercial, residential, and industrial development.

A preliminary assessment of the availability for workforce housing in the area found that while some occupations will pay enough for homeownership, there will be many employees who will be renters and the area does not have a significant residential rental market. The labor shed for employers in this area extends to Navarro, Ellis and Kaufman counties and those areas have more affordable housing and offer relatively easy access to the jobs by car. The study recommended labor rates should be used to approach residential development as cities develop their land use plans and zoning maps. This could include single and multi-family ownership units, rental properties and the supporting subsidized housing for lower income households.

For transportation infrastructure, the study found that limited transportation services are provided for senior citizens in the cities of Lancaster, Hutchins, and Wilmer. These services generally provide seniors dial-a-ride service to senior centers and in limited capacity to medical facilities. At the time of this report, DART was the only public transit service provider in the study area; however, private providers such as CVT Transportation Services, Metro Transporters and My Private Driver offered private on-demand transportation services to Dallas County. Although, recent internet searches found no active websites for CVT Transportation Services or Metro Transporters.

Additionally, STAR Transit began operating within the area in following years as they expanded service into Hutchins, Lancaster, DeSoto, and other cities. Transit-related recommendations, included DART Blue Line light rail expansion, DART Bus route enhancements, and expanded transit service throughout the area to match projected growth. The

DART Blue Line UNT Dallas Station is now operational and is a key connection between DART rail service and multiple STAR Transit shuttles.

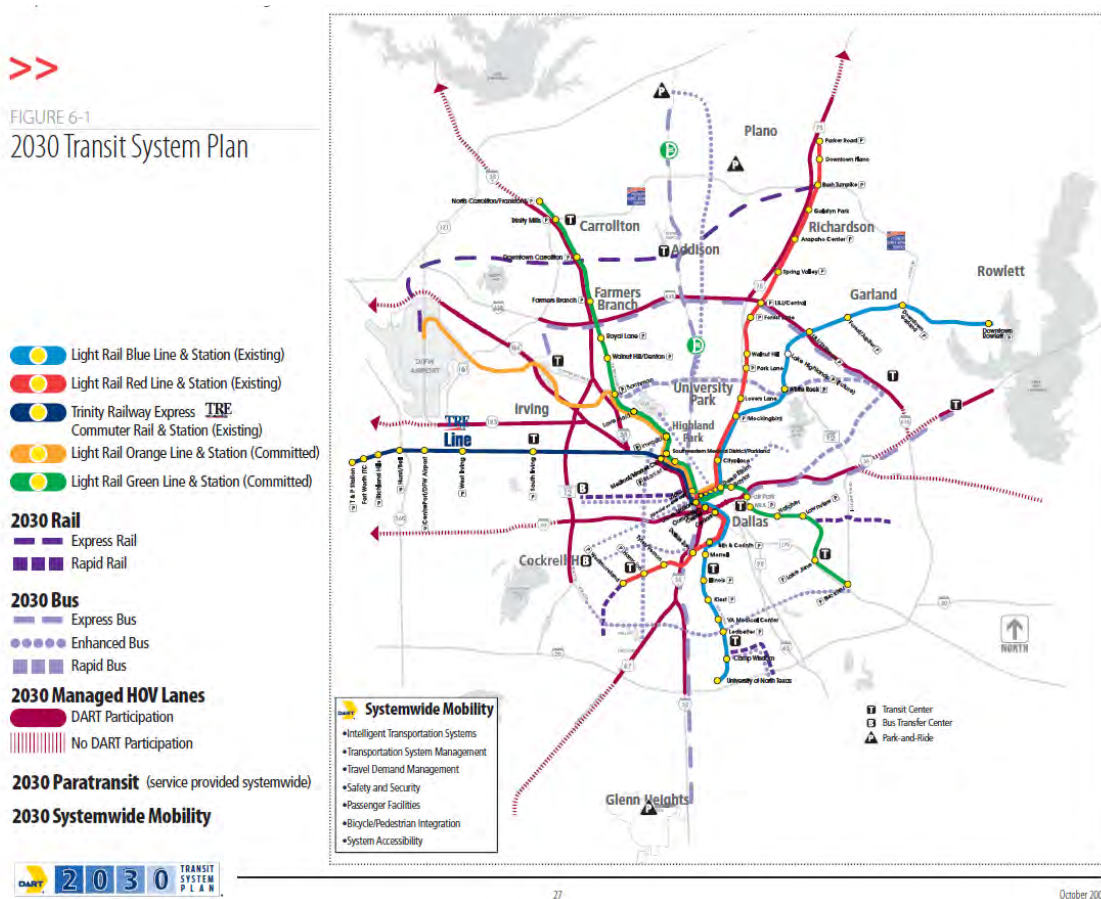
Overall, the study concluded that the area should continue to anticipate growth and that roadway capacity will be essential for additional trips from passenger and freight vehicles. Key corridors are east-west arterials of Wintergreen Road, Pleasant Run Road, and Belt Line Road. North-South arterials highlighted include, Bonnie View Road and Lancaster-Hutchins Road.

1.2.6 Dallas Area Rapid Transit (DART)

2030 Transit System Plan, 2006

DART's 2030 Transit System Plan identified Cedar Hill, Duncanville, and Lancaster as potential new member cities with moderate to high potential to support rail into their communities. The 2030 Transit System Plan, as shown in Figure 6, includes a 2.9 -mile extension from the Camp Wisdom Blue line station to the Southport (Inland Port) area and a Red Line extension from Westmoreland to Red Bird Lane near the Dallas City limits, as shown in the map below. These extensions would bring rail closer to Southern Dallas County communities and perhaps drive greater demand. The Plan also calls for a managed HOV lane on the US-67 corridor from I-35 East to the County Line, which would run through both Cedar Hill and Duncanville and potentially incentivize transit use between these communities and Downtown Dallas.

Figure 6. DART System Plan 2030



Source: 2030 Transit System Plan

DART ZOOM, Ongoing

DART Zoom, the agency's ongoing bus network redesign project, has developed two future bus system concepts for review by the public. The two concepts are essentially the big-picture goals for the transit agency, although in many cases the goals compete against each other. The two goals are as follows:

- **Ridership Concept:** In this scenario, the 206 Glenn Heights route would become an all-day route with 60-minute frequency, the 555 Camp Wisdom/Cedar Valley route would be eliminated, and all GoLink microtransit zones would be eliminated.
 - The primary purpose of the Ridership concept is to focus on providing more frequent, all-day service to higher density places of people and jobs. This type of service may encourage denser, walkable environments and help reduce vehicle trips.
- **Coverage Concept:** In this scenario, the 206 Glenn Heights route would become an all-day route with 60-minute frequency and the 555 Camp Wisdom/Cedar Valley route would be renamed "95 Cedar Valley College" but maintain the same alignment and frequency as existing.
 - The primary purpose of the Coverage concept is to provide service to as many places as possible within the service area. The priorities service to more people, rather than more frequent and longer hours of service.

DART is currently engaging the public and stakeholders to collect ideas for how to balance the two goals. DART Zoom has a goal of implementation in Early 2022; however, the timing may be altered due to effects from the COVID-19 pandemic.

1.2.7 STAR Transit

STAR Transit operates fixed route and on-demand service in the study area and in greater Dallas County. The agency is in the process of completing a comprehensive operations analysis (COA) of their system assessing efficiencies of their bus operations.

1.2.8 North Central Texas Council of Governments (NCTCOG)***Mobility 2045, 2018***

NCTCOG updated its Metropolitan Transportation Plan (MTP), Mobility 2045, in May 2018. Mobility 2045 sets transportation, mobility, and environmental goals for the North Texas region and guides federal and state expenditures through prioritization of projects. The plan includes chapters on all forms of mobility from vehicles, transit, freight rail, walking, and bicycles.

The mobility chapter includes a discussion of public transit that acknowledges the difference in needs for residents and businesses across the region. The Plan reviewed public transportation provider service areas, existing commuter rail services, and mobility programs. Recommendations were then created based on existing and forecasted conditions in population, congestion, potential transit and commuter rail investment and corridors. Additionally, the plan assessed what amenities can make high-intensity bus service more attractive to riders.

As the plan takes a regional perspective to mobility options and priorities, findings relevant to Southern Dallas County are generally viewed as commuter trips and connectivity. However, recommendations regarding local transit investment and potential commuter and light rail investment within Southern Dallas should be considered when assessing potential transit services within the study area.

Access North Texas, 2018

NCTCOG developed a public transit-human services transportation coordination plan titled Access North Texas in March 2018. The plan identified service needs for seniors, individuals with disabilities, and individuals with lower incomes. The plan analyzed transit accessibility using US Census Bureau information for specific populations. The plan included a Public Transportation Toolbox which identifies 19 transit services that can be implemented in the near term to meet specific needs within a community. Recommendations identified in the plan are identified in Table 1:

Table 1. Access North Texas Summary of Transit Related Recommendations

Recommendations
Volunteer Driver Program
Mobility Management
Coordination and Cost Sharing Opportunities
Subsidized Taxi Program
Carpool
Vanpool
Eligibility-Based Dial-A-Ride
General Public Dial-A-Ride
Mobility on Demand Service – General Public
Mobility on Demand Service – Eligibility-Based
Mobility on Demand Service – Microtransit
Community Shuttle
Express Bus/Park-and-Ride Service
Limited Stop Service
Point Deviation Service
Route Deviation Service
Feeder/Connector Service to Fixed-Route
Site-Specific Shuttle
Local Fixed-Route Bus Service

Source: NCTCOG Access North Texas

The plan highlights how STAR Transit has provided Hutchins residents with transit service that helped connect employees lacking mobility options to their employers within the study area. NCTCOG has helped expand this effort by offering more flexible vehicle types that can provide transportation to areas with potential lower demand or specific need. In total, 100 small, medium, and light duty vehicles were procured for nine different transit providers.

Key strategies outlined for Dallas County include:

- In areas with no public transit service, assess community needs and implement transit
- In areas with limited public transit service, expand service hours, to new and vulnerable populations, for additional purposes (work, school, grocery, pharmacy, social)
- Connect transit to regional job centers and large medical facilities
- Expand transit for underserved populations
- Complete and expand projects that have a ‘no wrong door’ approach to accessing transit
- Advocate for agency funding and support transit champions
- Create partnerships with municipalities, community organizations, and leverage municipal investment

This Southern Dallas County transit study can build upon the comprehensive set of strategies outlined within the Access North Texas plan.

NCTCOG Regional Rail Plan – E-5 Midlothian Line Corridor Considerations, 2003

The Midlothian corridor was one of eight existing freight rail corridors in DFW that was being studied for the feasibility of implementing commuter rail, light rail, or other forms of transit service. The study conducted an infrastructure review and identified constraints and challenges related to implementing passenger rail service. The potential corridor would be approximately 19 miles and owned entirely by BNSF railroad. The average right-of-way is approximately 100 feet and utilized by typical four freight trains per day.

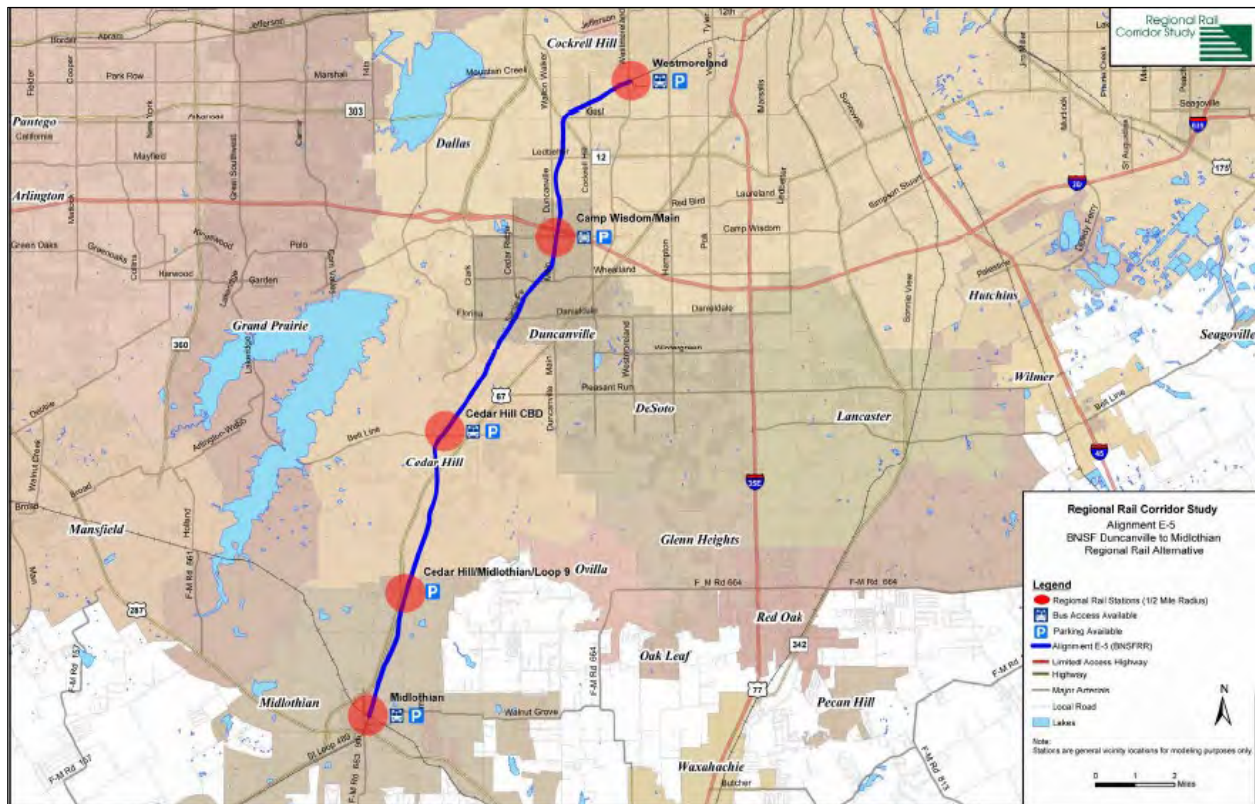
Constraints:

- Population density along the corridor is sparse compared to other rail corridors being studied
- Compatibility with the existing DART light rail line at Westmoreland would need to be considered, relative to the technology used
- The track would need to be upgraded. There is enough right-of-way for double track installation

Proposed Alternative for Regional Rail:

The regional rail would provide passenger service from Westmoreland Station to Midlothian. **Figure 7** shows the proposed station locations. Cedar Hill would have one station, near the intersection of Belt Line Road. Another station would be located in Midlothian, just south of the Cedar Hill border.

Figure 7: Proposed Regional Rail Corridor with Stations

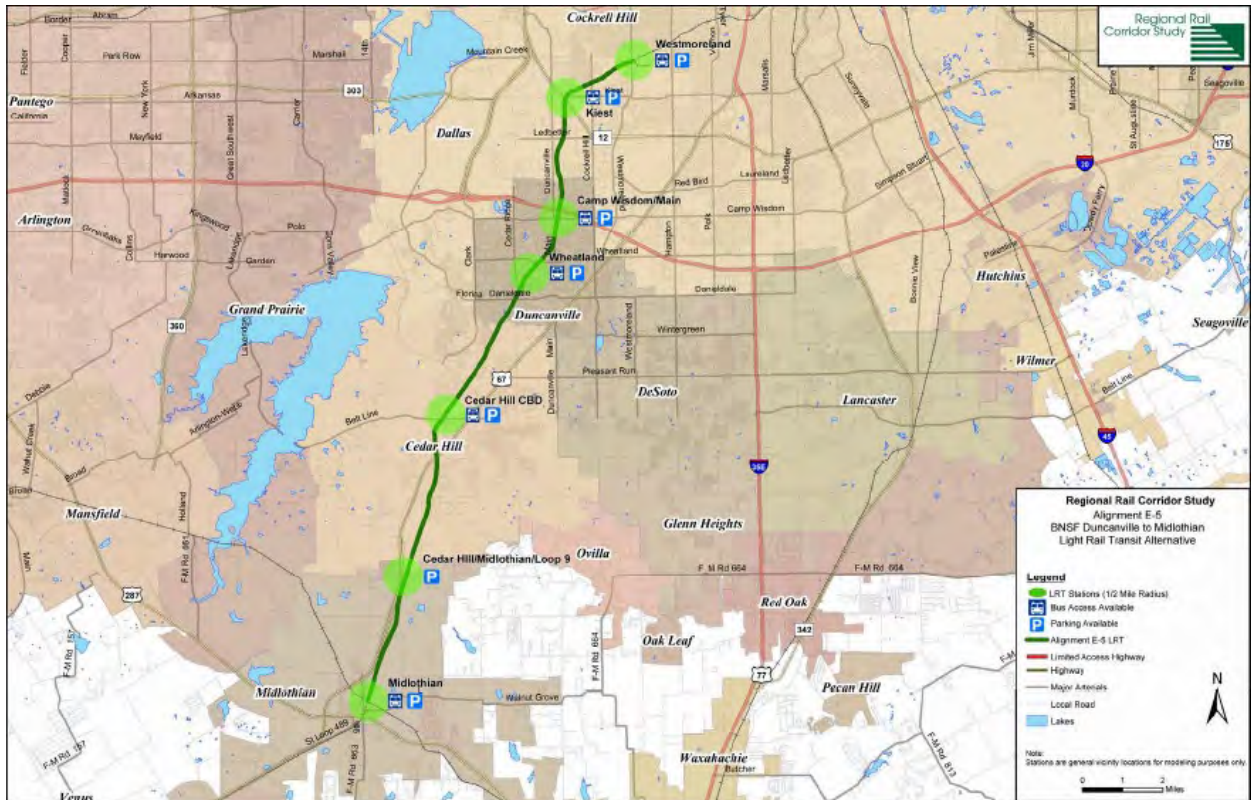


Source: NCTCOG Regional Rail Plan, 2003

Proposed Alternative for Light Rail:

The light rail alternative would provide light rail transit (LRT) service within the E-5 Corridor. An LRT line would be constructed along BNSF right-of-way, between Midlothian and Cockrell Hill. The new LRT line would begin at DART's existing LRT line at the Westmoreland Station in southwest Dallas. Six LRT passenger stations would be constructed along the Corridor between Westmoreland Station and Midlothian. The exact locations of stations would be determined in later phases of project development. **Figure 8** shows the corridor and proposed stations.

Figure 8: Proposed Light Rail Corridor with Stations

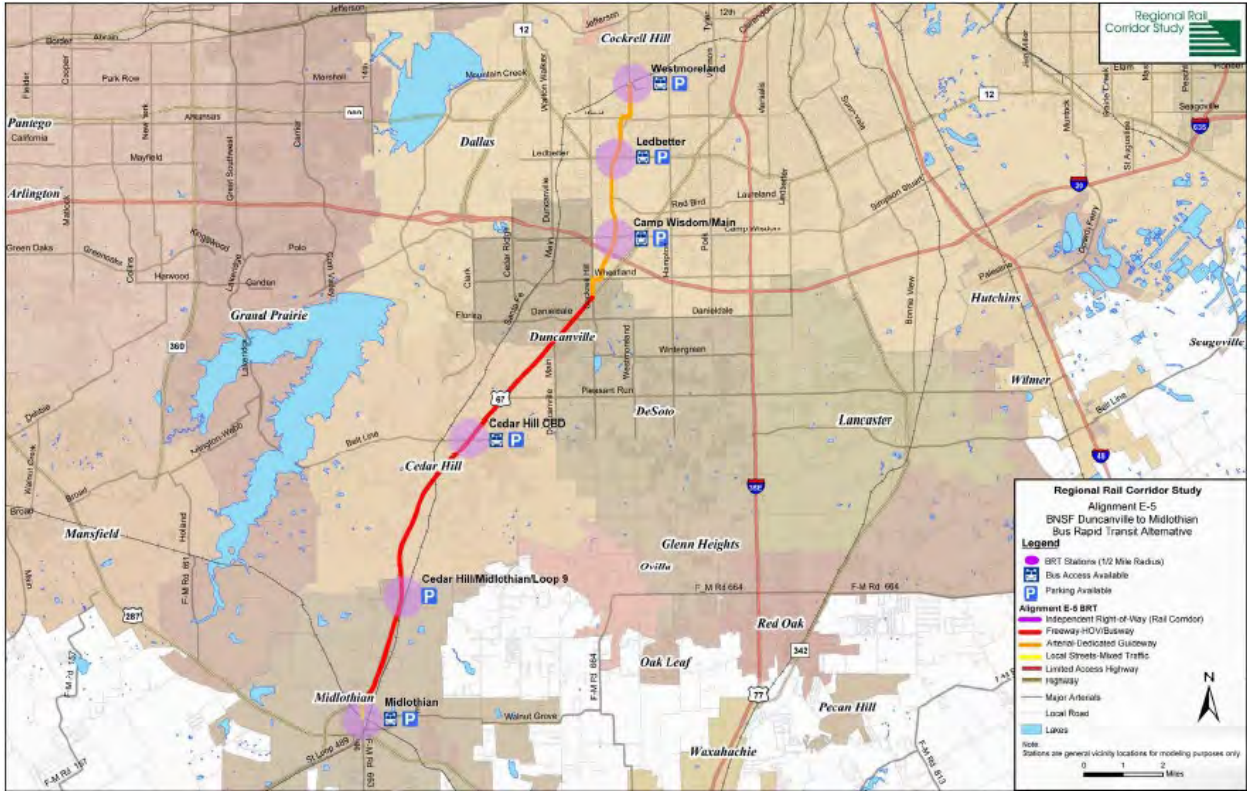


Source: NCTCOG Regional Rail Plan, 2003

Proposed Alternative for Bus Rapid Transit:

The Bus Rapid Transit (BRT) alternative would provide express bus service operating along a fixed guideway located within the right-of-way of U.S. Highway 67, Cockrell Hill Road, Wheatland Drive, and Westmoreland Avenue, approximately 18 miles between Midlothian and Dallas. The BRT service would operate within the roadway in mixed traffic approaching Midlothian and approaching the northern end of the line. **Figure 9** shows five potential BRT passenger stations would be constructed along the Corridor between the existing DART LRT Westmoreland Station and Midlothian. The exact locations of new stations would be determined in later phases of project development.

Figure 9: BRT Corridor and Stations



Source: NCTCOG Regional Rail Plan, 2003

1.2.9 Dallas Regional Chamber

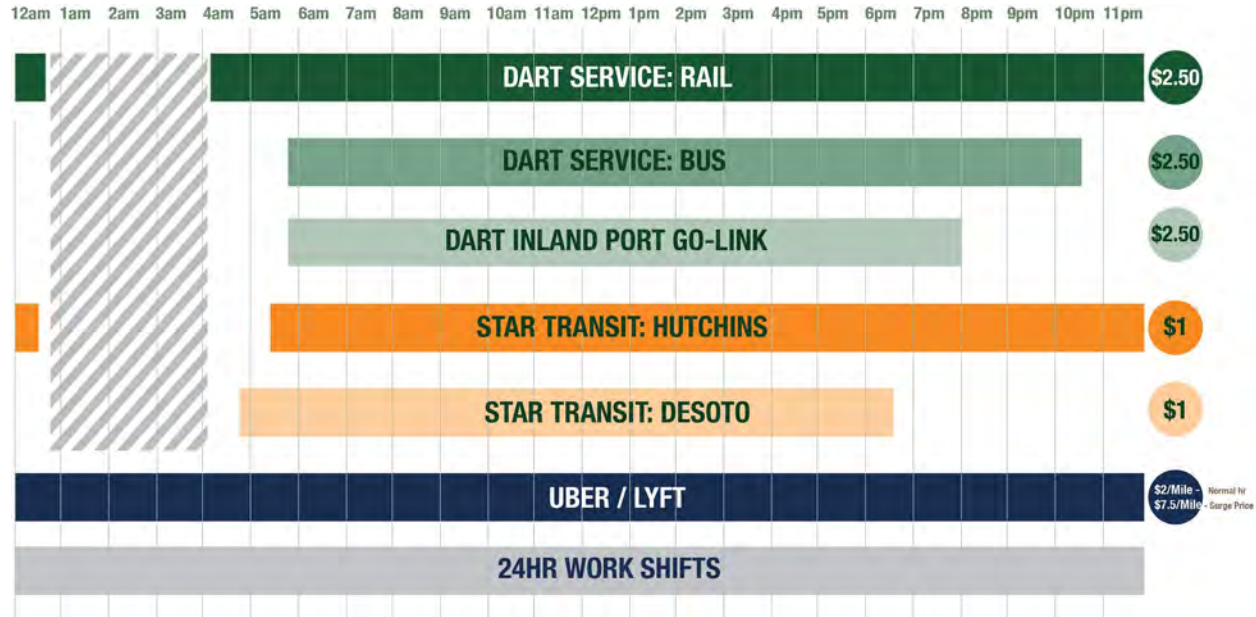
Southern Dallas Inland Port Employer and Employee Survey, 2019

In December 2019, the Dallas Regional Chamber commissioned a survey of employers and employees in the Southern Dallas Inland Port area in order to provide a better understanding of their use of the transportation services that currently exist and to inform future mobility planning. Key findings show that a majority of surveyed employers experience transportation-related issues with employee retention and that over half have had employees ask for help getting to and from work. Nearly 90% of the area’s employees travel more than 10 miles to work and 35% see lack of reliable transportation as a barrier to maintaining a job.

The survey overview describes the challenges that these transportation conditions pose to the Inland Port as it grows into a hub for employment and related activity. A key challenge includes providing transit service appropriate hours of operation. **Figure 10** shows the transit service gap identified through the survey. Due to the shift-based nature of work in the Inland Port, there is a noticeable gap in the evening periods for all area residents, especially DeSoto. Those

with the least gap in service are those with access to DART rail service, which only has a three-hour gap from approximately 1:00 am to 4:00 am. An exception, Uber or Lyft can operate 24 hours per day; however, the availability of on-demand mobility service may not be consistent in early morning hours, the cost of Uber/Lyft is much higher than transit and some workers may not feel comfortable riding alone during these hours.

Figure 10. Inland Port Area Transit Service Schedule Gaps



Source: Dallas Regional Chamber Employer and Employee Survey

Although STAR Transit currently serves a portion of the Inland Port study area with the 401 Hutchins Shuttle, there is still unmet demand for transit service. The area is significantly less dense than the city of Dallas, so alternatives such as expanded on-demand service, flex service, or microtransit may be considered to reach more of the area. Additionally, the Southern Dallas Inland Port Transportation Management Association (TMA) formed in 2018 and will connect various stakeholders to help market transportation options as they grow and change.

The survey report states that these findings will be used in the creation of a comprehensive strategic plan for the Inland Port area. Recommendations for this plan are shown in Table 2.

Table 2. Summary of Recommendations

Recommendations
Consider expanding STAR Transit service within Inland Port through demand response, flex service, or microtransit alternatives
Increase the available transportation options in the area to relieve traffic congestion
Encourage employers to provide incentives such as preferred parking for carpools and transit pass subsidies to reduce transportation demand
Continue outreach to employers in the Inland Port area as transportation conditions change

Source: Dallas Regional Chamber Employer and Employee Survey

1.2.10 Southern Dallas County Inland Port Transportation Management Association (TMA)

Southern Dallas County Microtransit Pilot Service Plan, 2020

The Transportation Management Association (TMA) is a 501-C6 membership organization that was formed in 2019 to collectively address transportation issues within the Southern Dallas County Inland Port. The primary purpose of the TMA is to address local transportation issues such as:

- Advocating for transportation modes that support the Inland Port
- Shuttle service contracts
- Sponsorship of Vanpool or other rideshare matching services
- Transit pass subsidies
- Guaranteed ride home programs
- Providing member newsletters and educational forums

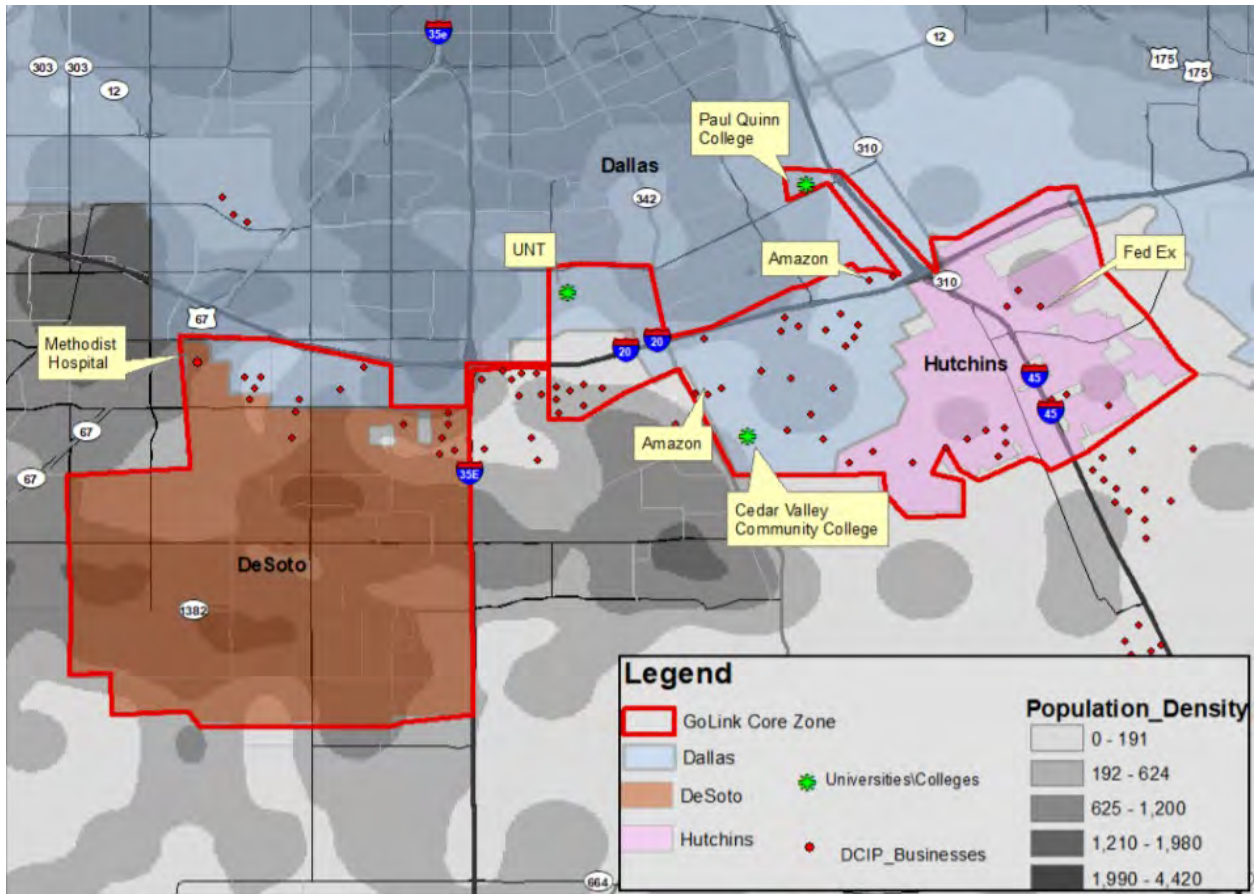
The TMA is structured around five classes of annual membership dues based on the members' annual budget, number of jobs or students, or the type of business. There are currently 10 board members and one interim Executive Director.

In May 2020, the TMA adopted the following services as the plan for 24-hour transportation coverage of the Inland Port:

- Expanded GoLink microtransit services supported by Uber Pool operating from 5:00 am to 8:00 pm. The map below shows the current Inland Port microtransit zone and expansion.
- Inland Port Rides rider subsidy program available for trips to and from member employers between 8:00 pm and 5:00 am, when microtransit would not be in operation.

Figure 11 outlines the area designated for the microtransit zone.

Figure 11. Areas Identified for Potential Microtransit Service

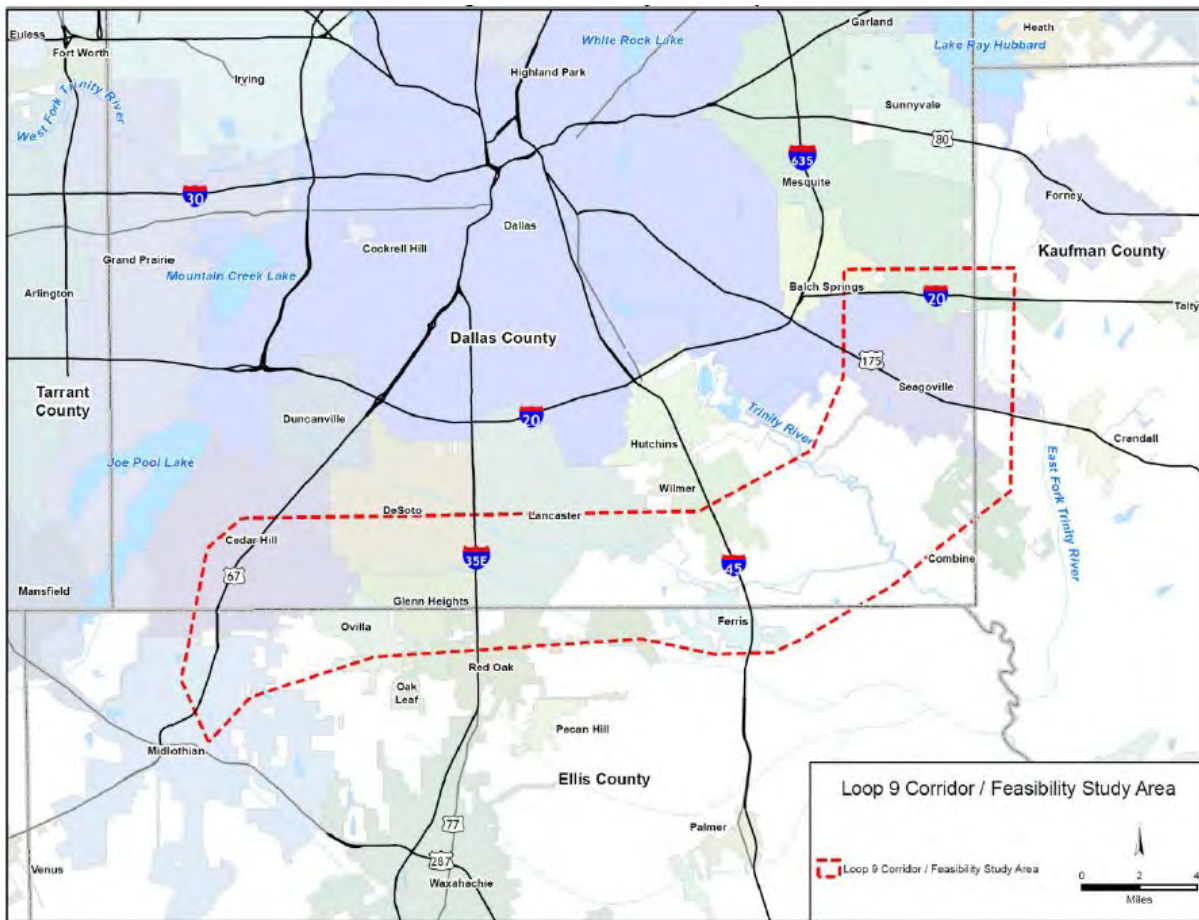


Source: Southern Dallas County Microtransit Pilot Service Plan

**1.2.11 Texas Department of Transportation
Loop 9 Southeast Corridor/Feasibility Study, 2014**

The Loop 9 Southeast Corridor/Feasibility Study reevaluates the concept of a roadway facility connecting US Highway 67 to I-20 within Dallas, Ellis and Kaufman Counties. The study reassessed infrastructure potential benefits and impacts and developed a program of individual projects to advance into the National Environmental Policy Act process based on mobility needs, engineering and environmental data, and coordination with local and state agencies. The proposed roadway would intersect cities within the study area including Cedar Hill, DeSoto, Lancaster, and the Southern Dallas County Inland Port area, as shown in Figure 12.

Figure 12: Loop 9 alternatives



Source: Loop 9 Southeast Corridor/Feasibility Study

Population forecasts in the area, according to the document, were anticipated to increase nearly 45 percent and employment 43 percent from the year 2000 to 2035. Existing transportation infrastructure was anticipated to be inadequate for projected growth. Additionally, the area lacks sufficient connectivity and has limited east-west corridors. Loop 9 Southeast would provide additional capacity and regional connectivity to land within the Southern Dallas County Inland Port.

1.3 Demographic and Land Use Assessment

The demographics and land use assessment provides detailed insight into the study area cities' demographic makeup, land use patterns, commuting patterns, and gives insight into potential transit needs for the study area. The assessment was conducted using data from the U.S. Census Bureau (USCB) American Community Survey (ACS) 2018 5-year estimates. Additional data has been sourced from NCTCOG related to employers, land use, and mobility.

Information gathered from the Document Review was also utilized for a qualitative assessment of potential need in the study area, particularly the Southern Dallas County Inland Port area. The following subsections provide assessment and key takeaways for the demographic topics studied.

1.3.1 Population Characteristics

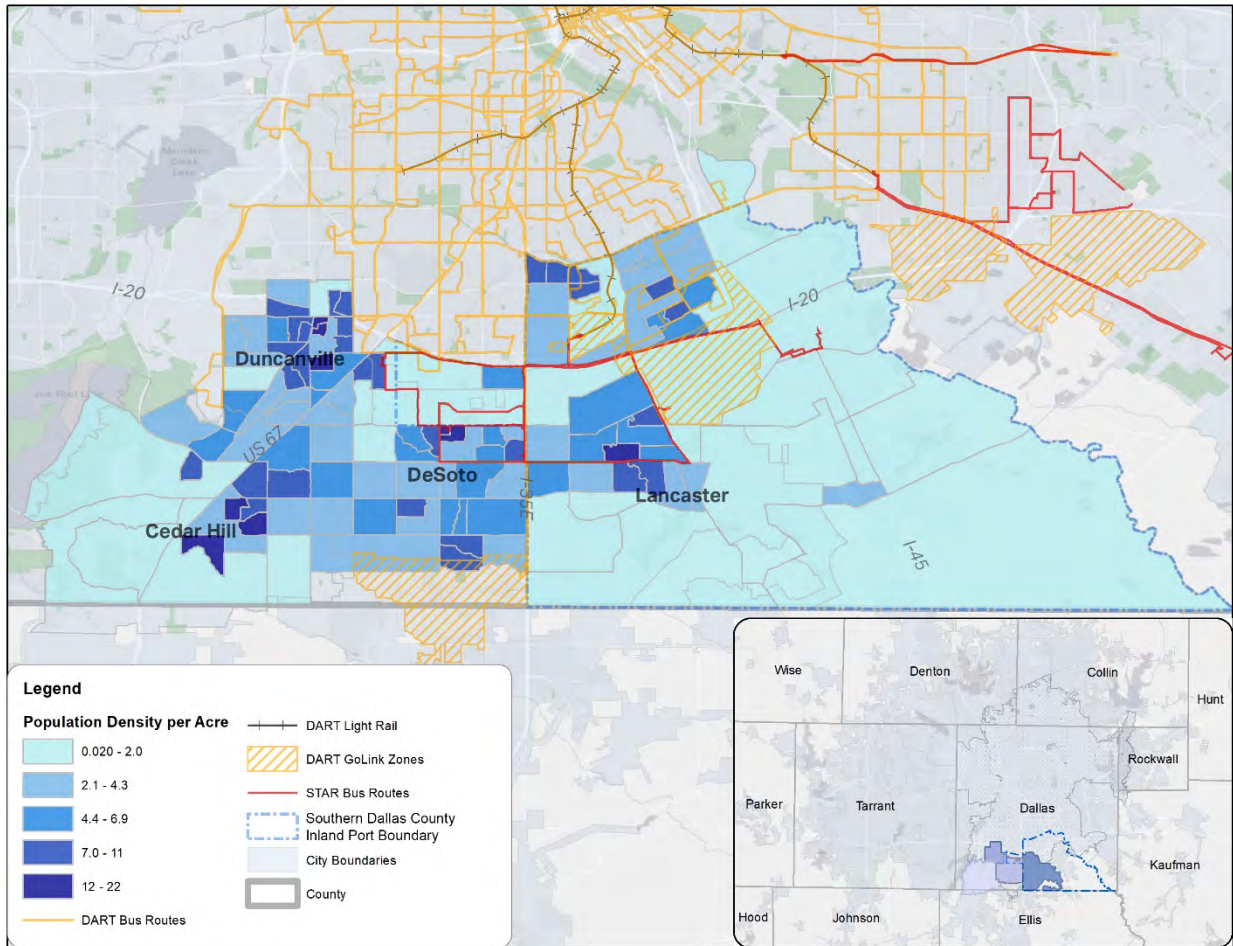
This section provides information related to demographic characteristics of the study area, which include population density, employment types and density, transit-dependency, and commuting trends. These demographic categories are important to our study to identify potential higher density populations and jobs which could support various types of transit modes. Transit dependency allows us to locate the populations who may have the most difficulty travelling around the study area, or around the DFW Metroplex. Commuting trends illustrate potential corridors of activity which could be used to support different types of transit.

Population Density

Population data was mapped geographically at a block groups level to identify density per acre. **Figure 13** displays darker shaded regions where a higher density was calculated.

The highest density areas range from 12 to 22 persons per acre and are near geographic centers of each city in the study area. These locations tend to align with major transportation infrastructure such as I-35E in DeSoto and Lancaster, and US 67 in Cedar Hill and Duncanville. Notably, the inland port area has the lowest population density at two or less persons per acre for large tracts of land.

Figure 13. Study Area Population Density



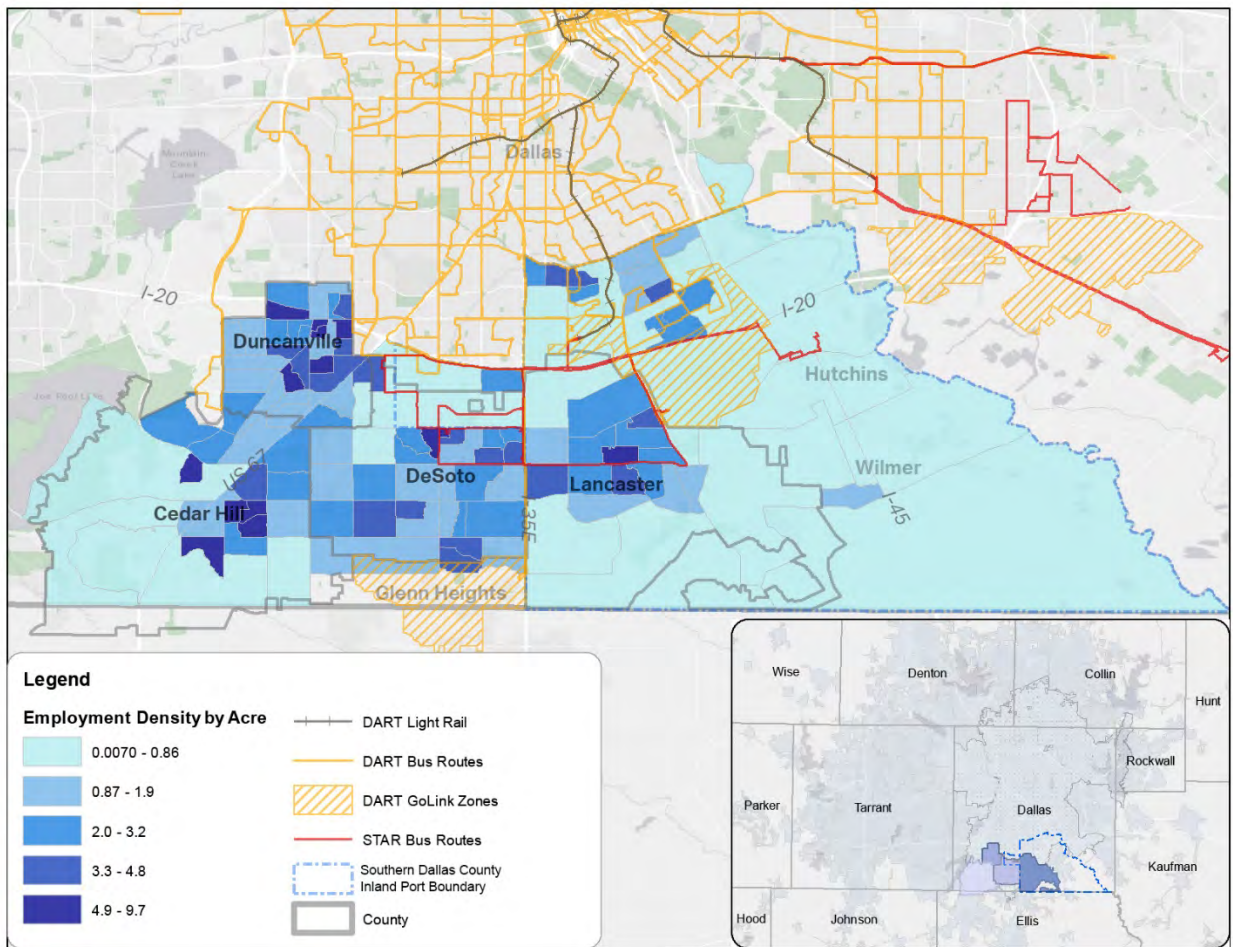
Source: USCB ACS 2018 5-year estimates, NCTCOG, DART, STAR

Employment Density

Transit often serves as a primary transportation option for commuting to work. The demographics analysis has shown places of high population density and propensity for transit need. **Figure 14** shows employment densities within the study area using employment status information from the USCB.

Highest employment block groups are shown in similar areas to locations of high population density. Duncanville, DeSoto, and Lancaster have pockets of high employment density areas adjacent to existing transit routes. While there is no transit service in Cedar Hill, the city has several areas of higher employment density. As population density is generally low in the Southern Dallas County Inland Port, employment densities are low as well. However, as shown in **Figure 17**, there are many large employers spread out throughout the area. Physical size of industrial use footprints for warehousing and manufacturing structures combined with modern business practices and technologies (i.e. many distribution warehouses operate with fewer staff, as further discussed in the Comprehensive Goods Movement Needs Assessment) contribute to lower overall densities.

Figure 14. Study Area Employment Density



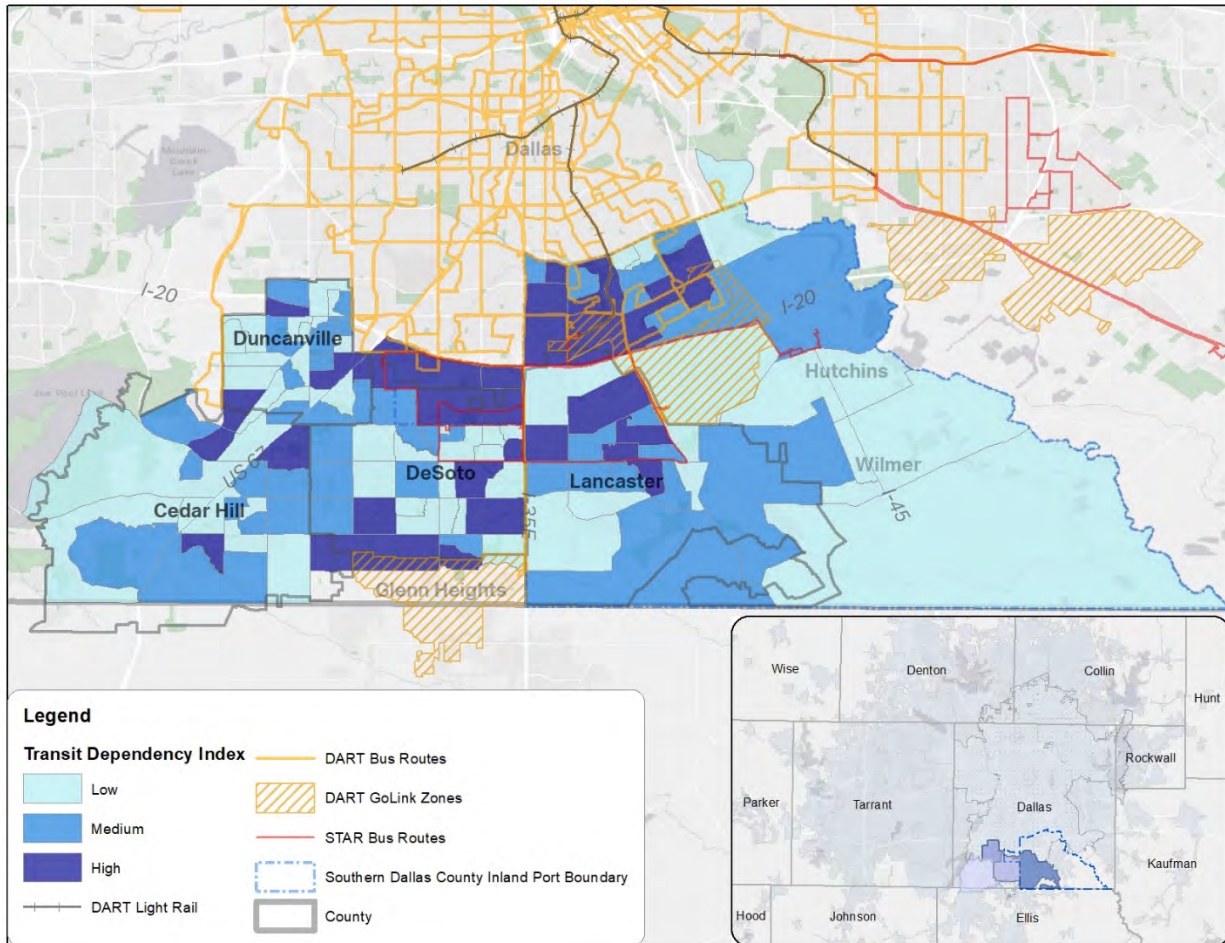
Source: USCB ACS 2018 5- year estimates, NCTCOG, DART, STAR

Transit Dependency Index

The transit dependency index map is a composite of five datasets from the U.S. Census Bureau including: Households without access to a vehicle, persons with disabilities, low-income, youth population (under 18 years of age), and elderly populations (over 65 years of age). Information is overlaid and mapped at a block group level and then scored to identify areas where transit service and access may be an individual's primary form of transportation.

Figure 15 displays the results of the overlaid information

Figure 15. Transit Dependency Index

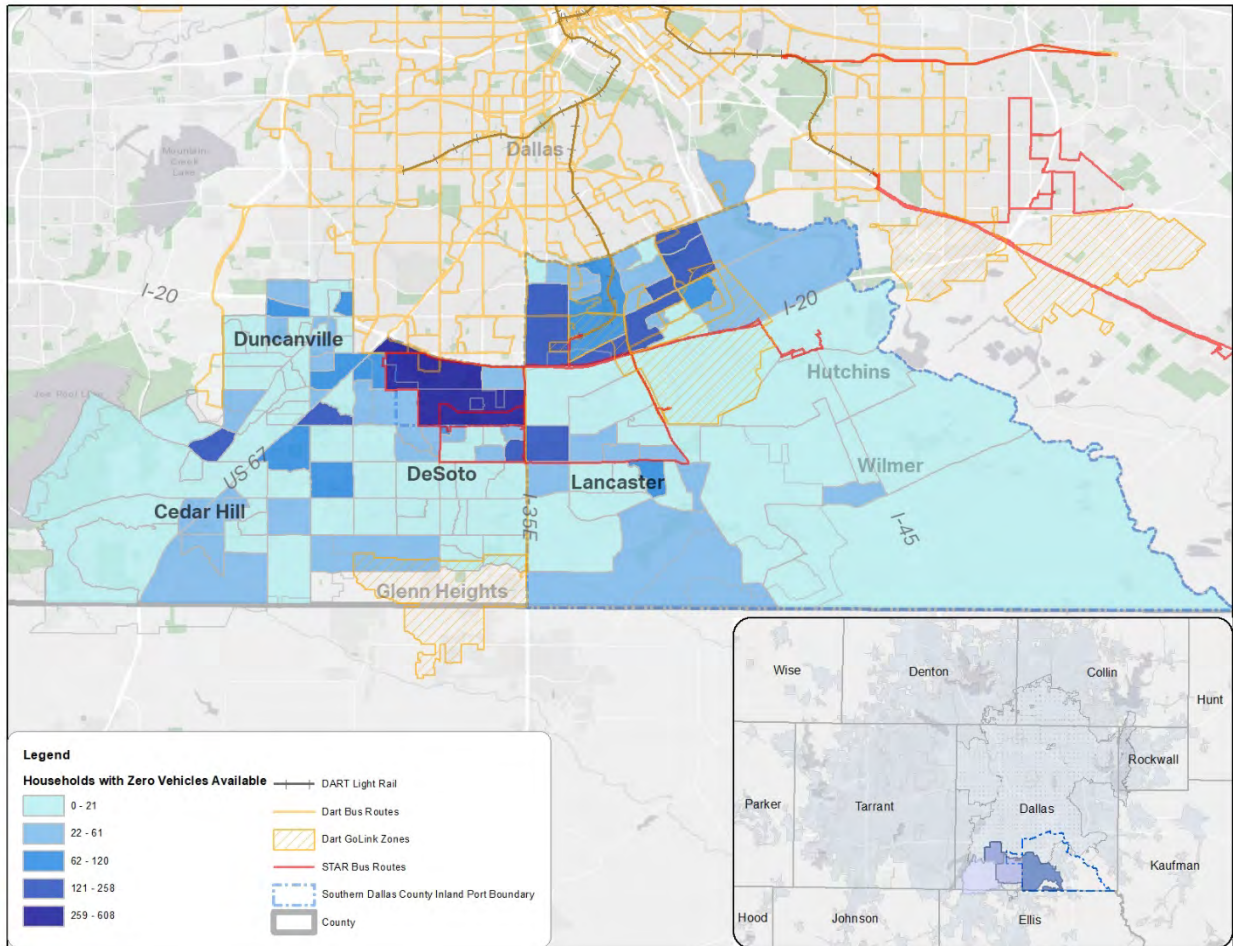


Source: USCB ACS 2018 5- year estimates, NCTCOG, DART, STAR

From low to high, the index displays the presence of populations with a higher propensity for transit need. The highest needs appear in the northern sections of DeSoto and in parts of south Dallas between IH-35E and IH-45, north of the City of Lancaster. Existing transit service from DART and STAR are provided or adjacent to some of these areas of need. However, in the southern areas of the study area and in the cities of Cedar Hill and Duncanville there is no available transit service.

Households with zero vehicles available can be an indication of the potential need for transit services, as shown in Figure 16.

Figure 16. Households with Zero Vehicle Access within the Study Area



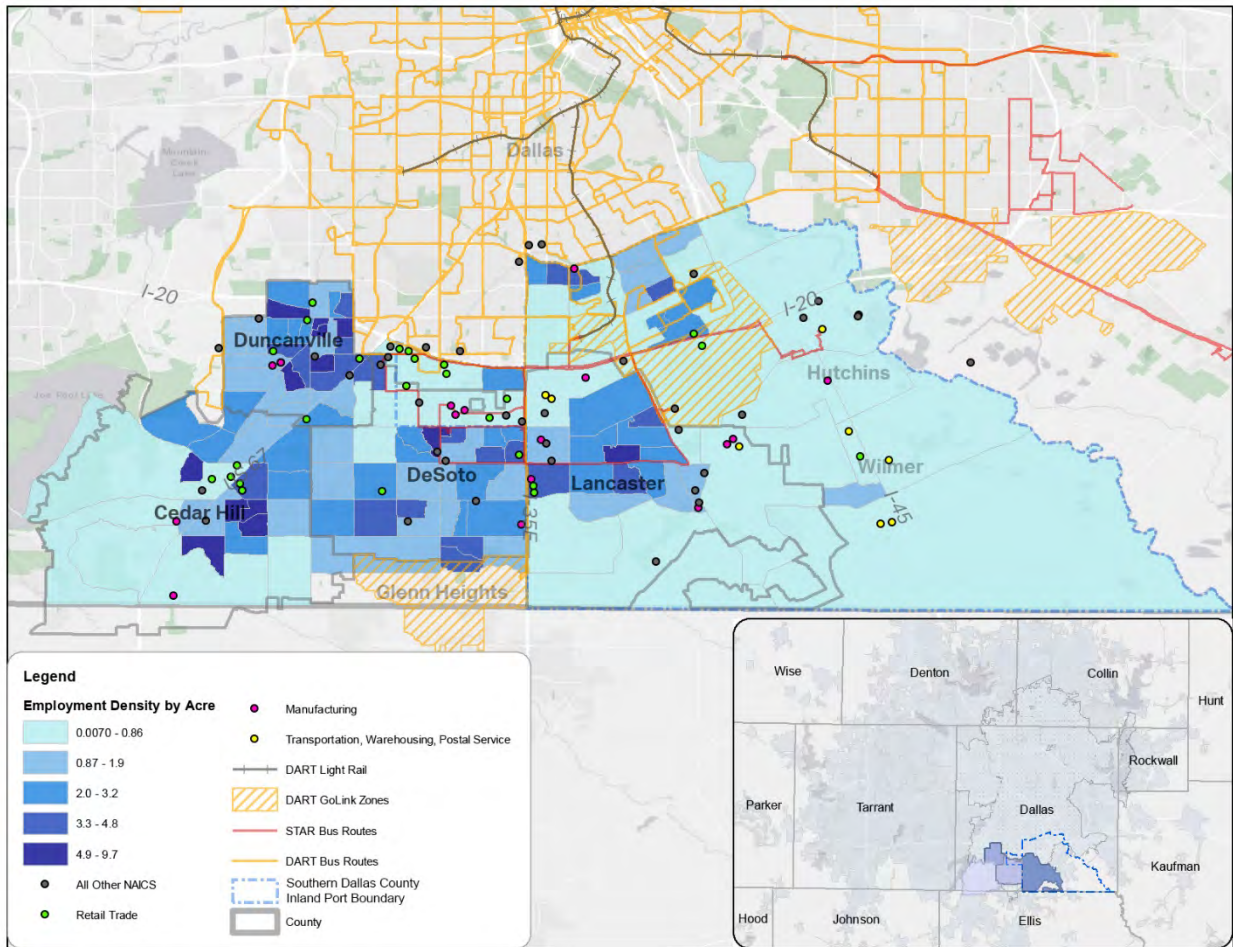
Source: USCB ACS 2018 5- year estimates, NCTCOG, DART, STAR

1.3.2 Employer Characteristics

This section utilizes information from NCTOG regarding employers within the study area. Analyzed information assessed potential number of employees and North American Industry Classification System (NAICS) descriptions to gain insight into large employers in the area, as well as, locations where employers may be clustered. This information is useful in determining potential transit recommendations and developing scenarios for Task 5.

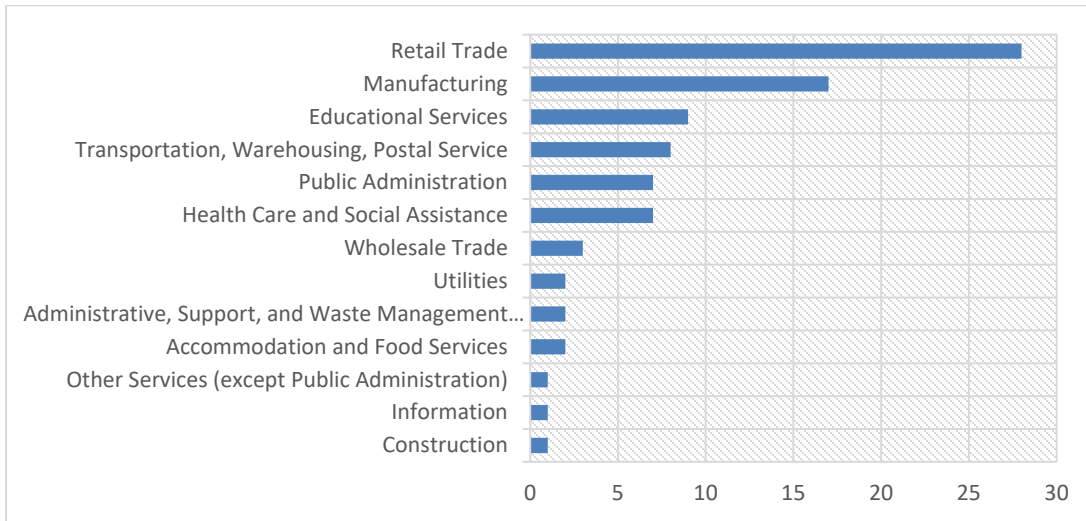
Figure 17 shows a sampling of employers in the study area with greater than 100 employees. While this dataset is not a complete accounting of employers within the study area it provides insight into locations of large employers and their relative location to existing transit services. A total of 88 employers are displayed in the map, Table 3 provides a breakdown of their industry category by NAICS.

Figure 17. Study Area Sampling of Employers



Source: NCTCOG Employers 2015, USCB ACS 5-year 2018

Table 3. Sampling of Study Area Employers by NAICS



Source: NCTCOG, 2015 Employer Shapefile, 2020

Retail trade makes up approximately 32 percent of the sampled employers in the study area, representing over 7,800 employees. Companies classified as manufacturing represent 19 percent of industries surveyed. Transportation, warehousing, and postal service industries are often located within the Inland Port area. Table 4 examines the sampled employers identified in the previous map and table and displays the most common employer by NAICS in each city.

Table 4. Most Common NAICS by City

City	NAICS Description	Approximate # of Employers*
Cedar Hill	Retail Trade	5
Dallas	Retail Trade	10
DeSoto	Retail Trade	5
Duncanville	Retail Trade	5
Hutchins	Administrative, Support, and Waste Management services	2
Lancaster	Manufacturing	6
Wilmer	Transportation, Warehousing, Postal Service	4

*This table represents a sample of employers with over 100 employees. The table should not be considered a complete accounting of employers in the study area.

Source: NCTCOG, 2015 Employer Shapefile, 2020

1.3.3 Commuting and Travel Characteristics within the Study Area

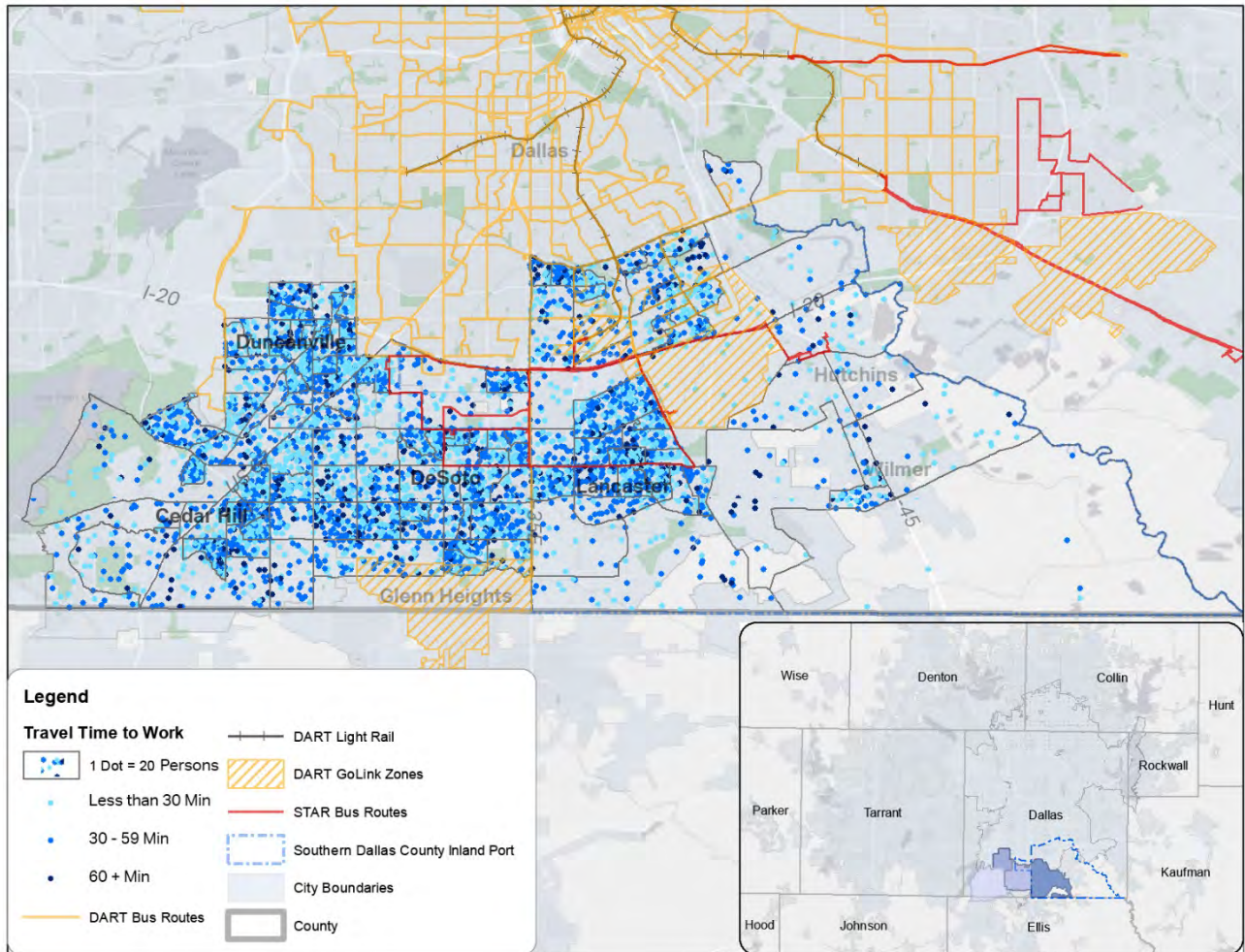
This section provides an analysis of travel characteristics and travel patterns within the study area. The analysis looks at commute times identified from USCB and travel patterns using location based data sources in comparison to modeled travel patterns from the NCTCOG Travel Demand Model (TDM). The location-based dataset is generalized information at a block group level that calculates origin and destination trips by time of day and purpose. The analysis compares this year 2020 dataset to the TDM modeled trips for the year 2045. The TDM uses an array of data

sources including employment and population density to model forecast trips and identifies locations where travel may be higher or lower.

Commute Times in the Study Area

Figure 18 shows travel times to work within the study area. Each dot is a generalized representation of 20 persons or respondents in census data spatially mapped within block groups. The map shows where people generally live that have long commute times as shown by blue and dark blue dots. Areas with more dark blue dots are generally located in the center of the study area cities, similar to the locations of high population and employment density.

Figure 18. Travel Time by Commute to Work



Source: USCB ACS 2018 5-Year Estimates

Notably, block groups in the southeastern portion of the study area, within the Inland Port area, have much fewer dots. This corresponds with a lower population density in these locations. In places with lower population density the map shows that persons often have commute times greater than 30 minutes and many times greater than 60 minutes. In locations with greater population density, generally within the study area cities, there is a mix of commutes less than 30 minutes and greater than 30 minutes.

High commute times could suggest that persons who may live in the study area are travelling to other parts of the region for work. Conversely, lower commute times could indicate interlocal travel within the study area or nearby.

Travel Patterns and Travel Demand Model Assessment

This section further identifies locations within the study area where travel patterns or demand is high or low to determine the need for potential transit recommendations that will be developed in a later part of this study. The section compares location-based data collected from 2019 to modeled travel patterns in 2045 beginning with the large scale of the entire study area and narrowing down to each individual city. The location-based data is calculated from anonymous location-based services data typically sourced and anonymized from mobile devices. The location-based services data uses GPS signals to identify trip origin and destination. The information is then anonymized and aggregated at a U.S. Census block group level to perform analysis. Location-based data can be used to discern potential origin and destination frequency, general time of day (i.e. A.M. Peak or P.M. Peak), and potential trip purpose. Comparatively, Travel Demand Model (TDM) data utilizes historical trends in travel patterns based on Traffic Survey Zones (TSZs) to forecast travel patterns in the future. For this study, the TDM model baseline data started with year 2017 and forecasted travel patterns for the year 2045 and analyzed as trips occurring weekdays, including Saturday and Sunday.

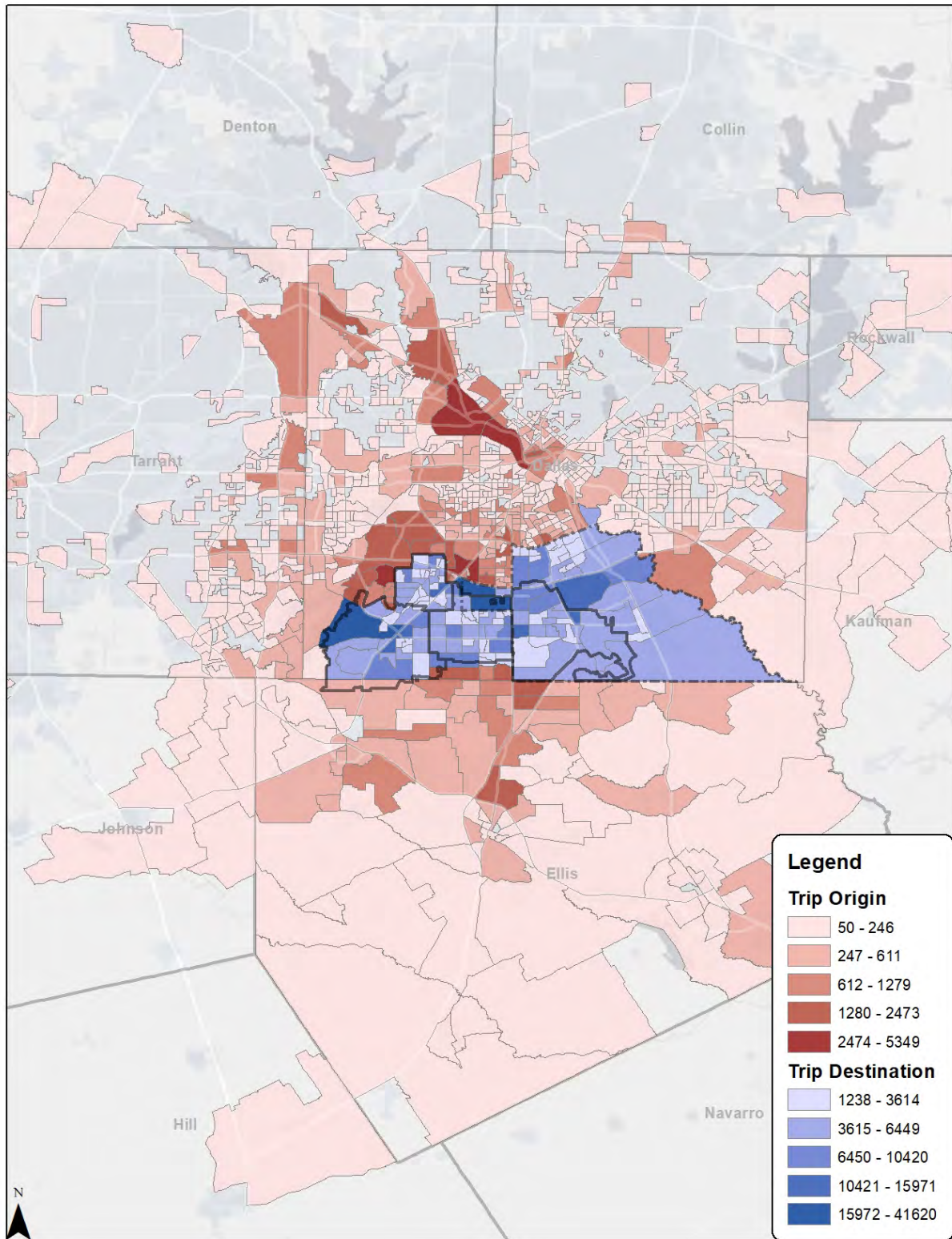
Using both sets of travel pattern information provides valuable insight into how people use the transportation network in the region and in the study area which provides a lens in which to plan for potential public transit solutions.

Southern Dallas County Study Area

Beginning with the location based dataset for the Southern Dallas County area, **Figures 19 and 20** show weekday trip patterns with origins beginning both from in and outside of the study area, respectively. Data used to create these maps estimates weekday travel based on trends in data collected in 2019. Notably, trip origins begin and end in many locations in adjacent counties. As shown in **Figure 19**, high trip origins were seen adjacent to the study area near Duncanville and DeSoto, and in the north Dallas, City of Irving area. Other large trip originators are DFW International Airport and locations in northern Ellis County.

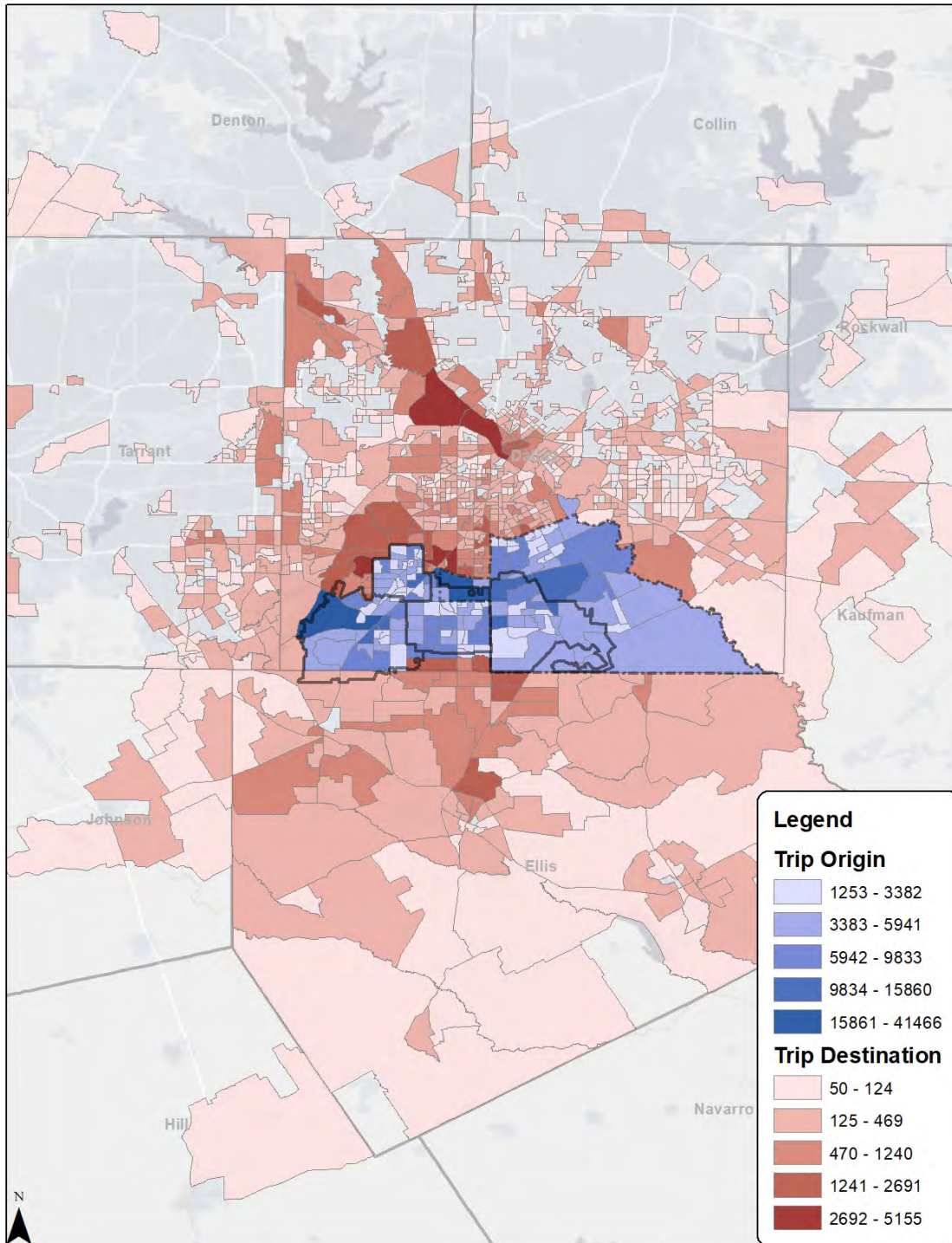
Figure 20 shows trips originating in the study area block groups with destinations outside of the study area. This map is very similar to Figure 19, with notably more trips ending in northern Ellis County. Potential return trips occur in north Dallas area as well as just north of the study area.

Figure 19. Travel Patterns for Weekday Trips with Origins Outside the Study Area



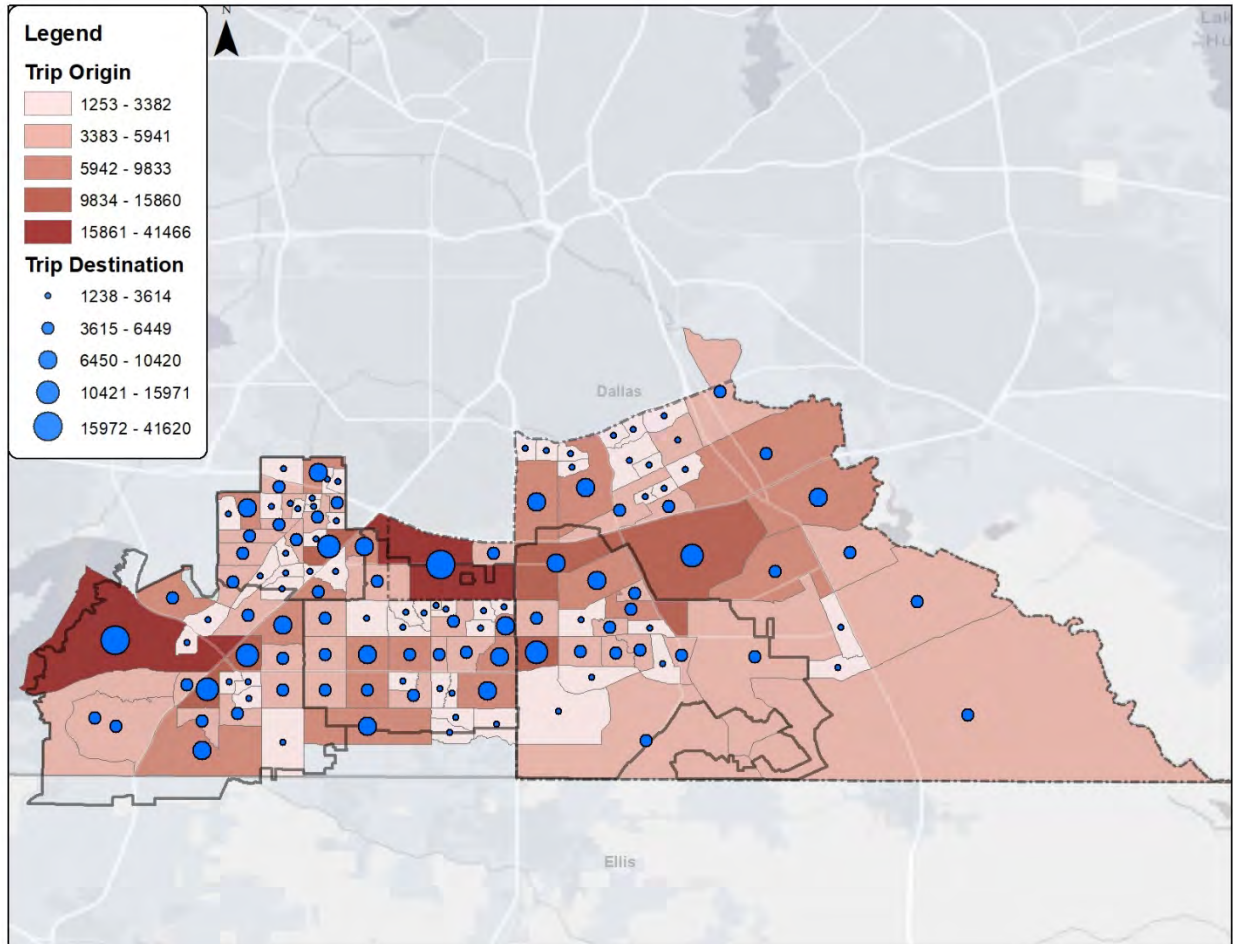
Source: Cambridge Systematics LOCUS Data, 2020

Figure 20. Travel Patterns for Weekday Trips with Origins Within the Study Area



Source: Cambridge Systematics LOCUS Data, 2020

Figure 21. Travel Patterns for Weekday Trips with Origins and Destinations in the Study Area

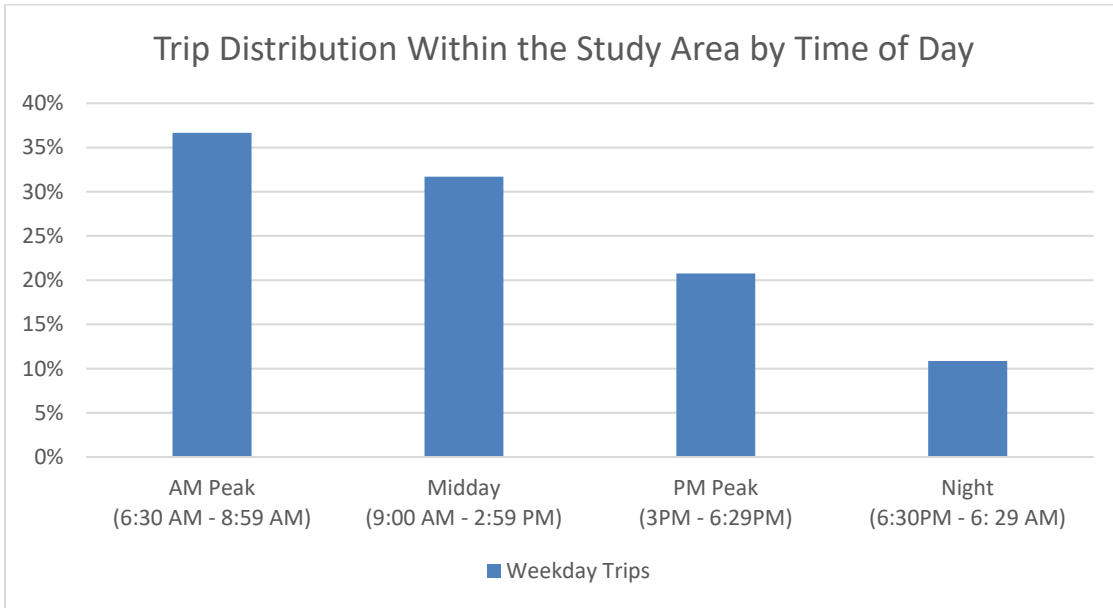


Source: Cambridge Systematics LOCUS Data, 2020

Travel patterns observed in **Figure 21** occur entirely within the study area. In most cases, locations with high trip origins are also locations with high destinations. Notably fewer trips travel to the southeastern portions of the study area. In section 1.3, Demographic and Land Use Assessment, portions of the study area had low population density but also large employers. Overall, high numbers of origins and destinations occur in Cedar Hill, DeSoto, along the I-35E corridor and within the Inland Port Area and nearby Cedar Valley College, which is served by DART bus route 555 and links to the DART Blue Line Light Rail Station

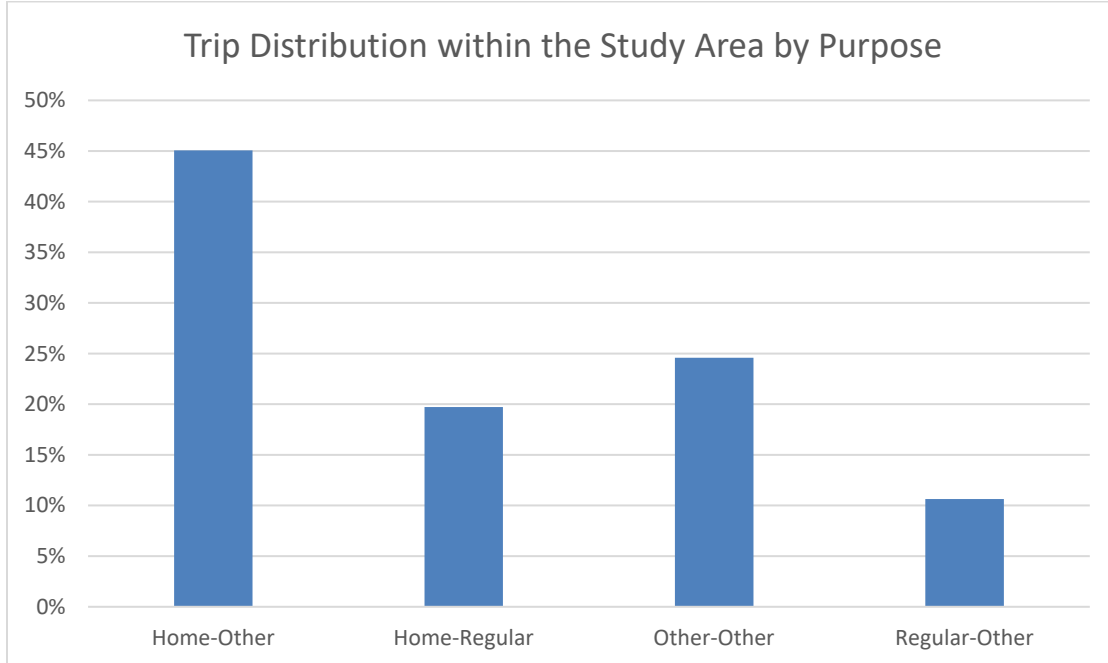
Tables 5 and 6 show trip distribution by time of day and purpose within the study area identified in **Figure 21**.

Table 5. Weekday Trip Distribution Within the Study Area by Time of Day



Source: Cambridge Systematics LOCUS Data, 2020

Table 6. Weekday Trip Distribution Within the Study Area by Purpose



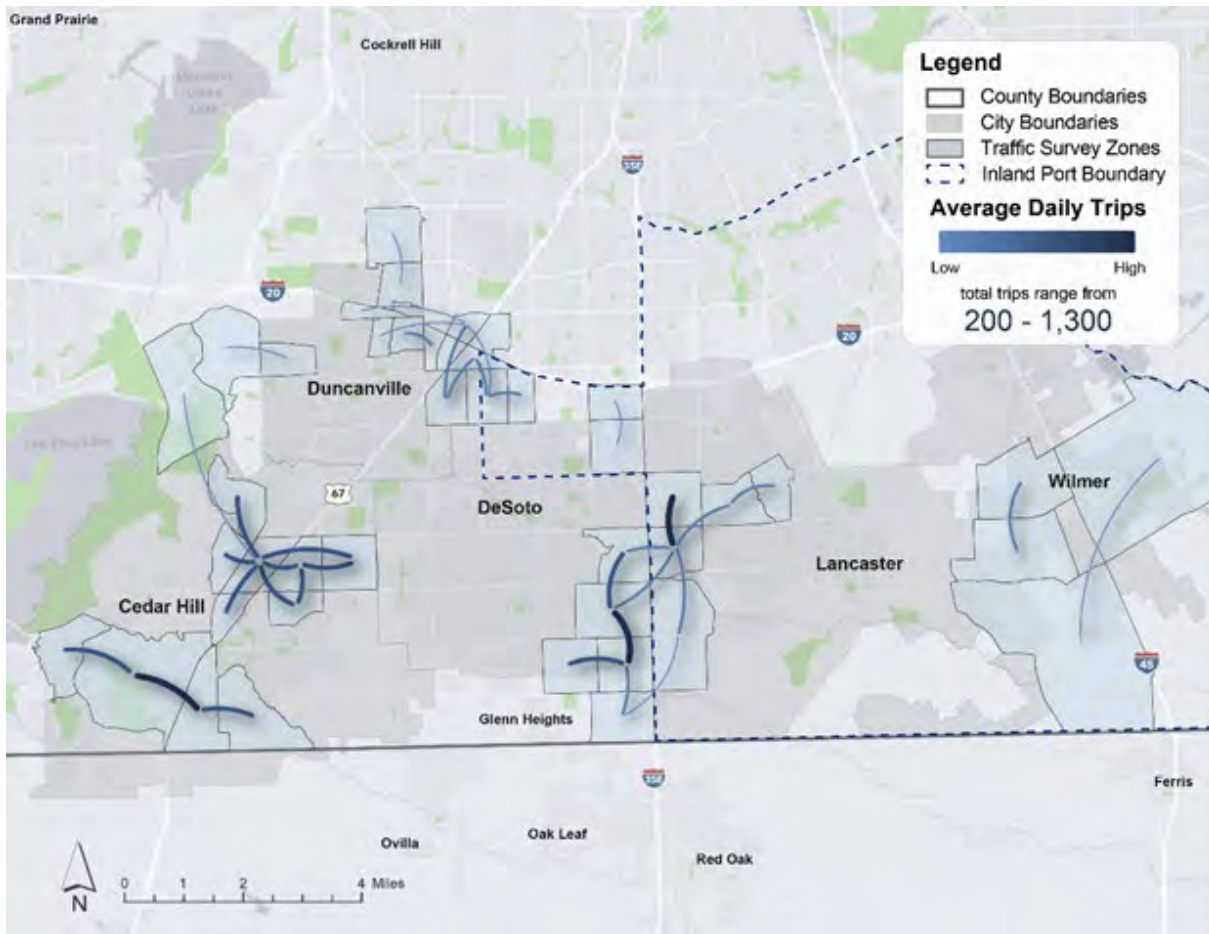
Source: Cambridge Systematics LOCUS Data, 2020

Over 35 percent of trips occur during AM Peak travel times. Overall, nearly 70 percent of trips occur prior to PM Peak travel. Approximately 45 percent of trips, as shown in Table 6, are categorized as 'Home-Other' meaning they are not

a typical commute from home to work or school. Commute to work or school would be categorized as “Home-Regular” and account for approximately 20 percent of trips in the study area. The “Other-Other” category accounts for the 2nd most trips; this designation indicates potential shopping trips to locations such as malls and grocery stores.

When comparing the Year 2019 travel patterns to the forecasted trips from the NCTCOG TDM, shown in **Figure 22**, similar trends are identified. High level of trips occur in the Cedar Hill and DeSoto areas along major arterials of US 67 and I-35E. The I-35E corridor along the DeSoto and Lancaster municipal border is a highly concentrated commercial area that generates a significant number of trips. Additionally, frequent travel to and from northeast Duncanville is clustered around a mall, shopping center, and medical center which are just outside the city. Several outlying desire lines, such as those in Wilmer, southwest Cedar Hill, and north of DeSoto, connect with commercial uses such as shipping and distribution centers, warehouses, and the Union Pacific freight terminal to nearby lower-density residential communities.

Figure 22. Study Area Trip Patterns Year 2045, All Trips

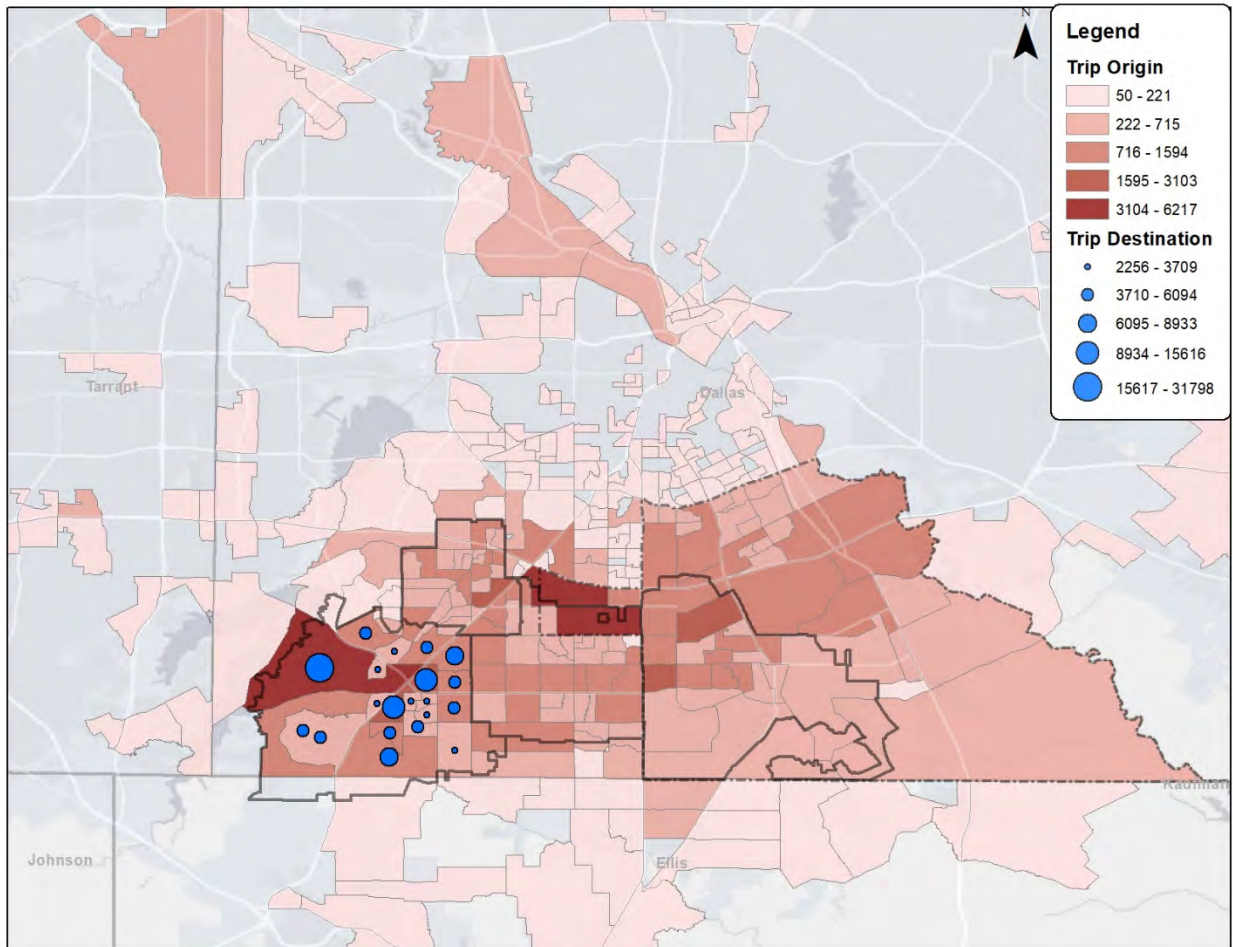


Source: NCTCOG, 2020

City of Cedar Hill

The City of Cedar Hill displays highest origin and destination travel within or nearby its city boundaries. **Figure 23** displays travel patterns for trips with destinations within the approximate Cedar Hill boundaries. Notably, a moderate and high number of trips appear to originate within or adjacent to the city limits. Additionally, a high number of trips originate adjacent to US 67 and I-20 in northern DeSoto. Trips originate from as far as DFW International Airport and Tarrant County. Fewer trips originate from Ellis County and eastern Dallas County. East-west travel is noticeable from areas in the northeast portion of the study area near UNT Dallas, Cedar Valley College, northern portions of the Inland Port Area, Lancaster, and DeSoto. Overall travel seems to follow major thoroughfares including US 67, I-20, and Belt Line Road.

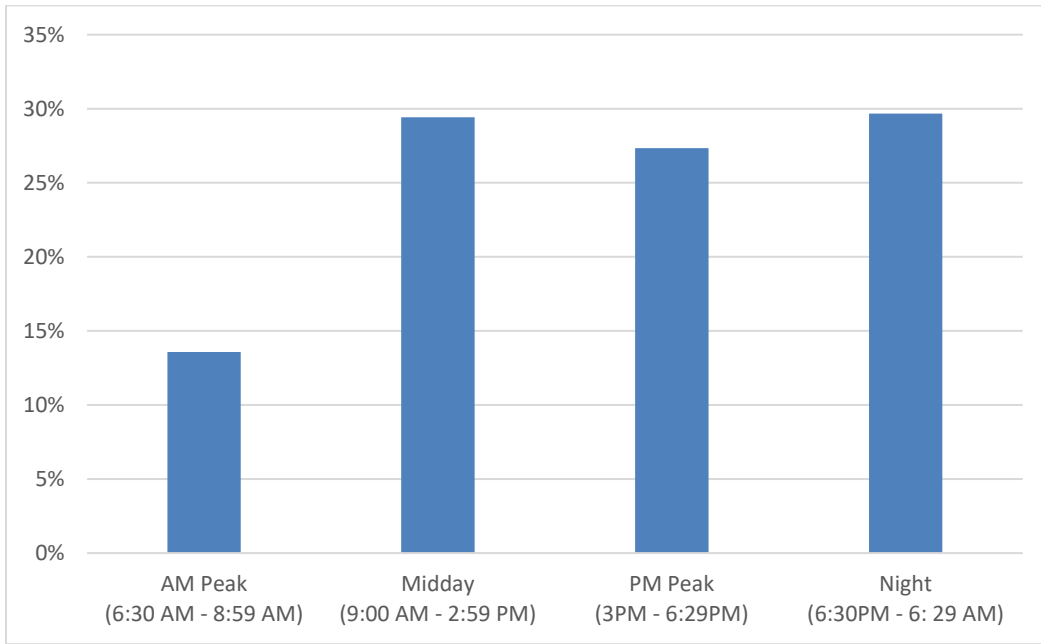
Figure 23. Cedar Hill Area Travel Patterns Year 2019, Weekday Trips



Source: Cambridge Systematics LOCUS Data, 2020

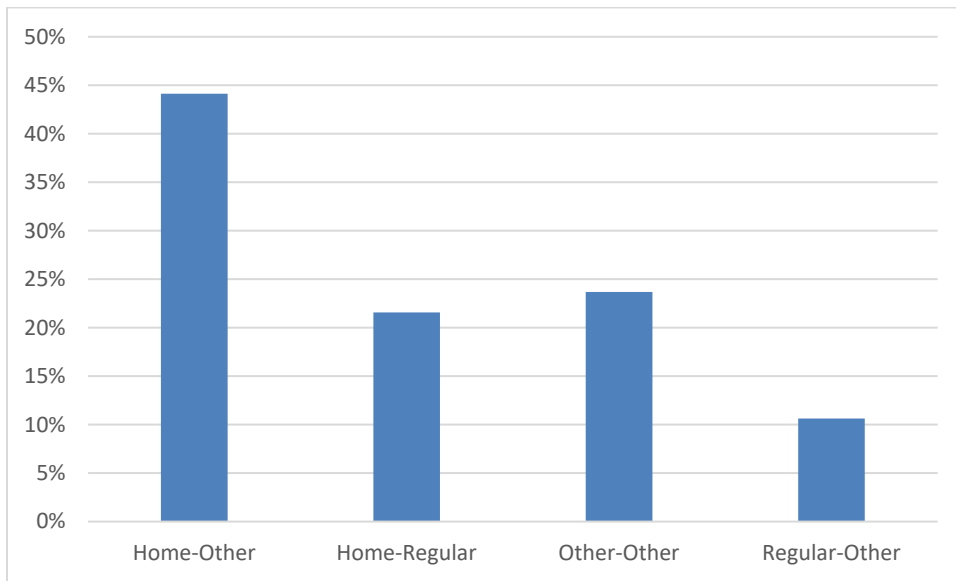
Tables 7 and 8 provide additional detail regarding trip time of day and purpose in the Cedar Hill area.

Table 7. Weekday Trip Distribution in Cedar Hill Area by Time of Day



Source: Cambridge Systematics LOCUS Data, 2020i keep

Table 8. Weekday Trip Distribution in Cedar Hill Area by Purpose



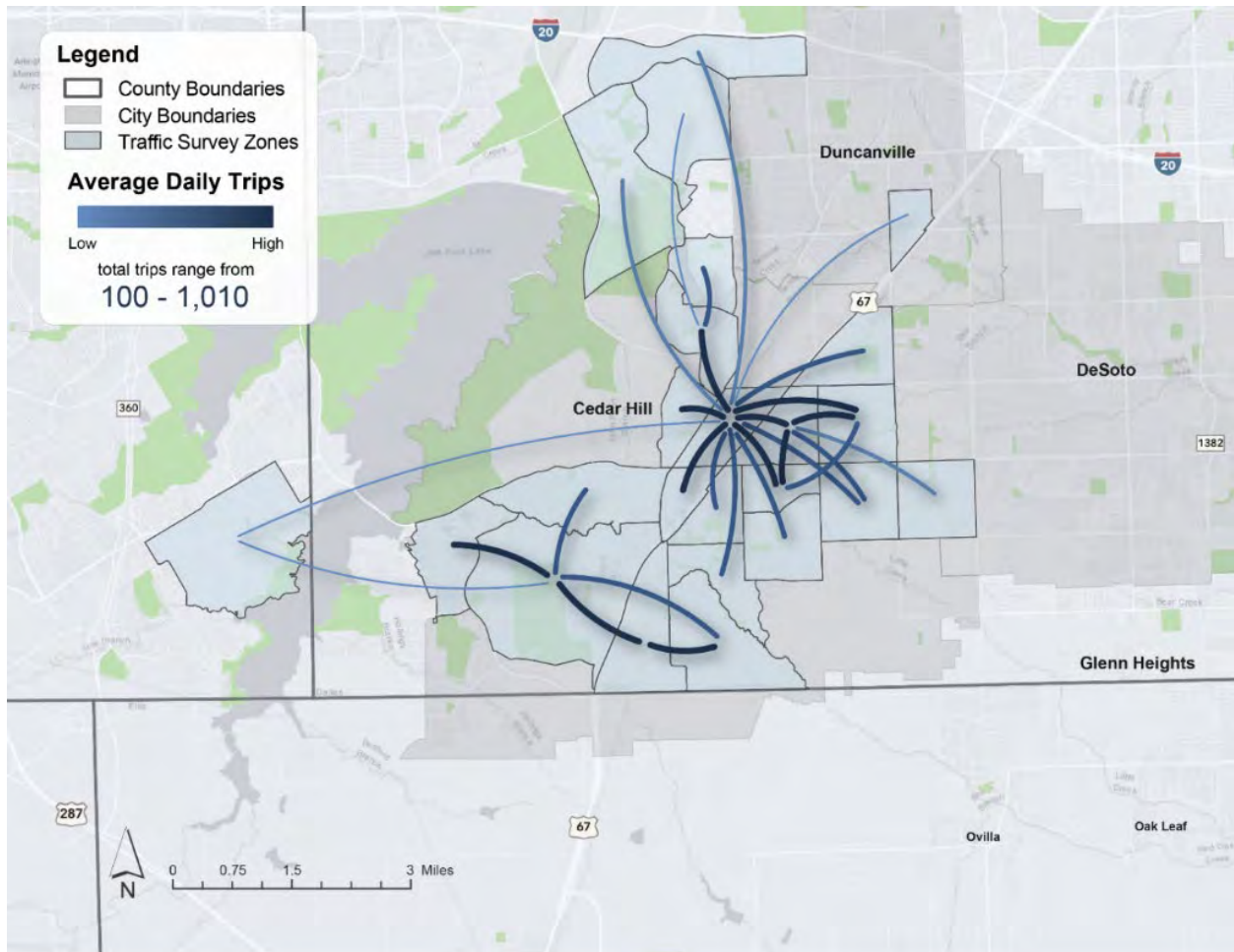
Source: Cambridge Systematics LOCUS Data, 2020

More trips occur during midday and night than peak hours of travel for the area. The primary purpose (approximately 44 percent of weekday trips) occur as “Home-Other”, meaning travel was to locations from home to a place other than work or school. This trend seems to coincide with off peak travel being the primary driver of trips.

Comparing the travel data for 2045, as shown in **Figure 24**, the shopping district at the intersection of US 67 and FM 1382 accounts for a majority of trip activity. The US 67 corridor in Cedar Hill, has a high concentration of commercial

and retail land use, as shown in Section 3.44, Land Use Assessment. Additionally, travel patterns cross municipal boundaries, connecting residential and commercial land uses.

Figure 24. Cedar Hill Area Travel Patterns Year 2045, All Trips

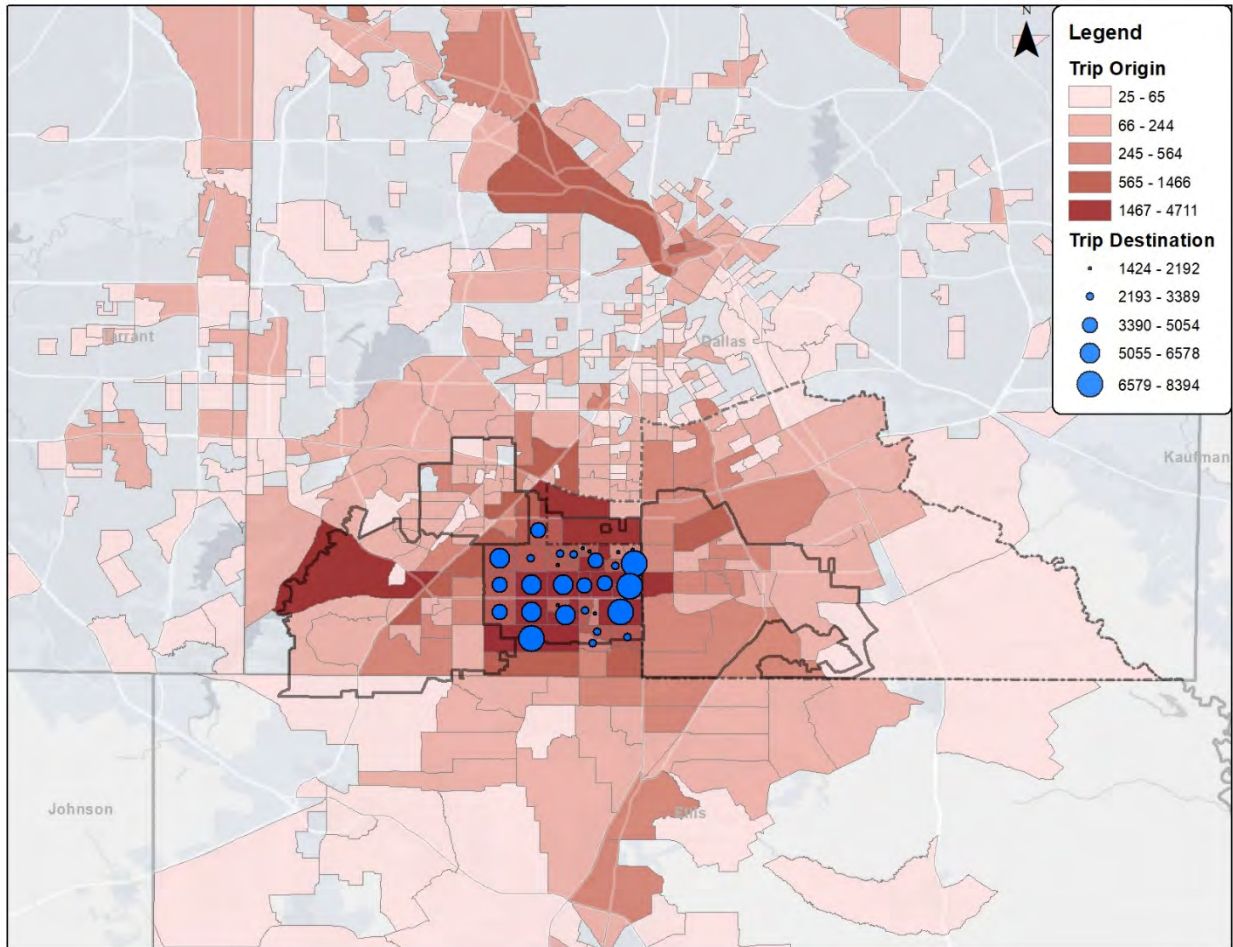


Source: NCTCOG, 2020

City of DeSoto

Travel patterns for the DeSoto area are shown in Figure 25. Trip originations for DeSoto shift east in comparison to Cedar Hill. Many block groups identified in the darkest red shades are located along major arterials in travelling east to west in the center of DeSoto. Outside of DeSoto, high number of originations occur in Cedar Hill at the intersection of US 67 and Belt Line Road. Fewer trips originate in Tarrant County and higher number of trips originate directly south in Glenn Heights and Ellis County. Again, near the US 67 and I-20 interchange origin and destinations are highest. As seen in sections 3.4.1 and 3.4.2, this area did not rank highly in population density, but did rank highly in potential transit dependency and high commute times. Notably, most destinations are at east-west intersections with I-35E.

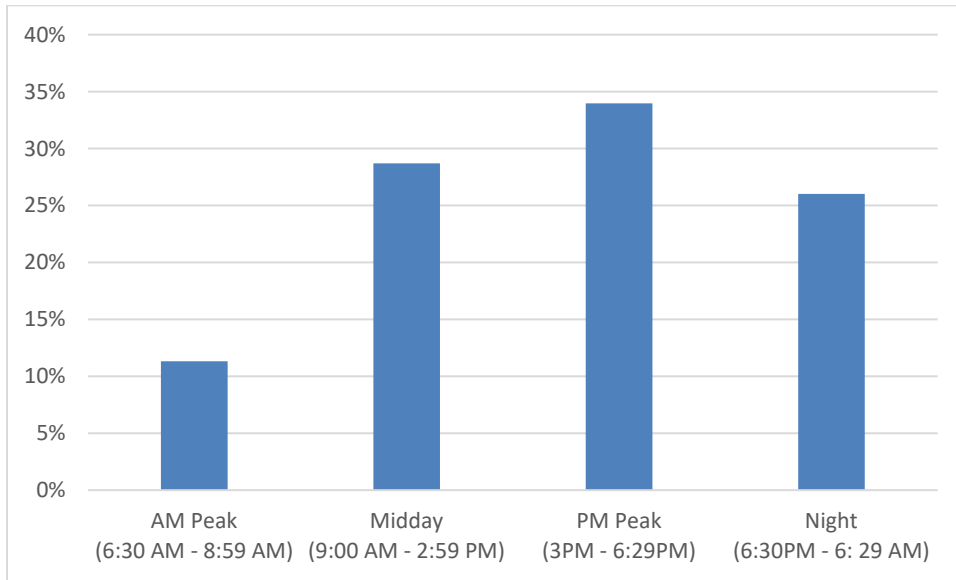
Figure 25. DeSoto Area Travel Patterns Year 2019, Weekday Trips



Source: Cambridge Systematics LOCUS Data, 2020

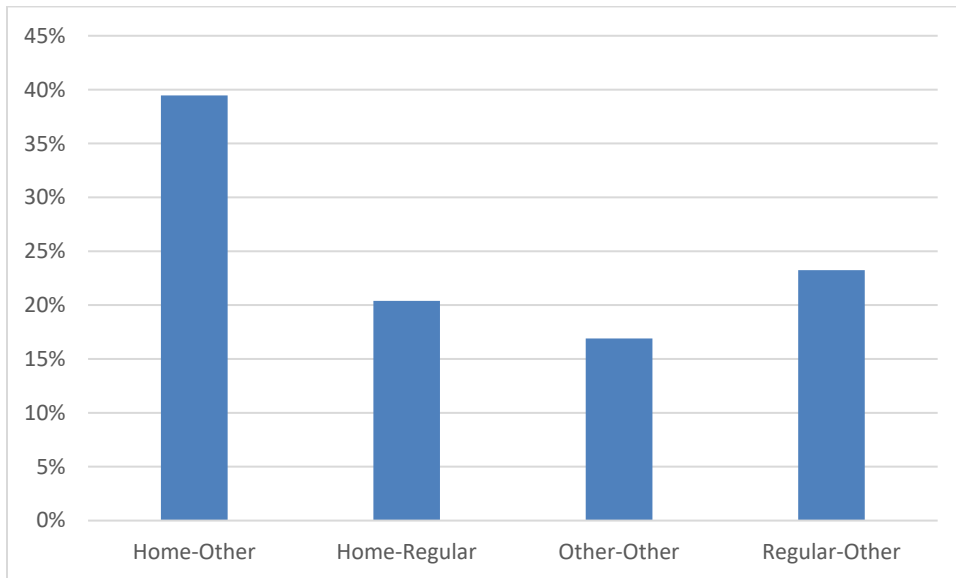
Tables 9 and 10 provide additional detail regarding trip time of day and purpose in the Cedar Hill area.

Table 9. Weekday Trip Distribution in DeSoto by Time of Day



Source: Cambridge Systematics LOCUS Data, 2020

Table 10. Weekday Trip Distribution in DeSoto by Purpose

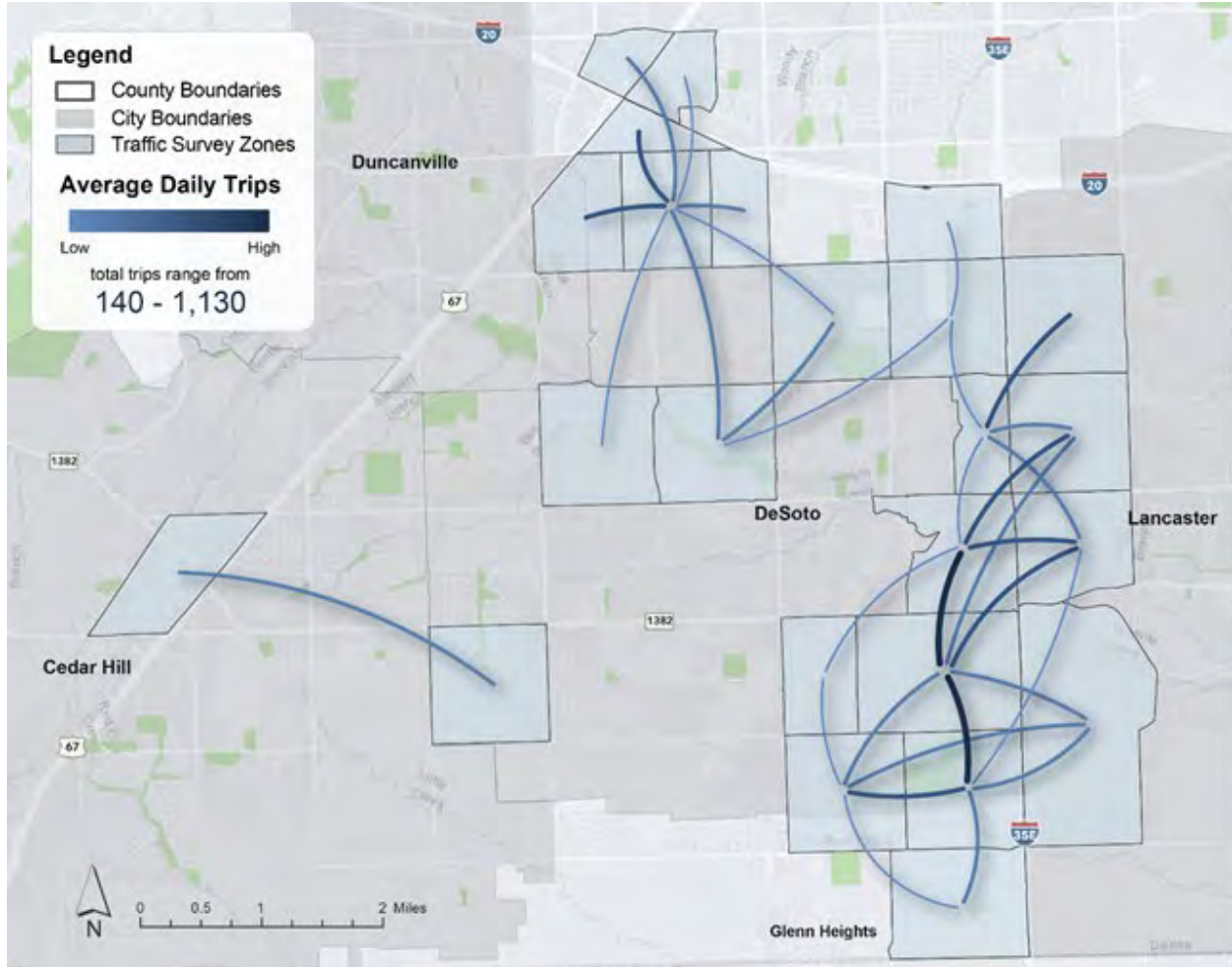


Source: Cambridge Systematics LOCUS Data, 2020

Travel characteristics in DeSoto follow similar trends to Cedar Hill, with mostly off-peak travel with the primary trip purpose being “Home-Other”, referring to destinations other than work or school. However, for DeSoto, PM Peak travel represents the highest single time for trips.

For year 2045, the I-35E corridor is an activity hub that serves both DeSoto and Lancaster. Retail and shopping centers are the highest trip generators. Few east-west travel patterns are noted with the exception of trips into Cedar Hill for potential commercial retail uses. Figure 26 display travel patterns forecasted for the year 2045.

Figure 26. DeSoto Area Travel Patterns Year 2045, All Trips

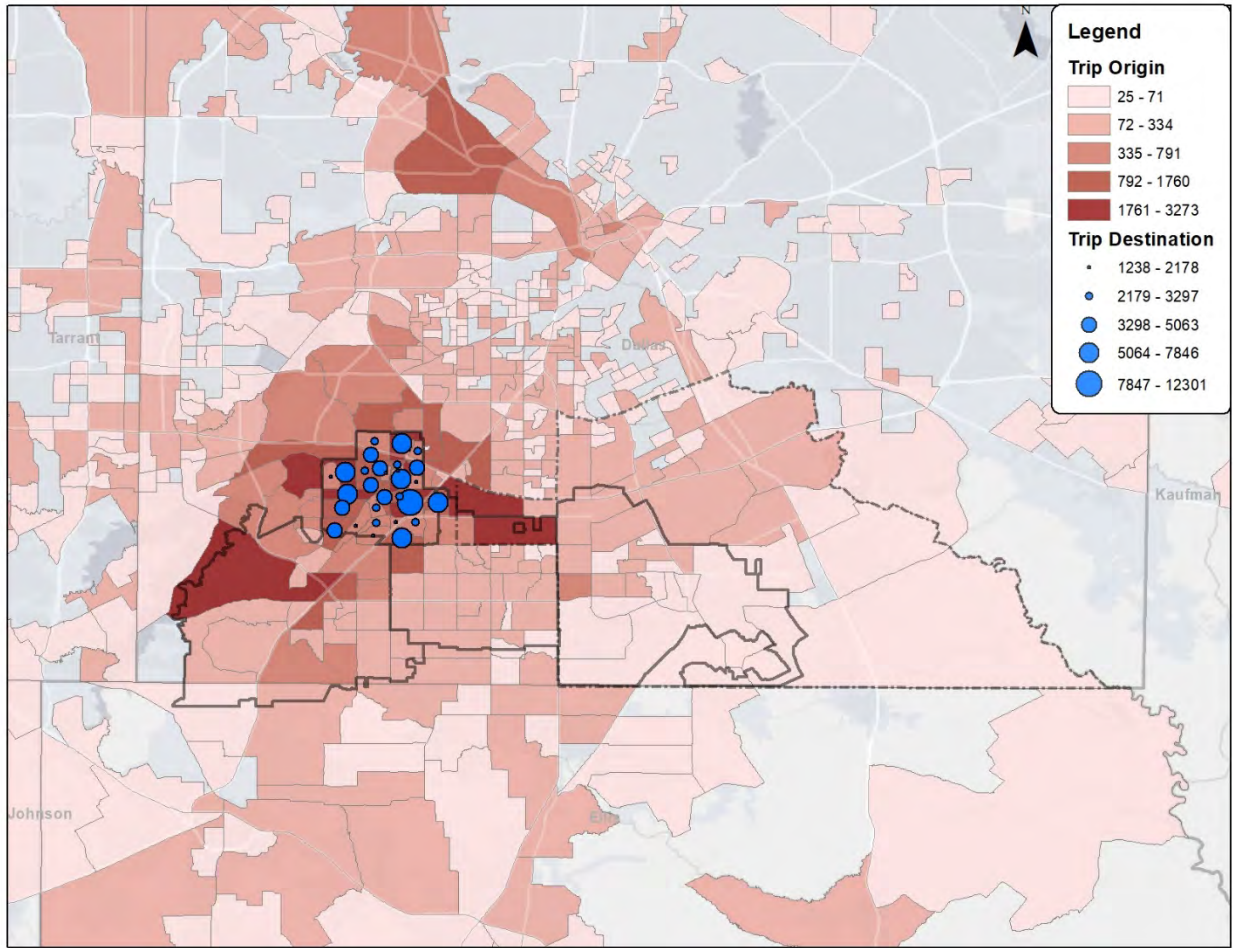


Source: NCTCOG, 2020

City of Duncanville

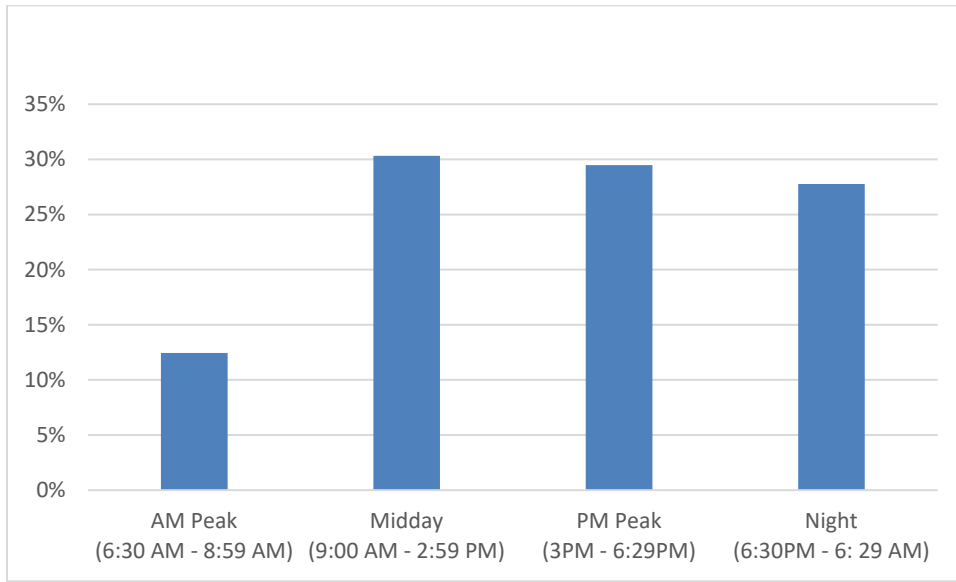
Year 2020 travel patterns for the Duncanville area produce differing results than previous cities. Duncanville's proximity to the I-20 corridor amplifies origins from east to west producing trip origins from as far as Kaufman County and Tarrant County, as shown in **Figure 27**. High trip destinations and origins appear the north and east area of the city where residential and commercial/industrial land uses are present. Additionally, familiar block groups highlighted in travel patterns from the previous cities are noted along I-20 and US 67 and Bellline Road interchange.

Figure 27. Duncanville Area Travel Patterns Year 2019, Weekday Trips



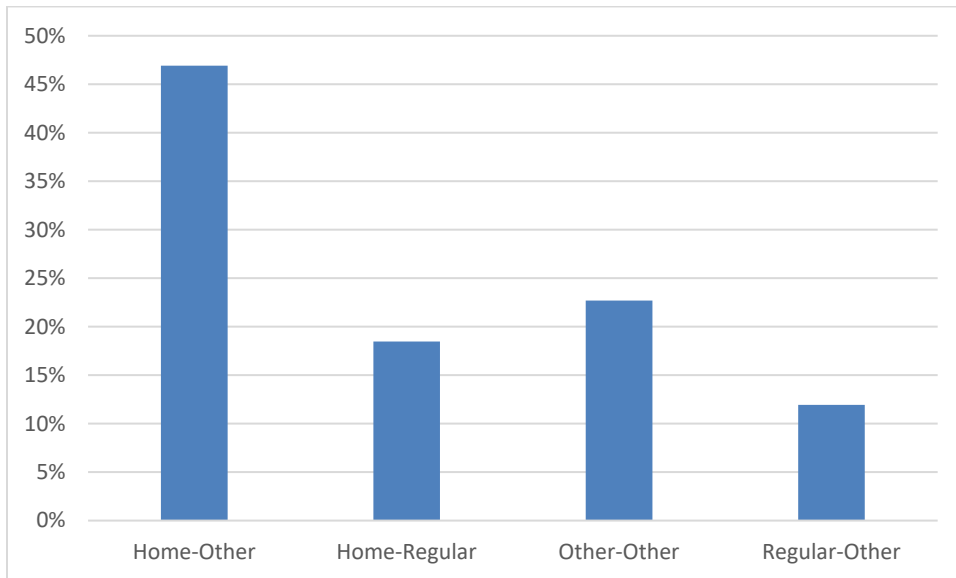
Source: Cambridge Systematics LOCUS Data, 2020

Table 11. Weekday Trip Distribution in Duncanville by Time of Day



Source: Cambridge Systematics LOCUS Data, 2020

Table 12. Weekday Trip Distribution in Duncanville by Purpose

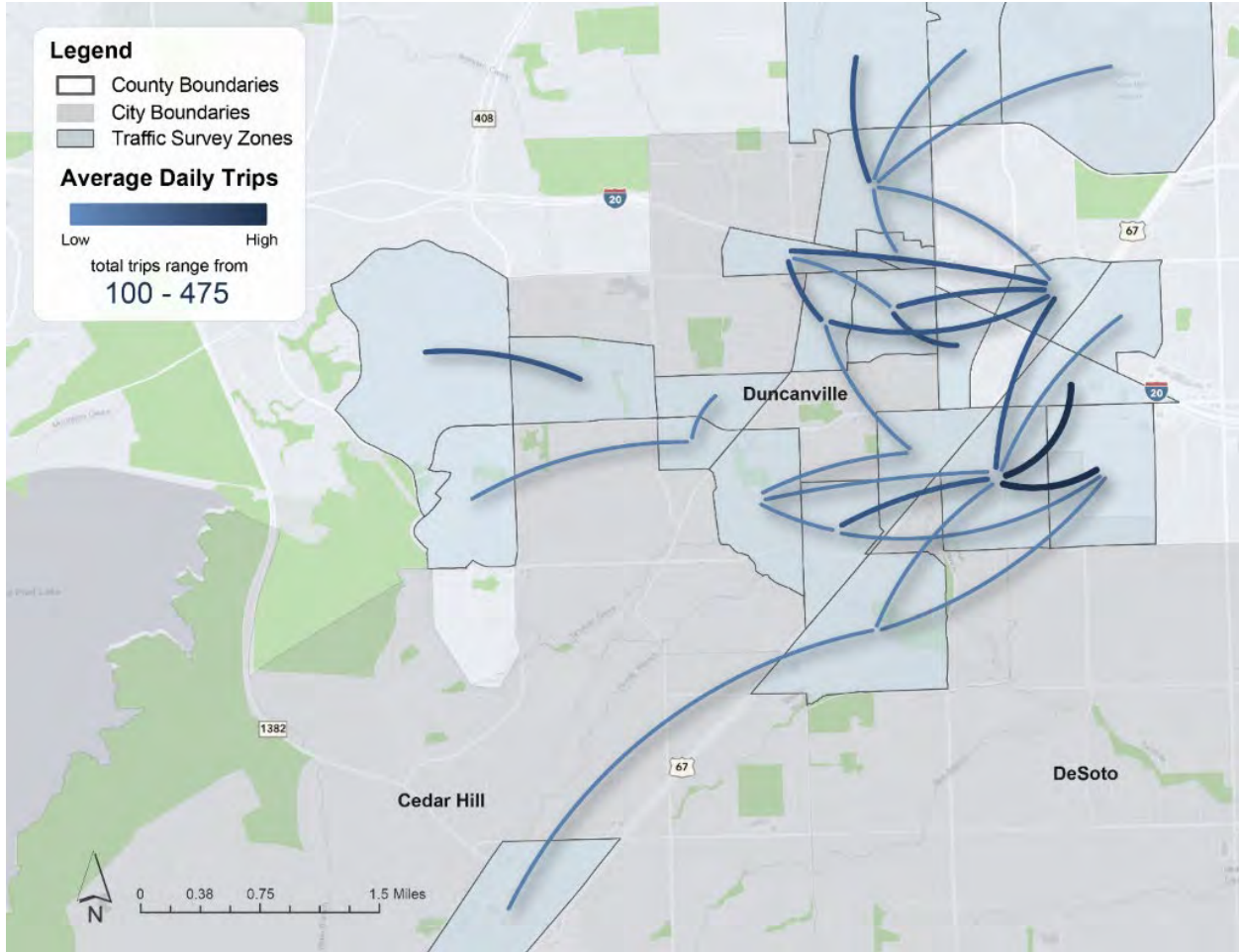


Source: Cambridge Systematics LOCUS Data, 2020

Travel characteristics identified in **Table 11** and **12** follow similar trends previously noted in Cedar Hill and Duncanville. Most trips occur in off-peak times with the primary purpose being to destinations other than home and work. Similar to Cedar Hill, trips categorized as “Regular-Other” rank lowest around 10 percent. These trips typically represent travel between work or school to a restaurant or retail.

Similarly, for year 2045, more east to west travel is identified in the TDM (Figure 28). Trip activity is especially concentrated around the intersection of US 67 and I-20 where commercial destinations are located. A significant amount of travel crosses city boundaries to access locations with retail amenities and resources.

Figure 28. Duncanville Area Travel Patterns Year 2045, All Trips

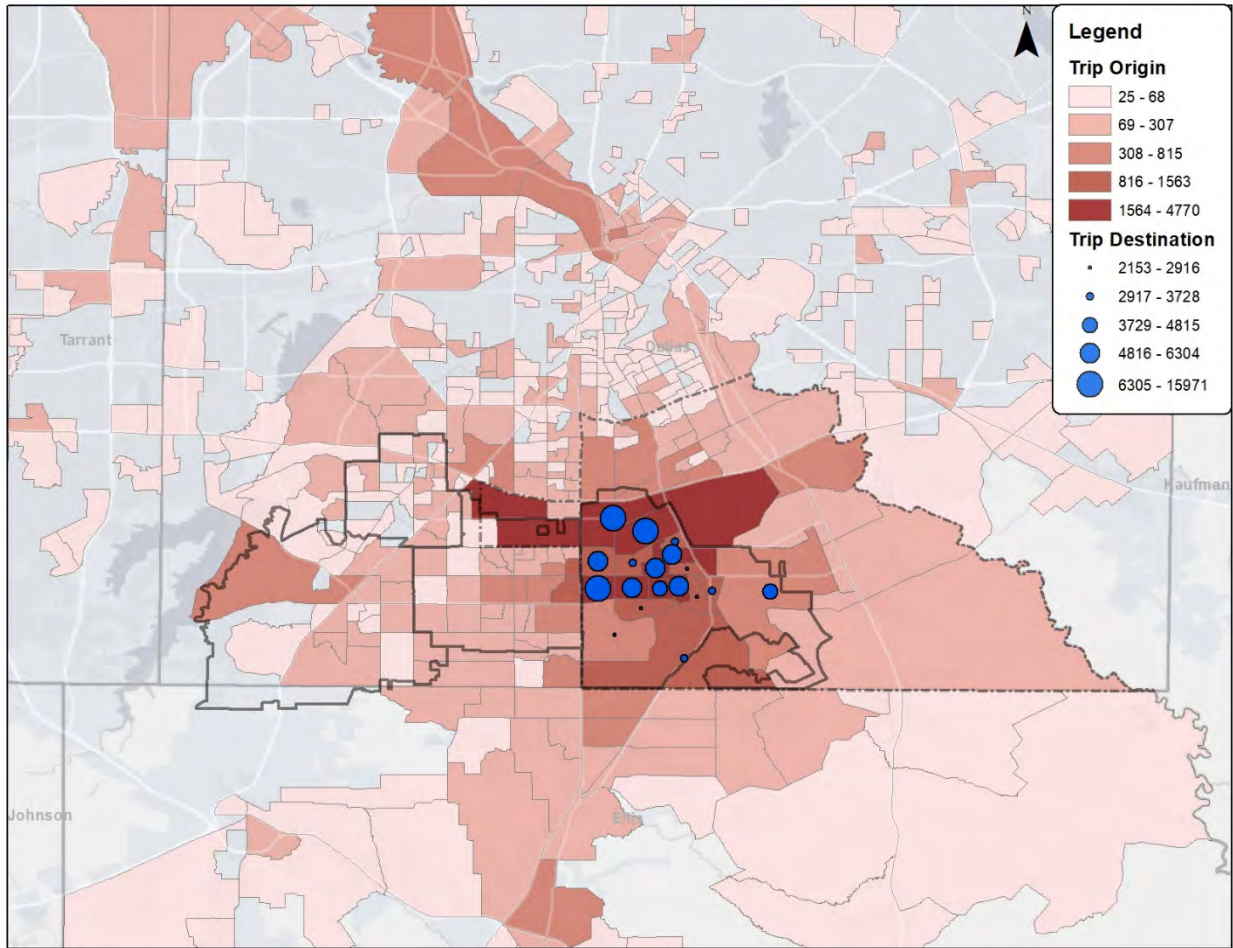


Source: NCTCOG, 2020

City of Lancaster

Trip origins for Lancaster appear mostly in or adjacent to the city boundaries. High amounts of trips originate along the I-20 corridor near the Dallas City limits and in DeSoto, as seen in **Figure 29**. Block groups adjacent to the I-20 corridor also show the highest destinations. Cedar Valley College and other employment generators are located in this area. Block Groups with high trip origins are also highest for trip destinations. High numbers also appear on the east-west Beltline Road Corridor. The fewest destinations appear in the southern portions of the city.

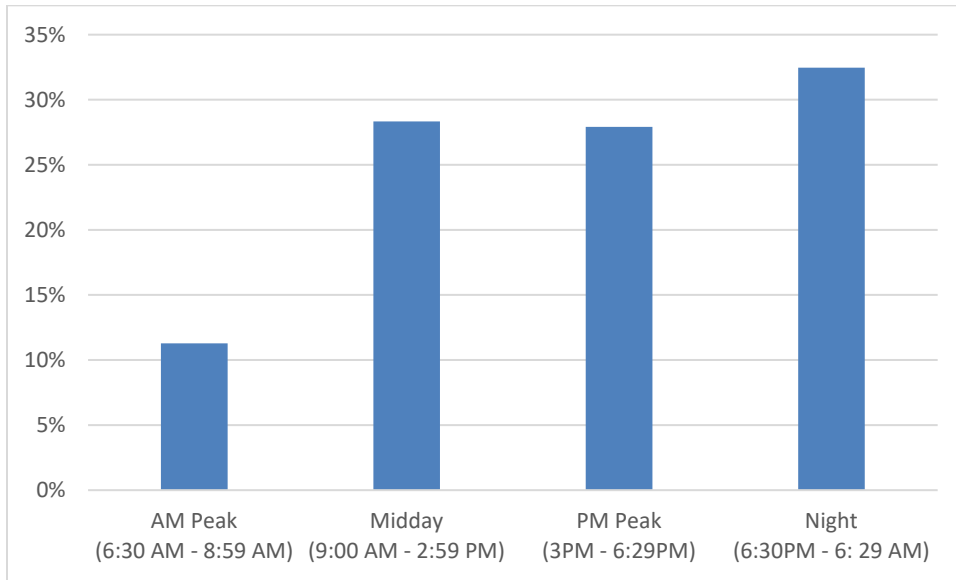
Figure 29. Lancaster Area Travel Patterns Year 2019, Weekday Trips



Source: Cambridge Systematics LOCUS Data, 2020

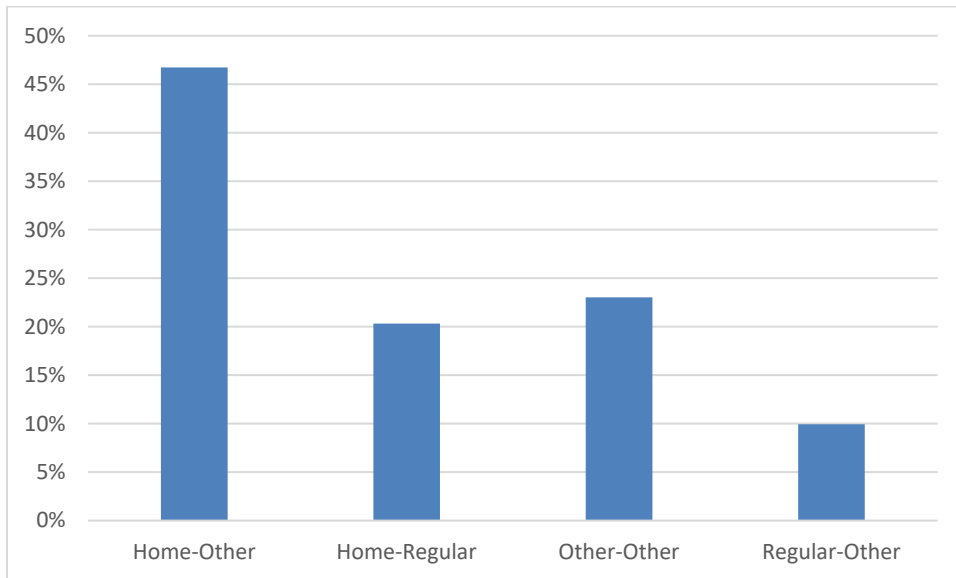
Tables 13 and 14 show similar patterns of travel characteristics previously identified. Trips occurring at night beginning at 6:30 PM to 6:29 AM account for the highest number of trips in the area. Home-Other trips account for over 45 percent of trips in Lancaster.

Table 13. Weekday Trip Distribution in Lancaster by Time of Day



Source: Cambridge Systematics LOCUS Data, 2020

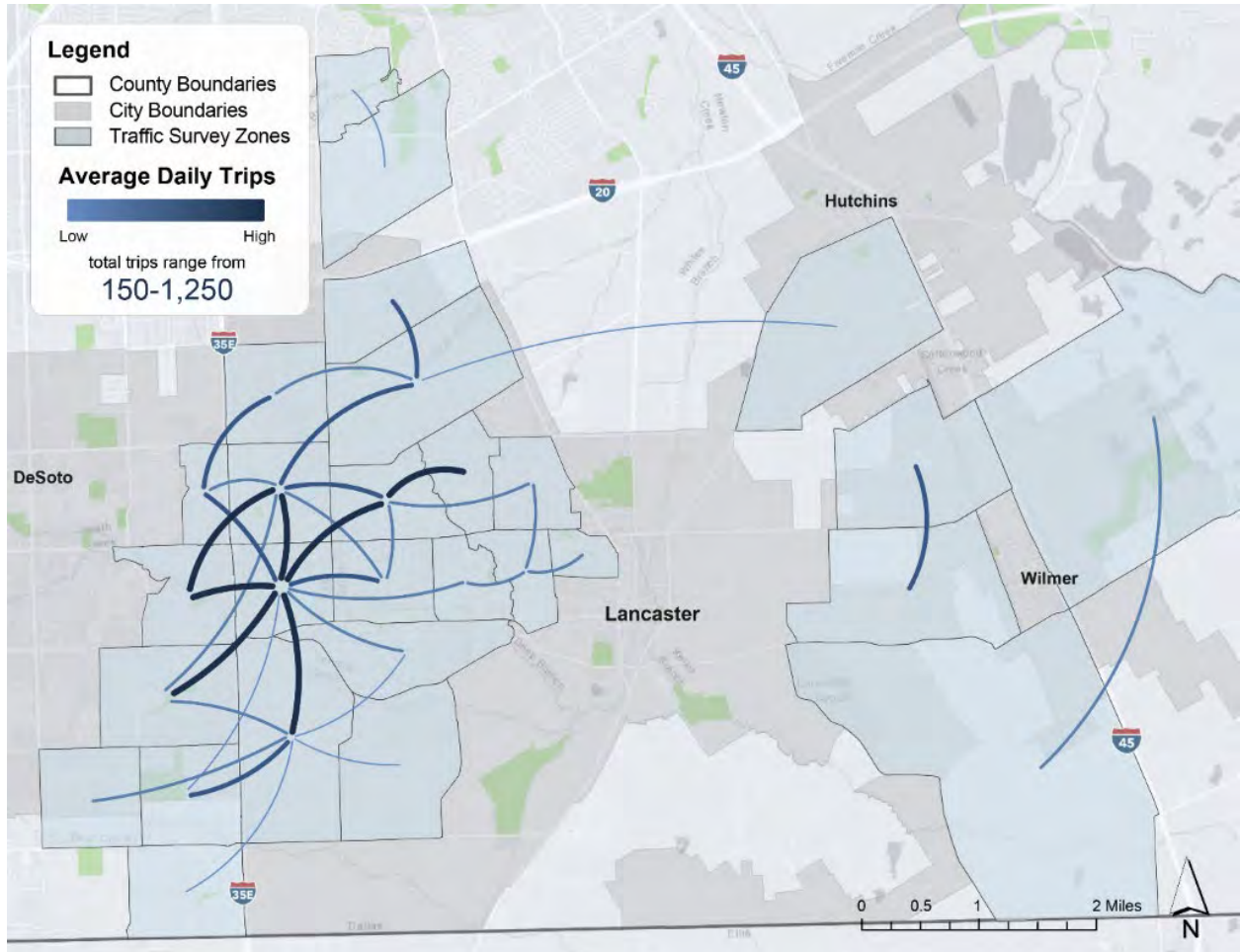
Table 14. Weekday Trip Distribution in Lancaster by Purpose



Source: Cambridge Systematics LOCUS Data, 2020

For year 2045, commercial land uses on the I-35E corridor are potential trip generators. Distribution centers, the Lancaster Airport, and other logistics facilities on I-45 in Wilmer and Hutchins may create activity east of the city, as shown in Figure 30.

Figure 30. Lancaster Area Travel Patterns year 2045, All Trips



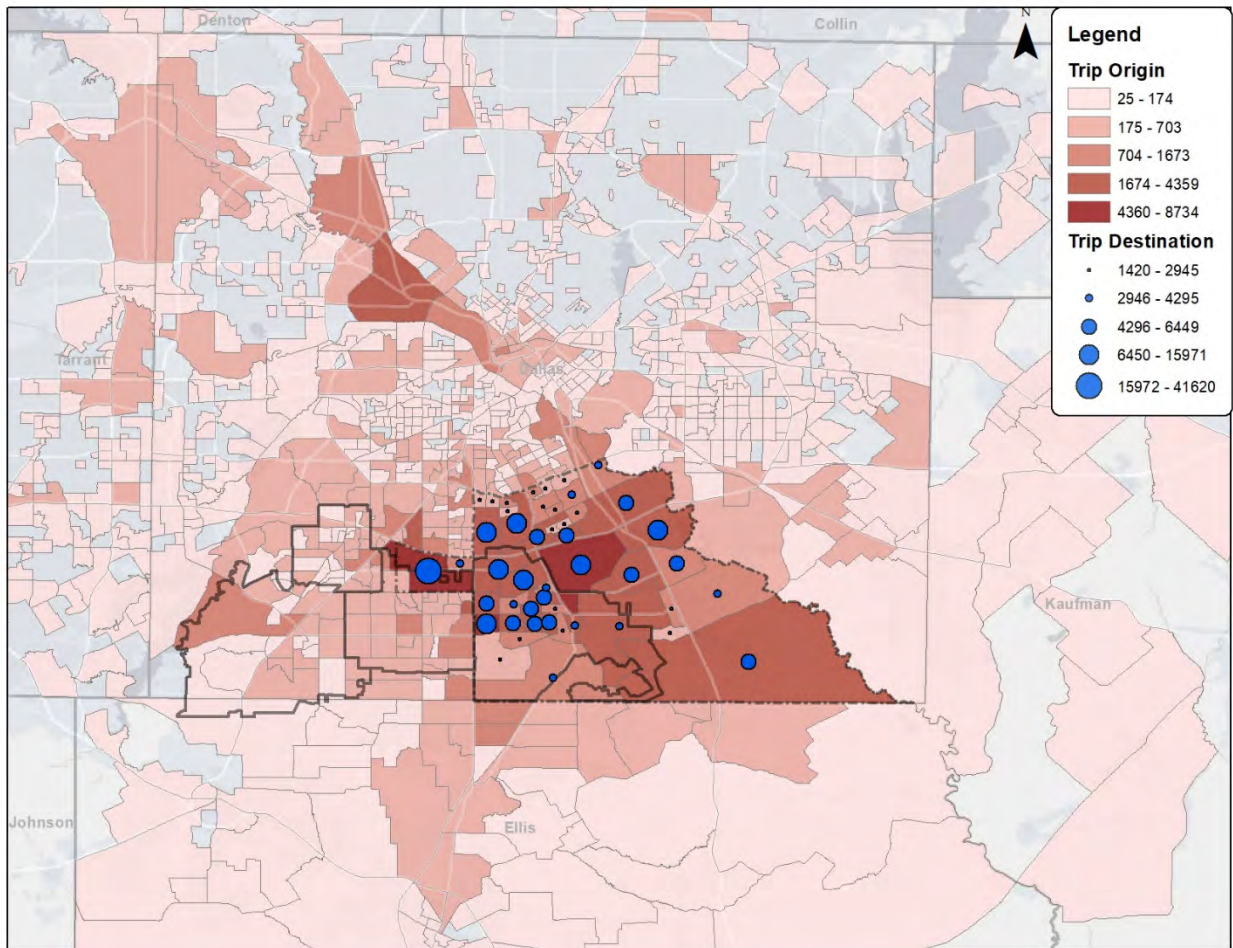
Source: NCTCOG, 2020

Southern Dallas County Inland Port Area

Travel patterns for the Inland Port area are similar to cities previously discussed. Proximity to major arterials such as I-20, I-30 and I-45 act as trip originators as can be seen in **Figure 31**. DFW International Airport in Tarrant County and block groups in Ellis County near the cities of Ferris and Waxahachie appear to make up the majority of trips originating outside of Dallas County. Locations with high trip destination numbers are similar to trends seen in Lancaster with most occurring in the northern portions of the Inland Port. These locations contain major arterials as well as major employers and universities.

The Inland portion of the study area has more block groups than any of the previously analyzed cities. Therefore, the reach of trip origins is greater and appears more similar to the study area maps presented in **Figures 19 and 20**.

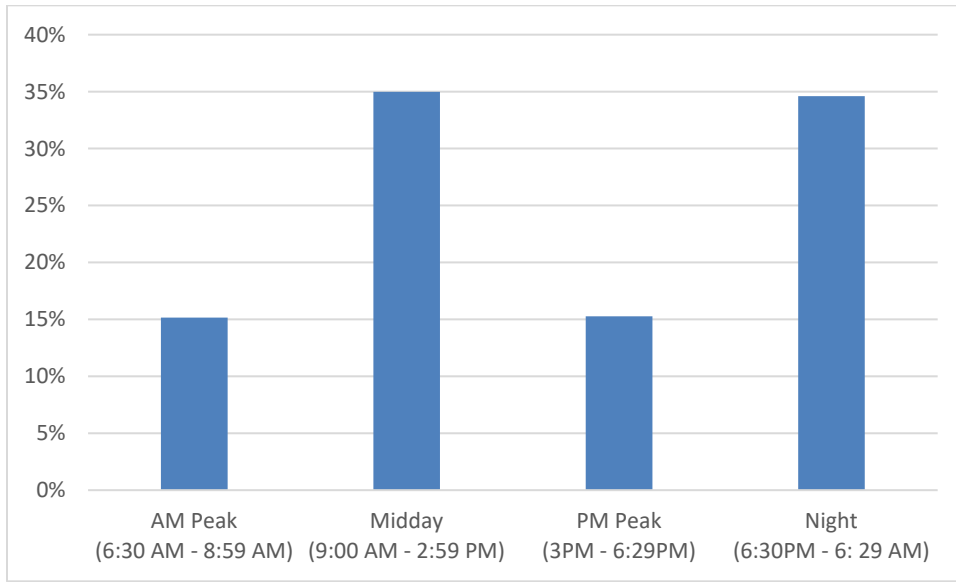
Figure 31. Southern Dallas County Inland Port Travel Patterns Year 2019, Weekday Trips



Source: Cambridge Systematics LOCUS Data, 2020

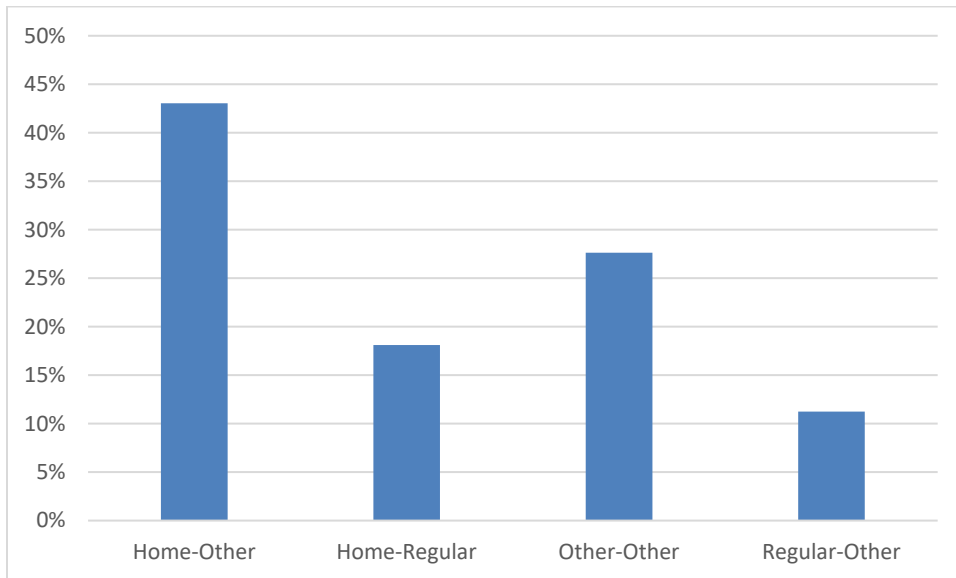
Similar patterns as previously noted are again seen in the Inland Port area. Many block groups captured in the DeSoto and Lancaster analysis are also captured in the Southern Dallas County Inland Port boundary. **Tables 15 and 16** show similar off peak travel trends observed in previous cities.

Table 15. Weekday Trip Distribution in the Southern Dallas County Inland Port by Time of Day



Source: Cambridge Systematics LOCUS Data, 2020

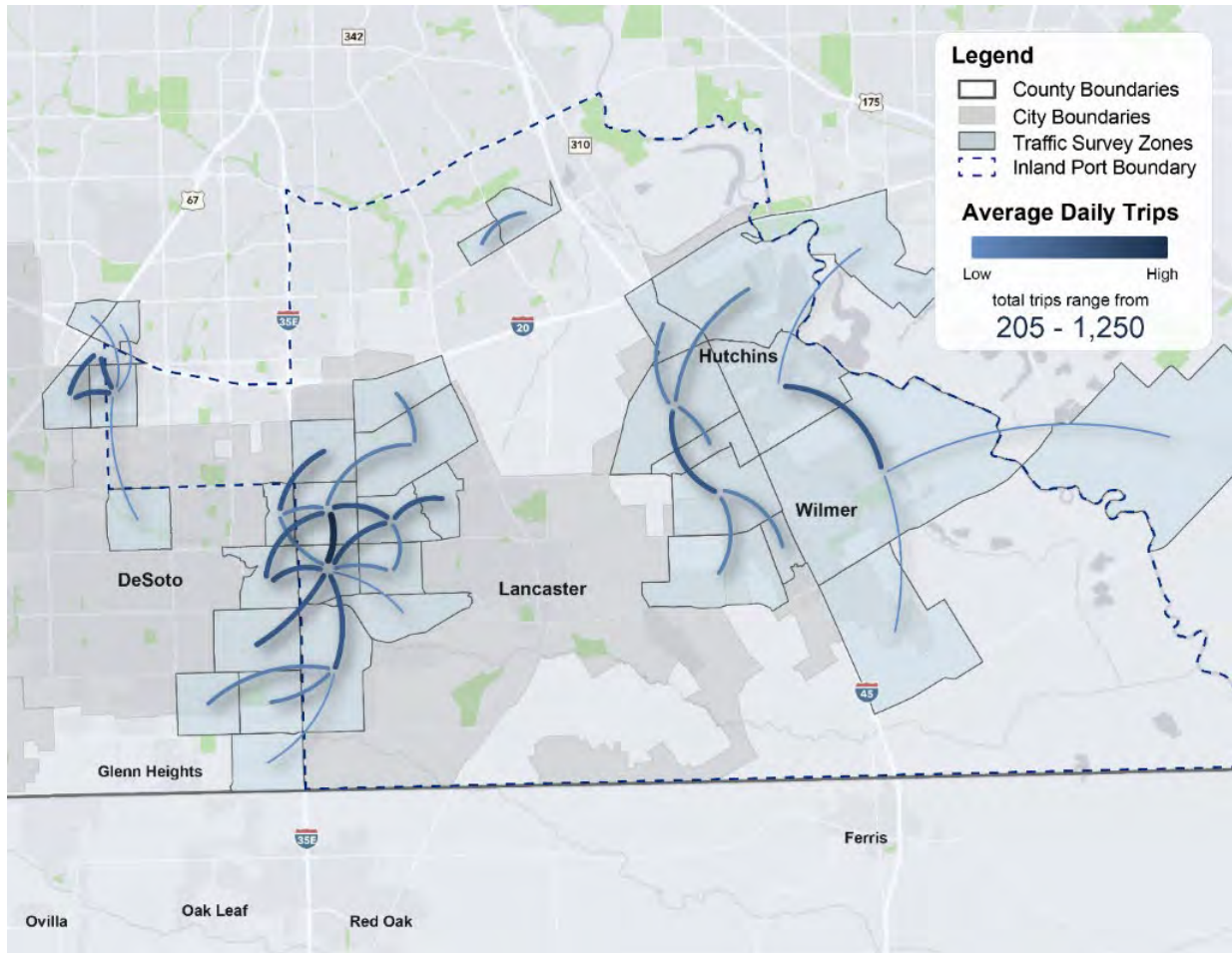
Table 16. Weekday Trip Distribution in the Southern Dallas County Inland Port by Purpose



Source: Cambridge Systematics LOCUS Data, 2020

Forecasted trips within the Inland Port area are mainly within the DeSoto and Lancaster city boundaries, as shown in **Figure 32**. The I-35E corridor and surrounding commercial and retail land uses generate the majority of trips. Comparatively, industrial, shipping, and distribution uses to the east are trip generators. Locations in the southeastern corners of the Inland Port area are low population density and are mostly agricultural uses, as shown in **Figure 33** in the following section.

Figure 32. Southern Dallas Inland Port Area Travel Patterns Year 2045, All Trips



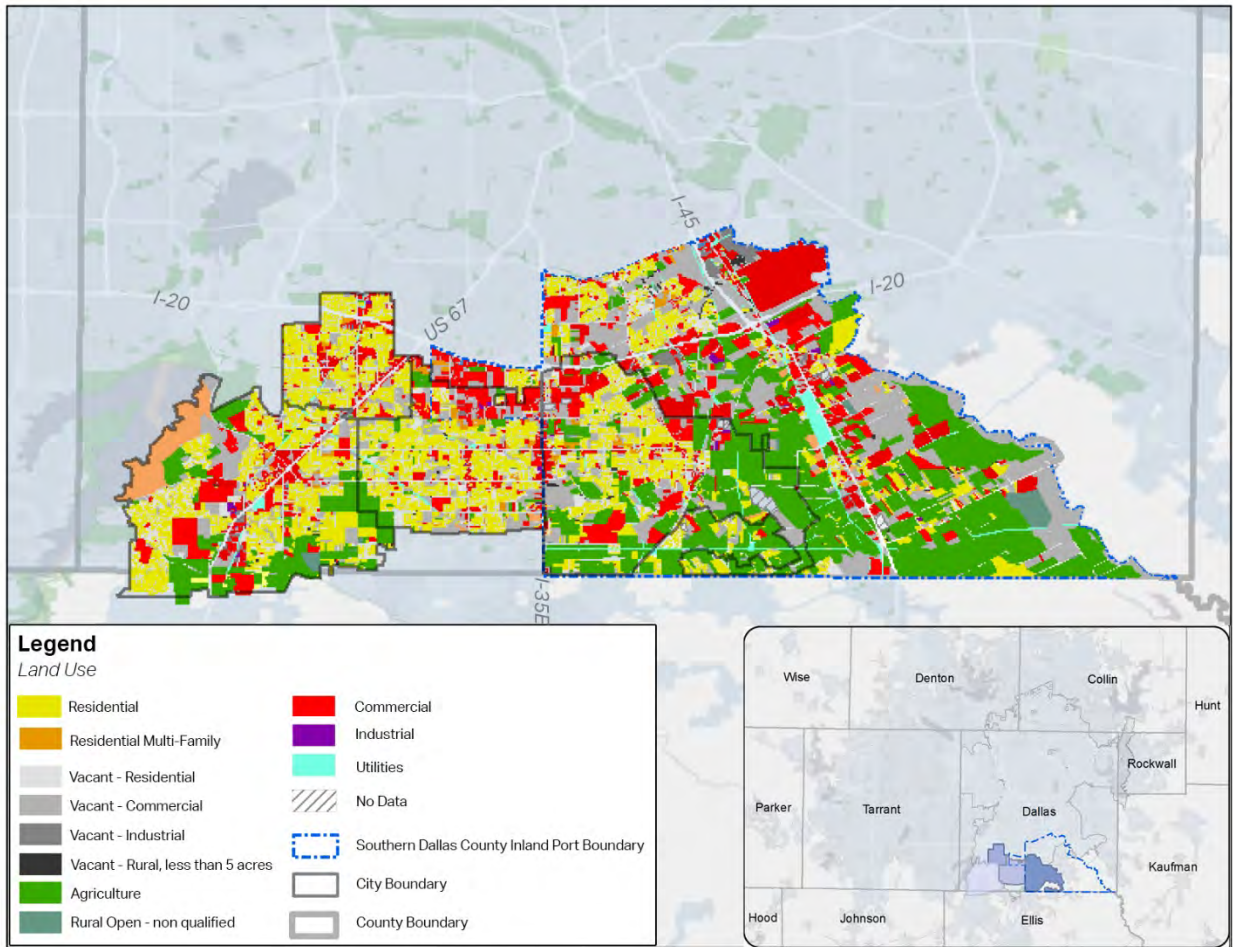
Source: NCTCOG, 2020

1.3.4 Land Use Assessment

The land use assessment utilized parcel data from the Dallas Central Appraisal District (DCAD) 2020 tax rolls to identify land use by state code. Appraisal district information was then mapped using GIS software and analyzed for each study area city and the Southern Dallas County Inland Port.

Within the study area, residential land use accounts for 80 percent of all uses. Vacant land makes up the next largest category at 11 percent. As shown in **Figure 33**, most vacant uses occur sparsely in the study area cities, but primarily in the Dallas County Inland Port area.

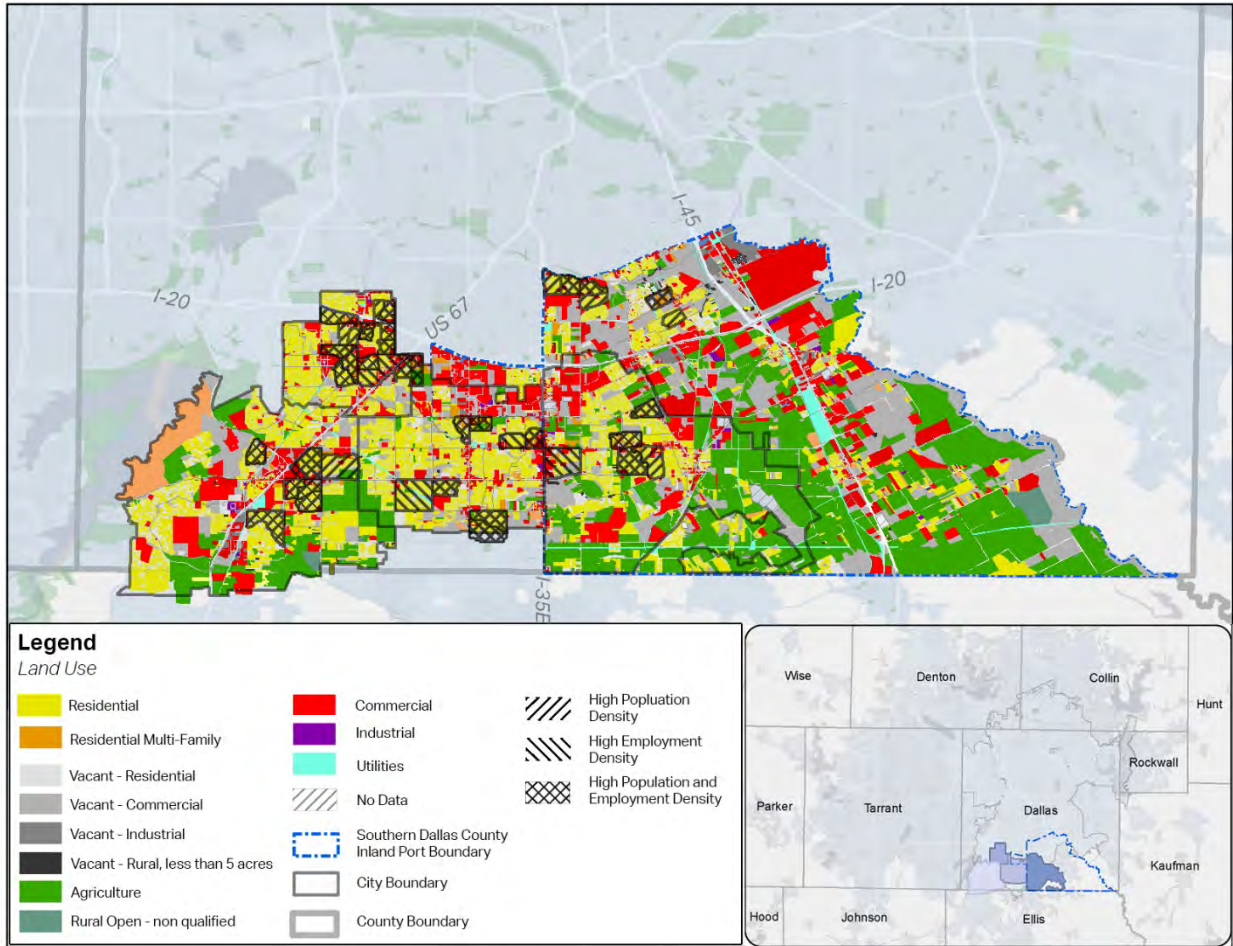
Figure 33. Study Area Land Use



Source: Dallas Central Appraisal District, 2020

Figure 34 illustrates population and employment density maps overlaid onto the land use data. Using this information, we can spatially identify where high population density and high employment density occurs in the study area. For each city, locations of high population and employment density typically occur near major thoroughfares. Residential land use accounts for the highest percentages of use in the study area and it is also found in most of the locations where transit could provide much needed mobility services.

Figure 34. Transit Supportive Land Uses



Source: Dallas Central Appraisal District, 2020; USCB ACS 2018 5-year Estimates

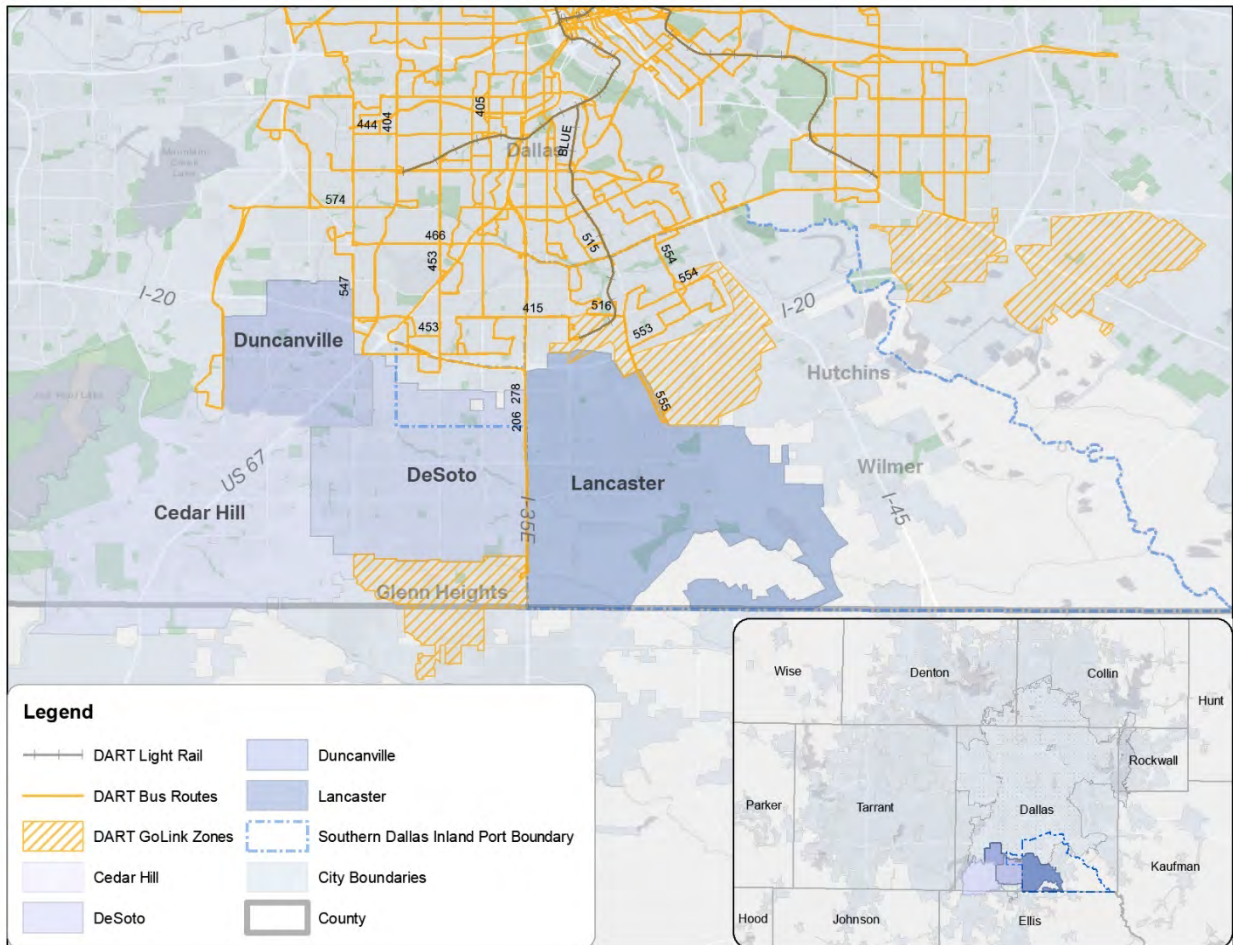
For each city, locations of high population and employment density typically occur near major thoroughfares. Residential land use accounts for the highest percentages of use in the study area and it is also found in most of the locations where transit could provide much needed mobility services.

1.4 Existing Transit Services and Mobility Review

1.4.1 Dallas Area Rapid Transit

DART provides 15 bus routes and one light rail line into the cities within the study area and the Southern Dallas County Inland Port boundary, as shown in **Figure 35**. However, cities in and adjacent to the Inland Port are not within DART’s service area (Cedar Hill, DeSoto, Duncanville, and Lancaster). The majority of bus routes are crosstown or local bus routes. There are two express routes providing service into Downtown Dallas from the City of Glenn Heights and from the Red Bird Transit Center in southern Dallas. **Table 17** provides a list of DART bus routes in proximity to the study area.

Figure 35. DART Service in the Study Area



Source: DART, 2020

Table 17. Overview of DART Routes Adjacent to the Study Area

Route ID	Type	Description	Headways (min) peak/off-peak	Major Destinations
206	Express	Glenn Heights Express	15/30	Glenn Heights Park & Ride, Downtown Dallas / Market Center Station
278	Express	Redbird Express	20/30	Red Bird Transit Center, Downtown Dallas/Market Center Station
404	Crosstown	Westmoreland/Parkland	20/40	Southwestern Medical District/Parkland Station, Kirnwood & Wheatland
405	Crosstown	Parkland-Ledbetter Station	15/45	Southwestern Medical District/Parkland Station, Tyler/Vernon Station, Ledbetter Station
415	Crosstown	Ledbetter Station /SW Center Mall	60	UNT Dallas Station, Southwest Center Mall
444	Crosstown	Ledbetter Station/SW Center Mall	60	Ledbetter Station, Illinois Station, 8th & Corinth Station, Cockrell Hill Transfer Location, Carbondale
453	Crosstown	Wheatland Rd - Parkland Station	30/40	Southwest Center Mall, Hampton Station, Southwestern Medical District/Parkland Station
466	Crosstown	Buckner Station - AAFES	20/30	AAFES, Ledbetter Station, Buckner Station
515	Bus	Zoo Station – Ledbetter Station	30	Dallas Zoo Station, Ledbetter Station
516	Bus	Camp Wisdom Station/Singing Hills	30	Ledbetter & Singing Hills, Camp Wisdom Station
547	Bus	Westmoreland Station – Kirnwood	60	Westmoreland Station, Wheatland Towne Crossing, The Potter's House
553	Bus	Camp Wisdom Station	60	Camp Wisdom Station, Bonnie View & Simpson Stuart
554	Bus	Ledbetter/Bonnie View/Paul Quinn	20/30	Ledbetter Station, Bonnie View
555	Bus	Camp Wisdom/Cedar Valley	60	Camp Wisdom Station, Cedar Valley College
574	Bus	Woods Sugarberry/Westmoreland Station	30	Westmoreland Station, Walton Walker and Duncanville, Woods Sugarberry
Blue Line	Light Rail	Blue Line	20	Downtown Rowlett Station to UNT Dallas Station

Source: DART, 2020

Vanpool

The vanpool service provides transportation for 6 to 15 passengers to a workplace from an area not served by DART rail or bus. Vanpools riders are encouraged to work with employers to set up the program and to split costs. DART provides driver training and vehicle. DART is currently promoting the vanpool program to employers in the Inland Port area. In 2019, Vanpool service provided approximately 50,000 rides per month. The number of rides began trending slightly down in August 2019. COVID-19 has drastically reduced the number of rides since March 2020. The low point occurred in June 2020 (approximately 2,800 rides), but started trending slightly up in July 2020 (3,600 rides).

GoLink

In the Southern Dallas County Inland Port area, DART provides an on-demand transit service in partnership with UberPool that offers integration with DART Light Rail and local bus service (**Figure 36**). Service is provided Monday to Friday from 5:00 am to 8:00 pm, and on weekends from 5:00 am to 8:00 am and 5:00 pm to 8:00 pm from the UNT-Dallas station. The service also provides connections to the Amazon distribution center near the intersection of I-20 and I-45. DART also operates a GoLink zone in the City of Glenn Heights, as shown in **Figure 37**. This service operates anywhere within Glenn Heights Monday to Friday from 5:15 am to 9:00 am and 3:00 pm to 7:30 pm. During midday service (9:00 am to 3:00 pm) the service only operates out of the Glenn Heights Park and Ride and serves predefined stops and the UNT-Dallas Station.

GoLink is provided with a regular DART fare at no additional cost and provides curb-to-curb transportation service. Both GoLink zones provide connections to the DART Blue Line UNT-Dallas Station.

GoLink ridership performance across the board had been steadily increasing ridership since April 2018, but did dip at the end of 2019. Similar to Vanpool, ridership on GoLink has been negatively impacted by COVID-19. Riders went from approximately 20,000 in January 2020 to a low of 7,500 trips in June 2020. Overall, GoLink improved ridership slightly in July 2020 (approximately 8,500 riders). The Inland Port GoLink zone is the only zone to report an increase in average weekday ridership. The following shows the ridership trends for the two GoLink zones within or adjacent to the study area.

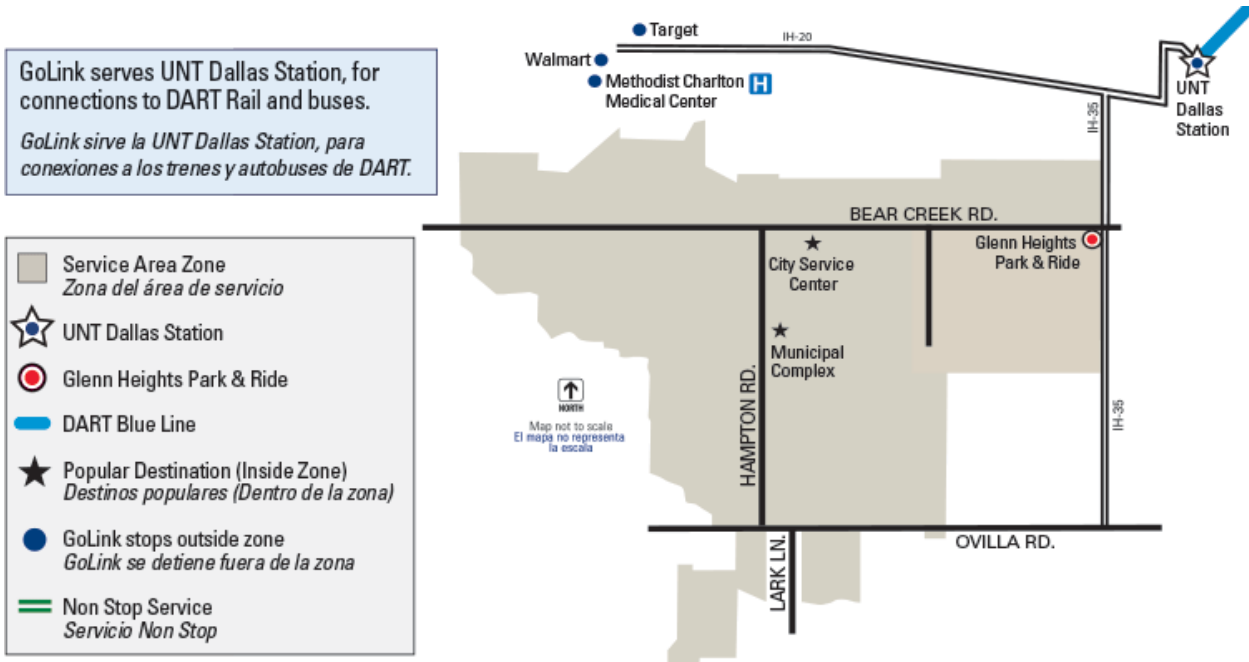
- Inland Port
 - July 2019 = 42 average weekday riders
 - July 2020 = 46 average weekday riders
- Glenn Heights
 - July 2019 = 27 average weekday riders
 - July 2020 = 16 average weekday riders

Figure 36: DART Inland Port GoLink Zone



Source: DART GoLink Inland Port, 2020. <https://www.dart.org/riding/golinkinlandport.asp#map>

Figure 37: DART Glenn Heights GoLink Zone



Source: DART GoLink Glenn Heights, 2020. <https://www.dart.org/riding/GoLinkGlennHeights.asp#map>

1.4.2 STAR Transit

Routes 401 & 501

STAR Transit Routes 401 and 501 serve the Southern Dallas County study area (Figure 38 and Figure 39). Major connections are provided at The Crossing Shopping Center, as well as the DART Blue Line UNT-Dallas Station. Table 18 provides a summary of the operating characteristics and major destinations of the two STAR Transit routes operating in the study area.

Table 18. Overview of STAR Transit Routes in the Study Area

	Route 401 Hutchins Shuttle	Route 501 DeSoto
Service Days	Monday-Friday, Sunday	Monday-Friday
Span	M-F: 5:30am-11:59am, 4:00pm-12:29am Sun: 12:00pm-1:29pm, 6pm-8:59pm, 11pm-12:29am, 1:15am-2:44am	4:45am-9:36am, 2:45pm-6:36pm
Frequency	M-F AM: 1.5 – 2 hours M-F PM: 1 hour 45 minutes (No service between 12:00 – 16:00) Sun: 5 trips daily	M-F AM/PM: 60 minutes (No service between 9:30 – 14:45)
Capacity	28 seats	28 seats
Ridership	M-F Average Daily Boardings: 74 Sun Average Daily Boardings: 14	Average Daily Boardings: 37
Major Destinations	UNT Dallas Station on the DART Rail Blue line, FedEx Home Delivery, Hutchins Senior Center, Cedar Valley College, Hutchins Gateway Apartments	Kohl's e-Fulfillment Center, Wal-Mart Distribution, Methodist Charlton Medical Center, UNT Dallas Station on the DART Rail Blue Line, The Crossing Shopping Center

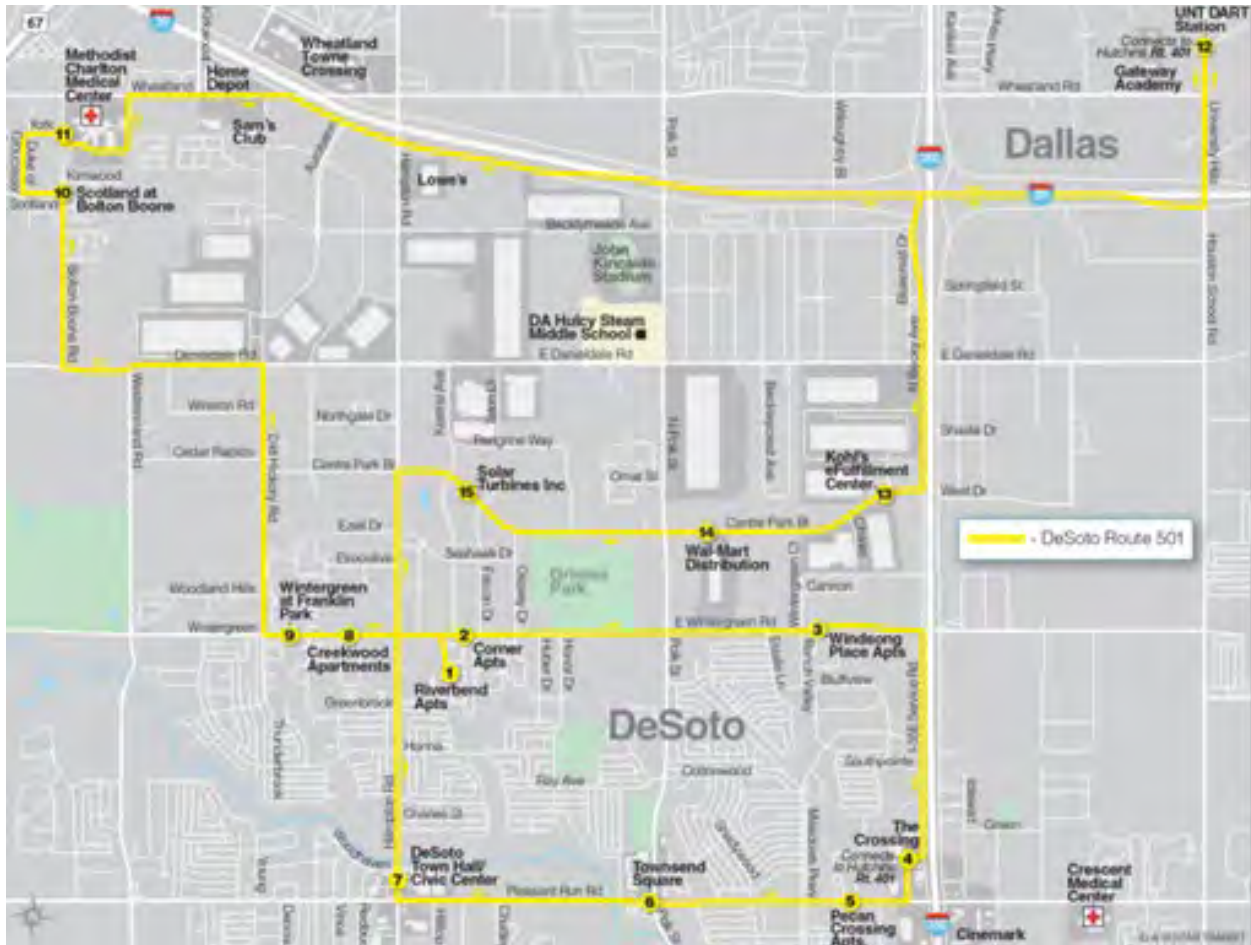
Source: STAR Transit, 2020

Figure 38: STAR Transit Route 401 Service Map



Source: STAR Transit 401 Hutchins, 2020. https://www.startransit.org/routes/hutchins_shuttle/

Figure 39: STAR Transit Route 501 Service Map



Source: STAR Transit 501 DeSoto, 2020. <https://www.startransit.org/routes/desoto/>

1.4.3 Southern Dallas Link

Southern Dallas Link is a non-profit organization that provides transportation for employees at warehouses and other employers located in the southern sector of the city and seniors living in southern Dallas. Its transportation services are provided through a sponsorship program that allows transportation costs to be covered by family members and others who wish to sponsor rides. The operating characteristics of Southern Dallas Link are shown in Figure 40. There are six departure times from each of the seven stations, or pick-up locations.

Figure 40: Southern Dallas Link Operating Characteristics



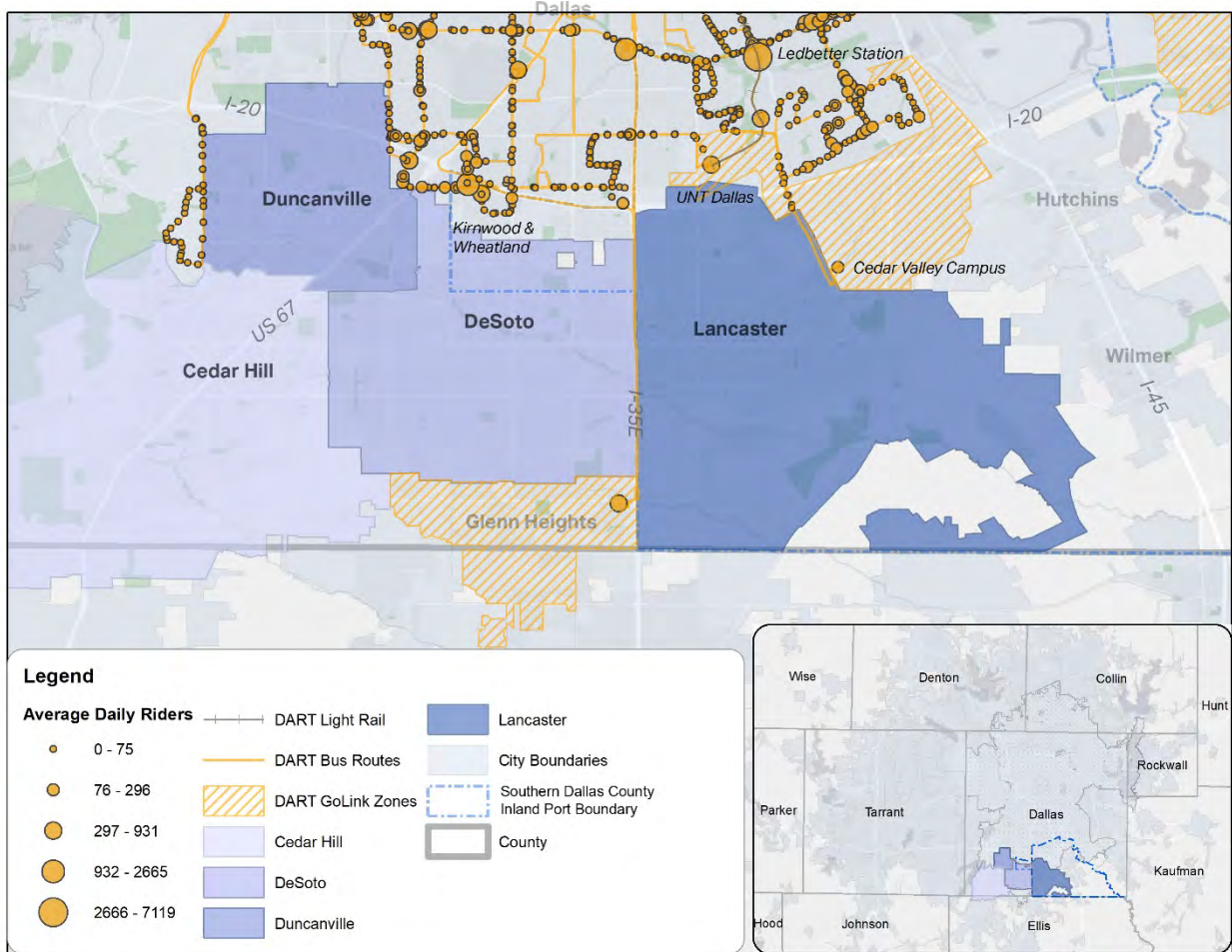
Source: Southern Dallas Link, 2020. <https://southerndallaslink.org/home-1>

1.5 Existing Transit Services and Mobility Review: Study Area Cities

The Cities of Cedar Hill, DeSoto, Duncanville, and Lancaster are outside the DART service area, but some areas of each city are within walking distance of a DART bus route. DeSoto and Lancaster are also served by STAR Transit. Figure 41 show average daily ridership for DART services, not including the GoLink zones. The map shows several bus stops adjacent to the study area with ridership from 0 to 75 passengers per day. A few key areas with higher ridership include the UNT Dallas Station, Redbird Transit Center, Cedar Valley Campus, and Glenn Heights Park and Ride.

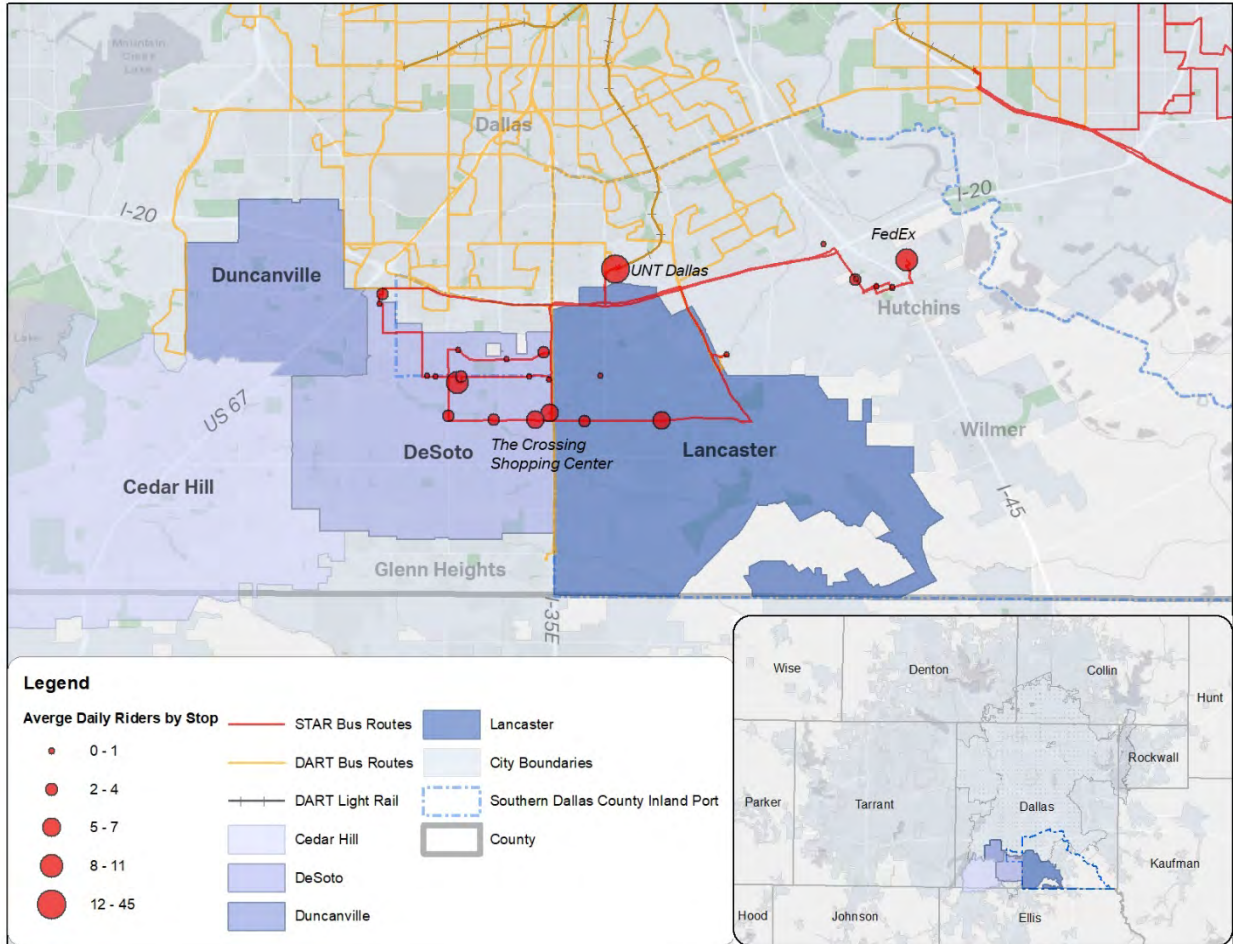
Figure 42 illustrates average daily ridership for STAR Transit routes in the study area. There are several key ridership areas including, FedEx, UNT Dallas Station, and the Crossing Shopping Center; however, no stop has more than approximately 60 passengers per day.

Figure 41: DART Ridership Sampling February-March 2020



Source: NCTCOG, DART, 2020

Figure 42. STAR Transit Ridership Sampling February – March 2020



Source: NCTCOG, STAR Transit, 2020

1.5.1 Duncanville

Four DART bus routes are within walking distance (½-mile) of the City of Duncanville:

- Route 404 Westmoreland/Parkland
- Route 415 Ledbetter Station/SW Center Mall
- Route 547 Westmoreland Station – Kirnwood
- Route 574 Woods Sugarberry/Westmoreland Station

Route 574 bus provides weekday stops within ½-mile of Duncanville on the west side of the city and serves approximately 250 passengers per day, while Routes 404, 415, and 547 bus stops within ½-mile of the city on the east side serve approximately 3,260 passengers per day.

The most popular bus stops for all trips within ½-mile of Duncanville are:

- Westmoreland Road & Gannon Lane northbound and southbound (649 average daily riders total)
- Wheatland Road & Prince George Avenue (413 average daily riders total)
- Preferred Place & Westmoreland Road eastbound (234 average daily riders)

- Westmoreland Road and Wheatland Road southbound (192 average daily riders)

1.5.2 Cedar Hill

DART bus Route 574 (Woods Sugarberry/Westmoreland Station) is the only transit route that operates near Cedar Hill, running down Clark Road and looping back up to the Westmoreland Red Line station via Cedar Ridge Preserve. Route 574 bus stops within ½-mile of Cedar Hill and serves approximately 115 passengers per day. This route has a 30-minute frequency. Major destinations include Westmoreland Station, Walton Walker and Duncanville, and Woods Sugarberry.

1.5.3 DeSoto

STAR Transit's Route 501 operates within the City during peak periods serving approximately 145 average daily passengers. STAR Transit's Route 401 Hutchins Shuttle also runs adjacent to the City at select times throughout the day. The Route 401 bus stop at the DeSoto Cracker Barrel has three average daily passengers and the stop at Crossing Shopping Center has 38 average daily passengers.

DART also operates the Route 278 Redbird Express adjacent to the City of DeSoto. The Glenn Heights Park and Ride, the closest Route 278 stop to DeSoto, serves approximately 740 passengers per day. DART's GoLink: Glenn Heights zone is also adjacent to DeSoto to the south.

1.5.4 Lancaster

STAR Transit Route 401 (Hutchins Shuttle) is the only transit route that operates within the City of Lancaster at select times throughout the day. Route 401 averages approximately 74 daily passengers in its entirety with key stops in Lancaster on Pleasant Run Road, and travelling just outside Lancaster city limits to UNT Dallas and Cedar Valley College. DART's GoLink: Inland Port microtransit zone are also adjacent to Lancaster to the east.

1.6 Conclusions

The purpose of the Transit Existing Conditions and Needs Assessment Report is to document, analyze, and provide a foundation for transit recommendations to be completed in a later task of the Southern Dallas County Transit Study. This report makes initial conclusions regarding:

- The state of existing planning efforts undertaken in the study area
 - Demographic and employment characteristics
 - Commuting and travel trends and patterns
 - The state of existing transit services within and adjacent to the study area

Initial findings that will contribute to later tasks include:

- The Document Review provided a qualitative lens touching on a variety of mobility topics in which to view planning efforts within the study area.
 - Overall findings identify that each city faces challenges related to land use regarding the potential for catalyst areas
 - Public transit consideration is found in nearly all of the reviewed comprehensive plans
 - East-west travel throughout the study area remains challenging
- Population, employment and transit dependent populations generally are found adjacent to or nearby the major arterials (I-20, US 67, I-35E) in the study area
- Travel patterns and characteristics generally identify areas of high employment and commercial activity.

- Overall a high number of trips are interlocal
- High numbers of trips with destinations in the study area originate within Dallas County, generally north of the study area
- Excluding Dallas County, Tarrant and Ellis counties show travel patterns that indicate origins beginning in Tarrant or Ellis counties and ending in the study area.
- Cities in the study area view existing transit services as an opportunity
- Fixed routes for STAR Transit provide east-west travel to commercial and retail destinations
- Low population density within the study area may best be suited for on-demand transit services
- Low population density in the Southern Dallas County Inland Port area is challenging for transit providers

July 2021

Appendix D

SOUTHERN DALLAS COUNTY

Comprehensive Goods Movement Needs Assessment



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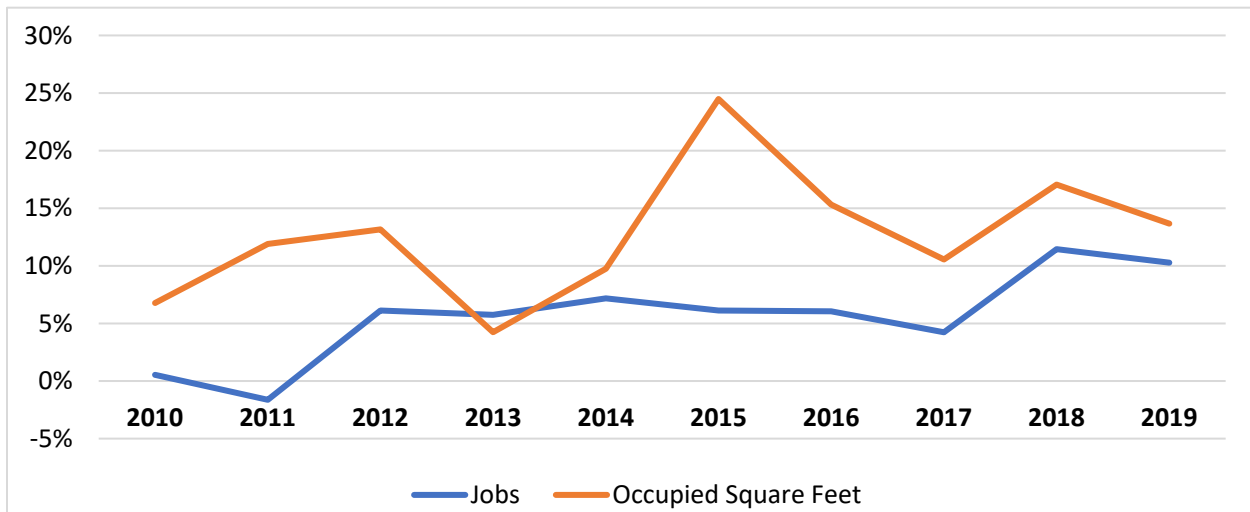
1. Key Findings

This report provides a comprehensive assessment of the goods movement and freight needs of the Southern Dallas County Inland Port (SDCIP). In the past decade, the inland port has seen significant growth in industrial and manufacturing development, with corresponding impacts on job and real estate markets. Draft key findings include:

- 17% of all Dallas-Fort Worth CSA job growth between 2010 and 2019 occurred in the Inland South Dallas Inland Port (SDCIP). As of 2019, the Inland Port supported an estimated 33,900 total jobs, with roughly 15,200 in manufacturing, transportation and warehousing, wholesale, and e-commerce sectors.
- SDCIP supports a total of 53 million square feet of industrial space and has added 35 million square feet of new industrial space since 2010, and 21.6 million square feet since 2015 alone – alongside a 3% reduction in vacancy. 90% of all industrial space in the Inland Port has been built after 2000, with 70% of all industrial buildings constructed in the last decade.
- Over the past ten years, the SDCIP study area has been adding industrial square footage at a higher rate than job growth (Figure 1).
- As of 2019, there are an additional 530 acres of proposed industrial development opportunities in the pipeline across SDCIP, particularly alongside of I-45. There are currently 800 acres of vacant industrial land (625 acres of parcels larger than 5 acres), and 26,500 acres of agricultural land (mostly parcels larger than 5 acres), per the Dallas Central Appraisers District. Growth since 2010 was sufficient to absorb roughly 2,300 acres of vacant land; as such, while SDCIP has more than adequate vacant land remaining, the current pace of growth would place SDCIP at 100 million square feet in 10 years, with potential for more than 30,000 jobs in industrial sectors.
- SDCIP growth aligns with several factors:
 - A consequential Union Pacific (UP) intermodal ramp which offers “steel wheel” connections to Santa Teresa, NM, Los Angeles, CA, and Chicago, IL.
 - E-commerce rapidly creating demand for new warehouse and distribution space and pulling jobs out of traditional brick and mortar retail locations (department stores and malls in particular).
 - The continued significance of the Dallas-Fort Worth Metroplex in anchoring a larger Texas “Mega Region,” which supports in excess of 27 million residents and continues to be one of the fastest growing places in North America; these trends will continue to be supportive of growth for inland port facilities and SDCIP.
 - In general, as inland ports accelerate in size beyond 40 million square feet, they become more attractive for manufacturing development, with corresponding jobs that pay higher than average wages.
- COVID-19 has dramatically accelerated the shift to e-commerce, with US on-line sales growing from about 10% to 16% of total retail sales within a few months; this has also made clear the dependence of US consumers on foreign manufacturing locations. As a result, more manufacturing activity is expected to return to the US and Mexico in coming years, and locations such as SDCIP would expect to compete for this activity.
- Inland ports such as SDCIP create unique challenges for transit:
 - Larger warehouses and e-commerce facilities often operate on a 24-hour schedule with multiple shifts, in context with typical transit operations which tend to focus on standard nine-to-five job schedules.
 - While job densities in manufacturing buildings can be attractive (<600 sf per worker), job densities in warehouse buildings can exceed 2500 sf per employee.
 - A larger share of warehouse and trucking jobs pay wages generally less than \$20/hour

- Insights from larger inland ports suggest that individual companies (Amazon in particular) have responded to employment shortages in similar environments by paying for last mile connections from available transit locations.
- Reflective of the impact of robotics and the scale of modern warehouses, these districts often add space at a faster rate than they add jobs.
- Impending shortages of truck drivers are focusing interest on the need for these inland port districts to support autonomous trucking, alongside interest in support for alternative fuels (CNG / LNG) and electricity.
- Given dynamic trends in local industrial markets linked to COVID-19, it is likely that available state level freight models will under-estimate the impact of emergence of inland port facilities such as SDCIP.
- Trip generation data from the Institute of Transportation Engineers (ITE) Trip Generation Simulator reinforces that there is generally a significant linear relationship between industrial building size and truck counts – indicating that industrial buildings grow beyond 250,000 square feet to approaching 1 million square feet, on average, truck traffic grows in parallel.
- The 2015 NCTCOG Freight Congestion and Delay Study Report illustrated that the SDCIP focus area contains 29% more intersections that require low radius right turns than the Alliance focus area, and that truck routes in the SDCIP area are routed through 13 more railroad crossings than the Alliance area routes.
- As the SDCIP remains poised for continued future growth – with the potential to nearly double in size – there remain significant implications for future land use, economic, and transit policy considerations.

Figure 1. Year-Over-Year Percent Change: Total Jobs and Occupied Industrial Square Footage



Source: CoStar, US Census OntheMap, ESRI, 2020

2. Introduction

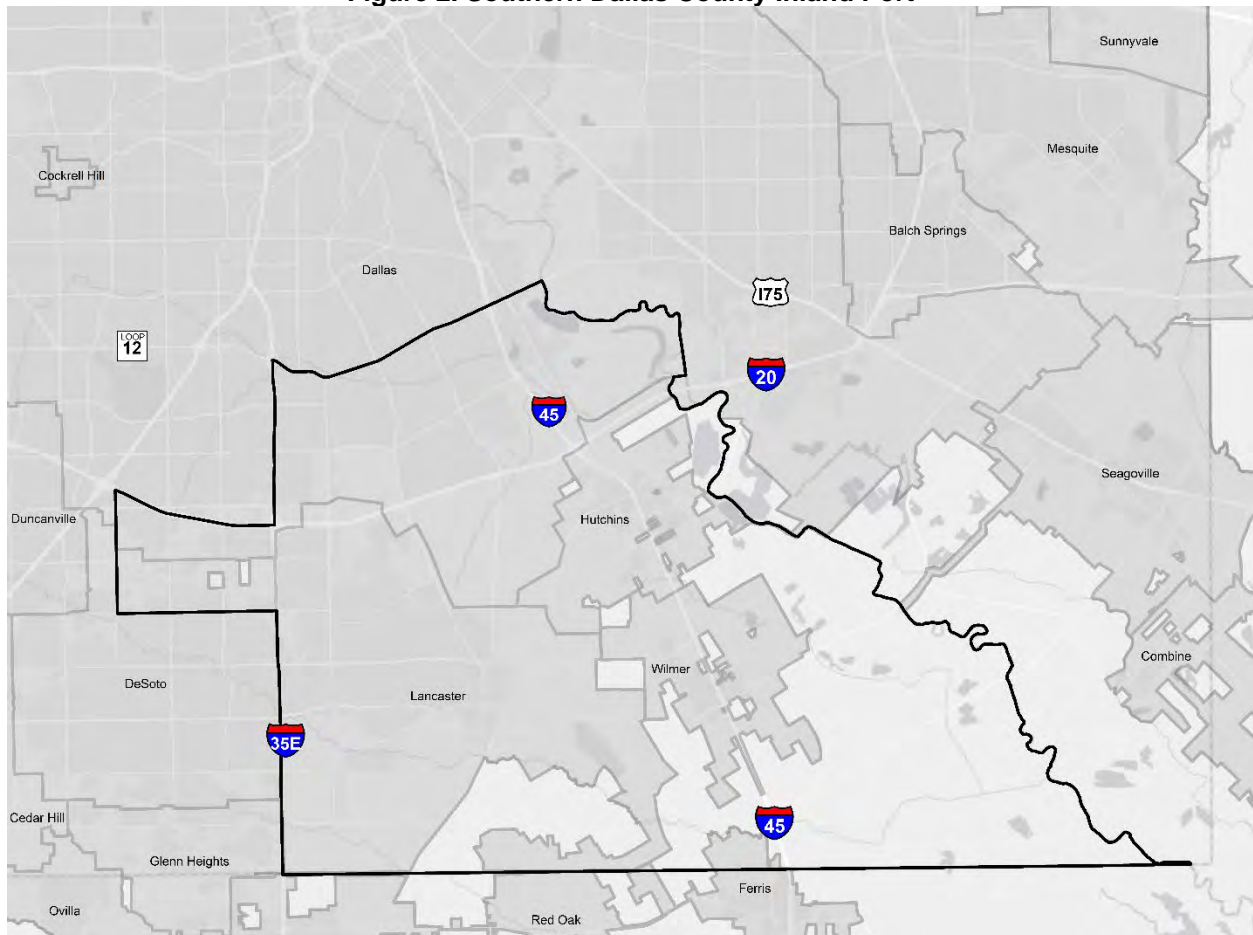
As part of the larger team effort, AECOM was asked to evaluate specific trends unfolding across the SDCIP, with a focus on recent rates of job creation in industrial sectors and construction of new warehouse space. The report summarizes the following:

- Study area description
- Trends impacting North American Freight Movement and Industrial Development
- The taxonomy of inland ports, with case studies
- Review of previous plans related to SDCIP
- Implications for future jobs and goods movement

2.1 Study Area

The project study area includes the four cities of Cedar Hill, DeSoto, Duncanville, and Lancaster, and the Southern Dallas County Inland Port. The Southern Dallas County Inland Port is located just south of the heart of the City of Dallas, along both sides of Interstate 45 in Dallas County. The study area includes approximately 120 square miles (76,000 acres) and encompasses the cities of Lancaster, Hutchins, and Wilmer, and portions of Dallas and Desoto.

Figure 2. Southern Dallas County Inland Port



Source: AECOM, 2020

3. Freight & Industrial Development in North America

The analysis of goods movement and industrial development begins at the North American level with three focus areas. First, that there will be growth in freight tonnage across North America, as explained in the USDOT National Freight Strategic Plan:

“The US economy is expected to double in size over the next 30 years. By 2045, the nation’s population is projected to increase to 389 million people, compared to 321 million in 2015. To support projected population and economic growth, freight movements across all modes are expected to grow by more than 40%.”

Second, that freight and logistics will remain a cost of doing business. Consistent pressure on manufacturers will correlate with an array of changes:

- Interest in fuel efficiency, alternative fuels, and autonomous trucks
- Growth in the number of larger (>500,000 sf) distribution buildings and emergence of multi-story warehouses to gain economies of scale
- Class 1 Railroad investments in larger scale integrated intermodal yards and distribution centers, leading to emergence of inland port districts.
- Larger embrace of big data to better manage goods movement

Third, that industry will continue to face regulatory burdens; examples include hours of service (trucking) and positive train control (railroads). Environmental regulations (including air emissions) for trucks and trains remain a focus; these burdens typically result in higher costs. All of these factors will tend to drive future freight activity to locations such as SDCIP.

3.1 Modern Industrial Development

Particularly since 2010, as the US manufacturing economy first recovered following the “Great Recession”, it has become clear that the word “industrial” increasingly fails to properly frame the evolving diversity of activities related to modern industrial development which could be expected to occur at inland ports such as SDCIP in the future, including:

Table 1. Industrial Development Characteristics

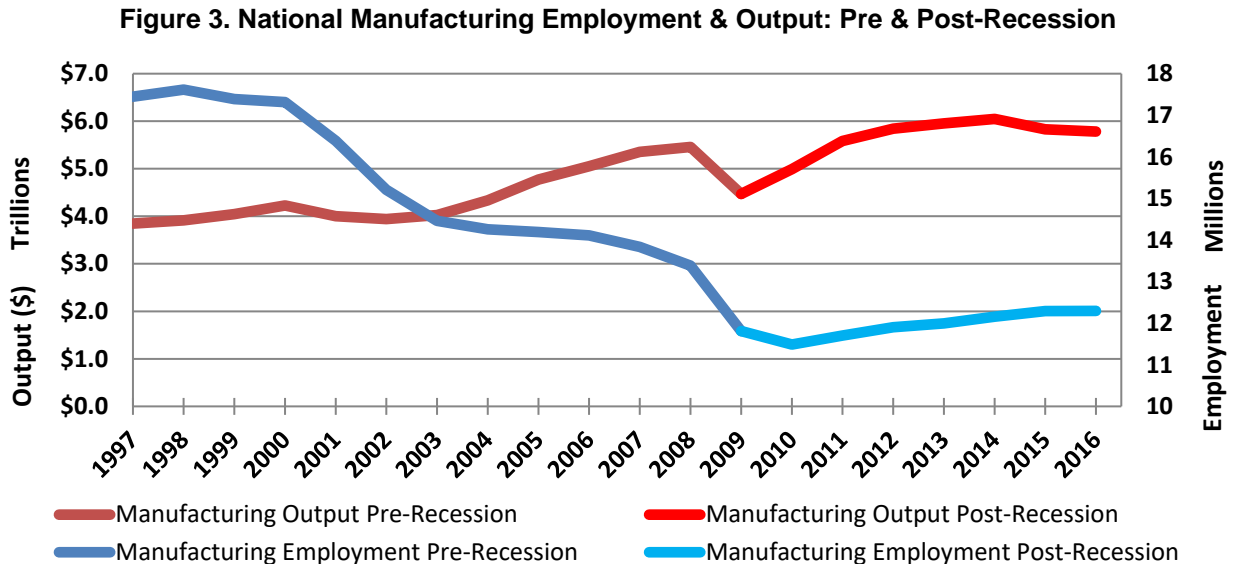
Artisanal / Craft Production	Food, beverages, and consumer goods, generally in buildings smaller than 50,000 square feet and a focus on regional markets.
Local Production (General)	Large- scale companies in food production, metalworking, and value-added machining, coatings, etc.
Industrial Services, Recycling & Repair	Support services, employment agencies, metal recycling, remediation, printing, laundry, spare parts, etc.
Export Oriented Manufacturing	Goods for national and global markets; pharmaceuticals, automotive, aerospace, metals, packaging, etc.
Bulk Commodity Logistics	Bulk movement of sand, gravel, asphalt, and chemicals, using truck, rail, barge, and pipeline.
Wholesale / Distribution	Includes the activities of Third-Party logistics providers, many of whom are providing additional services to their clients, including component assembly and parts sequencing.

E-Commerce	Order fulfillment for retail goods for delivery. With companies such as Amazon making investments to achieve same-day delivery, demand for warehouse sites closer to population centers has accelerated. Developers are also responding with new two-story warehouse projects in higher-cost urban locations (London, Seattle, Paris, Hong Kong) to ensure same-day delivery.
Transportation Services	Covers general trucking, intermodal container drayage, and rail / intermodal operations. Modern intermodal ramps are one clear example of this activity, linking terminal operations with adjacent industrial activities.
Heavy Industrial Production	Generally focused on metals, fuels, chemicals, plastics. these activities tend to be larger in scale and more likely to develop in rural areas which are more likely to be in attainment for air quality.

Source: AECOM, 2020

3.2 Output Versus Jobs

Of particular importance to inland port locations such as SDCIP, are the clear trends unfolding across North American industrial activity as the impact of technology increasingly influences how things are made – as a result, fewer workers are needed to produce more output. Across industrial districts the pace of job growth will not sufficiently frame the extent of demand and contribution of industrial activity to the local economy. While there are significantly fewer manufacturing jobs nationally compared to 1995, total manufacturing output (GDP) per worker has grown at a significant 4.5% annualized rate; i.e. healthy growth in output with fewer workers. At a policy level, this point is important for inland ports, in that modest growth in employment may conceal more dramatic growth in freight volumes. Figure 3 depicts pre- and post-recession trends in the national manufacturing sector.



Source: BLS & BEA, 2017

3.3 Mega-Region Growth

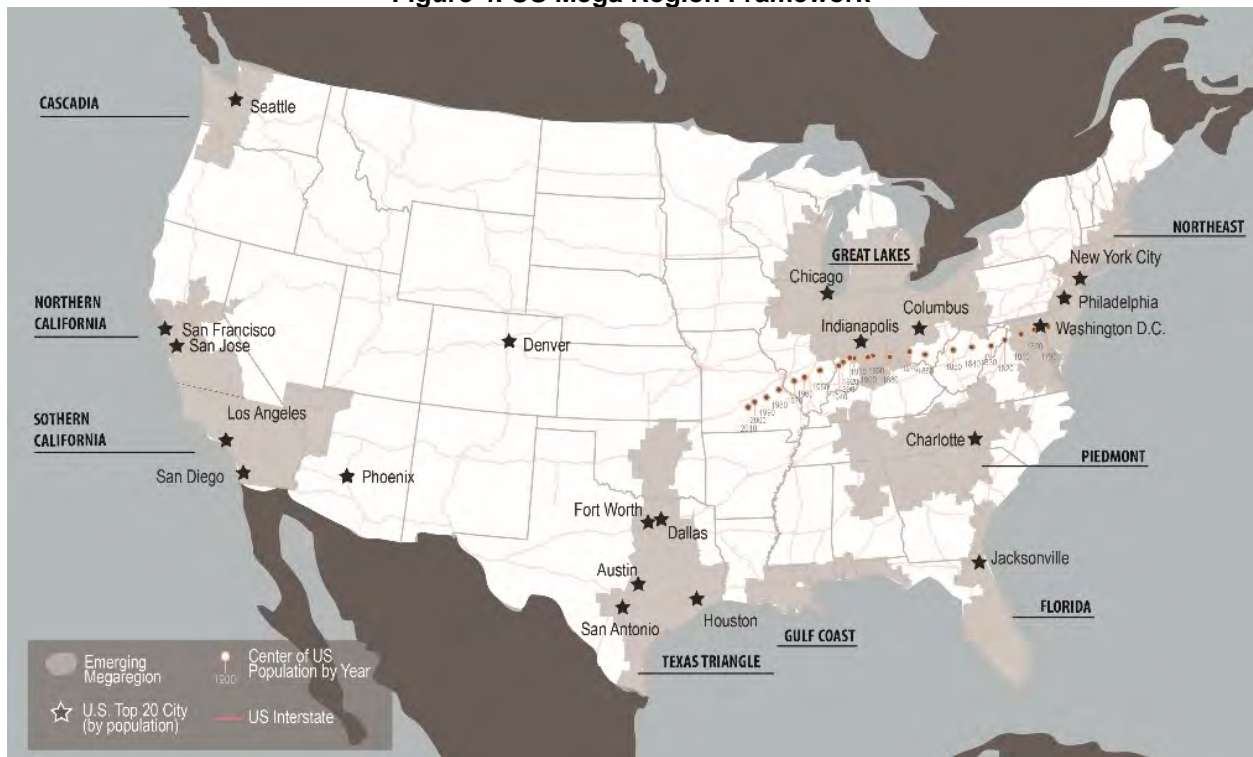
Regional DFW strength in manufacturing and warehousing needs to be seen in context with broader growth occurring at a small number of defined “Mega Regions” (Figure 4) which collectively account for 70% of US population and 69% of employment growth. Looking across the defined mega regions, the defined Texas Triangle

anchored by Dallas/Fort Worth, Houston, San Antonio/Austin, but extending into Oklahoma as well, continues to have the third largest concentrations of jobs and population (after the Great Lakes and Northeastern regions). Key metrics include:

- The Texas Triangle supports 12% of US mega region population, with growth at the fastest rate of all mega regions since 2002 (1.8% annually)
- The Texas Triangle supports 11% of total mega region jobs, with annual growth of 1.7% since 2002, fastest rate of all regions.

The key point is that the ingredients are in place across the Texas “Mega Region” to sustain growth in inland port locations such as SDCIP.

Figure 4. US Mega Region Framework



Source: AECOM, 2020

3.4 Re-Shoring/Near-Shoring on Manufacturing Demand & COVID-19 Impacts

Recovery and growth in US manufacturing since 2010 links with concepts such as “re-shoring” (i.e. manufacturing returning to the US) and “near-shoring” (i.e. manufacturing moving from Asia closer to the US; Mexico). Emergence of these trends is connected with increasing logistics costs and growing supply chain instability linked to labor cost growth in China, rapid labor turnover in India, and climate volatility. In addition, and particularly since 2016, trade disputes between the US and China, as well as with Canada and Mexico have added to uncertainty. In particular, the US / China trade dispute is expected to “decouple” the two countries’ economies leading to concern that trade flows will fragment as production source markets diversify.

COVID-19 has taken the entire country from expansion and opportunity to recession within three months. While short-term economic implications reflect obvious economic distress, long-term ramifications for US logistics and manufacturing sectors are notable. For example, with decreased gasoline demand, ethanol production has also

decreased, and because carbon dioxide is a by-product of ethanol, the beverage industry is seeing increased costs and supply constraints. The virus has also highlighted:

- US production gaps in protective equipment (PPE) a majority of which is no longer made domestically.
- Supply chain impacts due to reduced demand for oil; production of carbonated gasses has been impacted and prices have increased.
- Weaknesses in food supply chains.
- Dependence on China specifically for pharmaceuticals/drug supplies, according to recent reporting by the Wall Street Journal.

3.5 E-Commerce and Warehouse Demand

In the past decade, E-Commerce has moved beyond being a new business model to a major force impacting retail and industrial markets and consumer spending. For Amazon, as well as traditional retailers with an online presence, there is a new kind of industrial property, the fulfillment center, often covering in excess of 500,000 square feet. While plans for package delivery by drone have circulated in the media, the Journal of Commerce (JOC) noted Amazon's decisions to register as a non-vessel-operating common carrier, lease air cargo planes and purchase semi-trailers; all strategies that relate to controlling logistics costs and ensuring timely delivery of goods.

Analysis suggests that for every \$1,000 in retail sales which shifts from brick and mortar to e-commerce, an additional 2.4 square feet of warehouse space is occupied at the expense of retail space. Over time, these shifts will impact local property taxes as fewer new retail stores are built and alter the mix of jobs in retail versus trucking, warehousing, and order fulfillment.

3.6 Intermodal Yards as a Focus for Industrial Development

Containerization of freight has dramatically reduced transportation costs. Trends for containerization are closely linked with recent Class 1 Railroad investments in new intermodal yards. Examples include:

- 2002 – BNSF Logistics Park Chicago (Joliet) – 3 million lift capacity
- 2003 – UP Global III – Rochelle, IL – 720,000 lift capacity, 4,000 parking spaces
- 2005 – UP Dallas Intermodal Yard: 387,000 lift capacity
- 2010 – UP Global IV – Joliet: 500,000 lift capacity, 4,200 parking stalls
- 2010 – UP San Antonio Intermodal Terminal: 250,000 lift capacity, 1,300 parking stalls
- 2011 – CSX Northwest Ohio Intermodal Center: 2 million lift capacity
- 2013 – BNSF Logistics Park Kansas City: 1.5 million lift capacity, 1,800 parking stalls
- 2014 - UP Santa Teresa: 225,000 lifts with capacity for 700,000 lifts, 1,266 parking stalls with capacity for 4,380 stalls
- 2015 – CSX Central Florida Intermodal Logistics Center: 300,000 lift capacity

These higher capacity yards have generated economies of scale for the railroads; they have also significantly altered regional logistics markets. For example, one facet of intermodal facility operation is truck movements into and out of the facility to drop off / retrieve freight containers. One source estimated that the number of truck trips can be 15% to 20% greater than the number of lifts, based on the observation that some trucks will come in empty, but leave with a container, or vice-versa.

3.7 Energy

Since 2010, through processes known as hydraulic fracturing ("fracking"), domestic extraction of oil and natural gas has grown, and prices have fallen. Between 2010 and 2019, resulting growth in domestic production has created interesting consequences. First, energy efficiency measures combined with reduced demand motivated Saudi Arabia and Russia to maintain market share. Covid-linked reductions in oil demand have further exacerbated these

trends, forcing entities such as the Texas Railroad Commission to consider price targets for oil. And second, while the public is very aware of gasoline prices, diesel fuel prices are critical to freight movement. While diesel remains the fuel of choice, there is emerging interest in natural gas and electricity (aligned with battery research) as alternatives to petroleum. As inland ports tend to be locations where a larger number of trucks make predictable round trips, these locations are seeing interest in supporting alternative fueling capacity (both CNG/LNG and battery). Energy continues to be an important topic for Texas, as the state remains highly sensitive to changes in demand for oil, so efforts that lead to future economic diversification will have bearing on the pace of future growth in inland ports such as SDCIP.

3.8 Trends in Port Infrastructure

For the Dallas Fort Worth Region, consequential changes in how freight is moving through coastal ports has bearing on the directionality of freight across the region, and the pace of future growth at SDCIP. In general, the 2016 Panama Canal expansion has had the largest impact on changes in goods movement. Prior to expansion, annual growth in tonnage crossing the canal remained steady around 1% annually; for FY17, tonnage increased by 22%. Increased capacity has also permitted more vessels carrying liquified petroleum and natural gas (grown to 7.9%). One concern relates to sufficient water to sustain vessel draft requirements; recently inconsistent rainfall has raised operational concerns for larger vessels. Beyond the Panama Canal, other changes include:

- Egypt completed an \$8-billion-dollar expansion of the Suez Canal, which opened in early 2016 to allow for two-way transits.
- A small number of US ports have been dredged to the 50-foot post-panama standard, including West Coast ports (LA/Long Beach, Oakland, and Seattle), as well as the East Coast ports of Norfolk and Baltimore. The Port of New Orleans can only support ships that draw up to 45 feet; the Port of Houston is in a similar situation. In 2019, the Port Authority of NY/NJ completed a major project to increase the height clearance of the Bayonne Bridge to allow for post-Panamax ships.
- Mexican ports have made investments (including Lazaro Cardenas) in response to growth in intermodal volumes, but constraints along rail corridors that limit double stack containers are a structural constraint, along with customs clearance and security concerns.

The Port of LA & Port of Long Beach continue to represent the lion's share of US port volumes, although market share has slipped in part due to the Panama Canal expansion, but also due to labor strife and cost of regulation. Both ports are making investments to sustain capacity and market share. Considerations include:

- The need to position for looming environmental mandates for zero port emissions by 2030, under the Clean Air Action Plan.
- Berths are adding automated straddle carriers (APM-Pier 400 is one example) as part of on-going investments to manage costs and streamline inland delivery of containers.
- Ports are expanding on-dock rail capacity to reduce emissions from truck trips and reduce travel time into destination markets. The Port of LA received grant funds to expand on-dock rail capacity on Terminal Island and Pier 400, with a reported 10% increase in overall capacity and reduced impacts on off-port container yards.

While distant from ocean-going ports, that the Metroplex benefits from robust Class 1 rail connections (i.e. UP Sunset Route) reinforces the need to pay attention to these capacity improvements, as they reinforce the preeminent role of the Metroplex as a distribution hub for a rapidly growing Texas Triangle region. Given considerable costs for channel deepening, other port districts are less likely in the near term to alter current supply chain connections.

3.9 Advanced Manufacturing

Our experience with inland ports reinforces that while their initial growth is linked with distribution and warehouse activities, as the scale of warehouse activity grows, manufacturing and final assembly activities tend to follow; with jobs that tend to command higher wages compared to warehouse work. With the nature of US manufacturing changing, it is important to consider how an on-going pivot toward “advanced manufacturing” will impact land use and employment. In general, Advanced Manufacturing has been generally defined as a family of manufacturing activities that:

- Depend on the use and coordination of information, automation, computation, software, sensing, and networking;
- Utilize cutting-edge materials, advanced processes, and emerging capabilities in the physical and biological sciences (nanotechnology, chemistry, and biology).
- Advanced manufacturing production is also Additive; products move through several assembly stages using third party logistics providers, linked by nimble supply chains.
- Are highly aligned with research and development and closely associated with workforces that are strong in STEM fields, including science, technology, engineering, and math.

While the technological enhancements that drive advanced manufacturing are recent, what has not changed is the important reality of end market competitive pressures, where customers are constantly asking suppliers to fabricate or redesign a part faster, cheaper, or lighter. This constant pressure drives manufacturers to pursue capital investments to sustain incremental process improvements (i.e. efforts to make something slightly faster, cheaper, or lighter). It also leads to an infrequent number of far more profound and radical new product innovations, otherwise known as “industrial revolutions”:

- **1.0 Mechanization** of production using water and steam power.
- **2.0 Evolution** of mass production using electrical power.
- **3.0 Digitization** and use of electronics and information technology to automate production.
- **4.0 Collective** embrace of big data, logistics, advanced materials, lean manufacturing techniques, and the “Internet of Things” to create mass customization of production, albeit in shop floor settings that do not look like traditional manufacturing (smaller buildings for example).

While these innovations all eventually disrupted existing markets and created new opportunities, it still took many years to move from proof of concept to commercial marketability, a reality which remains true today. Our research shows that there are several distinctions about the now unfolding 4th Industrial Revolution related to “Advanced Manufacturing” that are critical for Dallas:

- Manufacturers are evaluating new enabling technologies (3D / Additive Printing) and advanced materials (powdered metals, composites, nanotubes, adhesives) in their manufacturing processes as they pivot toward new and evolving end-market opportunities.
- The unfolding revolution in energy costs is impacting sectors that rely on natural gas as a feedstock for production processes, but also sparking innovation in energy storage and renewables, as manufacturers seek to gain a measure of control over their utility bills.
- As quality expectations are already consistently high, companies are compelled to compete on price and contemplate purchase of capital equipment to increase capacity. This reality has implications for state incentives for manufacturing, which remain linked to job creation.

The pivot to advanced manufacturing activities is already unfolding across the Metroplex, supported by growth across a host of sectors, aerospace in particular.

3.10 Negative Externalities

For communities, sustainability questions associated with freight movement are also moving to the forefront. As freight tends to concentrate in metropolitan areas, awareness of “negative externalities” has emerged, related to air emissions / air quality, including particulates associated with diesel emissions (PM 2.5), congestion resulting from “run-through” and “last mile” freight movements, and broader social justice, health, and equity concerns – although these equity concerns have largely remained absent from recent regional transportation planning efforts. While sustainability arguments have not gained universal traction, there are realities about the relative efficiency of different modes of freight movement (Table 2). From an efficiency standpoint:

Table 2. Freight Mode Emissions

Mode	Average Capacity (Tons)	Average Capacity (Volume)	CO ₂ Emissions (Grams Per Ton-Mile)	PM-10 Emissions (Grams Per Ton-Mile)
Barge (Inland Towing)	1,500 tons of cargo	52,500 bushels of volume	15.62	0.0056
Rail	112 tons of cargo (rail car)	4,000 bushels of volume (rail car)	21.19	0.0075
Truck	26 tons of cargo	910 bushels of volume	154.08	0.05

Source: AECOM; National Waterways Foundation & Texas A&M, 2014

Trucking companies have been looking into alternative fuels, specifically compressed / liquefied natural gas (CNG / LNG), in part to reduce the amount of particulate emissions (pm2.5) that otherwise tend to be generated by diesel-powered trucks. The driver from an infrastructure standpoint are fueling stations that can be built through partnerships with trucking companies and other, generally public sector operators of fleet vehicles. Regions are pursuing the formation of “low emissions zones”, with one example in London (UK) beginning to achieve a shift toward lower emissions vehicles for deliveries.

4. Inland Port Perspectives

The following section presents an overview of various trends and considerations related to inland ports across the US. The Southern Dallas County Inland Port does not stand alone on a national scale; rather, it follows a well-worn path of intermodal-anchored ports that have seen significant growth in manufacturing and industrial development, anchor tenant clustering, freight movement increases – and direct rail and transit implications. If other US inland ports serve as a roadmap, we can better understand the challenges, opportunities, and policies that can be proactively put into place as the SDCIP, and the greater Dallas region, continues to grow.

Growing warehouse demand in coastal ports (East Coast and in Southern California) has led to increased costs and shortages of space. To relieve congestion, private developers and state governments are investing in various types of inland ports to directly move containers away from the coasts for storage and distribution. Manufacturers are increasingly demanding short haul rail moves as an alternative to trucking, with large manufacturers like BMW serving as anchor customers to get facilities off the ground. Rail moves directly to and from seaports both hedge against cost increases in trucking and at marine ports while also offering higher productivity and reliability.

Recent changes in federal hours of service regulations for truck drivers have made some drayage trips more costly than similar rail moves, and broader cost growth in trucking may improve the relative attraction of short haul rail moves to inland distribution centers going forward. Sources such as the Journal of Commerce indicate that a truck move from the Buffalo / Syracuse area to the Port of New York and New Jersey, for example, is more difficult to make in a single 8-hour period, adding the cost of an overnight stop that would not be required by a rail move. Rail-

served inland ports are also part of a growing trend placing distribution centers closer to cities. Rising costs in trucking, growing freight volumes, and congestion at coastal ports are creating demand for inland ports and inland intermodal facilities. Several large inland ports have opened over the last decade, and other inland intermodal terminals have seen major expansions and investments from Class I railroads.

The initial benchmark for a “best in class Inland port” was established at Alliance in Fort Worth (BNSF), and by UP and BNSF in Will County, IL. In both places, intermodal yard investment was leveraged to support adjacent warehouse and manufacturing capacity. These earlier projects have been replicated in other markets where a similar formula is being used:

- 2013 – BNSF Logistics Park Kansas City: Initial 500,000 lift capacity
- 2014 - UP Santa Teresa: 225,000 lifts with capacity for expansion to 700,000 lifts
- 2015 – CSX Central Florida Intermodal Logistics Center: 300,000 lift capacity

Recent Class I Railroads’ embrace of “precision railroading” has resulted in closure of older traditional hump yards in favor of flat yards where blocks of cars can be swapped more efficiently. The inland port trend thus far has largely grown on the East Coast, with major feeder marine ports like Savannah, Charleston, and PONYNJ.

But inland ports are not just an East Coast phenomenon, as similar developments are now emerging in places like Tucson, Arizona and Santa Teresa, New Mexico. Less competitive trucking markets on the West Coast, along with growing warehouse costs in Southern California, may drive further inland port development in Arizona and New Mexico in the coming years.

Class I railroads have made major investments to accommodate and serve inland ports. Several expansions have taken place in East Coast ports to increase on-dock rail capacity to quickly move containers to inland facilities, such as the Georgia Port Authority’s “Mega Rail Terminal” project. In the Southwest, Union Pacific directed over \$400 million in private funding over the last decade to build their Santa Teresa, NM intermodal ramp.

4.1 Taxonomy of Inland Ports

A few distinct types of inland ports are emerging, largely driven by their distance from the marine ports and existing industrial developments in their surrounding areas. A handful of these ports are either publicly managed with well-defined jurisdictional boundaries or are private developments with published geographic boundaries (Joliet, San Antonio, Alliance Texas, and Dallas). As such, the data below reflects industrial space and activity within those boundaries, but actual industrial activity around the inland port is larger.

4.1.1 “Relief Valve” Ports

Several inland ports have been created as so-called “relief valves” for large marine seaports. This trend began in earnest on the East Coast, as the capacity of coastal facilities were strained by freight growth. Containers are unloaded at seaports and immediately moved by rail between 100 to 300 miles inland to be processed for further transit or stored in warehouse and distribution districts that grow around inland facilities. Some facilities exist purely to transload cargo for moves to other destinations while larger facilities have storage on-site or nearby.

The first wave of inland ports was largely funded and managed by state government agencies. The South Carolina Ports Authority, in addition to operating large coastal ports around Charleston, has opened two inland ports – Inland Port Greer and Inland Port Dillon – over the past few years. The Georgia Ports Authority, looking to ease congestion around the Port of Savannah, opened the Appalachian Regional Port in Crandall, with a direct 388-mile rail link to Savannah. The Port Authority will open a larger facility in Gainesville, GA next year with a similar purpose.

Several common characteristics among this type are:

- Public facilities tend to be 50-100 acres and only include an intermodal facility, while private facilities are master-planned and hundreds of acres in size.
- Direct connection to marine ports via short haul rail lines that replace lengthy, expensive trucking routes
- Often set up in consultation with inland clients and anchor users already in mind
- On the East Coast, inland ports have smaller footprints and scattered independent industrial development surrounding them.
- Emerging facilities on the West Coast have tended to be larger private developments.

When built to replace longer truck drayage routes, the savings offered by a rail connection to a satellite inland port can be substantial. A study commissioned by New York State found that a rail link from the Port of New York and New Jersey to an inland port in Central New York would reduce costs per container by up to \$500. The authors found the typical truck route to cost between \$1,000 and \$1,300, which could be reduced to \$700 via rail plus \$100 for local drayage moves to final destinations. In the survey, they found firms were concerned with the national shortage of truck drivers, new hours of service regulations for drivers, and expected increases in freight volume.

Table 3. Relief Valve Ports

Facility	Location	Year Opened	Feeder Port	Annual Container Capacity	Site Size
Inland Port Greer	Greer, SC	2013	Charleston	143,000*	50 AC
Virginia Inland Port	Fort Royal, VA	1989	Norfolk	60,000	161 AC
CSX DeWitt**	Syracuse, NY	2020	NY/NJ	30,000	43 AC
Northeast Georgia Inland Port**	Gainesville, GA	2021	Savannah	150,000	104 AC
Appalachian Regional Port	Crandall, GA	2018	Savannah	50,000	42 AC
Port of Tucson	Tucson, AZ	2004	LA/Long Beach	150,000	767 AC***

*Actual lifts, FY2019, **Not yet open, ***Size of entire development
Source: AECOM Research and Analysis, 2020

4.1.2 Historic Warehouse and Trucking Hubs

Another batch of inland port facilities have emerged further from the coast in areas with existing logistics, trucking, or warehousing hubs. These inland ports have tended to be large, high-capacity developments built out in areas with ample highway access. Kansas City is a major hub for inland ports and similar rail facilities. The area is conveniently located at the intersection of four interstate highways, allowing quick access to major cities in the Midwest, Mountain West, and South. The region is now host to multiple intermodal ramps. A nonprofit, KC SmartPort, has been leveraging the region's history as a transportation hub to attract freight investments to the area.

Table 4. Historic Truck and Storage Hub Ports

Facility	Location	Year Opened	Annual Container Capacity	Site Size
Santa Teresa	Santa Teresa, NM	2013	225,000	2,200 AC
Logistics Park Kansas City	Edgerton, KS	2013	750,000	430 AC rail facility on 1,700 AC site
Will County	Joliet/Elwood, IL	1989	1,500,000*	785 AC UP facility and 770 AC BNSF facility

*Actual lifts, 2018
Source: AECOM Research and Analysis, 2020

4.1.3 Integrated Air, Rail, and Truck Ports

A final type of inland port is the most diversified in the functions it performs and the modes of freight movement. These large, integrated inland ports are either directly affiliated or otherwise heavy users of nearby airports, moving freight via air, rail, and truck. They tend to be privately-owned, master planned developments. Intermodal yards on these developments tend to be 200-500 acres within much larger industrial parks. In some cases, these ports are located near or around former air force bases, such as Port San Antonio, which is redeveloping the Kelly Air Force Base on the southwest side of the city. In other cases, they are simply highly integrated with large regional airports, such as in Dallas or Charlotte.

The two largest of this type of port – the Southern Dallas County Inland Port and Alliance, Texas in nearby Fort Worth – are massive, master planned developments encompassing logistics, manufacturing, office space, and even some housing development. Each of these developments are home to well over one million square feet of manufacturing space in addition to tens of millions of square feet for both distribution and warehousing.

Table 5. Integrated Inland Ports

Facility	Location	Affiliated Airport	Year Rail Facility Opened	Annual Container Capacity	Site Size
Midwest Inland Port	Decatur, IL	DEC	2013	150,000	280 AC
International Inland Port of Dallas	Dallas Metro Area	DFW	2005	387,000	360 AC UP facility in 6,000 AC site
Alliance Texas	Fort Worth, TX	AFW	1992	1,000,000*	500 AC intermodal facility within 9,600 AC logistics hub
Port of San Antonio	San Antonio, TX	SKF	2008	20,000	350 AC UP facility on 1,900 AC site
Rickenbacker	Columbus, OH	LCK	2008	260,000	175 AC on 1,777 AC site
Charlotte Regional Intermodal Facility	Charlotte, NC	CLT	2014	200,000	200 AC

*Average actual lifts per year

Source: AECOM Research and Analysis, 2020

4.2 Case Studies

On a national scale, the SDCIP is the first- to second-fastest growing inland port in the country, since 2010. Given the unique nature of inland port facilities such as SDCIP, additional case studies have been developed to provide additional context regarding key facilities which will have bearing on the future performance of the South Dallas area. These case study ports are included in Table 6, below.

Table 6. U.S. Inland Port Case Studies

Facility	Year Opened	Developer/ Operated By	Affiliated Rail Connection	Site Size	Annual Capacity	Surrounding Industrial Space	Designated Foreign Trade Zone?
Santa Teresa, NM	2004	Private	Union Pacific Sunset Route	2,200 Acres	225,000	2.5 million SF of surrounding industrial space (additional 224,000 under construction). Area is master planned for	Yes

						an additional 10 million SF. Overweight Zone allowing trucks to carry 96,000 pounds of cargo instead of the typical 80,000 pounds.	
Port of Tucson (Tucson, AZ)	2004	Private	Union Pacific Sunset Route	767 Acres	150,000	3.3 million SF of surrounding industrial space, including 1.2 million SF of warehouse space	Yes
Inland Port Greer (Greer, SC)	2013	South Carolina Ports Authority	Norfolk Southern	50 Acres	143,000 rail lifts	2.3 million SF of surrounding industrial space, including 1.3 million SF of manufacturing space	No
Port of San Antonio (San Antonio, TX)	2008 (rail facility)	Port Authority of San Antonio	BNSF and Union Pacific Sunset Route	1,900 Acres (35-acre rail yard)	20,000 rail lifts	5.3 million SF of industrial space, including 1.3 million SF of manufacturing space	No

Source: AECOM, 2020

4.2.1 Santa Teresa, New Mexico

Figure 5. Santa Teresa Gateway Rail Park



Source: [Ironhorse Resources](#)

The Santa Teresa rail hub opened in 2014 after receiving over [\\$400 million of private investment](#) from Union Pacific for a terminal that can currently handle 225,000 containers per year with capacity to build out to 700,000. The 2,200-acre UP property includes a refueling station, intermodal ramp, and crew change buildings. Since opening, this increasingly strategic rail hub has been able to integrate shipments from Mexico with intermodal cargo flows between Los Angeles, Dallas, and Chicago.

Two miles south, between the rail hub and the port of entry is a 1,200-acre master planned development called the Santa Teresa Gateway Rail Park, a growing rail-served industrial park that transloads cargo from truck to rail and vice versa to cross the Mexican border. The park transloads wind blades, corn syrup, grain, and scrap metal, among other commodities. While 800 miles from the Port of Los Angeles and the Port of Long Beach, public officials and

developers around the intermodal hub are pitching the area as a lower-cost alternative to coastal warehousing and distribution options.

4.2.2 Port of Tucson (Tucson, Arizona)

Figure 6. Port of Tucson



Source: Pima Association of Governments, Tucson Regional Economic Opportunities, Arizona Daily Star, 2020

The Port of Tucson is a privately developed 767-acre development located along Union Pacific’s Sunset Corridor line on the southeastern side of the city. The developer bought up land in the area throughout the 1990’s before opening a UP terminal in 2004. The area was home to a handful of modest manufacturing facilities before the intermodal terminal was opened, but industrial space grew rapidly leading up to and in the years immediately after it began operations. Between 2000 and 2019, the area around the port added 170,000 square feet of industrial space per year, on average. In 2001, it saw seven new facilities totaling over 1.1 million square feet of new industrial space, most of which is owned by the developers around the port.

In 2013, the port received a federal TIGER Grant for a major expansion that will ultimately raise its capacity to about 150,000 container lifts per year. That same year, it also began receiving international freight. Currently, the port

receives freight both from Mexico and from the Ports of Los Angeles and Long Beach. Beyond rail, the port facility also receives between 13,000 to 15,000 trucks per year, according to its developers. Recently, the area saw a major boost as Amazon acquired 94 acres to build an 855,000 square foot distribution facility that opened last year.

4.2.3 Inland Port Greer (Greer, South Carolina)

Figure 7. Inland Port Greer



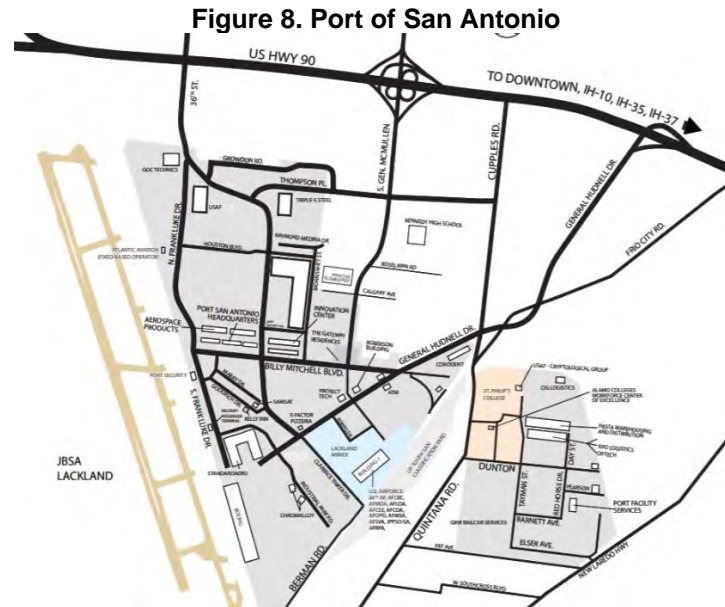
Source: CenterPoint Properties

Rapid freight growth at the Port of Charleston in South Carolina over the last decade has created congestion and built demand for inland port facilities. The South Carolina Port Authority has met that demand with two inland ports: one in Greer and another in Dillon. As a result, the number of containers shipped out of Charleston via rail has grown from 85,000 in 2009 to 350,000 today. Much of this traffic has been directed to Greer.

Greer is home to the largest BMW manufacturing plant by volume in the world. BMW currently manufactures about 400,000 vehicles per year at the Greer plant, with plans to increase production to 450,000. The plant previously relied on roughly 50 two-way truck trips per day from the Port of Charleston to haul parts to the plant and send back finished vehicles. Now it sends thousands of finished vehicles per week to Charleston via a Norfolk Southern rail line, which has been more reliable and allowed the company to cut CO² emissions. According to South Carolina Ports Authority executive director, the rail move is more attractive compared to a drayage move.

While the facility was built to serve the BMW plant as its priority, other business soon followed. Just three years after opening, non-BMW business already made up the majority of Inland Port Greer's volume. After the port opened, industrial space in the surrounding area dramatically expanded, with local firms adding 1.9 million square feet since 2013.

4.2.4 Port of San Antonio (San Antonio, Texas)



Source: [Port Authority of San Antonio](#)

Kelly Air Force base in San Antonio was closed as a part of the Base Realignment and Closure (BRAC) Commission’s round of base closures in 1995. As it was gradually shuttered in subsequent years, control of its campus was transferred to a special development authority, becoming Port San Antonio. The Air Force maintains a footprint on-site and still employs thousands of workers. The Authority took advantage of the base’s gradual closure to turn over hangers and facilities to private-sector manufacturers like Boeing, Lockheed Martin, and StandardAero. Many existing workers employed by the Air Force were able to transition to these private-sector jobs thanks to careful planning by the Authority.

As a result, Port San Antonio has a rich manufacturing base that employs thousands of workers and uses well over one million square feet of industrial space within its confines. In all, more than 80 companies employ over 14,000 workers on the port’s campus. The port has a handful of clusters and specializations, including cybersecurity, aerospace, defense, logistics, and manufacturing. The Port recently opened a 90,000 square foot building tailored specifically to cybersecurity firms, with redundant power sources and SCIF (Sensitive Compartmented Information Facility) capabilities. The Department of Defense occupies multiple facilities within the Port, including Building 171, a 450,000 square foot building tailored to DoD needs.

4.2.5 Key Takeaways

Our case study analysis of inland ports highlights the following implications for SDCIP:

- Inland ports which leverage immediate access to larger Class 1 Railroad intermodal ramps appear capable of dramatic growth in industrial space (capacity to add > 1 million sf per year).
- It is important to distinguish between developer-driven projects on discrete sites, versus larger inland port districts (which include Will County and South Dallas) that cover multiple sites.
- As inland port districts expand, truck traffic will increase in step, so local connections to interstates need to be studied, to ensure that existing routes can remain congestion free.

5. Freight Plan Review

The Project Team conducted a review of previous and existing planning efforts relevant to freight/goods movement in Southern Dallas County and the Southern Dallas County Inland Port (SDCIP). This plan review seeks to help identify existing conditions, deficiencies, opportunities, and future improvements of the region's freight network. The following reviews are organized by study year, starting with plans most recently finalized.

5.1 Texas Statewide Truck Parking Study, 2020

The Texas Department of Transportation (TxDOT) recently identified a statewide truck parking shortage in a previous 2018 study. The 2020 Texas Statewide Truck Parking Study further analyzes truck parking needs across the state. According to the study, Dallas is home to over 2,000 truck parking spaces. Even so, demand for parking often exceeds capacity during peak parking hours (1am-2am) – especially in the southeast Dallas area near the SDCIP on I-20, I-35, and I-45. When a parking shortage occurs at the end of a driver's shift, the driver must often choose to park illegally or drive illegally to find a legal parking space, becoming a potential public safety hazard to themselves and other motorists.

The need for parking is growing rapidly. Without investment in additional truck parking by 2050, the demand for parking spaces will be at 170 percent of current capacity. Key findings and recommendations regarding truck parking in the Dallas area are listed below:

- The volume of freight moved by truck is expected to grow by 80% to 2.3 billion tons by 2040
- Dallas is the highest priority location in the state of Texas for truck parking needs in 2050
- In Dallas, more than 100 trucks are parked daily in unauthorized spaces that are in the right of way
- Truck drivers prefer parking at private truck stops instead of state-maintained truck stops due to the limited amenities at many public stops
- TxDOT suggests a collaboration with planning partners to examine the feasibility of truck parking at non-TxDOT public facilities and private facilities that have large parking lots
- Identification of truck parking needs before additional developments are built in the SDCIP area will mitigate congestion and create a safer environment for all drivers
- Additional signage may be needed at SDCIP truck facilities that do not regularly reach capacity but are in proximity to other at-capacity facilities, giving truck drivers more options for legal parking

5.2 Dallas Intermodal Transportation Facility Fatal Flaw Analysis, 2019

Lockwood, Andrews & Newman, Inc. conducted an analysis on fatal flaws and challenges associated with transportation connectivity and economic development at the proposed Texas Central Railway Intermodal Transportation Facility (ITF). The location of the potential high-speed rail (HSR) facility is east of the Trinity River and south of I-30, adjacent to the Dallas Convention Center. The location is just north of the SDCIP and seeks to create a "one-stop shop" for commerce and all transportation modes. While high-speed trains typically serve as transportation modes for freight goods added high-speed connectivity to Houston provide additional regional mobility opportunities for passengers in both locations.

The study found no fatal flaws for the proposed ITF site and recommends moving forward with an ITF feasibility study to develop rail station concepts to further evaluate project development and implementation. Key findings are listed below:

- Existing Core Express, freight, and passenger rail corridors as well as surrounding roadway and utility infrastructure create a supportive environment for the ITF and potential high-density development
 - Study findings imply that the proposed ITF is feasible and should move on to next steps in the project process which may have future implications for SDCIP activity

- The proposed rail alignment runs parallel to I-45 through Hutchins, Lancaster, and Wilmer; while the HSR alignment contains three proposed stops (Dallas, Brazos Valley, and Houston), the SDCIP's proximity to the rail line and ITF presents an opportunity for increased opportunity for regional mobility and should be considered in future analysis
 - The SDCIP contains the Union Pacific Railroad (UPRR) Intermodal Terminal which provides direct access to the existing Union Station/proposed ITF site

5.3 TxDOT Metroplex Freight Mobility Study: Phase 1 Freight and Passenger Rail Integration Study, 2019

This plan reviews the NCTCOG rail system plan for both passenger and freight movement and gives a review of the current conditions and the proposed projects in the region. In addition, the plan reviewed the relevant models in the north Texas region and found them to be both accurate and valid. The plan proposes improvements to the network to reduce rail delay. Plan improvements are primarily focused on increasing passenger service between the areas of Irving and Prosper. However, the plan also designates several key nodes in the region and addresses strategies to improve travel throughout the region, such as reducing rail delay, which would positively impact the SDCIP. The plan concludes that all of its proposed improvements do not have an adverse effect on freight operations.

5.4 NCTCOG Truck Parking Study: A Freight North Texas Study, 2018

Truck parking is a concern in the North Texas region. The plan reviews parking conditions for freight trucks in 2018 and makes recommendations for increasing the availability and quality of truck parking in the region. North Texas is the intersection of many freight corridors with rail, air, and trucking modes of transportation. The area near the SDCIP has two rest stops capable of holding truck traffic, multiple overnight truck parking facilities, and many fuel center options for freight traffic. The study calculated the truck capacity for I-20 and I-45 (the two interstates that intersect at the SDCIP) as 10,395 and 13,984 respectively. A survey was given to drivers to decide what amenities they desired in the area. Results suggest drivers desire an increase in long-term parking near the SDCIP. I-20 and I-45 were both designated as corridors of concern when looking at the current parking facilities and local land use laws. Further efforts should be made to increase both long- and short-term parking in the areas around the SDCIP. Key recommendations of the study include:

- Retrofitting state historic picnic and rest areas to accommodate trucks
- Parking in unused TxDOT and other publicly owned areas
- Creating Safety Rest Areas with truck parking
- Altering truck parking ordinances to be more truck parking friendly
 - Requiring on-site parking for freight-focused facilities for short-term parking only
- Conducting a Land Use Study to create more compatible land uses around Freight-Oriented Developments (FOD)
- Opening the I-45 weigh station to truck parking when not in use
- Clearly defining where drivers can and cannot park in freight-focused areas using signage and ordinances
- Allowing staging in freight-focused areas
- Increasing parking near the existing Love's Truck Stop at Fulghum Rd. and I-45, with at least 50 long- and short-term spaces

5.5 TxDOT Freight Mobility Plan, 2017

The TxDOT Freight Mobility Plan analyzed the statewide freight system. Importantly, while this plan did not specifically mention the SDCIP, it did address key trends for freight travel in and through Texas. The statewide tonnage of freight transported for Texas is projected to double by the year 2045. Employment and population are expected to grow along with freight in the region. Stakeholders were engaged to vote on criteria for project

prioritization. The Dallas area stakeholders ranked increasing the Truck Travel Time Reliability Index for the region as their top priority. It was estimated that congestion costs \$406 million per year in the Dallas-Fort Worth area.

5.6 NCTCOG Freight Congestion and Delay Study Final Report, 2016

NCTCOG conducted an analysis on the challenges and delays that exist within Dallas County freight transportation systems. Two of the focus areas in the analysis included the Alliance Texas Port and the SDCIP, showcasing the different challenges and advantages between the two ports. The NCTCOG also provided practical solutions to improve the efficiency of freight deliveries in each focus area. Key findings are listed below:

- Both ports are concentrated in areas of FOD, and Alliance's surrounding area includes over 150 freight-oriented facilities
- Superb logistics systems are required for both ports to efficiently move freight between modes
- The SDCIP focus area contains 29% more intersections that require low radius right turns than the Alliance focus area
- Correcting roadway geometry to reduce low-radius turns will prevent damage to vehicles and make turning easier and faster for truck drivers
- Truck routes in the SDCIP focus area are routed through 13 more railroad crossings than the Alliance focus area routes
- Rebuilding, updating, or closing railroad crossings can allow for quicker freight movement

5.7 International Inland Port of Dallas (IIPD) Update Report, 2015

A study by the City of Dallas Economic Development Committee detailed possible growth opportunities for the Inland Port with the addition of the BNSF Intermodal port. The potential port would be located just south of I-20 and east of SH 342 in the South Dallas area. Due to the nearby Union Pacific South Dallas Intermodal port on I-45, several warehouse developments already exist, including major tenants such as L'Oreal, Whirlpool, Quaker, Unilever, Conns Appliance, Home Depot, Serta/Dormae, Amazon, Mars, and others.

The existing industrial development provides a prime location for the future BNSF intermodal port. However, despite the prime location, the BNSF intermodal facility is not as likely to be developed unless demand volumes increase and traffic congestion in the area decreases. Key findings regarding the potential BNSF port are listed below:

- The amount of developed space in the port area essentially doubled from January 2014 to November 2015 (from approximately 16 million square feet to more than 30 million square feet)
- The property value of port developments rose approximately 90 million dollars from 2011 to 2015
- The City of Dallas will actively promote the area to other industrial developers in pursuit of a strong market for the potential BNSF port
- Funding for the development was obtained through a public-private partnership that garnered 419 million dollars from federal, state, county, and municipal entities
- The City of Dallas will support Foreign Trade Zone (FTZ) designations as needed, [lessening fees and taxes on potential businesses](#)
- Infrastructure improvements (such as [Loop 9](#) and [the water line from Lancaster to Wilmer](#)) will mitigate traffic congestion in the area and provide the high water pressure that manufacturing businesses need

5.8 NCTCOG Freight North Texas, 2013

NCTCOG developed a freight inventory for the regional freight system to identify existing conditions, strengths, and opportunities. The document serves as a guide for future policies, programs, and projects to help improve the region's freight network. Key findings are listed below:

- Key freight assets within the South Dallas County area include I-20, I-35E, I-45, and UPRR

- Dallas County's access to key freight assets allows for 480 million tons of goods to be handled within the county annually
- Trucks are the most utilized mode of freight transportation in the region (83%), and the region relies heavily on trucks to deliver nonmetal mineral products, gasoline, food products, and wood products
- Three Class I railroads exist in the NCTCOG Metropolitan Planning Area (MPA), one of which has an intermodal terminal within the SDCIP boundary (UPRR)
 - The UPRR intermodal terminal contributes to over one million intermodal transfers annually
- Dallas County exists within the Barnett Shale formation (an onshore gas field) and contains pipelines which transport commodities associated with the oil and gas industry (e.g. gasoline, natural gas, water, other fuel oils)
- The Dallas Intermodal Terminal, located in Hutchins/Wilmer, has an annual lift capacity of 365,000 containers
- Freight system strengths include strong multimodal infrastructure, large population base and workforce pool, and FTZ designations
 - Weaknesses include I-35E congestion, lack of public awareness on freight issues, and policies focused on passenger traffic
 - Opportunities include fast-growing population and increased global trade
 - Threats include increased road and rail congestion, funding shortages, and aging infrastructure
- Quickly-implementable freight projects were identified for current system issues:
 - Add turn lanes/widen lanes
 - Extend and restripe existing lanes
 - Extend ramps and add auxiliary lanes
 - Add traffic signals and channelization
 - Add warning signs and reduce speeds
 - Improve intersection layouts
 - Install and upgrade signals
 - Revise parking restrictions and add truck parking

5.9 NCTCOG Southern Dallas County Infrastructure Analysis, 2012

NCTCOG performed the Southern Dallas County Infrastructure Analysis (SDCIA) in response to the region's significant industrial/light industrial development. All work was conducted in partnership with the cities of Dallas, Ferris, Hutchins, Lancaster, and Wilmer, along with Dallas County. The analysis details the inventory of existing infrastructure and provides implementation recommendations with the intent of creating an integrated SDCIP able to accommodate and spur regional growth. For this plan review, only the transportation infrastructure analysis was reviewed. Key findings are as follows:

- Due to growth potential and increasing passenger and freight travel, roadway capacity expansion must be prioritized. Other recommended roadway improvements include shoulder widening, ITS integration, and additional fueling locations.
- Key improvements focus on east-west arterials to provide connectivity to freight centers and I-45, including Wintergreen Rd., Pleasant Run Rd., and Belt Line Rd.
- The analysis also recommends capacity improvements for north-south arterials such as Bonnie View Rd. and Lancaster-Hutchins Rd. to enhance connectivity to I-20
- A new roadway alignment connecting the SDCIP area to Lancaster Airport and the City of Ferris
- Available rail capacity over time will more likely be strained by passenger rail travel than by demand from the SDCIP
 - Support capacity may need to be developed with any additional intermodal facility infrastructure

- The analysis detailed policy and design strategy needs to address unreliability and inaccessibility concerns, listed as follows:
 - Context sensitive solutions
 - Access management strategies
 - Intersection design criteria (truck aprons, traversable islands, grade-separated crossings)
 - Enhanced signage practices
 - Freight-Oriented Development (FOD)

5.10 TxDOT Statewide Freight Resiliency Plan (Phases I & II), 2011

The TxDOT Statewide Freight Resiliency Plan, Phases I and II, assess the statewide freight network and the level of resiliency based on differing disasters. The plan in Phase I determined whether the SDCIP is at risk for the potential disasters as described in chart below.

Table 7. SDCIP Disaster Risk Assessment

Potential Disasters	Is the SDCIP at Risk
Earthquake	No
Flood	Yes
Landslide	Yes
Hurricane	No
Man Made Disaster	Yes
Tornado	Yes
Wildfire	Yes
Wind	Yes
Winter Storms	Yes

Source: TxDOT Statewide Freight Resiliency Plan, 2019

The South Dallas County area is in a **medium risk location** according to the resiliency plan analysis.

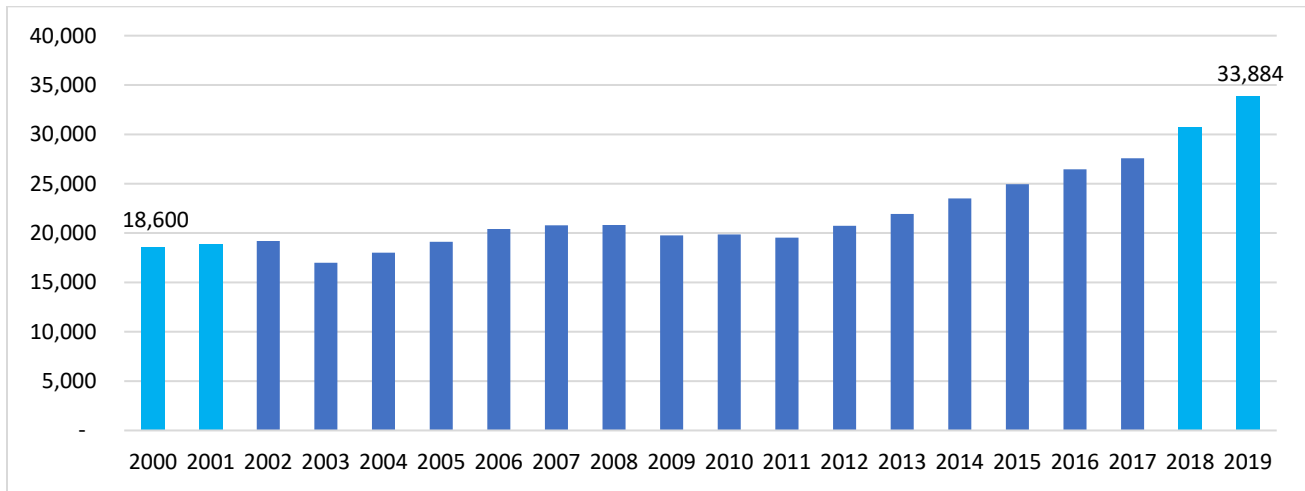
6. Southern Dallas County Inland Port Market Analysis

The below market analysis examines industry trends, job growth, manufacturing, warehousing and distribution space availability and deficiencies, land use, and the origin and destination of goods traveling via freight networks through the Southern Dallas County Inland Port and larger Dallas-Fort Worth metro area freight zone.

6.1 Job Growth

Along with its nearly 93,000 residents, as of 2019, the Southern Dallas County Inland Port Study Area (Inland Port/SDCIP) includes 33,900 total jobs, more than 15,000 of which are in the industrial and manufacturing sectors. In the past two decades, the area has seen a net increase of 15,300 new jobs – including more than 14,000 added since 2010 (Figure 5). Since 2012, the port has seen an average net job growth between 1,000 and 1,500 jobs per year. Per Figure 6, since 2010, the Inland Port has added jobs at an annual growth rate (6.1%) that is greater than both Dallas County, the 19-county Dallas-Fort Worth CSA/Freight Zone, and the US. The port also accounts for 3% of the County's resident labor force and almost 2% of the County job market. 17% of all Dallas-Fort Worth CSA growth between 2010 and 2019 occurred in the Inland Port.

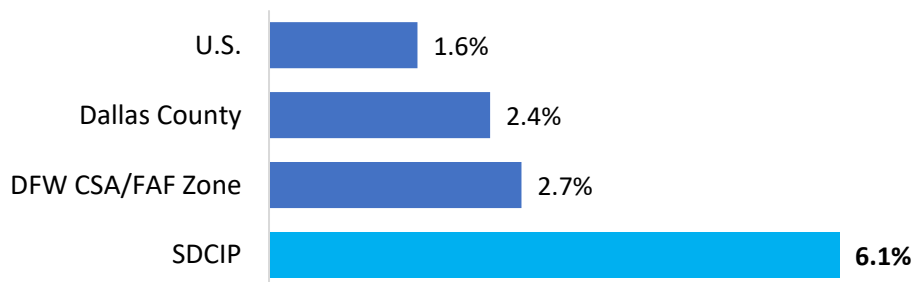
Figure 9. Inland Port Job Growth



Source: US Census OntheMap (Private Primary Jobs), ESRI 2020

Note: Job count data is only available for the period from 2002 to 2017 through the US Census, and current year through ESRI proprietary business data. Data for 2000, 2001, and 2018 are estimated projections, calculated using pre- and post-recession growth rates.

Figure 10. Comparative Employment Growth (2010-2019)



Source: EMSI, ESRI, US Census, 2020

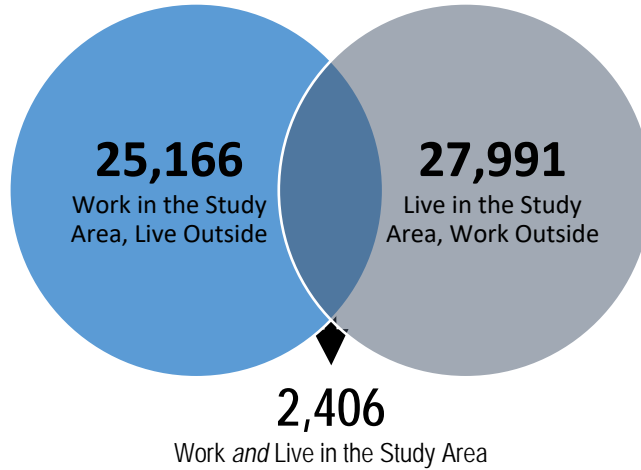
Census data can also provide a snapshot of where Study Area workers live and work, as seen in Table 4 and Figure 7. As of 2017, the port has seen a net outflow of 2,825 jobs. The outflow indicates a larger resident labor force than local workforce – or a larger population of residents that leave the study area for work than workers commuting into the study area.

Table 8. Inland Port and Dallas County Labor Market

Selection Area Labor Market (2017)	Inland Port	Dallas County	Share
Living in the Selection Area (Labor Force)	30,397	962,135	3.2%
Employed in the Selection Area	27,572	1,440,027	1.9%

Source: US Census OntheMap, 2020

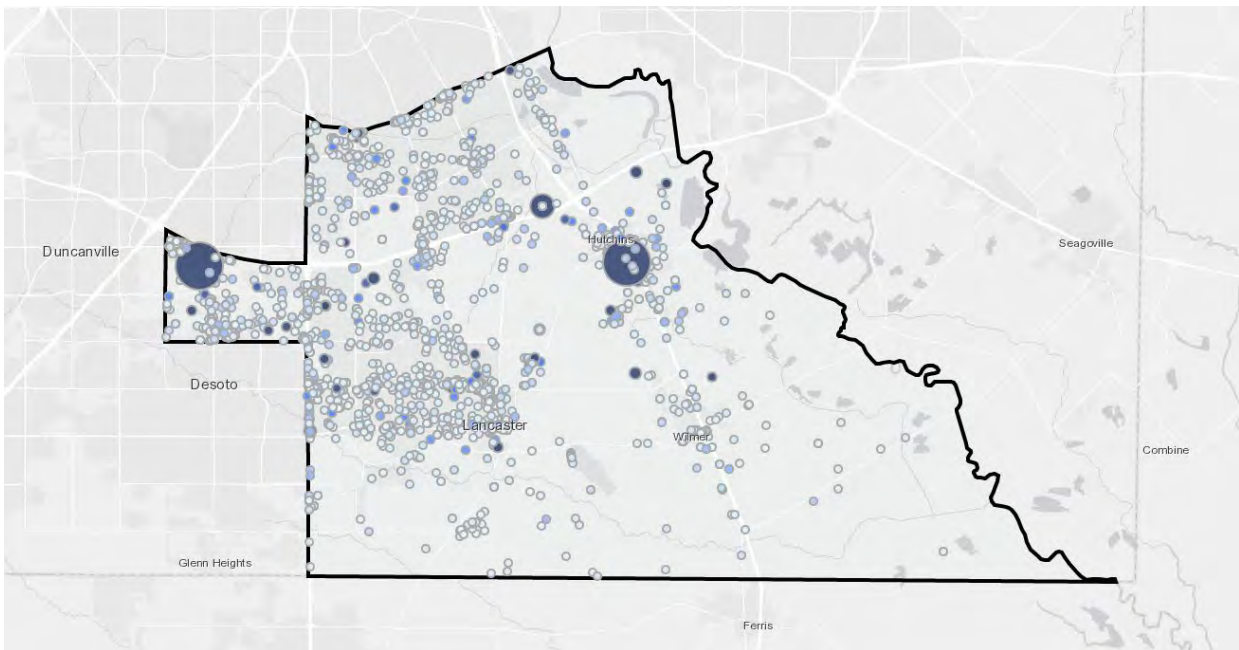
Figure 11. Inland Port Job Inflow/Outflow (2017)



Source: US Census Bureau OntheMap, 2020

The Inland Port is characterized by significant industrial, manufacturing, warehouse and distribution, and fulfillment center employment. Key major employers include Amazon, Taylor Communications, Walmart, FedEx, Proctor & Gamble, Kohl's, Home Depot, United Natural Foods, Shippers Warehouse, and Brass-craft.

Figure 12. Inland Port Employment Concentrations



Source: ESRI Business Analyst, 2020

6.2 Industry Trends

Looking to ESRI and NCTCOG on data for current employers in the region, business listing data indicates a total of 33,059 jobs in the SDCIP area as of 2019, a slight increase from available Census projections. Of all industrial sector employment in the inland port, manufacturing, wholesale, transportation and warehousing, and e-commerce (i.e.

Amazon fulfillment centers) make up close to half – or 46% - of total jobs. Manufacturing accounts for almost a quarter (23%) of all port employment, with Transportation and Warehousing accounting for 12% of all jobs. With recent growth in Fulfillment Centers on a national and local scale, including an increasing Amazon footprint, three E-Commerce businesses account for more local employment than all 81 Wholesale businesses combined.

Table 9. Inland Port Industrial Employment Clusters

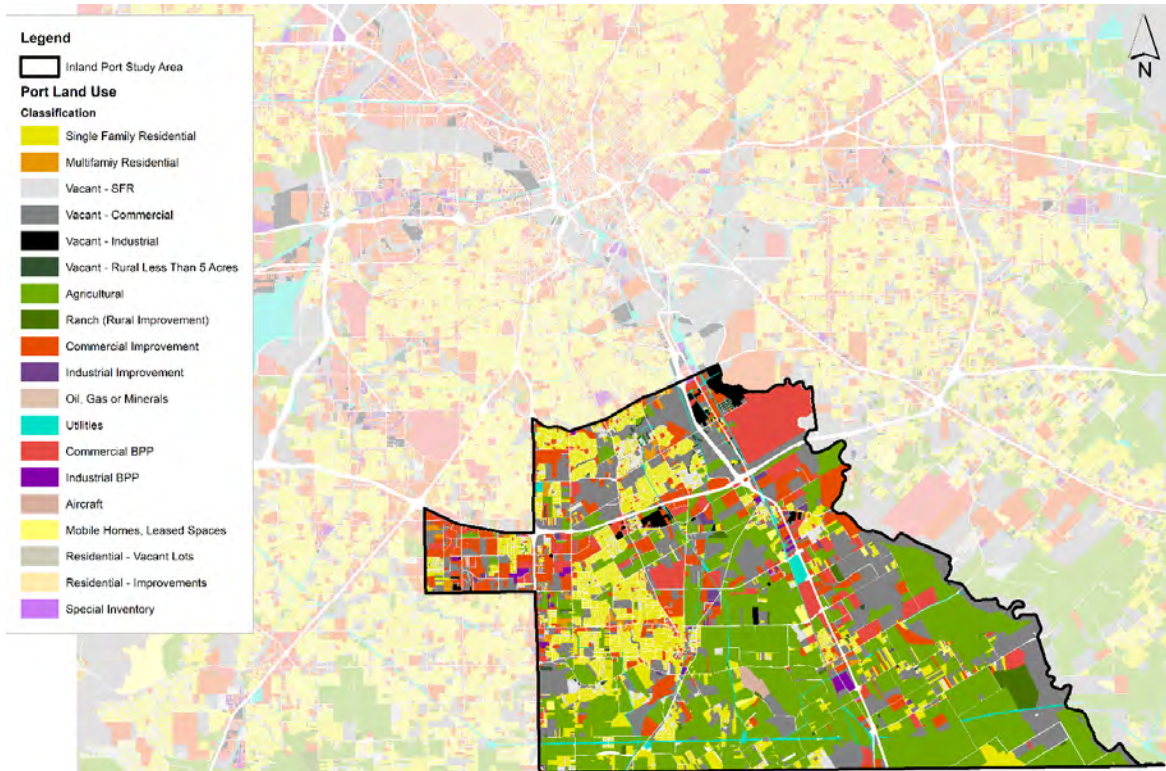
Industry Cluster	2019 Businesses	2019 Employment	Employment Share of Total Port
Manufacturing	81	7,497	23%
Wholesale	81	1,868	6%
Transportation & Warehousing	117	3,924	12%
E-Commerce	3	1,903	6%
Total	282	15,192	46%

Source: NCTCOG, ESRI Business Analyst, AECOM Analysis, 2020

6.3 Land Use

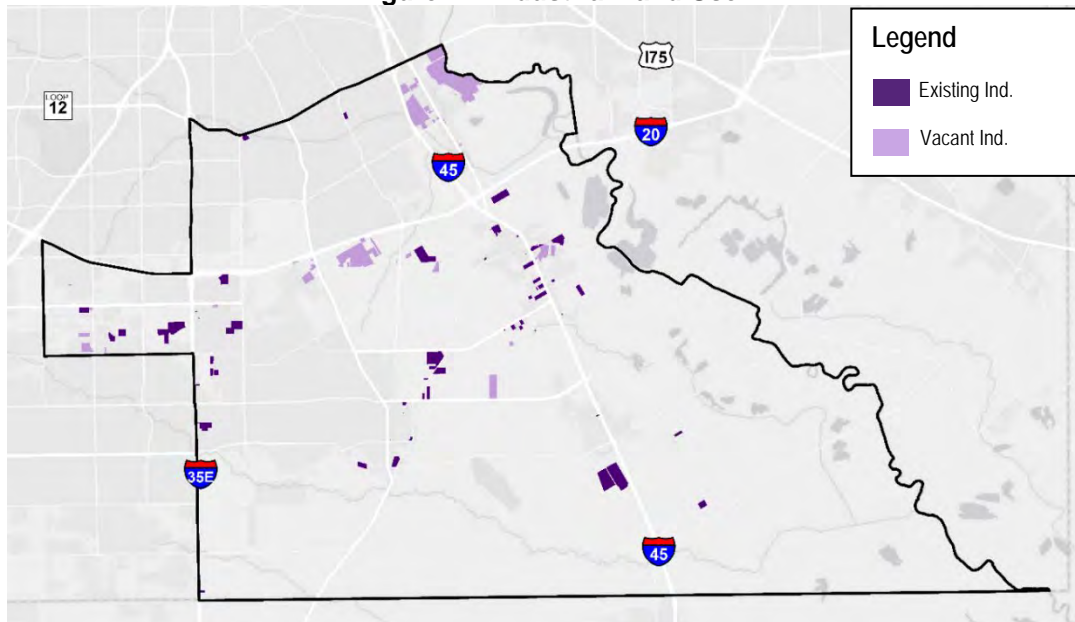
The SDCIP is characterized by significant commercial and industrial uses, residential land use clustered in the northwest portion of the area (Figure 9). While the Dallas Central Appraisal District (DCAD) land use data indicates only 800 of acres of land in the SDCIP area currently designated as “vacant industrial,” there is significant land currently designated as agricultural – 26,500 acres, or about one-third of the total inland port land area. AECOM’s GIS analysis indicates 26,625 of total vacant industrial and agricultural parcels greater than five acres. In context with recent demand for industrial space absorbing about 230 acres per year since 2010, 26,000 acres would represent more than 110 years of future industrial development. In practical terms, however, the scale of modern industrial buildings (often in excess of 750,000 square feet), future planning will need to appreciate the capacity of SDCIP to sustain absorption of more than 2,000 acres every 10 years.

Figure 13. Land Use



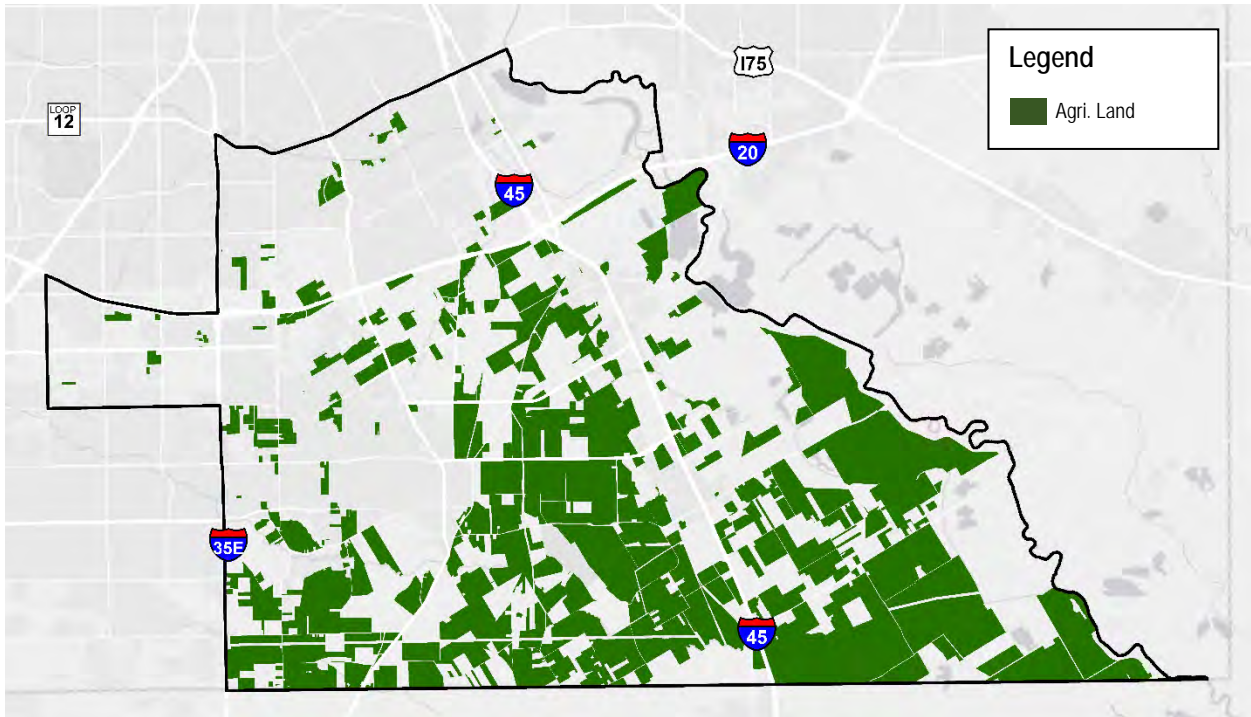
Source: DCAD, 2019

Figure 14. Industrial Land Use



Source: DCAD, 2019

Figure 15. Agricultural Land Use

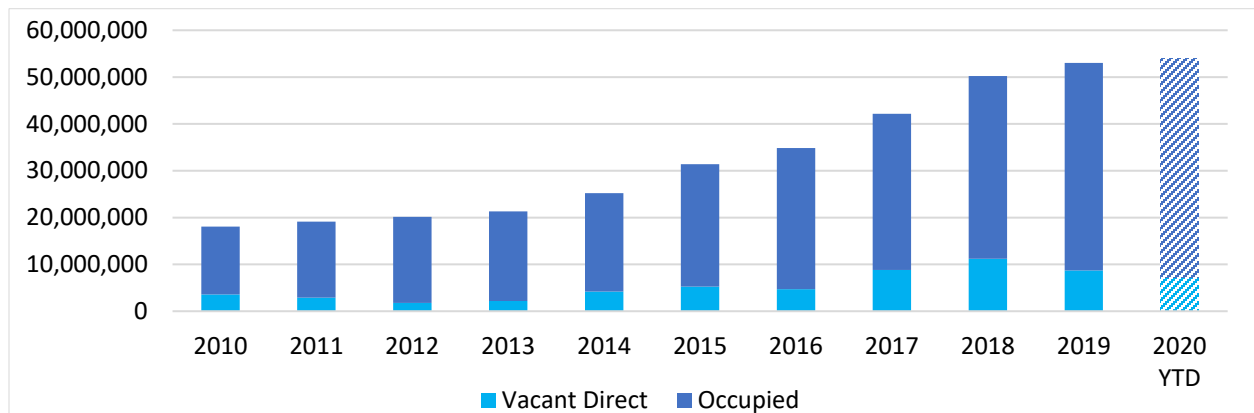


Source: DCAD, 2019

6.4 Market and Real Estate Analysis

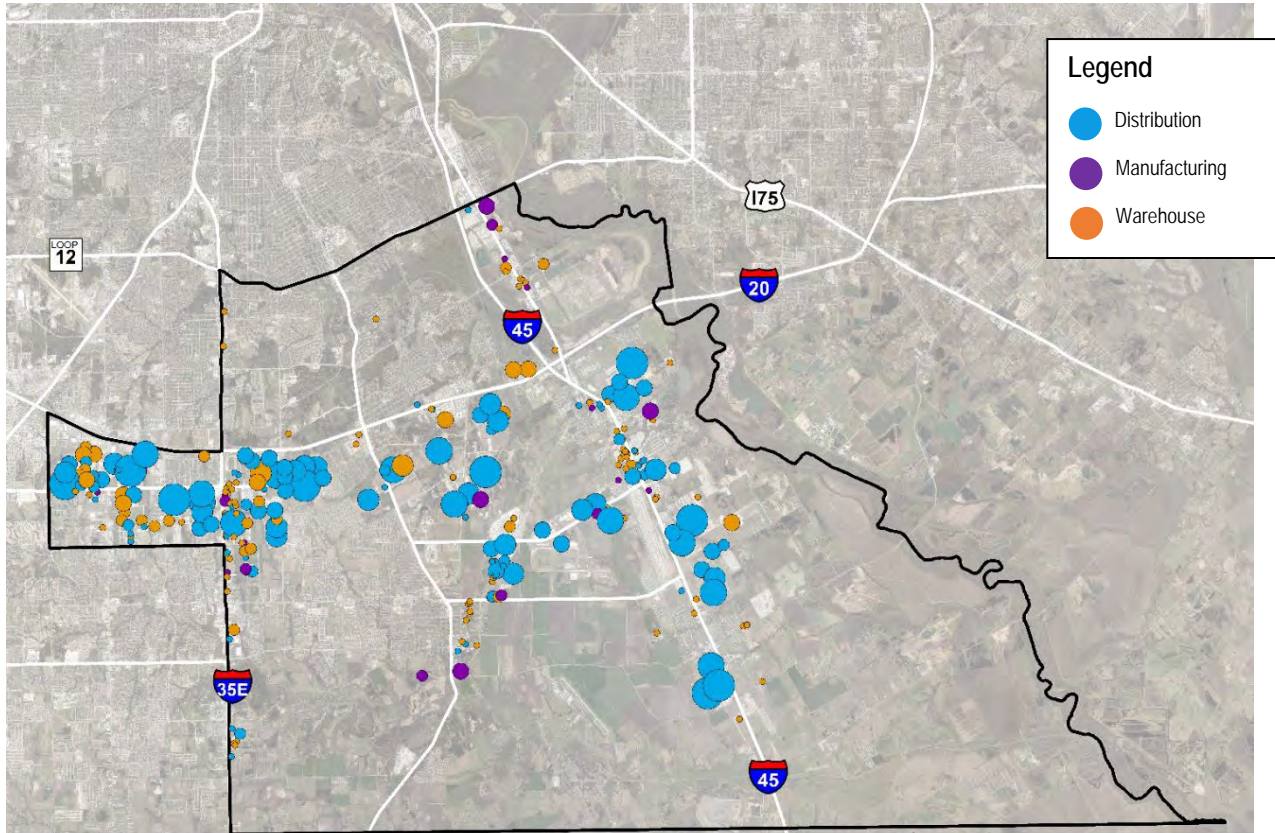
In addition to job growth, the SDCIP has seen rapid growth in industrial development and occupied square footage (Figure 12). Across the port, 70% of all Rentable Building Area (RBA) square footage (25 million square feet) was constructed between 2010 and 2019, and 90% of all square footage within the inland port area has been developed in the past two decades. Nearly all of the new industrial construction since 2010 has been distribution space – 22.4 of the total 25 million square feet of new construction between 2010 and 2019 was industrial distribution space.

Figure 16. Total Inland Port Industrial Square Footage



Source: CoStar, 2020

Figure 17. Industrial Property (Rentable Building Area) by Type and Size



Source: CoStar, 2020

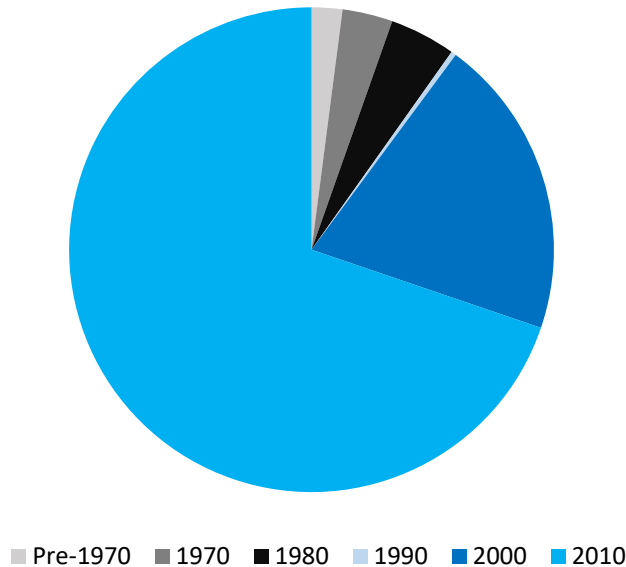
Table 10. Industrial Inventory by Type

Port Study Area	2019 Total SF	2019 Share of Total (%)	2010 Total SF	2010 Share of Total (%)	CAGR 2010-2019
Warehouse	7,429,804	14%	4,644,742	26%	5%
Manufacturing	1,808,519	3%	1,439,019	8%	3%
Distribution	42,528,275	80%	11,201,582	62%	16%
Other Industrial	1,275,590	2%	798,890	4%	5%
Total Industrial	53,042,188	100%	18,084,233	100%	13%
Adjacent Cities*	26,243,892	-	11,633,046	-	9%

Source: CoStar, 2020

*Adjacent Cities include Cedar Hill, DeSoto, Duncanville, and Lancaster. Portion of adjacent cities bucket includes the Inland Port study area. The areas are not mutually exclusive.

Figure 18. Port Industrial Square Footage by Decade of Construction



Source: CoStar, 2020

Note: Does not reflect 730,000 SF constructed YTD in 2020 or 55,600 SF with unknown decade of construction.

Table 11. Industrial Inventory by Decade of Construction and Type

Inventory (SF RBA)	Pre-1970	1970	1980	1990	2000	2010
All Industrial	724,976	1,187,778	1,558,954	117,340	7,106,860	24,692,703
Manufacturing	455,062	607,523	200,599	-	-	322,000
Warehouse	211,608	178,984	207,275	49,400	945,375	1,703,953
Distribution	54,668	401,271	1,095,591	67,940	5,722,080	22,361,750
Other	3,638	-	55,489	-	439,405	305,000

Source: CoStar, 2020

Table 12. Industrial Inventory by Share of Dallas-Fort Worth CSA/Freight Analysis Zone (FAF)

Geography	2019 Total SF	2019 Share of DFW (%)	2010 Total SF	2010 Share of DFW (%)	CAGR 2010-2019
Port Study Area	53,042,188	6.4%	18,084,233	2.7%	10%
Adjacent Cities	26,243,892	3.1%	11,633,046	1.7%	7%
DFW CSA/FAF	833,935,443	100.0%	679,026,690	100%	-

Source: CoStar, 2020

On average, the vacancy rate of the Inland Port is approximately two times (209%) that of the Dallas-Fort Worth Combined Statistical Area (CSA) (Table 9).

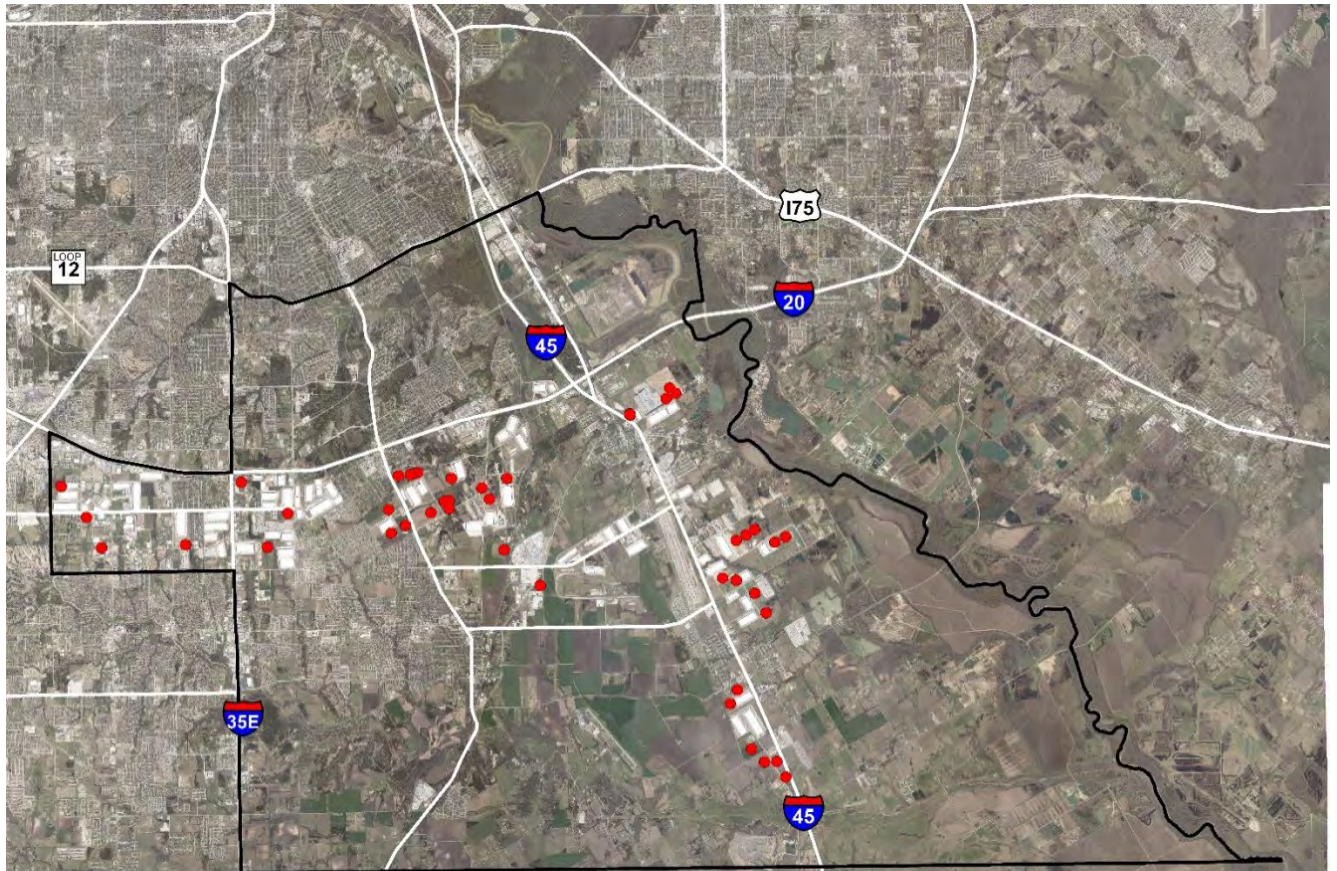
Table 13. Industrial Vacancy Rates

Geography	2019 Vacancy	2010 Vacancy	Net Change	CAGR 2010-2019	5-Year Avg. Vacancy [*]
Port Study Area	16%	20%	-3%	-2%	18%
Adjacent Cities	18.4%	12.9%	5.5%	4%	17%
DFW CSA/FAF	6.0%	10.4%	-4.4%	-6%	6%

Source: CoStar, 2020

*Five-year average is calculated for 2015-2019.

Figure 19. Industrial Proposed and Under Construction



Source: CoStar, 2020

As of 2019, the SDCIP study area had seven industrial properties under construction, including three distribution center projects – and an expansion of the ACE Hardware Distribution Facility – as well as 32 proposed industrial developments in the pipeline (23 million square feet, or 530 acres), for a total of 23.7 million square feet of possible new construction coming to market in the next few years.

In order to calculate relative square feet per employee in the Inland Port area, and larger Freight Analysis Framework Zone (FAF Zone), AECOM analyzed existing employment and real estate trends by industrial and manufacturing clusters.

Table 14. Inland Port Square Feet per Employee

Industry Cluster	2019 Port Employment	Real Estate Cluster	Occupied Square Feet 2019	Vacant Square Feet 2019	Occupied Square Feet/Employee Inland Port
Manufacturing	7,497	Manufacturing	1,742,508	66,011	232.43
Wholesale, Transportation, Warehousing, Ecommerce	7,695	Warehouse + Distribution	41,339,438	8,618,641	5,372.25

Source: ESRI Business Analyst, NCTCOG Regional Employment, CoStar, AECOM Analysis 2020

Table 15. Dallas Fort Worth CSA/Freight Zone (FAF) Square Feet per Employee

Industry Cluster	2019 CSA/FAF Employment	Real Estate Cluster	Occupied Square Feet 2019	Vacant Square Feet 2019	Occupied Square Feet/Employee CSA/FAF Zone
Manufacturing	298,791	Manufacturing	103,600,016	2,336,870	346.73
Wholesale, Transportation, Warehousing, Ecommerce	407,447	Warehouse + Distribution	632,759,564	44,859,098	1,552.98

Source: EMSI, CoStar, AECOM Analysis 2020

The Inland Port averages a relatively smaller SF-per-employee footprint in terms of manufacturer than the 19-county CSA/FAF region, but a larger SF-per-employee footprint for wholesale and warehousing (over 5,000 square feet per employee compared to 1,500 square feet per employee). Two key takeaways are, first, that a majority of inland ports first emerge and then rapidly develop through warehouse and logistics activities, which tend to support a lower density of workers per square foot (generally between 1,200 and 5,000 sf per job). Secondly, as inland port districts grow in scale, manufacturing activity tends to expand due to benefits from growing supply chain connections. Manufacturers tend to support greater densities of workers per square foot (generally between 600 and 1,200 sf per job) often with higher wages. As the South Dallas County Inland Port is still a relatively “new” district, manufacturing activity is only beginning to grow with its boundaries.

7. Southern Dallas County Freight Analysis

As shown above, SDCIP has experienced dramatic growth since 2010, tied to the development of more than 40 million square feet of modern warehouse space. Over time, delivery of modern space is expected to allow inland ports such as SDCIP to capture a larger share of regional goods movement, at the expense of older industrial districts, defined by lower clear ceiling heights, smaller floorplates, and more limited truck docks.

To frame perspectives as to the current share of freight being influenced by SDCIP, data from the US DOT Freight Analysis Framework was leveraged for context. The following tables summarize tonnage trends for the Dallas Fort Worth CSA region, which covers a larger geographic extent compared to the NCTCOG region. In aggregate, the analysis reinforces the prominence of trucks as the primary mover of freight into and out of the Metroplex by mode. Since 2012, tonnage moved by air has seen the fastest growth, along with tonnage linked to multiple modes.

Table 16. Dallas CSA Region, Freight Moving in and Out, 1,000's of Tons

Mode	2012	2020	CAGR
Truck	488,151.756	522,183.249	0.85%
Rail	26,314.303	29,687.721	1.52%
Air (include truck-air)	309.632	420.840	3.91%
Multiple modes & mail	20,185.579	25,071.339	2.75%
Other and unknown	106.701	146.897	4.08%
Pipeline	64,308.456	65,505.071	0.23%
Total Tonnage	599,376.428	643,015.118	0.88%

Source: FAF, 2020

The following table summarizes additional trends related to the breakdown of tonnage by commodity group moved into and out of the region since 2012. While energy product movement has slowed since 2012, other segments have shown consistent growth, particularly in manufacturing sectors.

Table 17. Dallas CSA Region, Tonnage by Commodity Group, 1,000's of Tons, All Modes

Commodity	2012	2020	CAGR
Food	59,488.161	67,953.475	1.68%
Minerals & Metals	21,625.419	24,659.655	1.65%
Chemicals	40,005.834	44,226.765	1.26%
Building materials	91,733.620	94,624.580	0.39%
Energy	218,355.979	214,807.761	-0.20%
MFG	52,073.135	63,442.927	2.50%
Other MFG	94,755.808	111,316.001	2.03%
Recycling	21,338.471	21,983.954	0.37%
Total	599,376.428	643,015.118	0.88%

Source: FAF, 2020

The following two tables summarize tonnage trends by commodity group between truck and rail modes. The table reinforces the scale of energy products moving by truck and rail, as well as chemicals.

Table 18. Dallas CSA Region, Tonnage by Commodity Group, 1,000's of Tons (2012)

Commodity	Truck	Rail
Food	52,993.526	2,619.152
Minerals & Metals	18,811.929	1,693.149
Chemicals	32,844.674	4,916.396
Building materials	87,501.840	1,616.977
Energy	145,098.143	5,399.510
MFG	40,743.177	7,707.417
Other MFG	91,260.803	1,244.619
Recycling	18,897.665	1,117.083
Total	488,151.756	26,314.303

Source: FAF, 2020

Table 19. Dallas CSA Region, Tonnage by Commodity Group, 1,000's of Tons (2020)

Commodity	Truck	Rail
Food	60,333.445	2,952.077
Minerals & Metals	21,283.221	2,025.524
Chemicals	35,643.016	6,032.810
Building materials	90,894.411	1,587.687
Energy	138,372.461	4,939.318
MFG	48,918.289	9,513.118
Other MFG	107,283.602	1,283.339
Recycling	19,454.805	1,353.848
Total	522,183.249	29,687.721

Source: FAF, 2020

The primary challenge in understanding the impact of growing freight volumes is that over short-term periods (i.e. within 12 months), freight volumes can be quite volatile as cargo owners and shippers make tactical decisions to minimize the cost of freight movement, and to respond to seasonal variations in demand. However, over the long-term, freight volumes inevitably grow in line with population and job increases. For SDCIP this reality is highlighted in the following table, which breaks out a subset of freight tonnage for the larger Metroplex region in context with the comparable share of regional warehouse and manufacturing space. Since 2010, while the regional inventory of occupied industrial space increased at a 2.8% annual rate, the amount of occupied space in SDCIP grew at a far stronger 11.9% annual rate.

Placed in context with the share of regional freight moving in and out of the Metroplex since 2012 (an increase from 384 million tons to 433 million tons), and using occupied industrial space as a proxy for share of freight tonnage, it is reasonable to assume a doubling of tonnage moving through SDCIP since 2012.

Table 20. Dallas CSA Region, Freight Moving In and Out, 1,000's of Tons

Commodity	2012	2020	CAGR
Truck	343,053.613	383,810.788	1.41%
Rail	20,914.794	24,748.403	2.13%
Multiple modes & mail	20,185.579	25,071.339	2.75%
Total	384,153.985	433,630.531	1.53%
Regional Occupied Industrial Space	589,806,000	736,360,000	2.81%
Study Area Occupied Industrial Space	17,526,100	43,082,000	11.90%
Study Area Share of Inventory	3.0%	5.9%	8.84%
Study Area Tonnage	11,415.145	25,370.295	10.50%
Truck	343,053.613	383,810.788	1.41%
Rail	20,914.794	24,748.403	2.13%
Multiple modes & mail	20,185.579	25,071.339	2.75%

Source: FAF, 2020

In other words, as the SDCIP's share of regional industrial space has doubled since 2012 (from 3% to nearly 6%), we can see the direct impact of a nearly identical doubling of freight tonnage. AECOM's expectation is that this approach is conservative, in that access to a UP intermodal ramp, combined with the dramatic growth in warehouse space will allow SDCIP to capture more than its fair share of future regional warehouse space in coming years, constrained only by vacant land, infrastructure, and available water infrastructure.

7.1 Future Forecast Implications

In context with historic trends, it is also important to evaluate how statewide freight models evaluate the Texas Metroplex in terms of growth expectations. The project team analyzed changes in traffic volume, freight tonnage, and commodity mix using the Texas Statewide Analysis Model Version 4 (SAM-V4), which provides multimodal travel forecasts and level-of-service performance measures for highway passenger and freight transport, intercity and high-speed passenger rail ridership, freight rail tonnage, and forecasts of air passenger travel associated with the state of Texas. The SAM-V4 provides travel forecasts at a level of detail suitable for use in comparative analyses of statewide systems planning, complex multimodal transportation corridor projects, and other large-scale investments. *Note that the SAM-V4 runs off a different geography than the in-depth market goods movement and FAF freight analysis above and serves to provide a broader context for future implications.*

The model can also be used to perform analyses of the transportation outcomes and economic impacts of state level transportation, land use, and economic policy decisions and strategies. The SAM-V4 includes a 2015 base year and 2050 forecast year, with a 2025 milestone year. To understand the reasonableness of the SAM-V4, 2018 vehicle classification counts (truck counts) from the Texas Department of Transportation (TxDOT) was obtained and compared to the SAM-V4 base and milestone years. After review, the project team found the 2018 TxDOT counts to be comparable to both the 2015 and 2025 outputs. Based on this validation check and the proximity of 2020 to the 2025 milestone year, 2025 is used as a baseline to compare with the 2050 forecast year in this analysis.

7.2 Regional Freight Trends

The following table summarizes expected increases in Vehicle Miles Traveled (VMT) for freight related trucks (freight trucks) and Vehicle Hours Traveled (VHT) for all modes for both the NCTCOG region and Dallas County. VMT is expected to increase by approximately 30 percent for the NCTCOG region and approximately 23 percent for Dallas County. The freight truck VHT in the NCTCOG region is expected to triple, while VHT within Dallas County is expected to increase by almost 70 percent. This county wide increase in VHT will cause additional stress to the transportation system, likely including SDCIP infrastructure.

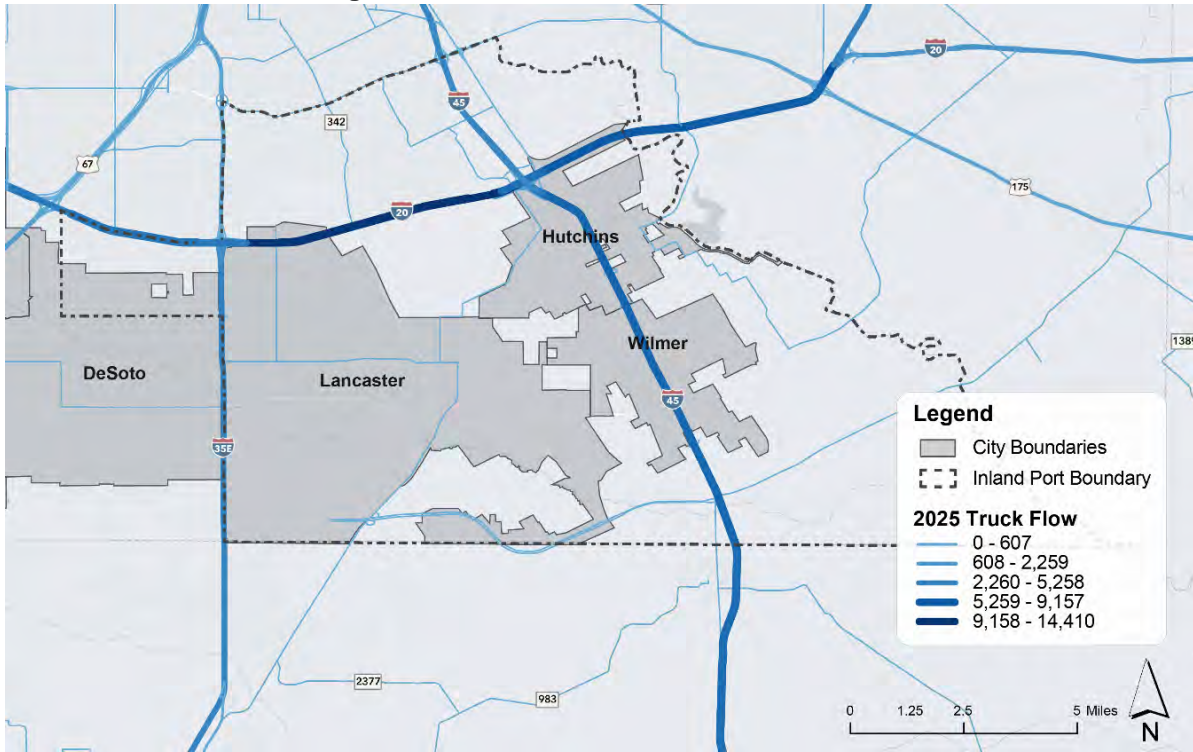
Table 21. 2025 to 2050 changes in VMT and VHT

	Truck VMT Increase	Truck VMT Increase %	Total VHT Increase	Total VHT Increase %
NCTCOG	4,080,285	28.90%	27,349,881	354.50%
Dallas County	789,999	22.90%	1,554,828	69.70%

Source: SAM-V4, 2020

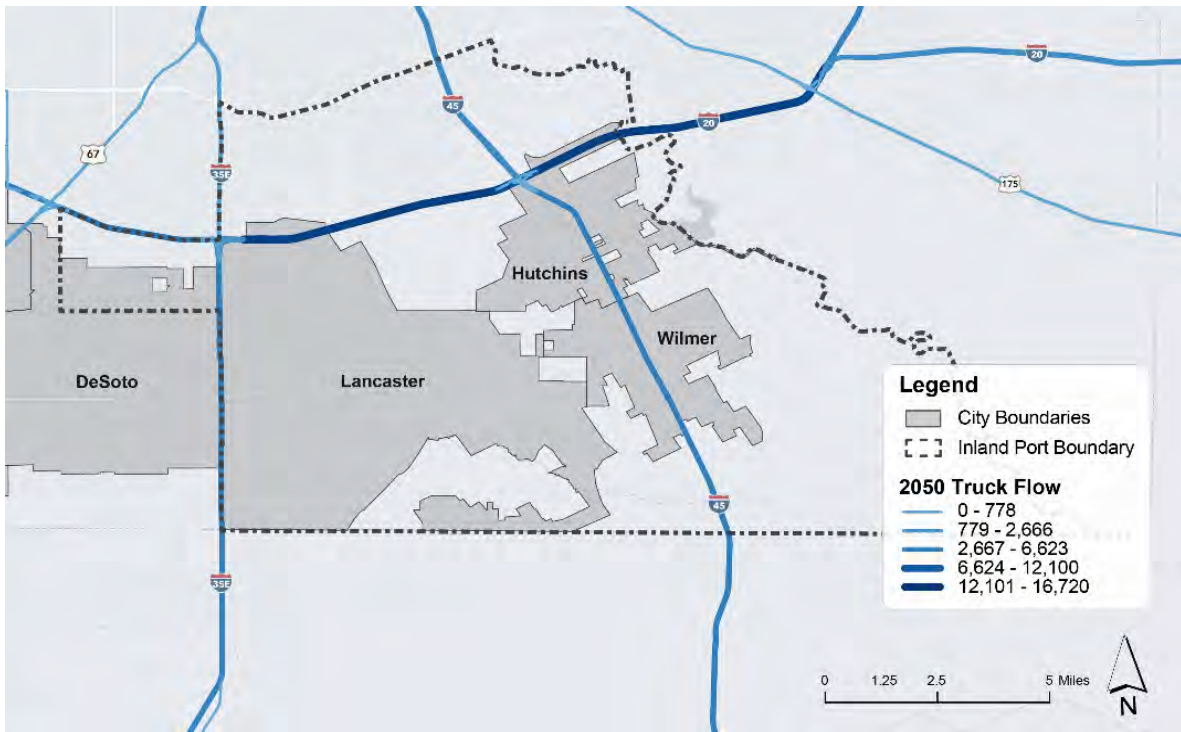
The following figures illustrate how daily truck volumes near the SDCIP for 2025 and 2050. Freight facilities in the SDCIP area are estimated to see an increase in truck travel over the 25-year horizon, and I-20 and I-45 are expected to continue to be primary freight corridors.

Figure 20. Truck Flows near the SDCIP 2025



Source: SAM-V4, 2020

Figure 21. Truck Flows near the SDCIP 2050



Source: SAM-V4, 2020

7.3 Congestion

Congestion has important implications and impacts on the freight industry and was analyzed for the SDCIP area in terms of delay. Expected delay is a metric that serves as a key indicator for where growth will have a substantial impact on travel time. Identifying these areas allows the project team to review corridors for roadway characteristics that may cause certain segments to experience higher expected delay. Further, this knowledge can ensure that the right preventative measures are put in place to combat expected delays.

The following figure summarizes expected system delay in the SDCIP area and highlights where the system may become stressed in the future, suggesting the I-20 corridor is expected to see a high level of congestion by 2050.

Figure 22. Potential Delay near the SDCIP in 2050

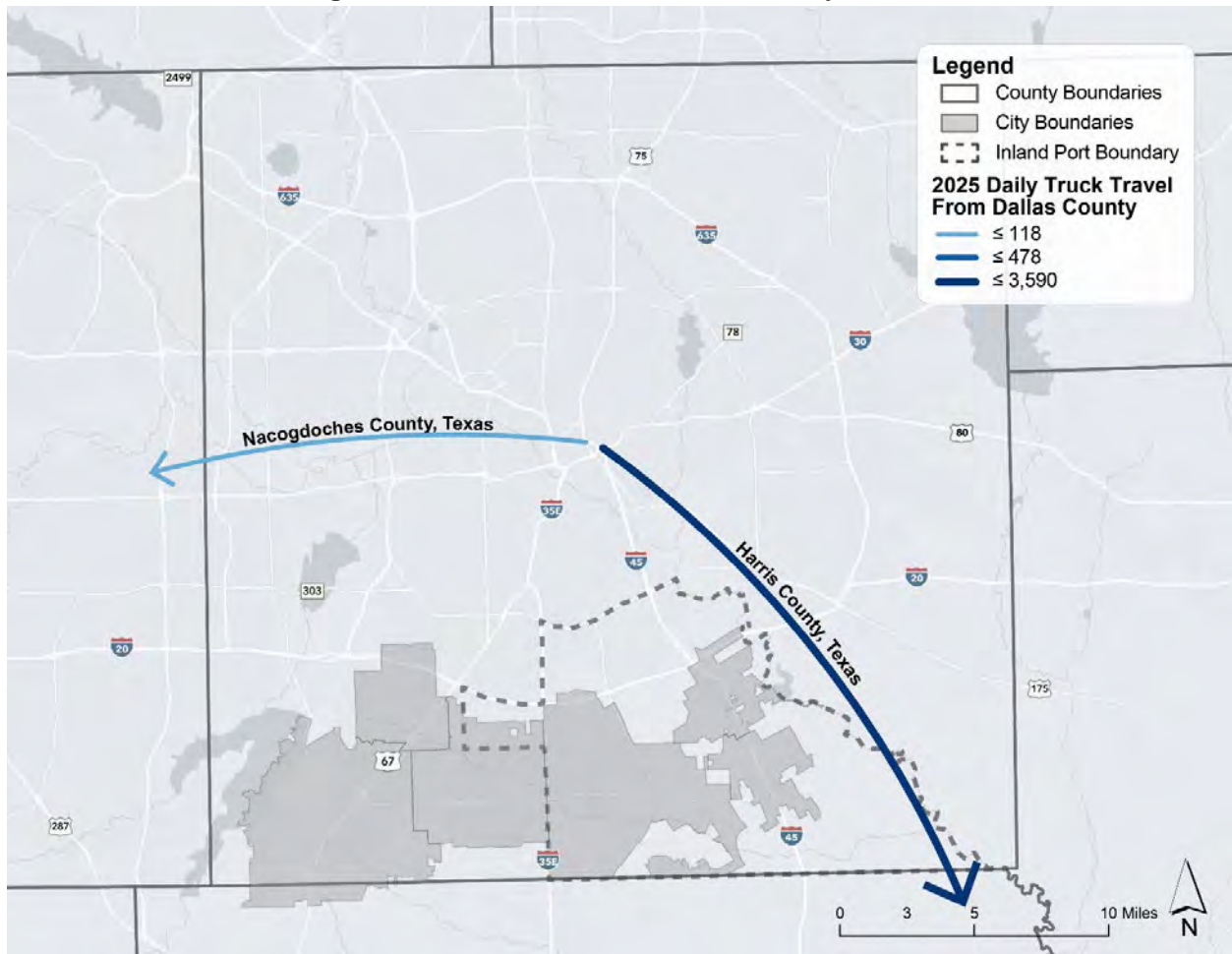


Source: SAM-V4, 2020

7.4 Freight Trips

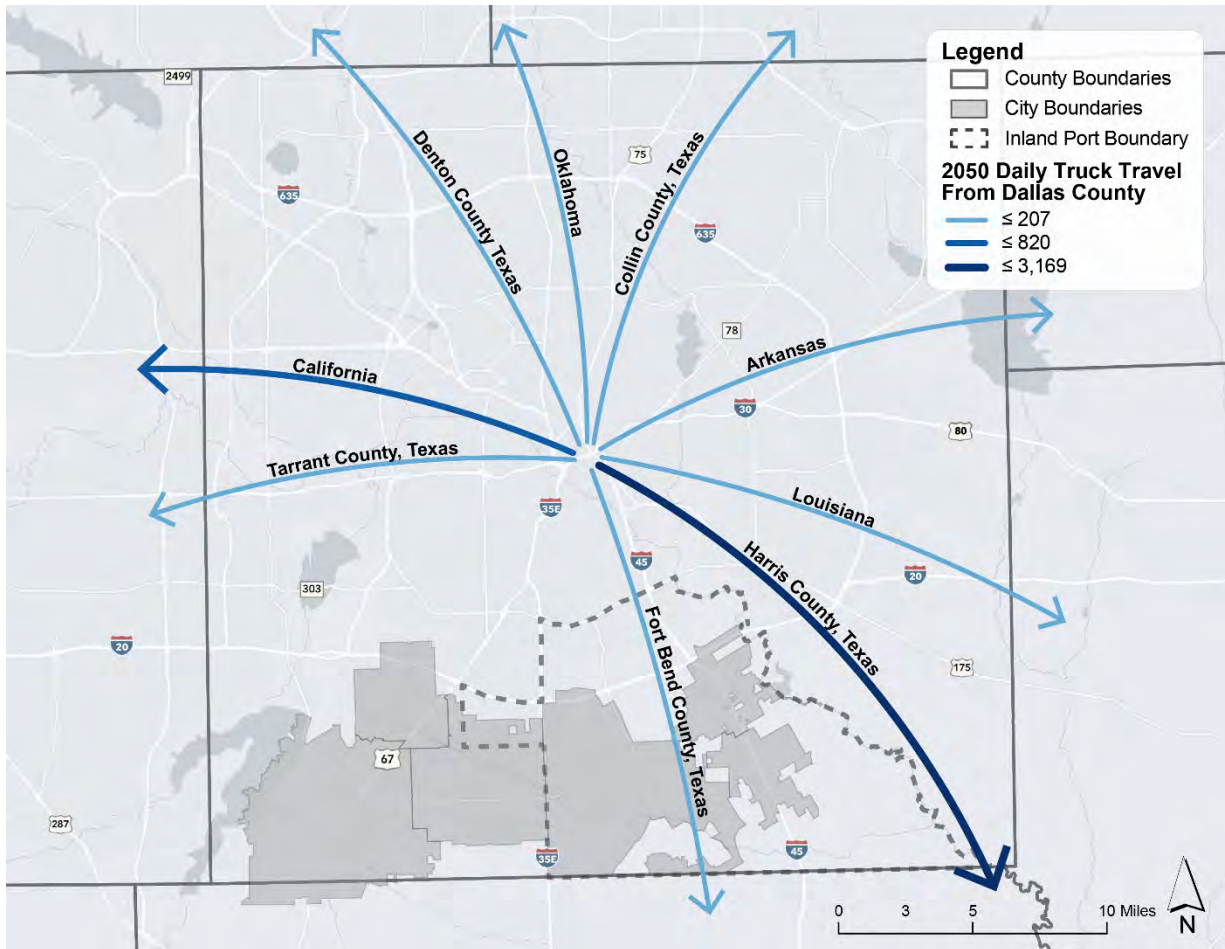
Inbound and outbound truck trips are shown in the following figures. Each line represents a different destination in North America. Analysis shows that outbound freight trips are higher than incoming freight trips to Dallas County. Further, the SAM-V4 suggests that Dallas County is expected to see an increase in tonnage of materials. This projection could lead to increased activity at the SDCIP. The number of destinations receiving greater than one million tons of goods is also projected to increase.

Figure 23. Truck Travel from Dallas County in 2025



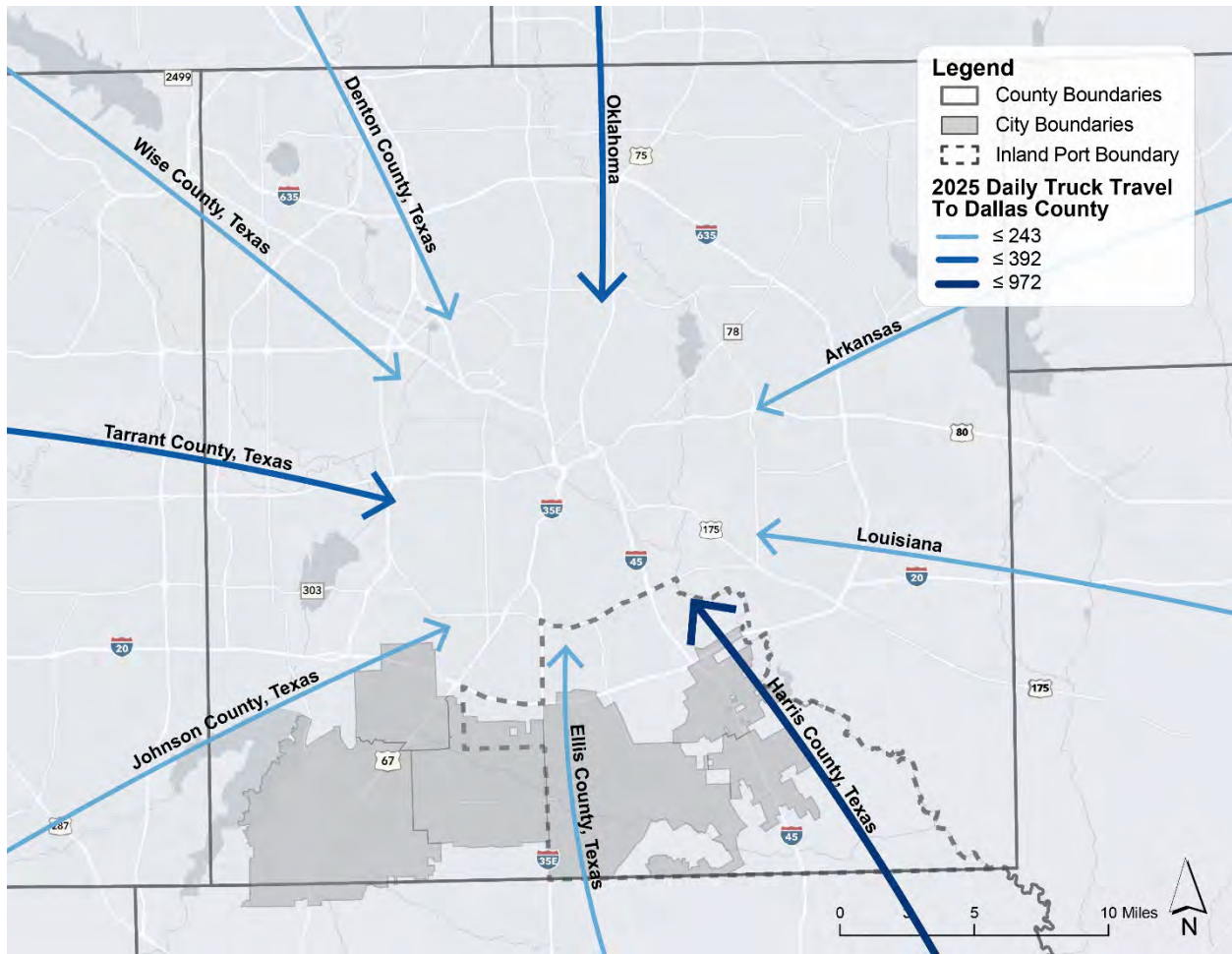
Source: SAM-V4, 2020

Figure 24. Truck Travel from Dallas County 2050



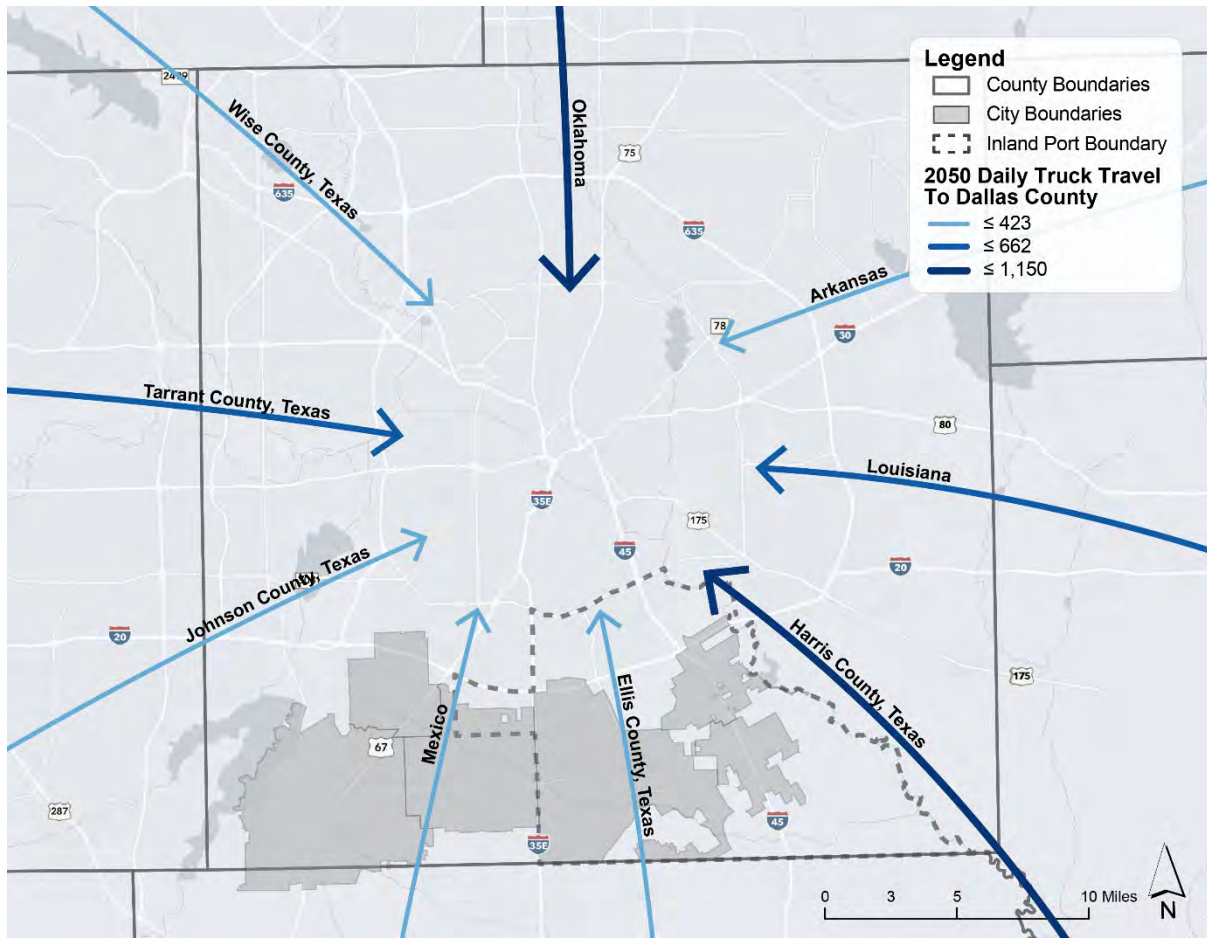
Source: SAM-V4, 2020

Figure 25. Truck Travel to Dallas County 2025



Source: SAM-V4, 2020

Figure 26. Truck Travel to the SDCIP 2050



Source: SAM-V4, 2020

7.5 Goods Movement

Imports and exports in Dallas County are expected to increase by over 27 million tons from 2025 to 2050. Of this 27 million tons, 18 million tons are expected to be imports and 9 million tons are expected to be exports. The following table summarizes predicted modal changes in freight tonnage from 2025 to 2050. Truck, carload, and intermodal rail are all expected to see an increase in tonnage. The increase in truck tonnage is the most significant, as it is expected to increase by over 20 million tons (74% of growth) throughout the South Dallas area. Intermodal rail is expected to see an increase of 3.5 million tons (13% of growth). Connections to three major railways (Union Pacific, Burlington Northern-Santa Fe, and Kansas City Southern) will help the SDCIP reach most of the US market and accommodate the expected growth.

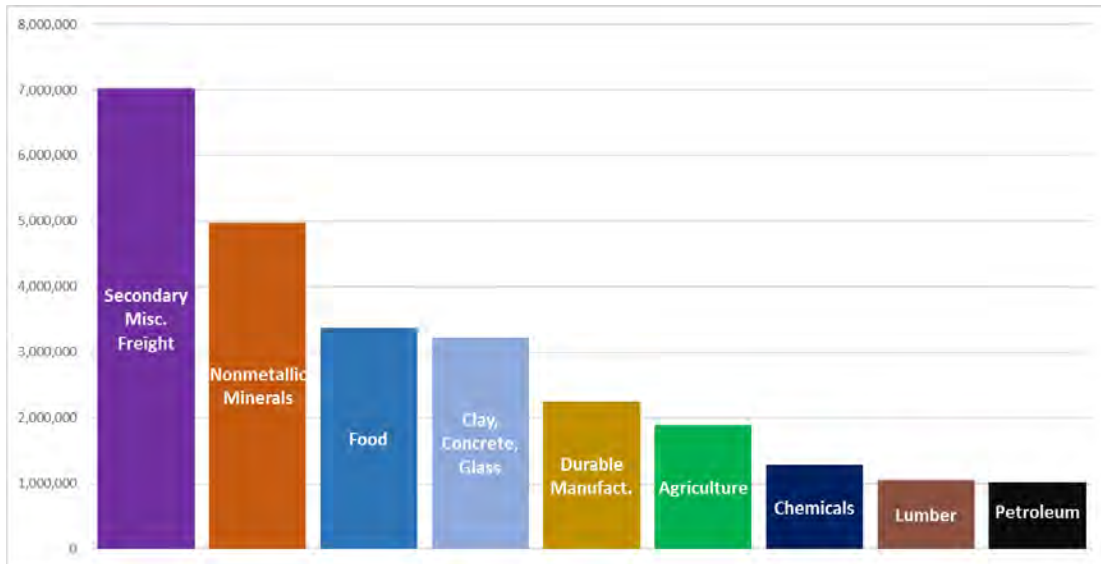
Table 22. Tonnage Change by Mode 2025-2050

Origin	Destination	Truck	Carload	Intermodal Rail	Air
Outside Dallas County	Dallas County	14,316,387	3,552,721	1,102,109	-80,423
Dallas County	Outside Dallas County	6,924,953	352,714	2,461,688	-37,702
Total		20,432,048	3,905,452	3,563,797	-118,125

Source: SAM-V4, 2020

Dallas County's primary import is nonmetallic minerals while its primary export is secondary and miscellaneous freight. The secondary and miscellaneous category includes waste or scrap materials, miscellaneous freight shipments, shipping trailers/containers, mail or contract traffic, miscellaneous mixed shipments, secondary traffic, freight forwarder traffic, shipper association traffic, small-packaged freight shipments, and hazardous waste materials. The following graph displays commodity groups expected to grow by over a million tons between 2025 and 2050.

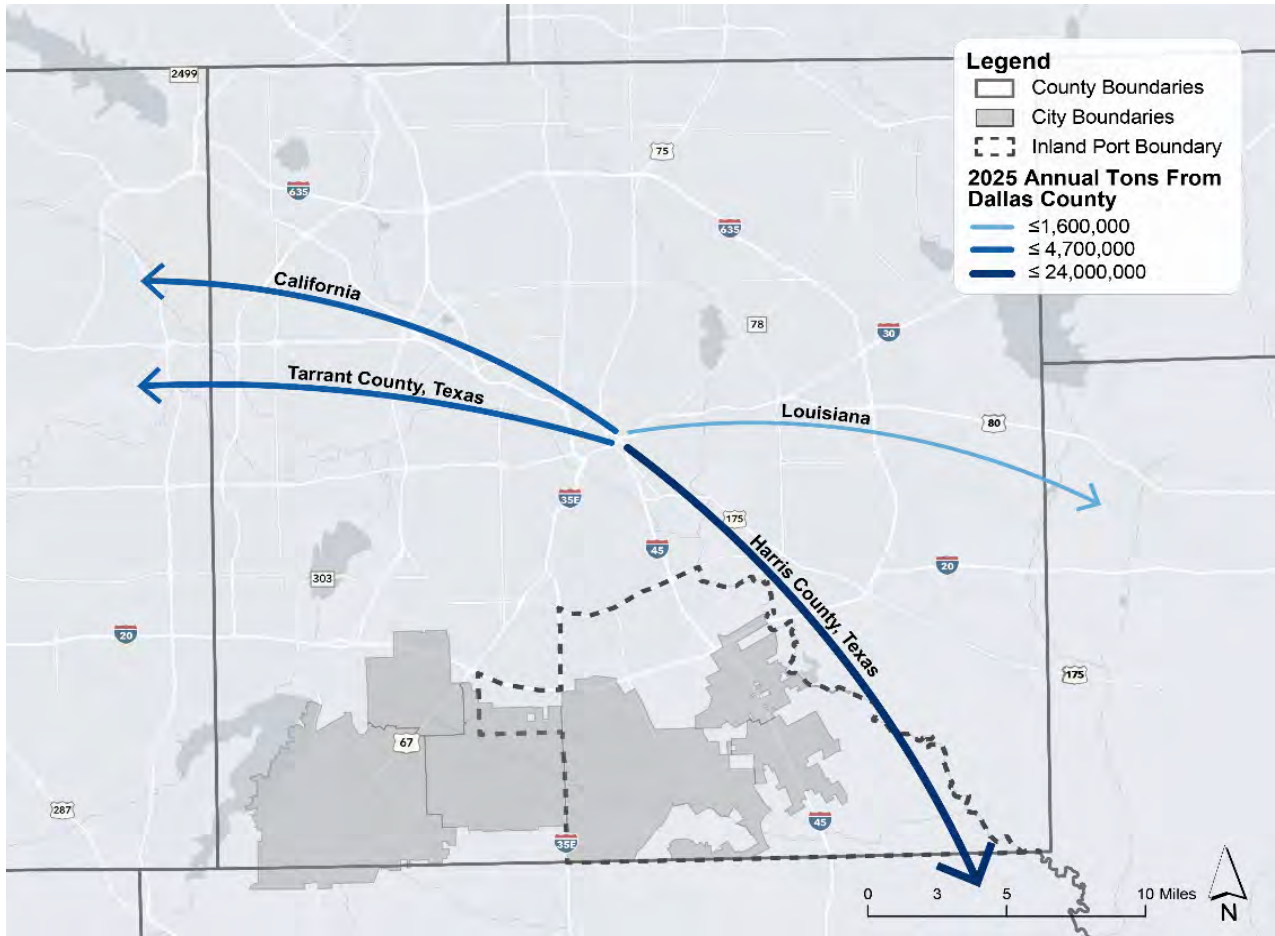
Figure 27. High Growth Commodities



Source: SAM-V4, 2020

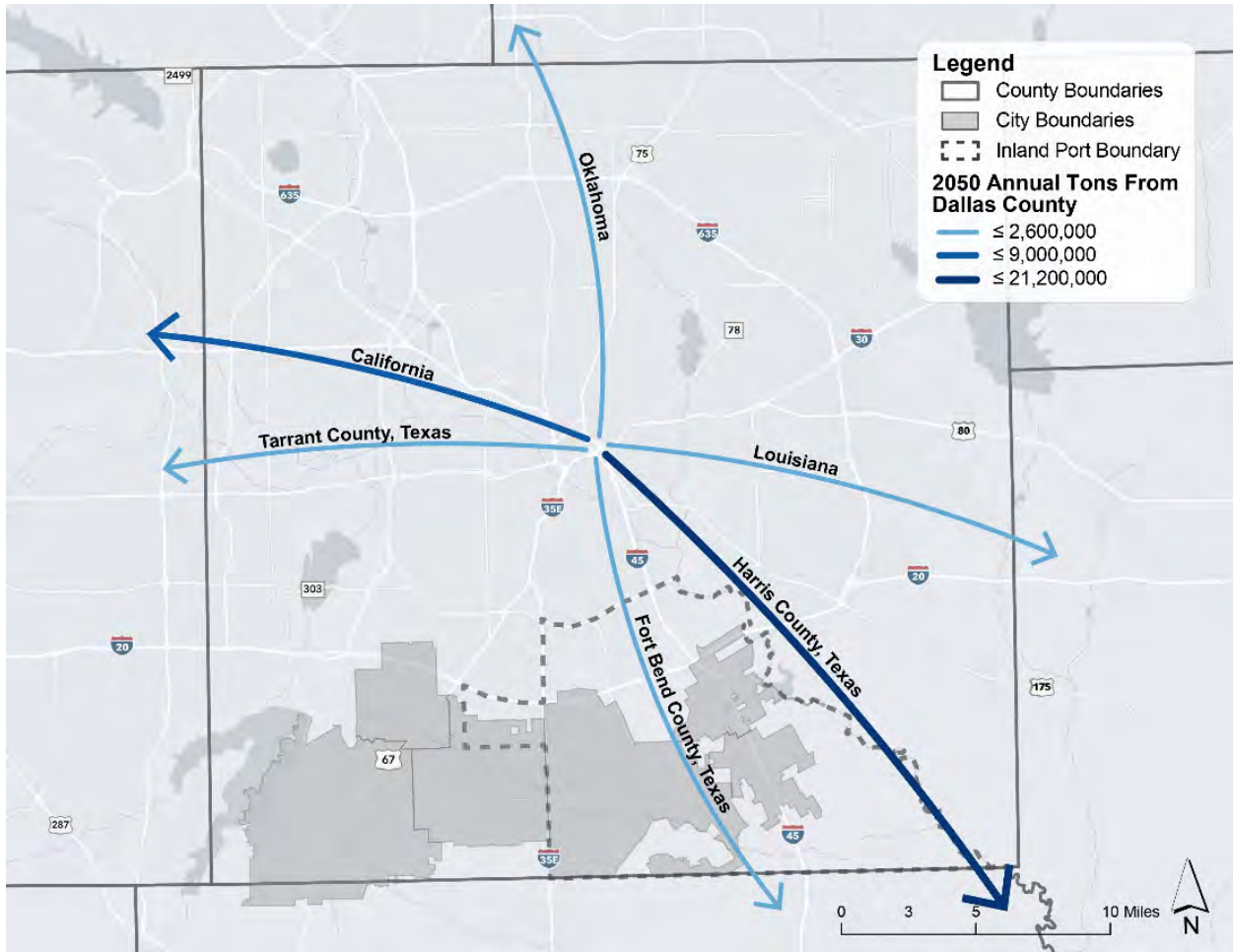
The following maps present the expected growth in exports from Dallas County for years 2025 and 2050. The maps include all modes of travel. Since Dallas County incorporates multiple intermodal facilities, not all tonnage can be directly attributed to the SDCIP. The area is expected to see an increase in destinations receiving above a million tons of product.

Figure 28. Annual Tonnage from Dallas County 2025



Source: SAM-V4, 2020

Figure 29. Annual Tonnage from Dallas County 2050

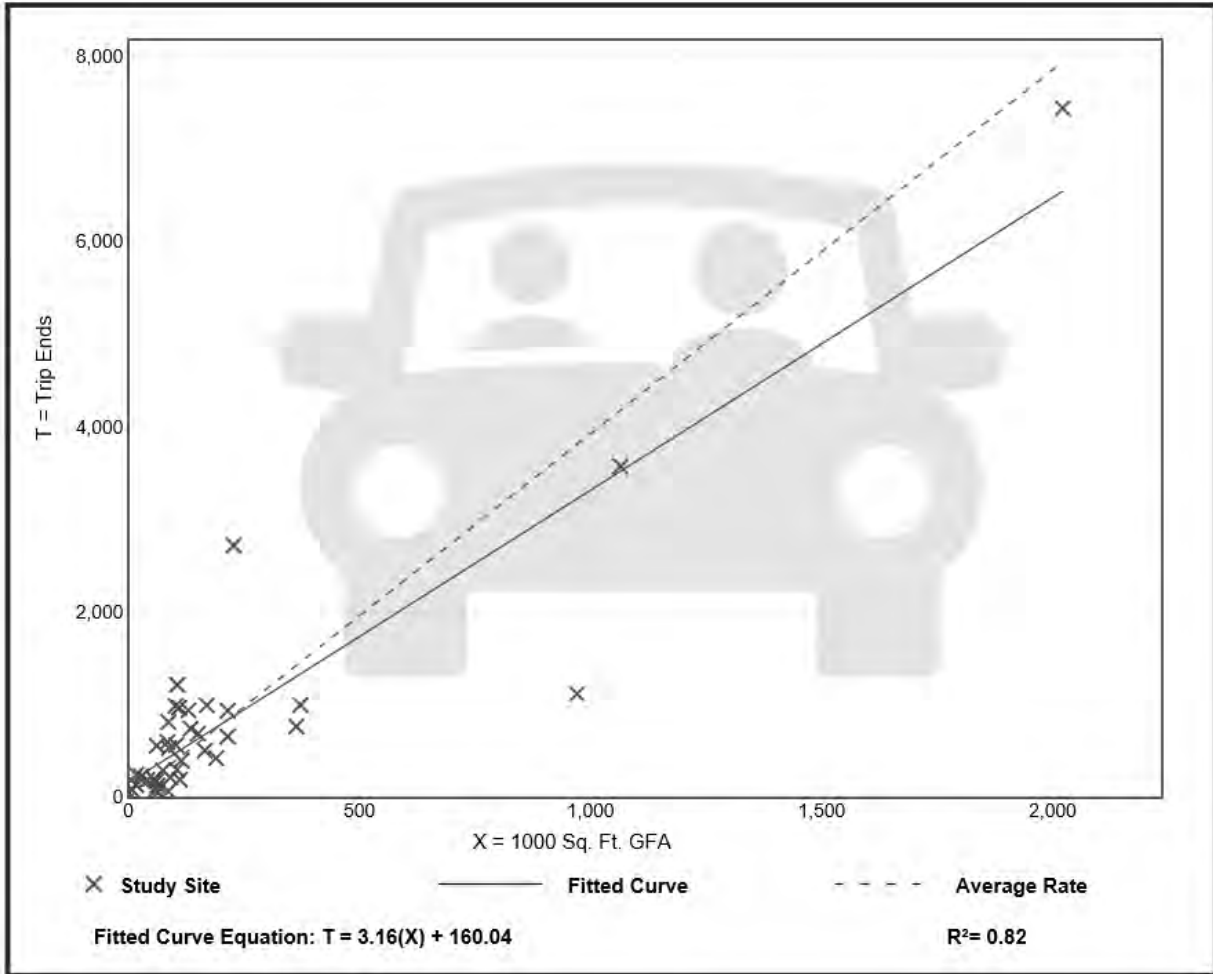


Source: SAM-V4, 2020

Appendix I: Truck Trips and Building Size

AECOM completed an analysis in Spring 2020 to better understand the relationship between truck trips and building size within industrial corridors in US cities. Using the Institute of Transportation Engineers (ITE) Trip Generation Simulator, AECOM utilized daily traffic and historic truck counts to gauge relationships between industry type, building footprint, and generated traffic over time. The analysis showed a significant linear relationship between building size and truck counts – indicating that industrial buildings with larger footprints, on average, generate more truck traffic.

Figure 30. Data Plot and Equation



Source: ITE, AECOM Analysis, 2020

Appendix II: Inland Port Industrial Space

Table 23. Inland Ports: Industrial Space

Inland Port	Total Industrial SF	Warehouse and Distribution SF	Mfg. SF	Nearby/On-site Structures	Avg Year Built
<i>Annual Rail Lift Capacity: 100,000 Containers or Fewer</i>					
Virginia Inland Port	3,395,277	3,263,257	88,020	13	2001
Manlius, NY	1,005,246	306,825	432,291	33	1975
Port San Antonio	5,265,618	3,878,666	1,307,202	22	2005
I-49 Logistics Park KC	2,225,895	1,746,660	420,000	6	2017
<i>Annual Rail Lift Capacity: 100,001 to 500,000 Containers</i>					
Northland Kansas City	5,381,927	5,115,091	144,671	22	2001
International Inland Port of Dallas	51,763,370	49,111,788	1,794,419	214	1997
Greer Inland Port	2,268,372	989,029	1,279,343	15	2010
Midwest Inland Port	7,067,011	5,725,994	530,582	83	*
Port of Tucson	3,258,512	2,967,095	281,942	42	2003
Charlotte, NC	6,848,131	6,635,156	51,481	175	1989
Santa Teresa	2,541,741	2,493,741	48,000	14	1999
<i>Annual Rail Lift Capacity: Greater than 500,000 Containers</i>					
Rickenbacker (OH)	44,372,420	43,248,565	530,393	120	2002
Alliance Texas ¹	36,769,861	35,782,009	273,526	96	2003
Logistics Park Kansas City	10,056,693	10,041,926	0	19	2015
Joliet/Will County ²	15,747,012	15,419,893	300,000	25	2005

*Insufficient data

^{1,2} Flexible boundaries

Source: AECOM Research and Analysis

Table 24. Average Growth in Industrial Space Around Inland Ports

Inland Port	SF Added Per Year, 1990-1999	SF Added Per Year, 2000-2009	SF Added Per Year, 2010-2019
<i>Annual Rail Lift Capacity: 100,000 Containers or Fewer</i>			
Virginia Inland Port	200,987	89,802	8,000
Manlius, NY	4,260	11,423	6,500
Port San Antonio	38,370	393,396	21,363
I-49 Logistics Park KC	0	0	140,590
<i>Annual Rail Lift Capacity: 100,001 to 500,000 Containers</i>			
Northland Kansas City	43,520	108,468	166,929
International Inland Port of Dallas	227,748	978,352	3,494,246
Greer Inland Port	25,920	1,500	191,149
Midwest Inland Port	*	*	*
Port of Tucson	15,987	170,160	110,294
Charlotte, NC	76,367	135,038	177,298
Santa Teresa	68,638	79,569	21,600
<i>Annual Rail Lift Capacity: Greater than 500,000 Containers</i>			
Rickenbacker (OH)	1,020,658	2,010,079	1,230,550
Alliance Texas ¹	1,216,931	1,111,505	1,215,112
Logistics Park Kansas City	0	0	984,788
Joliet/Will County ²	1,902	845,160	742,383

*Insufficient data

^{1,2} Flexible boundaries

Source: AECOM Research and Analysis

Note: For master-planned properties and inland ports governed by development authorities, properties were pulled from exact boundaries when available. In others, properties were pulled from radius centered around the rail facility. Boundaries were available for Port San Antonio, the International Inland Port of Dallas, AllianceTexas, and Joliet/Will County.