Downtown Troy Transportation 3ÔÕÄÙ

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INTRODUCTION

This report documents the Downtown Transportation {údzŘè prepared for the City of Troy, Alabama. Land use and the transportation system which includes the roadway system, pedestrian system, transit system and parking system were analyzed in this study effort. The purposes of the downtown transportation ăűdzŘè are to assess the effetiveness of the existing transportation system, considering the present land uses and transportation network, and to develop a transportation plan that will mitigate current and future roadway deficiencies, increase mobility, improve the pedestrian safety and convenience, improve the parking environment, provide a pedestrian and bicycle connection between downtown and the campus of Troy University, support a downtown plan, and create a safe and efficient downtown transportation system for the future. Downtown Troy's relationship to the regional roadway network is illustrated in Figure 1.

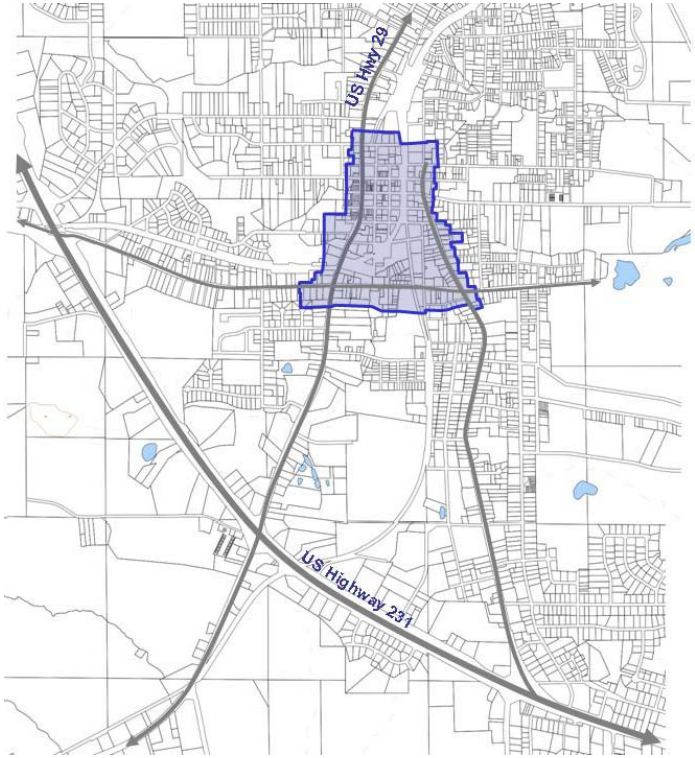


Figure 1
Study Area

Sources of information used in this report include the Alabama Department of Transportation, Traffic Data, LLC, the Federal Highway Administration, the Transportation Research Board, the City of Troy, South Central Alabama Development Commission and office files and field reconnaissance efforts of Skipper Consulting, Inc.

BACKGROUND

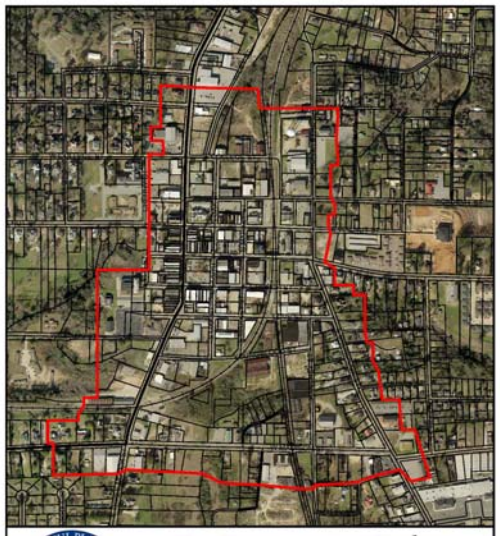


Figure 2
Downtown Location

The City of Troy is located approximately 40 miles southeast of Montgomery, Alabama and currently has approximately 18,900 inhabitants. Troy is the county seat of Pike County and is home to Troy University. Over the past decade Troy has experienced a population increase of over 4,000 people. Since Troy was founded in 1838, Downtown has been the center of government and commerce for the area. Downtown Troy is located along U. S. Highway 29 and is bounded by Murphree Street to the north, Madison Street to the South, Brundidge Street to the east and Cherry Street to the west. CSX Railroad run through Downtown Troy it interchanges with the Conecuh Valley Railroad. The location of Downtown Troy is illustrated in Figure 2.

EXISTING TRANSPORTATION SYSTEM

Roadway Classifications and Descriptions

All transportation networks have some form of classification to categorize the hierarchy of movement in the system. The roadway network developed for the Trussville study area was based on the functional classification system prepared by the Alabama Department of Transportation. The components of this network are, arterials, collectors and local streets.

Each type roadway provides separate and distinct traffic service functions and is best suited for accommodating particular demands. Their designs also vary in accordance with the characteristics of traffic to be served by the roadway. The following is a brief description of each roadway type.

- *Arterials* are important components of the total transportation system. They serve as feeders to the interstate system as well as major travelways between land use concentrations within the study area. Arterials are typically roadways with relatively high traffic volumes and traffic signals at major intersections. The primary function of arterials is moving traffic. Arterials provide a means for local travel and land access.

- *Collectors* provide both land service and traffic movement functions. Collectors serve as feeders between arterials as well as provide access to the local streets. Collectors are typically lower volume roadways that accommodate short distance trips.

- *Local Streets* sole function is to provide access to the land uses that are immediately adjacent to the roadways.

The Functionally Classified Roadway System for the downtown area is illustrated in Figure 3.

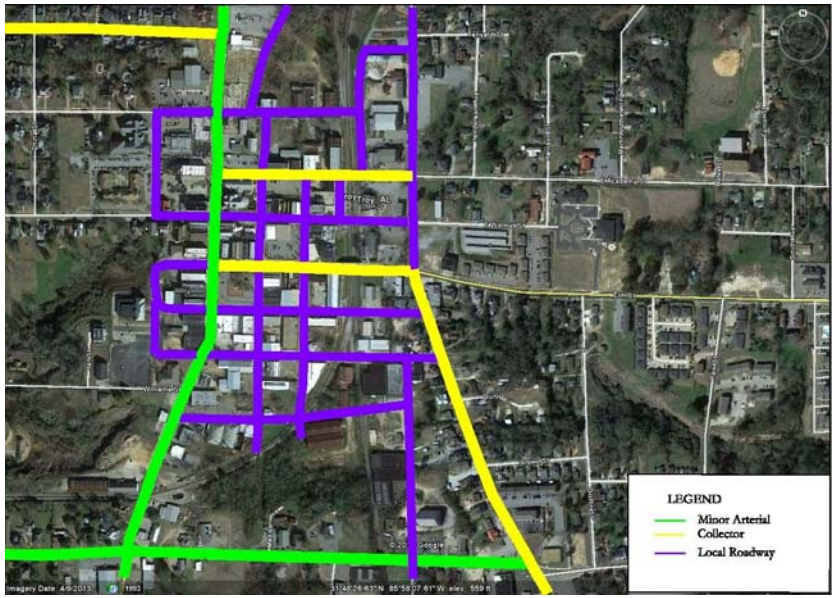


Figure 3

Functionally Classified Roadway System

Existing Traffic Volumes

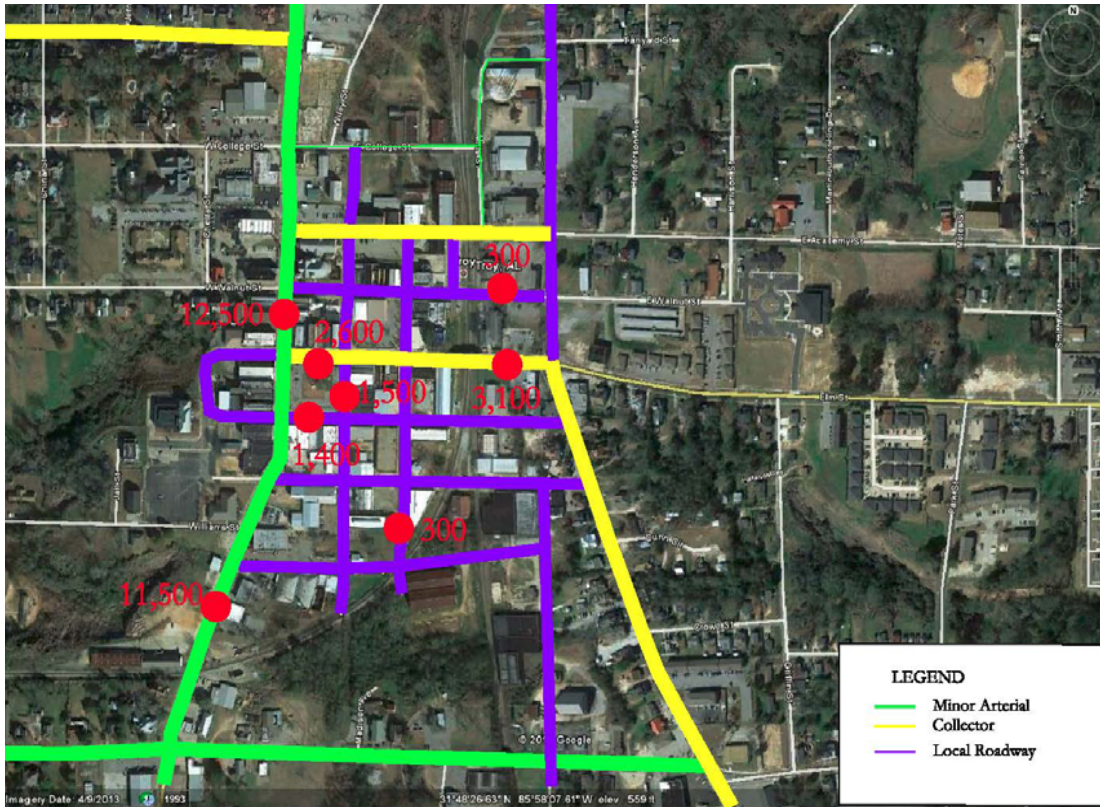


Figure 4
Existing Traffic Volumes

Traffic volume, as indicated by traffic counts at various locations on the roadway network, reflect current travel patterns and how well the network is serving the travel demand. Traffic counts were collected throughout the study area. Existing daily traffic counts, which were conducted in 2014, are shown in Figure 4. In addition to the daily traffic counts peak hour turning movement counts were conducted at the following intersections:

- Three Notch Street at Church Street;
- Three Notch Street at Elm Street;
- Church Street at Oak Street; and
- Elm Street at Oak Street.

The peak traffic period for these intersections occurred between 12:00 noon and 1:00 PM. The peak hour traffic volumes are illustrated in Figure 5.

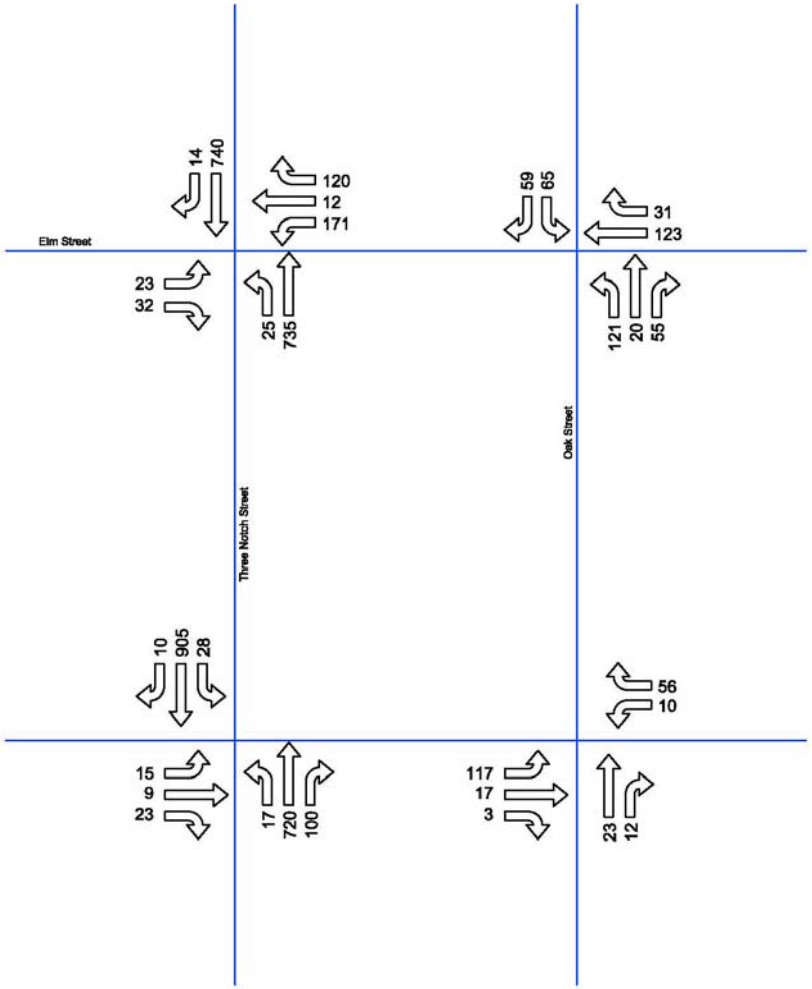


Figure 5
Existing Peak Hour Traffic Volumes

Roadway Capacity

Roadway networks are evaluated by comparing the traffic volumes along each facility to the facility's capacity. Roadway capacity is defined as the ability of the facility to accommodate traffic. Service flow volume is the level of traffic flow (vehicles per day) that can be accommodated at various levels of service. The current level of service scale, as developed by the Transportation Research Board in the *Highway Capacity Manual*, ranges from a level of service "A" to a level of service "F". Abbreviated definitions of each level of service are as follows:

Level of Service A	Free traffic flow (0% –35% of capacity)
Level of Service B	Stable traffic flow (35% –50% of capacity)
Level of Service C	Stable traffic flow (50% –62% of capacity)
Level of Service D	High-density stable traffic flow (62% –75% of capacity)
Level of Service E	Capacity level traffic flow (75% –100% of capacity)
Level of Service F	Forced or breakdown traffic flow (>100% of capacity)

As a general rule, the desired operation of a roadway should be no lower than level of service "C". Level of service "D" may be acceptable under certain circumstances. A level of service "E" or "F" is considered unacceptable.

The methodology used to evaluate roadway segment capacity in this project was a tabular analysis relating roadway classification, number of lanes, levels of service, and daily service volumes. The estimated 24-hour capacities of the facilities included in the area network are shown in Table 1. The analyses indicate that there are no deficient roadway segments in the Downtown Study Area.

TABLE 1
CITY OF TROY DOWNTOWN TRANSPORTATION {¢¦5¸
ROADWAY CAPACITIES

FUNCTIONAL CLASSIFICATION	# OF LANES	CAPACITIES
Minor Arterial	2	17,800
	4	27,400
Collector	2	16,600
	4	26,200
	6	38,700
One-way Minor Arterial	2	14,100
	3	19,500
	4	26,000
One-way Collector	2	11,300
	3	15,600
	4	20,800

Existing Intersection Capacity Analysis

Using methods as outlined in the latest edition of the *Highway Capacity Manual,* the existing capacity and operation of the following intersections were evaluated:

- Three Notch Street at Church Street;
- Three Notch Street at Elm Street;
- Church Street at Oak Street; and
- Elm Street at Oak Street.

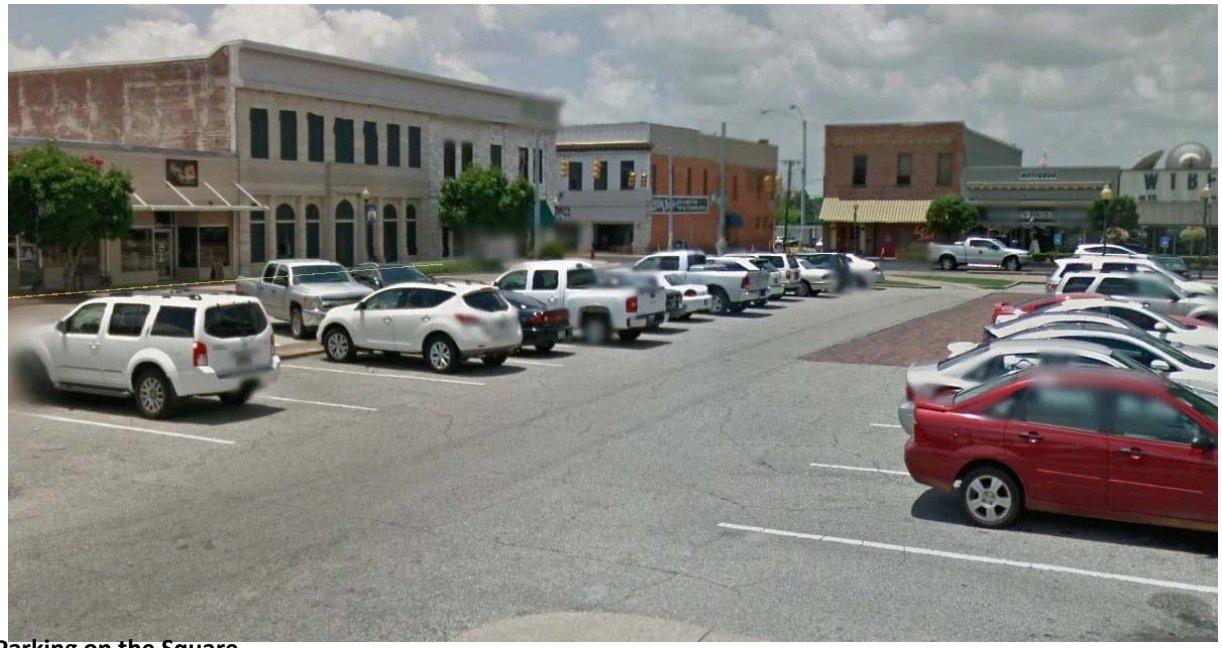
According to methods of analysis, intersection capacity is expressed as levels of service, ranging from "A" (best) to "F" (worst). In general, a level of service (LOS) "C" is considered desirable, while a level of service "D" is considered acceptable during peak hours of traffic flow. As indicated in Table 2, the study area intersections are currently operating at acceptable levels of service during the peak traffic hour.

Table 2
Existing Intersection Levels of Service

Intersection (traffic control)	Approach	Peak Hour Level of Service
Three Notch Street At Church Street (signal)	Eastbound	C
	Northbound	A
	Southbound	A
Three Notch Street At Elm Street (signal)	Eastbound	C
	Westbound	B
	Northbound	B
	Southbound	B
Church Street At Oak Street (all way stop)	Eastbound	A
	Westbound	A
	Northbound	A
Elm Street At Oak Street (all way stop)	Westbound	A
	Northbound	A
	Southbound	A

Current Parking Demand

The downtown study area was examined to determine its ability to meet the current parking demand. There are approximately 630 parking in the study area. These parking spaces are contained in public parking lots, private parking lots and on street. A parking occupancy count determined that approximately 52% of the parking spaces were occupied during the peak parking period which occurred at 12:00 noon. Also during this time, 98% of the parking spaces in the vicinity of the square were occupied.



Parking on the Square

A sidewalk in Downtown Troy

Existing Pedestrian and Bicycle Facilities

An assessment of the pedestrian and bicycle network was conducted for Downtown Troy. There is an extensive sidewalk network throughout the Downtown area. However, many of the sidewalks are narrow and lack lighting and landscaping. There are no exclusive bicycle facilities in the vicinity of Downtown.

DOWNTOWN TRANSPORTATION STUDY DEVELOPMENT

The Downtown ¢roy ¢ℕl·yğĹJ2ℕl·úλ2y˝{űdzŘè was developed in an effort to provide a guide for local officials to dztilize ʎn addressing existing traffic congestion, improve mobility, increase safety and promote economic vitality. The Downtown Transportation {űdzŘè was developed as a result of meetings with űĸŝ 5owntown ¢ransportation Steering Committee and the results of analyses that were performed by Skipper Consulting. During the planning process, the Downtown Plan Transportation Steering Committee oversaw the development of the ăűdzŘè. The committee included ¢ℕ2è ŏλűẽ 2ŦŧλŎʎl·tă Pike County Officials, Troy University officials, downtown business and property owners, representatives of the South Central Alabama Development Commission, the Chamber of Commerce and the Economic Development Co2ℕLJ2ℕl·úλ2y˝.

Meetings were held with űĸŝ Downtowy˝¢ranăportation Steering Committee to collect informationΣ discuss emerging recommendations and elicit feedback. ¢2 identify the committee's expectations for Downtown, űĸŝ Ŏ2Yʎűűŝŝ ø l·ă invited to attend a workshop in August 2014 for a discussion on the future of Downtown Troy. During the course of the meeting, participants elaborated on their desires for the downtown area. After reviewing Downtown Troy's opportunities and challenges, participants were asked to identify a downtown that they would like Downtown Troy to be most like. The following summarizes the discussion:

Opportunities

- The Square
- The Center for the Arts
- The Court House
- Historic Buildings

Challenges

- Railroad Crossings
- Railroad Traffic
- 4 Way Stop Vs 2 Way Stop
- Directional Signs
- Through Traffic

Model Downtowns

- Oxford, Mississippi
- Fairhope, Alabama
- Asheville, North Carolina

DOWNTOWN TRANSPORTATION STUDY

Various types of roadway improvements have been included in Troy's Downtown Transportation {üdzŘè ThŜ improvements include the following:

- Develop Corridors into Downtown
- Develop Gateways into Downtown
- Develop Wayfinding Signs
- Improve Sidewalks
- Improve Select Intersections
- Improve Pedestrian Environment
- Develop Bicycle and Pedestrian Plan
- Establish Pedestrian & Bike Connection between Downtown and the University
- Improve Roadway Connections between Downtown and the University
- Improve Parking Lots
- Improve Landscaping
- Convert the Square to Two-Way Traffic

Railroad

There are two railroads that run through Downtown Troy. In the Downtown core nine roadways cross the railroad. Seven roadways, Three Notch Street, Market Street, Youngblood Street, Love Street, Church Street, Walnut Street, Academy Street and College Street cross the railroad at grade. Elm Street and Madison Street have overpasses over the railroad. Even though the trains blocking crossing can cause inconvenience for the traveling public, the overpasses at Elm Street and Madison Street offer alternatives.

Another issue that results from the railroad is the noise from the train horns. The Federal Railroad Administration has developed a program to create quiet zones. A quiet zone is a section of a rail line at least one-half mile in length that contains one or more consecutive public highway-rail grade crossings at which locomotive horns are not routinely sounded when trains are approaching the crossings. The prohibited use of train horns at quiet zones only applies to trains when approaching and entering crossings and does not include train horn use within passenger stations or rail yards. Quiet zone regulations also do not eliminate the use of locomotive bells at crossings. Therefore, a more appropriate description of a designated quiet zone would be a "reduced train horn area."

Communities wishing to establish quiet zones must work through the appropriate public authority that is responsible for traffic control or law enforcement at the crossings. For more detailed and authoritative information, communities should review the official regulations governing the use of locomotive horns at public highway-rail grade crossings and the establishment of quiet zones that are contained in Federal Register 49 CFR Part 222.

Intersection Traffic Control

Intersection traffic control throughout the study area was reviewed. It was determined there were three methods of intersection control in Downtown Troy. Each intersection was controlled by a traffic signal, a side street stop or an all way stop. The review indicated that all intersections throughout Downtown Troy had the appropriate method of intersection control. There were no unsignalized intersections that warranted traffic signalization. There were no side street stop conditions that warranted all way stops. The intersections with all way stops appeared to have the traffic volume to warrant all way stops or had sight distance issues due to building or other immovable objects that caused unsafe conditions. All way stop conditions improve the safety at intersections with limited sight distance.

Corridors

There are four major corridors, which are illustrated in Figure 6, that connect Downtown Troy to other activity centers in the City. Three of the corridors, Montgomery Street, Three Notch Street and Brundidge Street connect Downtown to the high traffic volumes and the other commercial areas along U.S. Highway 231. Elm Street connects Downtown with Troy University. These corridors act as an extension of Downtown and should serve as direct routes into Downtown. Each corridor should have a streetscape plan designed to identify with downtown.

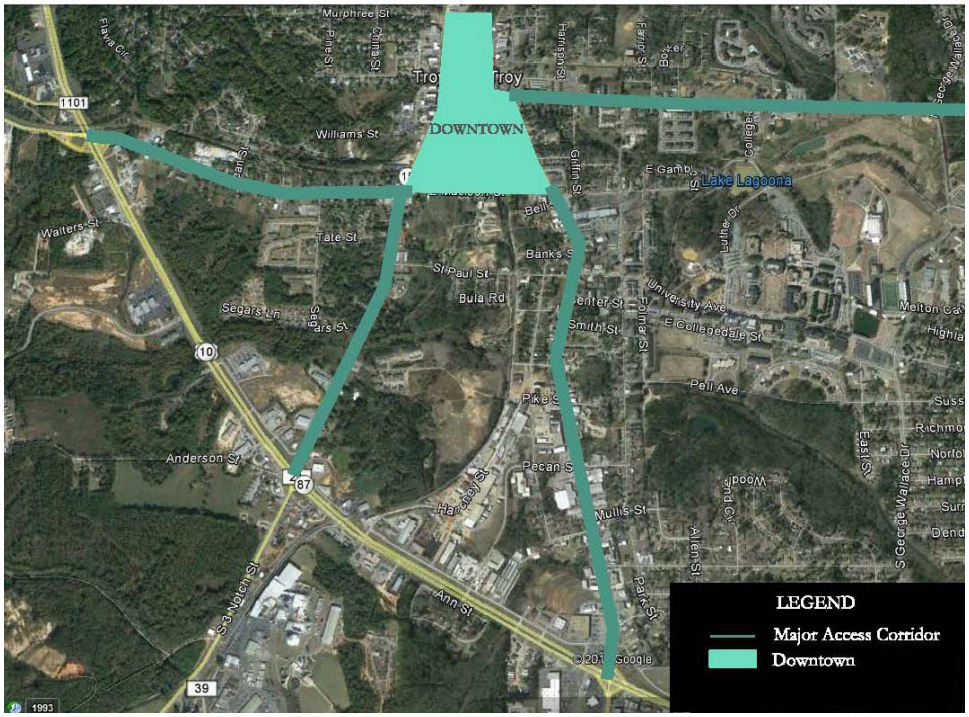


Figure 6

Access Corridors

The sidewalks along each corridor should be repaired to good condition. Decorative lighting to match the lighting used in Downtown should be installed along each corridor. Wayfinding signs directing the traveling public to Downtown should be installed along each corridor.

The success of Downtown relies on the ability of the four major corridors to provide safe and uncongested access to the Downtown area. Access management can benefit Downtown Troy by promoting safety and improving roadway capacities along the major access corridors. If approached properly, access management can enhance property values while safeguarding past and future public investments in the infrastructure. Access management techniques developed for Downtown corridors should incorporate the following strategies to retrofit the access corridors:

- Separate conflict points – distance between major intersections and driveways should be regulated. As a general rule, driveways should not be located within the area of influence of intersections.
- Restrict turning movements at unsignalized driveways and intersections – the use of full directional unsignalized streets and driveways should be limited. Full movement intersections should serve multiple developments through joint use driveways or cross access easements.
- Establish design standards – design standards that address access spacing, the length of turn lanes and tapers and driveway dimensions should be developed for application throughout the corridor.

- Traffic signal spacing – signals should only be installed when appropriate studies indicate their spacing and interconnection can be accomplished without significant impacts on the corridors capacity.
- Turn lanes – left and right turn lanes should be required for all public streets and major access points to adjacent land uses.
- Shared driveways/inter-parcel access – joint use driveways should be required to reduce the proliferation of driveways and to preserve the capacity of the corridors.

Gateways

Downtown gateways are points of arrival where design elements let visitors know they have arrived at a special community destination. Landscaping improvements and signage are typical gateway components. Decorative lighting, banners, and other features that distinguish downtown streetscapes also contribute to the sense of arrival. Locations that should be considered for gateway enhancements, as indicated in Figure 7.

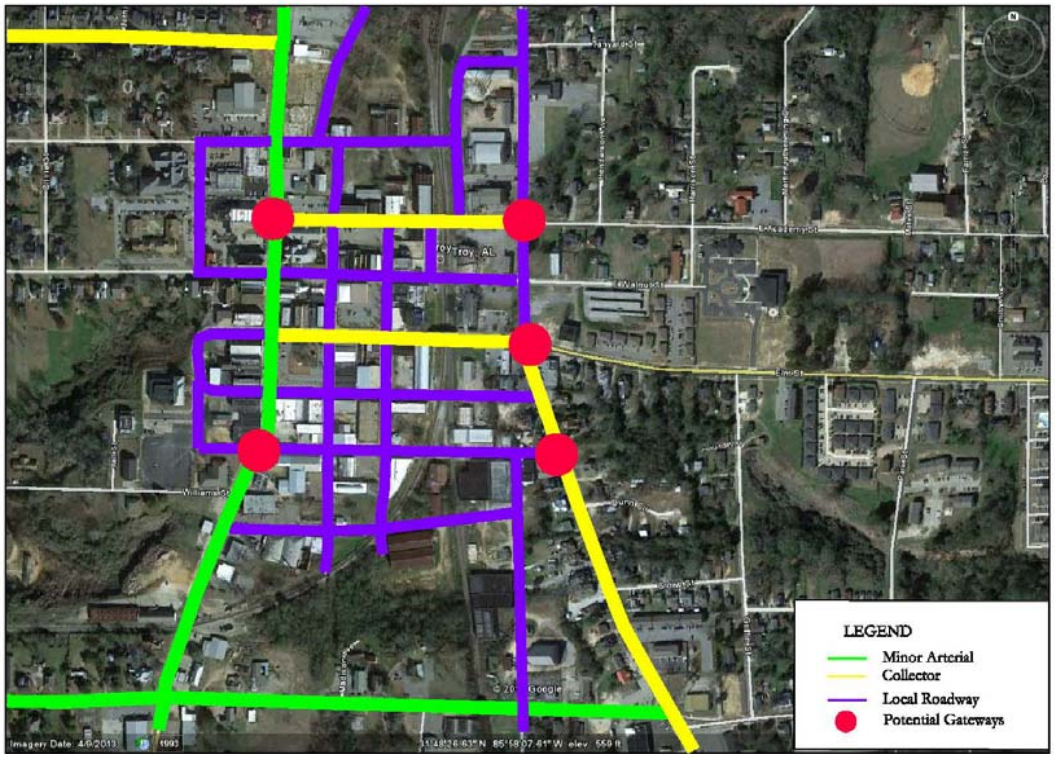


Figure 7

Potential Gateways

In addition to physical improvements and any signage that may be installed as part of the gateways, the design of the streetscapes upon entering downtown through the gateways should be consistent in landscaping, lighting, sidewalk finishes, and banners, where provided.

In addition to these improvements to the public realm, quality and consistency should be maintained in each of the developments along these corridors. This also entails diligence in maintaining buildings, properties and rights-of-way. Improving the image of the community along these corridors will be beneficial to the city overall, not just downtown.

Wayfinding Signs

Wayfinding or directional signs for Downtown should be installed throughout the City, especially along the regional roadway network and the major access corridors. The signs should provide direction to Downtown Troy. Once the traveling public arrives in Downtown there should be signs to direct them tp public parking as well as to other destinations.

Downtown Bicycle and Pedestrian Plan

Bicycling and walking have become popular modes of travel in university towns over the last several years. A bicycle and pedestrian plan was developed to link Downtown Troy with Troy University in an effort to provide residents and visitors a choice of travel modes. There are three types of bicycle facilities as well as sidewalks that have been considered in developing a bicycle plan to link Downtown Troy with Troy University. These facilities are Share the Road signage, bicycle lanes and multi-use paths. Bike lanes should be one-way facilities that carry bike traffic in the same direction as adjacent motor vehicle traffic. On a two-way street bike lanes should be provided on both sides of the roadway. On one-way streets, bike lanes should be placed on the right side of the street.

ShareThe Road

Signed shared roadways are those that have been identified by signing as preferred bike routes. On Share the Road routes there are no exclusive bicycle lanes. Bicycle and route provides continuity to other bicycle facilities such as bike lanes and multi-use paths. The route are preferred for bicycling due to low motor vehicle traffic volume. The routes typically extend along local neighborhood streets and collectors that lead to destination such as a park, school or commercial district.

Bicycle Lanes

Bicycle lanes are lanes that are for the exclusive use of bicycles that are incorporated into a roadway. Bike lanes should be one-way facilities that carry bike traffic in the same direction as adjacent motor vehicle traffic. On a two-way street bike lanes should be provided on both sides of the roadway. On one-way streets, bike lanes should be placed on the right side of the street.

R3-17

Along roadways where parking is permitted bicycle lanes should be placed between the parking area and the travel lanes and have a minimum width of five feet. Where parking is permitted but a parking stalls are not marked, the shared bicycle lane and parking area should be a minimum of 11 feet wide. Bicycle lane along streets, with prohibited parking, should be four feet wide. If a roadway has a curb then the width of the gutter pan should not be included in the bicycle lane width. Bicycle lanes should be delineated from the motor vehicle travel lanes with six inch solid white line. If a right-turn lane exists on the roadway then the bicycle lane should be placed between the vehicle through lane and the right-turn lane.

Multi-Use Path

Multi-use paths are facilities on exclusive rights-of-way that accommodate bicyclists, pedestrians, wheelchairs, skaters and all other forms of non-motorized users. A multi-use path is usually a two way facility. When two-way multi-use paths are located adjacent to a roadway, wide separation between a multi-use path and the adjacent highway is desirable to demonstrate to both the bicyclist and the motorist that the path functions as an independent facility for bicyclists and others. When this is not possible and the distance between the edge of the shoulder and the multi-use path is less than five feet, a suitable physical barrier is recommended. Such barriers serve both to prevent path users from making unwanted movements between the path and the highway shoulder and to reinforce the concept that the path is an independent facility. Where used, the barrier should be a minimum of 42 inches high, to prevent bicyclists from toppling over it. A recommended paved width for a two-directional multi-use path is 10 feet minimum and 12 feet preferred.

Sidewalks

Sidewalks are separate (usually concrete) pedestrian travel ways that are separate from automobile lanes and bicycle lanes. Where a sidewalk is adjacent to a road, it, like the bicycle lane, should be separated from the roadway by open space or graded separately. According to AASHTO, using a sidewalk as a shared use path (i.e. allowing or encouraging bicycle use)is unsatisfactory for a variety of reasons.

The Downtown Troy Bicycle Plan is illustrated in Figure 8 and outlined below:

- Construct a multi-use path along the south side of Elm Street from Brundidge Street to College Street;
- Construct a multi-use path along the west side College Street of from Elm Street to Madison Street;

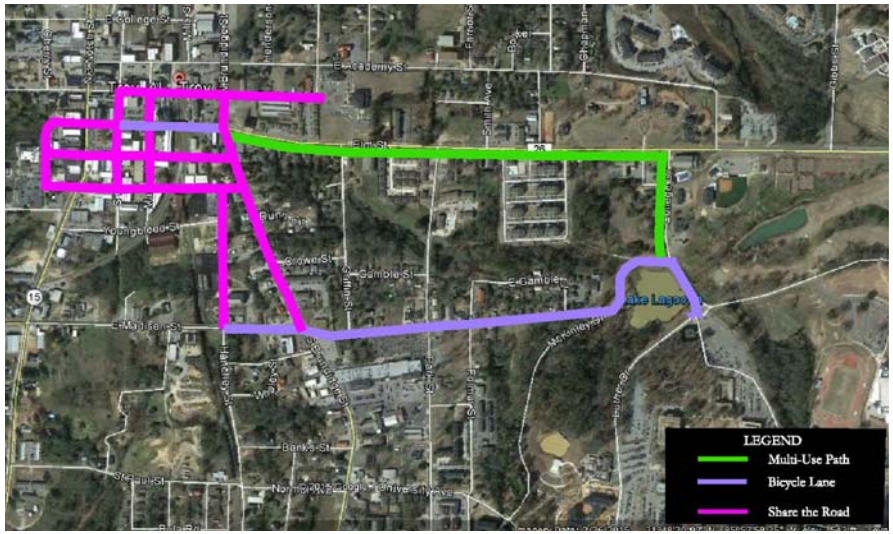


Figure 8

Bicycle Plan

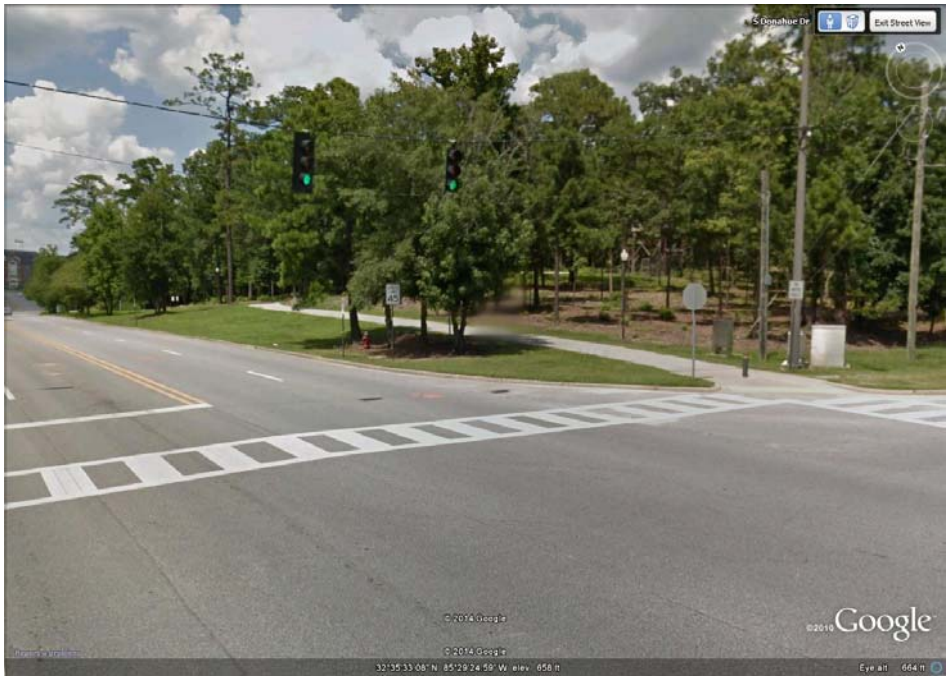
- Construct bicycle lanes along both sides of Madison Street from Hanchey Street to College Street;
- Install bicycle lanes along both sides of Elm Street from Bainbridge Street to Oak Street by removing 16 parking spaces along this section of roadway;
- Install "Share the Road" signs along Bainbridge Street from Madison Street to Walnut Street;
- Install "Share the Road" signs along Hanchey Street from Madison Street to Love Street;
- Install "Share the Road" signs along Market Street from Love Street to Walnut Street;
- Install "Share the Road" signs along Oak Street from Love Street to Walnut Street;
- Install "Share the Road" signs along the Court House Access from Love Street to Elm Street;
- Install "Share the Road" signs along Love Street from Bainbridge Street to the Court House Access;
- Install "Share the Road" signs along Church Street from Bainbridge Street to the Court House Access;
- Install "Share the Road" signs along Elm Street from Oak Street to the Court House Access; and
- Install "Share the Road" signs along Walnut Street from the library to Oak Street;

Sidewalks and Pedestrian Environment

Sidewalks should be widened to at least five feet where practical. Plantings and street trees should be installed. Street trees provide color and shade and cool the urban environment. They should be of a species that is tall enough at maturity that storefronts and signs can easily be seen beneath the tree canopy. Depending on canopy width, trees

should be spaced an average of about 50 feet on center. Tree placement should avoid conflicts with building entrances, window displays and the door swing of on-street parking spaces. Other greenery within the streetscape can be located within the planting strip either in the ground or in containers. Curb extensions at intersections create additional planting space.

Street Lighting should be installed along the sidewalks and especially between the parking lots and the square. Street lighting should be of a type and size that provides consistent lighting levels along sidewalks. Too often, tall, high- powered lights are installed sparingly along streets to minimize costs and in the process greatly sacrifice the quality and safety aspects desired for downtown street lighting. Shorter street lights—in the range of 15-20 feet—spaced more closely together create more attractive and uniform light levels that make downtown visitors feel safer and more comfortable. For best results pedestrian-oriented lighting should be placed 60-80 feet on center.



Connection between Downtown and the University

There should be a direct roadway connection as well as a bicycle and pedestrian connection between Downtown Troy and Troy University. Elm Street should serve as this connection. Elm Street should be transformed into a complete street. The Elm Street corridor should be landscaped to visual connect Downtown and the University. Consideration should be given to constructing a ten foot wide multi-purpose path in the Elm Street Corridor. Troy University should consider providing transit service between Downtown and University along using Elm Street

Signalized Intersections

The signalized intersections in the Downtown area should be improved to include mast arms, decorative signal poles and pedestrian signals. These improvements should be made at the following intersections:

- Three Notch Street at Madison Street
- Three Notch Street at Love Street
- Three Notch Street at Church Street
- Three Notch Street at Elm Street
- Three Notch Street at Walnut Street
- Three Notch Street at Academy Street
- Three Notch Street at College Street
- Brundidge Street at Madison Street
- Brundidge Street at Elm Street

The intersections listed below are not in the downtown core but should be improved to enhance the major access corridors:

- Brundidge Street at University Park
- Brundidge Street at University Avenue
- Brundidge Street at Pecan Street
- Brundidge Street at 2nd Street

Parking Lots and Landscaping

To encourage usage, the parking lots that are located off of the square should be landscaped to provide shade and cool the parking environment. The parking lots should also be well lit to improve safety. The sidewalks between the parking lots and square should be landscaped to include street trees and pedestrian scale lighting should be installed along the sidewalks.

The Square

The square should be converted to two traffic circulation. This would improve access to all the businesses located around the square and help alleviate driver confusion. To successful convert the Square to two way traffic circulation the parking angles around the square would have to be changed. The traffic signal at the intersection of Three Notch Street and Church Street would have to be modified to accommodate two-way traffic. A concept for the conversion of the Square to two way traffic circulation is illustrated in Figure 9. Currently there are 63 parking spaces around the Square. The two concept in Figure 9 yields 66 parking spaces.

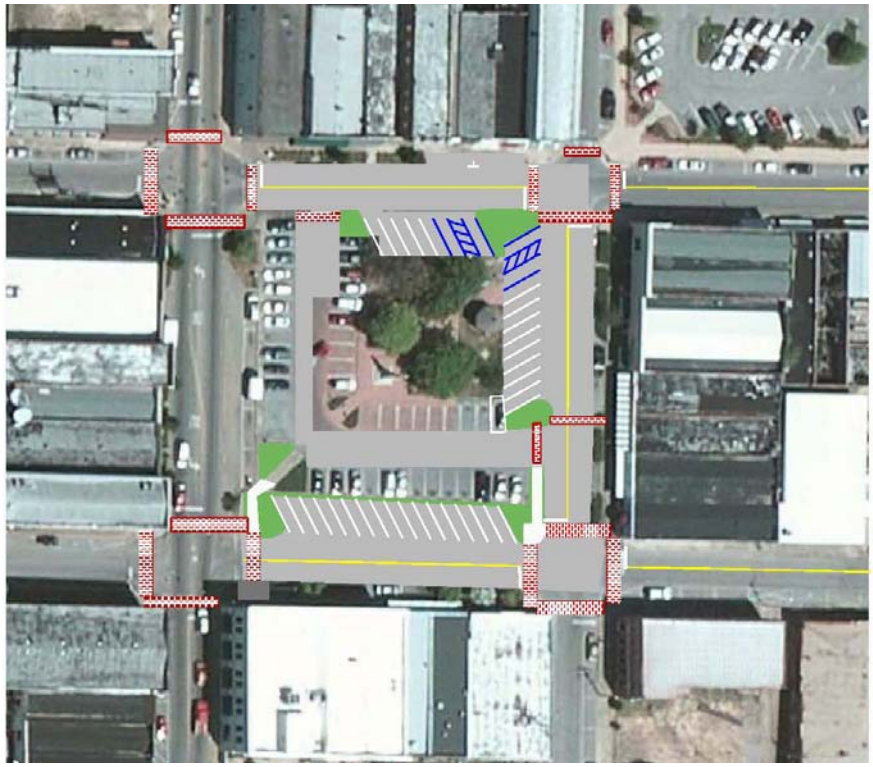


Figure 9

Two-Way Concept

Analyses were conducted determine the impacts of converting the Square to two-way traffic operations. The traffic around the Square was redistributed using a travel demand model. The peak hour redistributed traffic volumes are illustrated in Figure 10.

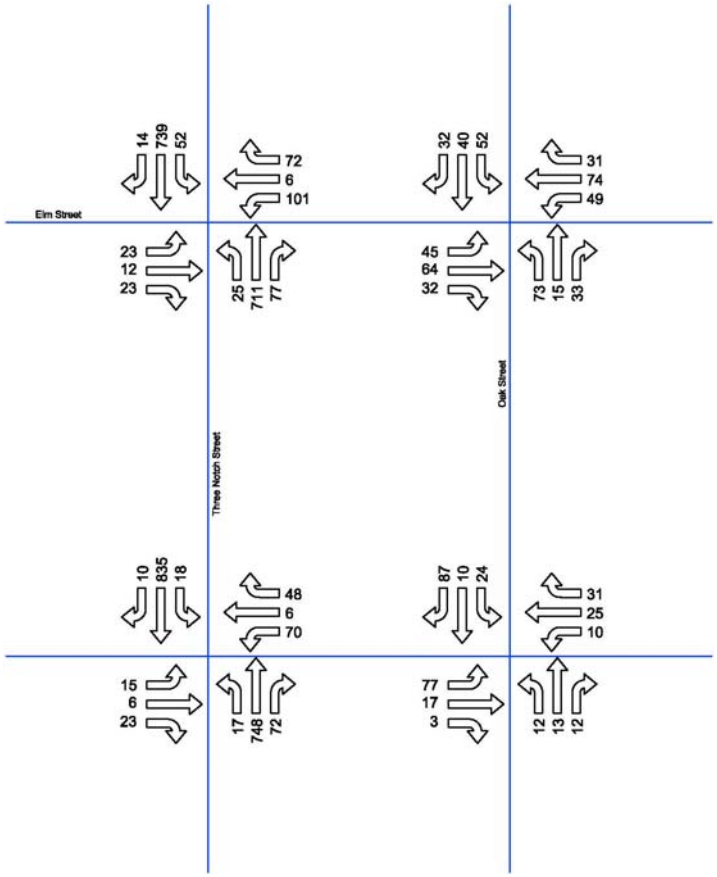


Figure 10

Redistributed Peak Hour Traffic Volumes

Peak hour intersection capacity analyses were conducted using the redistributed peak hour turning movement volumes, depicted in Figure 10 for the intersections assuming that the Square was converted to two-way traffic operations. Capacity analyses were conducted using methods as previously outlined in latest the *Highway Capacity Manual*. The results of the capacity analyses are shown in Table 3. As indicated in Table 3, then study area intersections will continue to operate at acceptable levels of service with the Square converted to two-way traffic operations.

Table 3
Redistributed Intersection Levels of Service

Intersection (traffic control)	Approach	Peak Hour Level of Service
Three Notch Street At Church Street (signal)	Eastbound	B
	Westbound	C
	Northbound	B
	Southbound	C
Three Notch Street At Elm Street (signal)	Eastbound	C
	Westbound	B
	Northbound	B
	Southbound	B
Church Street At Oak Street (all way stop)	Eastbound	A
	Westbound	A
	Northbound	A
	Southbound	A
Elm Street At Oak Street (all way stop)	Eastbound	A
	Westbound	A
	Northbound	A
	Southbound	A