CENTRAL TEXAS

CAMPO

CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION

Freight Plan

Existing Conditions Report

Final 1: July 5, 2023

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Acronyms

AADTT – Average Annual Daily Truck Traffic

AAMPO - Alamo Area Metropolitan Planning Organization

ABIA – Austin-Bergstrom International Airport

ASPM – Aviation System Performance Metrics

ATRI – American Transportation Research Institute

CAMPO – Capital Area Metropolitan Planning Organization

CapMetro – Capital Metropolitan Transportation Authority

DOA – City of Austin Department of Aviation

CRFC - Critical Rural Freight Corridors

CRIS – Crash Records Information System

CUFC – Critical Urban Freight Corridors

EIA – Energy Information Administration

ETJ – Extraterritorial Jurisdiction

FAA – Federal Aviation Administration

FEMA – Federal Emergency Management Agency

FHWA – Federal Highway Administration

FM – Farm-to-Market

HGL – Hydrocarbon Gas Liquids

IIJA – Infrastructure Investment and Jobs Act

IRI – International Roughness Index

KTMPO - Killeen-Temple Metropolitan Planning Organization

LMI – Labor Market Information

LP - Loop

MPO – Metropolitan Planning Organization

NAICS – North American Industry Classification System

NHFN – National Highway Freight Network

NHFP - National Highway Freight Program

NMFN – National Multimodal Freight Network

NPMRDS – National Performance Management Research Data Set

NRI – National Risk Index

OEM – Original Equipment Manufacturers

OS/OW – Oversize/Overweight

PHFS – Primary Highway Freight System

POLA/POLB – Port of Los Angeles and the Port of Long Beach

RM – Ranch-to-Market

RTP – Regional Transportation Plan

SH – State Highway

SL – State Loop

SS – State Spur

THFN – Texas Highway Freight Network

TMFN – Texas Multimodal Freight Network

TOFC/COFC – Rail Trailer on Flatcar or Container on Flatcar

TTI – Texas A&M Transportation Institute

TTTR – Truck Travel Time Reliability

TxDMV – Texas Department of Motor Vehicles

TxDOT – Texas Department of Transportation

TxFAC – Texas Freight Advisory Committee

UP – Union Pacific

VMT – Vehicle Miles Travelled

Introduction/Overview

The Capital Area region, a six-county metropolitan area in Central Texas, has experienced rapid growth and economic development in recent years. A key aspect of this growth is an increase in freight and the movement of goods by truck, rail, pipeline, and air. Efficient freight movement is crucial to the competitiveness of the region's businesses and industries, and the overall way of life for its residents. Recognizing this importance, the Capital Area Metropolitan Planning Organization (CAMPO) is developing a Freight Plan that will highlight the importance of freight to the region and inform the Regional Transportation Plan (RTP) by identifying policies, strategies, and investments to enhance the performance and safety of the multimodal freight network.

Project Background and Purpose

CAMPO's six-county region is comprised of Bastrop, Burnet, Caldwell, Hays, Travis, and Williamson counties. The total land area for the region is 5,215 square miles or roughly the size of Connecticut. The region is traversed by IH 35, a national corridor for trade, commerce, and passenger travel that connects major cities in Texas, spanning 21 counties from the border with Mexico to Oklahoma. The CAMPO region itself is diverse geographically, with the population concentrated in the urban metropolitan core in Travis County and a variety of established and emerging suburbs, historic towns, and rural areas in the surrounding counties. These areas generate and attract freight, each providing a unique set of industries and challenges.

Since the last regional freight plan in 2008, several forces have contributed to the increasing demand for freight transportation in the CAMPO region. First, the growth of e-commerce carried over from the COVID-19 pandemic has significantly increased the demand for last-mile delivery services, which has increased the demand for truck transportation and warehousing. Second, the region has experienced tremendous population growth, resulting in an overall higher demand for goods and services. Finally, growing key freight-intensive industries in the region, such as automobile and semiconductor production, have increased the need to transport raw materials, finished goods, and equipment. These factors underscore the importance of efficient and reliable freight transportation in the CAMPO region.

The purpose of this existing conditions report is to provide insights into freight transportation in the CAMPO region and help in developing regional planning and policy decisions. To that end, this report has four objectives:

- Provide an overview of the existing multimodal freight network and its assets;
- Assess the conditions and performance of the freight network, including key topics such as safety, mobility, and reliability;
- Analyze the role of land uses in the region, specifically those that generate freight activity; and
- Examine the role of key supply chains in the region, identifying critical industries and their transportation needs.

To achieve these goals, this report comprehensively analyzes the freight transportation network in the CAMPO region. Drawing from publicly available data, data acquired by CAMPO, and datasets from Texas Delivers 2050,[1] the latest statewide freight mobility plan, this Existing Conditions report details the characteristics and needs of each mode and how they influence freight mobility in the CAMPO region. Conversely, this report will also describe how the CAMPO region's freight-intensive industries influence freight movements, including an analysis of trip flows and freight generators within the region.

The following bullets summarize key findings in the existing conditions analysis regarding highway infrastructure, non-highway infrastructure, and freight-intensive industries/supply chains.

Highway Infrastructure

- IH 35 is the primary corridor for freight movement, as well as the most highly utilized and most congested. It serves critical industries in the region, connecting supply chains with manufacturers, suppliers, and markets in the urban areas of the Texas Triangle and beyond. Trucks utilize the corridor for long-haul trips and also for shorter, interregional trips. Automotive manufacturing, electronics, warehousing, and mining/quarrying are key freight-generating industries that cluster in proximity to IH 35.
- The congestion on IH 35 leads to trucks using SH 130 as a bypass around the Austin-Round Rock metro area in Travis and Williamson counties. Trips bound to and from IH 10 in Caldwell County utilize SH 130 to bypass the congestion on IH 35 between San Antonio and Austin.
- Other key north-south corridors include US 281 in Burnet County and US 183, which traverses most of the region from Caldwell County through Travis, Williamson, and Burnet counties. To the east, SH 95 connects Bastrop and Williamson counties.
- Principal arterials consisting of US highways, state highways, and RM/FM roads provide key east-west connectivity with the primary freight corridors on IH 35, US 183, and SH 130. On these types of roadways, delay and travel time unreliability are the highest in Travis County. Additionally, US 290 and SH 71 provides east-west connectivity with Houston and other regions along the Texas Gulf Coast; these longer distance trips benefit from having access to maritime gateways for domestic and international trade.
- The pavement condition for the roadway network in the region is rated mostly fair or better. Only 4% of the roadway mileage is rated poor.
- Most of the overpasses that carry the Texas Highway Freight Network (THFN) are in good or better condition (87% of the total). Most of the underpasses on the THFN are 16.5 feet or taller (59%), with nearly 20% of the underpasses meeting the updated vertical clearance standard of 18.5 feet to accommodate oversize vehicles.
- Nearly all of the overpasses on IH 35 are also in good or better condition (98% of the total). Most of the underpasses on IH 35 are 16.5 feet or taller (63%), with 9% of the underpasses meeting the updated vertical clearance standard of 18.5 feet.

[1] https://www.txdot.gov/projects/planning/freight-planning/texas-delivers-2050.html

Non-Highway Infrastructure

- Austin-Bergstrom International Airport (ABIA) is the only commercial airport in the region and is an important gateway for high-value freight arriving from the rest of the U.S. and the world. Since 2020, congestion at ABIA has increased as air traffic recovers from the COVID-19 pandemic.
- Pipelines are an element of the multimodal freight network and are used for the bulk transport of liquefied products and natural gas. Pipelines supply product terminals with motor gasoline and other fuels that are distributed to homes, businesses, and industries by truck.
- The freight rail network consists of Class I and Class III railroads. The Class I rail corridor through the CAMPO region complements IH 35 and SH 130 in facilitating north-south freight movements. The region lacks a major rail hub, so much of the long-haul movement by rail passes through. The Class III railroads provide east-west connections to the Class I network and serve mining and agriculture supply chains.

Freight-Intensive Industries and Supply Chains

- Freight-intensive industries are important to the regional economy. Employment in these sectors represents nearly 3 out of every 10 jobs. Most of the activity is concentrated in Williamson and Travis counties.
- Supply chains for key Texas industries in the region are clustered along the IH 35 corridor. Establishments for automotive, semiconductors, warehousing, and construction materials are concentrated in Williamson and Travis counties. Other freight-intensive sectors such as agriculture and energy are located in the surrounding counties and are served by east-west corridors such as SH 29, US 79, SH 71, and US 290.
- Manufacturing supply chains in the CAMPO region are connected to markets and suppliers in the major urban areas of the Texas Triangle. The THFN and rail provide connectivity to those areas, as well as the trade gateways along the border with Mexico and on the Texas Gulf Coast.

Report Organization

This document is one of the deliverables as defined under Task 3 – Existing Conditions Report from the scope of work for Cambridge Systematics, Inc.'s project number 220134. The remainder of this document is organized into the following sections:

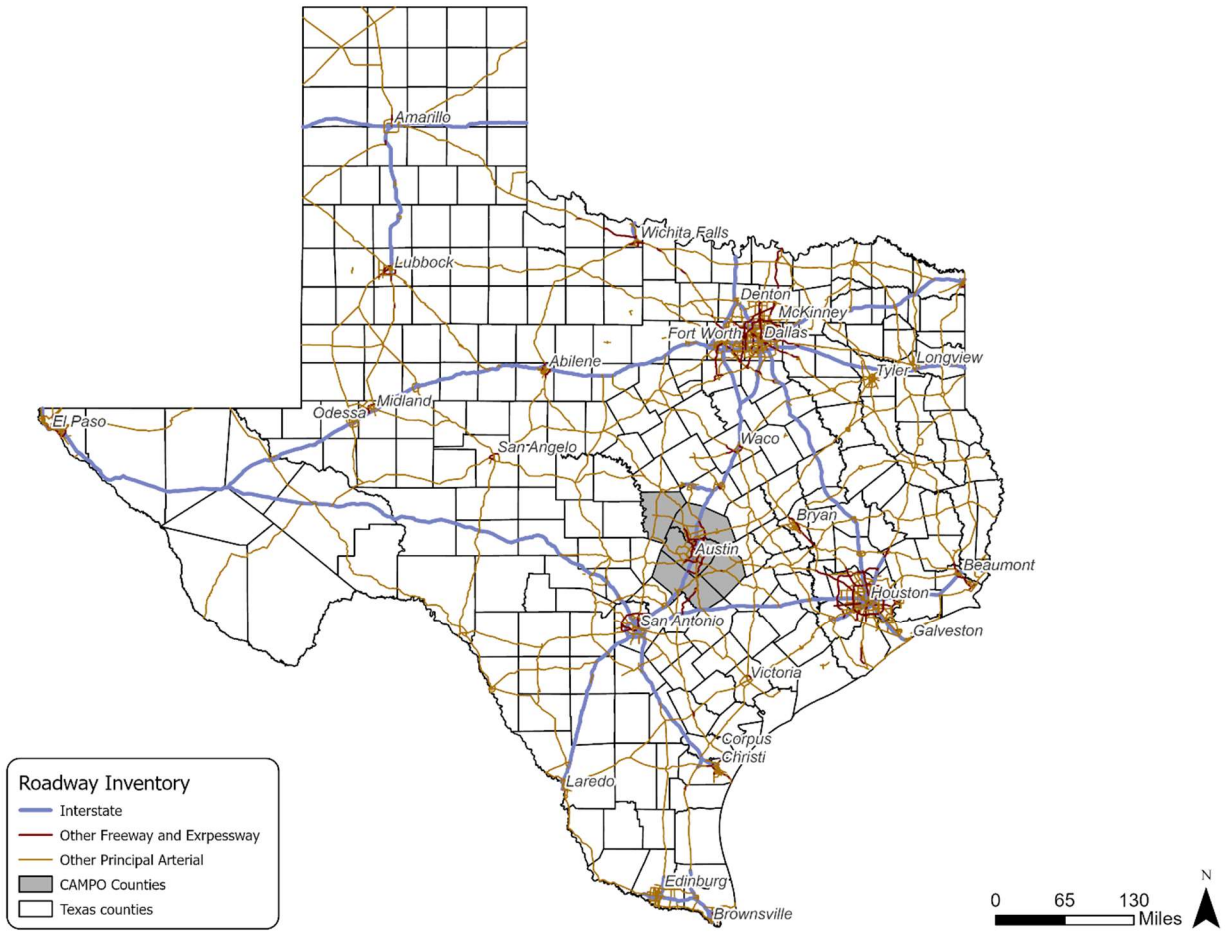
- **Highway, Rail, Airport, and Pipeline Asset**s: These sections together identify the freight transportation assets in the CAMPO region and provide an overview of the current condition and performance of each mode.
- **Equity**: This section identifies equity populations in the CAMPO region and how much of the highway freight network comes in proximity to minority populations and populations living in poverty.
- **Resiliency**: This section evaluates how much of the highway freight network intersects areas of the region that have a high risk exposure to natural disasters according to federal definitions.

- **Freight Trip Origins and Destination**s: This section identifies the origins and destinations for truck trips that originate or end in the CAMPO region.
- **Freight Generators**: This section identifies the location of existing industrial land uses that supports freight-intensive activity. The analysis looks at where the establishments for key supply chains are concentrated in the CAMPO region and the freight transportation activity that those industries generate.
- **Conclusion/Next Steps**: This section summarizes how the existing conditions analysis will inform next steps in the development of the regional freight plan.

Highway Assets

Highways are the most extensive component of CAMPO's freight network infrastructure. Highways directly connect population centers, freight-generating businesses, and the broader economic system both within the region and beyond. Figure 1 shows the CAMPO region's counties in relation to the statewide roadway network, which connects Central Texas to suppliers and consumers in markets around the state and with gateways to domestic and international trade.

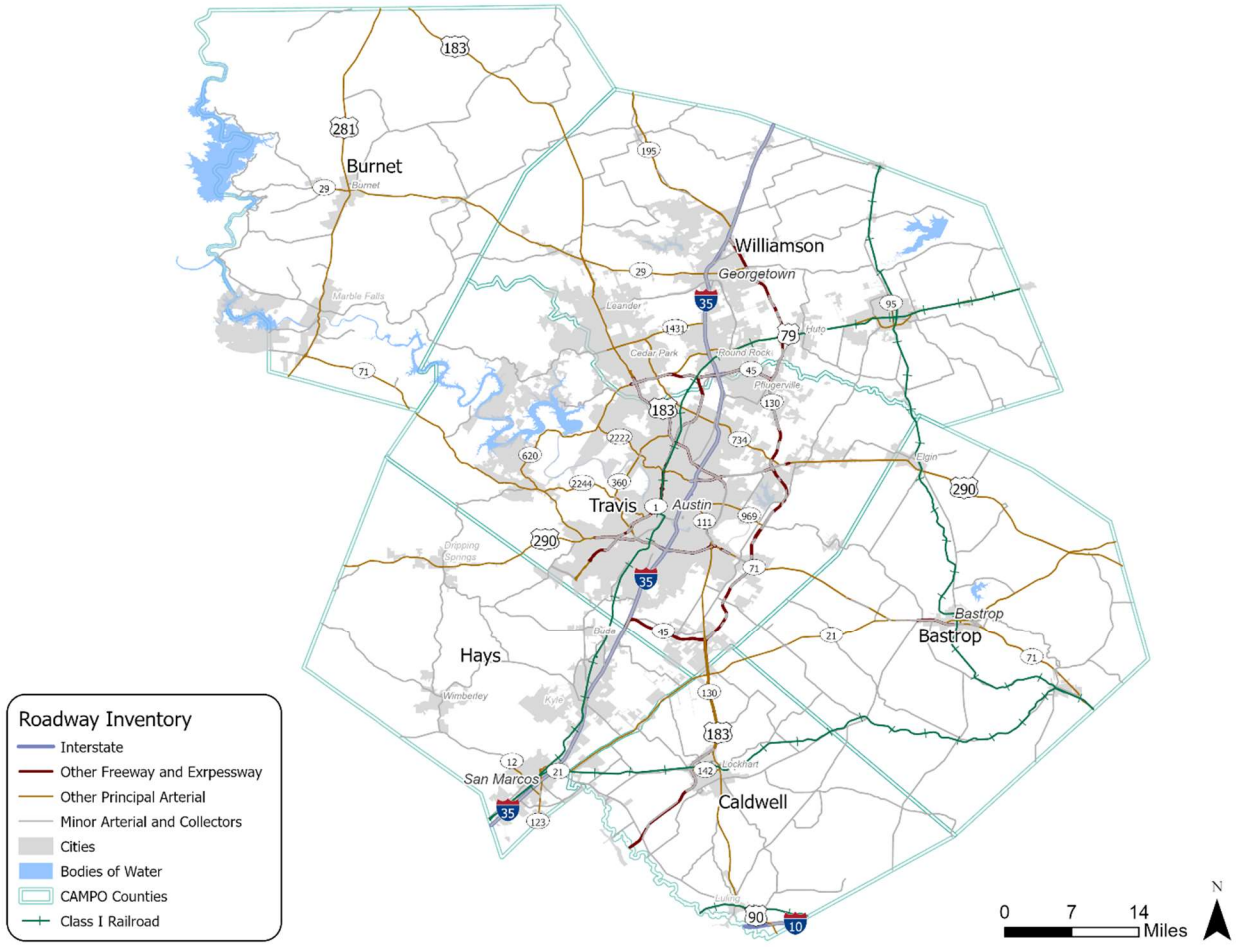
Figure 1: CAMPO Counties and Texas Statewide Roadway Network



Source: Texas Department of Transportation (TxDOT). Roadway Inventory (2021). Available at: https://www.txdot.gov/data-maps/roadway-inventory.html

Figure 2 provides a comprehensive view of the major corridors within the six-county region. Austin and IH 35 have clearly influenced the region's development pattern, with the urbanized area extending north-south through Williamson, Travis, and Hays counties. In most cases, towns and population centers in the more rural counties (Bastrop, Burnet, Caldwell) connect back to this urban core through a network of highways and principal arterials. CAMPO's position within the Texas Triangle megaregion connects it to the large Dallas-Fort Worth and San Antonio metropolitan areas via IH 35 to the north and south and Houston to the east via IH 10 and US 290. In addition, the network of interstates and U.S. and state highways provides connectivity between the CAMPO region and gateways to domestic and global trade.

Figure 2: Inventory of Roadways in the Capital Area Region



Source: Texas Department of Transportation (TxDOT). Roadway Inventory (2021). Available at: https://www.txdot.gov/data-maps/roadway-inventory.html

Functional Classification

The following analysis uses geographic databases maintained by the Texas Department of Transportation (TxDOT) and the Federal Highway Administration (FHWA). The TxDOT Roadway Inventory is a statewide public road database published annually in FHWA's Highway Performance Monitoring System Program and internal TxDOT inventory reports.[2] The database includes information on functional classification, physical features, traffic, and population data. Mileage, unless otherwise stated, references centerline miles.

[2] https://www.txdot.gov/data-maps/roadway-inventory.html

Table 1 shows the total mileage by county for each functional classification within the TxDOT roadway inventory. Functional classification is a definition maintained by the FHWA that defines roadways based on the roadway and traffic characteristics, mainly access, continuity, and connectivity:

- **Interstates** – functional classification indicates roadways that are part of the Interstate system. These are usually access-controlled highways (e.g., access and egress limited on- and off-ramps, limited at-grade intersections, directional travel lanes separated by a physical median, and have an overall high mobility design). These roadways span large portions of the U.S., connecting major urban centers in states nationwide.
- **Other Freeway and Expressways** – in terms of physical design, these roadways have all the features of interstates though they are not part of the interstate system.
- **Other Principal Arterial** – these roadways tend to serve longer trips and have a high-mobility design as the previous two functional classifications but only have partial or uncontrolled access.
- **Minor Arterial** – these roadways tend to short to moderate length intracommunity trips, with moderate mobility and limited access control.
- **Major and minor collectors** – these roadways funnel traffic from local roads onto arterial routes. Major and minor roadways are somewhat subjective, with major roadways having higher speeder limits, fewer access points, and higher traffic volumes.
- **Local roads** – this classification is the largest in terms of mileage and accounts for all not otherwise classified roadways. They tend to disallow thru-traffic, serve small trip lengths, and have many access points.

Table 1: Roadway Functional Class Mileage by County

Functional Classification	Bastrop County	Burnet County	Caldwell County	Hays County	Travis County	Williamson County
Interstate (miles)	0 (0%)	0 (0%)	15 (2%)	73 (5%)	99 (2%)	89 (2%)
Other Freeway and Expressway (miles)	10 (1%)	0 (0%)	67 (7%)	0 (0%)	398 (7%)	132 (3%)
Other Principal Arterial (miles)	175 (12%)	95 (9%)	54 (6%)	53 (3%)	265 (5%)	272 (7%)
Minor Arterial (miles)	42 (3%)	11 (1%)	45 (5%)	78 (5%)	359 (6%)	191 (5%)
Major Collector (miles)	178 (12%)	162 (16%)	154 (17%)	233 (15%)	718 (13%)	538 (13%)
Minor Collector (miles)	68 (5%)	91 (9%)	57 (6%)	18 (1%)	129 (2%)	88 (2%)
Local roads (miles)	1,040 (69%)	679 (65%)	530 (58%)	1,113 (71%)	3,772 (66%)	2,865 (69%)
Total	1,514 (100%)	1,039 (100%)	922 (100%)	1,568 (100%)	5,741 (100%)	4,174 (100%)

Source: Texas Department of Transportation (TxDOT). Roadway Inventory (2021). Available at: https://www.txdot.gov/data-maps/roadway-inventory.html

The TxDOT roadway inventory uses on and off-system designations to indicate maintenance responsibilities for the state's roadway network. Table 2 shows the on-off system designation by county. Overall, TxDOT maintains 22% of the roadway mileage in the CAMPO region. However, across the different counties, that average is split between the rural and urbanized counties somewhat unevenly. The rural counties of Bastrop, Burnet, and Caldwell have a slightly higher percentage of their roadway mileage designated as on-system. For instance, Caldwell has the highest percentage at 40%. The percentages for the urbanized counties are slightly lower. Williamson, for example, only has 18% of its roadway mileage maintained by TxDOT, and Hays and Williamson counties have 22% and 20%, respectively.

Counties and cities maintain the vast majority of total roadway centerline mileage, representing 77% of the total combined. Most freight trips will eventually use TxDOT's on-system network, but local arterial roadways are the final connections to consumers of other freight destinations.

Table 2: TxDOT On and Off-System Roadway Mileage by County

Roadway Type	Bastrop County	Burnet County	Caldwell County	Hays County	Travis County	Williamson County	Total
On-System Mainlines	414	296	327	291	821	740	2,889
On-System Right Frontage Road	10	0	21	26	109	50	216
On-System Left Frontage Road	6	0	16	26	107	51	208
On-System Total	**430 (28%)**	**296 (29%)**	**364 (40%)**	**344 (22%)**	**1,037 (18%)**	**841 (20%)**	**3,313 (22%)**
County Road	949	481	427	782	1,386	1,564	5,590
City Street	135	260	129	438	3,207	1,686	5,855
Non-TxDOT Toll Authority Road	0	0	0	1	58	43	102
Federal Road	0	0	0	3	2	26	31
Off-System Total	**1,084 (72%)**	**741 (71%)**	**556 (60%)**	**1,225 (78%)**	**4,653 (82%)**	**3,319 (80%)**	**11,578 (78%)**
Total	1,514 (100%)	1,037 (100%)	920 (100%)	1,569 (100%)	5,690 (100%)	4,160 (100%)	14,891 (100%)

Source: Texas Department of Transportation (TxDOT). Roadway Inventory (2021). Available at: https://www.txdot.gov/data-maps/roadway-inventory.html

National Highway Freight Network (NHFN)

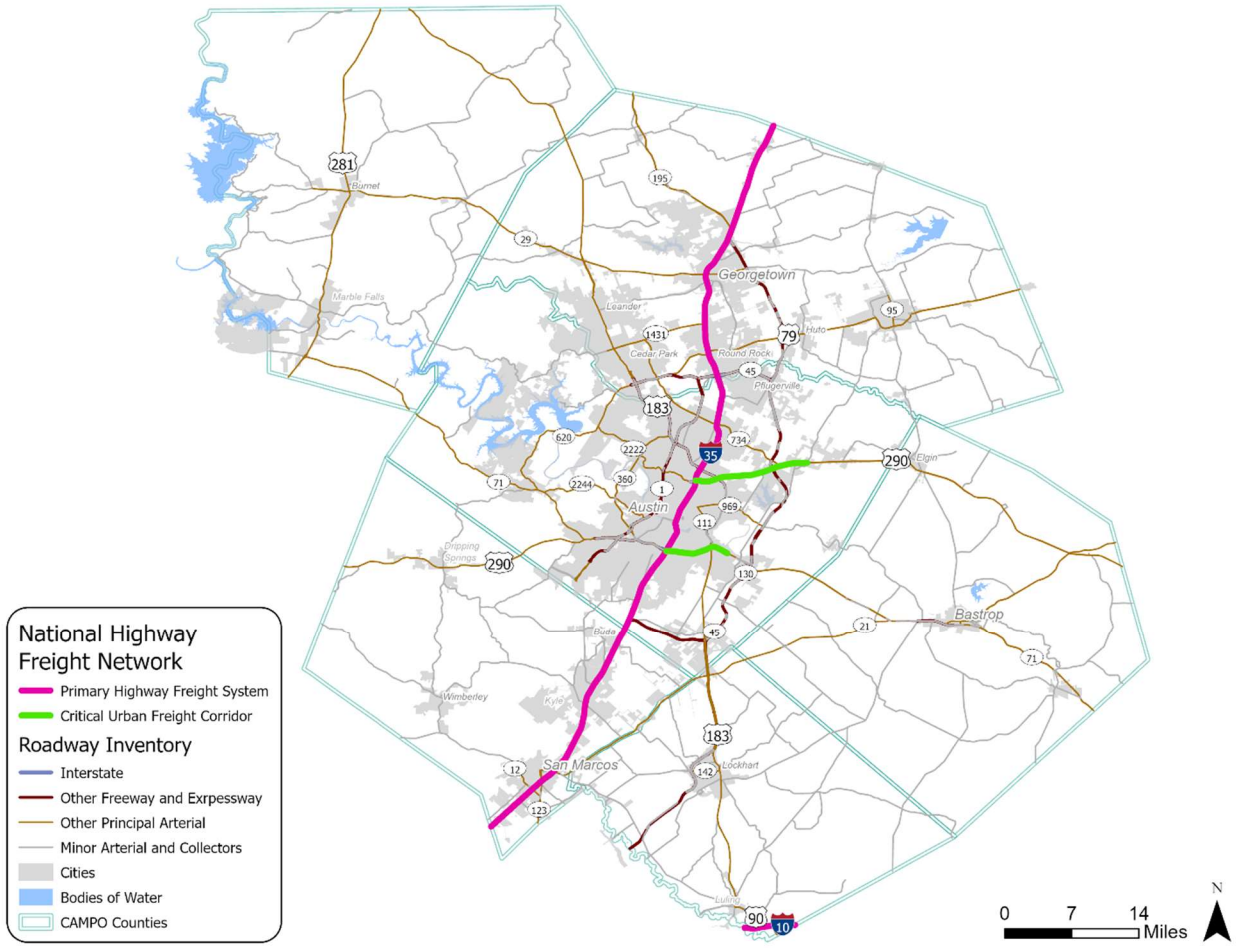
The National Highway Freight Network (NHFN) is a system of federally designated roadways that the FHWA uses to prioritize policy and funding for improving highway performance on facilities used to transport freight.[3] The Fixing America's Surface Transportation (FAST) Act required the FHWA to establish an NHFN, which has been continued under the recent Infrastructure Investment and Jobs Act (IIJA). Figure 3 shows the portions of the NHFN designated within the CAMPO region. The NHFN includes all of IH 35 and IH 10 within CAMPO and portions of US 290 and SH 71.

The NHFN consists of multiple subsystems, including the Primary Highway Freight System (PHFS); the PHFS is a network of highways identified as the most critical portions of the U.S. freight transportation system. The NFHN includes Interstate portions not on the PHFS - Critical Rural Freight Corridors (CRFCs), and Critical Urban Freight Corridors (CUFCs) – that are also critical to freight movement.

In the CAMPO region, IH 35 and IH 10 are designated as parts of the PHFS. CUFCs are designated in partnership between TxDOT and metropolitan planning organizations (MPOs). Federal requirements limit TxDOT to approximately 382 total miles of CUFC corridors statewide, and 16 miles of US 290 and SH 71 within the CAMPO region are designated as CUFCs. There are no CRFCs in the CAMPO region. Projects on the PHFS and the CUFCs are eligible for National Highway Freight Program (NHFP) funds.

[3] https://ops.fhwa.dot.gov/Freight/infrastructure/nfn/index.htm

Figure 3: National Highway Freight Network (NHFN)

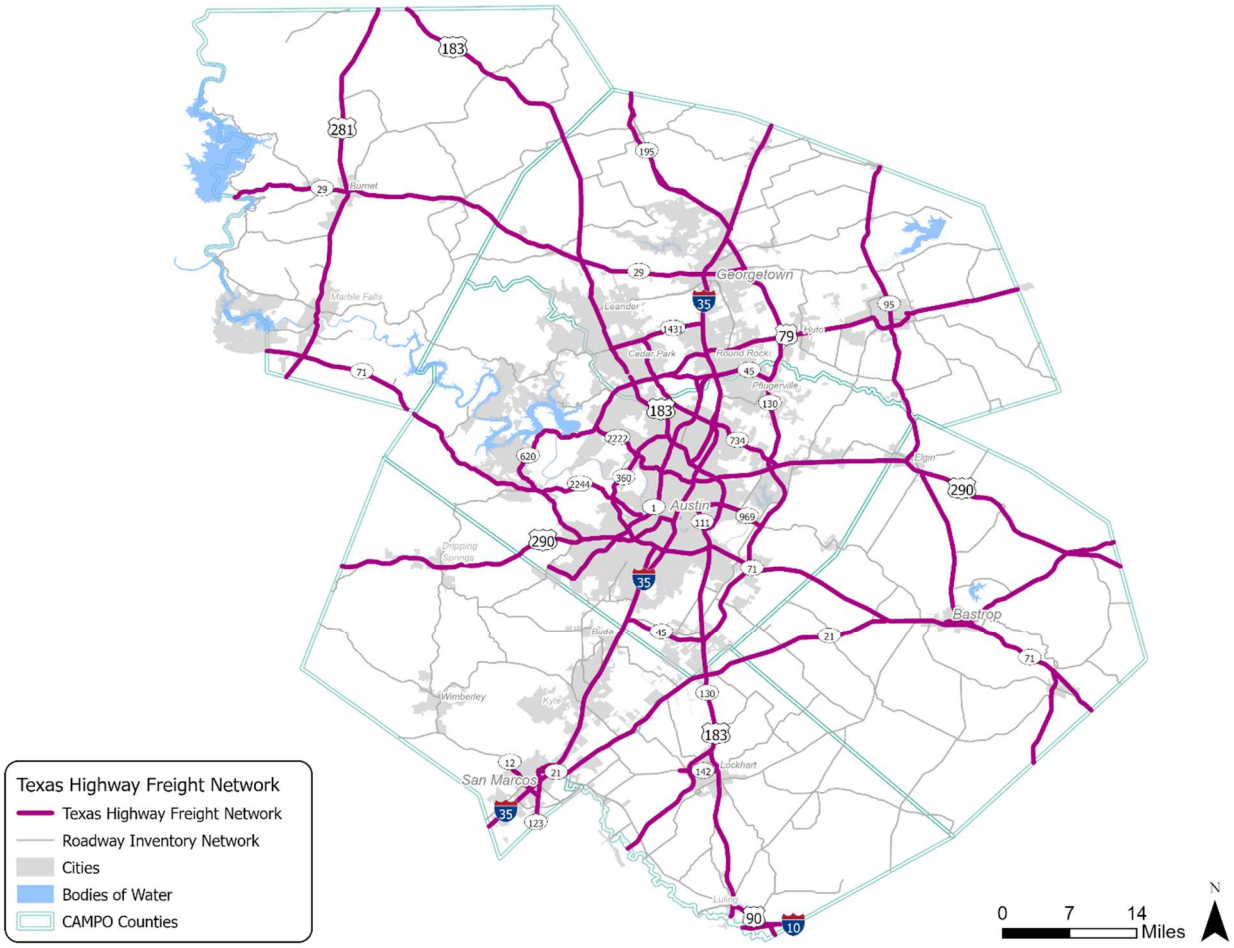


Source: Federal Highway Administration (FHWA). National Freight Network. Available at: https://ops.fhwa.dot.gov/freight/infrastructure/nfn/index.htm

Texas Highway Freight Network (THFN)

The THFN, an element of the Texas Multimodal Freight Network (TMFN), identifies the highway corridors and segments most critical to freight movement for planning and project prioritization. Done in conjunction with Texas Delivers 2050, the designation of the THFN is based on geospatial analysis of freight movement patterns, freight-generating businesses, population and workforce centers, and trade and transportation gateways. As seen in Figure 4 every interstate, freeway, expressway, and most principal arterials in the CAMPO region are included in the THFN. Notably, these roads are the primary connections between counties and provide interconnectivity between urban and rural areas of the region.

Figure 4: Texas Highway Freight Network (THFN)



Source: Texas Department of Transportation (TxDOT). Roadway Inventory (2021). Available at: https://www.txdot.gov/data-maps/roadway-inventory.html

Table 3 provides a summary of the mileage on the THFN by county. In the CAMPO region, Travis County has the most significant share (34%) of the mileage on the THFN, followed by Williamson County with 25%. Caldwell County has the least mileage, with 7% of the total. Travis County is the only county with roadways in the PHFS and roadways designated as CUFCs.

Table 3: Mileage on the Texas Highway Freight Network (THFN) by CAMPO Counties

County	Primary Highway Freight System Mileage (% of THFN Mileage)	Critical Urban Freight Corridor Mileage (% of THFN Mileage)	Texas Highway Freight Network Mileage
Bastrop	0 (0%)	0 (0%)	119 (14%)
Burnet	0 (0%)	0 (0%)	101 (12%)
Caldwell	5 (5%)	0 (0%)	63 (7%)
Hays	24 (29%)	0 (0%)	70 (8%)
Travis	28 (33%)	16 (100%)	292 (34%)
Williamson	28 (32%)	0 (0%)	211 (25%)
Total	85 (100%	16 (100%)	856 (100%)

Source: Texas Department of Transportation (TxDOT). Roadway Inventory (2021). Available at: https://www.txdot.gov/data-maps/roadway-inventory.html

Route Restrictions

Route restrictions can apply to commercial vehicles, usually of a specific size, restricting them from using certain roadways. In addition, restrictions apply to vehicles carrying specific loads such as hazardous materials, and to increase safety, specify which routes these vehicles can use. According to TxDOT, the CAMPO region currently has no non-radioactive hazardous materials (NRHM) routes.[4]

TxDOT is the state routing agency in charge of approving NRHM routes in Texas, which is required by state law for cities with a population of 850,000 or greater. The City of Austin is the only municipality in the region that meets the population threshold. The City has developed a draft network of recommended NRHM routes that identifies US 290 and SH 71 as designated through routes for east-west travel and SH 130 for north-south travel to avoid routing NHRM loads through the city on IH 35.[5]

CAMPO currently has no publicly available list of route restrictions. Some truck restrictions can be found at the jurisdictional level by searching jurisdictional websites and records. The City of Austin, for instance, has specific requirements for large commercial vehicles loading and unloading within certain areas of the city.[6] San Marcos and Wimberly both restrict thru-truck traffic within the city limits. These restrictions do not preclude commercial vehicles from entering the jurisdiction for delivery purposes. In 2021, Bastrop County enacted a similar policy on a number of county roads.[7]

[4] TxDOT. Non-radioactive hazardous materials (NRHM) routing maps. Available at: https://www.txdot.gov/data-maps/reference-maps/non-radioactive-hazardous-materials.html
[5] City of Austin. Non-Radioactive Hazardous Route Designation Plan. Available at: https://www.austintexas.gov/department/non-radioactive-hazardous-materials-route-designation-plan
[6] City of Austin. Commercial Vehicle Loading. Available at: https://www.austintexas.gov/loadingpermit
[7] Bastrop County. Ordinance #2021-01. Available at: https://www.co.bastrop.tx.us/upload/page/0283/docs/Ordinance%20Imposing%20Thru%20Truck%20Restriction%20on%20Certain%20Bastrop%20County%20Roads%202021-01%2012%2027%2021.pdf

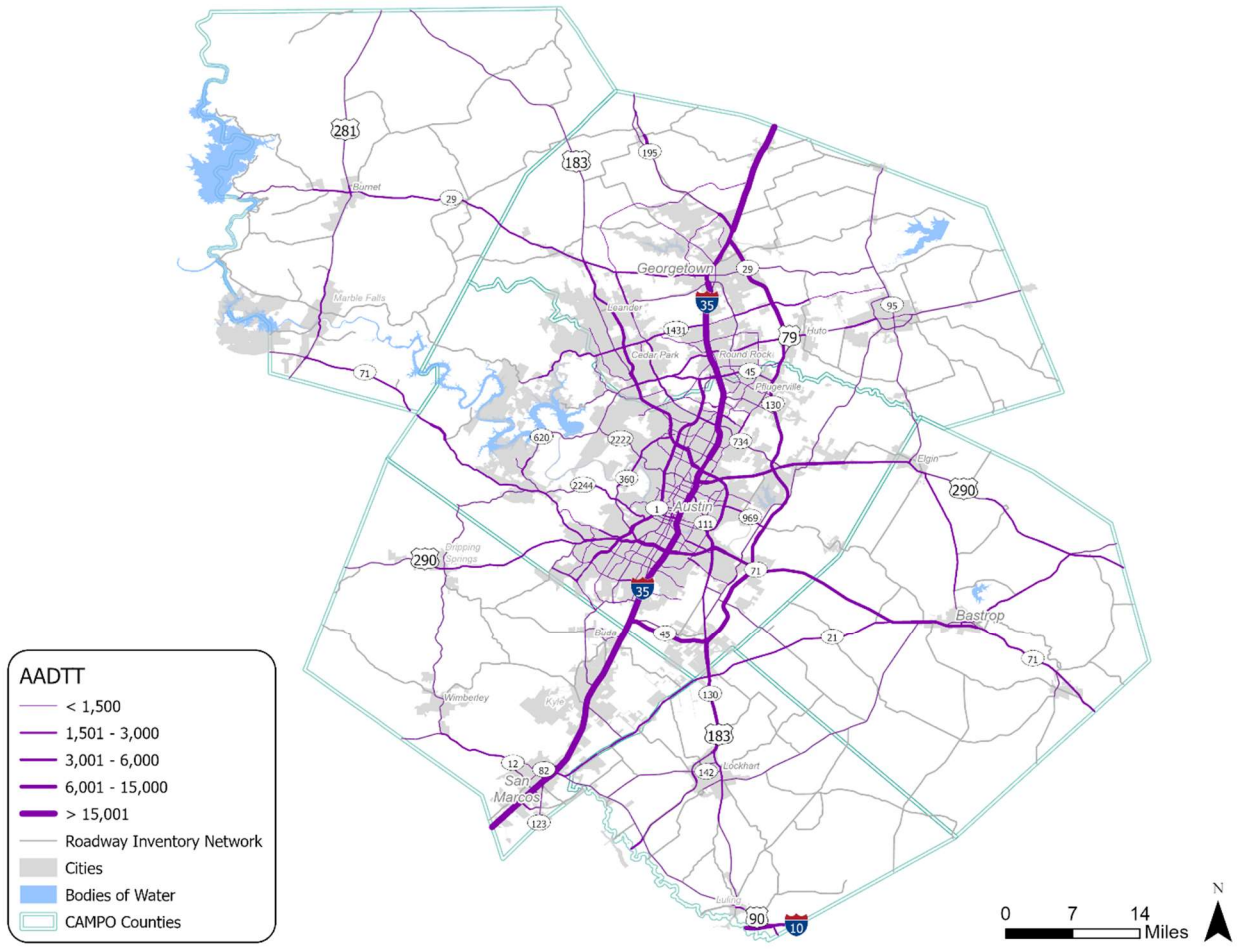
Highway Condition and Performance

This section discusses the performance of highways in the CAMPO region, focusing on mobility measures that assess the efficiency of freight vehicle movements on the roadway network, as well as safety and asset conditions.

Truck Traffic Volumes

Figure 5 shows the Average Annual Daily Truck Traffic (AADTT) for the CAMPO region. IH 35 carries the majority of daily truck traffic in the region, and the additional concentration of traffic on SH 45 and SH 130 results from trucks avoiding the north-south congestion on IH 35 that goes through central Austin from Hays County to Williamson County. Other notable routes tend to be east-west highways connecting Travis and Williamson counties to other urbanized areas such as Bastrop, Lockhart, Leander, and Dripping Springs.

Figure 5: Average Annual Daily Truck Traffic (AADTT), 2021



Source: Texas Department of Transportation (TxDOT). Roadway Inventory (2021). Available at: https://www.txdot.gov/data-maps/roadway-inventory.html

Table 4 lists the top 5 corridors in each county according to AADTT. To identify top corridors by AADTT, segment-level values were aggregated and weighted by the length (in miles) to identify a representative level of truck volume for the corridor.

Table 4: Top Roadway Corridors by Average Annual Daily Truck Traffic (AADTT), 2021

County	Corridor	Functional Classification	Average Annual Daily Truck Traffic (AADTT)	Length (miles)
Bastrop	SH 71	Other Principal Arterial	2,980	76
	SH 21	Other Freeway and Expressway	2,229	74
	US 290	Other Principal Arterial	1,733	49
	SH95	Minor Arterial	1,417	31
	FM 1100	Major Collector	911	2
Burnet	SH 71	Other Principal Arterial	2,417	15
	SH 29	Other Principal Arterial	1,795	26
	US 281	Other Principal Arterial	1,307	46
	US 183	Other Principal Arterial	926	21
	FM 3509	Minor Collector	452	6
Caldwell	IH 10	Interstate	7,529	17
	SH 130	Other Freeway and Expressway	2,507	84
	SH 21	Other Principal Arterial	1,851	7
	SH 80	Minor Arterial	1,086	22
	US 183	Other Principal Arterial	1,029	39
Hays	IH 35	Interstate	12,896	123
	SH 21	Other Principal Arterial	1,620	17
	US 290	Other Principal Arterial	1,472	17
	SH 123	Other Principal Arterial	1,179	6
	SL 82	Other Principal Arterial	1,089	7
Travis	IH 35	Interstate	10,637	158
	71 Toll Lane	Other Freeway and Expressway	5,020	6
	183 Toll	Other Freeway and Expressway	4,767	22
	SH 130	Other Freeway and Expressway	4,216	143
	SH 71	Other Freeway and Expressway	3,714	76
Williamson	IH 35	Interstate	9,983	144
	SH 130	Other Freeway and Expressway	5,123	59
	183A Toll	Other Freeway and Expressway	3,545	32
	SL 1	Other Freeway and Expressway	2,646	3
	RM 620	Other Principal Arterial	2,014	12

Source: Texas Department of Transportation (TxDOT). TxDOT Roadway Inventory (2021). Available at: https://www.txdot.gov/data-maps/roadway-inventory.html

Congestion, Reliability, and Delay

This section discusses key metrics of highway performance that compare the potential performance of a highway under ideal traffic conditions and actual conditions. For example, the IH 35 corridor through Travis and Williamson counties is among the most congested segments in the country. Each year, the American Transportation Research Institute (ATRI) analyzes the top 100 truck bottlenecks in the U.S. and has consistently found IH 35 (from Manor Road to Cesar Chavez Street) in central Austin to be a significant bottleneck. In ATRI's 2023 list, IH 35 was ranked the 32nd worst truck bottleneck in the entire nation.[8]

Texas A&M Transportation Institute (TTI) maintains a list of Texas' most congested truck roadways, using person-hours of delay per mile as the primary measurement for ranking roadway segments.[9] As shown in Table 5, IH 35 from US 290 N to SH 71 ranks first in the whole state for truck delay. Four other segments of IH 35 in Travis and Williamson counties rank within the top 100 roadways. Additionally, US-290/SH-71 from RM 1826 to SL 1 (MoPac Expressway) ranks 79th statewide. The two remaining segments on IH 35 from SH 45 to US 290 are ranked 91st and 98th on TTI's list.

Table 5: Texas A&M Transportation Institute (TTI) List of Top Truck-Congested Roadways in Texas, 2021

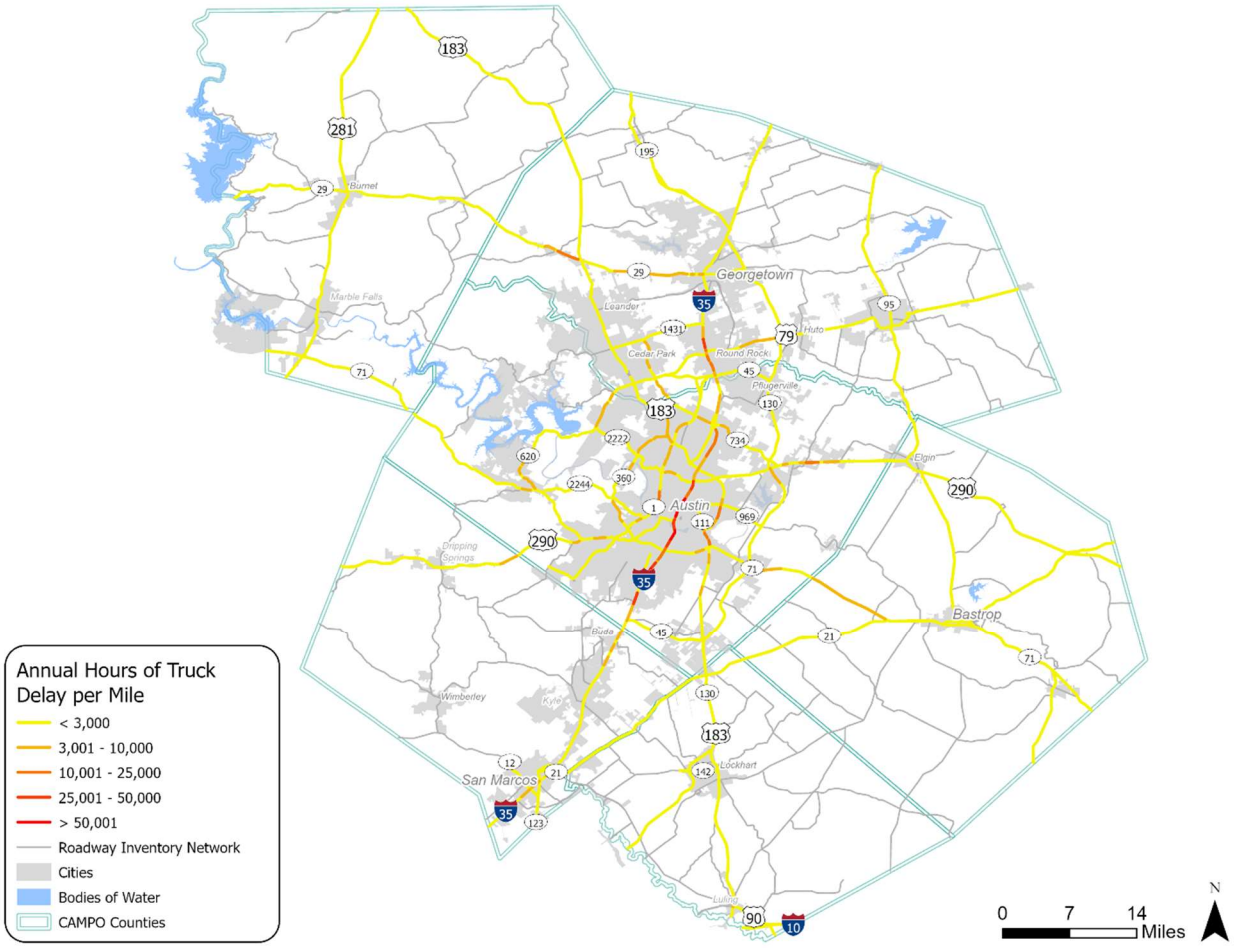
TTI Rank	Road Name	From	To	Annual Hours of Truck Delay/Mile
1	IH 35	US 290 N	Ben White Blvd / SH 71	78,333
13	IH 35	RM 1431	SH 45 / Louis Henna Blvd	35,975
19	IH 35	Ben White Blvd / SH 71	Slaughter Ln	27,897
30	IH 35	Slaughter Ln	SH 45	19,375
79	US 290/SH 71	RM 1826	S MoPac Expy / SL 1	8,381
91	IH 35	SH 45 / Louis Henna Blvd	Parmer Ln / FM734	7,228
98	IH 35	Parmer Ln / FM 734	US 290 N / SS 69	6,854

Source: Texas A&M Transportation Institute (TTI). Texas' Most Congested Roadways. Available at: https://mobility.tamu.edu/texas-most-congested-roadways/

Figure 6 shows the annual hours of truck delay per mile on the THFN according to TTI's analysis of 2019 INRIX data. The IH 35 corridor shows the highest levels of truck delay. However, segments with elevated levels of truck delay are also seen on several other north-south corridors, such as US 183 and SL 360 in Travis County. In addition, high truck delay is seen on east-west corridors such as SH 29 in Williamson County between Burnet and Georgetown, US 79 in Round Rock, and SH 71 in western Bastrop County.

8 American Transportation Research Institute, Top 100 Truck Bottlenecks – 2023. Available at: https://truckingresearch.org/2023/02/07/top-100-truck-bottlenecks-2023/
9 Texas Transportation Institute, Texas' Most Congested Roadways. Available at: https://mobility.tamu.edu/texas-most-congested-roadways/

Figure 6: Annual Hours of Truck Delay per Mile on the Texas Highway Freight Network (THFN), 2019



Source: Texas A&M Transportation Institute (TTI) analysis of INRIX data, 2019.

Table 6 lists the top five (5) corridors in each CAMPO county by annual hours of truck delay per mile. To identify top corridors by hours of truck delay, segment-level values were aggregated and weighted by length to identify a representative level of delay for the corridor. For example, in Travis, Hays, and Williamson counties, IH 35 has the highest levels of truck delay. In the more rural counties of Bastrop, Burnet, and Caldwell counties, principal arterials such as SH 71, US 281, and US 183 are notable corridors with a high level of truck delay.

Table 6: Annual Hours of Truck Delay per Mile Summarized by Corridor and County, 2019

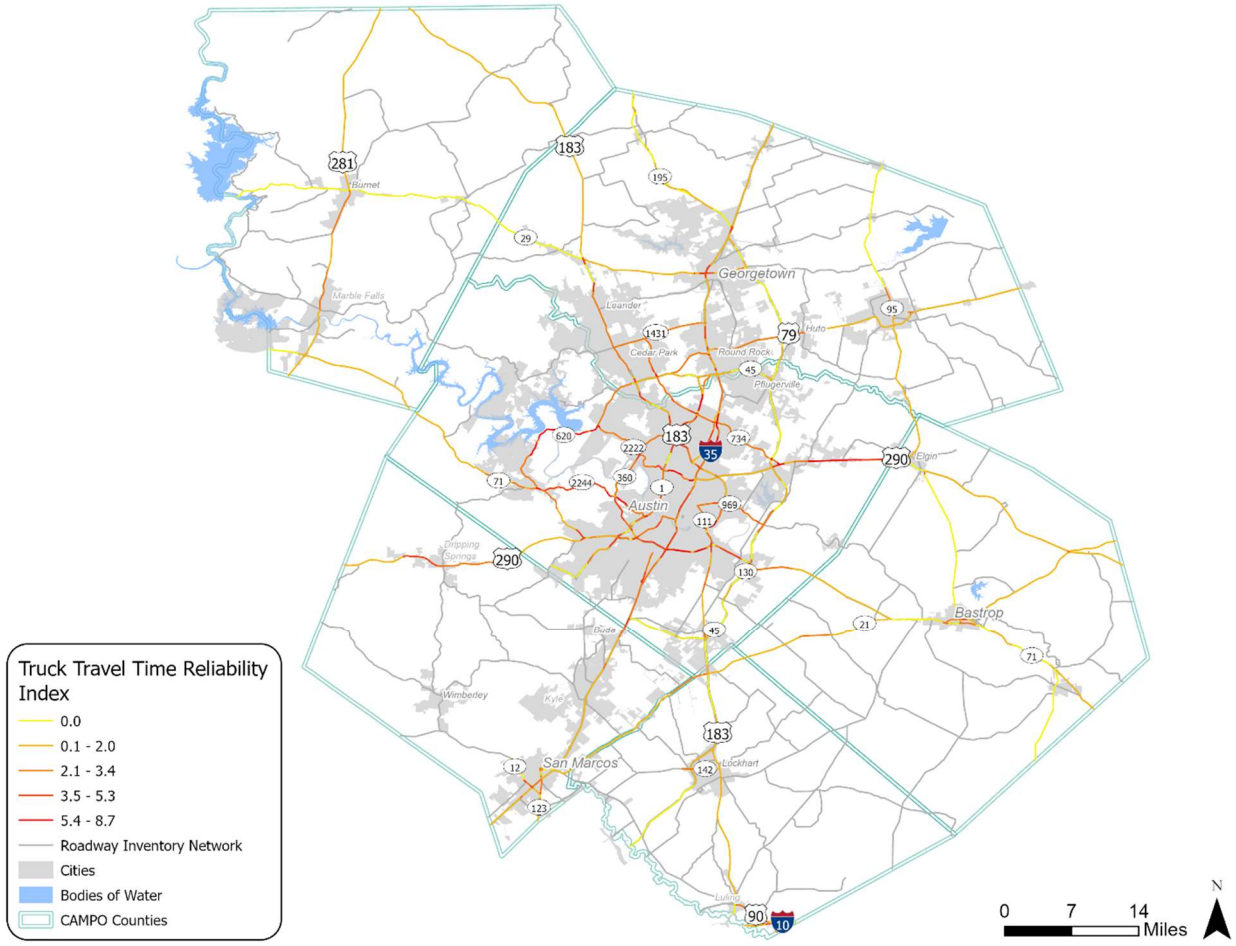
County	Corridor	Functional Classification	Annual Hours of Truck Delay per Mile	Mileage
Bastrop	SL 150	Other Principal Arterial	2,261	2
	SH 71	Other Principal Arterial	960	24
	SH 21	Other Freeway and Expressway	724	38
	US 290	Other Principal Arterial	641	25
	SH 95	Minor Arterial	505	31
Burnet	US 281	Other Principal Arterial	654	40
	SH 29	Other Principal Arterial	592	26
	US 183	Other Principal Arterial	232	21
	SH 71	Other Principal Arterial	113	15
	RM 963	Major Collector	44	0
Caldwell	SH 142	Other Principal Arterial	1,215	3
	US 183	Other Principal Arterial	994	18
	SH 80	Major Collector	959	1
	SH 21	Other Principal Arterial	813	8
	US 90	Other Principal Arterial	634	6
Hays	IH 35	Interstate	3,428	24
	SL 82	Other Principal Arterial	2,597	3
	SH 80	Minor Arterial	2,163	1
	SH 123	Other Principal Arterial	1,983	4
	RM 12	Other Principal Arterial	1,647	5
Travis	IH 35	Interstate	52,613	28
	US 183	Other Freeway and Expressway	6,887	28
	FM 734	Other Principal Arterial	4,104	13
	SL 1	Other Freeway and Expressway	3,852	24
	SL 360	Other Principal Arterial	3,294	14
Williamson	IH 35	Interstate	7,389	28
	SS 377	Major Collector	4,884	1
	SH 29	Other Principal Arterial	3,813	24
	FM 734	Other Principal Arterial	3,516	7
	RM 620	Other Principal Arterial	2,922	6

Source: Cambridge Analysis of truck delay data from the Texas A&M Transportation Institute (TTI), 2019

Truck Travel Time Reliability (TTTR) is defined by comparing truck travel times between a free-flow period with no congestion against normal travel times (95th percentile). The lower the TTTR, the more reliable travel time is, with little difference between the roadway's optimal performance and typical traffic patterns. Figure 7 maps TTTR on the THFN, and Table 7 summarizes this information by corridor for each county in the region.

While truck delay in the region is more concentrated along specific corridors/segments, reliability is an issue across the region. Several parts of the region experience high levels of congestion during peak travel periods, with non-recurring events such as incidents and inclement weather causing additional delays and variability in travel times. For truck drivers, this means adding buffer time to a trip or taking circuitous routes to avoid congestion to ensure on-time arrival, which increases vehicle miles traveled and leads to higher transport costs. While travel delay is concentrated along IH 35, it is important to note that travel time unreliability can still impact less congested roadways, particularly on the east-west connecting with IH 35 and corridors that provide parallel north-south access.

Figure 7: Truck Travel Time Reliability Ratio (TTTR) on the Texas Highway Freight Network (THFN), 2019



Source: Cambridge Systematics Analysis of the National Performance Management Research Data Set (NPMRDS), 2019.

Table 7: Truck Travel Time Reliability (TTTR) Summarized by Corridor and County, 2019

	Corridor	Functional Classification	Truck Travel Time Reliability (TTTR)	Length (miles)
Bastrop	SL 150	Other Principal Arterial	2.3	2
	US 290	Other Principal Arterial	1.3	25
	SH 21	Other Freeway and Expressway	1.2	38
	SH 71	Other Principal Arterial	1.2	24
	SH 95	Minor Arterial	0.2	31
Burnet	US 281	Other Principal Arterial	1.7	40
	RM 963	Major Collector	1.2	0
	US 183	Other Principal Arterial	1.2	21
	SH 71	Other Principal Arterial	1.1	15
	SH 29	Other Principal Arterial	<0.1	26
Caldwell	SH 142	Other Principal Arterial	2.0	3
	IH 10	Interstate	2.0	5
	SH 21	Other Principal Arterial	1.7	8
	US 90	Other Principal Arterial	1.5	6
	US 183	Other Principal Arterial	1.4	18
Hays	FM 2439	Major Collector	4.4	0
	US 290	Other Principal Arterial	2.5	17
	FM 621	Major Collector	2.3	0
	SL 82	Other Principal Arterial	2.1	3
	SH 123	Other Principal Arterial	1.9	4
Travis	RM 2244	Other Principal Arterial	4.7	11
	RM 620	Other Principal Arterial	4.6	17
	SS 69	Other Freeway and Expressway	3.9	1
	RM 2222	Other Principal Arterial	3.5	11
	IH 35	Interstate	3.4	28
Williamson	FM 734	Other Principal Arterial	3.5	7
	FM 1325	Minor Arterial	2.8	1
	RM 620	Other Principal Arterial	2.7	6
	RM 1431	Other Principal Arterial	2.6	9
	US 183	Other Freeway and Expressway	1.9	30

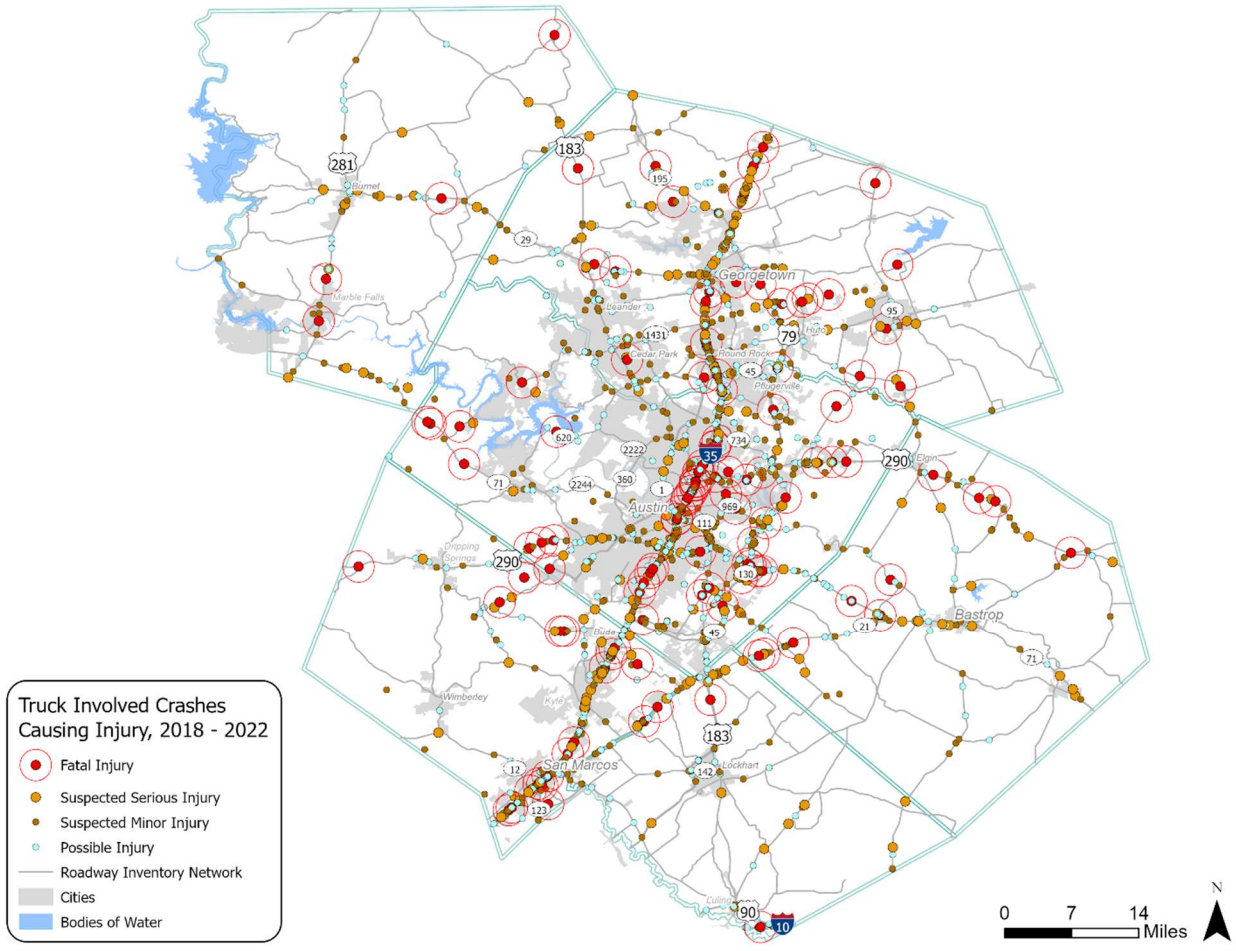
Source: Cambridge Systematics Analysis of the National Performance Management Research Data Set (NPMRDS), 2019.

Safety

This section analyzes truck-involved crashes using data from the Crash Records Information System (CRIS) for the reporting period of 2018 to 2022. Due to their inherent size and momentum, the involvement of a truck vehicle can contribute to severe crash injuries. Therefore, understanding the location of crashes and severity is essential for assessing the safety of freight movement in the region. Over the five-year period, a total of 6,415 truck-involved crashes have occurred in the CAMPO region.

Figure 8 maps the location of truck-involved crashes that resulted in injury. The map shows visual concentrations of these crashes along the IH 35 corridor, particularly in the segment through the central part of Austin in Travis County and in San Marcos in Hays County. Across the network, there were 145 crashes involving a fatality (2% of the total). Injury crashes represented 32% of all truck-involved crashes in the region.

Figure 8: Truck-Involved Crashes Causing Injury by Severity, 2018-2022



Source: Texas Department of Transportation (TxDOT). Crash Records Information System (CRIS) Query. Available at: https://cris.dot.state.tx.us/public/Query/app/home

Table 8 breaks down truck-involved injury crashes by severity for each county. For example, over 50% of fatal crashes occurred in Travis County though only 37% of all crashes involving trucks occurred there. Bastrop also had a higher share of fatal injuries than its total share of truck-involved crashes. Overall, 2,081 or nearly a third of the total truck-involved crashes resulted in a form of personal injury.

Table 8: Truck-Involved Crashes by Severity, 2018-2022

Crash Severity	Bastrop County	Burnet County	Caldwell County	Hays County	Travis County	William. County	Total
Fatal Injury	12 (8%)	4 (3%)	4 (3%)	74 (51%)	30 (21%)	21 (14%)	145 (100%)
Suspected Serious Injury	26 (10%)	15 (5%)	19 (7%)	81 (30%)	80 (29%)	52 (19%)	273 (100%)
Suspected Minor Injury	60 (7%)	30 (4%)	30 (4%)	368 (45%)	203 (25%)	128 (16%)	819 (100%)
Possible Injury	47 (6%)	30 (4%)	48 (6%)	408 (48%)	173 (20%)	138 (16%)	844 (100%)
Not Injured	332 (8%)	210 (5%)	243 (6%)	1,436 (33%)	1,395 (32%)	684 (16%)	4,300 (100%)
Unknown	2 (6%)	2 (6%)	3 (9%)	15 (44%)	8 (24%)	4 (12%)	34 (100%)
Total	479 (7%)	291 (5%)	347 (5%)	2,382 (37%)	1,889 (29%)	1,027 (16%)	6,415 (100%)

Source: Texas Department of Transportation (TxDOT). Crash Records Information System (CRIS) Query. Available at: https://cris.dot.state.tx.us/public/Query/app/home

Table 9 ranks corridors in the region by the total number of truck-involved crashes. IH 35 represents 40% of all crashes, with the next highest roadway, US 183, representing about 8% of all truck-involved crashes; compared to US 183 which had more truck-involved crashes, SH 71, US 290, and SH 130 had more fatal injury crashes.

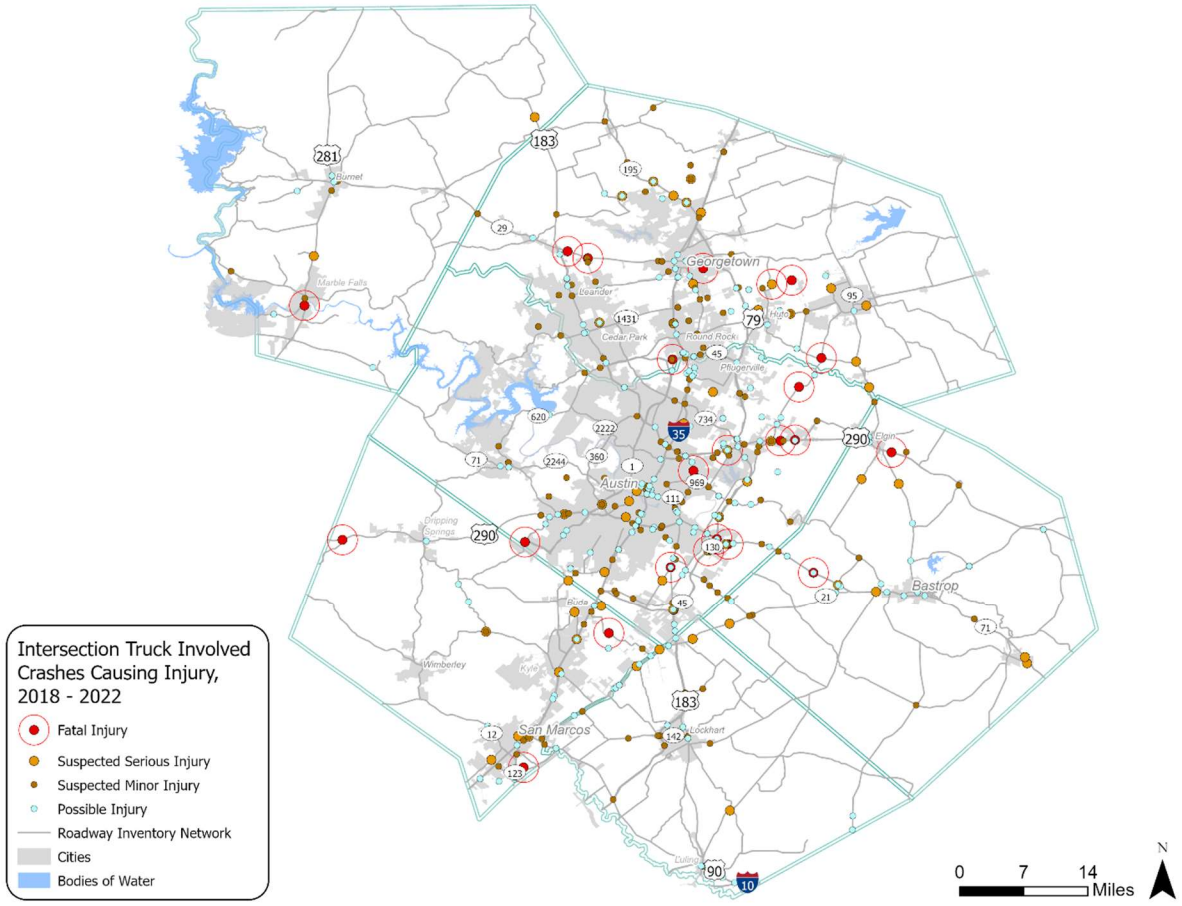
Table 9: Top 20 Corridors by Total Truck-Involved Crashes, 2018-2022

Corridor	Total Crashes	Fatal Injury	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	Not Injured	Unknown
IH 35	1,794	40	79	264	254	1,152	5
US 183	349	4	14	48	42	238	3
SH 71	280	10	11	34	45	177	3
US 290	237	11	12	35	32	147	0
SH 21	208	6	12	26	25	138	1
SH 130	192	8	4	22	36	122	0
SH 29	146	3	9	16	11	107	0
US 281	103	2	4	8	12	77	0
US 79	81	1	3	15	5	56	1
RM 1431	69	0	1	11	5	52	0
FM 973	59	2	1	9	9	38	0
FM 969	52	2	0	9	5	36	0
IH 10	49	1	0	5	5	37	1
SH 45	45	0	1	2	7	34	1
SH 95	44	2	3	5	5	28	1
LP 1	42	0	4	3	12	23	0
FM 812	40	1	4	7	7	21	0
SH 195	37	1	4	3	4	25	0
US 90	37	0	0	2	6	29	0
RM 620	34	1	0	1	3	29	0

Source: Texas Department of Transportation (TxDOT). Crash Records Information System (CRIS) Query. Available at: https://cris.dot.state.tx.us/public/Query/app/home

Figure 9 shows the truck-involved injury crashes in the region that occurred at an intersection. Between 2018-2022, trucks were involved in 543 intersection-related crashes resulting in an injury, representing 26% of all injury crashes. Intersection crashes could suggest issues with access control on principal arterials and at certain arterial intersections, especially along corridors in exurban and rural areas that were not initially designed to handle the volume and types of truck traffic. These corridors include undivided U.S. highways and FM/RM roads.

Figure 9: Truck-Involved Injury Crashes located at an Intersection, 2018 – 2022



Source: Texas Department of Transportation (TxDOT). Crash Records Information System (CRIS) Query. Available at: https://cris.dot.state.tx.us/public/Query/app/home

Truck Parking

Truck drivers need parking for various reasons, including rest and travel amenities on long-haul routes, staging outside of pick-up/delivery locations and border crossings, taking federally mandated rest breaks, and parking vehicles during off-duty periods. TxDOT's 2020 Truck Parking Study analyzed truck parking safety and the deficit of available spaces during periods of peak demand.

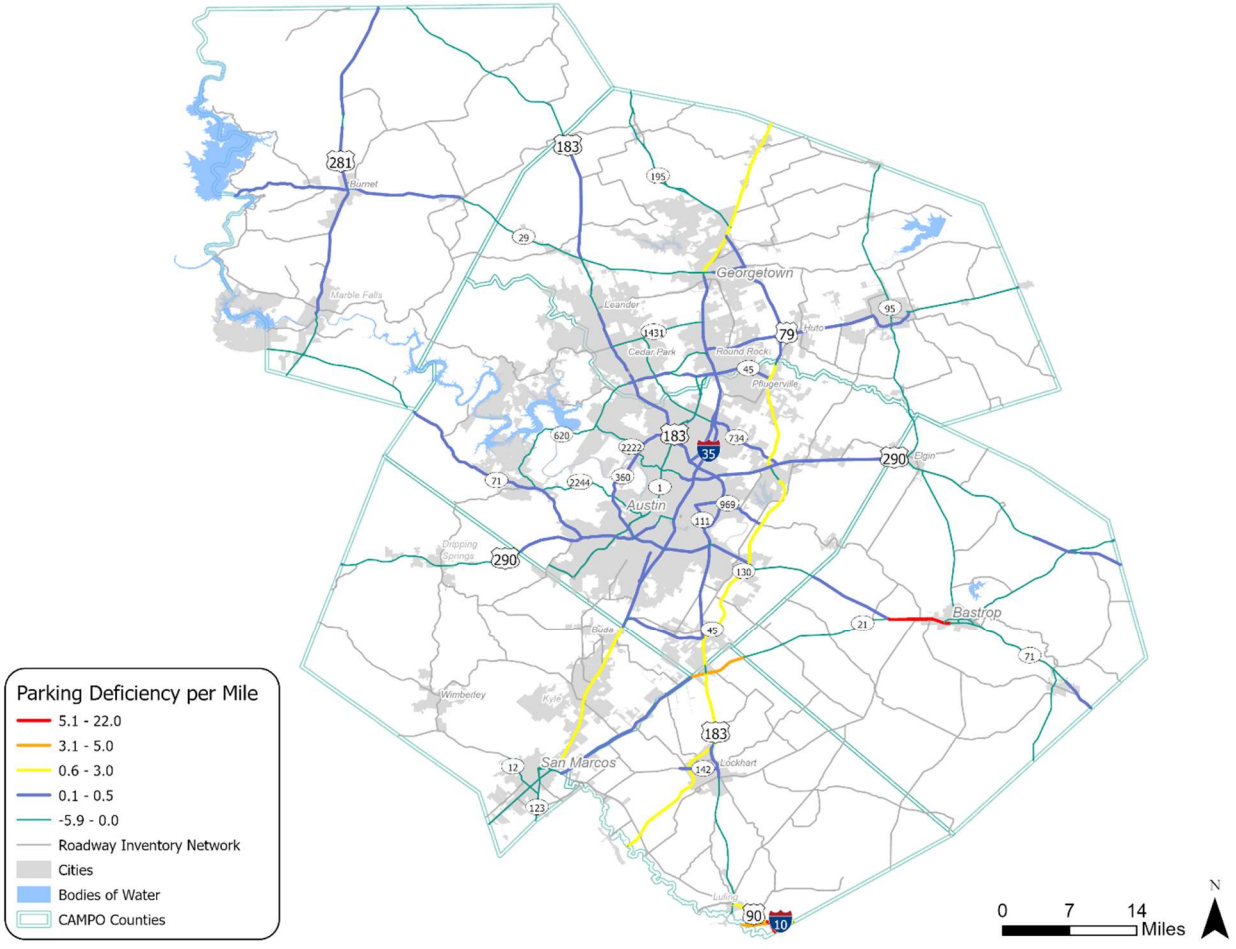
Currently, the CAMPO region does not have public truck parking locations along its Interstate corridors, notably along IH 35. Several public truck parking facilities are located just outside the region along key freight corridors:

- Northbound/southbound Bell County Safety Rest Area, north of Williamson County along IH 35
- Fayette County Picnic Area, east of Bastrop County along eastbound SH 71

- Eastbound/westbound Guadalupe County Safety Rest Area, southwest of Caldwell County along IH 10

Figure 10 shows the estimated peak hour deficit for truck parking in the CAMPO region using the analysis from the Truck Parking Study. Many corridors near Austin, including IH 35, have only slight to moderate parking deficits. The largest deficits along IH 35 are in Williamson and Hays counties, south of SH 45 and north of SH 29. Truck parking deficits are also seen on SH 130, which trucks use to bypass the congested segments of IH 35 through Travis County. The greatest deficiency in the region by far occurs west of the city of Bastrop along SH 71. Another significant deficit along SH 21 occurs in north Caldwell County where the highway intersects with US-183. The short segment of IH 10 in Caldwell County is also notably deficient for truck parking.

Figure 10: Peak Hour Truck Parking Deficit on the Texas Highway Freight Network (THFN)



Source: Texas Department of Transportation (TxDOT). Statewide Truck Parking Study, 2020.

Pavement Condition

Table 10 summarizes the pavement condition rating for roadways in the CAMPO region and the THFN. A rating is assigned according to the International Roughness Index (IRI). IRI values are measured in inches per mile and are used by the FHWA and state DOTs to evaluate pavement ride quality. Qualitative ratings – "Good," "Fair," and "Poor" – are assigned to roadway segments according to the following performance thresholds:

- **Good** – IRI value is less than 95
- **Fair** – IRI value is between 95 and 170
- **Poor** – IRI value is greater than 170

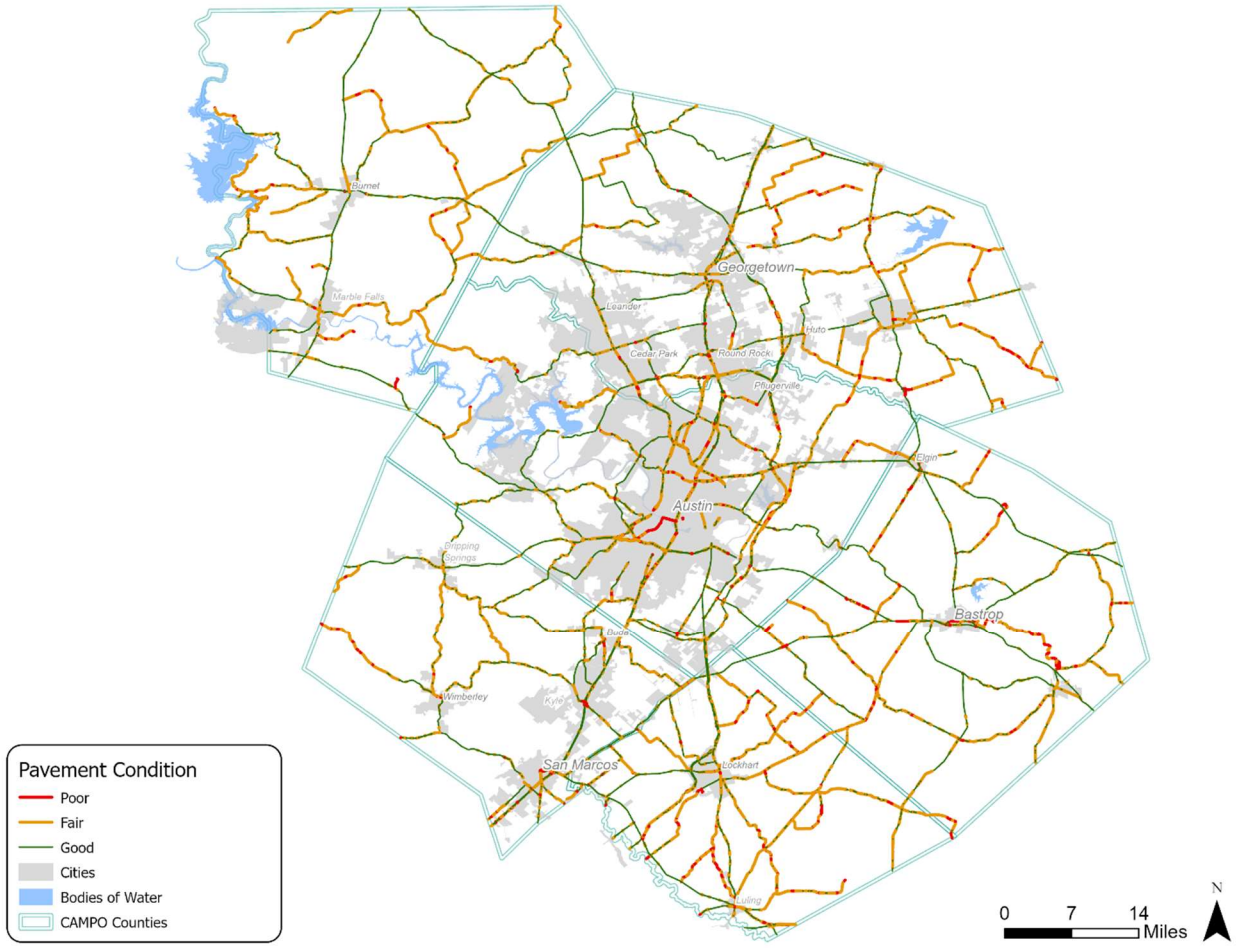
Among the roadway mileage reported for the on-system network, 92% were rated in "good" or "fair" condition, while only 8% were rated "poor." Figure 11 maps this information for the on-system network in the CAMPO region.

Table 10: Pavement Conditions in the CAMPO Region

Pavement Quality	Bastrop County	Burnet County	Caldwell County	Hays County	Travis County	Williamson County
Good	180 (56%)	134 (46%)	137 (45%)	158 (60%)	345 (59%)	323 (58%)
Fair	108 (33%)	142 (49%)	135 (44%)	89 (34%)	200 (34%)	197 (35%)
Poor	35 (11%)	14 (5%)	32 (11%)	15 (6%)	44 (7 %)	37 (7%)
Total	323 (100%)	290 (100%)	304 (100%)	262 (100%)	589 (100%)	557 (100%)

Source: Texas Department of Transportation (TxDOT), 2021.

Figure 11: Pavement Condition for On-System Roadways, 2021



Source: Texas Department of Transportation (TxDOT), 2021.

Bridge Condition and Vertical Clearance

The TxDOT bridge database was analyzed to evaluate bridge conditions and vertical clearances specific to freight considerations. These factors could affect the overall efficiency of freight operations by limiting the route options for certain trucks, particularly those that are transporting oversized and overweight loads. This requires vehicles to travel additional distances to avoid striking a low-clearance bridge, for example. In addition, trucks are not always aware of bridge condition issues, and traveling on them accelerates the rate of deterioration of the deck and structure.

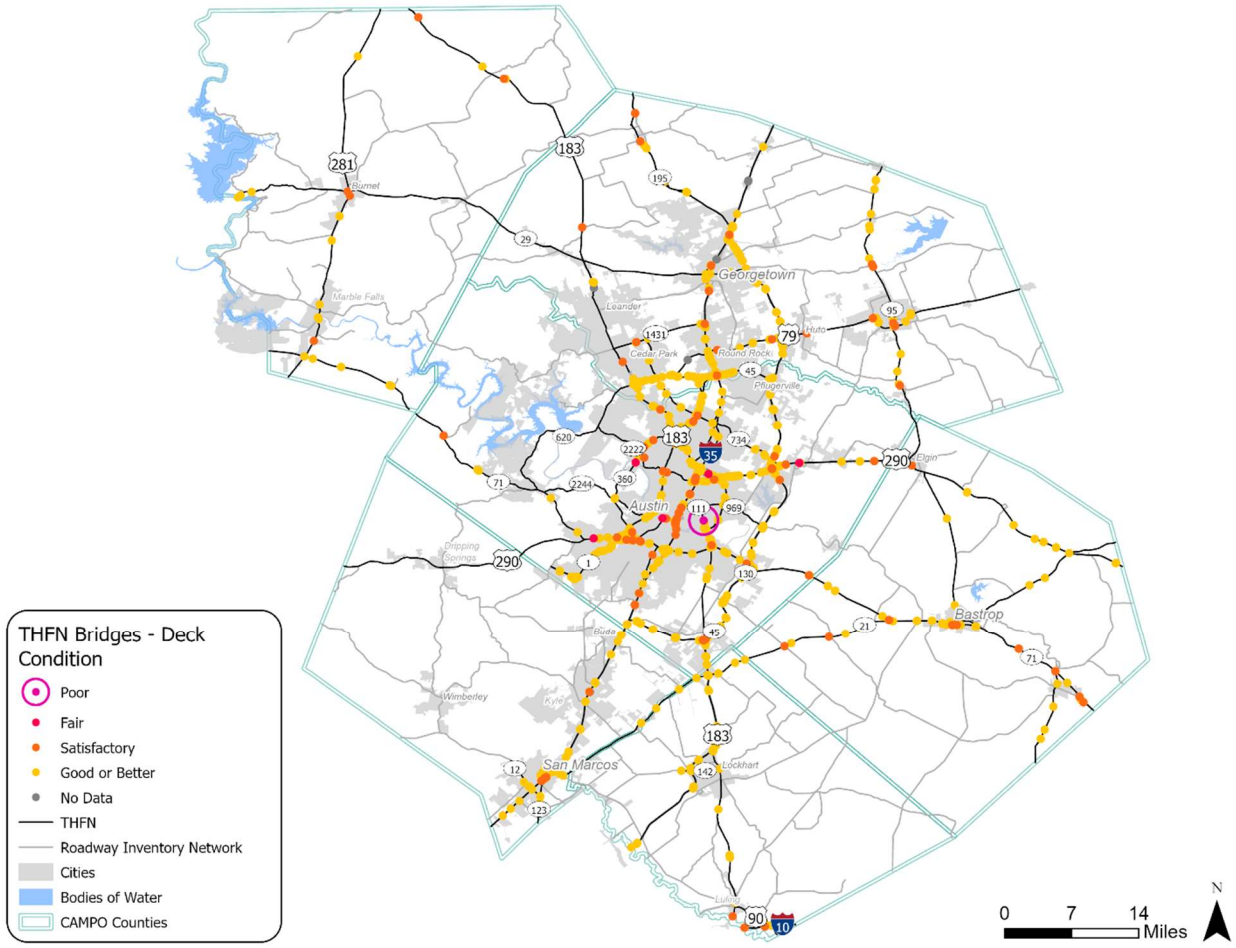
Using the bridges point shapefile from the TxDOT data portal, bridges along the THFN were identified and analyzed for deck condition according to the following classification codes:

- **Excellent Condition:** N/A (no definition provided).
- **Very Good condition:** No problems noted.
- **Good Condition:** Some minor problems.

- **Satisfactory Condition:** Structural elements show some minor deterioration.
- **Fair Condition:** All primary structural elements are sound but may have minor section loss, cracking, spalling, or scour.
- **Poor Condition:** Advanced section loss, deterioration, spalling, or scour.
- **Serious Condition:** Loss of section, deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present.
- **Critical Condition:** Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present, or scour may have removed substructure support. Unless closely monitored, it may be necessary to close the bridge until corrective action is taken.
- **Imminent Failure Condition:** Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. The bridge is closed to traffic, but corrective action may put it back in light service.
- **Failed Condition:** Out of service; beyond corrective action.

Figure 12 maps the location and deck condition for bridge overpasses carrying the THFN in the CAMPO region. Of the 920 bridges shown on the map, 87% are rated good or better for deck condition, and 11% are rated in satisfactory condition. Most of the overpass locations are in Travis County, which has 53% of the total, followed by Williamson County with 25%. Burnet County has the most significant proportion of locations rated as satisfactory, with 23%. Travis County has the only location with a poor deck condition rating – the overpass carrying LP 111 (Airport Blvd.) over railroad tracks in East Austin.

Figure 12: Bridge Deck Condition on the Texas Highway Freight Network (THFN)



Source: Texas Department of Transportation (TxDOT). TxDOT Bridges (2021). Available at: https://gis-txdot.opendata.arcgis.com/datasets/txdot-bridges

TxDOT has implemented a vertical clearance requirement of 18.5 feet for bridges spanning the THFN. Since September 28, 2017, an 18.5-ft bridge underpass vertical clearance has been required on the THFN for all new construction and reconstruction projects.[10] The higher vertical clearance standard is designed to increase freight mobility across the network by accommodating the needs of oversized loads. The increased vertical standard also improves safety and asset management by reducing the potential for bridge strikes.

[10] TxDOT. Roadway Design Manual. Section 8: Texas Highway Freight Network (THFN).

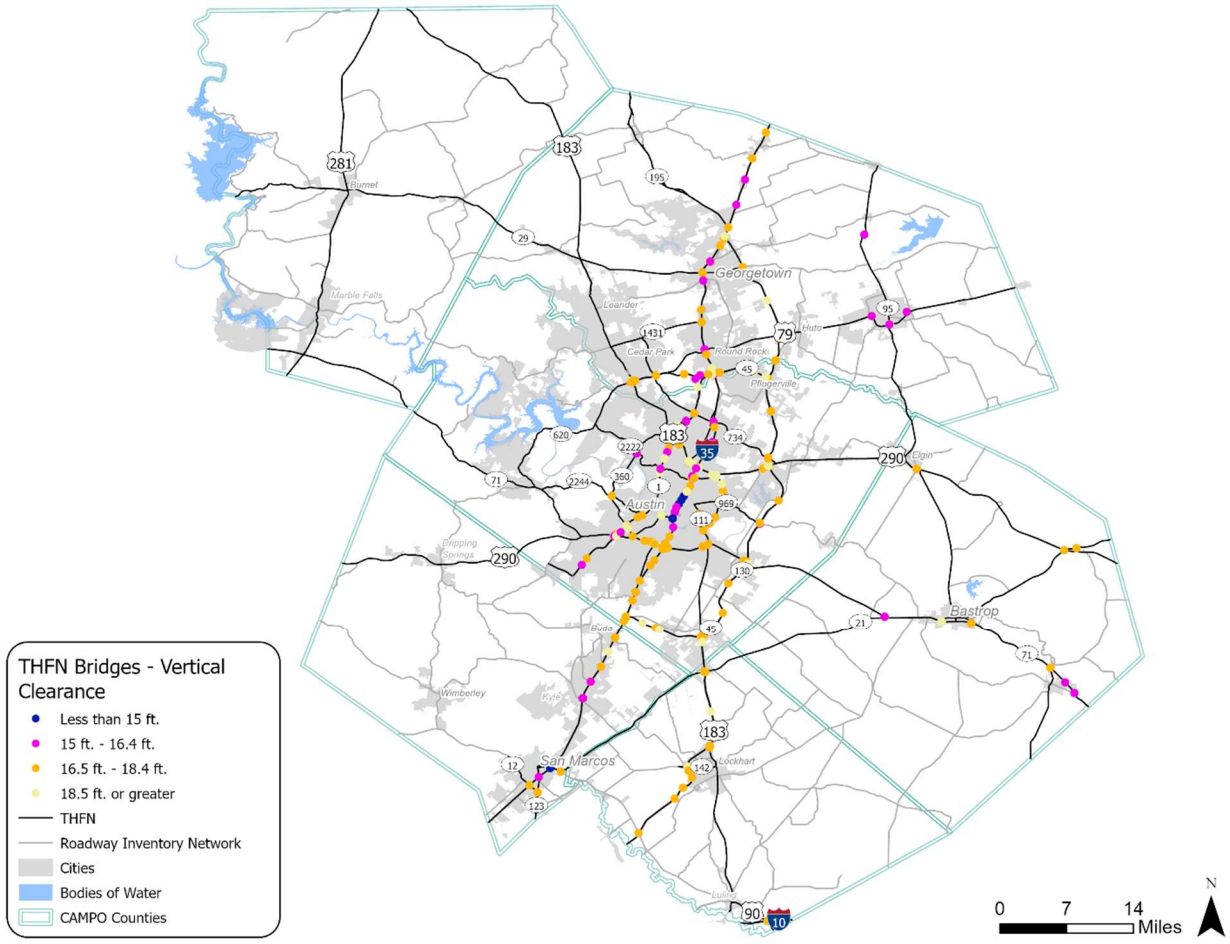
Table 11 summarizes the number of highway and rail underpasses by minimum vertical clearance on the THFN. It is important to note that the totals do not include bridges spanning non-THFN roadways since the vertical clearance standard applies to constructing or reconstructing bridge structures over the THFN. Most bridges (59%) are between 16.5' and 18.4'; 18% meet the 18.5-foot standard for vertical clearance over the THFN. Travis County has the most underpasses on the THFN, with 58% of the total, and has the highest proportion of bridges that meet the vertical clearance standard (21%). Conversely, Hays County has the smallest percentage of bridges that meet the vertical clearance standard at 9% and a greater proportion of bridges under 15 feet (14%). Figure 13 maps the location of the highway and rail underpasses on the THFN.

Table 11: Bridge Vertical Clearance over the Texas Highway Freight Network (THFN)

Vertical Clearance	Bastrop County	Caldwell County	Hays County	Travis County	Williamson County	Total
Less than 15'	0 (0%)	0 (0%)	3 (14%)	5 (3%)	0 (0%)	8 (3%)
15'-16'5"	5 (33%)	0 (0%)	6 (27%)	32 (19%)	18 (28%)	61 (21%)
16'6"-18'5"	8 (53%)	18 (86%)	11 (50%)	97 (57%)	38 (58%)	172 (59%)
18'6" or greater	2 (13%)	3 (14%)	2 (9%)	36 (21%)	9 (14%)	52 (18%)
Total	15 (100%)	21 (100%)	22 (100%)	170 (100%)	65 (100%)	293 (100%)

Source: Texas Department of Transportation (TxDOT). TxDOT Bridges (2021). Available at: https://gis-txdot.opendata.arcgis.com/datasets/txdot-bridges

Figure 13: Bridges Vertical Clearance on the Texas Highway Freight Network (THFN)



Source: Texas Department of Transportation (TxDOT). TxDOT Bridges (2021). Available at: https://gis-txdot.opendata.arcgis.com/datasets/txdot-bridges

Oversize and Overweight Vehicle Permits

Vehicle types and loads over a specific size or weight must apply for oversize/overweight (OS/OW) permits from the Texas Department of Motor Vehicles (TxDMV). Freight vehicles carrying OS/OW loads need to be routed along corridors without impediments to their size, such as low bridges, narrow roads, steep grades, sharp turns, or other restrictions. Overweight vehicles can accelerate wear and tear on roadway networks, so they must be permitted to ensure pavement conditions do not deteriorate under these heavy loads. Some permits carry additional restrictions, such as restricting OS/OW movements during certain hours.

Table 12 summarizes average tonnage and permit counts for single-use trip permits traveling in the CAMPO region for 2022 by county. Super Heavy permits are required for any vehicle exceeding a gross vehicle weight of 250,000 lbs. Overheight permits are required for any vehicle exceeding 16 feet in height. Super Heavy loads had the highest average tonnage and number of permits on roadways in Bastrop County. For overheight loads, the roadways in

Bastrop County had the highest average tonnage and number of permits. Overall, roadways in Hays County saw the highest average tonnage and permits for all types of OS/OW permitted loads.

Table 12: OS/OW Permits Activity in the Capital Area Region, 2022

Permit Type	Bastrop County	Burnet County	Caldwell County	Hays County	Travis County	Williamson County
Super Heavy Permit Tonnage	5,552	2,012	3,400	2,828	2,927	4,230
Super Heavy Permit Count	39	15	25	22	22	32
Overheight Permit Tonnage	4,843	3,112	2,128	1,071	1,271	2,140
Overheight Permit Count	98	102	55	33	30	52
All OS/OW Permits Tonnage	44,030	27,936	42,499	88,251	61,435	73,081
All OS/OW Permits Count	1,261	1,013	1,338	2,712	1,966	2,520

Source: TxDMV, Oversize/Overweight Permits Database, 2022; Analysis by the Texas A&M Transportation Institute (TTI).

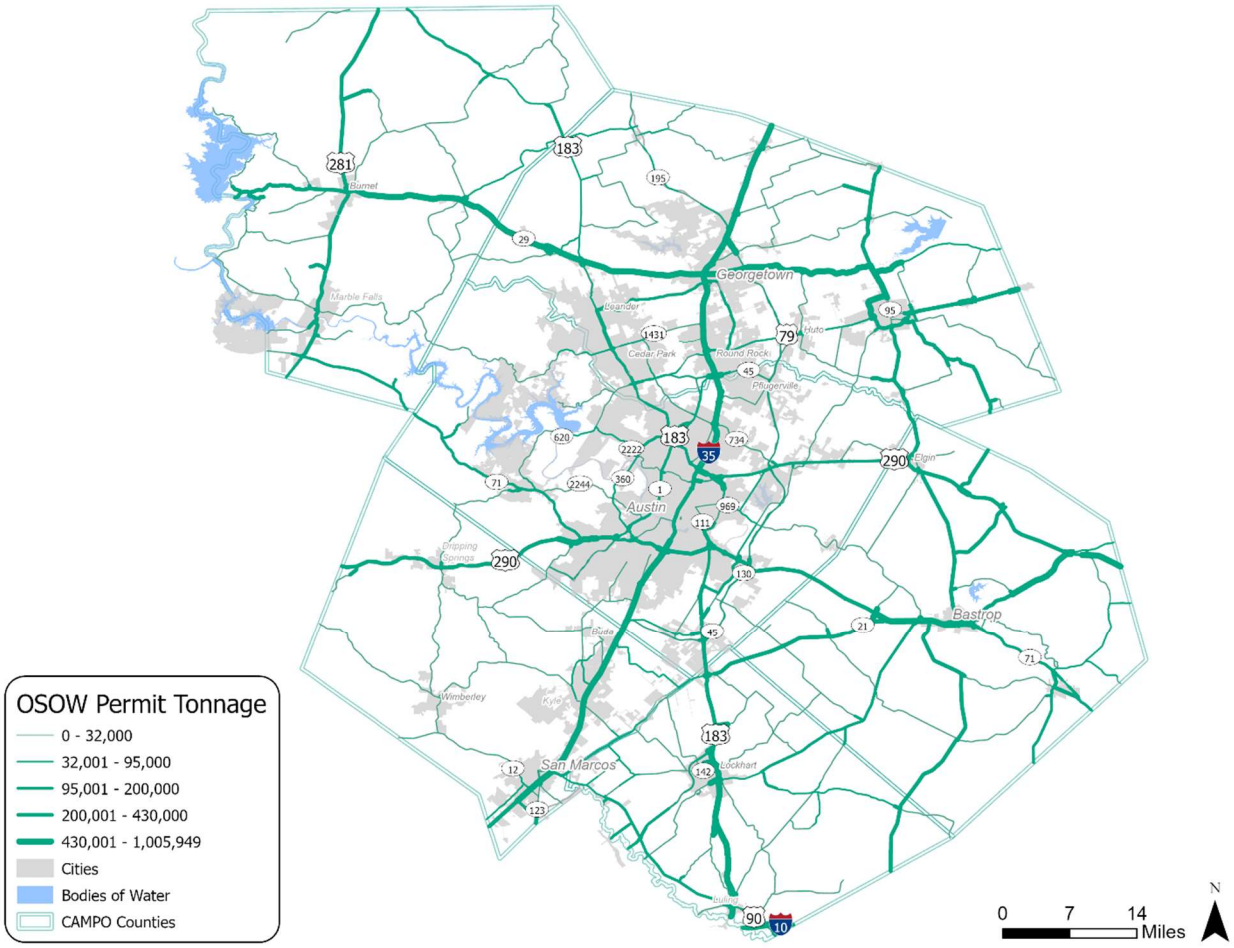
Figure 14 shows the tonnage for all OS/OW permits in the CAMPO region in 2022. Clearly, OS-OW permitted trucks are using major roadways across the region. Major north-south routes with high levels of OS/OW permit activity include:

- IH 35, notably with less tonnage directly within downtown Austin between US-183 and US-290
- US-183, particularly between Lockhart and Luling in Caldwell county
- US 281 in Burnet County
- SH 95, which connects the cities of Bastrop, Elgin, and Taylor in Bastrop and Williamson counties

Major east-west routes include:

- US-290, which passes through southern Austin and connects the cities of Dripping Springs, Austin, and Bastrop
- SH 29, which goes between the cities of Burnet and Georgetown
- SH 71, especially between US-183 and US-290 near the city of Bastrop

Figure 14: Tonnage Transported by all Oversize/Overweight (OS/OW) Permitted Loads, 2022



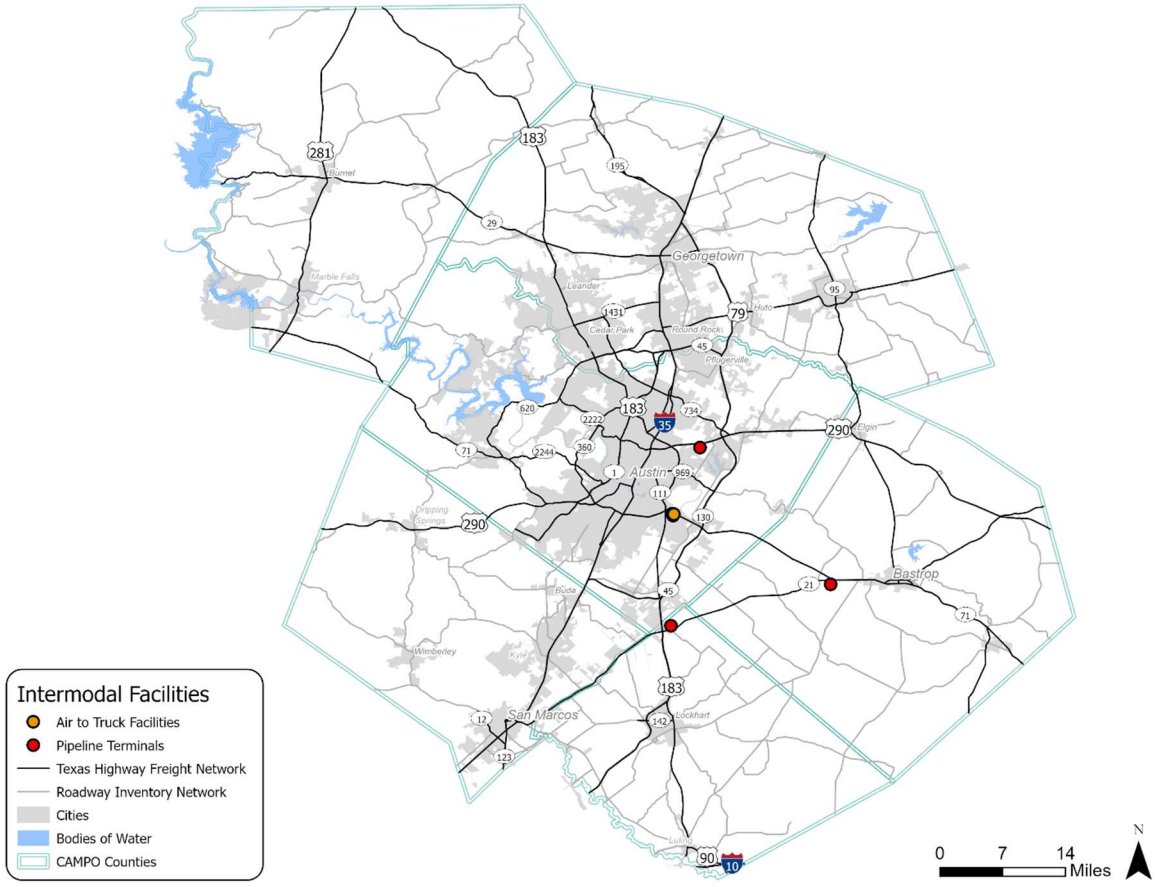
Source: TxDMV, Oversize/Overweight Permits Database, 2022; Analysis by the Texas A&M Transportation Institute (TTI).

Intermodal Freight Facilities

Intermodal facilities allow goods shipped by one transportation mode to be transferred to another. Major intermodal facilities are reported to the FHWA, which maintains a database of all facilities in the U.S. The reported facilities include pipeline terminals, marine roll-on/roll-off facilities, rail trailer-on-flatcar or container-on-flatcar (TOFC/COFC), and air-to-truck facilities.

Figure 15 shows all seven (7) facilities within the CAMPO region comprised of three (3) pipeline terminals and four (4) air-to-truck facilities. Notably, the region lacks any Rail TOFC/COFC facilities despite having a moderate railway infrastructure. All air-to-truck facilities are located at the ABIA. The three pipeline terminals are located in Travis, Bastrop, and Caldwell counties. These terminals store crude and refined petroleum products for transfer from pipelines to rail and trucks.

Figure 15: Intermodal Freight Facilities



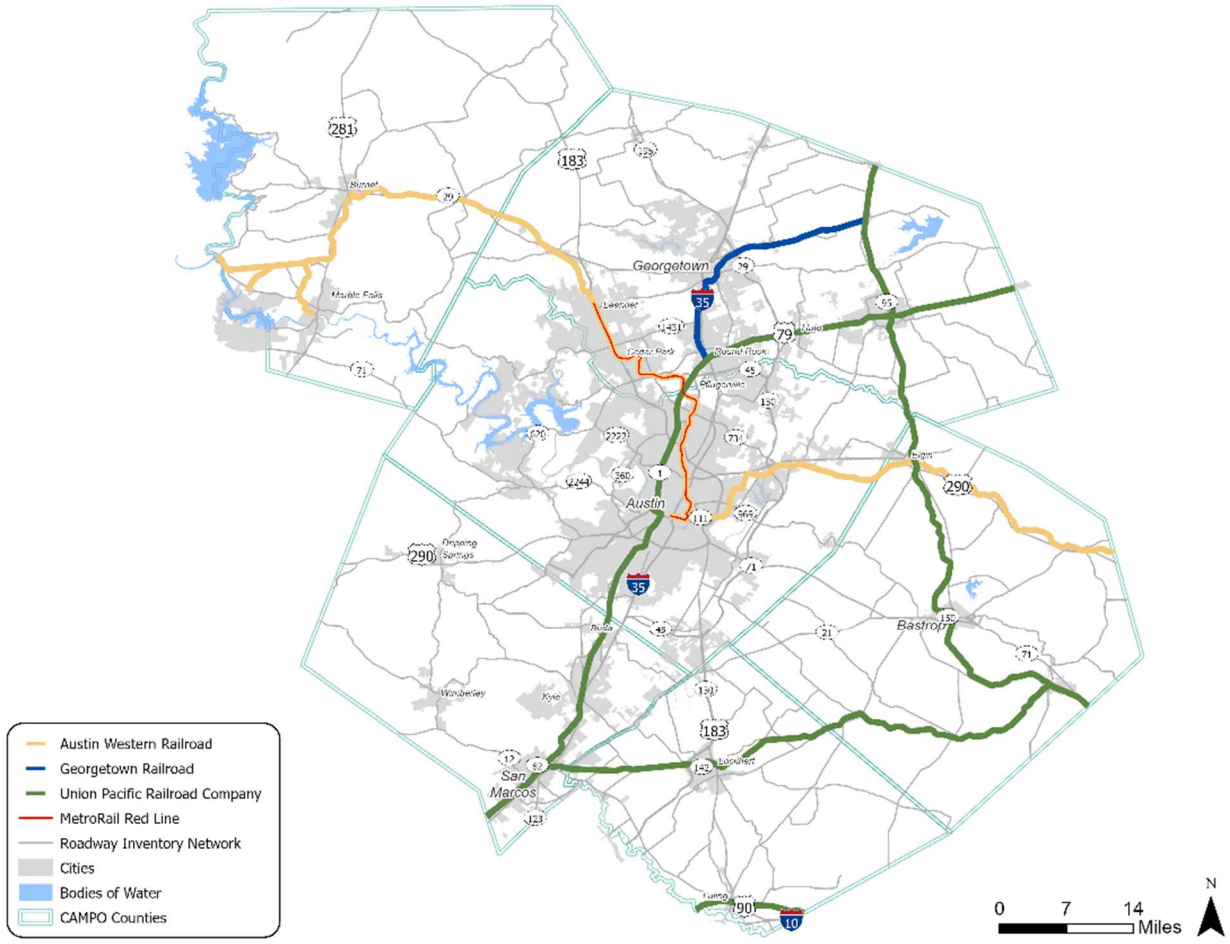
Note: The air-to-truck facilities are in close proximity to each other and appear as overlapping dots due to the extents of the map.
Source: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS). Open Data Catalog. Available at: https://geodata.bts.gov/

Rail Assets

Rail is an important element of the multimodal network in the CAMPO region that provides freight transport over longer distances without congesting highways. The CAMPO region is served by Union Pacific (UP), a Class I railroad, and Class III freight railroads.[11] Figure 16 shows the existing active freight rail system within the CAMPO region. Summarized in Table 13, UP operates 260 miles of Class I railroads in the region. In addition, the Austin Western Railroad, known as the Austin Area Terminal Railroad before 2017, and the Georgetown Railroad each operate 156 and 37 miles of Class III railroads, respectively. The Austin Western Railroad also shares 32 miles of track with the Red Line, a passenger rail service operated by the Capital Metropolitan Transportation Authority (CapMetro).

[11] The Surface Transportation Board (STB) classifies rail carriers based on their annual operating revenues. Class I carrier operating revenues are greater than $943.9 million annually, while Class III carriers have annual operating revenues below $42.4 million. https://www.stb.gov/reports-data/economic-data/

Figure 16: Active Freight Rail Networks in the Capital Area Region



Source: Texas Department of Transportation (TxDOT). Open Data Portal. Texas Railroads. Available at: https://gis-txdot.opendata.arcgis.com/datasets/texas-railroads

Table 13: Active Freight Track Miles by Class and Operators

Railroad	Standard Carrier Alpha Code	Railroad Class	Total Miles
Austin Western Railroad	AWRR	Class III	156
Georgetown Railroad	GRR	Class III	37
Union Pacific Railroad	UP	Class I	260
Not Specified	-	-	22
Total Miles			475

Source: Texas Department of Transportation (TxDOT). Open Data Portal. Texas Railroads. Available at: https://gis-txdot.opendata.arcgis.com/datasets/texas-railroads/explore?location=30.965836%2C-100.077132%2C6.55

Within the CAMPO area, there are 47 at-grade crossings that intersect the on-system roadway network. As shown in Table 14, Williamson County has 16 on-system railroad crossings, the most of the six counties, which make up around 34% of all railroad crossings in the study region. With 11 railroad crossings (23%), Bastrop County has the second-highest number in the study area.

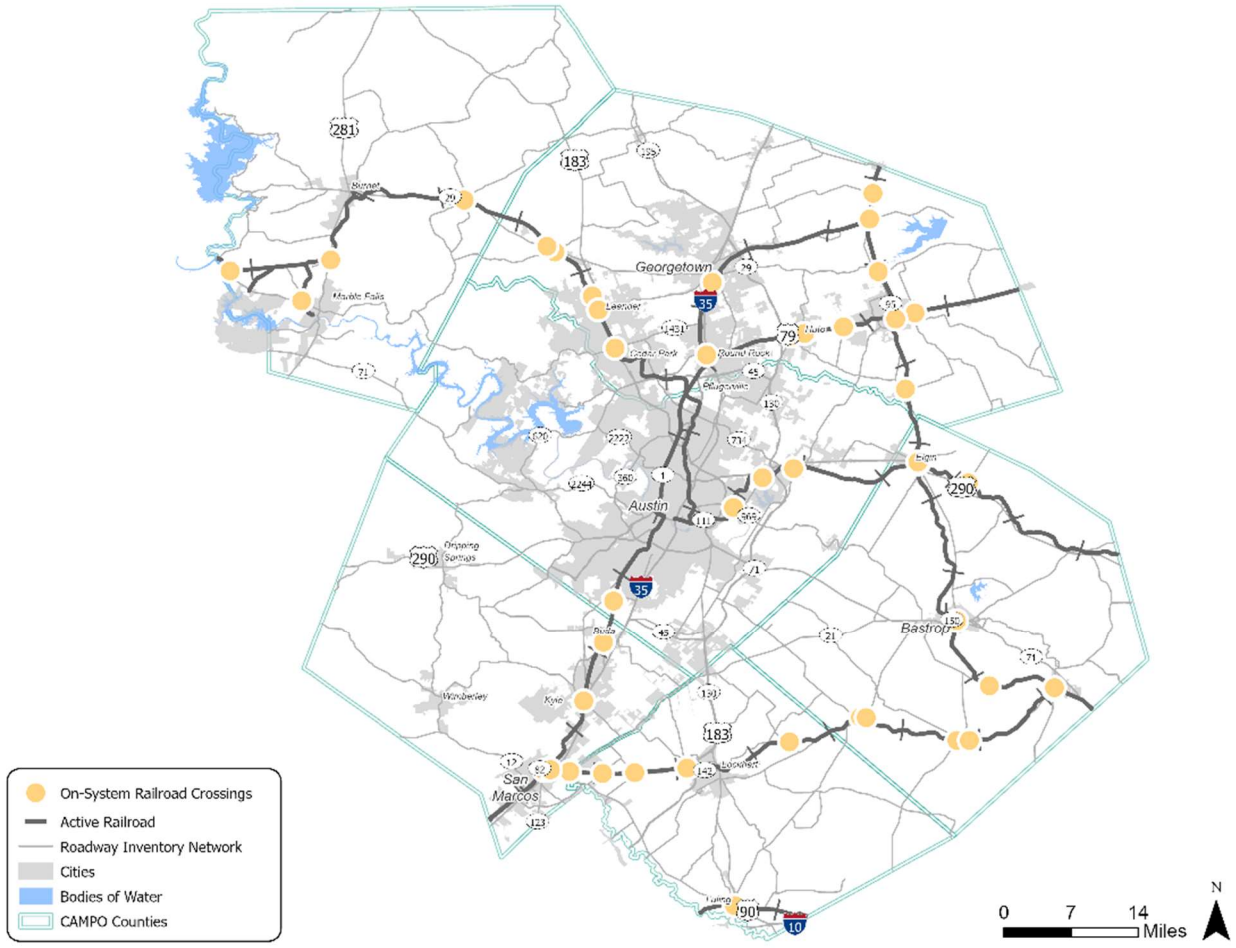
Table 14: Summary of On-System Railroad Crossings by County

County	Number of At-Grade Crossings
Bastrop County	11
Burnet County	5
Caldwell County	5
Hays County	6
Travis County	4
Williamson County	16
Total	47

Source: Federal Railroad Administration (FRA), Highway-Rail Crossing Inventory Data. Available at: https://safetydata.fra.dot.gov/officeofsafety/publicsite/downloaddbf.aspx.

Figure 17 maps the locations of the at-grade crossings that intersect the on-system roadway network.

Figure 17: At-Grade Highway-Rail Crossings on the On-System Roadway Network

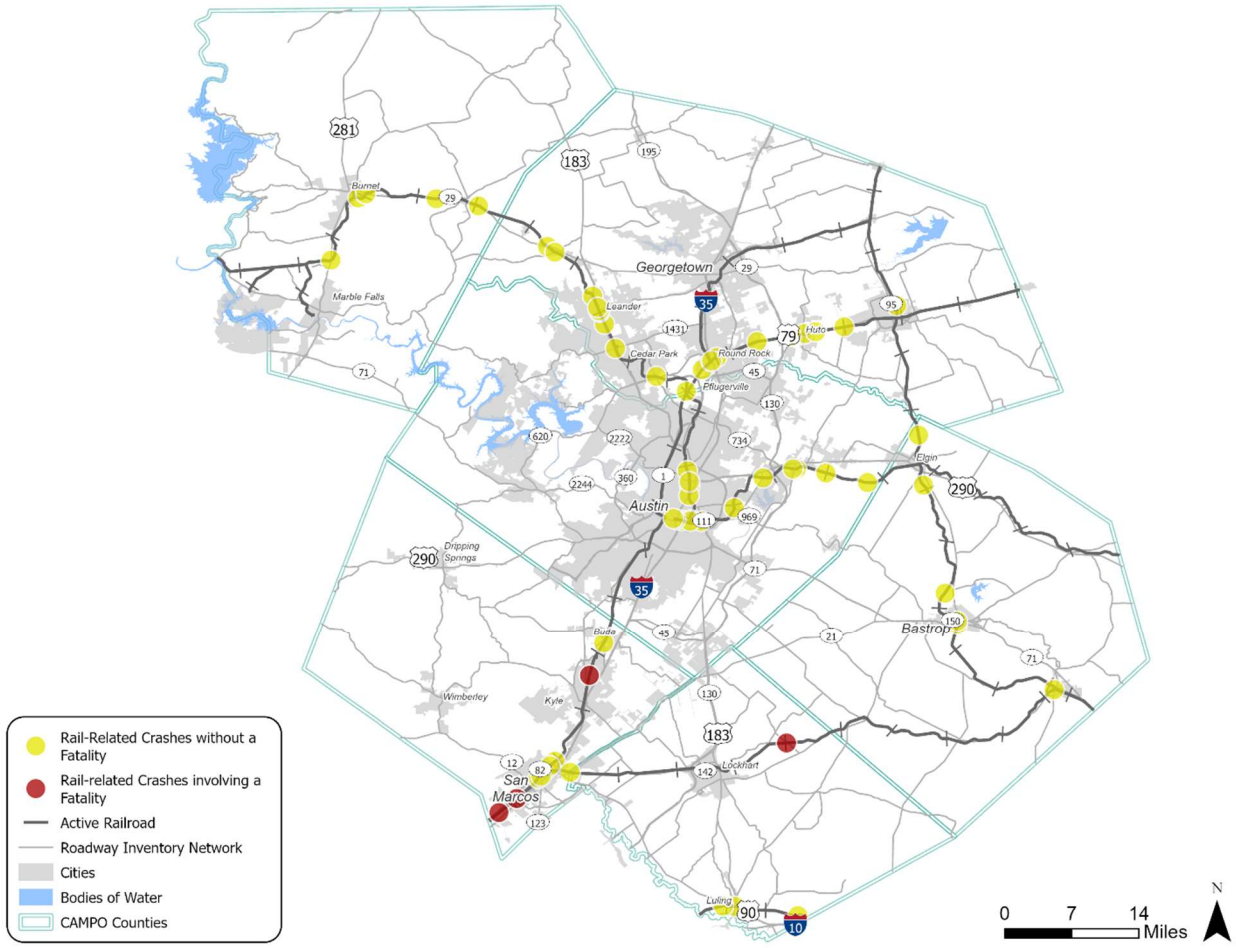


Source: Federal Railroad Administration (FRA), Highway-Rail Crossing Inventory Data. Available at: https://safetydata.fra.dot.gov/officeofsafety/publicsite/downloaddbf.aspx

Rail System Performance

Figure 18 shows the location of 132 rail-involved crashes in the CAMPO region. A crash is rail-involved if it is related to a train, railcar, or a rail crossing. Geographically speaking, Travis County, Williamson County and Hays County each account for 37%, 31%, and 19% of the total crashes in the region, respectively.

Figure 18: Rail-related Crashes in the Capital Area Region, 2018- 2022



Source: Texas Department of Transportation (TxDOT). Crash Records Information System (CRIS) Query. Available at: https://cris.dot.state.tx.us/public/Query/app/home

Table 15 shows the total number of individuals involved in rail-related crashes by severity. From 2018 to 2022, a total of 292 persons were involved in rail-related crashes. Of the 60 persons injured (nearly 21% of total), 5% were seriously injured; during the period there was a total of 4 fatalities. Three fatalities were located in Hays County and one in Caldwell County. Overall, most persons involved in rail-related crashes were not injured (73% of total).

Table 15: Injury Type and Associated Headcounts for Rail-Related Crashes located at At-Grade Crossings, 2018 – 2022

Severity Type	2018	2019	2020	2021	2022	Total
Non-Suspected Serious Injury Count	4	0	3	4	3	14
Possible Injury Count	23	9	1	7	3	43
Suspected Serious Injury Count	1	0	1	1	0	3
Total Injury Count	**28**	**9**	**5**	**12**	**6**	**60**
Crash Death Count	1	0	2	0	1	4
Not Injured Count	38	45	21	83	27	214
Unknown Injury Count	1	3	1	5	4	14
Total Personnel Involved In Crash	**68**	**57**	**29**	**100**	**38**	**292**

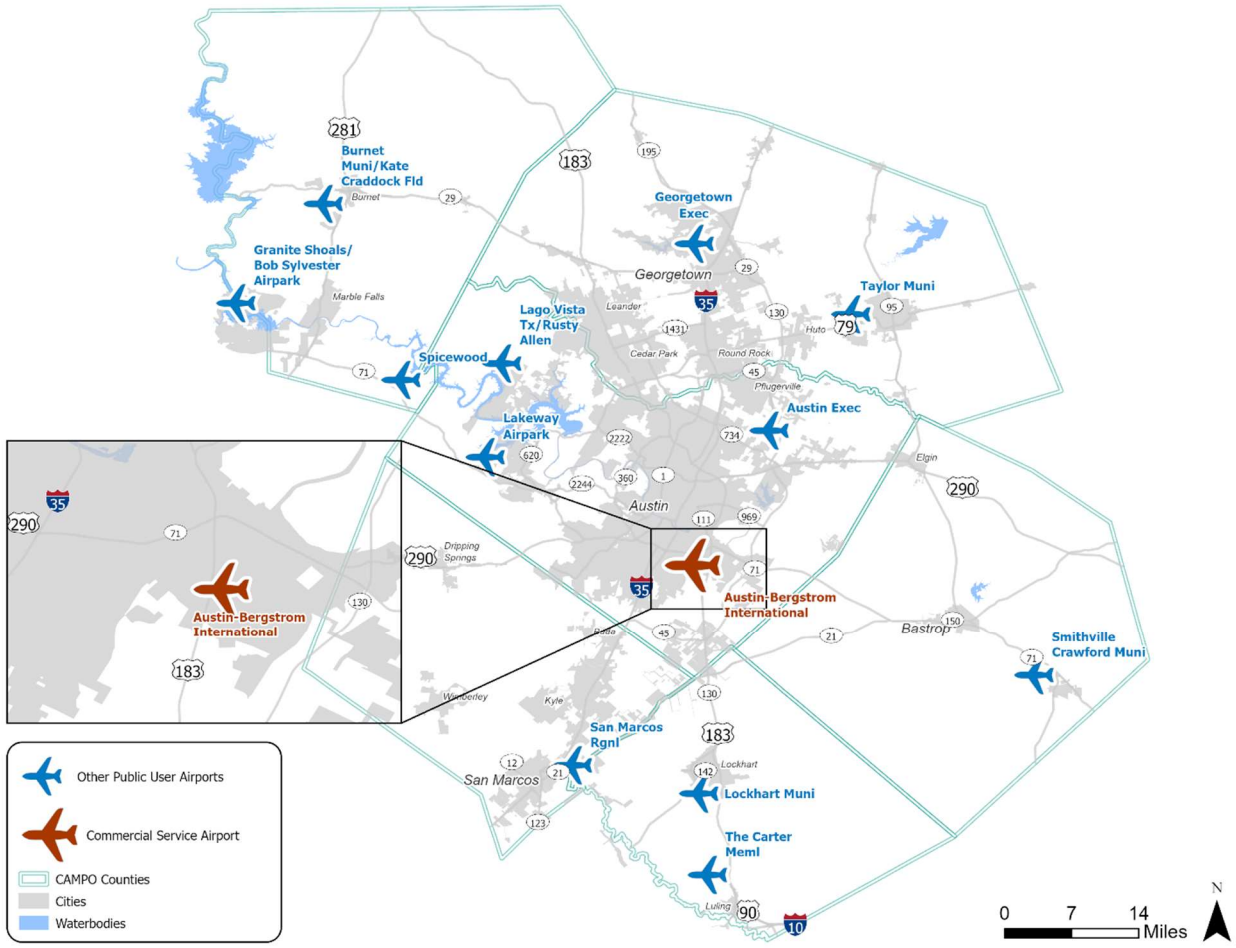
Source: Texas Department of Transportation (TxDOT). Crash Records Information System (CRIS) Query. Available at: https://cris.dot.state.tx.us/public/Query/app/home

Airport Assets

Commercial Service and Public-Use Airports

Texas has one of the largest state airport systems with nearly 400 public-use airports and 24 commercial service airports. As shown in Figure 19, there are 13 public-use airports in the CAMPO area. ABIA, considered part of the National Multimodal Freight Network (NMFN) and TMFN, is the only commercial service airport in the region. In addition, the San Marcos Regional Airport is located between the Austin and San Antonio metropolitan areas and is the designated reliever airport for the commercial airports situated there.

Figure 19: Public Use and Commercial Service Airports



Source: Federal Aviation Administration (FAA). Airports. Available at: https://adds-faa.opendata.arcgis.com/datasets/faa::airports-1/explore?location=1.244470%2C-43.129815%2C1.84

Airport Conditions and Performance

Due to the substantial weight of aircraft resulting from a fuel load and cargo, runway length is critical for air cargo plane takeoff. Generally, 8,000 feet is required for most large domestic cargo aircraft and 10,000 feet for most international operations.[12] With two runways, the longest of which has a maximum length of 12,248 feet and a width of 150 feet, ABIA is the only airport qualified for the runway length requirements for large cargo aircraft. Other airports in the CAMPO region may handle on-demand cargo or package service via small aircraft; however, this data is generally not reported. Some of these airports may handle small amounts of cargo or provide feeder service to larger airports.

ABIA is five miles southeast of the City of Austin, next to SH 71 to the north, U.S. 183 to the west, and within minutes of IH 35. This convenient location allows the airport to transport cargo easily

[12] https://ftp.txdot.gov/pub/txdot/move-texas-freight/resources/texas-delivers-2050.pdf

via ground transportation. The airport has two parallel runways: a 12,248-foot 17R/35L runway and a 9,000-foot 17L/35R runway.[13] Aeroterm and the City of Austin's Department of Aviation DOA operate the air cargo facilities at ABIA, located on the northeast side of Runway 17R.[14]

- Aeroterm is a property investment firm. It has 51,000 square feet of freight facility space (building #6040). The City of Austin's DOA, United Parcel Service (UPS), Air General, and Worldwide Flight Services (WFS) all have facility leases from Aeroterm.
- The City of Austin's DOA manages Buildings #6029, #6030, and #6035. The total area adds up to 194,500 square feet. FedEx, DHL, UPS, and certain non-cargo activity companies lease the space.

As one of the major commercial airports in Texas, ABIA handled approximately 260 million pounds of cargo in 2022, including both on-flight freight enplaned and mail enplaned. Table 16 summarizes enplaned cargo that arrived at and departed from ABIA. As the trend shows, from 2018 to 2022, the enplaned mail fluctuated slightly and reached its peak weight in 2019. The enplaned freight generally indicates an increasing trend but decreased slightly between 2018 and 2019; arriving and departing freight grew by an average rate of 8% per year between 2020 and 2022. Additionally, ABIA appeared to have more arrival freight and mail than departure during the reporting period.

Table 16: ABIA Enplaned Freight and Mail, 2018 - 2022

Type	2018	2019	2020	2021	2022
Arrival-Mail	5,609,865	8,289,574	5,329,591	6,985,945	5,448,213
Departure-Mail	2,424,463	2,635,866	2,186,154	1,899,467	311,540
Arrival-Freight	115,733,867	113,431,549	124,655,767	126,293,710	135,722,607
Departure-Freight	85,597,381	87,532,956	90,445,778	102,168,878	118,340,558
Total Enplaned (lbs.)	209,365,576	211,889,945	222,617,290	237,348,000	259,822,918

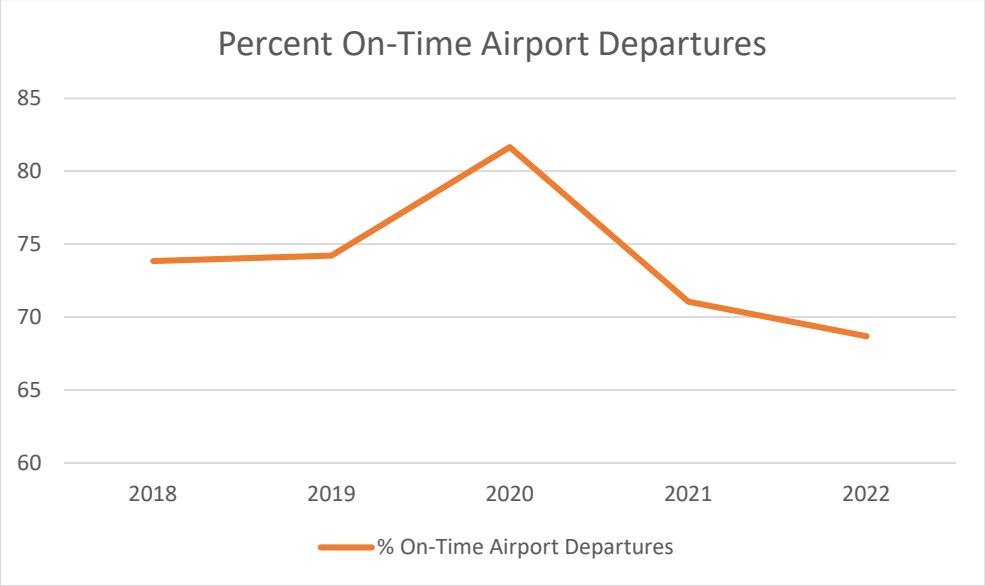
Source: United State Department of Transportation (USDOT). Bureau of Transportation Statistics (BTS). T-100 Market (all-carrier). 2018-2022.Available at: https://www.transtats.bts.gov/Fields.asp?gnoyr_VQ=FMF

ABIA is the only airport in the CAMPO region that is required to report performance data to the FAA. Figure 20, Figure 21, and Figure 22 shows the percent on-time departures, average departure delay, and the taxi-in delay measures generated from Aviation System Performance Metrics (ASPM) database, respectively. The calendar year 2020 shows an abnormal trend as compared to other years. The percent on-time departure is the highest, and departure and taxi-in delays were the lowest for 2020. This is likely due to the reduction in flights caused by COVID-19. The on-time departure rate dropped sharply after 2019, likely due to the labor shortages and early retirement phenomena among workers in the transportation industry influenced by the pandemic.[15] Since 2020, the figures show declines in the percentage of on-time departures and increases in departure and taxi-in times, which suggest that ABIA is getting

[13] https://ftp.dot.state.tx.us/pub/txdot-info/avn/airport-directory-list.pdf
[14] https://www.austintexas.gov/sites/default/files/images/Airport/business/AUS_Master_Plan/c2_Master Plan.pdf
[15] https://ftp.txdot.gov/pub/txdot/move-texas-freight/resources/texas-delivers-2050.pdf

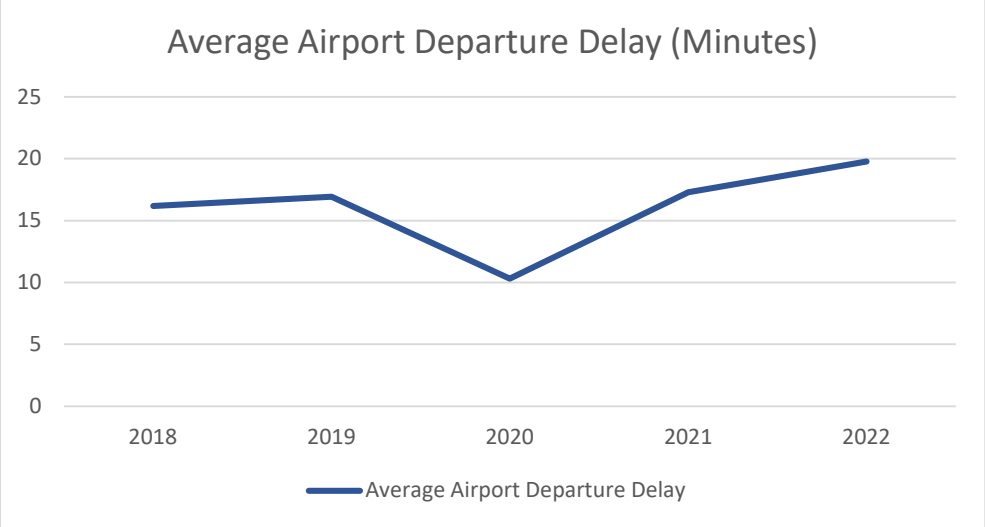
more congested; the delays are also attributed to a shortage of airport staff to handle security screening and baggage.

Figure 20: Percent On-Time Airport Departures at ABIA, 2018 - 2022



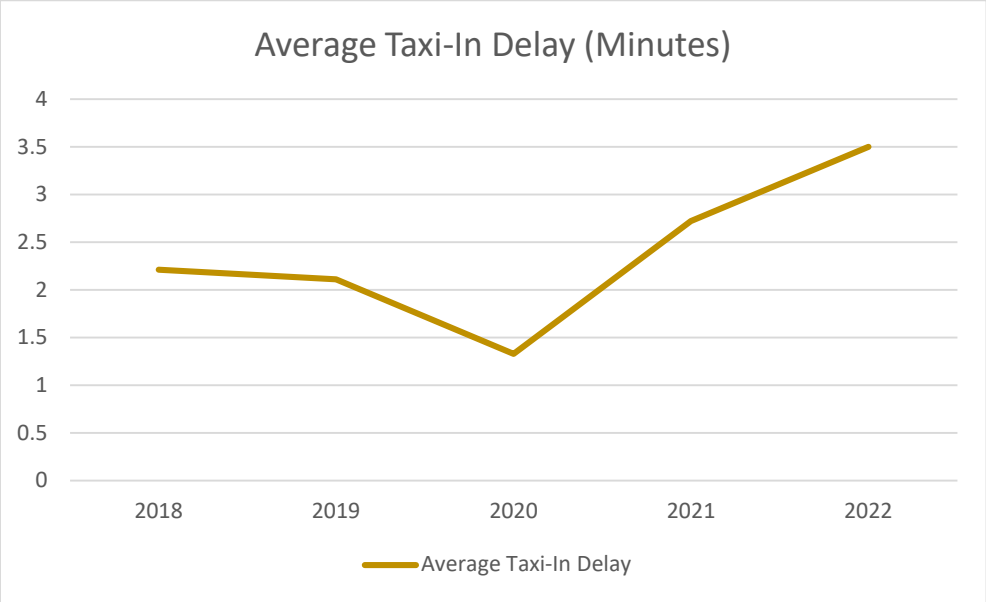
Source: Federal Aviation Administration (FAA). Aviation System Performance Metrics (ASPM) database. Available at: https://aspm.faa.gov/apm/sys/main.asp

Figure 21: Average Airport Departure Delay at ABIA, 2018 - 2022



Source: Federal Aviation Administration (FAA). Aviation System Performance Metrics (ASPM) database. Available at: https://aspm.faa.gov/apm/sys/main.asp

Figure 22: Average Taxi-In Delay at ABIA, 2018 - 2022



Source: Federal Aviation Administration (FAA). Aviation System Performance Metrics (ASPM) database. Available at: https://aspm.faa.gov/apm/sys/main.asp

Pipeline Assets

Pipelines are involved in many aspects of supply chain operations for the petroleum industry – from initial extraction to refinement, processing, storage, and last-mile distribution to customers. While most products are transported by gathering and transmission pipelines, pipelines interface with other modes (i.e., truck rail and water) on the multimodal network.

Table 17 breaks down pipeline mileage by the major commodity types transported by petroleum industry supply chains. Texas pipeline systems transport crude oil, natural gas, and hydrocarbon gas liquids (HGLs) from sources of energy production,[16] traversing the CAMPO region to reach refineries and petrochemical complexes on the Gulf Coast. These transmission pipelines tend to span larger areas with fewer branches and terminals, which is the case in the CAMPO region. Petroleum product pipelines, in turn, transmit refined products such as motor gasoline and various fuels to urbanized areas where product is stored and distributed from terminals for last-mile deliveries by truck to fueling stations, industrial establishments, airports, and other consumption points. In addition, processed, or dry natural gas is delivered directly to homes and businesses via distribution pipelines.

Travis and Bastrop counties are traversed by the most pipeline mileage in the region consisting primarily of natural gas and petroleum product pipelines.

[16] Hydrogen gas liquids (HGLs) are extracted at natural gas processing plants to produce natural gas plant liquids such as propane and butane used for heating or cooking. Ethane is a key natural gas liquid that is converted to ethylene and propylene at "cracking" plant facilities. These products are feedstocks for petrochemical manufacturing to make plastics and synthetic rubber.

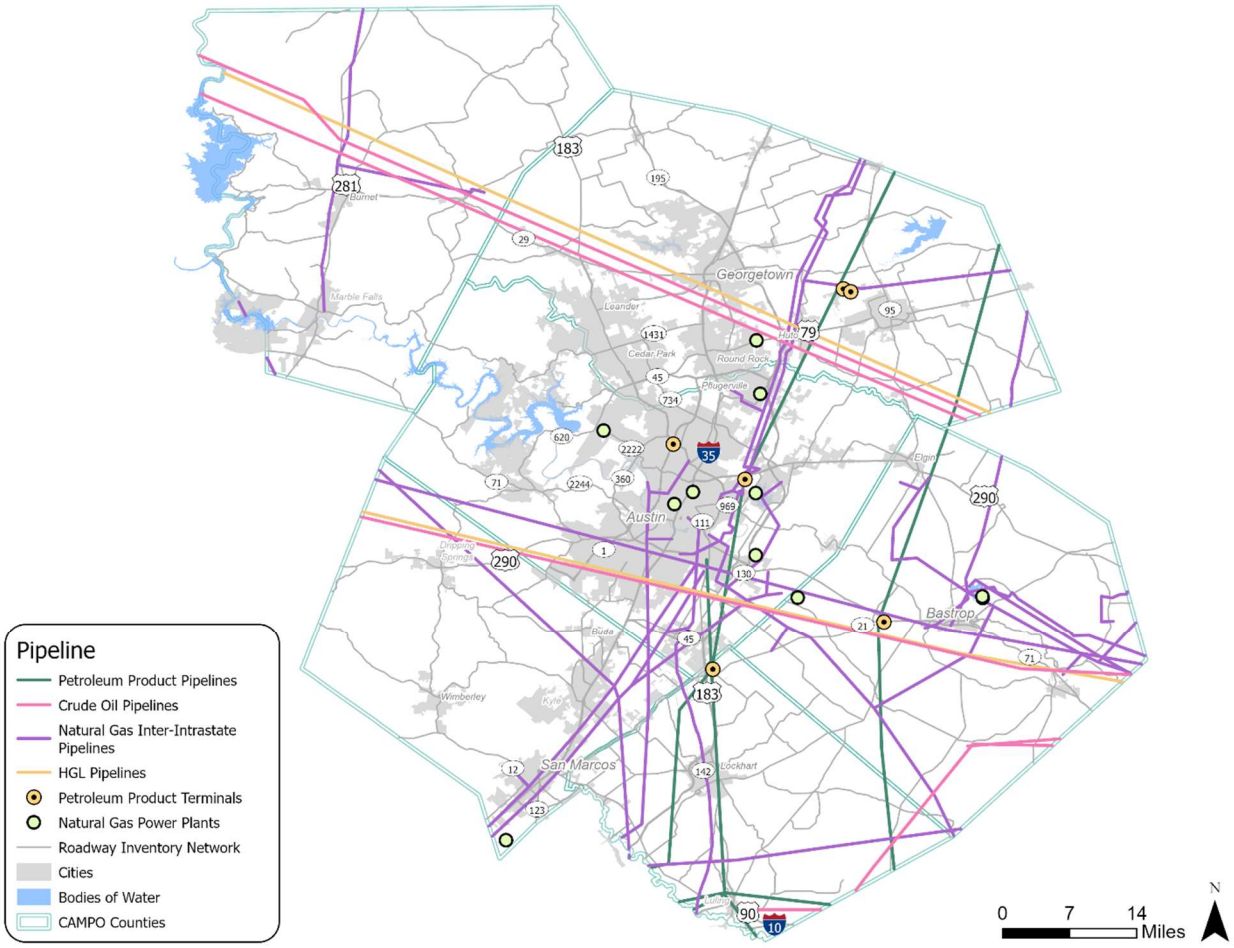
Table 17: Pipeline Mileage by Commodity Type

Type	Bastrop County	Burnet County	Caldwell County	Hays County	Travis County	Williamson County
Crude Oil	105 (19%)	156 (50%)	32 (10%)	71 (15%)	71 (12%)	156 (32%)
Natural Gas	249 (44%)	80 (25%)	85 (27%)	266 (56%)	282 (46%)	116 (24%)
Petroleum Products	137 (24%)	0 (0%)	200 (63%)	71 (15%)	188 (31%)	143 (29%)
Hydrocarbon Gas Liquids	71 (13%)	77 (25%)	0 (0%)	71 (15%)	71 (12%)	77 (16%)
Total	562 (100%)	313 (100%)	318 (100%)	478 (100%)	612 (100%)	493 (100%)

Source: U.S. Energy Information Administration (EIA). US Energy Atlas. Available at: https://atlas.eia.gov/

Figure 23 maps the pipeline networks in the CAMPO region, power plants, and product terminals. Several natural gas power plants are within Austin limits, with a few other plants in Bastrop and Hays counties. In addition, the map shows the location of product terminals. The single terminal within Austin city limits with no obvious pipeline connection is an asphalt plant receiving product deliveries by rail and truck. The other terminals shown in Travis, Williamson, Bastrop, and Caldwell counties serve regional demand for fuel.

Figure 23: Pipeline Infrastructure in the Capital Area Region



Source: U.S. Energy Information Administration (EIA). US Energy Atlas. Available at: https://atlas.eia.gov/

Equity

The equity analysis in this section identifies the locations of historically marginalized communities in the CAMPO region in order to better understand where freight activity is likely to impact these populations. Consistent with the definitions in CAMPO's 2045 Regional Transportation Plan, census tracts representing equity focus areas were identified based on socioeconomic characteristics. The definitions include any census tract with 50% of its population earning less than 80% of the county median family income and/or having at least 25% of its population earning an income below the national poverty threshold or any census tract with 50% of its population not identifying as non-Hispanic white.

Table 18 identifies the equity populations in the CAMPO region by county. Across the region, the population living in equity census tracts represented nearly 30% of the overall population of 2.3 million. Travis County has the highest number of people living in equity census tracts and by

proportion (33% of the county total); Hays County follows closely with the second highest proportion of its population living in equity census tracts (32%).

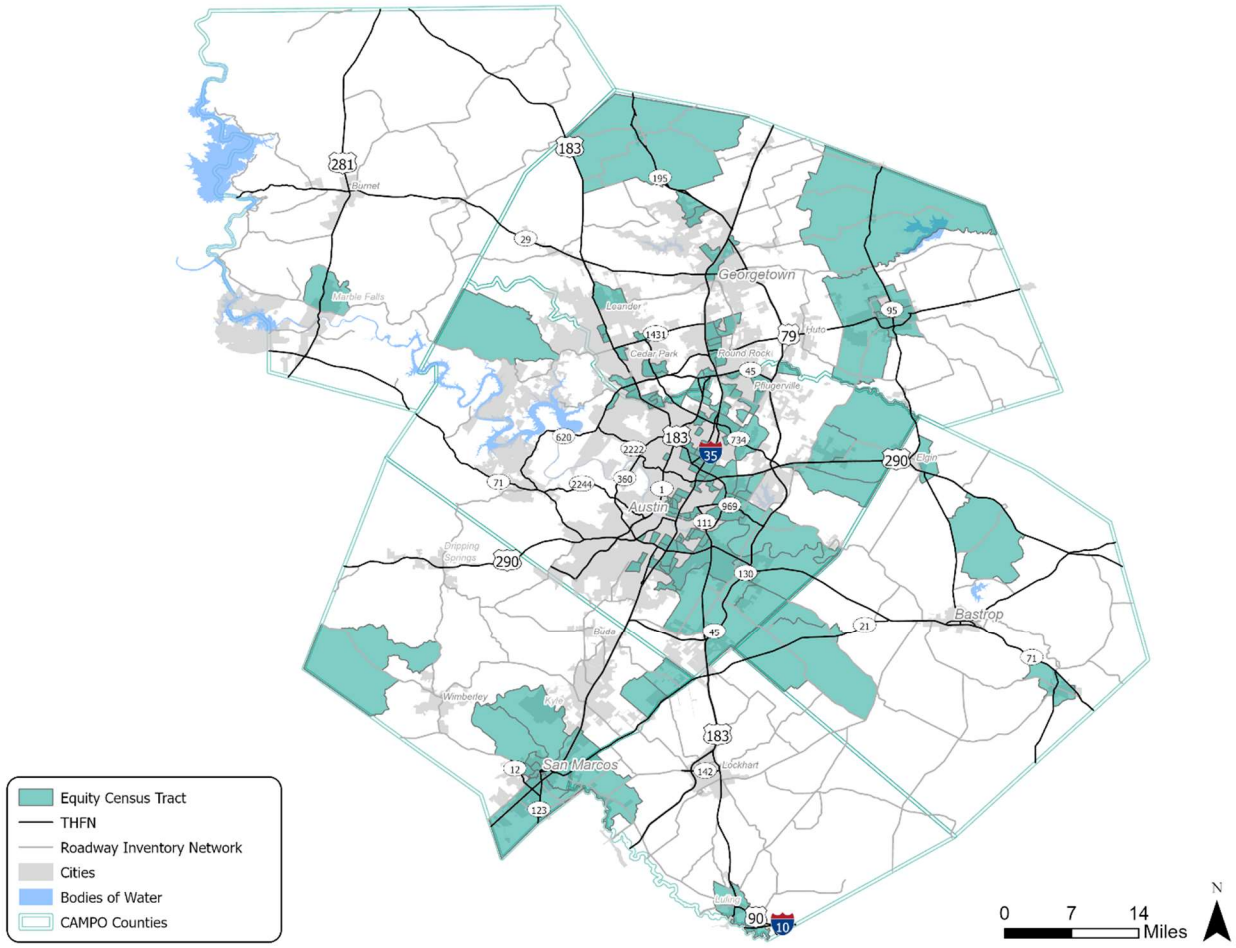
Table 18: Equity Populations in the Capital Area Region

Equity Populations	Bastrop County	Burnet County	Caldwell County	Hays County	Travis County	William. County
Minority Population (non-Hispanic white)	35,848	7,078	13,725	54,870	428,955	166,538
Below County Median Income Population	12,398	6,466	5,578	29,925	181,992	84,347
Below National Poverty Line Population	10,089	3,403	5,737	30,917	139,464	36,983
Equity Census Tracts	6	1	3	18	98	35
# of Census Tracts	21	15	11	46	290	135
Equity Tract Population	**27,297**	**4,079**	**10,895**	**75,176**	**424,206**	**125,655**
Total Population	**94,887**	**48,424**	**45,286**	**234,573**	**1,267,795**	**591,759**

Source: US Census Bureau 2021 5-year American Community Survey. Available at: https://www.census.gov/

Figure 24 maps the location of the equity census tracts. Where the tracts intersect, the THFN highlights areas where concentrated freight activity can come near equity populations. Nearly 30% of the total mileage on the THFN is intersecting the equity census tracts. Frequent truck movements along those corridors can impact the quality of life for these communities from increased exposure to tailpipe emissions, noise, and pollution.

Figure 24: Equity Populations in the Capital Area Region



Source: US Census Bureau 2021 5-year American Community Survey. Available at: https://www.census.gov/

Table 19 summarizes the overlap between certain freight infrastructure assets and metrics discussed in previous sections with the equity and non-equity census tracts. If a piece of infrastructure/metric fell within a census tract, then the entire population of that census tract was considered to be affected by the infrastructure/metric. Proximity to freight infrastructure has positive and negative externalities for local populations that can be difficult to balance. Freight infrastructure is often associated with increased exposure to pollutants, noise, and safety risks and may create access barriers (e.g., rail lines with limited crossings) or decrease the utility of other infrastructure (e.g., roads with heavy truck volumes.) However, freight infrastructure is a vector for economic activity in terms of the investment that can be leveraged to improve local infrastructure and create jobs.

Truck exposure is heavily skewed towards equity populations. Despite having less THFN mileage per population, equity tracts have a higher average AADTT, higher average TTTR, a significantly higher truck Vehicle Miles Traveled (VMT) per capita (around 35%), and nearly twice as many truck-involved accidents per capita including higher numbers of fatal and serious injury crashes.

Railroad mileage and crossings per equity and nonequity populations are very similar, with nonequity populations having only slightly more mileage and crossings per capita. Pipeline mileage is skewed towards nonequity populations with around 5 additional miles per 10,000 people in nonequity tracts. Comparison of pipeline terminals and power plants is somewhat difficult due to the low numbers of terminals in the region. For instance, three petroleum product terminals are located in equity and nonequity tracts each. However, the total nonequity population exposed to terminals is more than four times larger than the equity population. Eight natural gas power plants are located in equity tracts and 16 are located in nonequity tracts mirroring the population exposure which is about twice as large for nonequity tracts as equity tracts.

Table 19: Summary of Freight Equity Indicators for Equity and Nonequity Census Tract Populations

Freight Equity Indicators	Equity Census Tracts	Nonequity Census Tracts
THFN Mileage per 10,000 population	5.18	5.66
Mileage weighted AADTT on THFN	4,787	3,257
Mileage weighted TTTR on THFN	4.44	3.96
Truck VMT per Capita on THFN	905	672
Truck Involved Crashes per 10,000 population	48.4	27.6
Fatal and serious injury Truck-Involved crashes per 10,000 population	2.8	1.9
Railroad Mileage per 10,000 population	7.1	8.7
Railroads Crossings per 10,000 population	11.8	11.9
Pipeline Mileage per 10,000 population	11.6	16.0
Population near a Petroleum Product Terminals	4,505	19,076
Population near a Natural Gas Power Plant	37,056	74,301

Source: Cambridge Systematics Analysis, 2023

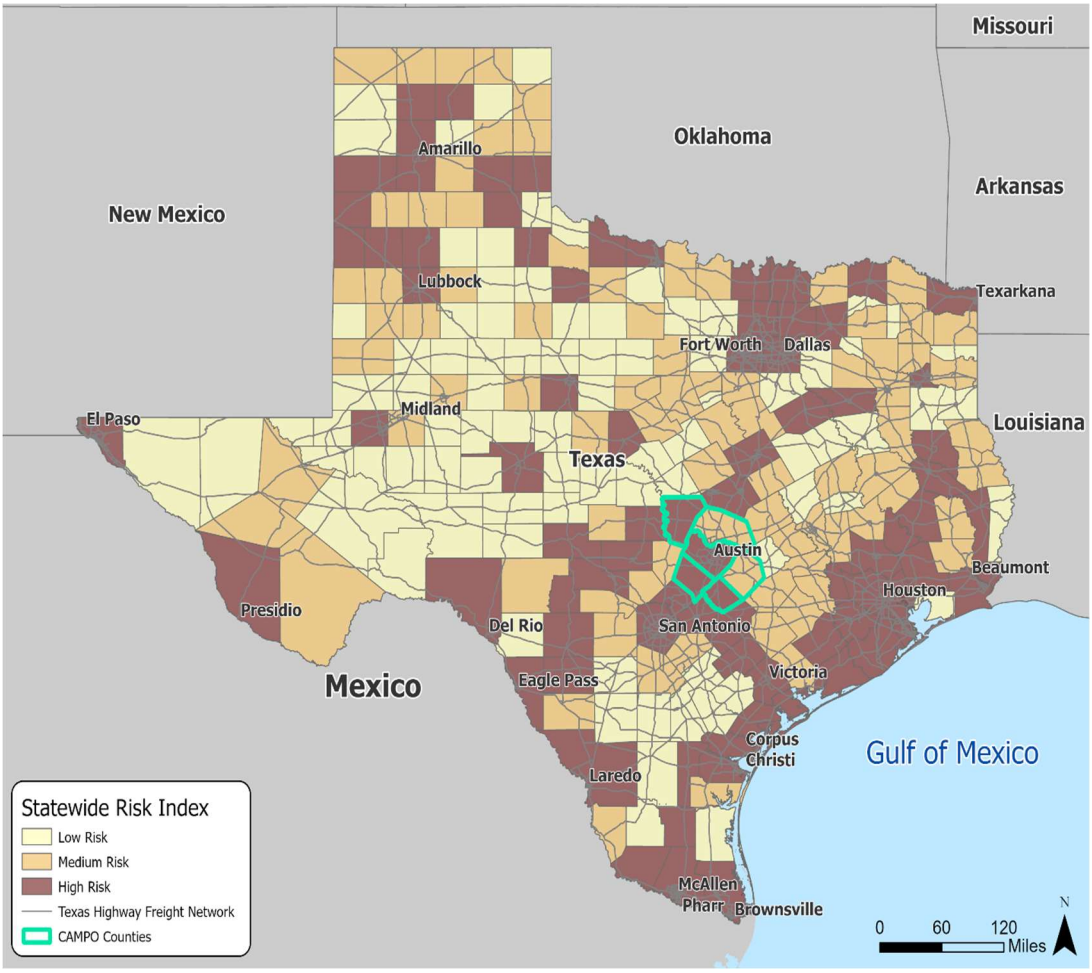
Resiliency

Resiliency needs on the THFN were evaluated for Texas Delivers 2050 using the Statewide Risk Index (SRI), which scores the level of likely impacts for various natural disaster risks. The SRI was calculated for each county in Texas based on the National Risk Index (NRI) provided by Federal Emergency Management Agency (FEMA). Natural disasters include coastal flooding, cold

waves, drought, earthquakes, hail, heat waves, hurricanes, ice storms, landslides, lightning, riverine flooding, strong wind, tornados, wildfire, and winter weather.

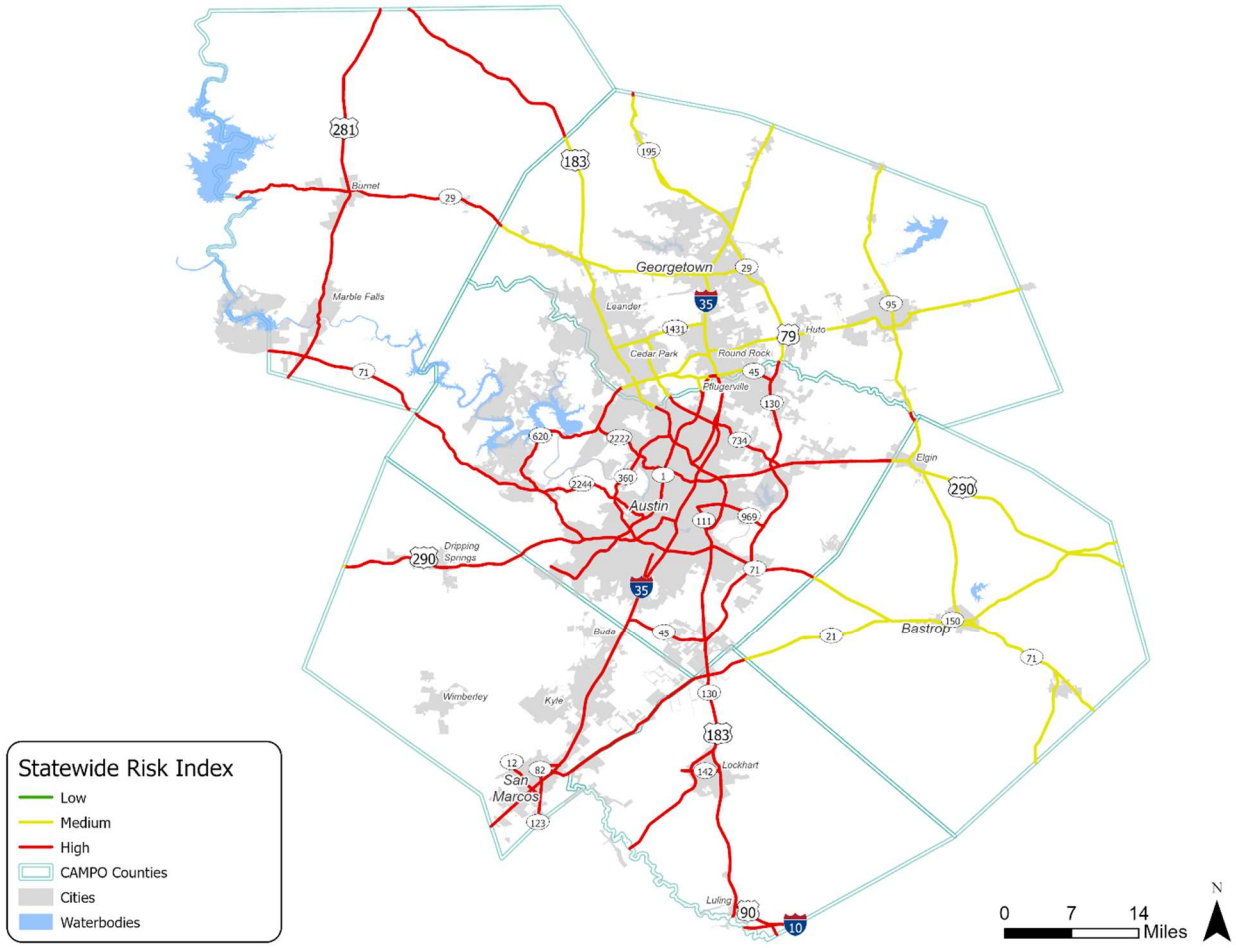
Figure 25 shows the hazard risk index for each county in Texas. The risk is categorized into Low, Medium, and High. Overall, 84 out of the 254 counties in Texas are classified as having high-hazard risk, and 85 are low-hazard risk. As the map shows, counties along the coast are likely more vulnerable than inland counties, and most major cities in Texas are located in high-hazard risk counties. In the CAMPO area, Burnet County, Travis County, Hays County, and Caldwell County are classified as having high hazard risk, while Williamson County and Bastrop County are characterized as having medium hazard risk. Figure 26 shows the THFN classified based on the SRI in the CAMPO area. As the figures show, all segments of THFN within the CAMPO area are classified as either medium or high-risk index. Approximately 526 miles, accounting for more than 61% of total THFN in the area, have a high hazard risk index.

Figure 25: State Hazard Risk Index for Texas Counties



Source: TranSystems analysis of FEMA National Risk Index (NRI) data prepared for Texas Delivers 2050.

Figure 26: Texas Highway Freight Network (THFN) Classified by the Statewide Risk Index



Source: Prepared by Cambridge Systematics based on Transystems analysis of FEMA National Risk Index (NRI) data.

Freight Trip Origins and Destinations

Developed for Texas Delivers 2050, the Texas Truck Analysis Tool uses INRIX commercial vehicle GPS data from 2022 to report the origin and destination flows for truck movements in the state. As outlined in Table 20, there is an average of 43,860 truck trips entering and leaving the CAMPO region each day. Approximately one-third of these trips originate or end in Travis County, followed by Williamson and Hays counties. Caldwell, Bastrop and Burnet counties have the smallest share of truck trips, accounting for about 7%, 6%, and 6% of daily trips, respectively.

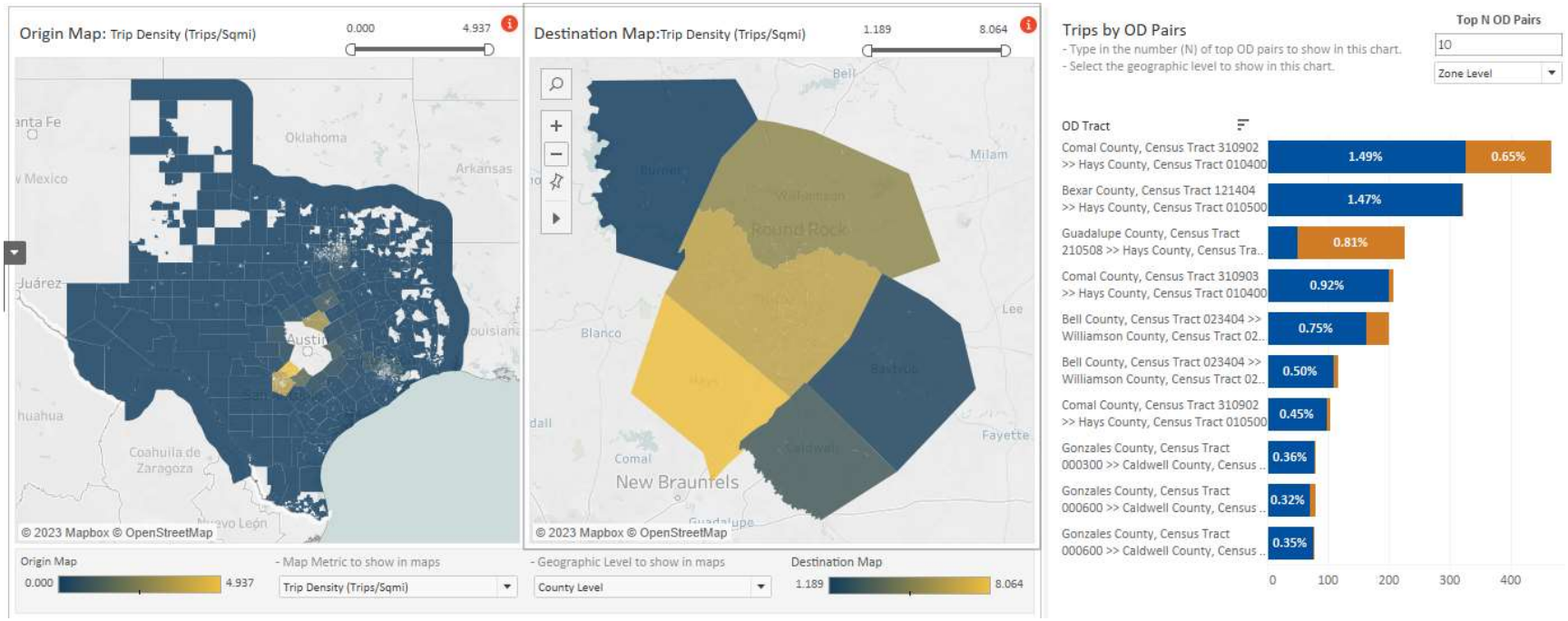
Table 20. Total Inbound and Outbound Trip Trips by County

County	Average Daily Trips (Inbound & Outbound)
Bastrop	2,681 (6%)
Burnet	2,522 (6%)
Caldwell	2,902 (7%)
Hays	9,871 (23%)
Travis	13,349 (31%)
Williamson	11,749 (27%)
Total	43,074 (100%)

Source: Texas Department of Transportation (TxDOT). Texas Truck Analysis Tool (2022).

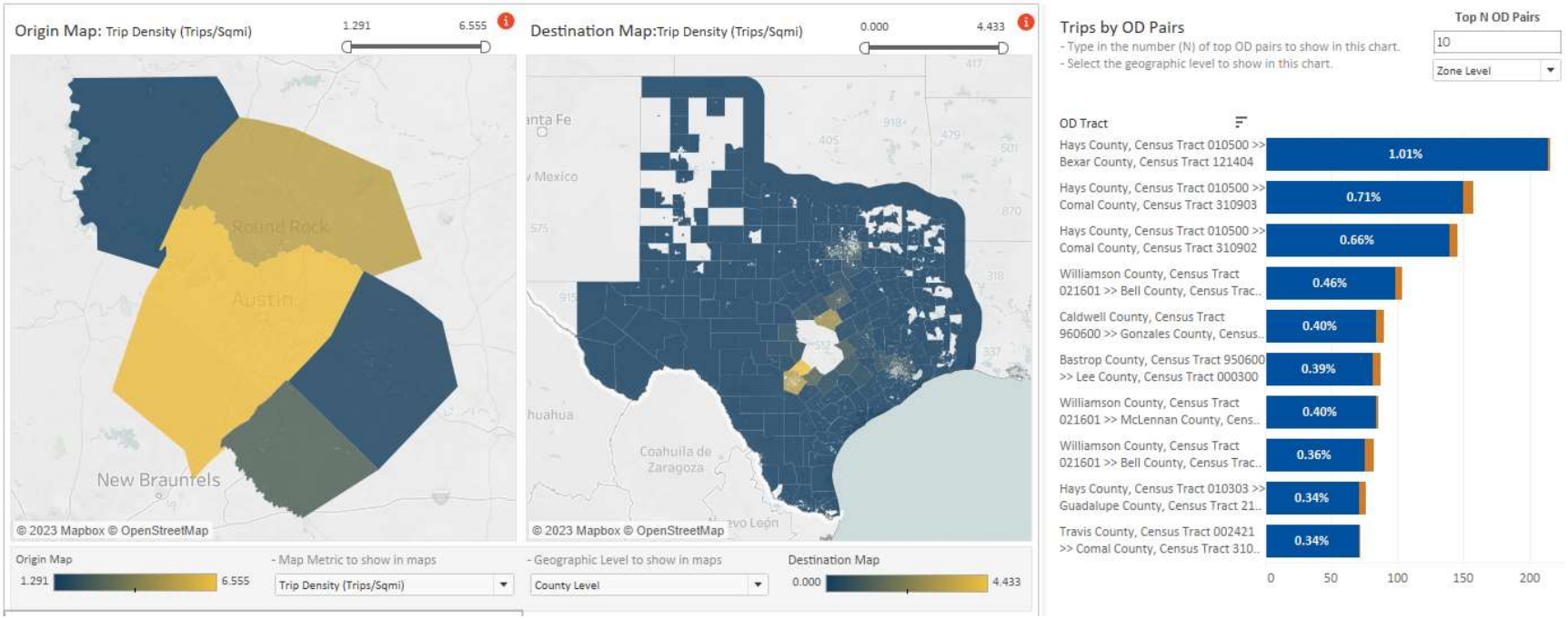
Figure 27 and Figure 28 shows the dashboard from the Texas Truck Analysis tool displaying information on the daily trip flows between the rest of Texas and the CAMPO region. For both inbound and outbound flows, most truck trips are associated with the counties surrounding the CAMPO region such as Bell County to the north and Comal and Bexar counties to the south. The figures show the top 10 origin-destination (O-D) pairs. The top 5 inbound and outbound O-D pairs include Comal, Bexar, Guadalupe, Bell, and Gonzales counties, all of which are adjacent to the CAMPO region. The top 10 O-D pairs are distinguished by vehicle class – blue for heavy-duty trucks and orange for medium-duty. Most of the O-D pairs shown are comprised of trips by heavy-duty trucks.

Figure 27: Daily Inbound Truck Trips to the Capital Area Region, 2022



Source: Texas Department of Transportation (TxDOT). Texas Truck Analysis Tool (2022). Note: In the chart shown (Trips by OD Pairs), trips by heavy-duty trucks are denoted in blue and medium-duty trucks are denoted in orange.

Figure 28: Average Daily Outbound Trips from the Capital Area Region, 2022



Source: Texas Department of Transportation (TxDOT). Texas Truck Analysis Tool (2022). Note: In the chart shown (Trips by OD Pairs), trips by heavy-duty trucks are denoted in blue and medium-duty trucks are denoted in orange.

As shown in Table 21, most truck trips, over 162,000 a day, occurred entirely within the CAMPO region. For trips entering the CAMPO region, 43% originated from the rest of the state of Texas, excluding the Killeen-Temple Metropolitan Planning Organization (KTMPO) and Alamo Area Metropolitan Planning Organization (AAMPO) regions; 39% was from the AAMPO region, 17% from the KTMPO region, and 1% from outside of Texas. Regarding outbound trips from the CAMPO region, 46% of trips terminated within the rest of Texas, excluding the KTMPO and AAMPO regions; 36% went to the AAMPO region, 17% went to the KTMPO region, and 1% went outside of Texas.

Table 21. Trip Distribution Summary for the Capital Area Region

Origin	Destination	Average Daily Trips (% of directional total)
Internal		
CAMPO Region	CAMPO Region	162,715 (100%)
Inbound Trips		
Rest of Texas (excluding KTMPO and AAMPO Regions)	CAMPO Region	9,361 (43%)
Outside of Texas	CAMPO Region	244 (1%)
KTMPO Region	CAMPO Region	3,766 (17%)
AAMPO Region	CAMPO Region	8,519 (39%)
Outbound Trips		
CAMPO Region	Rest of Texas (excluding KTMPO and AAMPO Regions)	9,756 (46%)
CAMPO Region	Outside of Texas	243 (1%)
CAMPO Region	KTMPO Region	3,608 (17%)
CAMPO Region	AAMPO Region	7,580 (36%)

Source: Texas Department of Transportation (TxDOT). Texas Truck Analysis Tool (2022).

Freight Generators

The CAMPO region has experienced rapid population growth, as well as the growth of key industry sectors. As a result, demand on the regional freight network is increasing. This section looks at the intersection of freight activity and land use to identify where freight-intensive industries are clustered and where freight compatible uses are located in the region.

Freight Intensive Industries

The following uses Texas Labor Market Information (LMI) data from the Texas Workforce Commission (TWC) that categorizes employment in the state using North American Industry Classification System (NAICS) codes. Table 22 summarizes employment for particular industries that generate large amounts of freight traffic according to the NAICS classification. With a workforce of over 673,000, the CAMPO region represents nearly 8% of all freight-intensive industry employment in Texas. Travis County has by far the largest workforce in the CAMPO

region across all industries, with 1.7 million total jobs. Travis County's workforce is more diverse than the rest of the region, where freight-intensive employment represents the smallest share of the county total (25%). Outside of Travis County, which is the most populated and urbanized in the region, freight-intensive industries account for a greater share of the employment total. The percentage of jobs in freight-intensive industries is 34% in Bastrop, 37% in Burnet, 38% in Caldwell, 41% in Hays, and 38% in Williamson County. Retail trade and construction employment account for each county's highest share of freight-intensive employment.

Table 22: Freight-Intensive Industry Employment in Texas, 2022

Industry	Bastrop County	Burnet County	Caldwell County	Hays County	Travis County	William. County	Total
Ag., Forestry, Fishing, Hunting (NAICS 11)	396	232	306	292	1,028	458	2,712
Energy (NAICS 2111, 2131, 2211, 2212)	333	216	448	482	7,476	2,048	11,003
Construction (NAICS 23)	3,032	3,501	1,635	13,607	98,528	35,151	155,454
Advanced Manufacturing (NAICS 326, 331, 332, 333, 334, 335, 336)	464	936	130	4,284	64,100	22,946	92,860
Wholesale Trade (NAICS 42)	464	1,606	328	4,092	61,622	27,352	95,464
Retail Trade (NAICS 44-45)	7,896	4,530	3,268	24,450	134,352	54,470	228,966
Transportation, Warehousing, Waste Mgmt. (NAICS 48-49, 562)	944	470	760	16,287	46,724	10,166	75,351
Food, Beverage, and Tobacco Product Manuf. (NAICS 311-312)	434	262	144	1,718	8,352	1,024	11,934
Total, Freight-intensive industries	**13,963**	**11,753**	**7,019**	**65,212**	**422,182**	**153,615**	**673,744**
Total, All Industries	**41,175**	**31,468**	**18,638**	**159,483**	**1,697,504**	**402,968**	**2,351,236**

Source: Texas Workforce Commission (TWC). Texas Labor Market Information. Available at: https://texaslmi.com/LMIbyCategory/QCEW

Land Use

Understanding the linkages between freight and land use is crucial for developing the CAMPO regional freight plan. Land use is important in an existing conditions context since it influences where freight generators and employment are located. The ability to accommodate freight-generating businesses and industries is important for contributing to tax revenues and increasing economic output at state and local levels. This section identifies the region's existing land uses compatible with freight and can help develop a baseline for future land use considerations and freight trends and forecasts.

The land use assessment looks at parcels located within incorporated city limits, which carry three designations that will influence where each type of land use is: Current, Zoning, and Future. Additionally, parcels in a city's extraterritorial jurisdiction (ETJ) are considered. The ETJ is where cities plan for future growth and how they anticipate using those parcels.

These designations influence land use planning, providing insights for formulating recommendations for improving freight access and mobility and supporting economic development. Land use is essential in freight planning, specifically analyzing freight-intensive uses' current and potential future locations. An understanding of future freight trends and needs can be used to inform policies and strategies, such as reserving the most compatible parcels for freight-intensive uses, or prioritizing freight-intensive developments in locations with minimal impacts to surrounding communities and natural resources yet near the multimodal freight network which provides efficient access and connectivity.

Approach

Several steps were taken to gather information concerning land use. First, freight-intensive establishments were mapped within the CAMPO region using Data Axle data. The freight-intensive industries were identified using NAICS codes that correspond to the following industries and are consistent with the definitions used to analyze supply chains for Texas Delivers 2050:

- **Agriculture** (crop, livestock, and food manufacturing)
- **Energy** (oil & gas production and product manufacturing)
- **Mining** (construction materials such as aggregates and cement)
- **Advanced manufacturing** (automotive, electronics, and aerospace)
- **Warehousing, transportation, and retail trade**

Second, to identify existing freight-related land use in each city and county, several sources were referenced, such as land use maps, zoning maps, and economic development corporation websites. Digital news articles were also used to gather information about recently approved or built industrial parks and developments.

Finally, studies were available as additional sources to gather existing land use data. For example, the CAMPO 2045 Regional Arterials Study provided existing land use information along RM 1431, FM 734 (Parmer Lane), RM 12, and SH 21, which will be discussed further in the

County/City Analysis section.[17] Another study available was the City of Austin's Planning and Zoning Department's "Analysis of Industrial Land Use and Zoning," which reviewed the current state of Austin's industrially zoned land.[18]

The total land area for the six-county region is 5,215 square miles. There are numerous municipalities in the region, each with its own land use and zoning maps. **Appendix A** provides a summary assessment of existing industrial land uses and is organized by county. In addition, cities with notable freight-intensive uses are described in further detail within their respective county. Land use maps are provided in **Appendix B**.

Summary

The CAMPO region has experienced significant growth, and vacant or industrial-zoned land should be preserved to accommodate and encourage freight-related growth. Municipalities with suitable access to the freight network that plan for industrial uses within city limits and ETJ will attract freight-intensive users. The economic benefits of industries are numerous – creating jobs, increasing the tax base, promoting business diversity, and catalyzing growth in the surrounding area.

Travis County and Williamson County currently have the highest concentration of freight-intensive uses. Smaller municipalities with existing land use designated as industrial, near major roadways, and without environmental constraints are well-positioned for increased freight-intensive uses. The remaining vacant land designated for industrial uses will be critical to CAMPO's economic growth opportunities to redevelop areas located near major highways that may not have an industrial land use designation and preserve land for agricultural uses. In these developing areas, the roadway networks may not be designed initially to handle frequent truck traffic and oversized/overweight loads. The following are considerations for integrating freight-intensive land uses with the multimodal freight network across the region:

- Access management
- Rural highway safety
- Bridge and pavement asset management
- Presence of low-clearance or load-restricted bridges
- Roadway design criteria
- Connectivity with the Texas Highway Freight Network (THFN)

The Forecasts and Trends section in the CAMPO regional freight plan will identify major planned projects, examine economic development priorities, and review land use policies to create a conceptual map of freight growth areas. Most importantly, stakeholder input will be critical for proposing future freight-intensive land use designations and identifying preferred growth areas. These areas will also depend on identifying multimodal freight roadway networks for

[17] Capital Area Metropolitan Planning Organization. Regional Arterials Concept Inventory, p. 318. August 2019. Accessed at FINAL-CAMPO-Regional-Arterials-Concept-Inventory
[18] Water, M., & Engstrom, J. Analysis of Industrial Land Use and Zoning in Austin, Texas, September 2020. Accessed at Presentation to Planning Commission

improvements. This comprehensive approach will address growth and development for one of the nation's fastest-growing regions.

Key Supply Chains

With the national focus on supply chains and their sensitivity to disruption, Texas Delivers 2050 informed freight transportation investments and decision-making by analyzing the TMFN's role in the State's critical supply chains. In coordination with the Texas Freight Advisory Committee (TxFAC) and targeted industry clusters identified by the Texas Governor's Office on Economic Development, critical supply chains contribute to key areas of the Texas economy. The supply chains and subsectors listed below have major clusters located in Central Texas and generate significant freight activity.

- **Agriculture**: animal and crop production and food manufacturing
- **Construction**: mining and production of non-metallic minerals and aggregates
- **Electronics**: production of electrical components and semiconductors
- **Petroleum**: midstream distribution and downstream production of petroleum-based products
- **Transportation Equipmen**t: automobile parts manufacturing and vehicle assembly
- **Warehousing and Distribution**: general warehousing and retail distribution

The sectors above represent the high-profile investments fueling the rapid growth and transformation of the regional economy in Central Texas. On the manufacturing front, recent investments by Tesla and Samsung in Travis and Williamson counties are closely identified with the growth of the region's semiconductor manufacturing, automotive production, and other high-value sectors. Those industries have been attracted to the CAMPO region with its strong manufacturing base, access to skilled and talented labor, and connectivity with markets and trade gateways through the multimodal freight network.

The following section references the supply chain analysis conducted for Texas Delivers 2050 to highlight clusters of key freight generators and land uses in the CAMPO region. The commodity flow analysis for Texas Delivers 2050 includes using the Transearch database from IHS Markit (now S&P Global) for Texas. This database has the base year of 2019 and was enhanced to improve how some important flows in Texas are captured, including cross-border trade, maritime trade, and energy-related commodities. The analysis also references the location of business establishments for the six supply chains using the Business Data product from Data Axle (formerly InfoUSA). The locations were filtered to the industry sectors represented by the supply chains using NAICS codes that correspond to the types of commodities for the sectors outlined earlier.

Agriculture

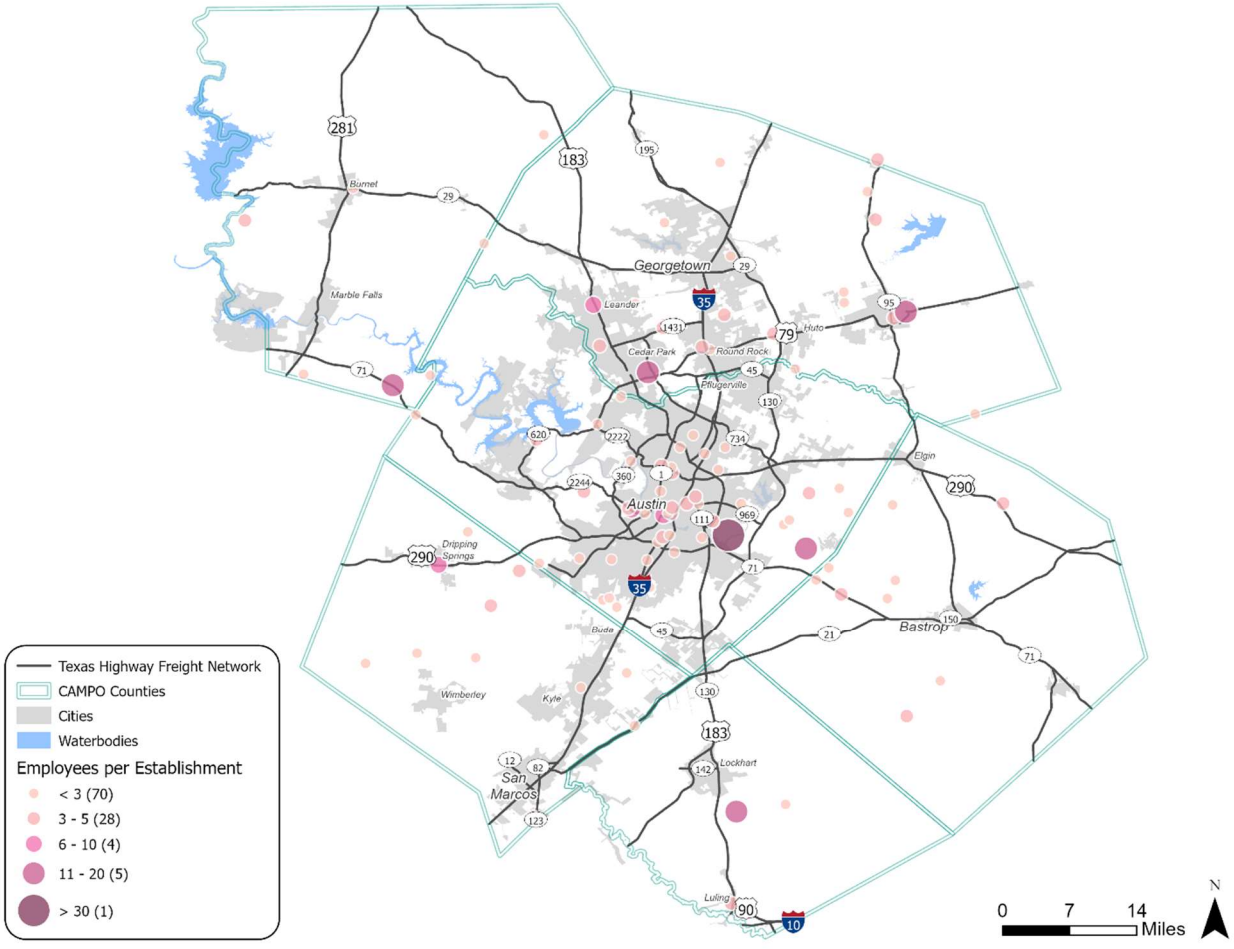
This section discusses the location of supply chains in Central Texas that support the state's agriculture and food manufacturing industries. The sector includes establishments in agriculture crop production, animal livestock production, and food manufacturing. Crop production includes crops that are farmed, harvested, and sent to market. Animal livestock production

includes livestock breeding, farming, and slaughter. Finally, food manufacturing is associated with the production of food products.

Crop Production Sector

The location of agricultural crop production establishments is shown in Figure 29. Crops produced in the CAMPO region include corn, hay, and wheat. Most establishments are located in Travis and Williamson counties, especially in the parts east of the IH 35 corridor where most cultivated land is situated. For example, the cluster shown in central Austin includes small-scale urban farms, orchards, and nurseries located in the city's eastern part. Outside of urbanized Travis County, roadways such as SH 95, SH 71, US 290, and US 79 provide access to the THFN for agricultural production establishments.

Figure 29: Agricultural Crop Production Establishments by Employee Size in the Capital Area Region, 2020



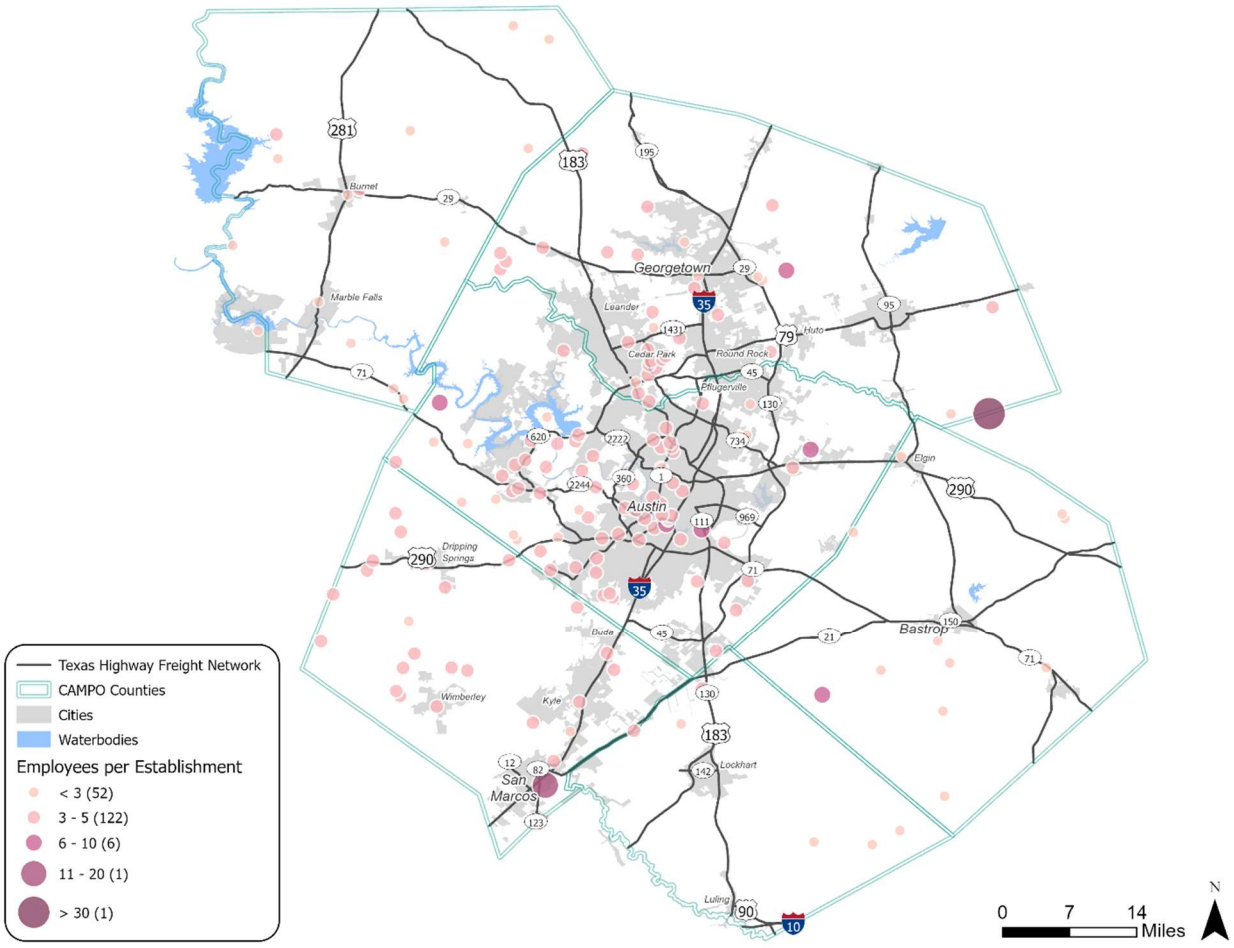
Source: Prepared by Cambridge Systematics using data provided by Data Axle. (2021). Business Data (2020)

Animal Livestock Production Sector

The location of establishments in the animal production industry is shown in Figure 30. Compared to the previous figure for crop production, most establishments in Travis, Hays, and

Williamson counties, especially in the parts west of the IH 35 corridor where many ranches are located in the Hill Country area. Roadways such as SH 29, RM 620, RM 2244, US 290, and SH 71 provide access to the THFN for animal production establishments in Hays County and the western parts of Travis and Williamson counties.

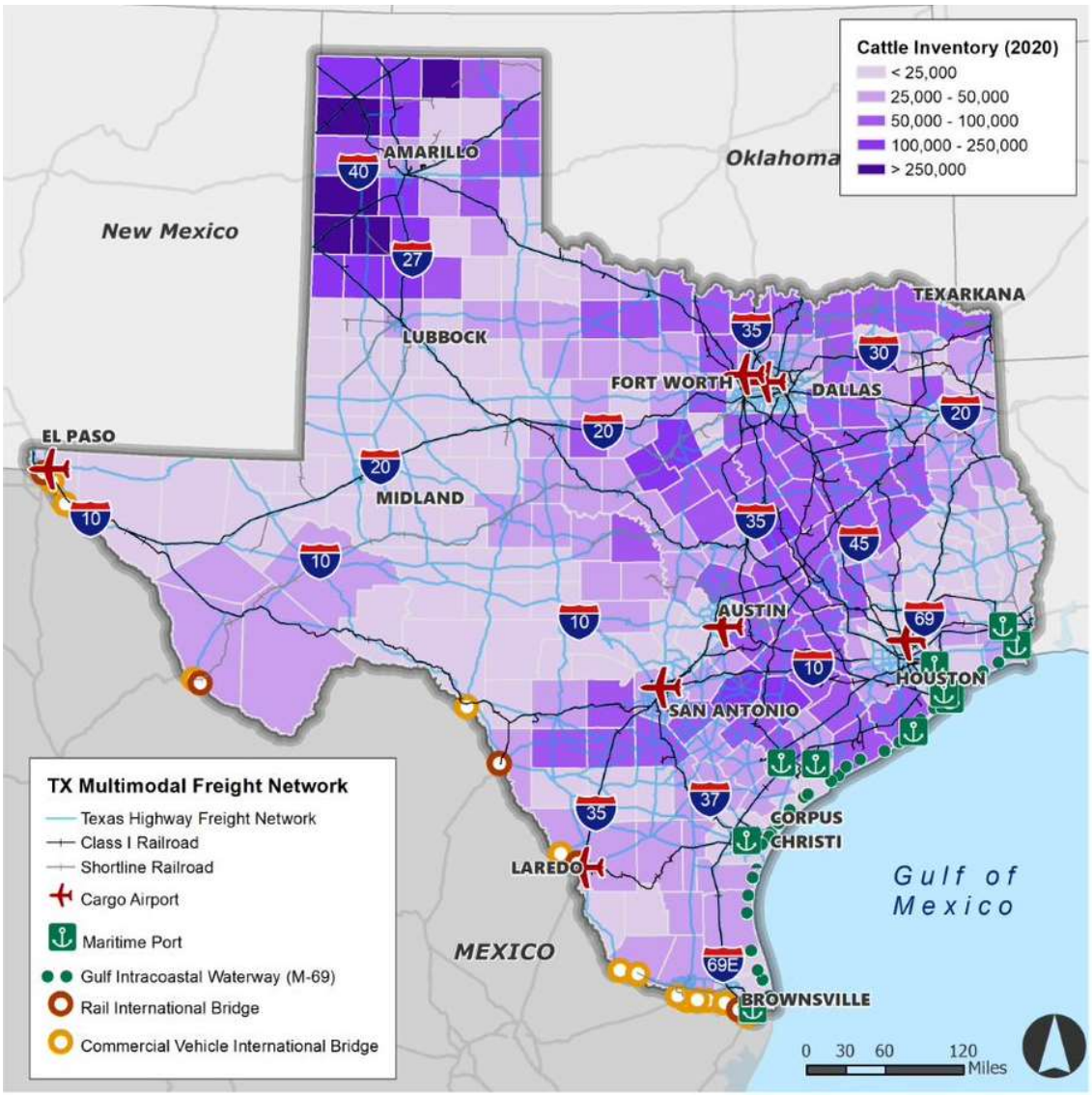
Figure 30: Animal Production Facilities by Employee Size in the Capital Area Region, 2020



Source: Prepared by Cambridge Systematics using data provided by Data Axle. (2021). Business Data (2020)

The livestock cattle supply chain consists of multiple well-defined clusters, especially within Texas. However, it also consists of numerous small farms dispersed throughout the majority of the state. For Texas-born cattle, large concentrations of early-stage farms can be found throughout the state, but especially in eastern Texas (Figure 31). Williamson and Bastrop counties have the highest cattle inventory within the CAMPO region.

Figure 31: Cattle Inventory by County in 2020

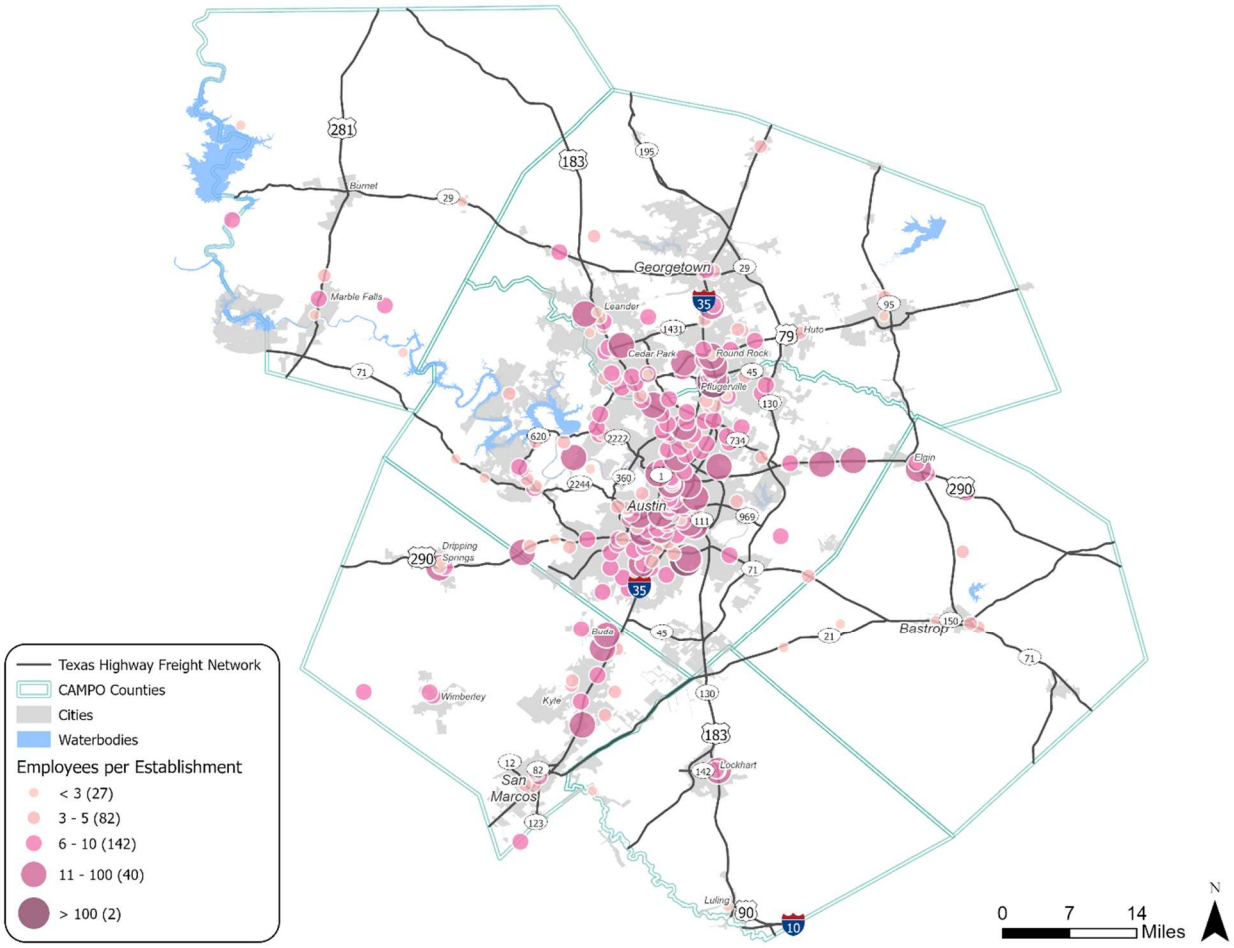


Source: Prepared by Cambridge Systematics using data provided by USDA, Texas Agricultural Statistics 2020, Available at- https://www.nass.usda.gov/Statistics_by_State/Texas/Publications/Annual_Statistical_Bulletin/index.php

Food Manufacturing Sector

The location of establishments in the food manufacturing industry is highlighted in Figure 32. Many establishments are close to roadways such as US 183, FM 734, and IH 35 in Austin's north and central parts. Some of the larger establishments by employee size are outside of the urban areas of Austin along US 290 and IH 35 in Hays County and along US 290 in the western and eastern parts of Travis County.

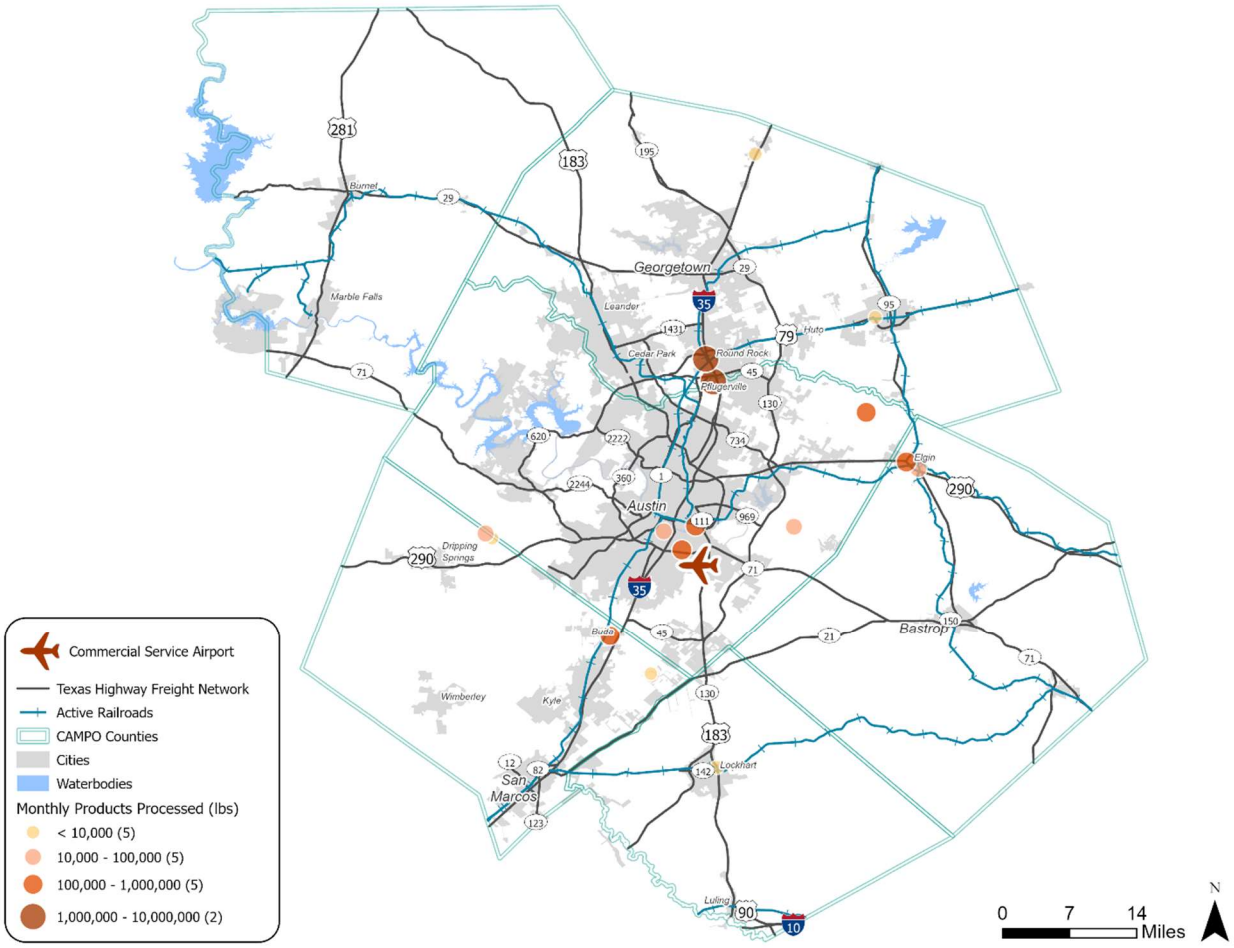
Figure 32: Location of Food Manufacturing Establishments in the Capital Area Region, 2020



Source: Prepared by Cambridge Systematics using data provided by Data Axle. (2021). Business Data (2020)

Figure 33 shows the location of meat, poultry, and egg product manufacturing plants in the CAMPO region by volume of monthly processed products. Much of the food manufacturing activity in the region is located in the area of IH 35 and US 79, and SH 45 in the northern part of Austin and to the south near the airport. Other locations with a high production volume are near Elgin in Bastrop County and Buda in Hays County.

Figure 33: Meat, Poultry, and Egg Manufacturers in the Capital Area Region, 2020



Source: Prepared by Cambridge Systematics using data provided by USDA's Food Safety and Inspection Service (FSIS).

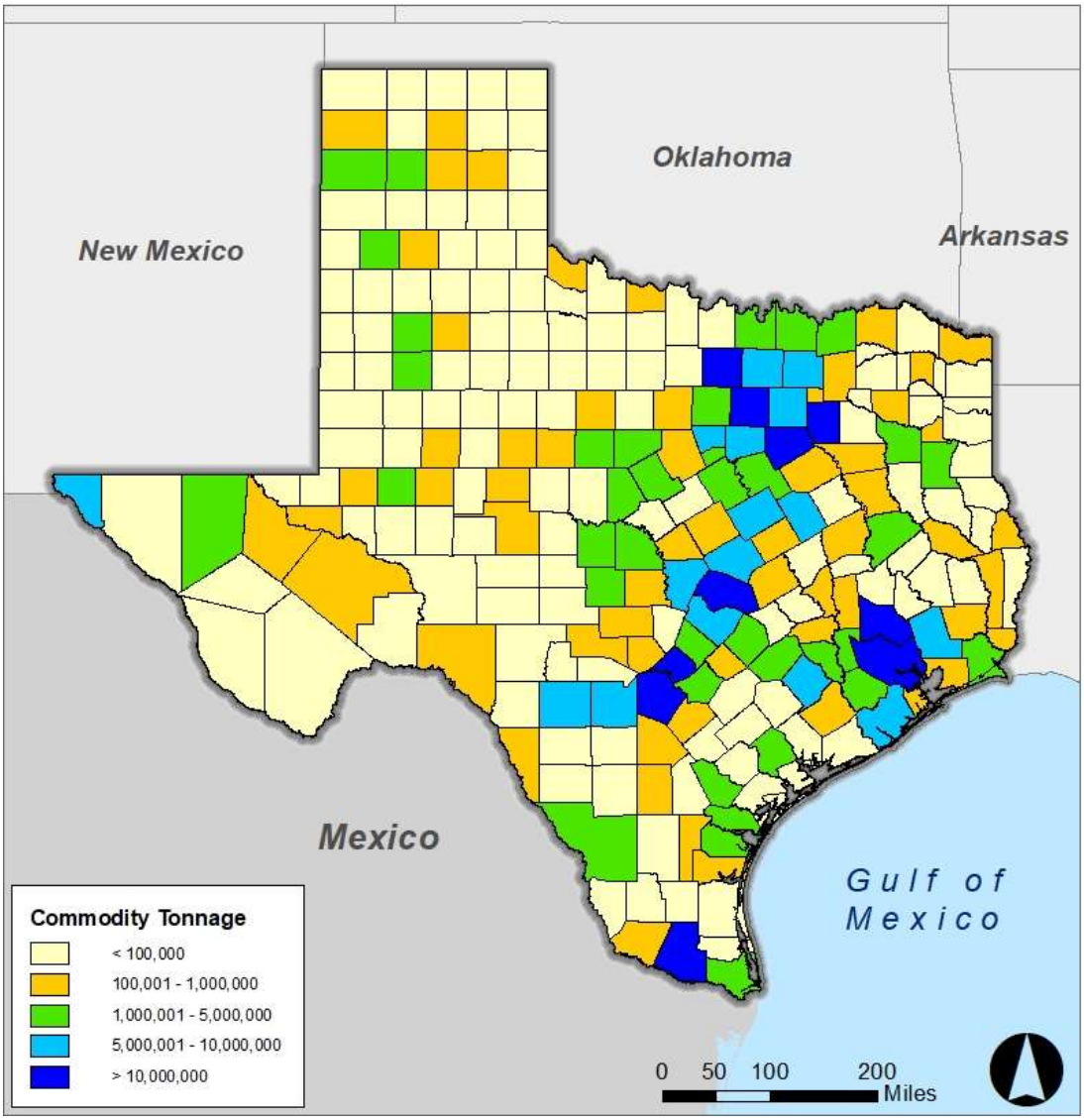
Construction

This section discusses the location of supply chains in Central Texas that supports construction industries in the state. The sector includes nonmetallic mineral production establishments, including raw materials, such as aggregates and limestone originating from quarries and mines, and finished materials, such as cement and concrete, either brought to or manufactured in Texas. Central Texas is both a producer and consumer of nonmetallic minerals; the region has the requisite geological formations to produce limestone and sandstone.

Nonmetallic Mineral Production Sector

Nonmetallic mineral products have a low value per ton and are expensive to transport, so they tend to be sourced from locations close to where they are consumed. Since much of the construction occurs in urban metropolitan areas, the highest concentrations of nonmetallic mineral production in Texas are located near metropolitan areas, as shown in Figure 34. Within the CAMPO region, Williamson County has the highest level of originating tonnage, followed by Williamson, Travis, and Burnet counties; production is concentrated on the west side of IH 35.

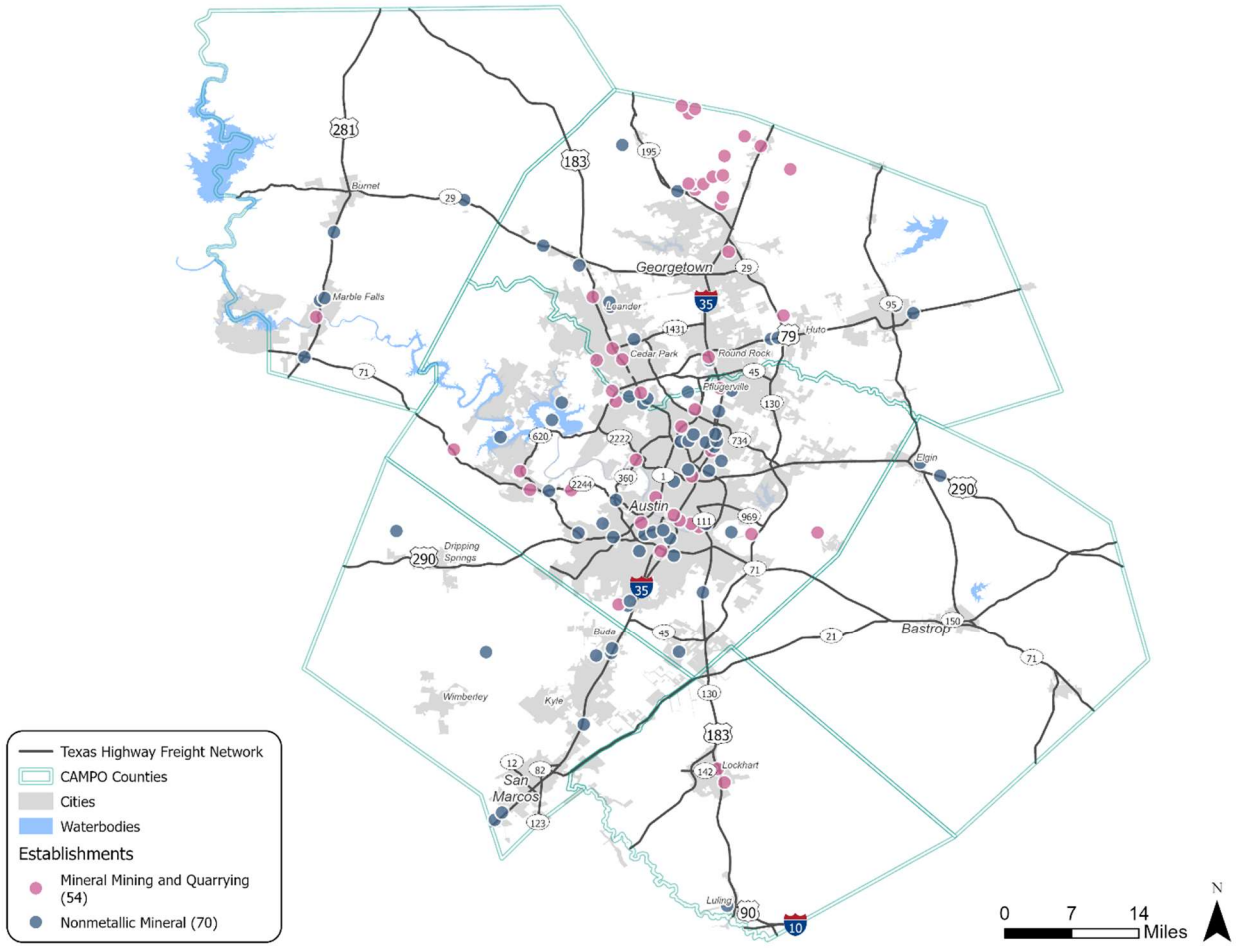
Figure 34: Origins of Commodity Flow Tonnage for Nonmetallic Mineral Production, 2019



Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

Figure 35 displays mining and quarrying establishments and nonmetallic mineral manufacturing establishments, which use nonmetallic minerals to make products like cement, concrete, and precast concrete items. Establishments are mainly clustered to the west of IH 35 in Williamson and Travis counties. These locations are near roadways on the THFN, such as SH 195, US 183, and SH 71, and in proximity to the freight rail network.

Figure 35: Location of Nonmetallic Mineral Product Manufacturing and Quarrying Establishments, 2020



Source: Prepared by Cambridge Systematics using data provided by Data Axle (2021). Business Data (2020).

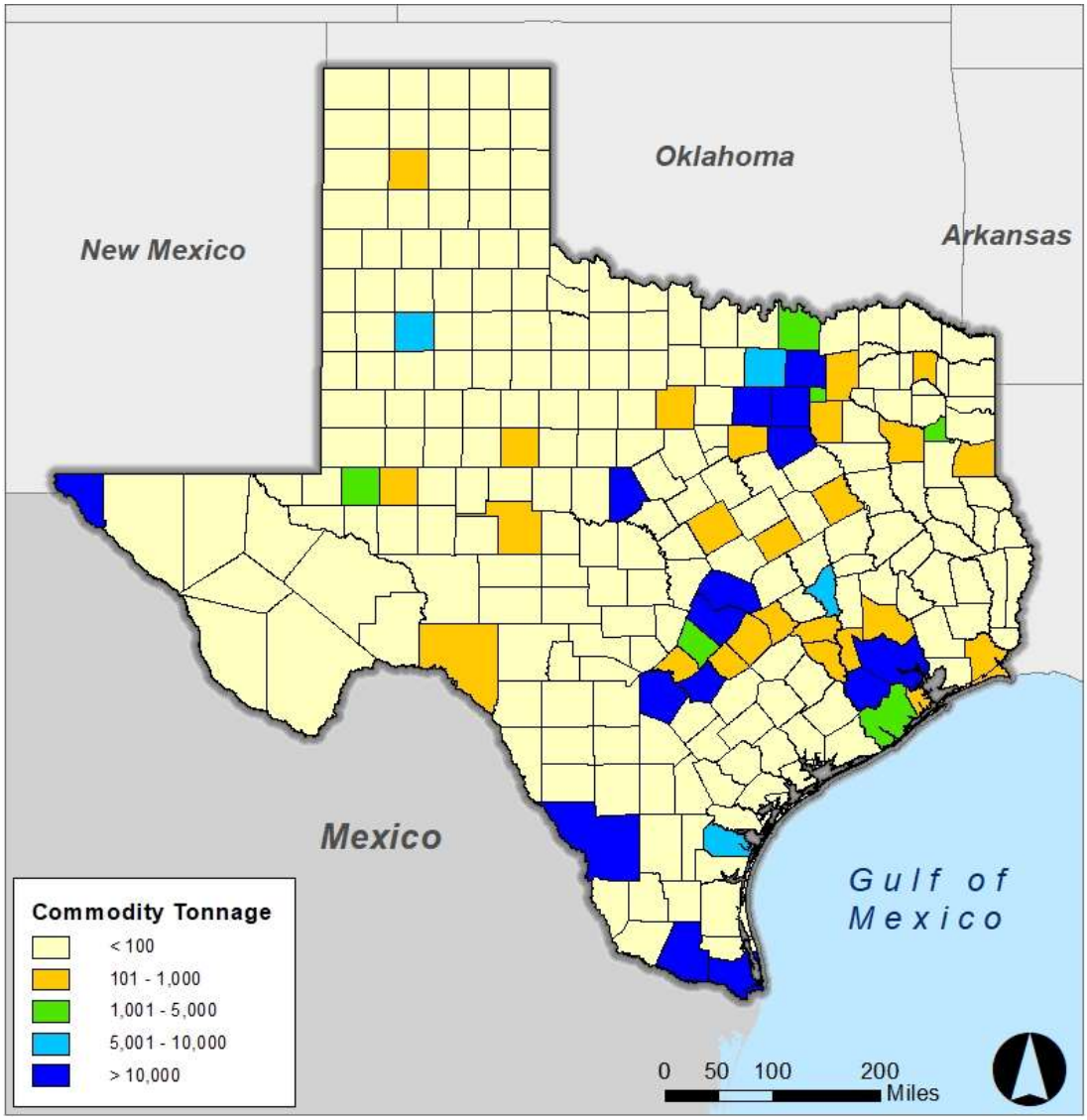
Electronics

This section discusses the location of supply chains in Central Texas that supports electronics industries in the state. The sector includes establishments that manufacture electronic components and semiconductors. Electronic commodities include consumer products such as televisions, radios, phones, and equipment used in industrial and commercial settings; the sector also produces components such as batteries and semiconductors. Semiconductors are a key sector comprising a broad set of intermediate products, including diodes, computer logic modules, and transistors, essential components of most electronic circuits. All items in this category are critical building blocks of the components that go into computers, cell phones, automobiles, and many other products.

As shown in Figure 36 the largest concentrations of electronics commodities originate in the Texas Triangle (Austin, Dallas-Fort Worth-Arlington, Houston, and San Antonio). Within the CAMPO region, Williamson and Travis counties have the highest levels of originating tonnage for electronics commodities. Overall, production facilities are primarily centered in the Texas

Triangle. However, the concentration in Houston is likely attributed to imports through Port Houston. Likewise, the tonnage along the border in El Paso, Laredo, McAllen, and Brownville is likely attributed to imports from Mexico.

Figure 36: Origination of Commodity Tonnage for Electronics, 2019



Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

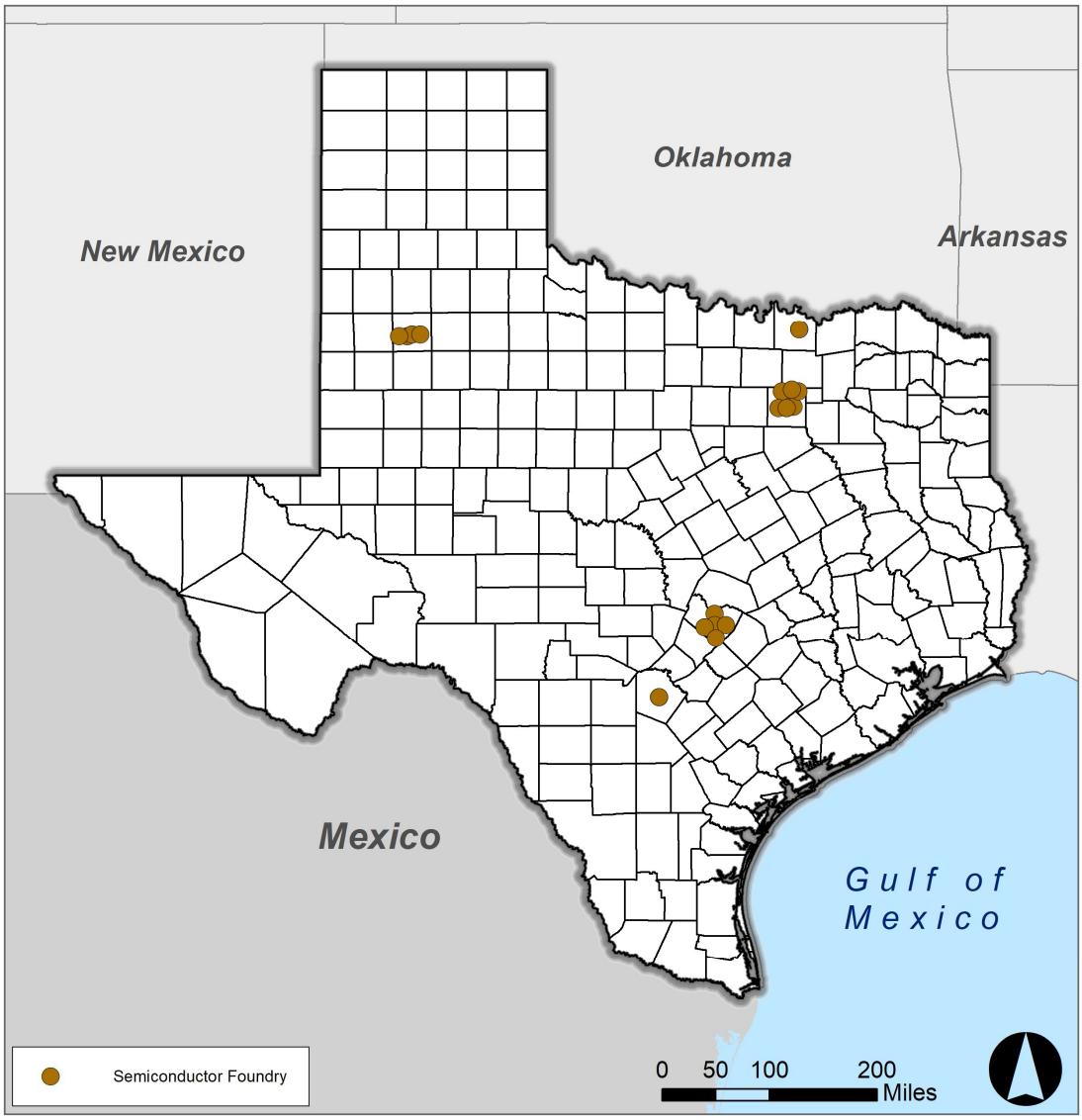
Semiconductor Sector

Semiconductors are an important part of the U.S. and Texas economies. Moreover, they are an integral part of the technology used in everyday life, and they go into everything from light switches and refrigerators to computers, automobiles, and cell phones. The term semiconductor for the purpose of this supply chain analysis is a broad term that includes items such as solid-state electronic devices, diodes, computer logic modules, and transistors.

Semiconductor foundries are high-tech plants that are a vital part of the chip manufacturing process. These large facilities use a tremendous amount of electricity at rates higher than automotive plants and oil refineries. Additionally, the amount of water used by these plants is very substantial. Further, the manufacturing of semiconductors is a complex process that includes hundreds of inputs, a large portion of which are raw materials such as chemicals and gases. Raw materials and intermediate materials are sourced both domestically and internationally. However, while there are domestic sources of some of these materials (such as gases and wet chemicals), a large portion of materials, including intermediate products (such as silicon wafers, photomasks, and photoresists), are imported from abroad, especially Asia. For these reasons, as well as the cost of labor, most semiconductors are currently produced in Asia. However, Texas has a growing number of semiconductor facilities, with newer arrivals such as Samsung joining well-established companies such as Texas Instruments, Advanced Micro Devices (AMD), and National Instruments, which have long-standing design and fabrication facilities in Central Texas.

Within Texas, two main areas produce a large portion of the state's semiconductors: Dallas-Fort Worth-Arlington to the north and Austin-Round Rock in the CAMPO region. These two metro areas are home to 12 of the 15 semiconductor foundries within the state, as shown in Figure 37. In the CAMPO region, the foundries are concentrated in Travis County.

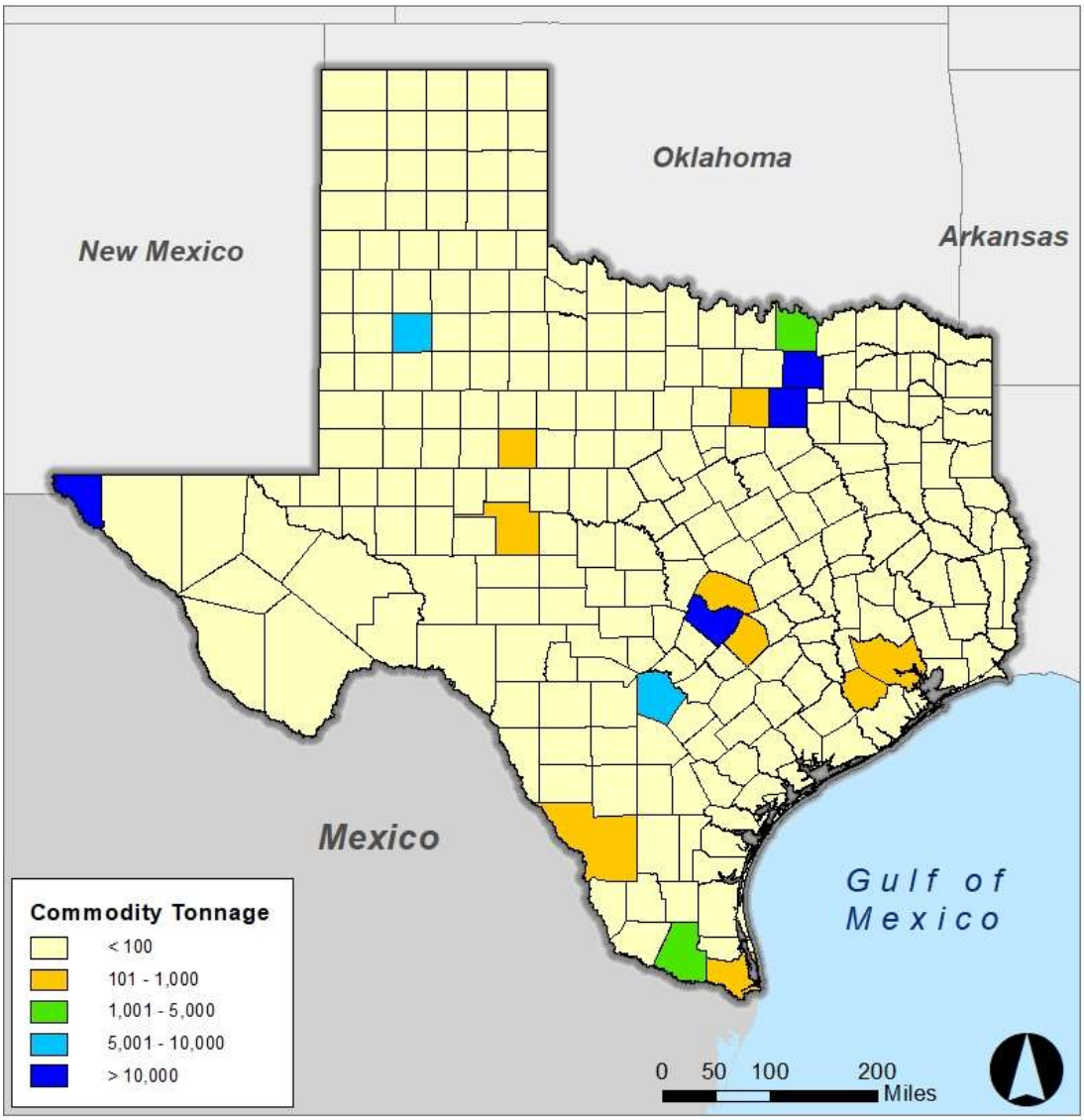
Figure 37: Semiconductor Foundry Locations in Texas, 2021



Source: Semiconductor Industry Association

As shown in Figure 38, Travis County is among the Texas counties with the highest originating tonnage for semiconductor commodities. Williamson and Bastrop counties are also among the counties that produce originating tonnage. However, these are more likely to be diodes and other smaller components categorized with semiconductors.

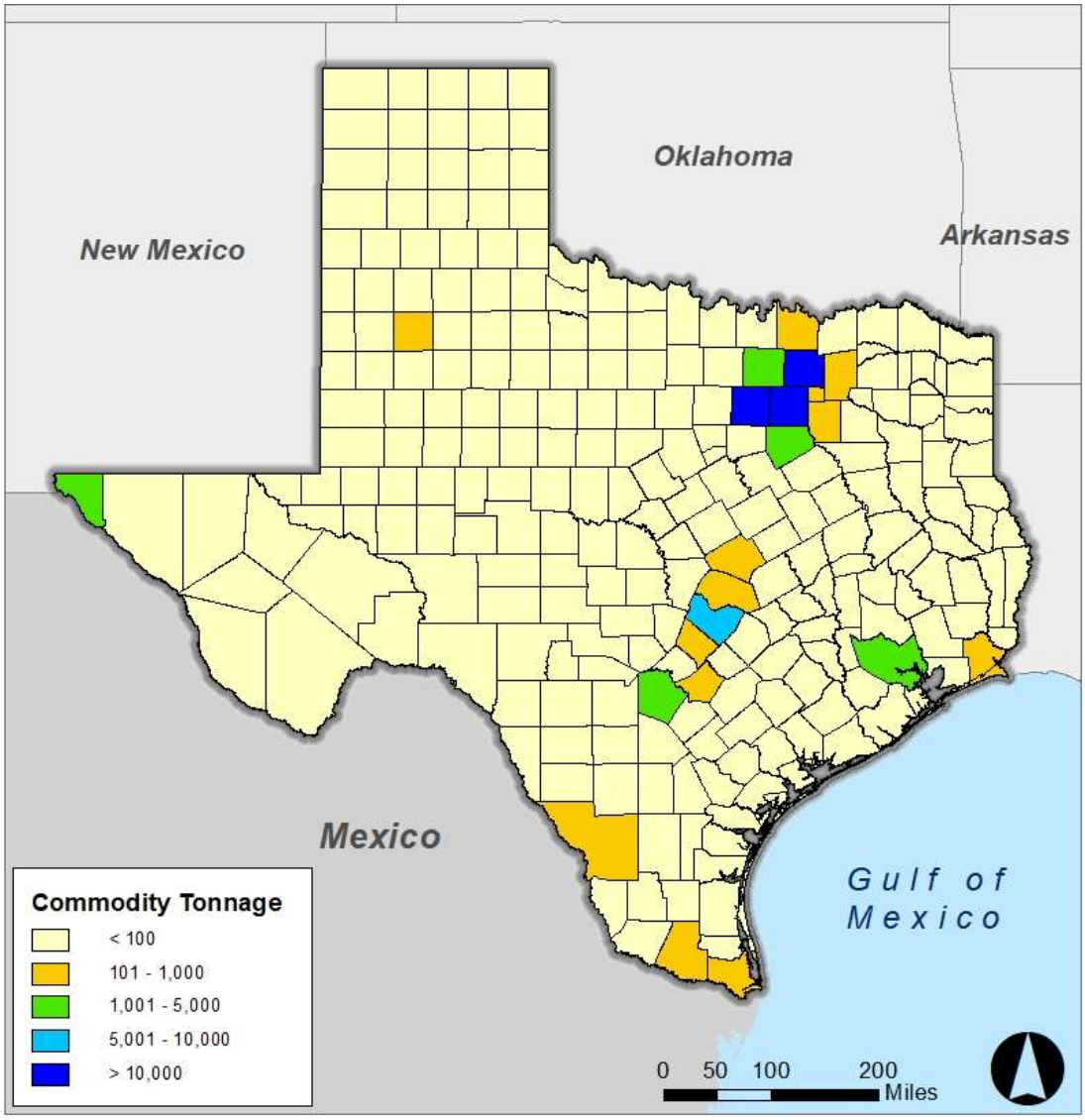
Figure 38: Origins of Commodity Tonnage for Solid-State Semiconductors, 2019



Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

As shown in Figure 39, the demand for semiconductors is concentrated in the Texas Triangle since this area serves as input to computers and other electronics products manufactured in these areas. Along with the Dallas-Fort Worth-Arlington metropolitan area, counties in the CAMPO region have the highest concentration of semiconductor demand. The high-value shipment of semiconductors requires access to air freight. Airports such as DFW and Austin-Bergstrom provide global gateways to manufacturing materials, intermediate products, and finished semiconductors. Semiconductors are extremely fragile, and the vibrations from truck travel can easily damage them. Thus, they are predominately trucked to an airport and shipped via air to locations domestically and internationally.

Figure 39: Destinations of Commodity Tonnage for Solid-State Semiconductors, 2019



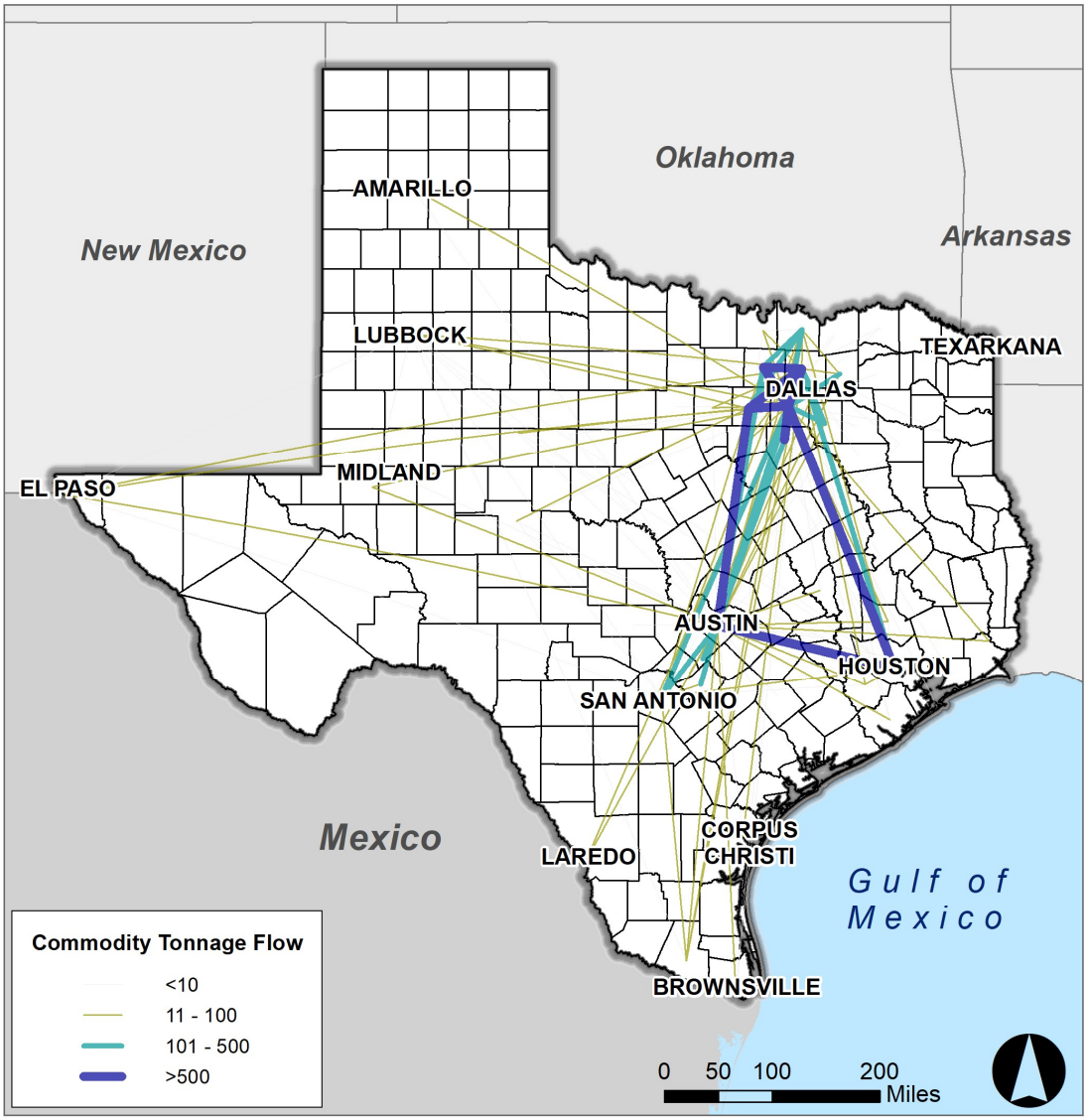
Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

According to Transearch, the predominant inbound flows are from California, Oregon, and Colorado, which includes semiconductors manufactured in those states but, importantly, the flows from ports of entry which, in this case, include significant flows from airports. In addition, international air cargo consists of flows from Asia with suppliers and semiconductor manufacturing in countries such as Taiwan, South Korea, and Malaysia.

For outbound flows, large portions go domestically to states such as Illinois, Florida, and New York. Internationally, there are large flows that go to Mexico and Central America and considerable flows to Europe. International air cargo flows also connect manufacturers and suppliers in Texas with East Asia. Figure 40 shows the commodity flows for semiconductors

within Texas. The flows connecting the urban areas of the Texas Triangle highlight the importance of the CAMPO region as a primary consumer and producer of semiconductors.

Figure 40: Commodity Tonnage Flows within Texas for Solid-State Semiconductors, 2019



Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

Petroleum

This section discusses the location of supply chains in Central Texas that supports petroleum industries in the state. The sector includes establishments in petroleum product distribution and the downstream production of plastics and rubber derived from petrochemicals. Texas is the leading domestic producer of crude oil and natural gas, and Central Texas has several transmission pipelines crossing the region. The sector includes establishments involved in storing and distributing finished products such as motor gasoline, diesel, and other liquified fuels

and gasses refined and processed in other parts of the state. The plastics and rubber manufacturing sector uses resins that are a byproduct of petroleum refining and polymerization to create pellets that are key components for the other manufacturing industries, namely automotive, which has a major cluster in the CAMPO region.

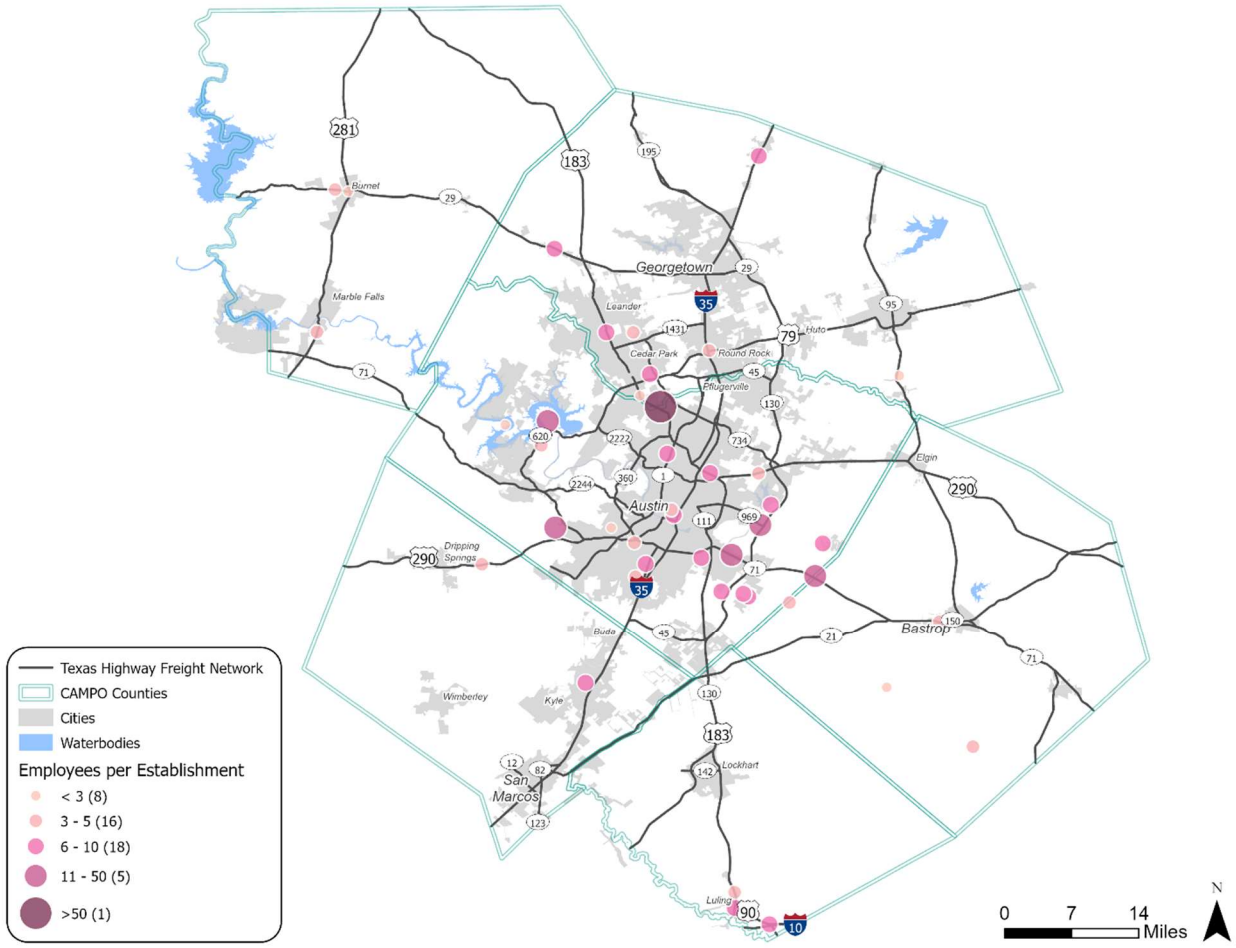
Petroleum Product Distribution Sector

The distribution part of the supply chain refers to the midstream operations of the petroleum industry. This sector provides the logistical networks and the storage and handling facilities that link upstream oil & gas producers with downstream operators that refine and process petroleum into various products. For example, pipelines transport crude products in bulk from shale gas-producing regions such as the Permian Basin in West Texas to storage terminals closer to urban areas and ports. There, products are redistributed by pipeline, tanker truck, or tanker ship to downstream oil refineries, natural gas processing plants, and petrochemical manufacturers.

Most of Texas's refining and petrochemical manufacturing is clustered in complexes along the Gulf Coast in Houston, Beaumont, Port Arthur, and Corpus Christi. From there, finished products such as motor gasoline, diesel fuel, dry natural gas, and propane are transported by pipeline and rail to the state's population centers and delivered to end users at homes, gasoline stations, power plants, airports, and other sources of energy demand. Other products, such as petrochemicals, are diverted downstream to produce resins for various rubber and plastic materials and goods.

Petroleum distribution in Texas is classified under several NAICS codes, including the movement of crude oil and petroleum products via pipelines and terminals. They specifically include petroleum bulk stations and terminals, crude oil transportation, refined petroleum products, and fuel dealers. Therefore, NAICS codes were combined, and employment was mapped for the CAMPO region, as shown in Figure 41.

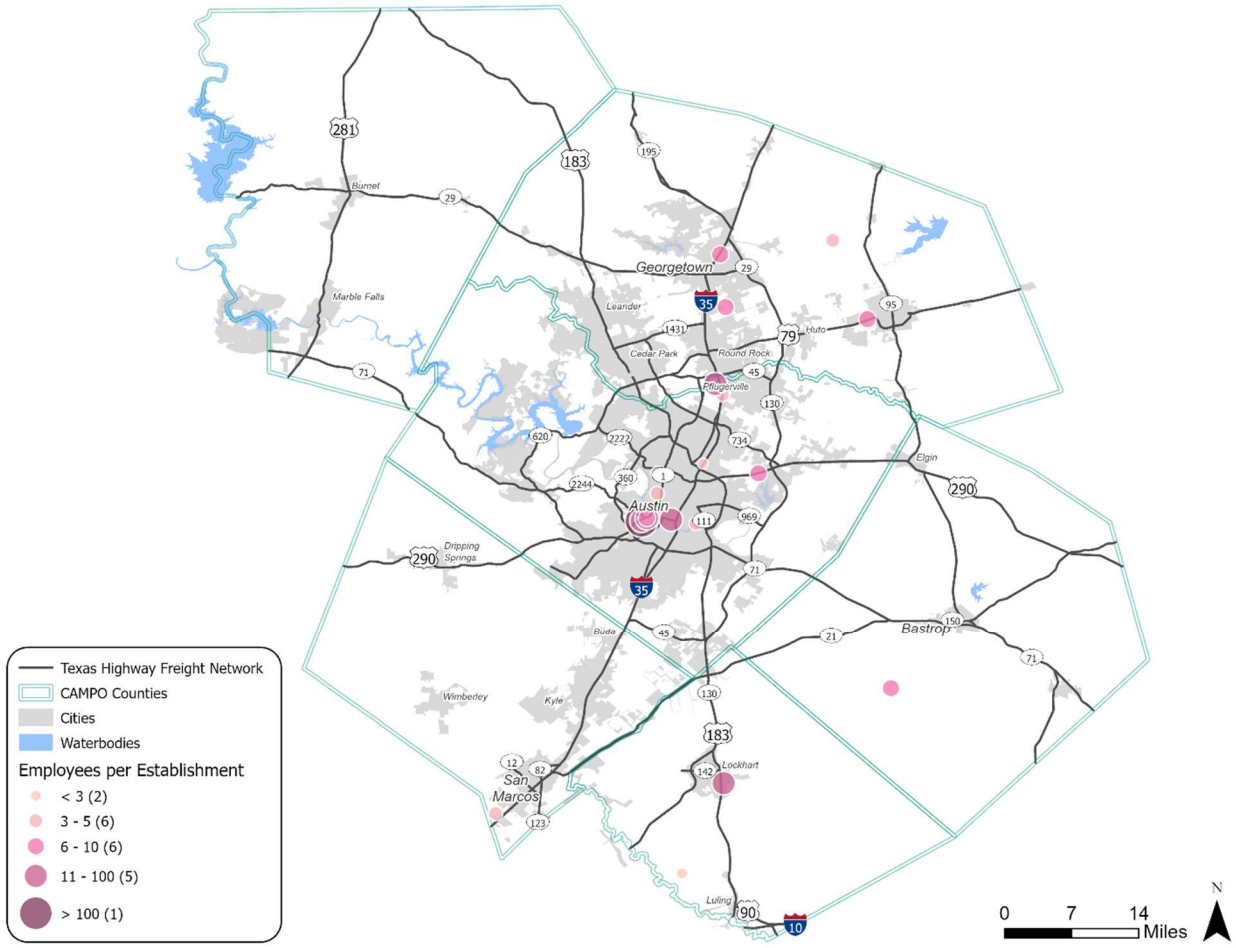
Figure 41: Location of Petroleum Distribution Establishments in the Capital Area Region, 2020



Source: Prepared by Cambridge Systematics using data provided by Data Axle (2021). Business Data (2020).

Figure 42 shows the location of establishment involved in the pipeline transport and distribution of natural gas. The main cluster is surrounded by RM 2244, SL 360, and SL 1 (MoPac Expressway).

Figure 42. Location of Natural Gas Distribution Establishments in the Capital Area Region, 2020



Source: Prepared by Cambridge Systematics using data provided by Data Axle (2021). Business Data (2020).

Plastics and Rubber Manufacturing Sector

The plastic and rubber manufacturing supply chain involves many complex chemical processes resulting in consumer products. Before plastic and rubber products reach consumers, the raw resources and processed materials change hands often amongst various modal alternatives.

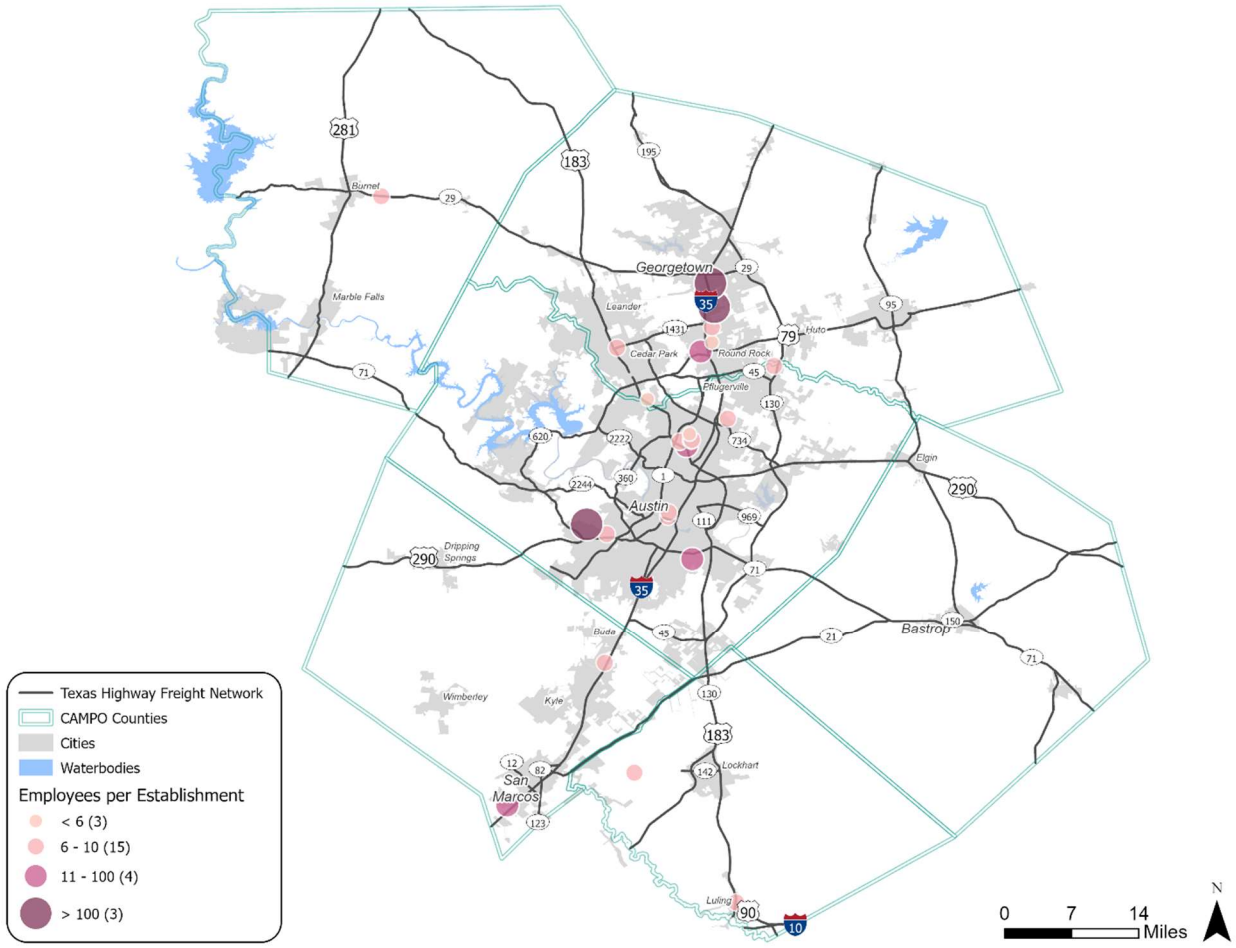
Plastic resin is the primary staging point for many plastic and synthetic rubber products. The resin, as a byproduct of petroleum refining and polymerization, exists in its raw form as plastic pellets that are easily hoppered, or bagged and containerized, for distribution to manufacturing facilities. Overseas manufacturers import resins as primary inputs for plastic and rubber product manufacturing. International, and often domestic, distribution of plastic pellets requires it to be shipped by container to the manufacturing facility. This almost exclusively involves transport by rail and sometimes trucks to domestic manufacturing facilities or maritime ports of entry.

Once the resin has reached manufacturing facilities, the plastic and rubber products are fabricated and shipped to down-chain manufacturers or end-users through direct transactions

or wholesale purchasers and distributors. Downstream manufacturing includes the shipment of multiple plastic and rubber products, both domestic and international, to facilities that require multiple inputs to manufacture the ultimate end-used product, as is the case with car parts or other assembly-type manufacturing.

Figure 43 shows the locations and approximate employment for plastic and rubber manufacturing establishments. The larger establishments by employee size are near SH 71 in the southwestern part of Travis County and IH 35 near Georgetown.

Figure 43: Location of Plastic and Rubber Product Manufacturers in the Capital Area Region, 2020



Source: Prepared by Cambridge Systematics using data provided by Data Axle (2021). Business Data (2020).

Warehousing and Distribution

This section discusses the location of supply chains in Central Texas that supports warehousing and distribution industries in the state. The warehousing sector includes facilities dedicated to storing raw materials before production, maintaining work in progress through the production cycle, and collecting finished goods ready for delivery to the point of final consumption by

businesses or consumers. Warehouse establishments are considered an intermediate stage in the consumer goods supply chain.

Distribution and fulfillment centers play an important role in the final stages of the warehousing supply chain, ensuring that goods move from convenient storage facilities to retail locations and consumers. Distribution and fulfillment centers tend to store goods for shorter periods than general warehouses. Distribution centers typically serve as transit hubs for goods, whereas fulfillment centers store products before they are shipped to customers. However, the distinction between these facilities is becoming less clear over time, as fulfillment centers increasingly provide transit services while some distribution centers offer storage and direct shipment to customers. Retail Distribution includes facilities primarily engaged in selling goods or services to consumers or end users. Retail distribution establishments are considered the final stage of the consumer goods supply chain.

Warehousing Sector

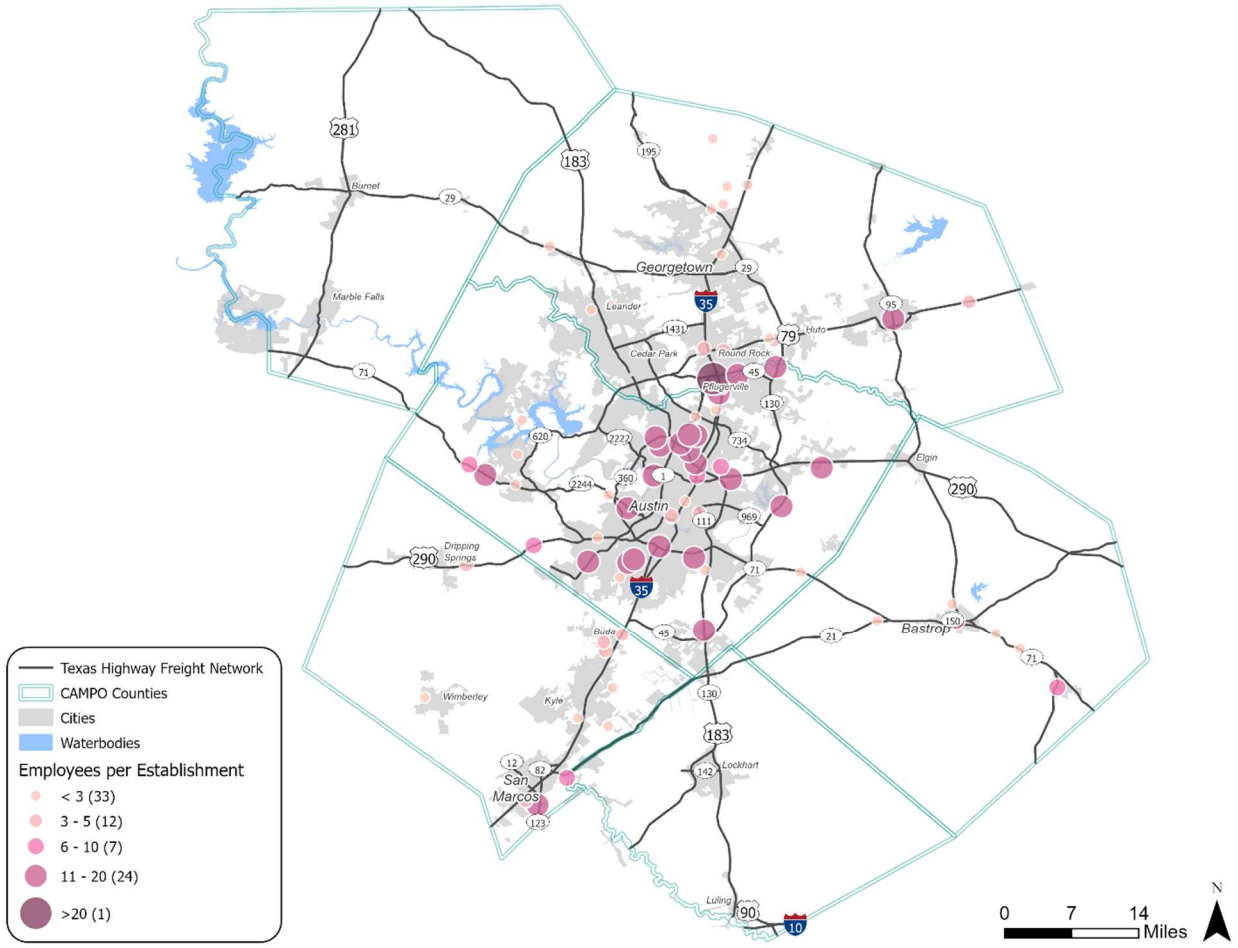
General warehouses are ideally suited for storing bulk quantities of consumer products that do not have strict refrigeration requirements. As a result, they play a major role in the supply chains of various non-perishable goods that go to retail, grocery, and drug stores. These facilities are usually the first stopping point for goods after manufacturing and processing; the products will then move onto distribution centers or retail distribution establishments.

Products move to and from Texas warehouses and international and domestic sources via water, rail, and truck. Texas has 28 border crossing points from Mexico, three of which are official land ports for incoming and outgoing freight.[19] In addition, there are twelve deep draft seaports in Texas, owned mainly by port entities with land leased to private operators along the Gulf of Mexico. Products from Asia via West Coast ports (primarily in California) are moved into Texas markets via rail and truck. Warehousing is critical to effectively storing and sorting a variety of commodities as they make their way from the initial mode of transport into the distribution chain.

Figure 44 shows the location of general warehouses by employee size in the CAMPO region. Most warehouse establishments are clustered in Travis County and located along segments of the THFN in proximity to the IH 35 corridor. Some of the larger establishments in terms of employment are located near US 183 and SH 45 in north Austin and along SH 130.

[19]TxDOT (Accessed 2022, April 9). Texas-Mexico Border Crossings. Available at: https://www.txdot.gov/inside-txdot/projects/studies/statewide/border-crossing.html

Figure 44: Location of General Warehousing Establishments in the Capital Area Region, 2020



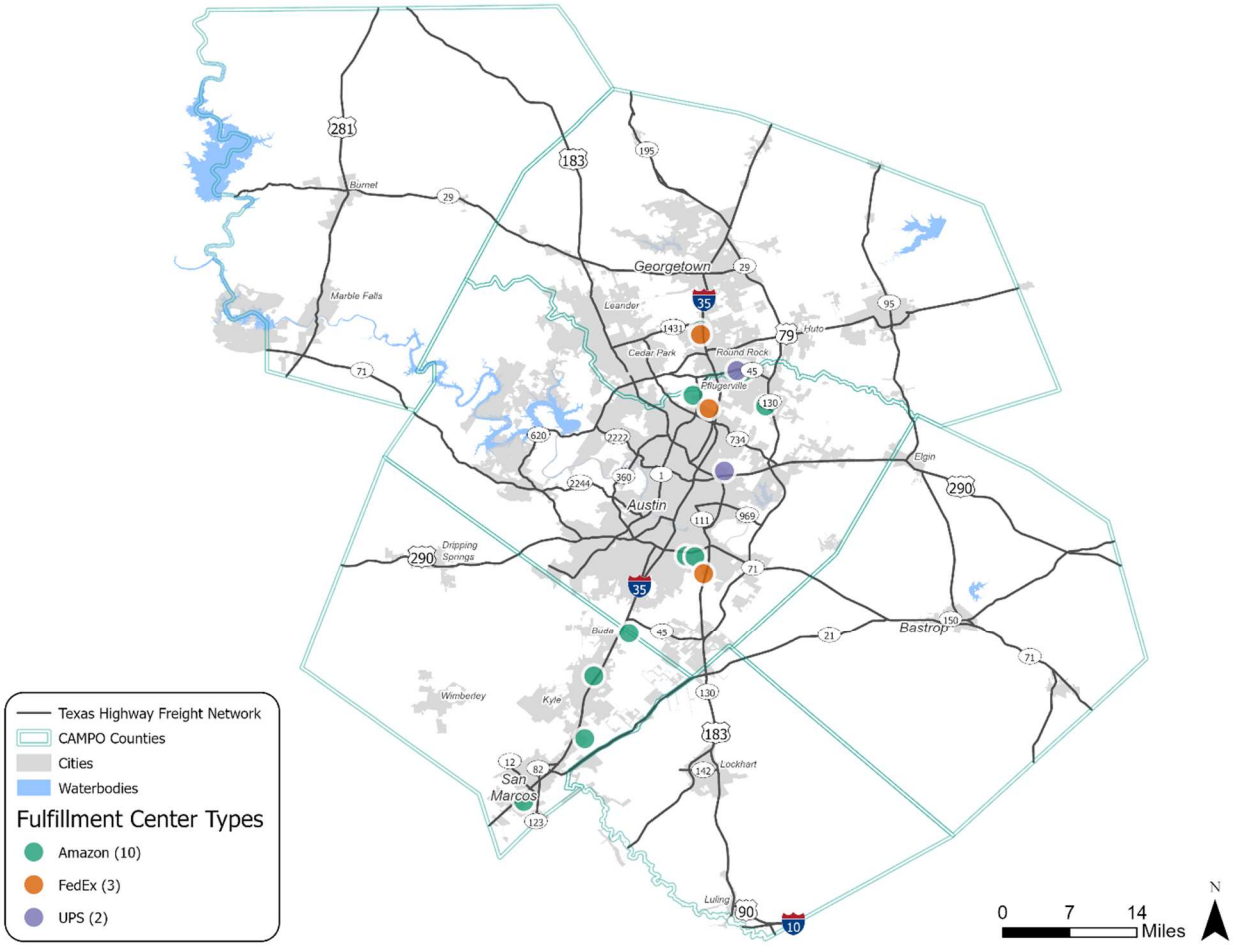
Source: Prepared by Cambridge Systematics using data provided by Data Axle. (2021). Business Data (2020)

Much of the goods flowing through the warehousing and distribution supply chains are imported into the U.S. from manufacturers in East Asia. Before arriving in Texas, goods are brought on container ships to ports on the West Coast, namely the Port of Los Angeles and the Port of Long Beach (POLA/POLB). The containerized cargo is then transported across the western U.S. by rail and truck to warehouses and fulfillment centers in El Paso, San Antonio, and Dallas-Fort Worth; goods then make the final journey by truck to reach households and businesses in urban areas where consumer demand is concentrated, including the CAMPO region. Commodity flows for warehousing also originate in the Midwest, with large inbound flows from Illinois. Other sources of tonnage arrive via seaports, such as Port Houston, for imports from Central America and Europe. Tonnage also enters Texas from Mexico, going north by rail and truck through Laredo to San Antonio via IH 35 to reach the rest of the state.

Figure 45 shows the location and number of warehouse and fulfillment centers in the CAMPO region, focusing on the dominant players in in the e-commerce space – Amazon, FedEx, and UPS. Four (4) are located in Hays County, eight (8) in Travis County, and three (3) in Williamson

County. All of the locations shown are located in proximity to the THFN. The facilities operated by Amazon, FedEx, and UPS store and distributes customer orders and packages for final delivery in the CAMPO region and in surrounding counties. Capital Area households and businesses benefit from the convenience of online shopping and access to a broad selection of goods and products from around the world.

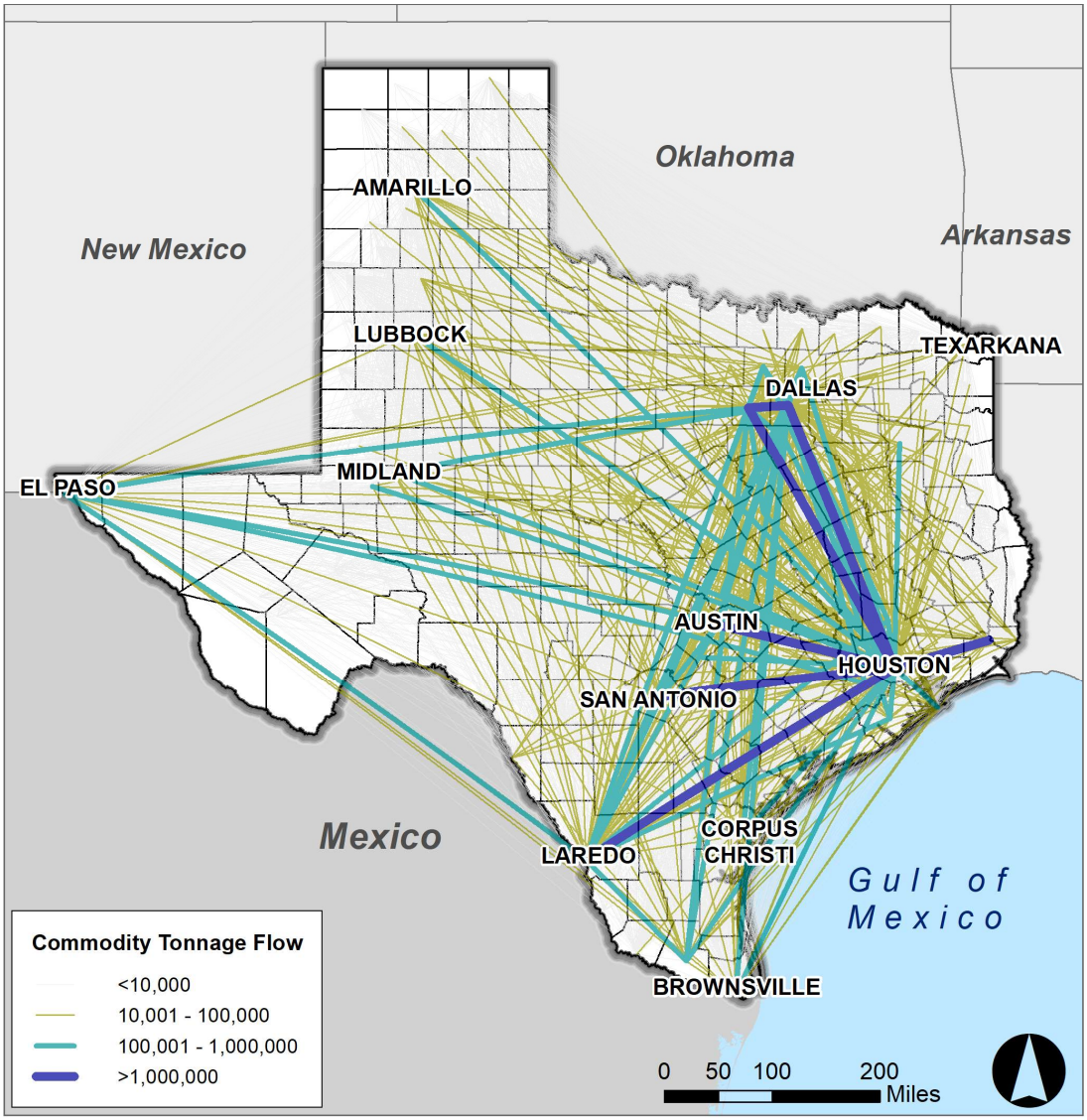
Figure 45: Capital Area Warehouses and Fulfillment Centers operated by Amazon, FedEx, and UPS



Source: Prepared by Cambridge Systematics using data provided by CAMPO (2023).

Figure 46 shows that the largest warehouse distribution commodity tonnage flows within Texas are between Houston and Austin and between Houston and urban areas in Laredo, San Antonio, and Dallas. There is also a large movement of distribution cargo from Houston to the border with Louisiana.

Figure 46: Commodity Tonnage Flows within Texas for Warehouse Distribution, 2019



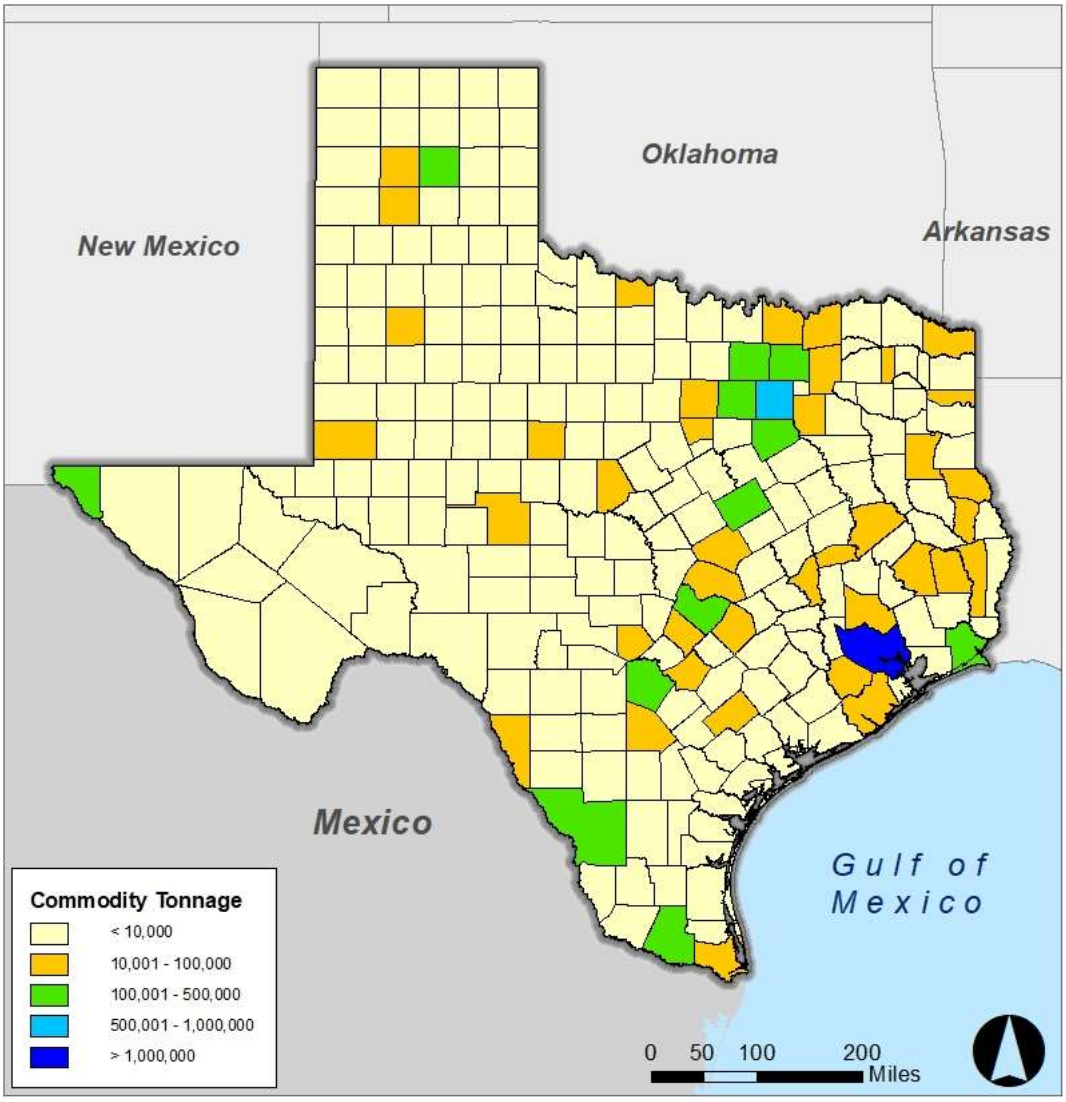
Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

Retail Distribution Sector

The Retail Distribution Sector includes many establishments, which can be categorized according to their general purpose and the types of goods handled. General retail is a broad category that covers selling various consumer goods, primarily to individuals. These establishments may also sell medical and grocery products. The general retail category includes

malls as well as warehouse clubs (e.g., Costco), specialized retailers (e.g., Best Buy), and big box retailers (e.g., Walmart and Target). In addition, the sector includes e-commerce as a growing sub-sector of retail distribution. Figure 47 shows that the highest origination volume of general retail commodities comes from densely populated urban areas such as Houston and Dallas-Fort Worth. Travis, Hays, Williamson, and Bastrop counties in the CAMPO region are major source of originating tonnage for retail commodities.

Figure 47: Origins of Commodity Tonnage for General Retail, 2019

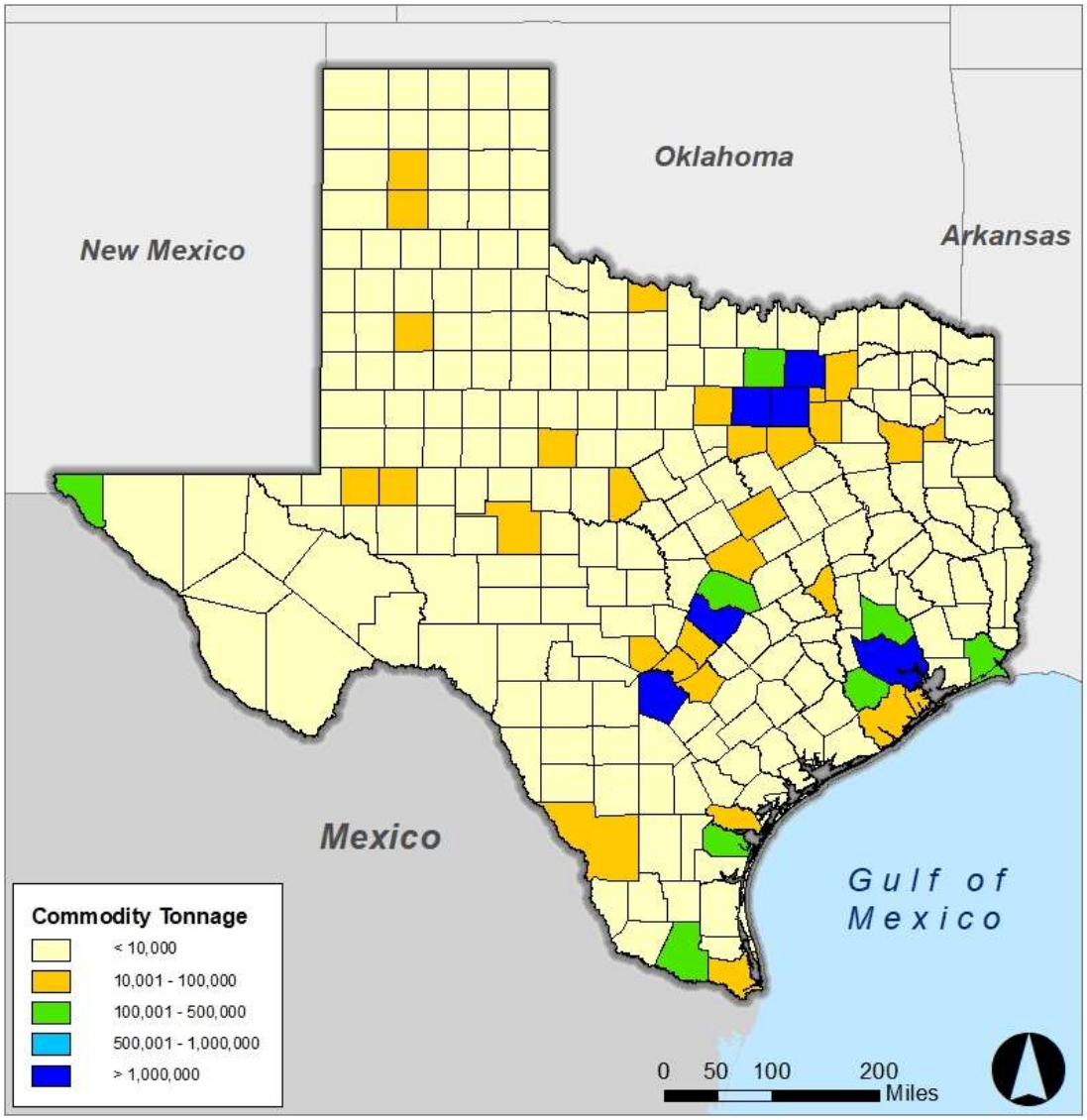


Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

Figure 48 shows that the greatest destination volume of general retail commodities is headed to densely populated urban areas such as Austin and the other major metropolitan areas of Houston, Dallas-Fort Worth, and San Antonio. Travis County is among the counties with the

highest amount of inbound tonnage for retail commodities. Williamson and Hays counties are also major destinations for retail commodities.

Figure 48: Destinations of Commodity Tonnage for General Retail, 2019



Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

Travel Characteristics for E-commerce Warehousing Trips

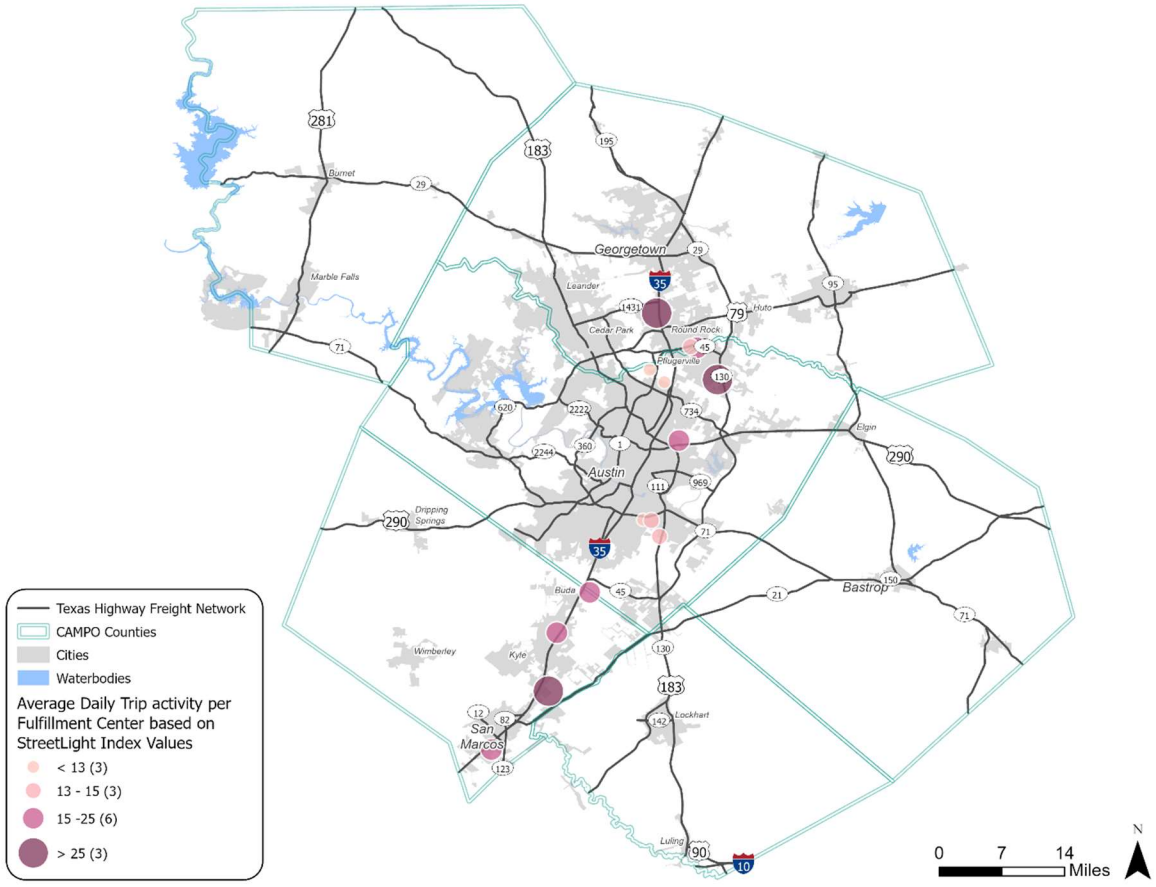
Trip origins and destinations were analyzed for the 15 fulfilment centers in the CAMPO region operated by FedEx, UPS, and Amazon. Using StreetLight Data,[20] zones were created at facility

[20] StreetLight Data is a transportation analytics platform that uses location-based data from mobile devices to analyze data on trip origins-destinations (O-Ds) and other travel metrics.

location to capture information on the trips that started and ended at each location. The period of 2018 to 2022 was analyzed.

Figure 51 shows the location of the fulfillment centers in the CAMPO region and the daily trip activity observed at each location. The size of the circles represents the relative level of average daily trip activity for each location based on the number of data samples indexed by StreetLight Data. The fulfillment centers in Hays and Travis counties that have the highest levels of activity are located near IH 35 and SH 130, respectively, and are operated by Amazon. The location with the highest level of activity in Williamson County is located near IH 35 and is operated by FedEx.

Figure 49: Relative Daily Trip Activity for Fulfillment Center Locations in the Capital Area Region, 2018 – 2022

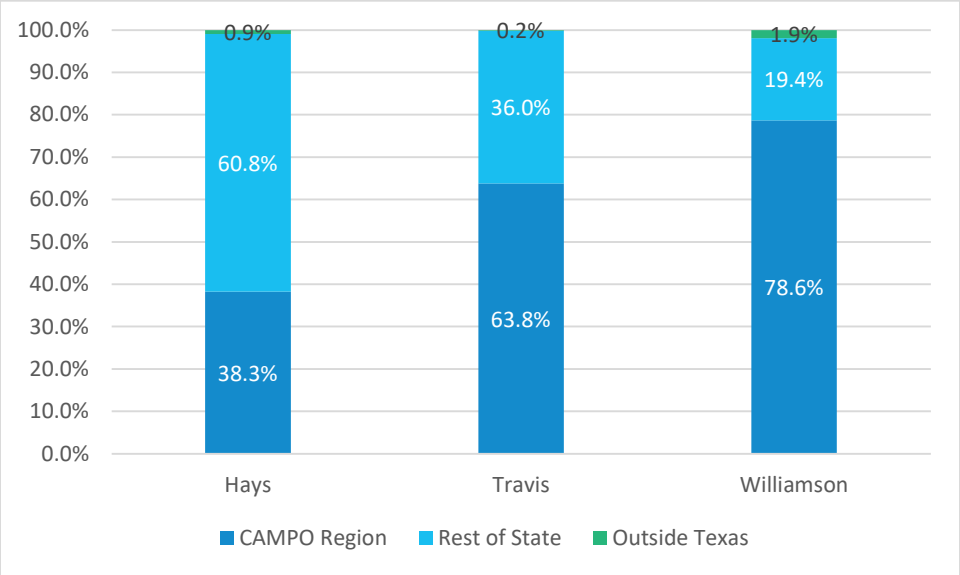


Source: Cambridge Systematics Analysis of data from StreetLight Data Insights, 2018-2022. Note: Relative trip activity is shown based on index values that correspond to the number of data samples captured at each fulfillment center location. The index value is not the actual number of trips or vehicles.

Figure 50 provide a trip distribution summary identifying the proportion of outbound truck trips that stay within the CAMPO region and the proportion that travels to counties outside of the region. The fulfillment centers in Hays County have the highest proportion of outbound trips (60.8%) that travel outside of the CAMPO region; among these trips, the top interregional destination is Comal County, located in the Alamo Area region to the south. Travis County has

the next highest with 36% of its trips going north towards Waco, with McLennan County the top destination. Williamson County has the lowest proportion of interregional trips (19.4%) and the top outbound destination is going north as well to Bell County.

Figure 50: Trip Distribution Summary for Fulfillment Center Locations in the Capital Area Region, 2018 - 2022



Source: StreetLight Data Insights, 2018-2022.

Table 23 provides a trip distribution summary for intraregional trips that originate and end within the CAMPO region. Most of the trips from the originating county stay within that county to serve the households and businesses there. Williamson County has the highest share of intra-county trips (84.2%). Hays has the lowest (53.4%), with a proportion of its trips serving Travis (25.5%) and Williamson counties (16.4%).

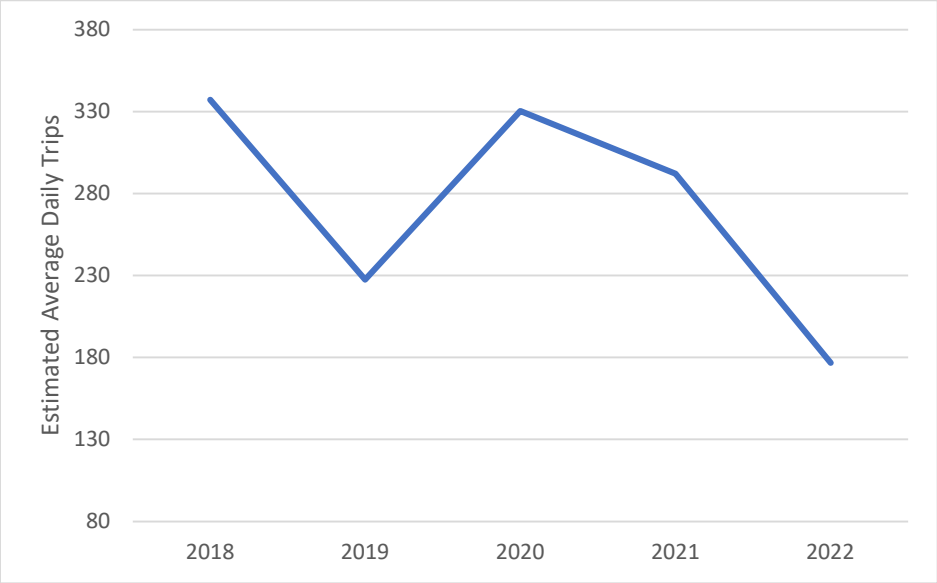
Table 23: Trip Distribution Summary for Fulfillment Center Trips within the Capital Area Region, 2018-2022

Originating County	Destination County						Total
	Bastrop	Burnet	Caldwell	Hays	Travis	Williams.	
Hays	0.3%	0.6%	3.8%	53.4%	25.5%	16.4%	100.0%
Travis	2.2%	0.8%	1.5%	10.9%	63.2%	21.4%	100.0%
Williamson	1.3%	0.1%	0.3%	1.5%	12.5%	84.2%	100.0%

Source: StreetLight Data Insights, 2018-2022.

Figure 51 shows the average daily trip activity by year across the 15 locations. Year 2019 saw a decline from the previous year and then increasing significantly in 2020 when stay-at-home restrictions were in effect for the COVID-19 pandemic. Trip activity remained elevated in 2021 while the Texas economy was just reopening, and then dropping drastically in 2022 when restrictions largely ended. The drop in activity in 2022 could be attributed to a slow down in consumer spending as the Federal Reserve initiated a series of interest rate hikes to curb persistent inflation. In addition, signs of recessionary headwinds in the overall U.S. economy also dampened consumer sentiments.

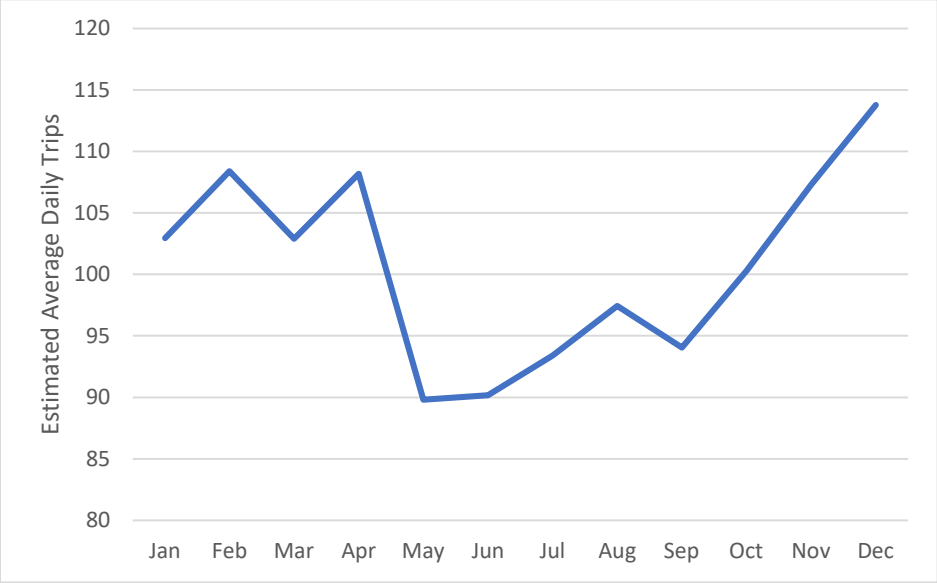
Figure 51: Average Daily Trips by Year for Capital Area Fulfillment Centers, 2018-2022



Source: StreetLight Data Insights, 2018-2022

Figure 52 shows the seasonal distribution of the average daily trip activity by month. The chart indicates that the peak holiday season begins in September and increases steadily until reaching the highest level of daily activity in December.

Figure 52: Average Daily Trip Activity by Month for Capital Area Fulfilment Centers, 2018-2022

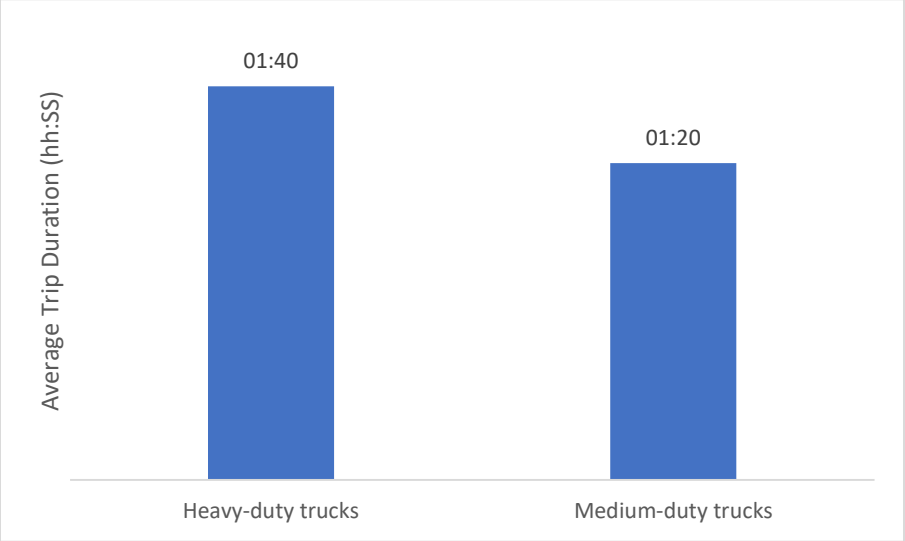


Source: StreetLight Data Insights, 2018-2022

Figure 53 compares the average trip duration for medium and heavy-duty trucks that serves the fulfilment center locations. Heavy-duty trucks includes Class 8 tractor-trailers used for long-haul

trips. On average, the trip duration was 25% longer than that of the medium-duty vehicles, which includes box trucks used for shorter distances.

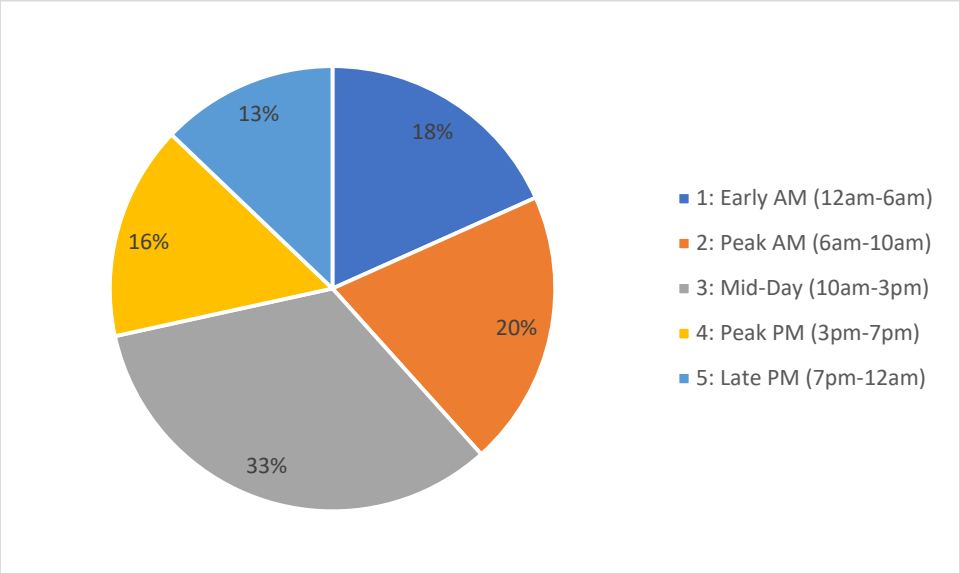
Figure 53: Average Trip duration for Medium and Heavy-Duty Trucks, 2018-2022



Source: StreetLight Data Insights, 2018-2022

Figure 54 shows a breakdown of daily trip activity by time of day. Most of the trip activity (33% of total) occurs in the mid-day period, followed by the morning peak period (20% of total). This suggests that trip activity is highest in the morning and mid-day periods when businesses are open and congestion is lower.

Figure 54: Average Daily Trip Activity by Time of Day for Capital Area Fulfilment Centers, 2018-2022



Source: StreetLight Data Insights, 2018-2022

Transportation Equipment

This section discusses the location of supply chains in Central Texas that supports transportation equipment industries in the state. The sectors include establishments in vehicle parts production and vehicle assembly or manufacturing. The vehicle parts sector includes manufacturing many materials and components necessary to produce finished automobiles, buses, and trucks, but not actual vehicles. Vehicle manufacturing includes receiving manufactured inputs, assembly of components into finished automobiles, buses, and trucks, and shipment of finished products through customer distribution channels.

Vehicle Parts Sector

The Texas Governor's Office of Economic Development and Tourism identifies nearly 140 Texas industries associated with vehicle parts manufacturing.[21] Employers from the directory located in the CAMPO region are listed in Table 24. Semiconductor manufacturers are well represented on the list and highlight the importance of the sector as a key supplier of electronic components for advanced manufacturing. The COVID-19 pandemic saw shutdowns in vehicle manufacturing due to the limited supply of semiconductors affected by disruptions to the global supply chain. The electronics industry in the CAMPO region is a major supplier of microprocessors used in various components and forms a close ecosystem with the vehicle manufacturing industry in Texas and across the border in Mexico.

Table 24: Texas Vehicle Parts Employers and Locations

Company	Description	Location
Corvac Composites	Airflow and water deflection systems	San Marcos
DANA Holding Corp.	Axles, driveshafts, transmissions	Cedar Park
Freescale Semiconductor	Automotive semiconductors	Austin
Microchip Technology	Automotive semiconductors	Austin
Samsung	Automotive semiconductors	Austin
Silicon Laboratories	Automotive semiconductors	Austin
Spansion	Automotive semiconductors	Austin
TASUS Texas Corp.	Plastic injection molding	Georgetown
Texas Instruments	Automotive semiconductors	Austin
US Farathane	Plastic components	Austin

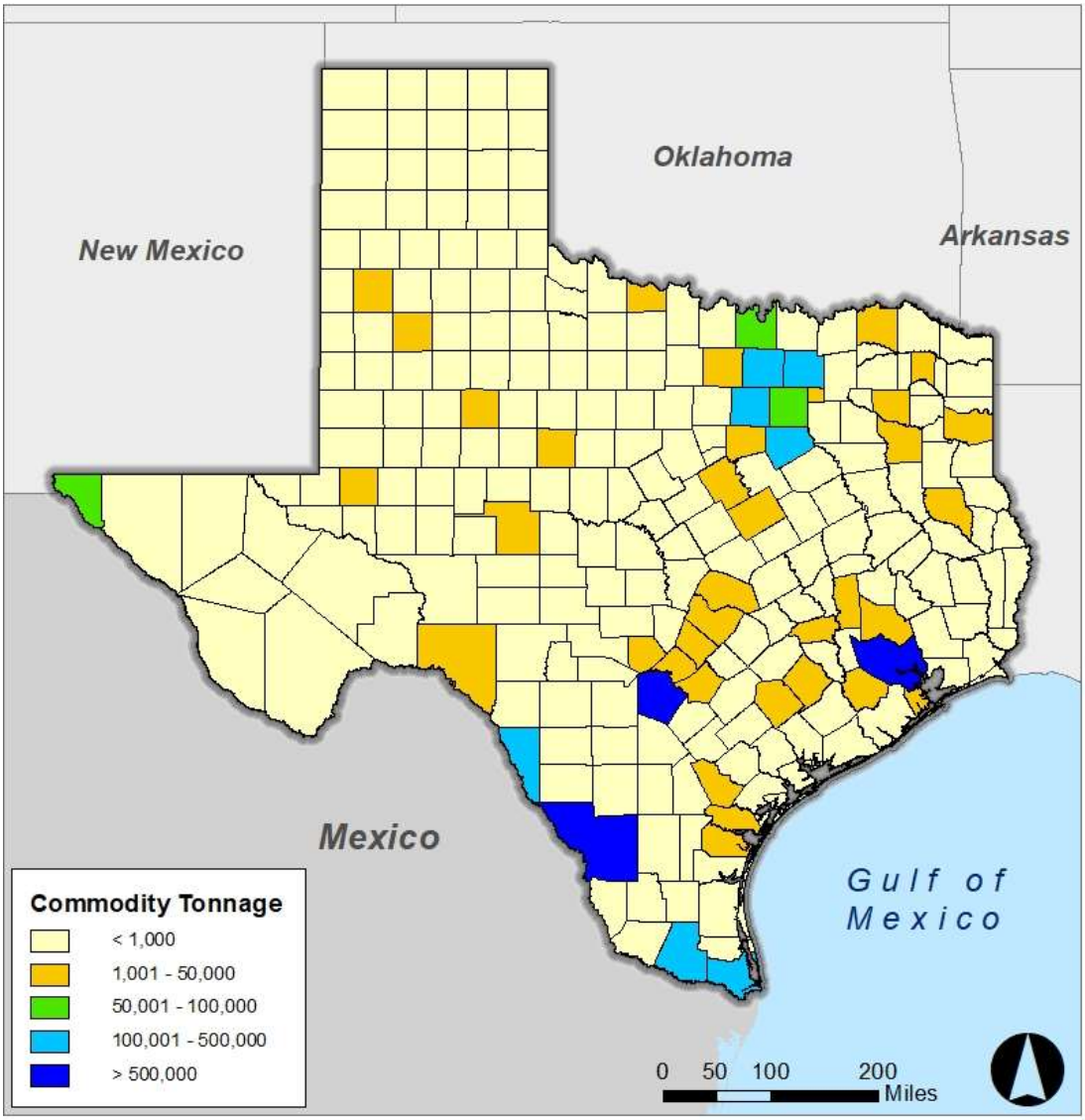
Source: https://gov.texas.gov/uploads/files/business/auto_parts_directory.pdf

Vehicle parts manufacturers are located in the major urban areas of the Texas Triangle and connected via IH 35, IH 10, and IH 45 and with supply chains in Mexico. Figure 55 shows the state's top originator of vehicle parts by county. Webb County in the Laredo area, Bexar County

[21] The complete directory is available at: https://gov.texas.gov/uploads/files/business/auto_parts_directory.pdf

in the San Antonio area, and Harris County in Houston have the highest outbound tonnage for vehicle parts. In the CAMPO region, manufacturers are located in Williamson, Travis, and Hays counties along the IH 35 corridor, which also connects with parts manufacturers and vehicle assembly plants in San Antonio and Dallas-Fort Worth.

Figure 55: Origins of Commodity Tonnage for Vehicle Parts, 2019

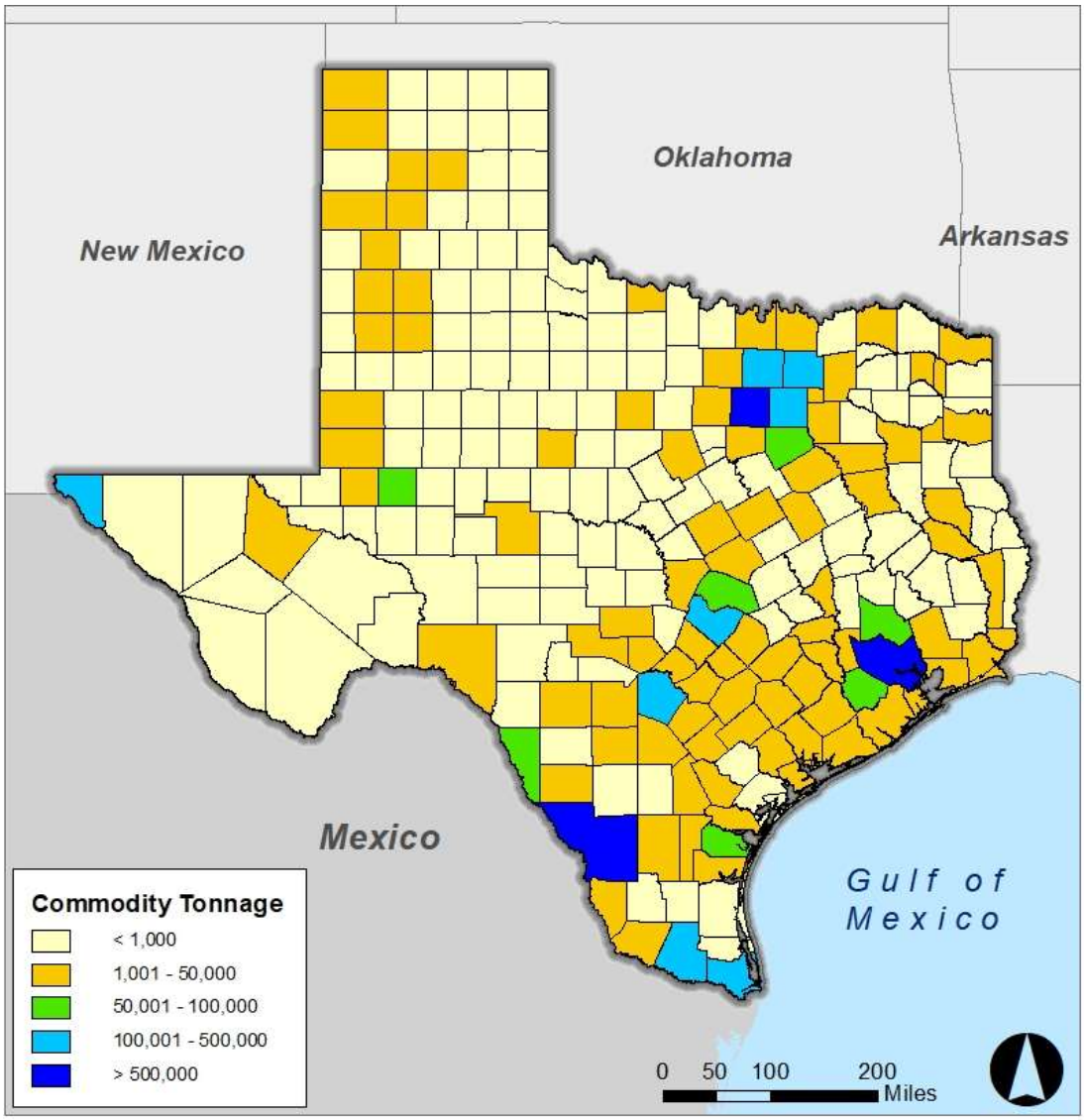


Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

Figure 56 shows the destination counties for vehicle parts. Similar to Figure 10, showing originating tonnage, the urban areas of the Texas Triangle and along the border with Mexico are the top destinations for parts, where it is assembled into other components or used in vehicle assembly. In the CAMPO region, Travis and Williamson counties are the top destinations for

vehicle parts. Once the Tesla plant becomes operational, the amount of inbound tonnage is expected to increase.

Figure 56: Destinations of Commodity Tonnage for Vehicle Parts, 2019



Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

International trade is essential to producing and using vehicle parts by Original Equipment Manufacturers (OEMs). TTI analyzed the locations and relationships of Tier 1 parts manufacturers and OEMs in Texas and Mexico (see Figure 57). The TTI exhibit illustrates the clustering of facilities along IH 35 in Texas and its Federal Highway 85 counterpart in Mexico and the significance of Laredo connecting the two.

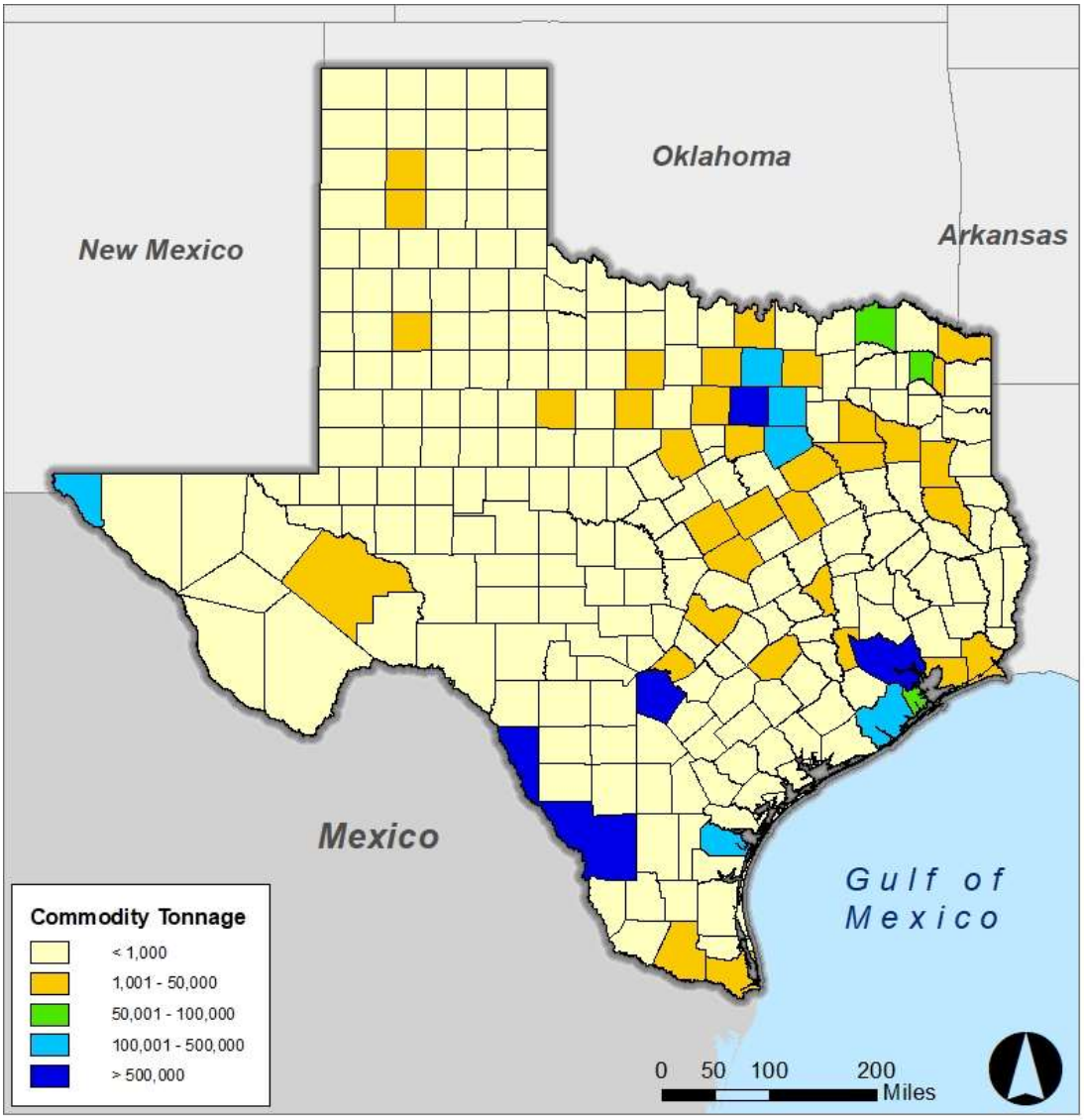
Figure 57: Auto and Motor Vehicle Parts Trade Manufacturing, Texas and Mexico

Source: Texas A&M Transportation Institute (TTI). "Moving Texas Exports: Examining the Role of Transportation in the Vehicle Parts Supply Chain." March 2016. Accessed from: https://policy.tti.tamu.edu/freight/moving-texas-exports/the-vehicle-part-supply-chain

Vehicle Manufacturing Sector

Figure 58 shows the counties that are leading originators of vehicle manufacturing tonnage. Webb, Maverick, and El Paso counties are located along the border and facilitate trade with Mexican supply chains. Within the Texas Triangle, Harris, Bexar, and Tarrant counties have major production facilities. In the CAMPO region, Travis County has the highest level of originating tonnage.

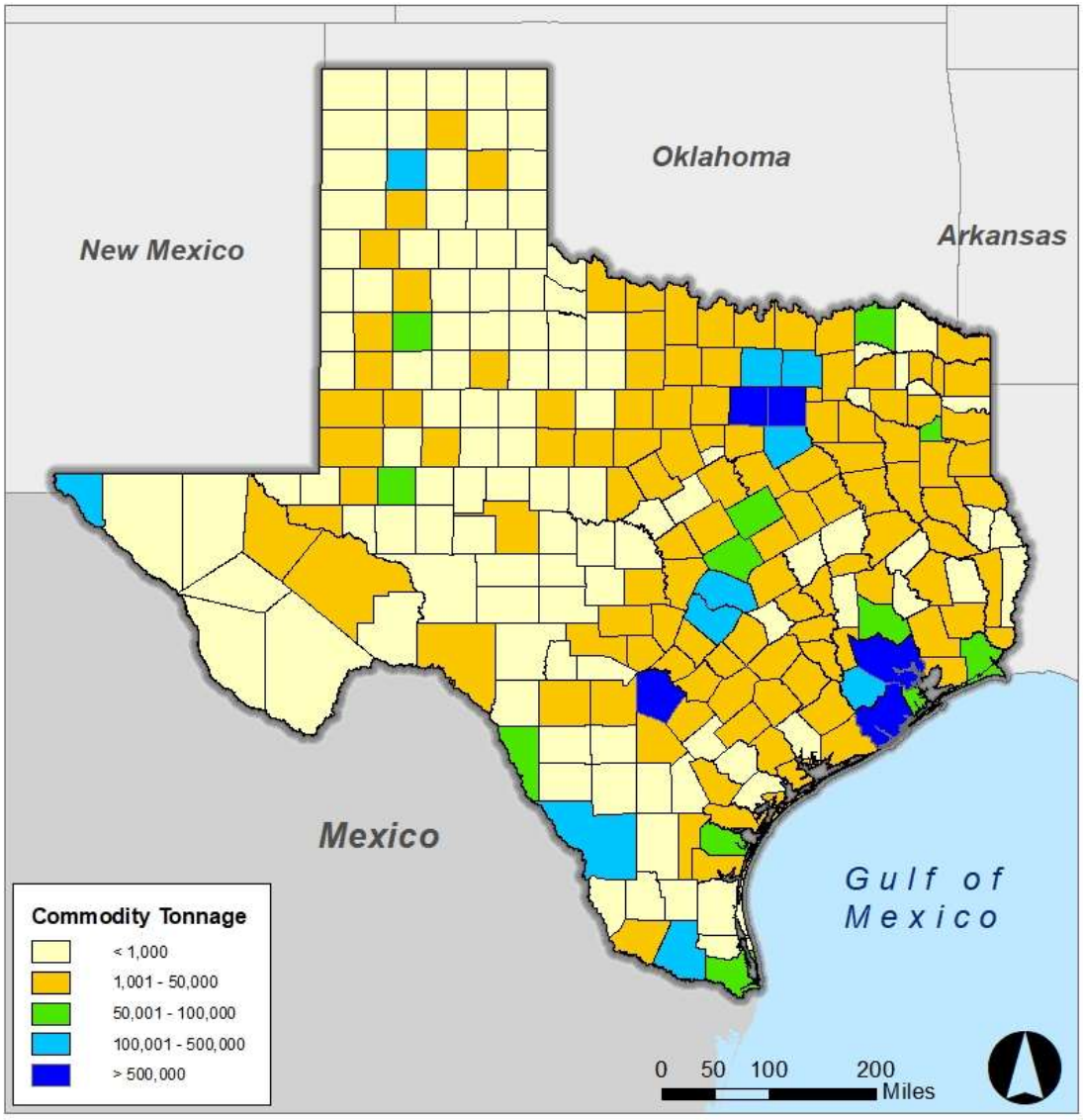
Figure 58: Origins of Commodity Tonnage for Vehicle Manufacturing, 2019



Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

Figure 59 shows the inbound tonnage for vehicle manufacturing by county. The urban areas of the Texas Triangle again dominate with the state's highest populations, where demand for assembled vehicles is the greatest. Similarly, Williamson and Travis counties in the CAMPO region have the highest level of destination tonnage.

Figure 59: Destinations of Commodity Tonnage for Vehicle Parts, 2019



Source: WSP analysis of 2019 Transearch database updated to reflect energy-related commodities (sand, brine, and water) and international water and air cargo.

Conclusion/Next Steps

The population and economic growth in the CAMPO region is increasing freight demand on the multimodal network. This report has provided an assessment of the current conditions of the freight network in the six counties comprising the region. By establishing a baseline understanding of the network's performance and identifying areas of concentrated freight activity, this analysis serves as a valuable reference point. Furthermore, this examination of existing conditions will inform the evaluation of trends and opportunities that will shape the future of regional freight movement. It is crucial to address these challenges and leverage the

identified opportunities to ensure a resilient and efficient multimodal freight network that can accommodate the growing demands of the region's population and economy.

CENTRAL TEXAS

CAMPO

CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION

Existing Conditions

Appendix A: Existing Land Use Assessment

Final 1: July 5, 2023

Bastrop County

- 888 square miles (land only)
- Cities: Bastrop (county seat), Mustang Ridge, Elgin, Smithville
- Major highways: US 290, SH 21, SH 71, SH 95, SH 304

Freight generators are scattered throughout Bastrop County, mainly along SH 71. According to Bastrop County's Economic Overview Report, the pharmaceutical industry cluster has the highest relative concentration.[1] The report defines a cluster as a geographic concentration of interrelated industries or occupations. Employment in the pharmaceutical industry was projected to expand in the region by about 0.7% per year over the next ten years. The largest employment sector identified in the county was retail trade. The next-largest sectors in the area were educational services and accommodation and food services. The National Guard's Camp Swift Army Base is in the northern portion of Burnet County on SH 95 and is the home of the 136th Combat Arms Training Regiment and Texas National Guard Training Center of Excellence.[2] The Guard also uses the base as a storage and training facility.

Bastrop

The Bastrop Comprehensive Plan Update Existing Land Use Map (see Appendix B) shows minimal industrial land use within the Bastrop city limits.[3] However, the city has a sizeable ETJ area, including substantial portions of land along SH 21, SH 71, and SH 95. In the Existing Land Use Map, nine acres are designated light industrial, and 215 in the ETJ are designated heavy industrial. In addition, there are 62 acres in the city limits designated light industrial. Currently, the freight uses identified as part of the regional supply chain in Bastrop County are along SH 71/SH 21.

The land use data in the comprehensive plan is twenty years old. Therefore, additional sources were used to identify areas of freight-intensive uses. According to Bastrop's Economic Development website, the area has grown tremendously in the manufacturing, media and entertainment, bio and life sciences, and tourism and hospitality industries. Bastrop has a 263-acre business park zoned commercial/industrial use located south of SH 71/SH 21 and east of the Colorado River. Johnson Architectural Metal Company's (JamCo, Inc.) 40,000-square-foot facility is in the business park. Designed Security Inc. is another manufacturing business located in Bastrop, close to SH 95/Hawthorne St.[4]

Bastrop's bio and life science industries include the MD Anderson Cancer Science Park, The University of Texas MD Anderson Cancer Center (both near SH 95/FM 2336), Agilent Technologies (on SH 71), The Coghlan Group (SH 71/SH 21), and ARQ Genetics (just north of TX Loop 150). All are within the city limits.

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[1] Economic Overview Bastrop County, October 2016. Accessed at Economic Overview - Bastrop County
[2] Texas Military Department. Camp Swift, 2016-2023. Accessed at Camp Swift
[3] Bastrop Comprehensive Plan Update (2016-2036), p. 5-4. November 2016. Accessed at Bastrop Existing Land Use 2016
[4] Bastrop Economic Development. Target Industries, 2023. Accessed at Target Industries

In 2021, The Boring Company purchased 73 acres in Bastrop County to build an 80,000-square-foot warehouse and manufacturing facility at 130 Walker Watson Road north of the SH 71 and SH 21 westbound split.[5] The Bastrop County Commissioner's Court tabled the conditional use permit in February 2022.[6] As a result, the project has not been approved as of May 2023.

Burnet County

- 994 square miles (land only)
- Cities: Bertram, Burnet (county seat), Cottonwood Shores, Double Horn, Granite Shoals, Highland Haven, Horseshoe Bay (mostly in Llano County), Marble Falls, and Meadowlakes
- Major highways: US 183, US 281, SH 29

Burnet County has several freight generators sporadically located along US 281.[7] The agriculture and tourism industries are the main economic drivers.[8]

Burnet

The City of Burnet has an industrial land use area along Houston Clifton Drive, just north of the Burnet Municipal Airport (see Appendix B).[9]

Marble Falls

Marble Falls has a few manufacturing businesses located along US 281.[10] The city has 341 acres of industrial land use within the city limits and 93 acres in the ETJ.[11] The city's Zoning Map only has two industrially zoned parcels at the corner of Granite Mountain Trail and S. Avenue. S (see Appendix B).

The Marble Falls Economic Development Corporation references several planned business and industrial parks for manufacturing, distribution, regional service companies, regional corporate headquarters, and professional service firms.[12] These include:

- Marble Falls Business & Technology Park – a 300-acre park with immediate access to US 281.
- Gateway Business Park – a light manufacturing and office park with access to US 281.

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[5] Ashbrook, M. *Elon Musk's The Boring Company purchases land in Bastrop outside Austin,* July 9, 2021. KVUE News. Accessed at Elon Musk's The Boring Company
[6] O'Kane, S. and McBride, S. *Elon Musk's Tunneling Company Hits Roadblock on Texas Plans,* March 1, 2022. Bloomberg News. Accessed at Elon Musk Tunneling Company
[7] Data Axle
[8] Burnet County, Texas. *Welcome to Burnet County, Texas,* 2023. Accessed at Burnet County Texas
[9] City of Burnet. Zoning Map. February 23, 2021. Accessed at Burnet Zoning Map
[10] Data Axle
[11] Halff Associates, Inc. Marble Falls Comprehensive Plan Update 2016, pg. 59. June 7, 2016. Accessed at Marble Falls Comprehensive Plan Update
[12] Marble Falls Economic Development Corporation. May 2023. Access at Marble Falls Business Industrial Parks

- Industrial Boulevard Park – a light manufacturing park with access to FM 1431 for east-west shipping.
- Commerce Business Park – a light manufacturing business park for start-up manufacturing and distribution companies.

Marble Falls is updating their Comprehensive Plan, which may result in an increase or decrease of land designated for industrial use. In addition, the plan will address physical development, redevelopment, and future direction of growth within the Marble Falls planning area.[13] The plan is expected to be complete in fall 2023.

Caldwell County

- 545 square miles (land only)
- Cities: Lockhart (county seat), Niederwald, Martindale, Luling, San Marcos (mainly in Hays County)
- Major highways: IH-10, US 90, US 183, SH 80, SH 130

Lockhart

Lockhart is situated along SH 130 and has access to major highways, including I-10 and I-35. There are two large industrial land-use clusters (see Appendix B).[14] The first is near the intersection of SH 130 and SH 142. A second area is near SH 20 and FM 1322. Much of the land on the city's periphery is designated as agricultural/rural development land use.

According to the Lockhart Economic Development Corporation (LEDC), Lockhart targets several industries, such as auto parts, metal, and electronic manufacturing, food and beverage processing, logistics and distribution, pharmaceutical and medical supplies, and medical device manufacturing.[15]

A recently added freight-intensive use in Lockhart is Iron Ox, a hydroponic farm.[16] The 535,000-square-foot facility broke ground in the spring of 2021 and is located on 25 acres along FM 20. The company operates autonomous robotic greenhouses to grow fresh and pesticide-free farm products. It plans to distribute its products to customers and communities throughout Texas. The LEDC also has a 75-acre industrial park on SH 130 located about 27 miles south of Austin-Bergstrom International Airport and Tesla's new Giga Texas facility. The industrial park is on the city's west side adjacent to SH 130, approximately 10 miles from I-35 and 17 miles from I-10.[17]

[13] City of Marble Falls. Marble Falls Comprehensive Plan Update, May 2023. Accessed at Comprehensive Plan Update
[14] Lockhart 2020 Land Use Plan. Figure 3.2. Access at Land Use Plan
[15] City of Lockhart Economic Development Corporation. May 2023. Accessed at Lockhart Economic Development
[16] Fisher, L. *Iron Ox Farm Optimizes Indoor Farming with AI and Robots,* April 19, 2022. The Austin Chronicle. Accessed at Iron Ox article
[17] City of Lockhart Economic Development Corporation. May 2023. Accessed at Lockhart Economic Development

Hays County

- 680 square miles (land only)
- Cities: San Marcos (county seat), Niederwald, Uhland, Buda, Dripping Springs, Hays, Kyle, Mountain City, Wimberley, Woodcreek
- Major highways: I-35, US 290, SH 21, SH 80

Hays County has a concentration of freight generators along I-35 from McCarty Lane to SH 123. In addition, several freight generators are located along US 290 in northern Hays County, including in Dripping Springs. Finally, freight generators are sparsely located in the remaining southern portion of the county.[18]

Dripping Springs

Dripping Springs has few freight-intensive uses. The city's zoning map has an industrial-zoned parcel on Springs Lane just north of W US 290 (see Appendix B).[19] The CAMPO 2045 Regional Arterials Study notes the land use along RM 12 is mostly vacant/rural. However, there is commercial development at the corner where RM 12 joins US 290. Meanwhile, Dripping Springs and RM 12 have many breweries and distilleries.[20]

The City of Dripping Springs initiated a Comprehensive Plan update in April 2022, which may result in an increase or decrease of land designated for industrial use. The city's website indicates the plan will help guide real estate, infrastructure investments, economic development, and zoning.[21] The public input process will continue through 2023.

San Marcos

The San Marcos Comprehensive Plan's Preferred Scenario Map designates land use as high intensity, medium intensity, and employment areas (see Appendix B.)[22] The land use corridors are conservation, employment, and mixed-use.

Large clusters of high-intensity land use are in the downtown, midtown, and entertainment areas. For example, downtown is located at I-35 and SH 123, midtown is at I-35 and SH 80, and entertainment is at I-35 and Aquarena Springs Drive.

The Preferred Scenario Map also shows both sides of the interstate are designated medium intensity and employment areas along I-35 from the city's southern end to just south of SH 123 near Bintu Drive.[23] This area includes the medical district and Texas State University. The San Marcos Airport is on the city's eastern side along SH 21. The land use surrounding the airport is

[18] Data Axle
[19] City of Dripping Springs Citywide Zoning Map. January 2017. Accessed at Dripping Springs Planning & Zoning
[20] Capital Area Metropolitan Planning Organization. Regional Arterials Concept Inventory, p. 422. August 2019. Accessed at FINAL-CAMPO-Regional-Arterials-Concept-Inventory
[21] City of Dripping Springs. *Dripping Springs Launches Comprehensive Plan Initiative,* April 18, 2022. Accessed at Comprehensive Plan Initiative
[22] City of San Marcos Preferred Scenario. April 2018. Accessed at Comprehensive Plan Map
[23] City of San Marcos Preferred Scenario. April 2018. Accessed at Comprehensive Plan Map

designated as low density. This corridor has a significant volume of undeveloped land, with just over 250 acres of vacant lots and/or qualified open space.[24]

The city's zoning map shows heavy and light industrial zoning districts on the west side of I-35 at the southern end of San Marcos (see Appendix B).[25] These properties have direct access to I-35, and adjacent land is in the ETJ. Heavy and light industrial tracts are also located east of I-35, near McCarty Lane, SH 110, Clovis Barker Road, Civic Center Loop, and Wonder World Drive. There is a light industrial area on the north side of San Marcos west of I-35 along Carlson Circle and an area of light industrial east of I-35, just north of the Blanco River.

As of April 2023, the city is processing an annexation and zoning request for land east of FM 110, between SH 80 and the Union Pacific Railroad Tracks. The site is east of the alignment for the new FM 110 loop. The land is part of an approved Development Agreement called SMART (San Marcos Air, Rail, and Truck) Terminal. Based on the SMART Terminal Amendment FAQ on the City of San Marcos website, the project is requesting annexation into San Marcos and heavy industrial zoning.[26] The current SMART Terminal agreement covers approximately 2,020 acres of land. One of the developer agreements is the construction of public improvements, including additional roadways to carry truck traffic to and from FM 110/I-35. This project is still under review as of May 2023.

The CAMPO 2045 Regional Arterials Study evaluated the segment of Wonder World Drive from Hunter Road to I-35, including land use information.[27] Wonder World is located on the southern side of San Marcos and runs northwest from I-35. The current land use is oriented toward industrial and warehouse-based commercial, with some multi-family residential. The current zoning along Wonder World Drive is primarily commercial and industrial. Additional heavy and light industrial-zoned properties are located on the west side of I-35 north and south of Wonder World Drive.

This corridor also has approximately 70 acres of vacant lots. The study notes if the 70 acres of undeveloped property are developed consistently with the future land use plan and zoning, over one million square feet of new commercial and industrial space could be developed.[28]

In 2022, the San Marcos City Council annexed 40 acres of land in its extraterritorial jurisdiction on Posey Road between Transportation Way and I-35.[29] The parcel along Posey Road is zoned commercial, and the parcel along Transportation Way is industrial. Heavy industrial zoning was

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[24] Capital Area Metropolitan Planning Organization. Regional Arterials Concept Inventory, p. 426. August 2019. Accessed at FINAL-CAMPO-Regional-Arterials-Concept-Inventory
[25] San Marcos, Current Zoning Districts. September 2020. Accessed at San Marcos Zoning Districts
[26] City of San Marcos. SMART Terminal Amendment FAQ, April 2023. Accessed at SMART Terminal
[27] Capital Area Metropolitan Planning Organization. Regional Arterials Concept Inventory, p. 334. August 2019. Accessed at FINAL-CAMPO-Regional-Arterials-Concept-Inventory
[28] Capital Area Metropolitan Planning Organization. Regional Arterials Concept Inventory, p. 335. August 2019. Accessed at FINAL-CAMPO-Regional-Arterials-Concept-Inventory
[29] Weilbacher, E. *San Marcos City Council approves annexation, rezoning for two industrial, heavy commercial areas,* May 6, 2022. Community Impact Newspaper. Accessed at San Marcos City Council approves annexation

recommended to be compatible with the area's surrounding land use, including an Ingram Ready Mix concrete plant, Transdev transportation services, and other industrial uses. The zoning allows for a significant increase in commercial and industrial development on the fringes of San Marcos.

Approximately 65 acres of a 112-acre property near Clovis Barker Road and SH 123 intersection was rezoned from a "future development district" in 2022 to a "light industrial district." Warehouses, manufacturing facilities, and vacant properties surround the property.

Travis County

- 990 square miles (land only)
- Cities: Austin (county seat) (small parts in Hays and Williamson Counties), Cedar Park (mainly in Williamson County), Elgin (mostly in Bastrop County), Leander (mainly in Williamson County), Mustang Ridge (small parts in Caldwell and Bastrop Counties), Pflugerville (small amount in Williamson County), Round Rock (mainly in Williamson County), Bee Cave, Creedmoor, Jonestown, Lago Vista, Lakeway, Manor, Rollingwood, Sunset Valley, West Lake Hills
- Major highways: I-35, US 183, US 290, SH 71, TX Loop 1 (Mopac Expressway), SH 45, SH 130

Austin

Austin has an extremely high concentration of freight-intensive uses, especially along TX Hwy Loop 1 (Mopac Expressway), I-35, US 290 W, SH 71, US 290 E, Research Blvd., and W. Parmer Lane. In October of 2021, the City of Austin Planning and Zoning Department conducted an "Analysis of Industrial Land Use and Zoning" as part of a Comprehensive Plan Joint Committee Briefing.[30] Using 2018 data, the study notes 11,657 Acres, or 6.6% of Austin, were zoned for industrial use. Only 38% of industrial-zoned land was used for industrial purposes. Approximately 27% of Austin is undeveloped (see Appendix B). In the past twenty years, about 1,900 acres were rezoned from industrial to non-industrial use.

The analysis identifies industrial-zoned areas strategically located near highways or close to the Austin-Bergstrom International Airport. Airport cargo facilities are on the property's northern end, including those for FedEx, DHL, and UPS.

The analysis also identified eight industrial clusters within Austin (see Appendix B):

- North Research Boulevard (US 183/Research Park/Technology Blvd.)
- North Burnet/Gateway (on US 183 near North Mopac Expressway/Hwy 1)
- Tech Ridge (near I-35/Tech Ridge/Palmer Lane)
- US-290 E (at US 183/I-35)
- Near East
- US-183

[30] Water, M., & Engstrom, J. Analysis of Industrial Land Use and Zoning in Austin, Texas, September 2020. Accessed at Presentation to Planning Commission

- St. Elmo
- Ben White (along SH 71 between I-35 and US 183, SH 71/SH 130)

The CAMPO 2045 Regional Arterials Study included Parmer Lane (FM 734).[31] Parmer Lane is in eastern Travis County in Austin's ETJ and is a significant roadway connecting SH 45 to SH 130. The land use in this area is primarily vacant or rural, with some single-family uses. Parmer Lane passes through highly developed areas and connects major job centers in Travis and Williamson counties.

Parmer Lane is home to the campuses of Electronic Arts (EA), Apple/Oracle, Tech Ridge, Dell South, and Samsung. Austin is also home to the Tesla Giga Texas vehicle assembly plant, where the company will build its Cybertruck, semi-truck, and Model Y. The 2,000+ acre site is adjacent to SH 130 near Austin-Bergstrom International Airport.

Austin's Land Use Inventory Map identifies additional large clusters of industrial land use not included in either the "Analysis of Industrial Land Use and Zoning" or the 2045 Regional Arterials Study (see Appendix B):[32]

- US 290 W/SH 130
- US 183 near FM 969
- FM 2222 and FM 620

Williamson County

- 1,118 square miles (land only)
- Cities: Georgetown (county seat), Austin (mostly in Travis County and a small part in Hays County), Bartlett (partly in Bell County), Cedar Park (a small part in Travis County), Leander (small amount in Travis County), Pflugerville (mostly in Travis County), Round Rock (small amount in Travis County), Thorndale (mostly in Milam County), Coupland, Florence, Granger, Hutto, Jarrell, Leander, Liberty Hill, Taylor, Thrall, Weir
- Major highways: I-35, US 79, US 183, SH 29, SH 45, SH 95, SH 130, Loop 1, SH 195, 183A Toll Road

There is a high concentration of freight-intensive uses in Williamson County along I-35 and US 183.[33] The highest concentration is in Round Rock. In addition, US 183 has numerous uses from the southern county line to Leander.

Round Rock

Most industrial land uses in Round Rock are located along or close to I-35. Many are manufacturing businesses. Most notably, Dell headquarters is in Round Rock near I-35 and Louis Henna Blvd (SH 45.)

[31] Capital Area Metropolitan Planning Organization. Regional Arterials Concept Inventory, p. 325. August 2019. Accessed at FINAL-CAMPO-Regional-Arterials-Concept-Inventory
[32] City of Austin Land Use Inventory. March 2023. Accessed at Austin Land Use Inventory map
[33] Data Axle

According to the Round Rock Comprehensive Plan 2030, the city has 663 acres of industrial land use, with only 2% being developed.[34] The property at the southwest corner of I-35 and E. New Hope Drive is in the ETJ and has a mining future land use designation (see Appendix B).

Taylor

Taylor currently has a small number of freight-intensive users. However, Samsung will open a new semiconductor chip fabrication plant in Taylor.[35] The plant will be located near US 79 and CR 401. Construction was scheduled to begin in 2022 and is expected to be completed in 2025. As a result, the City of Taylor is planning to update its Comprehensive Plan in anticipation that the considerable investment by Samsung will influence the growth and development of the small town.[36]

Cedar Park

Cedar Park is located on US 183, north of SH 45. Cedar Park's zoning map shows a few heavy industrial zones on the city's western side (see Appendix B).[37]

A light industrial-zoned property is home to Brushy Creek Corporate Center. The two-building campus sits on a 16-acre site. The property's current tenants include manufacturing, research, and development companies.[38]

Shop LC is relocating its headquarters from Austin to Cedar Park.[39] The home shopping network will begin construction of its headquarters this year. Construction was expected to start in early 2023, with anticipated completion in mid-2024. The 200,000-square-foot facility will be constructed near East New Hope Drive and North Bell Boulevard (US 183).

Georgetown

The Georgetown 2030 Plan indicates that almost 300 acres are designated for light, heavy industrial uses, and approximately 10,000 acres are designated for light and heavy industrial uses in the ETJ (see Appendix B).[40] The most prominent heavy industrial land use areas are at the city's southern end on I-35, Leander Road, and SH 29. In addition, numerous smaller areas are scattered in the northern part of the city between SH 195 and CR 234. They include quarries and stone suppliers.

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[34] Round Rock 2030 *Developing Our Future*, p. 111. June 2020. Accessed at Adopted Comprehensive Plan
[35] Falcon, R. and Madden, M. *$17B Samsung plant officially coming to Taylor, Texas,* November 23, 2021. KXAN Austin News. Accessed at Samsung KXAN Austin News
[36] Ortiz, M. *Samsung development leaves residents questioning Taylor's infrastructure plans,* December 12, 2021. Spectrum News 1. Accessed at Taylor's infrastructure plans
[37] Cedar Park Zoning Map. April 2023. Accessed at Cedar Park Atlas
[38] Aquila. *Dogwood Industrial Properties Acquires Brushy Creek Corporate Center in Cedar Park, Texas,* March 23, 2023. Accessed at Brushy Creek Corporate Center
[39] *Shop LC moving headquarters from Austin to Cedar Park,* November 19, 2021. KVUE News. Accessed at Shop LC to move headquarters
[40] Georgetown 2030 Plan Land Use, p. 28-29. March 2020. Accessed at Georgetown 2030 Plan

Georgetown Logistics Park is a new industrial park with 625,000 square feet of development for larger tenant warehouse space driven by e-commerce, last-mile delivery, and manufacturing tenants.[41] The development is at the southwest corner of I-35 and SH 130 along Aviation Drive, just east of Georgetown Municipal Airport. It is suited to larger warehouse/distribution and manufacturing tenants in the greater Central Texas region.

he Capital Area region, a six-county metropolitan area in Central Texas, has experienced rapid growth and economic development in recent years. A key aspect of this growth is an increase in freight and the movement of goods by truck, rail, pipeline, and air. Efficient freight movement is crucial to the competitiveness of the region's businesses and industries, and the overall way of life for its residents. Recognizing this importance, the Capital Area Metropolitan Planning Organization (CAMPO) is developing a Freight Plan that will highlight the importance of freight to the region and also inform the Regional Transportation Plan (RTP) by identifying policies, strategies, and investments to enhance the performance and safety of the multimodal freight network.

[41] Widner, C. *Stonelake breaks ground on massive Georgetown logistics park,* August 1, 2022. Urbanize Austin. Accessed at Georgetown logistics park

CENTRAL TEXAS

CAMPO

CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION

Existing Conditions

Appendix B: Land Use Maps

Final 1: July 5, 2023

Industrial Cluster Typology for Austin

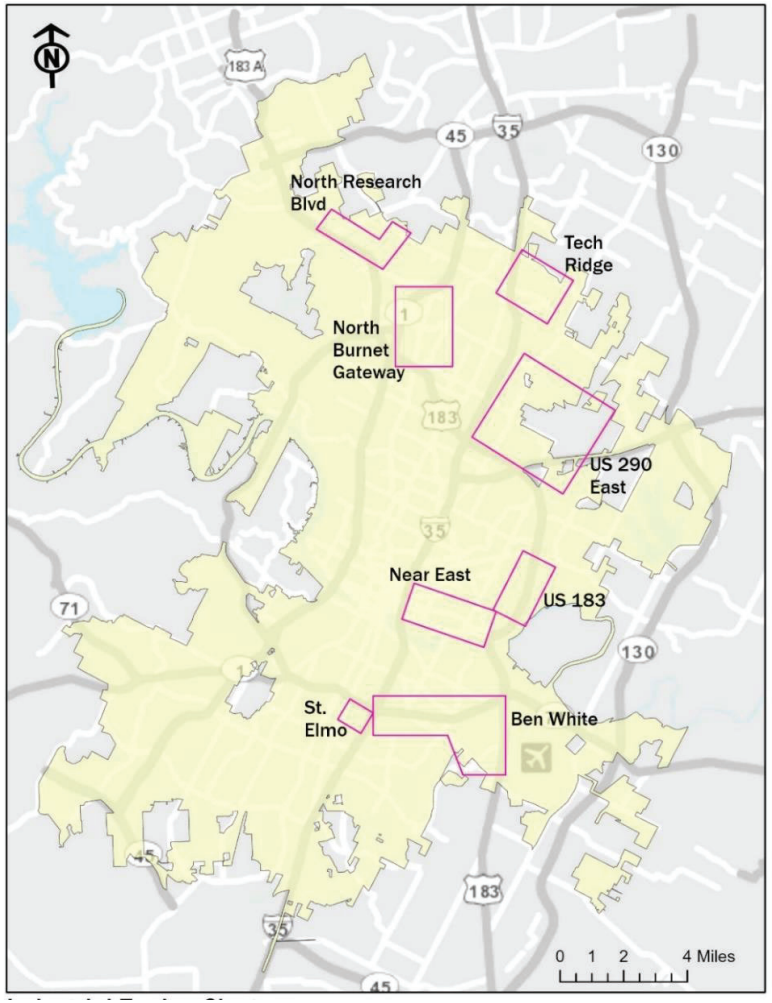
Identified 8 industrial clusters within Austin

Based on best practices from Las Angeles, CA and Philadelphia, PA staff developed an industrial cluster typology

Protection

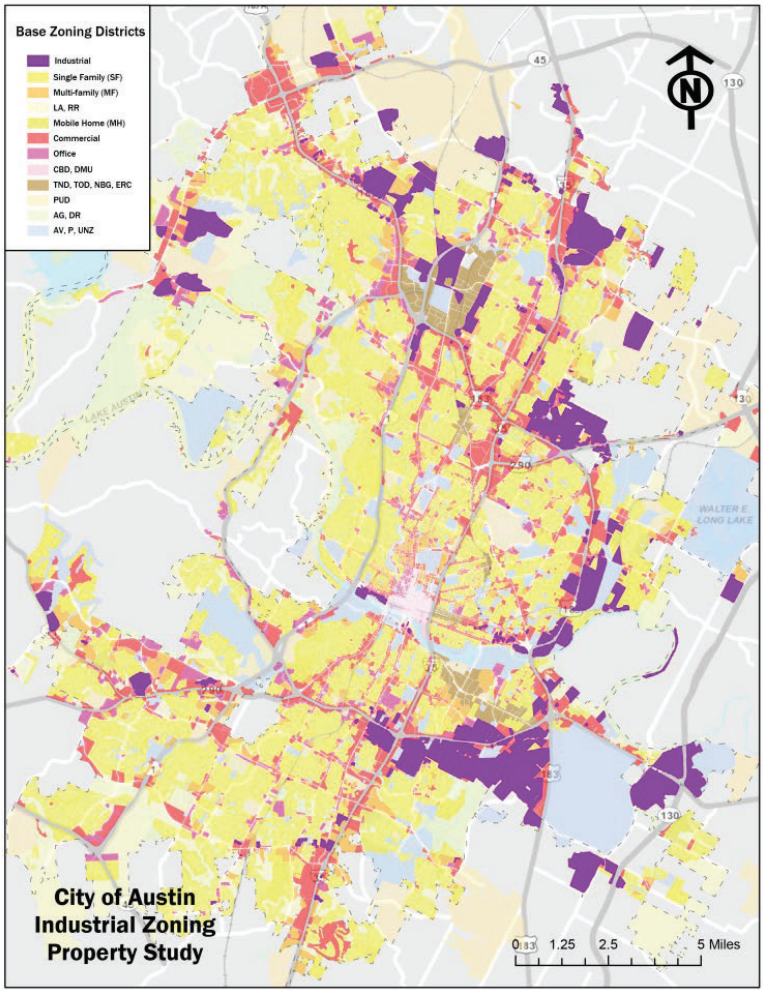
Intensification

Transition



Current State of Austin's Industrially-Zoned Land

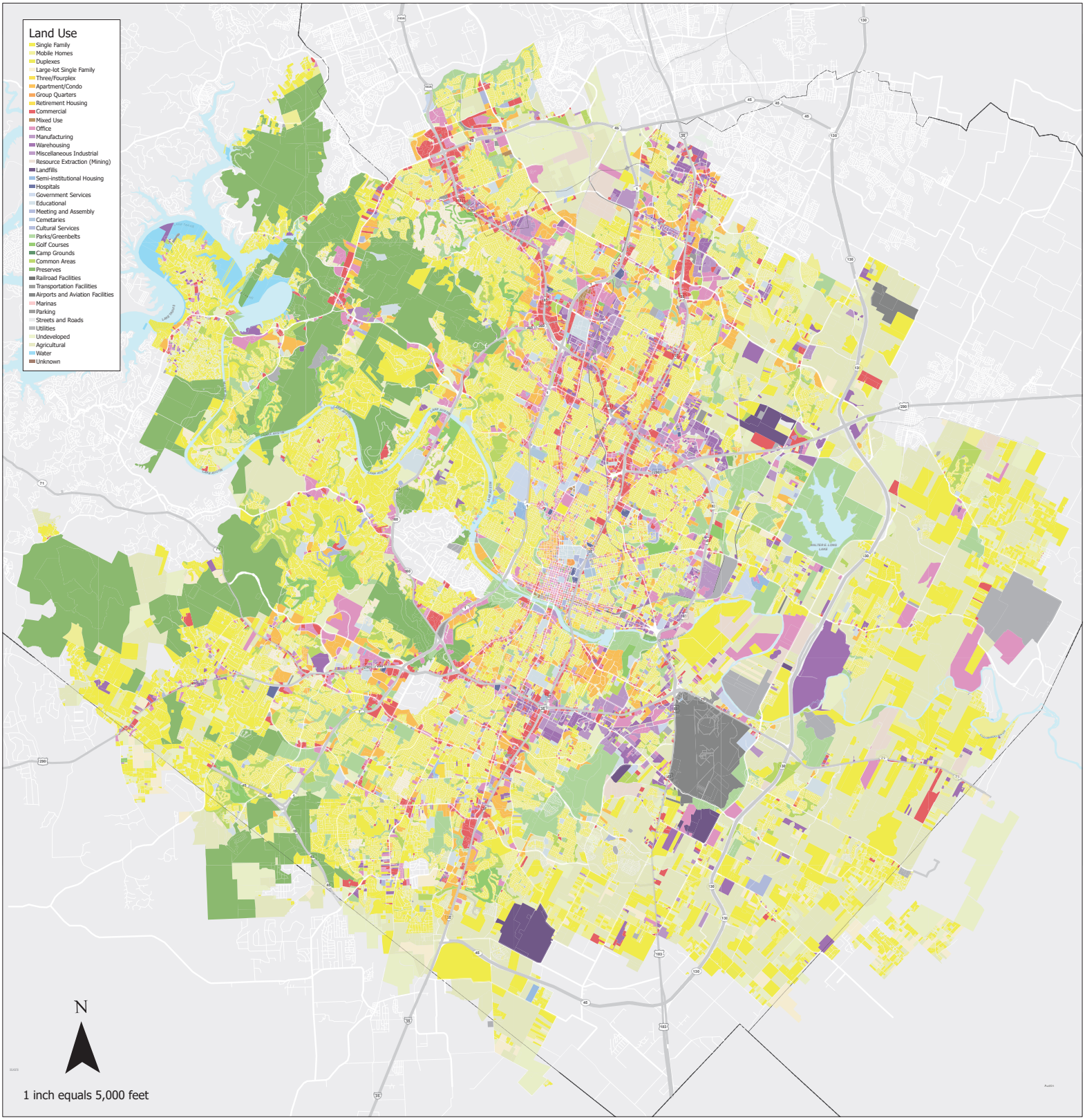
Map #1 Base Zoning Districts



11,657 Acres or 6.6% of Austin zoned for industrial (2018)

Only 38% of Industrial zoned land used for industrial uses

- Undeveloped 27%
- Office 12%



Land Use Inventory

CITY OF AUSTIN
EXTRA-TERRITORIAL JURISDICTION

Date Exported: 3/30/2023

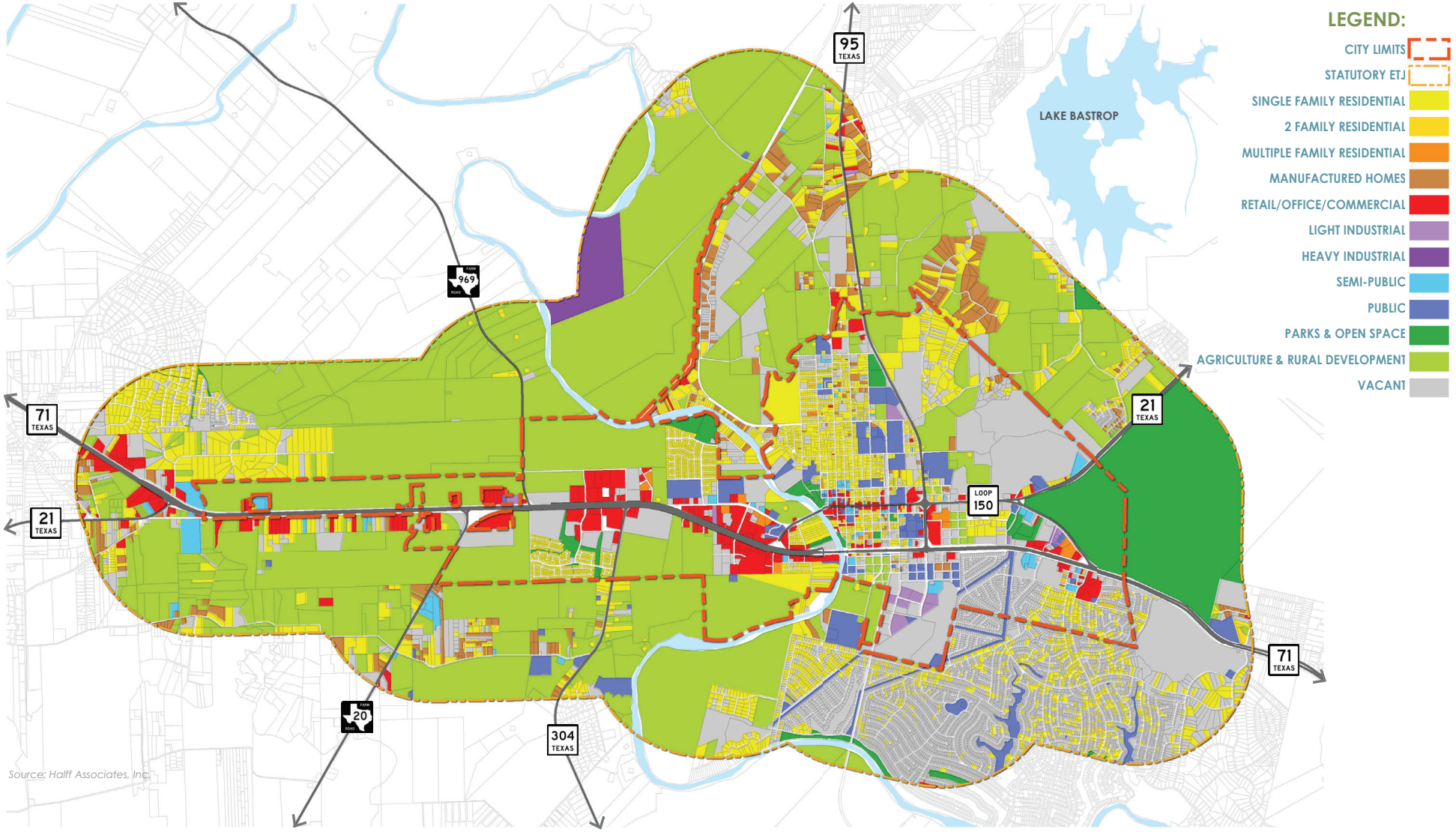
This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.

This product has been produced by the Development Services Department for the sole purpose of geographic reference. No warranty is made by the City of Austin regarding specific accuracy or completeness.

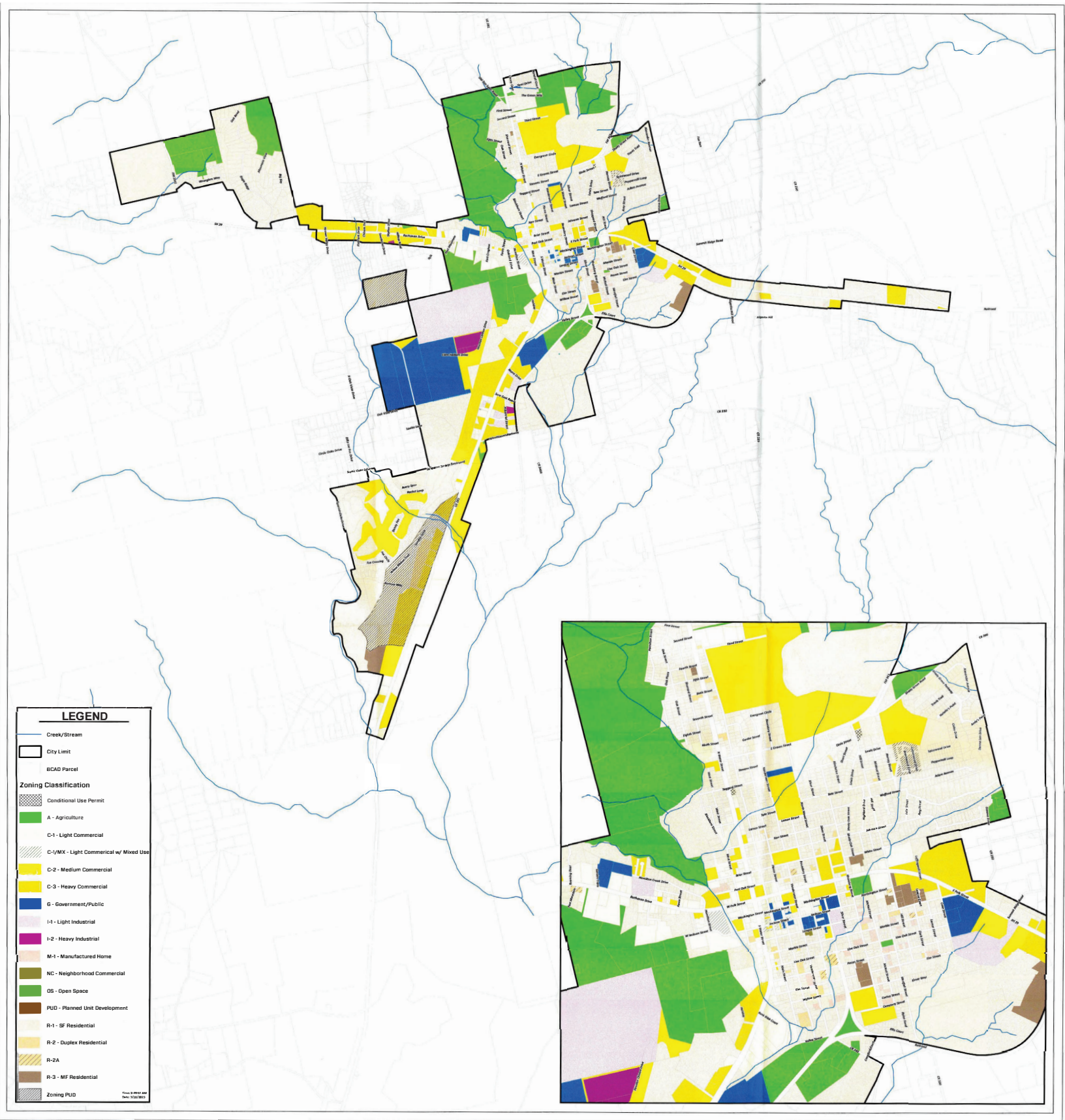
The land use inventory is maintained in a geographic information system (GIS) that electronically stores parcel boundaries and land use information. The inventory is a snapshot of how land was being used at time of export. However, different source materials mean that the data may reflect different timeframes.

BASTROP EXISTING LAND USE (2016)

MAP 5-A:



Source: Halff Associates, Inc.



QUIDDITY

CITY OF BURNET

The official Zoning Map of the City of Burnet, Texas, accepted by the City Council of the City of Burnet

Signed _____ (Mayor)

CITY OF BURNET

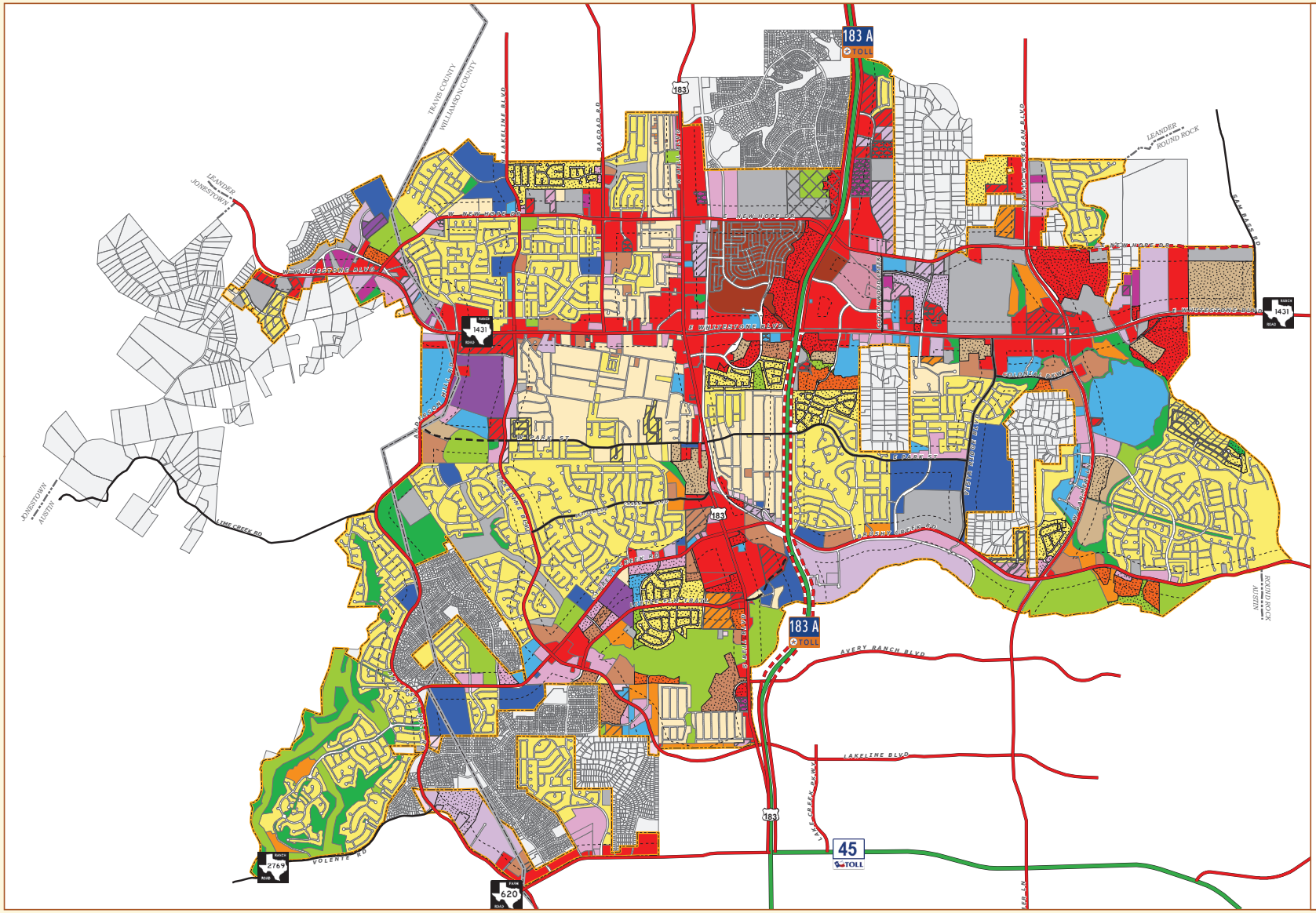
Official Zoning Map - February 28, 2023

0 0.25 0.5 0.75 1 Mile

VICINITY MAP
Scale: 1 inch equals 100 miles

CITY OF CEDAR PARK

OFFICIAL ZONING DISTRICTS



ZONING DISTRICTS

- DR - DEVELOPMENT RESERVE
- ES - ESTATE RESIDENTIAL
- SR - SUBURBAN RESIDENTIAL
- SU - SEMI URBAN RESIDENTIAL
- UR - URBAN RESIDENTIAL
- MF - MULTIFAMILY RESIDENTIAL
- NB - NEIGHBORHOOD BUSINESS
- LB - LOCAL BUSINESS
- GB - GENERAL BUSINESS
- PO - PROFESSIONAL OFFICE
- HC - HEAVY COMMERCIAL
- LI - LIGHT INDUSTRIAL
- HI - HEAVY INDUSTRIAL
- H - HOSPITAL
- PS - PUBLIC SERVICES
- OG - OPEN SPACE GREENBELT
- OR - OPEN SPACE RECREATIONAL
- MU - MIXED USE
- TC - TOWN CENTER
- PA - PLANNING AREA

SPECIAL DISTRICTS

- PD - PLANNED DEVELOPMENT
- CONDITIONAL OVERLAY
- ENTERTAINMENT CENTER
- SPECIAL USE PERMIT
- MAJOR CORRIDORS

- CITY LIMITS
- MAJOR ARTERIAL
- MAJOR ARTERIAL (PLANNED)
- MINOR ARTERIAL
- MINOR ARTERIAL (PLANNED)
- TOLLWAY

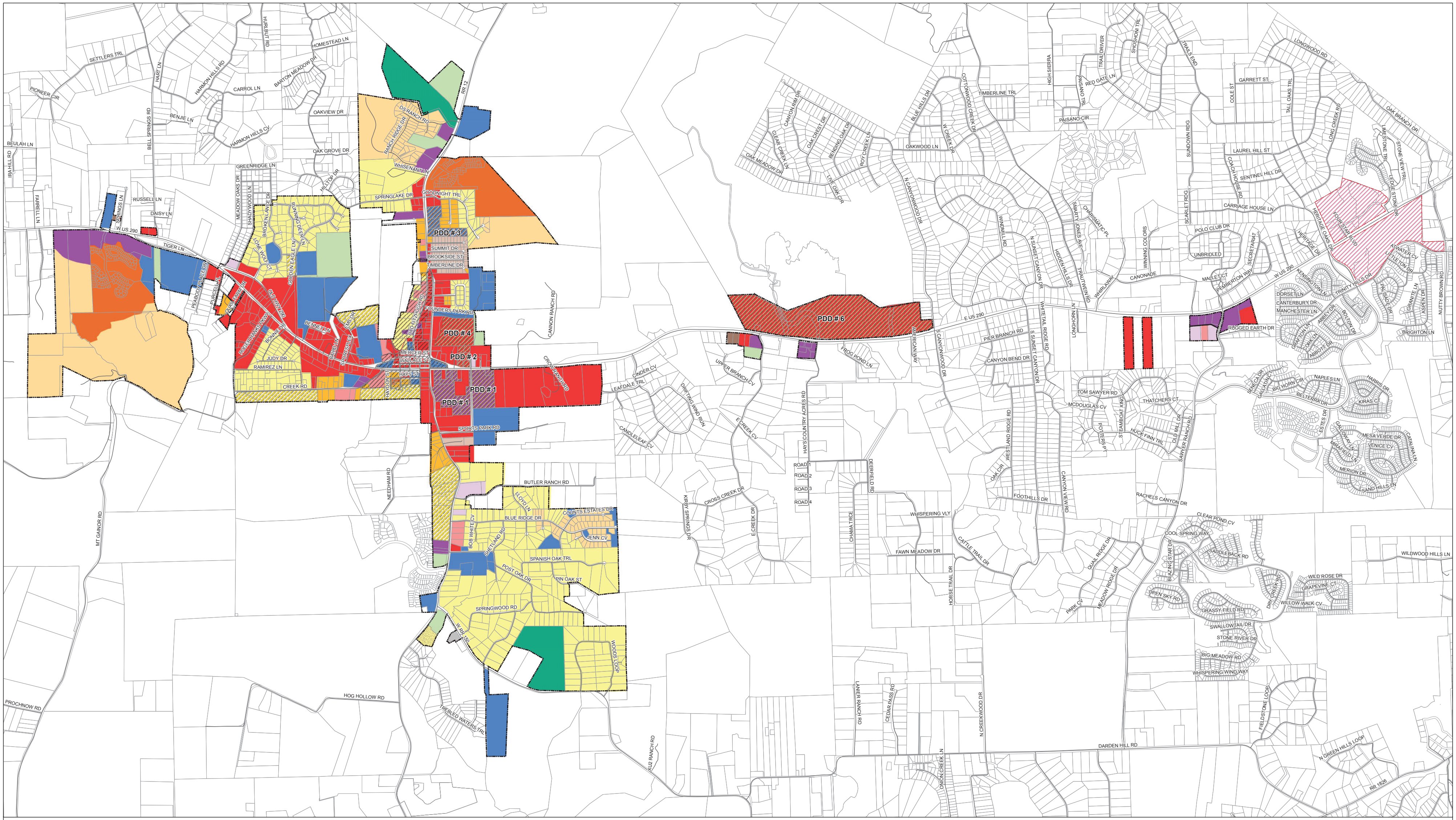
1:48,000

0 0.25 0.5 0.75 1 Miles

Coordinate System: NAD 1983 Texas Statewide Mapping System
Projection: Lambert Conformal Conic
Units: Meter
Datum: North American 1983
False Easting: 1,000,000.0000
False Northing: 1,000,000.0000
Central Meridian: -100.0000
Standard Parallel 1: 27.4167
Standard Parallel 2: 34.9167
Latitude Of Origin: 31.1667

Updated: January 26, 2023

CEDAR PARK



Legend

- City Limits
- Limited Purpose
- Historic Overlay
- PDD Overlay
- AG
- PP
- SF-1
- SF-2
- SF-3
- SF-4
- SF-5
- MF
- MH
- O
- LR
- GR
- GUI
- CS
- LI
- Industrial

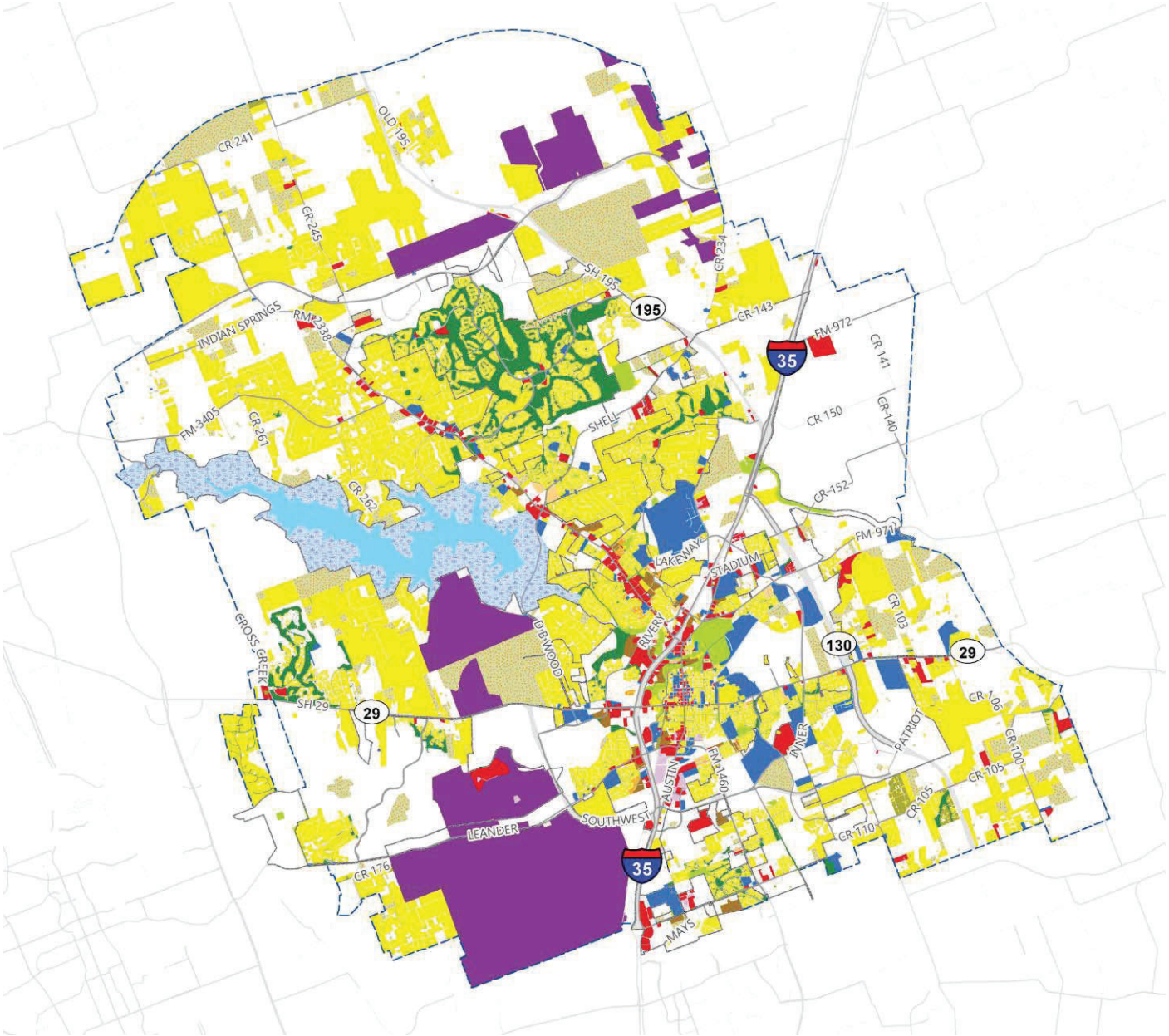
0 0.5 1 2 3 Miles

City of Dripping Springs, Texas
Official Zoning Map

Map Updated January 2017

CITY OF DRIPPING SPRINGS INC. 1981 TEXAS

Figure 21. Existing Land Use Map (as of 1/22/2020)



Classification: Light vs. Heavy Industrial

Light industrial uses are typically conducted entirely inside and include uses such as light manufacturing and assembly. Such uses often generate truck traffic.

Heavy industrial uses may have outside storage or on-site excavation. Such uses may generate noise, light, dust, vibration, and other impacts.

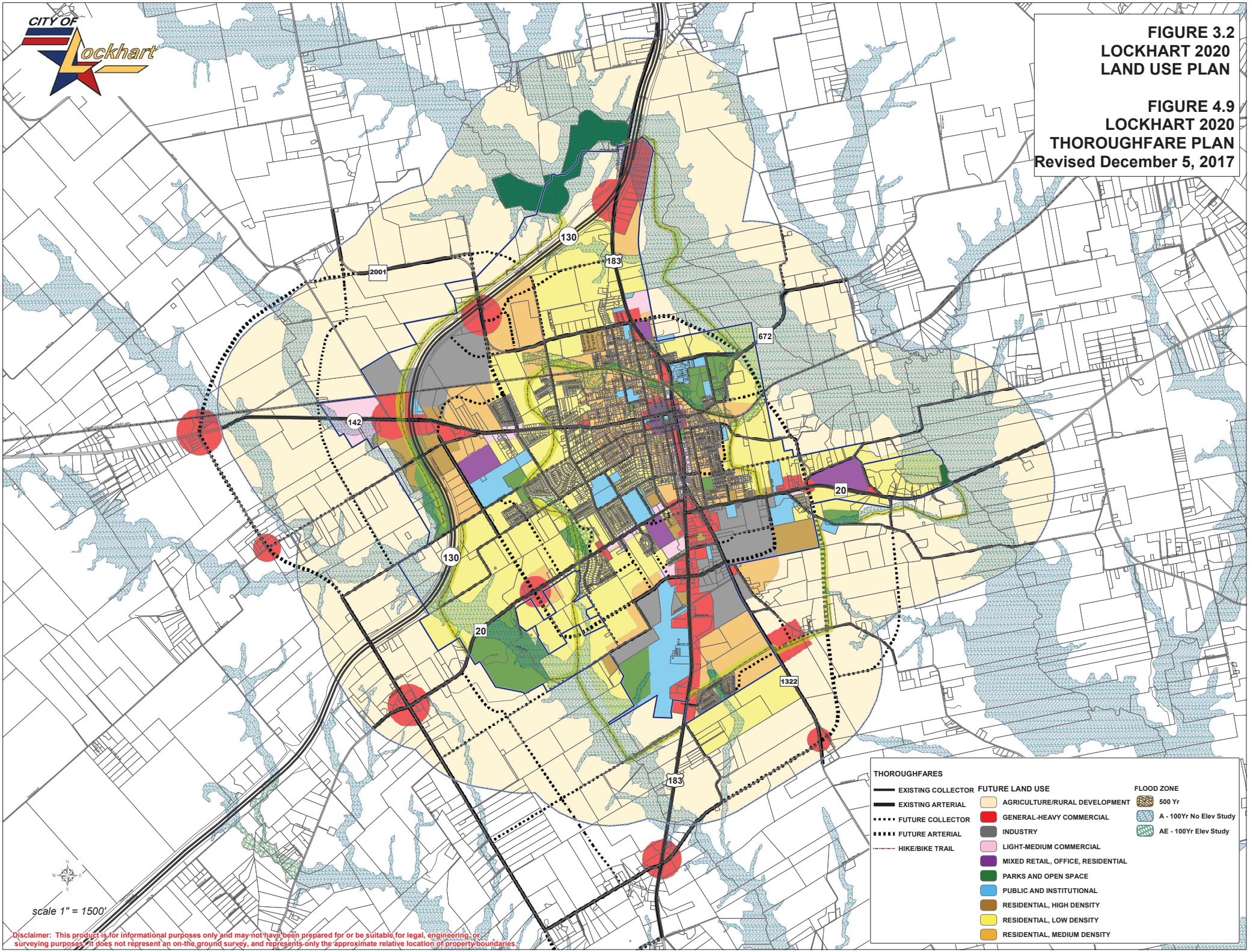
- Agriculture/Rural Residential
- Single Family
- Two-Family (Duplex)
- Townhome
- Multi-Family
- Manufactured Home
- Office/Retail/Commercial
- Light Industrial
- Heavy Industrial
- Parks and Open Space
- Private Recreation
- Public/Semi-Public
- Right-of-way
- Lake Georgetown
- Lake/Corps of Engineers
- Vacant
- Georgetown City Limits
- Georgetown ETJ

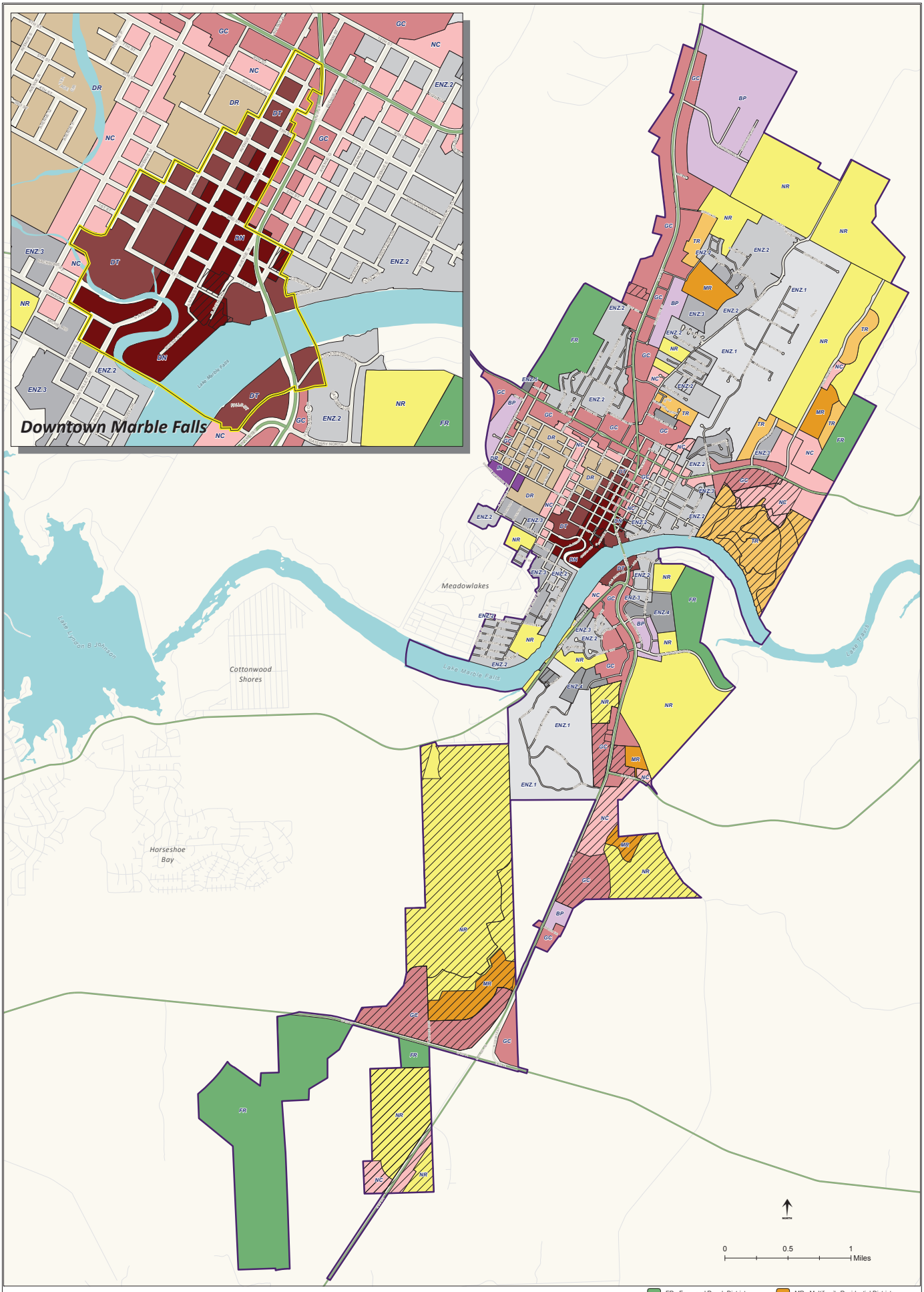
NORTH

0 1 2 3

MILES

Source: Williamson County Appraisal District


CITY OF Lockhart
FIGURE 3.2
LOCKHART 2020
LAND USE PLAN
FIGURE 4.9
LOCKHART 2020
THOROUGHFARE PLAN
Revised December 5, 2017
130
183
2001
672
142
20
130
20
1322
183
THOROUGHFARES
EXISTING COLLECTOR
EXISTING ARTERIAL
FUTURE COLLECTOR
FUTURE ARTERIAL
HIKE/BIKE TRAIL
FUTURE LAND USE
AGRICULTURE/RURAL DEVELOPMENT
GENERAL-HEAVY COMMERCIAL
INDUSTRY
LIGHT-MEDIUM COMMERCIAL
MIXED RETAIL, OFFICE, RESIDENTIAL
PARKS AND OPEN SPACE
PUBLIC AND INSTITUTIONAL
RESIDENTIAL, HIGH DENSITY
RESIDENTIAL, LOW DENSITY
RESIDENTIAL, MEDIUM DENSITY
FLOOD ZONE
500 Yr
A - 100Yr No Elev Study
AE - 100Yr Elev Study
scale 1" = 1500'
Disclaimer: This product is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the ground survey, and represents only the approximate relative location of property boundaries.



Official Zoning Map of Marble Falls, Texas

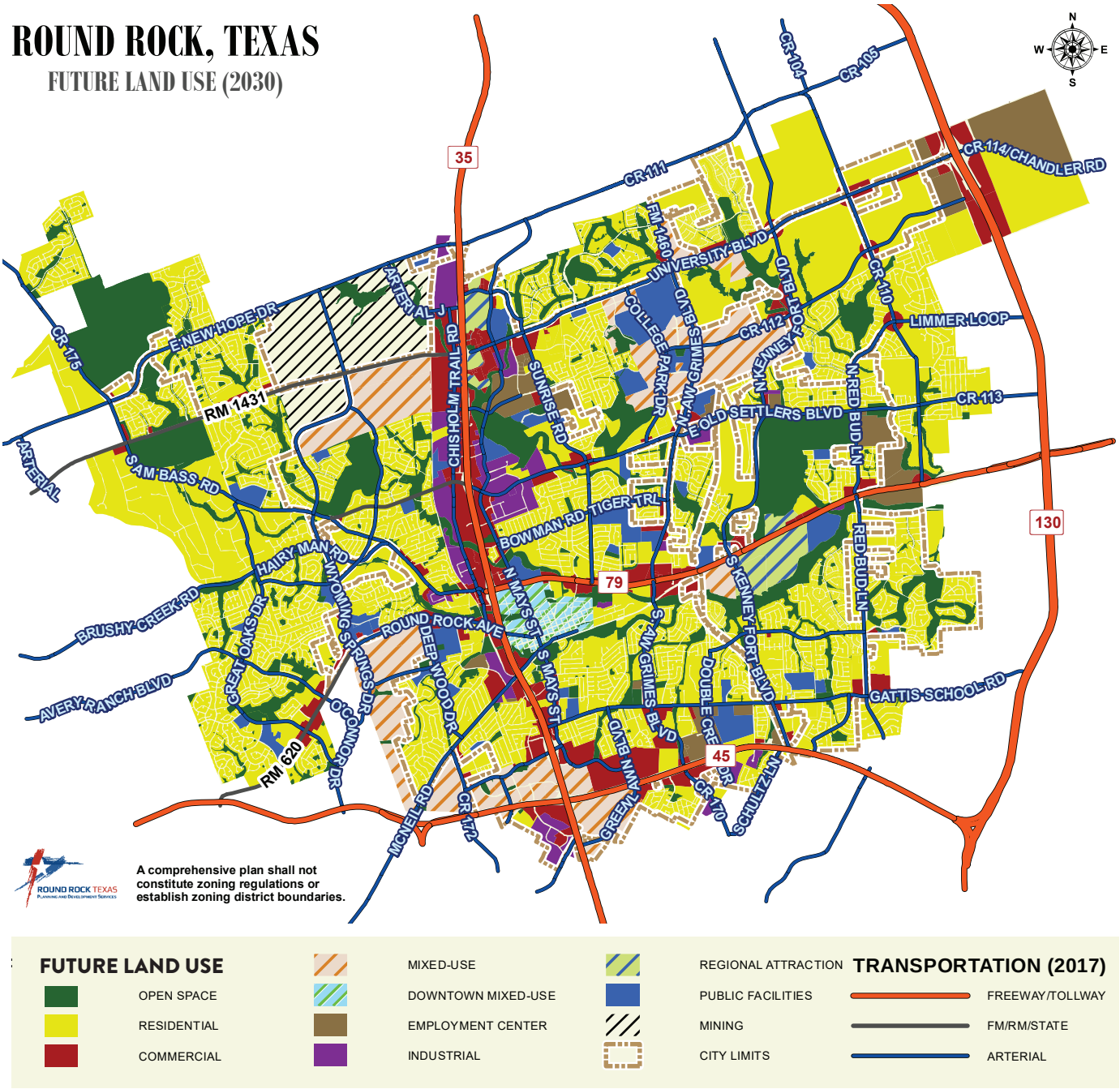
CITY OF Marble Falls TEXAS

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of boundary properties.

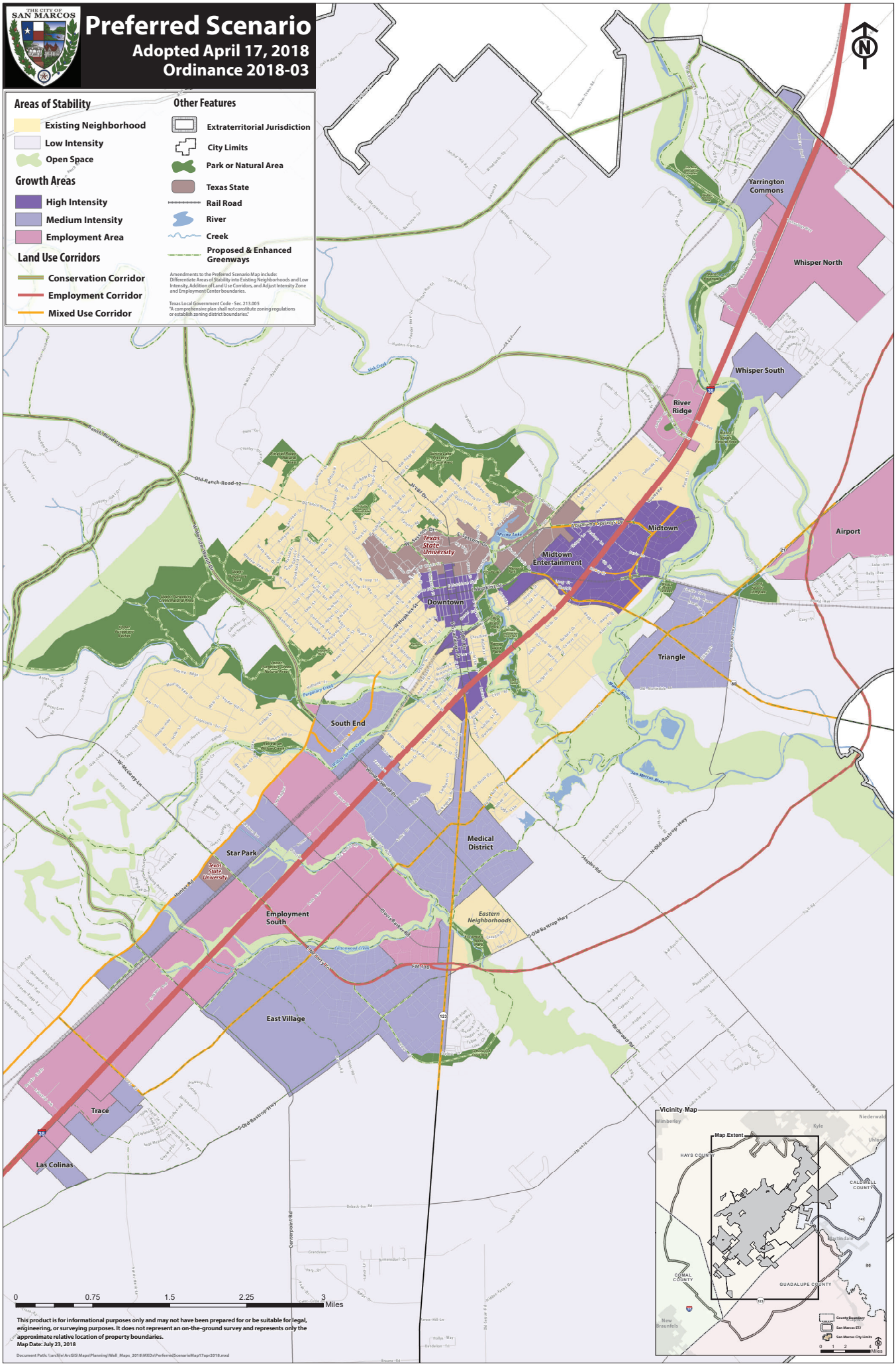
Effective Date: January 1, 2019

- FR - Farm and Ranch District
- ENZ.1 - Existing Neighborhood Zone 1
- ENZ.2 - Existing Neighborhood Zone 2
- ENZ.3 - Existing Neighborhood Zone 3
- ENZ.4 - Existing Neighborhood Zone 4
- ENZ.5 - Existing Neighborhood Zone 5
- RE - Rural Estate District
- NR - Neighborhood Residential District
- TR - Transitional Residential District
- MR - Multifamily Residential District
- DR - Downtown Residential District
- NC - Neighborhood Commercial District
- GC - General Commercial District
- DT - Downtown Transition District
- DN - Downtown District
- BP - Business/Industrial Park District
- IN - General Industrial District
- Planned Development Districts

FIGURE 29. FUTURE LAND USE MAP



changes to map categories associated with new zoning districts and changing land use trends. To consider adjustments on the FLUM, staff conducted a preliminary review of the existing FLUM and identified potential revisions to create a new draft map. Staff then offered individual meetings between staff and stakeholders owning 100-plus acres of land in the city limits and/or ETJ to discuss potential changes to their land envisioned in the next ten years. Once a new draft FLUM was created, staff held an open house on July 22, 2019 to solicit public input. Staff identified 402 parcels of land in the city limits and ETJ consisting of five acres or more with a single owner and sent a letter inviting those owners to attend the Open House. The Open House was open to the public as well. The public and stakeholders provided input on how they saw the city and their parcels being developed or redeveloped in the future. Staff then revised the FLUM based on the input received.


THE CITY OF SAN MARCOS
Preferred Scenario
Adopted April 17, 2018
Ordinance 2018-03
Areas of Stability
Existing Neighborhood
Low Intensity
Open Space
Growth Areas
High Intensity
Medium Intensity
Employment Area
Land Use Corridors
Conservation Corridor
Employment Corridor
Mixed Use Corridor
Other Features
Extraterritorial Jurisdiction
City Limits
Park or Natural Area
Texas State
Rail Road
River
Creek
Proposed & Enhanced Greenways
Amendments to the Preferred Scenario Map include: Differentiate Areas of Stability into Existing Neighborhoods and Low Intensity, Addition of Land Use Corridors, and Adjust Intensity Zone and Employment Center boundaries.
Texas Local Government Code - Sec. 213.005
"A comprehensive plan shall not constitute zoning regulations or establish zoning district boundaries."
N
Yarrington Commons
Whisper North
Whisper South
River Ridge
Airport
Midtown
Midtown Entertainment
Texas State University
Downtown
Triangle
South End
Medical District
Star Park
Employment South
Eastern Neighborhoods
East Village
Trace
Las Colinas
Old-Ranch-Road-12
Ranch-Road-12
W-McCarty-Ln
Centerpoint-Rd
S-Old-Bastrop-Hwy
N-Old-Bastrop-Hwy
Staples-Rd
Redwood-Rd
Hunter-Rd
Wonder-World-Dr
Clovis-Barker-Rd
Purgatory-Creek
San-Marcos-River
Cottonwood-Creek
Spring-Lake
Sink-Creek
0 0.75 1.5 2.25 3 Miles
This product is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.
Map Date: July 23, 2018
Document Path: \\archfile\ArcGIS\Maps\Planning\Wall_Maps_2018\MXDs\Perferred\ScenarioMap17apr2018.mxd
Vicinity Map
Map Extent
HAYS COUNTY
CALDWELL COUNTY
COMAL COUNTY
GUADALUPE COUNTY
Wimberley
Kyle
Niederwald
Uhland
Martindale
New Braunfels
County Boundary
San Marcos ETJ
San Marcos City Limits
0 1 2 4 Miles

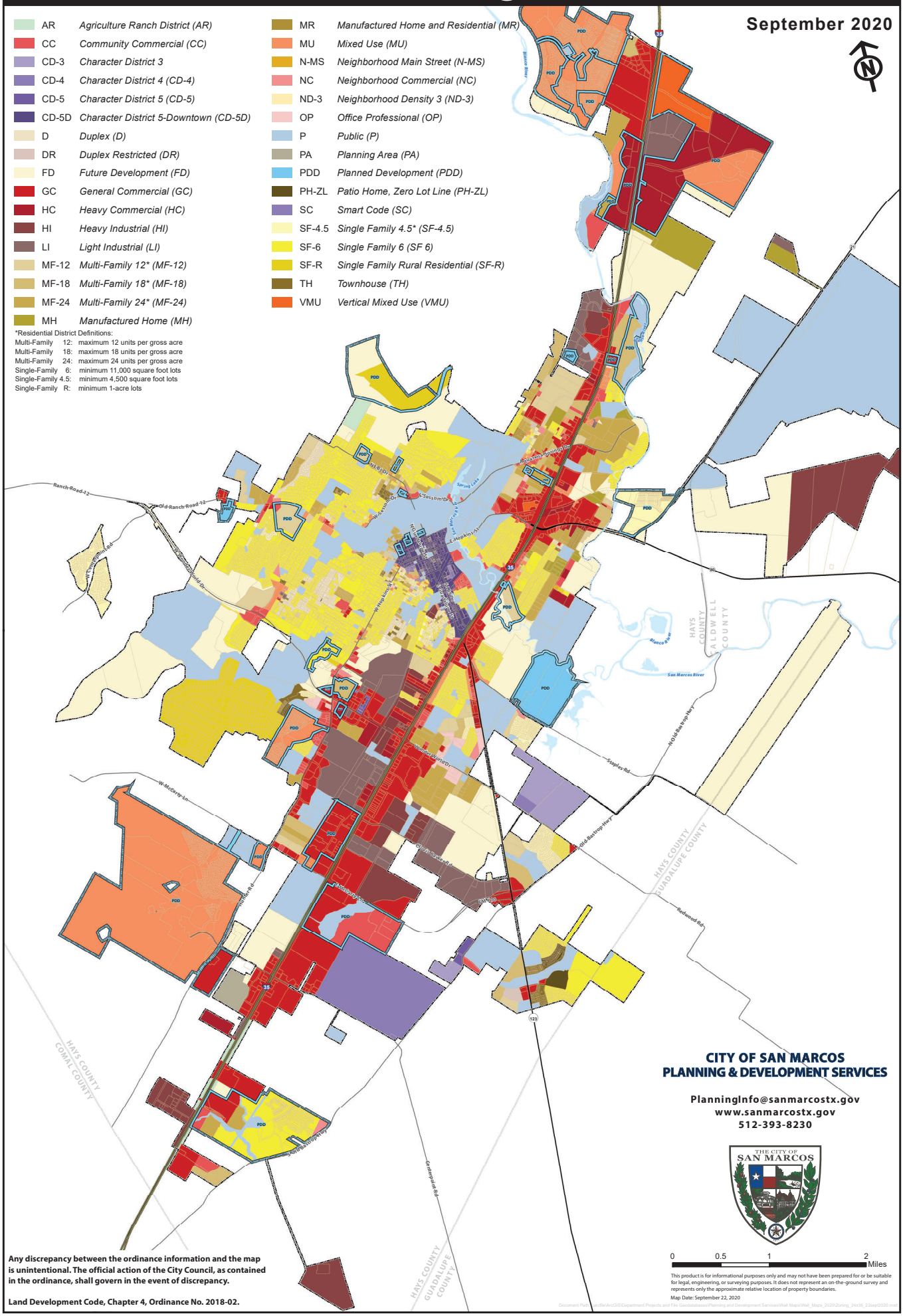
Current Zoning Districts

September 2020

AR	*Agriculture Ranch District (AR)*
CC	*Community Commercial (CC)*
CD-3	*Character District 3*
CD-4	*Character District 4 (CD-4)*
CD-5	*Character District 5 (CD-5)*
CD-5D	*Character District 5-Downtown (CD-5D)*
D	*Duplex (D)*
DR	*Duplex Restricted (DR)*
FD	*Future Development (FD)*
GC	*General Commercial (GC)*
HC	*Heavy Commercial (HC)*
HI	*Heavy Industrial (HI)*
LI	*Light Industrial (LI)*
MF-12	*Multi-Family 12* (MF-12)*
MF-18	*Multi-Family 18* (MF-18)*
MF-24	*Multi-Family 24* (MF-24)*
MH	*Manufactured Home (MH)*
MR	*Manufactured Home and Residential (MR)*
MU	*Mixed Use (MU)*
N-MS	*Neighborhood Main Street (N-MS)*
NC	*Neighborhood Commercial (NC)*
ND-3	*Neighborhood Density 3 (ND-3)*
OP	*Office Professional (OP)*
P	*Public (P)*
PA	*Planning Area (PA)*
PDD	*Planned Development (PDD)*
PH-ZL	*Patio Home, Zero Lot Line (PH-ZL)*
SC	*Smart Code (SC)*
SF-4.5	*Single Family 4.5* (SF-4.5)*
SF-6	*Single Family 6 (SF 6)*
SF-R	*Single Family Rural Residential (SF-R)*
TH	*Townhouse (TH)*
VMU	*Vertical Mixed Use (VMU)*

*Residential District Definitions:

Multi-Family 12: maximum 12 units per gross acre
Multi-Family 18: maximum 18 units per gross acre
Multi-Family 24: maximum 24 units per gross acre
Single-Family 6: minimum 11,000 square foot lots
Single-Family 4.5: minimum 4,500 square foot lots
Single-Family R: minimum 1-acre lots



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THE CITY OF SAN MARCOS

0 0.5 1 2 Miles

This product is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.

Map Date: September 22, 2020

Any discrepancy between the ordinance information and the map is unintentional. The official action of the City Council, as contained in the ordinance, shall govern in the event of discrepancy.

Land Development Code, Chapter 4, Ordinance No. 2018-02.