TRANSPORTATION

The economic vitality, character, and identity of College Station depend, in part, upon a well-connected transportation system. College Station requires a transportation system that provides mobility in the face of ever-increasing population and traffic. Residents seek a system that responds to this mobility challenge in an integrated and context sensitive manner. Facilities should accommodate automobiles, transit, bicycles, and pedestrians, furthering the City's efforts to promote positive community character and identity.

By living in a growing university community, College Station residents have mobility options beyond the private automobile, including designated bike routes, an extensive sidewalk network, and local transit services.

Residents have voiced their support for a transportation network that better manages congestion; offers more travel options and choices; and is sensitive to the neighborhoods, natural areas, and districts. The challenges facing the current transportation system demand strategic thought about how College Station plans land uses, designs projects, and makes the system more bike friendly and walkable. It is also necessary that significant expenditures be made to add capacity to our existing roadways and to build new streets. The City must also keep planning for to ensure adequate right-of-ways exist to accommodate the needs of future generations, while not compromising future transportation options. Developing a successful transportation plan requires a thorough understanding of current conditions, opportunities, challenges, and preferred outcomes.

PURPOSE

The purpose of this chapter is to ensure orderly and integrated development of the community's transportation network, considering not only facilities for automobiles, but also transit, bicycles, and pedestrians. This chapter includes the Thoroughfare Plan, identifying the network's roadway needs for the next 20 years. It also includes an overview of the planning considerations associated with the City's transportation needs and a discussion of context sensitive solutions. It also serves as the foundation for the Bicycle, Pedestrian, and Greenways Master Plan. Finally, there is the identification of strategies and action recommendations that will facilitate the development of the transportation system.

EXISTING MOBILITY

Street Network

The thoroughfare network in College Station and its Extraterritorial Jurisdiction consists of more than 200 miles of existing streets. The freeways and a majority of the arterial streets are part of the Texas Department of Transportation system, with the remainder planned, built, and maintained by the City and Brazos County. Many of the freeway and arterial streets have seen dramatic increases in traffic volumes over the past decade, necessitating substantial capacity improvement projects, such as the widening of Texas Avenue, interchange improvement on State Highway 6, and improvements on Wellborn Road (FM 2154) and Harvey Mitchell Parkway (FM 2818). Current traffic counts on various roadways across the community are displayed in **Map 6.1, Existing Traffic Volumes**.

Increases in traffic volumes have resulted in peak hour congestion along certain corridors and at specific intersections. These hotspots are dispersed throughout the City, but tend to be found most often where two high-volume roadways intersect. In addition to increases in traffic volume, intersection design, traffic signal operations, driveway locations, and adjacent land uses each contribute to the decreased service levels in these hotspots. The *College Station: Existing Conditions* report, prepared to accompany this Plan, provides detailed information about the current thoroughfare network. The level of service on area roadways in 2007 is displayed in **Map 6.2, 2007 Level of Service**.

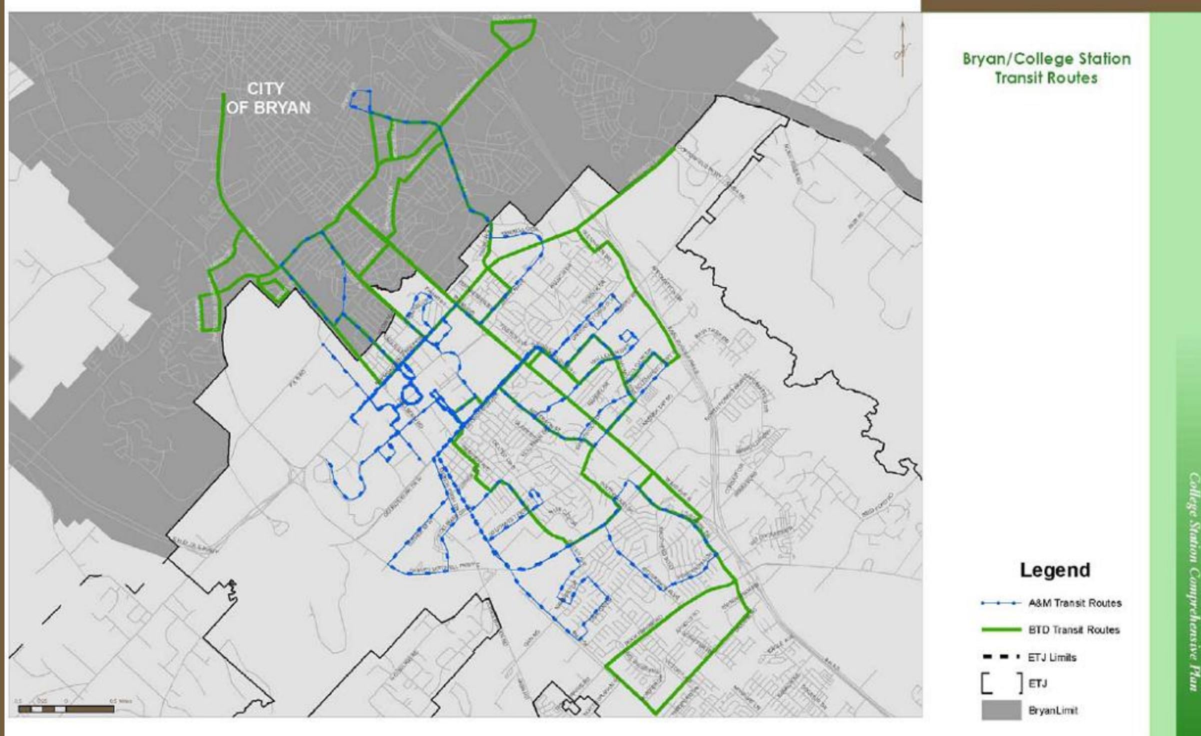
Transit

A variety of organizations provide transit service in College Station, with the primary provider being Texas A&M University. Other providers include The District and the Brazos Valley Area Agency on Aging. Additionally, the College Station Independent School District operates a large fleet of buses used to transport students to and from its schools.

Texas A&M University has operated a transit system for students, employees, and on-campus visitors since 1982. The system currently consists of 95 buses operating 13 off-campus routes in the cities of Bryan and College Station, every day of the week. In addition to these fixed off-campus routes, the system also includes seven on-campus routes, a door-to-door shuttle service for disabled students and employees, an airport shuttle between campus and Easterwood Airport, and charter services. During home football games, special game day transportation is provided, shuttling riders between the campus and park-and-ride lots located at Post Oak Mall. Based on the latest available data, the daily ridership on the fixed off-campus routes averaged more than 18,000 passengers and on-campus routes averaged nearly 15,000 passengers (2004).

The District, first established as the Brazos Transit System, has operated transit routes for the general public since 1982. Services extend across a 16-county area in southeastern Texas. The system currently operates eight fixed-routes in the cities of Bryan and College Station, Monday through Friday. In addition to these fixed-routes, the system also includes limited door-to-door services for elderly and disabled residents and demand response (by schedule) door-to-door services, with a preference to persons with medical appointments. Based on the latest available data, the annual ridership for the system in the cities of Bryan and College Station was more than 270,000 passengers (2001). **Map 6.3, Existing Transit Routes**, displays the existing bus transit routes in College Station and Bryan.

MAP 6.3
Existing Transit Routes



SOURCE: City of College Station

The Brazos Valley Area Agency on Aging operates a demand response (by schedule) door-to-door service for elderly residents of College Station with a preference to persons with medical appointments. This service is coordinated through the Brazos Valley Council of Governments.

The College Station Independent School District operates a fleet of 48 buses, including eight buses designed and used for special needs. Currently, the system consists of 42 routes serving 12 schools and more than 2,500 of the 9,000 students enrolled in the district.

Bicycle and Pedestrian Facilities

College Station currently accommodates bicyclists by on-street bike lanes, off-street multi-use paths, and signed bicycle routes. Pedestrians are accommodated by a network of sidewalks and multi-use paths. Over the past couple of decades, the City has adopted a series of master plans addressing the bicycle and pedestrian needs of the community. Each of these plans has initiated actions and funding approvals by residents, resulting in 32 miles of on-road bike lanes, three miles of off-road multi-use paths, 50 miles of signed bicycle routes, and 106 miles of sidewalks dispersed throughout the City. Texas A&M University has a similar network, facilitating bicycle and pedestrian movements on campus.

Aviation

Easterwood Airport connects the City of College Station to other metropolitan areas of Texas and the Nation. The airport has been owned and operated by Texas A& M University since 1938 and is served by two commercial airlines, as well as offering general aviation services. The airport encompasses nearly 700 acres, including three runways – one primary and two crosswind runways. The airport includes a passenger terminal constructed in 1990 and recently remodeled, as well as a general aviation terminal remodeled in 1994. Recent data (2005) indicates the airport had total aircraft operations of more than 60,000, with more than 60% of the operations involving general aviation aircraft. In 2008, the airport served more than 150,000 passengers through commercial operations, slightly fewer than the numbers served in the preceding year.

Pending Projects

The City of College Station and other regional transportation providers, through partnership with the Bryan-College Station Metropolitan Planning Organization, have identified transportation projects needed to meet increasing demands. These projects are identified in a number of plans and studies, but most important are those projects identified in the City's Capital Improvements Program, the City's most recent bond approval, the State's Transportation Improvement Program, and the Metropolitan Planning Organization's Transportation Improvement Program. These documents identify projects that have funding either authorized or appropriated for land acquisition, design, and construction, and are therefore imminent. Projects on these lists include the following:

- State Highway 6 ramp and interchange improvements;
- Barron Road - State Highway 6 interchange construction;
- Barron Road widening;
- William D. Fitch Parkway widening;
- FM 2154 and FM 2818 grade separation;
- Bee Creek Trail design and construction;

- Spring Creek Trail design and construction; and,
- Texas A&M University bus system improvements.

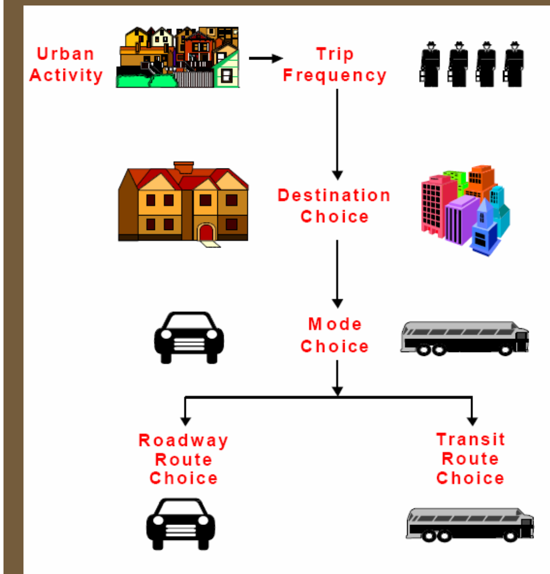
For a complete list and project details, consult the documents previously referenced.

PLANNING CONSIDERATIONS

Future Conditions

With the population projected to increase by approximately 40,000 persons by 2030, traffic, too, is expected to increase substantially. With increased traffic comes the potential for increased congestion and degradation of levels of service. However, this growth will also increase the demand for pedestrian, bicycle, and transit facilities.

FIGURE 6.1
Activities Analyzed by Travel Demand Model



A travel demand model was prepared for this Plan, in the manner depicted in **Figure 6.1, Activities Analyzed by Travel Demand Model**, using projected population and employment growth based on the Future Land Use & Character map. The model was used to aid in the determination of the transportation network needs, to refine the Future Land Use & Character map, and for identification and prioritization of the recommended capital expenditures.

Without significant investments in new and expanded roadways, pedestrian and bicycle facilities, and transit, the estimated travel demand will result in increased congestion and a degradation of level of service in numerous locations. To be successful, transportation investments must be accompanied by significant increases in transit ridership and the reduction of vehicle trip and travel distance through better land use planning, increased use of bicycles, and improved walkability. **Map 6.4, 2030 Lanes with Programmed Projects**, displays the number of lanes required to accommodate the projected traffic volumes in 2030. **Map 6.5, 2030 Traffic Volumes with Programmed Projects**, displays the projected traffic volumes on College Station roadways in 2030.

Regional Transportation Network

The City of College Station is only one of many entities involved in the planning, construction, and operation of transportation facilities. The Bryan-College Station Metropolitan Planning Agency, the Brazos Valley Council of Governments, and the Texas Department of Transportation each have their own role in transportation planning, funding, construction, and maintenance. The Metropolitan Planning Organization serves as the regional partnership that coordinates regional transportation planning and manages federal transportation funding that comes to the region. The Organization maintains the region's Metropolitan Transportation Plan and the Transportation Improvement Program.

The Brazos Valley Council of Governments is a regional partnership focused on a variety of topics of importance to its members. The Council is involved in planning for and operating transit services for the elderly through the Area Agency on Aging. The Council also assists the City in its involvement with the Texas High Speed Rail Initiative and the establishment of a regional mobility authority.

The Texas Department of Transportation is responsible for planning, constructing, and operating most of the City's primary mobility corridors, including State Highway 6, Harvey Road (State Highway 30), William D. Fitch (State Highway 40), Harvey Mitchell Parkway (FM 2818), Wellborn Road (FM 2154), and Texas Avenue. The Department also partners with the City to enhance landscaping within State highway rights-of-way, bicycle facilities funding, and railroad crossing safety improvements. It is critical that transportation planning in the City be coordinated with each of these partners so that the City's transportation system supports the mobility needs of the region.

Transit

Transit will need to play an increasing role in the City's transportation system in order to provide travel choices and minimize expenses in expanding roadway capacity. While providing valuable services and congestion relief today, the fragmented and limited system of current transit services will not be sufficient to meet future needs. The City is a partner in the Texas High Speed Rail Initiative which, if constructed, would provide high-speed commuter rail services to College Station, connecting it to the major metropolitan areas of eastern Texas.

Bicycle and Pedestrian Facilities

Expanded bicycle and pedestrian facilities, as part of an integrated multi-modal transportation network, needs to offer alternatives to vehicular travel and aid in reducing the vehicle miles traveled, and thus the costs associated with extensive roadway expansion.

Aviation

Continued modernization of Easterwood Airport and protection from incompatible land uses are essential to the long-term viability of airport operations. The presence of commercial airline service adds a critical and valuable element to both the City's transportation network and to its competitive advantage over other areas in the region.

Connectivity

Poor transportation connectivity can degrade the overall efficiency of the transportation network as the majority of trips are funneled to a few corridors. Connectivity in College Station is limited, especially where constrained by natural features, such as floodplains. Neighborhood opposition and development oriented around cul-de-sacs has limited connectivity in the City.

Future transportation system effectiveness necessitates improved connectivity to facilitate multiple routes 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. Connectivity with and to each of the travel modes is crucial to future accessibility and mobility. Context sensitive design and traffic calming measures are essential components of any effort at increased connectivity.

Extraterritorial Jurisdiction

This Plan proposes a land use pattern and growth management efforts that, if successful, will minimize the amount and intensity of development occurring in the Extraterritorial Jurisdiction. Still, the Extraterritorial Jurisdiction will continue to see some level of development. It will also continue to expand in size through annexation and should therefore be connected to the rest of the planning jurisdiction. It is essential, though not currently necessary for capacity, that the Thoroughfare Plan in the Extraterritorial Jurisdiction ensure the reservation of adequate rights-of-way in a pattern that is dense enough to provide connectivity through the area beyond this planning horizon.

Relationship to Land Use Pattern

A very close relationship exists between the transportation network and the land use pattern. For example, high-volume six-lane roads, designed exclusively for the private automobile, tend to attract uses such as big-box retail and large apartment complexes, while repelling other land uses such as single-family homes. In a similar manner, land uses arranged in a mixed-use, dense pattern can reduce the frequency and length of vehicular trips, and if designed properly, can promote walking, biking, and transit use, therefore reducing the demand placed on the street network. The Concept Map and Future Land Use & Character map define an approach to land use planning and design that, when combined with the proposed context sensitive solutions approach, will strengthen the transportation-land use relationship in a positive manner.

Build-out Conditions

Though beyond the scope, the framework of this Plan must, consider the transportation needs of the community as it approaches build-out, that is, as it approaches the complete development of all developable land in the City. This is necessary to ensure that actions taken within this planning time-frame do not preclude future options. Even better, it is to ensure that actions taken within this planning time-frame actually offer more opportunities for future decision-makers. An example of this approach is ensuring that rights-of-way are reserved in the Extraterritorial Jurisdiction for a future street system, even though this capacity is not expected to be necessary within this planning timeframe.

This Plan projects a 2030 population of approximately 134,000. The Future Land Use & Character map contained in this Plan identifies land uses capable of accommodating an ultimate population of approximately 196,000 within the current City limits. Planning for land uses capable of accommodating a larger population than is projected for the City provides a margin of error and allows for market flexibility. The transportation network needed to serve the build-out population could differ considerably from that proposed to serve the projected 2030 population.

More efficient and higher capacity streets, increased access management along heavily traveled corridors, increased reliance on transit, bicycling, and walking, and the emergence of dense mixed-use development are just a few of the possible needs to serve the build-out population. This Plan must respond to this possible future by providing a high level of connectivity with and to each travel mode; ensuring that rights-of-way are appropriate to accommodate future roadway expansion; access management is employed where appropriate; street designs promote multi-modal solutions and allow expansion into services such as bus rapid transit; and land use designations enable dense mixed-use development where and when appropriate and necessary.

Bus Rapid Transit (BRT) is a broad term given to a variety of transportation systems that, through improvements to infrastructure, vehicles and scheduling, attempt to use buses to provide a service that is of a higher quality than an ordinary bus line. The goal of such systems is to approach the service quality of rail transit, in terms of timeliness and amenities, while still enjoying the cost savings of bus transit relative to more capital intensive rail systems.

CONTEXT SENSITIVE SOLUTIONS

This Plan proposes the use of context sensitive solutions to meet the City's transportation needs and support its land use and character objectives. Context sensitive solutions, as promoted by The Federal Highway Administration and the Institute of Transportation Engineers, is a way of planning and building a transportation system that balances the many needs of diverse stakeholders and offers flexibility in the application of design controls, guidelines, and criteria, resulting in facilities that are safe and effective for all users regardless of the mode of travel they choose. The basic principles of context sensitive solutions include (*Context Sensitive Solutions in Designing Major Urban*

Context Sensitive Solutions (CSS) is a different approach to the design and planning of transportation projects. It balances the competing needs of stakeholders early on in the decision making process. Its benefit comes from the flexibility in the application of projects based on different standards and different transportation modes.

Thoroughfares for Walkable Communities, ITE: 2006):

- Balance safety, mobility, community and environmental goals in all projects;
- Involve the public and stakeholders early and continuously throughout the planning and project development process;
- Use an interdisciplinary team tailored to project needs;
- Address all modes of travel;
- Apply flexibility inherent in design standards; and,
- Incorporate aesthetics as an integral part of good design.

The use of context sensitive solutions in transportation planning can help ensure projects respond to the community's transportation needs, values, and vision for the future, helping specific projects move from design to construction faster and with less objection.

This Plan includes the long-range planning of the transportation system, in which context sensitive solution facilitates the planning of a transportation network integrated into the long-range land use and character strategies of the City. This approach allows the City to define the mobility needs of each of the system users. The transportation network should ensure reservation of rights-of-way needed for the ultimate thoroughfare width based on long-term need. The spacing of thoroughfares should be standardized and support the strategies of the Plan. For example, arterials spaced as far as one-mile apart may carry the anticipated traffic but will likely require six lanes, which may be inappropriate for some contexts. Closer spacing of arterials could carry the same volume of traffic but reduce the number of lanes necessary. Likewise, collectors spaced close together (one-eighth mile) result in lower block lengths and promote greater pedestrian and bicycling activities. Local streets should connect as frequently as practical to the collector network to keep block lengths short and to promote connectivity throughout the system.

In general, context sensitive solutions are focused on streets that play the most significant roles in the local transportation network and that offer the greatest multi-modal opportunities – arterials and collectors. Primary mobility routes or freeways, such as State Highway 6, are generally intended to move very high volumes of high-speed traffic through College Station, providing connections to the larger region. These streets should be the focus of their own unique planning and design process and are discussed elsewhere in this chapter. Similarly, local or residential streets are generally not the focus of context sensitive solutions, while they should be designed to accommodate bicycles and pedestrians and should be interconnected to one another and into the larger transportation network.

THOROUGHFARE PLAN

The Thoroughfare Plan is based on the projected transportation demand resulting from the anticipated growth in population and employment and is guided by the proposed Future Land Use & Character map. In the development of the Thoroughfare Plan, a travel demand model was used to project the increase in vehicle trips. This information was used to identify the purpose of the various transportation corridors – that is what they need to function as, such as an arterial or collector. This information also aided in identifying the location of new roads needed either for capacity enhancements or to provide connectivity, as well as the number of lanes needed for each of the streets in the network.

Three transportation network scenarios were developed based on results from the travel demand model. Each of these scenarios were tested against the community's goals and preferences identified in the development of this Plan. This testing resulted in the selection of a preferred scenario adopted as part of this Plan. Each of the scenarios considered is briefly discussed in the following. The selected scenario is further described through the accompanying maps and graphics.

Current-Network Option

This scenario would focus future efforts on maintaining the streets and lanes currently in place, with the additional construction of new streets to serve private development. This scenario would result in increased congestion and degradation of levels of service in some of the busiest areas. Although some locations may experience unacceptable levels of congestion and delay, much of the network will likely continue to function at acceptable levels of service. It is also possible that the scenario would promote a greater reliance on transit or alternative modes of travel, though without the construction of additional facilities, the success of even these options is questionable. Though offering some advantages, such as more efficient use of some of the road corridors, affordability, and increased use of alternative modes of travel, this scenario was rejected due to the increase in unacceptable levels of congestion, which conflicts with the community's desire to manage and reduce congestion.

Programmed-Project Option

This scenario focuses future efforts on expanding the capacity of existing streets, adding new streets and increasing multi-modal facilities and options as currently programmed – that is projects that have funding authorized or appropriated. This scenario would result in the construction of more than 130 lane miles in addition to the construction of local streets necessary to serve private development, several miles of off-street multi-use paths, and continued maintenance of the existing transit system. It is anticipated this scenario would require more than $200 million (in 2009 dollars) in public funds, as well as expenditures by development interests on streets serving private development.

This scenario accommodates the projected increase in vehicle miles; however it also results in a slight increase in congestion and degradation of levels of service in specific areas along the network. This scenario is dependent on an increase in the use of alternative modes of travel, which could be encouraged through multi-modal design with the new construction. A modified version of this scenario has been selected as the preferred scenario due to its fiscal practicality, its ability to support expansion of multi-modal opportunities, and its response to the community desire to manage and reduce congestion.

This option necessitates land use planning that promotes alternative modes of transportation and reduces the frequency and length of vehicular trips. Additionally, the selected option requires an increased investment in transit and enhancement of the Thoroughfare Plan in the Extraterritorial Jurisdiction to reserve rights-of-way for future needs and facilitates connectivity.

Congestion-Reduction Option

This scenario focuses future efforts on substantial expansion of roadway capacity and the construction of new streets. This scenario would result in the construction of more than 440 lane miles in addition to the construction of local streets necessary to serve private development, several miles of off-street multi-use paths, and continued maintenance of the existing transit system. It is anticipated this scenario would require more than $650 million (in 2009 dollars) in public funds, as well as expenditures by development interests on streets serving private development.

This scenario accommodates the projected increase in vehicle miles, with a decrease in congestion and maintenance or improvement in levels of service throughout the network. This scenario is dependent on an increase in the use of alternative modes of travel, though the general lack of congestion and abundance of six-lane streets could reduce the likelihood of this occurring. Though meeting the community's desire to reduce congestion, this option was rejected due to its high-costs and incompatibility with other community goals and strategies.

Preferred Scenario

A modified version of the Programmed-Project Option is the preferred scenario based on its multi-modal cost-effective approach to managing increasing transportation demands balanced with other community goals and objectives. The preferred scenario includes completion of all of the programmed projects. Additionally, the Thoroughfare Plan in the Extraterritorial Jurisdiction must be enhanced to reserve rights-of-way for future needs and promote connectivity. All new and expanded streets must meet the multi-modal objectives of this Plan. Additional funding must be provided for improvements and expansion to the bicycle, pedestrian, and transit systems in the City. Finally it is essential that all streets be designed to enhance their context.

FUNCTIONAL CLASSIFICATION

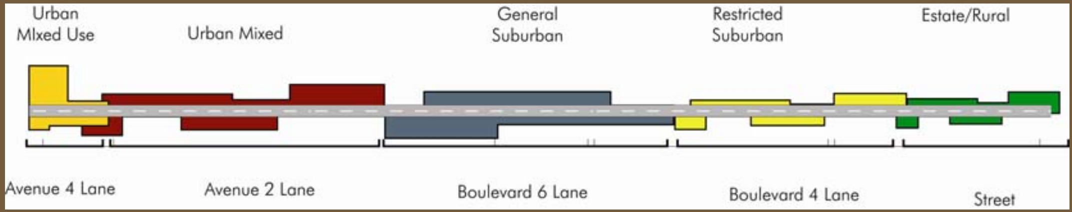
Functional classification categorizes streets according to the category's traffic service function they are intended to provide. All streets are grouped into a class depending on the character of traffic and the degree of land access they allow. For the purposes of this Plan streets in College Station are divided into five classes: freeway/expressway; major arterial; minor arterial; collector; minor collector; and local or residential street. Freeways/expressways are intended to carry the highest volumes of traffic for the longest distances with the least amount of direct access. By contrast, local residential streets are intended to carry low volumes of traffic at slow speeds for short distances, offering the highest level of access and connectivity. Functional classification identifies the necessary right-of-way width, number of lanes, and design speed for the streets. **Map 6.6, Thoroughfare Plan – Functional Classification**, displays the functional classifications for current and future proposed roadways.

Context

The first step in determining the appropriate context sensitive solution for streets is to define the contexts through which they travel. This step is accomplished by evaluating the Future Land Use & Character map and defining the context of segments of the transportation corridor. For the purposes of this Plan, five context classes are used as listed below and illustrated in **Figure 6.2, Link between Development Character and Roadway Design**:

- Urban Mixed Use (an example is Northgate).
- Urban (an example is the area surrounding University Drive between Texas Avenue and State Highway 6).

FIGURE 6.2
Link between Development Character and Roadway Design



- General Suburban (an example is the area surrounding Holleman Drive).
- Restricted Suburban (an example is the area surrounding Stonebrook Drive).
- Estate/Rural (an example of Estate is Foxfire Subdivision and an example of Rural is the area around Peach Creek).

Map 6.7, Thoroughfare Plan – Context Class, identifies the context class along each segment of major arterial, minor arterial, collector, and minor collector corridors in the City.

Thoroughfare Type

With the functional classifi-cation and context class defined, the thoroughfare type can be defined. There are three thoroughfare types: Boulevard, Avenue, and Street. The thoroughfare type is used to establish the design criteria of street. **Figure 6.3, Correlation between Functional Classifications and Context Classes,** displays one or more thoroughfare types for each functional classification. Specific cross-section designs for each of these thoroughfare types depend on the context class identified in Map 6.7. **Map 6.8, Thorough-fare Plan – Thoroughfare Type**, identifies the appropriate thoroughfare type for each of the functional classifications.

Design

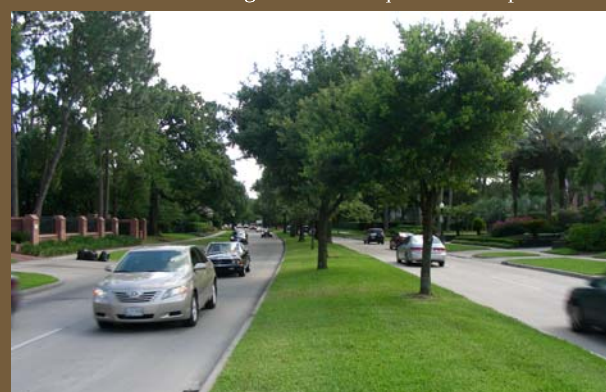
Once the functional classification, context class, and thoroughfare type are known, the specific cross-section designs can be determined for the street or street segment. Context sensitive solutions divides the right-of-way into two design components – roadside and travelway. Each of these has

FIGURE 6.3
Correlation between Functional Classifications and Context Classes

	Thoroughfare Type				
Functional Classification	Boulevard 6 Lane	Boulevard 4 Lane	Avenue 4 Lane	Avenue 2 Lane	Street
Major Arterial	■		■		
Minor Arterial		■	■		
Collector			■	■	■
Minor Collector				■	■

SOURCE: *Context Sensitive Solutions for Major Urban Thoroughfares,* Institute of Transportation Engineers

Boulevard
A high speed roadway that is capable of large traffic volumes. Speeds on boulevards do not exceed 40 miles per hour and can achieve volumes up to 50,000 vehicles per day. Boulevards generally carry long distance traffic. These road types are characterized by having a center median to allow for some elements of access management techniques to be implemented.



Avenue
Can be the most flexible of the three new road classes by integrating moderate traffic volume and speeds (not exceeding 35 miles per hour) with multi-modal transportation such as transit, bicycling and walking. Automobile capacity can vary from 1,000 vehicles per day in some suburban areas to 30,000 vehicles per day in busier areas of the City. Avenues are generally more walkable and allow for greater regional connectivity for bicycles because of the slower speeds.

specific sub-components as described through the following text and **Figure 6.4, Roadside Design**, and **Figure 6.5, Travelway Design**.

Sub-components of Roadside Design

- Edge Zone - The space needed to accommodate opening and closing of car doors and overhanging vehicles.
- Furnishings Zone - The space needed to accommodate street trees, landscaping, and street furnishings. This space may also be used to accommodate utilities.
- Throughway Zone - The space needed to accommodate the uninterrupted flow of pedestrians. Sidewalks are located in the throughway zone and in urban contexts may extend into the furnishings and frontage zone as well. This space may also be used to accommodate utilities.
- Frontage Zone - The space between the throughway zone and the right-of-way line or building façade. This space may include sidewalks and in urban contexts may accommodate outdoor seating or merchandise displays. In suburban contexts this may also be used to accommodate utilities.

Sub-components of Travelway Design

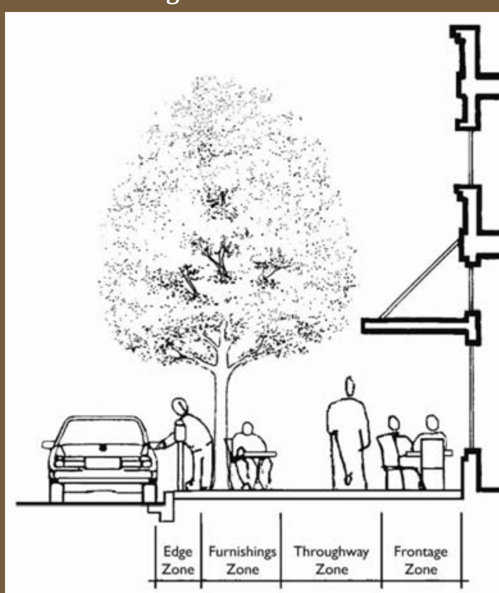
The sub-components of the travelway may include on-street parking, bike lanes, travel lanes, or medians. Each of these sub-components of design has been incorporated into the cross-sections included in this chapter. Additional consideration must be given for access management, cross-walks, bus stops, transition between designs, pedestrian refuges, and intersections. Each of these is discussed further in this chapter.

The **Street Cross-Section Standards** (located at the end of this chapter) provide a preliminary set of design criteria for both the roadside and travelway design. Additional design criteria are provided within the City's Unified Development Ordinance and the Bryan-College Station Unified Design Guidelines.

Street

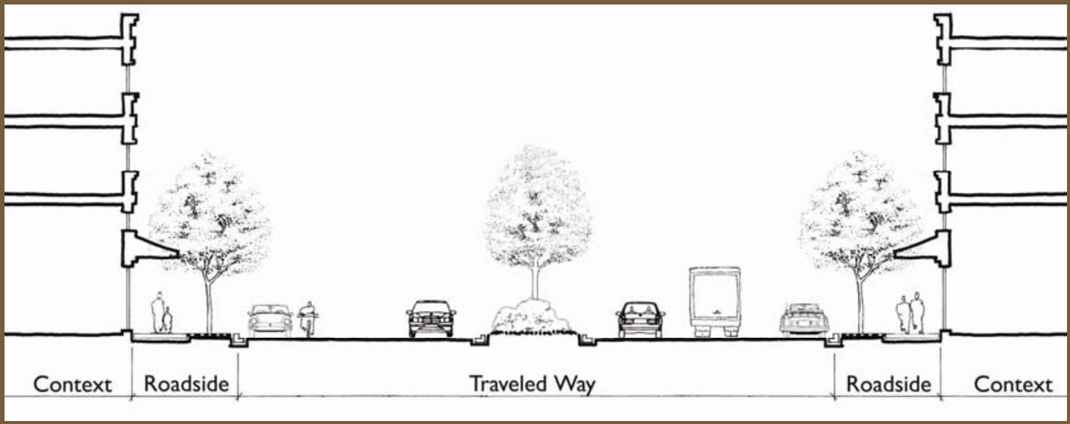
Low speed, low volume roadways that have a great deal of access to surrounding land uses. Speeds do not exceed 30 miles per hour, and volume does not exceed 10,000 vehicles per day. Ideal for retail activities in urban areas and also can serve residential neighborhoods with little disturbance. Ideal for multi-modal activity since vehicle speeds are low.

FIGURE 6.4
Roadside Design



SOURCE: *Context Sensitive Solutions for Major Urban Thoroughfares,* Institute of Transportation Engineers

FIGURE 6.5
Travelway Design



SOURCE: *Context Sensitive Solutions for Major Urban Thoroughfares,* Institute of Transportation Engineers

OTHER DESIGN CONSIDERATIONS

Context Transitions

When planning and designing a context sensitive transportation network, there will be the need to transition between street designs, from time to time. These transitions will most often involve a change in the right-of-way width, number of lanes and the character treatments found in the travelway or the roadside. Transitions may include traditional geometric design changes such as smooth tapers where lanes change and speed limit changes where design speeds change. Transitions in a context sensitive environment extend beyond geometric changes and include multi-modal considerations, as well as visual cues to the change in context. Transitions of these types can indicate that changes in the emphasis on pedestrians, the width of the street, or entering or leaving a special district or corridor. Transitions should, as with all other aspects of the context sensitive design, be guided by the principles found in the American Association of State Highway and Transportation Officials "Green Book," Geometric Design of Highways and Streets, the Manual on Uniform Traffic Control Devices and other approved design guides.

Intersections

In any street network the design and operation of intersections is significant. In context sensitive design the design and operation of intersections is critical. Multi-modal systems require the safe movement of vehicles, bicyclists, and pedestrians through the intersection. Intersection design encompasses the intersection itself and the approaches to the intersection, and may impact adjacent land uses. The Institute of Transportation Engineers publication, *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable*

Communities, identifies the following principles for the design and operation of intermodal intersections:

- Minimize conflicts between modes;
- Accommodate all modes with the appropriate levels of service for pedestrians, bicyclists, transit, and motorists;
- Avoid elimination of any travel modes due to intersection design;
- Provide good driver and non-driver visibility ;
- Minimize pedestrian exposure to moving traffic;
- Design for low speeds at critical pedestrian-vehicle conflict points;
- Avoid extreme intersection angles and break up complex intersections with pedestrian refuge islands; and,
- Ensure intersections are fully accessible to the disabled and the hearing and sight impaired.

As with other design considerations in the context sensitive design approach, accepted engineering guidelines should be used, with the aforementioned principles employed.

Other Design Components

In context sensitive design, consideration should be given to a number of design components that respond to the multi-modal nature of the system. These include, but are not limited to, access management and the placement and design of cross-walks, bus stops, curb extensions, and pedestrian refuges. The Institute of Transportation Engineers publication, *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*, and the various American Association of State Highway and Transportation Officials guidance documents should be consulted for the proper and safe application of each of these components.

Public Role in CSS

The community involvement that occurred through the Comprehensive Plan process provided a solid foundation for establishing context sensitive design objectives for most streets across the City. City Council public hearings related to street projects provide another avenue for community input on design considerations. Primary mobility routes will have their own unique design and input process. Likewise, streets in established neighborhoods and districts will be evaluated in greater detail through the development of area-specific plans (or, in the interim, would receive official and public scrutiny through the Council-approved involvement process for specific street projects).

Rehabilitation Projects and Neighborhood Street Network

Much of this chapter has focused on the design and construction of new streets. In a number of instances, improvements may be necessary within established neighborhoods, involving either rehabilitation projects or possibly even new street construction. While the guidance provided in this chapter should serve as a foundation for projects in established neighborhoods, it is necessary to recognize the sensitivity of such projects. Projects in such areas often have to address constrained rights-of-way, the presence of mature vegetation, and resident preferences. It is proposed that, where possible, the identification of and design for projects within established neighborhoods be guided by the neighborhood plan and direct public input unique to each project. A similar process is appropriate for the districts and corridors identified in the Future Land Use & Character map contained in this Plan.

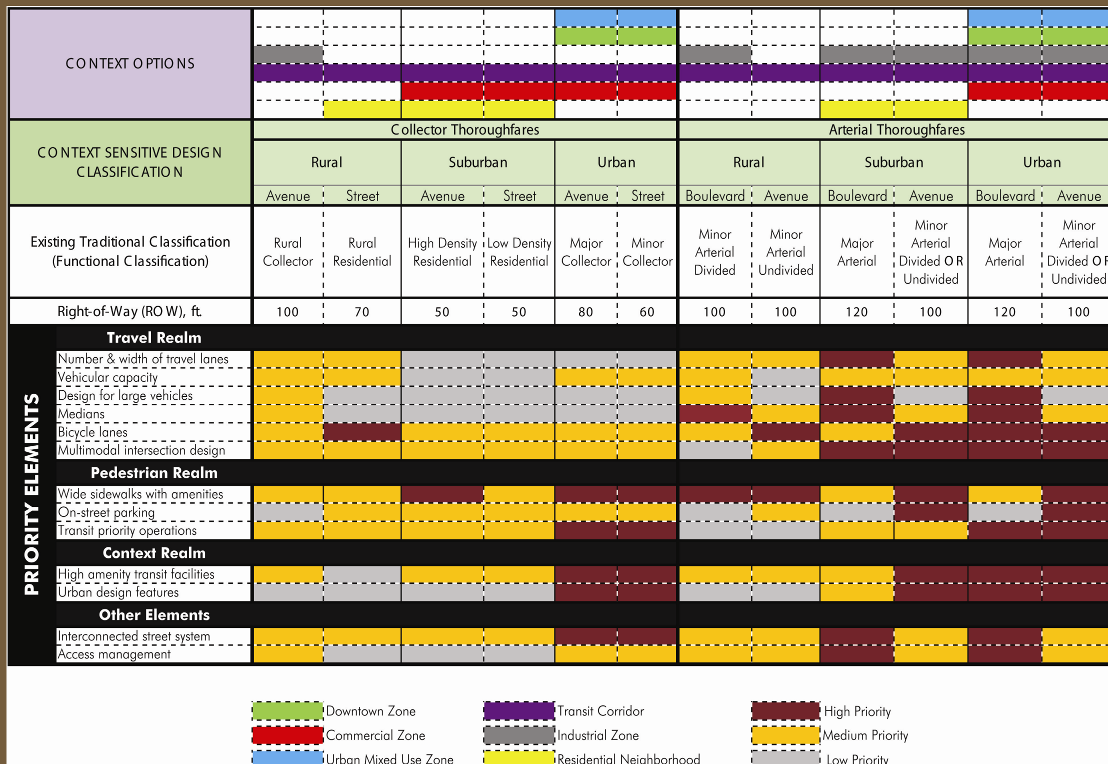
Primary Mobility Corridors

The context sensitive solutions approach outlined in this chapter focuses primarily on arterials and collectors, due to their role in the transportation network and ability to serve multiple modes of travel. Streets classified as freeways or expressways serve primarily to move vehicles through the City and between distant locations within the City. State Highway 6 and sections of Raymond Stotzer Parkway (FM 60), William D. Fitch (State Highway 40), and Harvey Mitchell Parkway (FM 2818) are examples. For the purposes of this Plan, these streets are considered primary mobility corridors. While it may be possible that these corridors be designed to handle pedestrians and bicyclists, in general they will be designed to accommodate high volumes of vehicular traffic at high speeds (usually in excess of 45 mph). These corridors can also carry transit vehicles, though they are not likely to provide transit stops. Alternative parallel routes should be identified to accommodate the modes of travel that the primary mobility corridors cannot. The design of these corridors should be guided by their own unique requirements (both mobility and access and other contextual needs) and should include direct public input unique to each project.

Right-of-Way Constrained Projects

From time to time, the right-of-way for a public street project will be constrained due to a natural constraint, such as floodplain, or because of the proximity of existing development. In such instances, it is necessary to evaluate what can and cannot be accommodated within the available right-of-way. This evaluation should be guided both by the vehicular needs and the context of the street. A uniform process should be developed incorporating a "decision-matrix," such as the example shown in **Figure 6.6, Example of Constrained Right-of-Way Decision Matrix**, that will aid decision makers in such trade-offs. In some contexts it may be appropriate to eliminate parking lanes to accommodate wider sidewalks or planting areas. In other contexts it may be appropriate to use narrower sidewalks to accommodate both parking lanes and bicycle lanes. In still other contexts it may be appropriate to eliminate a travel lane or alter the design of travel lanes to accommodate parking lanes.

FIGURE 6.6
Example of Constrained Right-of-Way Decision Matrix



GOAL, STRATEGIES, AND ACTIONS

College Station strives for **improved mobility through a safe, efficient, and well-connected multi-modal transportation system designed to be sensitive to the surrounding land uses**. Five strategies have been developed to progress toward this goal. Each strategy has a series of action recommendations designed to implement the related strategy.

Strategy 1: *Develop, implement and maintain, through regular review, a multi-modal transportation plan that supports the planned growth and development pattern.*

- **Thoroughfare Plan.** Adopt and implement the Thoroughfare Plan.
- **Future Planning.** Amend the Thoroughfare Plan as necessary as neighborhood, district, corridor, and master plans are adopted by the City.
- **Project Programming.** Maintain and amend as necessary the City's various programs (Bryan-College Station Metropolitan Planning Organization Transportation Improvement Program, Capital Improvements Program, etc.) used to fund projects.

- **Monitor Trends.** Continue to collect and monitor transportation data including vehicle miles traveled, traffic counts, levels of service, transit ridership, and pedestrian and bicycle facility usage, crashes.
- **Context Sensitive Solutions.** Amend as necessary, the various tools used to implement the Thoroughfare Plan to ensure context sensitive solutions are employed. These include the Unified Development Ordinance, the Bryan-College Station Unified Design Guidelines, and the City's project development process.

Strategy 2: *Reduce and manage traffic congestion.*

- **Thoroughfare Plan.** Adopt and implement the Thoroughfare Plan.
- **Monitor Trends.** Continue to collect and monitor transportation data including vehicle miles traveled, traffic counts, levels of service, transit ridership, and pedestrian and bicycle facility usage, crashes.
- **Access Management.** Promote access management strategies where appropriate to preserve modal efficiency throughout the thoroughfare system.
- **Traffic Control Technology.** Install a state-of-the-art computerized traffic control system including signal synchronization.
- **Travel Demand Management.** Develop and implement a travel demand management program including real-time traffic information, traffic incident alerts, ridesharing programs, promotion of flexible work schedules, and encouragement of dense mixed-use development.
- **Intersection Improvements.** Continue enhancements and upgrades at intersections to improve multi-modal efficiency.

Strategy 3: *Develop and implement context sensitive transportation solutions.*

- **Thoroughfare Plan.** Adopt and implement the Thoroughfare Plan.
- **Future Planning.** Amend the Thoroughfare Plan as necessary as neighborhood, district, corridor, and master plans are adopted by the City.
- **Context Sensitive Solutions.** Amend, as necessary, the various tools used to implement the Thoroughfare Plan to ensure context sensitive solutions are employed. These include the Unified Development Ordinance, the Bryan-College Station Unified Design Guidelines, and the City's project development process.
- **Bicycle and Pedestrian Planning.** Amend and implement the bicycle and pedestrian system master plans.

- **Transit.** Pursue opportunities with the current transit providers to expand and enhance transit services within and between activity centers and dense residential areas, concentrations of student housing, etc.
- **Project Programming.** Maintain and amend as necessary the City's various programs (Bryan-College Station Metropolitan Planning Organization Transportation Improvement Program, and Capital Improvements Program) used to fund projects.
- **Primary Mobility Corridors.** Adopt and implement the context sensitive approach identified in this Plan for identified primary mobility corridors.
- **Rehabilitation Projects.** Adopt and implement the context sensitive approach identified in this Plan for rehabilitation projects located within established neighborhoods or districts.
- **Right-of-way Constrained Projects.** Adopt and implement a context sensitive approach and decision matrix for City projects where the available right-of-way is constrained.

Strategy 4: *Promote and invest in alternative transportation options.*

- **Thoroughfare Plan.** Adopt and implement the Thoroughfare Plan.
- **Future Planning.** Amend the Thoroughfare Plan as necessary as neighborhood, district, corridor, and master plans are adopted by the City.
- **Context Sensitive Solutions.** Amend, as necessary, the various tools used to implement the Thoroughfare Plan to ensure context sensitive solutions are employed. These include the Unified Development Ordinance, the Bryan-College Station Unified Design Guidelines, and the City's project development process.
- **Bicycle and Pedestrian.** Amend and implement the bicycle and pedestrian system master plans.
- **Transit.** Pursue opportunities with the current transit providers to expand and enhance transit services within and between activity centers and dense residential areas, and concentrations of student housing.
- **Project Programming.** Maintain and amend as necessary the City's various programs (Bryan-College Station Metropolitan Planning Organization Transportation Improvement Program, and Capital Improvements Program) used to fund projects.
- **Commuter Rail.** Continue to participate in the Texas High Speed Rail Initiative and similar efforts to bring commuter rail services to the City.

***Strategy 5:** Balance changes in land use with the capabilities of the transportation system.*

- **Use of Future Land Use & Character Map.** Adopt and implement the Future Land Use & Character map contained in this Plan.
- **Land Use and Development Review.** Continue to evaluate the capacity of the existing and proposed transportation system in Comprehensive Plan amendments, rezoning requests, and site plan reviews.
- **Traffic Impact Analysis.** Require traffic impact analyses for all development proposals anticipated to generate significant volumes of traffic.
- **Monitor Trends.** Continue to collect and monitor transportation data including vehicle miles traveled, traffic counts, levels of service, transit ridership, and bicycle and pedestrian facility usage, crashes.