



Nacogdoches Comprehensive Plan Update

Transportation

CHAPTER 6

The purpose of the Transportation element is to provide for orderly development and upgrading of Nacogdoches' future transportation system to ensure safe and efficient movement of people and goods within and across the urban area.

In addition to providing findings and recommendations regarding various aspects and modes of transportation, this element includes a new Thoroughfare Plan to guide long-term right-of-way preservation and acquisition and to ensure carefully planned expansion and improvement of the City's system of arterial roadways and collector streets as the community grows and changes. The Thoroughfare Plan is intended to work hand in hand with the City's Future Land Use Plan as essential means for guiding and managing development, along with others elements of this Comprehensive Plan such as Parks and Recreation and Community Facilities. Transportation goals and objectives and action recommendations provide further guidance for the City's long-range planning efforts.

Key Issues

Review of current conditions and trends, previous plans and studies, and community input brought to the forefront a set of key issues regarding transportation concerns and needs in and around Nacogdoches. These issues were assembled into several broad categories that provide the basis for Transportation goals, objectives and actions, as well as the new Thoroughfare Plan map later in this chapter.

- ◆ **Coordinating Land Use and Transportation** – Like every urban community, Nacogdoches faces challenging decisions on how best to address increased traffic, problem intersections, and other locations with unsafe condi-

tions for drivers, bicyclists and pedestrians. In addition, the City must deal with a variety of county, regional, state and federal agencies that are involved in initiating, prioritizing, funding, designing, constructing and maintaining important pieces of the overall transportation system – particularly the various highways that criss-cross the community.

Besides maintaining local streets and related infrastructure, where the City has its greatest measure of control is in regulating the location, layout and design of land development relative to the roadway, transit and sidewalk networks. This significant local government function can go a long way toward ensuring safe and efficient travel conditions and is a day-to-day responsibility – always with long-term planning considerations in mind. The City's role includes:

- (1) participating in inter-governmental planning for major transportation improvements, such as Interstate 69, upgraded highway interchanges, expanded transit services, and airport enhancement/development – particularly for economic development purposes;
- (2) coordinating with major traffic generators/attractors (such as Stephen F. Austin State University, Nacogdoches Medical Center, and significant industrial and commercial developments) to manage transportation conditions and issues cooperatively;
- (3) planning for new and expanded roadways through effective thoroughfare planning procedures to open up new areas for development within the community versus at the urban fringe, to provide alternate travel routes and traffic relief for existing roadways, to ensure advance knowledge of roadway segments that are likely to be built or widened in the future, and to extend roadways into new growth areas as appropriate;
- (4) upgrading capacity and safety at key intersections through road widenings, additional lanes or turning lanes, new or adjusted signalization, better striping and signage, and crosswalks or other pedestrian enhancements;



- (5) managing access to developed properties along major roadways to control turning movements and reduce traffic conflict points, limit the uncoordinated proliferation and proximity of driveways, and set the

stage for eventual signalization at workable locations (as one public meeting attendee summed up, “We destroyed North Street in the 1970s”);

- (6) establishing appropriate design and dimensional standards for various types of streets to ensure traffic speeds and flows that will be compatible with anticipated development in the vicinity;
- (7) requiring adequate off-street parking to avoid off-site impacts of overflow parking and traffic; and,
- (8) considering annexation where and when appropriate to ensure that areas requiring upgraded roads or services contribute tax revenue to support such improvements.

Most importantly, City leaders and residents need to recognize the community-shaping role of transportation investments, both to guide the direction of growth more effectively and also to keep significant development and traffic away from valued agricultural lands, environmental assets, and residential neighborhoods. Avoiding “strip development” outcomes is another never-ending challenge, to avoid traffic nightmares and to maintain the accessibility and market appeal of commercial districts.

- ◆ **Upgrading Facilities to Enhance Mobility and Safety** – While some residents point with pride to the lack of “big city” traffic problems in Nacogdoches and the ability to “get anywhere in five minutes,” the City still faces many competing demands for capital improvements to enhance traffic flow, address walking and biking safety, and better serve growth and land development needs. According to Texas Department of Transportation (TxDOT) statistics, there were 47,535 registered vehicles in Nacogdoches County in Fiscal Year 2001 relative to a county population in the 60,000 range. The new Thoroughfare Plan provides for a logical pattern of roadway network improvements to accommodate increasing traffic. Some of these improvements may not occur for many decades, if ever, depending on development trends, while others are not too far from the “drawing board.” This chapter also outlines specific improvement needs, identified through official and public input, that involve roadways, sidewalks, bike lanes and trails, railroad crossings, parking, and related infrastructure such as drainage. Needs lists such as these can provide the basis for ongoing capital improvements programming and budgeting, lobbying of other transportation funding entities, and potential bond issues to finance and accomplish significant local projects.
- ◆ **Providing for Non-Vehicular Circulation** – It was generally agreed during public input discussions for the Comprehensive Plan Update that Nacogdoches is not a particularly walker- or biker-friendly community, which has health as well as transportation and public safety implications (as one advisory committee member noted, Nacogdoches could be the “Oldest and Healthiest Town in Texas”). Some observers suggested that the hilly topography and development pattern of the city discourages more pedestrian activity, and they do not sense great concern about lack of sidewalks. However, it was often pointed out how remarkably little investment in sidewalks and bike lanes/ways Nacogdoches has made relative to what is typically seen in other “college towns,” particularly in the immediate vicinity of the SFA campus, not to mention in many

residential neighborhoods. Sidewalks and trail networks are a basic “quality of life” component in many communities, and there is clear support for Nacogdoches to make greater strides in this area in the coming decades, especially to avoid this situation in newly-developing areas. However, given the size of the community, attempts to “retrofit” sidewalk and/or bikeway improvements in existing developed areas will require careful setting of priorities to ensure “bang for the buck” and satisfaction of real needs for better and safer walking and biking routes.



Also during the public input process, a local accessibility advocate complimented Nacogdoches for progress the community has made on behalf of the disabled population relative to other cities. However, it was noted that there is always more to do to create a truly barrier-free environment – for older members of society as well as the disabled. As in many communities, the desire is to go beyond minimum requirements of the Americans with Disabilities Act (ADA) to eliminate and prevent unnecessary and sometimes very basic obstacles, such as utility poles and fire hydrants placed within the sidewalk area and large trash cans, planters, vending machines or other items that limit the passable area of public sidewalks.

- ◆ **Enhancing Public Transportation Service** – While a formal system of public transportation is relatively new to Nacogdoches (since 2000), concerns were expressed about the viability and usefulness of the current system without better visibility and accessibility. These are challenging issues for any small-city transit system, but users and potential users suggested that such improvements are needed if the community wants to avoid losing a service it worked so hard to gain. The City of Nacogdoches already contributes funds annually in support of local transit service and will likely need other public and private partners to assist in service enhancement efforts. A diversity of interests expressed the need to work together on this issue given the dependence of many elderly, disabled and low-income individuals on reliable public transit service. It was also

pointed out that running the system from the restored railroad depot should be a great help in terms of marketing/visibility and basic operations (versus inactive buses sitting in parking lots). Additional information on current Brazos Transit District services in Nacogdoches (routes, schedules and fares) may be found at the following website:

<http://www.btd.org/Fixed%20Routes.htm>

- ◆ **Addressing Long-Term Air Transportation Needs** – During the comprehensive planning process, all facets of the community – from businesses to institutions (SFA, medical sector, etc.) to individual residents – expressed a strong desire for access to closer and expanded air service options. For individuals it is a matter of time and convenience. For businesses and institutions, it is an economic competitiveness and cost-efficiency issue, considering the driving distances to major airports in Houston and Dallas-Fort Worth and regional facilities in Longview and elsewhere. Many also cited the highway safety factor to and from distant airports, particularly for groups and sports teams that must travel regularly. In the case of one significant local institution, top SFA officials must frequently travel to Austin on short notice, particularly during legislative sessions, which makes for unappealing trip options. At the same time, many also recognize Nacogdoches' relative position within the air service market – combined with the current challenges facing the entire airline industry – plus the difficulties of arriving at a mutually workable joint facilities approach with the nearby City of Lufkin despite much effort and discussion over the years. For the immediate future it appears that Nacogdoches must continue to upgrade its airport facilities (as feasible), monitor opportunities to attract carriers and targeted service, and ensure a coordinated approach among all interested local parties through the Nacogdoches Economic Development Corporation (NEDCO) and other forums.

Goals, Objectives and Actions

The goals, objectives and action steps outlined in this element of the Nacogdoches Comprehensive Plan Update are based on traditional transportation planning and community design principles as well as input from community residents and leaders during the planning process. The goals, objectives and actions appear in no particular priority order.

Coordinating Land Use and Transportation

Goal: Constant coordination of land use and transportation planning and implementation to ensure viable development outcomes for the long term.

Objectives

- ◆ Use the Thoroughfare Plan as a tool to identify areas where transportation access is essential to spur desired development activity, along with necessary capital investment in utility extensions (e.g., northwest quadrant of city, other underutilized areas within Loop 224, desired ETJ growth areas, targeted areas for economic/industrial development).
- ◆ Recognize the importance of roadway and streetscape improvements to North Street as part of an overall, long-term redevelopment strategy.

- ◆ Monitor Interstate 69 activities and progress to be prepared for the likely development and transportation system impacts of this significant project.

Actions

- Utilize the Thoroughfare Plan during the subdivision and site development review process to ensure functional integration of new streets with the existing arterial and collector street system; interconnected street systems between adjacent developments, as appropriate; and, multiple points of ingress/egress for large subdivisions.
- Periodically review the City's Thoroughfare Plan and consider amendments as necessary, particularly to maintain consistency with the Future Land Use Plan, zoning and other development-related ordinances.
- Consider traffic impacts on affected transportation facilities during review of zone changes and subdivision applications, with developer participation in improvements needed to maintain an adequate level of service.
- Require traffic impact studies and mitigation actions for large-scale development proposals.
- Adopt access management regulations for arterials and other busy roadways pertaining to the design, construction, location, width, spacing, offset and potential coordination of driveways; street connections; medians and median openings; auxiliary lanes; on-street parking; traffic signals; turn lanes; and, pedestrian and bicycle facilities.
- Carefully regulate development and require high standards for landscaping and property maintenance along highways and major thoroughfares to maintain aesthetics and avoid "strip development" outcomes.
- Explore possibilities for provision of shared parking in conjunction with North Street redevelopment planning, particularly in areas with many small parcels and limited on-site parking.
- Consider the impact of ETJ population on city roads as a factor in annexation studies and decisions.
- Continue to require high standards for infrastructure in ETJ developments, in coordination with Nacogdoches County, to avoid inheriting problem situations as the City grows.

Upgrading Facilities to Enhance Mobility and Safety

Goal: A balance of new construction with steady maintenance of transportation facilities to address current deficiencies as well as future mobility needs.

Objectives

- ◆ Maintain an effective Thoroughfare Plan for Nacogdoches to ensure continuity of the major roadway network and desirable connections between major arteries for cross-town traffic flow, to support minimum response time for emergency vehicles, and to aid in prioritizing transportation improvement needs.
- ◆ Ensure that the transportation system adequately accommodates and encourages through traffic on the arterial street system and controls traffic and speeds on collectors and local residential streets.
- ◆ Design and place traffic control devices so as to maximize efficient traffic flow and minimize the impedance of traffic flow.

- ◆ Establish a formal mechanism for routine monitoring of street conditions and assignment of immediate, short-term and longer-range priority ratings to potential improvement projects – including consideration of equitable allocation of improvements citywide.
- ◆ Continue coordination with TxDOT, the Deep East Texas Council of Governments and Nacogdoches County to accomplish needed improvements to regional thoroughfares in the Nacogdoches area.
- ◆ Support efforts of local economic development organizations and others to represent the interests of Nacogdoches in regional, state and federal transportation planning and funding processes, particularly for the Interstate 69 initiative.
- ◆ Ensure that all transportation projects include landscaping of green spaces within the right-of-way and other aesthetic enhancements, consistent with traffic safety and design standards.

Actions

- Pursue specific transportation improvement projects consistent with the Thoroughfare Plan and the needs outlined in Table 6.1, Status of Transportation Issues in 1994 Comprehensive Plan.
- Perform traffic engineering studies on existing intersections, as necessary, to identify realignment solutions and improvement needs, including to determine when signalization is warranted (or altered timing) in conformance with the Texas Manual of Uniform Traffic Control Devices (MUTCD).
- Acquire additional right-of-way on existing facilities as needed to facilitate turn lanes and acceleration/deceleration lanes and to provide additional traffic capacity at intersections.
- Periodically conduct surveys of pavement conditions on all street segments in the City and maintain and update a street inventory and condition assessment database as part of an ongoing pavement management system. Also track the condition of traffic signals, signs, pavement markings and other related improvements requiring periodic maintenance or replacement.
- Complete needed street improvements based on priorities established through master street system planning and pavement management processes.
- Periodically review the City's engineering design and construction standards and adopt amendments as necessary.
- Continue to require dedication of public rights-of-way and construction of street improvements as development occurs in accordance with the City's subdivisions regulations and adopted Thoroughfare Plan. Also, directly acquire rights-of-way as needed to preserve future corridor opportunities.
- Encourage (or provide local matching funds to achieve) enhanced aesthetic design of bridges, overpasses, retaining walls and other improvements in coordination with TxDOT and Nacogdoches County.
- Acquire additional right-of-way at key locations to provide open space areas and buffer zones.
- Emphasize tree preservation in roadway planning and construction.
- Continue to target volunteer clean-up activities and donated landscaping in high-profile corridors, coordinating with TxDOT as necessary.

- Ensure use of buffering and noise reduction techniques in major roadway projects, particularly near residential neighborhoods and schools.
- Continue to leverage county, state and federal participation in funding transportation improvements to alleviate high accident locations and traffic congestion.
- Evaluate the feasibility of Public Improvement Districts or other special assessment approaches to fund transportation enhancements in downtown Nacogdoches and elsewhere.
- Consider adopting road impact fees to generate funding for or recoup the costs of roadway improvements necessitated by and attributable to new development.
- Facilitate safety improvements at roadway/railroad crossings to reduce conflicts between highway and rail traffic.



Providing for Non-Vehicular Circulation

Goal: Progress toward being recognized as a pedestrian- and bicycle-friendly community, and a community that shows particular concern for accessibility for all persons.

Objectives

- ◆ Fund and construct a comprehensive pedestrian and bicycle system to serve both recreational and alternative transportation needs, including an enhanced sidewalk network and off-street paths and trails accessible to all areas of the community and connecting neighborhoods, schools, parks, shopping and employment centers.
- ◆ Pursue improvements that increase the visibility and safety of pedestrians and bicyclists while also enhancing the streetscape.
- ◆ Improve the availability and safety of pedestrian crossing opportunities on major thoroughfares and other streets with high traffic volumes or speeds.
- ◆ Improve site design of residential and non-residential developments to discourage speeding, cut-through traffic and other driver behavior that makes after-the-fact "traffic calming" measures necessary.

Actions

- Continue to expand and enhance the La Nana Creek Trail, particularly to provide links between additional major destinations.
- Provide a trail connection across the U.S. 59 corridor between the existing baseball complex and the proposed future soccer complex to the west of the highway.
- Coordinate with SFA and TxDOT on potential sidewalk and bike lane/way improvements in the university vicinity, including a potential walking corridor between the campus and downtown along Mound Street.
- Prepare a pedestrian/bicycle system plan, either for the entire community or on a special-area plan basis (e.g., university area, downtown, North-South Street, MLK, etc.), with meaningful public input opportunities and in coordination with ongoing parks/trails planning.
- Conduct a comprehensive and detailed inventory of sidewalks and other pedestrian facilities throughout the community.
- Monitor locations with a high incidence of pedestrian-vehicle accidents.
- Conduct a condition assessment of existing sidewalks and pedestrian facilities and prioritize needed improvements by condition, need and location.
- Begin to acquire or obtain dedication of space for likely bike-ped routes, including coordination with owners of utility easements and other potential shared-use corridors.
- Establish a mechanism for considering and prioritizing targeted sidewalk improvements based on the type of street, adjacent land uses, local needs and projected utilization.
- Fund and construct pedestrian walkways, sidewalks, crosswalks, handicap accessible ramps and curb cuts along city streets in areas with significant pedestrian traffic, such as around schools, parks, SFA, retail districts, and other activity areas.
- Add provision of sidewalks as a standard requirement for new residential subdivisions, consider sidewalk requirements for some or all non-residential developments, and determine applicable specifications (only on certain types of streets, one/both sides of street, width, placement relative to street edge, continuity, etc.).



- Work with TxDOT and Nacogdoches County to provide pedestrian accessways on all bridges.
- Consider alternative funding sources such as special assessment districts, block grants, transportation enhancement funds, and public-private partnerships to accomplish sidewalk improvements along existing roadways in established neighborhoods.
- Provide improved pedestrian facilities at additional locations, including crosswalks, handicap accessible ramps, curb cuts, "pedestrian/ bicycle crossing" signs and warning lights (near schools, parks, etc.), and pedestrian-activated signal changers.
- Continue aggressive enforcement of speed limits and other traffic laws near schools and parks and along neighborhood streets.
- Experiment, at appropriate locations, with other "traffic calming" techniques besides speed humps, and encourage such methods in new developments.
- Establish school zones at private school locations, as appropriate.
- Continue to pursue federal and state financial assistance grants for pedestrian and bicycle transportation projects.

Enhancing Public Transportation Service

Goal: A viable, well-used public transit system that meets definite needs while also providing a practical alternative for various automobile trips in town.

Objectives

- ◆ Encourage greater community use of public transportation services offered locally.
- ◆ Determine ways the City and community can help to make public transit service more appealing and beneficial to expand ridership.

Actions

- Consider specific actions suggested by transit users and Nacogdoches residents: (1) more direct/express service versus loop routes that cause long trips on the bus; (2) higher-profile, designated stop locations versus flagging down buses; (3) improved signage; (4) expanded marketing (e.g., pocket brochures with routes, stops, schedules and fares); (5) easier options for purchasing tickets; (6) more accessible bus stops; (7) better student access to the system; and, (8) Saturday service to support weekend employment.
- In addition to the City's existing financial contribution, consider direct City funding of specific support activities, such as enhanced marketing of transit services (or wider distribution of materials) or higher maintenance of bus stop sites (trash, signage, benches/shelters, etc.).
- Explore joint planning/funding of transit-supportive street improvements at key locations (e.g., pull-out bus stops/bays).
- Encourage pedestrian and bicycle accessways to transit stops as part of new developments, through subdivision and site plan review.
- Provide incentives for transit-supportive design features (e.g., reduced parking requirement in exchange for transit stop/shelter and sidewalks incorporated into development).

Addressing Long-Term Air Transportation Needs

Goal: Expanded local air transportation options for area residents, businesses and public agencies.

Objectives

- ◆ Continue to enhance the Nacogdoches municipal airport.
- ◆ Maintain a coordinated approach to marketing Nacogdoches's airport facility and unmet air service needs of local residents, businesses and institutions.

Actions

- Maintain close coordination with Texas Department of Transportation aviation officials and planners regarding Texas air market trends, facility competitiveness issues, and funding and technical assistance opportunities.
- Continue systematic upgrades to the Nacogdoches municipal airport, including potential runway expansion and other new and improved features to improve the facility's market appeal.
- Continue to monitor opportunities for safe and cost-efficient surface transportation "shuttle" options between Nacogdoches and major airport hubs in East Texas.
- Through NEDCO and other forums, continue close coordination on air service issues and opportunities among the City, County, state and federal elected officials from the region, SFA, the business community (especially major industries with the greatest air service needs), and other interested parties.

Nacogdoches Thoroughfare Plan

The existing and proposed thoroughfare system in and around Nacogdoches is displayed in **Figure 6.1**. The Thoroughfare Plan shows approximate alignments for planned or enhanced thoroughfares that should be considered in platting of subdivisions, right-of-way dedication, and construction of major roadways within the City and its extra-territorial jurisdiction (ETJ). The primary objective of the Thoroughfare Plan is to ensure that adequate rights-of-way are preserved on appropriate alignments and of sufficient width to allow the orderly and efficient expansion and improvement of the thoroughfare system.

Thoroughfare planning is interrelated with other components of comprehensive planning and urban development, including land use, annexation, utilities, housing, environment, and other elements. The authority of Texas cities to plan and regulate thoroughfares within their incorporated area and ETJ is derived from Article XI, Section 5 of the Texas Constitution and Title 7, Chapter 212 of the Texas Local Government Code. As a result, the City of Nacogdoches can require that development plans and subdivision plats conform to "... the general plan of the municipality and its current and future streets ..." and "... the general plan for extension of the municipality and its roads, streets, and public highways within the municipality and its extra-territorial jurisdiction." Actual roadway alignments can vary somewhat from the plan depending on future development trends and necessary refinement of projected circulation needs and concepts depicted on the Thoroughfare Plan.

Some elements of the thoroughfare system will require new or wider rights-of-way and may ultimately be developed as two-lane or multi-lane roadways with various cross sections. Other streets identified as collectors on the plan will not necessarily ever be widened due to physical constraints and right-of-way limitations. Instead, the collector designation signifies their traffic-handling role in the overall street system and the importance of maintaining such streets in superior condition to maximize their traffic capacity since they most likely cannot be improved to an optimal width and cross section.

The plan does not show future local streets because these streets function principally to provide access and their future alignments may vary depending upon development plans. Local street alignments should be determined by the City and landowners as part of planning for development. Likewise, minor collectors are required with new development but are not shown in all places on the Thoroughfare Plan since their alignments will depend on the surrounding street system and the particular development concept. Minor collectors should be situated on a case-by-case basis to connect major collectors (and sometimes arterials) with other major collectors and local streets.

The Nacogdoches Thoroughfare Plan will have far-reaching effects on the growth and development of the City since it guides the preservation of rights-of-way needed for future thoroughfare improvements. As a result, the plan has significant influence on the pattern of movement and the desirability of areas as locations for development and land use. While other elements of the Comprehensive Plan look at foreseeable changes and needs over a 20-year period, thoroughfare planning requires an even longer-range perspective extending into the very long-term future.



Thoroughfare Plan Implementation

Implementation of thoroughfare system improvements occurs in stages as the City grows and, over many years, builds toward the ultimate thoroughfare system shown in the Thoroughfare Plan. The fact that a future thoroughfare is shown on the plan does not represent a commitment to a specific time frame for construction, nor that the City will build the roadway improvement. Individual

thoroughfare improvements may be constructed by a variety of implementing agencies, including the City, Nacogdoches County, and 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 developers, can utilize the Thoroughfare Plan in making decisions relating to planning, coordination and programming of future development and transportation improvements. Review by the City of preliminary and final plats for proposed subdivisions in accordance with the City's subdivision regulations should include consideration of compliance with the Thoroughfare Plan in order to ensure consistency and availability of sufficient rights-of-way for the general roadway alignments shown in the plan. By identifying thoroughfare locations where rights-of-way are needed, land owners and developers 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 rights-of-way for existing or planned thoroughfares.

Major constraints in the Nacogdoches area that could limit the development of roads, streets and highways include existing developed areas; areas of steep or uneven terrain; streams and drainage channels (particularly La Nana and Banita creeks) and associated floodplain areas; public parks and open areas; agricultural land; and, critical habitat areas and other valued environmental resources. Rail lines through town are major obstacles to traffic circulation in many communities, sometimes requiring consideration of costly solutions such as construction of grade-separated over or underpasses at key railroad-roadway intersections.

Perhaps the most significant influence on thoroughfare improvement is existing residential neighborhoods and other developed areas that present constraints when a new or expanded thoroughfare might impact the area. This is not intended to imply, however, that existing constraints prohibit the development of a desirable transportation system. These factors may affect the location, feasibility and construction cost of transportation improvements, so they should be considered in the planning and design of future facilities.

Plan Amendment Process

It will be necessary for the City to periodically consider and adopt amendments to the Thoroughfare Plan to reflect changing conditions and new needs for thoroughfare system improvements and development. A systematic procedure should be followed for making plan amendments, including a set schedule for annually inviting and considering proposed changes.

The process for amending the Thoroughfare Plan should be established in the City's subdivision regulations. Typically, plan amendment requests may originate from landowners, civic groups, neighborhood associations, developers, other governmental agencies, City staff, and other interested parties. Proposed revisions should be analyzed by the Planning and Zoning Commission, the municipal engineer, and other City staff. The proposed change and staff recommendations should then be formally considered by the Planning and Zoning Commission. The Commission should conduct a public hearing on proposed plan amendments following required public notice. Proposed amendments should be considered in a fair, reasonable and open process. The burden for proving compelling reasons for the public benefit of any proposed changes should rest

with the requesting parties. Decisions and determinations should represent the best interests of the public.

The revised Thoroughfare Plan, including any approved plan amendments, should be forwarded by the Planning and Zoning Commission to the City Commission for its consideration. The amended plan becomes effective upon final adoption by the City Commission.

Ongoing Transportation Needs and Challenges

Since the current Comprehensive Plan is intended as an update of the City's previous plan prepared in 1994, **Table 6.1** reviews the status of various transportation issues and proposed improvements that were identified at that time. Some of these will remain long-range planning challenges since they do not involve easy or low-cost solutions.

TABLE 6.1:
Status of Transportation Issues in 1994 Comprehensive Plan
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	ISSUE	STATUS
1	Shuttle service for student apartments	This concept has been attempted and abandoned previously, although interest remains for another potential coordinated effort between Brazos Transit, the City, SFA and apartment complex owners. Some are skeptical of this notion given the extent of parking available on and at the edge of the SFA campus plus the extra time that a bus trip involves.
2	W. Austin extension to Loop 224	Completed. There is discussion of eventually extending W. Austin past the loop to provide additional access to the future soccer complex and County Expo Center area (combined with a grade-separated interchange at U.S. 59, this would also provide the means for a suggested bike/ped trail connection between the existing baseball complex and future soccer complex).
3	New north-south route west of Banita Creek	This remains a longer-term concept due to physical constraints and limited development in the northwest sector relative to other parts of the community.
4	Brazos Transit Authority bus service	Completed (started in 2000).
5	Ramp signalization at S. Loop 224 and South Street	Completed.

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	ISSUE	STATUS
6	Access management (combined driveways, center median) along busy, strip development segment of North Street between Main and College to control turning movements	Access management enhancements will occur, and have already been accomplished, as individual properties redevelop. This plan update also recommends a comprehensive study of the North Street corridor, in part to evaluate the concept of a center median versus continuous turn lane and better control and coordination of turning locations.
7	Remove some signals on North Street between College and Austin to improve traffic flow (signals at minor side streets)	This requires ongoing coordination with TxDOT to make the case that certain signals are not needed but might be warranted at new locations. Signalization strategy would also be part of a comprehensive study of the North Street corridor.
8	Improvements to E. Austin and E. Starr to relieve traffic on College through SFA campus	TxDOT is moving forward with plans for E. Austin widening. Improvements to Starr are indicated on the new Thoroughfare Plan.
9	Eventual grade separation at N. Loop 224 and North Street	While some cannot visualize this ever being necessary, this intersection could become one of the busiest in Nacogdoches considering the roadways involved and the existing and ongoing commercial and medical center development surrounding the intersection. This is likely a longer-term prospect but could very well be warranted at some point with future traffic growth and the need to improve the flow of through traffic relative to local trips.
10	Eventual signalization at aligned driveways for Wal-Mart and Nacogdoches Medical Center	Completed.
11	Widening of E. Austin between North and Raguet (especially after W. Austin extension)	In process.
12	Upgrade from stop-controlled intersection at E. Austin and Raguet	CPAC discussion indicated that signalization is not desired and the existing four-way stop should be maintained.
13	Eventual grade separation of W. Main at major railroad crossing and switching area	This idea is considered unlikely and less desirable than the potential wholesale relocation of the Union Pacific switch yard to a less congested location, possibly farther north toward the industrial park area. This prospect has been studied as part of U.P. planning, so the City should continue to coordinate with U.P. officials regarding any such action. Some observers believe that even the relocation idea may stretch beyond the 20-year horizon of this Comprehensive Plan.
14	Improve sight distance at certain downtown intersections (e.g., Fredonia at Pilar)	CPAC discussion indicated this is not a high priority or need.

	ISSUE	STATUS
15	Downtown parking management (metering strategy)	Completed (downtown metering resolved).
16	Downtown bypass routes or one-way street options to improve east-west traffic movement through/around downtown (truck traffic, Main closures during special events)	Action alternatives to address downtown traffic problems require continued study (possibly in conjunction with the North Street corridor study), particularly to provide alternate ways in/out and across downtown and relieve traffic congestion at the intersection of North and Main streets. A current City ordinance requires trucks to use the Loop versus traveling through downtown, which is also intended to improve traffic flow through downtown. It was noted in the CPAC discussion that fewer special events are using all of Main Street, and street-closing hours are limited to avoid TxDOT approval procedures.
17	Access management measures to control turning movements along commercial stretch of North Street between Austin and Loop 224	Same as under Item 6 above.
18	Reworking of rough railroad crossing on MLK	Completed.
19	Reworking of six-direction intersection at Douglas/21-Durst/225-W. Main-Sanders (possibly eliminate some approaches, improve sight distance)	It was concluded in the CPAC discussion that this remains a difficult intersection where improvements cannot be accomplished easily.
20	Widening of E. Starr between North and Raguet to eliminate traffic bottleneck on major east-west route	In process.
21	Sight distance improvements at intersection of E. Starr and Appleby Sand (for vehicles turning onto E. Starr)	A turning lane was added, but the left turn onto Starr remains very difficult. Because two state highways are involved, this would have to be identified for TxDOT as a City priority.
22	Signalization of intersection of N. University and Loop 224 (and eventual grade separation?)	Completed (signalization).
23	Additional lanes for improved traffic capacity at intersection of Appleby Sand and Loop 224	Completed.
24	Reworking of angled intersection of Fredonia and South Street to clarify traffic flow and turning movements (better marking and signage, potential intersection realignment)	Directional arrows were recently added.
25	Reworking of unsafe intersection of Old Lufkin Road and Loop 224 (no left turns, potential grade separation)	Redesign of U.S. 59-Loop 224 interchange in process, which will also address the Old Lufkin Road intersection (some minor, but insufficient, changes already made).
26	Westward extension of Starr from Pearl to Old Tyler Road across Banita Creek and railroad	This would be a TxDOT project and require contribution of City funds. Creek and railroad crossings will add to the cost. An eventual extension all the way to the Loop has also been discussed.

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	ISSUE	STATUS
27	Direct connection between Appleby Sand at E. Austin and E. Starr (traffic currently cutting through residential neighborhood via E. Austin and Briargrove Drive, necessitating speed humps)	This concept was considered unlikely during the CPAC discussion, particularly because the existing neighborhood would be disrupted.
28	Direct connection between King and Martinsville to improve traffic circulation between Memorial Hospital area and Park Street to the east	CPAC discussion indicated this is a long-recognized problem with the original street network that would be difficult to address due to existing residential development, historic district issues, and creek crossings.
29	Realignment and/or signalization of intersection of Fredonia and MLK to address limited sight distance and hazardous condition caused by nearby railroad crossing of Fredonia to the south	CPAC discussion indicated this is not a high priority relative to other needs.
30	Sight distance improvements at angled intersection of Woden and Loop 224 (difficult to see approaching traffic)	Intersection is now fully signalized.
31	Potential reworking of off-set intersections where certain streets cross North Street (e.g., Powers/King, College, Parker)	CPAC discussion indicated support for such improvements, which could also be evaluated as part of a comprehensive study of the North Street corridor as noted in Items 6 and 7 above.
32	Intersection capacity improvements along Pearl Street and connection to North Street at northern terminus (north of Parker) given Pearl's bypass function	CPAC discussion led to the incorporation of a Pearl Street extension northward to Creek Bend Boulevard on the new Thoroughfare Plan.
33	Construction of a parkway along the east side of Banita Creek to relieve Pearl Street and serve as a north-south bypass of North Street	CPAC discussion indicated lack of support for the Banita Creek parkway concept relative to the Pearl Street extension in Item 32 above.
34	Relief of Mound Street traffic through limited widening of narrow portions, intersection widenings to incorporate left turn lanes, and/or by making Fredonia a continuous parallel route to Mound	CPAC discussion indicated doubts about potential Mound Street improvements, beyond possible intersection enhancements, due to historic district issues and potential neighborhood disruption.

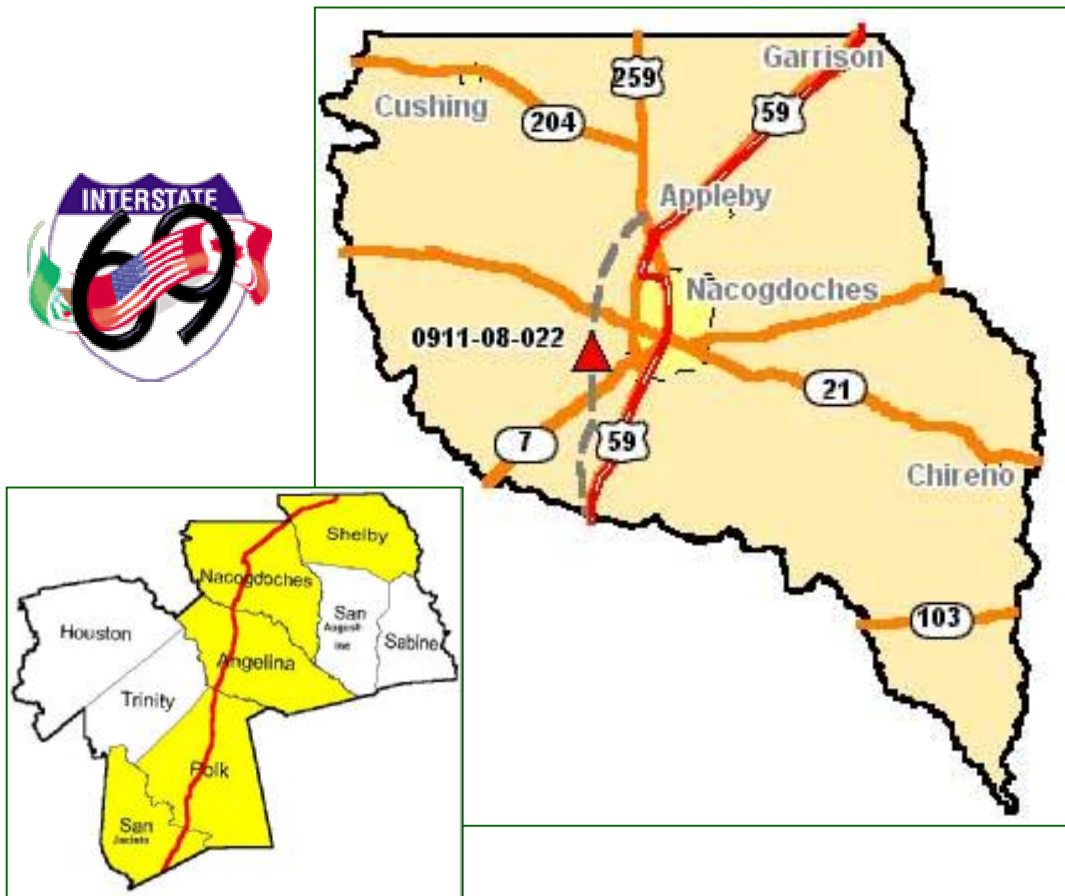
Interstate 69

Nacogdoches County is among the counties in East Texas that will someday accommodate a full-fledged interstate highway, already designated as IH-69. As shown in **Figure 6.2**, the projected IH-69 segment through Nacogdoches County is in the "Long Range Planning" category (denoted by the triangle symbol) as compared to other planned segments in Texas that are rated higher at Priority 1 or 2. Overall, IH-69 is a combination of two federally-designated High Priority Corridors, Corridor 18 (starting in Michigan) and Corridor 20, which is the equivalent of the existing U.S. 59 between Texarkana and Laredo.

Following preliminary studies and other initial efforts, "I-69" implementation now depends on the corridor prioritization process through the Texas Department of

Transportation plus the federal appropriations process in Congress, where the Texas delegation holds key leadership and committee positions and where interest in the project runs high. Promoting IH-69 as a premier NAFTA trade route to link markets in the U.S., Mexico and Canada, corridor proponents hope to accelerate project funding and development with state and federal resources and support.

FIGURE 6.2:
Projected Alignment of Interstate 69
 Nacogdoches Comprehensive Plan Update
 Nacogdoches, Texas



Source: Alliance for I-69 Texas

As former U.S. Transportation Secretary Rodney Slater stated, completing IH-69 “will provide a stretch of roadway that runs like a crescent through the world’s largest trade area. It is important to the well-being of the entire nation. This project represents the future.”

While the timing of IH-69 design and final construction remains uncertain, eventual implementation of this project would be a historic milestone for both the City and County of Nacogdoches that could influence development patterns and infrastructure investments many decades into the future, potentially attracting more growth to the west of the existing urbanized area, especially in the vicinity of future highway interchanges. Depending on final alignment and highway design decisions, the City’s Future Land Use, Thoroughfare and utilities plans would require re-examination to properly account for the impacts of this

significant corridor investment in the area. Nacogdoches would also be linked to a remarkable flow of interstate and international trade and commerce. According to the Alliance for I-69 Texas, the new interstate corridor will link 20 of the nation's top 25 seaports and 16 top U.S. air cargo airports. In addition, the Alliance boasts that "no other highway comes close to matching I-69 for trade volume and service efficiency" since nearly 64 percent of total U.S. truck-borne trade with Canada and Mexico flows through the states and border crossing points that IH-69 would connect.

Existing Transportation Concerns

During the comprehensive planning process, the graphics and data in **Figures 6.3 and 6.4** were used to highlight the most heavily-traveled roadway segments in Nacogdoches and apparent problem locations, as indicated by recent traffic accident statistics. Accident data from the five-year period 1997 to 2001 showed that nearly a quarter of the mishaps citywide occurred at three key intersections within an approximate two-mile stretch along North Street: (1) North Street at Starr Avenue, (2) North Street at College Street, and (3) North Street at Austin Street. Traffic volume data in **Figure 6.4** show that this busy segment of North Street, in the vicinity of the SFA campus, carries roughly as much traffic each day, on average (24,000 vehicles), as does the U.S. 59 bypass around the west side of the City (21,000-26,000 vehicles). However, the traffic flow along North Street obviously occurs in a much more restricted right of way lined with development and numerous side streets and access driveways, offering hundreds of potential turning movements and conflict points between vehicles, vehicles and pedestrians, and vehicles and bicycles.

These findings, combined with concerns about the long-term economic outlook and land use trend along North Street, led to a priority recommendation in this plan that the North Street corridor be the subject of a comprehensive study that would consider simultaneously issues of traffic, parking, pedestrian/bicycle circulation and safety, access management, transit, redevelopment, and aesthetic enhancement. It is also recommended that lessons learned from the historical development of the North Street corridor be applied in other growth areas of Nacogdoches, particularly along newly-developing segments of Loop 224 and places like the new W. Austin Street extension, to avoid the eventual pitfalls of corridors with unlimited property access and "strip" development outcomes.

Key Traffic Locations

The location and character of land uses that generate moderate to large numbers of trips can influence traffic volumes and flow patterns in their immediate vicinity as well as over a portion of the nearby street network. The following major trip generators in and around Nacogdoches were considered in reviewing existing transportation conditions and updating the City's Thoroughfare Plan:

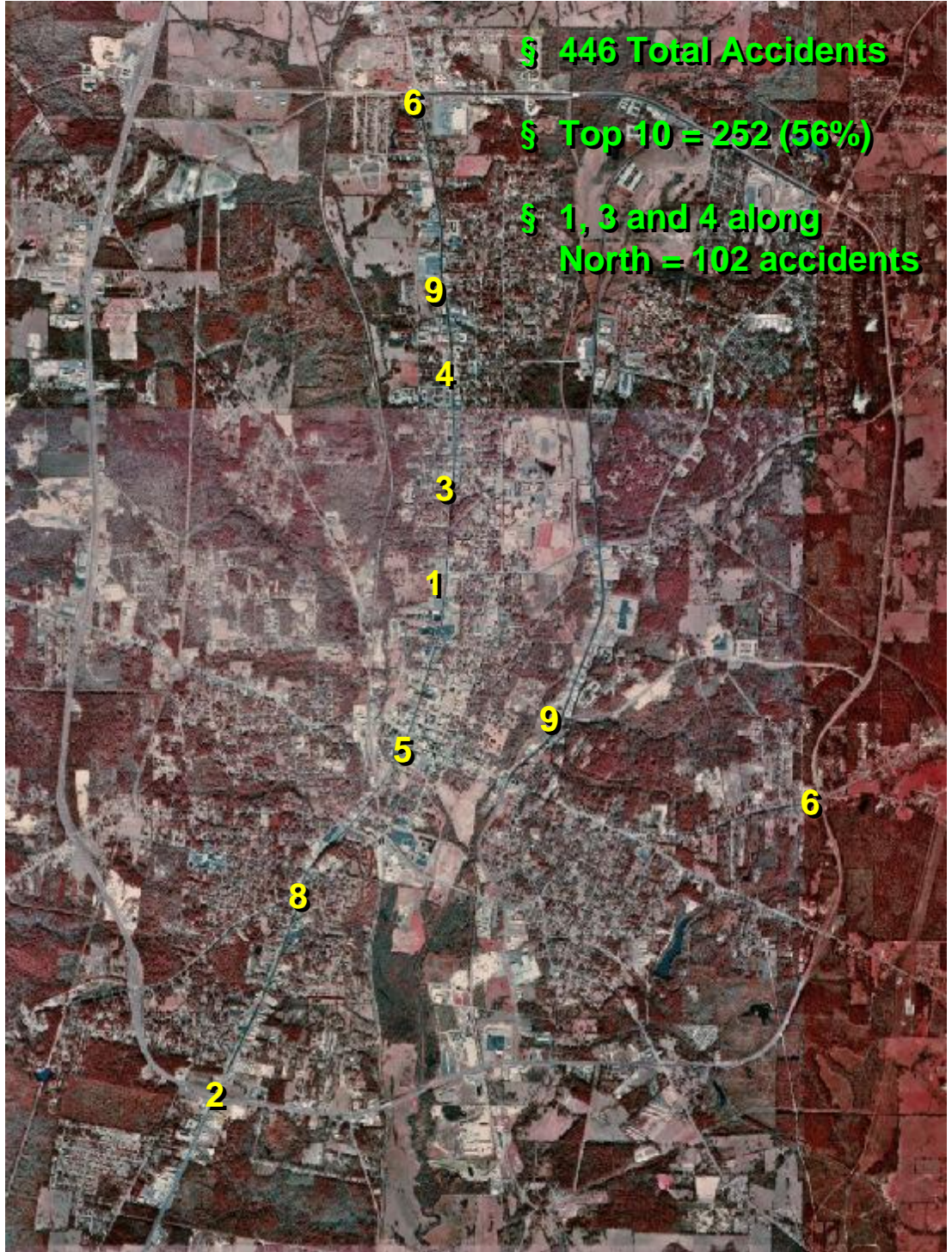
- ◆ Downtown (commercial areas, historic/tourism destinations, and government offices including the County Courthouse on North Street).
- ◆ Stephen F. Austin State University campus.
- ◆ Nacogdoches Medical Center and Memorial Hospital medical clusters.
- ◆ Commercial areas along North Street, University Drive and Stallings Drive.
- ◆ Industrial concentrations south of downtown and along University Drive.

- ◆ Nacogdoches High School (and all other school campuses at peak times).
- ◆ City Recreation Center and Library.
- ◆ Nacogdoches County Expo Center (during special events and peak usage).
- ◆ City soccer, baseball and softball complexes (at peak times).



Nacogdoches Comprehensive Plan

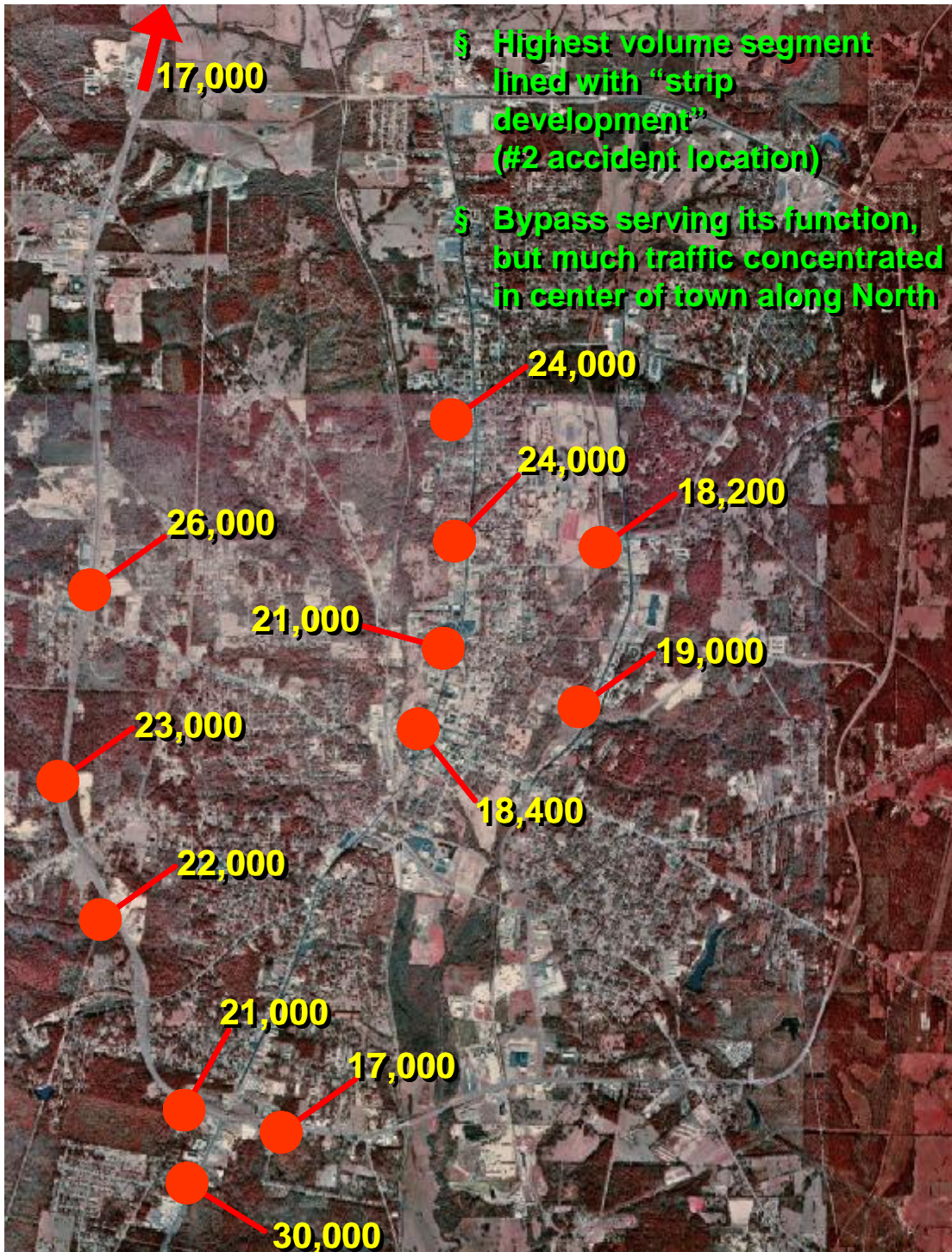
FIGURE 6.3
Top 10 Accident Locations: 1997-2001
Nacogdoches Comprehensive Plan Update
Nacogdoches, Texas



- | | | | |
|---|--------------------------|---|----------------------------------|
| 1 | North St. at Starr Ave. | 6 | North St. at Loop 224 |
| 2 | South St. at Loop 224 | 6 | Center Hwy at Loop 224 (TIE) |
| 3 | North St. at College St. | 8 | South St. at S. Fredonia St. |
| 4 | North St. at Austin St. | 9 | University Dr. at Park St. |
| 5 | North St. at Main St. | 9 | North St. at W. Parker Rd. (TIE) |

Source: City of Nacogdoches Police Department

FIGURE 6.4
Top Traffic Volume Locations: 2001 Average Daily Traffic
 Nacogdoches Comprehensive Plan Update
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30,000	U.S. 59 south of Loop 224	21,000	North St. north of Powers St.
26,000	U.S. 59 north of S.H. 21	19,000	University Dr. north of Park St.
24,000	North St. south of Austin St.	18,400	North St. north of Main St.
24,000	North St. north of Starr Ave.	18,200	University Dr. north of Starr Ave.
23,000	U.S. 59 north of FM 225	17,000	Loop 224 east of North St.
22,000	U.S. 59 south of FM 225	17,000	U.S. 59 south of Business 59
21,000	U.S. 59 at Old Lufkin Rd.		

Source: Texas Department of Transportation

Access Management

The transportation system is designed to provide access to the overall street network plus adjacent land uses. However, the number of access points can directly affect the efficiency and safety of the street system. Too many points of ingress and egress along a corridor can significantly impede traffic flow and result in more vehicular and pedestrian conflicts. On the other hand, too few access points can result in reduced marketability of area property. An efficient system is properly regulated with regard to the number and placement of curb cuts, traffic signals and signage.

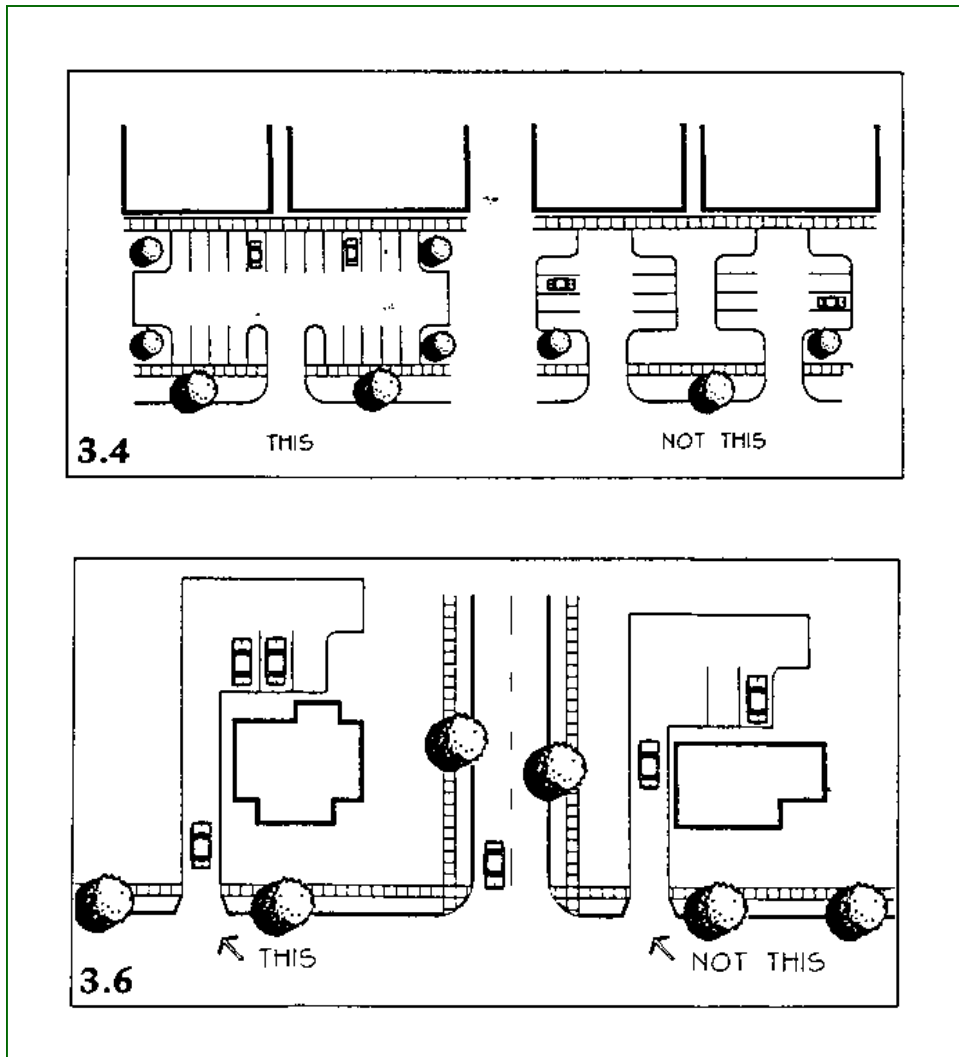
The practice of access management is intended to enhance the performance and safety of the major street system. It manages congestion on existing transportation facilities and protects the capacity of future transportation systems by controlling access from adjacent development. Properly utilized, it can eliminate or postpone the need for street widening or right-of-way acquisition.

As illustrated by the examples in **Figure 6.5**, means to accomplish access management include limiting and separating vehicle (and vehicle-pedestrian and vehicle-bicycle) conflict points, reducing locations that require vehicle deceleration, removing vehicle turning movements, creating intersection spacing that facilitates signal progression, and ensuring adequate on-site space for ingress and egress movements and vehicle queuing and maneuvering. Access management also focuses on the spacing and design of driveways, street connections, medians and median openings, auxiliary lanes and transit facilities, on-street parking and parking facilities, on-site storage aisles, traffic signals, turn lanes, freeway interchanges, pedestrian and bicycle facilities, bus stops and loading zones. Some of these design factors are accomplished within the public right-of-way while others require regulation of specific aspects of private development, particularly at the point where such developments will be accessed from the public street network.

Research indicates that a well-designed and effectively administered access management plan can result in the following tangible benefits:

- ◆ accident and crash rates are reduced by 40 to 60 percent;
- ◆ roadway capacity and the useful life of transportation facilities is prolonged;
- ◆ travel time and congestion is decreased;
- ◆ better coordination between access and land uses is accomplished;
- ◆ air quality is improved;
- ◆ economic activity is enhanced;
- ◆ urban design and transportation objectives are reconciled; and,
- ◆ the unique character and livability of a community is preserved through the coordination of land use and transportation.

FIGURE 6.5
Access Management Techniques
 Nacogdoches Comprehensive Plan Update
 Nacogdoches, Texas



Failure to manage access negatively impacts the efficiency of transportation networks in the following ways:

- ◆ more driveways related to strip commercial development;
- ◆ local streets becoming bypasses for congested streets thereby creating the need to address cut through traffic in residential neighborhoods;
- ◆ more frequent driveway related accidents;
- ◆ vehicle conflicts from closely spaced driveways, which increase congestion thereby reducing capacity;
- ◆ longer travel times that reduce market areas for business;
- ◆ more difficulty in providing safe access for new development thereby affecting economic growth;
- ◆ lower investment benefits of transportation improvements;

- ◆ greater need for wider streets to compensate for lost capacity; and,
- ◆ more cluttered streets and frequent driveways, which create an undesirable environment for pedestrians and bicyclists.

The following access management strategies may be used to balance the access needs of adjacent land uses with the function of the transportation system:

- ◆ *Separate Conflict Points* – Two common conflict points are driveways and adjacent intersections. Spacing driveways so they are not located within the area of influence of intersections or other driveways is a method to achieve access management objectives.
- ◆ *Restrict Turning Movements at Unsignalized Driveways and Intersections on Multi-Lane Roadways* – Full movement intersections can serve multiple developments through the use of joint driveways or cross-access easements. Turning movements can be restricted by designing accesses to limit movements or by the construction of raised medians that can be used to provide turn lanes.
- ◆ *Maintain a Hierarchy of Streets* – The development of a hierarchical street system that varies the amount of access based on the need to maintain vehicular mobility is a major goal of access management.
- ◆ *Establish Design Standards* – Design standards addressing the spacing of access points, driveway dimensions and radii, sight distance, and the length of turn lanes and tapers are effective mechanisms for managing the balance between the movement of traffic and site access.
- ◆ *Locate and Design Traffic Signals to Enhance Traffic Movement* – Interconnecting and spacing traffic signals to enhance the progressive movement of traffic is another strategy for managing mobility needs. Keeping the number of signal phases to a minimum can improve the capacity of a corridor by increasing green band width by 20 seconds.
- ◆ *Remove Turning Vehicles from Through Travel Lanes* – Left and right turn speed change lanes provide for the deceleration of vehicles turning into driveways or other major streets and for the acceleration of vehicles exiting driveways and entering major highways.
- ◆ *Encourage Shared Driveways, Unified Site Plans and Cross-Access Easements* – Joint use of driveways reduces the proliferation of driveways and preserves the capacity of major transportation corridors. Such driveway arrangements also encourage sharing of parking and internal circulation among businesses that are in close proximity.
- ◆ *Plan for Pedestrians, Bicycles and Transit Vehicles* – The specific access needs of pedestrians and bicyclist movements can be addressed by providing safe access to transit stops and bicycle lanes. It is helpful to design and time signals to accommodate pedestrians. It is also helpful to place bus stops so as to minimize impact to roadway capacity by providing pullout lanes.

“Traffic Calming” Measures

Cities of all sizes, in Texas and elsewhere, have joined a growing nationwide trend among local governments by adopting “traffic calming” programs. These programs are aimed at controlling cut-through traffic and speeding on neighborhood streets and generally aggressive driving that threatens the safety of other drivers, pedestrians, joggers, bicyclists and children at play as well as the targeted driver and his or her passengers. The Institute of Transportation Engineers (ITE) defines “traffic calming” as “the combination of mainly physical features that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users.” In addition to addressing motor vehicle issues, traffic calming can also involve disparate concerns such as improving aesthetics, promoting urban renewal, reducing crime, and increasing water filtration into the ground.

Specific objectives of traffic calming, as applied to local streets, include:

- ◆ achieving slower speeds for motor vehicles;
- ◆ reducing collision frequency and severity;
- ◆ increasing safety and the perception of safety for non-motorized users of the street;
- ◆ reducing the need for police enforcement;
- ◆ enhancing the street environment (streetscaping, etc.);
- ◆ increasing access for all modes of transportation; and,
- ◆ reducing cut-through motor vehicle traffic through neighborhoods.



Some cities began installing road humps on residential streets and in other strategic locations as a relatively easy and low-cost way to address neighborhood traffic concerns (speed humps have been installed in various neighborhood

locations across Nacogdoches). However, some communities later rescinded their road hump programs after the City and its residents soon became aware of the negative aspects of road humps, including the diversion of unwanted traffic onto other residential streets, the potential increase in emergency vehicle response times, complaints regarding the design speed of the humps, concerns about maintenance cost and effort, and friction among neighborhood residents who disagreed on the merits of road humps. In addition, while some cities follow a systematic process, others began placing road humps rather haphazardly in response to citizen complaints about traffic and speeding.

As shown in **Figure 6.6**, traffic calming can be accomplished through a combination of measures that control both traffic speed and volume. Volume-control measures include street closures, restrictive one-way streets, and turn restrictions, which are effective in reducing traffic on streets. Speed-control measures are important in reducing injury accident rates and increasing walking or bicycling on streets. Speed-control measures can be integrated into the community through urban design features such as street trees, center islands, traffic circles, textured pavements, speed humps and flat-topped speed tables.

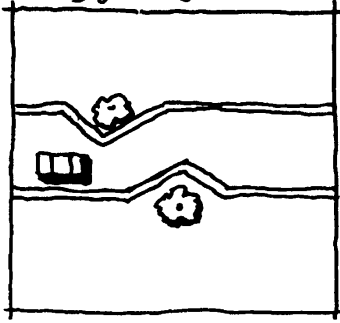
The Institute of Transportation Engineers, state transportation departments and others entities have published manuals and other materials documenting numerous traffic calming options and techniques, including some that are subtle and intended to influence drivers' perceptions of their surroundings and thereby their driving behavior. These can include road and intersection narrowing methods, better definition of crosswalks and pedestrian-oriented settings, and manipulation of road surfaces. Illustrations and specifications are provided, and the advantages and disadvantages of each calming method are presented.

Lessons from communities that have experimented with traffic calming initiatives point to the following characteristics of a successful program:

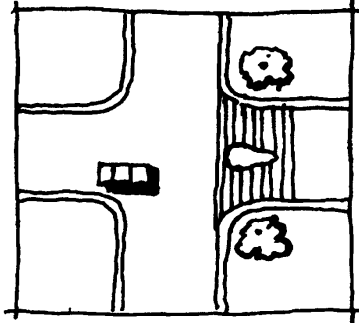
- ◆ ensuring early involvement of and communication between neighborhood residents, City staff, and elected officials;
- ◆ establishing specific procedures for defining and studying potential traffic problems;
- ◆ creating a clear process for requesting potential calming measures, securing project approval and funding, and then designing and implementing the measures;
- ◆ outlining an array of preferred calming techniques or combinations of methods based upon the latest revision of the *Texas Manual of Uniform Traffic Control Devices* and industry standards as documented in publications of the Institute of Transportation Engineers and similar professional associations;
- ◆ confirming neighborhood consensus and support before proceeding with implementation; and,
- ◆ monitoring and evaluating the effectiveness of calming measures on a case-by-case basis, with the ability to reconsider – and alter or remove if necessary – any traffic calming device or technique which inadvertently creates and/or shifts a traffic problem from one street or neighborhood to another.

FIGURE 6.6
Neighborhood Traffic Calming Techniques
Nacogdoches Comprehensive Plan Update
Nacogdoches, Texas

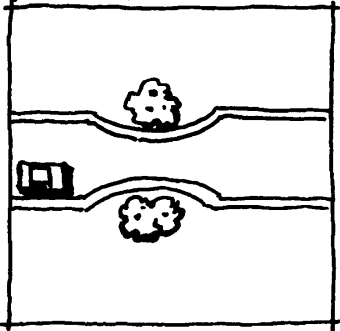
Chicane/
Staggering



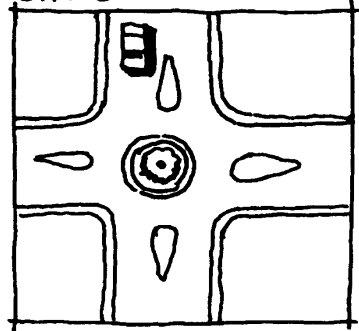
Gateway/
Threshold



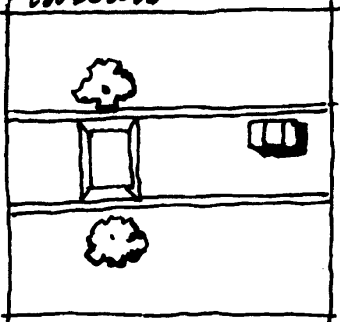
Narrowing/
Throttle



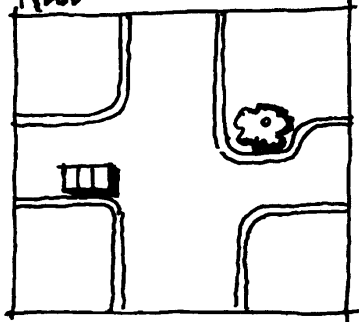
Roundabout/
Circle



Speed Table/
Plateau



Neckdown/
Nub



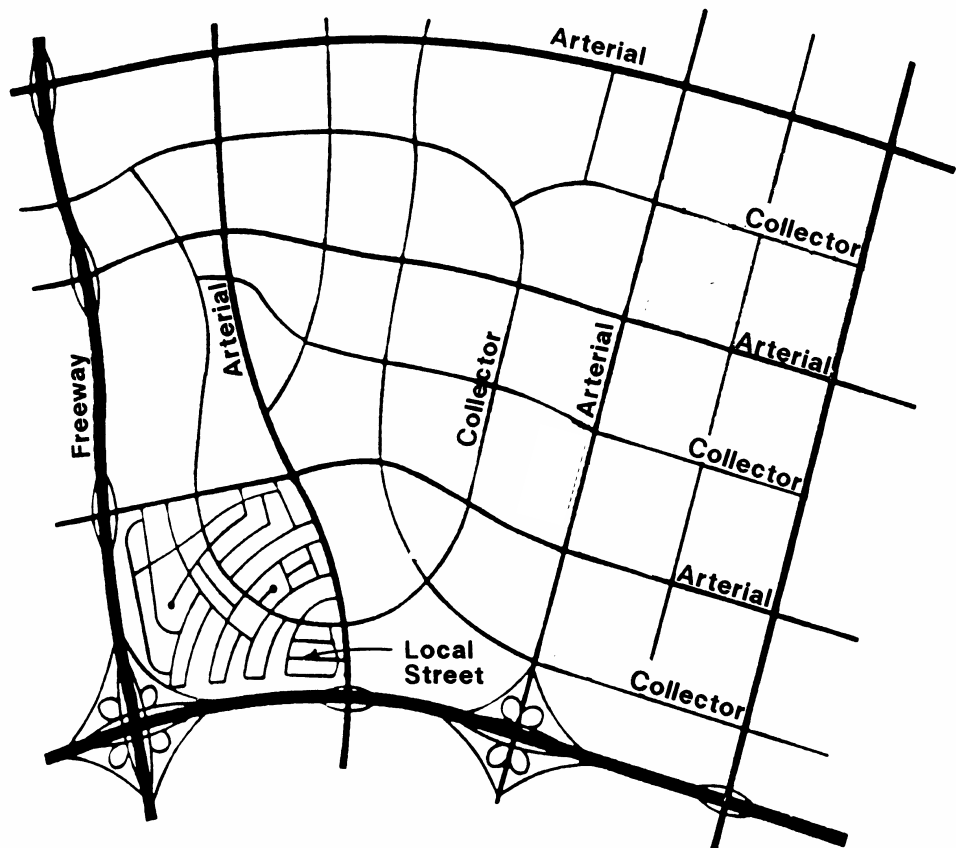
Source: Best Development Practices, Reid Ewing, Planner s Press, Chicago 1996, p. 63

APPENDIX: Functional Classification of Roadway Network

Streets are grouped into functional classes according to their purpose of moving traffic or providing access to property. A schematic illustration of a functionally classified roadway network is shown in Figure 6.7. Characteristics of each functional class of roadway are further described in this Appendix. The functional classification of area roadways is shown on the Nacogdoches Thoroughfare Plan and includes the following functional classes:

- ◆ Expressways
- ◆ Arterials (major and minor)
- ◆ Collectors (major and minor)

FIGURE 6.7
Functionally Classified Roadway Network
Nacogdoches Comprehensive Plan Update
Nacogdoches, Texas

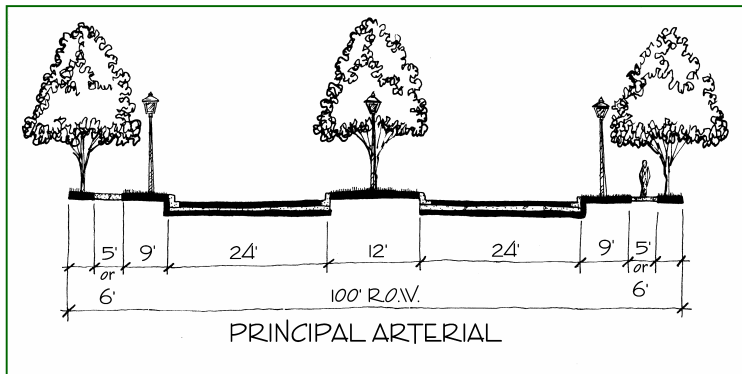


Arterial roadways form an interconnecting network for citywide and regional movement of traffic and provide connections to freeways and other express roadways. Although they usually represent only five to 10 percent of the total roadway network, arterials typically accommodate about 30 to 40 percent of an area's vehicular travel. Since traffic movement, not land access, is the primary function of arterials, access management is essential to avoid traffic congestion

and delays caused by turning movements for vehicles entering and exiting driveways. Likewise, intersections of arterials with other public streets and private access drives should be designed to limit speed differentials between turning vehicles and other traffic to no more than 10-15 miles per hour. Spacing of major, signalized intersections should be long enough (preferably one-third to one-half mile) to allow a variety of signal cycle lengths and timing plans that can be adjusted to meet changes in traffic volumes and maintain traffic progression.

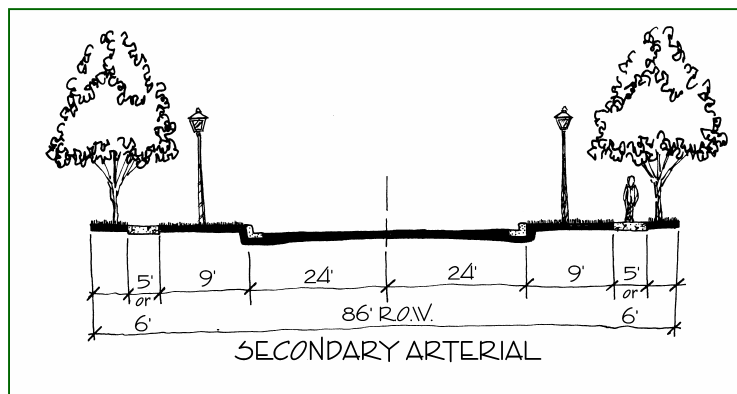
Arterials may vary from multi-lane roadways with three, four or five lanes down to two-lane roadways in developing fringe and rural areas where traffic volumes have not increased to the point that more travel lanes are needed. Functional classification is not dependent on the existing number of lanes since the functional role served by a roadway typically remains constant over time while the roadway's cross section is improved to accommodate increasing traffic volumes. Thus, lower-volume roadways that are continuous over long distances may also function as arterials, particularly in fringe and rural areas.

Arterials may be further categorized as Major and Minor (or Principal and Secondary). A typical cross section for a major arterial roadway is a minimum 100-foot right of way, providing for either a divided or undivided thoroughfare. A divided roadway may have a 48-foot total pavement section with a 12-foot raised median. Where there are constrained conditions, an undivided roadway may have 48 to 60 feet of pavement width with a center turn lane at intersections. Sidewalks are usually located on both sides and are placed nine feet from the back of the curb. A 12-foot median/esplanade



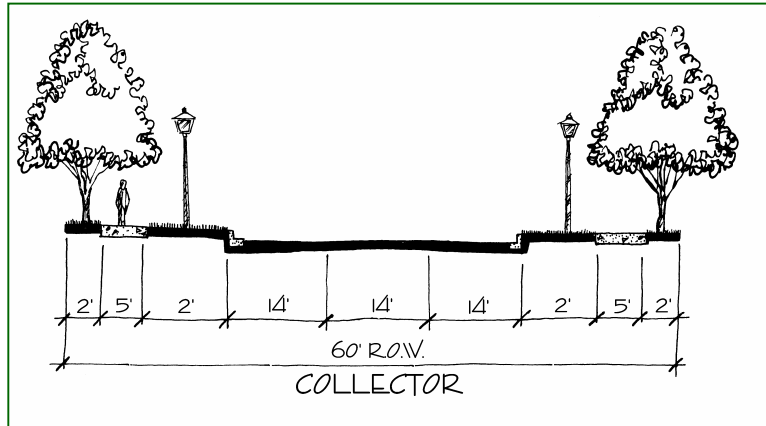
provides for access control and is sufficient for decorative street lighting and landscaping. Examples of major arterials on the Nacogdoches Thoroughfare Plan include University Drive, North Street and State Highway 21.

A minor, or secondary, arterial roadway is an undivided thoroughfare with a minimum recommended 86 feet of right of way and a 48-foot pavement section. Sidewalks are often located on both sides of the street and are placed nine feet from the back of curb.



The 38 feet of additional right of way, excluding the width of pavement, provides ample space for decorative street lighting, landscaping, and public green space. Examples of minor arterials on the Nacogdoches Thoroughfare Plan include Park Street, MLK Boulevard and Industrial Boulevard.

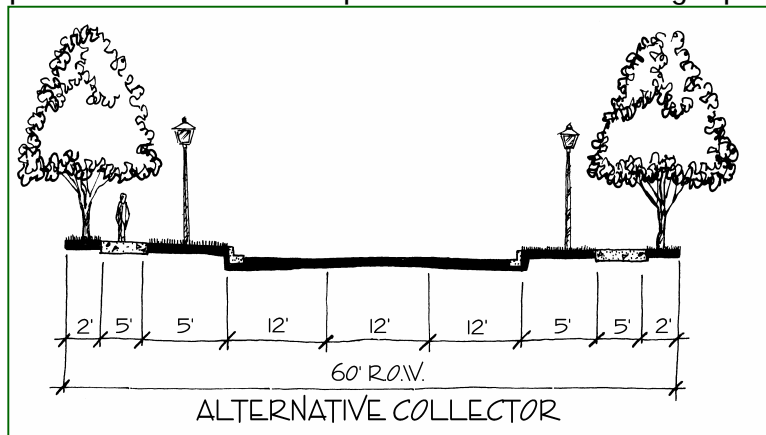
Street layout plans for residential subdivisions, as well as commercial and industrial districts, should include collectors as well as local streets in order to provide efficient traffic ingress/egress and circulation. Since collectors generally carry higher traffic volumes than local/residential streets, they may require a wider roadway cross section or added lanes at intersections with arterials to provide adequate capacity for both through traffic and turning movements. However, since speeds are slower and more turning movements are expected, a higher speed differential and much closer intersection/access spacing can be



used than on arterials. Collectors typically make up about 5 to 10 percent of the total street system.

A collector roadway is undivided with a typical 60-foot right of way and a pavement width of 42 feet. As an

alternative, a developer willing to set aside room for added green space or enhanced pedestrian pathways may request that pavement width be reduced to 36 feet, which allows lower development costs, increased pedestrian safety, improved ability to locate the street to preserve trees and other natural features, and reduced travel speed resulting from the narrower street. The 36 feet of pavement width is adequate to serve the design purpose of collecting and



distributing traffic to the arterial roadway network, particularly when walking is encouraged and considered in development design. The 24 feet of additional right of way, excluding the width of pavement, provides ample space for

neighborhood-scale street lighting, street trees and public green space. There are many examples of collector roadways in Nacogdoches including Maroney Drive, Tara Lane, Powers Street and Rayburn Drive.

Local/residential streets include all other roads that are not included in higher functional classes, particularly internal and access streets that allow direct property access within residential and commercial areas. Excessive speeds and through traffic should be discouraged by using appropriate geometric designs, curvilinear alignments, discontinuous streets, and traffic control devices (as a last resort). Local/residential streets typically comprise about 65 to 80 percent of the total street system in urban areas.

Cross sections for local/residential streets vary widely between communities depending on the extent of on- and off-street (driveway/garage) parking that is anticipated and whether sidewalks will be provided on all or most local streets – and on one or both sides of the street. Ease of access by emergency vehicles, including large fire apparatus, is also a critical factor in street width policy, and must be evaluated with worst-case scenarios in mind such as when a local street is lined with overflow parking from a large party or other neighborhood event. In general, the goal on a local street is to accommodate one travel lane for vehicles moving in each direction as well as some amount of on-street parking.

A typical right-of-way width for local streets is 50 feet. The City of Nacogdoches currently requires a 32-foot pavement width, which can be reduced to 27 feet on short local streets and cul-de-sacs. The extent of right of way beyond the paved roadway determines whether sidewalks, if provided, can be set back from the curb (typically three feet) to enhance pedestrian safety and allow a continuous green strip between the sidewalk and street. Extra right of way also allows for placement of neighborhood-scale street lighting plus landscaping or other streetscape amenities.

In communities where the circumstances are appropriate, local street width standards have purposely been reduced – in some cases, to as low as 20-25 feet – to restore the road network as a key component of traditional neighborhood design and not just an excessively wide conduit for automobile traffic and parking. This design approach is one of the defining principles of the “New Urbanism” movement, intended to create a pedestrian-scaled neighborhood with narrower streets and reduced building setbacks. A lesser street width also allows an increase in the distance from the sidewalk to the street and supports traffic calming efforts. In the narrowest situations, two full travel lanes may no longer be provided, requiring vehicles approaching from opposite directions to decelerate and possibly move toward the edge of the street to allow safe passage. Adequate off-street parking must be available, and emergency vehicle access is often handled through innovative methods.

Significant street-width reduction is probably not practical or desired for most Nacogdoches neighborhoods given the dependence on on-street parking in many areas. However, Planned Development provisions in the City's zoning regulations provide the opportunity for individual master-planned developments to incorporate narrower streets through careful design and possibly by diverting most resident parking to alley-access rear garages.

With the extent of residential development that is occurring away from the incorporated city, and which Nacogdoches regulates through application of its subdivision regulations in its two-mile ETJ, the City might consider a separate standard for “rural” street sections. While the right of way requirement might not be reduced at all, this option would allow greater flexibility in situations where bar ditches and other basic drainage techniques might be preferable to curb and gutter and where sidewalks and street lighting are not desired to achieve more of a “country” feel. However, the City should be careful to maintain urban standards in new subdivisions close to the city limits, which could be annexed someday and where residents may eventually lobby for sidewalks and street lighting as buildout occurs and local traffic increases.

Flexible Administration of Thoroughfare Plan

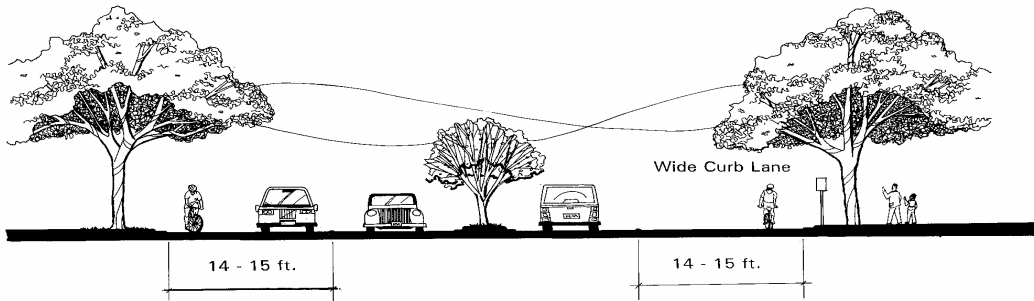
In the administration and enforcement of the Thoroughfare Plan, special cases and unique situations will occasionally arise where existing physical conditions and development constraints in certain areas conflict with the need for widening of designated thoroughfares to the planned right-of-way width and roadway cross section. Such special circumstances require a degree of flexibility and adaptability in the administration and implementation of the plan. Acceptable minimum design criteria and special roadway cross sections may have to be applied in constrained areas where existing conditions limit the ability to meet desirable standards and guidelines. Special roadway cross sections should be determined on a case-by-case basis when a unique design is necessary, and these exceptions should be subject to approval by the Planning and Zoning Commission. Otherwise, standard roadway cross sections should be used in all newly-developing areas and, whenever possible, in existing developed areas.

“Bicycle-Friendly” Roadways

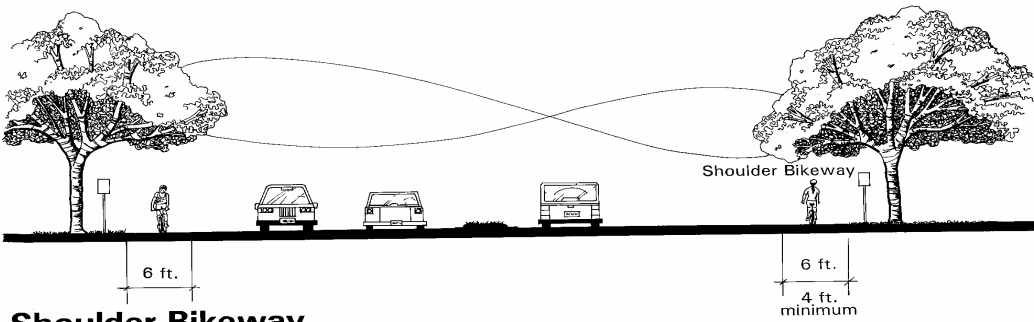
Additional alternatives to the standard thoroughfare include those designed to aggressively promote use of bicycles. A comprehensive, safe and efficient network of “bicycle-friendly” roadways not only emphasizes alternative methods of transportation but also improves overall quality of life for residents.

Skilled bicyclists usually prefer to travel along the street system and, where possible, should be accommodated through striped bike lanes or extra-wide curb lanes on arterials and collectors. Most bicyclists are less skilled and need to be separated from high-speed and high-volume traffic through the use of off-street bike lanes and paths. Typical design sections for different bikeway classifications are displayed in **Figure 6.8**. Local and collector streets are suitable for use by most adult bicycle riders while minor arterial streets are only suitable for limited use by bicyclists due to higher traffic volumes and speeds.

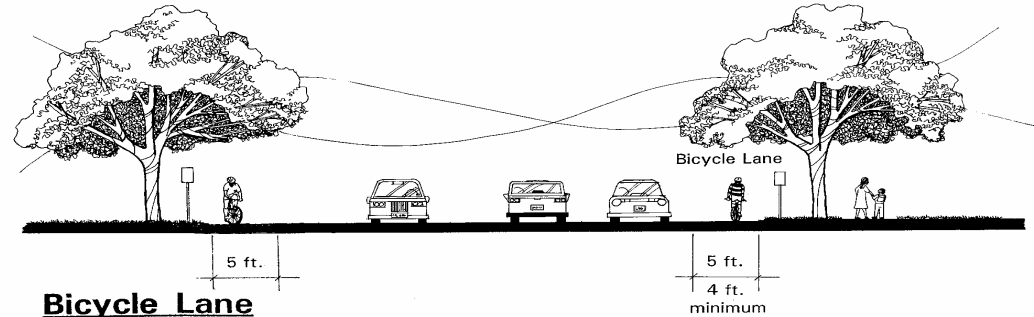
FIGURE 6.8
Roadway Designs for Bicycle Use
 Nacogdoches Comprehensive Plan Update
 Nacogdoches, Texas



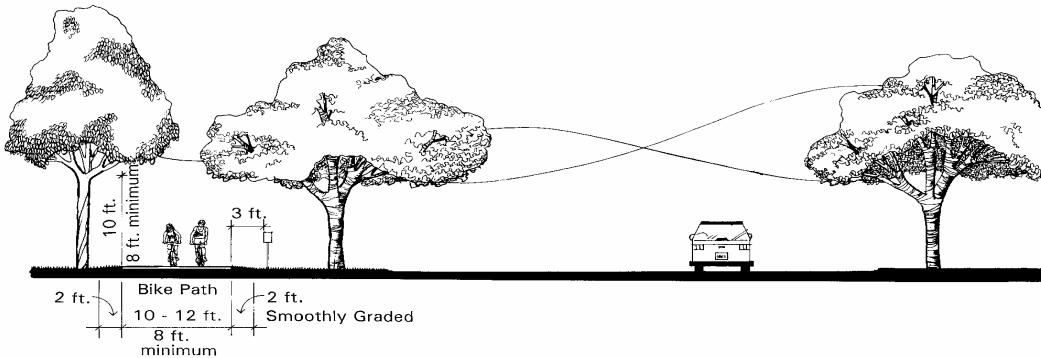
Wide Curb Lane



Shoulder Bikeway



Bicycle Lane



Bike Path