Transportation

Transportation planning is instrumental in preparing the community for future traffic demands and ensuring a safe and effective system of travel. A quality transportation system should be efficient in moving people through and within the community, offer a choice of modes, and should be appropriately designed for safety and visual appeal. A well balanced and managed system will enhance the local quality of life of residents while further promoting and contributing to the City's economic development initiatives.

Although traveling by car is the most predominant form of mobility in Huntsville, planning for future travel needs in the City will involve looking at transportation as an interconnected system of roadways, paths, trails and sidewalks, with multiple options for getting around including by transit and bike. An integrated and connected system with multiple alternatives for traveling within the community will help keep traffic flowing and alleviate congestion on local roadways. Options should apply not only in offering different modes of transportation but also in offering multiple connections and choices on the roadways system. The transportation system has a strong influence on the quality and type of growth and should therefore be closely coordinated with the community's overall land use policies and goals.

One of the key challenges in transportation planning for the City of Huntsville lies in preserving the community's small town atmosphere, while embracing the University and accommodating the growing student population. The University is an important part of the community, and coexisting with it in a harmonious fashion will be essential in the overall success of the City. Enrollment at the University is expected to grow to 25,000 students by the Year 2015. Addressing how to "move" these students throughout the community, while preserving community and neighborhood character, is an important transportation challenge facing the City.

This plan element places a strong focus on addressing traffic congestion at the core of the City where it is the biggest problem. Many of the recommendations do not focus on widening roadways or building new ones but rather on implementing measures to increase capacity and traffic flow through access management and other Transportation System Management (TSM) measures. Solutions to traffic problems

in Huntsville are going to involve a number of combined strategies that, as a whole, will work to alleviate traffic congestion on area roadways.

A detailed Transportation Plan and Thoroughfare Plan map was prepared in 2001 with the purpose of recommending roadway improvements needed to accommodate travel demands through the year 2020. The plan identified short-term and long-term improvements in the community to address future traffic needs. Recommended improvements included roadway widenings, construction of new facilities including extension of existing facilities, access management controls, transit improvements and bicycle and pedestrian improvements. The plan also includes a Thoroughfare Plan Map, which is a long-range plan for thoroughfare development that looks out beyond 20 years. The Thoroughfare Plan ensures the preservation of future corridors for transportation system development, as the need arises. Actual implementation is dependent upon future growth and development.

Transportation System Management (TSM) is the improvement of vehicular flow by implementing low-cost measures that increase the efficiency of the existing road pavement and avoid the need for major roadway expansion. Examples of such measures include traffic signal and intersection improvements, one-way road pairs, access control measures, and removal of on-street parking

Source: Your Government & Community Online Resource, Martin County, FL

Transportation planning is highly related to other elements of the plan including Land Use and Community Character, Parks and Recreation and Economic Development. For instance, the future land use and overall development patterns outlined in **Chapter 2** help determine the transportation infrastructure necessary to meet the future mobility needs. Additionally, the transportation system is vital to the movement of goods, thereby having direct influence on the community's economic development. Businesses seeking to locate or expand are interested in their access to and within the community and, in the case of a major industry, the proximity to a freeway. Transportation arteries provide opportunities for linear connections via sidewalks and/or bicycle trails, which complement the parks and recreation system. The location, design and capacity of roadways also determine the type and character of development. A coordinated planning approach was utilized in developing the Transportation element ensuring the plan and its recommended policies and strategies are compatible with the community's land use goals and economic development objectives.

Purpose

The purpose of this element is to identify and address key transportation issues in the community and make recommendations to help improve mobility in the area and accommodate future growth. Additionally included in this plan is a Thoroughfare Plan Map that can be used by City staff, Planning and Zoning Commission and City Council in securing needed rights-of-way as future development occurs.

Issues and Opportunities

Through the plan development process a number of issues and concerns were expressed related to mobility in the community. These discussions formed the basis of the following issue statements, along with analysis of the existing conditions, review of the thoroughfare plan and examination of expected future growth trends. These statements summarize and bring focus to this plan regarding the community's values, expectations and priorities for transportation in Huntsville. Following the identification of the key issues is a set of community goals and objectives along with discussion of necessary implementation steps.

Traffic Congestion and Movement

With the presence of the University and two state highways traversing the center of town, traffic congestion and movement at the core of the city is a major issue. State highways 30, 190 and 75 all converge into 11th Street, and just south of that lies several major traffic generators in Downtown including City and County facilities like the County Courthouse, City Hall and the Texas Department of Criminal Justice (TDCJ) prison facility. Additionally, Sam Houston State University is located just south of the Downtown core. All of this has contributed to traffic congestion at the core of the City in particular along 11th Street and Sam Houston Avenue. Although designated as major arterials, the capacity of these roadways has been severely reduced as development has occurred over time resulting in numerous driveways and access points slowing and disrupting traffic patterns along these corridors. These roadways have limited left or right turn lanes and numerous driveways resulting in conflict points and constant deceleration and acceleration of cars. What has resulted is slow-moving traffic along these corridors and backups at intersections. One major concern is traffic trying to make a left turn at signalized intersections, without a protected arrow, resulting in traffic backing up at the intersection. This issue is prevalent along 11th Street at the intersections of Sam Houston Avenue and University Avenue.

Traffic along 11th street.

While expanding roadways at the core of town is not really desirable or feasible due to extensive commercial development and right-of-way constraints, other access management and TSM measures can be implemented to help relieve traffic and congestion and improve capacity on area roadways. Access management improvements are recommended along 11th Street between IH 45 and University and on Sam Houston Avenue. Improvements should include traffic signal timing improvements, addition of turn bays at some intersections and driveway access restrictions. Lack of east/west connections through town also contributes to congestion along 11th Street.

***Access Management** is defined as the control of the location, spacing, design and operation of driveways, median openings, interchanges and street connections to a roadway, with the purpose of providing vehicular access to land development in a manner that preserves the safety and efficiency of the transportation system.*

Effects of Access Management

Add continuous, two-way left turn lane (CTWLTL)	35% reduction in total crashes, 30% decrease in delay, 30% increase in capacity
Add nontraversable median	35% reduction in total crashes, 30% decrease in delay, 30% increase in capacity
Replace CTWLTL with a nontraversable median	15%-57% reduction in crashes on 4-lane roads, 25%-50% reduction in crashes on 6-lane roads
Add a left-turn bay	25%-50% reduction in crashes on 4-lane roads, up to 75% reduction in total crashes at unsignalized access, 25% increase in capacity
Painted left-turn improvement	32% reduction in total crashes
Left-turn separator or raised divider	67% reduction in total crashes
Add right-turn bay	20% reduction in total crashes, limit right-turn interference with platooned flow, and increased capacity
Increase driveway speed from 5 to 10 mph	50% reduction in delay per maneuver, less exposure time to following vehicles
Visual cue at driveways, driveway illumination	42% reduction in crashes
Prohibition of on-street parking	30% increase in traffic flow, 20%-40% reduction in crashes
Long signal spacing with limited access	42% reduction in total vehicle-hours of travel, 59% reduction in delay, 57,500 gallons of fuel saved per mile per year

Source: *Access Management Manual, Transportation Research Board of the National Academies, 2003*

In addition to addressing existing and future traffic needs on the current roadway system the City should carefully plan for the logical extension of new roadways in emerging growth areas. Preserving adequate right-of-way in advance of development—and coordinating planning and design of the transportation system with appropriate land use and infrastructure planning—will allow for a more efficient and effective roadway network in new growth areas, along with better development outcomes for the long term. Traffic carrying capacity of roadways should be preserved and improved through appropriate design of the street system and adequate standards for property access.

Trans-Texas Corridor

The Trans-Texas Corridor (TTC) is a proposed multi-use, statewide network of transportation routes in Texas that will incorporate existing and new highways, railways and utility right-of-ways. Routes will include separate lanes for passenger vehicles and large trucks, freight railways, high-speed commuter railways and infrastructure for utilities.

Plans call for the TTC to be completed in phases over the next 50 years with routes prioritized according to Texas' transportation needs. The Texas Department of Transportation (TxDOT) will oversee planning, construction and ongoing maintenance.

Interstate 69 is a planned 1,600-mile national highway connecting Mexico, the United States and Canada. Eight states are involved in the project. In Texas, I-69 will be developed under the Trans-Texas Corridor master plan. The proposed I-69/TTC

corridor extends from Texarkana/Shreveport to Mexico (possibly the Rio Grande Valley or Laredo). Currently the I-69 corridor is in the environmental planning phase. Recommended reasonable corridor links have been identified with one of the corridors traversing to the northwest of Huntsville. The City should continue to coordinate with the state in the ongoing planning and development of the corridor and should evaluate impacts the corridor may have on the future growth and development of the City.

Maintenance of Existing System

A well managed and maintained transportation system is important in ensuring a safe system that is enjoyable by all users. While building new roadways or widening existing ones is often important in addressing existing and future traffic needs, maintenance of what is already there is equally important and should require the continued attention of City government. With limited financial resources, roadway and other transportation improvements should be carefully balanced with basic maintenance of the existing systems of travel. Some of the area roadways in Huntsville are in substandard condition and have been re-patched over and over and are now in need of resurfacing. Additionally sidewalks in the older parts of town have deteriorated over time and are also in need of repair, while sidewalks were never installed along some City streets.

Parking Management

Parking in the Downtown and University area is another issue affecting traffic congestion and safety in Huntsville. Parking around the University area is a problem with students not always parking in designated lots, and instead for convenience and out of necessity, parking on neighborhood streets around the University, in particular in the Avenues. Many of these streets have narrow rights-of-way which causes congestion and safety concerns when parking occurs on both sides of the street. Additionally parking and congestion on local streets affects residents living on those streets and changes the character and integrity of their neighborhood.

Student parking in the Avenues was a major issue identified by residents during the plan development process.

Parking issues are also prevalent in the Downtown area where on-street parking along 11th Street, Sam Houston Avenue and University Avenue often conflicts with through traffic. This is most prevalent on 11th Street in front of the courthouse where cars backing out onto 11th Street conflict with cars traveling east bound.

Parking management in the Downtown and University area will be instrumental in having an effective system that will reduce traffic congestion and meet the needs of business owners, students, and patrons of facilities in the Downtown.

Cars pulling in and out of parking spots in front of the courthouse on 11th Street slow through traffic and can be a safety hazard.

Some individuals have expressed the desire to remove on-street parking from the Downtown area to help alleviate congestion. However, while removing parking in the Downtown area will eliminate some of the traffic conflicts along Sam Houston Avenue, it will impact the character of Downtown. On-street parking contributes to the charm and pedestrian environment in Downtown, by providing a buffer zone between the roadway and sidewalk, reducing speeds along Sam Houston Avenue and providing convenient access to local businesses. One opportunity may be to eliminate on-street parking in front of the courthouse on 11th Street as this is one of the most heavily traveled roadways. Removal of parking here will have to be balanced with providing additional spaces elsewhere for those visiting the courthouse. Shared parking with other nearby businesses and facilities and informational signage directing patrons of other locations to parking can help alleviate this problem.

Alternative Modes of Transportation

Currently the private automobile is the primary form of transportation for most individuals in the Huntsville area. However with the presence of a large student population the opportunity for providing and accommodating alternative modes of transportation including transit and bike and pedestrian facilities is important. Many residents, during the public involvement process, expressed concern over parking and traffic issues related to students attending SHSU and how the City was going to address these issues and accommodate the growing student population.

Public Transportation

One way for the community to address the need for more parking and increase accessibility to the University is through the development of a public transportation system. In addition to accommodating students, the transit system should be implemented city wide to serve those segments of the population, including the elderly, disabled and low-income, that do not always have access to an automobile and require other transportation options. Like most cities its size, the City of Huntsville currently does not provide public transportation to its residents. Having a shuttle/transit service in the community could reduce auto use and parking demand in and around the City while meeting the mobility needs of students, elderly, low-income and other transit-dependent populations. To meet alternative mobility needs of the community the City should in joint partnership with the University, County or other agencies begin the process of planning for and implementing a city-wide transit system.

To successfully encourage transit use by the University community, the system will have to be convenient and highly desirable to students, faculty, staff and visitors.

Fares should be minimal or free, service should run frequently in particular during peak hours, and there should be several stops on campus dropping students off within close proximity to where they need to go. The transit system should include stops at key locations throughout the community including where students reside (apartments, student housing). The system should be open to all residents of the community and should provide access to major destinations including Downtown, the mall and hospital.

As recommended in the *2001 Transportation Plan*, development and implementation of a park-and-ride lot could also be part of this system and would serve students and others commuting to SHSU each day. This would involve construction of a park-and-ride lot near and within easy access to IH-45, as most commuting students enter Huntsville from the south via IH-45.

Funding the transit system will be a major effort and will require partnerships between the City, County, University and possibly other agencies or organizations. The transit system will have to be subsidized from a variety of sources, including student tuition and ridership plus public funds.

Bicycle and Pedestrian Facilities

In addition to providing transit service, making the community more pedestrian and bike friendly and accessible can help alleviate traffic on local streets through providing for another alternative mode of travel. Bicycle and pedestrian facilities add to the quality of life of the community and help create a cohesive environment that is interconnected not only through roadways but through a system of bike lanes, trails and sidewalks. In addition to their practical function of getting people around, pedestrian and bicycle opportunities can help meet some of the recreational needs in the community.

Crossing roadways safely was a concern expressed repeatedly by residents during the public involvement process.

Opportunities exist to increase pedestrian and bicycle activity and safety in particular in the Downtown and University area as many students walk to and from campus and nearby destinations. Safety and access will be instrumental in creating an environment that encourages walking and biking to and from destinations in the community. Comments received during the public involvement process called for improvements in pedestrian safety as many felt it was unsafe to cross major intersections in the community and residents also noted limited opportunities for biking. If transit or a shuttle service is implemented pedestrian amenities will be equally important in its overall effectiveness and use. Appropriate pedestrian amenities should also be in place to ensure users of transit service feel safe in arriving at their final destinations.

Currently there are limited bicycle facilities in the University area making it unsafe for students to bike to and from campus. Sidewalks are not present in most neighborhoods or commercial areas and where they are present, they are often discontinuous and in need of repair. Sidewalks are present in the Downtown area but also need repair in many cases. Crossing major roadways like Sam Houston Avenue (for example at 17th Street and Lake Road) and University Avenue in the Downtown and University area is also a critical issue due to high-speed traffic and conflict points with cars turning left and right while pedestrians are crossing. Some intersections like 12th Street have a cross walk, but it is difficult to cross the roadway with the volume and speed of traffic traveling along Sam Houston Avenue.

Pedestrian amenities should be improved and enhanced in the University and Downtown area, around schools and in other areas where pedestrian activity is predominant. Additionally opportunities exist for linking parks, schools and other destinations together through a series of sidewalks, trails and bike lanes. Improved bicycle facilities include bicycle lanes, bike paths, clear signage and pavement markings, and bicycle storage/parking facilities. One of the community's initial priorities should include providing bicycle lanes, where feasible, along roadways between student apartment complexes and SHSU. Pedestrian improvements include installation or repair of sidewalks in residential and commercial areas, as well as crosswalks and cross lights. Additionally the Downtown area and the corridors linking it to the University should be enhanced as a more pedestrian friendly environment through street landscaping, sidewalks, street furniture, street lights and signs.

Neighborhood Integrity and Preservation

One of the issues heard throughout the plan development process was the importance of preserving the integrity and character of existing neighborhoods. Residents complained of streets dividing neighborhoods, cut-through traffic, and parking by students and businesses along neighborhood roadways. One area of town where this is prevalent is the Avenues. The Avenues is an older part of town characterized by a grid pattern of streets and mix of uses including institutional, residential and office. While the primary use is residential, closer to the core of town some of the residential uses have transitioned into office uses over time. Roadways including Avenue O and 16th Street function as collectors or arterials with higher volumes of traffic and speeds, while other narrower roadways are lined with parked cars. Such circumstances change the character of the neighborhoods and often pose a safety hazard for neighborhood residents and emergency access. In planning for future traffic in the community careful consideration should always be given to neighborhood integrity and the impact policies and improvements will have on them. The transportation system should connect and enhance neighborhoods and be aesthetically pleasing and compatible with the surrounding environment.

Goals, Objectives and Action Recommendations

The following goals, objectives and recommended actions were formulated to specifically address the issues and needs outlined above. The goals reflect the overall vision of the community, which may be achieved through the objectives and by acting on the recommendations. It is important to note that these are also general statements of policy that may be cited when approving or denying development proposals and used in making important community investment decisions regarding the provision and timing of facilities and services.

GOAL 3.1: An efficient and effective roadway network.

- ***Utilize the Thoroughfare Plan map and functional classification of roadways to achieve adequate mobility within the community and preserve right–of-way.***

  1. Adopt the functional classifications of arterial and collector roadways as identified in the *2001 Transportation Plan* and shown on the Thoroughfare Plan map with the policies and design criteria identified in **Table 3.1**. The recommended street cross-sections and pavement widths that correspond with the functional classifications should be adhered to in all new developments. In certain instances where there are unavoidable constraints for complying with the City's standards that are peculiar to the location and not brought about by the subdivider by cause of the subdivision layout or design, the City may allow an exception as long as it is the minimum variation needed to otherwise abide by the City's standards. An impact study may be necessary for certain conditions to assess the impacts on the surrounding street system - and neighborhoods - and evaluate viable and warranted alternatives.
  2. Amend the Development Code to include the cross-section standards and required right-of-way and pavement widths for arterial and collector streets as identified in the *2001 Huntsville Transportation Plan.*
  3. Amend the Development Code to include performance standards for residential streets, whereby the type of access, number of dwelling units served, and the units' average frontages determine the street right-of-way, pavement width, and other design requirements such as parking lanes, curb width, parkways, and sidewalks. For instance, whereas a standard local street has 60 feet of right-of-way and 40 feet of pavement, 39 feet of right-of-way may be permitted for lots ranging from 15,000 to 40,000 square feet and with lot frontages between 90 and 129 feet where fewer than 10 lots are served. If more than 45 lots are served, however, the required right-of-way would be 60 feet. Therefore, the right-of-way and street design is directly tied to development density and generated traffic volumes.

4. Utilize the future land use plan for incorporation into the urban area transportation model to define the functional classification of streets and the necessary roadway capacities. The use of character-based land use designations allows quantification of the transportation impacts, including population and dwelling unit counts, trip generation, and other model inputs. The land use projections developed as part of this plan may be organized into traffic analysis zones (TAZs) as the planning variable inputs into the transportation model. In this way, there is a high level of coordination between the adopted land use and growth plans and the resulting thoroughfare network, thereby greatly improving the accuracy of trip generation and the corresponding assignment and distribution of trips.
5. Incorporate provisions into the Development Code authorizing the City to require a traffic impact study for traffic conditions that exceed a certain established traffic generation threshold or specified development conditions. Such situations would require submission of a study prior to the official acceptance of an application for subdivision or property development.
6. Prioritize and implement the short-term recommendations identified in the *2001 Transportation Plan*.

- ***Implement access management and other Transportation System Management measures to help increase capacity along constrained roadways and maintain capacity along arterials in the community.***

7. In conjunction with TxDOT, prepare an access management study for 11th Street and Sam Houston Avenue, which identifies and evaluates appropriate TSM measures that would be suitable and feasible along these corridors. These measures could include the addition of right or left turn lanes at certain locations, consolidation of driveways, removal of parking in front of the courthouse (on 11th Street) and signal timing.
8. Develop an access management program and guidelines that provide appropriate strategies and access design requirements based on a roadway's functional classification as identified on the Thoroughfare Plan map (with the greatest emphasis placed on mobility and access).
9. Revise and enhance existing access management regulations in the Development Code to restrict the number, location, and spacing of driveways, street intersections, medians and median openings, marginal access roads, turn lanes, and acceleration/deceleration lanes at major intersections. This is particularly important in preserving capacity along roadways that are not currently lined with development. The regulations should require marginal access roads and/or cross-access easements along all commercial frontage abutting arterial and collector roads to minimize the number of driveways. The number of residential streets with access to

arterial streets should be restricted by requiring marginal access streets or collector roadways located no less than 660 feet apart.

10. Amend the Development Code to require (as opposed to incentives) shared driveways and cross-access easements between adjacent and abutting properties to eliminate the need to use the public street for access between adjoining businesses. (Development Code Section 1302.1.7)
11. Periodically conduct signal warrant studies as area travel volumes increase with new development. In areas that are already managed by traffic signals, signal timing should be reviewed, particularly in congested areas, to determine if timed traffic signals are appropriate relative to the volume and peaks in traffic flow. Adjustments should be made to traffic signals so that they are timed accordingly. Pedestrian- and bicycle-actuated traffic signals should be installed at intersections around the University, specifically, as well as near schools, parks, and other areas with high pedestrian traffic.

- ***Utilize the Capital Improvement process in securing funds for maintenance of the existing system.***

12. Adopt a comprehensive maintenance program for area roadways that is based on a prioritized level of need. Needed improvements should be prioritized and placed in a 5 year Capital Improvements Plan (CIP) that is annually received and updated to add a new year 5.

GOAL 3.2: Available and convenient parking in the University and Downtown areas.

- ***Utilize ordinances, parking management techniques and transit options and incentives to have an effective parking system in the Downtown and University area.***

1. Adopt a targeted ordinance and enforce on-street parking restrictions in the Avenues. The City should identify which roadways are in need of restrictions and what methods would be most appropriate. The parking ordinance should be applicable to those roadways nearest to the University and most likely to be used by students and other non-residents of the neighborhood. Careful consideration should be given to those areas where businesses are located and some parking may be needed. Requirements could include parking restrictions during the day, time limitations, permit requirements and/or restricting parking to one side of the street.
2. Coordinate with the University on its timing and implementation of the parking recommendations identified in the campus master plan for additional parking garages and elimination of surface parking lots.

3. Prepare a parking management study for the Downtown area to identify actual parking needs and opportunities for more efficient management of existing parking supply. Prior to building additional parking lots or structures, opportunities should be identified to enhance the existing system and may include shared use of parking facilities and informational signage informing the public where to park. Additionally, enhancing the pedestrian environment and implementing transit will encourage the use of alternative modes of transportation and thus eventually reduce the demand for parking.

GOAL 3.3: A mobility system that offers a variety of choice in modes of travel.

- ***Develop and implement a public transit system.***

1. Develop a joint task force and partnership between the University, City and County and any other organizations that would be responsible for the oversight of evaluating and implementing public transit in the community.
2. Prepare a study to evaluate the feasibility of public transit in the community, potential routes, funding options and subsidies, incentives and programs for ridership.
3. Identify and acquire land – in advance of ensuing development – within the outlying areas of the City or ETJ for a park-and-ride location. This site would allow persons commuting to Sam Houston State University to park their vehicles and access the University via a shuttle service. An interim option would involve use of surplus parking at an existing retail center or other suitable and convenient location.

- ***Promote development patterns that are pedestrian friendly and encourage transit use.***

4. Support the land use policies and recommendations (identified in **Chapter 2, Land Use & Community Character**) for clustering residential development including off-campus housing. This type of development pattern could more readily be served by transit.

- ***Develop new and/or enhance existing pedestrian and bicycle amenities and facilities throughout the City.***

5. Prepare a comprehensive bike and pedestrian plan for the community that identifies a network of bike lanes, trails, greenways, and pedestrian linkages throughout the city limits and extraterritorial jurisdiction (ETJ). The resulting study should identify a network of on- and off-street linear connections between neighborhoods, parks, and schools, with prioritization of improvement packages. Attention should be given to identifying bikeway and sidewalk improvements in and around the University area in particular where roadways could be "retrofitted" to accommodate bike lanes or sidewalks.

6. Amend the Development Code to include alternative cross section standards for collectors and minor arterials that include sufficient right-of-way for bike lanes.
7. Amend the Development Code to require sidewalks on collector and residential streets concurrent with all new development, in addition to the current requirement for sidewalks on all arterial streets (Development Code Section 606).
8. Make it standard practice to add sidewalks along roadways where they are not already present when roadways are improved or widened.
9. Identify heavily used pedestrian intersections in the community and prioritize and implement safety improvements at these intersections. Intersections should be prioritized based on use and pedestrian risk. Many of these include intersections along Sam Houston Avenue and University Avenue near the Downtown and University area or near schools, the library or other public buildings. Improvements could include walk overs; installing accessible ramps for persons with disabilities; marked, signed and/or signaled pedestrian crossings; and pedestrian-actuated signal detectors.
10. Conduct a sidewalk inventory to denote the existence or non-existence of sidewalks along each street. Also, inventory segments that are in poor condition or unfit for safe use, as well as barriers to connectivity. Barriers may include major roadways, utility poles/boxes, and buildings. Subsequently, prepare a five-year capital improvement program (CIP). The program should include a prioritization of projects with the highest priority assigned to areas around the University, schools, Downtown, parks, and other areas where there is a high propensity for walking. An established amount should be budgeted annually for sidewalk improvement, replacement, and construction. Alternatively, the City could establish a public improvement district (PID), where appropriate, whereby the improvement costs would be proportionately allocated to individual property owners.
11. Amend the Development Code and adopted City construction standards to increase the minimum width of sidewalks from four to five feet.
12. Prepare a Safe Sidewalks Program to identify those locations where the condition and maintenance of the sidewalk are particularly important, such as around, adjacent to, and leading to/away from schools; around Sam Houston State University; near and adjacent to public buildings and spaces; and other areas prone to heavy utilization of the sidewalks. In these priority areas, conduct regular inspections of safety conditions to ensure the walking surface is free from hazards and dangerous obstructions. Also organize a public education program to notify the community of the Safe Sidewalks Program, the priority pedestrian areas, and the individual

Traffic Calming involves changes in street alignment, installation of barriers, and other physical measures to reduce traffic speeds and/or cut-through volumes, in the interest of street safety, livability, and other public purposes.

Speed Hump

Roundabout

Narrowed Entrance

Street Closure

Choker

responsibilities for care and maintenance. The City should submit a proposal to the Texas Safe Routes to School (SRS) program.

13. Install bicycle racks at key locations and buildings throughout the community including the University, Downtown, library, schools and parks.
14. Amend the City's street design standards for the installation of pedestrian and bicycle actuated traffic signals. Also coordinate with TxDOT to ensure their installation at signals on state highways in town.

GOAL 3.4: A mobility system that is integrated into and complements neighborhood and community character.

- ***Implement a traffic calming program in the City.***

1. Periodically conduct travel speed studies to determine appropriate speed restrictions in neighborhood pedestrian areas. Street pavement markings and signage for all school safety zones should be improved and regularly maintained. Raised cross-walks should be installed along all streets that front onto public facilities, such as schools, but also including municipal parks, the library, and the recreation center.
2. Perform localized traffic calming studies where there are observed unsafe conditions of cut-through and/or high-speed traffic. Traffic calming is applicable where there are continuous and relatively straight streets (for a distance of 500 feet or more) carrying higher volumes of traffic in excess of 100 vehicles per hour during peak hours, when actual speeds exceed the posted limit on a regular basis, and/or when the street is in close proximity to a school, park, or other location frequented by children. The study should identify the recommended improvements based upon site-specific conditions.

Thoroughfare Planning

The City's Thoroughfare Plan is designed to provide for the future travel needs of the community by ensuring orderly development of the street system, including the extension and improvement of existing streets, as well as planned future roadways. The Thoroughfare Plan is designed to ensure that adequate rights-of-way are preserved with a general alignment and sufficient width to allow for efficient expansion and improvement of the street transportation system. In addition, it is designed to provide opportunities for other transportation modes so as not to place a fiscal burden on the community to fund extensive road improvements, which, in turn, require long-term maintenance. This latter objective is essential given the level of current infrastructure investment and reinvestment needs in Huntsville.

Displayed in **Figure 3.1, Thoroughfare Plan**, are the proposed general alignments for the extensions of existing collector and arterial roadways and planned new roadways. It is important to note that the actual alignments of these roadways will likely vary somewhat from this plan and will be determined through the subdivision development process and the preliminary engineering phase of construction. Refinement of the Thoroughfare Plan on this basis is both warranted and accepted. Modifications that would alter the intentions of the plan to create a complete and continuous network, though, should not be permissible without the necessary study and proposals to achieve the objectives, policies, and purposes of the plan.

Through the comprehensive planning process, only one amendment was made to the City's pre-existing Thoroughfare Plan map: the projected new Secondary Arterial (Future) that skirts the western boundary of the Municipal Airport and proceeds north-northwestward to a future outer loop around Huntsville was changed to a Collector (Future). This change was made in the interest of airport protection (i.e., limited development to maintain clear flight paths and avoid noise issues) since the Future Land Use Plan reflects minimal development in areas immediately north of the airport, yet a new arterial roadway in this same vicinity could have the opposite effect of spurring greater development interest and activity.

Additionally, the following observations were made regarding the City's pre-existing Thoroughfare Plan map:

- A proposed Secondary Arterial to the south of downtown and the SHSU campus (extending from the Sam Houston Avenue-Sycamore Avenue intersection on the east to the I-45-Smither Drive intersection on the west) cannot be accomplished as literally depicted on the Thoroughfare Plan because the alignment traverses numerous developed properties. However, through reviews of new development applications, City staff is already in the process of preserving right-of-way sections on a similar alignment that would serve the same, appropriate purpose of providing a new east-west roadway connection in this area of Huntsville.
- A proposed east-west Secondary Arterial to the north of FM 2821 is shown intersecting with FM 247 precisely at its existing intersection with FM 980. This would create an awkward and likely hazardous five-point intersection that should be avoided, perhaps by shifting the new Secondary Arterial slightly to the south.
- Two proposed new Collector roadways – one shown extending southward past I-45 toward Veteran's Memorial Parkway, and another shown extending eastward from SH 19 to SH 190 (effectively an extension of Bearkat Boulevard)

– would both provide access to designated growth areas as indicated on the Future Land Use Plan map.

- Two proposed new Collector roadways on the west side of Huntsville, roughly parallel to and north and south of SH 30, would be appropriate to provide traffic circulation alternatives, and therefore relief, to SH 30. Significantly, they would also link several "leapfrog" subdivisions to the west of town with existing developed areas in the vicinity of the I-45/SH 30 interchange. This new land access could also spur development activity in the areas in between, immediately north and south of the SH 30 corridor, which are shown as designated growth areas on the Future Land Use Plan map.

Perhaps more than any other component of this Comprehensive Plan, the thoroughfare system will affect and directly influence the pattern of future community growth and development. For this reason, it is particularly essential for the community to be cognizant and remain diligent and steadfast in adhering to this plan so as not to act in a short-sighted manner. Rather, as indicated by the set of observations above, decisions about thoroughfare improvements must be made in coordination with the future land use plan and the policies of **Chapter 2, Land Use & Community Character**.

Functional Classification

An effective transportation system is comprised of a network of roadways each with its own designation, function and capacity within the overall system. Each street segment contributes to the interconnectivity of the network. Therefore, for a network to operate efficiently, it is essential for there to be a complete network of roadways designed in a hierarchy from highways, to arterial and collector streets, to the local street network. Each link is intended to function according to its design capacity, in effect, distributing traffic from the lowest design classification – local streets – to the highest functional classification – highway or expressway. Connectivity is a key to providing an efficient, safe, and convenient roadway network for vehicular traffic.

Characteristics of the City's functional classification system as shown on the Thoroughfare Plan map are shown in **Table 3.1**. A functional roadway system facilitates a progressive transition in the flow of traffic from the provision of access to the provision of movement. Freeway and arterial facilities are at one end of the spectrum, primarily providing the function of moving vehicles. Collector and local streets are at the opposite end of the spectrum, providing access to property. To enable streets and highways to accomplish their intended function, the planning and design of the facilities should consider those elements that support the intended functions.

Table 3.1 Functional Classification

Criterion	Highway	Primary Arterial	Secondary Arterial	Collector	Local Street
Functional Role	Entirely through traffic movement with no direct access to property.	Mobility is primary, access is secondary. Connects Freeways and other Arterials.	Connects Freeways, Principal Arterials, and lower classification roadways. Access is secondary.	Collects traffic destined for the Arterial network. Connects Arterials to Local Streets. Also land access.	Access is primary. Little through movement.
Roadway Continuity	Inter-city, regional, and interstate.	Connects Freeways to lower classification roadways. Connects major activity centers.	Connects Freeways and Principal Arterials to lower classification roadways.	Continuous between Arterials. May extend across Arterials.	Discontinuous. Connects to Collectors.
Roadway Length	Usually more than 5 miles	Usually more than 5 miles	Usually more than 3 miles	Varies from roughly one-half mile to 2 miles	Generally less than 1 mile
Traffic Volumes (VPD = vehicles per day)	40,000+ VPD	20,000 to 60,000 VPD	5,000 to 30,000 VPD	1,000 to 15,000 VPD	100 to 5,000 VPD
Desirable Spacing	5 miles or more	2 miles or more	Generally one-half to 2 miles	Generally one-quarter to one-half mile	Varies with block length (at least 125 feet between)
Posted Speed	55 to 75 mph	40 to 55 mph	30 to 45 mph	30 to 35 mph	20 to 30 mph
Access	Controlled access. Grade separated interchanges and frontage/service roads.	Intersects with Freeways, Arterials, Collectors, and Local Streets. Restricted driveway access.	Intersects with Freeways, Arterials, Collectors, and Local Streets. Restricted driveway access.	Intersects with Arterials and Local Streets. Driveways limited.	Intersects with Collectors and Arterials. Driveways permitted.
On-Street Parking	Prohibited	Restricted	Restricted	Normally permitted	Permitted
Community Relationship	Defines neighborhood boundaries	Defines neighborhood boundaries	Defines and traverses neighborhood boundaries	Internal and traverses neighborhood boundaries	Internal
Through Truck Routes	Yes	Yes	Permitted	No	No
Bikeways	No	Limited	Permitted	Yes	Yes
Sidewalks	No	Yes	Yes	Yes	Yes

Roadway Design Standards

This section describes existing and proposed roadway design standards associated with each of the functional classifications described above. Roadway design standards are located in the City of Huntsville Development Code and include roadway design criteria and cross sectional elements for arterial, collector and local streets. While street classification reflects the functions that roadways serve as part of the street network, roadway design standards are related to traffic volume, design capacity and level-of-service. **Table 3.2** displays the existing requirements while **Table 3.3** identifies those recommended in the *2001 Transportation Plan.* It is recommended that the City revise its Development Code to include the arterial and collector cross section standards identified in the *2001 Transportation Plan*. However with regards to local roadways, having options available is important in accounting for situations where less right-of-way and pavement width may be acceptable due to lower density and fewer trips generated. To offer more choice and flexibility the local standard should be supplemented with alternatives based on performance characteristics (type of access, number of dwelling units, units' average frontage dimensions) which determine required right-of-way and pavement widths.

Table 3.2 Existing Roadway Cross Section Standards

	ROW	Pavement Width	Median	Lanes
Primary Arterial	110′	84′	12′ CTWLTL	6
Secondary Arterial	80′	60′	12′ CTWLTL	4
Collector	70′	40′		2
Local	50′-60′	28′-40		2

Source: City of Huntsville Development Code

Table 3.3 Proposed Roadway Cross Section Standards in *2001 Transportation Plan*

	ROW	Pavement Width	Median	Lanes
Primary Arterial	120′	94′	22′ to 46′	4-6
Secondary Arterial	90′	64′	16′	4
Collector	70′	44′		2-4
Local	50′	30′		2

Source: 2001 Transportation Plan

Plan Implementation

Implementation of thoroughfare system improvements occurs in stages over time as the City grows and, over many years, builds towards the ultimate thoroughfare system shown by the Thoroughfare Plan. The fact that a future thoroughfare is shown on the plan does not represent a commitment to a specific timeframe for construction or that the City – or other jurisdiction – will build the roadway improvement. Individual thoroughfare improvements may be constructed by a variety of implementing agencies, including the City, County, and/or the Texas Department of Transportation (TxDOT), as well as private developers and land owners for sections of roadways located within or adjacent to their property.

The City, County, and TxDOT, as well as residents, land owners, and subdividers, can utilize the Thoroughfare Plan in making decisions relating to planning, coordination, and programming of future development and transportation improvements. Review of preliminary and final plats for proposed subdivisions in accordance with the City's Development Code should include confirmation of compliance with the Thoroughfare Plan in order to ensure consistency and availability of sufficient rights-of-way for the general roadway alignments shown on the plan. It is of particular importance to provide for continuous roadways and through connections between developments to ensure mobility. By identifying thoroughfare locations where rights-of-way are needed, land owners and subdividers can consider the roadways in their subdivision planning, dedication of public rights-of-way and provision of setbacks for new buildings, utility lines, and other improvements located along the right-of-way for existing or planned thoroughfares.

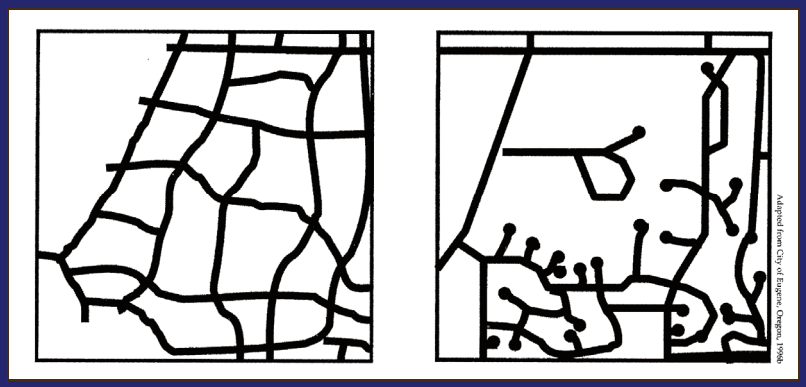
Requirements and Standards

This section outlines criteria for certain characteristics of street and land development. These criteria supplement or expand upon the design standards of the City's Development Code, providing further policy support for such provisions. These policies should be regulated through ordinance provisions to ensure proper implementation.

- **Location and alignment of thoroughfares.** The general location and alignment of thoroughfares must be in conformance with the Thoroughfare Plan, as currently expressed in the City's Development Code. Subdivision plats should provide for dedication of needed rights-of-way for thoroughfares within or bordering the subdivision. Any major changes in thoroughfare alignment that are inconsistent with the plan should require the approval of the City's Planning and Zoning Commission through a public hearing process. A major change would include any proposal that involves the addition or deletion of established thoroughfare designations or changes in the planned general

alignment of thoroughfares that would affect parcels of land beyond the specific tract in question.

- **Location and alignment of collectors.** Generally, to adequately serve their role to collect traffic from local streets and distribute it to the arterial street system, collectors should be placed between arterial streets, with a spacing of approximately one-quarter to one-half mile for minor and major collectors, respectively. Collectors must be shown on all proposed subdivisions of land consistent with the Thoroughfare Plan. In cases where a collector is not shown on the plan, but is warranted due to development density and projected traffic volumes, it is also required and must be shown.
- **Roadway continuity.** To maximize mobility, it is essential that collector streets traverse adjacent neighborhoods to provide access and circulation not only within, but also between neighborhoods. Collector streets should generally connect bounding arterials, rather than allowing developments to design a street system with limited or no points of ingress/egress other than the primary entrance(s) to the development. Rather than allowing waivers of this requirement, the Development Code should identify warrants and criteria for exemption.



Continuity of the street pattern, as illustrated on the left, is essential for its efficient and systematic function in the overall thoroughfare system

- **Right-of-way and pavement width.** The pavement and right-of-way width for thoroughfares must conform to minimum standards unless a waiver is granted using formalized criteria. Properties proposed for subdivisions that include or are bordered by an existing thoroughfare with insufficient right-of-way width must be required to dedicate land to compensate for any right-of-way deficiency of that thoroughfare. When a new thoroughfare extension is proposed to connect with an existing thoroughfare that has a narrower right-of-way, a transitional area must be provided. An alternative to the current practice of requiring street widening at the time of subdivision development is a street escrow program whereby funds for street construction are held in escrow until such time as widening of the complete street section is warranted due to development.
- **Continuation and projection of streets.** In accordance with the policies and recommendations of this plan, existing streets in adjacent areas should be continued, and, 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. Where adjacent land is undeveloped, stub streets must include a temporary turnaround to accommodate fire apparatus.

- **Location of street intersections.** New intersections of subdivision streets with existing thoroughfares within or bordering the subdivision should be planned to align with existing intersections to avoid creation of off-set or "jogged" intersections and to provide for continuity of existing streets, especially collector and arterial streets.
- **Angle of intersection.** Consistent with the design standards in the Development Code, the angle of intersection for street intersections 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.
- **Offset intersections.** The standard for offset or "jogged" street intersections should be 200 feet between the centerlines of the intersecting streets.
- **Cul-de-sacs.** Through streets and tee-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. However, when cul-de-sacs are used, they should have a maximum length of not more than 600 feet measured from the connecting street centerline to the centerline of radius point. It is advisable to amend the current pavement diameter in residential areas to 100 feet with a right-of-way diameter of 120 feet. A cul-de-sac with an island should have a diameter of not less 150 feet.
- **Residential lots fronting on arterials.** Subdivision layout must avoid the creation of residential lots fronting on arterials with direct driveway access to the arterial street. Lots should be accessed from local streets within or bordering the subdivision or an auxiliary street designed to accommodate driveway traffic.
- **Residential lots fronting on collectors.** Subdivision layout must avoid the arrangement of lots to access major collector streets and, to the maximum practicable extent, minimize access to minor collector streets, particularly within 180 feet of an intersection.
- **Geometric design standards and guidelines.** Other requirements and guidelines for the geometric design of thoroughfares and public streets should be provided in the Development Code and standard specifications. This includes special provisions for lot width and building setbacks on corner lots to preserve sight distances at adjacent intersections.

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