A Vision for Athens: Transportation Plan

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CERTIFICATE OF ADOPTION BY THE CITY OF ATHENS PLANNING COMMISSION

ADOPTED this the 17th day of March, 2015.

CHAIRMAN
CITY OF ATHENS PLANNING COMMISSION

CERTIFICATION OF SECRETARY

STATE OF ALABAMA)
LIMESTONE COUNTY)

I, Allison B Crawford Secretary of the City of Athens Planning Commission, do hereby certify and attest that the above and foregoing is a true and correct copy of a Resolution duly adopted by the City of Athens Planning Commission, on the 17 day of March, 2015.

Witness my hand this 20 day of March, 2015.

Allison B. Crawford
Secretary

Acknowledgments

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Ronnie Marks, Mayor

City Council
Chris Seibert – District 1
Harold Wales – District 2
Jimmy Gill – District 3
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Wayne Harper – District 5

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James Rich – Public Works
Taz Morell – City Engineer
Micah Cochran – Engineering Services/Community Development
Allison Crawford – Engineering Services/Community Development
Floyd Johnson – Police Department
Tony Kirk – Fire Department

The Planning Commission of Athens, Alabama:
Rod Huffman, Chair
Gina Garth, Vice-Chair
Rick Johnson
Venard Hendrix
Ronnie Marks, Mayor
Harold Wales, Councilman
Robert Malone
Jerald Blaxton
Tony Kirk

The Citizens of Athens, including those who participated in workshops, public hearings, and surveys.

INTRODUCTION

This document shall serve as the transportation component of the overall master planning effort of the City of Athens, Alabama entitled "A Vision for Athens," hereinafter referred to as the Plan. This Plan is incremental in nature, beginning with the "Future Land Use and Development Plan," adopted in December 2013. The transportation component is meant to serve as an additional step in fulfilling the duty conveyed on the City and its Planning Commission to "make and adopt a master plan for the physical development of the municipality," and more specifically, to make the plan with the "general purpose of guiding and accomplishing a coordinated, adjusted, and harmonious development of the municipality…in accordance with present and future needs, best promote health, safety, morals, order, convenience, prosperity, and general welfare…including, among other things, adequate provision for traffic…," according to Sections 11-52-8 through 11-52-10 of the Code of Alabama 1975, as amended. The purposes of the transportation component are to assess the effectiveness 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 deficiencies, increase mobility, support the Plan, and create a safe and efficient means of travel for the future.

BACKGROUND

Athens is a city of 21,897 in north-central Alabama. It is located at the heart of the Tennessee Valley region, roughly 24 miles west of Huntsville and 13 miles north of Decatur. For much of its history, Athens has been a small, agricultural town housing the seat of government for Limestone County. However, with the onset of the 21st century, Athens has continued to develop into an industrial and commercial center for Limestone County and a bedroom community within the Huntsville metropolitan area.

Athens has the good fortune of having access to all modes of transportation. The city lies at the junction of several major roadways. These roadways, including Interstate 65; U.S. Highways 72 and 31; and State Highways 99, 127, and 251 connect Athens to the rest of the Tennessee Valley and beyond. CSX Railroad's main rail line between Birmingham and Nashville runs through center of town, with several railroad spurs extending to industrial properties in both industrial parks. Athens is in close proximity to two airports: Huntsville International Airport, which provides full passenger and cargo transport, is 20 miles from Athens, and Pryor Field Regional Airport, which primarily serves private flights, is 9 miles away. Access to navigable waters on the Tennessee River at the Port of Decatur is only 14 miles away. Other points of access to the river for recreation are closer.

With such connectivity and access to the greater transportation network, Athens is poised to be a relevant option for continued residential, commercial, and industrial growth for the foreseeable future. Due to the limited influence the City has on rail, air, and water-based transport systems, the primary focus on this document will be addressing the city's street and road network. With rising gasoline prices and health problems, namely obesity, becoming more of a concern to the general public, active transportation services such as pedestrian and bicycle facilities are becoming more popular and commonplace. This document will cover those facilities as well.

An adequate road and street network should provide safe and efficient traffic flow and access throughout the city. The general purposes of the road and street network are as follows:

- To move people and goods with minimum interference to local residents and commercial activities.
- To enable residents to move safely and easily from one part of the community to another.
- To develop a local road and street system that connects to the regional network.
- To develop a road and street system that separates thru and local traffic.
- To develop a road and street system that is highly connected, allowing for the dispersal of local traffic, a more efficient provision of services, and improved emergency access.
- To minimize conflict points between motorists, pedestrians, and bicyclists.

(Daniels et. al., 2007)

EXISTING CONDITIONS

Functional Roadway Classifications

In order to develop a hierarchy of movement in the street and road network, each thoroughfare is classified by its primary function related to traffic movement and accessibility to property. This document utilizes the functional classification system developed by the Alabama Department of Transportation (ALDOT) as the standard for the classification of roadways within the city. The roads and streets of Athens are classified into four basic categories from highest level in the road hierarchy to lowest: freeways, arterials, collectors, and local streets (figure 1). The higher a classification is on the hierarchal scale, the more emphasis is placed on traffic movement. The lower a classification is on the scale, the more emphasis is placed on accessibility (figure 2).

A freeway's primary function is to carry through traffic for long distances at high speeds. Access to freeways is limited to exits specially designed to separate more localized traffic from the freeway and provide ramps designed to adequately slow or accelerate the speed of vehicles that are exiting or entering the freeway respectively. Pedestrians and non-motorized vehicles are prohibited from utilizing a freeway. The lone example of a freeway in Athens is Interstate 65.

An arterial road's primary function is to carry people and goods into and out of the community. These roads are generally major highways that carry motorized traffic at high speeds and have limited access to properties along them. Bicycles and pedestrians are not encouraged to travel on or close to arterials without proper separation and well-marked facilities. Arterials are often serve as the primary gateways into a community and are the most visible parts of town to the traveling public (Daniels et. al., 2007). According to ALDOT, arterial roadways include primary arterials U.S. Highways 72 and 31 and secondary arterials AL Highway 99, AL Highway 127, AL Highway 251, Jefferson Street, Market Street, and the eastern extent of Pryor Street.

Collector streets function to carry traffic from local streets to arterial roadways and vice versa. Collectors are designed to carry traffic at slower speeds and are meant to handle lower traffic volumes than arterials. Collectors have a higher level of accessibility to adjacent properties than arterials, but not to the extent local streets do. Collectors as a functional classification also begin

to accommodate more pedestrian and bicycle traffic with less separation from motorized vehicles. Collectors within the city of Athens include 5th Avenue, Brownsferry Street, southern portions of Clinton Street, Edgewood Road, Elkton Street, Forrest Street, Hine Street, eastern portions of Hobbs Street, Hoffman Street, southern portions of Houston Street, Huntsville-Brownsferry Road, southern portions of Jefferson Street, Lindsay Lane, Lucas Ferry Road, Mooresville Road, Nick Davis Road, Nuclear Plan Road, Sanderfer Road, Shaw Street, Washington Street.

All other streets within the city are classified as local streets. The primary purposes of local streets are to "provide access to property, serve as right-of-way easements for utilities, provide temporary parking space, separate buildings to provide light and air, and act as a border to prevent the spread of fire" (Daniels et. al. 2004, p. 149). Local streets accommodate bicycle and pedestrian traffic to a greater degree and with less separation that other classifications. Width, speed limit, and the availability of on-street parking may vary from street to street and across different zoning districts.

External Influences

Some external factors to consider as the Plan is developed include the following:

1. Construction of Greenbrier Parkway in Huntsville annexed Limestone County.
   The Greenbrier Parkway is a four-lane roadway being constructed between the Greenbrier exit on I-565 and Huntsville-Brownsferry Road at its intersection with Mooresville Road. The primary purpose of this project is to spur industrial development in the area, according to Huntsville's master plan for areas annexed in Limestone County. This will also create another commuting route between Athens and Huntsville. Widening of Huntsville-Brownsferry Road in Athens is not currently warranted. Without State funding, replacing bridges over the Piney Creek floodway will prove costly to local budgets. However, the Plan should take into consideration how traffic will be using this route for access to Athens proper, industrial areas (especially Breeding Industrial Park), and areas west of Athens. Said considerations should be made based on two-lane capacities until such a time that it is evident that this is becoming a major traffic artery and Level of Service (LOS) is adversely impacted. As presented in the next section, traffic counts along the two-lane Huntsville-Brownsferry Road in Athens are far below capacity.
2. US 72 improvements west of Athens.
   A widening of US 72 from the west side of Athens to the Lauderdale County line was recently completed. The widening of the roadway created wider travel lanes, wider shoulders, and a continuous center turn lane for the extent of the project. The project has created a safer travel route with fewer interruptions in flow from left-turning vehicles. Such an improvement may make this a more preferable route for those traveling between Huntsville and the Shoals region.

Figure 1. ALDOT Functional Classification Map for Athens, 2004.

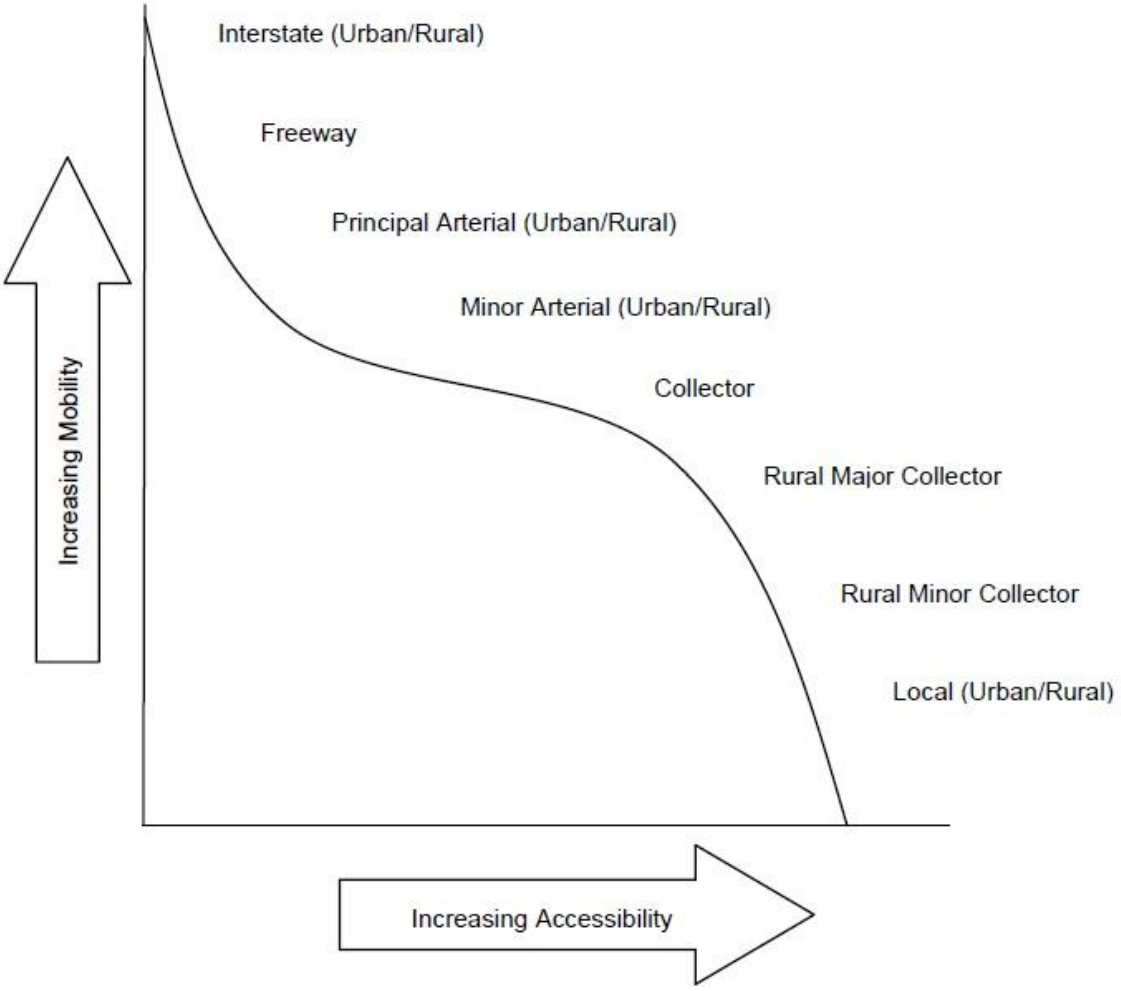


Figure 2. Functionality of Road Classifications.
Source: ALDOT Access Management Manual, 2014.

3. US 72 improvements through Huntsville and Madison

   As part of the State's ATRIP program, with additional funds from the cities of Huntsville and Madison, US 72 will be widened to 6 lanes east of County Line Road on Limestone County's east border to Providence Main Street. Said project will increase the capacity of US 72 along the segment improved.

4. Potential widening of I-565 from four to six lanes.

   While the start of this project has been delayed by ALDOT until 2019 (City of Huntsville, Restore Our Roads 2013), the additional capacity a widening of the interstate will bring will permit Athens residents to travel faster to destinations in Huntsville.

Traffic Volume

Analyzing traffic volume is a good way of determining whether or not a road is meeting the travel demands of the community. To study traffic volume, this plan looks at traffic counts taken at various points along the interstate, arterials, and collectors within Athens. Traffic counts reported in this plan along State highways were collected in 2013, while those for locally maintained arterials and collectors were collected in 2011-2013 (figure 3).

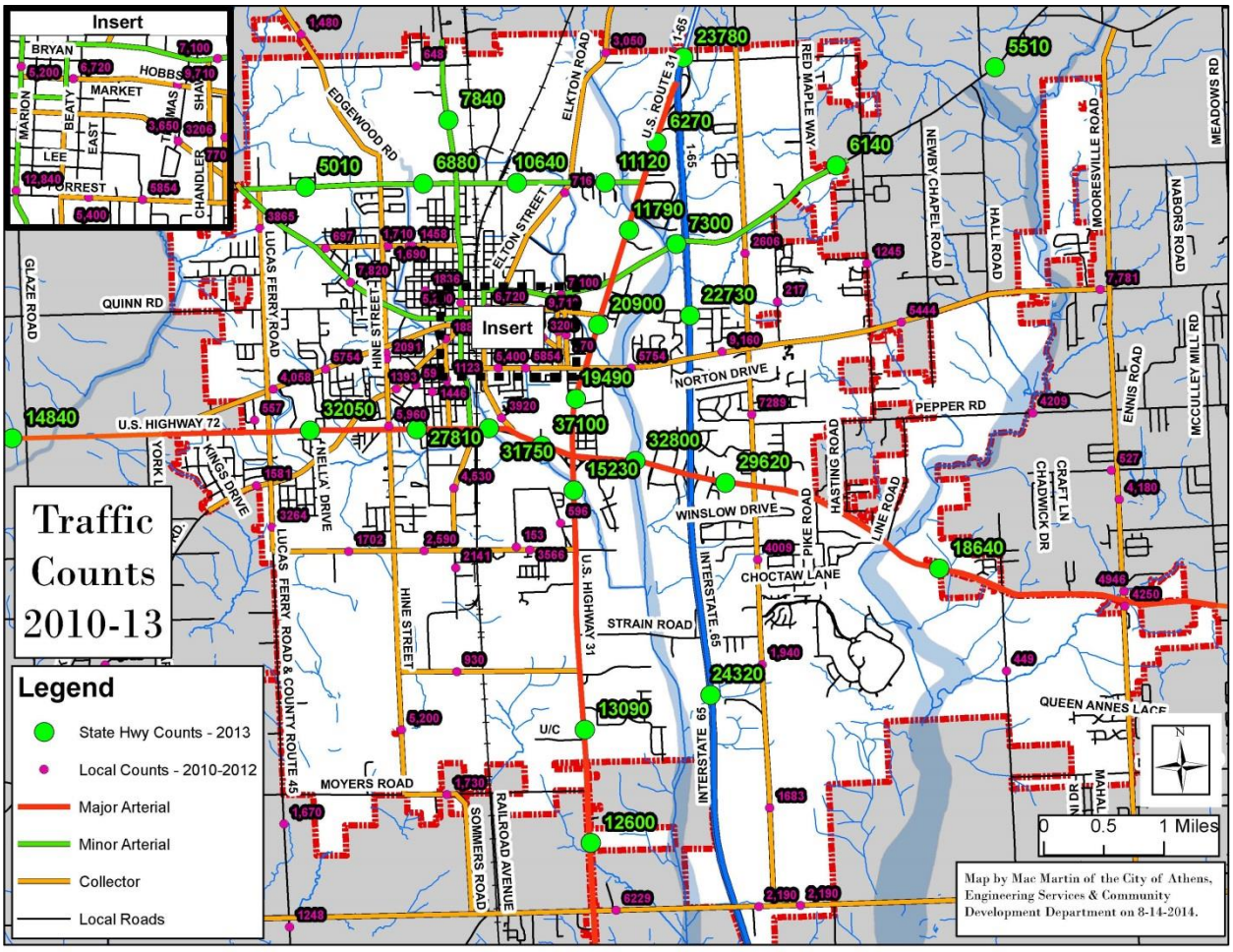


Figure 3. Traffic Counts on Area Roadways

According to current traffic counts, the roads carrying the largest volumes of traffic are I-65, US 72, and US 31, with each carrying more than 20,000 cars per day on at least one segment. By and large, the other roadways in Athens carry fewer than 10,000 cars per day.

Roadway Capacity and Level of Service

Level of services (LOS) as it relates to roadways is a measurement of that thoroughfare's performance in handling traffic volume. LOS is measured on a hierarchal scale similar to that of a grading scale used in school, with letter grades A-F representing how well or poorly traffic

flows on the thoroughfare. The LOS of a road is generally calculated by taking the existing traffic counts and dividing them by the roadway's capacity (table 1). A grade of LOS A-C means that the traffic along the roadway is in free to stable flow. LOS D is applied to roadways that have high and dense traffic volume, but the flow is still stable. LOS E signifies that stability of the traffic flow is breaking down, while LOS F means the roadway is not capable of functioning properly with the existing traffic volume. According to the Institute of Transportation Engineers, the functionality of a roadway is deemed to be acceptable if it operates at LOS A-D.

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)

Table 1. Transportation Research Board Automobile Level of Service Scale (LOS).
Source: Skipper Consulting Inc. City of Homewood Transportation Plan, 2007

A roadway's capacity is influenced by a number of factors including functional classification, number of lanes, presence of traffic signals, level of access management, etc. Given the geographical scope of this plan, it utilizes a general roadway capacity guide produced by ALDOT that utilizes functional classification and number of lanes (table 2). More localized studies should consider additional factors.

When applying the capacity guide to roadways in Athens with their respective traffic counts, we find that the vast majority of roadways in Athens are functioning at LOS A-C for automobile traffic. The design of the roadways by and large accommodates the traffic volume and permits a stable flow of traffic throughout the city. That portion of Jefferson Street running between US 72 and downtown is the only roadway that registers a grade of LOS D, with a volume of traffic that is 73% of its capacity. With this grade, the roadway is still able to handle the flow of traffic on that thoroughfare.

In all, the City's road network functions very well (figure 4). US 72 is the only thoroughfare registering a grade of LOS E-F. This means that traffic flow is either hampered or severly disrupted. Of particular interest, this study finds that the segment of US 72 from the US 31 interchange west to the intersection of Jefferson Street grades out at LOS F, or is operating at over 100% capacity. This segment includes a portion of the highway that narrows to a four lane, undivided configuration as it passes under a railroad trestle. According to ALDOT, the general capacity of a principal arterial with such a configuration is 31,000. This segment handles an average daily traffic volume of 31,750 vehicles. The portion of the highway in front of Walmart and numerious other businesses is divided with a dedicated turn lane, which has a capacity of 33,900 vehicles per day. However, current traffic counts indicate that the road is traveled by 37,100 vehicles per day.

Functional Classification	# of Lanes	Daily Capacity
Freeways	4	68,000
	6	102,000
	8	136,000
	10	170,000
Expressways	4	50,000
	6	75,000
	8	100,000
Divided Principal Arterials	2	22,000
	4	33,900
	6	50,000
	8	73,600
Undivided Principal Arterials	2	17,800
	4	31,000
	6	45,800
	8	63,100
Divided Minor Arterials	2	21,000
	4	31,900
	6	45,600
	8	
Undivided Minor Arterials	2	17,800
	4	27,400
	6	
	8	
Divided Collectors	2	20,800
	4	28,500
	6	42,000
Undivided Collectors	2	16,600
	4	26,200
	6	38,700
One-Way Principal Arterials	2	17,100
	3	25,600
	4	
One-Way Minor Arterials	2	14,100
	3	19,500
	4	26,000
One-Way Collectors	2	11,300
	3	15,600
	4	20,800
One-Way Ramps	1	9,000
	2	18,000
	3	27,000
Time Barriers		
Centroid Connectors	2	14,000

Table 2. ALDOT Approved Traffic Capacity by Functional Classification.
Source. Skipper Inc. Transportation Plan for East Alabama Regional Planning Commission, 2010.

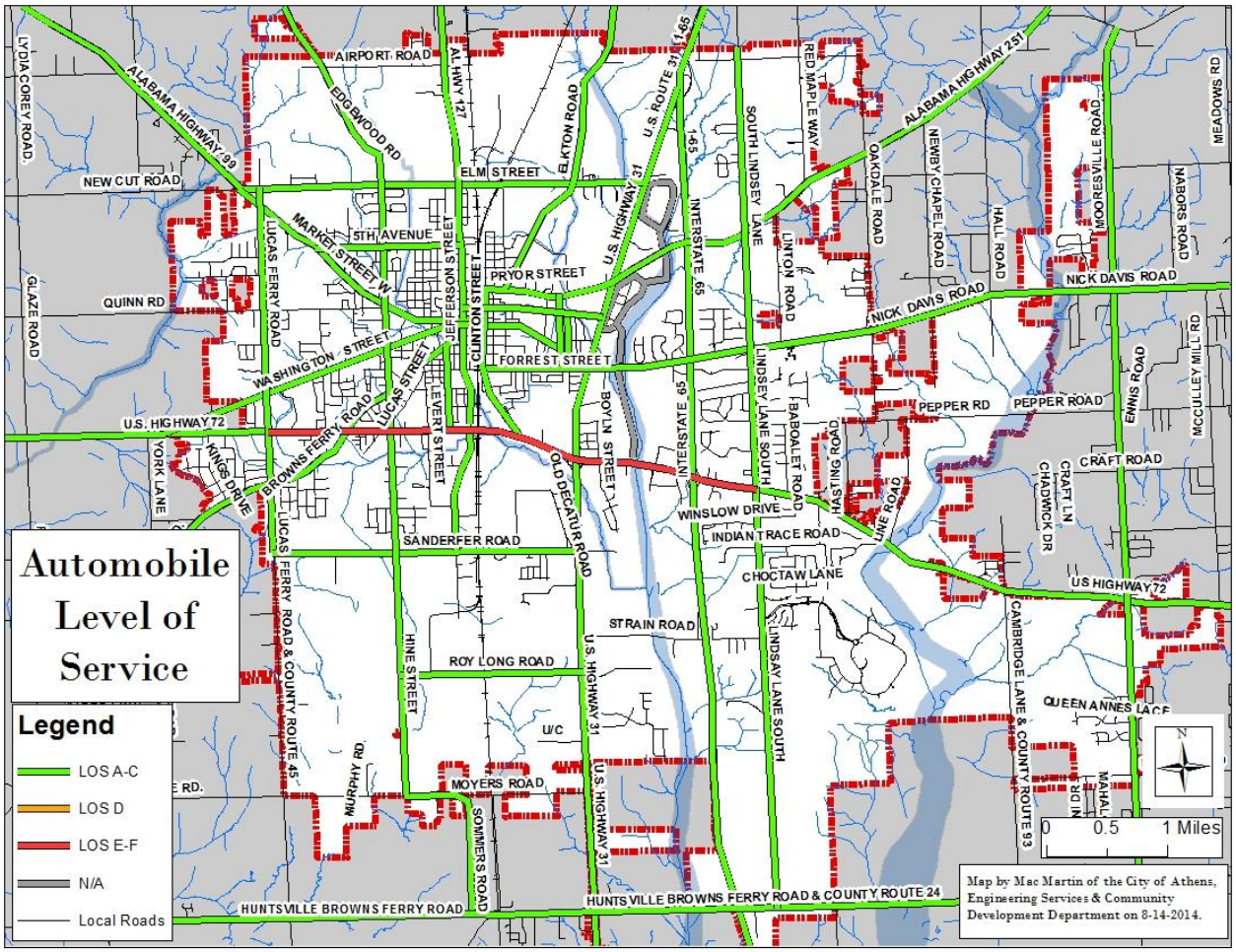


Figure 4. Current Level of Service (LOS) of Roadways in Athens.

To gain a more holistic understanding of traffic within the city, the plan examined past traffic counts in order to determine the overall trends. Once these data were collected, they were extrapolated onto a linear curve to help project future volumes. For this exercise, all State routes, as well as Jefferson Street and Hobbs Street East were analyzed. No other roads are examined for trends due to a lack of reliable data. The State routes have traffic data for each year from 2003 to 2013. Said data was accessed from ALDOT's online geographic information systems (GIS) portal. Data for Jefferson Street and the eastern extent of Hobbs Street where discovered in files at the Public Works office. These data reflect traffic counts collected near the beginning of the past three decades. The author found the data for the State and local roads to be seemingly reliable with reference dates and similar count station locations.

Data from each traffic count station were extrapolated onto a linear curve to show the trend for that singular station and its corresponding road segment. Linear projections were then performed for each station and corresponding road segment in order to forecast future traffic volumes over the next 10 years (Appendix A). Once the model was applied to each station, the percentage of volume increase or decrease for the next 10 years was calculated and mapped (figure 5). Then, the percentage was applied to the latest observed values to calculate future LOS (figure 6).

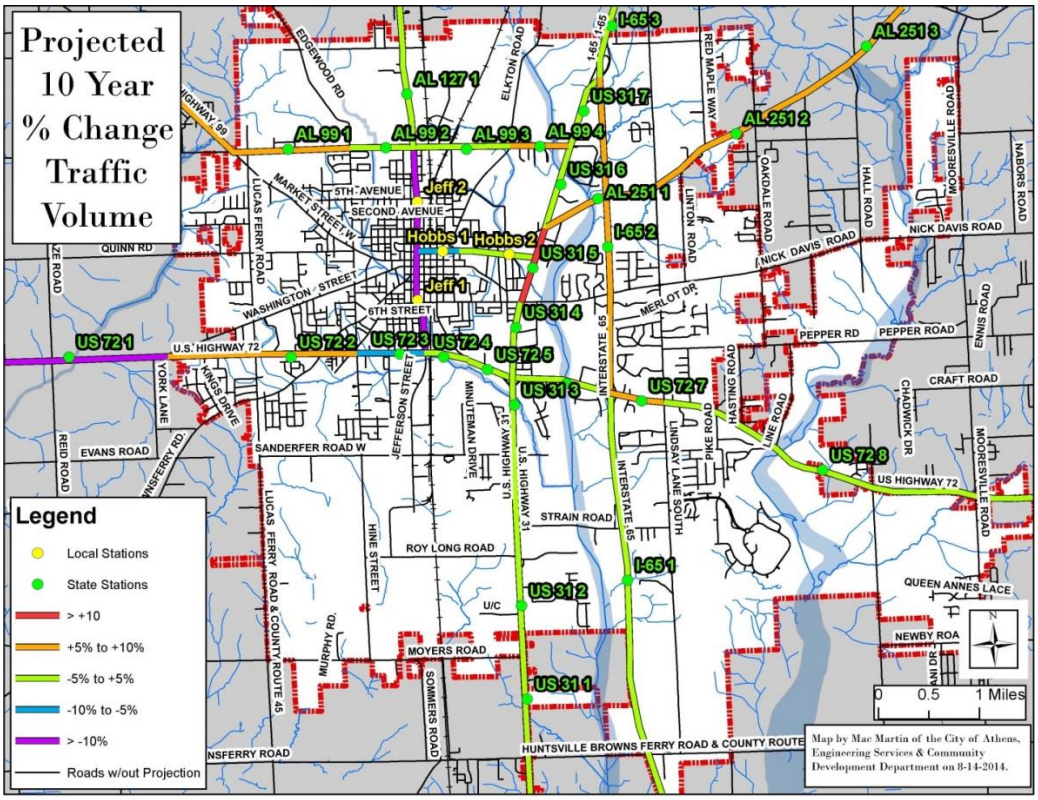


Figure 5. Projected Percent Change in Traffic Volume, 10 Years.

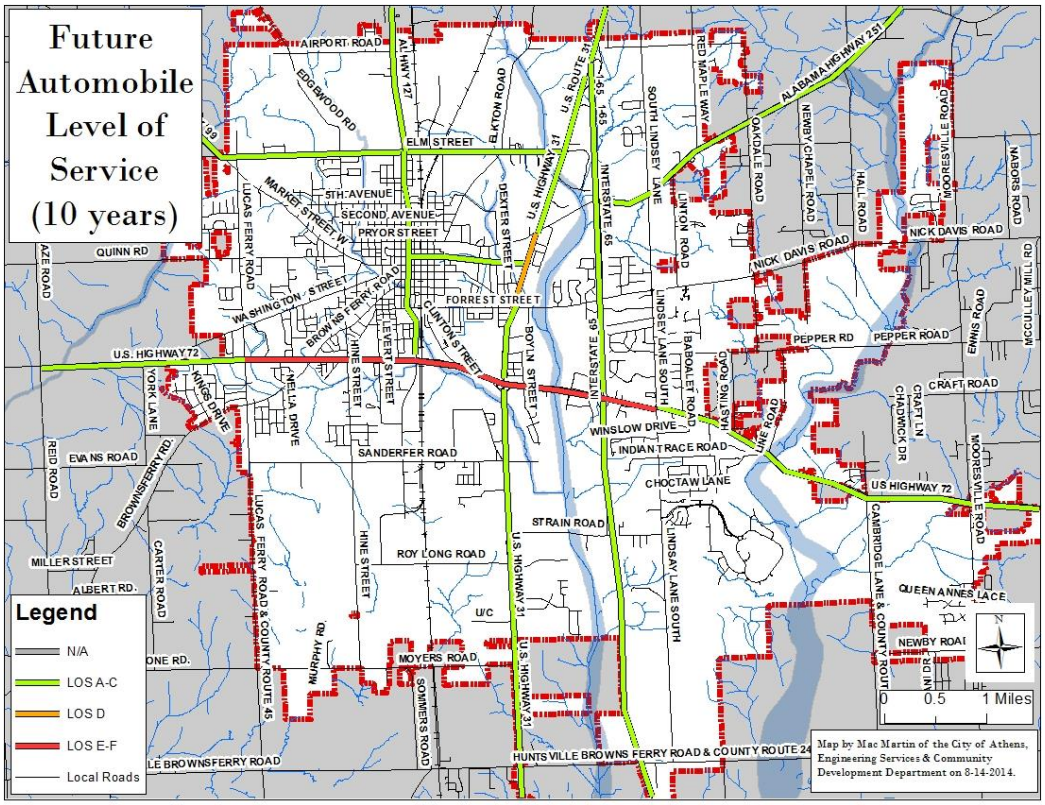


Figure 6. Projected Level of Service (LOS), 10 Years.

Analysis of the linear extrapolation of traffic counts on area roadways indicates varying trends occurring on most of them. AL 251 was the only roadway projecting to grow in traffic volume along each segment. Traffic volumes on both Jefferson Street and Hobbs Street are expected to decline in coming years. Traffic along AL 127 has been and is slated to remain constant. Projections indicate that traffic along I-65, US 72, and US 31 will increase or decrease depending on the segment. The sharpest increase in traffic volume is expected for the segment of US 31 between Forrest Street and AL 251, where traffic is expected to increase by more than 10%. In addition to school traffic, this stretch of US 31 will be handling some of the increased volume of traffic expected for AL 251. With the increase, this segment of US 31 is expected to downgrade to an LOS D, which still represents acceptable functionality.

Regarding US 72, the model shows that traffic volume is expected to increase at a modest pace for most segments. This is good news given that the roadway already operates at a LOS E-F through the city. The only segment within the core of town projecting to lose traffic volume lies between Hine Street and Jefferson Street. One possible explanation is that there are other routes adjacent to this segment of US 72 that offer alternatives for navigating to downtown or around this segment to US 31 and points east in order to avoid a number of traffic signals and arguably the most congested intersection in the city – that of US 72 and Jefferson Street.

With US 72 serving as the primary east-west route through Athens and showing signs of being the least functional roadway in the city, the author sought to examine this thoroughfare in greater detail – particularly the segments registering an LOS E-F. The traffic counts used to determine the LOS of US 72 were average daily counts. Of course, the traffic volume indicated in the counts is not constant throughout the day. Traffic volume changes depending on the time of day in response to the need for people to transport themselves or goods.

To gain a better understanding of the traffic patterns along US 72, the author observed and recorded qualitative data along segments 2 through 7 (figure _) at various times during the day. The author chose times often considered the busiest travel periods: 8:00 AM, midday, 3:00 PM, and 5:00 PM. These time intervals capture traffic to and from work and school, as well as lunch, dinner, recreational, and commercial traffic. Also, the observations took place on a Monday and a Friday in order to enhance the internal validity of the data. The specific dates selected, August 22, 2014 and August 25, 2014, represent a Friday and a following Monday with normal transportation operations - when school was in session and no holidays or special events occurred.

The qualitative data collected took the form of photographs (Appendix B) and a general description of events transpiring as experienced by the author. These data were used to complement the quantitative data previously collected to provide a more holistic picture of the happenings along this thoroughfare. With the additional data, the plan seeks to understand what specific aspects of the thoroughfare contribute to a lower level of service and attempts to develop possible remedies to improve the situation, or at least prevent a worsening of the situation as traffic volumes increase.

During the time spent in the field, the author observed that traffic on US 72 generally increases throughout the day, becoming heaviest from the time schools adjourn through the evening commute. Traffic flow was largely uninterrupted during the morning. However, as the day progressed and traffic became heavier from lunchtime on, the flow of traffic became increasingly interrupted. This was particularly the case along portions of US 72 where the number of signalized intersections increases and distances between them decrease.

The traffic signals seemed to be a primary factor in stymieing traffic flow. As traffic increased later in the day, the signals prevented groupings of vehicles from continuing to flow along the arterial. These groupings where forced to stop multiple times, often not recovering their flow rate from the previous intersection. The programming of the signals did not seem to adjust for the heavier traffic. Nor did it seem there was much coordination between signals. Rather, the timing of the signals seemed predicated on vehicles on the secondary streets or access points passing over sensors in the pavement, thus "sending a call" to the traffic signal to begin a countdown to signal change.

Consistent flow was further complicated along segments of the roadway that had excessive numbers of access points connecting to adjacent properties. Vehicles exiting the highway at numerous locations along a relatively short stretch of roadway, often without lanes dedicated to such movement, caused vehicles in the travel lanes to slow or stop abruptly. Vehicles entering the roadway from non-signalized access points would often pull out onto the road in front of traffic with the slightest of openings or dart across the first two travel lanes if making a left turn movement, causing a slowing of through traffic.

Another attribute of US 72 the author observed as contributing to queues in traffic were the presence of inadequate turn lanes. These features caused a substantial breakdown of flow, particularly in the left travel lane. This problem is worse when it involves a left turn lane due to that movement yielding on green to through traffic heading in the opposite direction. The dedicated left green signal is insufficient because many vehicles desiring to turn left cannot access the turn lane until the signal turns green for through traffic.

The best example of this is found as traffic approaches the intersection with Jefferson Street from the east. US 72 takes on the "four-lane, undivided" functional classification as it approaches and passes underneath the railroad trestle. Just past the trestle begins two dedicated turn lanes, one left and one right. The tapers for each begin about 50 feet to the west of the trestle. That portion of both turn lanes meant to serve as stacking space large enough to accommodate a vehicle, between the taper and the stop bar, measures less than 50 feet. More than two tightly stacked automobiles or the presence of one large freight truck, which usually measure in excess of 60 feet from end to end, can cause turning vehicles to queue in the travel lanes, bringing through traffic to a standstill until the turning vehicles can make their movements. The problem is more pronounced for the left turn lane as vehicles turning right typically can do so freely with the flow of through traffic on a green signal. The problem is amplified at this intersection by the number of freight trucks turning south onto Jefferson Street to access Breeding Industrial Park.

Another example of insufficient turn lanes causing travel delays can be found at Exit 351. Left turn lanes on the east and west-bound sides of US 72 appear to be of insufficient size to

accommodate the stacking space needed for the volume of vehicles turning onto Interstate 65. The bridge over Interstate 65 is only wide enough to accommodate travel lanes. The tapers for the left turn lanes begin once the end of the bridge is met. The stacking space in each turn lane is between 60 and 70 feet. Again, if multiple automobiles or freight trucks are attempting to turn, the queue extends back into the through lanes, causing an obstruction to efficient flow. If traffic is heavy enough, turning vehicles may not be able to access the lane until the dedicated left turn signal has passed.

US 72 Traffic Signals

After observing traffic patterns along US 72 in the field, the author inquired as to the inner-workings, maintenance, and timing of the traffic signals. Through an agreement with ALDOT, maintenance of the signals is the responsibility of the Athens Electric Department. They ensure the signals are in proper working order, from changing out lights to repairing/replacing components within the computer cabinets, with a crew specifically dedicated to signal upkeep on state routes and local streets across the city. The maintenance crew has a working knowledge of how each intersection's signals are programmed and function.

Each intersection operates on an independent loop system. The system is comprised of a combined timing and sensor program. The timing component is programmed in the signal computer and counts down the number of seconds of travel time on a thoroughfare until the signal changes and permits traffic on the secondary street to go. The sensors, most often located within the pavement, will affect the timing of the signal when triggered by the weight of a vehicle passing on top of them. The passing vehicle "sends a call" to the signal computer to change the light from red to green on the secondary street or add seconds onto the green signal if traffic is continuous. The only intersections not utilizing sensors in the pavement are found at Exit 351. Instead, this interchange utilizes a camera sensor to trigger signals due to the wear and tear large freight trucks cause on the pavement.

Timing of the signals remains under the explicit control of ALDOT. Local maintenance personnel cannot alter the timing programmed in the computer. Typically, prior to any change in the operation of a signal, ALDOT will perform a study of the intersection to ascertain whether or not a change is warranted, and to what degree the timing is altered if warranted.
As mentioned earlier, each signal along US 72 operates independently, with no communication between signals. The timing of each signal is meant to have some level of correlation during morning and evening rush hours to achieve maximum flow on US 72 - eastbound in the morning and westbound in the evening. During normal business hours, the signalization is set to the normal timing and sensor program with US 72 traffic flow favored over secondary streets. After 8:00 pm the signals enter "green rest" mode, where US 72 traffic is given a constant green signal until a car on a secondary street sends a call to the signal to begin the countdown to signal change.

According to Kerry NeSmith, the assistant State maintenance engineer with ALDOT, the last time an exercise was conducted to synchronize the timing of the signals on US 72 was in 2002. Rather than a published comprehensive study examining the traffic movements and patterns along US 72, the exercise was informal, internal to the DOT, and based off a more basic traffic

volume data observed along the roadway. Mr. NeSmith suggested that a study of the signalization for a corridor like US 72 should be conducted every 3 to 5 years in order to examine the patterns in detail over time and adjust the signals accordingly. It has been 12 years since the last study. This indicates that the current programming of the signals does not take into account the comprehensive nature of present traffic conditions along the thoroughfare.

Signalization of other Roadways

To the knowledge of the author, no other issues exist with the signals along other State routes. A combination of intersection geometry and lack of a dedicated left turn movement caused delays and confusion amongst travelers along Pryor Street and AL 251 entering the intersection with US 31. Since these issues were reported to ALDOT by the City, ALDOT reconfigured the signalization of the intersection to allow dedicated left turns from AL 251 and Pryor Street onto US 31.

On local streets, the City is in the process of studying intersections where some doubt exists as to whether or not a signal is warranted. Several intersections have already had signals removed where not warranted including Pryor/Sanders, Bryan/Madison, Bryan/Marion, and Houston/Brownsferry. The City recently contracted with Skipper Consulting to complete a signal warrant analysis of downtown intersections based on traffic volumes at the intersections. The analysis found that of the 18 intersections studied, 9 had signals that were not warranted. While intersection geometry and sight distance may make it so signals need to remain, most of the intersections where signals are not warranted can be governed by STOP signs. The City is planning to convert the intersections one at a time, starting with intersections along Hobbs Street. The traffic control conversion of these intersections is meant to coincide with other intersection and infrastructure improvements jumpstarted by the construction of the new city hall.

Figure 7. Intersections included in downtown traffic signal warrant analysis. Skipper Consulting, 2014.

Affordability and Automobile Dependency

For the average American family, the largest expense beyond housing is transportation. Transportation costs consume 25% of the average household income for families in the United States living in automobile-dependent communities. Additionally, those same families are spending on average 32% of their income on housing, leaving a mere 43% of disposable income for all other family expenses (FHWA 2014).

This information calls into question the true affordability of automobile-dependent suburbs for the average family. In fact, only recently has transportation been seriously considered as a variable in determining the affordability of living in a particular geography. Traditionally, housing costs in and of themselves were viewed as the singular determinant of the affordability of living in a community. If housing costs did not exceeded 30% of a household's annual income, the community was deemed "affordable" (CNT 2010). However, more and more households were finding the cost of driving to work and other functions increasingly expensive.

As a result, organizations such as The Center for Neighborhood Technology (CNT) developed models and indices including transportation costs as an additional variable in order to represent the true affordability of a community. The CNT has developed the H+T (Housing plus Transportation) Affordability Index, referenced by the FHWA, to determine the true affordability of residing within a community as determined by housing and transportation costs versus household income by census block group. This model states that a community is considered affordable when house and transportation costs for a household do not exceed 45% of its income, leaving 55% of household income for other expenses and savings. Under the standard "housing only" affordability index, 69% of all communities in the U.S. are considered affordable. However, when the H+T measure is applied, the percentage of affordable communities falls to 39% (CNT 2010).

By the standard "housing only" measure of affordability, all of the city of Athens is considered "affordable" with housing costs not exceeding 30% of the average household's income. However, when factoring in transportation costs in the H+T measure, roughly half of the geographical area of Athens is considered "not affordable", with the majority of households in those respective census block groups spending more than 45% of their annual income on housing and transportation (figure 8). The portion of the city considered "affordable" by the H+T measure is essentially the older, more established part of the city between Lindsay Lane and Lucas Ferry Road and locations along US Hwy 31 South. This indicates that housing prices on the whole may be less expensive in these block groups than other localities, or that these areas may be home to a higher portion of folks that work within Athens, cutting out the need to travel long distances commuting to a job. What is more clearly the case, and can be verified in the field, is that folks that live within the "affordable" portion of Athens live closer to retail, service, and social destinations, and are accessible to more alternative transportation options, such as pedestrian facilities. The reduction in distance traveled, or the need for automobile trips altogether, reduces the amount a household living in this portion of the city has to spend on transportation.

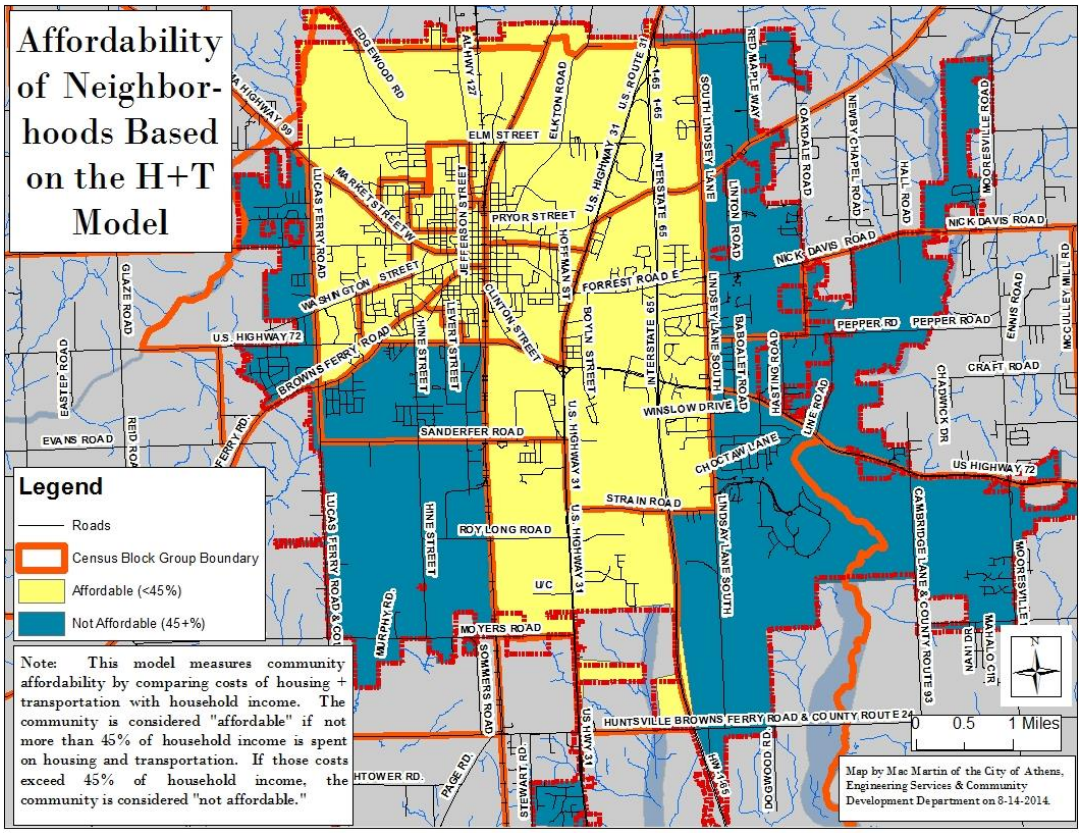


Figure 8. Affordability of Neighborhoods in Athens Using the H+T Measure.

If a household is located in a community that offers enough in the way of alternative transportation options or proximity to work and personal destinations to reduce automobile travel and transportation costs, that household will enjoy a larger disposable income. In fact, the FHWA estimates that if a household can reduce the number of private cars owned and operated to one vehicle, house and transportation costs for that household could be reduced by 50% or more (2014). Additional remaining income can thus be spent on other items and services, leading to an increase in the quality of life for the household and an increase in tax revenues for the municipality. In summary, Athens stands to benefit from supporting an approach to land use and transportation that enhances affordability and increases disposable incomes.

Alternative Modes, Level of Service

As mentioned earlier, offering alternatives in transportation plays a key role in reducing transportation costs and improving the affordability, quality of life, and tax revenues for the city. For communities like Athens that are too small and lack resources to support an extensive public transportation system, alternative forms of transportation take the form of pedestrian and bicycle facilities. In 1994, the U.S. Department of Transportation released a comprehensive, national report titled *The National Bicycling and Walking Study – Final Report*. The DOT concluded in the study that "increased levels of bicycling and walking transportation would result in significant benefits in terms of health and physical fitness, the environment, and transportation-related effects" (p. IV).

Private automobile travel continues to be the dominant mode of transportation in the U.S. However, with the shift in city-building from suburban to more dense, urban settings (covered extensively in the future land use component), spurred in part by increased travel times, traffic congestion, gasoline prices, new workplace technologies, and environmental concerns, alternate modes of transportation like walking and biking are becoming more commonplace. According to the FHWA, the percent share of trips by private automobile has been decreasing since the mid-1990s, while walking and other modes of transportation besides public transit have been increasing. The percent share of public transit travel has remained constant at just under 2% (figure 9) (Santos et. al., 2011).

Though recreation is certainly a major use for these biking and pedestrian facilities, people across the nation are increasingly utilizing them for commuting to work, accessing services and retail, and traveling to lifestyle and cultural destinations. To discount these modes as purely recreational in nature and to divert resources away from them because of that perception is not a preferred practice, especially seeing as most automobile trips today are generated for purposes such as recreation and errands (figure 10). Table 3 shows the number of person trips by type for various modes of transportation.

The study of the LOS of pedestrian and bicycle facilities has been much slower to develop than that of vehicular facilities. Of course, vehicular travel is the dominant transportation mode and volumes are fairly easy to determine. Studies of pedestrian and bicycle LOS are hampered due to the reality that current volumes of pedestrian and bicycle traffic do not reflect demand. This is the case for two primary reasons:

1. Lack of accommodations and facilities depress usage.
2. Separation of land uses creates trip distances that are perceived to be too long for travel by bicycle or on foot (ITE 1999).

In recent years, organizations have worked to create models for measuring pedestrian and bicycle LOS utilizing more qualitative data points, such as width of roadway, provision of sidewalks, and speed limits for automobiles, to determine the “friendliness” of roadways for these alternative transportation modes. One such model referenced by the National League of Cities’ Sustainable Cities Institute is the Bicycle and Pedestrian Level of Service Calculator, developed by the League of Illinois Bicyclists (figure 11). The calculator is accessible through the Sustainable Cities Institute website and requires numerous data inputs for each roadway being studied. This calculator is used to determine current LOS for bicycle and pedestrian transportation along arterials and collectors in this study.

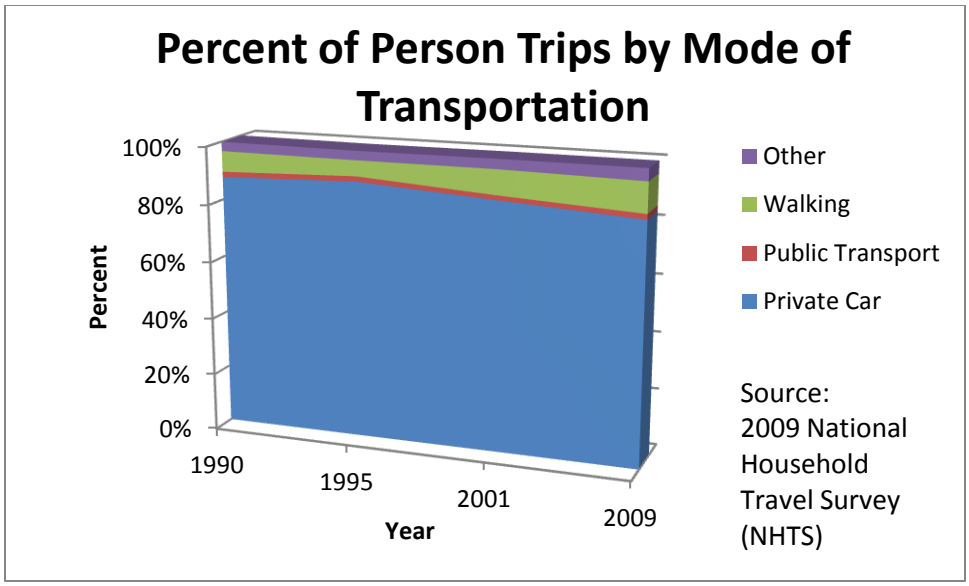


Figure 9. Percent of Person Trips by Mode of Transportation. Santos et. al. 2011

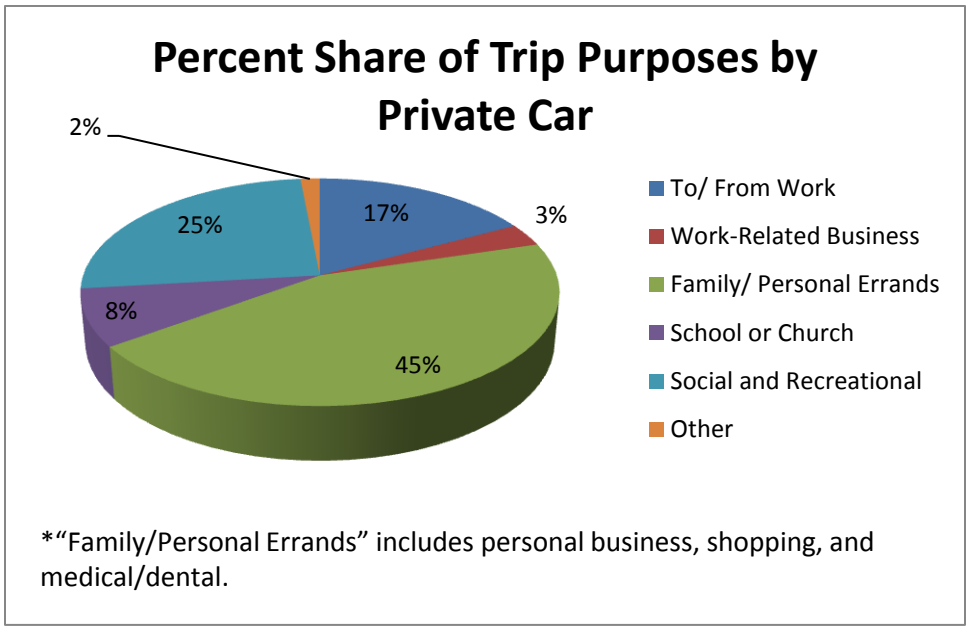


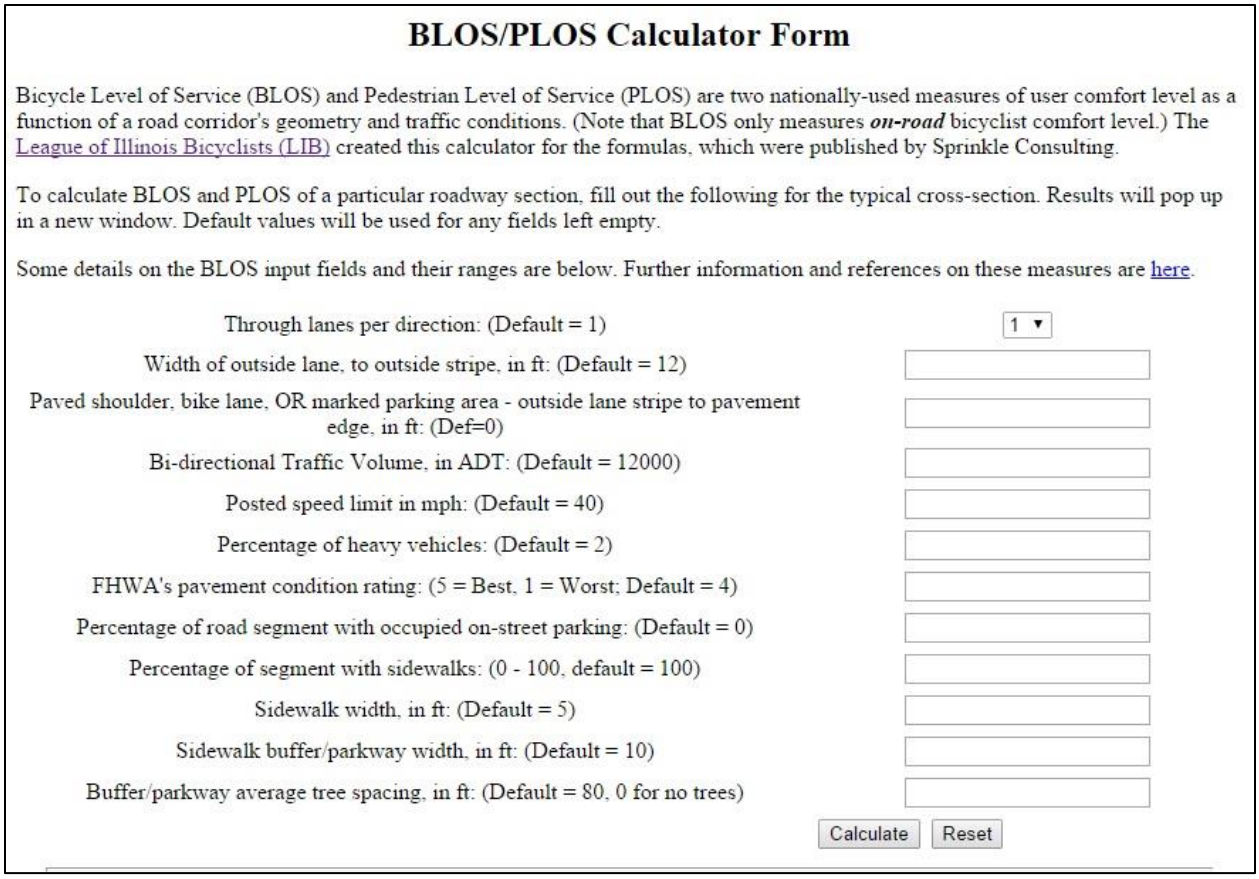
Figure 10. Percent Share of Trip Purposes by Private Car. Santos et. al. 2011.

`		1990		1995		2001		2009		95% CI
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Private Vehicle	To/ From Work	45,856	*91.2%*	60,740	*92.8%*	56,054	*92.4%*	55,969	*91.4%*	941.4
	Work-Related Business	3,178	*90.3%*	8,835	*91.9%*	10,648	*91.2%*	10,525	*88.1%*	767.1
	Family/ Personal Errands	128,368	*92.7%*	156,065	*92.6%*	153,270	*90.9%*	146,158	*87.8%*	2487.7
	School or Church	17,545	*61.9%*	22,436	*69.6%*	26,861	*71.3%*	26,654	*70.7%*	968.2
	Social and Recreational	70,382	*86.3%*	78,809	*87.6%*	82,437	*80.7%*	82,887	*76.9%*	1583.2
	Other	1,629	*81.4%*	470	*83.2%*	2,147	*67.2%*	4,925	*71.0%*	304.1
	Total	**267,029**	***87.8%***	**327,400**	***89.3%***	**331,791**	***86.3%***	**327,118**	***83.4%***	3468.5
Transit	To/ From Work	1,992	*4.0%*	2,328	*3.6%*	2,271	*3.7%*	2,247	*3.7%*	254.2
	Work-Related Business	92	*2.6%*	123	*1.3%*	213	*1.8%*	264	*2.2%*	93.7
	Family/ Personal Errands	1,318	*1.0%*	2,000	*1.2%*	1,776	*1.1%*	2,344	*1.4%*	264.7
	School or Church	1,076	*3.8%*	826	*2.6%*	800	*2.1%*	829	*2.2%*	131.8
	Social and Recreational	946	*1.2%*	1,350	*1.5%*	989	*1.0%*	1,426	*1.3%*	195.0
	Other	35	*1.7%*	11	*1.9%*	134	*4.2%*	409	*5.9%*	114.5
	Total	**5,460**	***1.8%***	**6,638**	***1.8%***	**6,202**	***1.6%***	**7,520**	***1.9%***	493.4
Walk	To/ From Work	1,999	4.0%	1,510	2.3%	1,715	2.8%	1,854	*3.0%*	230.4
	Work-Related Business	154	4.4%	240	*2.4%*	487	4.2%	684	*5.7%*	136.1
	Family/ Personal Errands	7,722	5.6%	8,756	5.0%	11,936	7.1%	15,174	*9.1%*	818.7
	School or Church	3,649	12.8%	2,925	8.8%	3,630	9.6%	3,542	*9.4%*	479.4
	Social and Recreational	8,090	9.9%	6,845	7.3%	14,824	14.5%	18,833	*17.5%*	768.4
	Other	265	13.2%	47	7.6%	507	15.9%	874	*12.6%*	157.6
	Total	**21,879**	**7.2%**	**20,325**	**5.4%**	**33,145**	**8.6%**	**40,962**	***10.4%***	1493.1
Other	To/ From Work	428	0.8%	887	1.3%	584	1.0%	1,144	*1.9%*	166.1
	Work-Related Business	95	2.7%	417	4.2%	317	2.7%	469	*3.9%*	169.2
	Family/ Personal Errands	1,087	0.8%	1,768	1.0%	1,468	0.9%	2,859	*1.7%*	337.3
	School or Church	6,086	21.4%	6,035	18.1%	6,351	16.9%	6,651	*17.7%*	413.1
	Social and Recreational	2,098	2.6%	2,954	3.1%	3,829	3.7%	4,576	*4.2%*	387.4
	Other	73	3.6%	37	6.0%	394	12.3%	725	*10.5%*	135.1
	Total	**9,867**	**3.2%**	**12,099**	**3.2%**	**12.975**	**3.4%**	**16,424**	***4.2%***	744.7
Total	To/ From Work	50,314	*100%*	66,901	*100%*	60,690	*100%*	61,214	*100%*	901.9
	Work-Related Business	3,529	*100%*	9,860	*100%*	11,676	*100%*	11,943	*100%*	849.2
	Family/ Personal Errands	138,559	*100%*	173,764	*100%*	168,560	*100%*	166,535	*100%*	2536.5
	School or Church	28,397	*100%*	33,355	*100%*	37,671	*100%*	37,676	*100%*	1119.2
	Social and Recreational	81,575	*100%*	94,362	*100%*	102,165	*100%*	107,722	*100%*	1617.9
	Other	2,014	*100%*	623	*100%*	3,198	*100%*	6,933	*100%*	468.3
	Total	**304,471**	***100%***	**378,930**	***100%***	**384,484**	***100%***	**392,023**	***100%***	3644.5

Note:

- All tables reporting totals could include some unreported characteristics.
- "Family/Personal Errands" includes personal business, shopping, and medical/dental. Please see Appendix A - Glossary for definition.
- 1990 person and vehicle trips were adjusted to account for survey collection method changes.
- The 1995 Vehicle Miles of Travel (VMT) and vehicle trips with "To or From Work" as a trip purpose as believed to overstated.
- Increases in walk trips between 1995 and 2009 are due, at least in part, to respondents being explicitly asked to include walk trips, which was not the case in prior surveys.
- Public transit includes local bus, commuter bus, commuter train, subway, trolley, and streetcar.
- NPTS is Nationwide Personal Transportation Survey. CI is Confidence Interval.

Table 3. Annual Number (in Millions) and Percent of Person Trips by Mode of Transportation and Trip Purpose 1990 and 1995 NPTS, and 2001 and 2009 NHTS. Santos et. al. 2011.



BLOS/PLOS Calculator Form

Bicycle Level of Service (BLOS) and Pedestrian Level of Service (PLOS) are two nationally-used measures of user comfort level as a function of a road corridor's geometry and traffic conditions. (Note that BLOS only measures ***on-road*** bicyclist comfort level.) The League of Illinois Bicyclists (LIB) created this calculator for the formulas, which were published by Sprinkle Consulting.

To calculate BLOS and PLOS of a particular roadway section, fill out the following for the typical cross-section. Results will pop up in a new window. Default values will be used for any fields left empty.

Some details on the BLOS input fields and their ranges are below. Further information and references on these measures are here.

Through lanes per direction: (Default = 1)	1
Width of outside lane, to outside stripe, in ft: (Default = 12)	
Paved shoulder, bike lane, OR marked parking area - outside lane stripe to pavement edge, in ft: (Def=0)	
Bi-directional Traffic Volume, in ADT: (Default = 12000)	
Posted speed limit in mph: (Default = 40)	
Percentage of heavy vehicles: (Default = 2)	
FHWA's pavement condition rating: (5 = Best, 1 = Worst; Default = 4)	
Percentage of road segment with occupied on-street parking: (Default = 0)	
Percentage of segment with sidewalks: (0 - 100, default = 100)	
Sidewalk width, in ft: (Default = 5)	
Sidewalk buffer/parkway width, in ft: (Default = 10)	
Buffer/parkway average tree spacing, in ft: (Default = 80, 0 for no trees)	

Calculate Reset

Figure 11. Bicycle and Pedestrian LOS Calculator. Source: League of Illinois Bicyclists, 2014.

The LOS for bicycle and pedestrian usage along a thoroughfare is graded similarly to that of automobile LOS with letter grades A-F. Using the League of Illinois Bicyclists calculator, said letter grades correlate to scores produced by computations for each segment of roadway studied (table 4). The letter grades are color coded similarly to those of automobile LOS. For this study, arterials and collectors were examined for their "friendliness" in accommodating pedestrians and bicyclists. Data required by the calculator were gathered for each and scores were computed (report on file at Public Works). The thoroughfares were then mapped according to the letter grade each earned for pedestrian LOS (figure 12) and bicycle LOS (figure 13).

Level of Service A - C		Extremely high to moderately high level of service. Thoroughfare score of 3.50 or less.
Level of Service D		Moderately low level of service. Thoroughfare score of 3.51 to 4.50.
Level of Service E - F		Low to extremely low level of service. Thoroughfare score of 4.51 or greater.

Table 4. Scale for Pedestrian and Bicycle Level of Service (LOS).

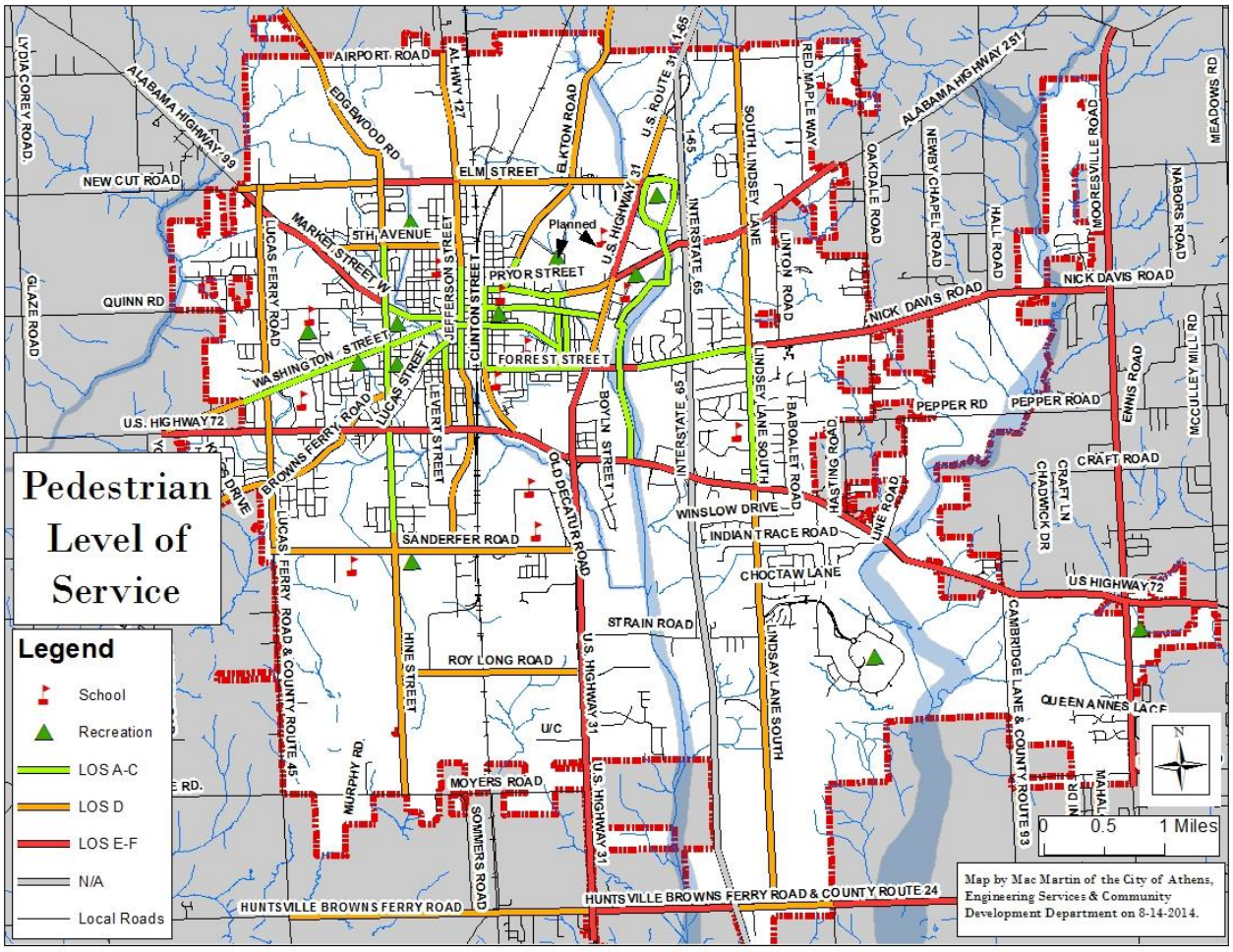


Figure 12. Current Level of Service (LOS) for Pedestrian Facilities.

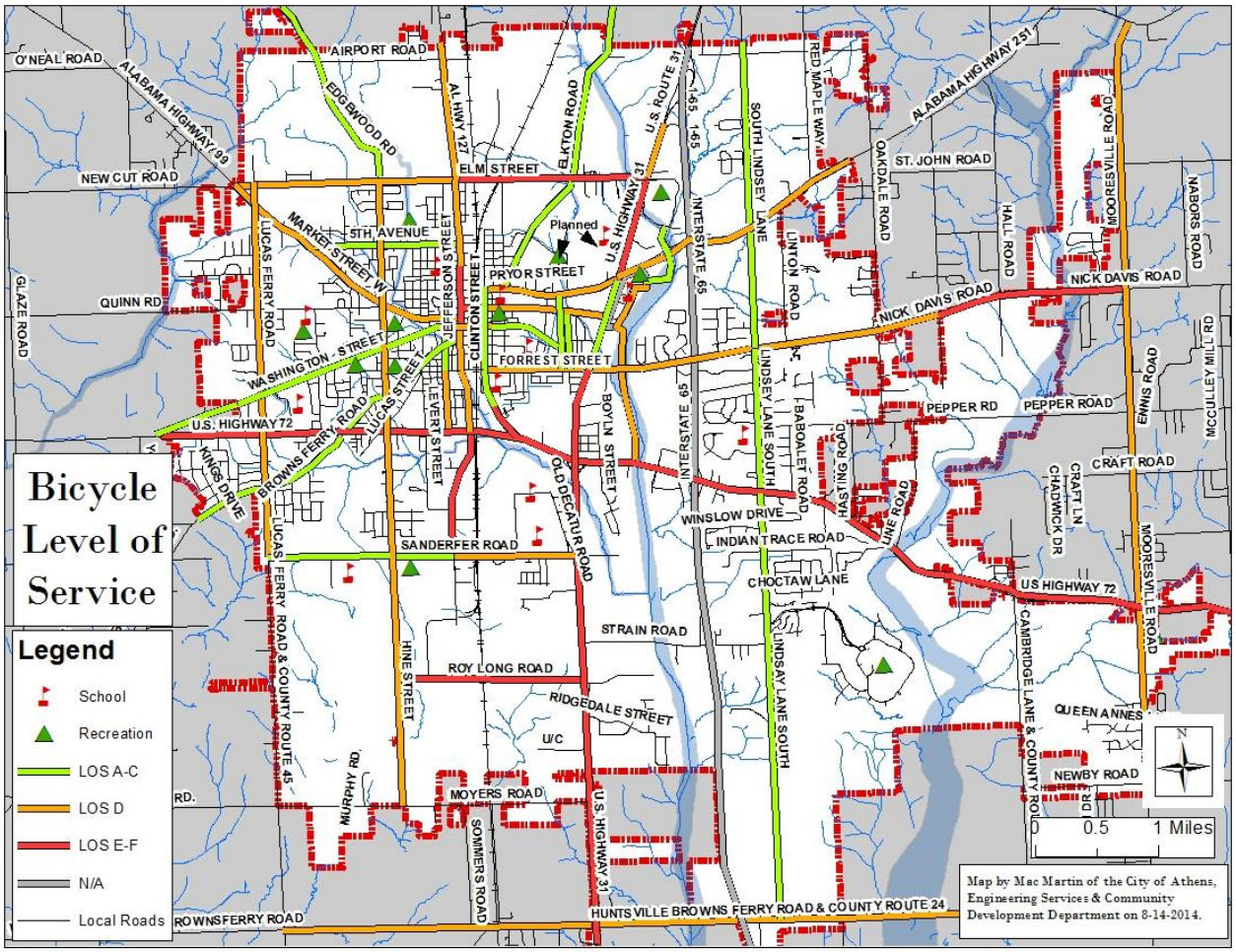


Figure 13. Current Level of Service (LOS) for Bicycle Facilities.

According to the LOS calculations, arterial and collector thoroughfares in Athens scored fairly low for both pedestrian and bicycle accommodations. Even along roads that scored in the LOS A-C category, most registered a grade of LOS C or moderately high. Scores typically improved for both modes closer to downtown. This is due to the increased presence of sidewalks, lower automobile traffic counts, and lower speed limits. LOS for each mode suffered on roadways where automobile counts and speeds increased, especially when sidewalks and adequate paved surface for bicycles were not present. In fact, upon review of the city's road network, no road had a designated lane for bicycles and few had asphalt surfaces beyond the travel lanes on the shoulders. It is also important to note that the pedestrian LOS scores do not reflect compliance with the Americans with Disabilities Act or general condition of the sidewalk. Some thoroughfares may have scored relatively well for pedestrian LOS, but require maintenance to be fully accessible and in good shape.

Safety and Efficiency

The City's primary concern related to transportation is that the network is safe and efficient in its capacity to permit travel around and through the community. Safety and efficiency can be addressed in large part by efforts to improve the LOS. According to ALDOT, "allowing roadways to operate according to their functional classification increases efficiency and enhances safety for all roadway users" (Access Management Manual 2014, p. 2-4).

According to data provided by the University of Alabama's Center for Advanced Public Safety, there were a total of 2,324 automobile accidents within the city of Athens for the 5 year interval from January 2009 to December 2013. Of those accidents, 82% were classified as property damage only, while 0.3% included a fatality (figure 14). Most of the accidents (66%) occurred in business and shopping areas (figure 15). The number of accidents steadily increased through the morning hours before peaking at lunchtime and when schools close for the day. Accident frequency then decreased as the evening hours progressed (figure 16).

Fifty-two percent of the crashes occurred on local municipal streets while the percentage of accidents on federal and state roadways equaled 40% and 6% respectively (figure 17). However, local streets account for 200 miles of the total road network compared to approximately 34 miles of federal and state roadways. When standardizing the accidents based on a per road mile measure, accident frequency is substantially higher on federal and state roads than local roads, measuring approximately 31 accidents per road mile and 6 accidents per road mile respectively (figure 18). Of those accidents on federal and state roadways, 848 out of a total of 1048 accidents, or 81%, occurred in business and shopping areas. The data suggest that the highest frequency of automobile crashes occur in commercial segments on US 72 and US 31 since commercial development is scarce on other state and federal roadways.

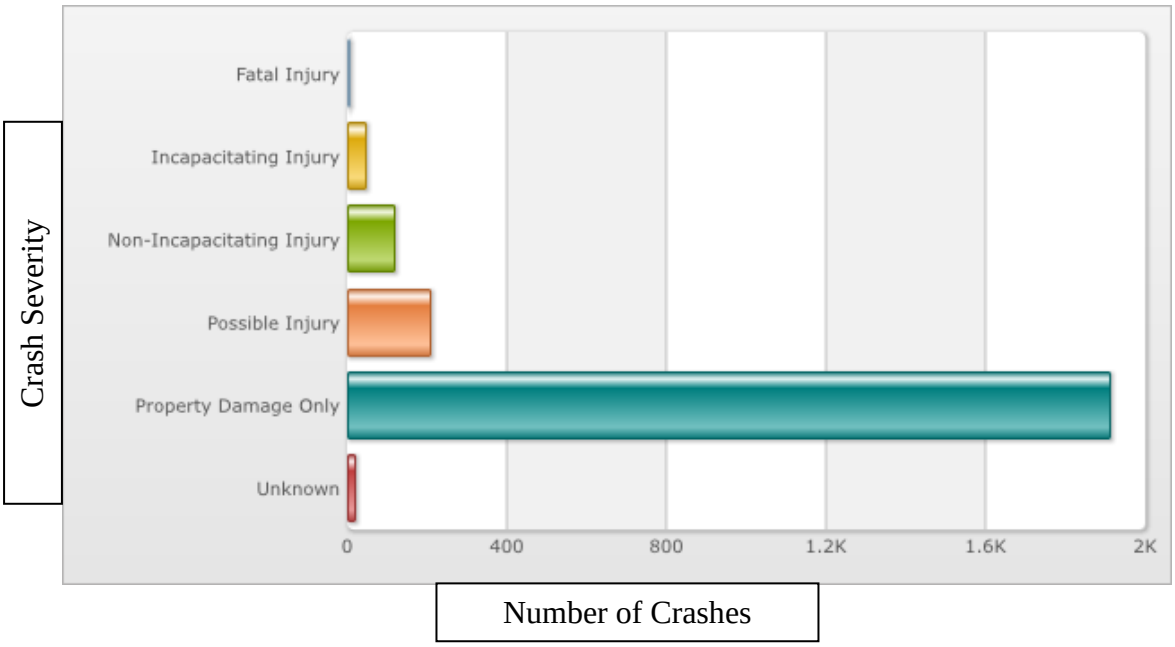


Figure 14. Severity of Crashes. Source: UA Center for Advanced Public Safety, 2014

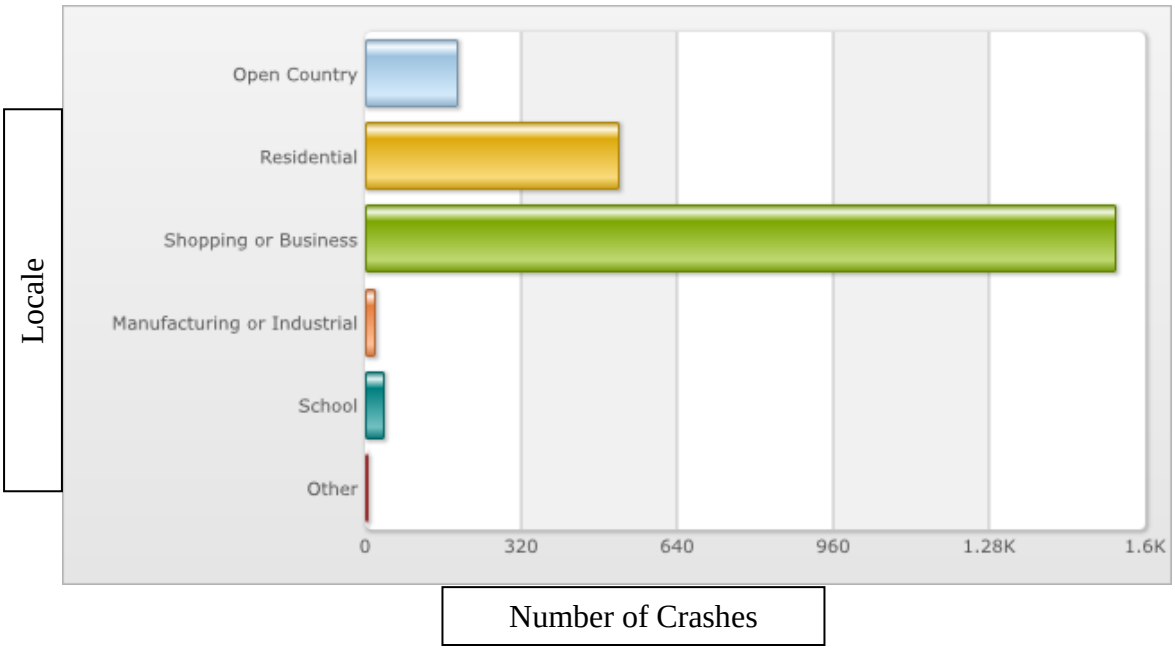


Figure 15. Crashes by Locale. Source: UA Center for Advanced Public Safety, 2014

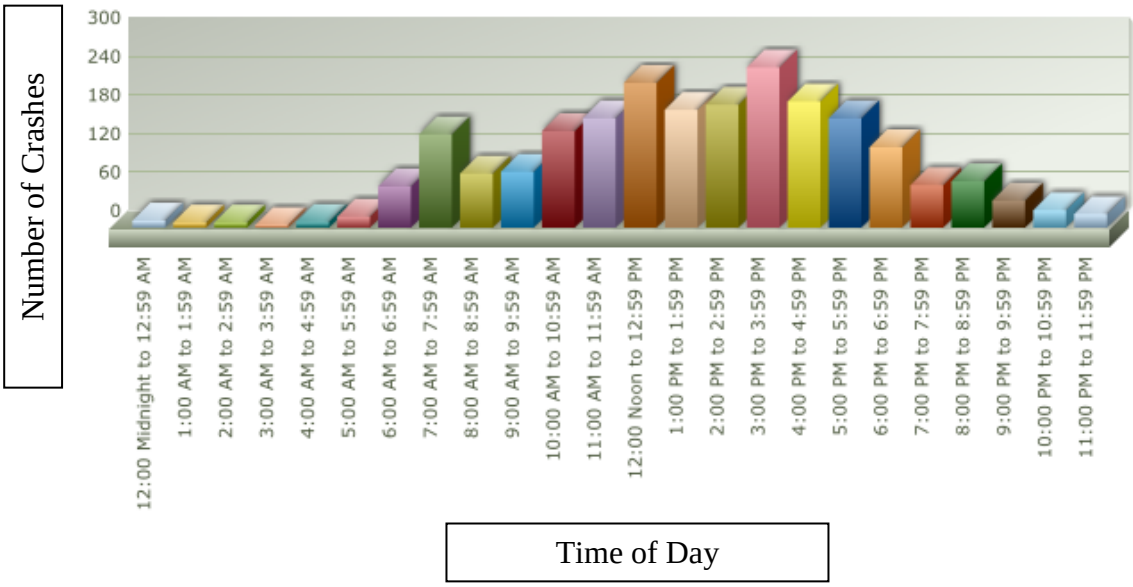


Figure 16. Crashes by Time of Day. Source: UA Center for Advanced Public Safety, 2014

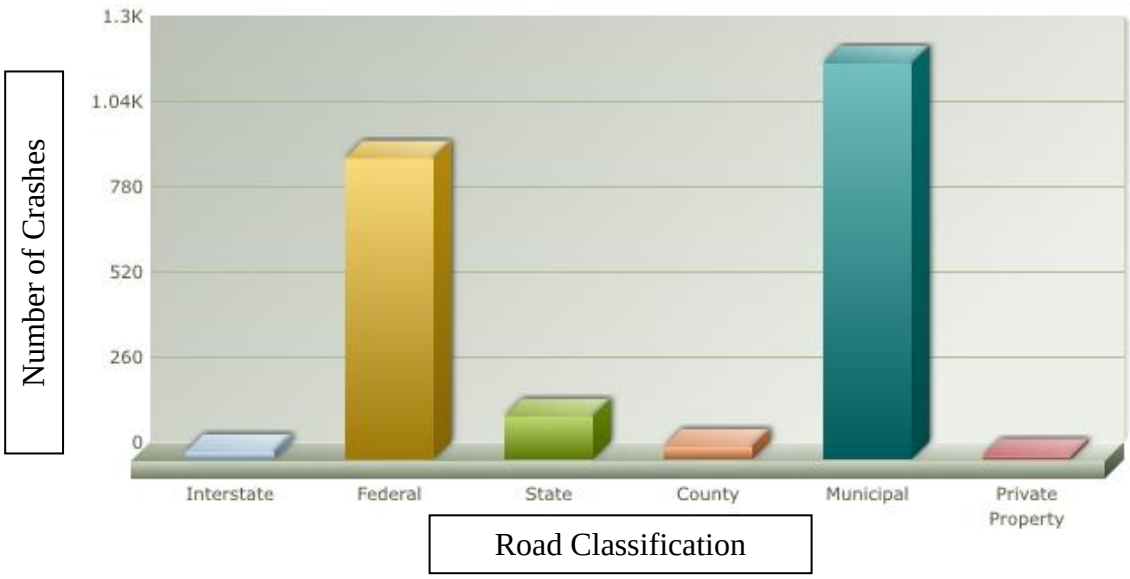


Figure 17. Crashes per Mile by Road Classification. Source: UA Center for Advanced Public Safety, 2014

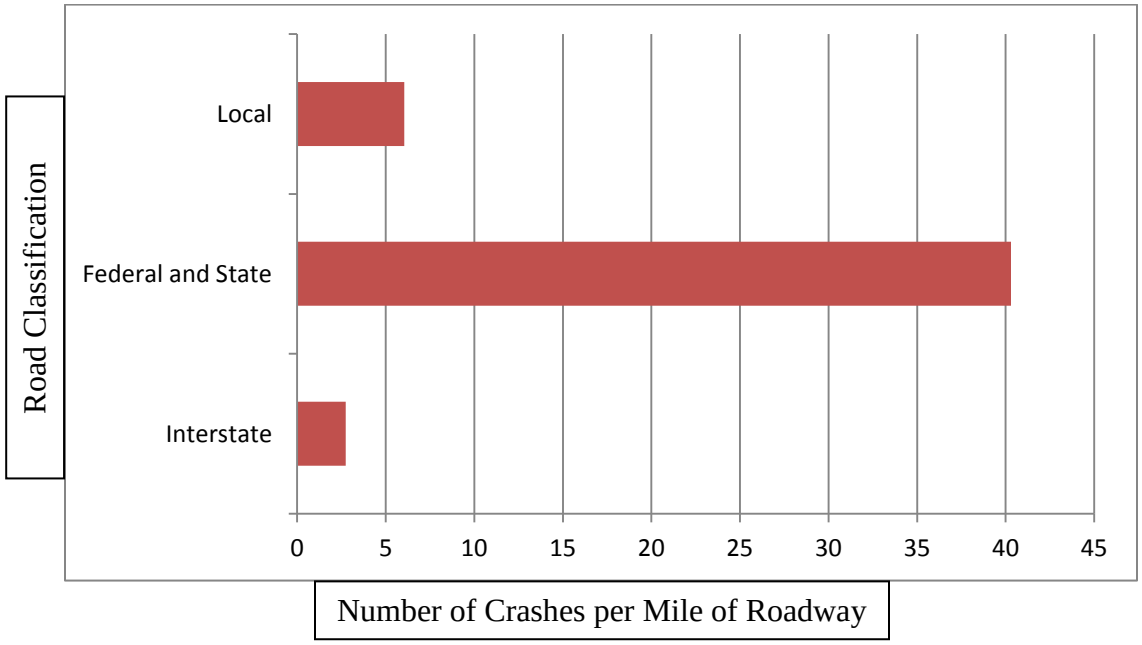


Figure 18. Crashes per Mile by Road Classification

One of the greatest threats to the LOS, safety, and efficiency of a roadway is having an excessive number of conflict points are present. A conflict point is any point where vehicle paths cross, merge, or weave (figure 19). Reducing the number of conflict points will enhance not only LOS,

safety, and efficiency, but preserve the useful life of the roadway, reduce the need for more expensive roadway widening or new roadway construction projects, improve travel times, and enhance access to properties. The programmatic approach to controlling and reducing conflict points is called access management.

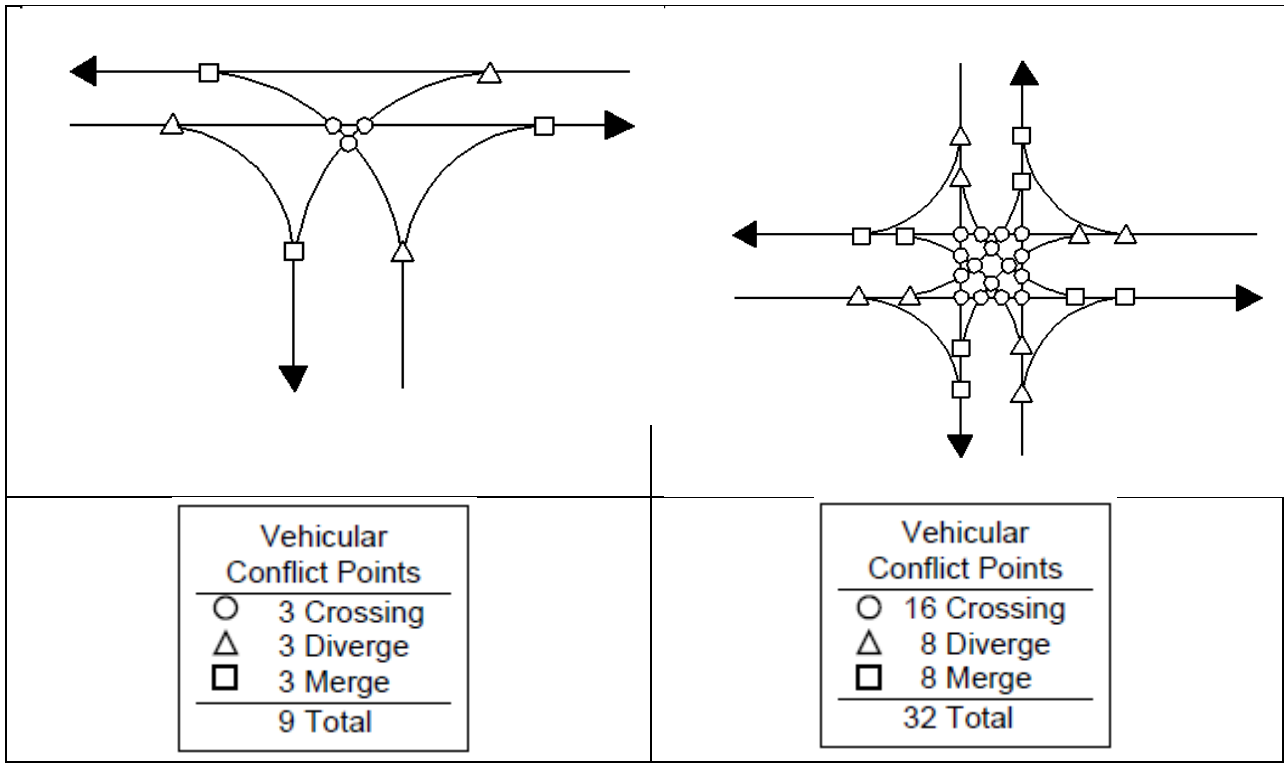


Figure 19. Traffic conflict points at typical three and four-leg intersections. Source: ALDOT Access Management Manual 2014.

Athens has adopted access management standards that control and reduce access points. The Athens Traffic Circulation Standards (2007), Zoning Ordinance (2007), and Subdivision Regulations (2006) work together to determine appropriate access to collectors and arterials for new development. The Zoning Ordinance requires access to be brought into conformity with the Traffic Circulation Standards should there be a triggering event (change of use, reactivation of property after abandonment, etc.), usually resulting in a reduction of access points where not warranted. It should be noted that the reduction of access points due to triggering mechanisms in the Zoning Ordinance is a component to the access management program that can take a very long time, perhaps years to realize as it is dependent on certain activities taking place on private property. A proactive program by the City and ALDOT (if applicable) would be necessary to address access reduction within rights-of-way for a segment of roadway within a specific timeframe.

Some examples of work that can be performed to improve LOS include timing signals, managing access to a roadway based on its classification, providing adequate lanes for turn movements. These actions improve LOS, safety, and efficiency by maximizing flow on major roadways,

reducing the frequency in which large volumes of traffic slow or stop, reducing the number of conflict points created when travelers enter or exit properties along the thoroughfare and cross paths with thru traffic, and allowing travelers making a turn movement or sitting in a queue prior to such a movement to do so entirely out of the travel lanes.

Concerns at Specific Locations

The following list includes graphics and brief descriptions of concerns (in no particular order) related to safety and efficiency at specific locations that the City is aware of and would like to address while implementing this plan. This should not be construed as a comprehensive list as the Plan addresses a number of general concerns.

1. Intersection of US 72, Athens-Limestone Blvd., and Audubon Ln.

This intersection is offset and handles traffic attempting to access numerous businesses near Exit 351. Traffic can be observed racing across the travel lanes from the two jogged roadways while attempting to turn left. Multiple vehicles are often observed in a queue in the median. There is no turn lane into Athens-Limestone Blvd. from US 72 eastbound, further restricting space for queuing vehicles attempting to get out of the travel lanes. This intersection is deficient in dedicated/channelized movements.

2. US 72 underpass at CSX railroad, turn lane onto Jefferson St. South.

The resources have been set aside for the widening of US 72 under the railroad bridge. It remains in the design phase and is awaiting approval by CSX Railroad. The widening of the roadway will permit a longer left turn lane onto Jefferson St. South. The existing lane has approximately 50 feet of stacking space, which is only long enough to accommodate two small vehicles without a queued vehicle remaining partially in the left travel lane. A considerable amount of truck traffic currently uses this turn to access Breeding Industrial Park. With many large trucks being about 60 feet in length, a portion of such a truck will be left in the travel lane while attempting to turn. Vehicles extending into the travel lane from the turn lane create a conflict between stopped vehicles and moving traffic in a 45 mph zone.

3. Turn lane length at Exit 351.

As with the left turn lane at US 72 and Jefferson St., the turn lanes are too short to accommodate observed traffic. With a stacking space of between 55 and 60 feet, there is insufficient space for multiple vehicles to remain in queue without extending into the travel lane. This is another instance where stopped vehicles create a conflict with moving vehicles in a 45 mph zone.

4. Intersection of US 72 and Cambridge Ln.

This intersection lies at the crest of a hill (shown above from the east along US 72 westbound) and has no distinguishing markers. Even the street signs are hard to detect, especially with this section of US 72 being a 60 mph zone. There are no turn lanes on US 72 to allow turning traffic to move out of the travel lanes and wait for an opportunity to turn. Traffic moving along US 72 is difficult to see for those entering the road from Cambridge Ln. with the slope of the highway creating blind spots. The addition of neighborhoods and businesses along Cambridge Ln. has created additional traffic entering and exiting US 72 at this intersection.

5. Intersection of Nick Davis Rd. and Oakdale Rd.

This intersection makes the list due to poor visibility. Nick Davis Rd. takes a sharp dip into a small gulley immediately to the east of the intersection. This makes it virtually impossible for traffic stopped on Oakdale Rd. to see westbound traffic on Nick Davis Rd. until cars are arriving at the top of the hill in front of the gas station, a mere 150 feet or so to the east. Traffic traveling westbound on Nick Davis Rd. and approaching the intersection are also unable to see whether or not cross-traffic is in the intersection until they arrive at about the same distance to the east.

6. Intersection of US 72 and Mooresville Rd.

With the development of new neighborhoods along Mooresville Rd., this intersection has become more heavily trafficked. It appears that quite a few residents along Mooresville Rd. commute to Madison and Huntsville, evidenced by the observed number of vehicles making a right turn onto US 72 eastbound from Mooresville Rd. There is no right turn lane in place and with the signal not adequately clearing the queue, a sizeable volume of traffic navigates onto the shoulder of the road to turn right. The County is currently widening the bridge on the north side of the intersection, which will aid in widening efforts to accommodate turning traffic on that side. The intersection currently has no lighting, making it hard to distinguish traffic movements at night, particularly when traffic is heavy.

7. Access management along retail corridor of US 72 – excessive driveways.

Along sections of US 72 that were developed prior to access management standards, numerous unwarranted driveways and curb cuts exist, often with multiple drives accessing singular properties. As mentioned earlier, each access point created conflict points along the highway, increasing the odds of an accident occurring. Also, excessive amounts of access creates more situations where traffic on the thoroughfare slow to access a property, backing up traffic.

8. Unwarranted median crossings.

Similarly to driveways, these median crossings create additional traffic conflict points. These crossings are often located in lesser developed segments of 4-lane highways and are usually in place to serve private driveways for homes and singular businesses. What is particularly concerning about these median crossings is they are located in high speed zones, do not have turn lanes, and have little or no indicating markers. Vehicles have to come to a near stop within travel lanes to utilize these crossings, causing traffic moving at the speed limit (60 mph) to strongly apply brakes or make sudden lane changes.

9. Pedestrians crossing Swan Creek bridge on Elm St./AL 99.

The bridge, as seen above from the west, was not designed to accommodate pedestrians. However, the bridge serves as a direct link between a large multifamily district and the nearest convenience store and park. Pedestrians are often observed walking in the outside travel lanes next to the concrete guardrail, even after dark. This State highway carries a considerable amount of traffic, including large trucks accessing Elm Industrial Park. Making matters more concerning, there are no lights illuminating the bridge, making pedestrians almost impossible to see until the traveling vehicle is upon them and they are illuminated by low-beam headlights.

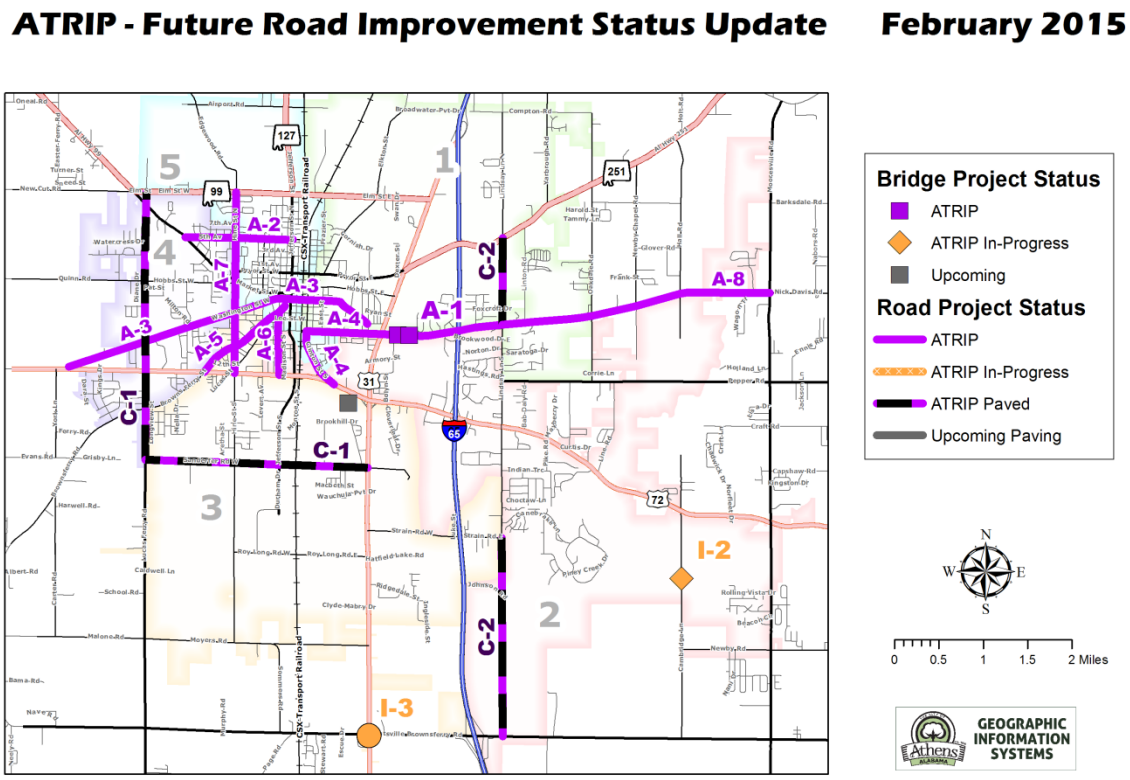
10. Four-lane undivided roadways.

Four-lane undivided roadways create conflicts in left travel lanes due to there being no dedicated space for left turn traffic movements. In what is marked and treated as a through lane, one vehicle can stymie traffic by making a left turn movement at an intersection or other access point, suddenly making the left travel lanes *de facto* turn lanes. Similarly to median crossings, this situation can force through traffic to make a hard stop or sudden lane change movement.

Current Projects

The following are projects that are currently under construction or will be in the near future:

ATRIP



Label	Description	ATRIP Round	Length	Status
C-1	Resurface Lucas Ferry Rd and Sanderfer Rd from SR-99 to US-31	1		Complete
C-2	Lindsay Lane Resurfacing from Brownsferry Rd to SR-251 Let Summer 2014	2		Complete
I-2	BR on Cambridge lane over French Mill Creek Let Fall 2014	2		In Progress

I-3	Intersection improve. @ Huntsville-Brownsferry Rd & US-31 (Local Match 50%/50% with Limestone Co.) ALDOT led project.	2		In Progress
A-1	BR on Forrest St. at Swan Creek & Swan Creek Relief. RSF Forrest St from SR 3 (US 31) to Lindsay Lane.	3	two bridges; 4,000 lf	Planning/Design
A-2	RSF 5th Avenue from Market St to Jefferson St	3	6,500 lf	Planning/Design
A-3	RSF Washington St from US 72 to Hoffman St	3	15,800 lf	Planning/Design
A-4	RSF Forrest St from Clinton St to SR 3 (US 31) & Clinton St from Forrest St to SR 72	3	5,500 lf	Planning/Design
A-5	RSF Brownsferry St from US 72 to Houston St	3	6,300 lf - paving 4,000 lf - milling	Planning/Design
A-6	RSF Houston St from Brownferry St to US 72	3	3,800 lf - paving 500 lf - milling	Planning/Design
A-7	RSF Hine St from US 72 to Elm St	3	10,800 lf	Planning/Design
A-8	RSF Nick Davis Rd from Lindsay Ln to Mooresville Rd (portions Athens – 62%, Limestone – 38% of matching funds)	3		Planning/Design

- **IMPORTANT!** Project A-1 will require that two bridges along Forrest Street over Swan Creek be fully removed and replaced. All traffic along Forrest Street will have to be diverted along Lindsay Lane to US 72 or AL 251. The City is concerned with the additional traffic load that is going to be placed on AL 251, more specifically its intersections with Lindsay Lane and US 31. The Lindsay Lane intersection is currently a 4-way stop, which presently creates long traffic queues during peak travel times. The US

31 intersection has some geometric issues that need to be resolved, particularly with turn movements onto US 31, if the intersections functionality is to be improved. While AL 251's projected increase will eventually require improvements, the Forrest Street bridge project makes said improvements desirable earlier.

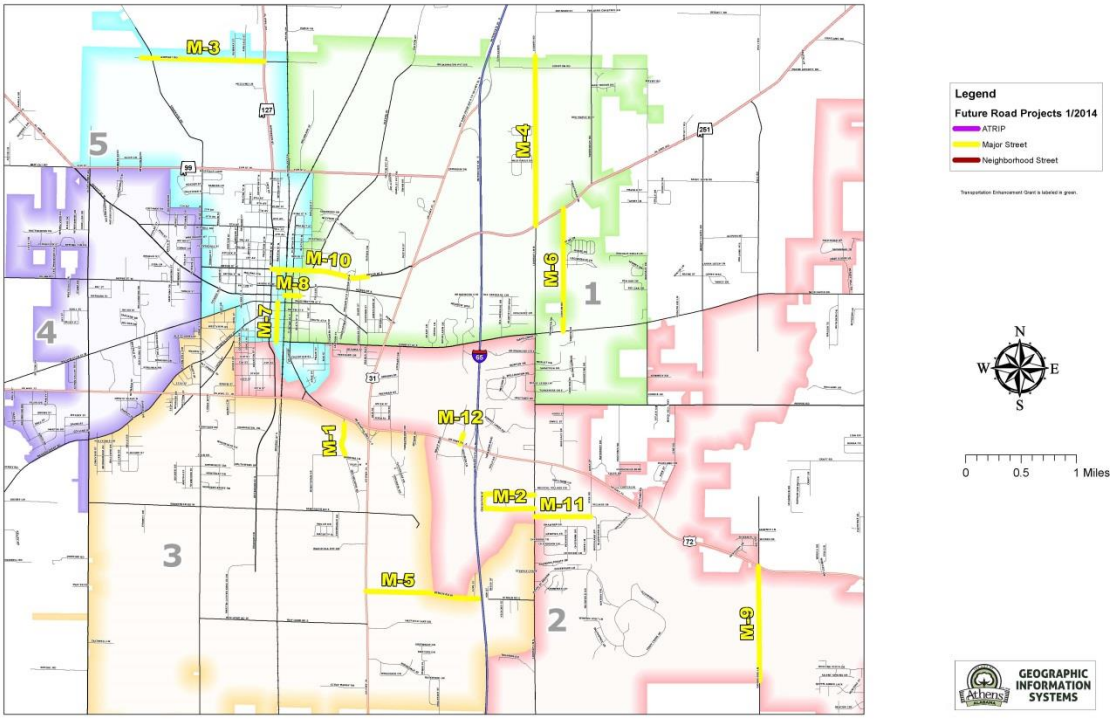
Old Decatur Road and Bridge

-Under construction. Set to be completed in 2015.

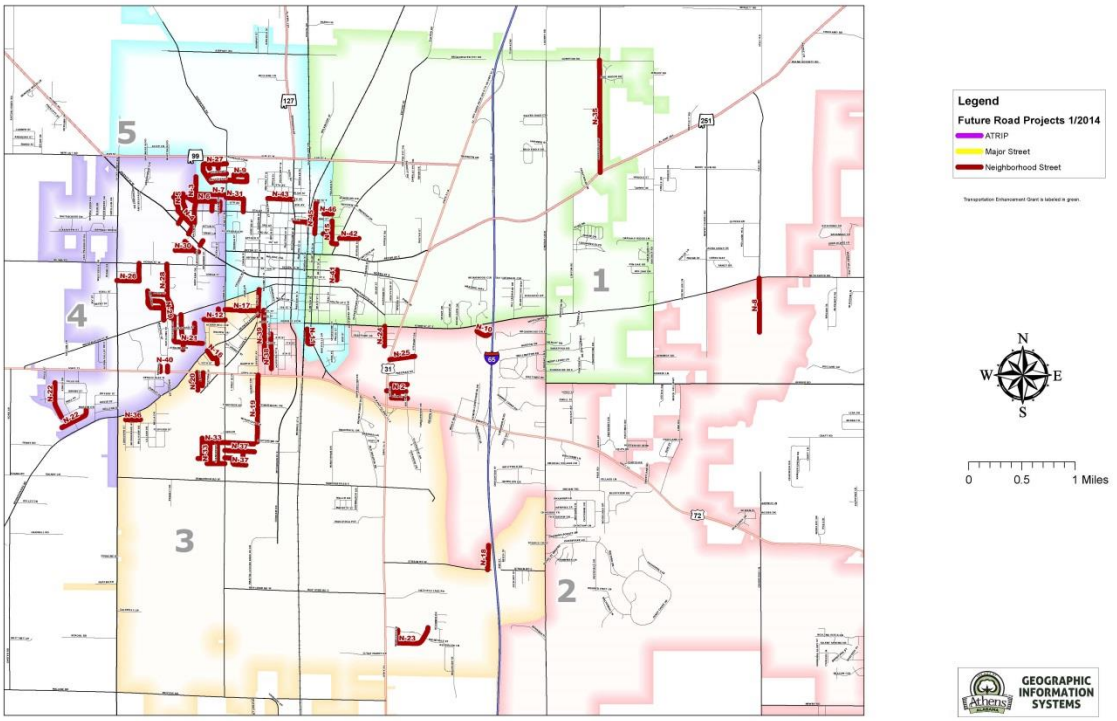
Additional Improvements

Additional improvements, such as paving, drainage work, and sidewalks are listed in the Public Works Capital Improvements Plan (CIP), a working document drafted in 2014 and updated each year. Many of those improvements have been incorporated into this plan. Once adopted, this plan will help guide the CIP in future updates.

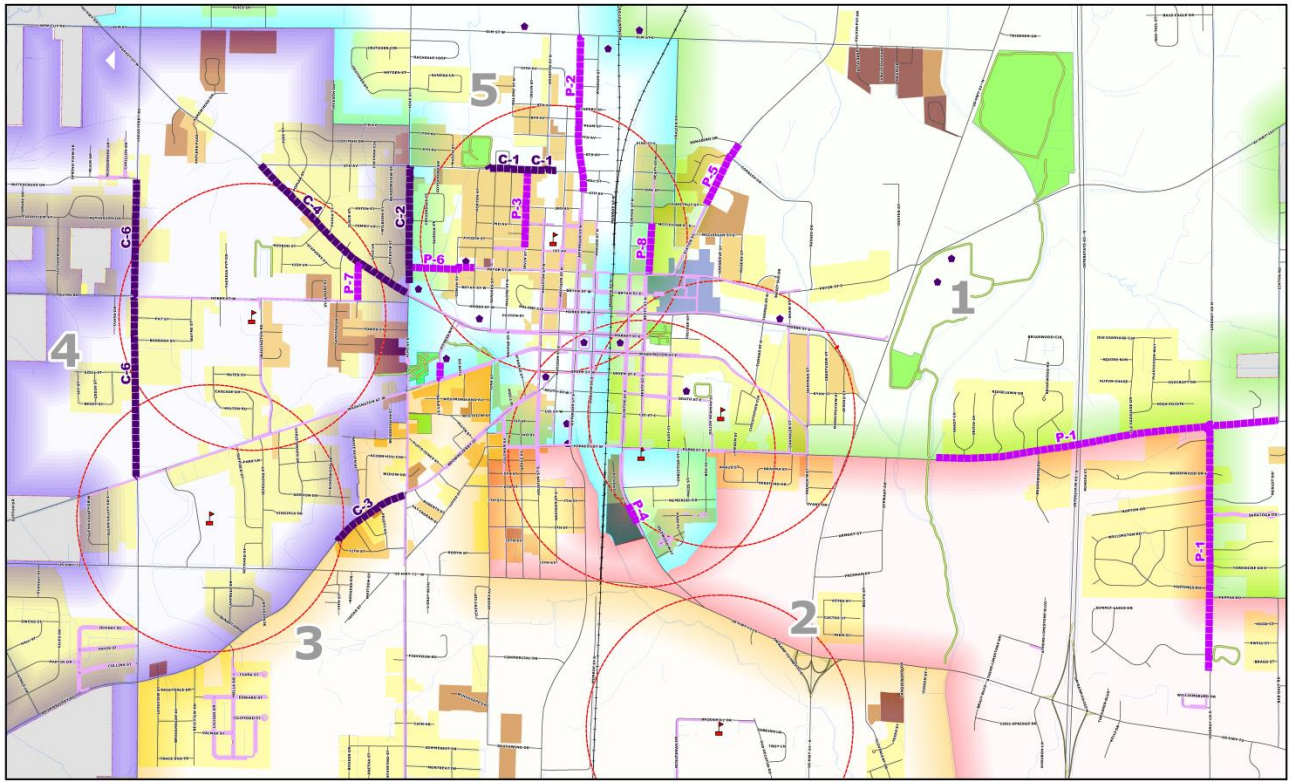
Major Streets - Future Road Improvement Projects **February 2014**



Neighborhood Streets - Future Road Improvement Projects **January 2014**



Proposed Sidewalk Projects — April 2013

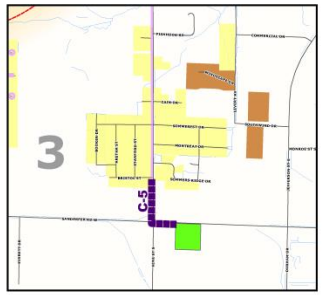


Sidewalk Projects List

	Line	Project (Prioritized)	Description	Reason for Project
COUNCIL LIST	C-1	5th Avenue	From Jefferson St. to Timon Park	Connects neighborhood to park and commercial corridor, busy collector
	C-2	Hine Street	From post office to 5th Ave.	Connects neighborhood to post office and commercial area, busy collector
	C-3	Brownsferry Street	From Hine St. to 12th St.	Connects neighborhood to existing sidewalk network and Trinity park, busy collector
	C-4	Market Street	From Hine to 5th Ave.	Connects neighborhood to post office and commercial area, busy collector
	C-5	Hine Street South and Sandarter Road West	From Beard St. to Jimmy Gill Park	Connects neighborhood to park, busy collector
	C-6	Lucas Ferry Road	From Washington St. to Waterview Dr.	Connects neighborhood to existing sidewalk network, busy collector
PUBLIC WORKS LIST	P-1	Forrest Street East, Lindsay Lane South, and Nick Davis Road. TO BE LET SUMMER 2013	Connects Swan Creek Greenway, Publix Shopping Center, and Linton Road	Multiuse path connecting neighborhoods to greenway and shopping and dining opportunities, busy arterial and collector roads that range from moderate to high speeds (30 mph to 45 mph)
	P-2	North Jefferson Street	From McClellan St. to Elm St.	Identified as area in need of revitalization. Rotary Club considering assisting with landscaping
	P-3	Iron Street	From 5th Ave. to 1st Ave.	Provide pedestrian link between Timon Park apartments, and Athens Elementary School
	P-4	Clinton Street	Connect dead ends near AMS	Provide uninterrupted link between apartments and Athens Middle School, busy collector
	P-5	Sirlton Street	Sunglard Dr. to Chestnut St.	Connect developing/newer neighborhoods with existing sidewalk network, busy collector
	P-6	Pryor Street	Sanders St. to Hine St.	Connects neighborhood to post office and commercial area, busy collector
	P-7	Shannon and Market Streets	Hobbs St. to Hine St.	Connects sidewalk extension on Hobbs with existing sidewalk network near post office
	P-8	Beaty Street	Pryor St. to McClellan St.	Connects sidewalk dead ends
	P-9	Fitness Way	Washington St. to existing sidewalk	Connects Trinity neighborhood to Fitness Park

Updated 3/28/2013

Jimmy Gill Park Sidewalk Inset



Scale

0 0.5 Miles

1,000 0 1,000 2,000 Feet

1 inch equals 1,000 feet

1:12,000

Proposed Sidewalks Projects
- Council
- Public Works

Existing Sidewalks
- Other
- Sidewalk
- Trail
- Schools
- Public/Semi-Public Places
- School Buffers 1/2 mile
- Railroads

Residential Density (Units Per Acre)
- 0.290790 - 3.000000
- 3.000001 - 6.000000
- 6.000001 - 12.000000
- 12.000001 - 20.583027

Destination Areas
- Park
- University Campus

N W E S

Map Created by Micah Cochran of City of Athens, Alabama Engineering Services and Community Development Department on November 9th, 2011 as a "Sidewalk Ideas Map." Redesigned on March 27th, 2013 for a project list. Updated April 16th, 2013 for the website.

THE PLAN AND IMPLEMENTATION STRATEGY

Vision Statement

We, the City of Athens, desire to develop a transportation network comprised of a variety of modes that allows people and goods to safely and efficiently travel around and through the community.

Goals and Objectives – Reference the City-wide Transportation Plan Map (Figure 20)and Future Development Plan with Transportation Overlay Map (Figure 21).

1) Goal: Improve the safety and efficiency of the existing network

    a) Objective: Address pressing safety concerns identified in the field.

        i) Reasoning: This is a primary task to ensure the health, safety, and welfare of the traveling public.

    b) Objective: Install larger street signs for cross streets at intersections along arterials.

        i) Reasoning: While moving at faster speeds along arterials, it can be difficult to see traditionally sized street signs. Motorists on arterials need to be able to see street signs at intersections from greater distances in order to make appropriate maneuvers in time to turn on the desired street.

    c) Objective: Re-design and reconfigure intersections identified as needing improvements in alignment and traffic movement. **Note: More extensive studies need to be conducted for each intersection prior to designing and constructing improvements**.

        i) These intersections include:

            (1) US 72 and I-65, Exit 351

                (i) Suggestions: Install longer turn lanes on US 72 to accommodate more vehicles making turn movements.

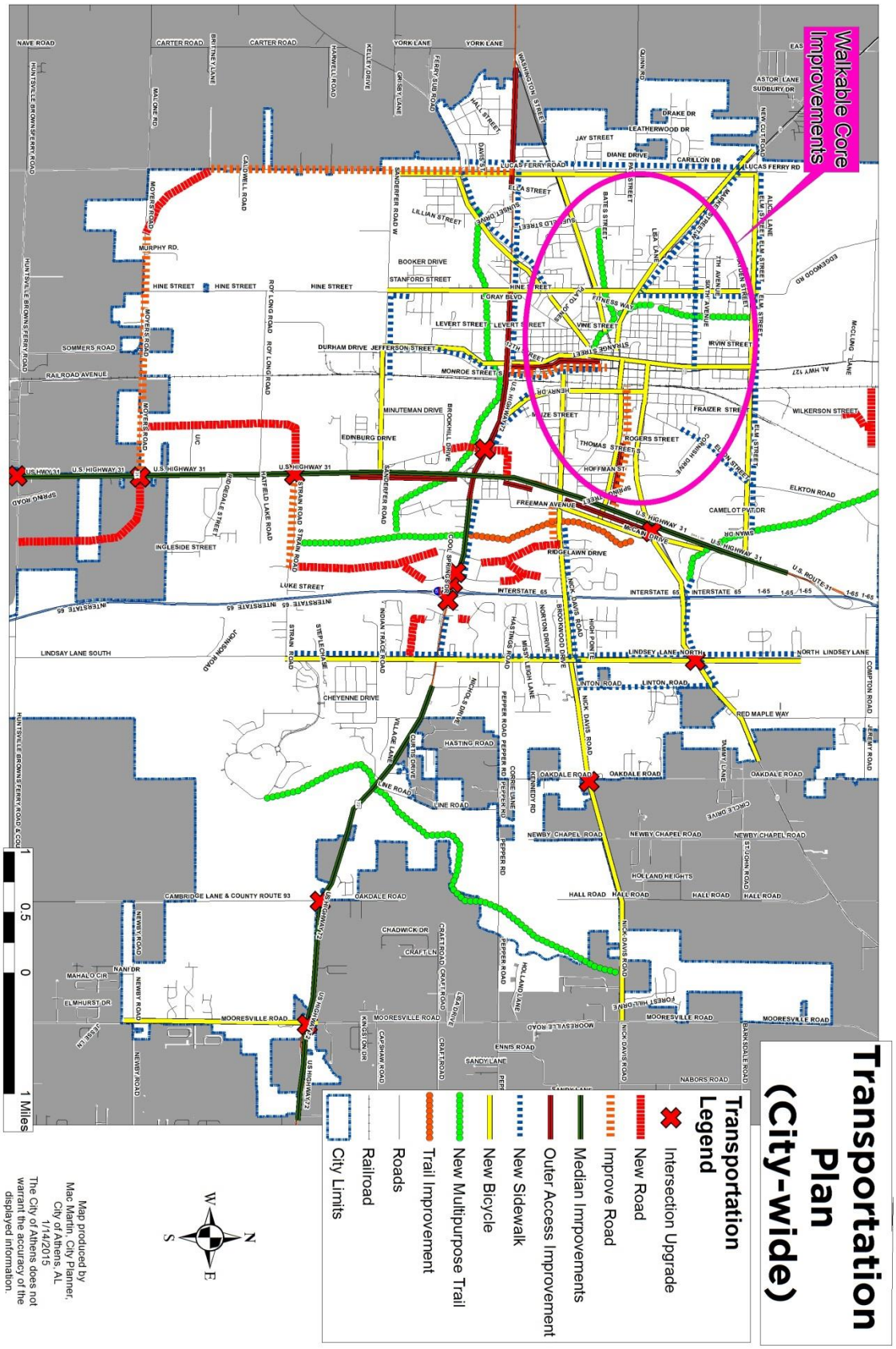


Figure 20. City-wide Transportation Plan

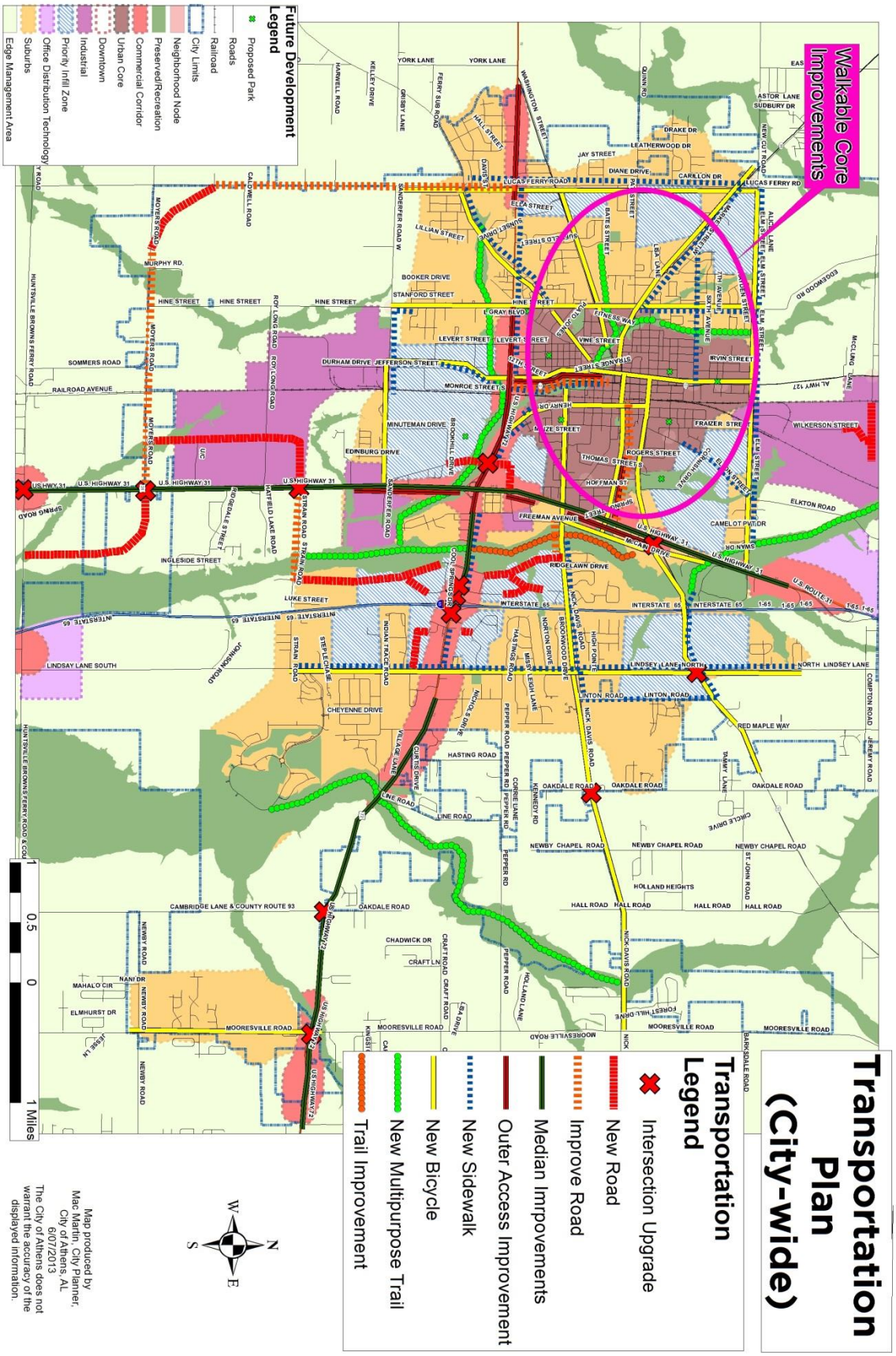


Figure 21. City-wide Future Development Plan with Transportation Plan Overlay.

(ii) Install lighting that is more efficient and reliable.
(iii) Include other functional and aesthetic improvements to denote this interchange as the primary gateway into the city.

(iv) Preference: Redesign and convert the interchange into a Single Point Urban Interchange (SPUI).

1. Reasoning: Considered an alternative interchange design by the FHWA, SPUIs can handle larger volumes of traffic in a more efficient manner than a conventional interchange (FHWA 2010). The SPUI gets its name from controlling all traffic movements on the secondary route from a singular traffic signal at the center of the bridge (figure 22 & 23). The current interchange has two signals stopping traffic on US 72. The design also pulls the on and off-ramps closer to the bridge, reducing the amount of space required for the interchange and creating more separation between the interchange and nearby access points along the secondary road. The design also affords greater opportunities to incorporate aesthetically pleasing elements, such as brickwork and landscaping along the edge of the ramps (figure 24) and monument/landscape features at ramp medians (figure 25).

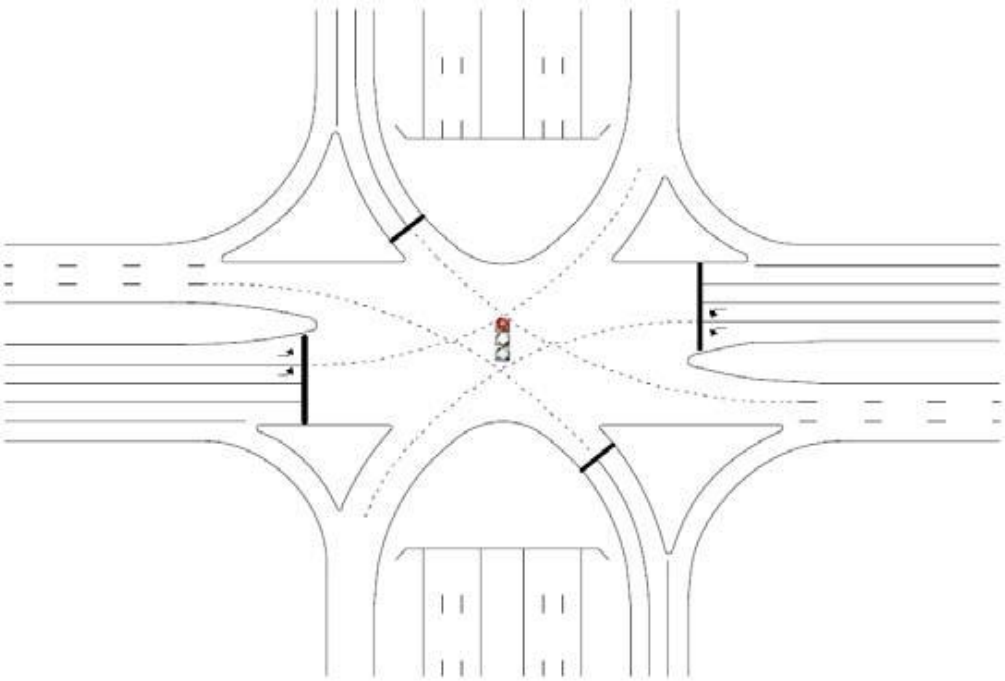


Figure 22. FHWA Diagram of a SPUI. Source: Alternative Intersections/Interchanges: Informational Report (AIIR), 2010

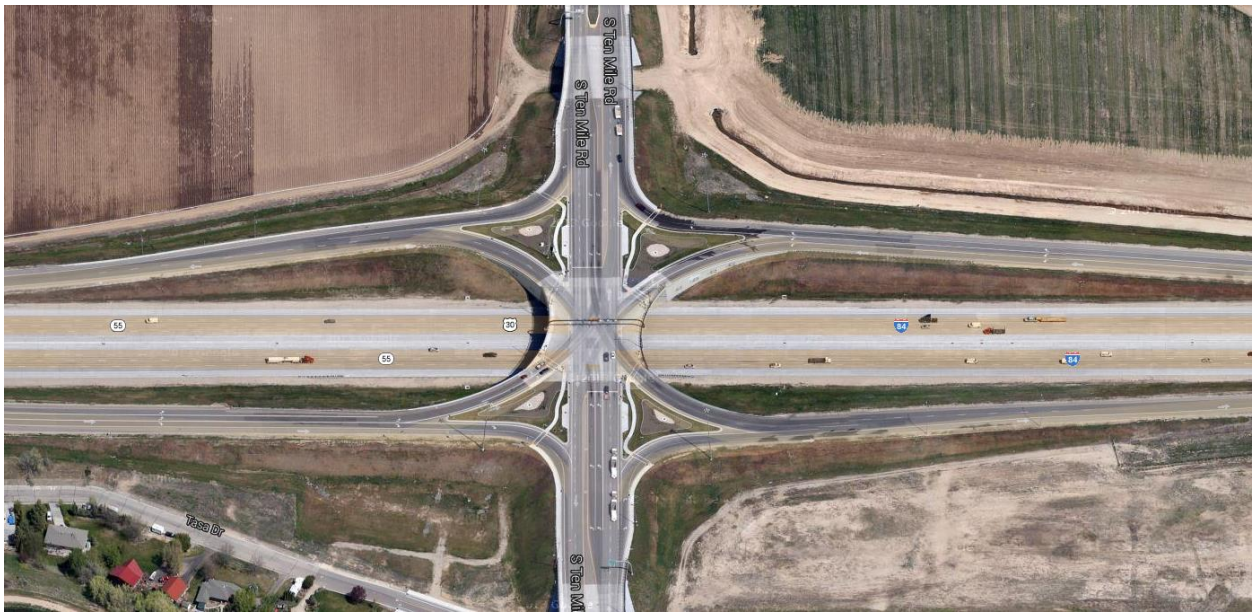


Figure 23. SPUI constructed outside of Boise, Idaho. Source: Google Maps, 2014.

Figure 24. Landscaping and brickwork at a SPUI in Madison, Mississippi. Source: Google Maps, 2013.

Figure 25. Monument in ramp median at a SPUI in Franklin, TN. Source: Google Maps, 2013.

(2) US 72 and Mooresville Rd.

(a) Suggestion: Place additional dedicated turn lanes on US 72 and Mooresville Rd. to accommodate turning traffic.

(3) US 72 and Cambridge Ln.

(a) Suggestions:
(i) Consider installing turn lanes, caution signals, “approaching intersection” signage on US 72, large print street signage for Cambridge Ln. Also consider using an appropriate alternative intersection design, such as a restricted left turn (figure 27) or a Michigan Right Turn, U-Turn (RTUT) (figure 29).

(4) US 72 and Audubon Ln/Athens-Limestone Blvd.

(a) Suggestion: Channelize left turn movements on US 72 and force left turn movements from secondary roads to be made at the signal to the west.

(5) US 72 and Athens-Limestone Blvd./Braly Blvd.

(a) Suggestion: Realign lanes, add dedicated turn movements, and adjust signal as traffic increases and new roads connect with the intersection.

(6) US 72 and French Farm Blvd.

(a) Suggestion: Realign lanes, add dedicated turn movements, and adjust signal as traffic increases and new roads connect with the intersection.\

(7) US 31 and Strain Rd.

(a) Suggestion: Realign lanes, add dedicated turn movements, and adjust signal as traffic increases and new roads connect with the intersection.

(8) US 31 and Moyers Rd.

(a) Suggestion: Realign lanes, add dedicated turn movements, and adjust signal as traffic increases and new roads connect with the intersection.

(9) US 31 and AL 251/Pryor St.

(a) Suggestion: Adjust intersection geometry and make accommodations for turn movements to account for substantial increase in traffic as a result of the Forrest Street bridge replacement project. Further study is required.

(10) AL 251 and Lindsay Lane.

(a) Suggestion: Adjust intersection geometry and make accommodations for turn movements to account for substantial increase in traffic as a result of the Forrest Street bridge replacement project. Traffic signal may be needed. Further study is required.

(11) Nick Davis Rd. and Oakdale Rd.

(a) Suggestion: Adjust the slope of Nick Davis Rd. to the east of the intersection by cutting down the height of the road near the intersection, raising the elevation of the road in the gully, or a combination of the two.

(12) US 31 and Huntsville-Brownsferry Rd. (Currently in queue).

d) Objective: Improve traffic signal coordination along US 72.

i) Suggestion: Time signals to permit traffic groupings along US 72 to pass through the city with minimal interruption.

ii) Suggestion: Program signals at intersections with lower traffic counts to “caution” setting (flashing yellow on US 72, flashing red on secondary road) after primary travel hours in the evening. Program them to return to normal phasing before morning primary travel times.

iii) Suggestion: Implement newer signalization techniques, such as giving dedicated left turn traffic a flashing caution (yellow arrow) signal (figure 26). This will allow left turning traffic to yield to oncoming traffic and move out of queue when oncoming traffic is clear. This approach is sensible particularly when oncoming traffic is not heavy enough to warrant all left turn traffic remaining in queue throughout the entire cycle.

iv) Reasoning: Signal synchronization along US 72 has not been studied in 10 years. Traffic has increased in that time span. Improved synchronization and the implementation of new techniques will improve traffic flow.

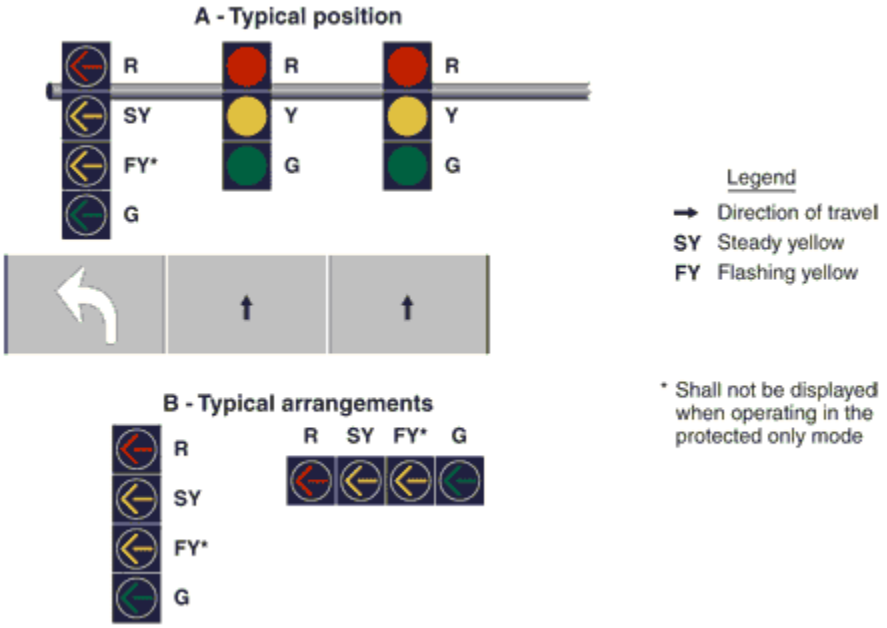


Figure 26. Typical Position and Arrangements of Separate Signal Faces with Flashing Yellow for Protected/Permissive Mode and Protected Only Mode Left Turns. Source: MUTCD 2009 Edition, Part 4, Figure 4D-12.

e) Objective: Improve and preserve traffic flow along US 72 and US 31 through access and traffic conflict management – i.e. reduction in unwarranted median crossovers and driveways. Full access should be limited to signalized intersections wherever possible. Alternative intersection designs should be implemented at intersections not warranting signals (figure 27). Left turn movements should be channelized with deceleration lanes (figure 28). U-turn facilities should be provided to allow access to properties fronting the roadway where medians are closed (figure 29) or to improve safety and traffic flow at non-signalized intersections, particularly when visibility is poor.

i) Reasoning: Each driveway and median crossover creates traffic conflict points and increased interruption of traffic flow. Removing unwarranted access points and crossovers reduce these conflict points while maintaining appropriate access to

properties and left turn movements, all the while preserving and enhancing traffic flow.

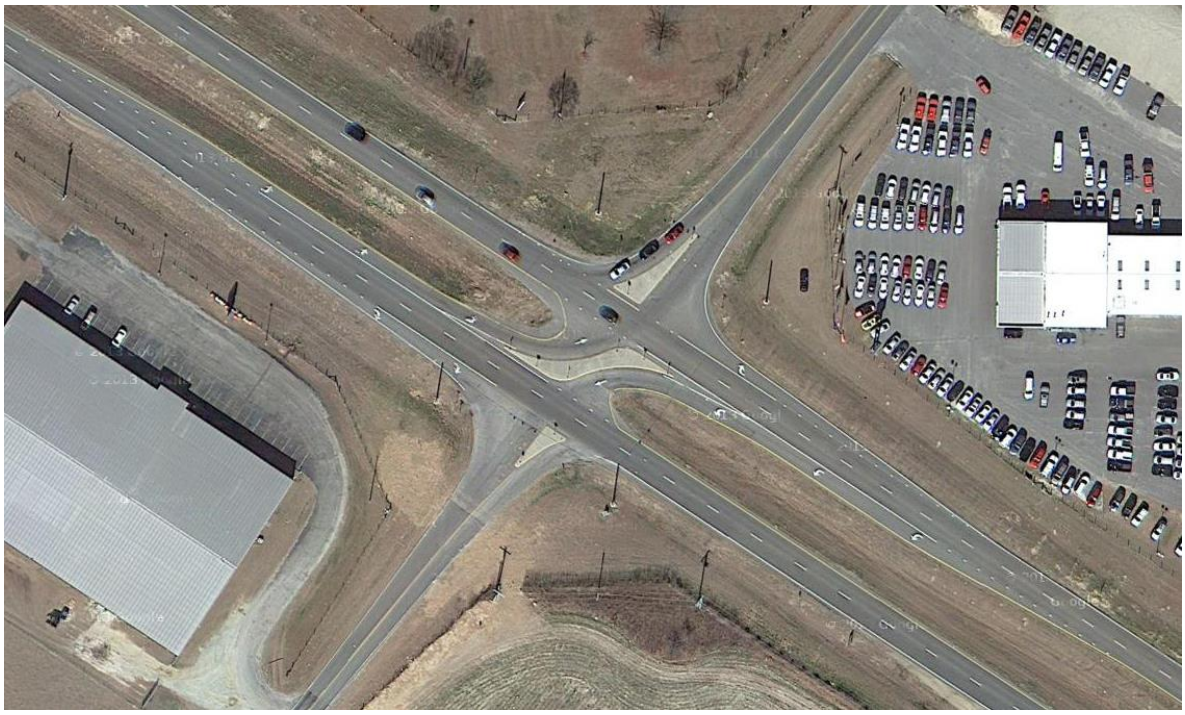


Figure 27. Alternative intersection design with restricted and channelized left turn movements. This design is usually accompanied by a designed U-Turn opportunity. Source: Google Maps, 2014

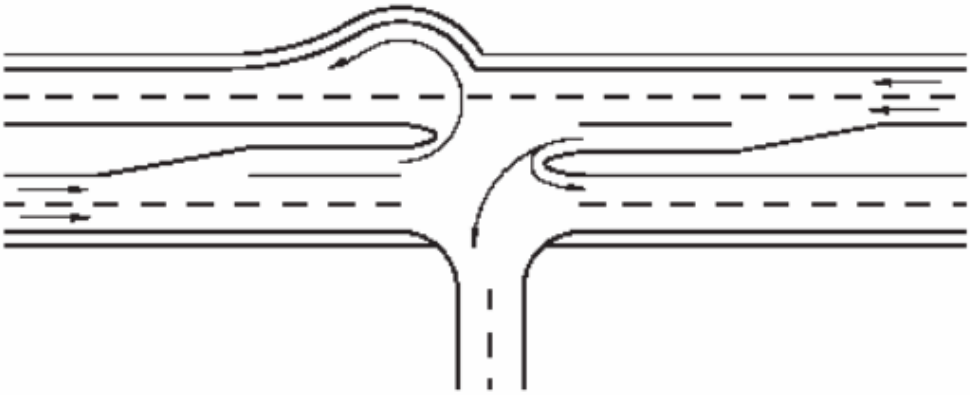


Figure 28. Conventional median opening with left-turn lanes and loons at three-leg intersection. Source: NCHRP report 524.

Figure 29. Example of a Michigan Right-Turn, U-Turn (RTUT) intersection. Source: Google Maps, 2014.

2) Goal: Expand the transportation network to meet growing travel demands and open territories to more direct access to the network.

    a) Objective: Construct new roads in the four quadrants around Exit 351 to open land for development along interstate frontage and create greater connectivity in the network in the vicinity.

        i) Reasoning: Doing so will give access to developable land close to our main interstate interchange and provide alternative routes to this regional commercial center, providing relief to US 72.

    b) Objective: Construct new roads within the Elm Industrial Park to open land for further industrial development and create greater connectivity in the network in the vicinity.

        i) Reasoning: Doing so will provide access to remaining land available in the park.

c) Objective: Construct new roads to the west and north of Wal-mart to open land for development and create more connectivity in the vicinity. New roads would tie into existing signalized intersections: US 72/French Farms Blvd and US 32/Freeman Ave.

   i) Reasoning: Doing so will open farmland to commercial and residential development and provide access at two existing lights – one on US 72 and the other on US 31. This project would also create secondary routes within three of the quadrants of the US 72 and US 31 interchange, leading to greater connectivity and relieving some traffic on the major arterials.

d) Objective: Construct a new roads on both sides of US 31 in the southern periphery of the city to open land for industrial development.

   i) Reasoning: With Elm Industrial Park close to being fully developed, the City will have to look elsewhere for industrial development. The most appealing area from a geographic standpoint is to the south of town proper along US 31. This area is generally flat and has good access to US 31, the railroad, and the interstate (via Exit 346). New access roads on both sides of US 31 would increase the area's capacity for industrial development. They would also provide alternative routes for traffic in the area that may be utilizing the proposed Greenbrier Parkway between Huntsville-Brownsferry Road and the Greenbrier exit on I-565, accessing Athens via I-65 Exit 347, or bypassing Athens to access points east and west of town.

e) Objective: When able, acquire additional right-of-way along collector streets for future travel lane or complete street improvements.

   i) Reasoning: Although current traffic projections may not warrant additional lanes on certain collector streets not specifically addressed in the Plan at this time, it would be wise to acquire additional right-of-way along collector streets in anticipation that at least one additional lane (turn lane) will be needed in the long-term future (beyond 20 years). Additionally, improvements such as sidewalks, widened shoulders, and wider culverts may be placed within additional right-of-way. Acquiring additional right-of-way along collector streets now will relieve the pressure to do so should we experience increased growth beyond what current projections suggest.

f) Objective: Expand greenway network, particularly along Swan Creek, Town Creek, and other tributaries and wooded areas.

   i) Reasoning: The current greenway trail along Swan Creek is a wonderful recreational trail. However, as we are beginning to see in many other cities, greenway networks can become important transportation routes. By expanding the greenway system as shown on the map, the trail becomes a network for alternative modes of transportation apart from busy major arterial roadways that are not favorable environments to pedestrians and bicycle use. As it is built out, this network connects neighborhoods and destinations, offering a true means of transport in addition to recreation. With a

crossing over Swan Creek near US 72, the network can connect our regional commercial center at Exit 351 with downtown and multiple recreational destinations.

g) Objective: Expand sidewalk network, primarily along arterials and collectors with lower levels of service, where residents can have greater access to destinations and recreation.

   i) Reasoning: Pedestrians need to be separated from the heavier volumes and higher speeds of automobiles along arterials and collectors. New sidewalks offer nearby residents an alternative means of travel to the automobile and greater recreational opportunities, thus improving their quality of life.

h) Objective: Provide more opportunities for bicycle travel, particularly along arterials and collectors with lower levels of service. The City can do so in a variety of ways including adding dedicated lanes (figure 30), constructing multipurpose side paths (figure 31), widening shoulders, and installing adequate signage (figure 32) and markings (figure 33). A reasonable objective would be to try to elevate the level of service by a letter grade.

   i) Reasoning: Bicycle travel is becoming more popular as an alternative to the automobile. It offers a means of transport that is faster and can go greater distances than walking. It also serves as a great means of recreation and exercise.

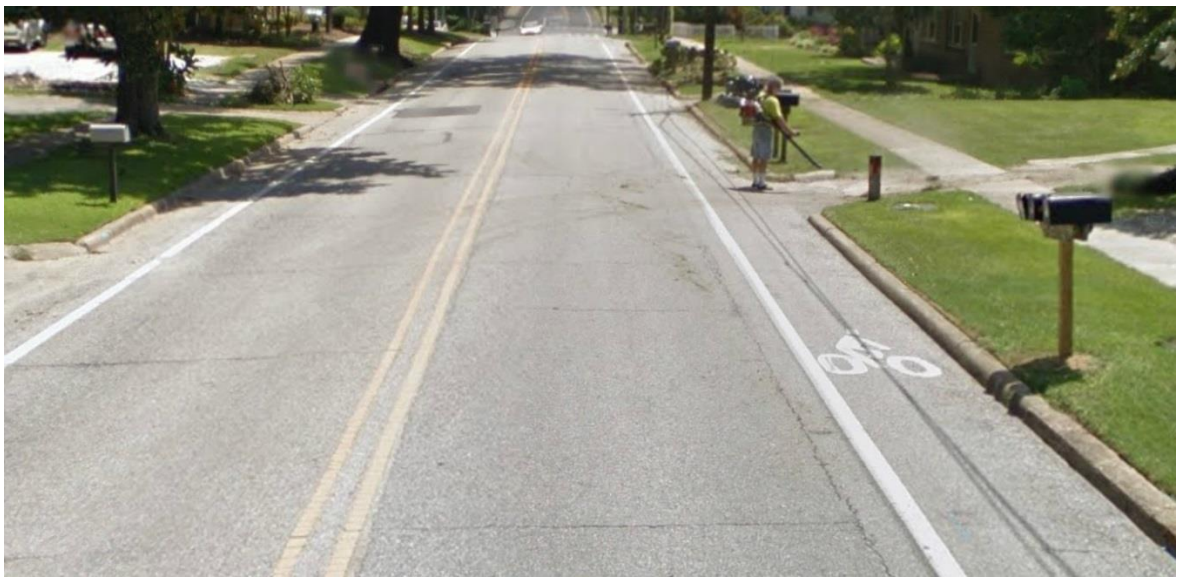


Figure 30. Dedicated bicycle lanes. Source: Google Maps 2014

Figure 31. Multipurpose side path. Source: Google Maps 2014

Figure 32. Bicycle signage. Source: Michelle Campbell, The Birmingham News, 2012

Figure 33. Dedicated bicycle lanes. Source: Google Maps 2014

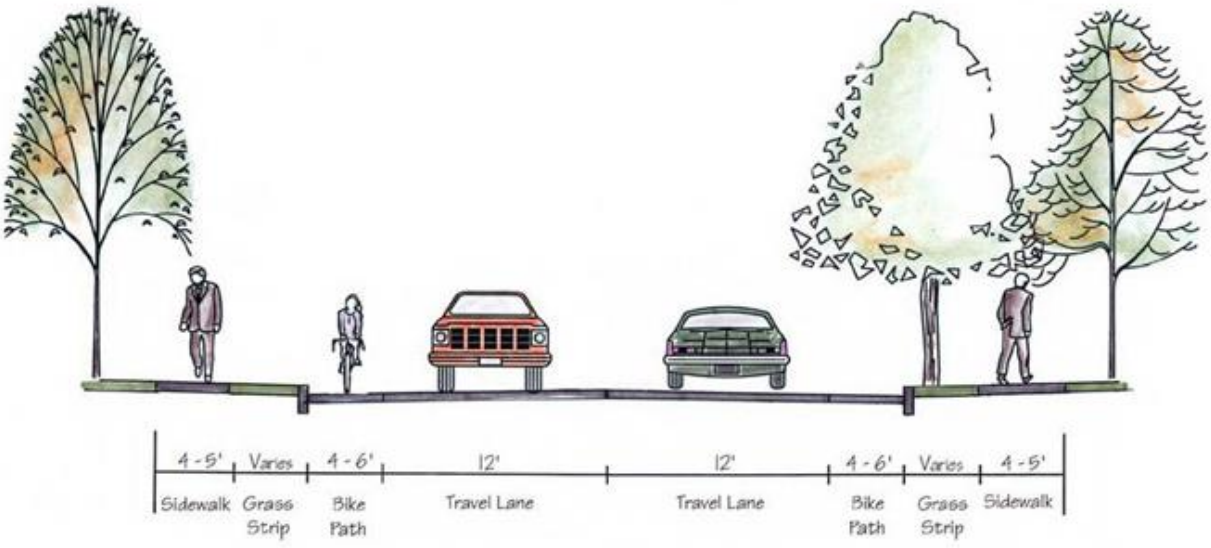
3) Goal: Create a transportation environment in the urban core that is accessible and usable by travelers of all ages and abilities and that accommodates all modes of transport available in the community. The term "walkable" is sometimes utilized to summarize this preferential urban transportation environment.

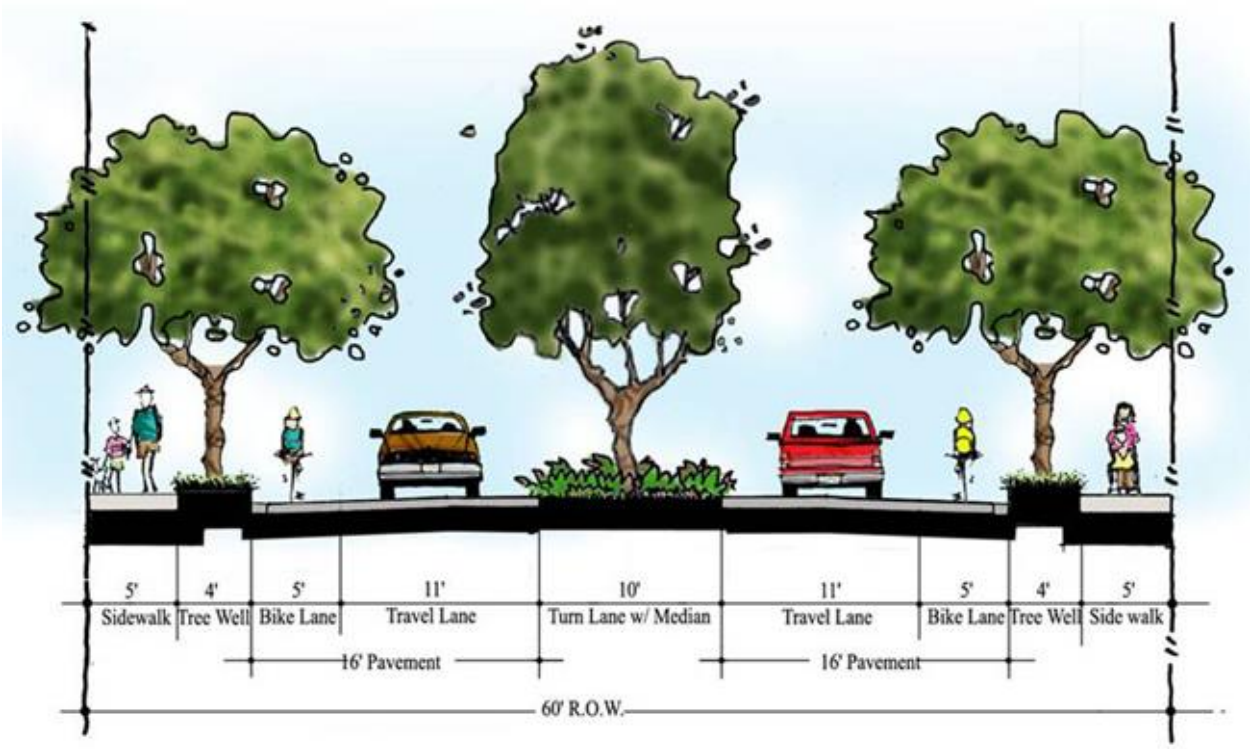
   a) Objective: Improve arterials, collectors, and local streets according to "complete street" design appropriate for said classifications and adjoining land uses (figure 34). This can include a "road diet" for portions of Hobbs Street and Jefferson Street that have the 4-lane undivided configuration (figure 35).

      i) Reasoning: The urban core of Athens is home to the greatest level of density and concentration of residential, institutional, and commercial development – with residences and destinations within short distances of one another. As such, there exists the highest possibility of having a functional system for alternative modes of transportation. This environment also has a concentration of people who are not automobile users (the young and old). Ensuring that the transportation network is "walkable" (and convenient for bicycle users) and accessible ensures that everyone in the area has the ability to travel. "Complete street" design also leads to redevelopment opportunities and supports an increased level of density.

ii) Reasoning: Additionally, regarding the "road diet" concept for Hobbs Street and Jefferson Street, the FHWA considers such a redesign as a proven countermeasure for improving the safety and efficiency for roadways that currently have 4-lane, undivided configurations. The benefits "road diets" provide are as follows:

(1) Decreasing vehicle travel lanes for pedestrians to cross, therefore reducing the multiple-threat crash (when one vehicle stops for a pedestrian in a travel lane on a multi-lane road, but the motorist in the next lane does not, resulting in a crash) for pedestrians,
(2) Providing room for a pedestrian crossing island,
(3) Improving safety for bicyclists when bike lanes are added (such lanes also create a buffer space between pedestrians and vehicles),
(4) Providing the opportunity for on-street parking (also a buffer between pedestrians and vehicles),
(5) Reducing rear-end and side-swipe crashes, and
(6) Improving speed limit compliance and decreasing crash severity when crashes do occur.
(FHWA, Report FHWA-SA-12-013, 2014)





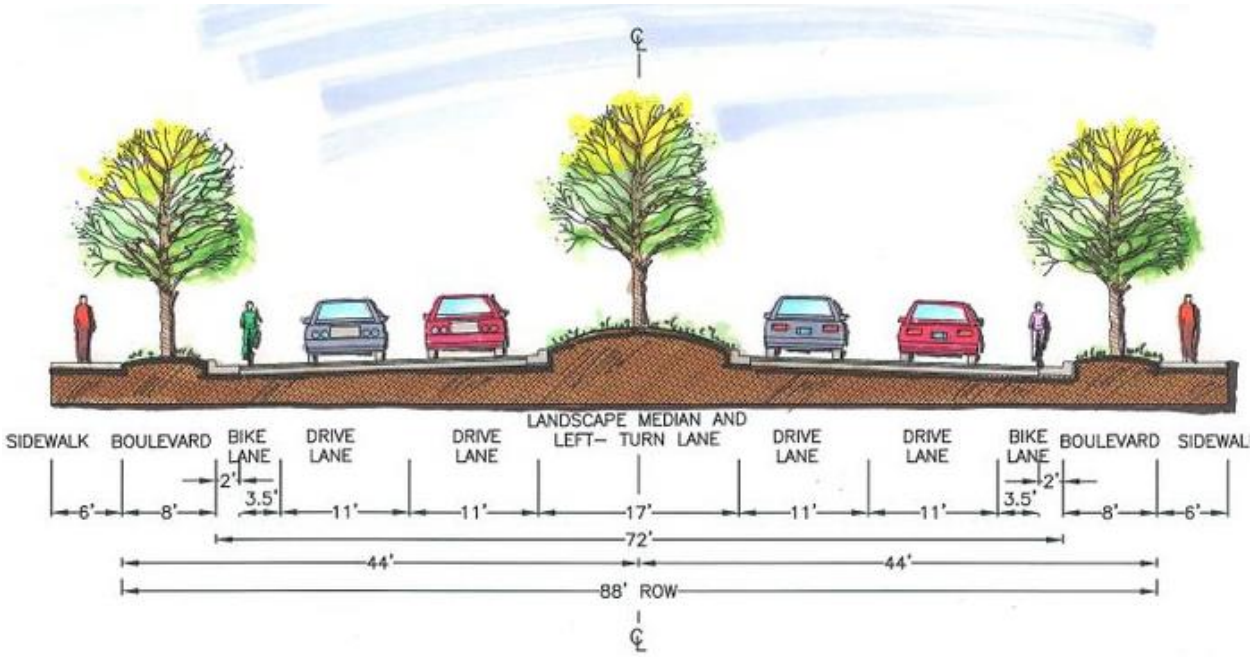


Figure 34. Examples of "Complete Street" design. Source: HART Commuter Information Services of Hunterdon County, NJ, 2014.

Figure 35. Example of a "Road Diet". Source: FHWA Report on Road Diets, FHWA-SA-12-013, 2014.

4) Goal: Ensure a high degree of connectivity and efficiency in the transportation network. Connectivity "refers to the density of connections in path or road network and the directness of links. A well-connected road or path network has many short links, numerous intersections, and minimal dead-ends (cul-de-sacs)" (Victoria Transport Policy Institute 2014) (figure 36).

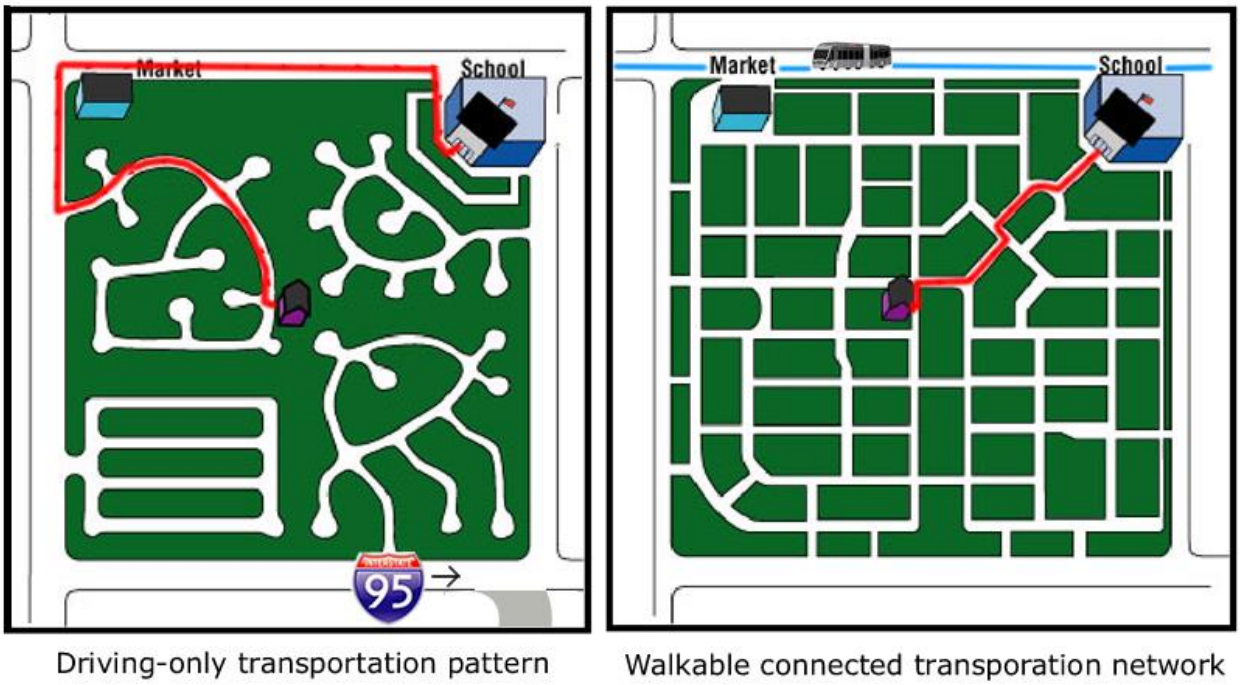


Figure 36. Comparison of typical suburban and well-connected street networks. Source: Congress of the New Urbanism, 2008.

The Planning Division of the Kentucky Transportation Cabinet states that the benefits of connectivity include the following:

- Reduction in travel distance (VMT) for drivers
- Reduction in travel times for drivers;
- Better and redundant emergency vehicle access;
- More efficient public services access (mail, garbage, transit)
- Improved bicycle and pedestrian routes and accessibility.
- Higher percentage mode share for transit, bicycling and walking
- Safer roads

(2009)

According to Handy et. al., the following are recommendations for improving roadway and pathway connectivity:

- Minimize dead-end streets, and where they exist limit their length to about 200 feet.

- Apply "complete streets" policies that insure that roadway planning and design accommodate diverse users and uses.

- Where dead-end streets exist, try to create paths that provide shortcuts for walking and cycling.

- A modified-grid street network with a high degree of connectivity should generally be used in urban areas.

- As much as possible, new developments and urban redevelopments should have a high degree of roadway and pathway connectivity.

- Use short street and small blocks as much as possible. An ideal for urban development is a 300 to 500 foot grid for pedestrians and bicycles networks and a 500 to 1,000 foot grid for motor vehicle streets.

- Planners should watch for opportunities to increase connectivity, particularly for non-motorized paths.

- Traffic Calming should generally be used instead of street closures to control excessive vehicle traffic on urban streets.

(2004)

a) Objective: Update Subdivision Regulations to ensure that new developments have a high degree of connectivity. Said update should cross-reference the City's other development policies.

i) Suggestion: As this relates to developmental subdivisions (primarily residential), ensure that new streets are interconnected with existing and future streets. Street network design should disperse residential traffic and discourage any particular residential street from becoming a de facto "cut-through" collector street. Dead-ends/cul-de-sacs should be discouraged in subdivision design unless physical attributes of the land render avoiding such streets impractical. Even in such instances, use and length of dead-ends/cul-de-sacs should be minimal.

ii) Suggestion: Subdivisions along collector and arterial roadways should use common access facilities wherever possible. The use of shared access easements on subdivision plats are encouraged to help facilitate the shared usage of access points and cross-property traffic to access points.

iii) Reasoning: The subdivision of property is considered the initial phase of the development of property. As such, the subdivision process is a prime opportunity to plan for improvements to the transportation network and implement the vision of this plan, a safe and efficient network of interconnected streets and roadways.

b) Objective: Update Traffic Circulation Standards for development/redevelopment to reflect the following: (1) Desires of the community as presented in this plan; (2) current best practices in access management, (3) latest criteria commonly used to determine if Traffic Studies are warranted. Said update should cross-reference the City's other development policies.

i) Reasoning: As the city continues to grow, the City's development policy as it relates to transportation should reflect the best and latest practices in determining design and placement of access drives onto public roads as well as on-site circulation and parking facilities in order to protect and enhance traffic movement on arterial and collector roads.

c) Objective: Update Zoning Ordinance parking lot design standards to ensure the implementation of the latest design techniques for on-site, off-street parking and drive areas. Said update should cross-reference the City's other development policies.

i) Reasoning: As the city continues to grow, the City's development policy as it relates to transportation should reflect the best and latest practices in determining design and placement of access drives onto public roads as well as on-site circulation and parking facilities in order to protect and enhance traffic movement on arterial and collector roads.

CONCLUSION

This plan constitutes a vision for moving traffic of various modes through and around the community in a safe and efficient manner. The plan serves as the next phase in our city's incremental planning program, following the Future Land Use and Development Plan. The transportation plan and its implementation will serve as a crucial step in implementing the community's overall vision set forth in the previous plan. Much like the Future Land Use and Development Plan, this plan looks at improving the transportation network in a manner complementary to the various environments within the city: urban, suburban, and rural. In doing so, the plan seeks to improve not only traffic flow, safety and efficiency, but overall quality of life.

The plan can be summarized into four goals: 1. Improve safety and efficiency of existing network; 2. Expand the network where it is advantageous to do so; 3. Make the network in the urban core accessible and usable by all travelers through all modes available; and 4. Ensure going forward that the highest level of connectivity in the network is achieved. These goals and their related objectives are an attempt to address concerns (1) expressed by the community and its leadership, (2) brought about by increased usage of the network, (3) related to low levels of service (LOS) and inefficiencies, and (4) related to anticipated growth by introducing innovative ideas and practical solutions.

After the Plan is adopted, the first step of implementation will be a prioritization of the various projects suggested herein. This will require close examination of each project by the City administration based on criteria such as safety, functionality, and possible funding. In some cases, the City will have to work with other agencies such as ALDOT and Limestone County to prioritize projects and commence work.

With the Tennessee Valley, and the various communities within the region experiencing substantial growth, each community will be working to improve its standing in the region and engage surrounding communities in friendly competition for jobs and residents. It will be vital to the future of Athens to provide exceptional levels of service and quality of life to attract residents, businesses, and industry. A safe, functional, and multi-modal transportation will be a critical element to our success in this endeavor.

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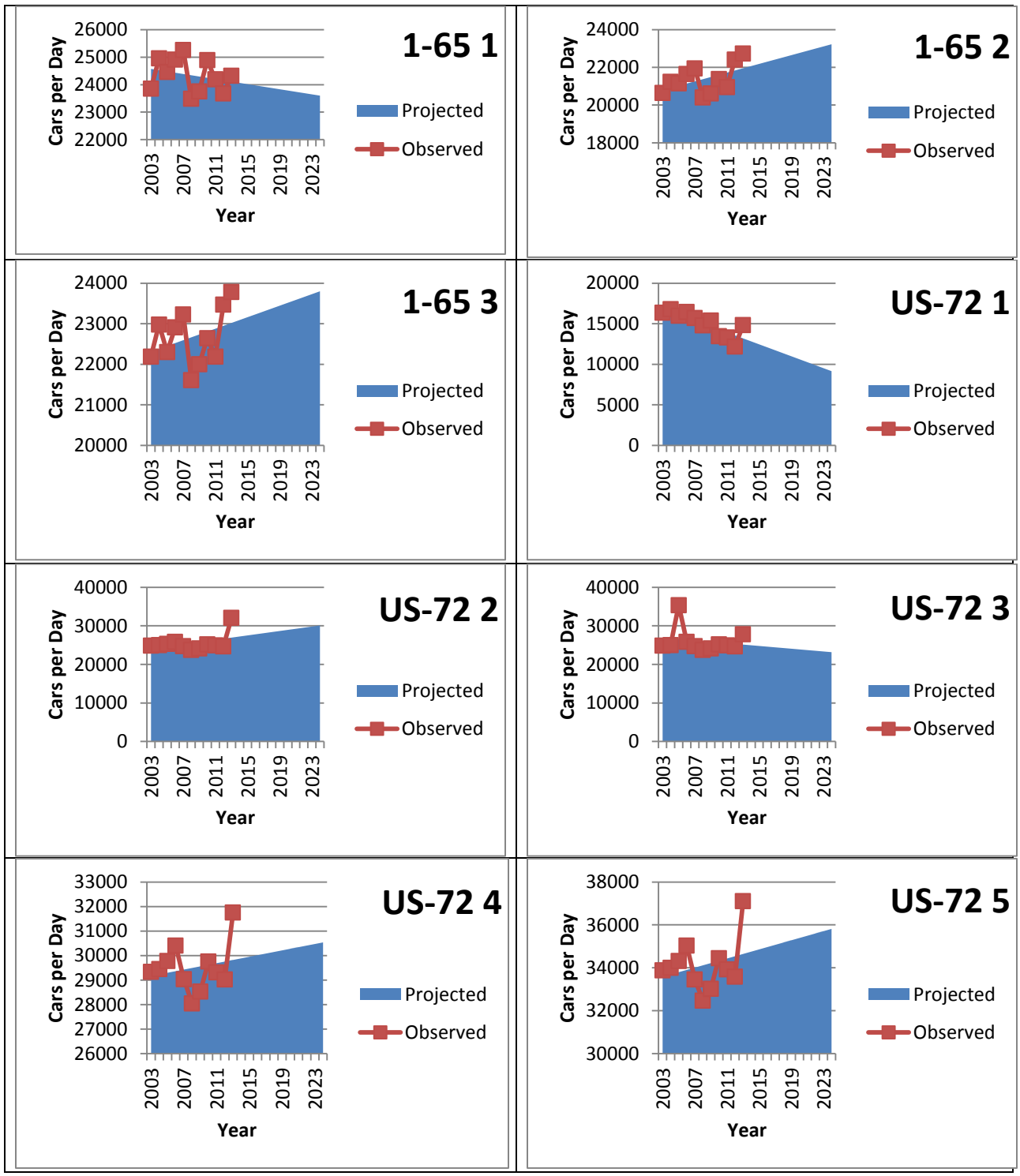
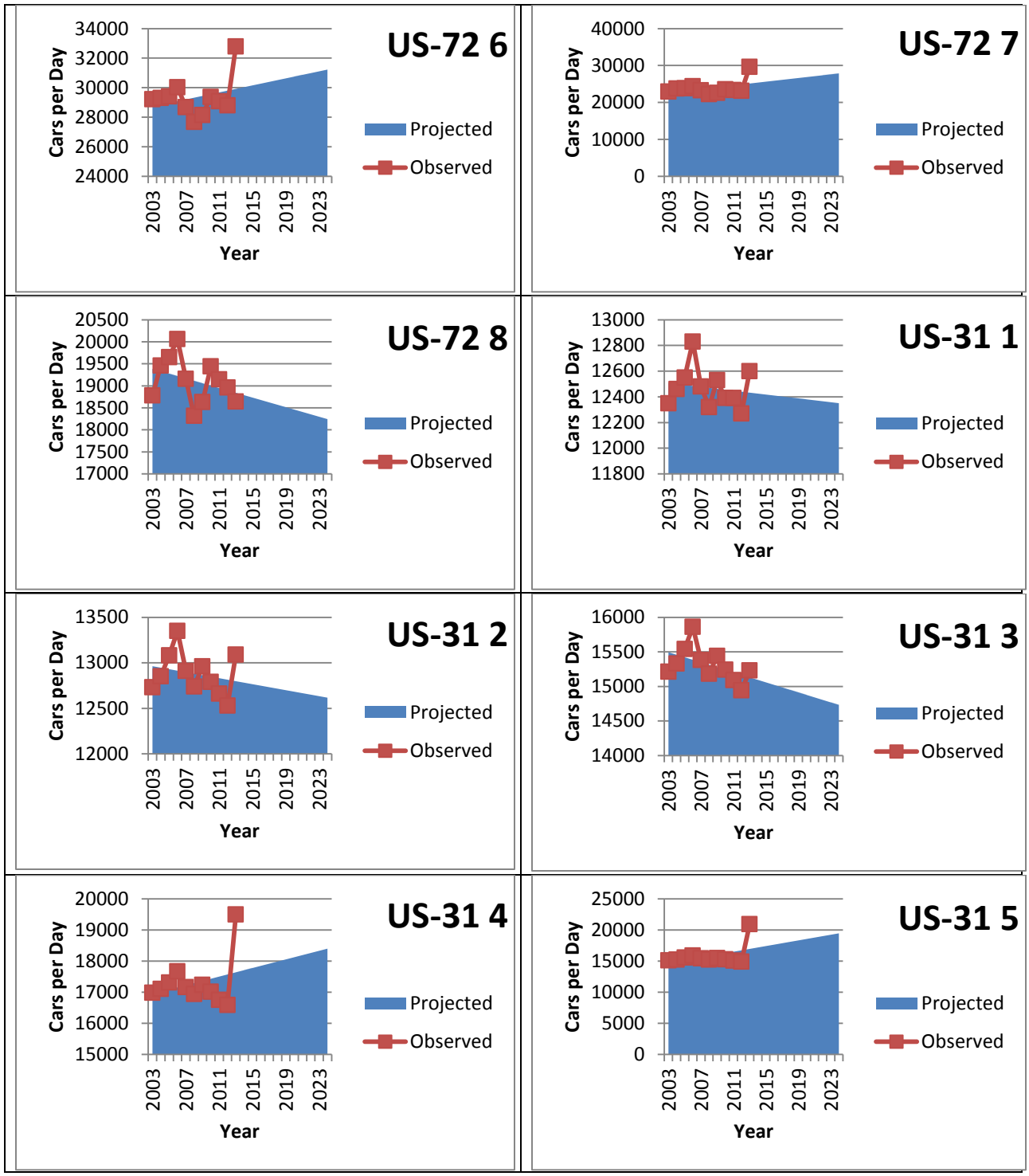
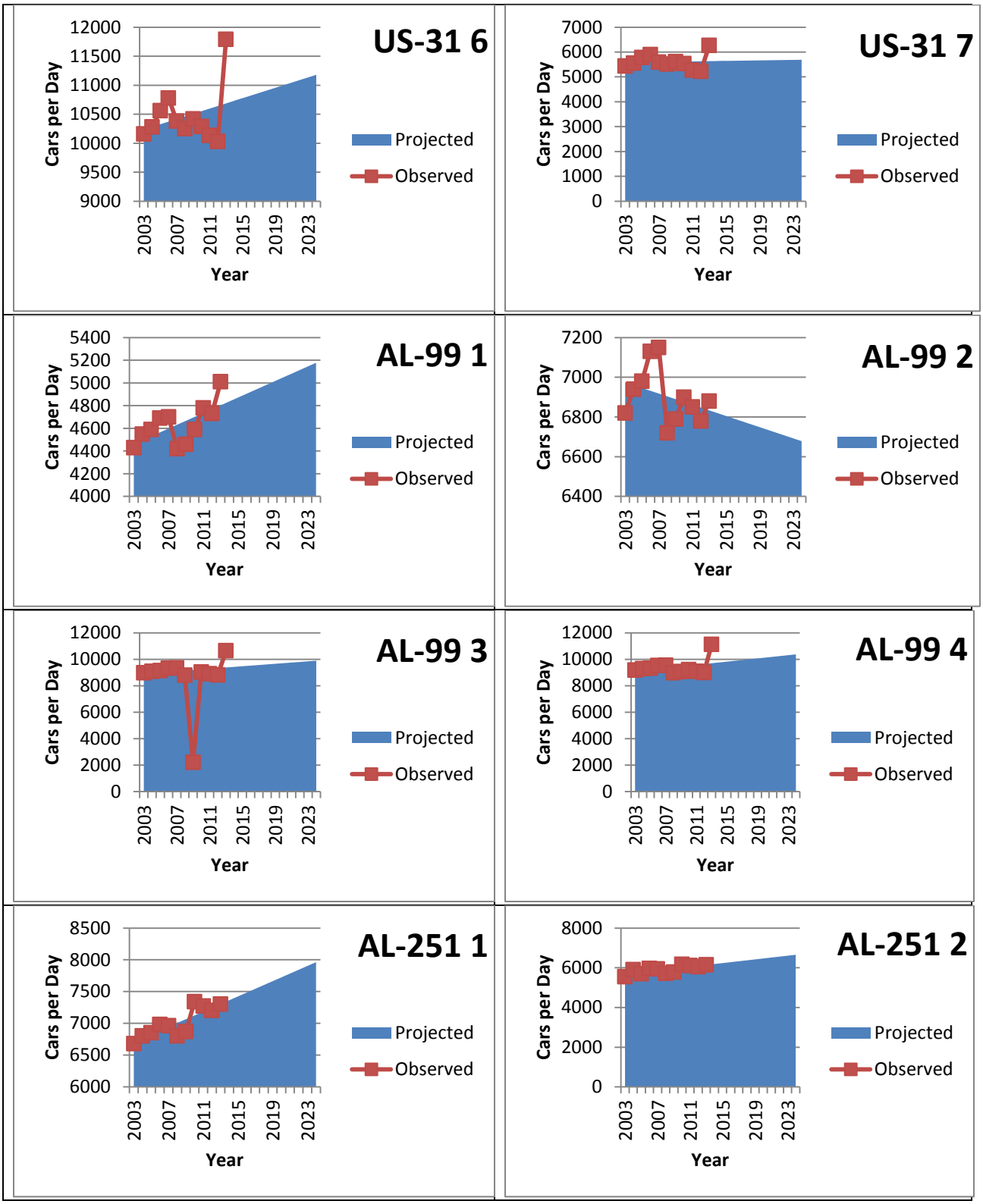
APPENDIX A – Traffic Projections along Roadway Segments




US-72 6
Cars per Day
34000
32000
30000
28000
26000
24000
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
US-72 7
Cars per Day
40000
30000
20000
10000
0
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
US-72 8
Cars per Day
20500
20000
19500
19000
18500
18000
17500
17000
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
US-31 1
Cars per Day
13000
12800
12600
12400
12200
12000
11800
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
US-31 2
Cars per Day
13500
13000
12500
12000
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
US-31 3
Cars per Day
16000
15500
15000
14500
14000
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
US-31 4
Cars per Day
20000
19000
18000
17000
16000
15000
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
US-31 5
Cars per Day
25000
20000
15000
10000
5000
0
2003
2007
2011
2015
2019
2023
Year
Projected
Observed


US-31 6
Cars per Day
12000
11500
11000
10500
10000
9500
9000
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
US-31 7
Cars per Day
7000
6000
5000
4000
3000
2000
1000
0
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
AL-99 1
Cars per Day
5400
5200
5000
4800
4600
4400
4200
4000
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
AL-99 2
Cars per Day
7200
7000
6800
6600
6400
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
AL-99 3
Cars per Day
12000
10000
8000
6000
4000
2000
0
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
AL-99 4
Cars per Day
12000
10000
8000
6000
4000
2000
0
2003
2007
2011
2015
2019
2023
Year
Projected
Observed
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Cars per Day
8500
8000
7500
7000
6500
6000
2003
2007
2011
2015
2019
2023
Year
Projected
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2011
2015
2019
2023
Year
Projected
Observed

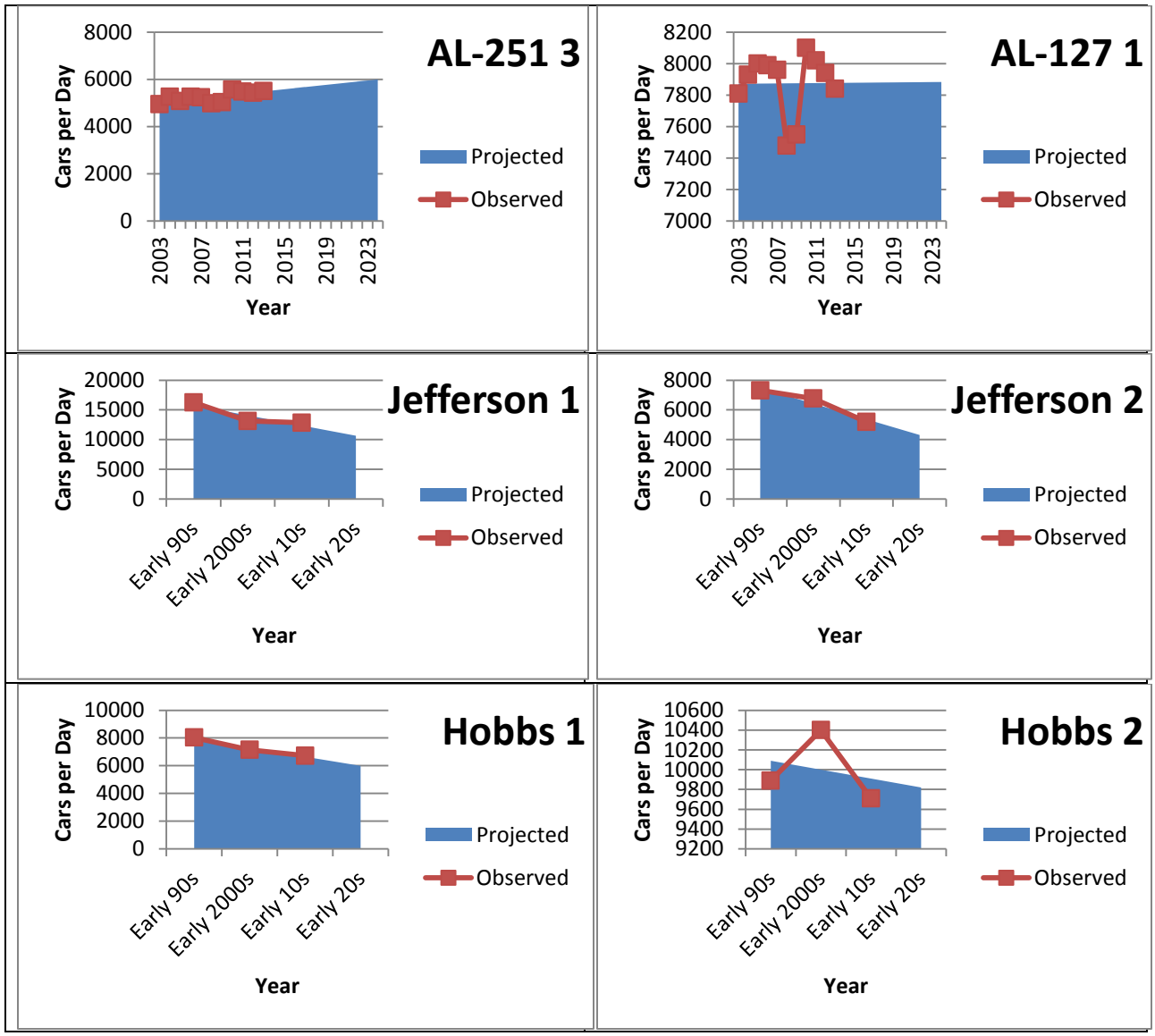
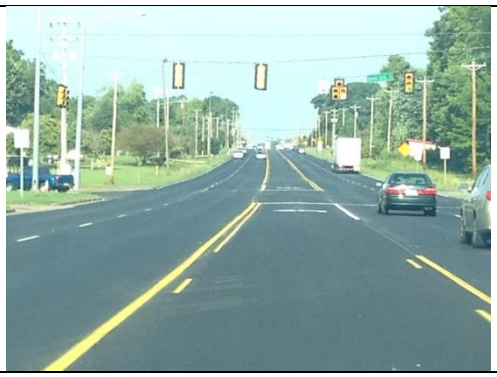
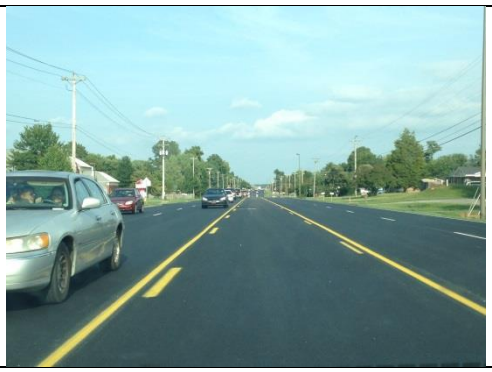
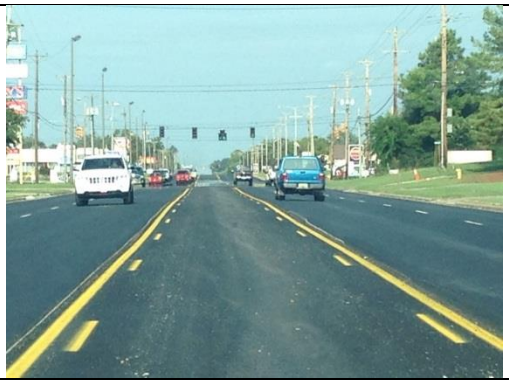


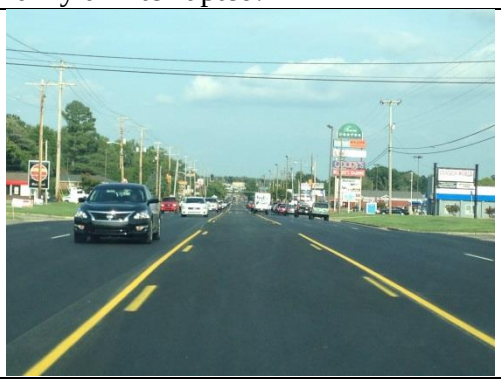
Figure __. Traffic Trends by Roadway.

APPENDIX B – Field Observations along US 72

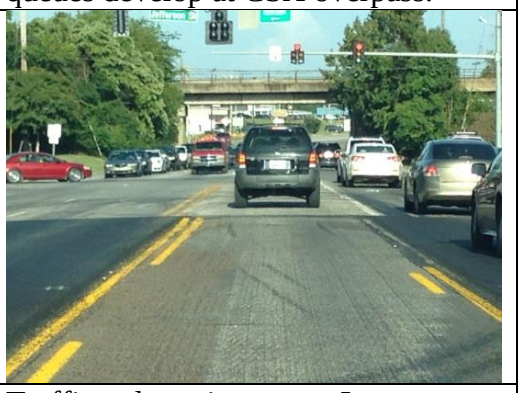
US 72, Segment 2	Monday	Friday
8:00 AM		
Description	Freeflow conditions.	Freeflow conditions.
Midday		
Description	Freeflow conditions.	Freeflow conditions.
3:00 PM		
Description	Traffic increases, especially around the intermediate school. Remains flowing	Traffic increases, especially around the intermediate school. Remains flowing

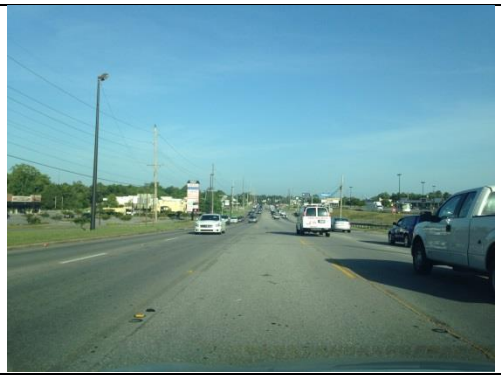
5:00 PM		
Description	Traffic volume increases, with some queueing at signals. Flow remains fairly uninterrupted.	Traffic volume increases, with some queueing at signals. Flow remains fairly uninterrupted.

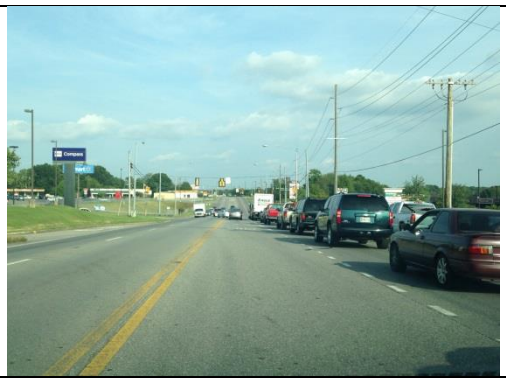
US 72, Segment 3	Monday	Friday
8:00 AM		
Description	Freeflow conditions.	Freeflow conditions.
Midday		
Description	Traffic volume increases, with some queueing at signals. Flow remains fairly uninterrupted.	Traffic volume increases, with some queueing at signals. Flow remains fairly uninterrupted.

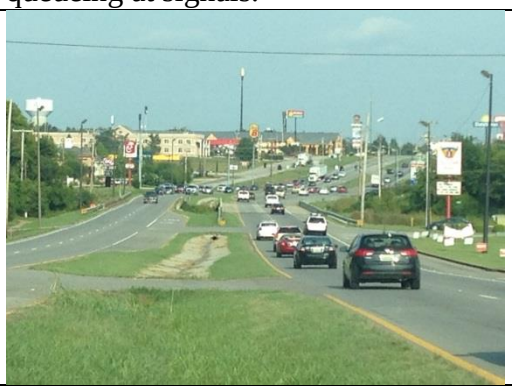
3:00 PM		
Description	Traffic volume increases, with some queueing at signals. Flow remains fairly uninterrupted.	Traffic volume increases, with some queueing at signals. Flow remains fairly uninterrupted.
5:00 PM		
Description	Traffic volume increases, with some queueing at signals. Flow remains fairly uninterrupted.	Traffic volume increases, with some queueing at signals. Flow remains fairly uninterrupted.

US 72, Segment 4	Monday	Friday
8:00 AM		
Description	Freeflow conditions.	Freeflow conditions.

Midday		
Description	Traffic volume increases, with some queueing at signals. Flow begins to experience interruption at CSX overpass.	Traffic volume increases, with some queueing at signals. Flow begins to experience interruption at CSX overpass.
3:00 PM		
Description	Traffic volume increases. Longer queues develop at CSX overpass.	Traffic volume increases. Longer queues develop at CSX overpass.
5:00 PM		
Description	Traffic volume increases. Longer queues develop at CSX overpass on both sides. Westbound may remain queued through multiple traffic signal cycles, especially if there is a vehicle attampting to turn left onto Jefferson St.	Traffic volume increases. Longer queues develop at CSX overpass on both sides. Westbound may remain queued through multiple traffic signal cycles, especially if there is a vehicle attampting to turn left onto Jefferson St.

US 72, Segment 5	Monday	Friday
8:00 AM		
Description	Freeflow conditions.	Freeflow conditions.
Midday		
Description	Traffic volume increases. Queues develop at signals.	Traffic volume increases. Queues develop at signals.
3:00 PM		
Description	Traffic volume increases. Longer queues develop at signals. Traffic turning into businesses hampers flow, particularly when no dedicated turn movements are present.	Traffic volume increases. Longer queues develop at signals. Traffic turning into businesses hampers flow, particularly when no dedicated turn movements are present.

5:00 PM		
Description	Traffic volume increases. Longer queues develop at signals and business entrances. Westbound flow begins being affected by queue at CSX overpass.	Traffic volume increases. Longer queues develop at signals and business entrances. Westbound flow begins being affected by queue at CSX overpass.
US 72, Segment 6	Monday	Friday
8:00 AM		
Description	Freeflow conditions.	Freeflow conditions.
Midday		
Description	Traffic volume increases. Flow remains fairly uninterrupted.	Traffic volume increases. Flow remains fairly uninterrupted.

3:00 PM		
Description	Traffic volume increases with some queueing at signals.	Traffic volume increases with some queueing at signals.
5:00 PM		
Description	Traffic volume increases with flow interruptions at signals and undesignated turn movements. Dinner traffic begins to clog median crossings.	Traffic volume increases with flow interruptions at signals and undesignated turn movements. Dinner traffic begins to clog median crossings.

US 72, Segment 7	Monday	Friday
8:00 AM		
Description	Freeflow conditions.	Freeflow conditions.

Midday		
Description	Freeflow conditions.	Freeflow conditions.
3:00 PM		
Description	Freeflow conditions.	Freeflow conditions.
5:00 PM		
Description	Traffic volume increases with minor flow interruptions at signals.	Traffic volume increases with minor flow interruptions at signals.

APPENDIX C – Maps

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