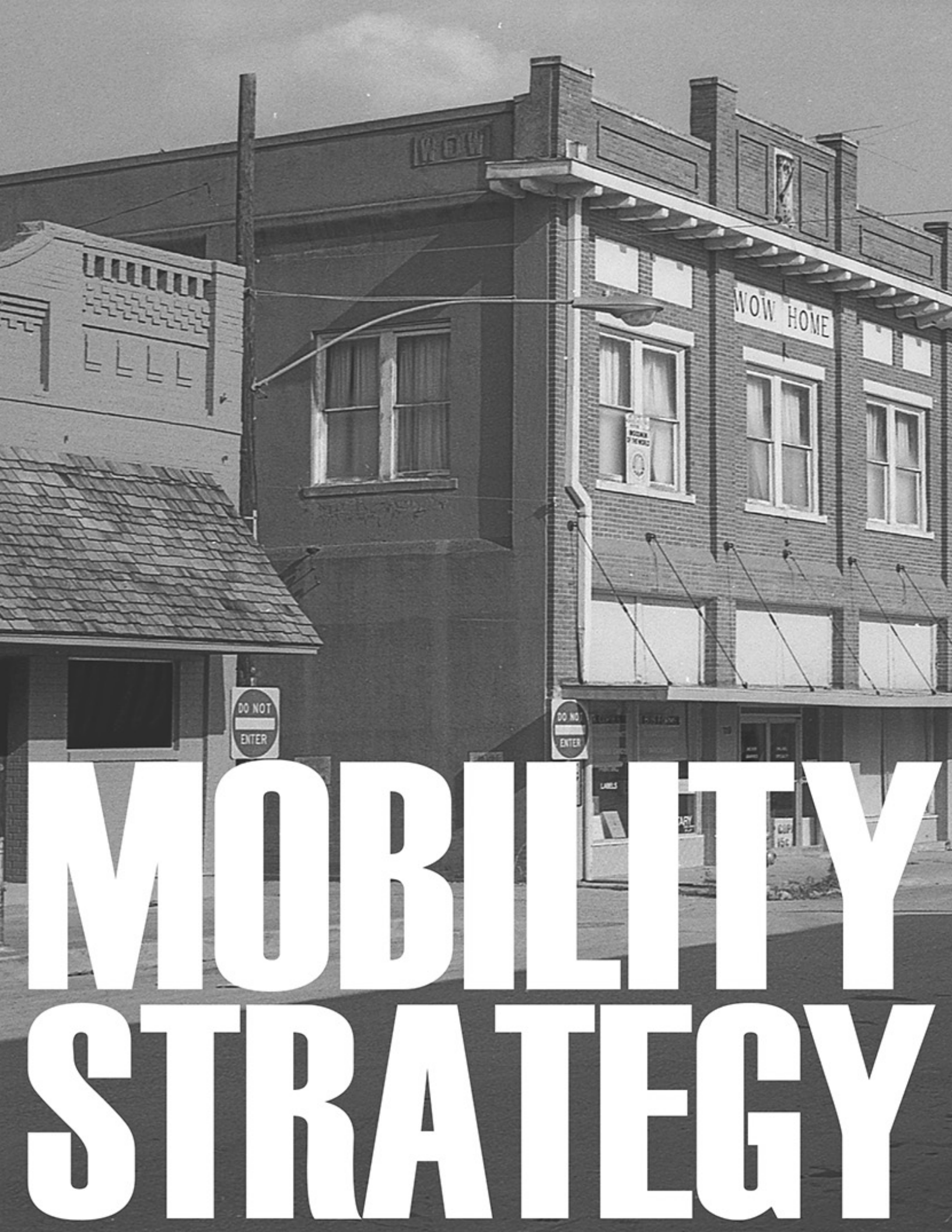

MOBILITY STRATEGY


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MOBILITY STRATEGY

Intended Outcomes

Develop a safe and efficient transportation network that:

- Manages traffic flow and maintains an appropriate level of service for all modes of transportation and users;
- Addresses regional and local needs by creating a connected and integrated transportation system;
- Contributes to the context and character of the area it serves;
- Promotes opportunities for desired economic growth and development; and
- Promotes mode choice (transit, biking, walking, etc.) to reduce dependency on a single mode of travel.

Overview

The OneMcKinney2040 Mobility Component identifies the long-range planning vision and tools to provide the City with guidance for making smart, strategic transportation investments in alignment with the development goals of the community. The City's thoroughfares and local streets provide a structural network that is essential to the community's daily life and commerce. To date, these facilities have primarily been developed to support vehicular travel, and appropriate connectivity for vehicles remains a central objective of this plan. However, a complete mobility network should consider the needs of all transportation users in the community and create multi-modal connectivity that supports the City's goals for not only efficient travel, but also health, safety, quality of life, economic vitality, and community character.

The Dallas-Fort Worth region, and in particular Collin County, is anticipating continued growth in population, housing, and employment, and it will be critical to provide the necessary transportation infrastructure to support this growth. Those who live, work or travel in McKinney understand the everyday challenges that occur when trying to get from one place to another. The existing auto-oriented development pattern creates long distances between trip destinations and often leads to area highways and arterials becoming congested during peak travel periods. Additionally, there are currently few alternative transportation options available to those seeking other modes of traveling in the McKinney area. Recent regional planning efforts have recognized that additional major highway routes are needed to support future growth and vehicular trip demand throughout Collin County. When these lanes are added to accommodate growing travel demand, it will be important to consider ways to ensure that the benefits from these system improvements are not short-lived with area roads becoming congested once again. These efforts should include strategies to reduce travel times, shorten trip distances, and provide more viable multi-modal options.

Many of the strategies and tools outlined in this Mobility component are intended to support connectivity and efficiency across the City's entire transportation network in conjunction with regional transportation plans. However, transportation improvements should also be planned with a regional mindset and implemented at the corridor and neighborhood level to best complement varying land uses. The OneMcKinney2040 Future Land Use district strategy will support the creation of a diverse mix of neighborhood types and activity centers across the City. The mobility strategy supports this approach by encouraging the City to consider the unique transportation needs of varied development contexts. Future transportation investment decisions should take a balanced approach that considers the relationship between transportation and land use, incorporates new transportation trends and technology, and meets the desires of the community, including changing preferences for transportation mode choices. This forward-thinking, multi-modal approach to connectivity will not only help movement within the area but will continue to make McKinney a desirable place to live, work, and play.

FUNCTION & **FOUNDATION**

Master Thoroughfare Plan

McKinney's Master Thoroughfare Plan (MTP) is the foundation of the community's transportation policy direction and provides a long-term vision of the major street network necessary to meet future travel needs. The MTP is the tool that enables the City to preserve future roadway corridors and to protect or acquire the necessary right-of-way to improve the local transportation system. The Thoroughfare Plan includes information for each thoroughfare in the city related to roadway classification, right-of-way requirements, the number of through travel lanes, and other basic design criteria, which can include options for multi-modal facilities.

McKinney's thoroughfare system is comprised of a variety of streets with standard functional classifications. The overall system is designed to maintain a balance between mobility (the through movement of trips) and access to destinations. McKinney's functional classification system is structured in a hierarchical manner, with the goal of providing a balanced network with appropriate roadway capacity, access, and efficiency.

Local Network

McKinney's local network is comprised of collectors, residential streets, and alleys to support trip movements between destinations and the thoroughfare network. Collector streets collect and distribute traffic between residential streets, other collector streets, and the arterial network. These facilities support connectivity within and between neighborhoods and other developed areas. Collectors must balance providing access to destinations with traffic circulation, and are not intended to carry significant through trips compared to arterials. Residential streets provide the most direct access to adjacent land uses, are designed for the lowest traffic speeds and volumes, and are used for the beginning and ends of many trips. Alleys may supplement the local street network in both commercial and residential areas to provide rear access to properties, garages, loading areas, or off-street parking.

Recommended practices for improving transportation, access, and mobility with connectivity of the collector and local street network in developing areas of the City, includes the following principles:

- Collector streets should offer easy access to and from various neighborhoods and non-residential developments in order to reduce the need to access arterial roadways.
- Local and collector streets should serve principally to provide neighborhood connections within and between subdivisions.
- Utilize sound street design principles (context-sensitive design, complete streets) to establish a roadway network that moves vehicular traffic with a high-quality level of service while offering safe mobility opportunities for pedestrians and bicyclists.
- Roadways should be planned to maximize specific characters or amenities within a particular district.

Collector and residential streets should provide access to residential property, small commercial areas and community amenities such as schools, parks and churches. This should be further supplemented with adequate and convenient trail, bicycle, and pedestrian accommodations. Planning of collectors and residential streets should consider the circulation and accessibility to destinations, and incorporate frequent intersections and short block lengths to make travel routes more efficient and improve walkability.

Additionally, The local street network shall aim to create an integrated street system within the arterial network that provides an overall connectivity strategy to encourage a mix lot types, preserve and enhance natural features, and create viewsheds to natural features, amenities, landmark buildings, or other important features. This network shall promote linkages between streets, alleys, and trails should be purposeful and enhance connectivity for pedestrians and bicyclists.

Safety

The function of roadways and efficient movement of traffic must also be balanced with providing a safe environment for all transportation system users, including those that are most vulnerable such as pedestrians and bicyclists. McKinney can make advances toward safer mobility by evaluating and implementing effective transportation design and policies that promote the effective function of roadways for everyone using them.

Intersection design is a critical component of a City's approach to transportation safety. Street intersections can be the most challenging aspect of street design due to the need to provide appropriate through capacity for traffic while also minimizing the number of conflicts between drivers, pedestrians, and bicyclists. When designed appropriately, intersections can find a successful balance between reducing delay, reducing crashes, and creating a predictable space for roadway crossings of all users. Existing accident-prone locations can be improved through a variety of techniques, including improved signal timing, signage, or high-visibility crossings. Intersection design in developing areas should also account for future land uses and intended modes of travel. For example, in urban and mixed-use areas where high pedestrian activity is expected, intersections should be as compact as possible to reduce pedestrian crossing distances and create increased visibility. Roundabouts may also be a suitable intersection design alternative in a variety of land use contexts. Modern roundabout design provides a variety of benefits over traditional intersections by encouraging slower speeds through the intersection while also allowing continuous traffic flow. This design alternative also provides unique opportunities for intersection aesthetics through the use of landscaping or pavement materials. McKinney should consider adopting a Roundabout first policy as part of the Engineering Design Manual.

Traffic safety in residential areas can be improved with the combination of implementing appropriate residential collector design and connectivity, along with the effective use of traffic calming measures as needed. Collector streets should be designed using a maximum target speed of 30 miles per hour, in order to encourage drivers to operate at intended safe speeds. Designing roadways for lower travel speeds can be achieved through a variety of design techniques including narrower lane widths, roadside landscaping, and other traffic calming techniques, which have the benefit of improving the level of comfort for bicyclists and pedestrians. Traffic calming is intended to mitigate cut-through traffic and speeding through a variety of physical and non-physical techniques aimed at slowing down vehicle traffic. As speeding and vehicular volume increases, walking and bicycling in residential areas can become an uncomfortable activity. Traffic calming techniques seek to reduce the impacts of excessive traffic volumes and speed, and address concerns about safety, noise, and quality of life by slowing down or "calming" motor vehicles.

Bicycle and Pedestrian Network

The use of sidewalks and trails promotes bicycle and pedestrian modes and facilitates transportation choices that benefits personal health, reduces traffic congestion, and air pollution, and enhances quality of life by creating opportunities for cost savings and social interaction. Throughout the City, the primary facilities for bicycles and pedestrians include off-street trails and sidewalks. McKinney has pro-actively planned and implemented a variety of trail and bikeway routes connecting parks, neighborhoods, and community destinations. Much of the current network has been implemented in the southwest portion of the City, with the Wilson Creek trail corridor as a highlight of the City's trail system. McKinney expanded its vision for additional trail and bikeway connectivity for the growing community with the adoption of the 2017 Parks, Recreation, Open Space, Trails and Streetscape Master Plan.

This plan envisions a network of dedicated facilities separated from moving traffic to accommodate active transportation users of all ages and abilities. Providing an interconnected system of separated and protected bike facilities can appeal to a broader range of people and can contribute to increases in bicycling volumes. The planned trail and side path system will include spine trails that connect through parks, floodplain and creek corridors, and other open space areas. Arterial trails and sidepaths will supplement this network with shared-use paths designed adjacent to roadway alignments. Additionally, neighborhood connector bikeways will provide connections between trails, neighborhoods, and other destinations with a variety of on-street bicycle facilities on low-stress collectors and local streets. The Parks Plan includes recommended locations for each of these facility types throughout the City and ETJ. Guidance also includes design best practices for width of facilities, crossings, and signage.

Design and Context

Complete Streets is a concept that supports the idea that streets should be designed for everyone, with safe access for pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. There is no single design for a Complete Street. Each one is unique and should relate to the surrounding community context. This design process is known as context-sensitive design and is focused on determining the most appropriate street cross section by taking into account not only the functional class of the road, but also the character of the surrounding development, future goals for each corridor, and the existing or future need for different modes of transportation. Each district identified in the City's Comprehensive Plan will have different land use, multi-modal, and urban design character priorities. These priorities can be reflected in adapting typical street design to better accommodate transportation goals at a local level. It is important to note that not every mode will need to be integrated into every street design to be considered a "Complete Street," but the thoroughfare design process should consider the needs of all roadways users to increase options for safe, alternative modes of travel appropriate for the local context.

Functional Classification System

The City's thoroughfare network is made up of five general classifications of roadways: Freeways and Major Regional Highways, Principal and Major Arterials, Minor or Greenway Arterials, Collectors, and Local Streets. Major highways within the City, such as US 75, US 380, and the Sam Rayburn Tollway, provide regional mobility with connectivity to surrounding communities and are designed to handle the highest traffic volumes. The City's arterial and collector system provides a balance between traffic movement and access to local destinations, and travel is typically dependent on utilizing a variety of routes and roadway types. The functional classification helps define the role of each roadway, both with the level of traffic flow it should serve and the amount of access it provides to adjacent property. The following graphic summarizes the mobility/access relationship across the thoroughfare network.

Changed to "US 380 (University Drive), the US 380 Corridor..."

STRATEGIC DIRECTION

Master Thoroughfare Plan

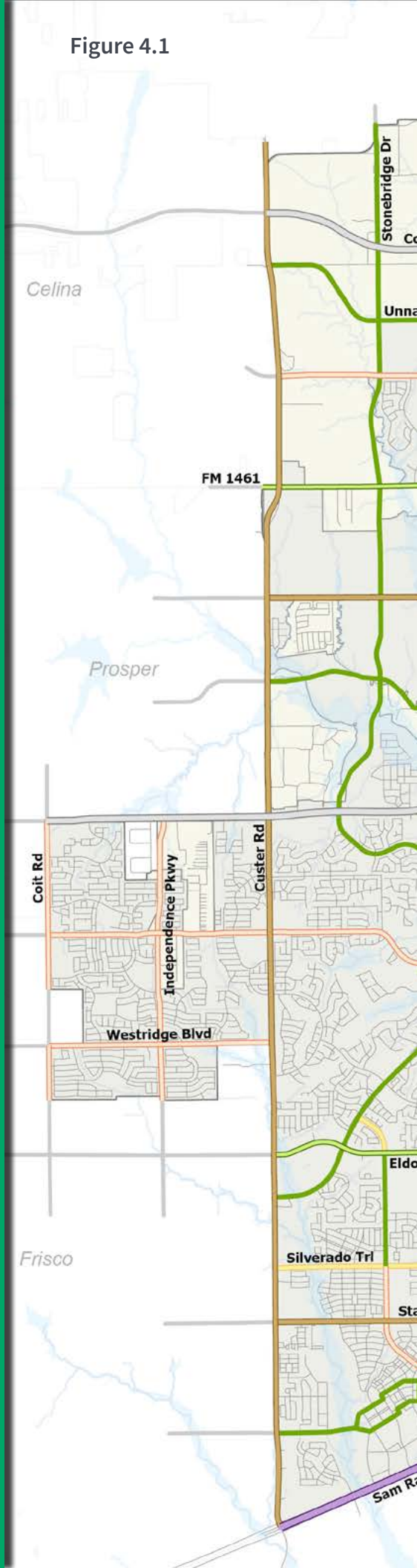
McKinney's Master Thoroughfare Plan (MTP) locates and classifies major streets by needed capacity for through traffic and access to adjacent land uses. This tool should also reflect compatibility with each street's development character with street design guidance that provides the ability to better integrate context-sensitive design elements and networks of other mode choices. The MTP map illustrates the existing and proposed thoroughfare system for the City and its Extraterritorial Jurisdiction(ETJ).

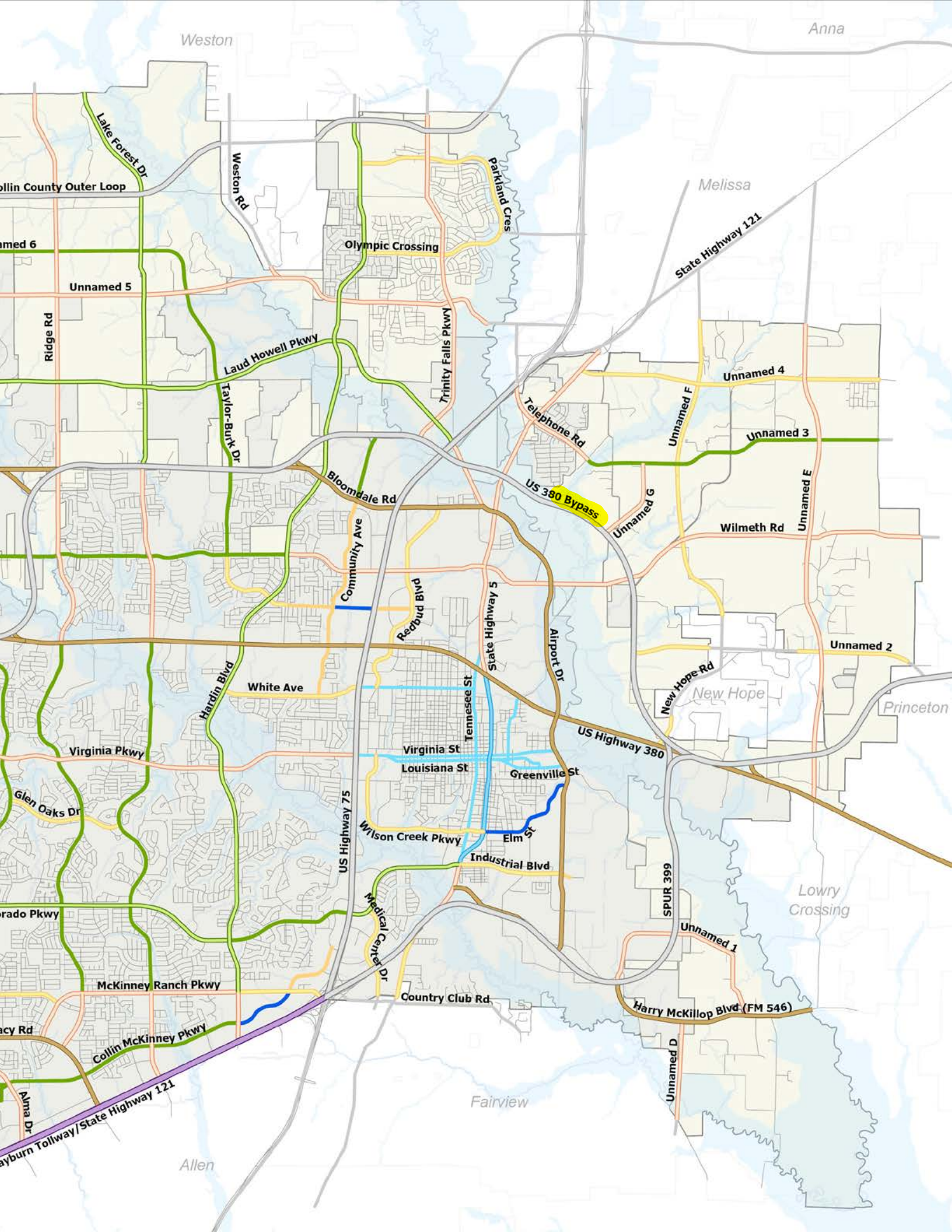
Completion of the system will occur over time as the facilities are warranted, either as development-initiated projects advanced as adjacent lands develop or as capital improvement projects to improve connectivity or capacity. The MTP provides generalized locations for thoroughfares. Alignments may shift as roads are engineered to accommodate natural or developmental constraints, and to meet sound engineering and urban planning principles.

The Master Thoroughfare Plan is comprised of a variety of standard street types, with the overall system designed to maintain a balance between mobility (the through movement of trips) and access to destinations. The mapped thoroughfare system is comprised of a network of regional highways, arterials, and town thoroughfares. This system is further supported by the collector and local street network which provides the most direct access to adjacent property and carries lower traffic volumes. The standards and criteria for all streets in McKinney are set forth in the City's Engineering Design Standards Manual (EDM). The thoroughfare cross-section designs illustrated below are to be followed for future construction, along with the design requirements for the roadway classifications found in the EDM. The following summarizes the classification of MTP roadways:

Town Thoroughfare is the designation of roadway that provides land access and traffic circulation through a variety of context based design option within the Town Center and Mill Districts, and is not a classification designated for future thoroughfares.

Figure 4.1




Weston
Anna
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llin County Outer Loop
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Olympic Crossing
State Highway 121
Unnamed 5
Ridge Rd
Laud Howell Pkwy
Taylor-Burk Dr
Trinity Falls Pkwy
Unnamed 4
Telephone Rd
Unnamed F
Unnamed 3
Bloomdale Rd
US 380 Bypass
Unnamed G
Unnamed E
Wilmeth Rd
Community Ave
Redbud Blvd
State Highway S
Airport Dr
Unnamed 2
New Hope Rd
New Hope
Princeton
Hardin Blvd
White Ave
Tennessee St
US Highway 380
Virginia Pkwy
Virginia St
Louisiana St
Greenville St
Glen Oaks Dr
US Highway 75
Wilson Creek Pkwy
Elm St
Industrial Blvd
SPUR 399
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rado Pkwy
Medical Center Dr
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McKinney Ranch Pkwy
Country Club Rd
Harry McKillop Blvd (FM 546)
cy Rd
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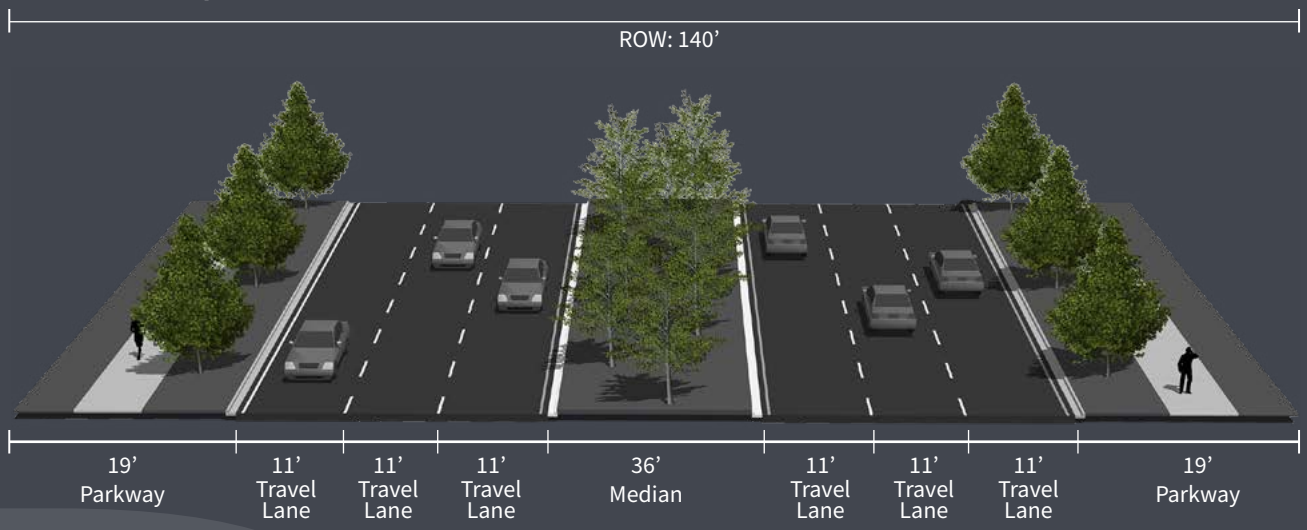
yburn Tollway/State Highway 121
Fairview
Allen

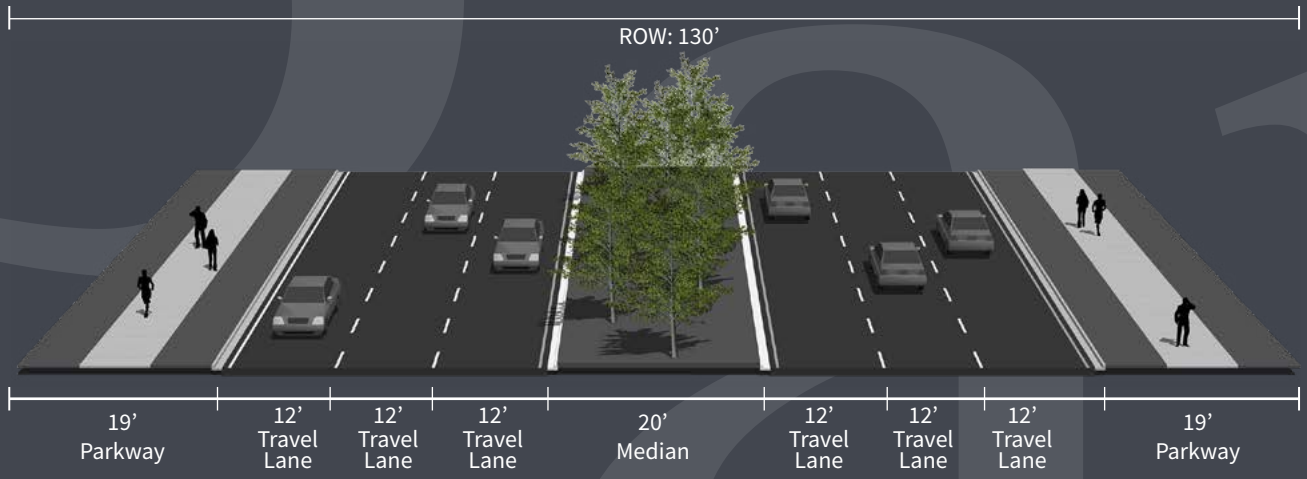
Illustrative Cross-Sections

G6D Greenway Arterial Divided (140')



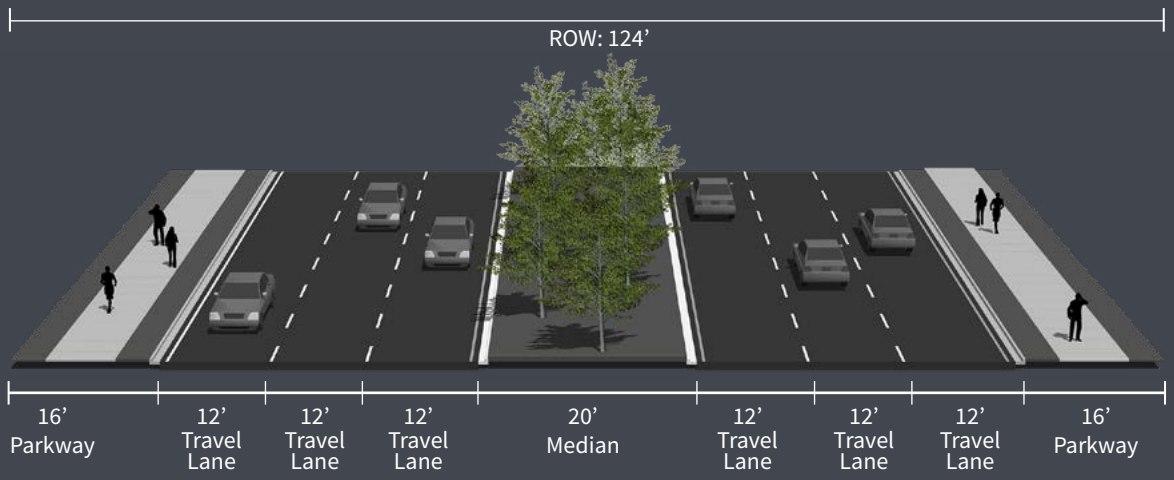
G6D greenway arterials have a minimum ROW width of 140 feet with an ultimate cross section of six lanes. The pavement section consists of two 33-foot roadways separated by a 36-foot center median to accommodate landscaping and trees.

P6D Principal Arterial Divided (130')



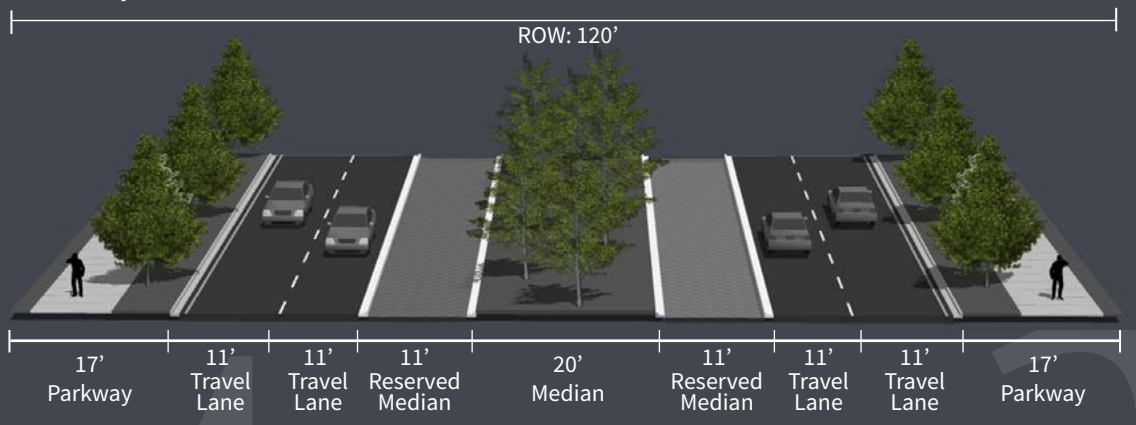
Principal arterials have a minimum ROW width of 130 feet and an ultimate cross-section of six lanes. The pavement section consists of two 36-foot roadways with a 20-foot center median. The parkway area is intended to accommodate deceleration lanes into driveways and intersecting streets.

M6D Major Arterial Divided (124’)



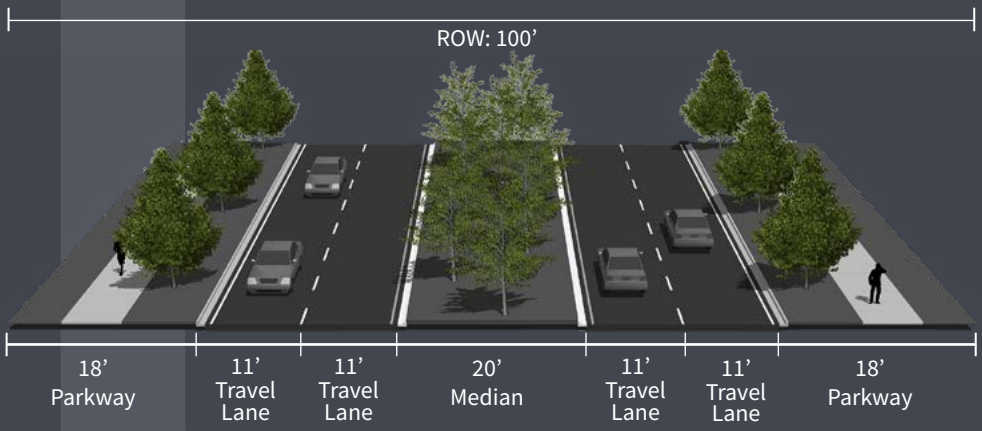
Major arterials have a minimum ROW width is 124 feet, but may be increased at intersections. The pavement section consists of two 36-foot wide roadways with a 20-foot center median. The ultimate cross-section of a major arterial is six travel lanes.

G4D Greenway Arterial Divided (120’)



G4D greenway arterials have a minimum ROW width of 120 feet and an ultimate cross-section of six lanes. The pavement section initially consists of two 22-foot roadways with a 42-foot center median. The ultimate cross-section consists of three 11-foot roadways with a 20-foot center median.

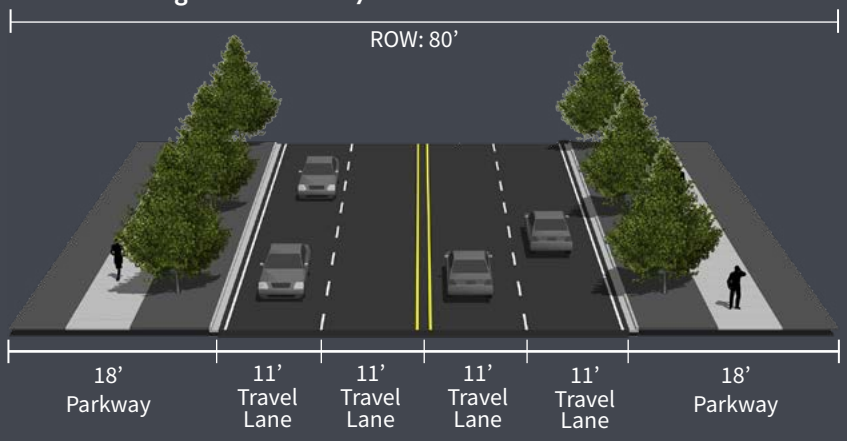
M4D Minor Arterial Divided (100’)



Minor arterials are a secondary thoroughfare used to move traffic. They include two 22-foot wide pavement sections, divided by a 20-foot wide median. The minimum ROW is 100 feet.

M4U Minor Arterial Undivided (80’)

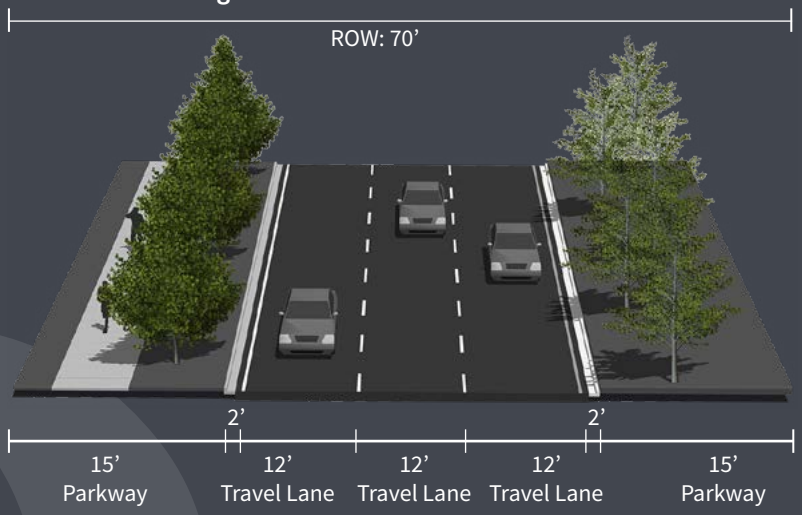
Note: This cross section for existing conditions only



Minor arterials are a secondary thoroughfare used to move local traffic. Minor undivided arterials include 22-foot wide pavement sections, with no median. The minimum ROW width is 80 feet.

M3U Minor Arterial Undivided (70’)

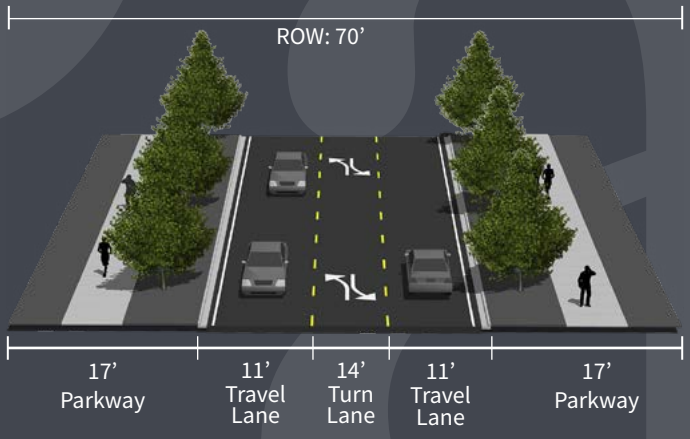
Note: This Cross Section is for the frontage road section



Minor arterials are a secondary thoroughfare used to move traffic. They include three 12-foot wide lane sections with a 2-foot shoulder area and a 15-foot parkway sections on both sides. The minimum ROW is 70 feet.

M3U Minor Arterial Undivided (70’)

Note: This cross section for existing conditions only

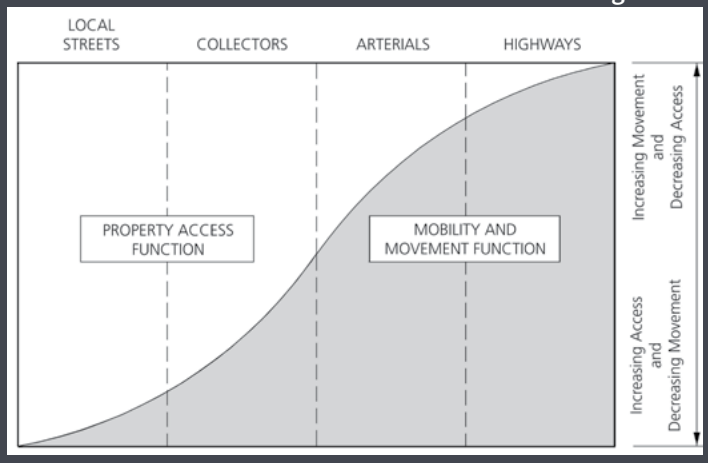


Minor arterials are a secondary thoroughfare used to move local traffic. Minor undivided arterials include 11-foot wide pavement sections, with shared lane for deceleration and turning. The minimum ROW width is 70 feet.

TRAVEL DEMAND ANALYSIS

Travel demand modeling involves the forecasting of traffic volumes on a transportation network based on land use, population, and network characteristics. Forecasting future traffic demand on a roadway network is an essential element in mobility planning. This section highlights the travel demand modeling process implemented as part of this plan as a basis for recommending updates to the Master Thoroughfare Plan, including an overview of the modeling process and methodology used to develop the model.

Figure 4.2



The model used for analysis of the ONEMcKinney 2040 preferred scenario was adapted from the Dallas-Fort Worth Regional Travel Model (DFWRTM) created by the NCTCOG. The updated model incorporated demographic estimates based on the ONEMcKinney 2040 recommended land uses and analyzed potential alternatives to future US 380 limited-access roadway alignments, as well as alternatives to the City's thoroughfare network. The travel demand modeling process follows the traditional four step gravity model, which is a nationally recognized standard in travel demand modeling.

The four steps in the gravity model include:

- Trip Generation – Estimate the number of trips that each zone will produce and attract
- Trip Distribution – Determine the number of trips from each zone that will be attracted by each of the remaining zones
- Modal Split – Determine the number of trips that will travel by each transportation mode to reach their destination
- Traffic Assignment – Estimate the route for each mode that will be used to travel from origin to destination

Level of Service

The model provides the City with a useful analysis output to predict the traffic impacts of various land use decisions and what the thoroughfare system will need to look like to accommodate future transportation needs. Level of Service (LOS) is a tool that is used to quantify traffic congestion along segments of a roadway and is a key performance measure to understand how well a planned thoroughfare can handle expected travel demand. Roadways are designated as LOS A, B, C, D, E, or F based on the volume-to-capacity ratio, which compares the estimate daily volume expected on a roadway to its intended maximum amount of traffic a roadway can handle. LOS A represents a roadway where traffic volumes are much lower than the capacity of a roadway while LOS F represents a roadway where traffic volumes are greater than the capacity of roadway. LOS A roadways have low traffic volumes with free-flowing conditions while LOS F roadways are extremely congested with stop-and-go traffic conditions.

The City of McKinney's policy is to plan and design thoroughfares to function at Level of Service D or better to balance vehicle movement and implementation cost. The City plans for a Level of Service D because it indicates that roads are not built with excess capacity and maintain appropriate speeds in comparison to free flow. Notably, many jurisdictions and the federal Department of Transportation recognize the limitations of the automobile-focused metric. New metrics for monitoring road performance that include walking and bicycling, as well as for vehicles, are being developed and implemented to monitor a multimodal level of service. In the future, the City of McKinney may choose to use a new metric to evaluate progress toward achieving a balanced transportation system.