

# Chapter 3:

# Transportation Plan

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The transportation system forms one of the most visible and permanent elements of a community. It establishes the framework for community growth and development and, along with the Future Land Use Plan, forms a long-range statement of public policy. As the alignment and right-of-way of major transportation facilities are established and adjacent property developed, it is difficult to facilitate system changes without significant financial impacts. However, by incorporating programmed land uses and densities of the Future Land Use Plan, as well as the connectivity provided through the pathways shown in the Parks & Open Space Plan, strategies can be developed that maximize the land use/transportation relationship.

**“...the streets and sidewalks are the social glue that binds the place together.”**

Hinshaw, Mark. “Great Neighborhoods.”  
Planning, Jan 2008, page 7.

Several key principles were recognized in the preparation of this Transportation Plan and should continue to serve the City in future transportation-related decisions:

- The community should have convenient internal circulation between neighborhoods, core community assets, and special districts.
- Through traffic should be directed to specific facilities designed to accommodate non-local and regional traffic. Transportation facilities should define rather than split residential areas in order to preserve neighborhood integrity.
- A safe pedestrian/bikeway system should provide interconnectivity between homes, community facilities, and retail areas.
- This Transportation Plan should monitor regional growth implications in order to proactively address mobility and accessibility issues to and from Granite Shoals.

This Transportation Plan is divided into two main sections. First, planning considerations such as population density, current traffic volumes, and projected traffic volumes are essential in determining what the future transportation conditions for the community will be. This analysis may reveal areas of future transportation congestion and allows for planning options which help mitigate forecasted congestion. Based upon this analysis, transportation recommendations, such as additional roadways, may be made.

The second component of this Plan will focus on the recommendations. A functional street classification system and recommended cross-sections will be created in conjunction with the Transportation Plan map. Context sensitive design (CSD) and alternative transportation options will also be discussed as a greater component of creating vibrant, livable, and sustainable public spaces.

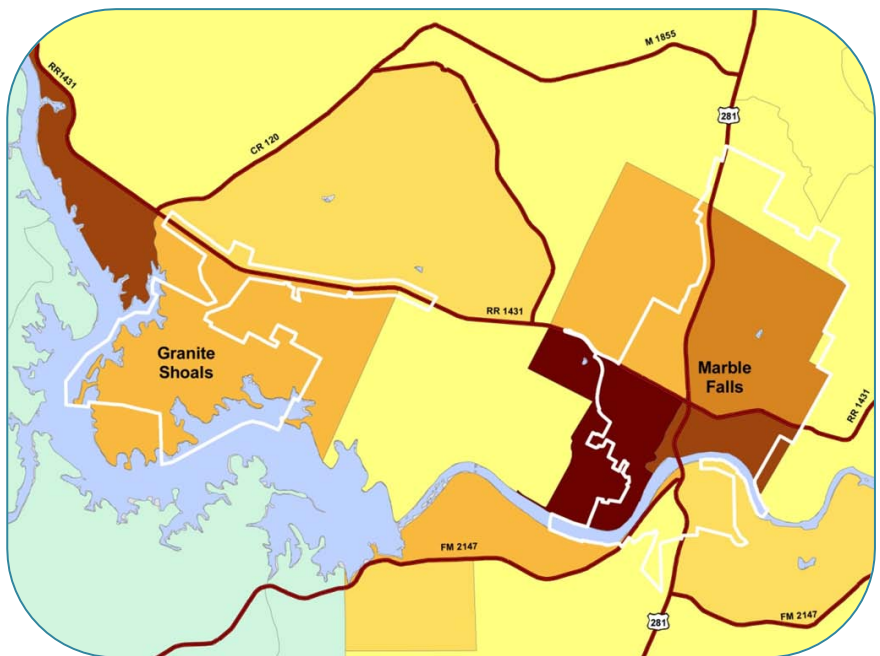
# Planning Considerations

Granite Shoals' existing transportation plan is included within the 1979 Burnet County Transportation Plan, and provides very limited detail to the types of thoroughfares necessary to support the current and future demands. The Plan is aimed at addressing the dynamic and changing needs that have occurred in Granite Shoals. Efficient movement, preventing congestion, connectivity, development activity, and roadway design considerations are among key issues to be addressed.

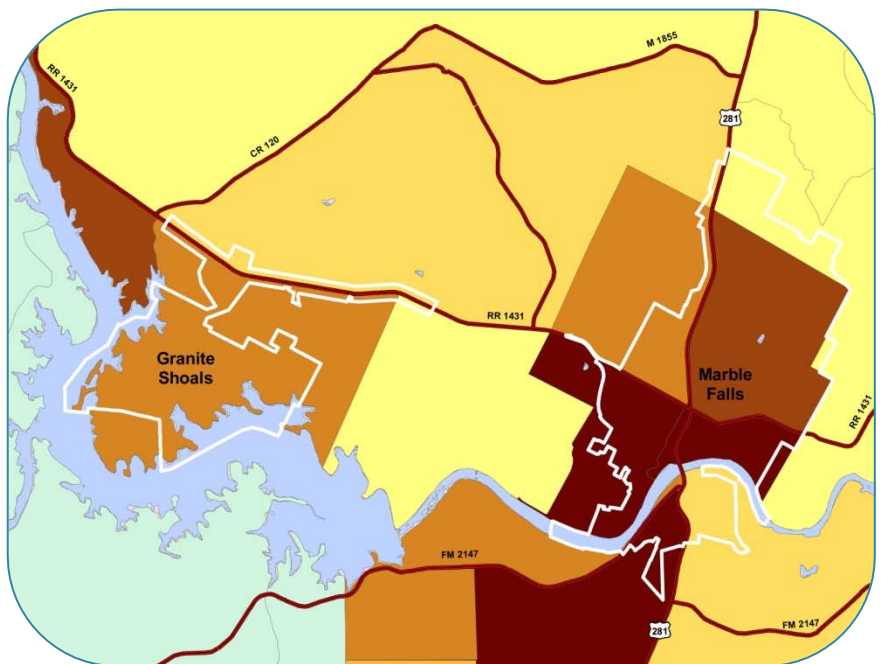
Burnet County is currently working toward creation of a comprehensive transportation plan, with adoption anticipated for March 2010. This section references information presented August 6, 2009.

Population growth is anticipated to occur throughout the region, according to the Burnet County Comprehensive Transportation Plan. **Figure 3-1** shows a 2005 generalized population density for Granite Shoals and the surrounding area. **Figure 3-2** shows the projected 2035 generalized population density for the same area. Darker shades indicate a higher population density. As can be seen, much of the area is anticipated to become more dense, including Granite Shoals. In order to support the demands of the growing population, Granite Shoals' transportation system must expand.

**Figure 3-1. 2005 Population Density**



**Figure 3-2. 2035 Population Density**



Source: Burnet County Comprehensive Transportation Plan



Figure 3-4. 2005 Current Traffic Congestion

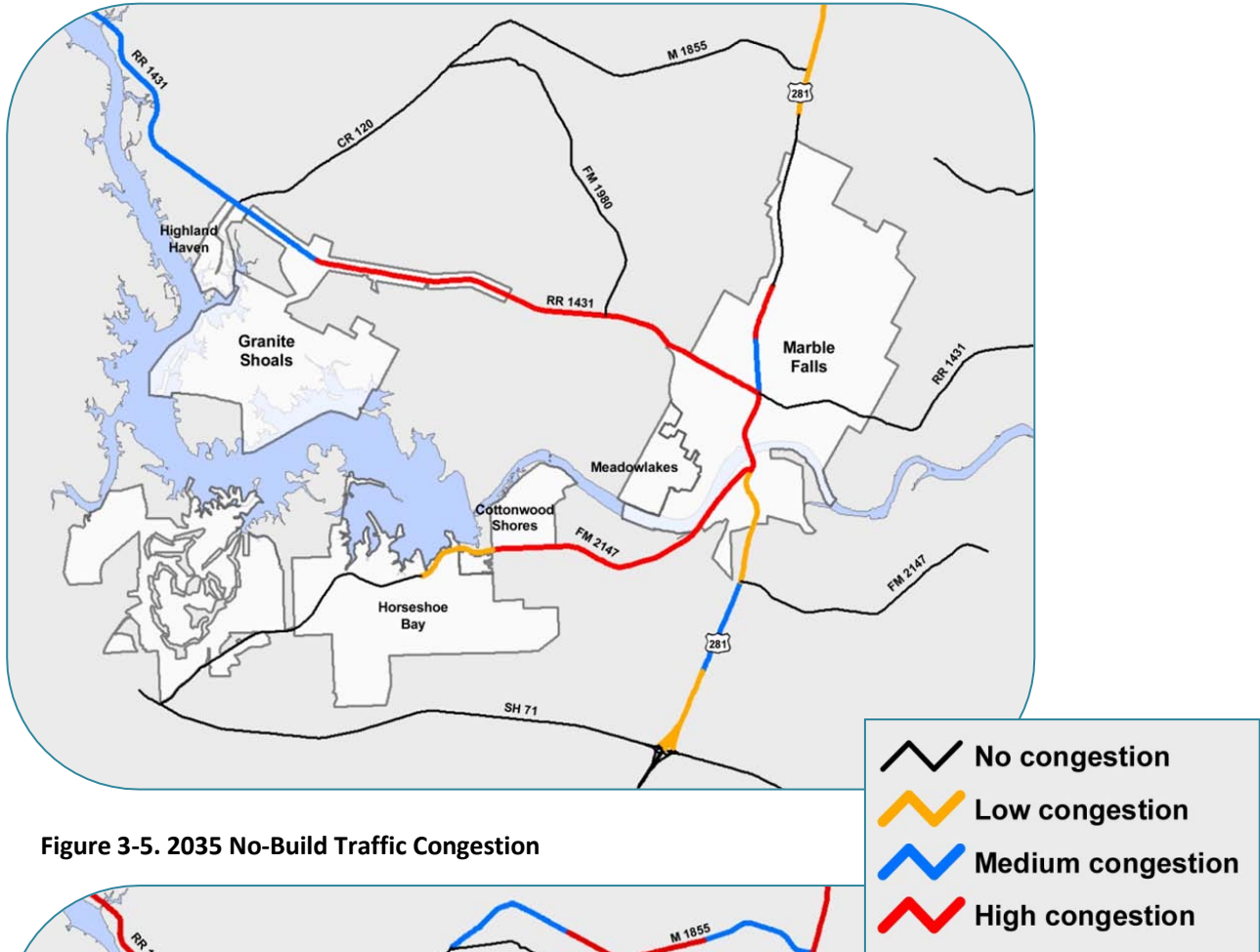
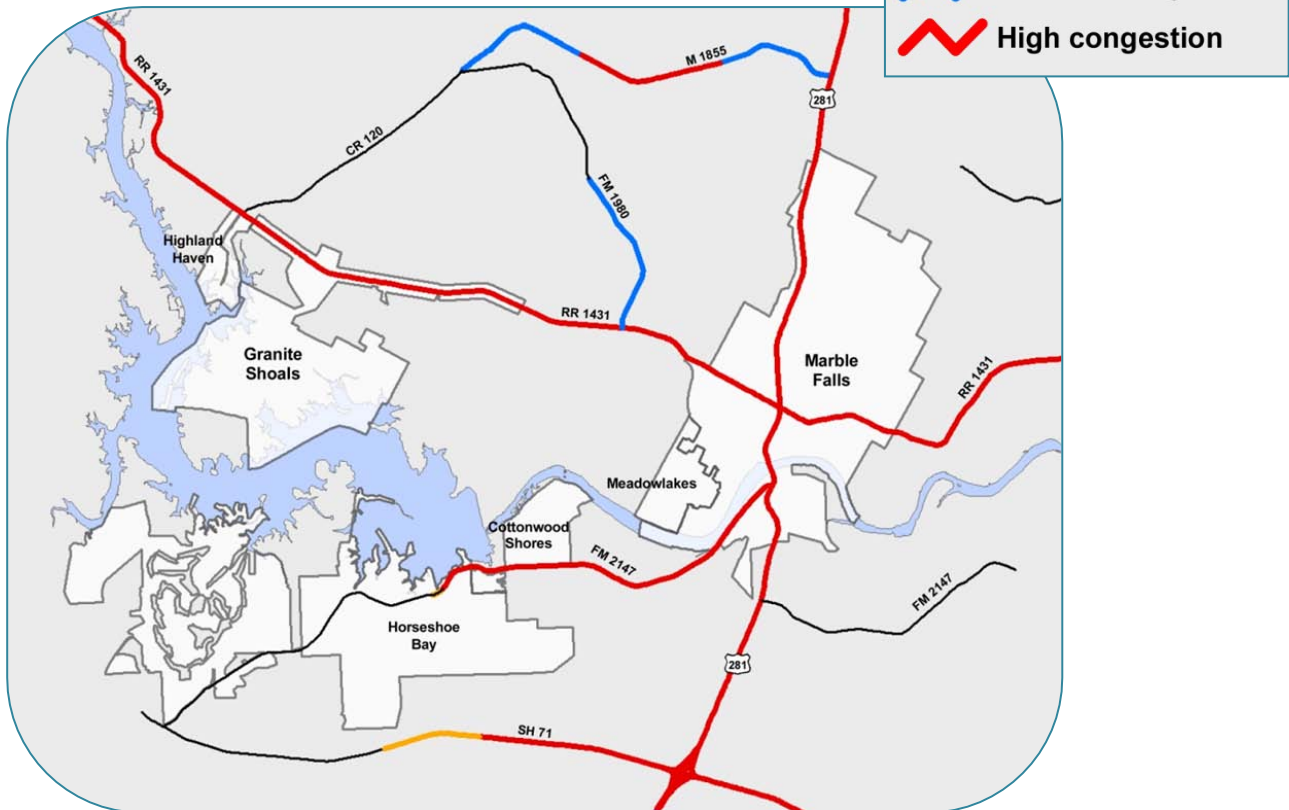


Figure 3-5. 2035 No-Build Traffic Congestion

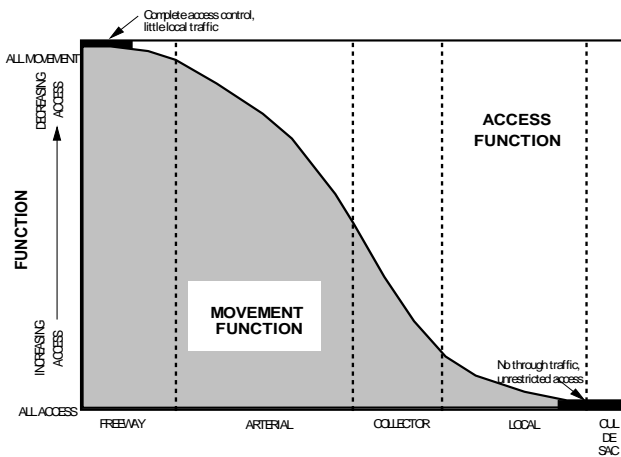


Source: Burnet County Comprehensive Transportation Plan

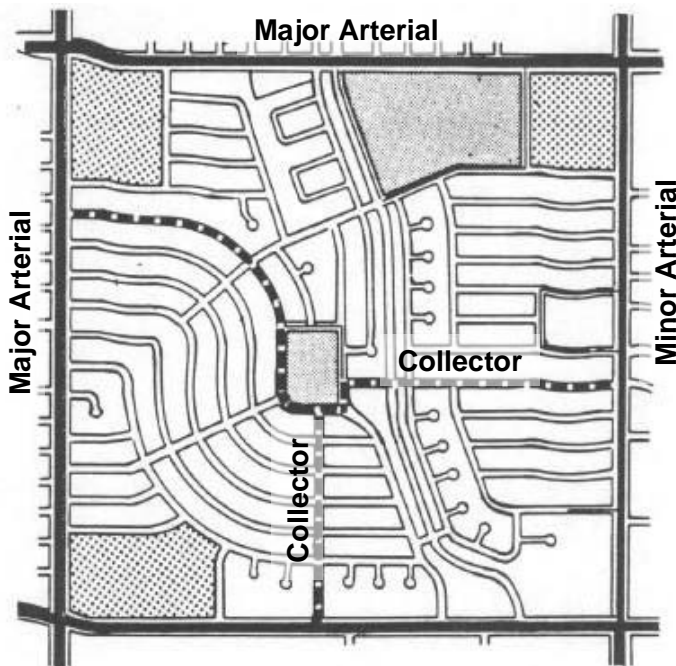
# Recommendations

The following sections are the recommendations for the transportation system within Granite Shoals. The Transportation Plan map, shown in **Plate 3-1**, is based on a system recognizing a hierarchy of streets, continuity of existing routes, and accommodating traffic flow.

**Figure 3-6. Relationship between Access and Movement**



**Figure 3-7. Functional Classification System**



## Functional Street Classification

Functional street classification recognizes that streets are part of a system having diverse origins and destinations. A typical trip involves the following stages: primary movement, transition, collection/distribution, access and termination. Functional classifications also describe and reflect a set of characteristics common to all roadways within each class. Functions range from providing mobility for through traffic and major traffic flows, to providing access to specific properties. Characteristics unique to each classification include the degree of continuity, general capacity, and traffic control characteristics. **Figure 3-6** and **Figure 3-7** illustrate the relative roles of each classification to achieve its intended function.

In short, the functional classification of streets provides for the circulation of traffic in a hierarchy of movement from one classification to the next. For each classification, there is typically a recommended set of operational and design criteria.

Transportation plans typically recognize four general classes of roadways that are based on a hierarchical function that include: freeways, arterial streets, collector streets and local/residential streets.

- **Freeways** are devoted entirely to traffic movement with limited or no direct land service function. Freeways are multi-lane divided roadways with a high degree of access control and grade-separated intersections. Full or partial control of access distinguishes freeways from other classes of roadways. Freeways serve large volumes of high-speed traffic, are intended to serve inter-regional trips, and typically fall under design guidelines established by TxDOT. Examples of Freeways near Granite Shoals include U.S. Highway 281 and State Highway 71.
- **Arterial Streets** are streets that provide a high degree of mobility, service relatively high traffic volumes, have high operational speeds, and service a significant portion of through travel or cross-town trips. Arterial roadways serve as connections between major traffic generators and land use concentrations. Minor arterials serve as connections between collectors and major arterial streets. Because direct access is a secondary function of arterial streets, access should be carefully managed. An example of an existing arterial class facility would be R.R. 1431.
- **Collector Streets** serve as connections between arterials and local/residential streets and serve to collect and distribute traffic to the arterial network. Collectors also serve to provide direct service to neighborhoods, commercial developments, and other local areas and their design involves site specific considerations. Collectors accommodate smaller volumes of traffic over shorter distances and may border or traverse neighborhood boundaries. Collector streets should be discontinuous to discourage cut-through traffic through neighborhoods. An example of a collector class facility would be Lake Drive.
- **Local Streets** are intended to provide direct access to abutting property and to collect/distribute traffic form individual parcels. These streets are intended for short, low volume and slow speed traffic movements. Right-of way for these two-lane streets is 50 feet.

Because the Freeway classification does not apply to roadways within Granite Shoals, this section will focus on Arterial Streets, Collector Streets, and Local Streets.

**Table 3-1** describes the most important characteristics of the various functional street classes. These planning guidelines should be utilized in developing or redeveloping areas to form a basic framework for the thoroughfare system.

Also included in **Table 3-1** is information on the typical level-of-service each roadway class is intended to provide. Level-of-service refers to a measure of capacity that a section of roadway or intersection can accommodate during peak traffic conditions. It is defined in terms of delay with six categories ranging from "A" through "F" being assigned to reflect the relationship between the design capacity and the traffic demand upon a particular segment. As demand approaches capacity, the level of service decreases. Level of service "C" is typically recommended for design purposes.

While the above described conditions are ideal, it may not be practical or even possible to modify existing streets in already developed areas to conform to the desired design standards for all the street functional classifications. In cases where neighborhood areas are bisected by major roadways, alternative cross-sections may be applied to assure that neighborhood integrity is preserved while providing traffic access.

**Table 3-1. Roadway Functional Classifications and General Planning Guidelines**

Type of Roadway	Function	Spacing <sup>(1)</sup> (Miles)	Direct Land Access	Roadway Intersection Spacing <sup>(3)</sup>	Volume Ranges (vehicles/day)	Speed Limit (mph)	Planning Level of Service (Los)	Parking	Comments
Arterial	Moderate distance inter-community, intra-metro area, traffic movement. Mobility function is primary; access function is secondary. Serves moderate or long trip lengths.	1/2 to 1 1/2 <sup>(2)</sup>	Restricted – some movements may be prohibited; number and spacing of driveways controlled.	1/8 to 1/4 mile	10,000 to 40,000	30-55	C-E	None	"Backbone" of the street system. Provides route and spacing continuity with major arterials.
Collector	Provide access within and between neighborhoods.	1/4 to 1/2 <sup>(2)</sup>	Safety controls; limited regulation.	300 feet	1,000 to 10,000	30-40	B-C	Limited	Two to four lanes of typically undivided traffic. Connects locals to arterials.
Local	Land access.	2 lot lengths	Safety control only.	300 feet	200 to 1,000	20-30	A-B	Permitted	Through traffic should be discouraged.

(1) Spacing determination should also include consideration of (travel within the area or corridor based upon) ultimate anticipated development.  
(2) Denser spacing needed for commercial and high-density residential districts.  
(3) Spacing and intersection design should be in accordance with state and local thoroughfare standards.

**Table 3-2** contains information related primarily to the amount of land required to provide adequate right-of-way for each type of roadway, ranging from two lane undivided local streets to four/six lane divided arterials.

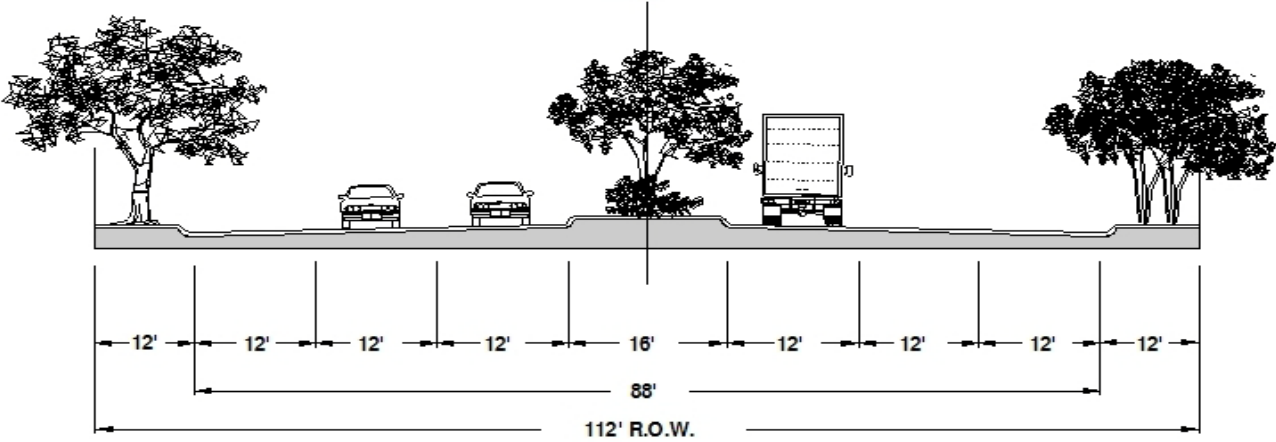
**Table 3-2. Roadway Functional Classification Characteristics**

Roadway Type	Arterial 4-6 lane* Divided	Collector 4 lane Undivided	Collector 2-3 lane Undivided	Local 2 lane Undivided
<b>ROW</b>	90' or 112'	64'-68'	60'	50'
<b>Pavement Width (face-to-face)</b>	2 @ 24' or 2 @ 36'	40'-48'	38'	27'
<b>Lane Width</b>	4/6 @ 12'	4 @ 12'	2 @ 11' (with 8' parking)	2 @ 13.5'
<b>Left-Turn Lanes</b>	1 @ 12'	--	--	--
<b>Median Width</b>	16'	--	--	--
<b>Sidewalks</b>	Both	Both	Both	Both
<b>Parkway Width</b>	12' or 13'	10'	11'	--
<b>Design Speed (mph)</b>	40-50	35-40	30-35	25

\*Note that outside lanes are intended to provide for on-street parking.

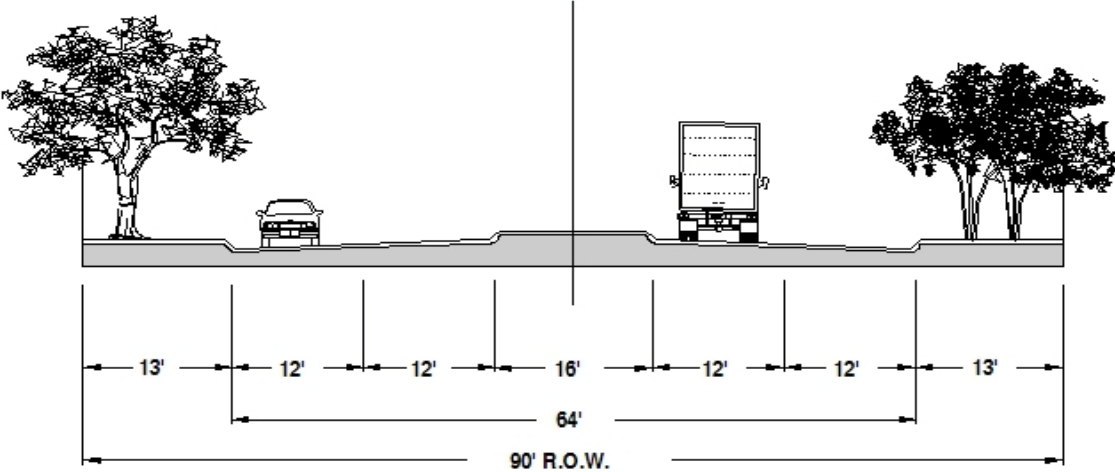
The following cross sections relate to **Table 3-2** and **Table 3-3**, providing visual examples of each type of roadway. With each figure, an example of an appropriate application is provided.

**Figure 3-8. Arterial (Major)**



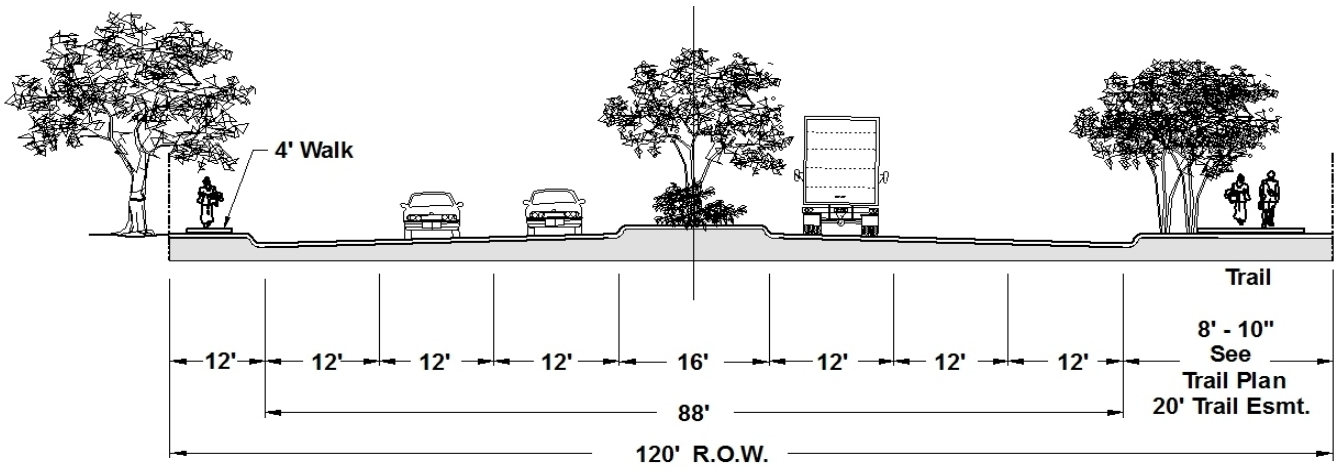
Arterial (Major): Appropriate for R.R. 1431

**Figure 3-9. Arterial (Minor)**



Arterial (Minor): Appropriate for C.R. 120

**Figure 3-10. Arterial (Major) with Trail**

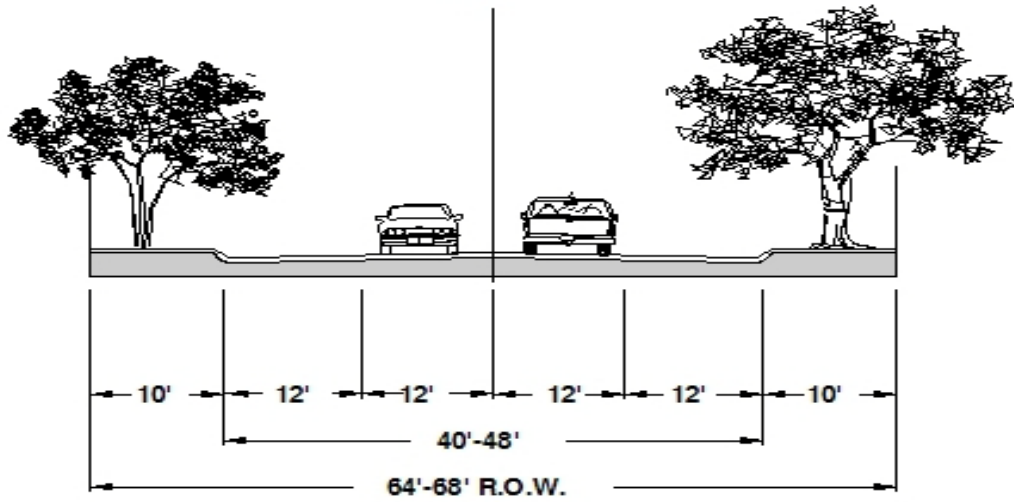


Arterial (Major) with Trail: Appropriate for middle portion of Phillips Ranch Road

\*Note that outside lanes are intended to provide for on-street parking.

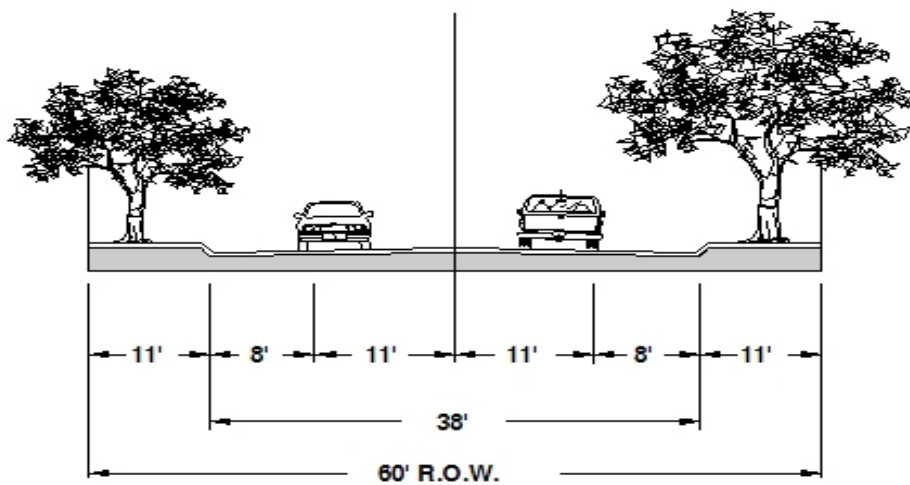
The City intends to develop Phillips Ranch Road similar to the cross section shown in **Figure 3-10**, which will require additional right-of-way. To acquire this additional right-of-way, the City will purchase any undeveloped property along the west side of the thoroughfare in order to widen the right-of-way while avoiding negative impacts on the existing businesses or homes.

Figure 3-11. Collector (Major)



Collector (Major): Appropriate for Prairie Creek Drive

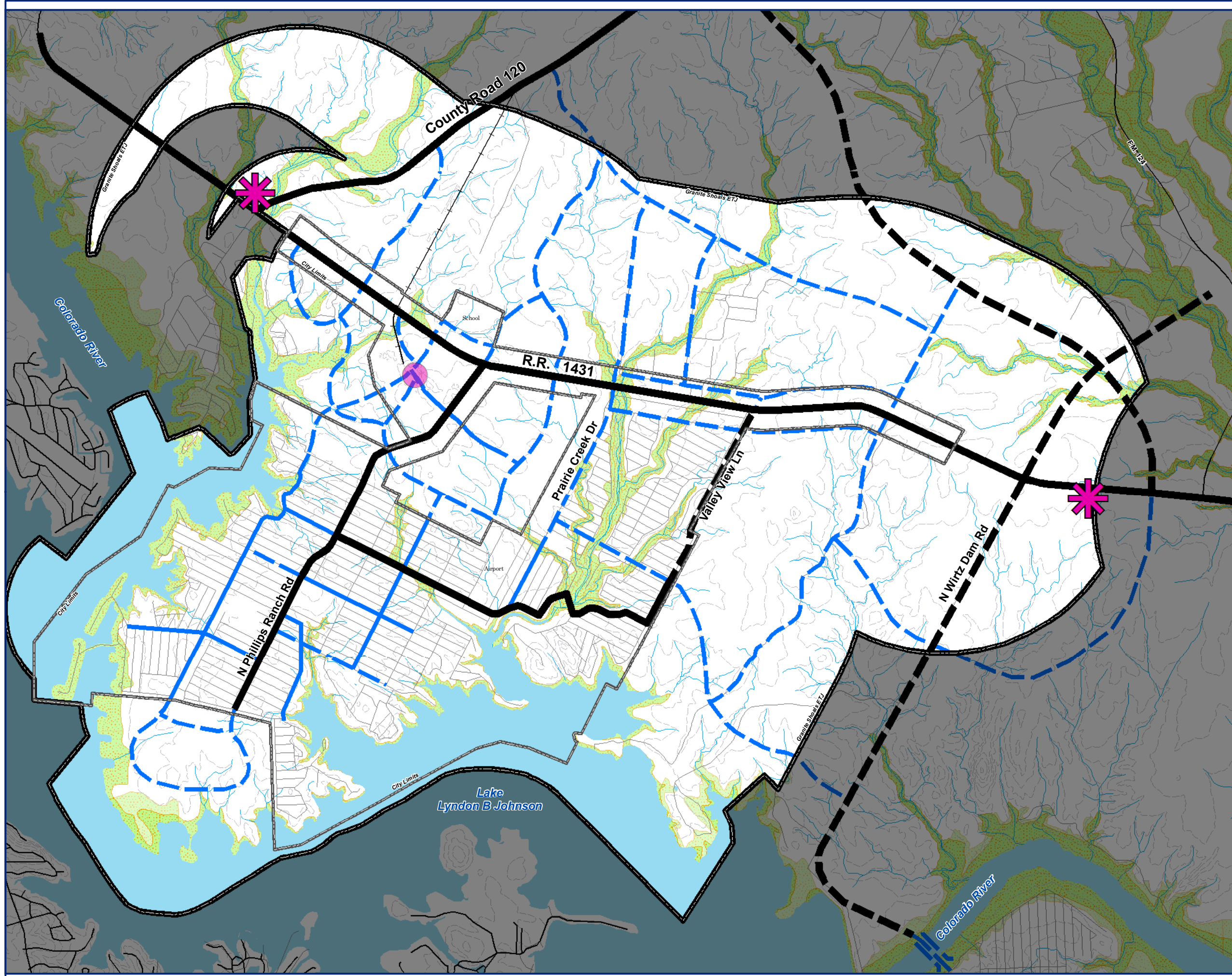
Figure 3-12. Collector (Minor)










Collector (Minor): Appropriate for Greencastle Drive

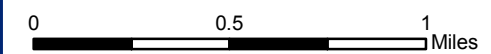
City of Granite Shoals, Texas  
**Transportation  
 Map  
 Plate 3-1**

Date: January 2010



**Transportation Legend**

-  Arterial
-  Proposed Arterial
-  Collector
-  Proposed Collector
-  Local
-  Gateway
-  Roundabout



Note:  
 A comprehensive plan shall not constitute zoning regulations or establish zoning district boundaries



## Transportation Plan Map

The Transportation Plan map, as shown in **Plate 3-1**, represents the recommended classification system, extensions, and design criteria. Shown as dashed lines, there are several proposed roadway extensions throughout the City and the ETJ. Two of the proposed arterials currently exist as smaller roadways – Wirtz Dam Road and Valley View Lane/Granitecastle Drive – however, development of these roadways as larger arterials is recommended to provide adequate support and circulation.

Additionally, a system of collector roads has been proposed throughout the area to allow for greater access and connectivity among neighborhoods, primarily within the lesser developed areas.

As can be seen on **Plate 3-1**, a bridge is proposed for Wirtz Dam Road to cross the Colorado River, providing access to Glen Drynette Drive and F.M. 2147 in Cottonwood Shores.

### Gateways

Communities that lack visual identity tend to be anonymous within a region. In contrast, the addition of eye-catching gateways can vastly improve the public’s perception of an area. Although there are no communities in direct proximity to Granite Shoals, there are no gateways welcoming people to the City and allowing them to know that they have “arrived” in Granite Shoals. It is therefore recommended that the City examine incorporating gateways as a component of promoting the City’s identity. **Plate 3-1** indicates two areas along R.R. 1431 which may be utilized for gateway features. Additional discussion regarding gateways is included within the Future Land Use Plan (Chapter 4).

The visual monotony inherent to communities within a particular geographic area makes it appear that each one is just like its neighbors. For example, the visual appearance of the City to a traveler along R.R. 1431 may be very similar to the appearance of any other nearby community. This lack of design variety, especially along major corridors, tends to create anonymity – one community looks just like its neighbor, and it becomes difficult for people to know when they have left one community and entered another. Gateways can provide a strong sense of arrival to, as well as





a sense of departure from, the community. These features are the first thing visitors see when they arrive and the last impression visitors have when they leave.

The design of gateways into the City of Granite Shoals should be guided by several factors. One of the most important factors is the number of people using a particular entry point. The most heavily traveled roadway entering the community is R.R. 1431. Two entry features for the City placed directly along R.R. 1431, both leading into and out of the community (i.e., at the western and eastern corporate limits) would be a positive step in creating a visual identity. This gateway could include the use of granite or other natural materials, signage, landscaping, and other design elements such as lighting, fencing, paving patterns, art/sculptural elements, a variety of earth forms, or other identifiers that signify arrival into the City.

In addition, the City should consider advertisement opportunities along larger thoroughfares, such as State Highway 71 and U.S. Highway 281, promoting Granite Shoals' unique features to increase tourism.



Another important factor in the design of gateways is to develop an entryway that provides a sense of identity for the community, while projecting a desirable image for the City. Consideration should be given to establishing a uniform design concept for all gateway treatment areas, and hierarchical distinction between major and minor gateways can be achieved through design modification for each type of entry feature. Minor gateways could be specific to the individual neighborhood, reflecting the distinct character of each area.

Design of entry features should take into consideration the setting in which each feature will be placed. Although any entry feature might ideally be placed at the corner of a roadway intersection which is at, or near, the true City limits, the design of the feature might conflict either visually or aesthetically with an adjacent use at the intersection. In such a situation, it may be prudent to move the entry feature further into the community to provide a better setting and better visibility, such as placing it upon the thoroughfare median, if there is one. The traffic speed at which an entry feature is viewed must also be taken into account, and the size, boldness and scale of

the feature should be designed accordingly.

Priority for funding gateway features, both in terms of total dollars spent per entry and in terms of the timing of expenditures, should be directly related to the number of people using a particular entry point. Donations can often be solicited from civic groups to assist in the funding of specific gateways and/or their maintenance (e.g., an "adopt a gateway" program).

Gateway features not only create a visual point of entry and exit within a community, but they can serve to introduce the community to visitors and create a first impression. For example, many communities will incorporate a specific design, materials, or landscaping into gateway design features in order to distinguish what makes their community unique. For this reason, granite shoals should seek to incorporate granite as a major component of its gateway design. Outcroppings, if located appropriately, may also serve as a potential gateway options.

## Context Sensitive Design

Context Sensitive Design (CSD) is the practice of developing transportation projects that serve all users and meet the needs of the neighborhoods through which they pass. It is a collaborative process that involves all stakeholders in developing street designs that fit into the character of surrounding neighborhoods while maintaining safety and mobility.

### Principles of Context Sensitive Design:

- **The project is in harmony with the community, and it preserves environmental, scenic, aesthetic, historic and natural resource values of the area.**
- **The project is designed and built with minimal disruption to the community.**
- **The project is seen as having added lasting value to the community.**

*From "An ITE Recommended Practice: Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities."*

The key is that elements of the street should complement the context of the surroundings or adjacent development to generate a "roadway experience" for instance, a roadway may need to be designed as a six-lane boulevard as it travels through a commercial area, but may need to be altered to a minor street configuration as it travels through a town center or mixed-use area.

The process of designing CSD roadways is similar to the process of designing traditional thoroughfares in that automobile traffic is considered with traffic counts, traffic demand, and level of service information-gathering efforts. However, the difference is that automobile traffic is only one element considered, among numerous others, in the design of CSD roadways.

TxDOT has begun to incorporate CSD concepts into its newer projects. The City should explore the possibilities of CSD solutions on any of its joint projects with TxDOT. Ideal areas for CSD application would be along R.R. 1431 east of Phillips Ranch Road, and along Phillips Ranch Road south of the proposed Town Center.

**Beyond functional purposes of permitting people to get from one place to another and to gain access to property, streets – most assuredly the best streets – can and should help to do other things: bring people together, help build community, cause people to act and interact, to achieve together what they might not alone. As such, streets should encourage socialization and participation of people in the community...The best streets create and leave strong, lasting, positive impressions; they catch the eyes and the imagination.**

*Jacobs, Allan B. – Great Streets. page 312. Massachusetts Institute of Technology. 1995*

## Alternative Transportation Options

The ability of an individual to move from one location to another, or general mobility, goes beyond simply creating opportunities for the automobile. Creating alternative transportation options is a fundamental component of a well balanced transportation plan. Consideration to transit options, pedestrian pathways, and bicycle opportunities should be of particular importance. Such options not only improve the general mobility of a community, but they have the opportunity to directly enhance the City's quality of life by creating recreational opportunities which improve the general health and well-being of the community's citizens.

### Transit

Public transit may become a more apparent need for Granite Shoals as Burnet County and the surrounding area grow in population and traffic congestion. Public transit, particularly light rail, allows for a reliable commuting schedule which is not dependent upon traffic congestion. Currently, a regional commuter rail line is being considered to run from Austin to points west. In Granite Shoals, an existing rail line ends at R.R. 1431 near the future Town Center. This would be a prime location for a commuter rail stop and could work in conjunction with the Town Center to create a transit oriented development (TOD). Although commuter rail may be an opportunity for the future, this site area could currently be utilized as a "park and ride" location.

### Pedestrian Pathways

Pedestrian walkability gives specific attention to creating sidewalks and pathways which are safe for pedestrians. The decision of an individual to walk to perform their daily needs is typically influenced by the availability and perceived safety of pathways. Therefore, the City should examine incorporating pedestrian pathways into cross-section designs. This may be implemented within current City right-of-way or may be acquired by easement.

Pathways may be in the form of sidewalks along City streets or may take the form of larger pedestrian pathways. Larger pedestrian pathways would require sufficient width to accommodate multi-modal uses such as biking, jogging, or walking. Additionally, it would be ideal for such pathways to provide trees, shrubs, or other landscaping between pedestrians and traffic flows, especially along corridors with higher traffic volumes.

Pathways should link various parts of the City, creating links between residential and nonresidential areas, parks, and schools. Three specific pedestrian crossings are also recommended on R.R. 1431 at Phillips Ranch Road and at the locations of two proposed minor arterial roadways, reflected in **Plate 7-2**.

### **Bicycle Options**

Bicycle options are another important alternative transportation mode. This option is specifically important for Granite Shoals due to its location on Lake LBJ and the many recreational opportunities available through City parks. Bicycle options may be included in multi-purpose pathways along roadways. These pathways would be located within City right-of-way or easement and would typically be, at minimum, six feet in width to accommodate pedestrians and bicyclists safely.

Another option for creating bicycle pathways is the inclusion of bicycle stripes within the street itself. This option is only intended for areas with lower traffic volumes in order to ensure the safety of the bicyclist. The advantage of this option is that it is economical and practical. Right-of-way and easement acquisition is not necessary, which reduces implementation cost.

As with pedestrian pathways, bicycle options should be examined as a part of the City's cross-sections. Additionally, bicycle routes should serve to connect various parts of the community such as residential areas to the Town Center and parks.

### **Aviation**

The Granite Shoals Airstrip is currently a 2,000' grass runway, however it is proposed the runway be paved and extended to 5,000' to support additional operations. Further detail regarding the airport is provided within Chapter 4: Future Land Use Plan.

# Conclusion

The purpose of this Transportation Plan, as a component of the overall comprehensive plan, is to accommodate the existing and future roadway transportation needs of the City. Similar to the Future Land Use Plan, implementation of the Transportation Plan will require consistent administration by the City. It is not suggested that the City engage in a major thoroughfare construction program, as the present system will be adequate for the existing development. As development occurs, however, right-of-way should be secured for widening of new roads, and acquisition of right-of-way along developed road, as possible. In addition, the City Council should continue to conduct annual reviews of the thoroughfare CIP to ensure the goals and priorities remain up-to-date.

**Table 3-3** below summarizes the recommendations from this Transportation Plan chapter.

**Table 3-3. Transportation Plan Recommendation Summary**

Recommendation	Page
Adopt a functional street classification system for all roadways within the City limits and the ETJ area, and characteristics and cross sections for each.	3-6
Begin planning to construct new or upgrade existing roadways as shown in the Transportation Plan map. Develop a capital improvements plan for purposes of defining project segments.	3-15
Identify specific sites for gateway entrances into the City. Allocate funding and acquire desired land.	3-15
Implement context sensitive design principles along highly visible key roadways, such as R.R. 1431 and Phillips Ranch Road.	3-16
Maintain coordination and consistency between the Transportation Plan and the Parks & Open Space Plan in order to ensure adequate connectivity, both pedestrian and vehicular, throughout the community. Coordinate with Burnet County and TxDOT to ensure State and County improvements are built to Transportation Plan standards.	3-17

Investigate feasibility of a light rail connection utilizing the existing rail line, as well as options for a future “Park and Ride”.

3-17