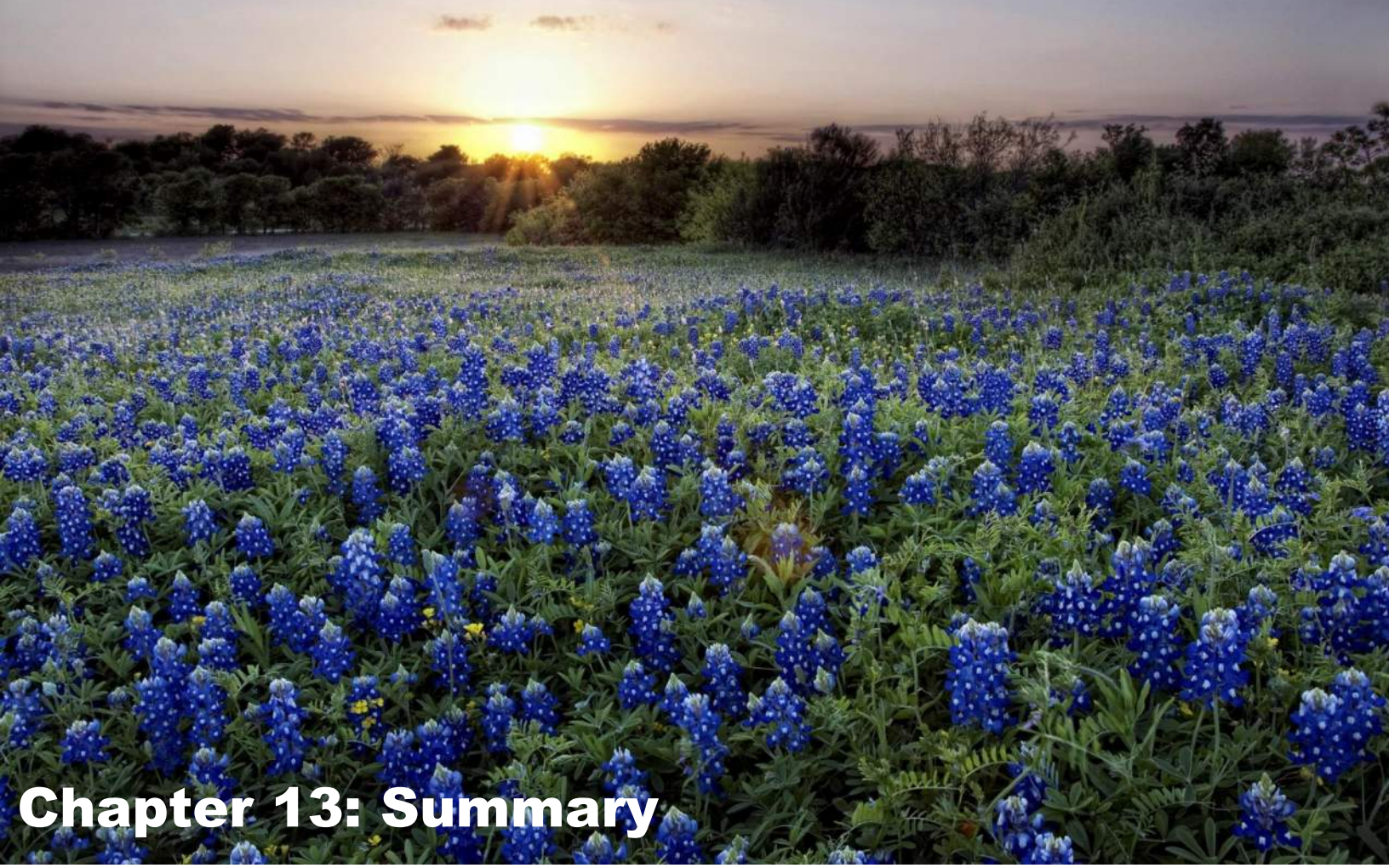


Chapter 13: Summary

CHAPTER HIGHLIGHTS

- The Transportation Planning Process
- Auto Network
- Bicycle Network
- Bus Network
- Truck Network
- Walk Network
- Complete Streets
- Summary

Introduction

Historically, the dominant mode of travel in the Killeen-Temple Metropolitan Planning Organization (KTMPO) region has been the personal automobile, and a transportation planning process that focused on automobile mobility was appropriate and adequate. However, people and industries are rethinking their transportation needs, preferences, and habits. It is now critical to consider multiple options for mobility and access, and the way we plan for transportation must progress to include all transportation modes for people and freight. Transportation planning must shift from its historic focus on the automobile and expand to consider all other modes within an **integrated multimodal transportation system**.

The vehicle for accomplishing the transportation planning task is this **Regional Multimodal Plan**. The change in names from the previous Regional Thoroughfare Plan to this Regional Multimodal Plan reflects the greater emphasis that this update places on planning for all transportation modes.

The integrated multimodal transportation system can be considered as a series of layered networks with some links shared among transportation modes, some links exclusive to one mode, and some modes interfacing with the system as points rather than as links. Multimodal transportation planning must consider the features of each mode individually, and must also plan for how each mode interacts with the others. While each mode in theory can operate independently, in practice the interface between modes can be vital in establishing how well each mode performs.

The goal of a regional multimodal system is to develop complementary modal networks that interact to provide safe, convenient, and practical transportation options for all users. Developing a better balance for the multimodal network does not mean that every mode will be equally used; but that users will have a practical choice among appropriate transportation modes for every trip. The private automobile is the predominant mode of transportation in the KTMPO area. Transportation planning must recognize this fact, and take care to balance the needs and traditional accommodation of this mode while increasing the integration of all modes into the regional multimodal system.

The Transportation Planning Process

The regional multimodal transportation system operates within the context of regional goals, regional demographics, regional plans, and the travel demand model setup and definitions. The intensities and patterns of existing demographics and projected growth show that the road infrastructure is generally well patterned to serve transportation demand. A review of each of these contexts shows that the existing transportation planning process and transportation infrastructure in the region are robust and supportive of this Regional Multimodal Plan.

The task of updating the previous Regional Thoroughfare Plan into this Regional Multimodal Plan is to extend a robust regional automobile-oriented planning process to include planning for all transportation modes. This extension and update must also include the consideration of new planning concepts. The Complete Streets, Vision Zero, and Context-Sensitive Solutions movements contribute to planning for an integrated multimodal system with a compatible focus on supporting and protecting all transportation modes and users. Consideration of these new concepts is a valuable addition to the traditional concept of typical street cross sections which have historically been used.

The purpose of a plan is not to predict the future; it is to enable it.

The Auto Network

The **auto network** is the base layer for the Thoroughfare Plan, with Functional Classes defined as providing a balance of access and mobility.

The Functional Classes for the auto network are:

- Controlled Access
- Major Arterial
- Minor Arterial
- Collector
- Frontage Roads & Ramps
- Local Streets

Facility Types distinguish between different features that can be applied to any Functional Class street. The traditional auto network Facility Types are divided, undivided, and continuous center turn lane. This plan has extended the list of Facility Types to include Complete Streets and Green Streets as well.

The inventory of current conditions for the auto network used the existing GIS files, previous Transportation Improvement Program (TIP) documents, and aerial photos to update the network to the year 2017. The network inventory is robust and aligns with the Functional Class system.

Design guidance for typical street cross sections have been provided for the auto network. The guidance is generalized to recognize that the implemented Functional Class and cross section for each project must consider the specific context of the project. Street cross sections provided in the Thoroughfare Plan are meant as guidance for typical conditions, and should be refined as needed for each specific project.

Table 13-1 summarizes the recommendations for right-of-way (ROW) considerations by street Functional Class.

Table 13-1: Summary of ROW Recommendations by Functional Class

Functional Class	Minimum ROW	Preferred ROW	Lane Width	Pavement Width	Median	Outside Buffer	Notes
Controlled Access	250'	Varies, up to 500'	Minimum 12'	Varies	Minimum 36' rural Minimum 10' urban	Varies	Inside shoulder minimum 4' Outside shoulder minimum 10' Vertical clearance minimum 14'
Major Arterial	130'	160'	Preferred 12'	82' to 106'	Preferred 18'	15'	ROW may be greater with parking, bicycle and pedestrian facilities, bus stops, and intersection treatments
Minor Arterial	80'	120'	Preferred 12'	47' to 75'	Center Turn Lane 14'	10'	
Collector	60'	80'	Minimum 11'	31' to 57'	Center Turn Lane 14'	5'	
Local	44'	50'	Minimum 10.5'	23' to 29'	None	5'	

The Thoroughfare Plan for the auto network includes:

- 22 projects from the KTMPO GIS layer of projects
- 24 funded projects from the 2040 MTP
- 28 unfunded projects from the 2040 MTP

Conceptual projects for the auto network include the ideas of inventorying candidates for road diets, identifying critical chokepoints in the network, and defining a hierarchy of access routes for emergency services.

To assist in project evaluation and planning, new performance measures were suggested to help balance the auto network within the integrated multimodal system. Suggested measures included evaluations of speeding, distracted driving, and driving under the influence (DUI) from crash data, measures of mode share from Census data, and inventories of network barriers, bottlenecks, and connectivity.

The Bicycle Network

While the basis for a Functional Classification system for the auto network is primarily that of balancing the purposes of access and mobility, in contrast, the basis for the **bicycle network** Functional Classification system can be seen primarily as addressing safety, which in turn directly affects convenience and building ridership volumes. Each of the bicycle Functional Classes therefore has multiple roles in developing a balanced regional multimodal network.

The Functional Classes for the bicycle network are:

- Protected Bike Lane
- Cycle Track
- Conventional Bike Lane
- Bicycle Boulevard
- Shared Road
- Off-Street Multi-Use Trail

The Facility Types applied to the bicycle network vary among the Functional Classes. They relate to the facilities' design, surface, and levels of protection.

The inventory of current conditions for the bicycle network reviewed the existing GIS files, previous Transportation Improvement Program (TIP) documents, and aerial photos to update the network. Not all the Functional Classes which were defined for the bicycle network are present in the 2017 inventory, but the inventory aligns with the Functional Class system.

Design guidance for the bicycle network included treatments for bicycle lanes, and was extended to discuss the design of intersections, curbsides, parking, and pavement color.

Projects for the bicycle network were sourced from the 2040 MTP and through public input through the KTMPO website. Since many projects are for multi-use trails which serve both the bicycle and the walk network, their projects were presented together. The combined list of projects includes 25 funded and 33 unfunded projects from the 2040 MTP and 52 suggested by the public.

Nine conceptual projects for the bicycle network included ideas for expanding the coverage and safety of the network and its connections to the transit mode. A separate listing of conceptual bicycle and pedestrian projects from the 2040 MTP is presented in Appendix A.

Suggested performance measures for the bicycle network included measures of safety, barriers and connectivity, and mileage of the bicycle network by Functional Class.

The Bus Network

The concept of Functional Classification for the **bus network** relates to the transit system infrastructure of bus stops. A consideration of passenger comfort and amenities is the primary driver in the definition of bus stop Functional Class.

The Functional Classes for the bus network are:

- Station
- Shelter
- Bench
- Basic Bus Stop

Facility Types for the bus network distinguish stops based on their relation with the street. ADA compliance is also established as a separate Facility Type that layers onto all other considerations.

The bus network inventory of current conditions was based on a GIS file of bus stops provided by The HOP and reconciled through field work. The inventory was updated for the recent route changes.

Design guidance for the bus network referenced the configuration of bus stops for ADA compliance and the placement of stops with relation to the street. Guidance for other group transportation modes recognized that they are controlled by the private sector, but stipulated the ADA compliance standards that is required for all spaces serving the public.

Only three projects for group transportation were noted: one as a funded project from the 2040 MTP to purchase new buses, and two from the Aviation Capital Improvement Program for the Draughon-Miller

Central Texas Regional Airport. Conceptual projects for high speed rail service and improvements to AMTRAK service were noted, but these are in the early planning stages and were therefore not listed.

Conceptual projects for the bus network were to develop bus shelters with enhanced treatments, and to improve the branding of transit routes.

Suggested performance measures for the bus network included measures of connectivity, comfort as rated by the presence of amenities at stops, on-time performance and reliability, and a measure of the completeness of the required Transit Asset Management Plan.

The Truck Network

The definition of Functional Classes for the **truck network** is intended to inform the street design process of the needs and impacts of trucks. This Functional Classification system is a tool to define a hierarchy of street facilities as used by trucks.

The Functional Classes for the bus network are:

- Truck Priority
- Truck Restricted
- Truck Hazardous Materials
- Truck Prohibited

The truck network inventory of current conditions was based on available GIS files and designations of routes from planning sources such as the National Highway System (NHS) and the Texas Highway Freight Network. TxDOT designations such as the listings of load-restricted routes and load-restricted bridges were also referenced.

Design guidelines for the truck network are treated by referencing the concept of the "design vehicle." Larger vehicles such as trucks, emergency response vehicles, and buses have specific needs which must be addressed in road design; particularly turning radius, lane width, vertical clearance, and horizontal clearance. Design guidance for the truck network is therefore similar to the auto network.

Truck network projects were derived from a variety of sources, including routes defined by the Freight Advisory Committee, inventories of routes with restrictions, and at-grade railroad crossings. Projects include:

- 9 routes identified by the Freight Advisory Committee
- 11 load-restricted bridges
- 34 load-restricted roads
- 4 roads with geometric restrictions

- 109 at-grade railroad crossings

Three conceptual projects were suggested for the truck network: inventorying hazardous materials origins and destinations, inventorying truck parking, and defining a more robust regional truck network.

Suggested performance measures for the truck network included evaluations of load restricted bridges and network barriers and connectivity. A conceptual project for railroad quiet zones was also included.

The Walk Network

The Functional Classes defined for the **walk network** set a hierarchy of facilities which can be implemented as appropriate when the walk network interacts with the other modal networks. This is considered in many contexts, supporting the primary purpose of promoting safety.

The Functional Classes for the walk network are:

- Off-Street Multi-Use Trail
- Sidewalk
- Desire Lines
- Crosswalk

Functional Classes for the walk network cover a wide range of infrastructure, so their associated Facility Types vary considerably.

The review of the inventories for the walk network revealed several topics and geographic area which need updates.

The definition of new Functional Classes for the walk network has established the need for new inventories in the topics of Desire Lines and Crosswalks. Additional attributes also need to be inventoried for some Functional Classes, including pavement width, surface, and ADA Compliance. To support the inventories, a more precise definition of the distinction between on-street multi-use trails and sidewalks is needed.

Geographically, there are new developments and older residential areas in Copperas Cove, south of Killeen and Harker Heights, north of Belton, Temple, and Troy where the sidewalk inventory is incomplete and needs to be extended.

Design guidance for the walk network generally reference the need for the provision of pedestrian facilities rather than their design. In general, design guidance for the pedestrian network relates to the sidewalk Functional Classes and ADA compliance.

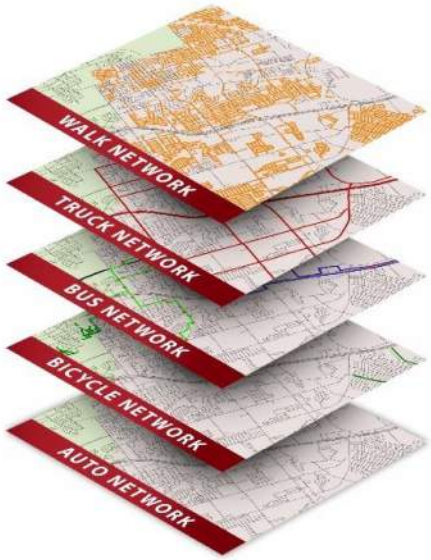
Projects for the walk network were sourced from the 2040 MTP and through public input through the KTMPO website. Since many projects are for multi-use trails which serve both the bicycle and the walk network, their projects were presented together. The combined list of projects includes twenty-five funded

and thirty-three unfunded projects from the 2040 MTP and fifty-two suggested by the public. A separate listing of conceptual bicycle and pedestrian projects is presented in Appendix A, and is not included in this count.

Six conceptual projects were suggested for the walk network, focusing on the efficiency and design of paths, connectivity, and the provision of livable spaces such as pocket parks and hidden places.

Suggested performance measures for the walk network included measures of the sidewalk network, ADA compliance, barriers and connectivity, and the mileage of trails.

Complete Streets



The KTMPO regional network consists of layers of interrelated networks for the auto, bicycle, bus, truck, and walk networks. Each of these networks has its own specific design standards specified by law or by professional practice. The **Complete Streets** concept is one tool that can help develop these individual networks into a balanced and integrated multimodal network. Complete Streets treatments are intended to bring the different layers of the multimodal system into a proper balance. This balance does not mean that every street must provide full accommodation for every transportation mode. It does mean that that every street should be designed with an appropriate consideration of all transportation modes to see how they can be balanced together.

…we could lay out an ideal street type, but in an existing city with constrained rights of way…not all streets can do all things at one time.

David Gaspers
Principal Planner
City of Denver

Implementing the desired Complete Streets design may be a challenge within the available right-of-way, funding constraints, and regulatory environment.

Complete Streets treatments and the balance of all the individual modes in the integrated multimodal network depends upon the regional and the street contexts, which define the intensity and character of activities and where they take place on the street for each mode.

Recognizing the contexts, the very specific and objective design guidelines for each mode are brought together and balanced under the very general and subjective concepts of Complete Streets. Guidance for developing the proper balance of modes for Complete Streets therefore relies as much on imagination and judgement as it does on engineering.

To support the planning of implementation of Complete Streets and bring the integrated multimodal network into a better balance, several conceptual projects were defined in the categories of policy, planning, and events. Conceptual projects include suggestions to adopt Vision Zero policies, safety strategies, rapid implementation of projects, updated inventories for transportation modes, and pursuing designations as

Bicycle Friendly Communities. A conceptual project for an annual Ciclovía was suggested as an education event to promote awareness of the balanced multimodal system and change drivers' attitudes towards other transportation modes.

Summary

The traditional transportation process and previous Regional Thoroughfare Plan supported a street network that is robust, well distributed, and well suited to serve the automobiles that serve over 92% of all trips in the region. However, a new vision for the region as expressed in the 2040 Metropolitan Transportation Plan (MTP) established the goal **to preserve and enhance the KTMPO area by developing a fully-integrated, multi-modal transportation system focusing on moving people and freight**. Accomplishing this vision calls for a shift in the way transportation planning is carried out in the region.

This Regional Multimodal Plan builds on the new vision to depart from the traditional automobile-oriented planning and pursue the development of a more balanced and integrated multimodal transportation system. The approach used in this Plan developed several new approaches to support the process:

If you always do what you always did, you'll always get what you always got.

- The transportation network was defined as several interrelated and interactive layers with individual auto, bicycle, bus, truck, and walk networks. Transportation modes for passenger air and rail were also considered, but they interact with the regional network as discrete points rather than as networks, so planning for those modes was approached slightly differently.
- The existing Functional Class and Facility Type system as defined for the auto network was extended to cover all transportation networks. This approach supported more precision in modal inventories of current conditions and network issues.
- Projects for network improvements were compiled from various official and unofficial sources to develop potential future networks for planning. These projects are not fiscally constrained or prioritized, and so form an input into the 2045 KTMPO MTP.
- Planning and projects are stimulated with conceptual projects that are suggested in the categories of policy, planning, and events, and each transportation modal network. These projects are conceptual rather than specific, and may not fall into one of the MTP funding categories, and they therefore may not be directly relevant to the KTMPO 2045 MTP. However, taken together with the MTP projects, these conceptual projects can contribute to developing a balanced regional multimodal network.