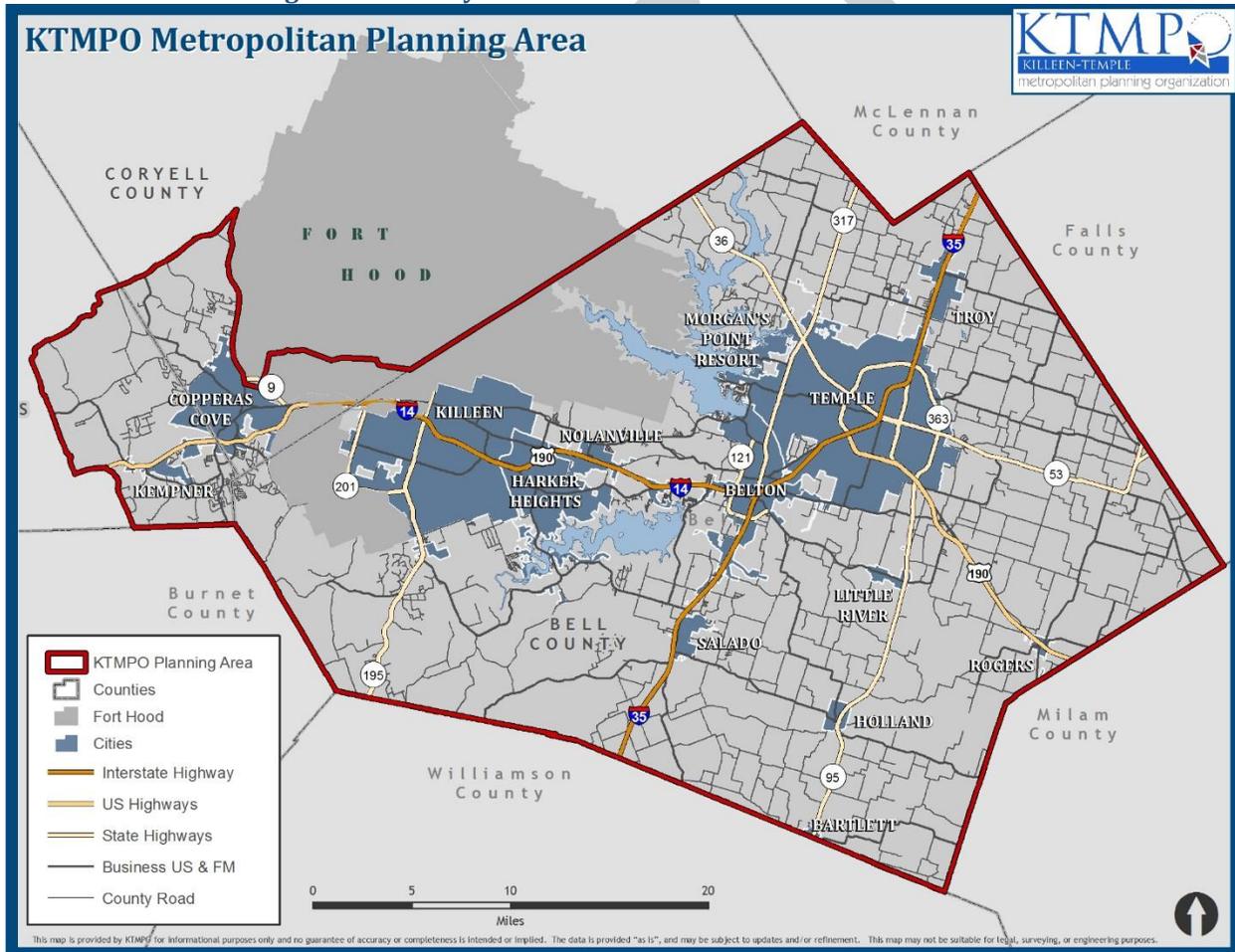


REGIONAL FUNCTION OF MAJOR TRANSPORTATION FACILITIES

The Killeen-Temple Metropolitan Planning Organization (KTMP) is situated in Central Texas and benefits greatly from growth economically. Located centrally between Dallas - San Antonio and El Paso – Houston, Central Texas maintains major roadway facilities that are vital to commerce, manufacturing and the military. As stated in the previous chapter, the KTMP region expects to add another 206,000 in population by 2045. Growth factors and expected pass-through traffic growth on our roadways will continue to warrant major investments for safe and reliable roadway facilities. These investments are essential to the economy and security for Texas and the United States.

Exhibit 4.1: KTMP Regional Roadways



Within our region are nationally known manufacturers of goods, distributors of various products, nationally recognized medical facilities and the largest active duty armored post in

the United States Armed Services. Our location allows for the movement of goods, services and the military in an economically viable manner. Major highways such as I-35 and US 190/I-14 provide a safe and efficient way to move products through the State and the nation.



As of 2015, the Killeen-Temple-Fort Hood metro area is #9 in Texas based on population. From 2010 through 2015, the KTMPO region grew an estimated 5% and projections show that growth in the KTMPO region is expected to increase by 56% by 2045. As previously stated, these growth factors have a

significant impact on the future KTMPO transportation facility needs. With growth comes the growth pains of congestion. Congestion in the KTMPO region has a significant impact on the region's ability to maintain air quality, effectively move goods, people and services, and to decrease transportation cost. KTMPO's goal is to maintain a safe, reliable, functional and efficient transportation system for the growing population, growing commerce needs and meet future air quality standards.

Quality of life events have been a local mantra for the KTMPO area for many years and is a large reason for business and the labor force to locate in Central Texas. KTMPO reaps the benefit of having two large US Army Corps of Engineers managed lakes/impoundments. Belton Lake covers 12,300 surface acres and Stillhouse Hollow Lake covers 6,430 acres. These impoundments are critical as water resources and are utilized heavily by recreational users.

Temple is home to the Wildflower festival and Belton has been named as one of the nation's "Top Ten Places to Fly Your Flag on the 4th of July." Belton is also home to the Bell County Expo center that brings visitors to the area weekly with events that draw crowds in the thousands.



Fort Hood holds major events annually that draws visitors by the thousands to include a 5-mile animated Christmas light display and one of Texas' premiere 4th of July festival and fireworks displays. The City of Killeen is home to Killeen Civic and Conference Center. Killeen hosts many

events to include fun runs, the arts and theatre productions to name a few. Copperas Cove holds an annual “Rabbit Festival” with over 20,000 visitors over a 3-day period. Harker Heights hosts the annual “Central Texas Food, Wine and Brew Festival”.

The entire Central Texas region embraces the military and their families in many efforts of support. Each of the Central Texas communities has vibrant and very active Chambers of Commerce. All Central Texas communities are dependent on safe, reliable, functional and efficient transportation systems to maintain a high quality of life, and to that end, this is a KTMPO goal.

The larger cities of the KTMPO region are home to higher education facilities such as Central Texas College and Texas A&M University - Central Texas in Killeen; University of Mary Hardin Baylor in Belton; and Temple College in Temple. Each of these facilities are experiencing phenomenal growth to meet the demand. Quality of life, central location, and opportunity have played important roles in the sustained growth the KTMPO region experiences. Along each of the KTMPO major transportation facilities, users of these facilities consist of businesses, commuters, school students, recreational users, freight haulers, military and medical personnel.



THOROUGHFARE PLAN DEVELOPMENT

KTMPPO developed a Regional Thoroughfare and Pedestrian/Bicycle Plan in 2008 to create a forward-thinking blueprint for the region’s transportation system. The plan consists of two distinct, but related components: a thoroughfare element and a pedestrian/bicycle element. This plan was updated in 2010 to accommodate an expansion in the KTMPO boundary, and again in 2011 to incorporate significant changes in the pedestrian/bicycle element.

In 2018, KTMPO developed a Regional Multimodal Plan which includes the Regional Thoroughfare and Pedestrian/Bicycle Plan. This plan expands its focus to include how other multiple transportation modes such as transit, freight and air interaction with the roadway and bike/pedestrian network and provides an outline on how to plan for developing an integrated

and comprehensive regional transportation network. The plan can be found in **Appendix E, Regional Multimodal Plan**.

TYPICAL CROSS-SECTIONS BY FUNCTIONAL CLASSIFICATION

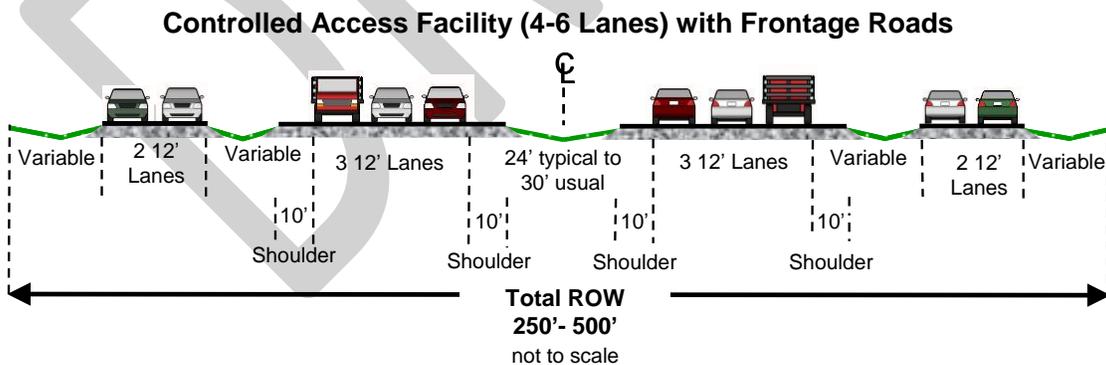
The cross-section designs that follow are taken from the Regional Multimodal Plan and are tailored for each classification in the KTMPO planning area. More details on the development of the typical sections can be found in **Appendix E, Regional Multimodal Plan**. Future regional thoroughfare plans are depicted in Exhibits 4.8 through 4.12.

Controlled-Access Functional Classification

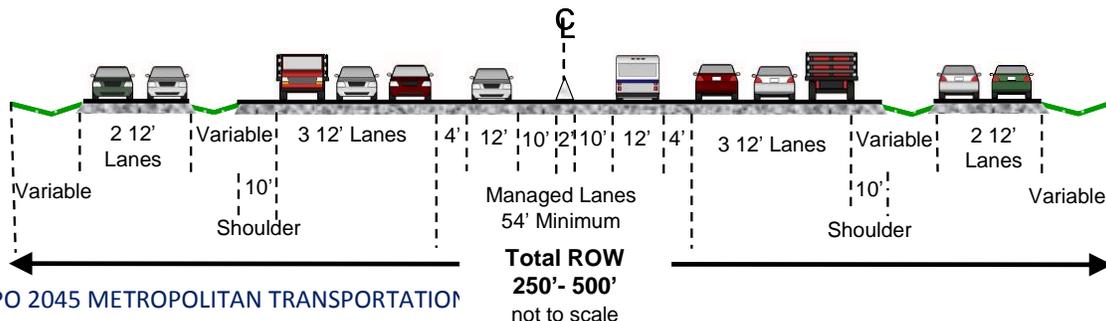
General design standards for Controlled-Access Function Class call for a minimum right-of-way width of 250' for four lanes, with the desirable standard being six lanes and 500'. Design details are determined by TxDOT. Bicycles and pedestrians are prohibited due to the high speeds of these classes of road, so the design of supporting bicycle and pedestrian infrastructure (including shared use of wide shoulders) is not applicable.

Where a wide grassy median is not desired, a raised concrete median such as a "Jersey barrier" can be installed. The use of Jersey barriers can serve as the base for light standards, sign posts, bases for the retaining walls between the main lanes and the frontage roads.

Exhibit 4.2: Typical Cross-Sections—Controlled-Access Arterials



Controlled Access Facility (4-6 Lanes) with Managed Lanes and Frontage Roads



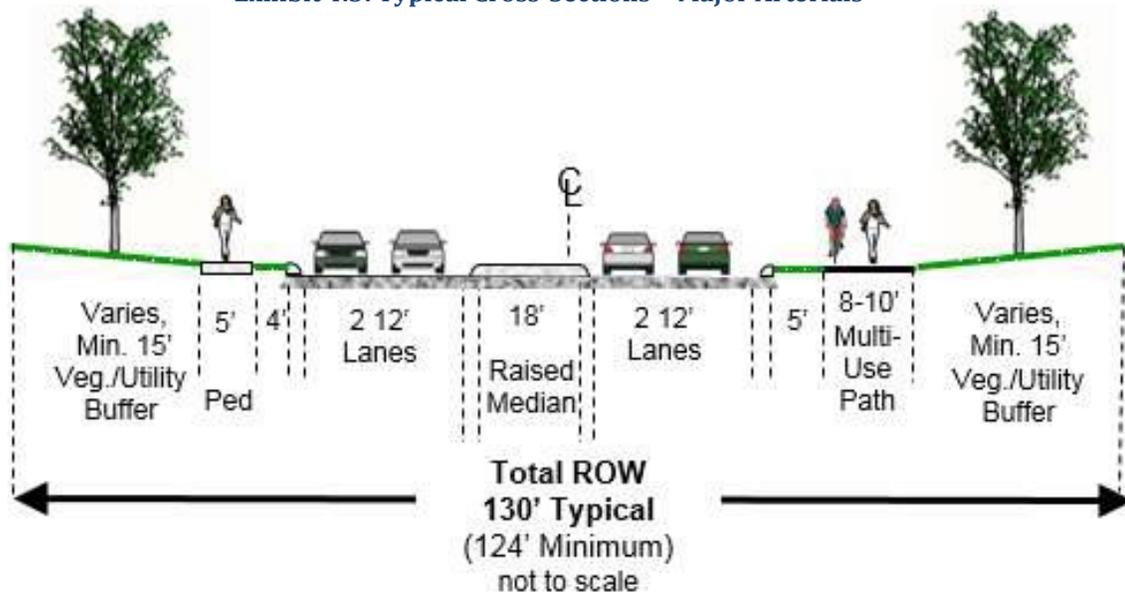
Major Arterial Functional Class

Major Arterial Functional Class general design standards call for a 130' minimum right-of-way for a four-lane facility, with 160' desirable for six lanes. A travel lane width of 12' as specified is common for existing Major Arterials in the KTMP region, but Complete Streets and Vision Zero guidance calls for narrowing travel lanes to 11' to slow traffic to speeds that are more safe for all road users.

For divided Major Arterials, a minimum median width of 18" is desirable. The median divider can be a permanent feature such as a curb or a raised concrete barrier, or can be landscaped. For landscaped medians, a minimum width of 15" is recommended. Typical practice in the KTMP region has been to install wider grassy medians, with widths of 15' typical for older urban streets such as Ave H in Temple, and 20' to 40' typical for new construction streets in suburban areas such as SH 201 in Killeen and S. 5th Street in Temple.

Bicycle and pedestrian facilities are permitted on Major Arterials and lower Functional Classes. Therefore, the cross sections for typical Major Arterials include sample variations in the different classes of bicycle and pedestrian infrastructure as well as differences in the number of lanes, lane widths, medians, and other road attributes. Typical cross-sections are shown in Exhibit 4.3.

Exhibit 4.3: Typical Cross-Sections—Major Arterials



Minor Arterial Functional Class

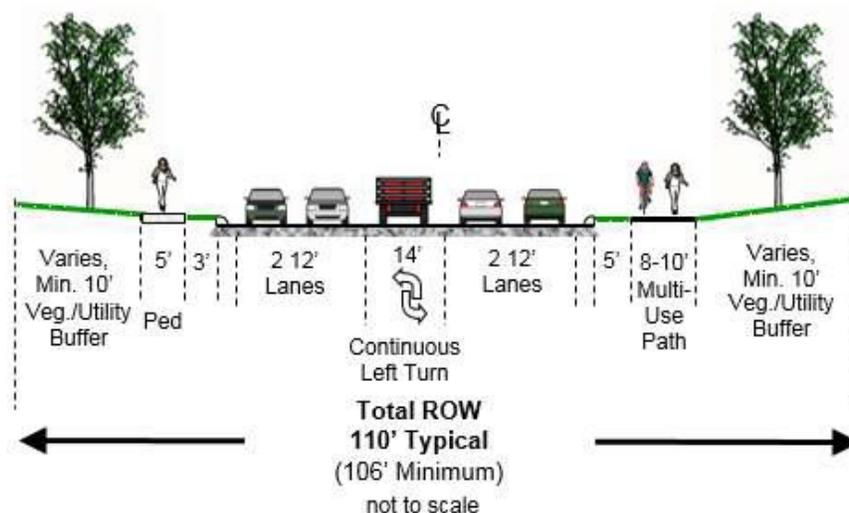
Minor Arterials general design standards call for a minimum right-of-way of 80' for three lanes, increasing to 110' for four lanes. The desirable right-of-way is 120', which will accommodate five lanes.

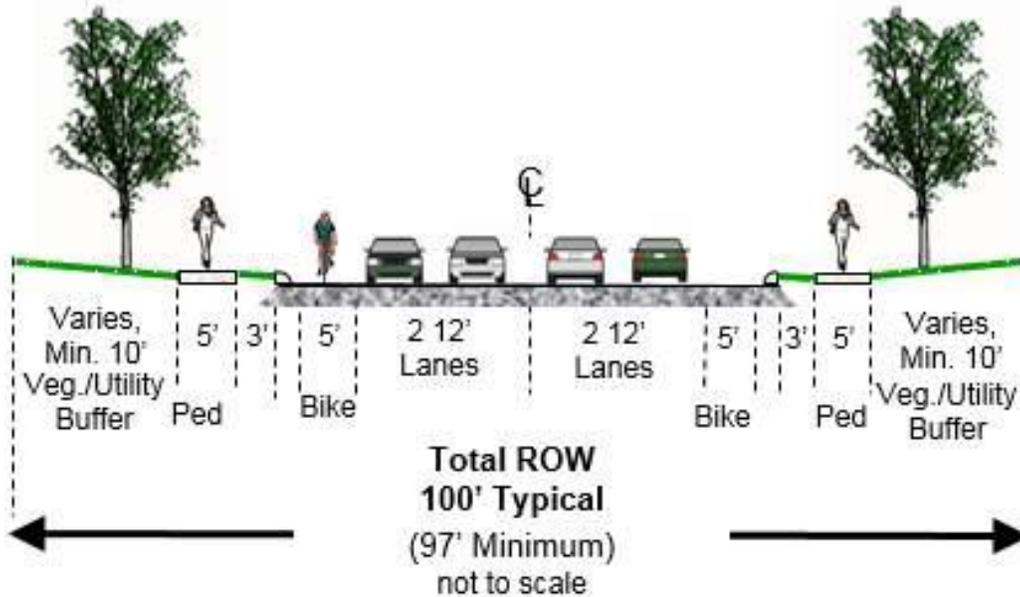
As with Major Arterials, a travel lane width of 12' is common in the KTMP region. The Complete Streets and Vision Zero guidance calling for travel lanes of 11' to slow traffic to speeds that are more safe for all road users is even more pertinent for Minor Arterials, given their position in the access/mobility continuum that has greater emphasis on access and on multimodal uses.

A continuous center turn lane has been recommended as an appropriate median treatment for Minor Arterials, with a desirable width of 16'. Landscaped buffer areas on the edges of Minor Arterials are recommended with a 10' width.

Minor Arterials may have greater accommodations for bicycles and pedestrians than Major Arterials, as they typically have lower speeds, lower traffic volumes, and a smaller percentage of trucks in the traffic stream. Separated off-street paths or sidewalks and a separated off-street multi-use may be included along Minor Arterials.

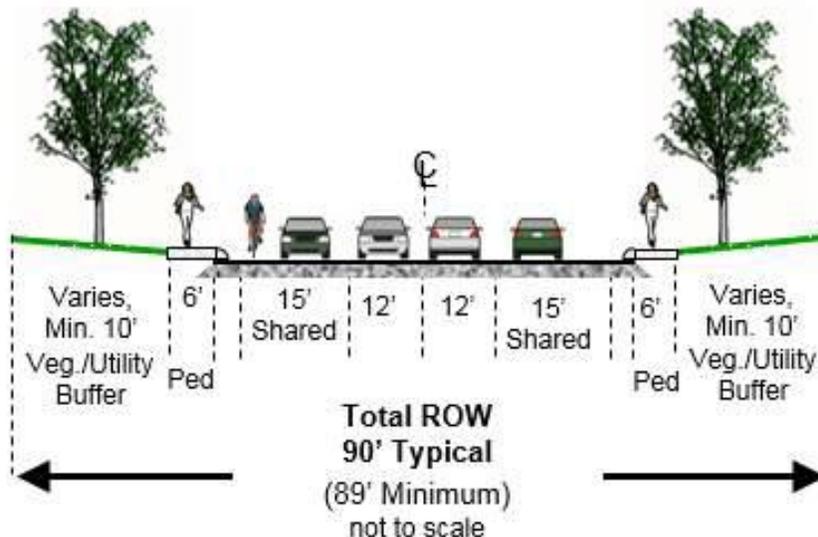
Exhibit 4.4: Typical Cross-Sections—Minor Arterials





More extensive bicycle and pedestrian accommodations are shown in the cross section in below. Separated off-street paths or sidewalks and on-street conventional unbuffered bike lanes are shown.

The next cross-section shows a typical four-lane Minor Arterial with wide outside lanes, intended to permit autos and bicycles to safely share a lane. The recommended width of the shared lane is 15'. The wider outside lanes should be carefully marked with visual clues to discourage excessive vehicle speeds and preserve street safety for all users. The width of the street can compromise the safety of the pedestrian crossing, but this can be mitigated by the use of median pedestrian refuges and well-marked crosswalks.



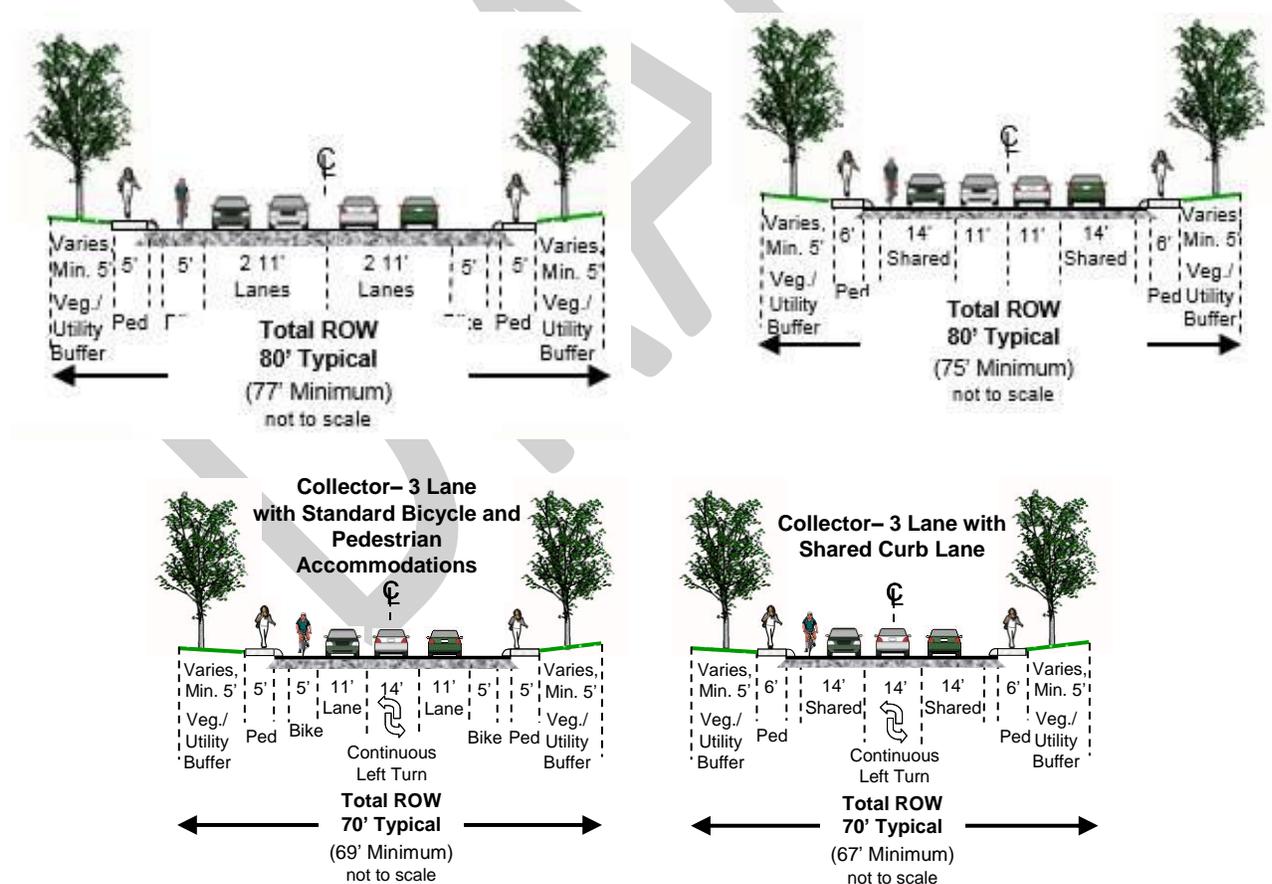
Collector Functional Class

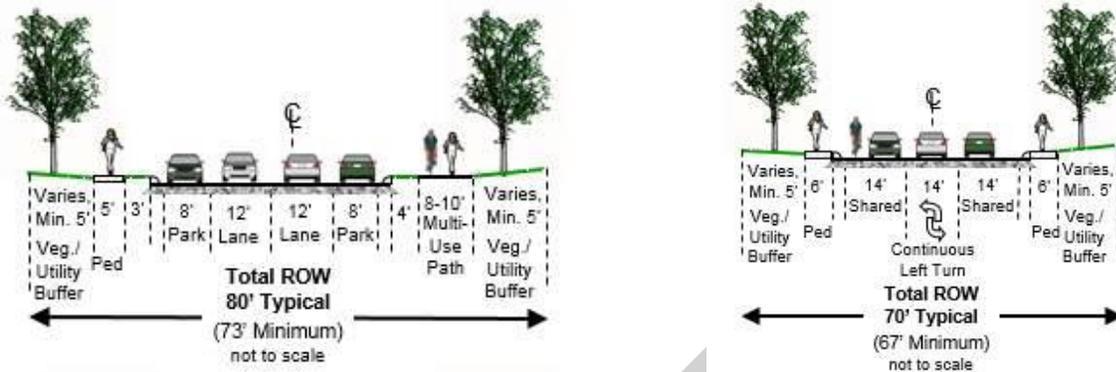
Collector Functional Class is the Functional Class which is most geared to providing access. With mobility as a less critical attribute, narrower lane widths of 11' are recommended, although widths as narrow as 10' are cited in Complete Streets and Vision Zero guidelines. Shared auto and bicycle outside lanes may be as narrow as 14'. Minimum right-of-way of 60' for two lanes and 70' for three lanes are listed in the guidance. For four lanes, a desirable right-of-way is 80'.

Due to the lower speeds and lower volumes of traffic, continuous center turn lanes on Collector Streets may be as narrow as 14'. Medians and buffers should have a minimum width of 5'.

More extensive bicycle row and pedestrian treatments should be expected on Collector Streets.

Exhibit 4.5: Typical Cross-Sections—Collectors



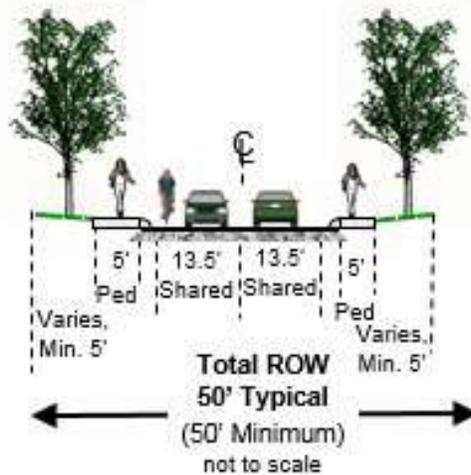


Local Street Functional Class

Local Functional Class Streets have the lowest speeds and volumes of all the Functional Classes. With these attributes, travel lane widths can consistently be narrower, with 10.5' recommended as a minimum. Widths as narrow as 10' are cited in Complete Streets and Vision Zero guidelines.

A right-of-way width of 50' is recommended for Local streets. The Exhibit 4.6 shows a typical cross section for a two-lane local street. In this illustration, shared lanes of 13.5' are provided. Narrower travel lane widths may be implemented to reduce traffic speeds to levels that are safe for users of all ages and abilities.

Exhibit 4.6: Typical Cross-Sections—Local Street Functional Class



The table below summarizes the recommendations for right-of-way (ROW) considerations by street Functional Class. Minimum ROW is based on 4 lanes for Principal Arterials, 3 lanes (two travel lanes and a center turn lane) for Minor Arterials, and 2 lanes for Collectors and Local streets.

Exhibit 4.7: Summary of ROW Requirements Recommendations by Functional Class

Design Element	Controlled-Access	Major Arterial	Minor Arterial	Collector	Local
Preferred ROW Width	Varies up to 500'	160'	120'	80'	50'
Minimum ROW Width	250'	130'	80'	60'	44'
Typical Pavement Width (BOC to BOC)	Varies	82' to 106'	47' to 75'	31' to 57'	23' to 29'
Auto Lane Width	Minimum 12'	Preferred 12'	Preferred 12'	Minimum 11'	Minimum 10.5'
Median Treatment	Rural: Minimum 36' Urban: Minimum 10'	Preferred 18'	Continuous Center Left Turn Lane Preferred 14' Minimum	Continuous Center Left Turn Lane Preferred 14' Minimum	None
Outside Vegetation/Utility Buffer (minimum)	Varies	15'	10'	5'	5'
Notes	Inside Shoulder: Minimum 4' Outside Shoulder: Minimum 10' Vertical Clearance: Minimum 14'	ROW may be greater with parking, bicycle and pedestrian facilities, bus stops, and intersection treatments.			

Exhibit 4.8: Future Regional Thoroughfare (Belton-Salado)

Insert Updated Map

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Exhibit 4.9: Future Regional Thoroughfare (Copperas Cove)

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Exhibit 4.10: Future Regional Thoroughfare (Harker Heights)

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Exhibit 4.11: Future Regional Thoroughfare (Killeen)

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Exhibit 4.12: Future Regional Thoroughfare (Temple)

Insert Updated Map

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THOROUGHFARE PLAN IMPLEMENTATION, FINANCING AND MAINTENANCE

Projects required for the implementation of the Thoroughfare Plan are to be constructed by a variety of implementing agencies, including municipalities, counties, Fort Hood, the Texas Department of Transportation, private developers, and in some cases, public-private partnerships. Municipalities are encouraged, while coordinating more closely with KTMP, to continue their own sound planning practices as they relate to zoning, subdivision regulations, building setbacks, access control, and visibility standards so that land and roadway development occurs in such a fashion to be consistent with the Thoroughfare Plan. In addition, they are urged to view the network within their jurisdiction as part of a larger regional system.

Traditionally, funding for the various types of roadway projects related to the development of the regional thoroughfare plan is provided via the local general obligation bond programs, the KTMP's Transportation Improvement Program, developer participation, and in some cases, toll revenue financing. The prioritization processes that are in-place for the development of these funding programs should continue to be followed to ensure that the most needed projects are the ones that are implemented first.

As with any long-range planning document, this Plan is considered a "living" document that responds to changing visions, goals, priorities, and trends of each individual jurisdiction. Alterations to the plan are derived from sound planning practices and are supportive of maintaining mobility of the transportation system in the KTMP region. As member jurisdictions make changes to their thoroughfare plan through either an incremental update process or through a complete restructuring as part of an updated Comprehensive Plan, notification should be provided to the MPO planning staff so that this regional plan can remain up-to-date. Any modifications to this plan should be such that they are harmonious with local plans and sensitive to the needs and constraints found within a local area. In turn, the local area plan must seriously consider the impact their changes have on the mobility needs of the entire region.

Due to Transportation Management Area (TMA) designation, it is vital that a plan maintenance process is formalized and incorporates suggested processes as recommended:

- The local entity presents the suggested revision to the MPO staff for initial review
- MPO staff reviews the suggested revision in terms of regional connectivity, impacts to future traffic patterns, and compatibility with the existing plan
- Once common understanding between MPO staff and the requesting entity is

reached, MPO staff and the requesting entity present the suggested revision to the MPO Technical Advisory Committee

- The MPO Technical Advisory Committee formally considers the proposed change(s) and staff recommendations
- Should the change be considered to be “significant” (e.g., in response to a complete overall of a city Comprehensive Plan), the proposed amendments are presented at a public hearing
- The MPO Technical Advisory Committee recommends approval by the MPO Transportation Planning Policy Board
- The revised Thoroughfare Plan network is adopted by the MPO Transportation Planning Policy Board

This process should be considered to be one element of the continuing, cooperative, and comprehensive transportation planning processes for the KTMPO planning area.

MAJOR FACILITIES IN THE KTMPO REGION



Below are the major facilities within the KTMPO region and their current state of usage:

Interstate Highway 35 (I-35)

As one of the highly recognized Congressional High Priority Corridors, I-35 is essential to the movement of goods and services within the state of Texas as well as from Canada to Mexico. Within KTMPO, I-35 stretches 36 miles from the Bell County lines north to south. I-35 is currently undergoing facility upgrades from the Bell County line to the south to the northern extent of Bell County. Facility upgrades will include: expansion from 4 lanes to 6/8 lanes of traffic, one-way service roads, bridge turnarounds, direct-connect bridges and others. Expected completion of all I-35 projects through Bell County is spring 2019.

I-35 is currently considered a lifeline for economic vitality. Future needs are far outgrowing the capacity of this facility. As a result, the State of Texas has organized an I-35 Advisory Committee that has developed a plan dated August 2011. The State of Texas I-35 Advisory Committee is taking a very holistic approach. This plan addresses future facility upgrades, maintenance and alternative measures (to include high speed rail) to relieve the current congestion as well as the anticipated future congestion challenges.



Left: I-35 at Thomas Arnold Looking North. The section of I-35 between FM 2843 in Salado to US 190 in Belton was completed in December 2016. This section of I-35 was upgraded to six lanes, improved ramps, one-way frontage roads, and new bridges.

The 2045 MTP incorporates consideration of projects that would continue upgrading I-35. One project will widen I-35, from six to eight lanes, from South State Loop 363 to US 190. The current average daily traffic count along this segment is _____. The projected 2045 average daily traffic count is _____.



Interstate 14 (I-14)/US Highway 190 (US 190)



Stretching approximately 50 miles, with 25 miles being designated as I-14, US 190 is another major corridor in the KTMP region. Primary use of US 190 is military and military support. With approximately 45,000 to 55,000 troops present in Fort Hood, there are approximately 278,000 members of military families and support personnel in the region. As a result of the large growing population, I-14/US 190 is continuing to be upgraded from four to six lanes. With I-14/US 190 in Killeen completed, the section of I-14/US 190 through Harker Heights has recently began to be upgraded. Future funding has been allocated to continue upgrading I-14/US 190 through the Nolanville area to the western side of Belton. As a strategic regional corridor, US 190/I-14 continues to be a top regional priority for the KTMP region.

Possible future consideration could be placed on relieving the congestion, increase freight movement, and providing a more direct connection of US 190. In 2018, KTMP, in partnership with TxDOT, completed the US 190 Feasibility Study to upgrade and/or relocate US 190 between FM 1670 in Belton to the Rogers Relief Route. The purpose of this study is to identify primary route options for a four-lane controlled access facility, with two to three lane frontage roads (if needed), 70 mph main lane design speed, overpass vertical clearance not less than 18'6", director connectors to/from I-35. A 400-ft right-of-way (typical) width was determined for this study.

As a community-driven effort, KTMPPO established a working group to guide the study and provide input. The working group, made up of city/county representatives, elected officials and other stakeholders, developed goals and objectives, route options and evaluation criteria to determine the five route options for further study as shown below. Exhibit 4.13 shows the five primary route options.

Exhibit 4.13: Primary Route Options

Pink Route: Utilizes existing I-14 and I-35; upgrades existing Loop 363 and US 190 between I-35 and Rogers



Blue Route: Follows existing I-14 to I-35 north to FM 93. Follows FM 93 and continues straight on an undeveloped land route to existing US 190.



Brown Route: Follows existing I-14 to north on I-35 to FM 93. Follows FM 93 from I-35 to existing US 190



Black Route: Follows existing I-14 to south on I-35. Briefly continues on an undeveloped land route to FM 436, and continues on an undeveloped land route north of Little River-Academy to existing US 190



Aqua Route: Takes an undeveloped land route from I-14 at FM 1670 to existing Shanklin Road, crosses I-35 to connect to FM 436. Continues on an undeveloped land route north of Little River-Academy to existing US 190



As part of the study, an open house was held to solicit public input on the proposed project and the five primary route options. A total 207 people registered their attendance at the open house by signing in. An online survey and public comment sheets were also available to those who did and did not attend the open house. In total, 428 online surveys were completed and 75 written comments were submitted. Overall, the Pink Route was the most supported and least opposed route, while the Black Route was the least supported and most opposed route.

The finding of the study was that the Pink Route is most supported/least opposed by the public, the general public does not see the need to relocate US 190, the Pink +2 Route option confirms regional planning efforts calling for the additional of a travel lane in each direction on I-35, and future US 190 improvements are compatible with and complement the Rogers Relief Route. If, in the future, it becomes necessary to relocate US 190, a fresh look at the primary route options

identified in this report is recommended to assess land use and environmental conditions at that time.

The working group considered the results of the open house, the goals and objectives, and other factors, the working group recommended that only the Pink +2 Route be carried forward into future studies/phases of project development and modify the MTP by adding other improvements as necessary to upgrade US 190 to interstate standards between I-35 and the Rogers Relief Route.

The US 190 Feasibility Study was conducted at the request of KTMP and local officials to gauge the level of public support for the concept and identify potential route options. The working group was created to guide the study and provide input. This report serves to document the findings of the study as well as the recommendation of the US 190 Working Group. The information contained in this report will be considered by KTMP and its Transportation Planning Policy Board as transportation funding decisions are made and the Metropolitan Transportation Plan is updated in the future. More about the US 190 Feasibility Study can be found on the KTMP website.

Gulf Coast Strategic Highway Coalition

A multi-state coalition for transportation improvements (Gulf Coast Strategic Highway Coalition) that includes Texas, Louisiana and Mississippi was formed to pursue the transportation needs of the U.S. Army and National Guard. The results of the “Forts to Ports” study show a corridor from El Paso Texas to Hattiesburg, Mississippi. US Highway 190 was selected as the corridor of choice for point to point delivery of troops and military goods. Local communities along US190 have shown significant need and desire to obtain interstate designation (I14). There appears to be significant regional, state and local support to upgrade and identify this facility as an East/West interstate connector to ports.



State Highway 195 (SH 195)

SH 195 connects travelers from I-14/US190 to I-35 north of Georgetown, Texas. Historically, this facility has been used for commuters to the Austin area. Whereas the facility continues to be utilized for commuters, in recent years it has become an important artery in the KTMPO roadway system. SH 195 is primarily utilized by commuters, students, military and regional airport travelers. SH 195 has recently undergone extensive upgrades to accommodate the needs of the public as well as the military as an alternative deployment artery. South of the KTMPO region, SH 195 was completed to finish upgrading SH 195 to a divided four lane highway all the way to I-35 in Georgetown.



The 2045 MTP incorporates consideration of projects that would widen this facility (four to six lane freeway with frontage roads) from Stan Schlueter Loop to Chaparral Road. The 2045 MTP also incorporates a grade elevation over the BNSF railroad tracks and Business 190 with widening of the roadway from Rancier Drive to US 190 (six to 10 lanes). The current average daily traffic count along this segment is 19,350. The projected 2045 average daily traffic count is 27,800.



State Highway 36 (SH 36)

This two-lane roadway has been used by trucking companies and travelers for many decades as an alternate route from Abilene to Houston. The route alternative is to pass through Fort Worth to Dallas and then to Houston. To the western portion of the KTMP region, SH36 passes through North Fort Hood just beyond the borders of the KTMP region. The North Fort Hood facility is home to the Military Equipment and Training Site which provides equipment for the US Army Reserve and Army National Guard. Fort Hood trains on average 22,000 guardsmen annually. As a result, SH36 is often a congested corridor with the movement of these troops. Oilfield activity in West Texas has also increased the usage of this facility.



The 2045 MTP incorporates consideration of projects that would widen this facility (two to four lane divided highway) from SH317 to the Coryell County line. The current average daily traffic count along this segment is 7,600. The projected 2045 average daily traffic count is 11,000.



State Highway 201 (SH 201)

SH201 begins at I-14/US190 and ends at SH 195. Recently, SH201 has undergone extensive upgrade to accommodate the traffic needs of higher education, the regional airport and the military. Texas A&M University – Central Texas (TAMUCT) has relocated along SH201. The TAMUCT is continuing to be develop and expand which can affect the amount of traffic along SH 201. The Killeen/Fort Hood Regional Airport is also located on SH201. Future considerations may include extension of SH201 for a direct connection to IH35. A SH201 connection was studied in 2014 that would allow for an alternative route to IH35, thereby relieving congestion and accommodating the future southern growth trends of Copperas Cove, Killeen and Harker Heights. On the northern end of SH201 there are three

major businesses that contribute to congestion. Central Texas College, Robert M. Shoemaker High School and Metroplex Hospital are all located close in proximity to US 190.

317 State Highway 317 (SH 317)
TEXAS

SH317 begins in Belton, Texas and ends at Valley Mills, Texas. This two-lane facility is utilized by a vast array of motorist to include commuters, recreational users, and freight haulers. Located parallel to I35, motorists utilize this two-lane facility at times as an alternative route. SH317 is also located near Lake Belton and many residential neighborhoods.



SH 317 provides major connections to I-35, Lake Belton and SH 36. SH 317 also acts as an alternate north to south route when I-35 becomes congested. There are many events that take place during the year on Lake Belton and in the Belton/Temple area. Each of the major holidays brings hundreds and sometime thousands to these communities and Lake Belton. Within the vicinity of SH 317 in west Temple, there are six Belton ISD facilities that compete with commuters, rock quarry truck traffic and recreational users. With the addition of a new future BISD high school at SH 317 and FM 2483 and a new future BISD elementary along Poison Oak Road, traffic along SH 317 is expected to increase.



KTMP has addressed current and future projections along SH 317 by allocating Proposition One funds to widen SH 317 from FM 439 to FM 2305 (Adams Ave) from two to four lanes with a median, and a shared-use path. This project was completed in fall 2018. Another project that will relieve congestion along this vicinity is the Prairie View Realignment Project. This project realigns Prairie View Rd and FM 2483 to a single intersection along SH 317 reducing the number of access points and increasing better traffic flow along each roadway. This project was

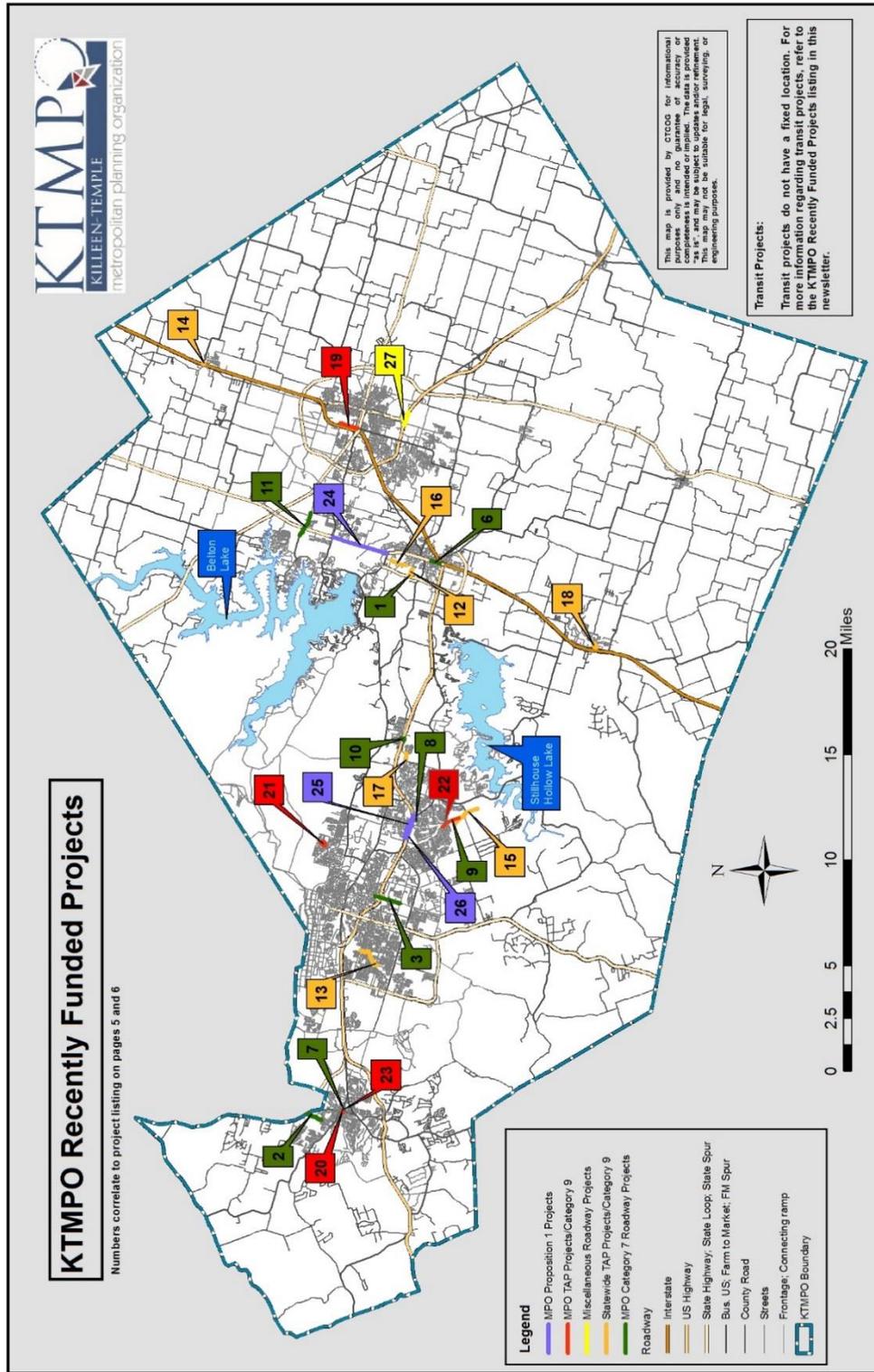
completed by the end of 2018.

**LOOP
363** **Loop 363 Expansion**

Loop 363 in Temple continues to experience heavy traffic. Expansion of this corridor over the past years appears to have accommodated traffic volume very well. By building out Loop 363 to a limit access facility with one-way frontage roads on the southern portion of the loop has allowed better flow of traffic and easier east/west movement through Temple. Notable projects include reconstruction of Loop 363 in Temple from South 57th Street to South 5th Street, construction from South 57th to SH 36, construction of the IH 35 overpass, construction of SH 36 underpass and others.

The 2045 MTP incorporates consideration of projects that would widen this facility (two to four lanes with frontage roads) from IH35 to SH36. The current average daily traffic count along this segment is 6,000. The projected 2045 average daily traffic count is 13,500

Exhibit 4.14: KTMPO Funded Projects (FY2013-FY2017)



MPO CATEGORY 7 PROJECTS						
Reference Number	KTMPPO ID	Project Name	Full Extents	Description	Total Cost	
1	B15-01	W 9th Ave	Loop 121 to University Dr on UMHB campus	Construct new roadway and bridge	\$ 3,990,610	Metro Mobility (Category 7 FY13 & FY14)
2	C35-04	Courtney Lane Sidewalks	FM 116 to Fairbanks St	Construct roadway/pedestrian improvements, including right turn lane and replacement of curb	\$ 273,133	
3	K35-03	W Trimmer Rd	Jasper Dr to Elms Rd	Reconstruct and widen to six lanes, access drive improvements, install signals and turn lanes	\$ 8,214,573	
4	A35-02	Bus Replacement	HCTD service in Temple UZA	Two replacement 25-passenger (Type 11) fixed route buses	\$ 803,303	
5	A40-03	Bus Replacement	Killeen/Temple UZA	Purchase of Fixed Route Service (FRS) buses and/or Special Transit Service buses	\$ 1,214,606	FY15 , FY16 & FY17
6	B40-03	Main St Sidewalk	Avenue C to Avenue J	Phase 1 of the proposed sidewalk expansion will include the repair and installation of sidewalks	\$ 406,908	
7	C40-02a	Ave D Sidewalk	South Main St. to South 2nd St.	Construct multi-terraced pedestrian walkway to include ramps, railings, crosswalk	\$ 330,492	
8	H40-02	Traffic Circle at Commercial Dr	Intersection of Commercial Dr. and Heights Dr.	Construct traffic circle at intersection of Commercial Dr. and Heights Dr.	\$ 571,349	
9	*K30-02	Rosewood Dr Extension	Riverstone Dr to Chaparral Rd.	Construction of a 4 lane roadway with center median with and off-system bridge	\$ 8,642,149	
10	N40-01	Main Street Connectivity	Avenue I to US190 Frontage	Construct ADA bicycle/pedestrian pathways along Main Street and under US190	\$ 627,186	
11	T35-24	Prairie View Road Enhancements	West of SH 317 to N. Pea Ridge	Construction of a 4 lane roadway, aligning FM 2483 to Prairie View Road with signalized intersection	\$ 6,858,000	
*Project partially funded--Cat 7 dollars: \$3,596,430					\$31,932,309	Total

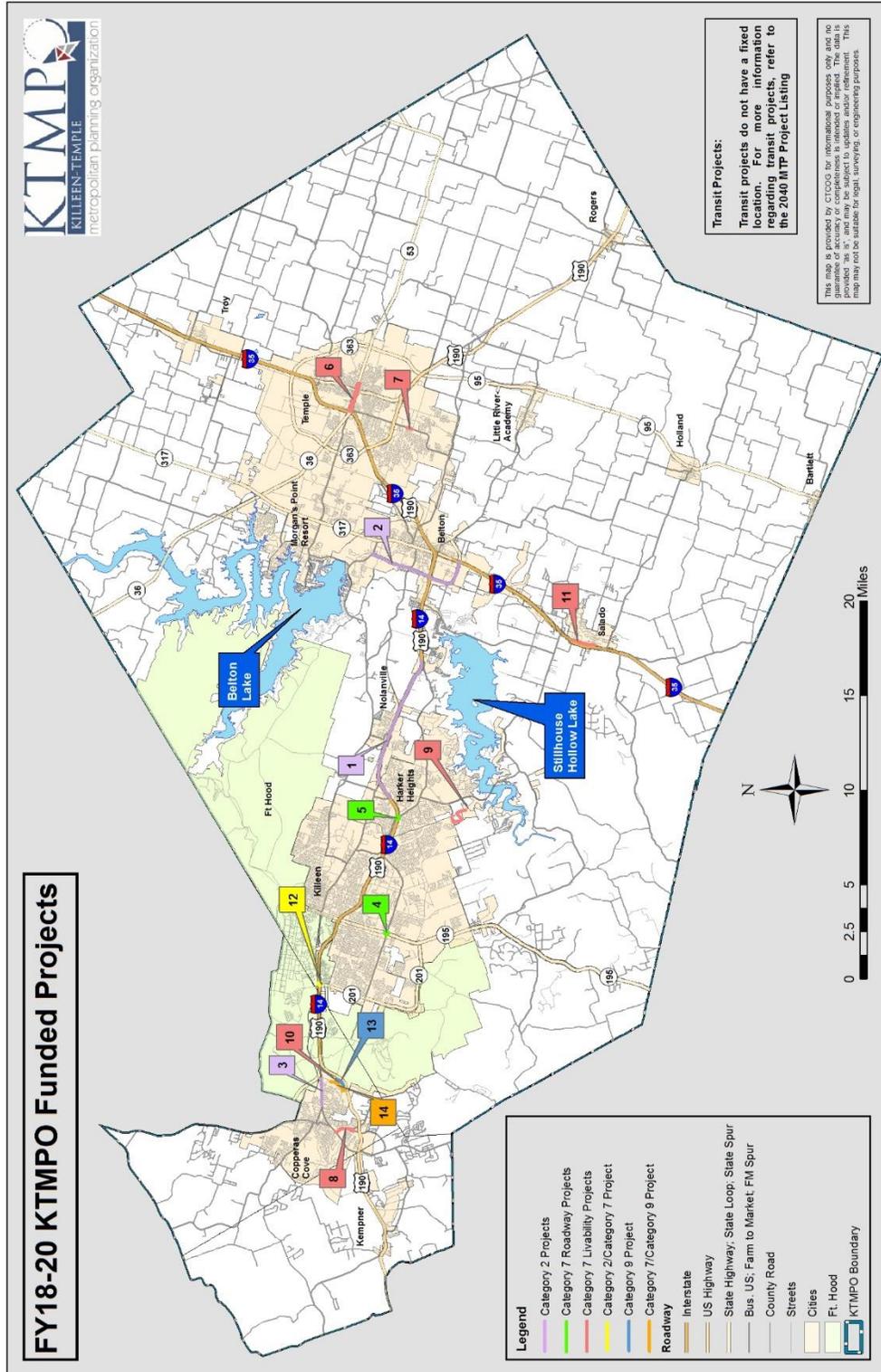
STATEWIDE TAP (Transportation Alternatives Program) PROJECTS (Category 9)						
Reference Number	KTMPPO ID	Project Name	Full Extents	Description	Total Cost	
12	B35-01	City Street	Loop 121 to University Dr on UMHB campus	Construct Chisholm Trail Corridor facility	\$ 1,569,750	Statewide TAP (previously Transportation Enhancements)
13	K35-02	City Street	Rimes to Watercrest Rd	Construct Killeen-Fort Hood Regional Trail, Segment 3	\$ 1,940,664	
14	D35-01	FM 935	Main Street to US Post Office Troy, TX	Construct downtown Troy Streetscape-Historic Commercial District	\$ 499,388	
15	K40-21	Heritage Oaks Hike & Bike Trail Segment 4	Proposed Roseword Elementary to USACE property at approx 1 mile N of Cedar	Shared Use Pedestrian/Bicycle Path	\$ 3,899,071	TAP FY13, FY14, FY15 & FY16
16	B40-04	Chisholm Trail corridor Hike and Bike Phase II	0.25 MI S of Crusader Way to Sparta Rd at Commerce St.	Construct alternate transportation route consisting of shared-use path for pedestrian and bicyclists.	\$ 3,109,795	
17	N40-02	Old Nolanville Road Elementary Bicycle and Pedestrian Safety Improvements	Old Nolanville Rd at Warriors Path Rd to Shaw Branch Creek	Construct alternate transportation route consisting of shared-use path for pedestrians and bicyclist.	\$ 673,782	
18	S40-01	Enhancements along Salado Creek	Main St. at College Hill Dr to 0.09 MI N of Royal St. on Center Circle	Construct alternate transportation route consisting of shared-use path for pedestrians and bicyclist.	\$ 411,682	
					\$12,104,132	Total

MPO TAP (Transportation Alternatives Program) PROJECTS (Category 9)						
Reference Number	KTMP ID	Project Name	Full Extents	Description	Total Cost	
19	T40-11	N. 31st St. Sidewalks & Enhance.	N. 31st Street from SH53 to Nugent Drive	PHASE 1 of T40-11 to Construct alternative transportation route of Pedestrian/Bike Trail	\$ 307,740	TAP FY13 & FY14
20	C40-03	Avenue D Streetscape	FM113 from FM116 to Main Street	Construct streetscape improvements to downtown Copperas Cove	\$ 221,220	
21	K40-20	Brookhaven Bike/Ped Trail	Traverse Drive to Brookhaven Elementary School	Construct alternative transportation route of Pedestrian/Bike Trail	\$ 348,837	
22	K40-23	Heritage Oaks Hike & Bike Trail, Segment 3	Rosewood Drive from Flagstone to Pyrite	Construction of a hike and bike trail with lighting	\$ 849,000	
23	C40-02b	Avenue D Streetscape	Avenue D from South 1st Street to South 3rd Street	Construction of multi-terraced concrete walkways, ramps, railings, striping and necessary signage	\$ 367,142	
TAP FY15, FY16 & FY17 Call For Projects due on February 22. TAC scoring and recommendation will be March 2nd with TPPB project selection on March 16th. Category 9 FY15-FY17 funds is estimated to be \$800,000.					\$ 2,093,939	Total

MPO PROPOSITION 1 PROJECTS						
Reference Number	KTMP ID	Project Name	Full Extents	Description	Total Cost	
24	W40-01	SH 317	FM 2305 to FM 439	Widen from 2 to 4 lane with raised median	\$18,998,000	FY 15
25	H15-02b	FM 2410	Roy Reynolds Dr to Commercial	Widen from 2 to 4 lane roadway, with sidewalks, median and turn lanes in a context sensitive design	\$9,200,419	FY 16
26	W40-02	US 190	1.0 mi West of FM2410 to Knights Way	Widen from 4 to 6 lane roadway.	\$9,510,000	FY 17
					\$37,708,419	Total

MISCELLANEOUS PROJECTS						
Reference Number	KTMP ID	Project Name	Full Extents	Description	Total Cost	
27	T25-06	Loop 363	At Spur 290	PHASE 1 of interchange construction	\$10,415,448	Category 1 & Local
28	A35-01	Bus Replacement	HCTD service in Killeen UZA	Replacement of ADA-accessible paratransit buses	\$ 77,293	FTA 5339

Exhibit 4.15: KTMPO Funded Projects (FY2018-2020)



MPO CATEGORY 2 PROJECTS					
Reference Number	KTMPo ID	Project Name	Full Extents	Description	Estimated Cost
1	W40-06 ¹	US 190	FM 3423 (Indian Trail) to FM 2410 in W Belton	Widen main lanes from 4 to 6 lane divided freeway and ramp alignments	\$39,000,000
2	W40-04a ¹	Loop 121 Phase 1	FM 439 to IH 35	Widen from 2 to 4 lane divided roadway with bike/ped improvements	\$27,000,000
3	C30-03b	Business US 190 Phase I	Ave D to Constitution Dr	Change the center turn to a raised center turn and convert one travel lane in each direction to 6' sidewalk, 5' bicycle lane and 1.5' curb and gutter	\$10,000,000
MPO CATEGORY 7 ROADWAY PROJECTS					
4	K40-27 ¹	SH 195	At FM 3470	Construct turn-arounds	\$800,000
5	H35-01	US 190 at FM 2410	East Central TX Expy W to East Central TX Expy East	Phase 2, West to East Connector- Turnaround	\$5,000,000
MPO CATEGORY 7 LIVABILITY PROJECTS					
6	T40-12	31st St Sidewalks (FM1741)	Marlandwood Rd to Canyon Creek Rd	Construct 6 ft wide sidewalks on both sides	\$500,000
7	T40-15	Adams Ave/Central Ave. Bicycle/Pedestrian Improvements	IH 35 to MLK Jr Blvd	Construct sidewalk and bike path along Central and Adams Ave	\$1,913,044
8	C40-05	FM 116 & 3046 Sidewalks	Business 190 to South Park on FM 3046	Construct ADA compliant sidewalks, curb ramps, crosswalks, and bike lanes	\$975,000
9	K40-21b	Heritage Oaks Hike and Bike Trail, Segment 5	Chaparral Rd to USACE Property	Construct shared use path for pedestrian and bicyclists	\$1,300,000
10	C40-04c	The Narrows (Charles Tillman Way)	Constitution Dr to RGIII Dr	Construct sidewalk	\$170,000
11	S40-04a ¹	Main St Sidewalks Phase 1	Salado Plaza Dr to College Hill Dr	Main St. improvements to include lighting, sidewalks, & striping for bicycles	\$1,616,956
MPO CATEGORY 7 TRANSIT PROJECTS					
N/A	A40-15	Fleet Replacement Project	Killeen UZA	Purchase of three fixed route buses to replace Killeen fixed route buses	\$1,285,000
MPO COMBINED CATEGORY 2 AND CATEGORY 7 PROJECTS					
12	W40-03 ¹	US 190 Turnaround	At SH 201 (Clear Creek Rd)	Roadway reconfiguration to improve turning movements	\$4,000,000
MPO CATEGORY 9 PROJECTS					
13	C40-04b	The Narrows (RG III at Old Copperas Cove Rd)	Loop on Old Copperas Cove Rd to RGIII ending at Constitution Dr	Construct sidewalk	\$680,000
MPO COMBINED CATEGORY 7 AND CATEGORY 9 PROJECTS					
14	C40-04a	The Narrows (Constitution Drive)	Bowen Ave to S of MLK	Construct sidewalk	\$850,000

TRAFFIC VOLUMES

Section will be updated during project scoring to show 2015 and 2045 AADT.

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TRAVEL DEMAND MODEL

A Travel Demand Model (TDM) is a helpful tool in projecting future traffic demand, and current and forecasted roadway capacity. An updated KTMPPO model was completed in spring 2018. In 2017, KTMPPO hired a consultant to assist in developing demographic and network data for inclusion in the updated TDM. This work involved developing and updating the Traffic Analysis Zone (TAZ) structure, TAZ-level demographics, and the modeled roadway network for the years 2015 and 2045.

During the model development process, KTMPPO sought to include the existing land use patterns as well as future trends across the region to provide better, more defined input. KTMPPO requested future land use plans, existing zoning, local transportation plans, plat logs, established land use and locations of substantial traffic generators from member cities. Data was also collected from a variety of sources, to include school districts and local colleges, to develop growth projections and determine new generators. This data was then refined by KTMPPO staff, and forwarded to consultant, Kimley-Horn.

TDM Supporting Documents will be included as an **Appendix**.

TRAFFIC ANALYSIS ZONE GEOGRAPHY

A Traffic Analysis Zone (TAZ) is a unit of geography most commonly used in transportation planning models. The zones are constructed by census block information. Typically, these blocks are used in transportation models by providing socio-economic data. Most often, the critical information is the number of automobiles per household, household income, and employment within these zones. This information helps to further the understanding of trips that are produced and attracted within the zone.

2015 population and household data were derived directly from the 2010 US Census at the block level. Since some TAZs span county boundaries, there are some TAZs that extend slightly outside of the official MPO planning area. Therefore, a query of the TAZ database will show slightly higher population and household values than the official MPO planning area. Education, household, and employment data were identified for each zone using data from the Texas Demographic Center.

ROADWAY NETWORK

The consultant updated the 2015 roadway network to include all roadways within the expanded metropolitan planning area boundary and assigned attributes for all defined links. Other fields in the network such as area type, capacity, speed, and time are assigned by TxDOT

during the model validation process. The 2015 network is detail coded for higher functional classed facilities as defined by TxDOT. Generally, only links with frontage roads and ramps are shown as separate road links for each direction. Special Generators are locations that generate a large volume of traffic such as a shopping mall, hospital, college, airport, etc. 2015 special generators were identified and included in the model.

Exhibit 4.16: Special Generators

List of Special Generators	
Name	Physical Address
Copperas Cove Nursing & Rehab	607 W Ave. B, Copperas Cove, TX 76522
Skylark Field	1523 Stonetree Dr., Killeen, TX 76543
Killeen Mall	2100 South WS Young Drive, Killeen, TX 76543
Central Texas College	6200 W Central Texas Expy., Killeen, TX 76549
Metroplex Hospital	2201 S Clear Creek Rd., Killeen, TX 76549
University of Mary Hardin-Baylor	900 College St., Belton, TX 76513
Temple Airport	7720-F Airport Rd., Temple, TX 76501
Baylor Scott & White	2401 S 31st St., Temple, TX 76508
Temple College West of S. 1st St	2600 S 1st St. Temple, TX 76504
Temple College East of S. 1st St.	1903 S 1st St., Temple, TX 76504
Temple VA Clinic	1901 S 1st St., Temple, TX 76504
Scott & White Temple Santa Fe Hospital	600 S 25th St., Temple, TX 76504
Temple Living Center Western Hills	512 Draper Dr., Temple, TX 76504
Cornerstone Gardens Nursing Home	763 Marlandwood Rd., Temple, TX 76502
Temple Mall	3111 S. 31st St., Temple, TX 76502
Mclane's Children Hospital	1901 SW H K Dodgen Loop., Temple, TX 76502
Weston Inn Health Center	2505 S 37th St., Temple, TX 76504
Will-O-Bell Nursing Home	412 Dalton, Bartlett, TX 76511
Killeen-Ft. Hood Regional Airport	8101 S Clear Creek Rd., Killeen, TX 76549
Ft. Hood	N/A

INTELLIGENT TRANSPORTATION SYSTEMS

Having management and operational strategies in place is crucial if transportation facilities are to function at their peak level of performance. Proper maintenance of facilities and use of Intelligent Transportation Systems (ITS) are key elements in system management and operations. ITS involve the application of advanced information and communication technologies on various transportation elements which ultimately enable users to be better informed and make safer, more coordinated and smarter use of transportation networks.

Transportation facilities generally cross various jurisdictional lines; therefore, it is important for the entities to work cooperatively to ensure a safe and efficient transportation network for the movement of people and goods. Management and operational policies and strategies at various jurisdictional levels are discussed in the following sections.

State Level

State designated highways in Texas are generally maintained by the Texas Department of Transportation (TxDOT). When these state highways fall within a city's corporate limits, the city and state enter into a Municipal Maintenance Agreement which lays out the responsibilities of both parties to include maintenance of facilities that lie within the right-of-way. TxDOT generally will install, operate, and maintain traffic signals in cities with a population less than 50,000, whereas the city takes on this responsibility if their population is equal to or greater than 50,000. According to TxDOT Waco District officials, most of the Killeen, Temple and Belton area TxDOT maintained roadway traffic signals have been equipped with Video Image Vehicle Detection System (VIVDS) devices. These devices have a large number of detection zones that can be used limitless ways to control intersections and their flow. The benefit of these devices improves delays at intersections for vehicles. Fewer delays at intersections have a positive impact on quality of life and air quality.

TxDOT generally maintains roadways on a seven-year schedule. Signs and striping are reviewed annually, and preventive maintenance is performed on traffic signals and school flashers on an annual basis. Bridges are inspected on a two-year cycle.

Thanks to increased public awareness, the use of DOT-supplied ITS resources are on the rise in KTMP. There are currently ten Dynamic Message Signs (DMS) locations along I-35, which is currently undergoing construction, and two along US 190 which are providing drivers with

estimated travel times, Amber alerts and other critical emergency statements. There are also There are currently 11 cameras along the I-35, one on LP 363, two on SH 36. In 2016, TxDOT also installed and that are of public use to citizens and planners to observe traffic flow.

TxDOT's My35 ITS project aims at keeping drivers informed of the congestion situations along the region's primary north-south corridor DMS technology has been placed along the interstate to give drivers real-time alerts of current conditions as they enter the work zone. This data is also used on the My35 website, which offers dynamic traffic maps showing real-time lane closures, incidents, and travel times. Traffic cameras in our region can be viewed online for live feed of current conditions.

KTMPPO Regional Level

KTMPPO lists the regional TxDOT maintenance projects under group "Control Section Job" (CSJ) numbers in each updated TIP. Through information obtained from our TxDOT partner it appears there is an estimated roadway maintenance investment of \$28 million in the KTMPPO region 2019-2022 TIP.

Increased activity in the area of ITS is motivated in part by an increased focus on homeland security. ITS can play a role in the rapid mass evacuation of people in urban centers after large casualty events such as a natural disaster or threat. Much of the infrastructure planning involved with ITS parallels the need for homeland security systems. As such, KTMPPO has coordinated with CTCOG's Homeland Security and other emergency service grants. Contacts at the municipal and county level for these efforts have been made. CTCOG is also coordinating with Department of Public Safety, the Texas Statewide Interoperability Channel Plan, a narrowband and cross-band plan utilized for emergency services in the region.

In the future, KTMPPO anticipates additional inputs, such as real-time GPS tracking utilizing existing resources and staff mobile phones with GIS applications installed. This will better track lane movements and speed progression through given segments. KTMPPO also plans to coordinate with contracted transportation consultants in implementing guidelines in this regard.

The use of global positioning system (GPS) source data collected by private companies may soon be available to MPOs via TxDOT and FHWA. The data is collected from GPS fixtures on large trucks and on other vehicles by cell phones that have activated mapping and GPS services

and depicts travel delays on major roadways. The MPOs may use this data to compare with other collected data; however, in some areas this may be the only data that is available.

Exploring regional and local ITS resources through interoperability, increasing ITS awareness and implementing new traffic surveillance technologies should prove to be a good return on investment. More specifically, signal timing/coordination in the region's cities could benefit the congestion management aspect of regional mobility. KTMPO will continue to seek ITS methods to implement in order to improve the efficiency of the regional transportation system. Innovative services which promote alternate means of transportation and encourage drivers to make more informed transportation decisions feed a congestion management strategy. KTMPO continues to collect and analyze travel time data on selected roadways identified in the Congestion Management Process

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