section 4: modal inventory

4.1 – highways and bridges

The Waco Metropolitan Area contains 6,965.1 lane miles of public roadways. Of this amount, the State of Texas maintains 1,788.9 lane miles or 25.7% of the regional highway system. Municipal Governments or McLennan County maintain 5,176.2 lane miles or 74.3% of the system. Despite the preponderance of lane miles being maintained by local or county governments, 79% of the daily vehicle miles traveled (VMT) occur on the State Highway system. Of the state system VMT, just more than half occurs on Interstate 35. Additionally, nearly 40% of the total daily VMT for all of McLennan County occurs on Interstate 35.

Each public roadway within McLennan County is classified under the Highway Functional Classification System based upon how each roadway is utilized. The system is defined in section 4.1.1 which also details how the roadway system in McLennan County is classified.

4.1.1 – highway functional classification system

The roadway network utilized for the MTP comprises those streets functionally classified in 2015 and those subsequently added to the functionally classified system through new construction. A functionally classified roadway system allows streets to be grouped according to their purpose and function within the transportation network of the urbanized area. Streets within urban areas serve two primary functions: traffic movement or mobility, and accessibility. The functional classification system describes the amount of mobility and land access that facilities possess within the transportation network. The transportation planning process uses functional classification to ensure that development issues are evaluated as a component in the determination of existing and future transportation needs. A summary of the characteristics of each functional class is provided in Table 4.1. A summary of McLennan County functional classification lane miles and VMT is provided in Table 4.2 and shown on Charts 4.1 and 4.2. Map 4.1 shows the functionally classified roads.

table 4.1 – functional classification system characteristics

Classification	Level of Mobility	Level of Accessibility	System Relationships
Interstate or Expressways	Connects urban and rural service, connects urban subregions, connects urban areas	No direct land access unless frontage roads are provided. Used for long trips at high speed.	Other Interstates or Expressways, principal arterials.
Principal Arterials	Connects two or more subregions, compliments expressways in high volume corridors	No direct land access except for major traffic generators. Used for medium to long distance trips at moderately high speeds. Access is subordinate to traffic movement.	Expressways, other principal arterials and high volume minor arterials and collectors.
Minor Arterials	Connects adjacent subregions or activity centers within a subregion. Provides intra-community continuity. Ideally does not penetrate into neighborhoods.	Land access restricted to major and minor traffic generators in industrial and commercial uses. Used for moderate to short length trips at moderate speed.	Limited expressway interaction, principal arterials, other minor arterials, or facilities that place more emphasis on land access than higher classifications.
Collectors	Connects neighborhoods and connects land uses with the arterial system.	Unrestricted land access to neighborhoods, commercial or industrial areas. Used for collection and distribution to arterial facilities at moderate to low speeds.	Arterials, other collectors, local streets and private driveways providing direct land access.
Local Streets	Connects facilities within neighborhoods, or land uses within transportation facilities.	Unrestricted land access. Used for collection and distribution to collector facilities at low speeds.	Collectors, other local facilities and private driveways providing direct land access.

table 4.2 – functional classification system lane miles and vehicle miles traveled: 2015

Classification	Lane-Miles	Percent of Total	Daily Vehicle Miles of Travel	Percent of Total
Interstate (Main Lanes Only)	229.5	3.3%	3,118,218	38.9%
Other Expressways (Main Lanes Only)	99.0	1.4%	750,085	9.4%
Principal Arterials	429.4	6.2%	1,385,206	17.3%
Minor Arterials	541.1	7.8%	1,332,411	16.6%
Collectors	867.0	12.4%	700,768	8.7%
Frontage Roads	322.1	4.6%	0	n/a
Local Streets	4,477.0	64.3%	731,146	9.1%
Total	6,965.1	100.0%	8,017,834	100.0%

*Traffic counts for the Interstate and Expressway Systems include the main lanes and frontage roads added together. Therefore, it is not possible to separate daily VMT between main lanes and frontage roads.

chart 4.1 –percentage of lane miles traveled by functional classification: 2015

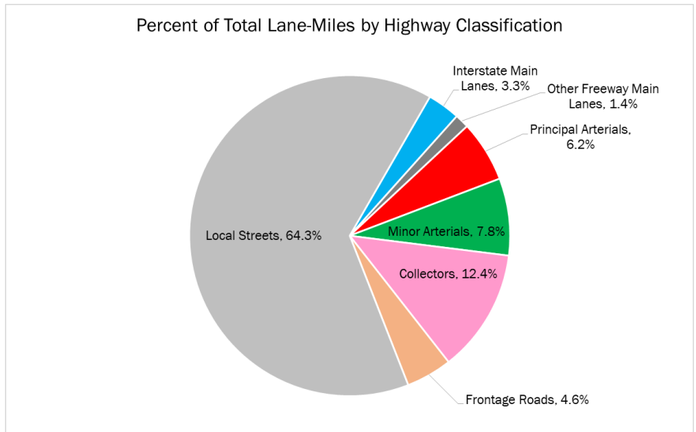
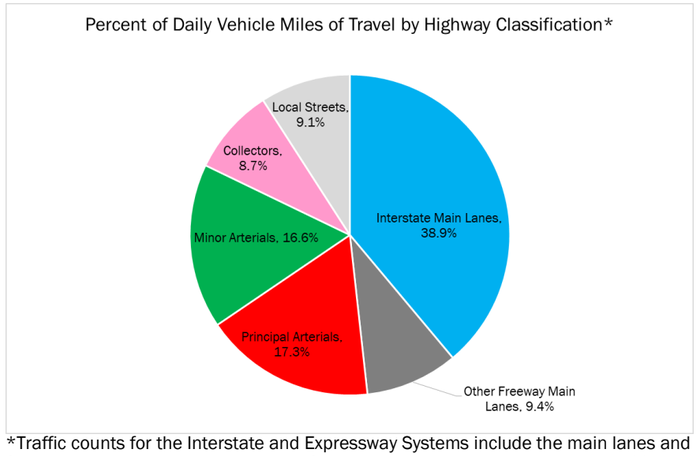


chart 4.2 –percentage of vehicle miles traveled by functional classification: 2015



*Traffic counts for the Interstate and Expressway Systems include the main lanes and frontage roads added together. Therefore, it is not possible to separate daily VMT between main lanes and frontage roads.

4.1.2 – regionally significant freight corridors

According to TxDOT's Texas Freight Mobility Plan, adopted in 2017, nearly 20 tons of freight per household and 12,700 tons of freight per business were moved within Texas in 2016. By 2045, volume is expected to reach 4.0 billion tons. In Texas, most freight is moved by truck, and growth in time-sensitive freight is greatly impacting the number of trucks on not only major roadways such as interstates, highways, and major arterials, but also neighborhood streets.

The Waco MPO integrates freight needs into its planning process to ensure freight moves safely and seamlessly through the Waco Metropolitan Area. The majority of freight movement within the Waco Region occurs by truck along important highway corridors that connect freight providers to critical transportation networks. Two Class 1 railroads and the Waco Regional Airport also contribute to freight movement. There are a number of regionally significant freight assets in the Waco Region but none more important than Interstate Highway 35 (IH-35), nicknamed 'Main Street Texas,' because of its state, national, and international significance as a key transportation corridor for both goods and passengers. IH-35 runs north and south through the center of McLennan County between Hill and Falls counties. Besides connecting major population centers in Texas, it connects land and maritime ports of entry, energy exploration with production facilities, and goods from Canada and Mexico to the national freight distribution network. IH-35 is designated as part of the Primary Highway Freight System and is the only facility within McLennan County eligible for National Highway Freight Plan (NHFP) funding. TxDOT's IH-35 Statewide Corridor Plan indicates population and employment along the I-35 corridor could increase by 82% and 77%, respectively, by 2040, and commercial vehicle miles of travel will increase by 46%. A portion of the facility in downtown Waco is currently being reconstructed to address aging infrastructure, congestion, and safety issues, but work on other sections remains to be completed to freight needs. The Waco MPO continuously monitors and inventories conditions on IH-35 and remains committed to IH-35 maintenance and expansion.

Although IH-35 is an essential portion of the roadway network, it must be supplemented by other facilities in order to serve all freight users. Through its freight mobility planning process, TxDOT has designated six other highway corridors in the Waco Region as important to the movement of freight across the state based on economic competitiveness, strategic supply chains, the amount of goods moved, and market access and connectivity. Below is a list of these highways which are included in the Texas Highway Freight Network (as designated by the Texas Freight Mobility Plan) and are depicted on Map 4.2:

- State Highway 31 – between US Highway 84 and the McLennan/Hill County line;
- US Highway 84 – between McGregor and the McLennan/Limestone County line;
- State Highway 6 – between the McLennan/Bosque County line and the McLennan/Falls County line;
- US Highway 77– State Highway 6 and the McLennan/Falls County line;
- State Highway 317– between the McLennan/Bosque County line and the McLennan/Bell County line;
- Loop 340 – between IH-35 and State Highway 6

The Texas Freight Mobility Plan does not identify any other facilities within McLennan County as part of the Multi-Modal Freight Network. No critical urban freight corridors were identified by TxDOT within the Waco MPO region.

The state designated freight corridors in the Waco Metropolitan Area are supported by a regional network of important freight facilities identified by Waco MPO staff. Freight generated from individual industries in high freight activity zones travel on these local streets and arterial connections to access state freight network facilities in the region. Map 4.2 also identifies roadways that were deemed regionally important to provide that direct connection to the state network. Map 4.3 identifies high freight activity zones in 2015 and Map 4.4 shows where high freight zones will likely be located in 2045.

truck parking

Recent federal restrictions regarding hours of rest and use of electronic logbooks for commercial drivers is having an enormous effect on the freight industry. Truck parking is now in high demand and there is a shortage of it in McLennan County. Currently, four privately owned truck stops in the Waco Region offer truck parking. All are located along IH-35. Between them, they provide over 800 available parking spaces but none are public. Two smaller truck stops furnish an additional 40 private spaces for a $10 fee and have plans to expand their operations by 2021. Table 4.3 details amenities currently available at major truck stops in the Waco Metropolitan Area. Map 4.2 shows the location of private truck parking facilities within McLennan County.

table 4.3 – truck stops and amenities: mclennan county

Truck Stop	City	Full Service Restaurant	Diesel Fuel Lanes	Parking Spaces	Driver Showers
CowBoy Truck Stop	Elm Mott	Yes	5	200	8
Road Ranger	Lacy Lakeview (Waco)	Yes	8	109	7
Flying J #739	Waco	Yes	9	226	9
Pilot Travel Center	Robinson	Yes	10	278	10
Gator Truck Stop 3	Ross	Yes	4	15*	0
Waco Travel Stop	Hewitt	Yes	3	25*	3

*Plans to expand amenities in 2021.
Source: 2019 phone interviews with managers.

freight infrastructure design

Roadway design plays a critical role in facilitating freight movement. The transportation system in McLennan County was built over multiple decades and the nature of freight movement is evolving over time as well. Some of the County's freight facilities were not originally designed for the types of freight vehicles used today. This may present costly schedule delays and unsafe conditions for freight operators and their assets. To aid in removing design impediments to freight movement in Texas, TxDOT is currently completing a Freight Infrastructure Design Considerations study which assesses design practices for infrastructure components such as pavement, bridges, rail crossings, intersections, tunnels and access points to the Texas Freight Network. Waco MPO incorporates the latest design recommendations from TxDOT into its project assessment process.

Present-day freight vehicles are carry taller and heavier loads than in the past. TxDOT now suggests a vertical clearance standard of 18 feet to accommodate current freight transport. Most bridges in McLennan County do not currently meet this standard but do meet the federal standard of 16'6". To avoid congested conditions in the Dallas-Fort Worth Metroplex, northbound oversized and overweight loads are routed through McLennan County using State Highway 6 and State Highway 31. Particular attention is paid to potential design issues such as turning radii at intersections, site distances, and extensive roadway deterioration along these routes in the design phase of reconstruction efforts.

4.1.3 – bridges and low water crossings

As of 2018, there were 686 publicly maintained bridges or culverts within McLennan County. Of these 437 or 63.7% were maintained by the State of Texas and 245 or 36.3% were maintained by a municipality or McLennan County (see Table 4.4). In addition to bridges, there are also 17 low water crossings within McLennan County that by definition are considered 'flood vulnerable.' Instead of a bridge being built at these locations over the water feature, the road uses the creek bed for the crossing. In general, these crossings have very low traffic volumes, cross water features that are dry except during significant rainfall events, and drain quickly after significant rainfall. As a result, the expense of constructing a bridge at these locations is not considered feasible. Section 5.1.5 provides an evaluation of bridge condition in 2016.

table 4.4 – bridge ownership: 2018

Bridge Owner	Number of Bridges	Percent of Total
State of Texas	437	63.7%
McLennan County	155	22.6%
Local Municipality	94	13.7%
Total	686	100.0%

4.1.4 – traffic signals and highway operations

Traffic operations within the Waco Metropolitan Area are generally controlled through traffic signals or flashing beacons at high volume intersections. Within the region there are 258 traffic signals, 6 flashing beacons and 1 'Hawk' pedestrian crossing signal. The City of Waco operates 200 signals with the remainder operated by the Texas Department of Transportation. As a general rule, the City of Waco operates signals between 6:00 AM and 2:00 AM, 7 days a week. At other times these signals operate in a flashing yellow mode as traffic volumes are low enough to safely permit arterial traffic to continue without stopping. High volume intersections, such as Waco Dr at Valley Mills Dr, are an exception where the signals operate 24 hours per day. All signals operated by the Texas Department of Transportation operate 24 hours per day, 7 days a week.

Flashing beacons are used at intersections that do not meet warrants for a traffic signal, but due to a combination of traffic volumes and limited sight distance benefit from having a flashing warning for motorists to stop or use caution. All but one of the flashing beacons within the region are operated by TxDOT. The City of Waco operates the one exception at the intersection of Orchard Ln and Forrest St. In addition to traffic signals and flashing beacons, the City of Waco operates one 'Hawk' type signal to assist pedestrian crossings on South New Rd in the vicinity of University High School.

A large percentage of signals within the region are controlled by loop detectors located within the pavement to detect vehicles. Both the City of Waco and TxDOT are transitioning to infrared camera detectors for all signals which have the advantage of better detecting motorcycles and not requiring adjustments after pavement overlays or rehabilitation.

Signals along some major corridors have been timed in order to permit vehicles to travel a consistent speed with minimal stoppages. These corridors are generally high volume corridors with numerous signals within a short distance and timing adjustments have proven to significantly improve corridor travel times.

traffic signal condition

As of 2019, all traffic signals operated within McLennan County by the Texas Department of Transportation meet the standards and requirements set forth by the Manual on Uniform Traffic Control Devices (MUTCD). Limited information, however, is available for the City of Waco signal system as no reliable signal inventory exists. MPO staff performed a visual survey of the City of Waco system to identify signals that did not meet MUTCD standards for number or

position of lanterns, overhead arm length or intersections with more than 10,000 vehicles per day that lacked a protected left turn phase. Of the 200 signals operated by the City of Waco, just over half or 102 signals were considered substandard for one or more of the criteria used for the visual survey. Map 4.5 shows the location of traffic signals within the region along with signals considered substandard by the visual survey.

intelligent transportation systems

The Texas Department of Transportation, in cooperation with the Waco MPO, McLennan County and cities within the region, has developed a regional architecture for intelligent transportation systems (ITS). The main implementation of ITS within the Waco Region to date has been associated with the reconstruction and widening of IH-35. During the construction phase, TxDOT has installed several dynamic message signs in both directions providing real-time travel time information to motorists. When construction requires lane closures, TxDOT has also implemented advance warning systems to alert motorists of stopped or slowed traffic several miles in advance in an effort to reduce the number of backup related crashes.

Of a more permanent status, TxDOT has installed cameras and dynamic message signs at several locations within the region as construction phases are completed. In addition to the message signs, TxDOT has also installed 2 signs to provide motorists comparative travel time information for IH-35 versus Loop 340 as an alternate route through Waco. In addition to these, TxDOT has also installed delay signs for northbound IH-35 just north of the Temple area to alert motorists heading to Waco. Outside of IH-35, there are a small number of traffic cameras installed by TxDOT to provide real time images for IH-35 alternate routes. Other than these facilities, there is currently no other ITS infrastructure within the Waco Region. Map 4.6 identifies the location of ITS infrastructure within the Waco Region.

The Texas Department of Transportation has installed dynamic message signs along IH-35 to provide real time travel information to alert motorists and provide alternate route information. This sign is located along southbound IH-35 near the SH 6 / West Loop 340 interchange as motorists head towards the Temple / Belton area. A similar sign is found for northbound IH-35 just outside of Temple to provide delay information through the Waco area.

Source: Waco Tribune Herald

4.2 – public transportation

Public transportation within the Waco Urbanized Area is characterized by two types of service: fixed routes providing regularly scheduled service on published routes; and demand response where individual riders who cannot utilize the fixed route service are provided door-to-door service. These services are provided for those who do not have a personal vehicle or are not able to (or choose not to) drive.

4.2.1 – urban services

Fixed route service is provided by the Waco Transit System (WTS or Waco Transit). Waco Transit is owned by the City of Waco and operated by RATP Dev, USA. Waco Transit currently operates an active fleet of 55 revenue vehicles. This fleet consists of 19 low-floor Americans with Disabilities Act (ADA) accessible transit buses, 3 mini vans, 18 cutaway vehicles, 9 automobiles, and 5 rubber-tired trolleys. All low-floor transit buses and trolleys are ADA accessible and equipped to accommodate mobility devices. In addition, each bus is equipped with bicycle racks on the front of the vehicle capable of securing two bicycles.

Waco Transit operates bus, van, and trolley services. The bus service operates with 11 fixed bus routes throughout the City of Waco (See Map 4.7). Routes 1 through 5, and 7 through 9, operate under a hub-and-spoke system with routes originating from the Intermodal Transit Center in Downtown Waco and radiating out to various parts of Waco. Route 6 circulates along the SH 6 / West Loop 340 corridor and connects with Route 9 at a transfer point each hour. Weekday fixed route service operates once per hour from 5:00am to 7:00pm. Saturday fixed route service operates once per hour from 6:00am to 8:00pm. Waco Transit does not operate Sunday fixed route service.

Waco Transit System also offers two free-fare downtown area routes: The Silo District Trolley which circulates the Downtown Waco Area; and the La Salle Circle Shuttle, which connects the Downtown Waco Area to La Salle Avenue and the historic Waco Circle. The Silo District Trolley and La Salle Circle Shuttle generally run between 9:00 AM – 6:00 PM Monday through Saturday.

Waco Transit operates 16 of the low-floor ADA accessible transit buses (similar to the one pictured) within the Waco Urbanized Area.

Source: Waco Tribune Herald

One-way fares for Routes 1 through 9 are $1.50 for adults, $1 for students ages 6 through 18, and $0.50 for persons over age 65 and persons with a mobility impairment. Day passes are $3 and permit the passholder to ride an unlimited number of times for the

duration of the calendar day. Monthly passes are $40 for adults and $30 for students and permit the passholder to ride an unlimited number of times for 31 days after the first use.

Demand response van service under the Americans with Disabilities Act (ADA) began in Waco in 1993. Demand response provides door-to-door service for those unable to use the fixed route service due to some type of ambulatory difficulty. Persons using this service must qualify based on several criteria as defined by the Federal Transit Administration (FTA). In addition, only persons residing within the designated ADA service area qualify to use the service (identified on Map 4.7). Current ridership on the van service is approximately 4,100 persons per month. Demand for this type of service is expected to continue to increase. The fare for the van service is $6 per round trip.

Each bus utilized for the urban fixed route system is compliant with the requirements for the Americans with Disabilities Act and is able to accommodate wheelchair access.

Source: Waco Tribune Herald

Waco Transit also provides service to the Baylor University campus during the fall and spring semesters. Rubber-tired trolleys circulate along five routes through the campus providing access between remote parking areas and off-campus housing to the central portion of the campus. This service also connects to the Fixed Route service via Route 9 – South Terrace. Additional connections may be made via Route 9 at the Intermodal Transit Center. This service is free of charge to all riders with operating costs provided by Baylor University.

Waco Transit's office and maintenance facility is located adjacent to the Intermodal Transit Center at 301 South 8th Street in downtown Waco. The facility contains all of Waco Transit's office, bus repair, fueling, cleaning, and bus parking operations.

Waco Transit also operates one special service called the LINK. This service circulates 3 times daily between Downtown Waco, the town of Marlin and then to Sanderson Farms located southeast of the Texas State Technical College (TSTC) campus. The LINK also provides limited late night service for employees of Sanderson Farms who work past the normal operational hours of Waco Transit. The LINK fare is the same as the fixed route fare. Sanderson Farms and the Texas Workforce Commission offsets the remaining costs of the LINK service. As of publication of the MTP, the LINK service is scheduled to be discontinued after FY 2020.

The total passenger boardings in 2018 for Waco Transit's urban services are summarized in Table 4.5.

table 4.5 – total passenger boardings: waco transit system: 2018

Fixed Route (Routes 1-9)	Downtown Area Routes	Demand Response	Baylor Campus Shuttle	LINK Service	Total
552,159	177,229	48,367	447,929	19,078	1,244,762

Source: Waco Transit

4.2.2 – rural and social service public transportation

FTA sections 5310 and 5311 provide funding in the form of capital grants to the state of Texas, to help make available mass transportation service that is planned, designed, and carried out to meet the special needs of elderly individuals and individuals with disabilities. Funds are available to private non-profit organizations and other public for-profit entities that certify to the governor that there are no existing non-profit corporations or associations in their area that already provide transportation service. Local stakeholder forums or committees plan and design the service for their local community, and existing rural and/or urban transit service providers operate the service as designed by the committees.

These funds are awarded directly to the transit operator who may use the funds for eligible capital expenses including acquiring transportation service from other transportation providers in the local area. Eligible capital expenses include but are not limited to buses, vans, or other paratransit vehicles, radios and communication equipment, vehicle shelters, and wheelchair lifts and restraints. Other options, with the concurrence of TxDOT Public Transportation Division, are lease of equipment, the acquisition of transportation services under a contract lease, and preventive maintenance service or parts associated with preventive maintenance service.

The Heart of Texas Rural Transit District (HOTRTD) operates rural transportation services in Bosque, Falls, and Hill counties, and plans to expand operations to Freestone County. Rural service in Limestone County is provided by the Limestone County Senior Services Project. Several of the HOTRTD rural services connect with Waco Transit service.

In addition to the services provided by HOTRTD, Waco Transit System also operates the McLennan County Rural Transit District (MCRTD) through an Interlocal Agreement between the City of Waco and MCRTD. This service provides transportation to anyone in the rural areas of McLennan County in order to improve access to jobs, education, healthcare and more. Destinations include anywhere in McLennan or adjacent counties, as long as one of your stops originates from or travels to a rural address. Service is available from 5:15 a.m. to 7:15 p.m., Monday through Friday and 6:15 a.m. to 8:15 p.m., on Saturday. Trips are arranged by clients calling Waco Transit System at least 24 hours in advance at (254) 750-1620 or 877-875-RIDE (7433). Ridership has increased from 850 in the first month of operation in July 2015 to current ridership of approximately 3,000 persons per month. A continuing increase in demand for the service per month is anticipated for the foreseeable future. Trips can scheduled up to two weeks in advance. Clients can ride anywhere within McLennan County for only $3 each way, and $5 each way for trips to adjacent counties. Same-day trips are $5 for a one-way trip, with limited availability.

4.2.3 – medicaid transportation

Waco Transit System provides non-emergency medical transportation through a contract with LogistiCare Solutions (Broker). Medicaid transportation is provided for trips originating in the six-county Heart of Texas region Monday thru Saturday 4 AM to 7 PM. This region includes the Waco Metropolitan Area. After hour service is also available for return trips.

4.2.4 – intercity bus service

As of 2019, there are three intercity bus services operating within McLennan County: Greyhound Bus Lines, Tornado Bus Company, and FlixBus. Greyhound operates out of the Downtown Intermodal Center at 301 S 8th St and shares terminal space with Waco Transit. Tornado buses operate out of a terminal located at 1900 Speight Ave. FlixBus operates out of the Flying J Travel Center, at 2409 S New Rd. See Map 4.8 for location of intercity bus terminals.

Greyhound operates on average nine buses daily from the transit center with the primary destinations of Austin, Dallas, Houston, Laredo, Brownsville, and San Antonio. Connections to most destinations within the US can be made in Dallas, Houston or San Antonio. The Tornado Bus Company provides service between Waco and Mexico via Laredo as well as to Florida via San Antonio. Tornado operates 8 to 12 buses dispatched daily from the Waco station depending upon demand. FlixBus offers connections between Waco and Texas cities such as San Antonio, Ft. Worth, Dallas, Killeen (Fort Hood), Austin, San Marcos, and New Braunfels/Wurstfest, with approximately five buses departing each day from the Waco stop.

As the Greyhound terminal shares space with the Waco Transit intermodal terminal, their services directly interconnect with all but one of Waco Transit's fixed route service. The Tornado Bus terminal connects with Waco Transit's route 3 – the VA / Colcord route. FlixBus connects with Waco Transit's route 9 – South Terrace.

4.2.5 – ride share and ride hailing services

The Waco Metropolitan Area is not served by a licensed taxi service. However, transportation network companies such as Uber and Lyft operate in the Waco Metropolitan Area and provide ride hailing/ride sharing services on demand. So far, no noticeable ride hailing or ride sharing congestion issues have been observed in the Waco Region.

Several limousine companies serve the Waco Metropolitan Area, such as Luxury Limousine of Waco, Care Limos, and Waco Limo Service. Waco Streak provides service between the Waco Urbanized Area and Dallas area airports; four daily round trips are made to provide access to DFW and Love Field airports. Echo Transportation provides charter bus service within the Waco Region, and between Waco and other metro areas such as Dallas and Austin.

4.2.6 – car share and shared micromobility services

Zipcar, a car sharing service, offers two cars for rent at Baylor University. The city of Waco will be launching a pilot shared micromobility program in 2020 for a 12-month trial period. The pilot program may include electric-assist bikes (e-bikes) and/or electric scooters (e-scooters) for shared use. The city of Waco plans to partner with a single vendor to operate the pilot program, which will be primarily located in the greater downtown Waco area.

4.2.7 – other private sector services

The Fixing America's Surface Transportation (FAST) Act requires MPO plans to identify several employer-based commuting programs operating within the region and to identify how projects within the MTP address challenges these programs have operating within the region. These types of programs include the following:

- Carpools
- Vanpools
- Transit Benefit Programs
- Parking Cash-Out Programs
- Employer Shuttle Programs
- Telework Programs

As part of their work associated with development of the McLennan County Transit Need Study, consultants with the Alliance Transportation Group performed a review to determine if any of these programs existed as of spring 2018. Their review determined that no such programs currently exist within the Waco Metropolitan Area. Websites (such as Waze Carpool and CarpoolWorld) are potential resources for individuals needing carpool services within McLennan County.

4.3 – bicycle and pedestrian

4.3.1 – bicycle facilities

Despite the presence of three higher education institutions within the Waco Metropolitan Area, bicycling is not a significant mode of transportation for commuting purposes. According to the 2013-2017 American Community Survey (ACS) 5-Year Estimate, only 0.3% of commuters in McLennan County use this mode as their preference. See Map 4.9 for the census tracts with the highest percentage of bicycle commuters.

The small proportion of bicycle commuters can be partially attributed to the small size of the existing bikeway network, which is almost entirely within greater downtown Waco. Major arterial streets (with heavy traffic volumes and high speeds), highways, and freeways hinder the development of a connected bicycle network. The Brazos River and Lake Waco are also natural barriers to connectivity. These physical constraints limit the ability of residents to safely commute from their homes to work, school, and other destinations outside of their immediate neighborhood.

Currently, the bikeway network includes off-street separated bikeways, on-street bike lanes (including buffered bike lanes), and on-street shared bikeways. Future bikeways include a protected on-street bikeway along Washington Avenue from University Parks Drive to 18th Street in the City of Waco.

Off-street separated bikeways in McLennan County include the following paved shared-use paths:

- Brazos Riverwalk (8.4 miles);
- Lake Waco Dam Trail (2.8 miles); and
- Cotton Belt Trail (2.5 miles)

The Brazos Riverwalk connects to the downtown bikeway network via the University Parks bike route, and will connect to future bikeways along Elm Avenue and Washington Avenue. The Lake Waco Dam Trail will connect to the future Lake Shore Drive bikeway. However, the Cotton Belt Trail does not connect to the bikeway network, and at this time, is primarily a recreational trail.

Waco has about 14.5 miles of on-street striped bike lanes, as listed below:

- 4th Street from Jefferson Street to Baylor University;
- 5th Street from Jefferson Street to Cleveland Avenue;
- 11th/12th Streets from Garden Drive to Columbus Avenue;
- Washington Avenue from University Parks Drive to 5th Street;
- Lake Shore Drive from Wooded Acres Drive to N 19th Street;
- Park Lake Drive from 19th St to Lake Shore Drive;
- S 26th St from Clay Avenue to Bagby Avenue;
- Panther Way between Woodgate Drive and Ritchie Road;
- Martin Luther King Jr Drive from Bus 77/SH 6 to the IH-35 southbound frontage road;
- Orchard Lane from Martin Luther King Jr Drive to Bus 77/ SH 6; and
- N 36th Street from Edmond Avenue to Hubby Avenue (bike/ped lane).

Baylor University has also striped a little more than one mile of bike lanes within their campus, including:

- S 3rd Street from Dutton Avenue to mid-block between Bagby Avenue and Daugherty Avenue;
- Bagby Avenue from S 4th Street to S University Parks Drive;
- Dutton Avenue from S 4th Street to S 5th Street;
- S 5th Street from Dutton Avenue to MP Daniel Esplanade; and
- S 7th Street from MP Daniel Esplanade to Speight Avenue.

Waco has two signed bike routes totaling 3.5 miles.

- University Parks Drive from the IH-35 southbound frontage road to Herring Avenue; and
- Columbus Avenue from 4th Street to 11th Street.

The existing bikeway network provides bicycle connectivity in the vicinity of downtown and Baylor campus. However, the remainder of the bikeway network is piecemeal and disconnected, and therefore does not serve as a meaningful way to connect residential areas to primary destinations. Table 4.6 below summarizes existing bikeways by facility type. See Map 4.10 for the location of existing bikeways.

table 4.6 – summary of existing bikeways

Bikeway Type	Length (Miles)
Off-Street Separated Bikeways *(paved shared-use paths)*	13.76
On-Street Separated/Protected Bikeways *(protected bike lanes or cycle tracks)*	0
On-Street Bike Lanes, including Baylor Campus *(conventional and buffered bike lanes, and bicycle/pedestrian lanes)*	15.65
On-Street Shared Bikeways *(signed bike routes with or without sharrows)*	3.52

In addition to a lack of designated bikeways, public bicycle parking outside of the Baylor University campus is extremely limited. Public bicycle racks are located at the Waco Transit Center, downtown Waco, and at some public buildings such as schools, libraries, and municipal buildings. Currently none of the jurisdictions in McLennan County require bike parking for new development or expansion of existing developments. Since 2012, the City of Waco zoning ordinance has allowed the reduction of building setbacks or vehicle parking if major urban design and/or multi-modal features are added to the project (e.g., wider sidewalks, pedestrian lighting, street furniture, and bike parking). Several projects have taken advantage of this requirement and added bicycle racks to their development (mostly university student housing).

Bicycling infrastructure is also beneficial for micromobility vehicles/devices such as e-bikes and e-scooters. Bikeways help micromobility riders travel safely by minimizing interaction with motor vehicle traffic and/or providing motorists with predictability and consistency for where cars can expect to interact with bikes, e-bikes and e-scooters on public roadways. Bike parking can also be modified to accommodate micromobility devices by providing flexible parking zones, such as geofenced parking areas in furniture zones or on-street parking spaces. The City of Waco has revised several city ordinances (e.g., zoning, traffic and vehicles, and parks and recreation) to define shared mobility and various micromobility devices; include riders of shared micromobility devices under the definition of vulnerable road user; and prohibit shared micromobility programs and micromobility devices in the public right-of-way without an agreement with the city.

4.3.2 – pedestrian facilities

A small percentage of McLennan County residents walk or roll (using a wheelchair or stroller, or other wheeled mobility device) as their primary mode of transportation. According to the 2013-2017 ACS 5-Year Estimate, 1.7% of workers in McLennan County walk to work. The small percentage of walking and rolling trips is likely due to a combination of factors, most notably land use (proximity of trip origins and desired destinations), the lack of a pedestrian-oriented culture, and the existing condition of the pedestrian network.

Areas developed prior to 1950, such as older downtown grid streets, contain most of the pedestrian facilities. Beyond these areas the sidewalk network is scattered and desired destinations are generally well beyond a walkable 0.25 mile from residences. Map 4.11 shows the distribution of sidewalks by Transportation Analysis Zones (TAZ) within the Waco Urbanized Area.

Only a few of the cities in McLennan County require the construction of sidewalks or have formally planned for the buildout of a pedestrian network. For example, the Waco and Hewitt comprehensive plans include a map of their preferred pedestrian

network. Bruceville-Eddy, Lorena, and Robinson have policies in their comprehensive plans to encourage walking and sidewalk connectivity in their downtowns and/or residential areas.

Waco city ordinance requires the construction of sidewalks under certain circumstances: all arterial and collector streets, including new streets and new/redevelopment on existing streets; new or redevelopment on all existing streets in the College & University and Downtown District zoning overlays; infill projects that would provide sidewalk gap closure; and infill projects fronting a street identified on the City Sidewalk Plan. These ordinances have incrementally increased the sidewalk network in Waco. This has been most successful in the downtown and college overlays because of highly-concentrated growth and Tax Increment Financing (TIF) contributions, which together result in continuous sidewalk improvements for entire blocks. In other parts of the city, the sidewalk network remains patchy because of the piecemeal and discontinuous nature of development/redevelopment.

The City of Waco recently revised its traffic ordinance to prohibit riding shared micromobility devices on sidewalks, and expressly allow them on shared-use paths.

4.4 – rail

4.4.1 – freight rail

Two railroad companies serve the Waco Metropolitan Area: Union Pacific Corporation (UP) and the Burlington Northern Santa Fe Corporation (BNSF). Union Pacific has two primary lines through Waco. One line provides freight service between Fort Worth and Temple. The other line provides freight service from the Bellmead Yards south through Bryan / College Station and represents a primary UP service between Dallas / Fort Worth and Houston. BNSF has trackage rights on the UP line between Temple and the Bellmead yards. The remaining lines are spurs providing freight service to individual industries within McLennan County. BNSF provides freight service connections to Temple and Fort Worth through Moody, McGregor and Crawford. The BNSF line is an important connection between the Port of Houston and Fort Worth. Table 4.7 summarizes rail line statistics within McLennan County.

The main concern of freight rail in McLennan County is the significant number of at-grade rail crossings. As of 2013, there were 93 public at-grade crossings, of which there are 8 crossings with particular concerns. These concerns are primarily: 1.) Traffic greater than 4,000 vehicles per day, 2.) Train speed in excess of 60 mph, and 3.) Crossings that are the primary cross-town access for several towns. Table 4.8 ranks the crossings that are of most significant concern in order of traffic volumes. Map 4.12 shows the location of both freight and passenger rail facilities within McLennan County as well as the at-grade crossings of concern.

table 4.7 – rail line statistics: mclennan county

Line	Company	Daily Trains	Grade Separated Intersections	At Grade Intersections	Proposed Grade Separations*	Percent Grade Separated*
Bellmead to Fort Worth	Union Pacific	24	3	18	0	14.2%
Bellmead to Temple	Union Pacific	14**	12	30	2	28.6%
Bellmead to Hearne	Union Pacific	12	3	14	0	17.6%
Temple to Fort Worth	BNSF	20	1	17	1	5.5%
Waco to Lehigh Cement	Union Pacific	1	3	6	2	33.3%
Lacy-Lakeview to Cargill	Union Pacific	2	3	6	0	33.3%
UP Main Line to M&M Mars	Union Pacific	8	0	1	0	0.0%
	Total	15.8[t]	25	92	5	21.4%

*Does not include proposed grade separations.
**Does not include 8 local trains that run between the Bellmead yards and the Texas Central Industrial Park.
[t] Represents the average number of trains per intersection in McLennan County.
Source: Federal Railroad Administration

table 4.8 – at-grade railroad crossings with concerns

Crossing	Community	2011 Traffic	Daily Trains	Concern
FM 2063 at UP RR	Hewitt	10,800	4	Traffic with high speed trains
FM 2114 at UP RR	West	7,300	18	Town split by RR
FM 2837 at UP RR	Lorena	4,300	4	Traffic with high speed trains
FM 308 at UP RR	Elm Mott	4,400	18	Traffic with high speed trains
FM 107 at BNSF RR	Moody	3,400	26	Town split by RR
FM 1860 at UP RR	Riesel	3,200	12	Town split by RR
SH 7 at UP RR	Bruceville-Eddy	2,400	4	Traffic with high speed trains
FM 185 at BNSF RR	Crawford	2,000	26	Town split by RR

4.4.2 – passenger rail

Passenger rail service provided by Amtrak stops at McGregor on the BNSF tracks. The station is located approximately 20 minutes west of Downtown Waco in Downtown McGregor near SH 317. The Texas Eagle provides daily service to Dallas / Fort Worth, Austin and San Antonio. Passengers may continue to Chicago on the Texas Eagle via Fort Worth. Three times a week the Texas Eagle continues west from San Antonio to Los Angeles. Connections to New Orleans may be made on the Sunset Limited in San Antonio. Passengers may also continue to Oklahoma City by connecting to the Heartland Flyer in Fort Worth. Table 4.9 summarizes passenger arrivals and departures at the McGregor Amtrak depot.

table 4.9 – passenger arrivals and departures: mcgregor amtrak depot

2013	2018	Change	Percent Change
5,209	5,061	-148	-2.8%

The McGregor depot is a historic structure dating back to the early 1900s. The depot is owned by the BNSF railroad which also owns the adjacent maintenance facility. The facility has recently been upgraded to provide full ADA accessibility to Amtrak services.

4.5 – aviation

Four public use airports service the Waco Metropolitan Area, Waco Regional Airport, Texas State Technical College Airport (formerly James Connally Air Force Base), the McGregor Executive Airport and the Valley Mills Municipal Airport. In addition to these there are several small, private landing strips with mostly unimproved surfaces that are available for emergency use.

4.5.1 – commercial aviation / waco regional airport (ACT)

Commercial service airports are publicly owned airports that have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service. Waco Regional Airport (ACT) is the only commercial airport in McLennan County. ACT is located northwest of downtown Waco with an approximate vehicle travel time of 12 minutes. ACT is a fully certified Federal Aviation Administration (FAA) airport and has an FAA tower, 24-hour National Oceanic and Atmospheric Administration (NOAA) automated surface observing system, and 24-hour fuel service. The control tower operates between the hours of 6:00 AM and 12:00 AM.

ACT is equipped with two all-weather runways. Runway 1-19 is 7,107 feet in length and 150 feet in width, and Runway 14-32 is 5,103 feet in length and 150 feet in width. Runway 1-19 is equipped with precision runway markings, and Runway 14-32 is equipped with non-precision markings. Runway 19 is also equipped with an Instrument Landing System and a Medium Intensity Approach Lighting System with Runway Alignment.

Commercial air service at ACT is provided by Envoy Air, which operates under the American Eagle brand. American Eagle is a wholly-owned subsidiary of the American Airlines Group. American Eagle provides six daily flights between ACT and Dallas / Fort Worth International Airport (DFW).

Currently American Eagle uses 44 passenger Embraer ERJ-140 and 50 passenger Embraer RJ-145 regional jets, and offers five or six daily departures, depending on the season. Assuming six daily departures, the annual one-way passenger seat capacity in 2019 is 102,930 seats. Table 4.10 provides the total passenger enplanements for the years 2010 through 2017. As shown in the table, enplanements have fluctuated up and down, with a peak in 2014. In 2017, commercial aircraft at ACT operated at an average of 70% of capacity (also known as load factor), compared to a national average of 82.5% (Bureau of Transportation Statistics).

table 4.10 – waco regional airport passenger enplanements: 2010 to 2017

Calendar Year	Passenger Enplanements	Percent Change from Previous Year
2017	58,888	-8.50%
2016	64,356	2.34%
2015	62,882	-5.63%
2014	66,631	6.38%
2013	62,634	4.68%
2012	59,836	-2.17%
2011	61,164	-0.39%
2010	61,401	-7.09%

Source: Air Carrier Activity Information System, FAA Airports (2011-2018)

4.5.2 – general aviation

General aviation airports are public-use airports that do not have scheduled service or have less than 2,500 annual passenger boardings. The Waco Metropolitan Area is served by four general aviation airports.

waco regional airport (ACT)

ACT is also a full service general aviation airport providing 24-hour refueling and tiedown services, charter flights, 18 executive hangars, 50 light aircraft hangars, major airframe and powerplant maintenance and repair services. ACT serves a substantial level of general aviation activity. While the majority of general aviation activity is conducted by small piston powered aircraft, ACT is also used extensively by itinerant business jet aircraft.

texas state technical college airport (CNW)

Texas State Technical College currently maintains and operates the former James Connally Air Force Base and provides training facilities at the airport, along with pilot training degree programs and certifications. The CNW airport is located just off of IH-35 approximately 8 miles north of downtown Waco, with an approximate drive time of 12 minutes. The airport has two parallel runways, 17L/35R which is 8,600 feet in length and 150 feet in width, lighted with an ILS approach to Runway 17L. Runway 17R/35L is 6,291 feet in length and 75 feet in width. The airport control tower operates from 7:00 AM to 11:00 PM and is staffed with FAA-certified controllers. On-site support services include a full-service fuel facility, Automated Weather Observation System (AWOS) and Aircraft Rescue and Firefighting (ARFF) Index E Unit. CNW is home to several aviation related industries, including L3 ISR Systems Waco, Siemens, and Night Flight Concepts. L3 primarily modernizes and modifies military aircraft, while also working on some civilian aircraft. The majority of aircraft operations at CNW are local; itinerant operations are a smaller percentage of aircraft operations.

Table 4.11 summarizes the 2017 aircraft operations for Waco Regional Airport and TSTC airport. Data for McGregor and Valley Mills airports were not available.

table 4.11 – aircraft operations by airport: 2017*

Aircraft Operation	Waco Regional Airport (ACT)	TSTC Airport (CNW)
Itinerant Operations		
Air Carrier	148	4
Air Taxi	4,341	54
General Aviation	21,498	20,667
Military	7,148	4,634
Total	33,135	25,359
Local Operations		
Civil	6,686	63,260
Military	1,178	9,892
Total	7,864	73,152
All Operations Total	40,999	98,511

*Data for McGregor and Valley Mills Airports were not available.
Source: Air Traffic Activity System (ATADS), Federal Aviation Administration

navigational aids

The FAA maintains two radio aids to navigation within the Waco MPO Area. The Waco VOR (Very-high frequency omni-directional range) transmitter is located off of FM 2490 approximately 3.6 miles northeast of the Waco Regional Airport and provides direction and distance information to commercial and military aircraft. The Waco VOR is monitored by the Fort Worth Flight Service Station to ensure continuous operation. The other radio aid to navigation is the Robinson NDB (Non-Directional Beacon) which provides aircraft direction information to and from the facility. The Robinson NDB is located off of FM 434 south of Loop 340. Map 4.13 shows the various aviation facilities and navigational aids within McLennan County.

mcgregor executive airport (PWG)

The McGregor Executive Airport (PWG) provides general aviation service approximately 15 miles west of downtown Waco off of US 84. The airport has two runways: Runway 17-35 is 5,501 feet in length and 75 feet in width with medium intensity runway lights; and runway 4-22 is 3,484 feet in length and 55 feet in width with no runway lighting. The airport does not have a control tower. There are currently no precision approaches for PWG. PWG provides 24 hour refueling and tie down services, and major airframe and powerplant maintenance and repair services.

valley mills municipal airport (9F1)

The Valley Mills Municipal Airport (9F1) is an unattended field providing general aviation service to the northwestern portion of McLennan County. The airport has two runways: Runway 6-24 is 3,028 feet in length and 40 feet in width and runway 14-32 is 2,788 feet in length and 40 feet in width. Both runways have unimproved surfaces. 9F1 does not provide any general aviation services.