COMPREHENSIVE PLAN

Rosenberg texas

2035 COMPREHENSIVE PLAN

2 TRANSPORTATION

IN GENERAL

Provision of an efficient transportation system within and around Rosenberg is crucial to promoting economic growth, and improving the quality of life for the City's residents. Many people think of transportation solely in terms of roads and streets that allow them to commute in their cars between home, work, recreation, and shopping. **Efficient transportation systems actually focus on the movement of people and goods – rather than vehicles - through the use of multiple means**. Only by considering multiple modes of ground transportation can Rosenberg meet the future needs of its citizens and businesses by effectively balancing fluid mobility with access options.

Chapter 2, *Transportation*, of *Rosenberg 2035* establishes the framework by which Rosenberg will accommodate anticipated local and regional travel demand through the year 2035 and beyond. Clear direction in the form of guiding principles established by planning participants, combined with Rosenberg's ongoing participation in metropolitan transportation planning efforts, renders the collection and presentation of extensive data in this plan unnecessary and redundant. The majority of Rosenberg's major transportation projects are already programmed in regional transportation improvement programs, long-range transportation plans, and the City's capital improvements program. Although this chapter contains some recommendations on location-specific projects that should be prioritized, its primary focus is on policy development. What are the parameters by which transportation improvements in Rosenberg should take place? How can street networks be extended? How should new thoroughfares be designed? How can facilities be provided for bicyclists and pedestrians? The answers to these and similar questions are rendered in the form of policies, programs, and regulatory activities intended to augment or adjust the City's existing transportation initiatives.

ROSENBERG 2035: TRANSPORTATION GUIDING PRINCIPLES

The following statements of principle delineate the manner by which Rosenberg will implement its preferred transportation vision over the next 20 years.

- ***Principle A:*** *Develop a transportation network that provides local interconnectivity and accessibility.*
- ***Principle B:*** *Design street systems that are context sensitive.*
- ***Principle C:*** *Provide for transportation choices.*
- ***Principle D:*** *Mitigate traffic patterns that are incompatible with neighborhoods and activity centers.*

TRANSPORTATION POLICY

Issues and Opportunities

Chapter 2, *Transportation*, identifies key issues that Rosenberg must address for the City to build and maintain a transportation system that balances effective mobility throughout the community while improving access to destinations for the greatest share of the population as possible. Transportation system recommendations consider not only existing population and development, but anticipated population growth and new land development. Key issues that have been considered in formulating the recommendations within this chapter include:

- ***Thoroughfare Development.*** *Preservation of rights-of-way both within the City, and areas identified for future expansion of urban services, will be critical to maintaining street network interconnectivity and effective traffic dispersal. Thoroughfare development must also consider the existing and intended character of surrounding areas, as well as suitability for all modes of transportation.*
- ***Traffic Management.*** *Traffic carrying capacities of area roadways must be preserved In order to provide for an efficient movement of vehicles. This relates to roadway design, with particular emphasis on access management and intersection improvements.*
- ***Pedestrian and Bicycle Mobility.*** *There must be an emphasis on incorporating pedestrian and bicycle improvements into codes and street projects to improve local access and quality of life. This is particularly important to segments of the population that do not have reliable access to motor vehicles.*
- ***Corridor Appearance.*** *Rosenberg's corridors offer an opportunity to establish a positive first impression of the City. The design and appearance of roadways, as well as the properties that abut them, are of essential importance to enhance community aesthetics and for a positive visual contribution to the built environment.*
- ***Regional Multi-Modal Mobility.*** *The full spectrum of transportation assets and facilities – the street network, active transportation facilities, public transportation, and freight movement – has been considered.*

Community Capacities

To develop Rosenberg's long-range mobility-related policy framework, the City's existing transportation network was reviewed in accordance with four "community capacities."

The community capacities (CC) evaluated in this chapter are:

- ***CC 1:*** *Street Network*
- ***CC 2:*** *Active Transportation*
- ***CC 3:*** *Public Transportation*
- ***CC 4:*** *Intermodal Transportation*

Recommended strategies and their associated initiatives and actions for each of the four community capacities have been developed and incorporated into the overall *Community Work Program* contained in Chapter 4, *Implementation*.

Major Thoroughfare Program

The issues and opportunities, as well as the community capacities discussed in this chapter, identify specific strategies, actions, and initiatives, for inclusion in the *Rosenberg 2035 Community Work Program*. Additionally they provide the information necessary to develop Rosenberg's long-range transportation policy program. The resulting *Rosenberg 2035 Major Thoroughfare Program* is the City's formal policy for future transportation system development, and can be found on pages 2.23 through 2.36.

TRANSPORTATION PARTNERS

State and regional agencies administer transportation plans, policies, and programs which often affect the prioritization, funding, design, construction, maintenance, and repair of transportation assets within or near the City of Rosenberg. Rosenberg is often only one of many partners "seated at the table" in which decisions regarding transportation facility design and funding is made. Associated state, regional, and county plans are rarely adopted as formal City transportation policy; but, such documents often contain valuable recommendations which may warrant inclusion in the City's own transportation plans or studies.

Various transportation plans and programs prepared or administered by the Texas Department of Transportation (TxDOT), the Houston-Galveston Area Council (H-GAC), and Fort Bend County were reviewed during the preparation of this chapter of Rosenberg 2035. Information from the The Fort Bend County Toll Road Authority and Fort Bend County Public Transportation Department also assisted in the development of this Chapter.

CC 1: STREET NETWORK

The most apparent component of most communities' transportation networks are streets. The street network is of significant importance as the vast majority of Americans rely on automobiles as their principal source of transportation. Maintaining or improving the efficiency of the street network (specifically motor vehicle travel lanes) is the most significant transportation concern of a majority of local governments. Rosenberg is a perfect example of this trend – with over 83.6 percent of all workers commuting alone via motor vehicle between 2008 and 2012. In total, roughly 95 percent of all Rosenberg workers commuted to work via a motor vehicle (alone or carpool) between 2008 and 2012 (see **Figure 2.5**, ***Methods of Transportation to Work***, page 2.11).

Functional Classification System

Roadways are classified by the Federal Highway Administration (FHWA) based on their function within the local highway network and according to their geographic location within urban or rural areas. Individual states have the discretion to make variations to the FHWA functional classification guidelines. The state of Texas mainly adheres to FHWA standards but separates classes into those that are rural and those that are urban. **Figure 2.1**, ***Rosenberg Functional Classification Map*** illustrates the current distribution of city streets according to the functional classification hierarchy utilized by the Texas Department of Transportation (TxDOT) - although the Houston-Galveston Area Council (H-GAC), Fort Bend County, and Rosenberg all use different variations of the functional classification system.

FIGURE 2.1: ROSENBERG FUNCTIONAL CLASSIFICATION MAP

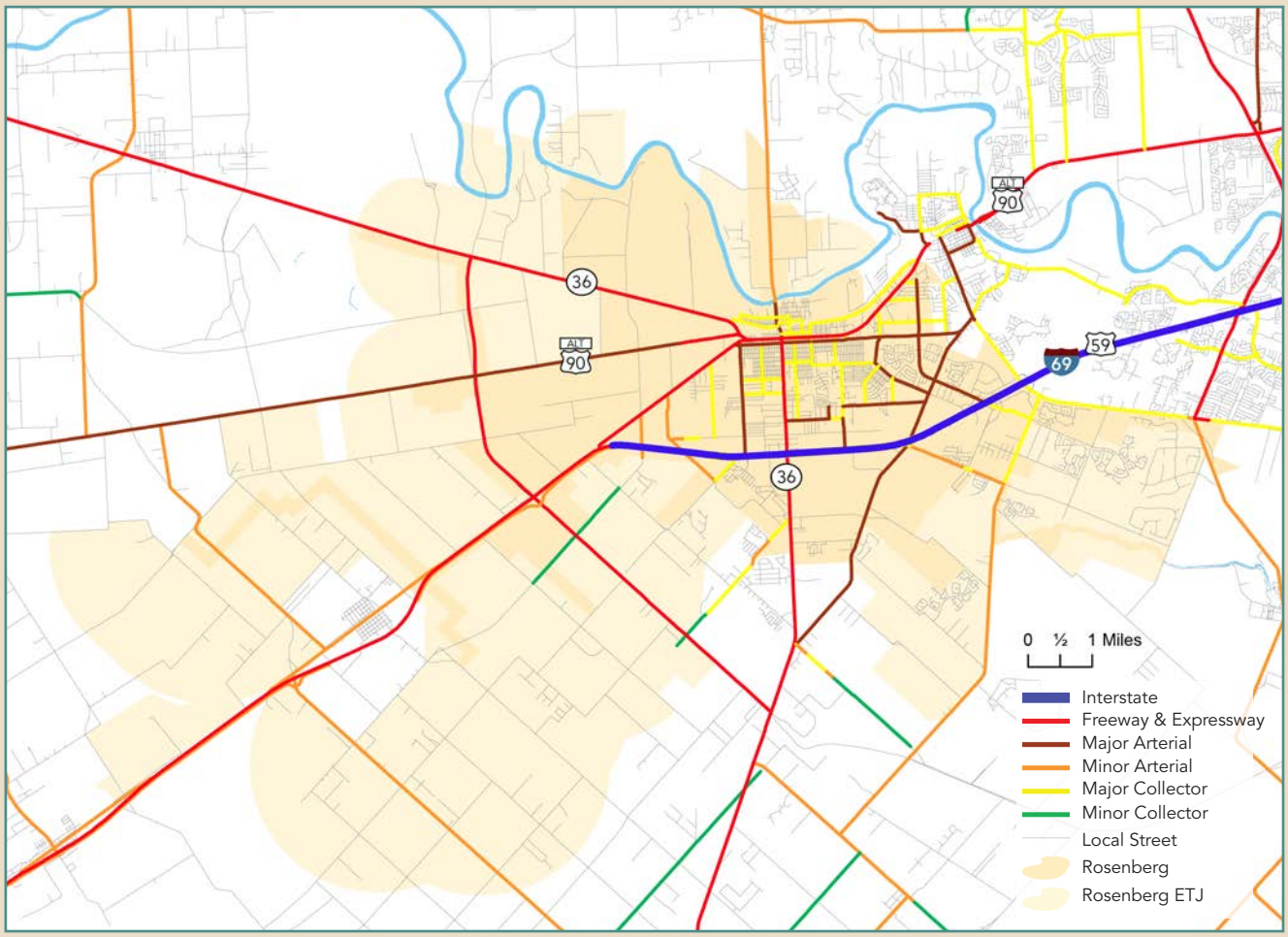


Figure 2.A illustrates the functional classification of streets and highways in the vicinity of Rosenberg according to the classifications utilized by the Texas Department of Transportation. Different functional classifications, which roughly correspond to the TxDOT designations are utilized by H-GAC, Fort Bend County, and Rosenberg for the purposes of major thoroughfare planning.

Traffic Volumes

Figure 2.2, ***Rosenberg Change in Traffic Counts (2004-2013)*** and **Figure 2.3**, ***Rosenberg Traffic Counts (2013)*** quantify local intuition and experience by illustrating high traffic volumes on all City thoroughfares. The figures also indicate that there has been extreme variation in traffic volumes on City thoroughfares between 2004 and 2013. This condition is consistent with the increasing rates of growth that have been experienced in Rosenberg and greater Fort Bend County over the last decade. These traffic volumes have been considered in developing the *Rosenberg 2035 Major Thoroughfare Program*.

Level of Service

The primary method for analyzing the operational efficiency of a community's road network is by measuring the Level of Service (LOS) of the major thoroughfares within the network. According to the Transportation Research Board's Highway Capacity Manual, LOS is a measure of highway congestion describing operational conditions of a roadway in terms of average speed, travel time, maneuverability, and traffic interruptions. **Figure 2.4**, ***Level of Service Characteristics***, provides a description of the 6 LOS categories.

FIGURE 2.2: ROSENBERG CHANGE IN TRAFFIC COUNTS (2004 - 2013)

LOCATION DESCRIPTION	CHANGE (ADT[1])	%
Spur 10 between US 59 and US 90A	+4749	+256.7%
Hartledge Road/Gerken Road between US 59 and Fenske Road	+658	+188.0%
US 90A between Cecil Robinowitz Road and Spur 10	+1573	+176.7%
FM 2977 between FM 762 and Koeblen Road	+4886	+101.8%
FM 762 between FM 2759 and Berdett Road	+3409	+45.5%
FM 2977 between Koeblen Road and Pleak Road	+1679	+45.4%
US 90A between Rude Road and Cecil Robinowitz Road	-1542	-38.6%
Loop 540 between US 59 and Hamlink Road	-765	-40.3%
HWY 36 between US 90A and Huntington Road	-2593	-40.5%
Millie Street between Avenue I and Avenue H/US 90A	-2752	-42.3%

Source: TxDOT Traffic Counts
[1] *Average Daily Traffic*

It is important to note that LOS descriptions focus solely on the freedom of drivers to travel between destinations with as little interference as possible. Communities are typically comprised of multiple street types, land uses, and development intensities; a LOS of A is rarely the most appropriate level of traffic flow within certain areas of Rosenberg. For instance, the high unrestricted speeds permitted by a LOS A street are not appropriate for a residential neighborhood or central business district. In reality, a LOS C is recommended for arterial thoroughfares in urban areas, and a LOS of D is recommended for collector thoroughfares and local streets.

Motor Vehicle Accidents

Data provided by Fort Bend County indicates that between 2010 and 2014 there was an annual average of 550 accidents in Rosenberg involving a motor vehicle. Of these, roughly 31 percent involved - or may have involved - an injury. The majority of motor vehicle accidents occurred on high volume controlled access highways or major thoroughfares maintained by TxDOT. Of streets owned and maintained by Rosenberg, the majority of motor vehicle accidents occurred on Commercial Drive, Lane Drive, Reading Road, and Town Center Boulevard. These streets present themselves as candidates for safety or traffic calming investments through amendments to the City's Capital Improvements Program (CIP).

Conclusions

Although traffic congestion in Rosenberg is obvious to the casual observer on a daily basis, there exists insufficient data to establish a "baseline" level of service on the vast majority of Rosenberg's thoroughfares. By extension, current data (combined with a lack of land use regulations) also makes it difficult to predict overall development potential in the City, and trip generation potential on its thoroughfares.

The population projections presented in Chapter 1, *Planning Context* (see pages 1.18 and 1.19), provide clear evidence that substantial growth will occur within and around Rosenberg during the *Rosenberg 2035* planning period. The City cannot wait until after development has occurred - along with resulting traffic congestion - to retrofit its street network to improve levels of service and meet capacity needs. More pro-active measures should be taken, such as City-commissioned sub-area traffic modeling and the development of ordinances that tie development to available infrastructure. Although Rosenberg already engages in traffic impact analysis tied to subdivisions exceeding 75 acres, a modification of when this tool is utilized is warranted.

FIGURE 2.3: ROSENBERG TRAFFIC COUNTS (2013)

LOCATION/DESCRIPTION	ADT[1]
US 90A between Wilson Drive and Lane Drive	22,107
HWY 36 between US 59 and Walenta Avenue	20,383
US 90A between 7th Street and Wilson Drive	17,004
HWY 36 between Avenue H and Avenue D	15,540
HWY 36 between Walger Avenue and Avenue I	15,047
FM 723 between Avenue D and Joerger Road	14,894
US 90A between Lane Drive and Collins Road	14,546
Ave I between Millie Street and Horace Mann Avenue	14,400
Ave I between Ward Street and Millie Street	13,592
FM 723 between Joerger Road and Riverside Boulevard	13,449

Source: TxDOT Traffic Counts
1 Average Daily Traffic

FIGURE 2.4: LEVEL OF SERVICE CHARACTERISTICS

LEVEL OF SERVICE	DESCRIPTION
A	Free flow with low volumes and high speeds.
B	Reasonably free flow, but speeds starting to be moderated by traffic conditions.
C	In stable flow zone, but most drivers are restricted in the ability to pick their own speeds.
D	Approaching restricted flow. Drivers have little discretion to pick their own speeds.
E	Unstable flow; there may be short stoppages.
F	Unacceptable congestion; stop & go; forced flow.

Source: FHWA,""Flexibility in Highway Design" (2012); adapted from: AASHTO, "A Policy on Geometric Design of Highways and Streets," 6th Edition, (2011)

Strategies and Actions

STRATEGY CC 1.1: Commission and prepare sub-area traffic models for developing areas.

Initiatives and Actions *(Cross reference: Strategy MTP 3, page 2.36)*

1. *Utilize traffic analysis zone information, assumed land uses, estimated population, basic/non-basic/service employment projections, and other similar data sets to model estimated sub-area traffic volumes and highway levels of service.*

2. *Utilize modeling data to determine build-out potential of sub-areas within the municipal boundaries and ETJ.*

3. *Adopt an "adequate public facilities" ordinance for modeled sub-areas that caps development until necessary capacity improvements are made by the City or private parties.*

STRATEGY CC 1.2: Base the preparation of traffic impact analyses on proposed land uses, density, and intensities rather than site acreage.

Initiatives and Actions

1. *Modify Chapter 25, Subdivisions, of Rosenberg City Code (and other associated development regulations) to establish thresholds, based on potential vehicle trips generated, under which the preparation of a traffic impact analysis will be required by the City.*

2. *Utilize traffic impact analysis results to determine not only the type and location of streets which must be constructed to accommodate the proposed development, but also other site improvements such as number and location of driveways, turn lanes, etc.*

3. *Extend traffic impact analysis requirements from subdivisions to individual development plats. Include development provisions that allow the City to deny or delay building permits or certificates of occupancy, if an individual development plat or site plan does not conform to land use, intensity, or density declarations incorporated into previously approved traffic impact analyses.*

Street Network Condition

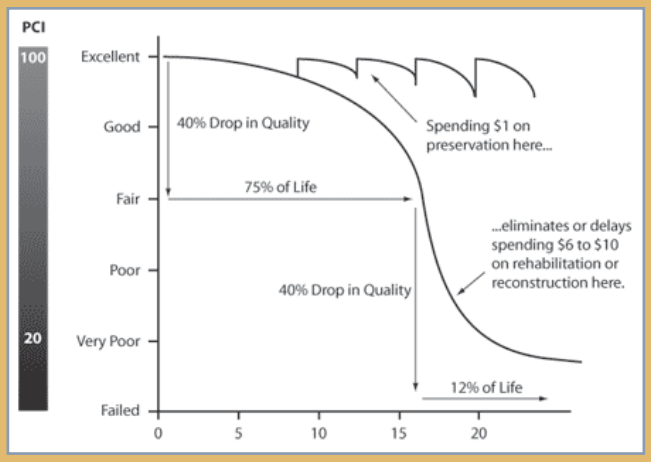
General Street Maintenance

The Rosenberg Public Works Department is responsible for the daily maintenance of the City-owned street network. The daily activities of the Department include activities such as: filling potholes, sealing cracks in street surfaces, clearing storm drains, fixing utility cuts in streets, maintaining curb and gutter sections, repairing sidewalks, maintaining right-of-way planting strips, and more.

Pavement Preservation (Condition)

Rosenberg's 2015 fiscal year annual budget allocated a total of 832,000 dollars for street overlay and crack sealing activities - a major increase from prior budget years. The ***Pavement Conditions Index*** (below) illustrates that over a 25-year life cycle, the paved surface of a typical street section will lose only 40 percent of its integrity over the first 75 percent of its life span – followed by a precipitous drop in structural integrity over the next 5 to 10 years. The message: save money by repairing early. Recent City Council expenditures for the Public Works Department's pavement preservation program illustrates an understanding of the need to sufficiently maintain street surfaces.

HOW EXPENSIVE IS IT TO PAVE A STREET?



Source: FHWA, "Pavement Preservation Compendium II" (2011)

Signalization and Signage

The Rosenberg Public Works Department is responsible for the maintenance of traffic signals and pedestrian signals within the municipal limits, as well as the maintenance of street signage and street lights. As of the 2015 fiscal year, Rosenberg allocated roughly 435,000 dollars toward the Department's maintenance responsibilities.

Most signalized street intersections in Rosenberg are associated with TxDOT-owned and maintained thoroughfares and are located within the State's public street right-of-way. Maintenance responsibility for traffic lights and pedestrian signals on state owned and maintained thoroughfares will be transferred to the city of Rosenberg once the City meets the 50,000 person threshold. The City should take steps now to coordinate with TxDOT on how such a transfer of responsibility will be funded, implemented, and administered.

Bridges

Maintenance of bridge and drainage structures in the City is largely funded through the TxDOT-administered Highway Bridge Program (HBP) - with a 10 percent local match. The City of Rosenberg will continue to utilize this program for the majority of bridge maintenance activities and focus local expenditures on maintaining drainageways and storm water facilities.

Strategies and Actions

STRATEGY CC 1.3: Adjust street network maintenance expenditures in anticipation of increased mileage and the transfer of maintenance responsibilities from TxDOT.

Initiatives and Actions *(Cross reference: Strategy MTP.3, page 2.36)*

1. *Maintain FY2015 budget levels for pavement preservation activities on City-maintained streets. Base subsequent adjustments in funding on a 15 year pavement preservation plan developed by the Public Works Department.*

2. *Begin coordinating with TxDOT to determine future City costs of maintaining traffic signalization and signage on TxDOT roadways when obligated due to meeting a 50,000 resident threshold.*

Traffic Management

Access Management

Traffic volumes are not the sole determinant of the capacity of a community's major thoroughfares. Thoroughfare level of service is affected by a range of factors that can be greatly impacted by minor adjustments to local land development regulations and operational policies. A few examples of these diverse traffic management factors include:

- *Number of access points (streets and driveways)*
- *Impedance of traffic flow by vehicles entering and exiting properties*
- *Number of intersections*
- *Lane width*
- *Synchronization of traffic control devices*
- *Allowances for deceleration and/or acceleration at ingress/egress points*
- *Presence/absence of a center turn lane/median*

Rosenberg's current development codes provide the City with only a limited range of tools to manage motor vehicle access to and from public street rights-of-way. Although there exist minimum lot width requirements in Section 25-67, *Lots, tracts, reserves*, of the *Rosenberg Subdivision Regulations*, the standards - based solely

on minimum lot width and spacing from intersections - are inflexible and can inhibit redevelopment potential in areas of older development near downtown. Rosenberg access management standards can be enhanced through the incorporation of variable driveway and intersection spacing requirements, cross-access and shared access requirements, and driveway throat lengths.

Likewise, Chapter 25, *Subdivisions*, of City Code allows a major thoroughfare (arterial) street cross-section that lacks a central median to manage access (yet in contrast, provides for a 51 foot wide pavement cross-section that is insufficient to serve as a center turn lane). In actual practice most new 4-lane major thoroughfares built in Rosenberg or the City's ETJ over the last several years have included central traffic control medians (referred to as a "boulevard" in the City subdivision regulations). Promulgation of a boulevard street type will benefit the City in the long-term by controlling access to adjacent property and maintaining higher levels of service on Rosenberg's streets.

Interconnectivity

Poor transportation connectivity can degrade the overall efficiency of the transportation network as the majority of trips are funneled to a few corridors. With expected growth of the Houston metropolitan area within and around Rosenberg, demand for new residential development will most likely be combined with proposals to develop more contemporary patterns of street development, one which could decrease the City's street connectivity over time, and over time make it more difficult to travel in and around Rosenberg.

Future transportation system effectiveness necessitates continued commitment to requiring multiple routes of travel to move traffic to and from destinations. Otherwise, traffic congestion will increase and will increasingly push additional traffic through neighborhoods. Increased connectivity must be balanced with resource protection and neighborhood concerns. Although Rosenberg's current subdivision regulations infer that the City may require the extension of existing streets to adjacent property, more specific language regarding street extensions may be necessary. Furthermore, the City's current provision on street interconnectivity (*Rosenberg Subdivision Regulations*, Section 25-61(n), *Point of access*) applies only to subdivisions. The City also has no tool whereby future thoroughfares may be extended across large parcels subject to pending commercial or multi-family residential development. Within subdivisions that currently require only a single street access, provisions should require a minimum number of street stubs to adjacent undeveloped property, and the corresponding development and classification of the projecting street as a "neighborhood" collector. These streets should be designed to carry higher traffic volumes while still allowing access to adjacent residential properties. Finally, the City's permissive standards regarding cul-de-sacs must be modified to disallow the excess use of cul-de-sacs, and cul-de-sacs that exceed 600 feet in length. The proliferation of excessively long cul-de-sacs not only funnels traffic to increasingly high volume thoroughfares (at points lacking signalized intersections) but also blocks potential long-term major thoroughfare routes. Cul-de-sacs that exceed a 600 feet might still be permitted, but only in instances where street stubs - spaced at established intervals can project to adjacent undeveloped properties.

Modifications to all of the standards referenced in this subsection must be made in order to ensure that rights-of-way illustrated on the *Major Thoroughfare Map* can be reserved as new development occurs, and that the City develops an overall system of interconnected streets.

Stehle Road extends roughly three quarters of a mile, funneling traffic to a single access point, and inhibiting the future extension of major thoroughfares intended to provide regional interconnectivity. Although cul-de-sac development patterns should be discouraged, future cul-de-sacs may be permitted if intermediate street projections are provided to adjacent undeveloped parcels. *Source: Kendig Keast Collaborative*

Traffic calming features on Sally Anne Drive (above left) are designed to slow traffic in an inexpensive manner. Speed cushions are not typically utilized to reduce traffic volumes. The neighborhood traffic circle and curb extensions (above right) have been applied to lower average speeds on a collector street while providing a lane of parking. *Source: City of Rosenberg & Kendig Keast Collaborative*

Traffic Calming

There exist several techniques to slow or reduce vehicular traffic in areas where the street network is intended to balance vehicular mobility with other activities. Traffic calming measures can be employed in a variety of overt or subtle forms including changes in paving materials, curb extensions, elevated pedestrian crossings, medians, on-street parking, speed tables, traffic circles, marked gateways, and more. Ultimately however, each traffic calming feature has a specific purpose. Some are meant to slow vehicles, while others are intended to reduce overall traffic volume. The common intent is to improve safety for all roadway users.

The most obvious use of traffic calming features in Rosenberg are the temporary speed cushions which were installed on Sally Anne Drive. This particular type of traffic calming measure is designed to control motor vehicle speed, but was employed in an area that is also experiencing a significant amount of cut-through traffic. The installation of temporary speed cushions on Sally Anne Drive in 2014 reflected the City's desire to prioritize affordability. City data indicates that the three features cost roughly 7,500 dollars (installed using City labor).

The Timber Lane traffic calming installation was not selected in accordance with a City-commissioned study or program which may have identified an alternative engineered traffic calming solution that might garner greater public support. A more formalized process in selecting and implementing traffic calming solutions on existing City streets should be employed in the future.

Parking

Areas of designated on-street parking – those parking spaces that are defined by pavement markings and/or curb extensions – are primarily confined to downtown Rosenberg and local streets. Chapter 28, *Traffic and Vehicles*, Article II, *Specific Street and Alley Regulations*, does not directly prohibit on-street parking on Rosenberg's major thoroughfares (arterial streets) and collector streets; but, the code includes a list of street segments where on-street parking is prohibited (which largely corresponds to the City's arterial and collector street system).

Conclusions

The *Rosenberg 2035 Major Thoroughfare Program* (pages 2.23 through 2.36) promotes the extension of an interconnected street grid throughout the City's current municipal boundaries and extraterritorial jurisdiction. A system that allows for multiple routes of traffic dispersal will extend the carrying capacity, and preserve or enhance the level of service, of the City's street network. To ensure that interconnectivity does not generate concerns about increased traffic volumes or speeds on existing thoroughfares, the *Major Thoroughfare Program* promotes the concept of "urban streets" in certain areas of the City. Since the premise of urban streets is to promote property access and the activities of multiple user groups over vehicular mobility, urban streets should gradually be converted by incorporating subtle traffic calming design features including but not limited to:

- *Narrower street widths;*
- *Reduced curb radii;*
- *Curb extensions; and,*
- *On-street parking.*

Ultimately the application of traffic calming measures as part of street design should be an integral part of the

built environment in any area that Rosenberg intends to promote pedestrian activity - such as in downtown or in close proximity to schools and parks.

The *Major Thoroughfare Program* also recommends the development of alternative arterial and collector street segments where on-street parking should be permitted in order to aid in neighborhood traffic calming and encouraging pedestrian activity.

Strategies and Actions

STRATEGY CC 1.4: Adopt comprehensive access management provisions.

Initiatives and Actions

1. *Adopt an access management ordinance that provides requirements for driveway spacing, driveway design, and common access to development parcels.*

2. *Calibrate access management requirements to ensure that spacing requirements do not prohibit the redevelopment of individual lots or other tracts on collector and major thoroughfare (arterial) streets that bisect older residential areas. Modify minimum lot frontage requirements on collector and major thoroughfare (arterial) streets accordingly.*

3. *Modify major thoroughfare (arterial) street requirements to require divided medians in all instances.*

STRATEGY CC 1.5: Adopt development provisions requiring street interconnectivity.

Initiatives and Actions

1. *While not banning cul-de-sacs, develop an interconnectivity index that requires a minimum degree of local street connections within residential subdivisions, and to adjacent properties.*

2. *Alter cul-de-sac requirements to limit lengths, and/or to require street stubs to adjacent property for cul-de-sacs that exceed a set distance.*

3. *Require large-scale non-residential development to comply with the spacing requirements of the Major Thoroughfare Plan even if not otherwise proposing to subdivide the parent tract. Compliance may be in the form of street right-of-way reservation or cross-access easement alignments of corresponding widths, and the placement and location of buildings to conform with setbacks that would apply at the time the thoroughfare was constructed.*

4. *Revise the Rosenberg Subdivision Regulations to include provisions to maximize thoroughfare connectivity for all new subdivisions and road construction projects.*

STRATEGY CC 1.6: Create and implement a neighborhood traffic calming program.

Initiatives and Actions

1. *Develop a list of traffic calming features that the City may find suitable for incorporation on neighborhood streets.*

2. *Establish a process by which petitions for neighborhood traffic calming may be considered by the City.*

3. *Determine the method by which the City will review traffic calming petitions and propose case-specific solutions.*

4. *Develop categories of approval (e.g. property owner vote, City staff approval, City Council action) for preferred traffic calming measures on a case-by-case basis.*

5. *Consider method(s) by which the use of a neighborhood traffic calming program may be funded, in full or part, by petitioning property owners or residents. Funding assistance by petitioners may occur in the form of a direct fee, a deferred assessment through a public improvement district (LGC Section 372.001, et. seq.), or other similar mechanism.*

6. *Amend the Capital Improvement Program (CIP) to commit annual funds for neighborhood traffic calming initiatives.*

STRATEGY CC 1.7: Retrofit urban street segments through the incorporation of traffic calming features.

Initiatives and Actions

1. *Identify collector and local street segments where average motor vehicle speeds significantly exceed the posted speed limit. Prioritize locations in close proximity to downtown, schools, or parks.*

2. *Determine if candidate street segments currently support – or have the potential to support – on-street parking or higher levels of pedestrian activity.*

3. *Amend the Capital Improvement Program (CIP) to commit annual funds for an urban street conversion initiative. Commitment can be for as little as a single block of City street (up to 400 linear feet).*

4. *Retrofit selected street segments through the incorporation of traffic calming features designed to slow traffic speeds (e.g. lane narrowing and re striping, curb extensions, chicanes, medians, etc.)*

Streetscapes

Medians and Landscaping

Medians, planting strips, and other similar features incorporated into the right-of-way not only improve the aesthetics of public streets, they also assist in the management of traffic flow and separation of motor vehicles from pedestrians and bicyclists. Chapter 25, *Subdivisions*, of City Code includes a major thoroughfare (arterial) street standard that incorporates a 15 foot center median (referred to as a "boulevard" in the regulations. The City's regulations do not specify that the median must be landscaped, and where medians have been constructed landscape materials exceeding grass cover are only found in medians that were subject to development agreements.

Rosenberg has also adopted the development guidelines of the West Fort Bend Management District in order to enhance building and site design on properties adjacent to many of the city's major thoroughfares. Application of the standards is inconsistent however, as much of Highway 90 and Highway 36 within the center-city portions of Rosenberg are not subject to the standards. The public opinion has certainly influenced the City's decision not to apply the Management District's guidelines to these key center-city corridors, the guidelines would require substantial modification to be properly applied to an "urban" type of built environment with smaller lots and buildings positioned close to the street.

The Management District design guidelines also include basic parking lot landscaping requirements and tree preservation standards. Current provisions limit the type of trees and vegetative material that may be planted on properties subject to the design guidelines, and do not apply to - nor permit - plantings within the public right-of-way.

Low impact development options can provide landscaping options in constrained spaces while assisting in storm water retention *Source: Kendig Keast Collaborative*

Trees provide more than just a decorative element in a streetscape. In addition to softening an otherwise hard urban environment, trees increase storm water retention, provide a defense against the "urban heat island effect," and protect residents from harsh summer conditions. Trees and plantings improve air quality by producing oxygen and removing carbon dioxide and particulate matter. For example, 13 mature trees remove the particulate matter generated by a car driven 12,000 miles a year.

When selecting street tree species for Rosenberg's roadways it is important to select species that are drought-tolerant, have minimal die-back in winter, maintain an upright branching pattern, and do not drop seed pods that can damage automobiles. Furthermore, City right-of-way landscaping standards could be developed that would allow planting strips or tree wells in the public right-of-way designed to mitigate storm water runoff through the use of low-impact development techniques.

Strategies and Actions

STRATEGY CC 1.8: Incorporate minimum landscaping requirements for public rights-of-way into the City's development regulations.

Initiatives and Actions

1. *Modify major thoroughfare (arterial) street requirements to require divided medians in all instances.*

2. *Amend Chapter 24, Streets, Sidewalks, and Other Public Places, of City Code to include street tree planting requirements for new development. Include standards for the establishment and maintenance of street trees within landscaped medians. Develop a list of acceptable street tree species. Amend Chapter 25, Subdivisions, in a complimentary manner.*

3. *Update the West Fort Bend Management District design guidelines to adhere to building and site design objectives developed through the City's 2015 Livable Centers Initiative (or subsequent downtown planning study). Apply modified design guidelines to downtown segments of US Highway 36 and US Highway 90.*

4. *Establish a line item to fund the planting of street trees in City owned and maintained medians, and re-establish the City's annual tree trimming program.*

CC 2: ACTIVE TRANSPORTATION

Active transportation is a term used to describe non-motorized methods of travel - principally in the form of bicycling or walking. Communities that support the development of multi-modal transportation networks systematically invest in a variety of active transportation facilities such as sidewalks and walkways, bicycle paths and lanes, and multi-use trails. Active transportation facility investment offers numerous benefits to a community, most notably:

- *The encouragement of healthy physical activity;*
- *The improvement of air quality by reducing carbon emissions;*
- *The provision of transportation options for user groups in the community that lack the mobility afforded by a personal motor vehicle; and,*
- *Long-term attractiveness to investment by developing community-wide linkages, accessibility, and recreational amenities.*

New attention has recently been focused on Rosenberg's active transportation network by the Mayor and City Council - as witnessed by the recent allocation of capital improvements funding to sidewalk construction and repair. A local emphasis on the enhancement of a community's pedestrian network typically precedes bicycle network investments because the separated nature of sidewalks and walkways from motor vehicle traffic is perceived as safer and more affordable. Bicycle facility investment is viewed in many low-density rural and suburban communities as an expensive luxury which serves only recreational purposes.

Regardless of one's personal perceptions on the utility of investing in pedestrian and bicycle active transportation facilities, there exist many affordable methods by which Rosenberg can gradually accommodate the needs of both user groups over the Rosenberg 2035 planning period.

ACTIVE TRANSPORTATION USER GROUPS

FIGURE 2.5: DRIVING AGE GROUPS

Over 27.3 percent of Rosenberg's population is under the age of 16 and, by law, not yet able to operate motor vehicles. In addition, 9.5 percent of the population are aged 65 or older and are more likely to rely on transportation methods that do not require them to drive. *Source: U.S. Census Bureau, 2010 Census Summary File 1 (QT-P1).*

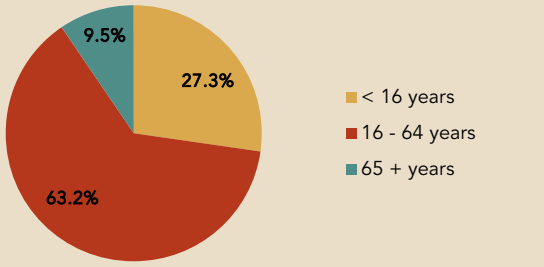


FIGURE 2.6: METHODS OF TRANSPORTATION TO WORK

Of the approximate 13,1992 workers in Rosenberg aged 16 or older, the majority (83.6%) commute to work by driving their personal vehicles. The remaining 17.4 percent must use alternative methods to get to work, including carpooling, public transportation, walking, bicycling, or by taxi. *Source: U.S. Census Bureau, 2008-2012 ACS 5-Year Estimates (B08141).*

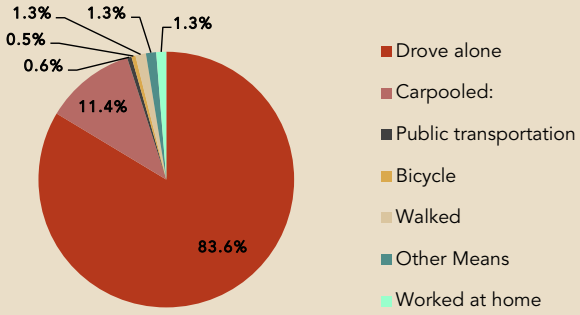
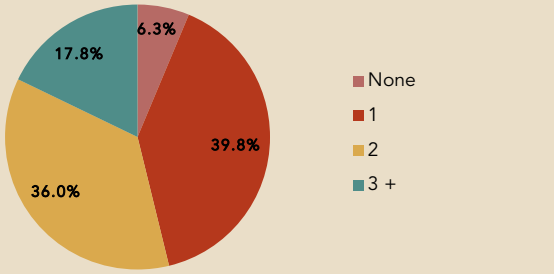


FIGURE 2.7: VEHICLE AVAILABILITY PER HOUSEHOLD

Just over half (53.8%) of all households in Rosenberg have access to two or more operating vehicles available. Only 39.8 percent have one vehicle for use, and 6.3 percent don't have a vehicle at all. *Source: U.S. Census Bureau, 2008-2012 ACS 5-Year Estimates (B08201).*



PLANS, GUIDES, & REGULATIONS

The following resources are integral to understanding Rosenberg's current active transportation capacity, and previously defined priorities:

Local:

- *Rosenberg Parks and Recreation Master Plan*
- *Rosenberg Sidewalk Plan*
- *Rosenberg 2010 Transit & Pedestrian Study*
- *City of Rosenberg, FY2015 Capital Improvement Projects*
- *City of Rosenberg Code of Ordinances*
- *Rosenberg Design Standards*

Regional:

- *H-GAC Regional Bikeway Map*
- *H-GAC 2040 Regional Pedestrian and Bicycle Plan*
- *Fort Bend Subregional Plan*
- *Brazos River Recreation Master Plan*

Active Transportation Network

Pedestrian Network

A community's pedestrian network includes all those facilities such as pedestrian walkways, cross-walks, signals, and signs associated with traveling safely around an area by foot. A comprehensive pedestrian network:

- *Improves mobility by providing connectivity between neighborhoods and major destinations and other transportation systems;*
- *Improves the safety of pedestrians and motorists alike; and,*
- *Invites increased pedestrian activity - whether for travel or recreation.*

Sidewalks

The most apparent component of a community's pedestrian network is the presence of paved sidewalks along a street right-of-way. At the end of 2014, roughly 20.5 miles of sidewalks existed along (on at least one side) Rosenberg's streets and thoroughfares. **Figure 2.8, *Rosenberg Sidewalk Plan***, illustrates the location of Rosenberg's existing sidewalks in an orange color. The mileage depicted is relatively limited compared to the 62.5 miles of streets with sidewalks (on at least one side) proposed in the *Rosenberg Sidewalk Plan*. Absent further network development, the City's existing sidewalks do not connect or allow for complete circulation between neighborhoods and destinations. Instead, sidewalks end abruptly, causing pedestrians to walk along the shoulder of the street or on private properties in between. Most of the major corridors within the City do not have sidewalks at all, and pose topographic or man-made challenges for developing safe pedestrian paths because of disruptions from open drainage ditches and multiple driveways approaches.

As reported by TxDOT, multiple vehicle accidents involving pedestrians have occurred in Rosenberg. Of all pedestrian accidents reported from 2010 to 2014, 77 percent occurred on roadways where there were no sidewalks present. **Figure 2.9, *Bicycle and Pedestrian Accident Locations*** (page 2.14), shows the location of all reported accidents between motor vehicles and pedestrians. The majority of accidents occurred along US 59, followed by US 90A - with 3 accidents specifically reported at the intersection of 90A and Radio Lane. In addition, just under half of motor vehicle/pedestrian accidents occurred at intersections. These findings suggest that Rosenberg has a definite need for additional sidewalks, and other pedestrian safety improvements focused at intersections.

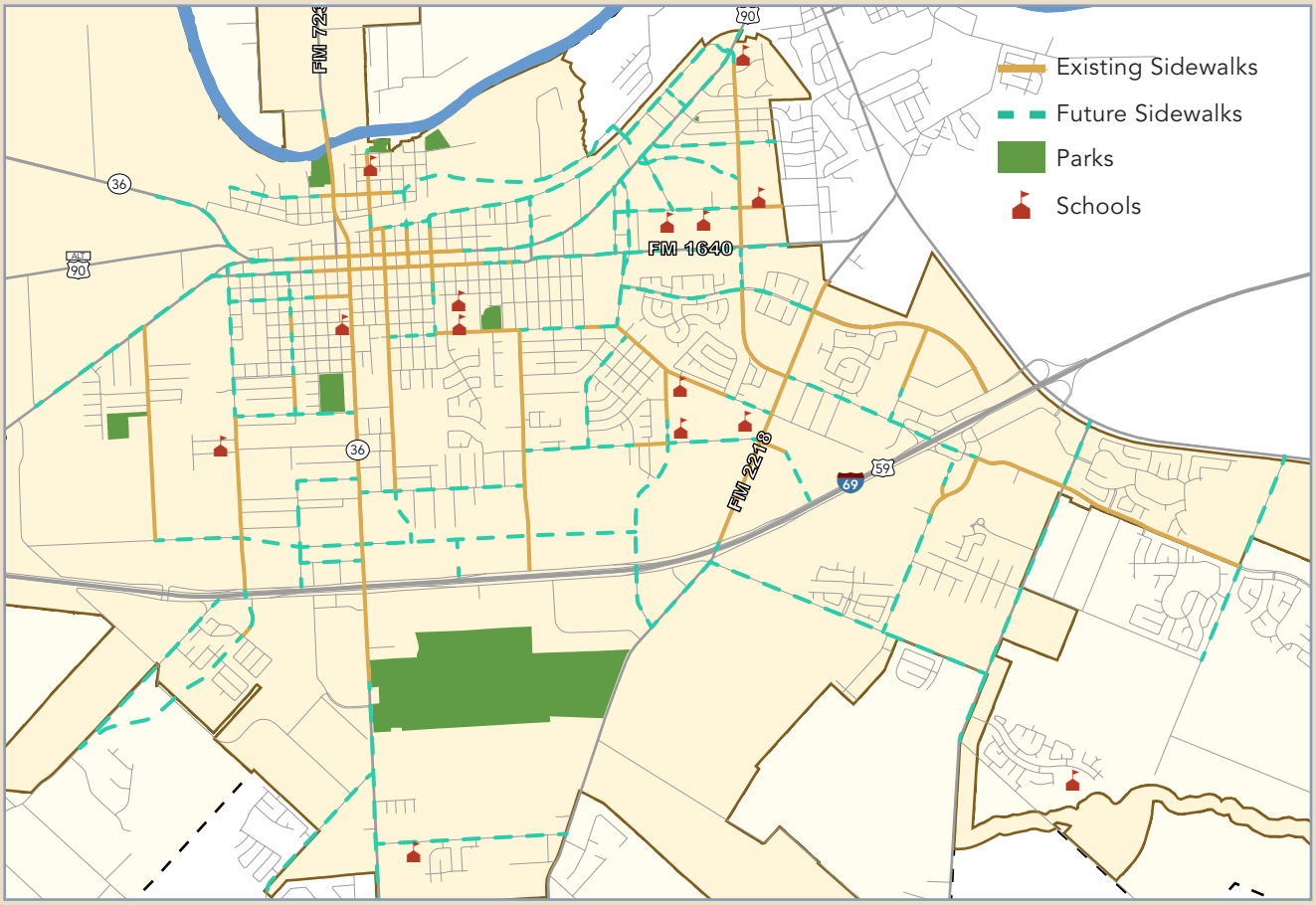
Walkways

Walkways refer to defined pedestrian pathways (not located within a public street right-of-way) that provide linkages between neighborhoods and other activity centers. Walkways are simply sidewalks that provide "short-cuts" between destinations by pedestrians and bicyclists (see "Off-Street Linkages" on page 2.15). Walkway connections are not a required component of Rosenberg's development regulations, but have been required by the City in the past on a case-by-case basis as part of new development. Further use of this simple tool during the development process can significantly increase non-motorized interconnectivity between two points, and reduce a tendency to view all trips in a community (even in suburban areas) as requiring the use of a car. Similar pedestrian facility requirements within a development site can improve linkages between the public sidewalk, parking areas, buildings, and out-parcels.

Current Regulations

Chapter 6, *Buildings and Building Regulations*, Section 6-470 requires sidewalks for all residential and non-residential construction or reconstruction, except along existing local/residential streets where no other sidewalk exists, or along US 59 or its frontage roads. Sidewalks must be constructed on at least one side of all major thoroughfares and collector streets as designated in the *Rosenberg Sidewalk Plan*, and constructed on both sides of any local or residential streets. Section 25-66 of Chapter 25, *Subdivisions*, requires sidewalks for all new subdivisions, and

FIGURE 2.8: ROSENBERG SIDEWALK PLAN



Recommended sidewalk extensions in the Rosenberg Sidewalk Plan (above) omit a significant portion of the City's major thoroughfares (arterial streets) and collector streets. Required sidewalk extensions should be tied to new development along all major streets. "Fees-in-lieu" options could be provided for property owners with frontage on a street not prioritized by the City's Sidewalk Plan.

Section 25-117 requires all subdivision developers to dedicate "sufficient and suitable" lands for the purpose of parkland or contribute cash in lieu. Parkland dedications conveyed to the city must be improved with a sidewalk or trail installed through the park and/or along all street frontage of the park. Unlike the City's building regulations, Rosenberg's subdivision regulations do not require a developer to construct sidewalk segments along existing highway frontage.

In support of the City's Codes, the *Rosenberg Design Standards* also lay out simple regulations for sidewalk design. On local residential streets, sidewalks must be four feet in width on each side of the street. Where required on collectors and major thoroughfares, sidewalks must be five feet in width. Sidewalks in an esplanade must be a minimum of six feet in width with six inches of concrete. In addition, wheelchair ramps are required at all intersections.

Bicycle Network

As with a community's pedestrian network, a comprehensive network of bicycle facilities may include a variety of components such as: roadway markings, dedicated lanes, trails, and destination facilities purposed for riding a bicycle. While pedestrian facility networks are usually developed in a consistent manner across most communities, bicycle facility networks can take a variety of built forms - reflecting widely divergent views among cities and towns regarding the desirability of providing for bicycle transportation or recreation. Basic bicycle facility options are introduced on page 2.16, and include suggestions for the type of improvements that may be good "first steps" to developing a bicycle network in Rosenberg, and in other communities without a substantial history of promoting bicycle use.

The Rosenberg Code of Ordinances prohibits riding

FIGURE 2.9: BICYCLE AND PEDESTRIAN ACCIDENT LOCATIONS

Figure 2.H illustrates the location of motor vehicle/bicycle and motor vehicle/pedestrian accidents between 2010 and 2014. Sidewalk conversions to side trails on Highway 36 may aid bicyclist safety, while pedestrians may be aided by better cross-walk facilities.

bicycles on sidewalks, but there is currently no type of bicycle system existing in Rosenberg or development provisions to accommodate their use. This forces current bicyclists to ride their bikes alongside traffic in streets or on the shoulders where available. From 2010 to 2014, there were a total of 12 vehicle accidents involving bicyclists – five of which were not intersection related and seven that were either at an intersection or related to intersection activity. **Figure 2.9, *Bike and Pedestrian Accident Locations***, shows the location of all motor vehicle accidents involving bicyclists. Most accidents occurred along segments of Rosenberg streets where sidewalks are provided. Such a pattern is not unusual given the mixed signals that bicyclists receive regarding where to operate their vehicles within the public right-of-way. Local law disallows riding bicycles on sidewalks, yet sufficient bicycle facilities are rarely provided on the street. Regardless, the location of motor vehicle/bicycle accidents should act a starting point for determining bicycle facility priorities.

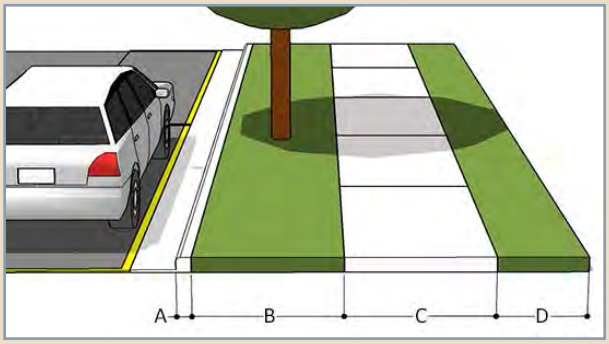
Combined Facilities

Combined or "integrated" active transportation facilities are pathways that share uses amongst pedestrians and bicyclists alike, and that provide both transportation and recreational opportunities. Facilities include multi-use trails, side trails (multi-use trails parallel to streets), and associated trail heads and connections. Each of these integrated facilities is discussed in detail on page 2.17 (see "Integrated Active Transportation"). There are no existing multi-use trails or side trails in the City of Rosenberg, but there are several candidate locations identified in the *2010 Rosenberg Transit & Pedestrian Study* where these facilities could be introduced - including along creeks, bayous, and utility easements.

Precedent Plans

As listed on page 2.12, there exist a number of plans that address aspects of active transportation in Rosenberg. Some pre-existing planning documents address local bicycle or pedestrian needs through a limited scope. Others view bicycle and pedestrian needs from a regional perspective - making recommendations that may link Rosenberg to other communities, but not providing for interconnectivity within the City. Many of these plans and studies were prepared by other organizations, and their results were not adopted as City policy.

SIDEWALK DESIGN BASICS



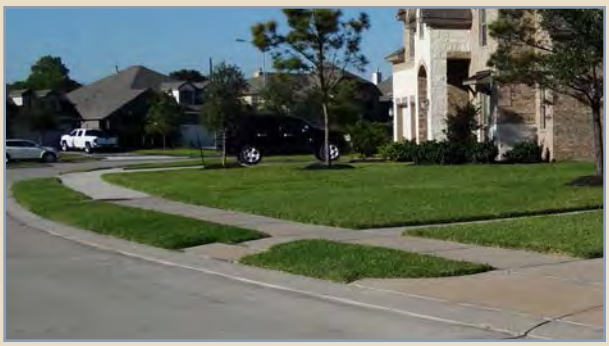
The proper placement of a sidewalk within a right-of-way will greatly impact the degree to which the facility is used. The following terms must be considered when determining the placement of sidewalks within a street right-of-way.

- **A: *Curb Zone:*** *The vertical separation of the pedestrian area from the roadway. Also serves as part of the drainage system.*
- **B: *Planter/Furniture Zone:*** *The horizontal separation between the curb and the sidewalk used to hold utilities and pedestrian amenities (benches, bus stops, etc.).*
- **C: *Pedestrian Zone:*** *Sidewalk area reserved for pedestrian movement.*
- **D: *Frontage Zone:*** *The area between the sidewalk and the property line.*

Standard Sidewalk Design ▶

Standard sidewalk sections serving residential and auto-oriented commercial areas are often clearly separated from the roadway with a continuous vegetative strip. FHWA recommends the following minimum sidewalk standards:

- ***Curb Zone:*** *6 in*
- ***Planter/Furniture Zone:*** *24 in (48 in if Planting trees)*
- ***Pedestrian Zone:*** *60 in*
- ***Frontage Zone:*** *12 in, but can be eliminated if located next to landscaping or lawn area*



◀ Urban Sidewalk Design

Sidewalks in downtowns and other urban contexts tend to provide substantial pavement widths to promote greater volumes of pedestrian activity. Often times planters replace continuous planting strips. FHWA recommends the following minimum standards for sidewalks in urban areas:

- ***Curb Zone:*** *6 in*
- ***Planter/Furniture Zone:*** *24 in (36 in if located next to on-street parking, 48 in if Planting trees)*
- ***Pedestrian Zone:*** *60 in*
- ***Frontage Zone:*** *30 in*

Source: Federal Highway Administration - Designing Sidewalks and Trails for Access; Photos: Kendig Keast Collaborative

OFF-STREET LINKAGES

The overall connectivity of the pedestrian network can be improved through requiring "walkways" (sidewalks not located parallel to a street) to connect to neighborhoods and activity centers through off-street linkages. Ideal walkway linkages are illustrated below.

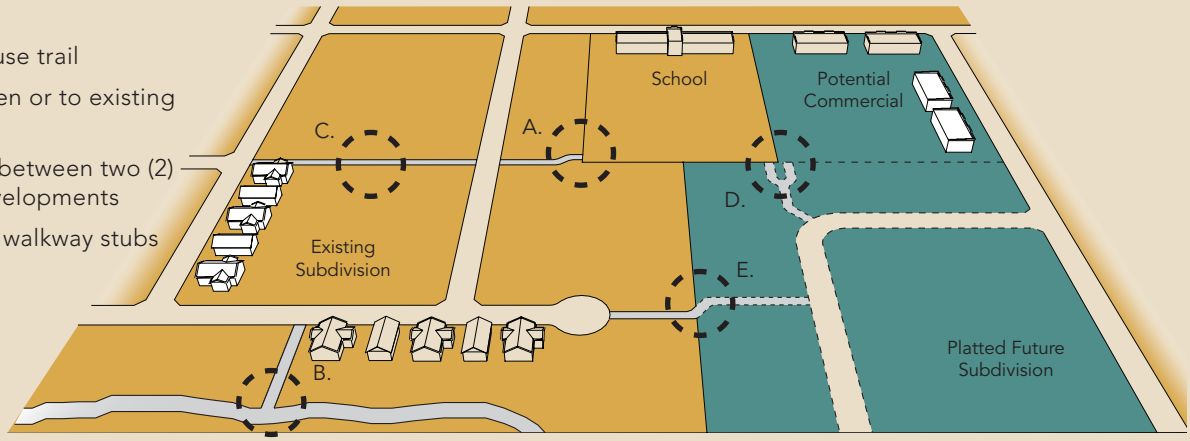
A. Walkway connections may be required to provide access to a public facility

B. Access a multi-use trail

C. Connect between or to existing or future streets

D. Provide access between two (2) or more future developments

E. Extend existing walkway stubs



BICYCLE FACILITY BASICS

Multiple bicycle facility options exist that reflect a community's level of comfort and means in promoting bicycle transportation. Each facility is meant to be used for a specific scenario, and not all those mentioned may be appropriate for use in Rosenberg. The options that are considered to be viable in Rosenberg are designated with a check (✓).

Sources: NACTO Urban Bikeway Design Guide and the USDOT Manual on Uniform Traffic Control Devices (MUTCD)

Types of Bicycle Routes

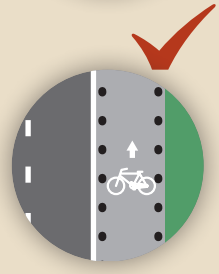
There are several ways to accommodate bicyclists within the street right-of-way, including the integration of shared roadways and bicycle lanes. These are several types used around the country today:

Shared Lanes

- *Visually alerts motor vehicles drivers to the possibility of bicyclists.*
- *Highlights a proper path for bicyclists through difficult situations.*
- *Requires no additional street space.*
- *Works best on low volume streets with speeds < 25 mph.*

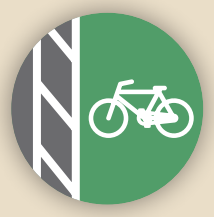
Conventional Bike Lanes

- *Increases predictability of bicyclist positioning by separating bicyclists from motor traffic.*
- *Great alternative for roadways with higher volumes and speeds of traffic.*
- *When parking lanes are present on a roadway, bike lane should run between motor vehicle lane and parking lanes.*



Side Paths & Shoulders

- *Bicycle paths separated from the roadway by a curb, landscaping, or grade change.*
- *Great option for roadways with high volumes of traffic and speeds where on-street options cannot be installed.*



Buffered Bike Lanes

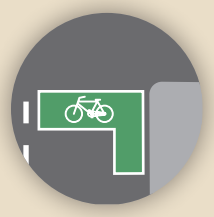
- *Buffer space of at least 18 in separates the bike lane from adjacent motor vehicle traffic.*
- *Creates greater distance between bicyclists and motor vehicles.*
- *Great alternative for high volume streets with speeds > 35 mph.*

Intersection Controls

To reduce conflict between bicyclists and motor vehicles at intersections, several treatments can be used to facilitate eye contact and awareness between the different modes of transportation. These are some methods to be considered:

Intersection Crossing Markings

- *Markings on the pavement show the proposed path of bicycle traffic through the intersection.*
- *Increases visibility and predictability by guiding bicyclists through intersections in a direct path.*
- *Reduces conflict between bicyclists and turning motorists.*



Bike Boxes

- *Increases visibility of bicyclists turning left.*
- *Allows all bicyclists to clear intersections more rapidly, thus minimizing delay to motorists.*

Destination Facilities

Bicycle parking is a commonly overlooked aspect of bicycle facilities. When cyclists reach their destination, they will need some type of safe and secure area specifically designated for bicycle parking. When designing parking facilities, the following general rules should be considered:

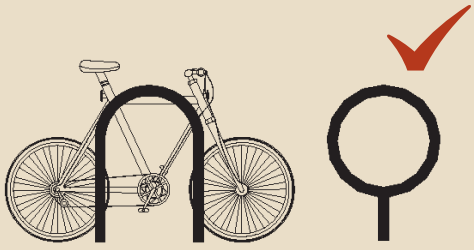
- *Parking areas should be covered to protect cyclists and their bicycles from the weather.*
- *Parking areas should be well lit.*
- *Parking areas should be in plain site and out of motorist and pedestrian ways.*

Bicycle Racks

These are fixed metal structures to which bicycles are securely locked in place. At minimum, bicycle racks should be located outside the entrance of all schools, commercial buildings, and recreational areas.

Bicycle Lockers

These are commercialized parking containers used to store bicycles in commercial areas, usually for a small fee.



The Association of Pedestrian and Bicycle Professionals (APBP) recommends that bike racks be designed to support the bicycle frame in two places. APBP also recommends dimensional standards for bike spaces, and the separation of individual bike racks.

Signage and Markings

All bike routes should contain the basic required signage and pavement markings. Here are a few additional methods used to help determine the location of bike lanes and provide way-finding.

Designation Markings

- *Markings must contain "Bicycle Lane" verbiage and/or a bicycle symbol with arrows pointing in the direction of the flow of traffic.*
- *Markings must be placed at the beginning of bike lanes, at all major changes in direction, at the far side of bike path crossings, and at every 1/2 mile interval.*

Colored Bike Facilities

- *Pavement within bike lanes and other bike facilities is color-coded, usually bright green, to increase visibility.*
- *This is a great way to make bicycle cross sections stand out to motor vehicles in an intersection.*

Way-finding Signage System

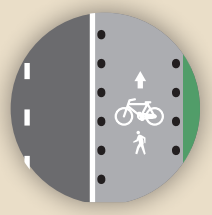
- *Used to guide bicyclists to destinations along bicycle routes.*
- *Signs are usually placed at the decision points along routes just before intersections and key locations.*

INTEGRATED ACTIVE TRANSPORTATION

Multi-use trails and side trails integrate pedestrian and bicycle activity into a single facility while serving both recreational and transportation needs.

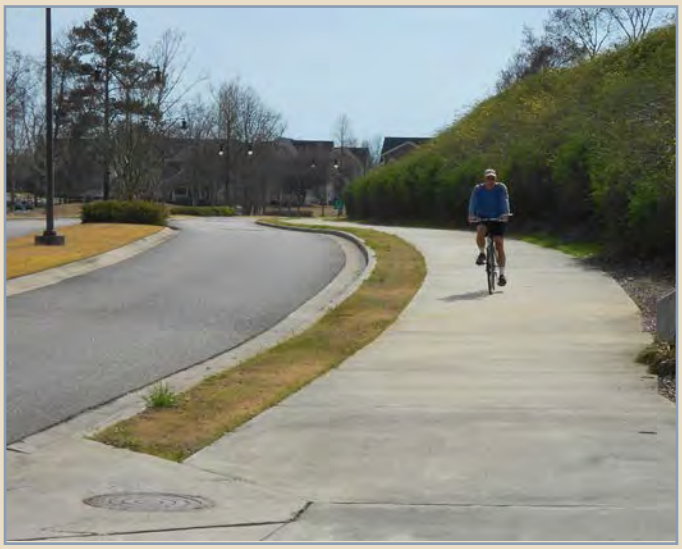
Multi-Use Trails ▶

- *Accommodate a range of users, including pedestrians, bicyclists, and other non-motorized means of transportation.*
- *Paths run through a greenways or alongside a road.*
- *Provide transportation routes exclusive of automobiles, and may provide "short-cuts" to activity centers.*
- *Can be paved or unpaved. Generally 8' – 16' wide.*



Side Trails (Side Paths) ▶

- *Accommodate a range of users, including pedestrians, bicyclists, and other non-motorized means of transportation.*
- *Path runs parallel to a street or road, and is separated from the roadway by a grassy landscaped buffer, a curb, or both.*
- *Usually paved.*
- *Dimensions similar to standard multi-use trails.*



Multi-use trails are commonly constructed in greenway corridors (top right) with the principal intention of providing citizens with recreational opportunities. When placed within the street right-of-way however, side trails provide more apparent transportation benefits to bicyclists (bottom right) - particularly in communities that prefer to reduce bicycle use within travel lanes that are shared with drivers.

The ***Rosenberg 2010 Transit & Pedestrian Study*** recommends the following priorities:

- *Sidewalk improvements near transit routes;*
- *A shared use path network that increases connectivity and recreation opportunities;*
- *Addressing connectivity and safety issues throughout the City; and,*
- *Implementing way-finding improvements to support the bicycle and pedestrian system.*

Other active transportation policy recommendations contained in *Rosenberg 2035* have been derived from the following regional documents:

H-GAC's Regional Bikeway Map identifies the existing, proposed, and needed bike ways in the entire H-GAC region. In the vicinity of Rosenberg this map illustrates no existing or proposed bikeways. Bikeway needs have however, been identified along FM 723 and FM 762 near the edges of the Rosenberg municipal limits.

The Fort Bend Subregional Plan discusses comprehensive subregional initiatives throughout the Fort Bend region. The mobility section of the plan proposes a regional trail system across Fort Bend County in which three trails would intersect the City of Rosenberg:

- *FM 2759/FM 762 from the Brazos River to Richmond (15 miles)*
- *Rabbs Bayou from FM 762 to the Brazos River (10 miles)*
- *US 90A from downtown Richmond to downtown Rosenberg (3.7 miles)*

Strategies and Actions

STRATEGY CC 2.1: Promote connectivity within Rosenberg through enhancing the active transportation network.

Initiatives and Actions

1. *As recommended by the Rosenberg Transit & Pedestrian Study, develop a Comprehensive Pedestrian and Bicycle Plan for the City. The plan should include on-street facilities and off-street facilities - including a trails and greenways network.*
2. *Coordinate with adjacent and regional jurisdictions to promote regional connectivity.*
3. *Modify the purpose of the Rosenberg Sidewalk Plan. Rather than illustrating only those arterial and collector street segments where streets should be constructed, allow the plan map to represent street segments where sidewalk construction should be prioritized.*

STRATEGY CC 2.2: Amend development ordinances to incorporate additional active transportation provisions.

Initiatives and Actions

1. *Require sidewalks along all arterial and collector street segments. Allow for fee-in-lieu options where an arterial or collector street segment is not identified as a priority on the Rosenberg Sidewalk Plan.*
2. *Modify sidewalk requirements to 5' minimum on local streets, and 6' minimum on all other streets. Incorporate minimum planting strip requirements to separate the sidewalk from the back of curb.*
3. *Draft standards requiring walkway connections within and between development sites to improve interconnectivity. Amendments would be required in both Chapter 6, Building and Building Regulations; and, Chapter 25, Subdivisions, of City Code.*
4. *Adopt riparian zone regulations that declare a minimum distance from each bankside of all waterways as City right-of-way or easement. Ensure that easement language grants the City the right to provide public access.*
5. *Draft side trail and multi-use trail regulations and design standards, including the required reservation of multi-use trail easements where not located in a riparian zone.*
6. *Incorporate bicycle parking provisions into City development regulations.*

STRATEGY CC 2.3: Target funding sources to implement active transportation improvements.

Initiatives and Actions

1. *Develop provisions within the Rosenberg Code of Ordinances to allow a developer to pay a fee-in-lieu of sidewalk construction along existing road frontage in front of their development. The fee could be used to augment the City sidewalk fund to build sidewalks segments prioritized by the Rosenberg Sidewalk Plan.*
2. *Submit funding requests to include multi-use trail construction projects in the H-GAC Transportation Improvements Program (TIP). Focus on segments of "regional priority" based on the recommendations of the Fort Bend Subregional Plan.*
3. *Prioritize roadway construction requests in the H-GAC TIP on highway segments that incorporate side paths identified by a city-wide bicycle and pedestrian plan. If necessary, identify side trail construction as part of the City's local match.*
4. *Seek land acquisition and recreational trails grant funding offered through the Texas Wildlife and Parks Department.*

CC 3: PUBLIC TRANSPORTATION

Figure 2.6, ***Methods of Transportation to Work*** (page 2.11), illustrates that a significant majority of Rosenberg's residents commute to work by motor vehicle. Public transportation options have therefore remained limited to the City's population. Still, the snapshot provided by **Figure 2.F** is easily misleading. First, it only measures commuting patterns to and from work - not to school, shopping, recreation, or other business. The figure also does not consider the commuting methods of individuals that do not work such as the elderly, children, or the unemployed. Finally, over 11.4 percent of the population referenced in **Figure 2.F** does not drive to work alone, but commutes via carpool.

Ultimately, there also exists the typical "chicken or egg" riddle. Do so few workers ride public transit in Rosenberg because they have other choices; or, might public transit ridership increase noticeably if route and schedule options were increased?

Existing Public Transportation Options

Bus Systems

Fort Bend Demand-Response Service

Fort Bend County offers a shared bus ride service to citizens traveling to destinations within the County. This service allows residents to schedule a bus ride that picks them up at their residence and drives them to their destination for only $1.00 per person each way between 8:00 AM and 5:00 PM, Monday through Friday. Demand-response systems of this kind do not offer- as they are not designed to- predictable scheduling and routing which would entice business commuters. Rather, such services are often supported by federal programs that provide for special needs populations such as the elderly or handicapped.

Disability Transportation

New Freedom Transportation is a transportation service offered to residents of Fort Bend County with disabilities who live in rural areas. Similar to the County-operated demand-response service, this service offers shared rides to destinations within Fort Bend County for only $1.00 per person each way. Rides must be scheduled between 8:00 AM and 5:00 PM Monday through Friday.

Fort Bend Express - Commuter Park and Ride

Fort Bend County offers the Fort Bend Express commuter service that provides rides from one of three Fort Bend County Park and Ride stations to three different destinations located in Houston. The station in Rosenberg is located at the Fort Bend County Fairgrounds (4310 State Highway 36 South). Destinations from this station include the Texas Medical Center and the other Fort Bend County Park and Ride stations where you can transfer to buses serving Greenway Plaza and the Galleria in Houston. Rides are given Monday through Friday from Fort Bend County between 4:40 AM to 8:30 AM and return between 3:15 PM and 6:40 PM.

Ride-Sharing Programs

METRO STAR

METRO STAR is a regional program that offers ride matching services for van-pooling and carpooling in the greater Houston area. For van-pooling, this program also provides van-poolers with passenger vans equipped with insurance and roadside assistance, which are driven by one of the van-pool group members.

Park and Pool Lots

Two uncovered parking lots located on the north and south sides of US 59 along the east side of FM 762 have been provided by TxDOT for local residents to park their cars and share rides with other commuters. Each lot contains roughly 30 parking spaces for participants to park their vehicles free of charge. According to the *Rosenberg 2010 Transit and Pedestrian Study*, the number of cars parked at the two lots ranges from about 10 to 30 vehicles.

Future Options

Circulator Routes

Circulator routes are fixed bus routes that offer scheduled transit services between specific origins and destinations. In the *Rosenberg 2010 Transit and Pedestrian Study*, circulator route services were recommended to be initiated in Rosenberg by 2015. The *Fort Bend Sub-Regional Plan* also recommends developing a local circulator system through a partnership with Richmond to offer transportation to major destinations like Oak Bend Hospital, Brazos Town Center, and County Social Service facilities.

The Fort Bend County Public Transportation Department has recently partnered with the Rosenberg Economic Development Corporation, the Richmond Economic Development Corporation, and the George Foundation, to create a 3-point deviation transit route within Rosenberg and Richmond. Three buses will operate roughly 11 hours per day on a route and

schedule to be determined. Funding to initiate the service will cost roughly $461,120. There are currently no City capital improvements programmed to support development of the system.

Commuter Rail

Commuter rail is a high capacity passenger transport service provided by passenger trains usually operating on existing railroad tracks used by freight trains. This service is designed to serve those commuting from the outlying areas of a metropolitan area to major employment centers located within the metropolitan area.

The Houston-Galveston Area Council (H-GAC) has proposed a $650 million commuter rail project along US 90A from Houston to Rosenberg in the *2040 Regional Transportation Plan*. To plan for a future commuter rail service, the *Rosenberg Transit & Pedestrian Study* recommends the identification of a location for a future commuter rail station and/or transit-oriented development, and the preservation of the necessary land. A recent Livable Centers Initiative being conducted in downtown Rosenberg through funding by H-GAC has provided some conceptual ideas of how a downtown rail development may be configured.

Strategies and Actions

STRATEGY CC 3.1: Promote the development of a scheduled circular bus service in Rosenberg.

Initiatives and Actions

1. *Work with Fort Bend County, Richmond, and other partners to determine preferred routes for a scheduled circular bus system.*

2. *Subject to preferred route determinations, amend the City's street design standards to include construction specifications for bus turnouts.*

3. *Submit amendments to the H-GAC Transportation Improvement Plan to provide funding for system buses and other infrastructure.*

STRATEGY CC 3.2: Position the City to serve as a regional passenger rail terminal destination.

Initiatives and Actions

1. *Utilize the conceptual plans generated by the downtown Livable Centers Initiative to promote preferred locations of a downtown passenger rail station in subsequent rail feasibility studies.*

2. *Begin acquisition of property to serve as the location of a downtown rail station and supporting high density development.*

CC 4: INTERMODAL TRANSPORTATION

Rosenberg's downtown location - straddling two Class I rail lines - provides ample evidence of the City's long history as an important transfer point for the movement of goods in southeastern Texas. Today's rail and highway routes continue to place Rosenberg in an important geographic position to provide for the transfer of goods between regional rail, highway, and port facilities.

While the definition of "intermodal" may be applied to passenger transportation, its more common usage infers the movement of goods - as is the case within *Rosenberg 2035*.

When planning for intermodal transportation, a regional outlook is critical in order to best determine how the City's various internal transportation networks can be leveraged and modified to ensure that commerce passes through Rosenberg. By extension, the investment in transportation for the movement of goods **through** a community serves as a pretext for fixed site direct employment generators **within** the community.

Air

Rosenberg currently serves no direct role in air freight activities in metropolitan Houston. Houston Hobby (HOU) and George Bush International (IAH) both service air freight operations, along with the non-commercial Ellington Airport. Combined freight services out of the region's three air cargo accessible airports are a major link in the nation's air cargo network - and cumulatively served to rank the Houston metropolitan area as 16th in the nation for air cargo tonnage in 2009. Ninety-Eight (98) percent of the region's air cargo network is transported through IAH.

Throughout the metropolitan area there are also a number of general aviation facilities that do not offer air freight services. The closest of these facilities to Rosenberg is the Sugar Land Regional Airport.

Rail

The Houston metropolitan region is a major origination and termination point within the national rail network rather than a hub or transit point. It is a major production market for the bulk industry as well as a receiving market for industrial supplies and consumer goods because it is home to a large proportion of the nation's petrochemical business and one of America's largest urban populations.

FIGURE 2.10: INDUSTRIAL STREET STANDARDS

"Industrial streets" accommodate large volumes of truck and heavy vehicle traffic within and between areas of intensive manufacturing, mining, or warehousing. With an individual gross vehicle weights of up to 80,000 pounds, industrial traffic can rapidly deteriorate public streets. To mitigate accelerated deterioration, industrial streets may be constructed with wider lane widths, larger turning radii, and thicker/sturdier pavement composition. An example of potential industrial street standards is provided in the figure below.

STANDARD	URBAN STREETS		RURAL STREETS
Description	With Median/ Center Turn Lane	Without Median/ Center Turn Lane	All
Total Lanes and Lane Widths	4 at 13' each	4 Lanes, 2 at 12' & 2 at 13'	2 at 13' each
Center Turn Lane Width	18'	N/A	14'
Turning Radii	15' to 30'		

Source: City of Fort Worth (TX), Street Development Standards

The rail industry is not only critically important to the Houston region, but also specifically to the City of Rosenberg. There are six different rail lines that merge together in Rosenberg. Because of this regional location, the City of Rosenberg has a rather large volume of rail tonnage passing through its city. In 2007 it was estimated that about 105 million tons of rail passed through the municipality. Rail tonnage in the City of Rosenberg may also increase due to a proposed new rail line between the port of Freeport and Rosenberg being advocated by the Highway 36A Coalition. In addition, the Kansas City Southern Railway has recently begun development of a trans-loading facility in the Rosenberg ETJ along the north side of US 59 (Interstate 69) between Beasley and Kendleton.

Rosenberg's geographic size and location along substantial stretches of track results in exceptional access to the nation's rail network. Such direct access opportunities reduce the City's need to expend substantial public dollars to the construction of railroad spurs leading to remotely located industrial property. The *Rosenberg Major Thoroughfare Program* recognizes the importance of retaining access to adjacent rail lines, proposes grade separations at railroad/highway intersections, and promotes the location of future major thoroughfares in a manner that preserves direct access to railways from adjacent property.

Strategies and Actions

STRATEGY CC 4.1: Coordinate with railroad providers to maximize the ability to move freight in and out of the City, while minimizing adverse impacts on resident quality of life.

Initiatives and Actions

1. *Work with rail providers to identify and prioritize at-grade railroad/highway intersections which may be subject to future closure in conjunction with upgrades at other intersections that correspond to Major Thoroughfare Program recommendations.*
2. *Continue to provide funding support to the 36A Coalition and the Rosenberg Economic Development Department in order to promote the development of a proposed rail line between Freeport and Rosenberg.*
3. *If warranted, modify the Rosenberg Major Thoroughfare Map to account for a proposed 36A rail alignment. Incorporate complimentary provisions onto the City's subdivision regulations that allow for the reservation of rail right-of-way, and associated adjustments to highway interconnectivity provisions.*

in•ter•mod•al (in'tər mōd'l), adj. Transp. pertaining to or suitable for transportation involving more than one form of carrier, as truck and rail, or truck, ship and rail.

STRATEGY CC 4.2: Decrease potential conflicts between rail operations and developing residential land uses.

Initiatives and Actions

1. *Investigate the feasibility of retrofitting at-grade crossings to "Quiet Zones" in order to mitigate noise impacts in areas where residential development is increasing.*

2. *Allow for the closure of non-prioritized at-grade crossings as new arterial thoroughfares are constructed or upgraded in accordance with the Major Thoroughfare Program.*

STRATEGY CC 4.3: Coordinate with the Texas oil and gas industry to determine what the city can do to enhance its pipeline capabilities.

Initiatives and Actions

1. *Complete a survey of the locations of all existing pipelines within the City of Rosenberg and strategically determine how to increase capacity.*

2. *Investigate methods by which potential pipeline routes may be incorporated into corridors parallel to highway rights-of-way.*

Trucking

Although a substantial volume of goods and materials transit through Rosenberg via rail and pipeline facilities, trucking is the method of shipping that most directly and impacts the activities of the City's residents on a day-to-day basis. Beyond the daily delivery of goods to Rosenberg's neighborhoods and business districts, truck traffic is especially heavy through the downtown district. The heavy volume of daily truck traffic at the downtown intersection of U.S. 90A and SR 36 is not only a condition of Rosenberg's "crossroads" location, but is also exacerbated by the lack of a controlled access by-pass around the downtown district. The volume heavy vehicles on Rosenberg's downtown thoroughfares may be eased through the construction of the proposed 36A highway segment to the north of the City, and the development of similar controlled access highway routes in the vicinity of the City.

Rosenberg has taken steps to mitigate the impact of heavy vehicle traffic on City-maintained streets. Section 28-159 of City Code identified City streets upon which heavy vehicle traffic is prohibited (with listed exceptions). In spite of this step, it must be acknowledged that increasing regional congestion and traffic volumes may result in an increase in local and collector streets not currently listed as prohibited from truck "through" traffic from becoming favored short-cut routes. Likewise, certain areas of the City will be developed to support activities that must be serviced by trucks and other heavy vehicles. Simple steps can be taken by the City to manage both of these future scenarios through the modification of existing ordinances.

Strategies and Actions

STRATEGY CC 4.4: Augment the *Major Thoroughfare Program* with the addition of preferred freight routes within and around the City.

Initiatives and Actions

1. *Support studies on the Highway 36A corridor to determine an appropriate route for a controlled access highway route to the north and west of the City. Develop criteria under which the City would support preferred routes. Criteria may include factors such as: estimated reduction of heavy vehicle traffic downtown, degree of access to key development parcels in the City, environmental factors, etc.*

2. *Based on the City's adopted criteria, amend the Major Thoroughfare Map to incorporate the preferred 36A route following completion of studies to determine a preferred route around the City.*

STRATEGY CC 4.5: Mitigate the impacts of heavy vehicle traffic to Rosenberg's neighborhoods and districts, as well as the City-maintained street network.

Initiatives and Actions

1. *Measure truck traffic on City streets upon which heavy vehicle through traffic is prohibited to determine the effectiveness of the City's current ordinance. Modify as necessary, and consider the incorporation of collector streets where there is a significant amount of residential development.*

2. *Amend Chapter 25, Subdivisions, of City Code (and corresponding City design standards) to include an industrial street standard (see page 2.21).*

ROSENBERG 2035 MAJOR THOROUGHFARE PROGRAM

The *Rosenberg 2035 Major Thoroughfare Program* (hereafter, the *Major Thoroughfare Program*) is incorporated into the City's comprehensive plan document on pages 2.23 through 2.36. The *Major Thoroughfare Program* is Rosenberg's formal plan for future transportation system development. It is designed to provide for the long-term travel needs of the community by ensuring orderly street system development. The *Major Thoroughfare Program* considers both the extension and improvement of existing streets, and the location of planned future roadways. The *Major Thoroughfare Program* is designed to identify where future rights-of-way should be preserved – illustrating future alignment and considering sufficient width to allow for the seamless extension and expansion of the City street network. The *Major Thoroughfare Program* is not intended to serve as a driver of development, but merely as a program that pro-actively anticipates development trends and directs City decisions regarding the methods by which it provides transportation infrastructure to its citizens.

The *Major Thoroughfare Program* is comprised of three sections:

- *Major Thoroughfare Program Principles*
- *Major Thoroughfare Map*
- *Major Thoroughfare Implementation Parameters*

The *Major Thoroughfare Program* should be used by City staff, and Rosenberg's elected and appointed officials in securing needed street rights-of-way as development occurs in the community. Requirements for right-of-way dedication and construction of street improvements should be applied to all subdivision of land within the City. Elements of the *Major Thoroughfare Program* are incorporated into Chapter 4, *Implementation;* but, their potential omission from Chapter 4 does not invalidate the remaining policy and project recommendations contained within the *Program* and identified on pages 2.23 through 2.36.

MAJOR THOROUGHFARE PROGRAM PRINCIPLES

Rosenberg's *Major Thoroughfare Program* promotes the development of a city-wide street network that balances motor vehicle mobility and access needs, with the desire to provide and promote multiple transportation options. The street network illustrated on the **Map 2.1**, ***Major Thoroughfare Map*** (page 2.27), and described in subsequent pages of the *Program*, has been developed according to the following four principles:

- ***Functional Classification.*** *The Major Thoroughfare Program promulgates the classification of streets according to their suitability to promote travel mobility versus access. In simple terms, major streets should be designed to move greater volumes of traffic with fewer barriers to mobility. More localized streets should be designed to calm traffic flow while promoting safe access to and from adjacent properties. It is important to understand that references to a thoroughfare's functional classification typically relate to the road or street's ability to move motor vehicles, as opposed to other modes of transit. The Federal Highway Administration states that the functional classification system serves to identify, "…the particular role of a roadway in* ***moving vehicles*** *[emphasis added] through a network of highways."*

In accordance with the principles of functional classification, arterial thoroughfares (above left) are designed and constructed to promote the mobility of high volumes of motor vehicle traffic. Local streets (above right) provide direct access to adjacent properties,and area commonly designed to support multiple activities including: on-street parking, walking, and bicycling.
Source: Kendig Keast Collaborative

- ***Interconnectivity.*** *The Major Thoroughfare Plan assumes that Rosenberg will promote the extension and interconnectivity of major thoroughfares within the existing municipal limits, the ETJ, and to potential areas of growth surrounding the ETJ. The Major Thoroughfare Map illustrates distinct principles of major thoroughfare connectivity in existing and developing suburban areas based on a variety of local and state models derived from FHWA recommendations (with variations that account for existing topography, buildings and property lines). Proposed thoroughfare spacing in urban areas is based on alternative standards jointly developed by the Institute of Transportation Engineers and the Congress for the New Urbanism.*
- ***Land Use Connection.*** *As with most communities, Rosenberg contains different areas which exhibit wide variations in street design within the right-of-way, and building and site design on adjacent parcels. The Major Thoroughfare Map illustrates two distinct areas of general character. Within both of these "character classes," the recommended parameters for street construction differ in order to better compliment the design and function of adjacent buildings and land uses. The urban and suburban character class boundaries illustrated on the Major Thoroughfare Map promote a preferred built environment for different areas of the City.*

FIGURE 2.11: ROSENBERG FUNCTIONAL CLASSIFICATION OF THOROUGHFARES

FHWA STANDARD CATEGORIES[1]:	CITY OF ROSENBERG:	
	2012 MAJOR THOROUGHFARE PLAN	***ROSENBERG 2035 MAJOR THOROUGHFARE PROGRAM***
INTERSTATE	STATE-LEVEL MAJOR THOROUGHFARE	**CONTROLLED ACCESS HIGHWAY**
FREEWAY AND EXPRESSWAY		
PRINCIPAL ARTERIAL	MAJOR THOROUGHFARE	**ARTERIAL STREET[2]**
MINOR ARTERIAL		
MAJOR COLLECTOR	COLLECTOR STREET	**COLLECTOR STREET**
MINOR COLLECTOR		
LOCAL STREET	LOCAL STREET[3]	**LOCAL STREET**

[1] *FHWA, "Highway Functional Classification Concepts, Criteria and Procedures" (2013)*
[2] *Future distinctions between principal arterials and minor arterials may be warranted subject to traffic models which more accurately measure estimated traffic volumes.*
[3] *Referred to as "Minor Streets" in Chapter 25, Subdivisions, of Rosenberg City Code*

- ***Means of Transportation.*** *Although the Major Thoroughfare Map illustrates street types based on common standards of [vehicular] functional classification, the Major Thoroughfare Program is not limited to providing for motor vehicle travel only. The Program also considers general parameters for the manner in which active transportation facilities may be incorporated into thoroughfare design.* ***Figures 2.5*** *through* ***2.7*** *(page 2.11) of the Plan illustrate that there exists a core population within Rosenberg which relies on non-motorized transportation as a principal means of travel. To accommodate these varying needs – as well as the interests of additional segments of the population to travel by a different method than the automobile, "complete streets" concepts are incorporated in Rosenberg's Major Thoroughfare Program.*

Functional Classification of Thoroughfares

There is a variable manner in which different government jurisdictions and authorities apply highway functional classification concepts to the street networks for which they are responsible. The *Rosenberg 2035 Major Thoroughfare Program* recommends slight adjustments to the City's major thoroughfare categories. **Figure 2.11**, ***Rosenberg Functional Classification of Thoroughfares***, lists the City's new standard street functional classifications – with cross-references to the pre-existing street functional classifications.

Reclassification of Rosenberg's thoroughfare types serves two purposes:

- *Reclassified thoroughfare types more closely align with those street functional classifications utilized by Fort Bend County and the Houston-Galveston Area Council (HGAC) – both agencies that influence thoroughfare alignments and funding.*
- *Reclassified thoroughfare types provide Rosenberg with greater flexibility in developing and applying street types that promote interconnectivity and recognize differences in built environments. For instance, sub-classes of arterial and collector streets may be created that serve unique built environments.*

Possible variations of the thoroughfares listed in **Figure 2.11**, and associated implementation parameters, are identified in other figures and sections of the *Program*.

MAJOR THOROUGHFARE MAP

The *Rosenberg 2035 Major Thoroughfare Map* (hereafter the *Major Thoroughfare Map*) is collectively represented by **Maps 2.1** and **Map 2.2**. The *Major Thoroughfare Map* illustrates the existing and planned arterial and collector thoroughfare routes within the Rosenberg municipal boundaries and the City's ETJ area.

Major Thoroughfares and Character Class

The consistency of a community's built environment depends as much on the arrangement and design of public rights-of-way and streets as it does on surrounding buildings and property. Although many cities and towns typically attempt to manage community character through the application of design requirements on private property, it is equally important to design streets which preserve or promote a similar preferred built "context." The linkage between building and street is the most critical component in sustaining or creating neighborhoods, districts, and corridors of unique character and function.

The recommendations of the *Major Thoroughfare Program* vary depending on a street segment's location in one of two planning context areas – suburban and urban – which are identified on the two maps which comprise the *Major Thoroughfare Map* (pages 2.27 and 2.28). Street arrangement and design recommendations differ depending on whether a street segment is located within an area intended to develop with urban or suburban characteristics. Rosenberg's two planning context areas are described in greater detail within Chapter 3, *Land Use and Character*.

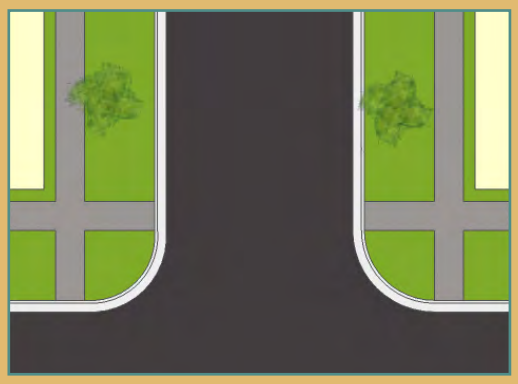
Street Network Projects

The *Major Thoroughfare Map* identifies street projects that have been incorporated into the H-GAC Transportation Improvement Program, and the City's Capital Improvements Program. The *Map* identifies additional street projects that have been prioritized for inclusion into future regional or City improvement programs.

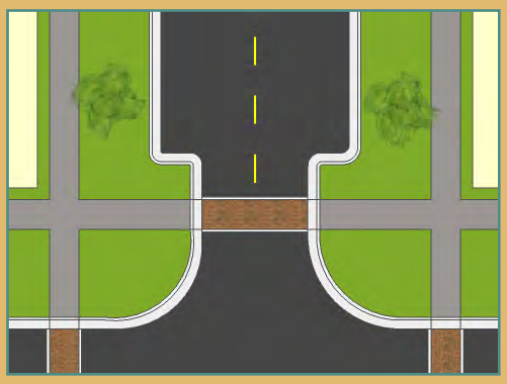
STREET INTERSECTIONS

The design of intersecting streets plays a significant role in the development of alternative street standards. Suburban streets typically have wider curb radii, and greater crossing distances for pedestrians (lower left). Urban street sections (lower right) are often designed to include curb extensions which visually narrow motor vehicle travel lanes, while reducing pedestrian crossing distances and defining parking lanes.

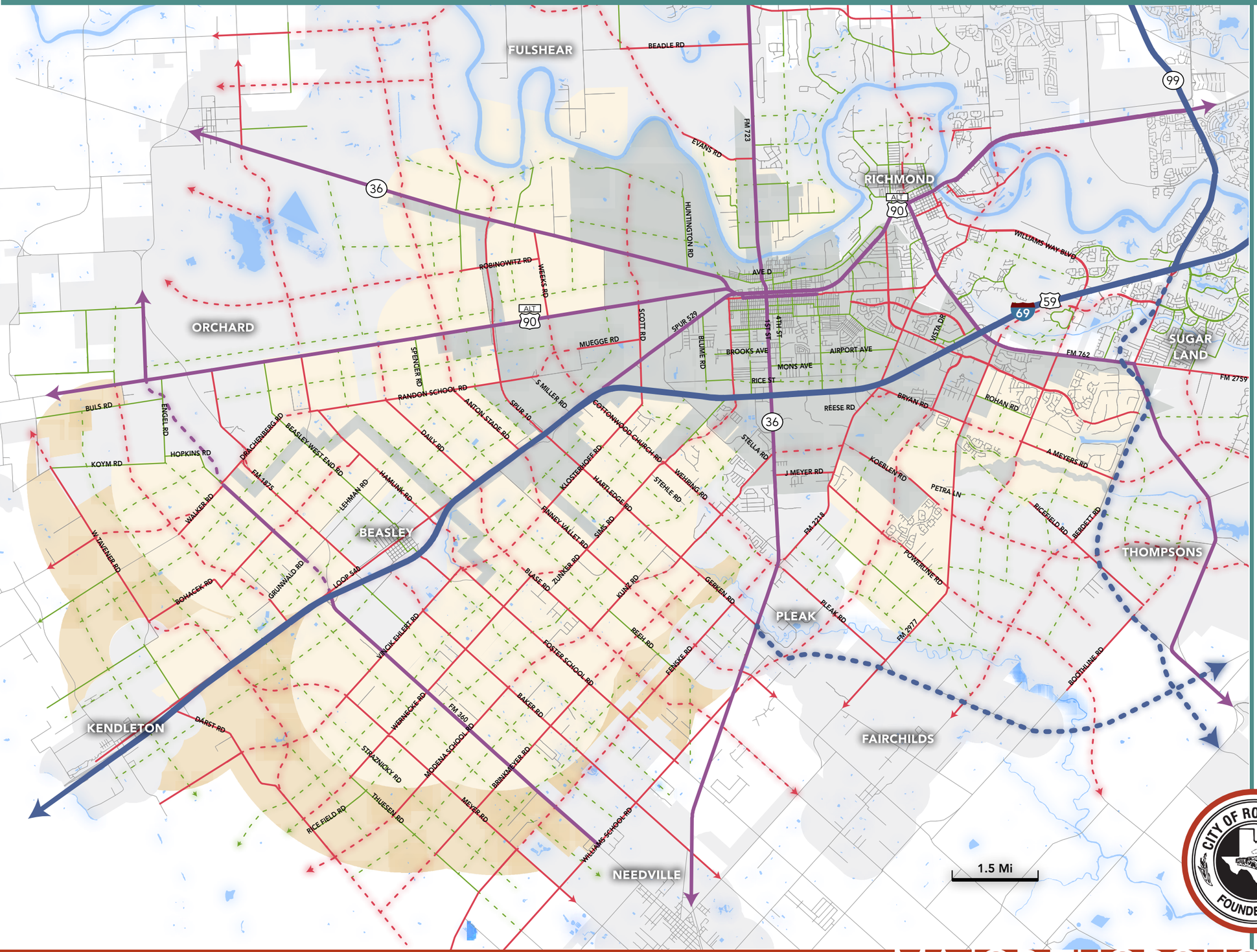
SUBURBAN STREET SECTION



URBAN STREET SECTION



MAP 2.1:
ROSENBERG THOROUGHFARE PLAN MAP



LEGEND

- City Limits
- Rosenberg ETJ
- Future ETJ (1.5 mile buffer)
- Other City and ETJ Limits
- Regional
- Other Freeways & Expressways
- Arterial
- Collector
- Local
- Proposed

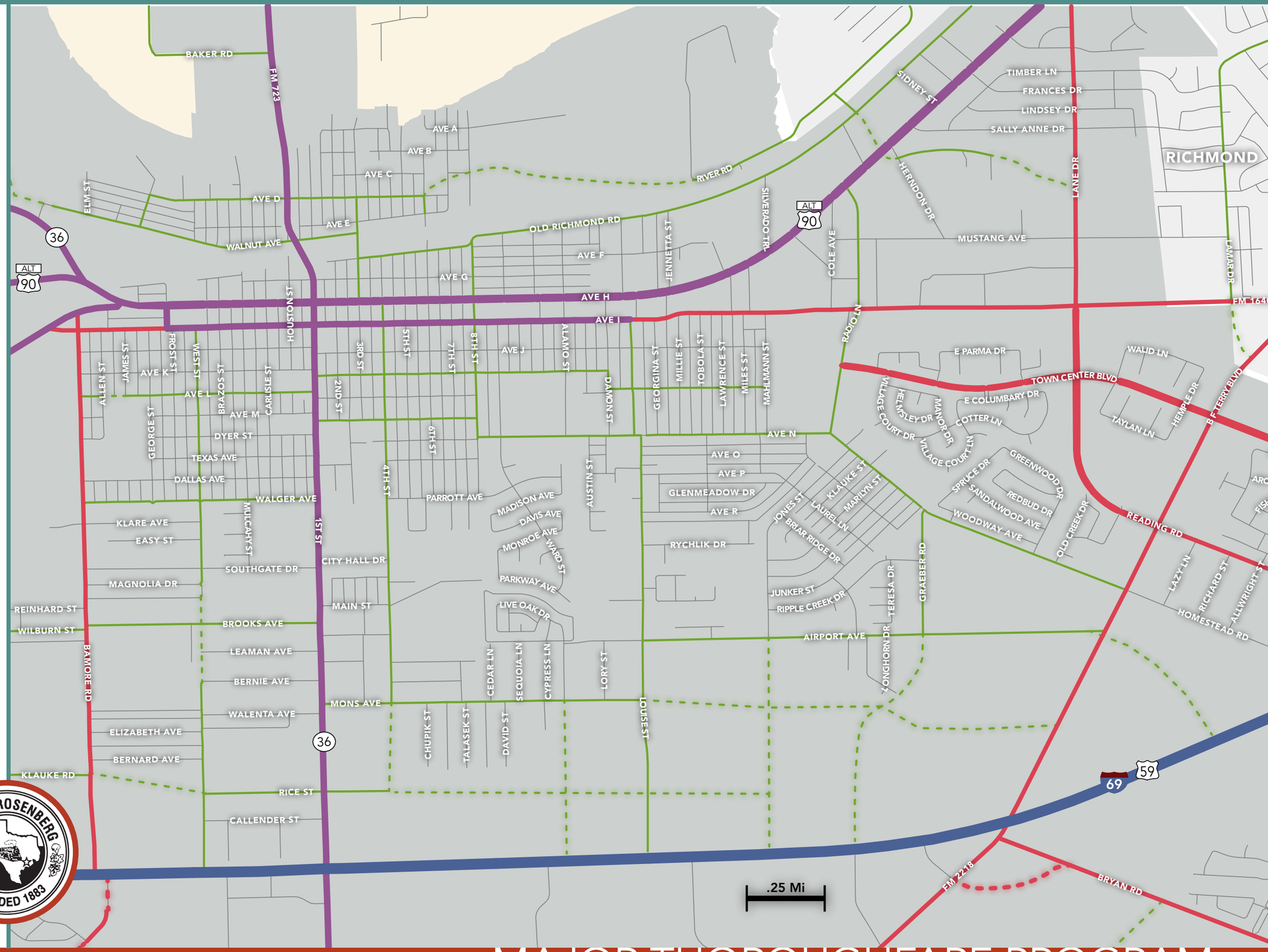
CITY OF ROSENBERG FOUNDED 1883

2035 Rosenberg texas COMPREHENSIVE PLAN

MAP 2.2:
ROSENBERG THOROUGHFARE PLAN DOWNTOWN MAP

LEGEND

- City Limits
- Rosenberg ETJ
- Future ETJ (1.5 mile buffer)
- Other City and ETJ Limits
- Regional
- Other Freeways & Expressways
- Arterial
- Collector
- Local
- Proposed



Rosenberg 2035 texas
COMPREHENSIVE PLAN

CITY OF ROSENBERG FOUNDED 1883

FIGURE 2.12: ROSENBERG MAJOR THOROUGHFARE CHARACTERISTICS[1]

FUNCTIONAL CRITERIA	SUBURBAN CHARACTER CLASS				URBAN CHARACTER CLASS		
	PRINCIPAL ARTERIAL[2]	MINOR ARTERIAL[2]	COLLECTOR STREET	LOCAL STREET	ARTERIAL STREET (BOULEVARD)	COLLECTOR STREET (AVENUE)	LOCAL STREET
FUNCTION							
FUNCTIONAL ROLE	Mobility is principal role	Mobility is principal role	Mobility between arterials and local streets	Access to property is principal role	Mobility is principal role	Mobility and access assume equal roles	Access to property is principal role
ROADWAY CONTINUITY	Connects major activity centers	Connects principal arterials to lower classification roadways	Continuous between arterials. May extend across arterials	Discontinuous. Connects to collectors	Connects major activity centers	Continuous between arterials within activity centers and districts	Interconnected at frequent intervals
DESIRABLE SPACING	2 miles or more	1/2 to 2 miles	1/4 to 1/2 mile	Variable	2 miles or more	660 - 1320 ft.	300 - 660 ft.
COMMUNITY RELATIONSHIP	Defines neighborhood and district boundaries	Defines and traverses neighborhood and district boundaries	Internal and traverses neighborhood boundaries	Internal to a neighborhood	Defines neighborhood and district boundaries	Central or bounding corridor in a neighborhood or district	Internal to a neighborhood or district
POSTED SPEED	40 to 55 mph	30 to 45 mph	25 to 35 mph	20 to 25 mph	30 to 35 mph	25 to 35 mph	20 mph
RIGHT-OF-WAY	124 to 100 feet	100 to 84 feet	84 to 62 feet	70 to 60 feet	92 - 80 feet	84 - 54 feet	66-55 feet
TRAVELED WAY							
NUMBER OF TRAVEL LANES	4 to 6 lanes	3 to 4 lanes	2 lanes	2 lanes	4 to 6 lanes with landscaped median	2 to 4 lanes with or without landscaped median	2 lanes
PARKING LANES	No	No	No	Permitted	No	Permitted	Permitted
CURB & GUTTER	Optional	Optional	Required	Required	Required	Required	Required
MEDIANS	Optional	Optional	Yes	Yes	Optional	Optional	Optional
BIKEWAYS[3]	Yes (Defined)	Yes (Defined)	Yes (Defined or inferred)	No	Yes (Defined or inferred)	Yes (Defined or inferred)	Yes (inferred)
TRANSIT	Yes (Bus turnouts)	Yes (Bus turnouts)	Yes	No	Yes	Yes	No
ROADSIDE							
PLANTING STRIPS	Yes (Variable width)				Yes (Variable width; Landscaped islands in place of continuous strip in non-residential areas)		
SIDEWALKS	Yes (Both sides)			Yes (One side)	Yes (Both sides)		

[1] Figure excludes interstates, expressways, and freeways as defined by FHWA (Controlled access highways as represented on the Rosenberg 2035 Major Thoroughfare Map). Such highways are typically owned and maintained by federal and state jurisdictions.

[2] Major Thoroughfare Map incorporates "Arterial Streets" only. Principal and minor arterial options are presented within the figure for illustrative purposes only.

[3] Bikeways: "Defined" refers to physical improvements within the roadway such as extra pavement width for bicycle lanes, or side trails. "Inferred" refers to low cost improvements such as lane markings and signage.

MAJOR THOROUGHFARE PROGRAM

MAJOR THOROUGHFARE IMPLEMENTATION PARAMETERS

Major Thoroughfare Design Options

Successful implementation of the *Rosenberg 2035 Major Thoroughfare Program* is not only dependent on the preservation of future rights-of-way, and the programming of public expenditures toward arterial and collector street improvements, but also on allowing for variable street design depending on the type and location of proposed development.

Chapter 25, *Subdivisions*, of City Code currently incorporates street design standards that (exclusively) promote and support suburban development character. While there is a legitimate purpose in developing street standards which support suburban growth patterns, there exist other areas of the City which have developed in an urbanized manner – with a linear interconnected street grid, smaller blocks, narrow widths, a greater frequency of curb cuts, and on-street parking. Many of these urban development patterns, although perfectly functional, would not be permitted under current City development standards.

Consistent with the adopted guiding transportation principle of Rosenberg 2035, ***"Design street systems that are context sensitive,"*** Rosenberg will promote alternative street designs for variable existing or proposed built environments in the City. The street cross sections presented in **Figure 2.13** through **Figure 2.15** present a list of "representative" design options that may assist the City as it considers future amendments to its development regulations allowing for context-sensitive street design and construction. The two principal design concepts presented in **Figure 2.13** through **Figure 2.15** are described below:

- ***Traveled Way.*** *All street components that are contained within the outside edge of a street's paved surface. May include motor vehicle travel lanes, parking lanes, landscaped medians, and bicycle facilities.*
- ***Roadside Edge.*** *The location for planting areas (grass strips, street trees, tree wells), pedestrian facilities, utilities, and construction buffers.*

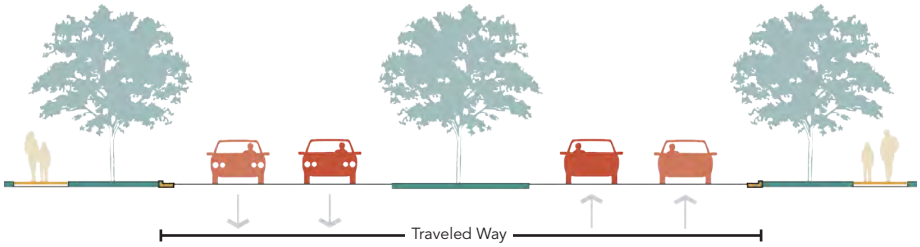
Figure 2.13 through **Figure 2.15** present conceptual design options only. Multiple street variations may be developed from the options presented in order to address elements such as side paths, on-street parking variations, downtown pedestrian facilities, incorporation of medians, etc. Other engineering considerations such as: grades, curve factors, radii, site distance, and more should be addressed by amendments to the City's engineering design standards which compliment potential subdivision regulation amendments.

Context sensitive roadway design considers the existing or intended character of surrounding property. It also, places equal importance on the appropriate design of the "roadway edge" and the facilities within the "traveled way" (which are otherwise often considered in relation to the motoring public). *Source: Context Sensitive Solutions for Major Urban Thoroughfares, CNU & ITE*

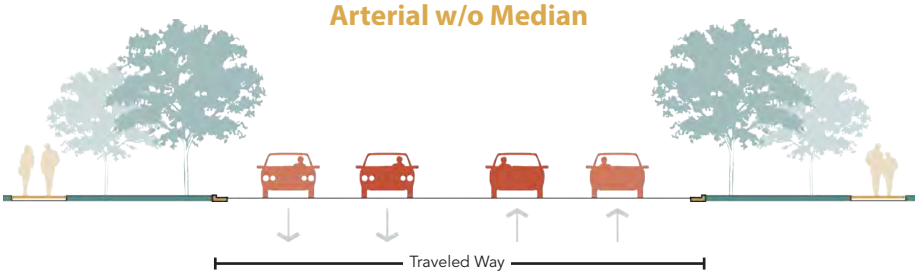
FIGURE 2.13: ARTERIAL STREET SECTIONS

Current Standards

Arterial w/Median (Boulevard)



Arterial w/o Median



STREET	RIGHT-OF-WAY	TRAVELED WAY			ROADSIDE ZONE		
		TRAVEL LANES	PARKING LANES	MEDIAN	ROADSIDE EDGE	SIDEWALKS	FRONTAGE ZONE
ARTERIAL (W/ MEDIAN)	100′	4 at 12′ each	None	15′	Curb/Gutter; Planting strip (2 at up to 10′ each)	2 at 5′ each	N/A
ARTERIAL (W/O MEDIAN)	100′	51′	None	N/A	Curb/Gutter; Planting strip (2 at up to 21.5′ each)	2 at 5′ each	N/A

Representative Alternatives

The arterial street sections (below) are provided as examples to assist in developing street standards that more closely align with the recommendations of the *Major Thoroughfare Program*. These representative alternatives do not incorporate the following considerations: turn lanes, angled parking, bus turnouts, bike lanes, side trails.

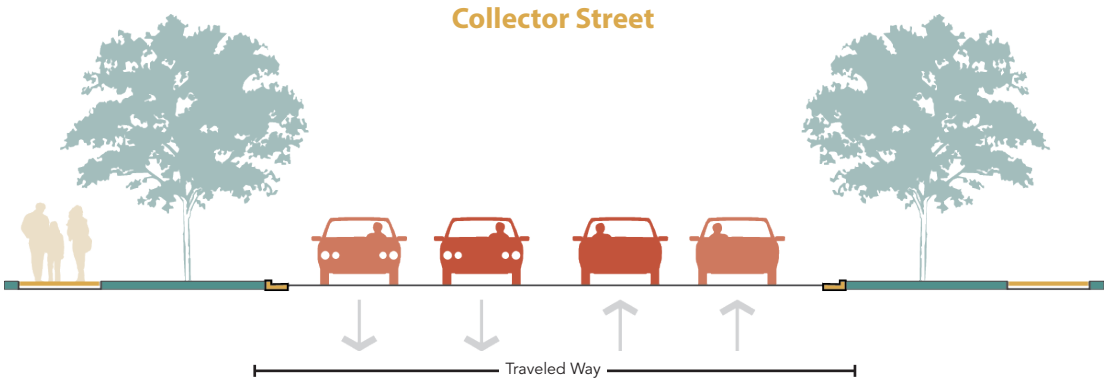
STREET	RIGHT-OF-WAY	TRAVELED WAY			ROADSIDE ZONE		
		TRAVEL LANES	PARKING LANES[D]	MEDIAN	ROADSIDE EDGE	SIDEWALKS	FRONTAGE ZONE[G]
SUBURBAN (MAJOR)	100′-124′	4 (12′ each)	None	Yes (Up to 15′)	Curb/Gutter; Planting strip (2 at up to 20′ each)	2 at 6′ each	2 (2′ each)
SUBURBAN (MINOR)[A]	84′-100′	4 (11′ each)	None	Yes (Up to 15′)	Curb/Gutter; Planting strip (2 at 12′ each)	2 at 6′ each	2 (2′ each)
URBAN (BOULEVARD)[B,C]	80′-92′	4 (10′-11′ each)	1 to 2 (8′ each)	Yes (Up to 15′)	Curb/Gutter; Planting strip[E] (2 at 6′-8′ each)	2 at 6′ minimum[F]	N/A

Figure Notes:

- *A A minor arterial street section is provided for reference only. Use of a minor arterial street section should be accompanied by amendments to the Major Thoroughfare Map and City development regulations.*
- *B Urban boulevards may be utilized in suburban character class areas in conjunction with specific development proposals.*
- *C The functionality of urban street sections may be improved through the complimentary use of alleys.*
- *D Parallel parking. Parking lane width will increase for angled or head-in options.*
- *E Tree planters may replace a continuous planting strip in urban or non-residential areas.*
- *F Sidewalks may be wider in urban or non-residential areas.*
- *G Frontage zone: Vegetative strip separating improvements from the outside edge of right-of-way. Defined as a "one foot reserve" in the Rosenberg Subdivision Regulations.*

FIGURE 2.14: COLLECTOR STREET SECTIONS

Current Standards



STREET	RIGHT-OF-WAY	TRAVELED WAY			ROADSIDE ZONE		
		TRAVEL LANES	PARKING LANES	MEDIAN	ROADSIDE EDGE	SIDEWALKS	FRONTAGE ZONE[A]
COLLECTOR STREET	80′	39′	None	N/A	Curb/Gutter; Planting strip (2 at up to 15.5′ each)	2 at 5′ each	N/A

Representative Alternatives

The collector street sections (below) are provided as examples to assist in developing street standards that more closely align with the recommendations of the *Major Thoroughfare Program*. These representative alternatives do not incorporate the following considerations: turn lanes, angled parking, bus turnouts, bike lanes, side trails.

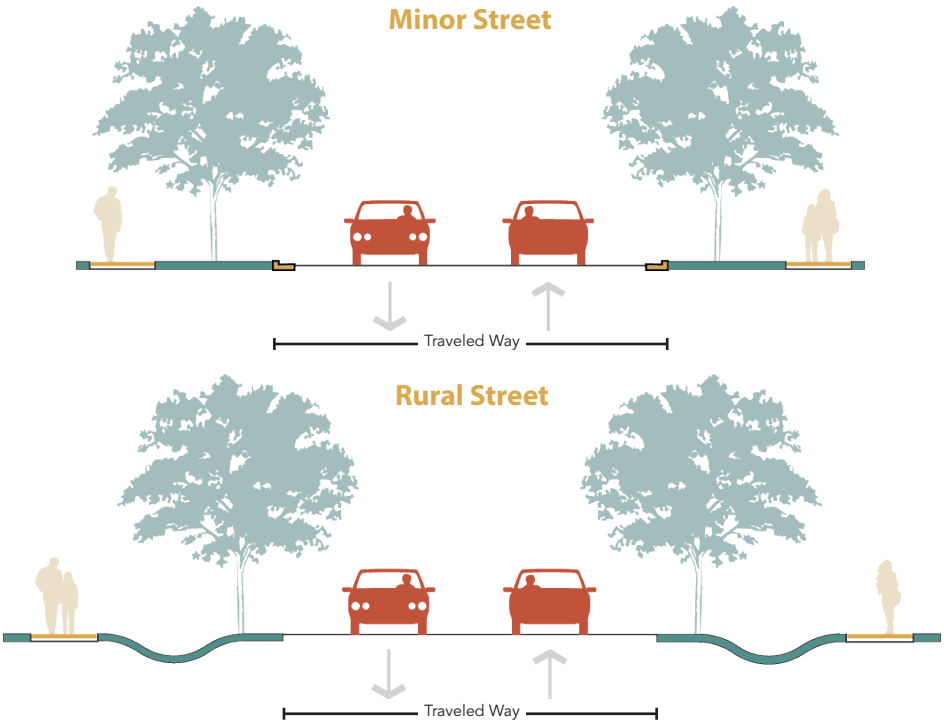
STREET	RIGHT-OF-WAY	TRAVELED WAY			ROADSIDE ZONE		
		TRAVEL LANES	PARKING LANES	MEDIAN	ROADSIDE EDGE	SIDEWALKS	FRONTAGE ZONE[H]
SUBURBAN	62′-84′	2 to 4 (10′-11′ each)	None[C]	Optional (Variable Width)	Curb/Gutter; Planting strip (2 at 12′ each)	2 at 6′ each	2 (1′ each)
URBAN (AVENUE)[A,B]	54′-84′	2 (10′-11′ each)	1 to 2 (7′-8′ each)[D]	Optional (Variable Width)[E]	Curb/Gutter; Planting strip[F] (2 at 6′-8′ each)	2 at 6′ minimum[G]	N/A

Figure Notes:

A Urban avenues may be utilized in suburban character class areas in conjunction with specific development proposals.
B The functionality of urban street sections may be improved through the complimentary use of alleys.
C On-street parking may be incorporated into an optional "neighborhood collector" street type within residential developments.
D Parallel parking. Parking lane width will increase for angled or head-in options.
E Hard-scape option for narrow medians.
F Tree planters may replace a continuous planting strip in urban or non-residential areas.
G Sidewalks may be wider in urban or non-residential areas.
H Frontage zone: Vegetative strip separating improvements from the outside edge of right-of-way. Defined as a "one foot reserve" in the Rosenberg Subdivision Regulations.

FIGURE 2.15: LOCAL STREET SECTIONS

Current Standards



STREET	RIGHT-OF-WAY	TRAVELED WAY			ROADSIDE ZONE		
		TRAVEL LANES	PARKING LANES	MEDIAN	ROADSIDE EDGE	SIDEWALKS	FRONTAGE ZONE
MINOR STREET	60′	27′ section (Travel & parking lanes integrated)		N/A	Curb/Gutter; Planting strip (2 at up to 9′ each)	2 at 4′ each	N/A
RURAL STREET	70′	28′	None	N/A	Open ditch section (2 at up to 21′ each)	N/A	N/A

Representative Alternatives

The local street sections (below) are provided as examples to assist in developing street standards that more closely align with the recommendations of the *Major Thoroughfare Program*. These representative alternatives do not incorporate the following considerations: turn lanes, angled parking, and bike lanes.

STREET	RIGHT-OF-WAY	TRAVELED WAY			ROADSIDE ZONE		
		TRAVEL LANES	PARKING LANES[C]	MEDIAN	ROADSIDE EDGE[D]	SIDEWALKS[E]	FRONTAGE ZONE[F]
SUBURBAN	66′	2 (10′-11′ each)	1 to 2 (7′-8′ each)	N/A	Curb/Gutter; Planting strip (2 at 8′ each)	2 at 5′ each	2 (1′ each)
URBAN[A,B]	56′-66′	2 (10′-11′ each)	1 to 2 (7′-8′ each)	N/A	Curb/Gutter; Planting strip[3] (2 at 5′-8′ each)	2 at 5′ each[2]	2 (1′ each)

Figure Notes:

A Urban streets may be utilized in suburban character class areas in conjunction with specific development proposals.
B The functionality of urban street sections may be improved through the complimentary use of alleys.
C Parallel parking only.
D Tree planters may replace a continuous planting strip in urban or non-residential areas.
E Sidewalks may be wider in urban or non-residential areas.
F Frontage zone: Vegetative strip separating improvements from the outside edge of right-of-way. Defined as a "one foot reserve" in the Rosenberg Subdivision Regulations.

Interpretation of Recommended Policies

The thoroughfare descriptions presented in **Figure 2.12**, ***Rosenberg Major Thoroughfare Characteristics,*** are guides. Rosenberg may exercise discretion on a case-by-case basis in the manner that recommended major thoroughfare components are applied to new development – provided such decisions do not conflict with adopted local ordinance. The City may also use *Major Thoroughfare Program* recommendations to promote its position regarding thoroughfare projects on highways and streets which may be owned and maintained by a different government jurisdiction or authority, but are within or in close proximity to the City.

At a minimum, Rosenberg will consider the following when applying major thoroughfare recommendations:

- ***Major Thoroughfare Map Alignments.*** *The street rights-of-way depicted on the Major Thoroughfare Map illustrate general alignments necessary to adhere to the spacing recommendations listed in* ***Figure 2.12****. The City may adjust alignments where necessary to account for topographic constraints, timing of development, or other factors that may only become apparent as development occurs.*
- ***Rights-of-Way.*** *The major thoroughfare rights-of-way that are suggested in* ***Figure 2.12*** *are minimums. The inclusion of right-of-way widths within the figure should not be interpreted as absolute – and are only intended to provide the City with a minimum dimension for purposes of future right-of-way reservation or dedication. Depending on the street cross-section desired by the City, wider rights-of-way may be necessary.*
- ***Continuation and Projection of Streets.*** *In accordance with the policies and recommendations of this Plan, existing streets in adjacent areas should be continued, when an adjacent area is undeveloped, the street layout must provide for future projection and continuation of streets into the undeveloped area. In particular, the arrangement of streets in a new subdivision must make provision for continuation of right-of-way for the principal existing streets in adjoining areas – or where new streets will be necessary for future public requirements on adjacent properties that have not yet been subdivided.*
- ***Retro-Fitting Existing Thoroughfares.*** *The dimensional constraints of existing thoroughfare rights-of-way may make future adherence to the recommendations of* ***Figure 2.12*** *impractical. The City may opt to alter recommended dimensions, or eliminate recommended facilities in limited instances, where additional right-of-way cannot be practicably acquired to accommodate all recommended thoroughfare elements. Exceptions for the retro-fitting of existing thoroughfares must be clearly stated in the City's development regulations.*
- ***Frontage Roads.*** *The Major Thoroughfare Map presumes that the entire length of US Highway 59 (Interstate 69) and Fort Bend Tollway Extension will include frontage roads collectively designed to serve as arterial thoroughfares.*
- ***Collector Streets.*** *Collector streets must be shown on all proposed subdivisions of land consistent with the Major Thoroughfare Program. In cases where a collector is not shown on the Major Thoroughfare Map, but is warranted due to development density and projected traffic volumes, it must also be shown. Rosenberg should also consider the development of a "neighborhood collector" street type in both urban and suburban character class areas which allows a greater degree of direct residential access while still serving their role of distributing traffic to arterial thoroughfares.*
- ***Townhouse and Duplex Streets.*** *The elimination of townhouse and duplex street standards is recommended. Existing dimensional standards utilize similar geometry, with no functional difference from other residential street types.*

The conversion of existing streets in urban areas can be accomplished with little expenditure. The curb extension above narrows travel lanes widths while providing a defined parking lane, and accommodating existing storm drainage. *Source: Kendig Keast Collaborative*

Anticipated traffic volumes that result in wide cross-sections for townhouse or duplex "access streets" should instead trigger a requirement to construct a collector street projecting to the property line.

- ***Rural Street Segments.*** *The Major Thoroughfare Program does not propose arterial or collector thoroughfares with open ditch cross-sections; but, the development of such standards is not precluded by the Program.*
- ***Intersections.*** *New intersections within or bordering a subdivision should align with existing intersections to avoid creation of jogs or offsets, and to provide for continuity of existing streets - especially collector and arterial streets. The angle of intersecting streets should be as nearly at a right angle as possible. Corner cutbacks or radii should be required at the acute corner of the right-of-way line to provide adequate sight distance at intersections.*
- ***Cul-de-Sacs.*** *Through-streets and T-intersections are preferable to cul-de-sacs. Care should be taken so as not to over utilize cul-de-sacs, which limits through-access, restricts pedestrian circulation, increases emergency response times, and confuses motorists. When cul-de-sacs must be used, they should have a maximum length of not more than 600 feet measured from the connecting street centerline to the end of radius point. Pavement diameter in all residential areas should be 50 feet with a right-of-way diameter of 60 feet, and should include a landscaped island. Pavement and right-of-way diameters in nonresidential areas could be larger but should not exceed 80 feet of pavement and 100 feet of right-of-way.*
- ***Alleys.*** *Full functionality of the urban street types introduced in* ***Figure 2.13*** *through* ***Figure 2.15*** *may require the corresponding development of alleys to reduce curb cuts on the street - thereby preserving the curb face and maximizing on-street parking options. Alleys also divert service vehicles and activities away from the principal roadways and associated pedestrian activity. Alleys - either in the form of dedicated right-of-way, or private cross-access easement agreements - should be a required for new development in urban character class areas.*
- ***Industrial Streets.*** *Some thoroughfare segments may convey, or be intended to convey, a high percentage of trucks and heavy vehicles to support industrial, resource extraction, or warehousing uses. Any of the major thoroughfare types listed in* ***Figure 2.13*** *through* ***Figure 2.15*** *may be modified to enable the street segment to serve heavy vehicle traffic. Example industrial street standards may be found page 2.21.*
- ***Geometric Design Standards and Guidelines.*** *Other requirements and guidelines for the geometric design of thoroughfares and public streets should be provided in either the subdivision regulations or design requirements - but not both. Duplicative standards referenced in both documents may conflict over time. Subdivision regulation standards should focus on general dimensional standards related to laying out the street network (rights-of-way, pavement widths, location of sidewalks, etc.), while the design standards should focus on construction standards such as cross sections, sub-grades, pavement thickness, cross slopes, etc.*
- ***Major Thoroughfare Map Amendments.*** *All amendments to the Major Thoroughfare Map resulting in the mapped realignment of an arterial or collector street shall be approved by resolution of the Mayor and City Council only following a public hearing and a review and recommendation of the Planning Commission. Minor realignments that, in the opinion of the City, do not require an amendment to the Major Thoroughfare Map shall not require a public hearing or resolution of the Mayor and City Council.*

The "alley" above accesses rear parking through the application of cross-access easement requirements. *Source: Kendig Keast Collaborative*

Implementation Strategies

The *Rosenberg 2035 Major Thoroughfare Program* serves as the City's formal policy for long-term transportation system development. In addition to adherence to the *Major Thoroughfare Map*, the utility of the *Major Thoroughfare Program* is greatly enhanced by the implementation of the following strategies, initiatives, and actions:

Strategies and Actions

STRATEGY MTP 1: Amend city land development regulations to incorporate street standards consistent with the recommendations of the *Major Thoroughfare Program*.

Initiatives and Actions

1. *Incorporate suggested Major Thoroughfare Plan street type modifications into city land development regulations and design standards. Amend City subdivision regulations to provide for corresponding minimum right-of-way widths and corresponding: travel lane widths, parking lanes, planting strips, pedestrian facilities and frontage zones. Vary the standards according to City character class area and provide a method to incorporate other street elements including, but not limited to: bicycle facilities, curb extensions, traffic calming features, medians, crosswalks, etc.*

2. *Amend the standards within the City's land development regulations to more clearly establish the criteria by which Rosenberg may require the reservation of thoroughfare rights-of-way as part of the development approval process. Do not limit right-of-way reservation requirements to subdivisions.*

3. *Amend Chapter 25, Subdivisions, of Rosenberg City Code, to address street network location, expansion and alignment. Include amended or new standards on intervals between thoroughfare type, standards for street extension, and minimum interconnectivity requirements.*

4. *Incorporate the urban character class street types into Chapter 25, Subdivisions, of Rosenberg City Code, and corresponding design guidelines; develope alternative standards for right-of-way widths, pavement width, driveway spacing, block lengths, on-street parking, curb extensions, and other spatial components.*

5. *Incorporate a provision into Chapter 25, Subdivisions, of Rosenberg City Code allowing the City to require/permit the conversion of street segments in downtown and center city neighborhoods to an urban character class type.*

STRATEGY MTP 2: Coordinate with adjacent local government jurisdictions and state agencies to amend route designations to be consistent with the recommendations of the Major Thoroughfare Program.

Initiatives and Actions

1. *Where necessary, work with Fort Bend County government to adjust route alignments and designations to conform with the Rosenberg Major Thoroughfare Program.*

2. *Convene discussions with adjacent municipal jurisdictions to ensure consistency of local major thoroughfare plans.*

STRATEGY MTP 3: Calibrate major thoroughfare recommendations through sub-area traffic modeling.

Initiatives and Actions.

1. *Utilize traffic analysis zone information, assumed land uses, estimated population, basic/no-basic/service employment projections, and other similar data sets to model estimated sub-area traffic volumes and highway levels of service.*

2. *Compare modeling data to major thoroughfare classification and spacing recommendations contained in the Major Thoroughfare Map to determine final dimensions and essential components of the traveled way such as right-of-way widths, number of travel lanes, and median separations.*

3. *Develop a minor arterial street classification - including design requirements - and amend the Major Thoroughfare Map on a case-by-case basis to distinguish between major arterial and minor arterial routes.*

SUMMARY OF STRATEGIES: **TRANSPORTATION.**

Chapter 2, *Transportation*, of *Rosenberg 2035* is a general inventory of the transportation facilities and services (termed herein as "community capacities") that the City and other public and private partners provide to the citizens of Rosenberg, residents of the City's ETJ, and surrounding areas. With a view toward improving public service delivery to current residents, property owners and business owners - as well as anticipating demand that will accompany increases in population - the Transportation chapter proposes a series of policies and strategies that have been incorporated into the City's overall comprehensive plan work program (Chapter 4, *Implementation*). All of Rosenberg's transportation policies and strategies are consistent with the City's guiding principles first introduced in Chapter 1, *Planning Context* (page 1.25). Rosenberg's guiding principles related to the topic of transportation include:

TRANSPORTATION GUIDING PRINCIPLES:

Principle A: Develop a transportation network that provides local interconnectivity and accessibility.

Principle B: Design street systems that are context sensitive.

Principle C: Provide for transportation choices.

Principle D: Mitigate traffic patterns that are incompatible with neighborhoods and activity centers.

The 21 transportation strategies that are highlighted throughout this chapter have been compiled into **Figure 2.16** below. The relationship between each of Rosenberg's recommended initiatives and actions, and the transportation guiding principles, is highlighted.

FIGURE 2.16: ROSENBERG TRANSPORTATION, SUMMARY OF STRATEGIES

STRATEGIES:	PAGE	GUIDING PRINCIPLES
STRATEGY CC 1.1: Commission and prepare sub-area traffic models for developing areas.	2.5	A,D
STRATEGY CC 1.2: Base the preparation of traffic impact analyses on proposed land uses, density, and intensities rather than site acreage.	2.5	A,D
STRATEGY CC 1.3: Adjust street network maintenance expenditures in anticipation increased mileage and the transfer of maintenance responsibilities from TxDOT.	2.6	A
STRATEGY CC 1.4: Adopt comprehensive access management provisions.	2.9	A,D
STRATEGY CC 1.5: Adopt development provisions requiring street interconnectivity.	2.9	A
STRATEGY CC 1.6: Create and implement a neighborhood traffic calming program.	2.9	D
STRATEGY CC 1.7: Retrofit urban street segments through the incorporation of traffic calming features.	2.9	D
STRATEGY CC 1.8: Incorporate minimum landscaping requirements for public rights-of-way into the City's development regulations.	2.10	B
STRATEGY CC 2.1: Promote connectivity within Rosenberg through enhancing the active transportation network.	2.18	C
STRATEGY CC 2.2: Amend development ordinances to incorporate additional active transportation provisions.	2.18	C
STRATEGY CC 2.3: Target funding sources to implement active transportation improvements.	2.18	C
STRATEGY CC 3.1: Promote the development of a scheduled circular bus service in Rosenberg.	2.20	C
STRATEGY CC 3.2: Position the City to serve as a regional passenger rail terminal destination.	2.20	C

FIGURE 2.16: ROSENBERG TRANSPORTATION, SUMMARY OF STRATEGIES

STRATEGY CC 3.1: Coordinate with railroad providers to maximize the ability to move freight in and out of the City, while minimizing adverse impacts on resident quality of life.	2.21	A,D
STRATEGY CC 3.2: Decrease potential conflicts between rail operations and developing residential land uses.	2.22	A,D
STRATEGY CC 3.3: Coordinate with the Texas oil and gas industry to determine what the city can do to enhance its pipeline capabilities.	2.22	D
STRATEGY CC 3.4: Augment the *Major Thoroughfare Program* with the addition of preferred freight routes within and around the City.	2.22	D
STRATEGY CC 3.5. Mitigate the impacts of heavy vehicle traffic to Rosenberg's neighborhoods and districts, as well as City-maintained street network.	2.22	D
STRATEGY MTP 1: Amend city land development regulations to incorporate street standards consistent with the recommendations of the *Major Thoroughfare Program*.	2.36	A,B,D
STRATEGY MTP 2: Coordinate with adjacent local government jurisdictions and state agencies to amend route designations to be consistent with the recommendations of the Major Thoroughfare Program.	2.36	A
STRATEGY MTP 3: Calibrate major thoroughfare recommendations through sub-area traffic modeling.	2.36	A,B

IMPLEMENTATION OF TRANSPORTATION STRATEGIES

Implementation of the transportation strategies that are referenced in this chapter must occur in coordination with corresponding strategies that have also been developed to address the topic of land use and character. Strategies contained in both chapters of *Rosenberg 2035* are important - and document community priorities. The order of their implementation must consider multiple variables, including (at least): **A)** The timing of expected growth and development impacts; **B)** Cost versus revenues; **C)** The availability of grants, loans and other financing methods; **D)** Staffing and other public resources; and, **E)** Dependence on completion of another strategy.

In consideration of these inter-related implementation variables, the strategies summarized in **Figure 2.16** have been incorporated into Rosenberg's overall comprehensive plan work program contained in Chapter 4, *Implementation*. Please reference Chapter 4 for a full overview on the methods and timing by which the city of Rosenberg's transportation actions and initiatives will be implemented to ensure the long-term welfare and prosperity of Rosenberg's citizens, business owners and property owners.