





# TRANSPORTATION & MOBILITY

# Introduction

The City's mobility network is vitally important to the economic, environmental, physical and social health of a community. The roadways that connect a community impact whether people can easily bike, walk or drive to their destinations. Roads and streets not only connect us to our jobs, shopping and places of worship, but more importantly, they connect us to one another. Design decisions have the ability to isolate or further connect the community by influencing the way in which residents interact with one another.

Complete streets, designed to accommodate various modes of transportation, inherently offer more room for residents to participate in physical activities such as walking and cycling. This not only enhances public health by encouraging exercise but also fosters a sense of community as people interact more frequently in these spaces. The transportation network also impacts the labor markets within reasonable commuting distance for residents, improving economic mobility. How roads are designed also affects how adjacent land is utilized. The size, capacity, and flow of traffic can heavily influence the "highest and best use" of land within the City, as certain development patterns may lend themselves to increased pedestrian or vehicular traffic.

Throughout the Plan engagement process, various community stakeholders were asked to help identify a vision for the future of Rockdale's transportation system. The overarching vision provided by the community was to: *"Develop and maintain a transportation system that will safely, economically and efficiently accommodate future growth."* This vision statement will guide the discussion and recommendations relating to the transportation network in Rockdale.

The Transportation Plan is divided into the following sections:

- Community Input
- Transportation Profile
- Thoroughfare Plan Classification
- Design Standards
- Action Plan



# WHAT WE'VE HEARD: TRANSPORTATION

When residents were asked **"What area(s) should the City of Rockdale work to prioritize and improve the most?":**

- **12%** said Infrastructure Condition
- **11%** said Roadways, traffic

"Safety concerns about getting into and out of the intermediate school. Traffic is often backed up on 79 because people are waiting to turn into the school. Traffic trying to exit has poor visibility."

- Community Member

"Road (East Belton Ave) is not maintained. People drive on the wrong side to avoid potholes big enough to damage vehicles."

- Community Member

"The intersection of Wilcox and Murray does not provide good visibility."

- Community Member

"Clean up Milam Ave so that it connects back to downtown."

- Community Member

## KEY TAKEAWAYS

- Maintenance of existing local street network should be prioritized.
- Rockdale's transportation network should provide options for multiple modes of transportation, including biking, walking, and private vehicles.
- Streets within the City of Rockdale should be designed with safety as a primary concern.
- Increasing walkability and space for businesses in Downtown Rockdale was valued more than convenient parking.

# Transportation Profile

The existing condition section of the thoroughfare plan is an overview of the transportation network within the City of Rockdale. This section provides a description of the City's major thoroughfares as they currently exist regarding capacity, functional classification and multi-modal accessibility. The purpose of the street classification system is to provide insight into the balance between accessibility and mobility across different road typologies. This provides valuable information that helps inform the long-range transportation plan and the broader land use planning process within the City of Rockdale.

## Major Roadway Network

### U.S. 79

U.S. 79 is an 855-mile, north-south interstate highway that begins off I.H.35 near Round Rock, Texas and terminates in Russellville, Kentucky. U.S. 79 is the primary east-west thoroughfare within the City and serves as a route for through traffic as well as providing local access to the vast majority of commercial/retail businesses with the City. The Texas Department of Transportation (TxDOT) maintains this roadway.

### U.S. 77

U.S. 77 is a 1,305-mile, north-south interstate highway that begins at the junction of I.H. 29 in Sioux City, Iowa and ends at the Mexican border in Brownsville, Texas. This route is located along the eastern city limits of Rockdale and primarily serves through traffic rather than providing local access to goods, services and jobs. TxDOT is responsible for the maintenance of U.S. 77.

### F.M. 487

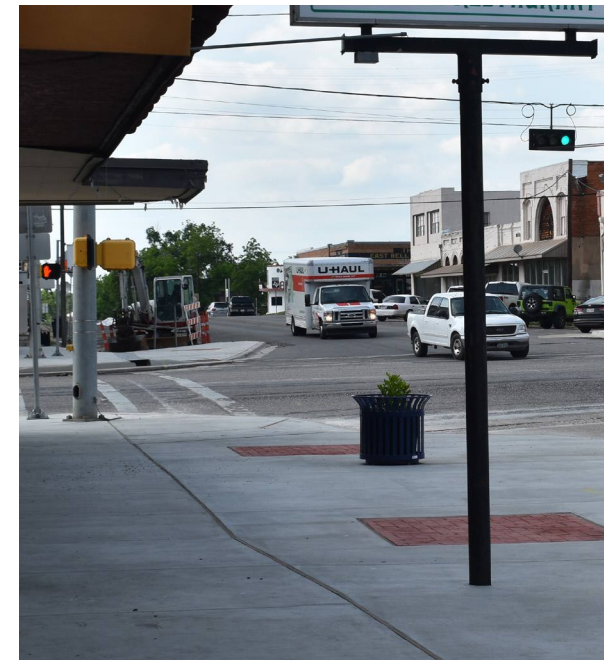
Farm to Market Road (F.M.) 487 is a paved rural road that is part of the Texas state Farm to Market Road System. The Farm to Market System's purpose is to connect agricultural areas to towns throughout the state. This route ends in Downtown Rockdale but extends north of Rockdale for about 60 miles, connecting the City to several rural communities in Williamson, Bell and Milam Counties.

### F.M. 908

This route currently serves as an important rural connector, running 34 miles north-south through Rockdale toward its southern terminus at the intersection of State Highway 21 near Caldwell, Texas. North of Rockdale, the roadway ends near San Gabriel, Texas. F.M. 908 largely provides local accessibility to several institutional and commercial facilities in Downtown and northern portions of Rockdale.

## Local Roadways

Most of Rockdale's local roadways are within a linear grid system, with block sizes varying from 300 feet by 320 feet to 270 feet by 850 feet. Most of these roads are high-access but offer limited mobility in terms of speed. Murray Avenue, Belton Avenue, and Mill Avenue are collector roads connecting local roads with significant arterials, such as U.S. 79.



U.S.79, Downtown Rockdale

Map 6. Rockdale Street Grid Pattern

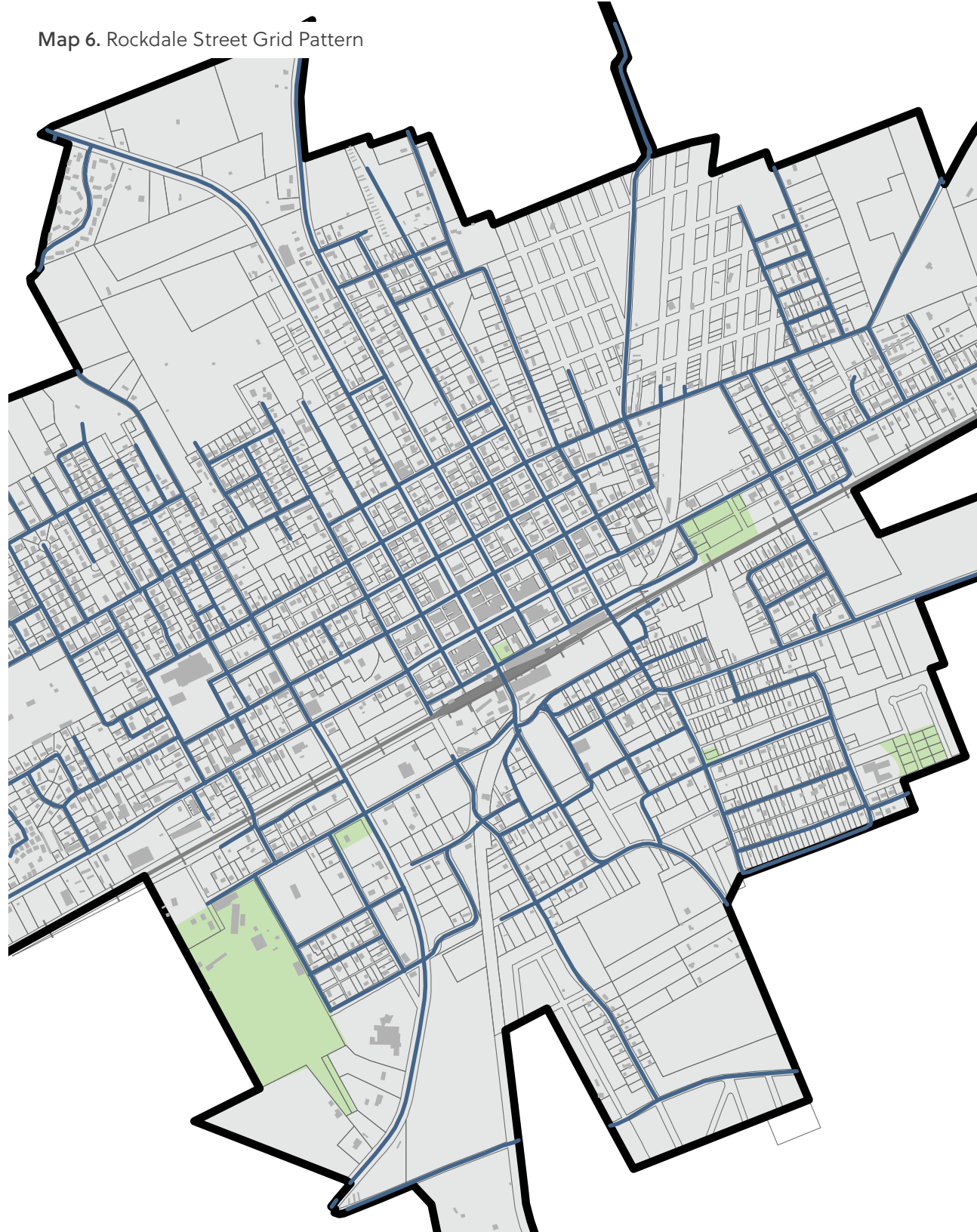
## Street Layout

The City of Rockdale has approximately 51 miles of road within its City limits. With only a few exceptions, the majority of Rockdale's roads lay on a grid with a wide variety of block sizes. Grids offer distinct advantages compared to hierarchical street designs such as those that are more curvilinear in nature.

One of the key advantages that grid systems offer is that it can help distribute trip destinations and origins along a wider variety of similarly sized streets, rather than collecting vehicles onto a few large arterial roads. In this way, the grid system can help mitigate congestion as the City grows, especially when working in tandem with land use policies that encourage a greater variety of land uses along many of the City's streets.

Grid systems also have the advantage of being easy to navigate for both pedestrians and automobile users, which helps with safety and access. Grids can also help create well defined, central gathering spaces such as parks or plazas.

Currently, most residents need to utilize the U.S. 79 thoroughfare to gain access to most goods and services. Focusing on creating complete streets and distributing trip generating commercial areas may help improve traffic flow within the City as well as improves the quality of life for residents.



## Commute Patterns

As of 2020, only about 13% of all workers in Rockdale live and work in the City. A slight majority (49%) of workers live in Rockdale and commute outside the City for jobs. Jobs are not highly concentrated in any particular area. Still, some commuting hotspots are located in the rural portions of Milam County and the nearby ALCOA site to the south of the City. The large number of inward and outward transportation flows illustrates a clear need for a transportation system that efficiently connects workers to regional and local labor markets.

**Figure 18. Job Counts by Distance/Direction in 2020, All Workers**

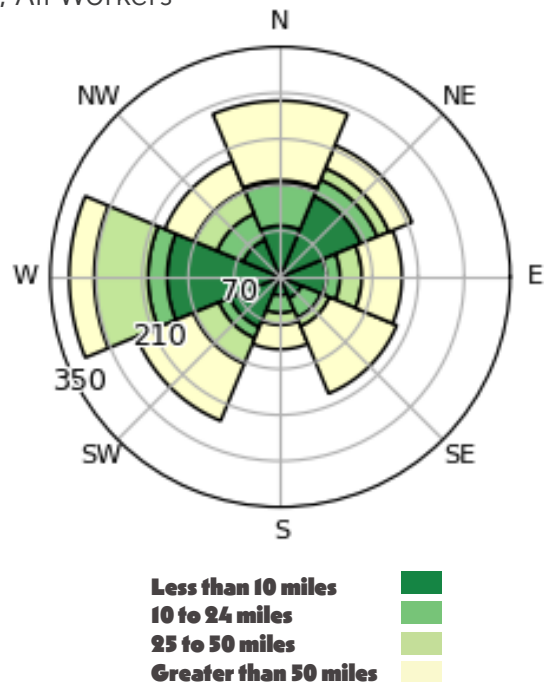
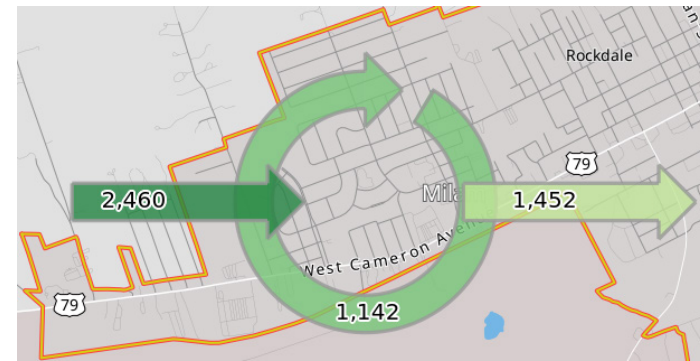
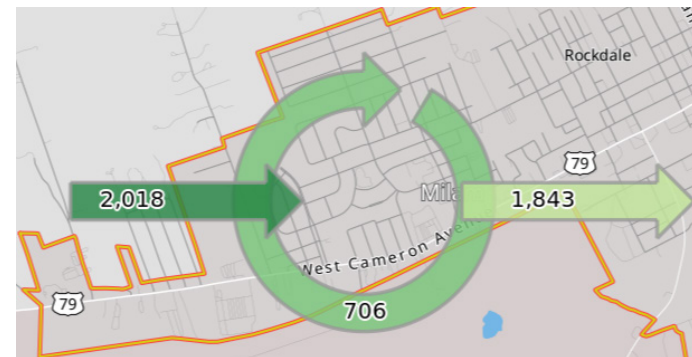


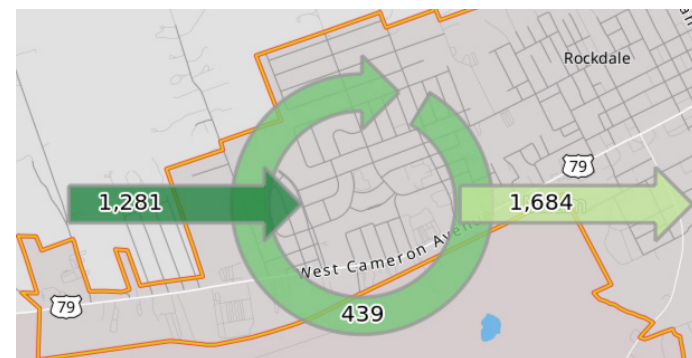
**Figure 19. Rockdale Commuting Patterns 2002-2020**



2002



2010



2020

## Legend

 Rockdale City Limits

 Rockdale Parcels

 Railroads

### Functional Class

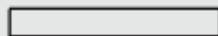
 Major Collector

 Principal Arterial - Other

 Unclassified/Local Street



0.5

 Miles

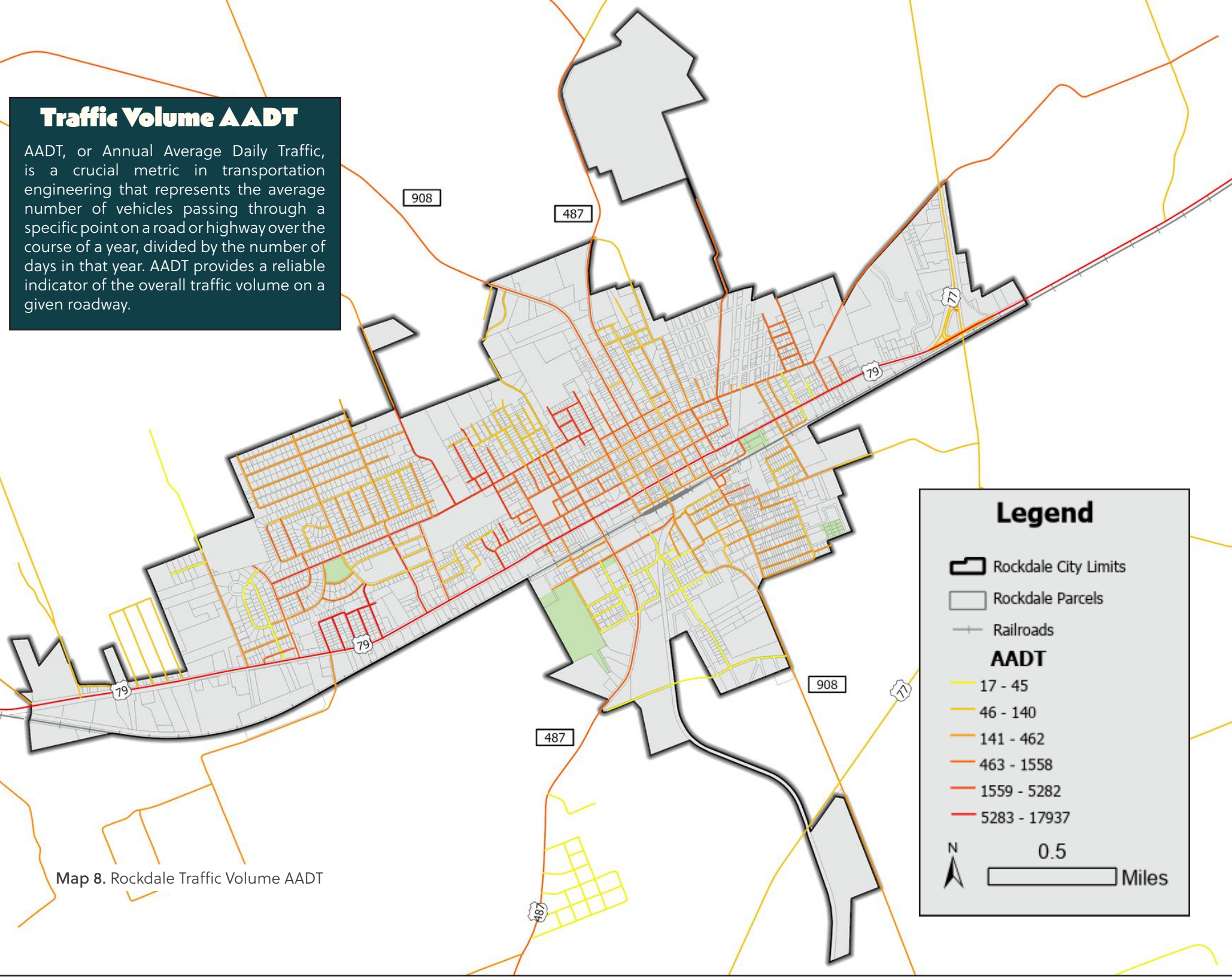
## Functional Classification

Functional classification in transportation planning involves organizing roads into a hierarchical system based on their intended roles and importance within a network. This hierarchy typically includes three main categories: arterial roads, collectors and local roads.

Map 7. Rockdale Street Functional Classifications

## Traffic Volume AADT

AADT, or Annual Average Daily Traffic, is a crucial metric in transportation engineering that represents the average number of vehicles passing through a specific point on a road or highway over the course of a year, divided by the number of days in that year. AADT provides a reliable indicator of the overall traffic volume on a given roadway.



Map 8. Rockdale Traffic Volume AADT



Map 9. Rockdale Crash Density

## Expressways/Freeways

This includes controlled access facilities such as interstates, expressways and freeways. While these technically fall under the category of principal arterials within the City of Rockdale, they are not owned or operated by the municipality and are subject to Texas Department of Transportation design guidelines. It is critical that the City works closely with the Texas Department of Transportation to make sure that local businesses and residential areas located along the frontage are easily accessible.

## Principal Arterials

Principal arterials are engineered to facilitate the movement of large traffic volumes with a focus on maintaining efficient mobility. They are designed to support longer-distance travel and provide critical access to major activity centers and neighboring cities. Principal arterials should have limited direct driveways connecting to them, and their primary intersections should typically involve other major arterials or larger transportation facilities. On-street parking is usually discouraged along major arterials to ensure smooth traffic flow.

## Minor Arterials

Minor arterials play a vital role in connecting traffic from collector roads to major arterials. They are designed to accommodate moderate traffic volumes at relatively lower speeds and often extend to cover a broader geographical area. Depending on factors like right-of-way (ROW) availability and level of service, minor arterials may allow on-street parking to serve local needs while maintaining traffic functionality.

## Collectors

Collector roadways are tailored for shorter journeys and slower travel. Their main purpose is to link trips to transportation routes with higher functional classifications and facilitate the movement of traffic between various Rockdale neighborhoods. Collector streets are characterized by their capacity to handle moderate traffic volumes and their reduced speeds, which cater to the need for easy access to nearby properties.

These thoroughfares typically consist of two to four lanes, a configuration that varies based on present traffic requirements, anticipated future demands, and potential development in the area. Collector streets are often good candidates for multi-modal lane improvements (i.e., bike lanes, pedestrian accommodations) due to their moderate speeds and volumes. While center turn lanes might be integrated into Major Collectors, raised medians are infrequently found on this category of roadways.

The design of collector streets aims to strike a balance between local access and regional connectivity, ensuring that they serve as vital components of the overall transportation network in the Rockdale area.

## Local Roads and Streets

Local roads are integral in providing access to residential areas and land parcels, with a primary focus on accommodating local travel needs, including pedestrian and bicycle mobility. These roads typically connect to other local roads and collector streets and, in some instances, may link to minor arterials. Local roads are tailored for short trips at lower speeds, with spacing that varies based on the urban or rural context.



# Evaluation of Future Roadway Needs

## Functional Classification

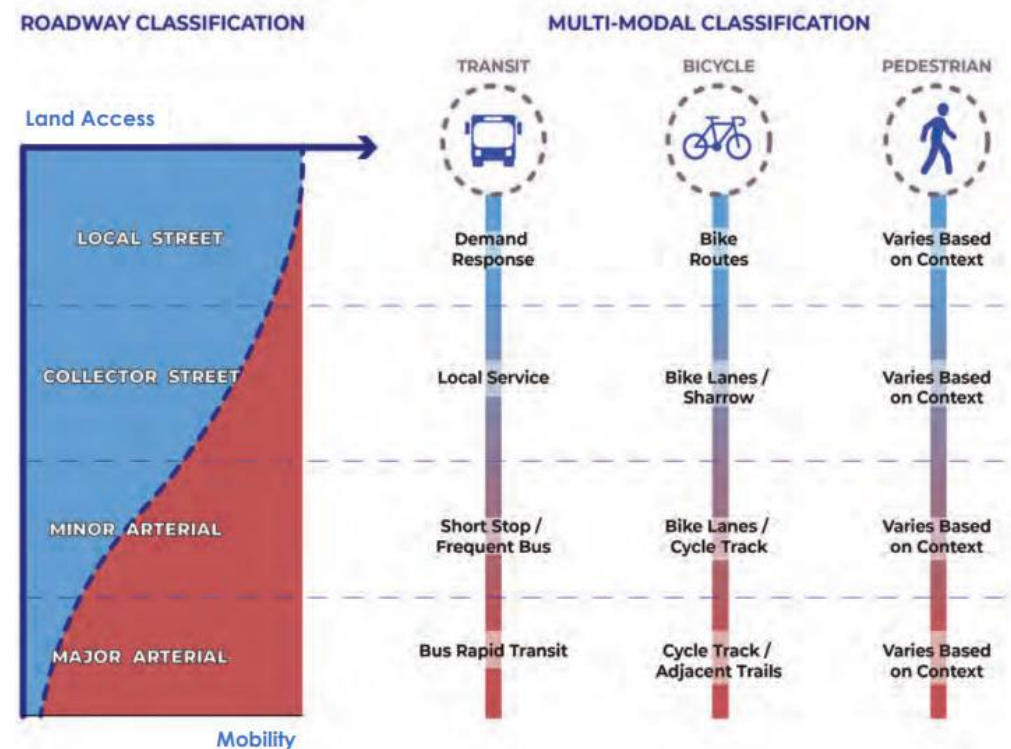
The functional classification system underpins local, state and national roadway design guidelines and manuals. The functional classification model categorizes streets in terms of access and mobility; as the functional classification tier increases, mobility increases, but land access decreases. As the classification tier decreases toward local streets, land access becomes easier, but mobility decreases. The functional classification of a street is not set in stone and may increase or decrease tiers for various reasons, but most often, it is because adjacent land uses change. Often, functional classification systems do not adequately account for the diversity of street typologies and various contexts in which they are located within a city. State and federal standards and guidelines may be the starting point for transportation planning, but cities should create street classification systems that better align with the community's goals for safety, growth, development and character.

## General Guidance Regarding Functional Classification

The functional classification of roadways involves defined engineering design standards but also offers some flexibility due to overlapping characteristics between classes. Here are key guidelines to follow:

1. Consider the primary purpose of the roadway: Is it for local access or through traffic? Always consider adjacent land uses and the impacts that road design may have on local businesses and the quality of life for residential areas.
2. Evaluate existing roadway features like right-of-way, lanes, traffic volumes, medians, on-street parking and road segment length. Examine speed characteristics based on observed and desired speeds.
3. Verify that the facility's operation aligns with its assigned classification. Significant deviations may require reevaluation or the creation of a new class, although this is usually not recommended.
4. Consulting a registered professional engineer is strongly recommended for future updates to roadway classification.

Figure 20. Functional Classification



# Rockdale 2024 Master Thoroughfare Plan

## Purpose

A Master Thoroughfare Plan (MTP) is a comprehensive long-term transportation plan that serves as a blueprint for the development and management of a city's transportation network. It provides the overall framework for the transportation network, including the hierarchy of roads (such as arterials, collectors and local streets) and the location of major transportation corridors.

One of the key functions of an MTP is to guide the future growth and development of the transportation network. It identifies existing and future transportation needs based on factors such as population growth, land use patterns, economic development and traffic congestion. By anticipating future demands, the plan can help prioritize transportation projects and investments to ensure that the network can support the community's long-term growth and vitality.

The MTP serves as a tool for decision-makers to allocate resources and prioritize projects that will enhance the overall efficiency, safety, and accessibility of the transportation network. It also helps coordinate transportation planning efforts with other sectors, such as land use planning, economic development and environmental protection, to ensure that transportation investments align with broader community goals.

The streets plan, which is derived from the MTP, translates these guidelines into detailed designs for specific streets. It considers factors such as street width, lane configurations, intersection design and streetscape elements to create a cohesive and functional street network. By aligning the streets plan with the broader goals and objectives of the MTP, cities can create a transportation network that meets the needs of all users, from motorists to pedestrians to cyclists, while promoting sustainability and enhancing the overall quality of life for residents.

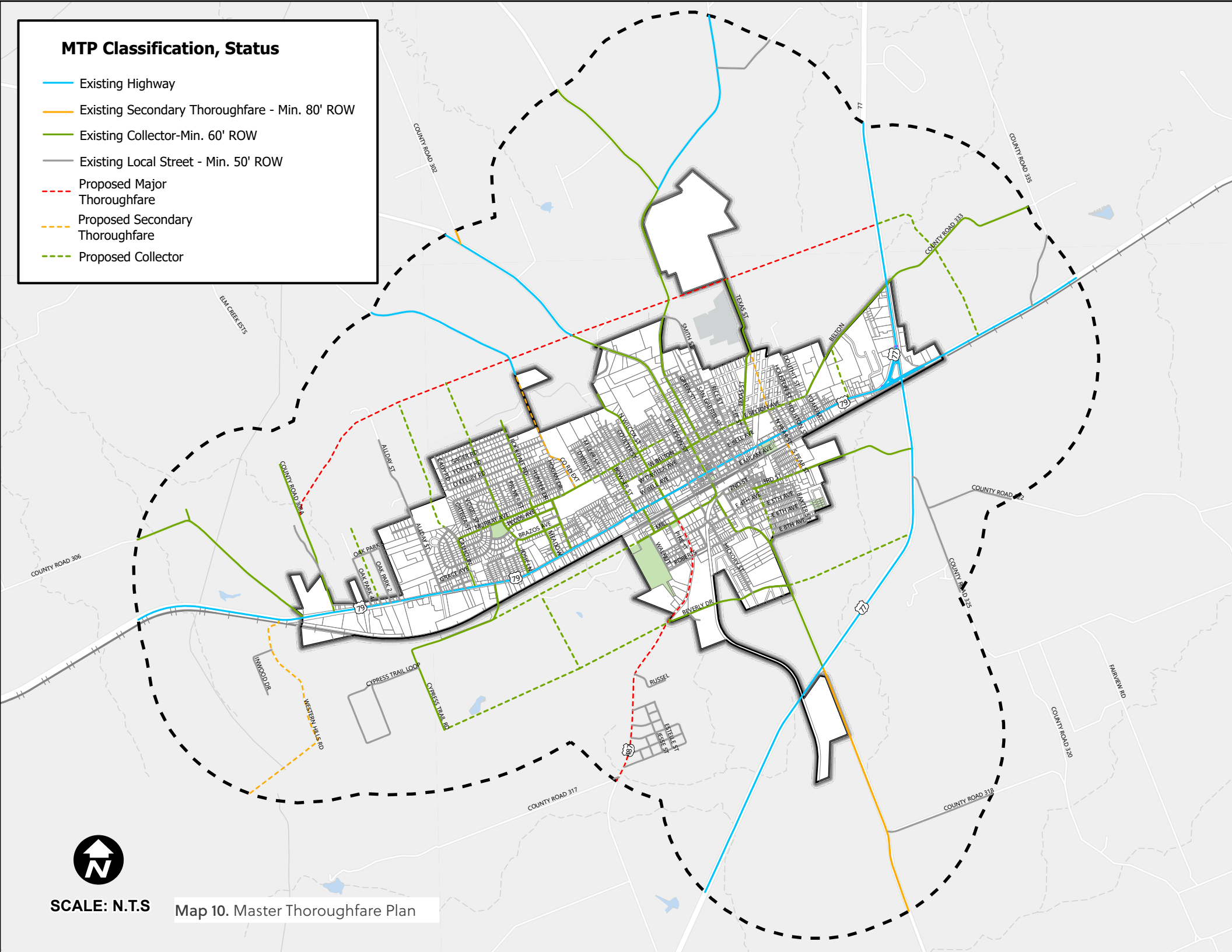
## Key Features of the 2024 Master Thoroughfare Plan

The most recent Master Thoroughfare Plan for the City of Rockdale was completed in 2010. Key features of this MTP update include:

- Removal of the proposed U.S. 79 relief route that ran east-west north of the City Limits.
- Two additional proposed Major Thoroughfares along S. Wilcox St., extending to County Road 317. Additionally, a thoroughfare running east-west between County Road 308A and terminating at U.S. 77.
- Several proposed extensions of existing collector streets, in support of future connectivity, congestion relief and route redundancy.
- Removal of several proposed collector routes that would disrupt developed residential areas. Some existing streets such as Highland Ave. were removed from the functional system to better support residential accessibility, rather than throughput.
- Additional routes that provide increased south-north street connectivity crossing the railroad tracks.
- Proposed secondary thoroughfare route along Western Hills Rd. to support increased industrial demand southwest of Rockdale's city limits.

## MTP Classification, Status

- Existing Highway
- Existing Secondary Thoroughfare - Min. 80' ROW
- Existing Collector-Min. 60' ROW
- Existing Local Street - Min. 50' ROW
- Proposed Major Thoroughfare
- Proposed Secondary Thoroughfare
- Proposed Collector



SCALE: N.T.S

Map 10. Master Thoroughfare Plan

# Rockdale Future Roadway Plan

## Roadway Planning Overview

The Future Streets Plan (Map 10) for the City is partially based on the functional classification system described in the previous section: expressways/freeways, principal arterials, minor arterials, collectors and local roads and streets. However, the Future Streets Plan recognizes that the functional classification system predominantly classifies roads in terms of their operational characteristics as it is relevant mostly to motor vehicles. It is important that streets are classified in a manner that acknowledges the full spectrum of users, including pedestrians, bicyclists or those utilizing other forms of transportation, a concept known as Complete Streets. The Rockdale Future Streets Plan includes a classification of streets that takes into account surrounding land uses and the neighborhood character in conjunction with the traditional considerations of access and mobility for cars found within the functional classification framework. Each context typology found within the Future Streets Plan includes compatible street typologies and sample design cross sections.

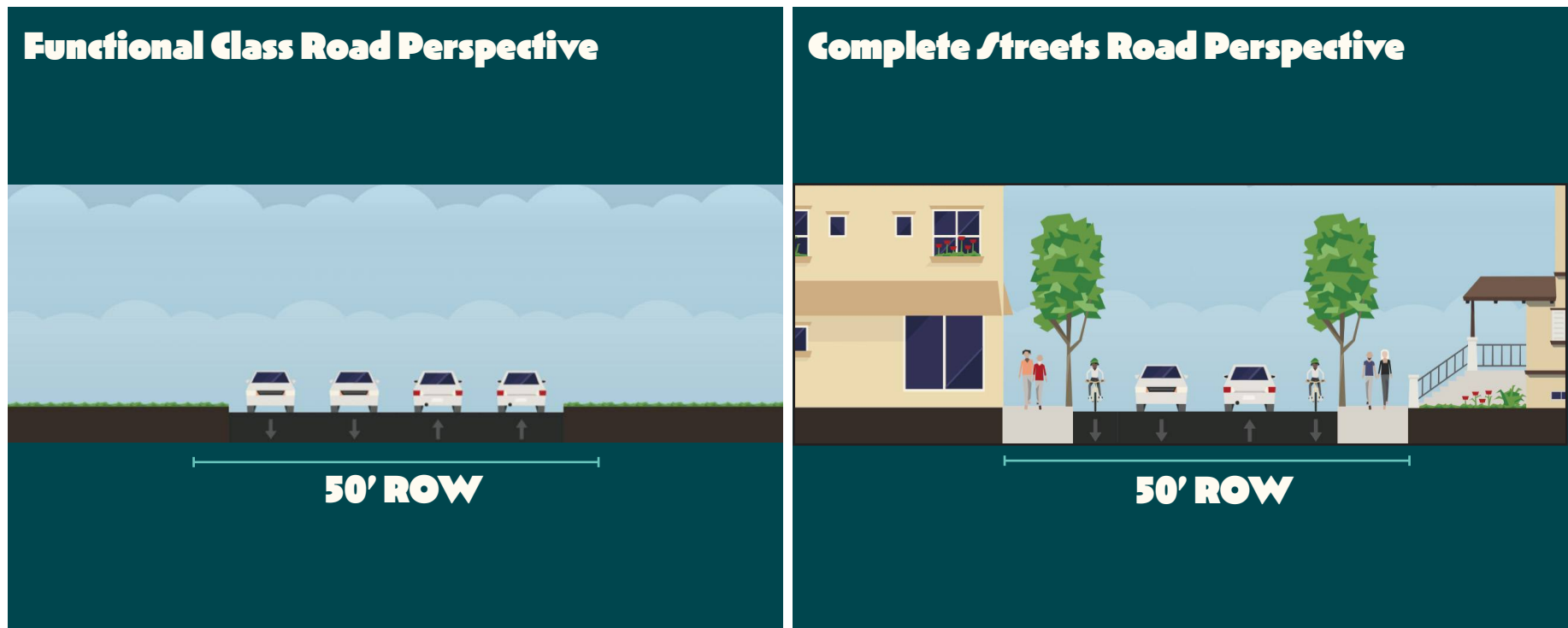


**Figure 21.** Complete Streets Comparison

Graphic created with StreetMix.

# Street Classification Considerations

During the transportation planning process, streets are classified based on function and context. The classification of a street guides its design and helps prioritize different users based on each unique context. This process helps clearly identify the tradeoffs that are made with each design decision so that the community can select approaches that most align with the vision outlined within the Comprehensive Plan. The methodology for identifying street classifications is broken down into the following steps:



1. Existing Land Use Context - Understand broader land use context in which a street is placed. When classifying streets, it is important that adjacent land uses are taken into account so that the street supplements the developments that are currently there and those that may be present in the future.



2. Multi-Modal Integration - Equally as important as the land use context is identifying the primary mode of travel for a street. Community members and policy makers should identify whether the street is used for moving vehicles quickly or if it is a street that focuses on multi-modal access, often times it is a balance between these priorities.



3. Economic Context - Each street typology will inherently support some economic development patterns over others. It is important to understand current and future commercial demands within an area and understand what street typology would best align with the community's vision for the area.

# Context Typologies

Context typologies are simplified categories that encompass the context of the surrounding area, taking into account factors like land use, development patterns and density. The initial step in selecting an appropriate street type involves identifying the most fitting site typology, considering both the present and future context of the area. Along a corridor, it's common to traverse multiple context typologies. Within Rockdale there are six distinct context typologies which are outlined below.

**Figure 22.** Context Typology Details

| Context Typology    | Land Use(s)                                        | Development Density | Street Setback*   | Multi-Modal Trip Generation** | Example Areas                                                                                     |
|---------------------|----------------------------------------------------|---------------------|-------------------|-------------------------------|---------------------------------------------------------------------------------------------------|
| Residential         | New Neighborhood, Core Neighborhood                | Low                 | Close to Moderate | Moderate to High              | Residential areas along Highland Ave., Belton Ave.                                                |
| Rural Living        | Ag/Rural, New Neighborhood                         | Low                 | Far               | Low                           | Ranch and agricultural developments along Allday St.                                              |
| Regional Commercial | Regional Node, Employment                          | Low-Medium          | Moderate to Far   | Low                           | Big Box Commercial along U.S. 79                                                                  |
| Local Commercial    | Commercial Corridor                                | Medium-High         | Close to Moderate | Moderate                      | E. Bell Ave, Ackerman St., Milam Ave., Transition Zone along U.S. 79 between Downtown and Walmart |
| Industrial          | Industrial                                         | Low                 | Moderate to Far   | Low                           | Airport, Industrial zones east of U.S. 77                                                         |
| Activity Center     | Downtown, Local Mixed-Use Node, Mixed-Use Corridor | High                | Close to Moderate | High                          | E. Bell Ave, Ackerman St, Milam Ave., Downtown                                                    |

\*Street Setback is the average distance between a building or structure and the edge of the street or road.

\*\*Multi-Modal Trip Generation is the sum of both automobile and non automobile trips.

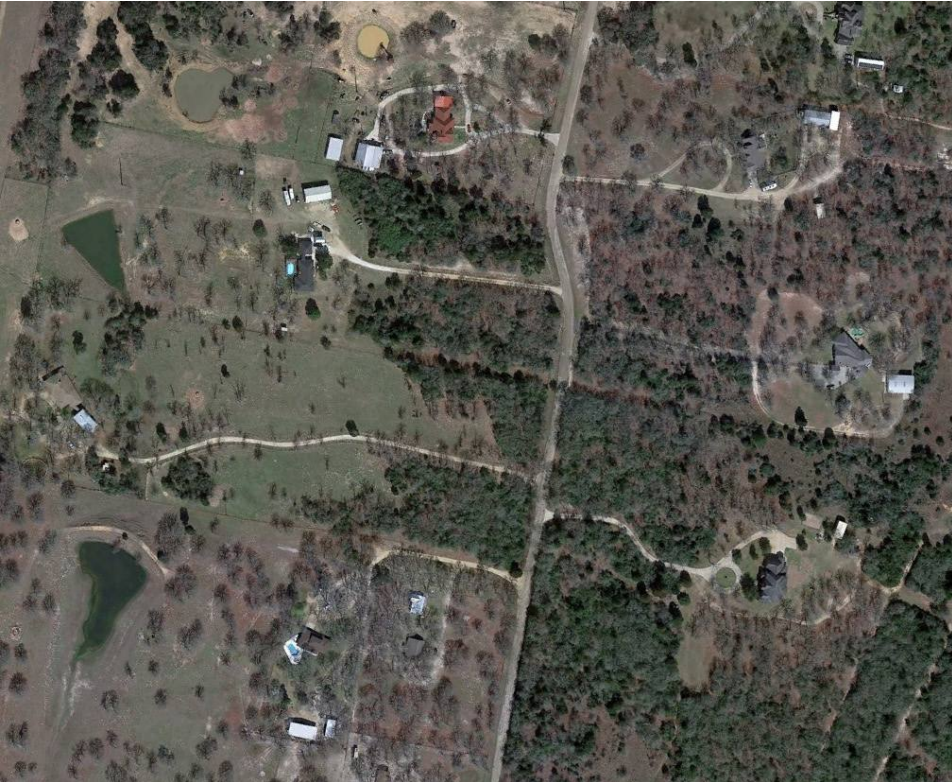
# Residential

| Examples in Rockdale                               | Land Use    | Development Density |
|----------------------------------------------------|-------------|---------------------|
| Residential areas along Highland Ave., Belton Ave. | Residential | Low                 |



# Rural Living

| Examples in Rockdale                                 | Land Use                  | Development Density |
|------------------------------------------------------|---------------------------|---------------------|
| Ranch and agricultural developments along Allday St. | Residential, Agricultural | Low                 |



# Regional Commercial

| Examples in Rockdale             | Land Use                                      | Development Density |
|----------------------------------|-----------------------------------------------|---------------------|
| Big Box Commercial along U.S. 79 | Commercial, office, parking and entertainment | Low-medium          |



# Local Commercial

| Examples in Rockdale                                                                               | Land Use                   | Development Density |
|----------------------------------------------------------------------------------------------------|----------------------------|---------------------|
| E. Bell Ave., Ackerman St., Milam Ave., Transition Zone along U.S. 79 between Downtown and Walmart | Retail, office and parking | Medium-high         |



# Industrial

| Examples in Rockdale                      | Land Use                               | Development Density |
|-------------------------------------------|----------------------------------------|---------------------|
| Airport, Industrial zones east of U.S. 77 | Industrial, retail, office and parking | Low                 |



# Activity Center

| Examples in Rockdale                             | Land Use                                | Development Density |
|--------------------------------------------------|-----------------------------------------|---------------------|
| E. Bell Ave., Ackerman St., Milam Ave., Downtown | Residential, retail, office and parking | High                |



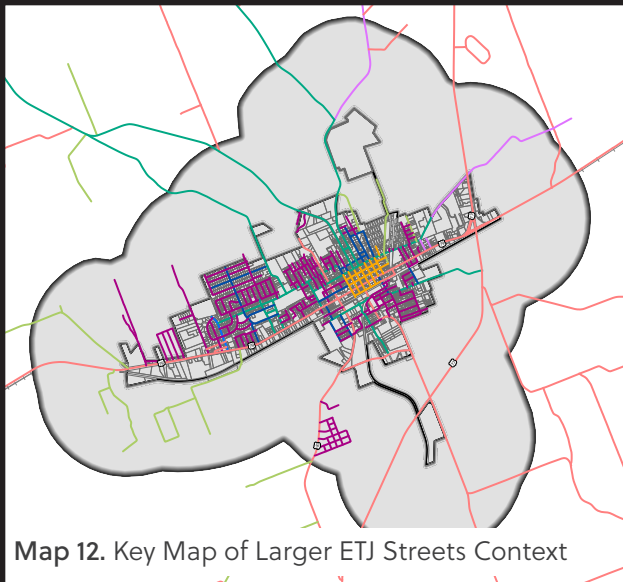


# Street Typologies

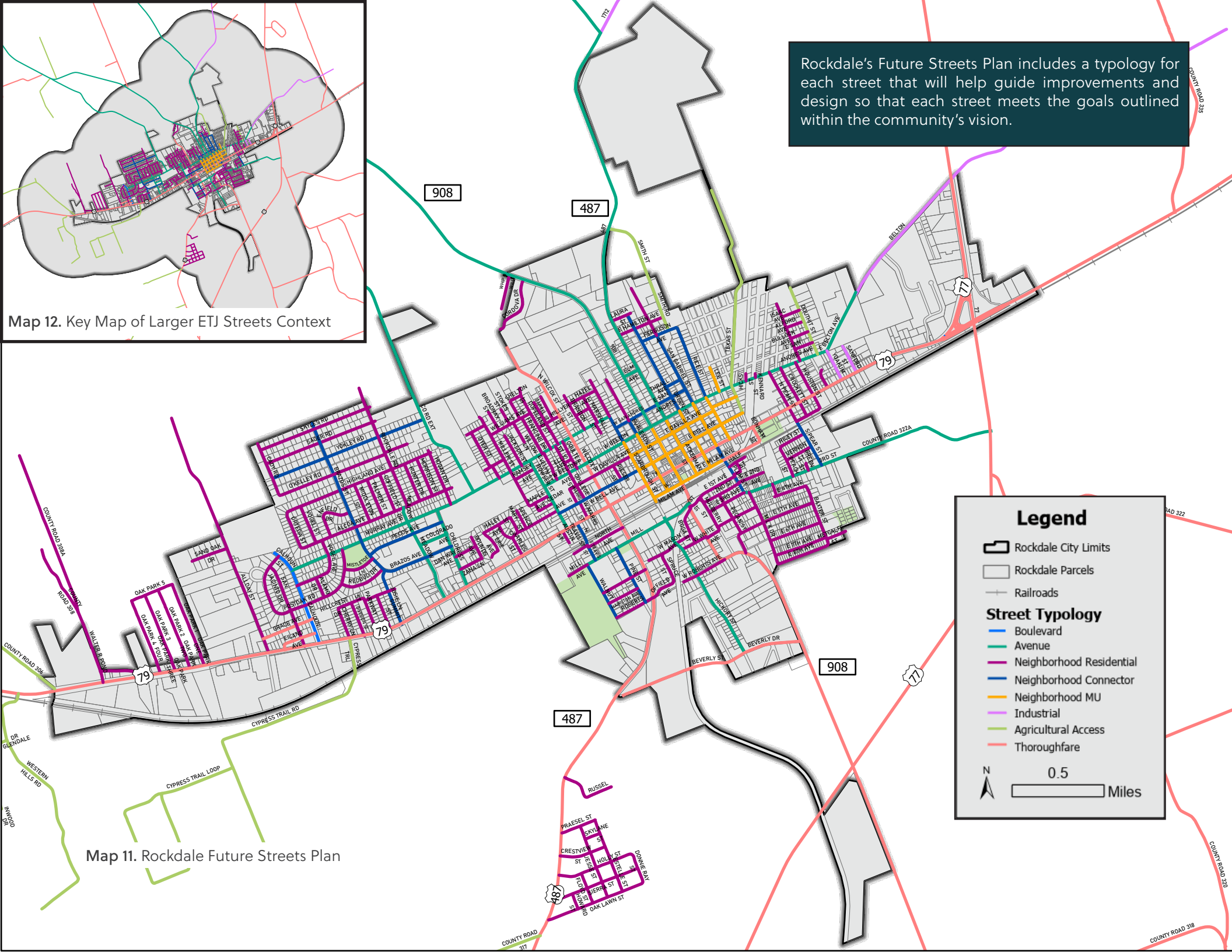
Once the context typologies and transportation function of a street corridor are determined, a street typology can be selected. Street typologies are unique to the conditions and contexts of Rockdale and provide a starting point for street designs that will be following the vision outlined in the Comprehensive Plan.

**Figure 23. Street Typology Details**

| Street Typology          | Description                                                                                                                                                                                                                                                                                                                        | Relevant Character Typologies                  | Accessibility                    |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------|
| Boulevard                | A boulevard street refers to a multi-functional roadway with a central landscaped median, designed to accommodate a mix of vehicular traffic, pedestrians and cyclists.                                                                                                                                                            | Residential, Local Commercial                  | Balance of Access and Throughput |
| Avenue                   | A street that accommodates higher volumes of traffic and is more automobile oriented relative to neighborhood streets typologies.                                                                                                                                                                                                  | Residential, Local Commercial, Activity Center | Balance of Access and Throughput |
| Neighborhood Residential | A low volume street within residential areas that emphasizes access to properties and provides multi-modal accommodations.                                                                                                                                                                                                         | Residential, Rural Living                      | Access                           |
| Neighborhood Connector   | A street within a residential area designed to facilitate safe and efficient transportation between neighborhoods. It emphasizes pedestrian and cyclist-friendly features while minimizing through traffic impact.                                                                                                                 | Residential, Activity Center, Local Commercial | Access                           |
| Neighborhood Mixed-Use   | A low traffic street that serves a wider variety of land uses including neighborhood oriented businesses. May include traffic calming and pedestrian-oriented design elements.                                                                                                                                                     | Residential, Local Commercial, Activity Center | Access                           |
| Industrial               | A street type characterized by its focus on supporting industrial activities, featuring wide thoroughfares for the movement of heavy vehicles, loading zones and industrial facilities. Design considerations prioritize efficient transportation of goods and may include infrastructure suitable for large trucks and machinery. | Industrial                                     | Balance of Access and Throughput |
| Agricultural Access      | A specialized street type crafted to serve dual purposes, providing essential access to both agricultural areas and residential ranch properties.                                                                                                                                                                                  | Rural Living                                   | Access                           |
| Thoroughfare             | A street with moderate to high volumes of traffic, used primarily to connect the City to other communities and provide access to automobile oriented developments.                                                                                                                                                                 | Regional Commercial, Rural Living, Industrial  | Throughput                       |



Rockdale's Future Streets Plan includes a typology for each street that will help guide improvements and design so that each street meets the goals outlined within the community's vision.



Map 11. Rockdale Future Streets Plan

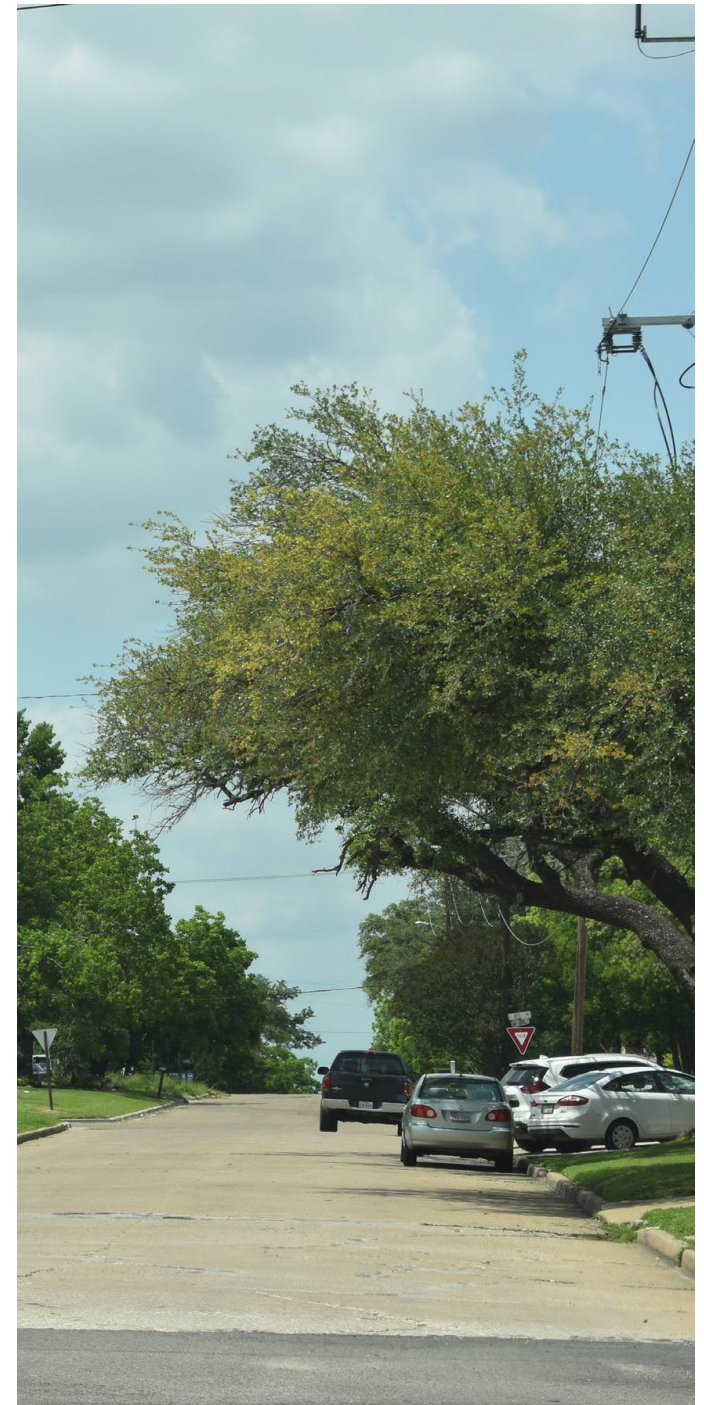
# How to Use a Future Streets Plan

The Future Streets Plan serves as a comprehensive guide for both the public and decision makers in envisioning and implementing the development of new streets for the future of Rockdale. The Future Streets Plan serves as a transparent and accessible resource, providing a clear understanding of the City's vision for its evolving street network. Citizens can access the plan to learn about proposed road expansions, new thoroughfares, and connectivity improvements. It serves as a tool for community engagement, allowing residents to offer input, voice concerns or express support for specific projects, helping to improve collaboration between the City and its inhabitants.

City officials can utilize the Plan as a guiding document to make informed decisions about infrastructure investments, zoning regulations and urban development initiatives. By categorizing new streets based on their purpose, such as residential, commercial or recreational, the plan assists officials in aligning infrastructure projects with the City's broader goals. It aids in optimizing traffic flow, enhancing accessibility and promoting sustainable and smart city development.

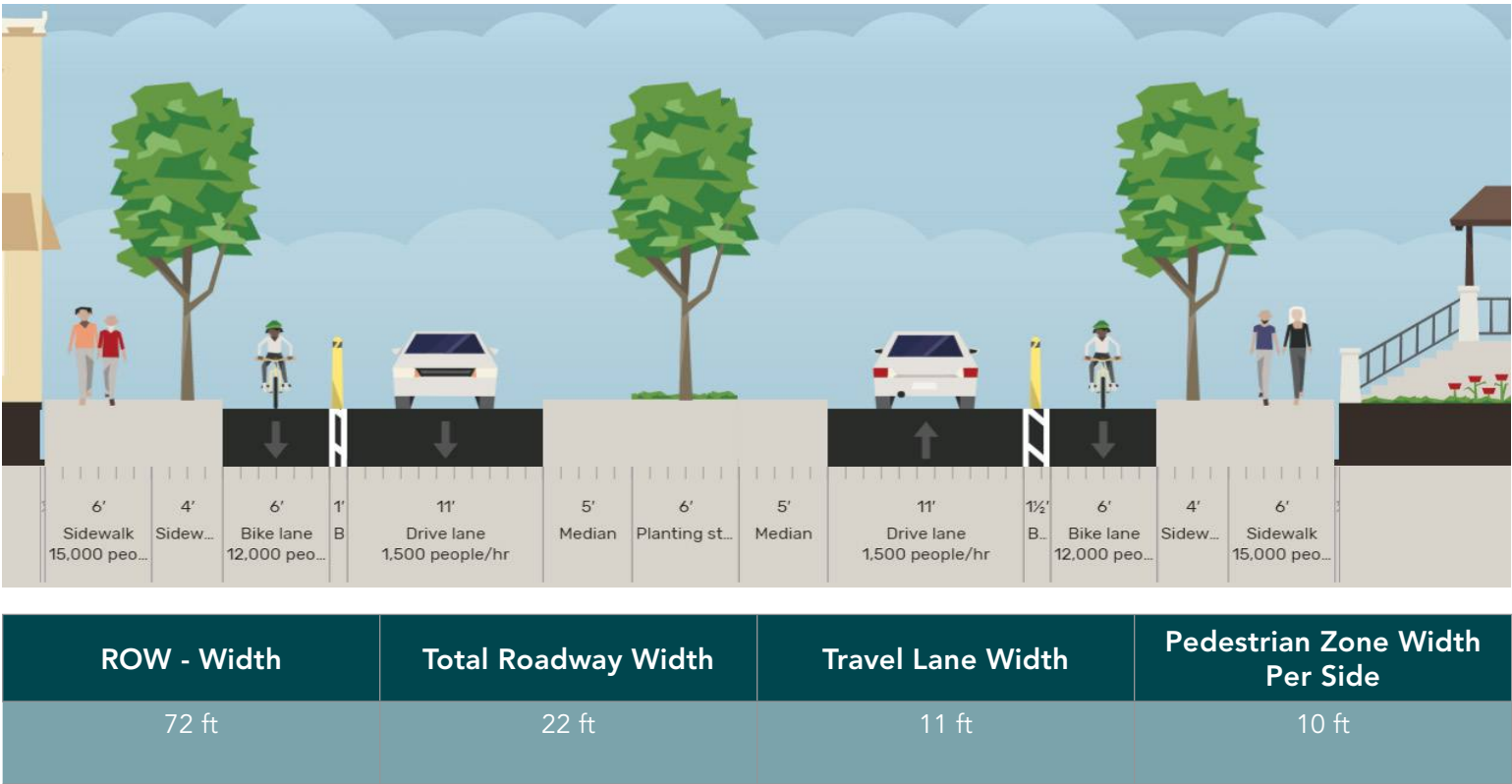
Moreover, the plan contributes to long-term urban planning, helping officials anticipate the needs of a growing population and evolving cityscape. It serves as a reference point for budgeting, resource allocation, and prioritizing projects, ensuring that the City's expansion is well-coordinated and follows a trajectory that will achieve the goals outlined in the City's Comprehensive Plan.

In essence, the Future Streets Plan is a dynamic tool that fosters collaboration, transparency and informed decision-making between the City and its residents. It plays a pivotal role in shaping the urban landscape, promoting sustainable development and creating a well-connected community.



# Boulevard

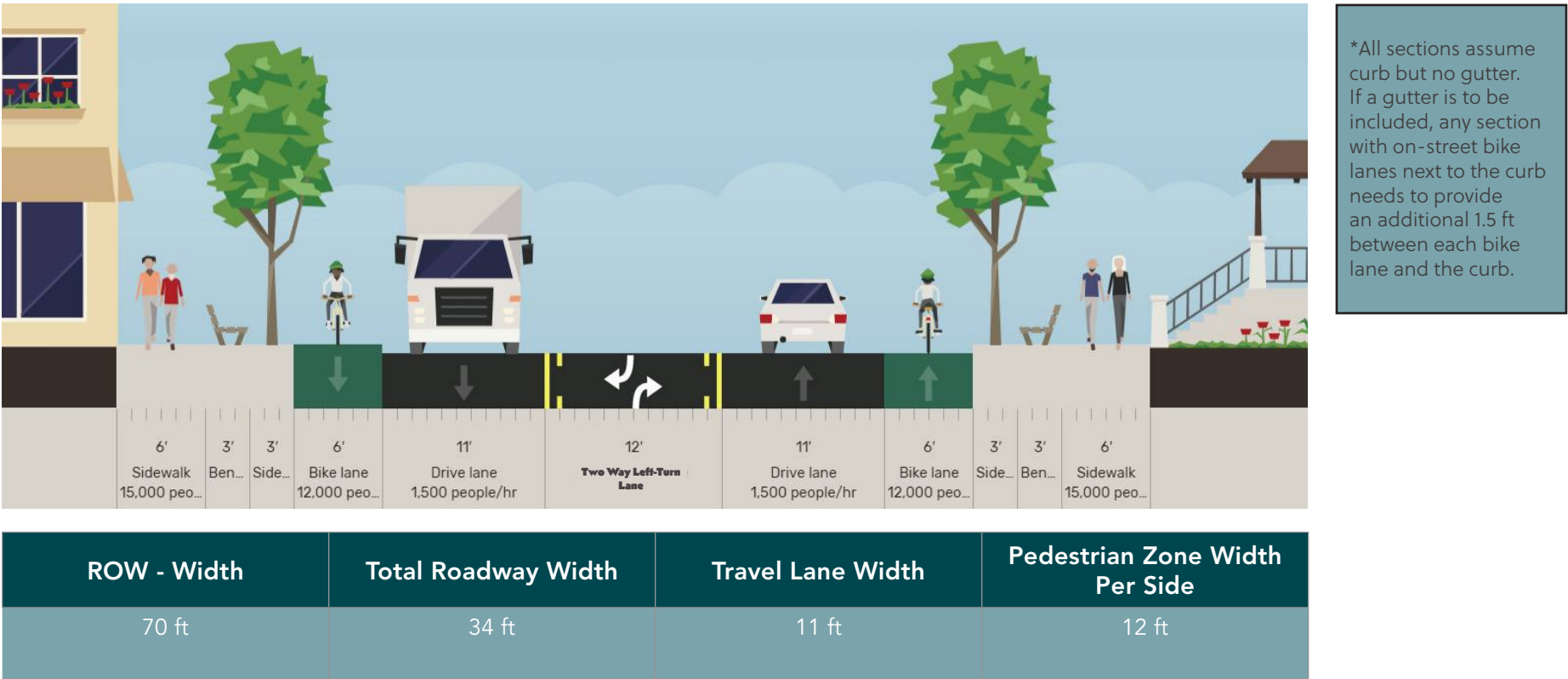
Boulevards are urban roads distinguished by their wide central medians that are often adorned with greenery and landscaping. Combining functionality with aesthetic charm, boulevards create visually appealing corridors for both vehicular and pedestrian traffic. Boulevards are generally four lanes, with some two lane examples within the City. Boulevards are medium to high volume streets that often include substantial pedestrian zones in addition to large landscaped buffers. Boulevards are primarily focused on throughput rather than access to adjacent land uses. Particularly within Boulevard street typologies, traffic calming measures may be ineffective and in some cases more dangerous for pedestrians due to obscured views from a large, landscaped median. Large side paths are recommended to accommodate pedestrians, bicyclists and other forms of micro-mobility.



Graphic created with StreetMix.

# Avenue

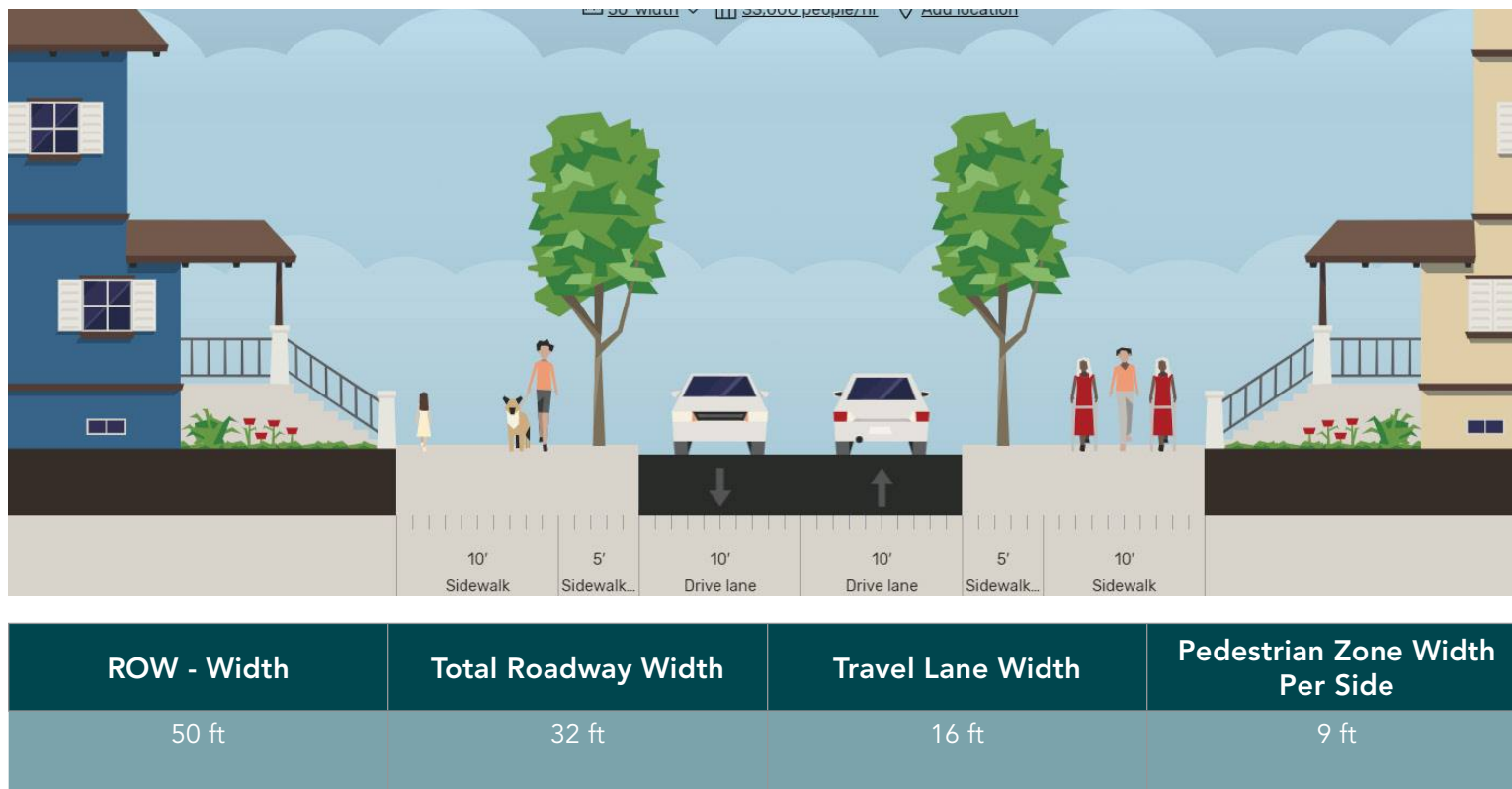
Avenues, prominent in urban and suburban settings, are generally characterized by right-of-ways that are slightly larger than those contained within access-oriented roadways such as neighborhood residential. In most contexts, Avenues aim to provide accessibility to commercial and higher density residential areas as well as balancing throughput for vehicular traffic. Avenues are often highly visible and accommodate moderate-high traffic volumes; therefore, pedestrian zone improvements such as landscaping, street furniture and lights can go a long way toward improving the quality of life and general perception of the street and neighboring areas.



Graphic created with StreetMix.

# Neighborhood Residential

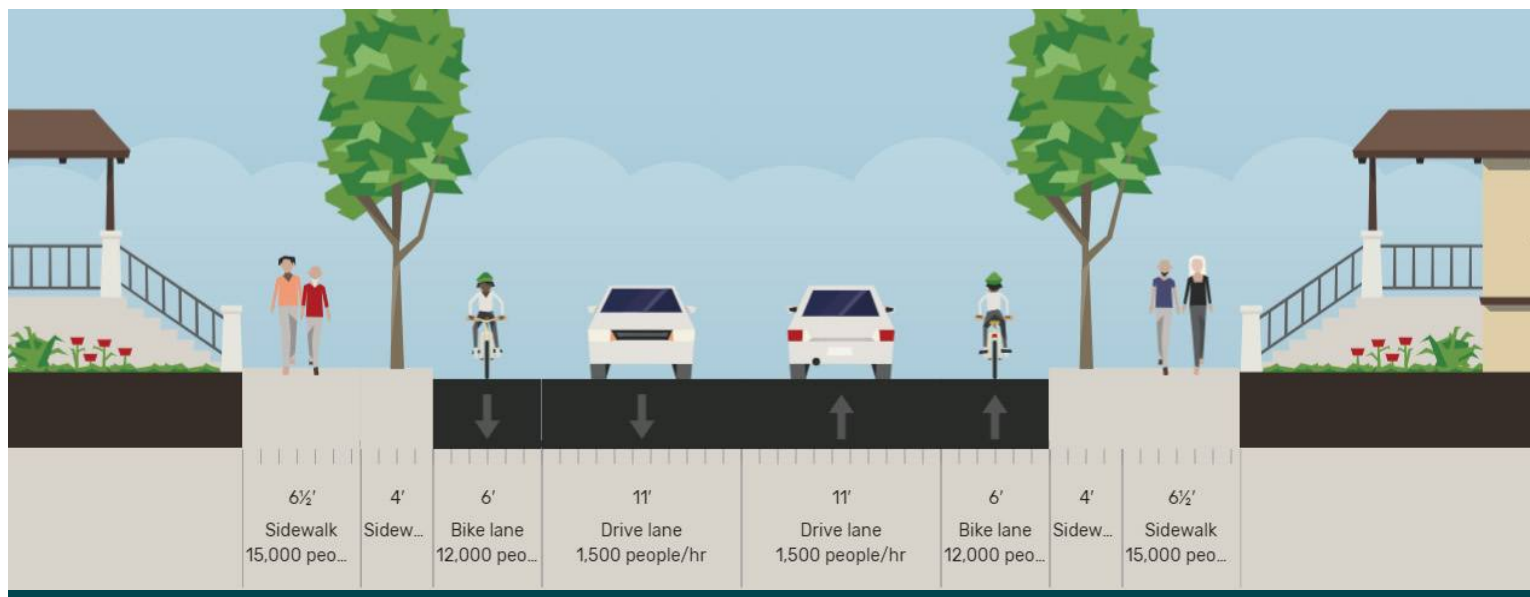
Neighborhood Residential streets are characterized by lower traffic volumes and are designed with a focus on safety and quality of life for residents. Lower speeds, narrower lane widths, and decreased curb radii naturally calm traffic and provide easy, safe access to residential properties. Pedestrian enhancements such as street trees and large sidewalk space are strongly encouraged. On-street parking is generally allowable, and often encouraged where there is sufficient right-of-way due to its ability to force drivers to slow down and pay closer attention to the road. Within Neighborhood Residential streets, bikes will typically share the street with vehicles due to the low speeds.



Graphic created with StreetMix.

# Neighborhood Connector

Neighborhood Connector streets link residential areas, providing conduits for local mobility within residential neighborhoods. These roads can afford slightly larger volumes of traffic compared to Neighborhood Residential, but are still primarily focused on accessibility and providing connections between neighborhoods in the community. Multi-modal improvements such as bike lanes are highly encouraged on Neighborhood Connectors. Pedestrian-focused improvements such as sidewalks and crossings are also highly encouraged.

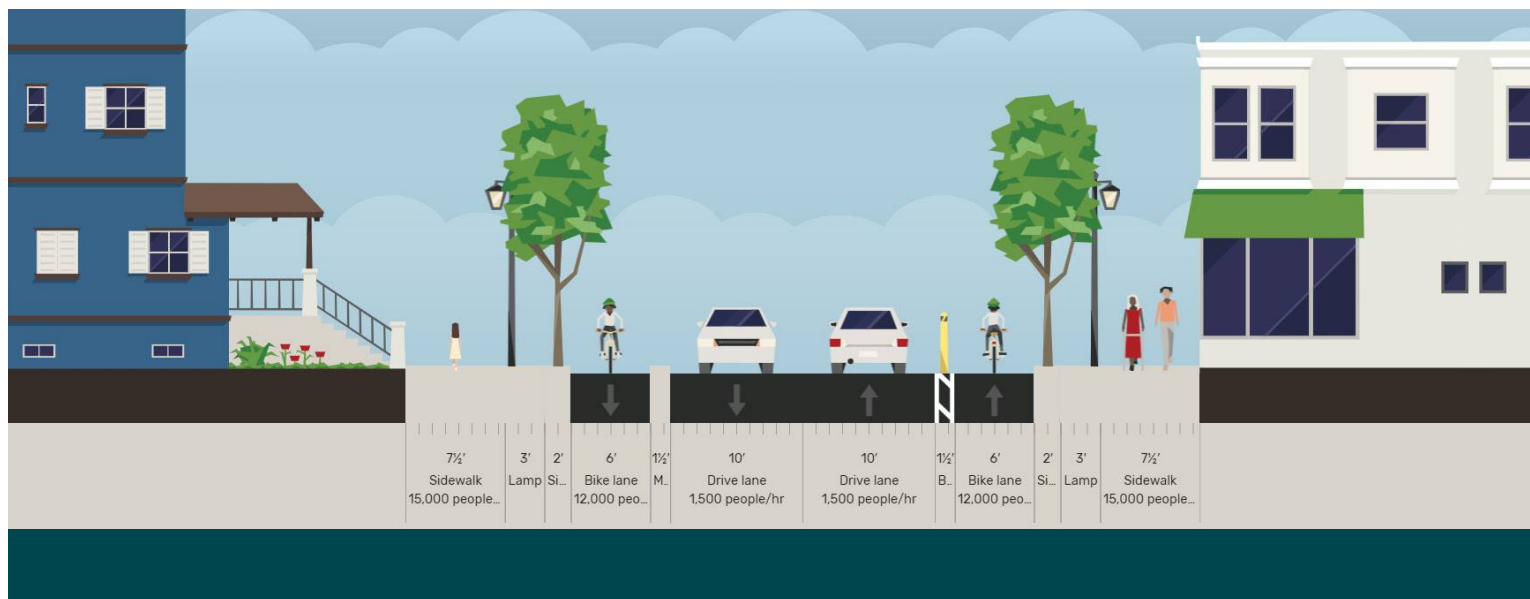


| ROW - Width | Total Roadway Width | Travel Lane Width | Pedestrian Zone Width Per Side |
|-------------|---------------------|-------------------|--------------------------------|
| 55 ft       | 34 ft               | 11 ft             | 10.5 ft                        |

Graphic created with StreetMix.

# Neighborhood Mixed-Use

Neighborhood Mixed-Use streets are located along commercial and mixed-use districts such as those in Downtown Rockdale. They are highly focused on providing multi-modal accessibility and connecting people to businesses and multifamily residential units. Street enhancements may include more significant bike and pedestrian infrastructure such as protected bike lanes and raised pedestrian crosswalks. Lane widths are often smaller than higher volume roadway typologies so that speeding is discouraged. Street furniture and landscaping is highly recommended in mixed-use and downtown areas as these are among the most visible and highly trafficked areas within a city.

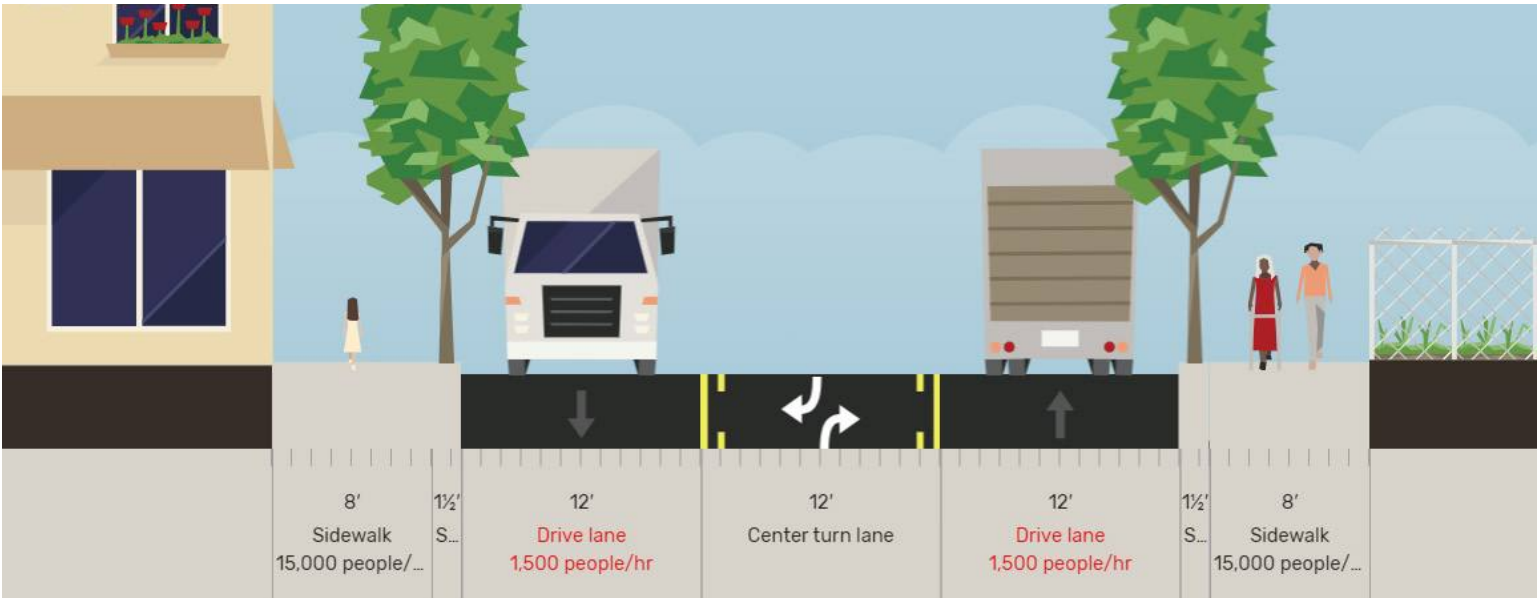


| ROW - Width | Total Roadway Width | Travel Lane Width | Pedestrian Zone Width Per Side |
|-------------|---------------------|-------------------|--------------------------------|
| 60 ft       | 27 ft               | 10 ft             | 11.5 ft                        |

Graphic created with StreetMix.

# Industrial

Industrial roadways are specifically tailored to meet the current and future transportation demands of Rockdale’s industrial base. Industrial roadways place an emphasis on accessibility, particularly for larger industrial truck traffic. Though Industrial roads area focused on providing accessibility for automobiles, they should still include good principles of design including sidewalks and moderate-high curb radii. Design features may include recessed stop bars at intersections, center turn lanes or increased lane widths between 11 and 12 feet to help improve access and safety within industrial areas.

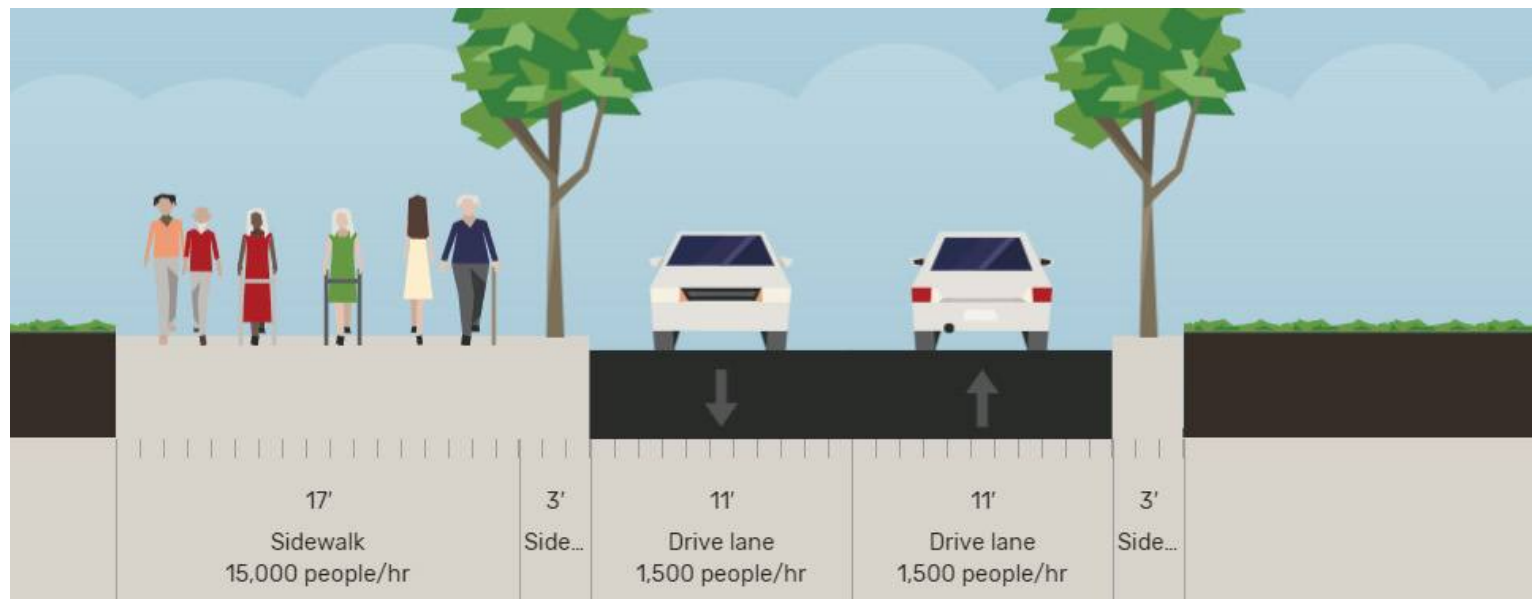


| ROW - Width | Total Roadway With | Travel Lane Width | Pedestrian Zone Width Per Side |
|-------------|--------------------|-------------------|--------------------------------|
| 54 ft       | 36 ft              | 12 ft             | 9 ft                           |

Graphic created with StreetMix.

# Agricultural Access

These roads, sometimes unpaved, cater to the needs of agricultural vehicles and provide crucial access to farms and rural properties located within and outside of Rockdale. Agricultural Access roads are low-moderate volume roads that generally extend toward the periphery of Rockdale's municipal limits and are focused on providing access to agricultural and ranch properties. These roads typically have less pedestrian accommodations, but may be outfitted with shared-use paths that can be utilized by walkers and cyclists and include a significant lined buffer to improve safety for those users.

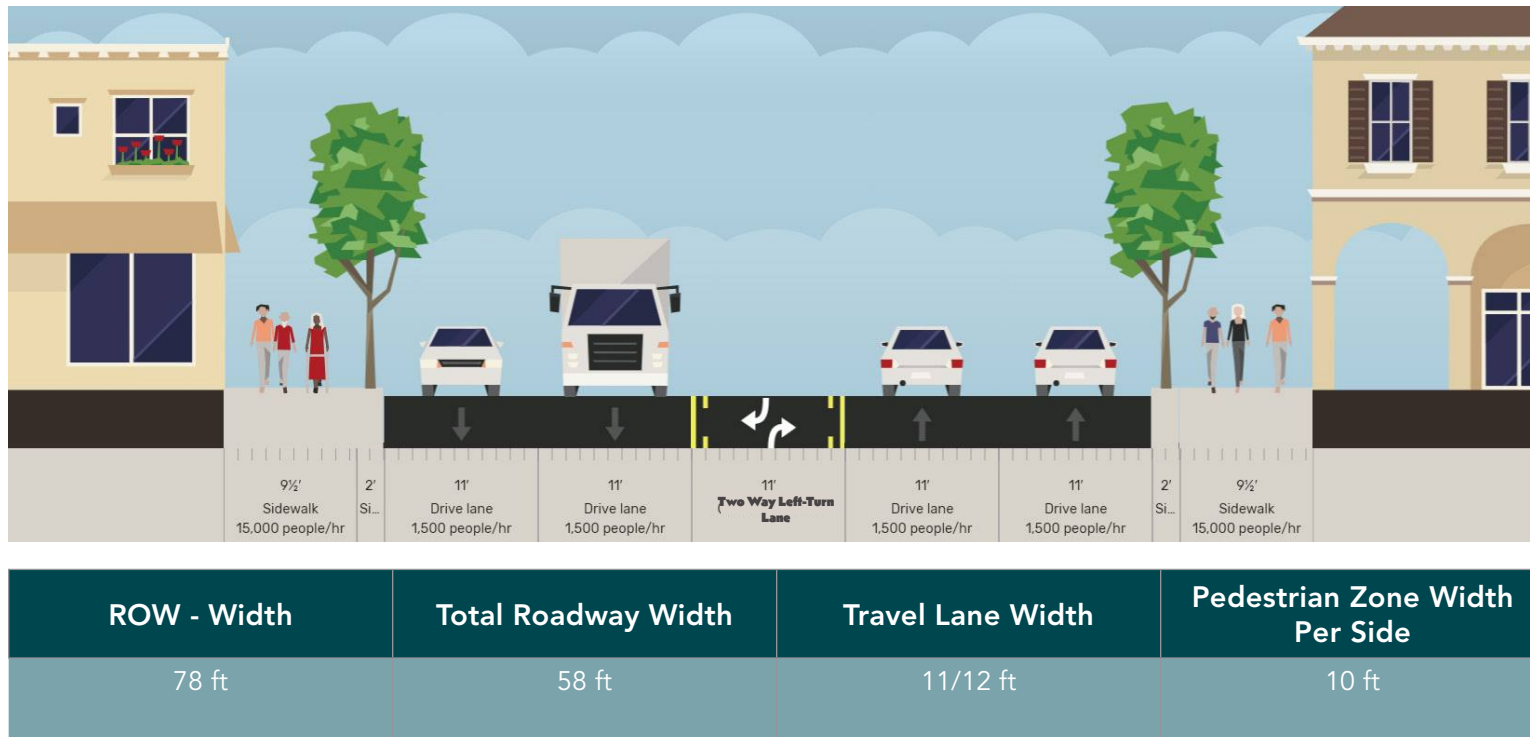


| ROW - Width | Total Roadway With | Travel Lane Width | Pedestrian Zone Width Per Side |
|-------------|--------------------|-------------------|--------------------------------|
| 45 ft       | 22 ft              | 11 ft             | 20 ft                          |

Graphic created with StreetMix.

# Thoroughfare

Thoroughfares are generally the highest volume streets within a jurisdiction and are in many cases state highways, such as U.S. 79 that runs through Downtown Rockdale. Thoroughfares are designed to focus on automobile throughput rather than accessibility, and primarily connect the community to other cities, rather than accommodating trips within the city. Due to high speeds, thoroughfares should be outfitted with pedestrian safety features such as crosswalks and controlled intersections to help facilitate safe movement across the larger streets. Sufficient pedestrian spaces either directly along the thoroughfare or along lower volume streets parallel to the thoroughfare should be provided as safer and more pleasant alternative routes for pedestrians and cyclists.



Graphic created with StreetMix.

# Transportation Design

## Parameters and Guidance

In the initial phases of a street design project, decisions regarding travel lanes, on-street parking and pedestrian infrastructure are made during the project scoping phase, and may be refined throughout the conceptual design process. These decisions are grounded in what are known as design criteria, with each street type having its unique set of parameters for roadway and pedestrian zone design that align with and support the relevant character typologies. Design criteria are often sourced from transportation engineering standard guides such as the AASHTO, NACTO, or the Texas Department of Transportation Standards. These criteria, encompass factors like the number of travel lanes, bikeway and parking configurations, sidewalk dimensions, and setback from the curb. Together, these standards help define the right-of-way that is generally required for each road type. Standards also help planning and engineering professionals select designs that will best meet the needs of the community while maintaining a reasonable amount of consistency across jurisdictions.

**Figure 24. Space Standards by Street Typology**

| Street Typology          | Total Pedestrian Zone Width |      | Total Roadway Width |       |       | Total Right-of-Way Width |       | Typical AADT    |
|--------------------------|-----------------------------|------|---------------------|-------|-------|--------------------------|-------|-----------------|
|                          | Pref.                       | Min. | Max.                | Typ.  | Min.  | Typ.                     | Min.  |                 |
| Avenue                   | 11 ft                       | 8 ft | 72 ft               | 34 ft | 20 ft | 70 ft                    | 44 ft | 1,000 to 15,000 |
| Boulevard                | 18 ft                       | 9 ft | 84 ft               | 60 ft | 33 ft | 72 ft                    | 60 ft | > 3,000         |
| Thoroughfare             | 14 ft                       | 7 ft | 78 ft               | 58 ft | 32 ft | 78 ft                    | 60 ft | > 15,000        |
| Neighborhood Residential | 10 ft                       | 7 ft | 35 ft               | 32 ft | 20 ft | 50 ft                    | 50 ft | <3,000          |
| Neighborhood Connector   | 10 ft                       | 7 ft | 50 ft               | 34 ft | 20 ft | 55 ft                    | 48 ft | <3,000          |
| Neighborhood Mixed Use   | 12 ft                       | 8 ft | 35 ft               | 27 ft | 20 ft | 60 ft                    | 48 ft | 3,000 to 25,000 |
| Industrial               | 10 ft                       | 6 ft | 60 ft               | 36 ft | 25 ft | 54ft                     | 42 ft | <3,000          |
| Agricultural Access      | 9 ft                        | 6 ft | 44 ft               | 36 ft | 24 ft | 52 ft                    | 40 ft | <1,000          |
|                          |                             |      |                     |       |       |                          |       |                 |

# Roadway Design Criteria

The roadway design criteria in Figure 25 provides standard design values that can be reasonably accommodated within each street typology contained within the Rockdale Master Thoroughfare Plan. The values for each parameter conform to state and federal standards (AASHTO, MUTCD, NACTO and the TxDOT RDM). Significant deviations from any parameter should be examined carefully by a licensed professional transportation engineer.

**Figure 25.** Space Allocation Parameters

| Street Type              | # of Travel Lanes | Lane Width |        |        | Center Turn Lane            | On-Street Parking             |
|--------------------------|-------------------|------------|--------|--------|-----------------------------|-------------------------------|
|                          |                   | Max.       | Typ.   | Min.   |                             |                               |
| Avenue                   | 2-4               | 11 ft      | 11 ft  | 10 ft  | Optional                    | Optional                      |
| Boulevard                | 2-6               | 12 ft      | 12 ft  | 11 ft  | Median or Crossbay Standard | None                          |
| Thoroughfare             | 2-4               | 12 ft      | 11 ft  | 10 ft  | TxDOT Standard              | None                          |
| Neighborhood Residential | No Center Lines   | 35 ft*     | 20 ft* | 20 ft* | Not Compatible              | Non-delineated                |
| Neighborhood Connector   | No Center Lines   | 50 ft*     | 36 ft* | 20 ft* | Not Compatible              | Non-delineated                |
| Neighborhood Mixed Use   | 2                 | 11 ft      | 10 ft  | 10 ft  | Optional                    | Parallel or angled acceptable |
| Industrial               | 2-6               | 12 ft      | 12 ft  | 11 ft  | Optional                    | None                          |
| Agricultural Access      | 2                 | 12 ft      | 11 ft  | 10 ft  | Not Compatible              | None                          |
|                          |                   |            |        |        |                             |                               |

\*Total travelway width, since there are no center lines

# Operational Standards

The roadway design criteria in Figure 26 provides standard operational values that can be reasonably accommodated within each street typology contained within the Rockdale Master Thoroughfare Plan. The values for each parameter conform to state and federal standards (AASHTO, MUTCD, NACTO and the TxDOT RDM). Significant deviations from any parameter should be examined carefully by a licensed professional transportation engineer.

**Figure 26.** Roadway Operational Standards

| Street Type              | # of Travel Lanes | Center Turn Lane            | Corner Radii |       | Target Speed |
|--------------------------|-------------------|-----------------------------|--------------|-------|--------------|
|                          |                   |                             | Pref.        | Max.  |              |
| Avenue                   | 2-4               | Optional                    | 15 ft        | 25 ft | 25 mph       |
| Boulevard                | 2-6               | Median or Crossbay Standard | 15 ft        | 30 ft | 35 mph       |
| Thoroughfare             | 2-4               | TxDOT Standard              | 15 ft        | 30 ft | 35 mph       |
| Neighborhood Residential | No Center Lines   | Not Compatible              | 5 ft         | 15 ft | 20 mph       |
| Neighborhood Connector   | No Center Lines   | Not Compatible              | 5 ft         | 15 ft | 25 mph       |
| Neighborhood Mixed Use   | 2                 | Optional                    | 5 ft         | 15 ft | 20 mph       |
| Industrial               | 2-6               | Optional                    | 40 ft        | 45 ft | 25 mph       |
| Agricultural Access      | 2                 | Not Compatible              | 5 ft         | 15 ft | 25 mph       |
|                          |                   |                             |              |       |              |

# Transportation Planning Toolbox

In addition to the Future Streets Plan Map and cross-section designs, the crafting of transportation policies can aid in providing and maintaining a well-functioning transportation system that meets the needs of its users. The following sections discuss several policies that, if implemented, are anticipated to build on and enhance the existing transportation network in Rockdale.

## Passive Design:

The passive design philosophy in transportation planning has traditionally erred on the side of caution, assuming and preparing for worst-case scenarios regarding both user behavior and traffic congestion. While this approach is sensible in engineering fields where mitigating known risks is essential, its application to city streets has led to unintended consequences. Over-engineered design elements, such as excessively wide buffers and setbacks meant to account for rare accidents, have inadvertently created an environment that is no longer people-centric and in many cases actually encourages dangerous and reckless driving.



## Proactive Design:

A proactive design approach recognizes that human behavior is inherently responsive toward the surrounding environment and seeks to shape desired outcomes based on this insight. Rather than designing streets based on the assumption of the fastest, largest or most reckless driver, proactive design employs intentional strategies to guide user behavior. By creating environments that naturally encourage safe speeds and responsible driving habits, proactive design aims to achieve positive outcomes through thoughtful and purposeful planning.



## Design Speed

In transportation planning, the distinction between design speed and target speed is crucial for creating roadways that prioritize safety and functionality. Operating speed refers to the maximum safe speed at which a road can be negotiated under ideal conditions, considering factors like geometry and alignment.

On the other hand, target speed is the desired speed at which authorities aim to encourage drivers to travel on a given road. Within the conventional transportation paradigm, roadways were designed where the operating speed equaled the design speed and was therefore the posted speed. Within a proactive framework, the design speed would be equal to the target speed that policy makers and community members have identified instead of being based on the maximum operating speed.

Reducing speeds, often achieved through measures like traffic calming or design adjustments, is paramount for enhancing road safety, mitigating the severity of accidents and creating more pedestrian- and cyclist-friendly environments. By aligning target speeds with the intended use of the roadway and the safety of all users, transportation planners can foster a harmonious and efficient transportation network that prioritizes well-being and accessibility over speed.

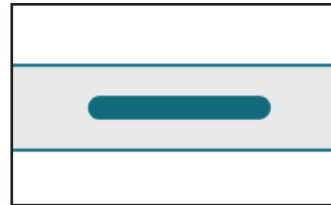
Figure 27. Driving Speed and Fatality Risk

| SPEED (MPH) | STOPPING DISTANCE (FT)* | CRASH RISK (%)† | FATALITY RISK (%)† |
|-------------|-------------------------|-----------------|--------------------|
| 10–15       | 25                      | 5               | 2                  |
| 20–25       | 40                      | 15              | 5                  |
| 30–35       | 75                      | 55              | 45                 |
| 40+         | 118                     | 90              | 85                 |

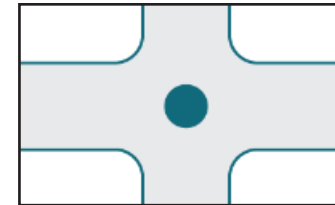
\*Stopping distance includes perception, reaction, and braking times

Source: Traditional Neighborhood Development: Street Design Guidelines (1999), ITE Transportation Planning Council Committee SP-8

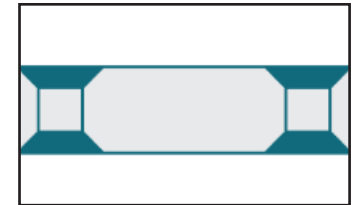
**Median**



**Roundabout**



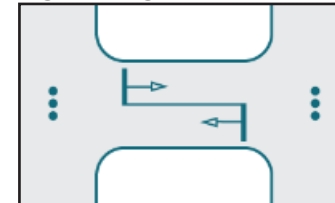
**Speed Lumps**



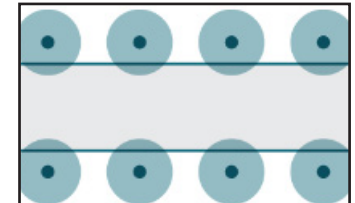
**Chicane**



**Signal Progression**



**Street Trees**



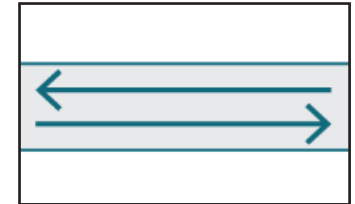
**Building Lines**



**Pinch Point**



**2-Way Street**



Source: NACTO, Urban Street Design Guide

## **Design Vehicle**

The design vehicle plays a crucial role in transportation planning as it serves as a fundamental benchmark for designing and dimensioning roads, intersections and other transportation infrastructure. The design vehicle represents the largest or most challenging types of vehicles expected to use a particular roadway and ensures that the infrastructure can accommodate the diverse range of vehicles operating within a given area. Often design decisions are made with the largest and heaviest vehicle being prioritized at the expense of more vulnerable users.

## **Design Hour**

The term “design hour” in transportation planning typically refers to the specific hour during the day when traffic demand is at its peak, and the transportation infrastructure needs to accommodate the maximum volume of vehicles and users. It is a crucial aspect of designing roads, intersections and other transportation facilities to ensure they can handle the highest levels of traffic efficiently.

Taking into account all users during this design hour is essential, encompassing pedestrians, cyclists and various types of vehicles. This inclusive approach results in transportation infrastructure that not only addresses peak-hour automobile demands but also caters to the diverse needs of the entire user population, promoting safety, accessibility and efficiency.

## **Design Year**

“Design year” is another important parameter that transportation planners consider when making investments into new infrastructure. The design year is based on a transportation model that estimates the future demand along that particular roadway. Often, these models may overestimate demand which results in an overbuilt roadway and a lost opportunity to develop high value land within the municipality. In many cases savvy land use planning and natural growth can help distribute trips more efficiently, rather than over-designing a single roadway.

## **Performance Measures**

Performance measures in transportation planning refer to quantifiable metrics used to assess the effectiveness, efficiency and overall success of transportation systems and projects. These measures help evaluate how well transportation goals and objectives are being met, providing valuable insights for decision-makers and planners. It is important to select measures that align with City priorities and that take a holistic approach towards the road. Simple measures such as level of service only take into consideration a road’s ability to move automobiles, but do not take into account the economic vitality of the street, or impacts toward pedestrians. Looking at measures of pedestrian delay, multi-modal safety and in some instances retail revenues, can all be effective methods of evaluating a street’s performance.

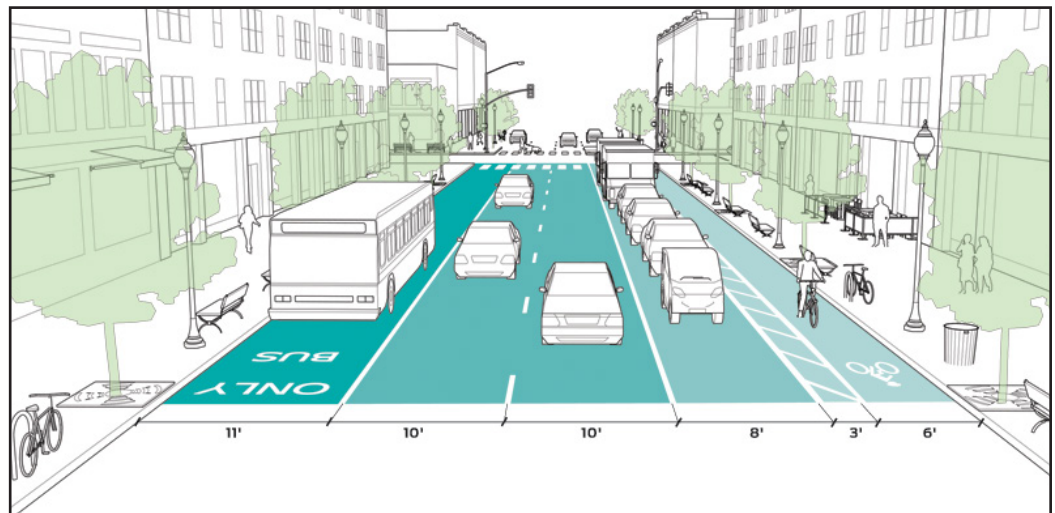
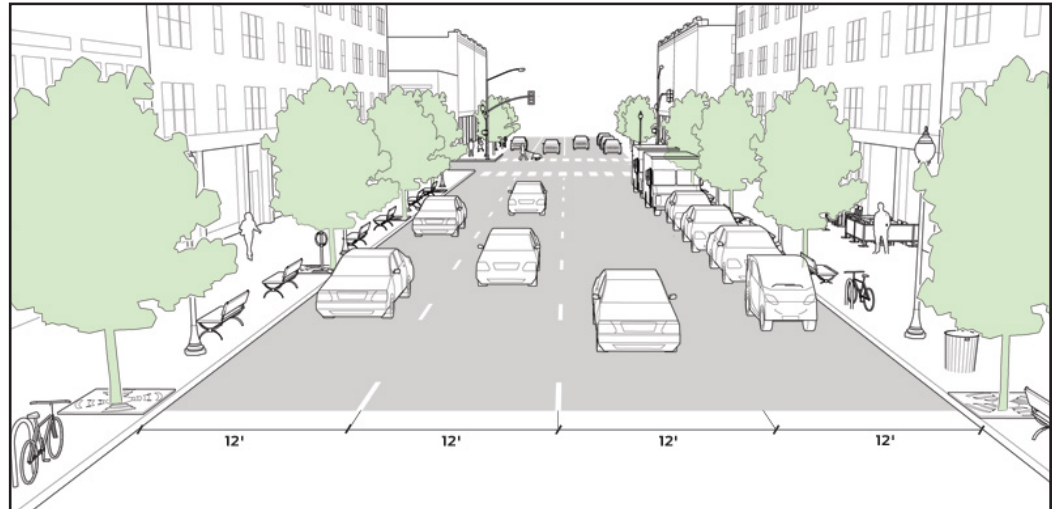
## Lane Width

Lane widths play a pivotal role in transportation planning, serving as a critical design element that directly influences the safety, efficiency and overall functionality of roadways. The dimensions of traffic lanes impact vehicular speed, maneuverability and the capacity of a road to accommodate various types of vehicles. Optimal lane widths are essential to maintain safe driving conditions, as they influence driver perception and behavior.

Narrower lanes can naturally encourage reduced speeds, enhancing road safety. Conversely, wider lanes can accommodate larger vehicles and higher speeds but may contribute to increased traffic velocity and reduced safety. Striking the right balance in lane width is crucial for accommodating the diverse needs of road users, including pedestrians, cyclists and drivers. Thoughtful consideration of lane widths in transportation planning ensures a harmonious flow of traffic, reduces congestion and contributes to the creation of a safe and efficient transportation network.

NACTO design standards provide that lane widths within urban and residential contexts should be 10 feet, while industrial areas or designated truck routes can be 11 feet. Parking lane widths should be between 7 and 9 ft, and bike lanes should be no smaller than 5-6 feet in width.

Figure 28. Conventional Street Revitalization Example



Source: NACTO, Urban Street Design Guide

# Intersections

Intersection controls play a pivotal role in ensuring the safe and efficient movement of traffic within road networks. These controls, including traffic signals, stop signs and roundabouts, are critical elements of transportation planning and traffic management. Properly designed intersection controls enhance safety by regulating the orderly flow of vehicles, pedestrians and cyclists, minimizing the risk of collisions.

Additionally, they contribute to the efficient use of road space and the optimization of traffic flow, especially during peak hours. Intersection controls help prevent congestion, reduce travel times and improve overall transportation system performance. Many streets in Rockdale such as U.S. 79 or Ackerman St. have a number of transition points in terms of adjacent land uses and requirements for accessibility. Unsignalized intersection improvements such as curb radii reductions or safety islands, along with improved signage help identify a low-speed, pedestrian-oriented zone. Creating an informal gateway and implementing design controls that force drivers to pay attention can help reduce conflicts between automobiles and pedestrians. When considering intersection improvements, it is also important to note intersections where public space can be reclaimed, this is particularly relevant for intersections along Bell Avenue, Davilla Avenue and Milam Avenue near Downtown Rockdale.

Figure 29. Downtown Intersection Revitalization



Source: NACTO, Urban Street Design Guide

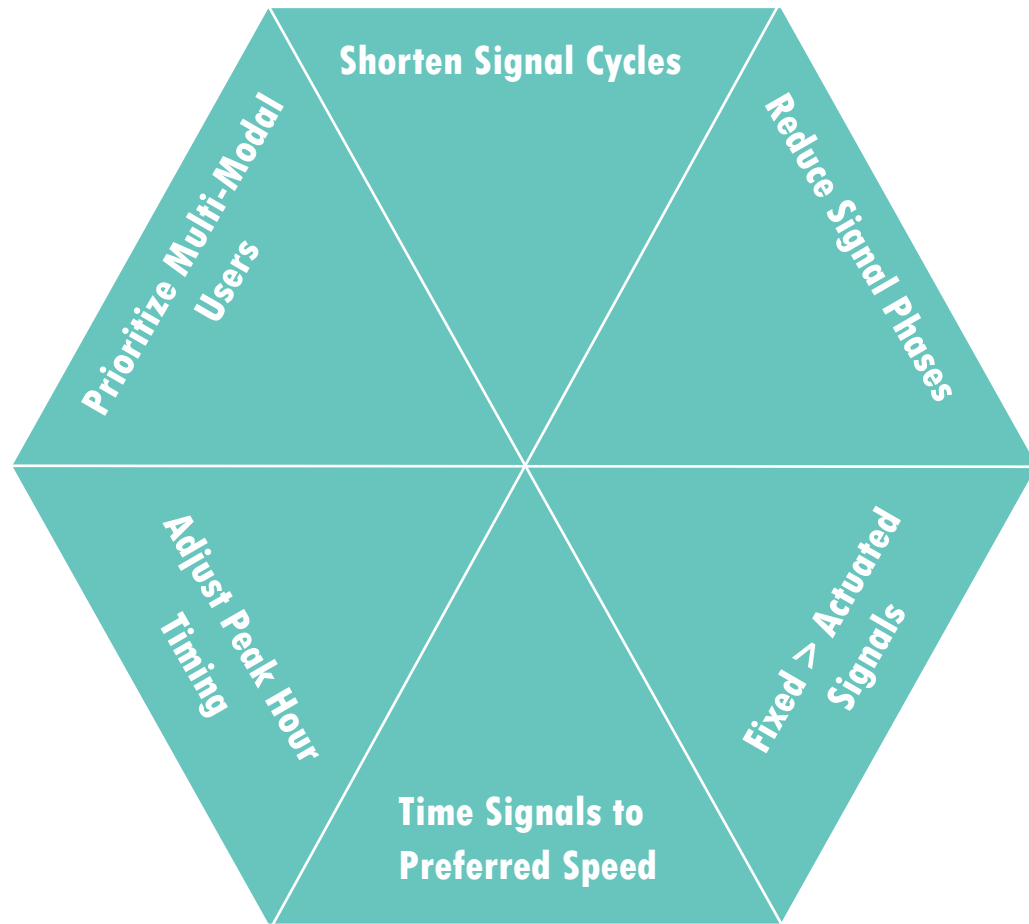
## Signalization

Signalization is a critical aspect of transportation planning as it serves as an important tool for managing traffic flow, enhancing safety and optimizing overall mobility within a transportation network. Traffic signals, as a form of signalization, regulate the orderly movement of vehicles, pedestrians and cyclists at intersections. By controlling the right-of-way, signals help prevent conflicts, reduce the risk of accidents, and ensure a smoother and more predictable traffic flow.

Signalization is instrumental in coordinating the movement of vehicles along arterial roads, mitigating congestion and improving overall travel efficiency. Moreover, well-designed signal systems contribute to the effective prioritization of different modes of transportation, promoting inclusivity and accommodating the diverse needs of road users. In the context of transportation planning, the strategic placement and timing of signals are crucial factors that influence the performance and safety of the entire transportation network.

NACTO provides six general signalization principles as shown in Figure 30. When designing and timing signalization controls it is important to consider creating separate timing schedules based around the typical user during that peak hour. It is also important to time signals at the speed that is preferred, to avoid congestion. Maintenance is another crucial factor as actuated signals (signals that operate on real-time sensor information) have high associated maintenance costs compared to fixed (pre-programmed) signal systems.

Figure 30. NACTO Signalization Principles



Source: NACTO, Urban Street Design Guide

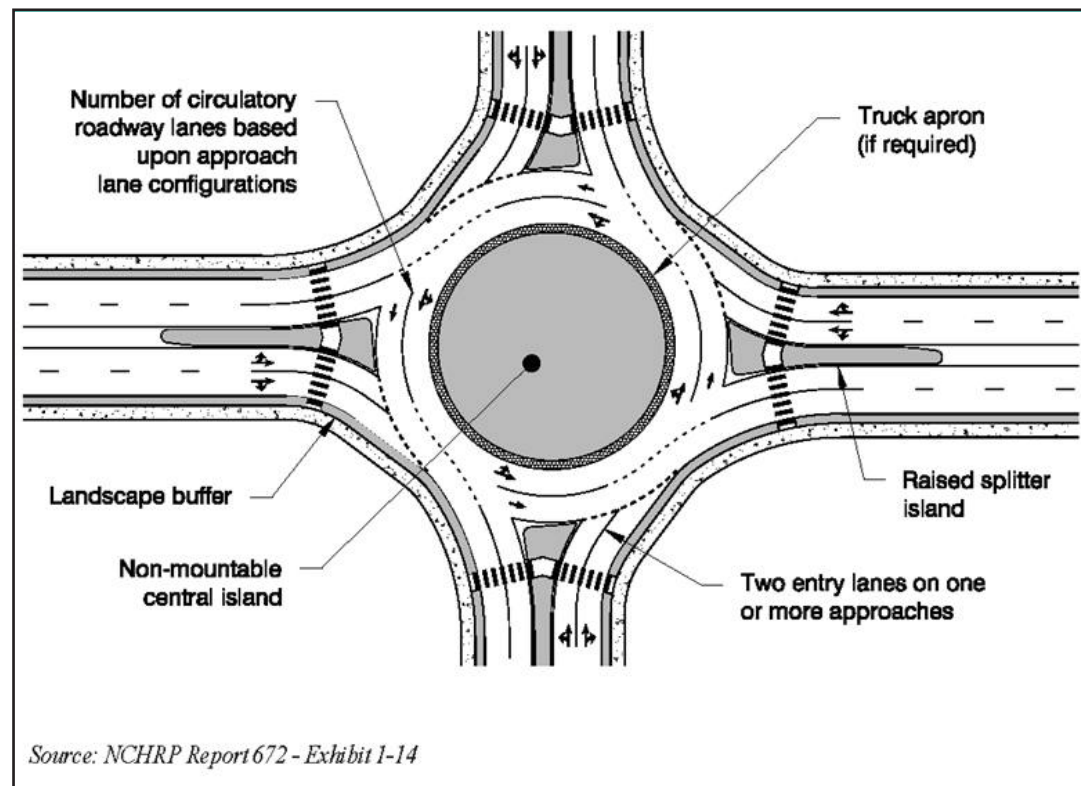
## Roundabouts

Roundabouts represent a distinct form of intersection characterized by a circular layout, yield control on entry and geometric features that guide vehicles into a low-speed environment. Modern roundabouts, depicted in Figure 31, have proven to offer various advantages in terms of safety, operational efficiency and overall effectiveness compared to alternative intersection types. In projects involving new or improved intersections on collector or minor arterial roadways, the feasibility of implementing a modern roundabout should be explored as a cost-effective alternative to all-way stops or traffic signal control.

When planning for a roundabout, the Federal Highway Administration (FHWA) recommends a structured approach encompassing six essential steps. These steps involve considering the context and any site-specific constraints, determining a preliminary lane configuration and roundabout category based on capacity requirements, developing a selection process justifying roundabout construction, conducting a thorough analysis using identified data, determining required right-of-way based on the preferred design, and performing an economic evaluation if additional right-of-way or alternative intersection control measures are considered. Additional steps may include comprehensive public involvement processes and the documentation of the decision-making process, emphasizing the chosen alternative.

Factors triggering further examination of roundabout applicability encompass physical or geometric constraints, challenges in traffic composition (e.g., high volumes of oversized trucks), proximity to structures or devices creating design complexities, and the risk of bottlenecks consistently affecting the roundabout due to nearby structures like drawbridges, railroad crossings or interchanges.

Figure 31. Two Lane Roundabout Diagram



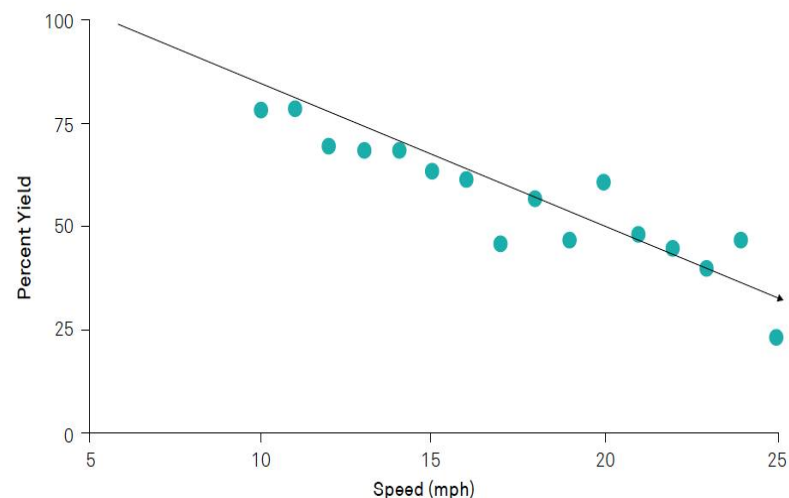
Source: NACTO, Urban Street Design Guide

## Curb Radii

Curb radii, the rounded corners at intersections where curbs meet, are crucial elements in transportation planning with significant implications for both vehicular flow and pedestrian walkability. In terms of vehicular traffic, the size of curb radii directly influences turning speeds and the ease with which vehicles navigate intersections. Larger curb radii accommodate sharper turns at higher speeds, potentially compromising pedestrian safety. On the other hand, smaller curb radii force vehicles to make wider turns at slower speeds, enhancing safety for pedestrians crossing at intersections.

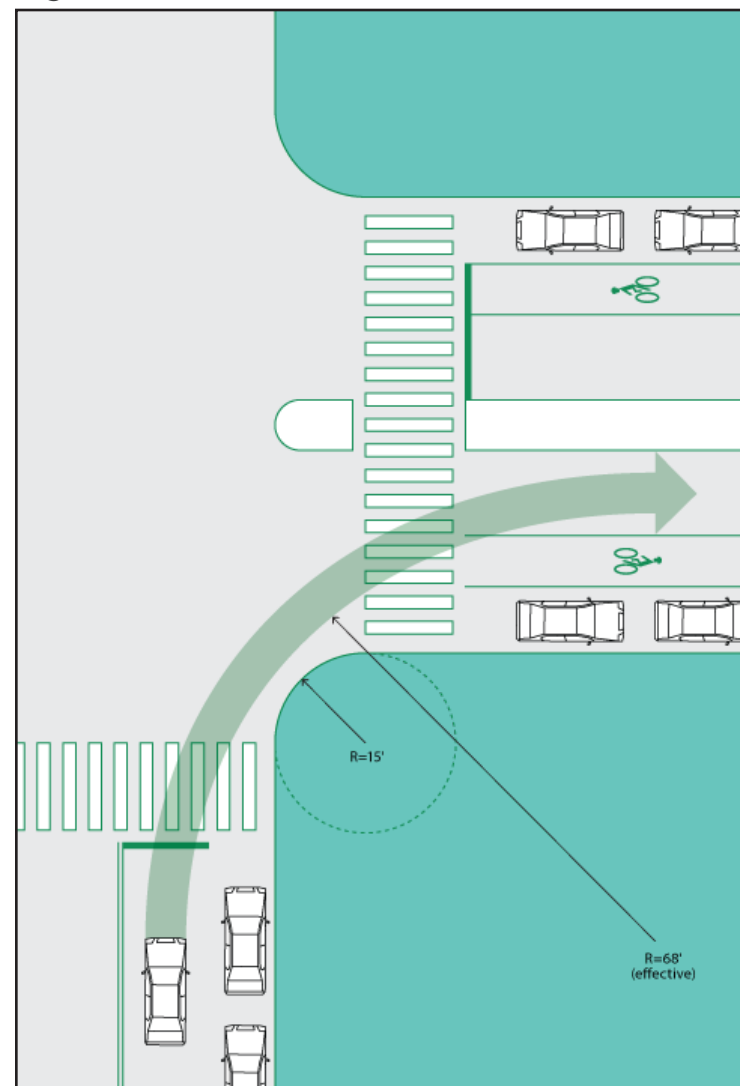
Generally, turning speeds should be limited to 15 mph or less to mitigation conflicts with pedestrians. Within most urban contexts corner radii should be no more than 15 feet and can often be less than 5 feet. Often lower corner radii can accommodate industrial vehicles as well due to the fact the effective corner radius is substantially larger than the actual corner radius as is shown in Figure 33. Recessed stop lines are another effective method for accommodating larger vehicles without compromising pedestrian space.

**Figure 32. Driving Yielding Rates & Travel Speeds at Crossings**



Source: Geruschat, D.R., Driver Behavior in Yielding to Sighted and Blind Pedestrians at Roundabouts. 2005.

**Figure 33. Effective Curb Radii**



Source: NACTO, Urban Street Design Guide

## Sidewalks

Sidewalks are fundamental components of urban planning, playing a pivotal role in shaping the character and functionality of a city. Beyond serving as pedestrian pathways, sidewalks contribute significantly to the overall livability and accessibility of urban spaces. They provide safe and designated routes for walking, fostering a sense of community, encouraging physical activity and enhancing public health.

Sidewalks are also economic catalysts that contribute significantly to the prosperity of urban areas. By providing a conducive environment for pedestrians, sidewalks encourage people to explore their surroundings at a leisurely pace, promoting casual encounters and increasing the visibility of local businesses.<sup>1</sup> The accessibility offered by well-designed sidewalks attracts foot traffic, making commercial districts more vibrant and attractive. Moreover, the presence of sidewalks enhances property values, making adjacent real estate more desirable for both residential and commercial purposes.

Best practices for sidewalk design should include pedestrian zone widths at least 6 feet and up to 8 feet with a 2-foot street furniture zone buffer when directly adjacent to moving traffic in residential areas. Pedestrian Zone widths may increase to 8-12 feet in main street commercial areas.<sup>2</sup> Lighting, trees, street furniture and green infrastructure are all recommended inclusions to buffer the pedestrian zone from traffic flows. Within all urban areas, ADA accessibility requirements should be strongly adhered to.

<sup>1</sup> Bill Ryan, "Let's Talk Business: Ideas for Expanding Retail and Services in Your Community," UW Extension, July 2003.

<sup>2</sup> NACTO, Urban Street Design Guide

Figure 34. Pedestrian Zones



Source: NACTO, Urban Street Design Guide

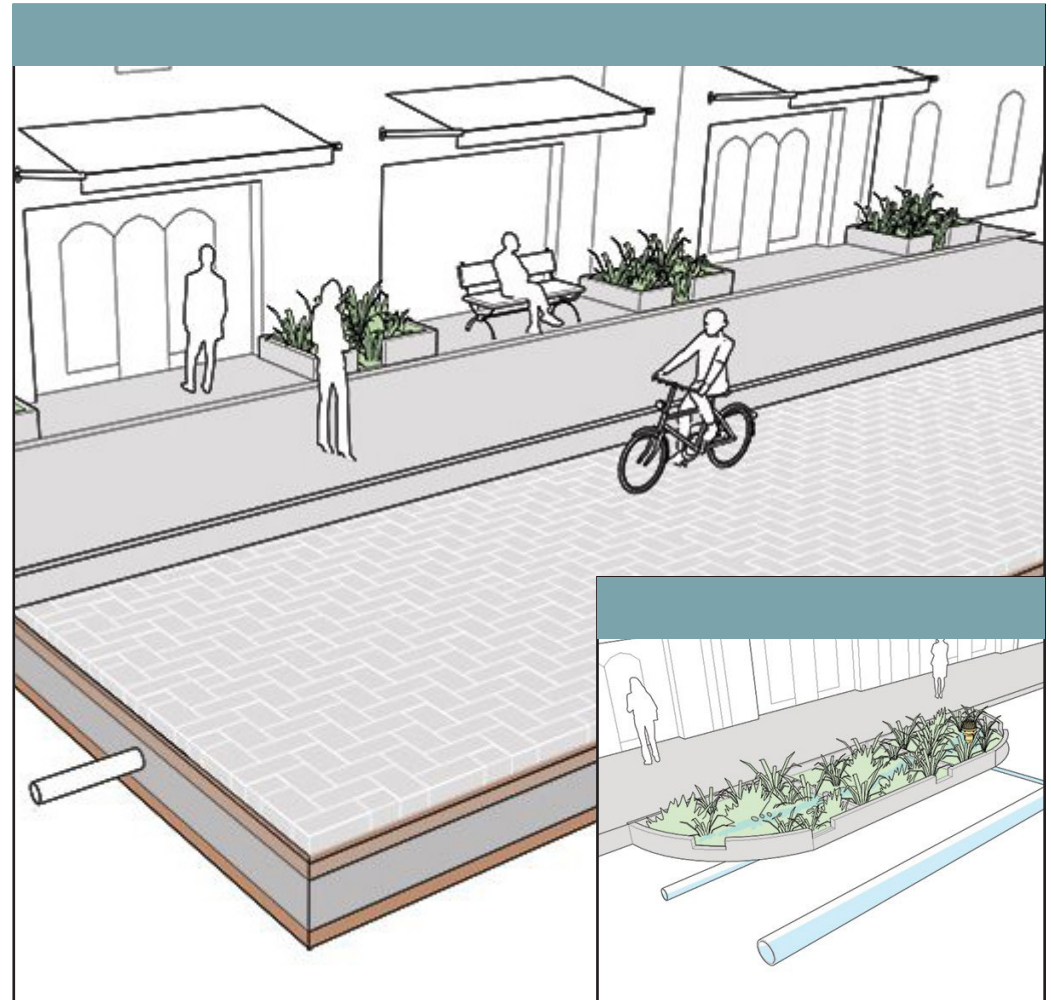
## Stormwater Management

Stormwater management holds a pivotal role in transportation planning, influencing the resilience and sustainability of the entire transportation infrastructure. Effective stormwater management is crucial for mitigating the impacts of heavy rainfall and preventing issues such as flooding and erosion along roadways. Well-designed drainage systems and permeable surfaces help control the flow of stormwater, reducing the risk of infrastructure damage and enhancing the longevity of roads and bridges.

Furthermore, environmentally conscious stormwater management practices contribute to water quality preservation by preventing pollutants from entering water bodies. By integrating stormwater management into transportation planning, cities can create resilient and ecologically sound transportation networks, fostering both the durability of infrastructure and the overall health of the surrounding environment.

The design of stormwater management mechanisms is highly dependent on local context and engineering requirements, particularly as they relate to soil and materials. Pervious pavement can often be used within pedestrian walkways, street furniture zones and to a limited extent along roadways. Each stormwater capture method has different levels of maintenance that are required, in the case of bioswales it is vegetation upkeep and with pervious pavements regular cleaning of void spaces is required to maintain infiltration.

Figure 35. Pervious Pavement & Bioswale Cross Section



Source: NACTO, Urban Street Design Guide