

City of Burleson

Master Mobility Plan



January 2015



Prepared by:

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Expect More. Experience Better.

Master Mobility Plan 2015

Prepared for:
City of Burleson



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Chapter 1 - Master Mobility Plan

The Burleson Master Mobility Plan (MMP) is a long-range plan that identifies the location and type of roadway facilities that are needed to meet projected long-term growth within the City of Burleson. The MMP serves as a tool to enable the City to preserve future corridors for transportation system development as the need arises. It also forms the basis for Burleson's roadway capital improvement program and developer requirements. The MMP includes detailed information related to roadway classification, right-of-way requirements, design criteria, and number of through travel lanes for each thoroughfare within the City and surrounding extraterritorial jurisdiction (ETJ).

Recent trends in development, locally and across the nation, have changed the approach to roadway planning, allowing for greater flexibility in thoroughfare design which better complements surrounding land uses. This emerging practice is based upon the principles of context sensitive roadway design. The Context Sensitive Solutions (CSS) Design Manual, written by the Institute of Transportation Engineers and the Congress for the New Urbanism, provides a guide on how this emerging practice can be implemented during the thoroughfare planning process. Opportunities for multi-modal corridors that advance economic development and create a safer, more efficient transportation system arise when the context of a roadway is taken into account during the planning and design processes. The context-sensitive approach has been adopted by the Texas Department of Transportation (TxDOT) and has already been successfully implemented in thoroughfare planning processes in numerous cities throughout the region. This MMP advances the concept of thoroughfare planning within the City of Burleson by taking advantage of context sensitive design while satisfying the mobility needs of the City and ETJ.

The development of the MMP utilized demographic and land use data projected for the year 2035. According to the North Central Texas Council of Government's 2035 Demographic Forecast, Burleson is expected to grow to a population of approximately 47,000 with over 24,000 jobs by the year 2035. Information about changes in land use and development patterns associated with this growth

was obtained from Burleson's Comprehensive Plan and incorporated into the creation of this MMP. A well-developed MMP based upon up-to-date information will ensure that adequate circulation and access will be provided as the City and ETJ continues to grow. It also ensure's that the City and ETJ are maximizing and prioritizing its transportation investments appropriately.

This MMP is based on a sound technical foundation combined with emerging practices in innovative street design, all of which are discussed in detail in Chapters 2 through 6.

Chapter 2 provides a summary of the technical analysis that is the basis for the MMP recommendations. It includes a description and results of Burleson's travel demand model, an analysis of the City and ETJ's congestion and levels of service, and an evaluation of the balance between supply and demand within the transportation system.

Chapter 3 discusses the use of Complete Streets strategies to create unique, corridor-specific design characteristics on thoroughfares. This chapter explains street contexts specific to the City of Burleson and includes detailed design elements in the form of a flexible design matrix.

Chapter 4 provides the framework for a project development process which results in an integrated approach to roadway design. It reviews the five steps that are used to take a project from the conceptual phase through final design under the flexible design approach.

Chapter 5 explains the corridors approach to implementing the Master Mobility Plan. It also outlines example corridors that have been addressed in the City of Burleson to date. Thoroughfare recommendations added to this update are detailed in this chapter.

Chapter 6 presents the Bike Path Plan and outlines the facility recommendations to develop a bicycle mobility network on existing roadways and off-street trails. Street design that prioritizes thoroughfare elements promoting physical comfort for pedestrians and bicycles is also discussed.

Chapter 2 - Traffic Conditions

Travel Demand Modeling Methodology

Much like the original Master Thoroughfare Plan (MTP) for the City, the MMP and its recommendations are based on a strong technical foundation utilizing travel demand modeling software (TransCAD). The software incorporates data and analysis at a regional and local level into the existing Dallas-Fort Worth Regional Travel Model (DFWRTM). The DFWRTM was updated to reflect revised demographic data. The model utilizes this demographic data to generate forecasted trip volumes, both locally and regionally.

Model-based analysis was completed through the following steps during the development of this MMP:

- Ensure model is up-to-date
- Analyze existing street network (capacity, LOS, etc)
- Analyze existing MTP (provided baseline data for update)
- Generate and test transportation network alternatives
- Finalize recommended system

Four Step Modeling Process

The DFWRTM is comprised of a series of mathematical models that simulate travel on the transportation system. The model divides the City into Traffic Analysis Zones (TAZs) which have specific demographic and land use data associated with them and are used to determine trip demand and travel patterns. The modeling process encompasses four following primary steps (Figure 1):

Trip Generation – the number of trips produced and attracted to a destination or zone.

Trip Distribution – the estimation of the number of trips between each TAZ, i.e., where the trips are going.

Modal Split – the prediction of the number of trips made by each mode of transportation between each TAZ.

Traffic Assignment – the amount of travel (number of trips) that is loaded onto the transportation network through path-building and is used to determine network performance.

The model provides the City with an accurate tool to predict what the thoroughfare system will need to look like to accommodate future transportation needs.

Although a primary use for the model is the development and updating of the existing MTP, it can also be used for other technical analysis such as:

- Evaluating development impacts and mitigation measures (Traffic impact analyses are often limited to their immediate area. This allows for a citywide snapshot.)
- Determination and prioritization of capital expenditures
- Land use / transportation scenario planning
- Emergency evacuation planning
- Special event planning

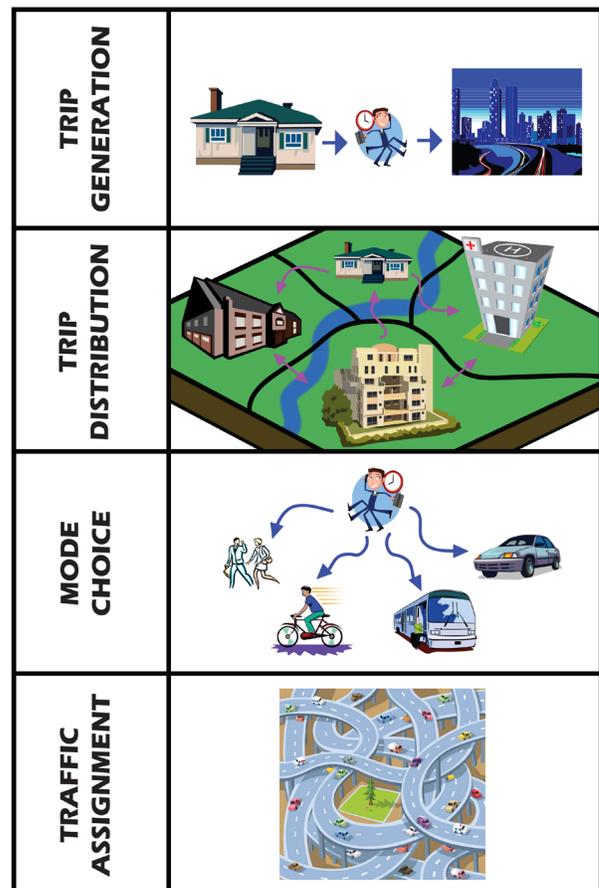


Figure 1 - 4-Step Modeling Process

	2010	2035
Households	12,197	15,813
Population	36,690	46,891
Basic	1,586	5,018
Retail	2,590	8,194
Service	3,593	11,367
Total Employment	7,769	24,579

Table 1: Burleson Demographic Summary

Demographic and Land Use Inputs

Every input into the model was based on projections out to the year 2035. The demographic data used in the trip generation step of the modeling process included the number of households, population, median income and number of employees by type of employment (basic, service and retail). This information came from the North Central Texas Council of Governments (NCTCOG) official 2035 Demographic Forecast which projects future

growth based on trends in development as well as current and previous growth patterns. Land use information was also entered into the model to incorporate future potential development patterns into the transportation demand forecasting process. Regional land use information was obtained from NCTCOG. Table 1 indicates the 2010 and 2035 population, households, and employment estimations assumed by NCTCOG and Kimley-Horn and Associates for Burleson.



Congestion Levels and Level of Service

Congestion levels and Level of Service (LOS) are two performance measures that are used to evaluate how well the transportation network is functioning. The congestion level of each roadway is related to both the traffic volumes and the capacity of the roadway. Future traffic volumes are one of the primary outputs of the model that help project transportation demand. Present-day traffic volumes are used to calibrate the model to ensure it is as accurate as possible and then future traffic volumes are then generated for each link (roadway segment) within the model. Capacity refers to the amount of daily traffic a particular roadway can handle. For example, a collector such as McAlister Road will have less traffic capacity than an arterial such as Wilshire Boulevard.

LOS is a tool that is used to quantify traffic congestion along specific roadways and within the entire transportation network. LOS is calculated by dividing the peak hour traffic volume by the available capacity (V/C). Roadways are designated as LOS A, B, C, D, E or F. LOS A represents a roadway where traffic volumes are much lower than the capacity for that roadway and LOS F represents a roadway where traffic volumes are greater than the capacity of the roadway. LOS A roadways are free flowing while LOS F roadways are extremely congested. The City of Burleson aims to maintain an LOS C or D or better on most roadways except in specific areas where congestion is desired to create a pedestrian-friendly environment with slower traffic. Figure 2 displays the LOS for the City of Burleson in the year 2035.

LEVEL OF SERVICE



LOS A/B

The A/B category is the most favorable for motorists due to the traffic flow being at or above the posted speed limit. Travel time in this category is not hindered as a result of congestion because traffic volumes are much less than the actual capacity of the thoroughfare.

LOS C/D

This category is slightly more congested than LOS A/B, however traffic volumes are beginning to reach their capacity of the thoroughfare. Traffic moves along at an efficient rate and posted speeds are maintained.

LOS E/F

Congestion is apparent in this Level-of-Service category. Traffic flow is irregular and speed varies. The posted speed limit is rarely, if ever, achieved in this category. In more congested corridors traffic can be at a mere standstill with limited progression.

As shown in Figure 2 below, congestion levels for most roads in Burleson and the surrounding ETJ are low, with traffic volumes lower than the capacity of the roadways. However, sections of Wilshire Blvd and frontage roads along Interstate 35W are at a LOS F, with congestion levels exceeding capacity.

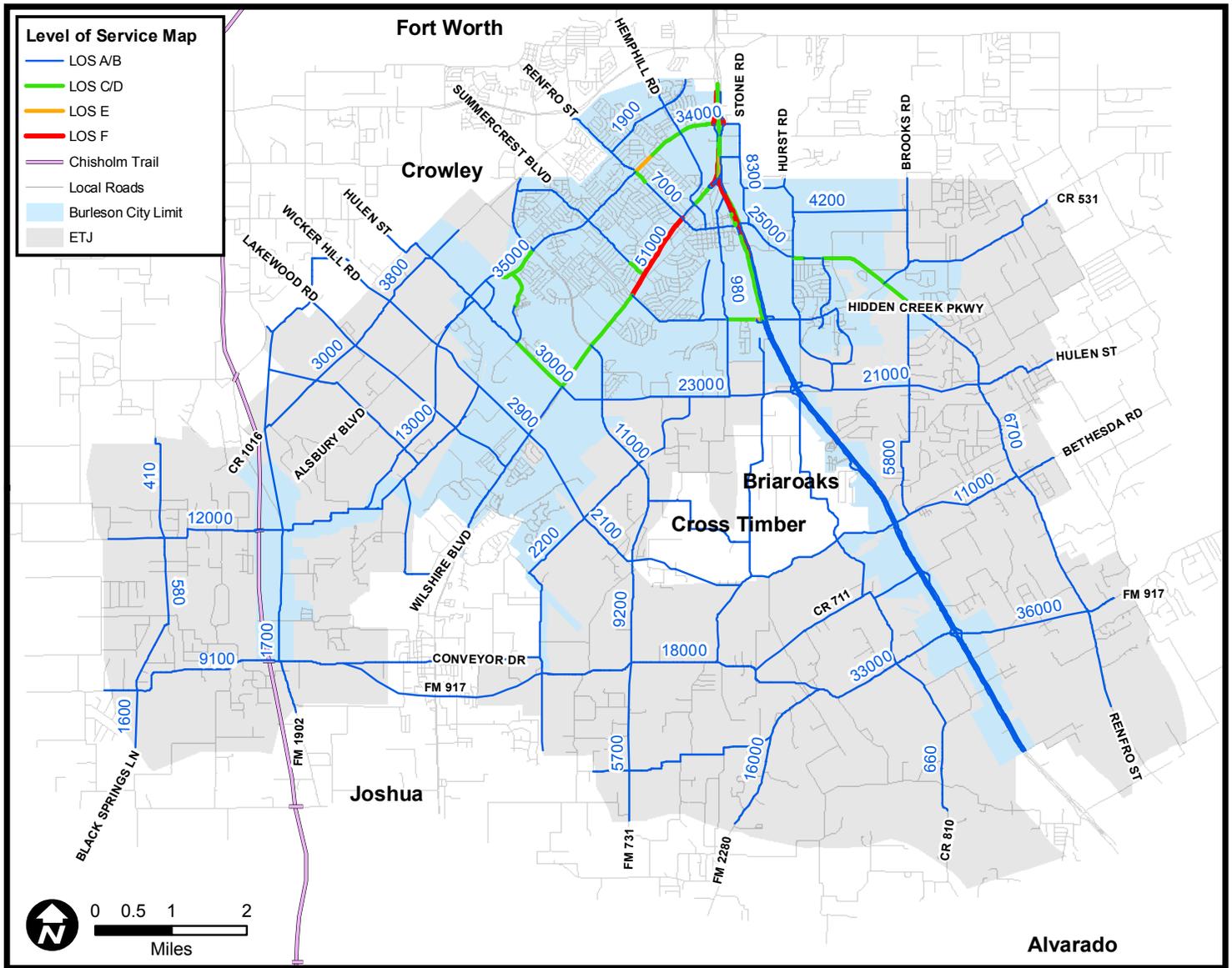


Figure 2 - 2035 Congestion Map

Supply and Demand

Much like the principles of economics, the transportation network also relies on the principles of supply and demand. For example, if a particular municipality neglects to appropriately manage capacity (supply) in an area that is expected for increased population or employment growth (demand), the transportation network will not function well. On the other hand, municipalities with depleting growth are finding reduced levels of congestion within their transportation network because less people are using the same transportation corridors that were once meant for a larger population.

A primary goal of the MMP is to plan for a future thoroughfare system that balances supply and demand so that resources are maximized and the system functions safely and efficiently. The results from the ATCSM provide an opportunity for the transportation network to be analyzed as a comprehensive system so that adjustments can be made where necessary to ensure there is neither too much or too little capacity to handle future traffic volumes. Adjustments to Burleson's future roadway system were based on the following issues related to supply and demand:

1. A roadway that is projected to experience traffic volumes greater than its capacity may need to be adjusted to allow for increased capacity.
2. A roadway that is planned for increased capacity improvements without the backing of increased traffic volume projections should be adjusted to match the demand.

3. A roadway may require increased capacity, but expansion may be limited by site-specific constraints such as right-of-way. In this instance, improvements on parallel facilities and throughout the entire network should be examined to mitigate the demand.
4. Increased use of alternate modes of transportation, such as transit or bicycling, could reduce vehicular demand on thoroughfare roadways over time.

Figure 3 (see page 9) shows daily traffic volumes expected by 2035. I-35 that runs through the City maintain the highest traffic volume at greater than 100,000 vehicles per day. Major thoroughfares that carry the most local north-south traffic will include Wilshire Boulevard, Alsbury Boulevard, and John Jones Drive (FM 731), while Renfro Street, Hidden Creek Parkway, and FM 917 are expected to carry the most East-West traffic.

The technical analysis, conducted through the MMP development process, validates proposed recommendations for future growth and expansion in Burleson. It allows for future conflicts to be anticipated and resolved or minimized, while at the same time adjusting the roadways that do not need improvements between 2013 and 2035.

Chapter 3 – Complete Streets

Theories and Concepts of Complete Streets & Street Design

Complete Streets is a relatively new concept that is being embraced by municipalities across the country to facilitate changing ideas regarding street design. It has a number of different terms that all have similar definitions and purposes that include “Flexible Design,” “Context-Sensitive Solutions,” and “Context-Sensitive Design.” The Complete Streets concept gives transportation planners and roadway designers flexibility to create unique characteristics specific to individual corridors. These unique characteristics are based on a number of dynamics present in the surrounding context. The changing dynamic that is causing this shift toward a more flexible approach to thoroughfare design is two-fold:

1. Alternative modes such as transit, cycling and walking are being requested and utilized more often by citizens, necessitating a shift away from designs that focus solely on the automobile, and
2. It is now recognized that elements such as adjacent land uses types, land use densities and even socioeconomic characteristics can affect the way a thoroughfare operates.

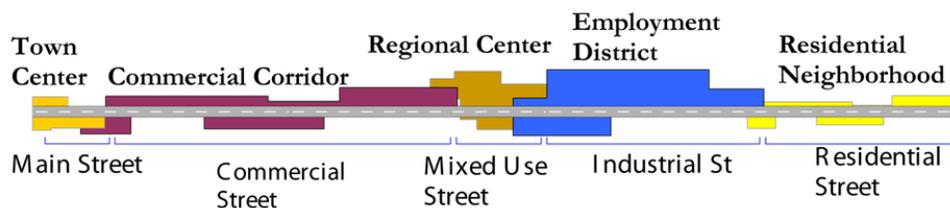


Figure 4 – “One Size Does Not Fit All” This graphic illustrates how a roadway may cross through a number of different context types. As the context changes, so should the street design.

This chapter focuses on the future design process recommended by this MMP. By utilizing this new state of practice, Burleson can continue to increase mobility within the City and surrounding ETJ while providing its residents and visitors increased livability, with a focus on pedestrian safety and a sense of community.



Traditional Functional Classification

Most cities use a traditional functional classification system to group roadways according to the type of service they intend to provide. This organized system assists citizens and developers in understanding the types of roadways that are planned for the City's transportation system and what those roadways might look like. Historically, street classification systems have been firm and standardized, allowing little to no flexibility in their application. Street design characteristics have typically been limited to the area from curb-to-curb and focused solely on the vehicle.

However, this standard of practice has evolved over time as the relationship between transportation and land use have become more influential in the design and operation of our streets. Thoroughfare design practice has begun to involve a number of additional design considerations that are often included in the streetside area (located between the building front and the curb) that affect not only automobile users, but also pedestrians and cyclists.

While the City of Burleson has historically utilized the traditional functional classification system for its roadways, this updated MMP incorporates a new functional classification system that utilizes the existing terminology (Principal Arterial, Minor Arterial, Major Collector, Minor Collector), while including additional flexibility for the design characteristics of the roadway. This allows for each roadway to be designed in a way that adapts to the surrounding built environment and that benefits all users. Pages 19-20 illustrates and describes this new functional classification system in greater detail.

Street Context and Development Policy

Along with the more flexible functional classification design standards, the street context, or character of the area adjacent to the roadway will play an important role in the way a street looks. One type of street design will not satisfy all of the different needs within the City and therefore it is important that the design standards offer flexibility to allow for these distinctions. There is no "one size that fits all" in the framework of street design.

The City of Burleson is divided into four different context zones (Commercial, Mixed-Use/Main Street/Downtown, Neighborhood, and Rural) to allow for flexible design standards to be applied to the various area types within the City. The following pages illustrate and describe each type of context zone proposed for the City and ETJ.

Burleson Context Types

There are a number of different development types throughout the city and surrounding extra-territorial jurisdiction (ETJ). The commercial uses range from urban-commercial along Renfro in Old Town to suburban-commercial along SH 174. There also is a wide variety of residential land uses and industrial uses within the city as well, while areas outside the city limits are characterized by ranch houses and open space.

How the street functions in these areas can change dramatically even along the same corridor, therefore it is important to distinguish the areas that have similar context and begin focusing the street on the surrounding context.

In Burleson, there are four primary context types that can be seen in different parts of the city. Figure 6 classifies each thoroughfare by its context. Each context is described in more detail on pages 12 to 15. Each of these context types can consist of a number of different land use types that help determine the priority elements of the streets that are within the context zone.

Commercial



Principal Arterial



Minor Arterial



Collector

Context Characteristics

This context type is characterized by retail and service destinations at low densities that are easily accessible by automobile. These streets are generally located near heavily trafficked corridors and prioritize traffic access and capacity. Developments tend to include multi-tenant commercial centers, restaurants, and professional office complexes with sufficient parking.

Priority Considerations

- Emphasis on travel lanes and automobile capacity
- Access management with the use of landscaped median or two-way left turn lane
- Usually serve faster moving traffic
- Less use of on-street parking
- Lower pedestrian activity, but provide safe opportunities for use with wider landscaped buffers and sidewalks

Mixed-Use/Main Street/Downtown



Principal Arterial



Minor Arterial



Collector

Context Characteristics

This context type is the most flexible and offers a mix of housing types within close proximity to employment, shopping, and community activity. The scale of development, slower traffic speeds and emphasis on the pedestrian encourage active living. Development includes attached housing types such as townhouses and apartments mixed with retail, workplace, civic activities, and walkable mixed-use developments.

Priority Considerations

- Higher pedestrian activity
- Reduced motor vehicle speeds
- Bike lanes or shared use of travel way
- Pedestrian-oriented development, street furniture and lighting
- Mix of commercial, residential and civic uses oriented to the street
- Maximized on-street parking

Neighborhood



Principal Arterial



Minor Arterial



Collector

Context Characteristics

This context type serves the areas that are predominantly residential without the higher intensity commercial and retail uses. Developments may include single-family detached homes, duplexes and townhomes with lower unit densities than in the mixed-use centers, as well as parks, churches and other civic uses. These streets will likely have a mix of pedestrian and bicycle activity to connect to important neighborhood destinations.

Priority Considerations

- Safety for pedestrians and bicyclists
- Medians on major facilities
- Increased sidewalk buffering from traffic through on-street parking, bicycle lanes and landscaping

Rural



Principal Arterial



Minor Arterial



Collector

Context Characteristics

This context type complements rural living and is characterized by large lots, open space, and natural views. Residential properties tend to be widely spaced and include single-family homes, ranchettes, urban farms, barns and sheds. Streetsides incorporate more natural elements and have the flexibility to have shared use paths for biking, hiking and equestrian use instead of sidewalks.

Priority Considerations

- Rural character and scale
- Wider travel lanes
- Streetsides with natural landscaping and paving for safe, multi-modal use
- No on-street parking
- Shoulders opposed to curb and gutter

Design Elements

As mentioned previously, street design has historically focused only on the area located between the curbs and has centered design criteria around the private automobile. However, emerging practice places emphasis on other aspects of the street in addition to the travel way. For example, pedestrian and bicycle infrastructure is being implemented more frequently in neighborhoods to encourage healthy living and exercise, and in more urban locations to spur increased economic development.

When planning future thoroughfares, it is essential to identify all aspects of the corridor in order to maximize efficiency of the roadway system and the value of the surrounding property. Three separate realms have been identified within the Master Mobility Plan to be taken into consideration when planning for roadways. These realms are the travel way realm, the pedestrian realm and the context realm, as shown in Figure 5 below.

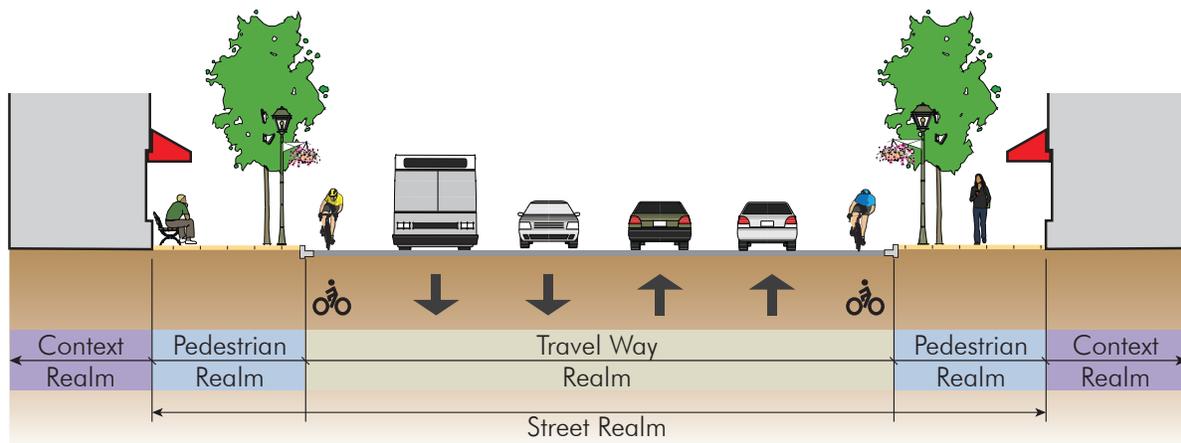


Figure 5 – Anatomy of the Street, identifying the different realms

Each of the realms are identified in the design matrix (see Pages 19-20) and have specific guidelines on how each of the thoroughfares can be designed. Desired dimensions are given in the design matrix, but flexibility in the number of lanes and the use of on-street parking and bike lanes allow developers and roadway designers the ability to adapt their vision of the corridor to the surrounding built environment. In ROW constrained situations, a great deal of emphasis should be placed on the context of the street and its priority considerations (see Pages 12-15).

Characteristics of Walkable Thoroughfares

- Walkable street design accommodates a mix of transportation modes – pedestrians, bicycles, transit and motor vehicles. The appropriate balance of right-of-way use should be determined based on the surrounding urban context. When streets are designed with pedestrians in mind, walking becomes a convenient alternative to driving, especially for short trips. Sidewalks should be buffered from traffic, continuous and well-maintained. Crossings should be safe and properly marked, and street design should encourage safe motorist behavior.
- Walking is supported by a compact, mixed-use environment with architectural and urban design features scaled for the appreciation of those traveling slowly along a sidewalk at street level. An appropriate mix of uses generates pedestrian activity and creates a place to be enjoyed during the day and evening.
- Walkable streets provide both accessibility and livability with desirable urban design elements. This is achieved by prioritizing thoroughfare elements that promote physical comfort, a defined street edge, and a unique sense of place.

Roadway Classifications and Street Context



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LEGEND

Classification Types

- PA-120 - Principal Arterial 120' ROW
- MiA-90 - Minor Arterial 90' ROW
- MaC-70 - Major Collector 70' ROW
- MiC-60 - Minor Collector 60' ROW

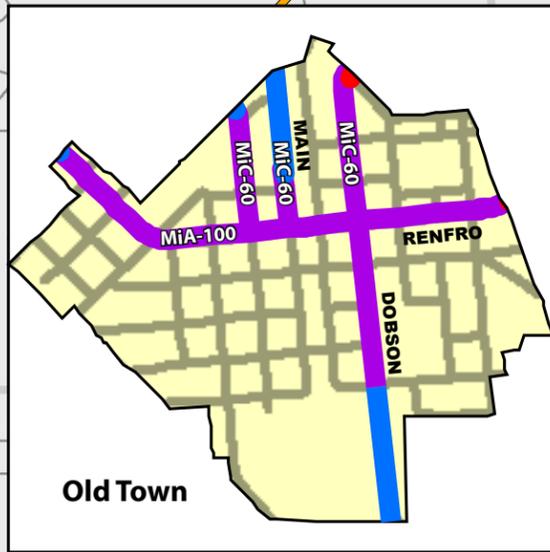
Street Context

- █ Commercial
- █ Mixed-Use/Downtown
- █ Neighborhood
- █ Rural

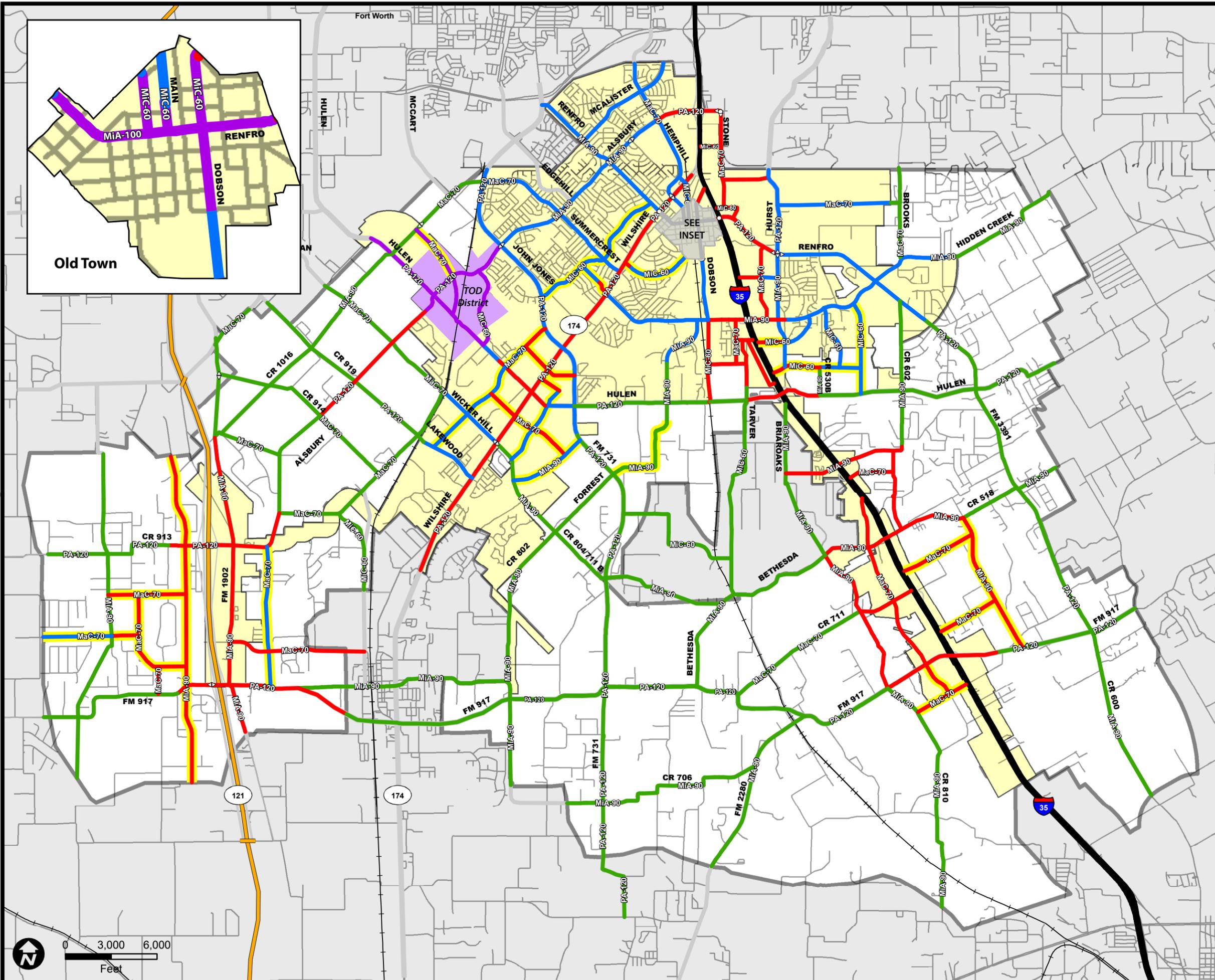
- Local Roads
- Freeway
- City Limits
- ETJ
- + Rail
- Thoroughfare Plan Update

Note: In some locations, existing right-of-way may exceed or be less than the figures shown on the Roadway Classification Map.

Master Thoroughfare Plan



Old Town



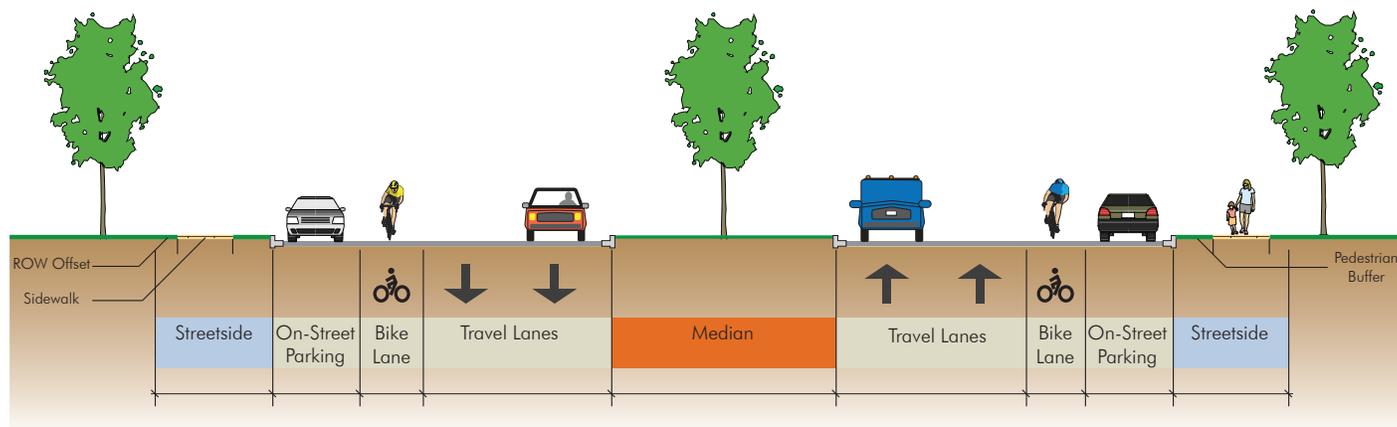
Thoroughfare Design Matrix

The Master Mobility Plan street contexts should be used as the guiding designation of the overarching vision and character that should be considered when planning specific thoroughfare design projects. Street design is flexible and should achieve the goals and priorities of the surrounding area. The Thoroughfare Design Matrix should be used as a starting point for determining the appropriate context-sensitive elements to develop a transportation facility that improves multimodal functionality of a particular area while maintaining a focus on overall safety and mobility. Depending on the surrounding land use contexts, not all elements will be appropriate. In existing built areas, possible right-of-way constraints may require that some non-vital elements need to be eliminated or reduced in the roadway design. The following guide identifies elements that should be considered first (**Essential**), those that are likely to benefit the context area over other lower-priority elements (**Preferred**), and those that are least likely to achieve the mobility objectives (**Optional**). Elements that are not appropriate for a particular thoroughfare have been identified as not applicable (N/A).

Thoroughfare Design Matrix (dimensions in feet)		Minimum Acceptable Width	Preferred Minimum Width															
			Commercial				Mixed-Use/Downtown				Neighborhood				Rural			
			Principal Arterial PA-120	Minor Arterial MIA-90	Major Collector MaC-70	Minor Collector MiC-60	Principal Arterial PA-120	Minor Arterial MIA-90	Major Collector MaC-70	Minor Collector MiC-60	Principal Arterial PA-120	Minor Arterial MIA-90	Major Collector MaC-70	Minor Collector MiC-60	Principal Arterial PA-120	Minor Arterial MIA-90	Major Collector MaC-70	Minor Collector MiC-60
Travelway Toolbox	Travel Lane	10'	11'	11'	10'	10'	10'	10'	10'	10'	11'	11'	10'	10'	12'	12'	11'	11'
	ROW Offset	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Median with Turn Lanes	16'	18'	11'	12'	12'	18'	N/A	N/A	N/A	18'	16'	10'	10'	18'	18'	N/A	N/A
	Decorative Median/ Pedestrian Refuge	5'	N/A	9'	5'			6'	5'	5'		6'	5'	5'				
	Bike Lanes	5'	N/A	6'	6'	6'	N/A	6'	6'	6'	N/A	6'	6'	6'	N/A	5'	5'	5'
	Separated Bike Lanes	6'	8'	7'	7'	7'	8'	7'	7'	7'	8'	7'	7'	7'	N/A	7'	7'	7'
	Shared Lane Markings	-	N/A															
	On-Street Parking	7'	N/A	7'	7'	7'	7'	8'	7'	7'	-	7'	7'	7'	-	N/A	N/A	N/A
Paved Shoulders	4'	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5'	4'	4'	4'	
Pedestrian Toolbox	Pedestrian Buffer	4'	10'	6'	5'	6'-7'	N/A	N/A	N/A	N/A	10'	6'	5'	6'	-	-	-	-
	Sidewalks	5'	5'	5'	5'	5'	14'	12'	10'	10'	5'	5'	5'	5'	-	-	-	-
	Shared-Use Sidepath	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'
	Seating	-																
	Bicycle Racks	-																
	Enhanced Streetscaping	-																
	Recycling and Garbage Cans	-																
	Provisions for Sidewalk Cafes	-																
	Plazas, Pocket Parks	-																
Landscaping	-																	

Thoroughfare Element Design Priority ■ Essential ■ Preferred ■ Optional

Sample Thoroughfare Elements



Thoroughfare Design Process

Once the priority elements have been chosen, the process leads to conceptually detailing the thoroughfare design. The conceptual design involves integrating the design of the street components, context, streetside, travelway, and intersections with a proposed project. As with any design process, this stage is iterative, can involve several options, and can result in potential updates to the thoroughfare plan and cross sections.

The following Cross Section Guide is a visual tool to show how the typical thoroughfare cross section designs may be adapted based on modal and context-sensitive priorities. In addition to the typical thoroughfare development standards, flexible cross section examples are provided for bicycle-oriented design and context-sensitive design.

How to Use the Cross Section Guide

- **Typical Sections** - These cross sections reflect the standard thoroughfare design criteria that has previously been used for much of the current roadway system.
- **Bike Options** - These cross sections introduce the preferred bicycle facility design for each functional class. Lower speed, lower volume collectors have the flexibility to utilize shared or separated bicycle lanes. Higher volume arterial design should prioritize bicyclist safety and comfort with the use of protected or physically separated facilities (such as shared-use sidepaths).
- **Flexible Design Options** - These cross sections demonstrate how various thoroughfare design elements may be combined and prioritized based on surrounding land use context and street activity. The art of thoroughfare design is balancing the desired design elements of the thoroughfare with right-of-way constraints. When the width of the right-of-way varies, or is constrained, it is useful to consider a series of cross-section options accommodating all or many of the higher-priority elements that are appropriate for the corresponding street context, and then select a preferred alternative. If the total width of the desirable design elements exceeds the right-of-way, determine the feasibility of acquiring the necessary right-of-way or eliminating or reducing non-vital elements.

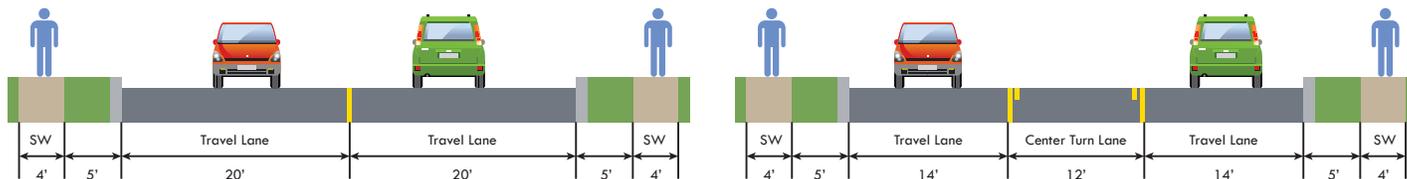


Cross Section Guide

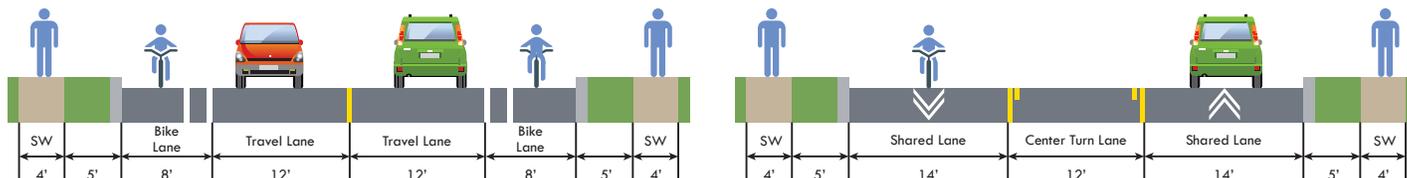
Minor Collector (60' ROW)

TYPICAL*

*Verify current design criteria.

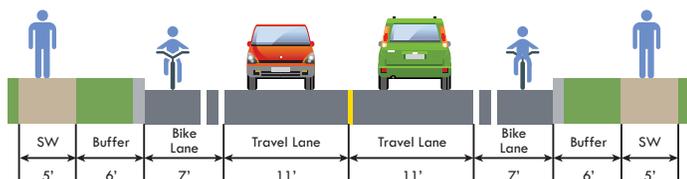


BIKE OPTIONS

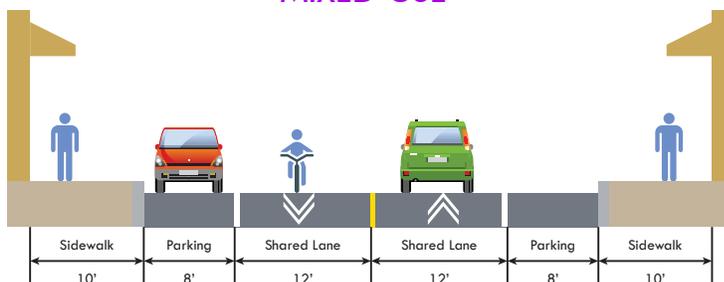


FLEXIBLE DESIGN EXAMPLES

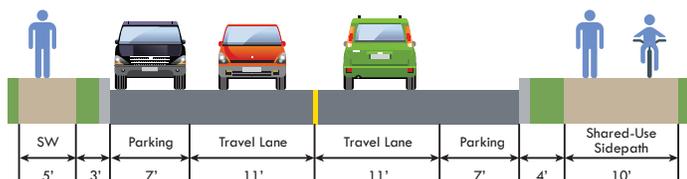
COMMERCIAL



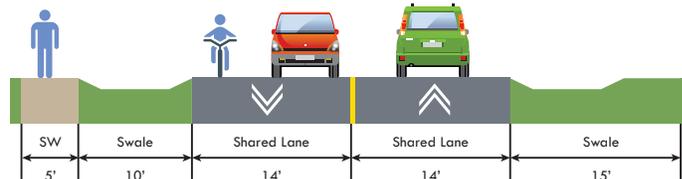
MIXED-USE



NEIGHBORHOOD



RURAL

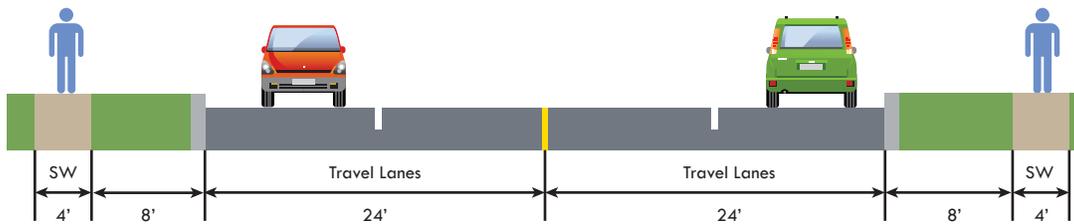


Cross Section Guide

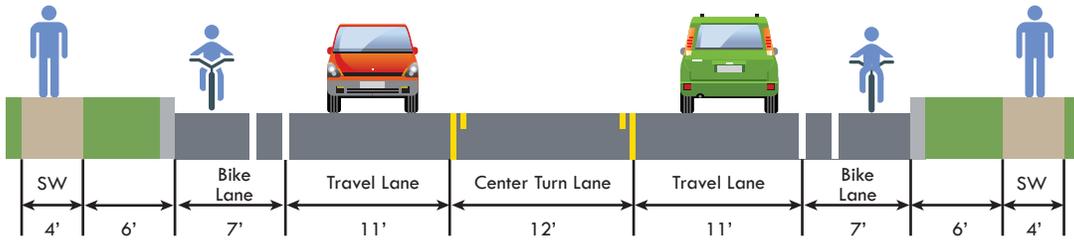
Major Collector (70' ROW)

TYPICAL*

*Verify current design criteria.

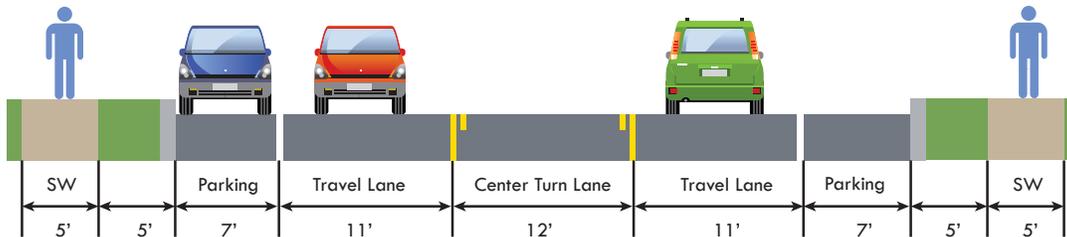


BIKE OPTION



FLEXIBLE DESIGN EXAMPLES

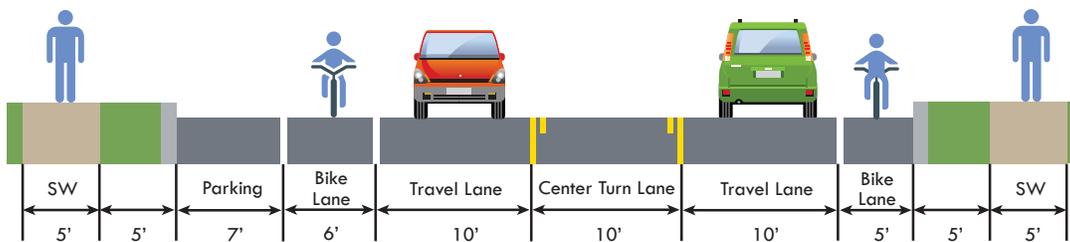
COMMERCIAL



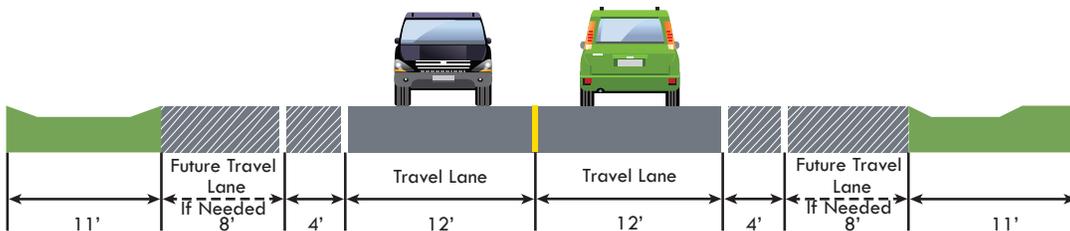
MIXED-USE



NEIGHBORHOOD



RURAL

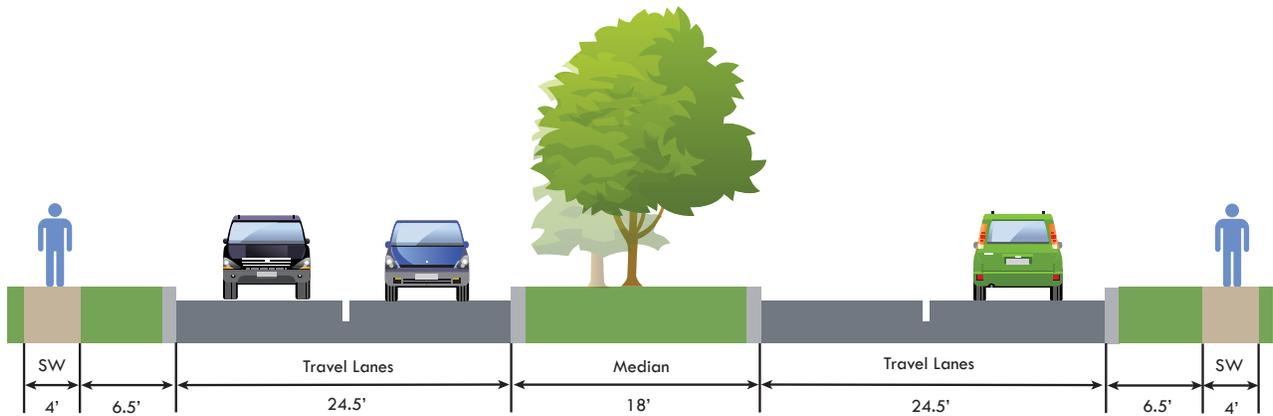
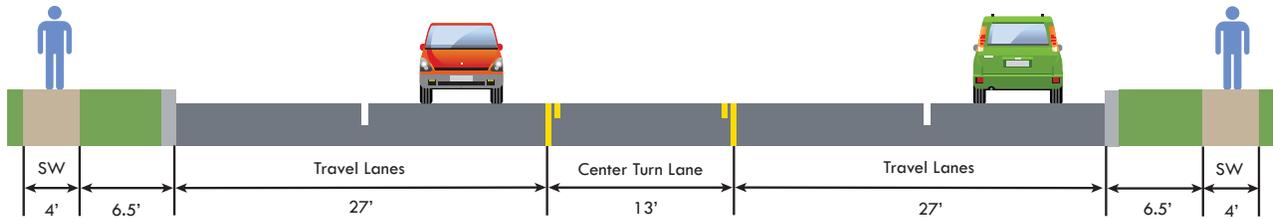


Cross Section Guide

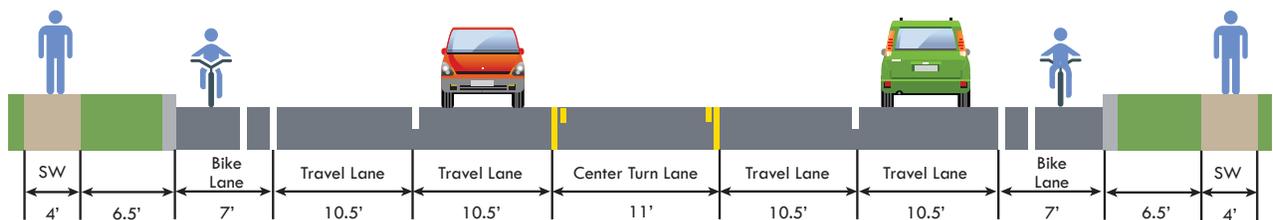
Minor Arterial (90' ROW)

TYPICAL*

*Verify current design criteria.

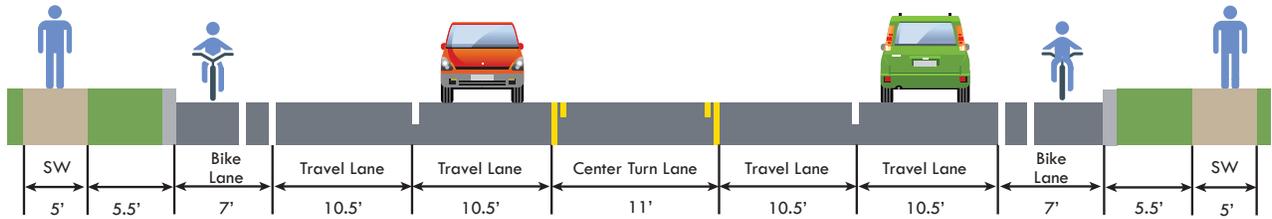


BIKE OPTION

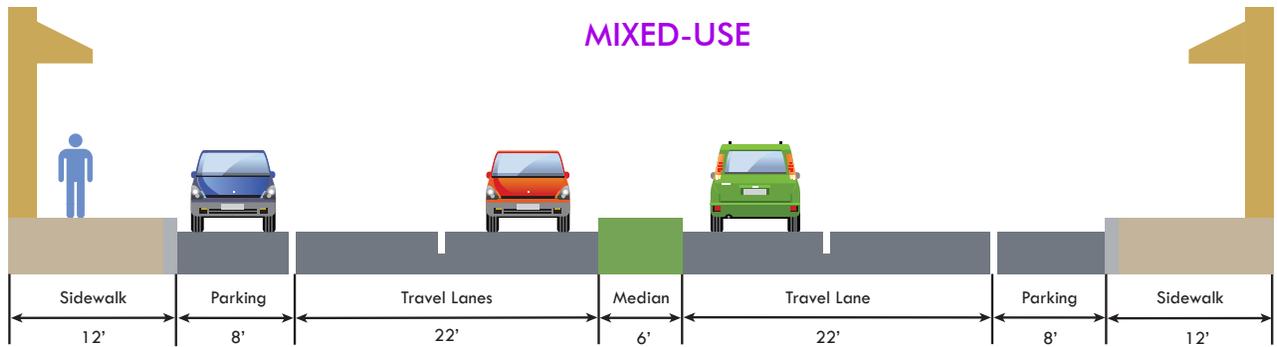


FLEXIBLE DESIGN EXAMPLES

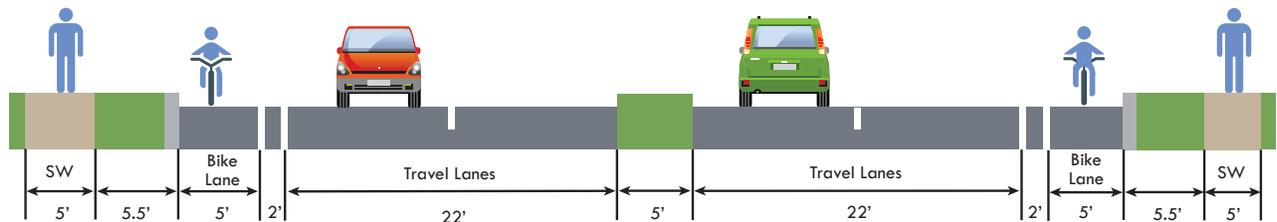
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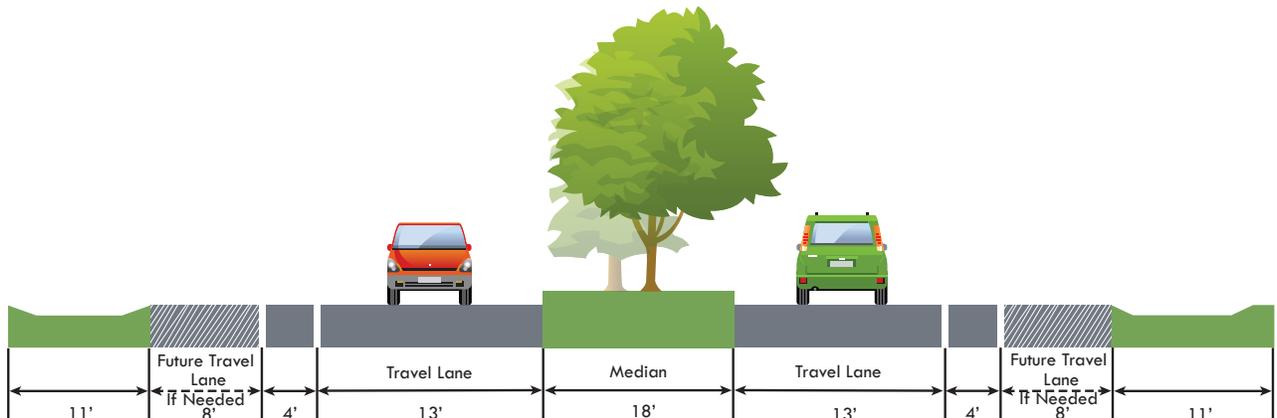
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NEIGHBORHOOD



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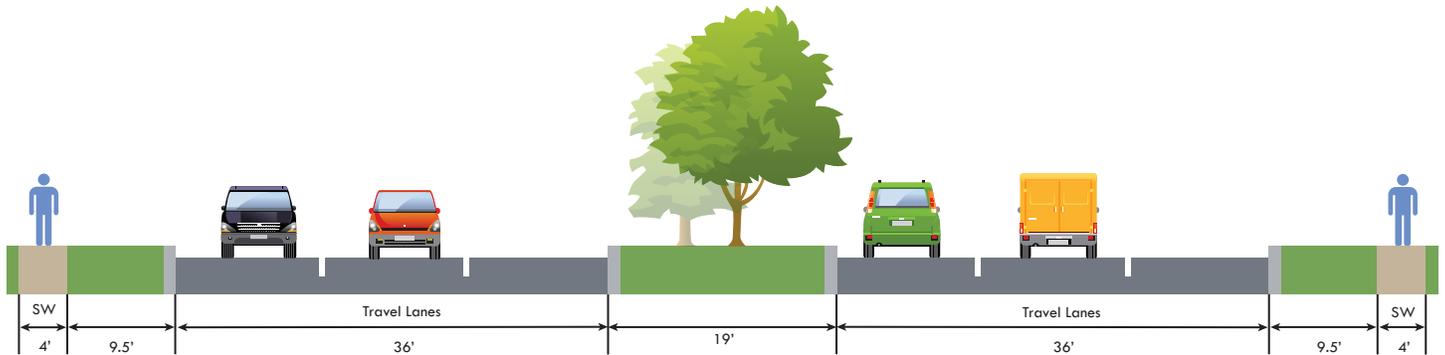


Cross Section Guide

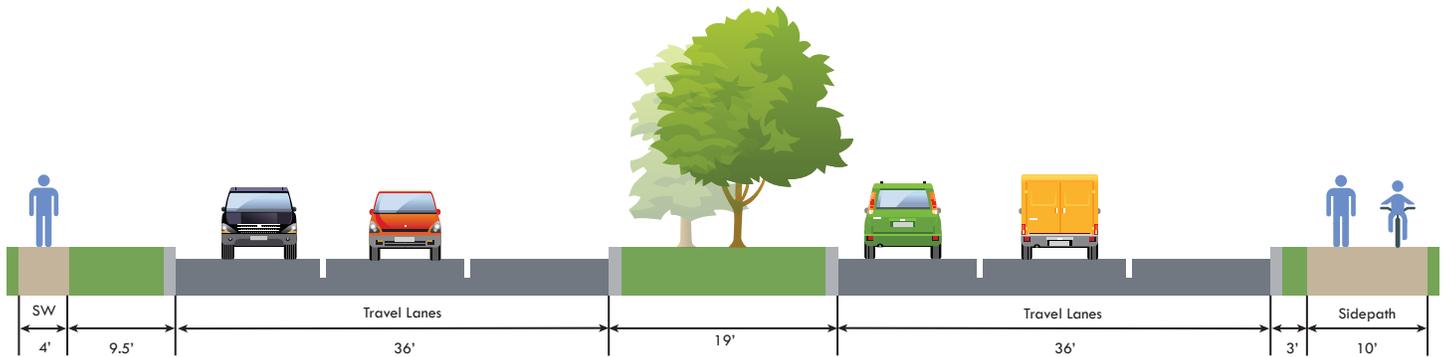
Principal Arterial (120' ROW)

TYPICAL*

*Verify current design criteria.

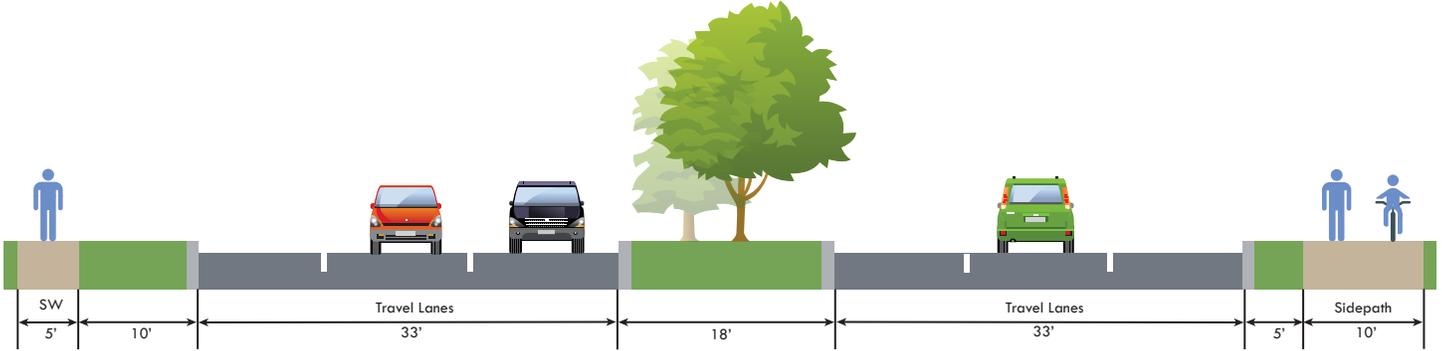


BIKE OPTION

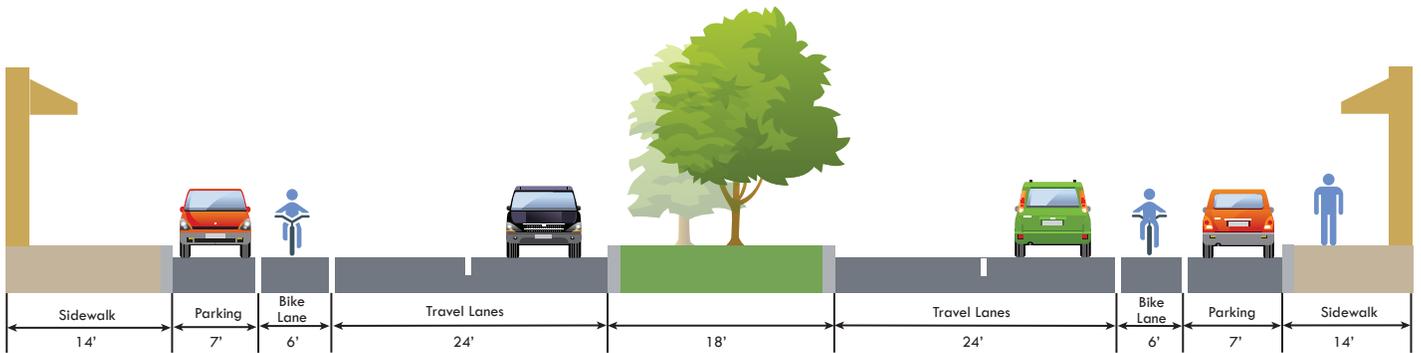


FLEXIBLE DESIGN EXAMPLES

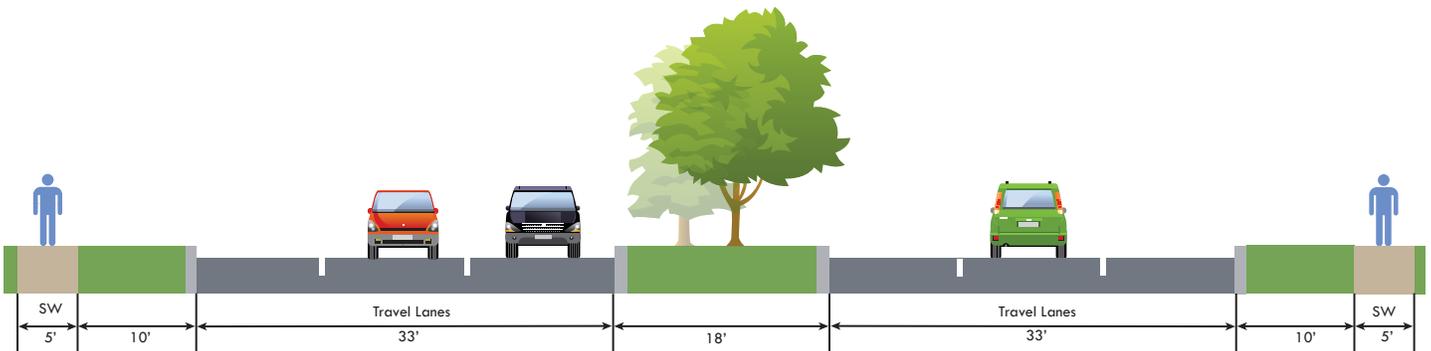
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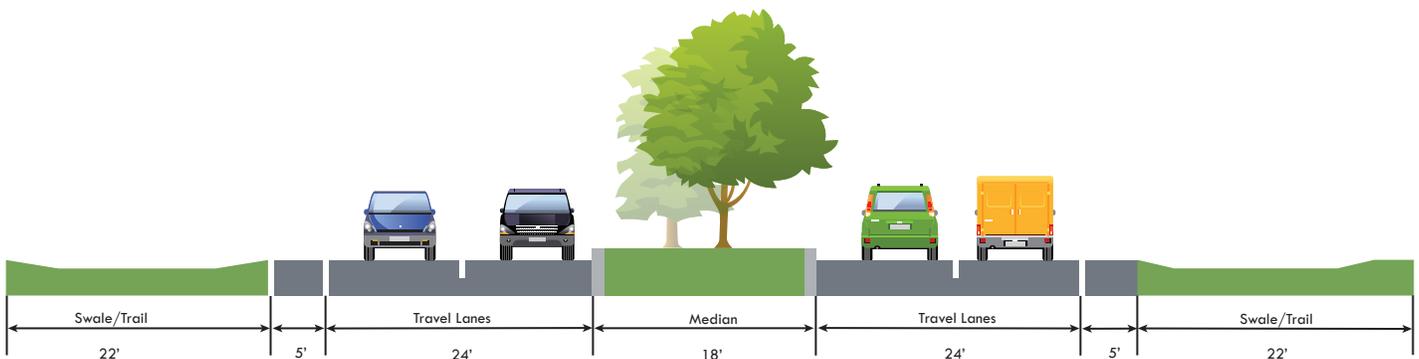
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NEIGHBORHOOD



RURAL



Chapter 4 – Project Development

Introduction

The following planning, design, and approval process provides the framework for developing a more integrated approach to roadway design by planners, engineers and roadway designers. This process can be used for all new and retrofit street projects within the City. A single comprehensive design process that guides all aspects of street design allows for a convenient and streamlined process for everyone involved.

The land use and surrounding context should help direct the design for streets and street networks. The design should take into consideration a multi-modal approach based on the goals, priorities, and context of each specific corridor. The following items should be taken into consideration when designing the transportation network:

- Safety and accessibility for all users
- Interconnected networks for all modes of transport
- Speed management
- Consideration of landmarks, views, vistas, and gateways
- Legibility and efficiency
- Environmental conditions

Interdepartmental Coordination

Coordination between the various departments at the City of Burleson is critical to successfully completing a project, maximizing resources and ensuring desired outcomes for future thoroughfares and the transportation network as a whole. Coordinating MMP implementation with other roadway work such as utility, drainage and resurfacing projects, and other departments, such as Community Development, Public Works, Parks and Recreation and other relevant departments, will provide opportunities for cost effective, streamlined implementation.

Thoroughfare Design Stages

The thoroughfare design process is a simplified process that allows for a more flexible approach to roadway design. The process can include collaboration with the public, stakeholders and a multidisciplinary team of professionals (both public and private sectors) if needed, depending on the complexity of the surrounding context and needs. Within the City of Burleson, inter-departmental coordination needs to occur throughout the process to ensure that the goals and priorities of the corridor are achieved. The design process applies to all street design scenarios and entails five steps:

- Step 1: Determine Functional Class
- Step 2: Determine Context Type
- Step 3: Identify Right-of-Way (Existing and/or Future)
- Step 4: Select Priority Elements for Thoroughfare
- Step 5: Finalize Design

Step 1: Determine Functional Class

The Master Mobility Plan identifies every arterial and collector within the City of Burleson as either a principal, major or minor facility. Refer to Page 12 for the detailed MMP map.

Step 2: Determine Context Type

Once the functional class has been identified, it is important to determine in which context type the thoroughfare is located: Commercial, Mixed Use/Main Street/Downtown, Neighborhood, or Rural. Refer to Pages 12-15 for more detail on the context types as well as the MMP map identifying the different locations of the contexts.

Step 3: Identify Right-of-Way (Existing and/or Future)

In this step, it must be determined whether the existing right-of-way is sufficient or if additional right-of-way must be acquired to fulfill the requirements of the corridor. During this step, use the thoroughfare design matrix (pages 19-20) to determine potential dimensions of the thoroughfare.

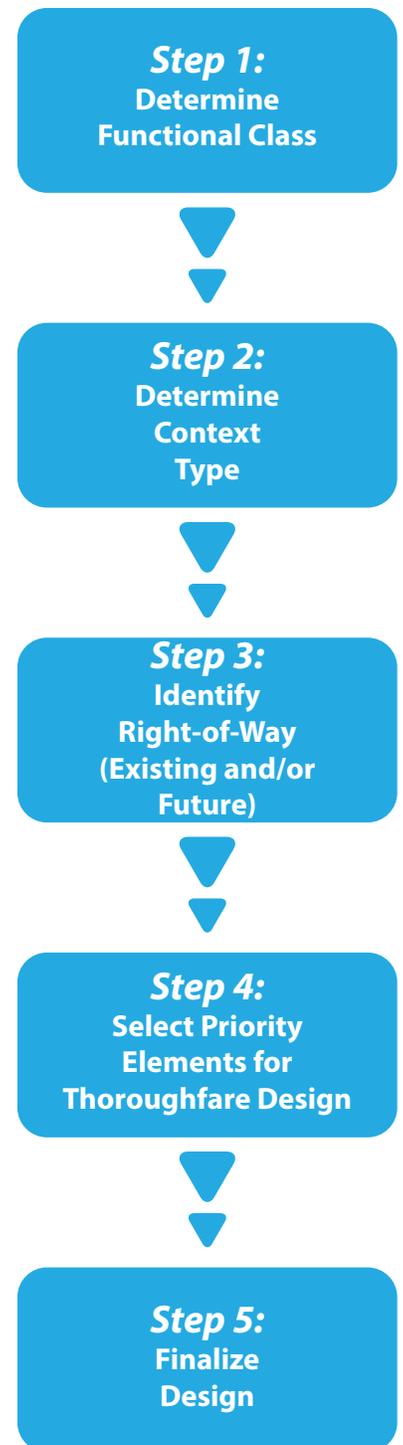
Step 4: Select Priority Elements for Thoroughfare Design

After the initial three steps have been completed, determining the priority elements that need to be included in the conceptual design of the roadway is the next step. This step will not only identify the characteristics of the travel way and the streetside, but will also rely more heavily on the surrounding land uses and built environment. The Thoroughfare Design Matrix and Cross Section Guide in Chapter 3 should be used as tools to create conceptual design alternatives. Coordination with relevant stakeholders is important during this stage of the planning process to ensure a community-supported and easily implementable design. The following list includes examples of questions that can be asked during this step to identify priorities.

- Is this a corridor heavily used by cyclists and pedestrians?
- Are commercial vehicles frequent?
- Are there businesses located on this corridor? Are they auto-oriented (big-box) or pedestrian-oriented (street frontage)?
- Is this a residential location with parks and schools near-by?
- Do people require on-street parking to access homes or businesses?

Step 5: Finalize Design

The previous steps lead to the final step which is to finalize the new thoroughfare design of the studied corridor.



Chapter 5 – Implementation

Corridors Approach

The corridor planning approach is a method to comprehensively address the transportation and land use needs along a specific thoroughfare. With public and stakeholder involvement, the process is intended to arrive at a long-range corridor vision. This vision will guide how the City of Burleson will look, function and feel over the next decades.

The following pages outline the application of the corridor planning approach on specific thoroughfares in the City of Burleson as part of the process to achieve the vision of the overall Master Mobility Plan.

Corridor Plans

Renfro Street

- Identified study area: Renfro between Wilshire and I-35
- Located in Burleson’s Old Town district, the corridor was determined to have a Mixed-Use/Main Street/Downtown context.
- An internal workshop with city staff and stakeholders was conducted as a sample corridor exercise. This developed ideas and alternatives to better serve all users of this corridor and complement the intended land use context. Ideas included wide sidewalks for pedestrian comfort, medians for aesthetic improvement opportunities and left turning traffic, and optional on-street parking. Improved pedestrian and bicycle connections were identified with future crossings, bike lanes and shared-use lanes along adjacent streets.
- Refinement of the ideas led to a preferred alternative and compiled into a concept plan, which is shown in Figure 7.

SH 174 (Wilshire Boulevard)

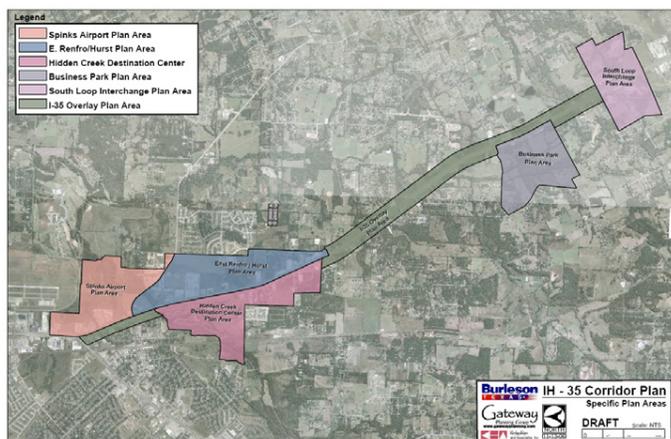
- Completed over 2009 and 2010, the plan addresses SH 174 from I-35 to the southern city limits.
- A series of public meetings addressed visual character, roadway design, connectivity and mobility. These resulted in identifying opportunities for future development and priority elements for improving the aesthetics and function of the corridor.
- The vision addresses two distinct zones that the roadway serves: the Wilshire Commercial District along the northern end that addresses already developed sections and the Wilshire South District concerning largely undeveloped property to the south.
- Recommendations for land use, zoning, architectural character, streetscape and access management are made to achieve desired goals.

Summercrest Boulevard

- Identified as a priority route to improve pedestrian and bicycle facilities
- Design options are currently being studied

IH-35

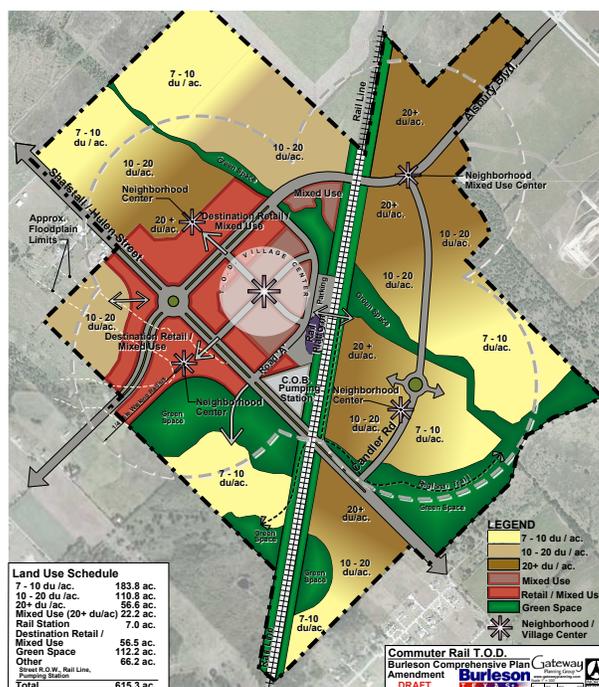
- This plan addresses the nine-mile stretch of Interstate Highway 35W between Alsbury Boulevard to FM 917.
- This corridor is identified as both an important transportation connector and an asset to the local economy.
- The plan identifies the strengths and weaknesses of the corridor and outlines goals for guiding future land use, open space, and transportation opportunities.
- In addition, special planning areas were studied that act as strategic nodes for economic development. They include Spinks Airport, E Renfro Street/Hurst Road, Hidden Creek Destination Center, Business Park, and the FM 917 Interchange.



IH-35 Corridor Plan

Burleson West TOD District

- With the annexation of land along the Burlington Northern Santa Fe rail line, the City of Burleson adopted a plan to guide transit-oriented development that would be compatible with a proposed commuter rail station.
- This site is centered around the planned intersection of two major roadways, Alsbury Boulevard and Hulen Street.
- The plan outlines goals to guide land use, a pedestrian network, and multi-modal transportation connectivity compatible with mixed-use and higher density residential development.
- A conceptual plan was included in the City's Comprehensive Plan in 2006, and a full TOD Master Plan study was completed in 2012. This study was funded by a Sustainable Development Grant from the North Central Texas Council of Governments (NCTCOG). The Master Plan included a real estate development market analysis, station design concepts, and a transportation analysis.



Burleson West TOD Master Plan

Thoroughfare Recommendations

Wilshire Corridor Connectivity: Gregory Street Extension

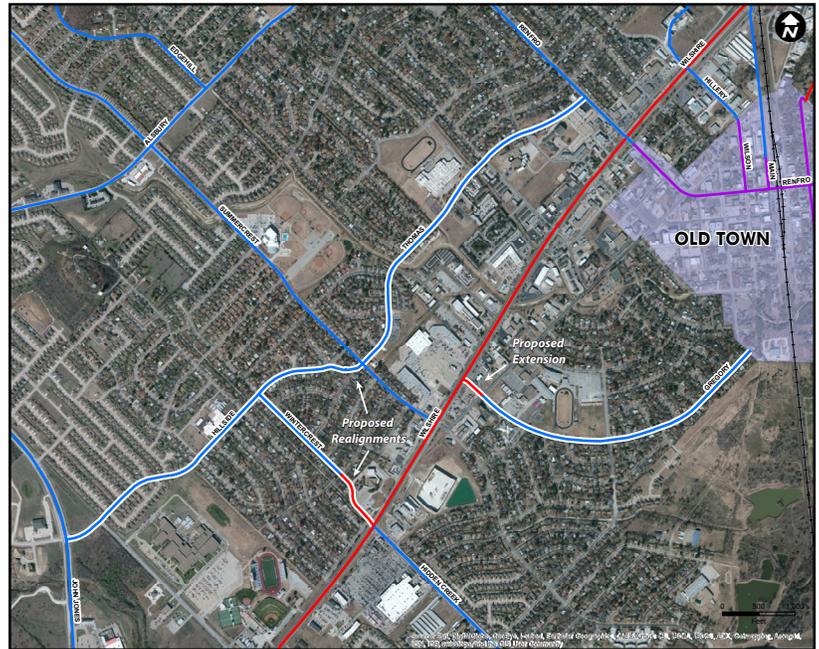
The existing section of Gregory Street is recommended to be added to the thoroughfare plan as a minor collector. A future extension of Gregory, west to Wilshire Blvd (SH 174), would create a continuous minor route to Old Town and add connectivity to the Wilshire commercial corridor.

Hidden Creek Parkway-Wintercrest Road

The existing section of Wintercrest Road east of Hillside Drive is recommended to be added as a thoroughfare with an extension aligning with the existing Hidden Creek Parkway signalized intersection. This will increase connectivity across Wilshire Blvd and provide additional access to future commercial development.

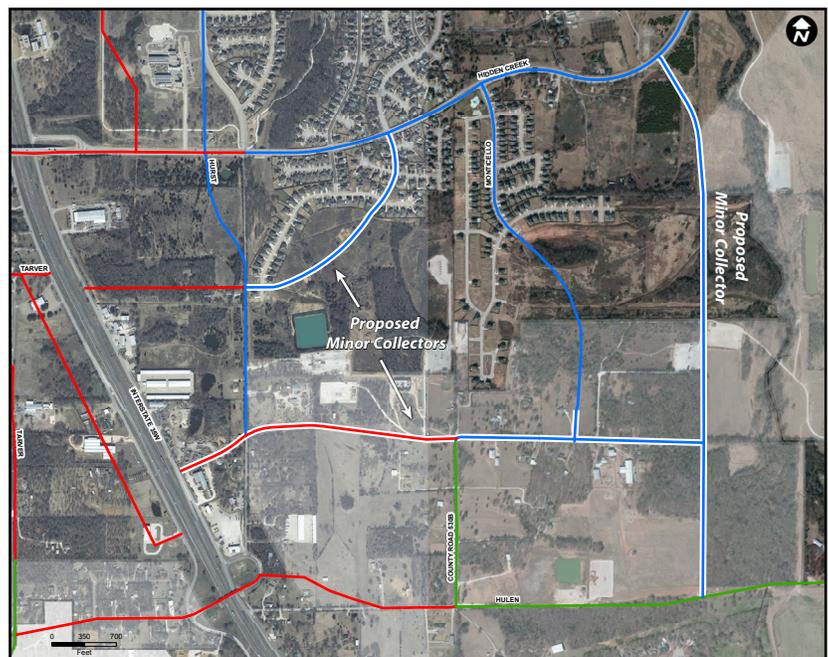
Hillside Drive-Thomas Street

Hillside Drive and Thomas Street between John Jones Drive (FM 731) and Renfro Street are recommended to be added to the thoroughfare plan as minor collectors. A realignment to connect the two streets at Summercrest Blvd would create an alternate neighborhood-context parallel route to Wilshire Blvd.



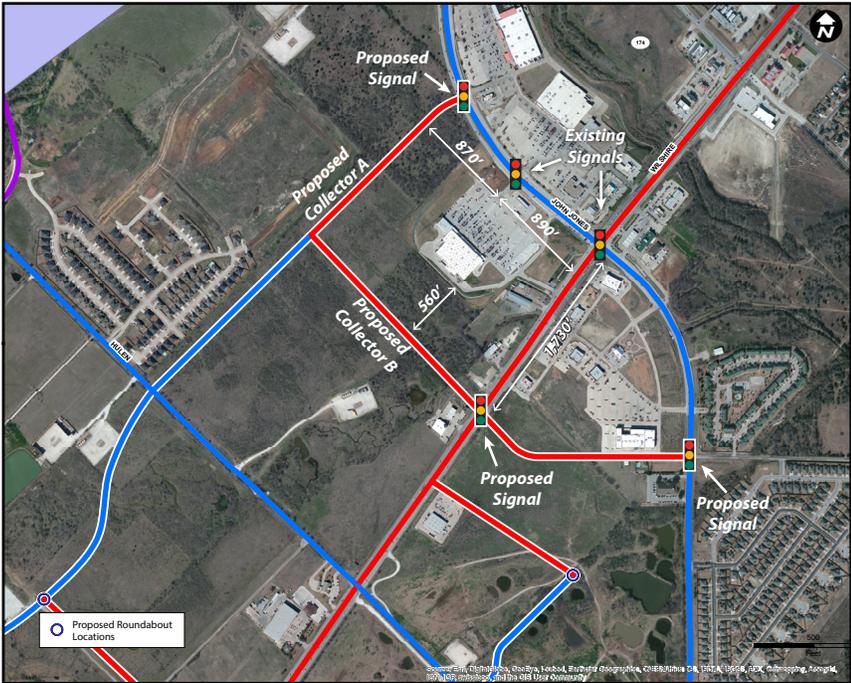
Hidden Creek-Hulen Connectors

New minor collectors are proposed to serve the Hidden Creek and Hulen area, which is expecting future residential and commercial development. These collectors will provide alternate connections to the businesses along I-35 and an additional north-south route east of the interstate.



FM 731-Hulen Commercial Connectors

Two collectors are proposed in the commercial area near the intersection of FM 731 and Wilshire Boulevard. This option would provide backage connections to HEB and new developments along Wilshire and Hulen St. The installation of a hooded left turn median opening should be considered at the existing signal on FM 731.

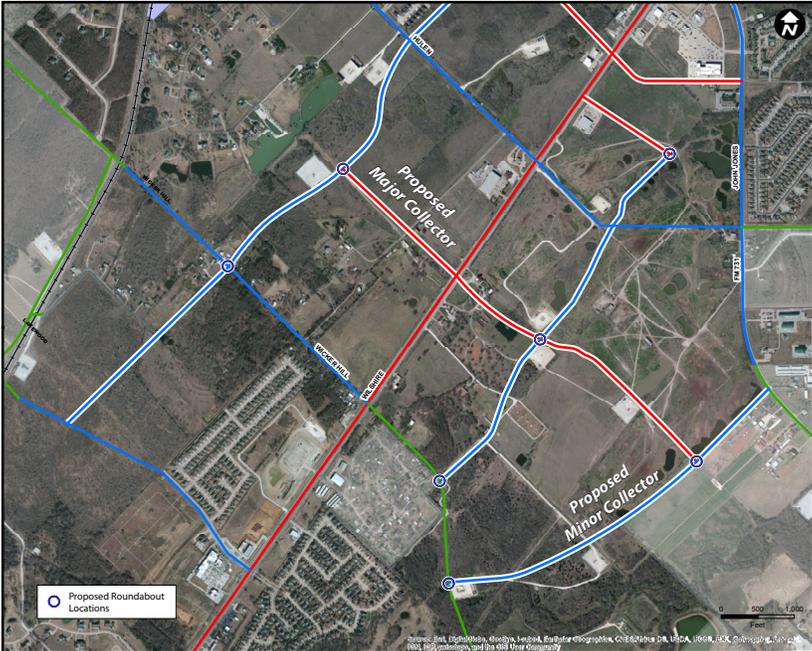


Benefits

- Collector A aligns with existing median opening.
- New signal at Collector B intersection evenly splits FM 731 and Hulen St.
- Developable land behind the existing HEB would be served by Collector B.

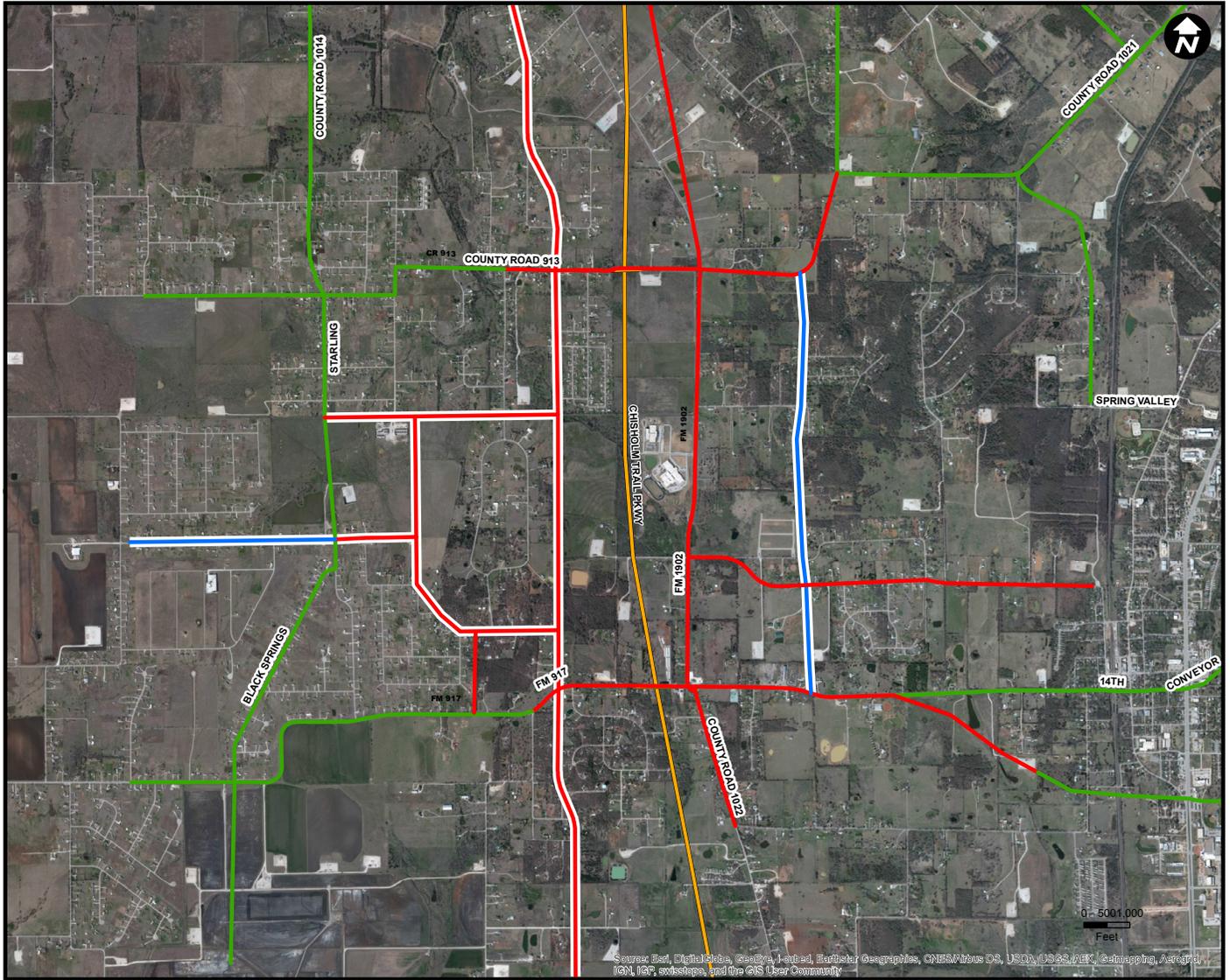
Wilshire (SH 174)-Forrest Connectors

Additional connections are proposed for the developing area along Wilshire (SH 174) and south of John Jones. A major collector would provide service to future commercial developments along the east and west sides of Wilshire. This would connect to a minor collector serving future residential areas south of John Jones. This collector would provide an additional east-west route in this area, along with the future extension of Hulen. Backage collectors and roundabouts at minor intersections are proposed to serve new development and reduce the traffic impacts along Wilshire for local trips.



Chisholm Trail Parkway/SH 121 Connectivity

A system of collectors are proposed in the expected growth area near the newly constructed Chisholm Trail Parkway (CTP). These thoroughfares would provide backage connections to future commercial and residential development and provide alternate routes for shorter, local trips.



Chapter 6 – Bike Path Plan

Introduction

In addition to the Complete Streets process which considers all street users and land use contexts in the design of future thoroughfares, Burluson’s Bike Path Plan is intended to identify the best set of bicycle facility improvements to establish a well-connected multi-modal network throughout the city’s existing road network. By retrofitting roadway facilities to safely accommodate bicyclists along with motorists, the City increases transportation mode options for all residents, and attracts bicyclists of different skill and comfort levels. The development of off-street trail connections will increase access to park facilities and create safe routes where on-street facilities are not feasible. Currently, most destinations in the city are best reached by motor vehicle, but in recent years there has been an increasing demand for a more bicycle-friendly roadways for both commuting and recreation. Oak Valley Trail, an off-street bike and pedestrian path, exists from Old Town to the east side of the city, but no other facilities exist to create safe and convenient bicycle connections to other key destinations throughout the community. By further developing both an on- and off-street network of routes, the City can achieve the goal of reducing the number of motor vehicle trips and increasing the safety and public awareness of bicycles on Burluson streets.

The recommendations presented in the Burluson Bike Path Plan were developed after a thorough evaluation of existing conditions of the City’s roadway network. The core goal was to develop a network throughout the city that provides safe and convenient connections to residential areas, schools, recreational facilities, commercial developments, and Old Town. Each recommended bicycle facility is based on existing roadway factors, such as pavement width, traffic speeds and number of lanes, as well as land-use context and route continuity.

The following sections outline the variety of facility options recommended to develop Burluson’s bicycle mobility network. These facilities include:

- Bike Lanes
- Bike Lanes with Parking Lanes
- Buffered Bike Lanes
- Shared Routes
- Sidepaths
- Off-Street Trails



Bicycle Facility Recommendations

Bike Lanes

Bike lanes are one-way facilities that typically carry bicycle traffic in the same direction as adjacent motor vehicle traffic. Bike lanes are provided for the exclusive or preferential use of bicyclists on a roadway and are identified through signage, striping, and other pavement markings. These lanes allow bicyclists to ride at comfortable speeds and encourage a position within the roadway where they are more likely to be seen by motorists. The separation from the automobile travel lane provides additional comfort for less experienced bicyclists who are not comfortable sharing a lane with cars. Bike lanes are typically located between the curb or road edge and the adjacent travel lane. While the lane distinguishes predictable areas for bicyclist and automobile movement, bicyclists may leave the bike lane to pass other cyclists or avoid any debris or conflicts with other street users.



Bike Lane

General Considerations

- Bike lanes are appropriate for any bicycle route when sufficient pavement width is present.
- Lanes should have a smooth riding surface.
- Lanes should be provided on both sides of a two-way street to prevent wrong-way use.
- Bike lanes are most appropriate on streets with higher traffic volumes and posted speeds of 30 mph and greater.

Design Guidelines

- The preferred minimum bike lane width is 5 feet; however, a bike lane width of 6 feet is often necessary due to potential conflicts such as wide gutters or parked cars. Where gutters or depressed drainage inlets are present, the operating lane width should be designed separate from the gutter area. The maximum width should not exceed 7 feet so that lanes are not mistaken for automobile travel lanes or parking areas.
- Appropriate pavement striping and markings should be used to identify bike lanes. Refer to the Texas Manual on Uniform Traffic Control Devices (TMUTCD) for detailed placement guidelines.

Bike Lanes with Parking Lanes

Certain roadways may have sufficient roadway width to provide both bike lanes and on-street parallel parking. Depending on roadway width, parking would be located on one or both sides of the street. On existing streets, this can typically be accomplished with the narrowing or reduction of existing travel lanes, or the reconfiguration of existing parking lanes. The bike lane should be placed between the parking lane and travel lane. This facility has been recommended for wider residential collector roads where on-street parking is currently used. In most cases, Burleson's roadways have sufficient width for a single parking lane with two bike lanes.

General Considerations

- Lane widths of streets with lower operating speeds and volumes are generally appropriate for narrowing.
- To prevent conflicts with opening car doors, bicyclists should be encouraged to ride further from parked cars with wider bike lanes, wider parking lanes, or a striped buffer.

Design Guidelines

- While the minimum bike lane width is 5 ft, a lane width of 6 to 7 ft is recommended.
- The recommended width of the adjacent marked parking lane is 8 feet.
- The combination of the bike lane and parking lane needs to be 13 ft.



Buffered Bike Lane



Shared Route Markings

Buffered Bike Lanes/Cycle Tracks

When sufficient roadway width is present, or if extra travel lanes are reduced, a buffer may be striped between a bike lane and travel lane to provide additional comfort for both bicyclists and motorists. This provides space for bicyclists to pass one another or ride side by side without encroaching into a motor vehicle travel lane. The buffer adds to the perception of safety and encourages greater use of the on-street bicycle network by appealing to a wider set of bicycle users. Flexible bollards or a raised curb may be used in the buffer zone to create a *protected cycle track*. A wide two-lane section of Summercrest Blvd has been recommended for buffered bike lanes with parking.

General Considerations

- Buffered bike lanes should be the primary consideration for bicycle facilities if sufficient pavement width is available.
- Beneficial on streets with higher travel speeds, higher travel volumes, and higher truck traffic
- Best accomplished as part of retrofits of existing roadways with more travel lanes than needed

Design Guidelines

- Buffers should be delineated by two solid white lines and be at least 2 feet wide. If wider than 3 feet, diagonal hatching should also be marked.
- A 5 foot minimum bicycle lane is recommended.
- Bicycle markings and signage should be used the same as a conventional bike lane.

Shared Routes

Certain roads that cannot accommodate bike lanes have been identified as preferable for use, and can be designated as a bike route with signage and markings. These roads typically have lower travel speeds and traffic volumes, and provide convenient routes to desired destinations, making bicycling more enjoyable. Implementation of proper markings on these roadways help guide bicyclists along routes, and also help bicyclists position themselves safely within the travel lane. In addition, the markings provide additional awareness to motorists of the likely presence of bicyclists and inform that they must share the road.

General Considerations

- Shared lane markings are best used on routes without sufficient roadway width to provide bike lanes. They are also useful for indicating gaps between discontinuous bike lanes or between shared use paths and destinations.
- Shared lane markings should not be used on roadways with speed limits above 35 mph.
- The “Bicycles May Use Full Lane” sign is best used for travel lanes too narrow for bicyclists and motorists to safely navigate side by side.

Design Guidelines

- Shared lane markings should be placed immediately after an intersection and spaced no more than 250 ft apart.
- Shared lane markings should be placed at least 4 feet from the face of curb on streets without parallel parking and at least 11 feet from the face of curb on streets with parallel parking.
- The preferred placement of markings is in the center of the travel lane to promote single-file positioning of vehicles and to minimize wear.

Sidepaths

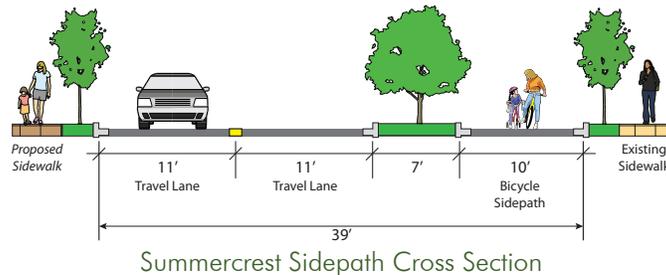
Shared use sidepaths are bikeways that are physically separated from motorized vehicular traffic, either by open space or a barrier, and follow roadway corridors. These paths are designed for two-way travel, and in addition to bicyclists, path users may include inline skaters, skateboarders and pedestrians.

General Considerations

- On-street facilities are preferred, but sidepaths may be considered along roadways with higher traffic volumes and speeds, and where no alternatives exist to install on-street facilities.
- Sidepaths should avoid being built along roadways with frequent street or driveway crossings. At intersections, bicyclists will often be out of the line of sight of turning motorists.

Design Guidelines

- The recommended minimum width of a two-way shared use path is 10 feet, but 8 feet may be used if bicycle traffic is expected to be low, or if other design constraints are present.
- Marked crosswalks are recommended at intersections between shared use paths and roadways.
- Sidepaths should have a physical separation from the roadway with a 5 foot landscape buffer or physical barrier.



Summercrest Sidepath Cross Section

Off-Street Trails

Paved off-street trails are also intended for shared use, but have routes independent of roadways. These facilities allow people to hike, bike, or walk without interference from motor vehicle traffic. This tends to attract users with a wide range of skill levels and riding speeds. Burleson's planned trail system has been incorporated into this plan, and additional trail connections to on-street facilities have been recommended. Upon completion, these facilities will provide seamless routes to Old Town and many of the City's parks, schools and neighborhoods.

General Considerations

- Off-street trails should be considered supplemental to the on-street network, but not a replacement.
- Sufficient access points should be provided from the on-street network.

Design Guidelines

- Since shared-use paths and trails are also used by pedestrians, these facilities must meet the requirements of the Americans with Disabilities Act (ADA).



Oak Valley Trail

Wayfinding

Wayfinding signs for bikeways make navigating unfamiliar routes via bicycle much easier and safer. For example, it may not be clear that both Hillery and Ellison Streets are available routes into Old Town. Wayfinding measures encourage more bicycle trips by informing bicyclists that destinations can be reached by bike from various locations. In addition to signage, wayfinding bike dot markings can be installed on the road surface to help navigate non-arterial circuitous routes, particularly in residential settings. These dots are an alternative to the standard shared lane marking.

General Considerations

- Wayfinding signage should indicate the direction to major points of interest. Distances are also useful to riders and may be included.
- Consideration should be given to the placement of signage so bicyclists following routes do not go off course.
- Bicycle dot markings may be used in combination with bicycle route and wayfinding signs.

Design Guidelines

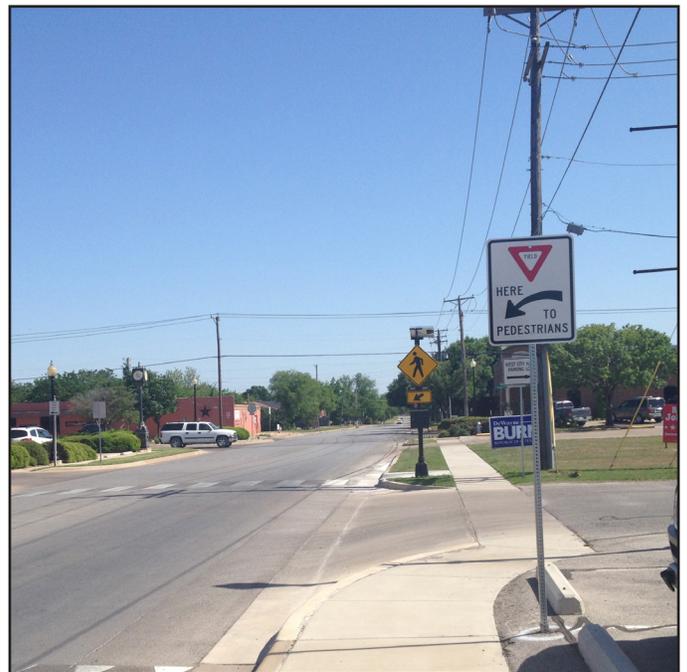
- Destination signs should always accompany a “Bike Route” or “Bike Lane” sign.
- There is no standard design for pavement wayfinding markings, but a 2 foot minimum diameter is recommended on roadways.
- At intersections where a route turns, markings should be placed 30 feet before the intersection and 50 feet after the intersection to confirm the turn.



Bicycle Wayfinding Sign



Bicycle Wayfinding Dot



Appendix – Public Involvement

A number of opportunities for public involvement were provided during the development of this document, both for the Master Mobility Plan and the Bike Path Plan. One example is provided below:

Public Meeting: February 21, 2013

On Thursday, February 21, 2013, the City of Burleson presented a summary of the Complete Streets process, new thoroughfare recommendations, and the Bike Path Plan recommendations in a public open house. Two stations explained the process and toolbox for developing the both the Master Mobility Plan and the Bike Path Plan. Maps, comment cards, and a bicycle ridership survey were provide for citizen feedback.

The following is a summary of feedback received:

- Trails should have both concrete and gravel/granite paths
- Would like to get to public transportation by bicycle
- Would like to have a bicycle connection to south Fort Worth
- Evaluate the need for on-street parking on Cardinal Ridge
- Better bicycle safety education for drivers
- Bicycle rack implementation
- Crossings at Wilshire are a concern
- Better lighting for bicyclists at night
- Renfro needs better pedestrian facilities east of I-35
- Improve pedestrian signal timing on SH 174

Additional Public Input Opportunities

- November 5, 2012 – City Council Meeting (Bike Path Plan)
- November 19, 2012 – City Council Meeting (Transportation Enhancement Funding)
- August 15, 2013 – MMP Public Meeting
- August 19, 2013 – City Council Meeting (MMP)
- December 9, 2013 – City Council Meeting (Sidewalks and Trails)
- December 12, 2013 – Planning and Zoning Commission Meeting (MMP)
- November 10, 2014 – City Council Meeting (MMP)
- December 18, 2014 – MMP Public Meeting
- January 22, 2015 – Planning and Zoning Commission Meeting (MMP)



