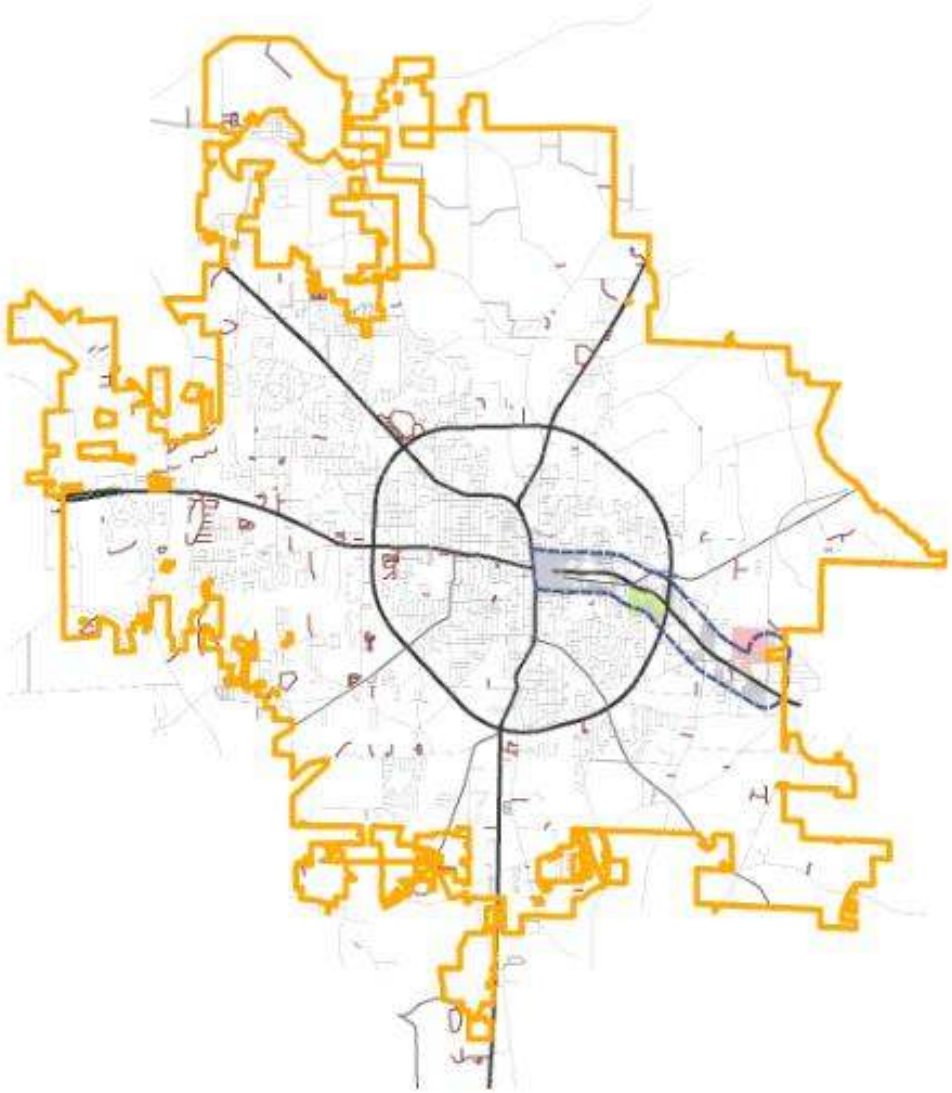


Highway 84 E Corridor Redevelopment Project Dothan, AL

Instructor: Sweta Byahut

CPLN 5060/6060 - Sustainable Transportation Planning

Spring 2018

AUBURN UNIVERSITY

Graduate Students

Name	Department
Rajas Bhalerao	Community Planning
Renae Burton	Adult Education
Daniel Butler	Community Planning
Kaylyn Cardinal	Civil Engineering
Qing Chang	Civil Engineering
Xiaoyu Chen	Public Administration
Xuekun Chen	Public Administration
Indrani Das	Community Planning
James Djamba	Community Planning
Yuying Huang	Community Planning
Jaspuneet Kaaur	Community Planning
Jingyu Mei	Community Planning
Mitch Moody	Public Administration
DeAndra Navratil	Community Planning
Ramya Rayapureddy	Civil Engineering
Guanlin Wang	Public Administration
Amanda White	Community Planning
Zhiling Zhu	Public Administration

Undergraduate Students

Name	Department
Jacob Bensinger	Civil Engineering
Kati Bero	Construction Engineering
Foster Denney	Environmental Design
David Dixon	Environmental Design
Kimberly Hooper	Environmental Design
Kyle Jackson	Geography
Jacob Ulak	Natural Resource Management

Project Process Plan

Stage 1: Case Study

Students were given the task to study any corridor plan in the United States and presenting that in the class. The criteria for the case study analysis are:

- Ways to incorporate bike and pedestrian
- Planning interventions in both land use and transportation
- Specific policy measures including zoning changes
- Design and engineering details for complete streets
- Traffic calming and other interesting aspects of the plan

Stage 2: Analysis of Existing Conditions

The students were divided into five groups for the analysis of the existing condition of the study area. Those groups are-

i) GIS Mapping and Land Use Analysis: this group looked the demographic and socio-economic characteristics, road network hierarchy, pedestrian and bike facilities, parking areas, land uses, built form and natural areas such as greenways, open spaces, trails, water bodies in the study area.

ii) Transportation Analysis: This group of students analyzed the pedestrian and bicycle level of service in the corridor and surrounding streets in the study area using Dixon method. Traffic Engineering Analysis has been conducted by this group to analyze the geometric changes that might be required for the roadway lanes.

iii) Photo-Documentation and Site Analysis: Students were given the task to develop an inventory with photos and general site observation, all indexed to a key map. Students built an inventory which includes photos of surrounding land uses, traffic –calming treatments,

sidewalks, visibility and safety issues, curb cuts and conditions, intersections etc. of the study area.

iv) Parking Utilization: The parking utilization study focused on large parking lots at the three nodes. A detailed study was conducted to analyze the current parking situation as per zoning ordinance consisting of occupancy rates, car counts, circulation areas and a record of existing parking and hourly usage of the large parking lots on weekday and weekend.

v) Review of Plans and Policies: This group studied the zoning ordinance and other plans and policy reports of Dothan to identify strengths and shortcomings, and determine what policy effect provisions for parking and impact pedestrian movements, land use, economic growth and changes, downtown historic district development. The reports which has been studied for this purpose are- Downtown Dothan Master Plan, Strategic Plan. City Business Plan, Bicycle and Pedestrian Plan.

Stage 3: Design Proposals and Policies

Students were divided into 4 groups to develop ideas and designs for the corridor. Each group were responsible to look into specific portion of the corridor.

- Roundabout/Traffic Circle Design near Poplar Park: this team developed the geometric design and proposals for improving the intersection and surroundings edges of the intersection using a roundabout by incorporating landscaping and image building elements within the design.
- Intersection redesign- Hospital Node: The task of this team was to articulate set of design guidelines for intersection design which includes pedestrian facilities, bicycle facilities, landscaping and image building elements.
- Corridor and Complete Street redesign – Downtown to Hospital Node and Hospital Node to Medical College: The student developed a set of existing and proposed street sections and highlighted how restriping or other solutions might work in design. A detailed design for

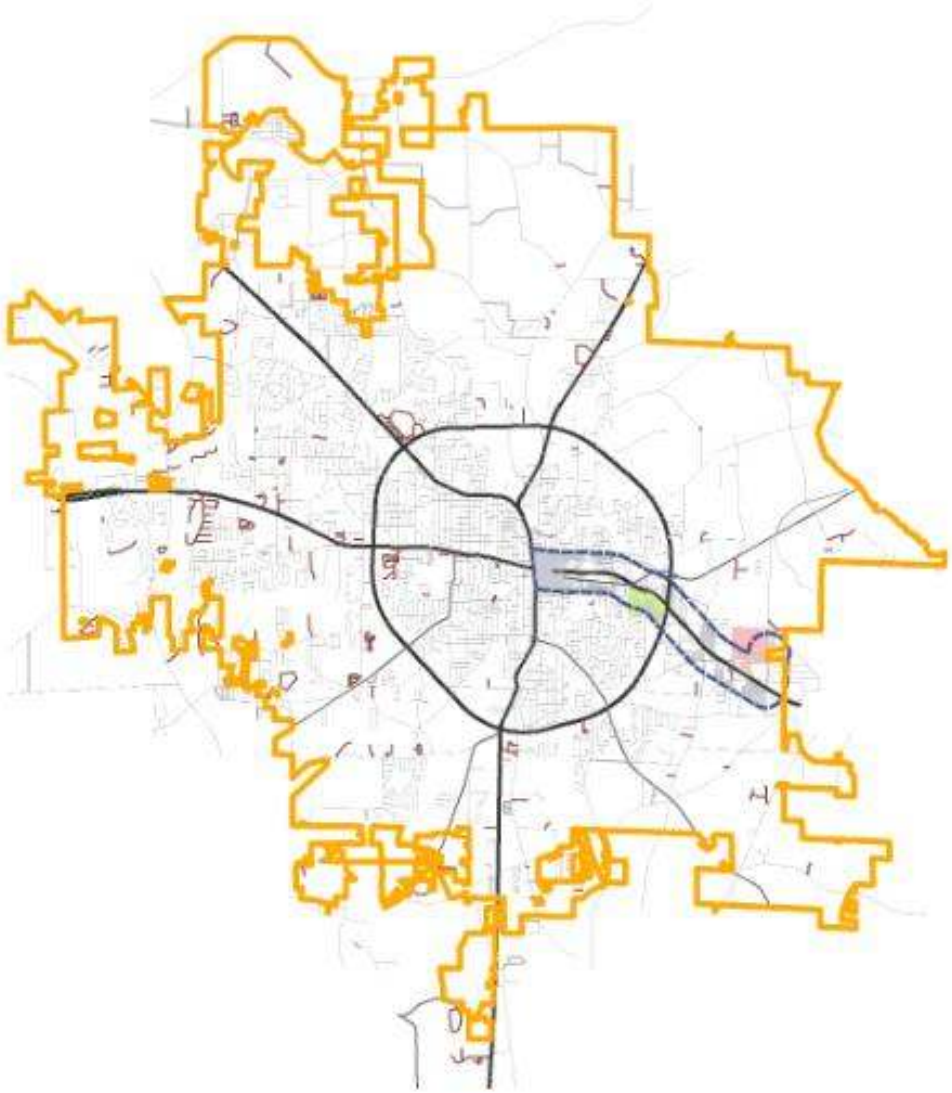
improved pedestrian facilities, bike facilities and traffic calming measures for different ROW has been developed. Recommendations has been given to improve accessibility and connectivity to the surrounding land uses in the corridor and also changing policies for land use zoning for surrounding land use.

PROJECT PROCESS PLAN - Students participated in two Public Workshops for the project organized by City of Dothan on 16 Jan. and 20 Feb. 2018

PROJECT PROCESS PLAN - Walking tour led by planning staff, City of Dothan

PROJECT PROCESS PLAN - Interim presentation on 26 April 2018, attended by Bob Wilkerson (Dothan City Planner) and several faculty

PROJECT PROCESS PLAN - Final presentation on 8 May, 2018 at Dothan Civic Center & City Hall. Attended by: The Mayor, the City Manager, Assistant City Manager, Planning Director, Public Works Director, Building official, and other planning staff.



Design Proposals and Policies

- Roundabout / Traffic Circle Design near Poplar Park
- Intersection redesign – Hospital Node
- Corridor and Complete Street redesign – Downtown to Hospital Node
- Corridor and Complete Street redesign –Hospital Node to Medical College

GROUP 1. THE ROUNDABOUT DESIGN

Qing Chang

Rajas Bhalerao

Jaspuneet Kaaur

Xuekun Chen

Foster Denney

Introduction and Current Conditon

Dothan's downtown is in proximity to recreational spaces, health care, shopping, and business centers with a variety of housing options available. East Main Street that merges onto Highway 84 supports multiple built characteristics and lacks a definitive design language. The street does not support a built to line and the zoning does not specify preferred building materials, the lack of which is evident in its irregular parcel sizes and sidewalk widths, variegated construction palette and façade treatments. The study area on East main street lacks design coherency which translates onto the street character and effects pedestrian use, and accessibility.

Dothan has a rich association with mural arts. Wiregrass Musuem that lies within the study area hosts 19 murals that depict the history of Wiregrass Area. Since East Main Street merges onto the highway it maintains its high speeds without heeding to pedestrians. So, art provides a relief in it that it not only makes the downtown more vibrant, but also provides relief to a pedestrian who is second to automobiles. This preference of automobiles has made the downtown more secluded and isolated than it should be. Vibrancy and life of the streets – the people are secondary. The lack of a comprehensive plan for downtown and a vision seems apparent after field research of the study area.

Roundabout Design

Roundabouts provide an opportunity to create focal points for community using landscaping and other features. This roundabout tries to incorporate storm water management into its design. The roadways can be made to slope towards the roundabout and drains spread across in a circular pattern have been designed to trap water. These drains can direct storm water towards an underground rain water collection tank which is built under the footprint of the roundabout.

The roundabout has been designed in accordance with the regulations of Federal Highway Administration. The roundabout design assumes that the train tracks passing through the study area will eventually go defunct as it presently operates only once a month. The design of the roundabout tries to achieve a balance of safety and efficiency. The roundabout tries to create smooth flow of traffic by creating smooth curvature that also tries to achieve consistent speeds, well-marked lane paths and appropriate sight distance.

Highway 84

The highway is a 12-foot-wide, 6 lane highway which can be subjected to a road diet and together with some public land on the right and left bike paths and sidewalks can be incorporated. While this provides access to pedestrians and bikers it also helps creates a walkable downtown. The built to line along both sides of the roadway should be made to follow along sidewalk, this will help create a human scale and provide a structure to the built environment in the area. The city can take this initiative a bit further by providing a list of specific materials and colors that need to be followed in the neighborhood.

Bike Facilities

For the study area the level of service for bicycle facilities is D. Since bicycle facilities such as bike lanes, bicycle parking, bicycle repair shop, and bike specific signage are not present in the area. This effects the end user and shows a lack of bike friendly policies at the city level. However, the design of the roundabout plans for bicyclists and includes suggestions for incorporating bike paths on all roads that are served by the roundabout. For example, East main Street after the roundabout can support a central median of 12- 14 feet as it merges on to highway 84. The other side of the roundabout that merges into downtown can support sidewalks that have shared space for bikes and pedestrians. To make streets bike friendly, we propose that automobiles are slowed down before they enter downtown area on East main street. We also recommend using Holoman St. as a one way that feeds the neighborhood and S. Appletree as a one way that merges onto the roundabout. The proposal indicates marking and proper signage for bike facilities in addition to building creative, eye catching, and sculptural bike stands for parking. Signage and marking will ensure that bike lanes remain clearly marked and labelled.

Pedestrian Network

The study area receives a "B" for its level of service, however field research provides insight into the irregular widths of sidewalks in the area. The sidewalks lack street furniture like benches, vegetative edges, human scale street lamps and pedestrian friendly signage. Furthermore, urban trees planted in the study area are planted in the middle of sidewalk which deter a pedestrian from walking on the sidewalk. The design aims to address these concerns by incorporating street lamps, signage, benches, and a vegetative edge along the edge that can help create a safe buffer for pedestrians such that trees provide the edge of sidewalk.

The Geometric Design for the roundabout

The objective of geometric design for the roundabout in this project was mainly focused on entry radius with speed limit, exit radius, inscribed circle diameter and roadway width. After these feathers been designed, the basic shape and size of the roundabout could be generated to further analyzing the land use and planning.

The geometric design for the roundabout are referencing the "Roundabouts: An information Guide" provided by Federal Highway Administration (FWA).

The Speed design for Entry

The speed design has profound impacts on safety, achieving appropriate vehicular speeds through the roundabout is the most critical design objective. A well-designed roundabout reduces the relative speeds between conflicting traffic streams by requiring vehicles to negotiate the roundabout along a curved path. The deceleration begins before entering the curved path, with circulating drivers keep operating the deceleration until achieve the speed limit. For each roundabout, there exists an optimum design speed to minimize crashes. The recommended maximum entry design speeds for

roundabouts at various intersection site categories from the guideline is shown below:

Table 1. The recommended maximum entry design speeds for roundabouts

Site Category	Recommended Maximum Entry Design Speed
Mini-Roundabout	25 km/h (15 mph)
Urban Compact	25 km/h (15 mph)
Urban Single Lane	35 km/h (20 mph)
Urban Double Lane	40 km/h (25 mph)
Rural Single Lane	40 km/h (25 mph)
Rural Double Lane	50 km/h (30 mph)

For the project area, it can be classified as urban. Due to each leg of the intersection are double lane, the site category of the roundabout was selected as "Urban Double Lane" with a recommended maximum entry design speed of 25 mph. This speed would also be used as speed limit in the circulatory roadway of the roundabout because the guideline suggests the speed in the roundabout should be 20-25 mph.

The Roadway Width

According to the guideline, a vehicle is assumed to be 2 m (6 ft) wide and to maintain a minimum clearance of 0.5 m (2 ft) from a roadway centerline or concrete curb and flush with a painted edge line. In this project, the roundabout should be designed as double-lane due to the traffic volume in this area. According to the landscape design, the inside island of the roundabout would be designed with a concrete curb. The outside of the roundabout would be paved by normal edge line. And the width of road in the roundabout can be designed according to the information provided by the guideline. The guideline suggested the width for the road should have 5 ft from a concrete curb, 5 ft from a roadway centerline and 3 ft from a painted edge. In this project, there's a need for a bicycle lane so an additional 3 ft was added for the bicycle lane. The roadway width of the roundabout was finally determined as 10 ft. With a total width of 23 ft.

The Entry/Exit Curve Design

The relationship between travel speed and horizontal curvature is documented in the American Association of State Highway and Transportation Officials' document. Which also been called "green book". To design the radius of the entry, the field research of speed limit for each road though the roundabout should be done. The table shown below shows the speed limit for each road though the roundabout. For the Hollman street, the speed limit is not available, but it won't affect it has been assumed as one-way exit.

Table 2. The speed limit for each Road through the roundabout

The Speed Limit for Each Road	
E Main St.	40 mph
Museum Ave.	30 mph
Columbia Hwy	30 mph
Hollman St.	NA

Once the speed limit is known, the radius for the entry curve can be determined by using the equations provided by green book. The equation shown below shows the relationships between speed and the radius of the curve.

$$V = \sqrt{15R(e+f)}$$

Where: V = Design speed,
R = Radius, ft
e = Superelevation, ft/ft
f = Side friction factor

To calculate the radius, the equation has been rewritten to proper format. The superelevation values were usually assumed to be +0.02 for entry and exit curves. The values for side friction factor can be determined in accordance with the AASHTO relation for curves at intersections. The friction factor would be determined by the vehicle speed as the plot shown below:

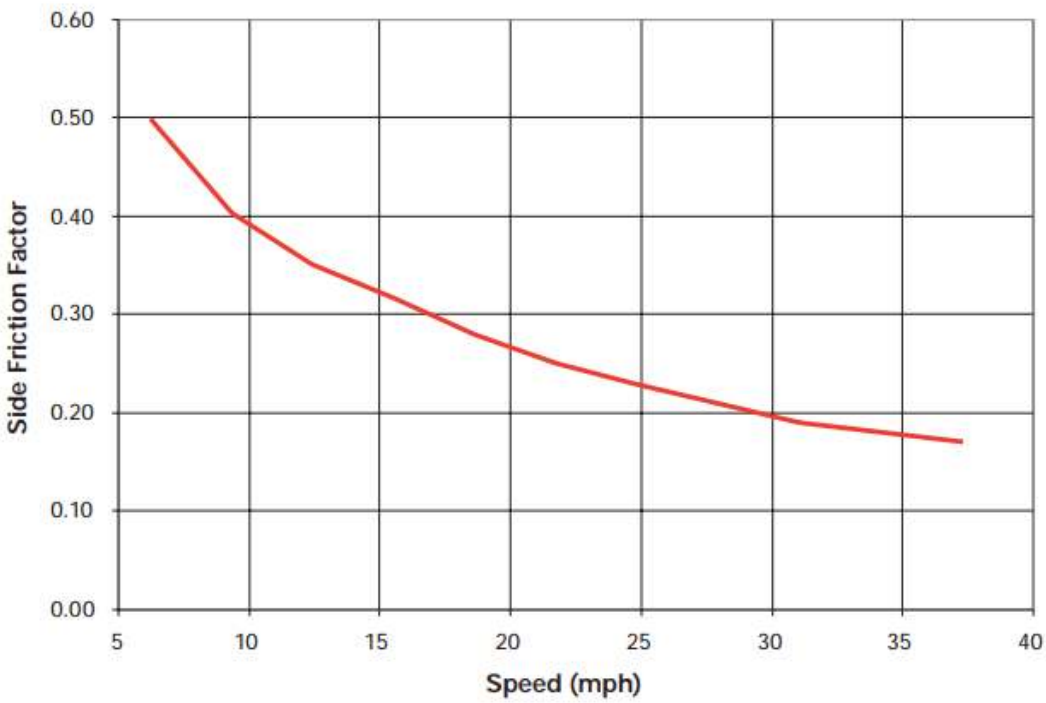


Figure 1. The relationship between speed and friction factor

With these information, the radius for each entry/exit curves can be calculated. Due to all the vehicles in the roundabout would have same speed limit, the radius for exit curve would be the same. For Hollman Street, it has been assumed as one way so only exit curves has been designed. The entry/exit curve radius for each road is shown below:

Table 3. The entry/exit curve radius for each road

Road Name	Entry Curve Radius	Exit Curve Radius
E Main St.	561.4 ft	111.1 ft
Museum Ave.	272.72 ft	111.1 ft
Columbia Hwy	272.72 ft	111.1 ft
Hollman St.	NA	111.1 ft.

The Inscribed Circle Diameter

The inscribed circle diameter is made up by central island diameter and road width inside the roundabout. The guideline provided the inscribed circle diameter range as the table shown below:

Table 4. The Inscribed Circle Diameter Rang

Site Category	Typical Design Vehicle	Inscribed Circle Diameter Range*
Mini-Roundabout	Single-Unit Truck	13–25m (45–80 ft)
Urban Compact	Single-Unit Truck/Bus	25–30m (80–100 ft)
Urban Single Lane	WB-15 (WB-50)	30–40m (100–130 ft)
Urban Double Lane	WB-15 (WB-50)	45–55m (150–180 ft)
Rural Single Lane	WB-20 (WB-67)	35–40m (115–130 ft)
Rural Double Lane	WB-20 (WB-67)	55–60m (180–200 ft)

* Assumes 90-degree angles between entries and no more than four legs.

The center island diameter is entirely dependent upon the inscribed circle diameter and the required circulatory roadway width. The designer must experiment with varying diameters before determining the optimal size at a given location due to different kinds of situation and land use type. According to table 4, the inscribed circle diameter range was given as 150-180 ft. As geometric design part, this range would provide to land use researcher to further adjust and make determination.

Traffic Sign Design for Roundabout

Our group followed the instruction of Gedeon's guide book to design the pavement marking and the signing near the roundabout.

Pavement Markings

Typical pavement markings for roundabouts consist of marking the entries and the circulatory roadway. Approach and entry pavement markings consist of yield lines, pavement word and symbol markings, and channelization markings. In addition, multilane approaches require special attention to pavement markings.

- Yield lines

  Yield lines should be used to demarcate the entry approach from the circulatory

roadway. Yield lines should be located along the inscribed circle at all roundabouts. No yield lines should be placed to demarcate the exit from the circulatory roadway.

- Pedestrian crosswalk markings

  Pedestrian crosswalk markings should generally be installed at all pedestrian crossing locations within roundabouts in urban locations. Because the crosswalk at a roundabout is located away from the yield line, it is important to channelize pedestrians to the appropriate crossing location. These markings should not be construed as a safety device, as data from other countries suggest that the presence of markings has no appreciable effect on pedestrian safety. Rather, markings provide guidance for pedestrians in navigating a roundabout and provide a visual cue to drivers of where pedestrians may be within the roadway.

  We decided to use the zebra pedestrian lines in our roundabout design, because zebra crosswalk has many advantages over the traditional transverse crosswalk marking in roundabout applications:

  • Because the crosswalk at a roundabout is set back from the yield line, the zebra crosswalk provides more visibility.

  • The zebra crosswalk is distinct from traditional transverse crosswalk markings typically used at signalized intersections, thus alerting both drivers and pedestrians that this intersection is different from a signalized intersection.

  • The zebra crosswalk is also less likely to be confused with the yield line than a transverse crosswalk.

  • Although the initial cost is somewhat higher, the zebra crossing may require less maintenance due to the ability to space the markings to avoid vehicle tire tracks.

- Circulatory roadway pavement markings

  Circulatory pavement markings are generally not recommended. Because, circulatory lane lines can be misleading in that they may provide drivers a false sense of security.

  Bike lanes within the roundabout are also not recommended. The additional width of a bike lane within the circulatory roadway increases vehicular speed and increases the probability of motor vehicle-cyclist crashes. Bicyclists should circulate with other vehicles, travel through the roundabout as a pedestrian on the sidewalk or use a separate shared-use pedestrian and bicycle facility where provided. (Gedeon, page 197)

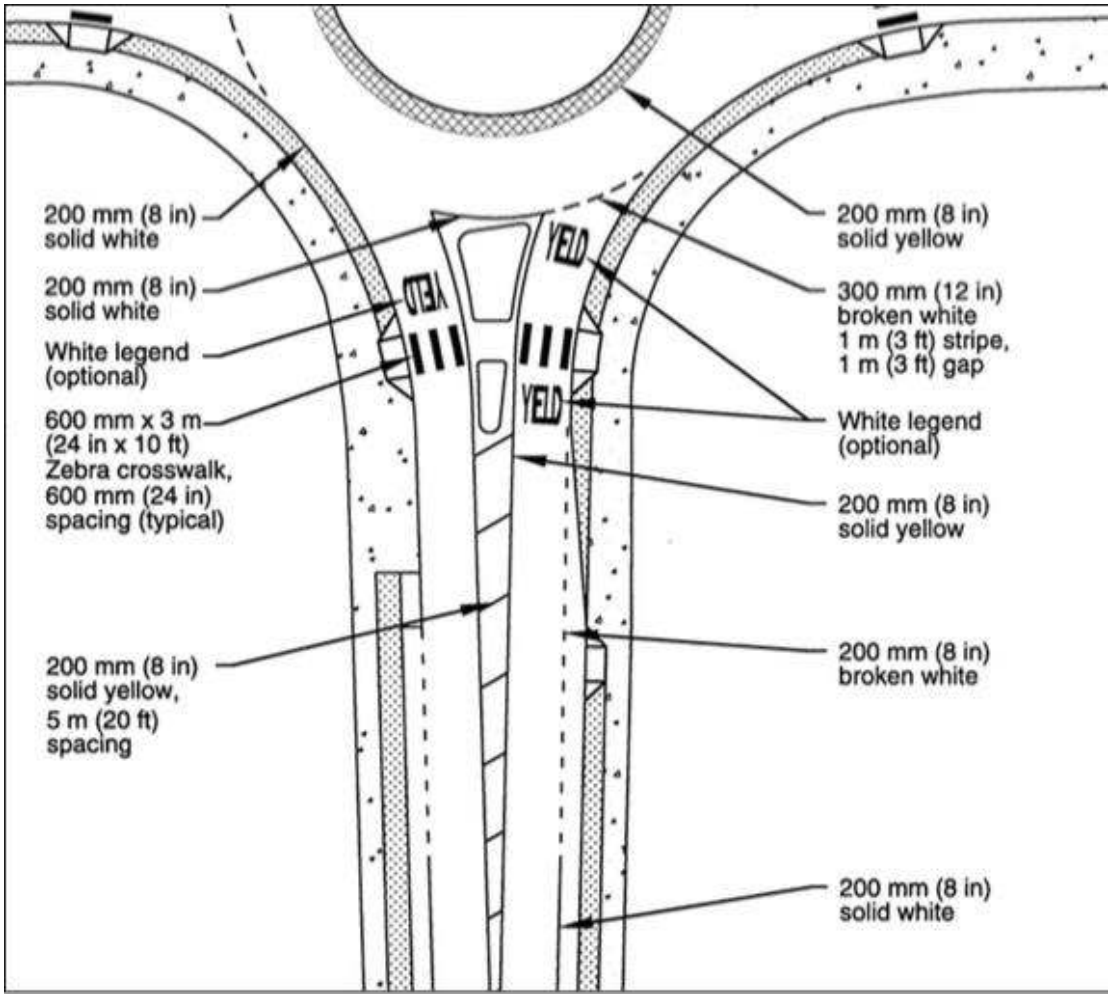


Figure 2. The draft of our roundabout pavement marking design

Signing

The overall concept for roundabout signing is like general intersection signing. Proper regulatory control, warning, and directional guidance are required to avoid driver expectancy related problems. Signs should be located where they have maximum visibility for road users but a minimal likelihood of even momentarily obscuring pedestrians as well as motorcyclists and bicyclists, who are the most vulnerable of all roundabout users. Signing needs are different for urban and rural applications and for different categories of roundabouts. (Gedeon, page 185)

The rough draft of our roundabout signing and pavement marking design

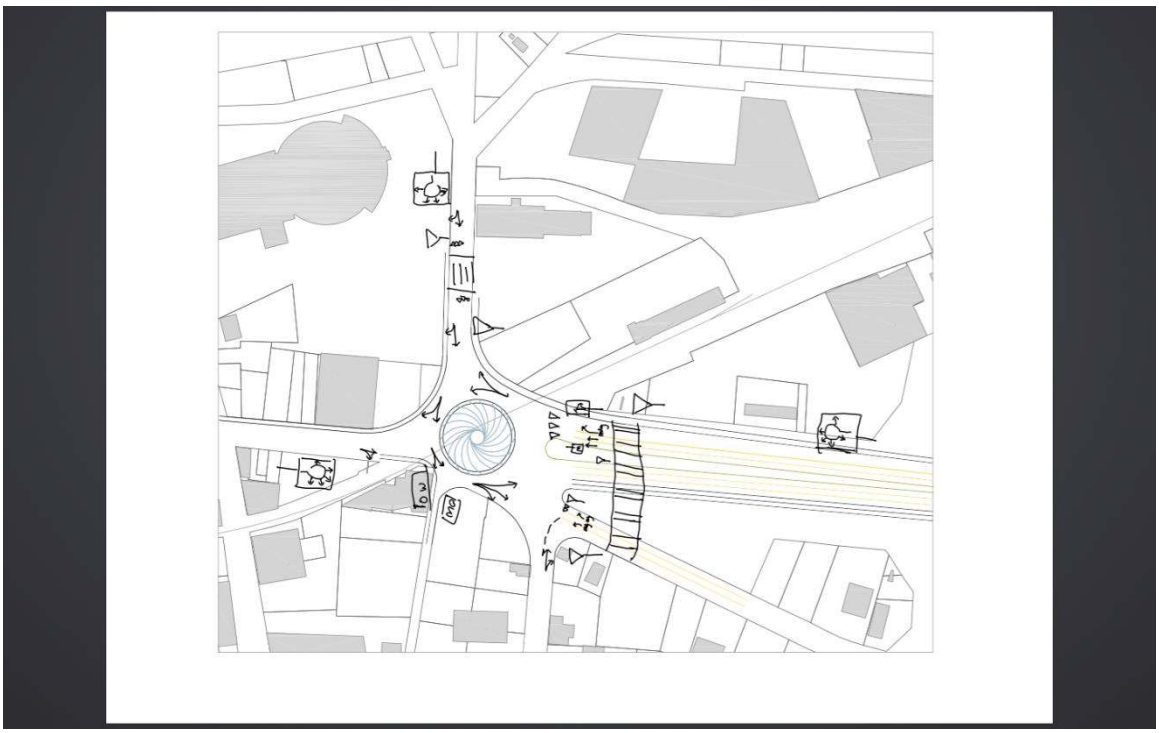


Figure 3. The draft of the advance destination guide sign towards to roundabout

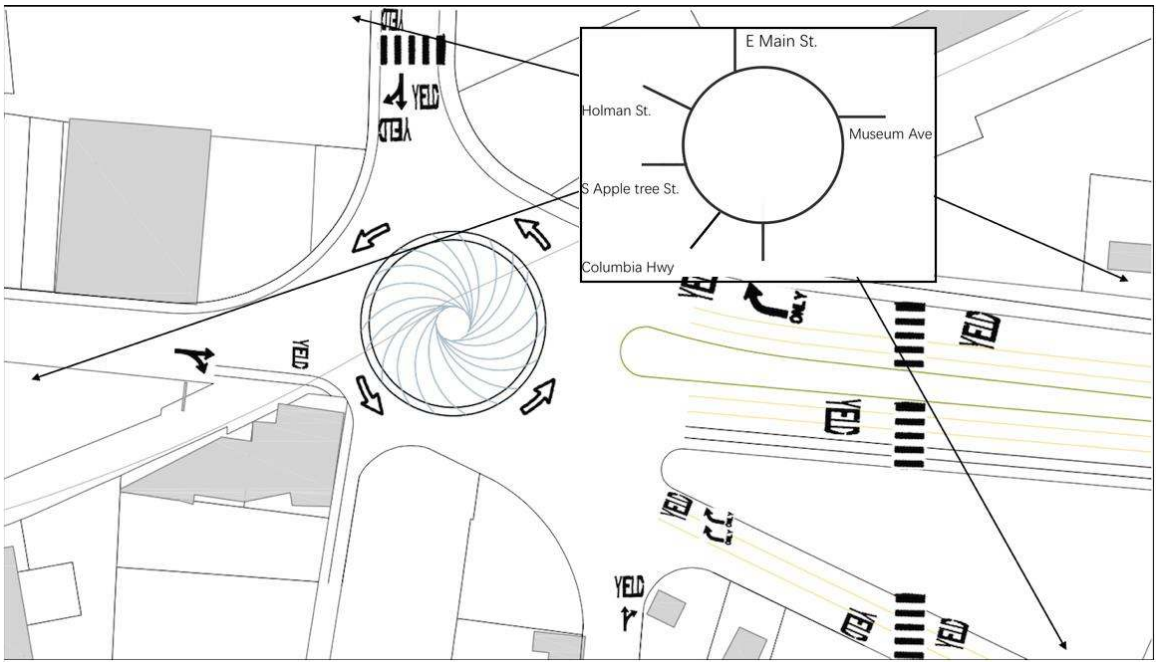


Figure 4. The draft of the signing in eastern part of the main street

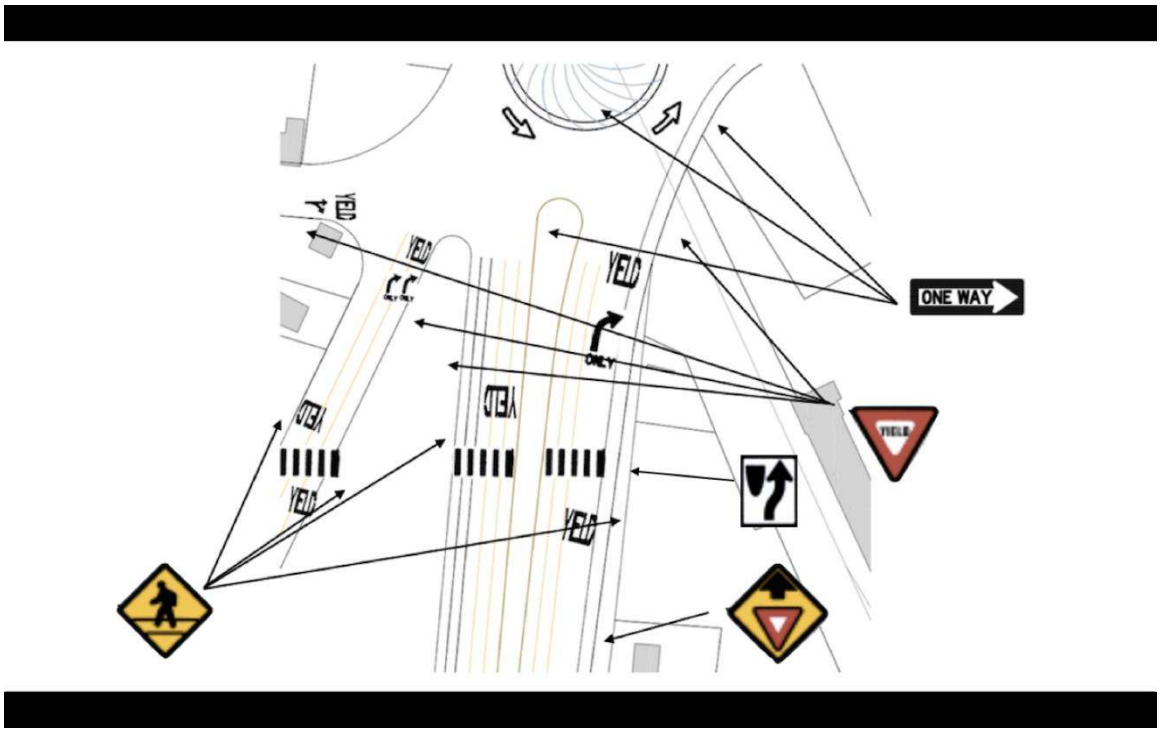
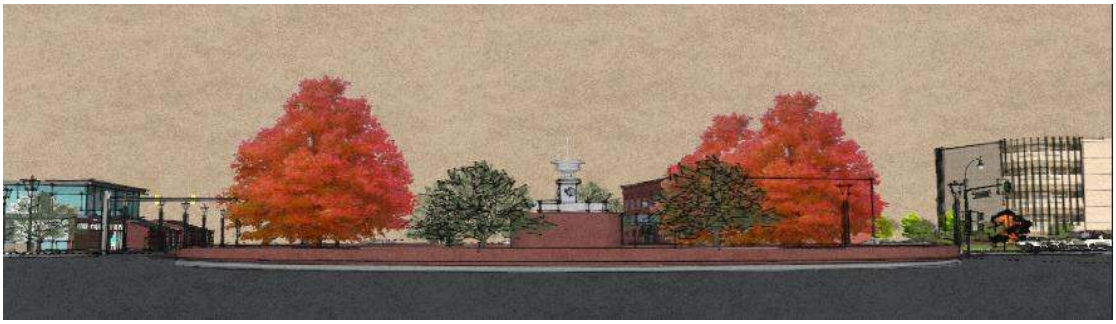


Figure 5. The draft of the signing in western part of the main street

Landscaping for roundabouts:

- Landscaping is one of the most important aspect of roundabouts. Besides providing aesthetics features, landscaping has many different objectives like:
- Making the central island clearly visible, thus avoiding accidents and increase safety.
- Maintaining adequate distance between cars and roundabout.
- Discourage pedestrian traffic through the central island.



Figue 6. Proposed Landscaping:

- Contains rows of trees as dividers.
- Storm water management in the central island.
  - Dothan gets around 55m of rain per year.
  - Each curved road, curb are given drainage which collects storm water.

- Main purpose of Landscaping is to ensure that vehicles can observe the signing & ships of the roundabout as they approach & have adequate visibility for make decision accordingly.

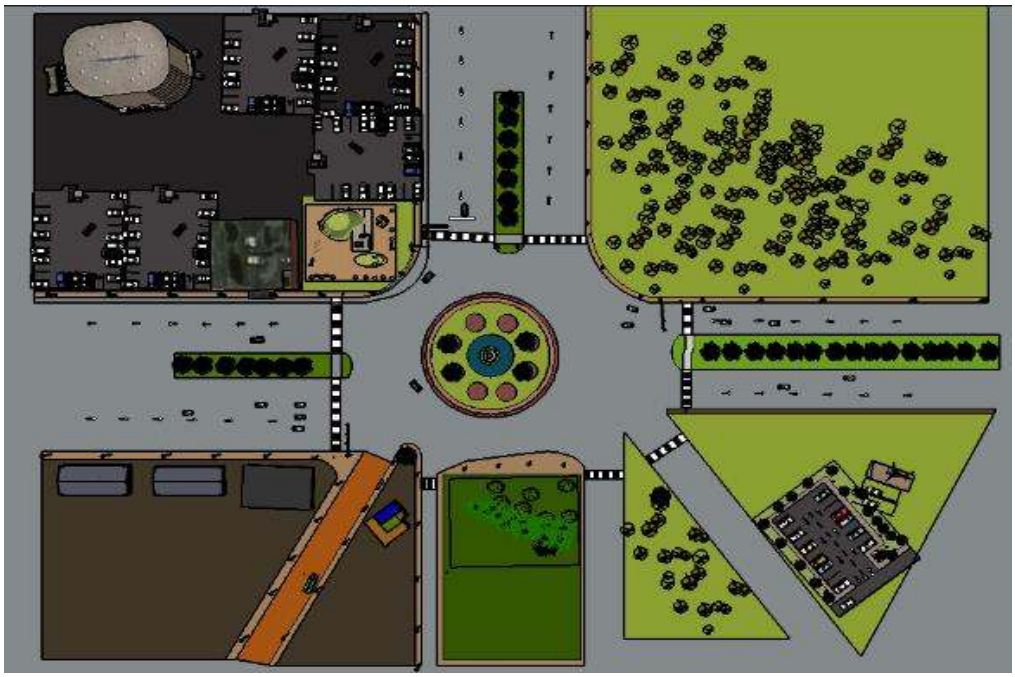


Figure 7. the view of the roundabout

- As dothan is connected with the highway, the drivers must understand when they are entering the residential or city area. For that trees help trees help them to slow down.

<u>Central Island Landscaping:</u>

- In the landscaping, central island is the focal point by promoting lower speeds and by breaking the headlights glare of oncoming traffic.
- Minimum curb height must be around 3 inch and a perimeter of about 6 ft.
- Truck aprons are used to facilitate the movement of large vehicles while maintaining the distance.
- Fixed objects are generally used for safety , that may be trees, statues , rocks ,etc.

<u>Splitter Island:</u>

- While landscaping a splitter generally divides 2 way street to help safety and create a buffer between 2 roads.
- While landscaping care must be taken to avoid obstructing sight distance since the splitter island are usually located within the critical sight triangle.

Figure 8. The view of the roundabout

Figure 9. The view of the roundabout

Reference

1. U.S. Department of transportation Federal Highway Administration (FWA) https://www.fhwa.dot.gov/publications/research/safety/00067/000676.pdf
2. *A policy on geometric design of highways and streets: 2004. (2004*). Washington, D.C.: American Association of State Highway and Transportation Officials.
3. https://www.fhwa.dot.gov/publications/research/safety/00067/000676.pdf
4. http://library.ite.org/pub/e27147ca-2354-d714-511f-1b6b41443fb4
5. http://www.wsdot.wa.gov/publications/manuals/fulltext/M22-01/1320.pdf
6. http://www.virginiadot.org/business/resources/4/Roundabout_Design_Guidance.pdf

Department of Community Planning

Auburn University

Redesign of Hospital Node for Highway 84 Corridor

Submitted to:

Dr. Sweta Byahut

Submitted by:

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Kyle Jackson

DeAndra Navratil

Jacob Ulak

Guanlin Wang

Date and Time:

Friday, May 4, 2018

3:00 PM

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CONCLUSION **19**

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INTRODUCTION

The intersection of Highway 84 and Ross Clark Circle as well as the surrounding Hospital node located along Highway 84 in Dothan, Alabama were the areas being inspected for redesign. The purpose of this redesign was to make the areas more multi-modal friendly by implementing bicycle and pedestrian facilities while still maintaining a sufficient level of motor transit quality. Landscaping elements of the surrounding hospital area and new multi-modal routes were also taken into consideration. To improve the selected area, the evaluation of the level of service and implementation of countermeasures that improve safety for all modes of transportation were considered for improvements of this area. The area being considered for redesign consists of the Southeast Alabama Medical Center, a combination of retail spaces, and some surrounding residential neighborhoods. For this redesign, the node was broken down into two sections: Intersection of Highway 84-Ross Clark Circle and Hospital Node. These two areas are represented in Figure 1 by the yellow circle and red box.

FIGURE 1 Area of Hospital Node (1)

HIGHWAY 84 AND ROSS CLARK CIRCLE INTERSECTION

For the purposes of this section, the area that pertains to this intersection is shown in Figure 2. East Main Street is also known as Highway 84 East.

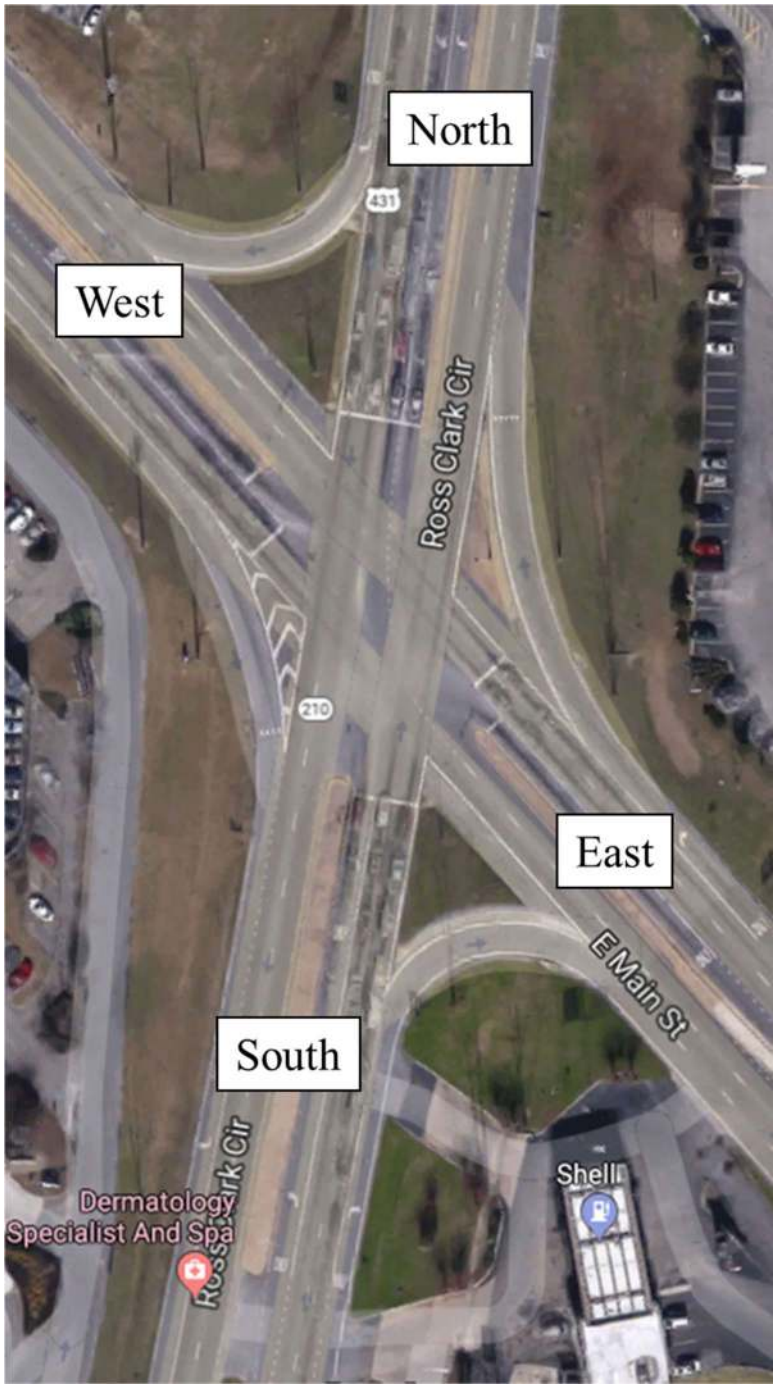

FIGURE 2 Highway 84 and Ross Clark Circle Intersection (1)

Summary of Current Conditions

The areas previously evaluated for this section were the existing conditions of the level of service for the roadway, pedestrian, and bicycle facilities. As defined by the Highway Capacity Manual (HCM), level of service is a qualitative measure used to relate the quality of traffic service (2). Level of Service uses grades A through F to qualitatively measure the service of a roadway. With A through C grades being considered stable or better flows of traffic whereas D through F are considered unstable or insufficient. These grades can also be applied to pedestrian and bicycle facilities, but have a different method of identifying the grades than for roadways.

For planning purposes, the Florida Department of Transportation (FDOT) provides tables based on annual average daily traffic (AADT) values, speed, amount of lanes, presence of medians, and classification of the roadway (3). The Alabama Department of Transportation (ALDOT) provided the AADT values (4). The geometric attributes associated with this roadway to use the tables were the AADT values shown in Table 1, 45 – 55 mile per hour speeds, four lanes, presence of medians at all sides, and state signalized arterial for the roadway classification (3). The table used for the purposes of the existing conditions and improved conditions was for Urbanized areas (3). Based on these tables the average level of service for the roadway for both the intersection and hospital node was B (3). According to the HCM, this means that there is a reasonable amount of free flow traffic, speed, and maneuverability (2). The amount of space between cars is on average about 16 car lengths or 330 feet. The feelings of the people driving associated with this grade have a high level of physical and psychological comfort (2).

TABLE 1 Average Annual Daily Traffic (4)

AADT for Intersection			
North	29100	**South**	25140
East	24040	**West**	19760

Since the intersection was considered a high-speed roadway there were no pedestrian or bicycling facilities along Highway 84 or Ross Clark Circle. Due to there not being any type of facility already present for the intersection the level of service for pedestrians and bicyclists was automatically an F or not applicable

Summary of Improved Conditions

Based on the findings of the analysis from the existing conditions, the design of the roadway was not reconsidered since it already has an acceptable grade for the roadway level of service. The focus of the redesign for the intersection was improving pedestrian and bicycling facilities. The intersection currently has no countermeasures to provide safety for bicyclists or pedestrians in the area. Countermeasures for the purposes of this report means an installation of a structural or operational system to improve safety at a specific location (5). Since it is a high-speed roadway, it was not possible to place items such as sidewalks or bicycle lanes within the intersection, but there could be improvements in pavements markings, signals, or signage to aid in the safety of pedestrians or bicyclists.

To evaluate the improvements made by installing certain countermeasures were by using crash modification factors (CMFs). The Federal Highway Administration (FHWA) and Highway Safety Manual (HSM) define CMFs as a multiplicative factor that represents an improvement in safety or decrease in crashes for a given countermeasure (6; 7). The National Clearinghouse Database stores all crash modification factors approved by the FHWA. All the CMFs applied for the intersection redesign were found through this database (8).

The CMF used for the intersection redesign was CMF 9021. This CMF is an installation of a pedestrian hybrid beacon with pedestrian advanced yield or stop markings or signs. The configuration of these countermeasures is shown in Figure 3. A hybrid beacon is a pedestrian sign that has signals that flash to notify a motorist when a pedestrian or cyclist is walking across the road. Examples of advanced yield or stop signs or pavement markings are shown in Figure 4. There does not need to be a median to apply this CMF, but adding green medians were considered for the intersection. The CMF for this is 0.43, which means there was an increase in safety or crash reduction of 57 percent (8).

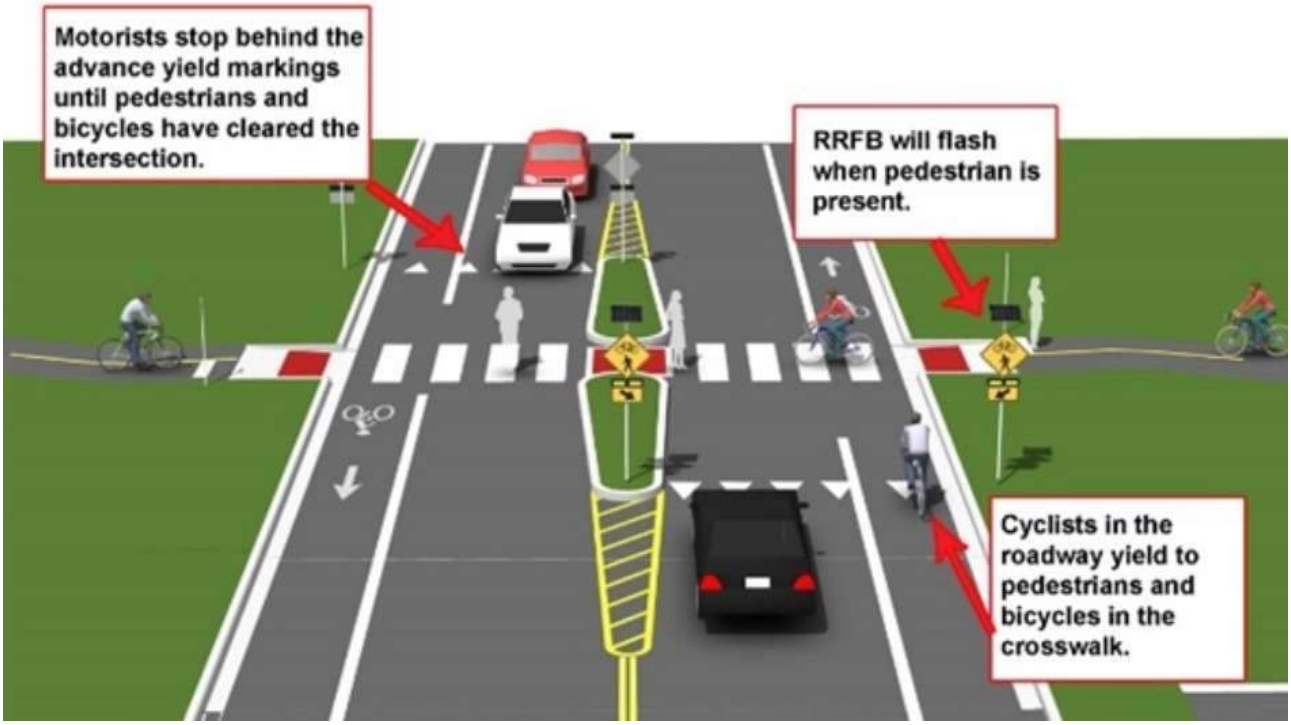

FIGURE 3 Configuration of CMF 9021 (9)

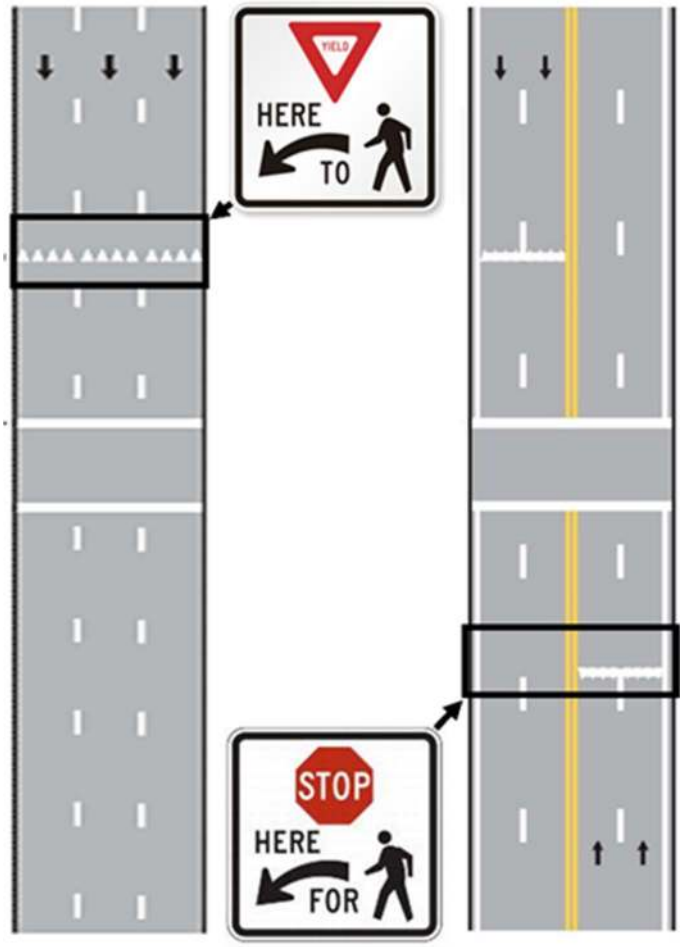

FIGURE 4 Example of Advanced Yield of Stop Sign or Marking (10)

The installation of these countermeasures were placed at the intersection as well as at the medians for the new proposed alternative bicycle and pedestrian route. The proposed alternative bicycle and pedestrian route occurs at the minor streets just pass the intersection on both the west and east sides. They occur at Haven Drive and Crossings Lane along Highway 84. This was proposed in hopes of pedestrians and bicyclists to use this route to get to their destination rather than walking along Highway 84 or crossing the heavy traffic intersection. The proposed route and intersection redesign will be discussed in further detail within the following sections.

Bicycle and Pedestrian Alternative Route

The new proposed route for pedestrian and bicyclists is shown in Figure 5. This route provides an alternative route for pedestrians and bicyclists from the Highway 84 and Ross Clark Circle intersection. The current intersection has high traffic counts, large transport vehicles, and fast speeds that can make it intimidating for leisure activity and daily travel. The alternative route proposed is located on the eastern edge of residential neighborhoods at Haven Drive (purple circle) and Crossings Lane (red circle) along Highway 84, providing a more convenient and safe connection for residents in the area.

The southern edge of this route is located on parcels that are not currently developed, allowing potential partnerships to be made with the city and parcel owners. Public-private partnerships can also be utilized with medical businesses to lift a major section of the trail off the road and into a separated trail located on business property. Safety along this route can be improved by adding crosswalks of the same design that currently exists for one intersection within the hospital node. Applying the CMF 9021 previously described, can be duplicated at each intersection where the trail crosses the road to improve safety for pedestrian/bicyclists and bring awareness to motorist of the presence of them on the roadway.

FIGURE 5 Alternative Transportation Route for Pedestrians and Bicyclists (11)

Intersection Redesign

The intersection of Ross Clark Circle and Highway 84 is an unsafe node for pedestrians and bicyclists. It is the area where two streets join and cross at-grade. As shown in Figure 6, there are no facilities for pedestrians and bicyclists at the nearby channelizing island and pavement edge corner. Even in the turning roadway, deceleration strips and stop signs are not constructed yet. This redesign concept identifies the need for intersection improvements, reinforces to motorists to remember to look for pedestrians and bicyclists at the intersection, and adds more options to upgrade the intersection service quality for different users.

The goal of the redesign concept is to provide safe and user-friendly crosswalks for all modes of transportation, especially for bicyclists and pedestrians. In addition, adding crosswalks would give proper accessibility for pedestrians from the hospital to Highway 84 and resolutions for decreasing vehicle to pedestrian or vehicle to bicyclist crashes.

FIGURE 6 Highway 84 and Ross Clark Circle Intersection (1)

As shown in Figure 7, the T intersection is an un-signalized intersection without a traffic control signal nor a STOP or YIELD for pedestrians or bicyclists. To decrease traffic conflicts, a STOP or YIELD sign should be applied. Insufficient sight distance from Crossing Lane with high speed and large vehicle volumes would increase the probability of accidents. It is hard for pedestrians and bicyclists to go across the intersection because no crosswalks and other facilities are currently present. Lack of a left turn signal greatly decreases the safety, and the intersection should be visible for bicyclists and pedestrians to pass appropriately and safely. Pedestrians and bicyclists should be able to see the motorists reducing the speed from the STOP and YIELD sign of Highway 84.

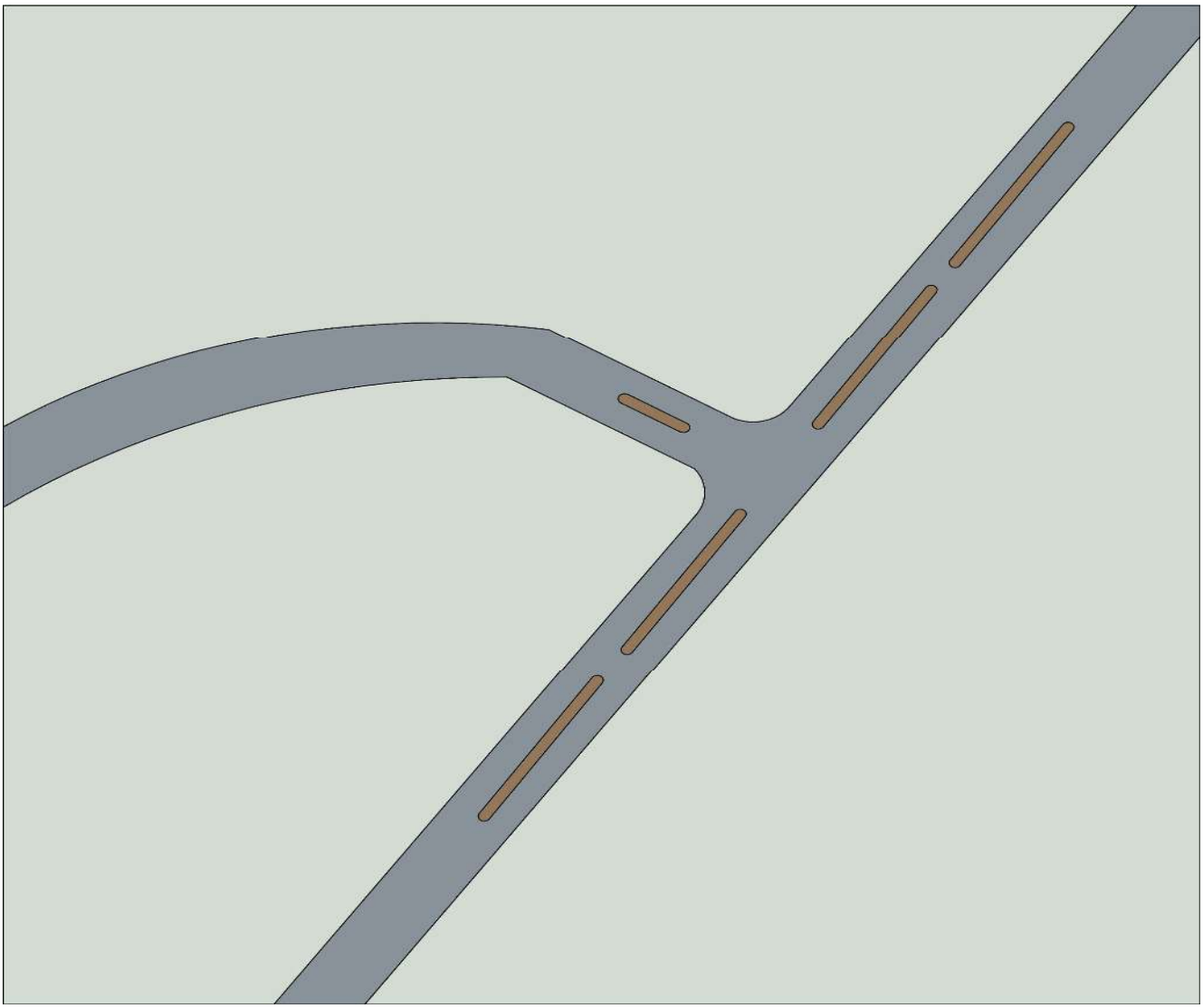

FIGURE 7 Highway 84 and Crossing Lane Intersection

Skewed intersections such as the one shown in Figure 8 at Haven Drive and Highway 84, indicates a shortage of un-signalized control options. To upgrade the level of livability and pedestrian safety reduced speed and pedestrian traffic controls are the main way for improving the entire Highway 84 traffic environment. This oblique intersection has significant volumes of mixed traffic flow from Highway 84. A lack of traffic signals or controls make it hard to merge multi-modal systems.

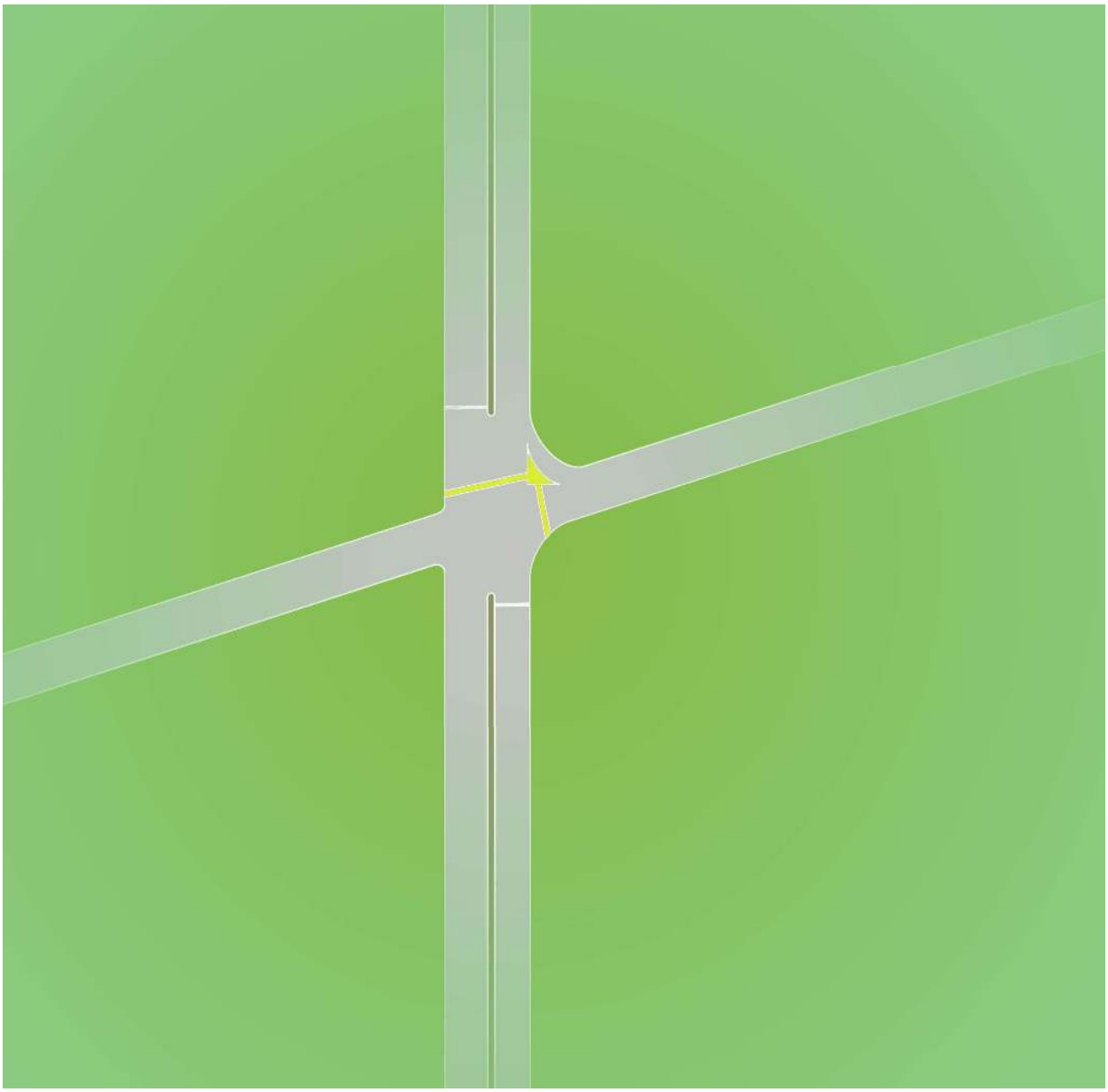

FIGURE 8 Highway 84 and Haven Drive Intersection

To assist pedestrians crossing the intersection the countermeasures associated with CMF 9021 were applied to the intersection, as shown in Figure 9. This included four crosswalks that would be constructed in front of applied advance yield markings. The crosswalks would connect Highway 84 and the hospital. Crossings and Pedestrian Curb Cut Ramp locations must have accessibility to the sidewalks along approaching streets. In future improvement plans, crosswalk signals would be added at the channelizing island for adapting the walking speed of pedestrians. Four advance yield markings would be set up in the lateral clearance of turning roadways to control the motor vehicle speed and ensure the pedestrian safety. The markings would create a right turn auxiliary lane.

FIGURE 9 Highway 84 and Ross Clark Circle Intersection Redesign (11)

To ensure the connectivity of Highway 84 in the east and west directions, two new crosswalks would be assigned to the Haven Drive and Highway 84 intersection. This intersection along with the Crossings Lane and Highway 84 intersection were redesigned for the purposes of the previously proposed alternative route. The improvements include a pedestrian STOP sign installed at both sides of the approaching streets and advanced yield markings to slow the motor vehicle speed before direct drivers pass the crosswalks. When pedestrians and bicyclists are cleared, motorists can continue to go straight along Highway 84. It is helpful for minimizing conflicts between multiple modes. Adding yield control can reduce unnecessary accidents caused by mixed traffic flow. The countermeasures previously discussed are the ones associated with CMF 9021. The redesign to apply all the countermeasures at the Haven Drive and Highway 84 intersection are shown in Figure 10.

FIGURE 10 Highway 84 and Haven Drive Intersection Redesign

A similar procedure was performed at the Crossings Lane and Highway 84 intersection as at the Haven Drive intersection. The redesign layout suggests constructing three new crosswalks at the three-way intersection. Additionally, advanced yield markings would diminish conflicts from right and left turn lanes, unifying the cityscape and road appearance. The layout would strengthen urban traffic consciousness and raise awareness of road civility. Two-way speed control is a low cost, low consumption, and high efficiency form of intersection control. Appropriate stops can effectively slow traffic in Highway 84. The countermeasures applied for this intersection were the ones associated with CMF 9021. The redesign applying these countermeasures at the Crossings Lane and Highway 84 intersection is shown in Figure 11.

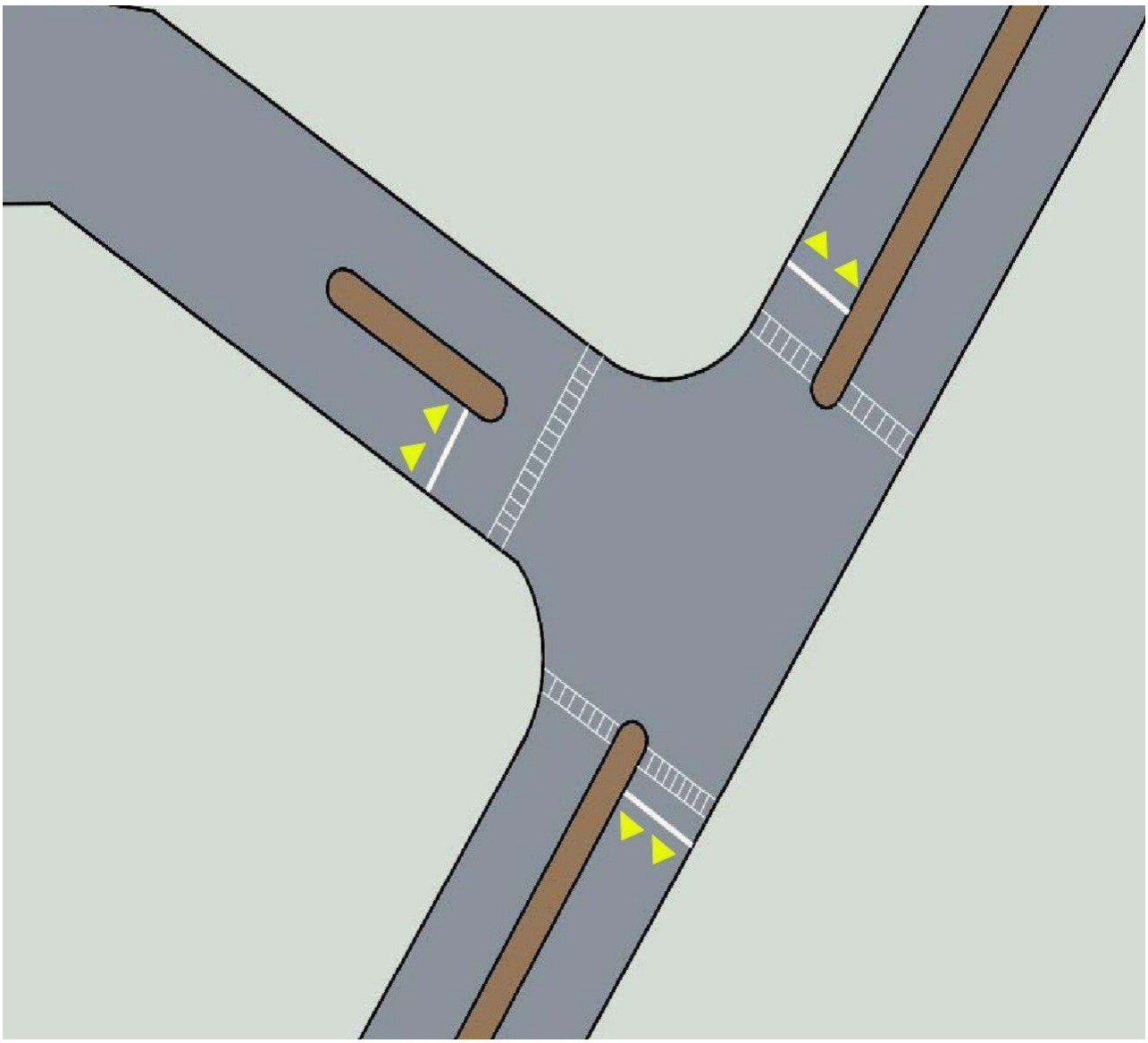

FIGURE 11 Highway 84 and Crossing Lane Intersection Redesign

HOSPITAL NODE

Figure 12 highlights the areas of the hospital node that were evaluated for this section. The highlighted lines represent the 21 different roadway segments that the hospital node was divided into to evaluate the level of service for the roadway, pedestrian, and bicycle facilities for this area. The red circle notated at the intersection of roadway segments 9, 14, and 15 represents the only crosswalk currently placed in the entire hospital node, including the previously described intersection.

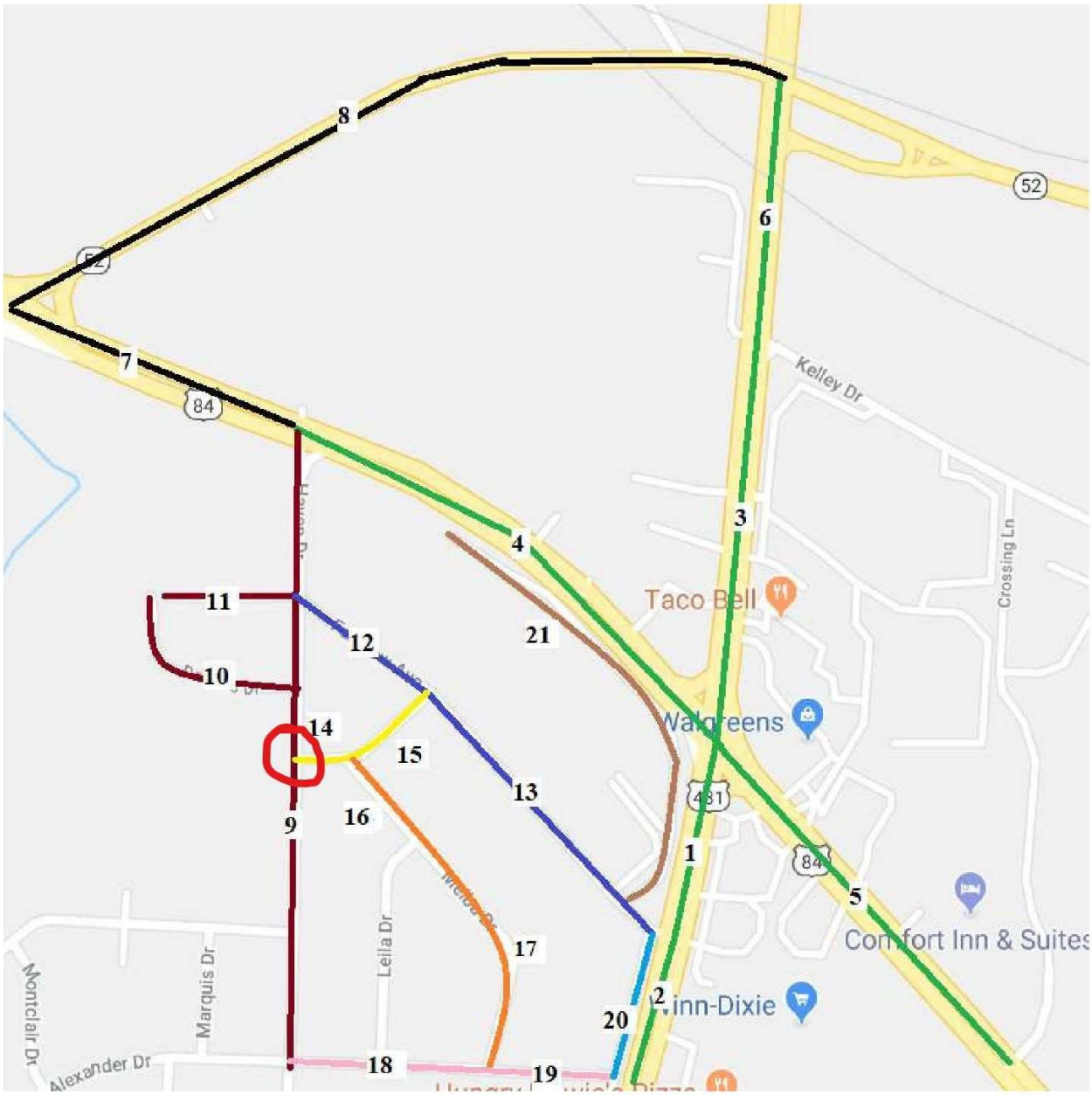

FIGURE 12 Breakdown of the Hospital Node (11)

Summary of Current Conditions

As previously discussed in the summary of current conditions of the intersection, the same evaluation for level of service for the roadway, pedestrian, and bicycle facilities was performed. The level of service determined by the FDOT tables for the intersection, B, was applied for the hospital node (3) . Due to the hospital node overall having a level of service for the roadway of B, reconsideration of the design of the roadway was not investigated since the roadway already has a sufficient level of service.

Dissimilar to the existing conditions for the intersection, the level of service for the pedestrian and bicycle facilities could be evaluated since the speeds within the nodes were approximately 20 to 30 miles per hour. The method used to evaluate the level of service for the pedestrian and bicycle facilities was the Dixon Method (12). The Dixon method uses a point system to evaluate the level of service. The points range from a minimum of zero to a maximum of 21 points. Depending on the amount of points received were associated with a certain grade. The Dixon method uses grades A through F. Similar to roadway level of service, A to C are acceptable grades whereas D through F are not acceptable. The Dixon method considers bicycle/pedestrian facilities currently provided, conflicts, speed, roadway level of service, maintenance, and presence of multi-modal systems. From the analysis performed for the existing conditions it was found that the level of service for both pedestrian and bicycle modes was a D or an average of 9 points. This grade was considered not acceptable and in need of improvement.

Summary of Improved Conditions

Similar to the intersection, a crash modification factor (CMF) was used to improve safety conditions for the roadway. The CMF used within the hospital area was CMF 9017 (8), install advanced yield or stop markings or signs. This CMF has a value of 0.75 which means it improves safety and decreases the chance of vehicle to pedestrian or bicycle to vehicle crashes by 25 percent. The only crosswalk within the hospital node that has this countermeasure already installed is shown in Figure 13. To improve the safety of pedestrians and bicyclists within the area, crosswalks and signage similar to the one in Figure 13 would be mimicked throughout all the intersections that it could possibly be applied to. Examples of types of signage and markings used that apply for this CMF are shown in Figure 4.

FIGURE 13 Example of CMF 9017 Installed within the Hospital Area (1)

As stated above the simplest and most cost effective way of improving the roads was to install signage and pavement markings associated with the applied crash modification factor. Pedestrian improvements were for the most part the same across the board. The road segments next to the hospital mainly needed a few small improvements to increase the safety for the area. Continuous sidewalks on both sides of the roads as well as added vegetation such as trees for shade was needed on most if not all roadways. Six of the road segments needed a posted speed sign. In terms of pedestrian safety and level of service the most pertinent need was crosswalks with advanced yields. Seventeen intersections needed crosswalks with advanced yield or stop markings. Adding bike lanes to the road was not feasible since the roads are already within the minimum lane width state agencies require, so there is no room to add bike lanes. However, on Alexander Drive a bike lane could be added to improve connectivity. In addition to this, adding combined driveways and a speed signage could improve the overall biking level of service.

After applying the CMF, additional posted speed signage, and approximately two miles worth of continuous sidewalks, the level of service for both the pedestrian and bicycle facilities were improved by one letter grade. From the improvements made the new grade for the pedestrian and bicycle modes of transportation was C and an average amount of points of 12. This grade makes the pedestrian and bicycle network for the hospital node within the acceptable limits. Figure 14 is a representation of the crosswalks and sidewalks added to the hospital area.

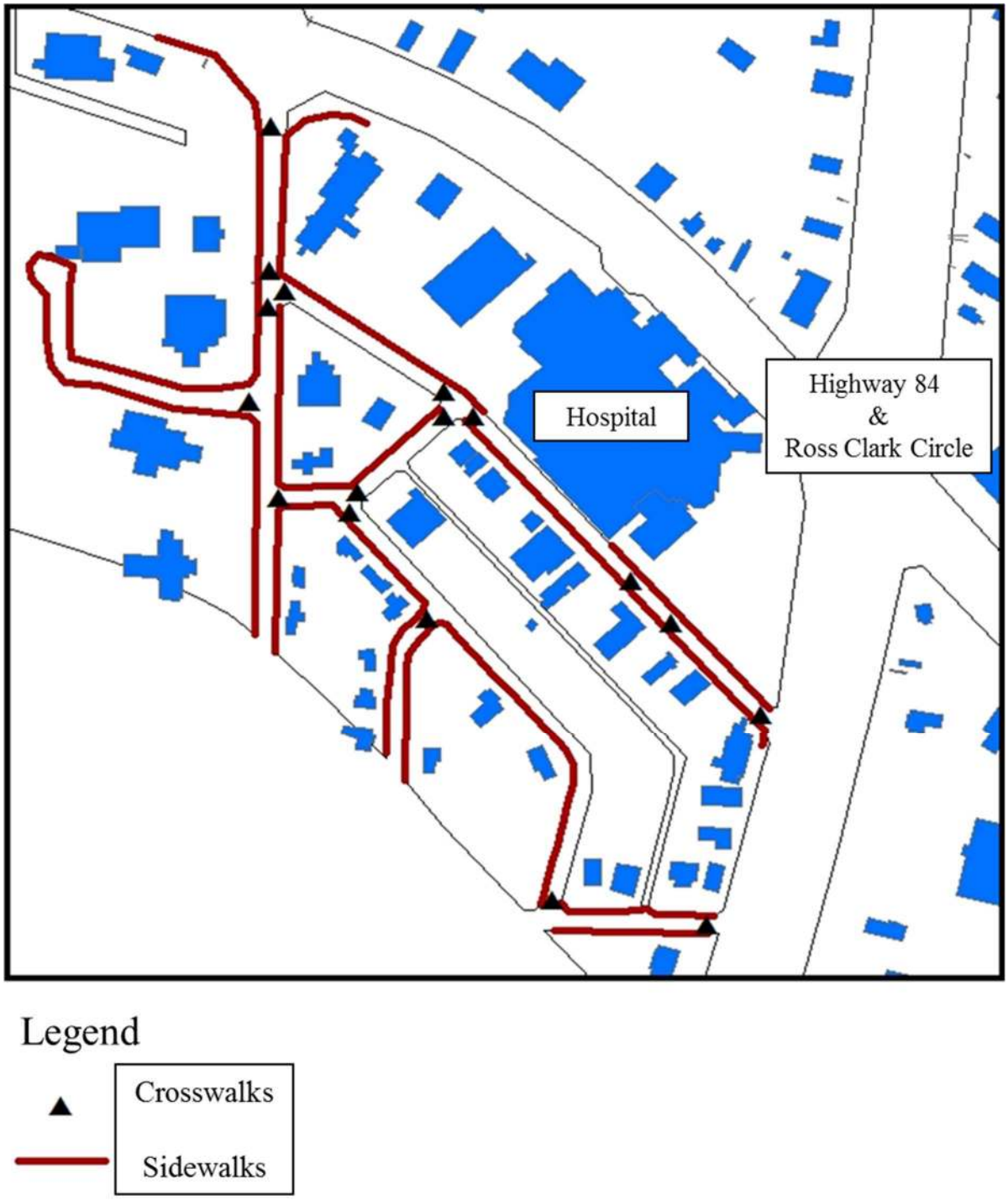

FIGURE 14 Addition of Crosswalks and Sidewalks for Hospital Nodes

CONCLUSION

This report evaluated the hospital node along the four-mile Highway 84 corridor being investigated by the City of Dothan for a multi-model transportation network improvement. This report broke down the hospital node into two sections. One section was the Ross Clark Circle-Highway 84 intersection and the hospital node (the hospital area). Currently, there is an insufficient level of service or quality associated with the pedestrian and bicycling modes of transportation, with a grade of D for the hospital node and nonexistent for the intersection itself. The level of service for the roadway for both the hospital node and intersection was a B, and was not considered for redesign due to its already sufficient level of service.

Using crash modification factors and the Dixon method of evaluating the pedestrian and bicyclist level of service, areas for improvement could be determined. The following report proposed improvements of adding advanced yield or stop markings for pedestrians/bicyclists, advance yield or stop signage for pedestrians/bicyclists, pedestrian/bicyclists hybrid beacons, continuous sidewalks, and an alternative pedestrian/bicyclist route to avoid the heavy traffic intersection for traveling purposes. The advanced yield or stop markings or signage were associated with crash modification factors that prove that it can improve safety and decrease vehicle to pedestrian or bicycle to pedestrian crashes at approximately 57 and 25 percent, respectively.

By adding the previously listed improvements, the pedestrian and bicycle level of service was able to have a passing grade level of C for its multi-modal transportation network. Providing a safe and quality multi-modal transportation network could potentially improve the perception of citizen's ideas of using other modes of transit besides roadways. Proposing these improvements are an initial step in providing sufficient facilities for a multi-modal transportation network. Additional facilities such as urban streets should be considered for the Highway 84 corridor in the future.

REFERENCES

1. **Earth, Google.** [Online] 2018.

2. **Board, Transportation Research.** *Highway Capacity Manual.* Washington D.C : National Research Council, 2010.

3. **Transportation, Florida Department of.** *Generalized Annual Average Daily Volumes for Florida's Urbanized Areas.* 2018.

4. **Transportation, Alabama Department of.** *Alabama Traffic Data.* Montgomery : s.n., 2018.

5. **Board, Transportation Research.** *Making Transportation Tunnels Safe and Secure.* Washington D.C. : The National Academics of Sciences, Engineering, and Medicine, 2006.

6. **AASHTO.** *Highway Safety Manual* . Washington D.C : American Association of State Highway and Transportation Officials, 2010.

7. **Scurry, Karen.** *Introduction to Crash Modification Factors.* s.l. : Federal Highway Administration, 2010.

8. **Clearinghouse, National.** Crash Modification Factors. s.l. : Federal Highway Administration.

9. **Lewiston, City of.** Pedestrian and Bicyclist Countermeasures. Lewiston : Idaho Department of Transportation, 2018.

10. **FHWA.** Manual for Uniform Traffic Control Devices. Washington D.C : Federal Highway Adminstration, 2009.

11. **Maps, Google.** Hospital Node. 2018.

12. *Bicycle and Pedestrian Level of Service Performance Measures and Standards for Congestion Management Systems.* **Dixon, Linda.** s.l. : Transportation Research Board.

Highway 84 Corridor: Connecting Downtown Dothan to Healthcare Node

CPLN 6060: Sustainable Transportation Planning

5/3/18

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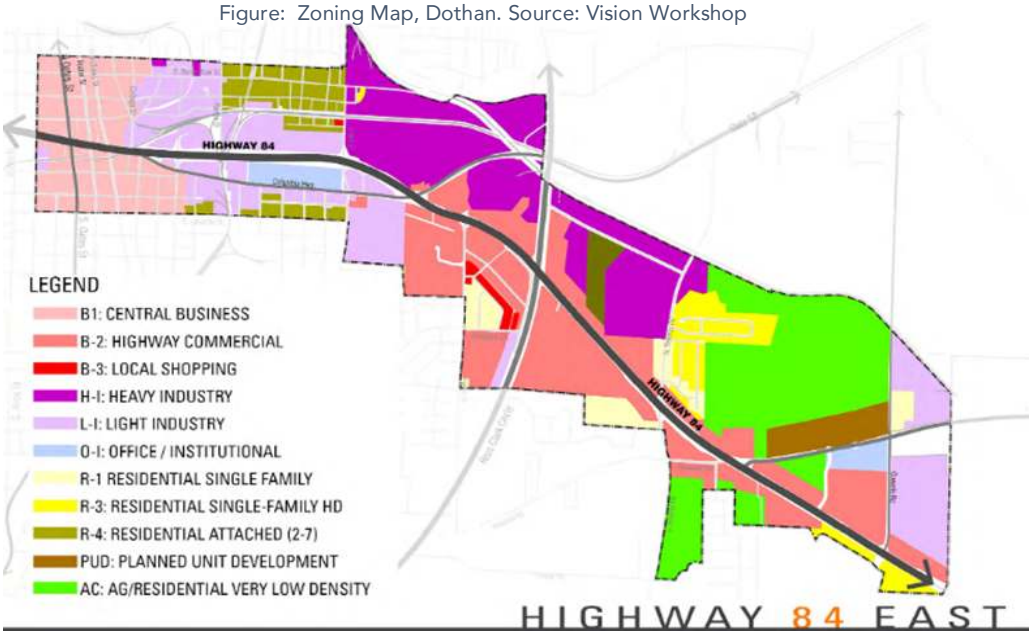
Introduction and Overview

The City of Dothan has a rich history built around agriculture and production industries. Historic downtown Dothan was originally designed with sidewalks, bike parking, street parking and other pedestrian facilities. As the city grew and automobiles became the popular means of travel, pedestrian access decreased. Now that Dothan has a booming healthcare market with a premiere hospital and new medical campus, the city has a new vision and is looking to modify its economic base with modern urban facility developments. The focus of this plan is redeveloping Highway 84 and the surrounding area to tackle the city's need to protect and promote cyclists as a mode of transport, increase community walkability, and spark new economic development. This team of students has identified six key points for redesign of this section. General practices for enhancing downtown Dothan, how to connect and open up the area using Columbia Highway, creating new city centers, changing the focus of Highway 84, and increasing community connectivity.

Zoning and Policy

Central to this team's recommendations are zoning and policy implementations that would have major and long lasting positive effects on Dothan City. Primarily, our team noted a significant amount of light and heavy industry along the corridor. It is our belief that changing this to Central Business District or Office/Institutional may be favorable for the improvement plan. New uses may also include small markets, bakeries, florists, coffee shops, or sit-down restaurants. In commercial districts, it is important to provide enough parking for bicycles at shopping centers, office parks, and in parking garages for people to use when running errands and commuting. So, the volume and placement of bicycle parking should be codified to ensure that it is secure and accessible to cyclists. Planning codes can be created to support walking and biking in the city without affecting existing budgets. Although there are federal and state programs to assist with the construction of bike facilities or sidewalks, receiving that funding may only come after facilities have been implemented. If municipal codes reflect the desire of a community for these facilities to be provided, developers will not resist requirements such as providing bike parking and maintaining sidewalks to walkability standards.

Figure: Zoning Map, Dothan. Source: Vision Workshop



Downtown Dothan Improvements

Encouraging bicycle and foot traffic saves residents and visitors money they would otherwise spend on fuel, reduces greenhouse gas emissions, and makes the city more attractive to young professionals. This team has identified three major ways of improving the downtown area. Adding "sharrows" for cyclists safety, road diets to put the spread the focus of the area, and redesigning intersections for all modes.

Adding Shared Lane Markings (SLM) and bike lanes throughout downtown: SLM, or "sharrows," can be used to signify a shared lane environment for bicycles and automobiles. Shared lane markings help to reinforce the legitimacy of bicycle traffic on the street and recommend proper bicyclist positioning while providing directionality for the cyclist to identify their safest route.

Figure: Shared Bike lanes, Source: NATCO guide

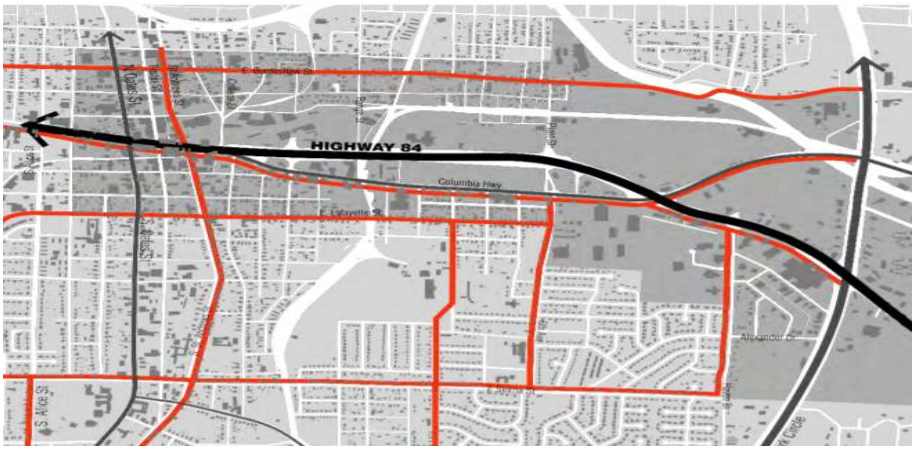
Road diets on crossroads: The biggest danger to pedestrians and bicyclists is speeding cars. The threat of a fatal pedestrian crash increases exponentially as speed increases above 20 mph. The most successful walkability improvement is one that slows cars down. To increase safety for the pedestrian and bike users, road diets can be install on the crossroads. Road diets can include- removing lanes, narrowing lanes, putting on-street parking back in place. More significant Road Diets involve moving the curb to expand the space for pedestrians.

Figure: Road Diet Example, Source: City of Charlotte

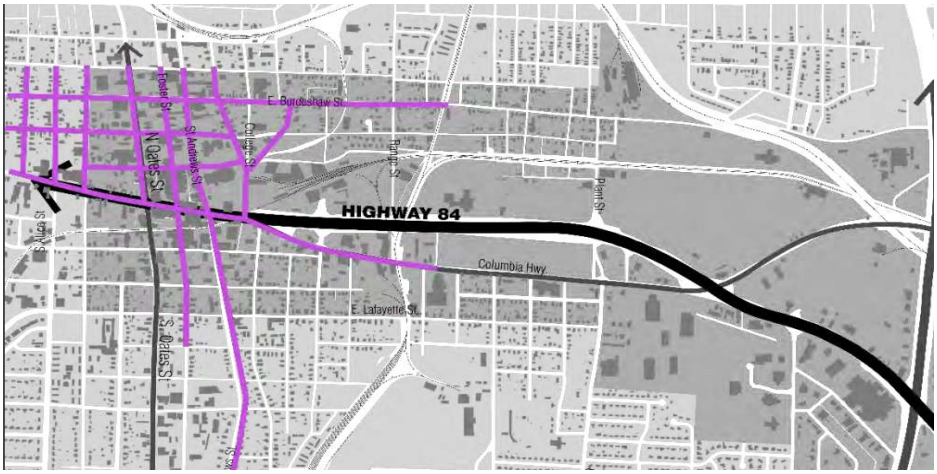
Intersection upgrades: To ensure safety for the pedestrian, increased parallel bar crosswalks and pedestrian-actuated warning signs can be installed. Parallel bars are more visible to drivers and user-actuated flashing yield signs are efficient ways to prioritize the pedestrian.

Figure: Parallel bar crosswalk with pedestrian-actuated signaling, Source: NATCO guide

Existing Facilities



City of Dothan's proposed new bike lanes (source: Vision workshop, Dothan)



City of Dothan's existing pedestrian network (source: Vision workshop, Dothan)

The above two figures depict the existing pedestrian network and proposed new bike lanes of the city of Dothan's. The city of Dothan has no biking facility at any of these two key nodes. The calculated level of service for the biking facility in the downtown is E marking that there is a need for the incorporation of bike lanes and "sharrows" in the downtown. The calculated level of service for pedestrians is C, and can be improved by incorporating facilities such as street trees, lighting facilities, minimum sidewalk widths as per ADA requirements, vegetative buffers, benches, and multi modal support. As Dixon method had been used for the LOS calculations of biking and pedestrian, it is our team's prediction that the addition of these facilities in the existing pedestrian network can increase the LOS from C to A in the downtown.

City of Dothan's key roads (source: Vision workshop, Dothan)

- Downtown area is concentrated with many commercial and building footprints.
- Observed speed is 40 mph and 75 ft ROW with 2 lanes in each direction
- LOS calculated for pedestrians in downtown is C
- LOS calculated for cyclists is E

In the above figure, the red dotted line represents Oates street which intersects Highway 84. It has many commercial complexes with a strong need for biking facilities.

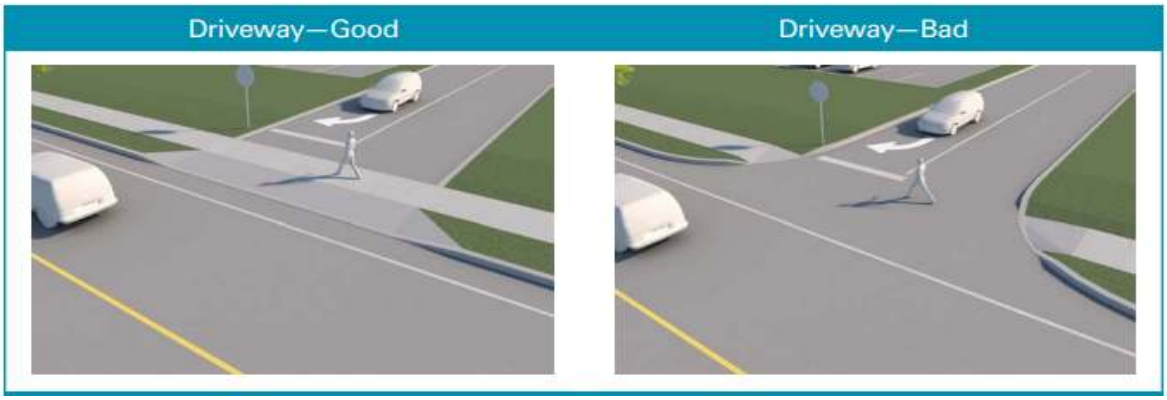
Source: Google maps

In the above figure it can be observed that Oates street in the downtown has 4 lanes, with two lanes in each direction with a center two-way left turn lanes and sidewalks on both sides of the street with no biking facility. A road diet can be incorporated in this street decreasing four lanes to two and a biking facility with sidewalks on both sides. This is a key step in encouraging cycling as a mode of transport throughout the city due to the street's significance as a commercial center and major intersection with Highway 84. Similarly, there is a need for the incorporation of bike facilities and improved sidewalks on other streets of the downtown like Alice, Lena, and Adams streets.

source: Google maps

The above figure represents the Burdeshaw street in the downtown, which does not have minimum sidewalk width and a bad drive way design with no proper access management. There is a need for minimum sidewalk widths as per ADA requirements. ADA standards specify a minimum of a 5-foot clear path width to accommodate two wheelchairs passing each other. It not only provides more accessibility, but also creates a comfortable environment for pedestrians to walk side-by- side, pass each other, and for families with strollers. In order to accommodate the foot traffic of increasing the pedestrian network, the sidewalks should be constructed as wide as possible in improving pedestrian comfort within

the transportation right of way. The sidewalk width should support existing surrounding streets, land uses, and current and future pedestrian demand. Generally, downtown and commercial areas require and also benefit from wider sidewalks.



source: http://njbikeped.org/wp-content/uploads/2017/05/Complete-Streets-Design-Guide.pdf

The above figure represents an example of good and bad driveway. The bad driveway does not have a continuous sidewalk and causes disturbance to the pedestrians with conflicts of the moving vehicles along the driveway. Driveways should be designed for continuous and level pedestrian passage to increase visibility of pedestrians and encourage drivers to stop for pedestrians on the sidewalk. In a proper driveway design, drivers must yield to pedestrians. In places of intersections and crossings, where pedestrians must interact with motor vehicles, the design should have a pedestrian right-of-way that is clear and obvious to motorists.

Columbia Highway – Complete Street Transformation

source: Google maps

One of our main strategies to increase the attraction to the area was to turn Columbia Highway into a complete street. It is important to note that at the Dothan City Meetings many people reported that they did not feel comfortable with the idea of walking or biking near the highway. So in addition to the Highway 84 road diet, we also are proposing this change to Columbia highway as a means to provide citizens an optional route designed with all modes of traffic in mind that could also bring business to yet another part of Dothan, very close to downtown.

source: Google maps

Columbia Highway is the perfect candidate for a road diet and complete street improvements. The road has been overdesigned in the past, with no continuous sidewalks. Some of the changes that can be made include:

- Beautifying and adding facilities to Dothan City Cemetery to create a park/public space
- Establish a Road Diet down to 2, 10' lanes with a paved median.
- Establish multi-use lane for pedestrian and bicyclers with a median or buffers between the two for safety
- Utilizing pervious pavement and pervious landscaping strips
- Addition of pedestrian-actuated parallel bar crosswalks
- Improved landscaping along highway such as native vegetation for water retention and drainage
- Inearth utilities to limit crossovers

Source: NACTO Urban Design Guide

Before

After

Sources: Map data- Google, Rendering- Kimberly Hooper

Rail Line Access

The rail line that runs through downtown imposes traffic and pedestrian limitations. A public-private partnership between the city and rail line owner could transform the access into downtown from the north and south of Highway 84. The rail line runs near and between many historic buildings. Within the area of focus, the historic hardware store has been renovated. The pedestrian connection from downtown to Columbia would allow bikes and people to move along the redesigned Columbia Highway

and into a new entertainment area of downtown. Additionally, there are a couple bars and a jazz club along the rail line. There is an open space behind the Jazz club that could be converted into an entertainment courtyard. The courtyard should be a well-lit area with adequate seating and connection to new and existing buildings. The development of a pedestrian courtyard would encourage new businesses to redevelop the area with more entertainment options while being an attraction to younger populations in and of itself.

Map data: Google

Dothan City Cemetery

Map data: Google

Dothan city cemetery is nearly 30 acres of history within an already historic city center. Cemeteries, before given the creepy association they now carry, were used as "parks" before parks were even considered the public necessity they are today. This is why our team proposes reclaiming this nearly untouched area as a new city center. Gentle maintenance of the existing prolific pathways and simple infrastructure improvements as funding allows, would create a beautiful public space for families, biking, picnics, and even small performances.

Looking at several cities and cemeteries with park like uses, our team has identified simple improvements that can recreate this entire area. Considering the complete street improvements recommended for the area, things such as adding trees, edible landscaping, benches, water sources, and pet facilities can greatly change the feeling about the area and how citizens will use it. This is in line with recreating this area to encourage walking and biking within and to the area. Examples this team recommends reviewing for policy and aesthetic suggestions include the Oakland cemetery in Atlanta, Georgia and the Congressional Cemetery in Washington DC. Oakland was reviewed due to cultural similarities between the cities of Dothan and Atlanta and the Congressional Cemetery was chosen as an example due to its openness to pets and families despite the significance of its use.

Highway 84 Road Diet

Highway 84, Map data: Google

The current Highway 84 goes from six to four lanes. The wide and openness of the road encourages vehicles to travel at higher speeds which significantly decreases pedestrian and bike safety. Considering this and the known average daily traffic falling below the threshold of 25,000 vehicles a day,

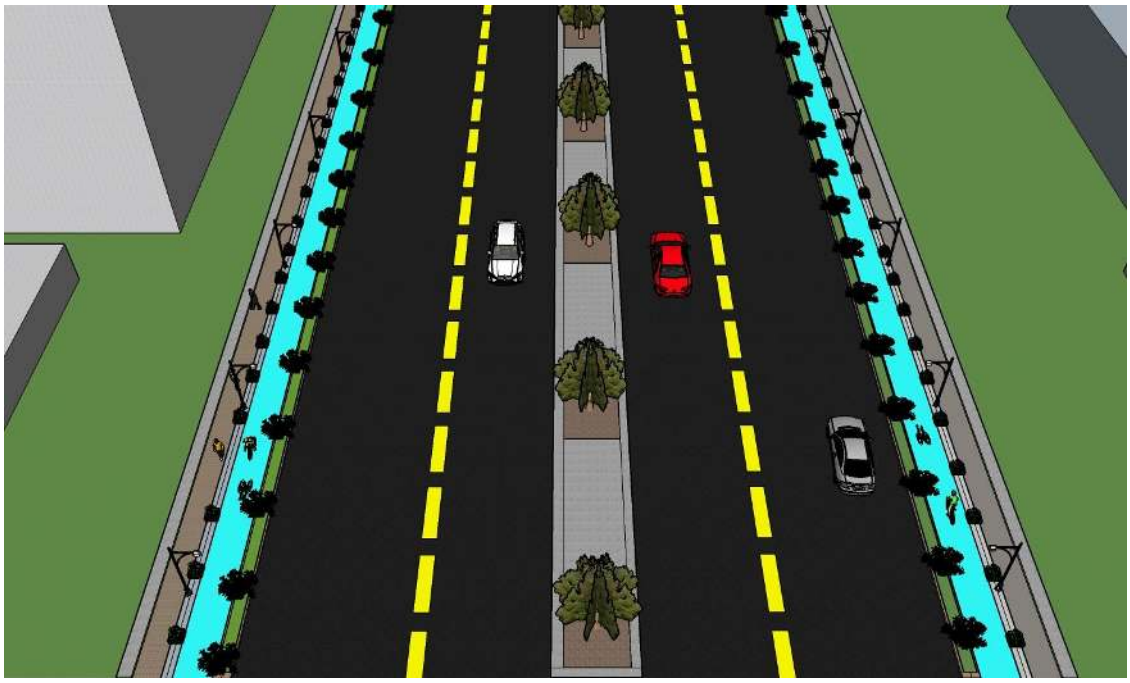
Hwy 84 is a good candidate for a road diet. A road diet is a technique in transportation planning whereby the number of travel lanes and effective width of road is reduced in order to achieve systemic improvements. Benefits that would be see from implementing a road diet here include:

- Lower and more consistent vehicle speeds. By reducing the number of lanes and their width, the observed vehicle speeds have been seen to decrease.
- Reduced crash rates.
- Increased consideration shown for safety of other modes. The largest factor in pedestrian and bike safety is vehicle speed with fatalities increasing with speed.
- Reduces pedestrian crossing distances.
- Provide space for other modes of travel with the addition of bicycle lanes or sharrows and a sidewalk on both sides of the highway.

Map data: Google

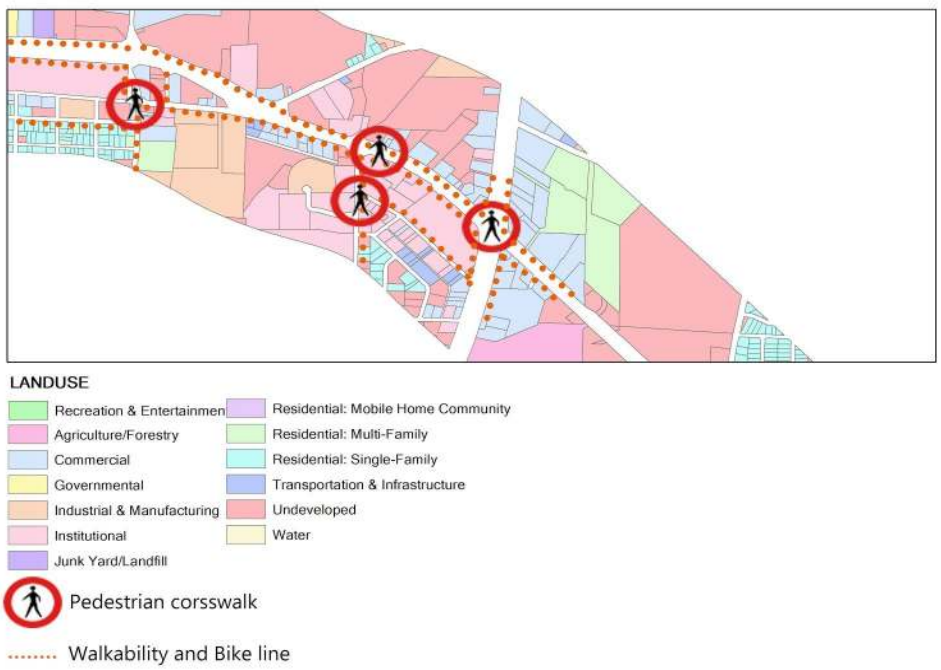
The northside of Highway 84 is the most important channel into downtown, but it is without any landscape design and many above ground power lines are along the roadsides. Therefore, in addition to the road diet, improvements could be found from:

- Signifying pedestrian and bike areas with divided landscaping.
- Adding landscape to the median of Highway 84. The current highway 84 is without any landscape, and the median is very open for waste water or aesthetic landscaping.
- Remove the above ground utilities and build street light facilities that are pedestrian and bike minded.



Future vision of Highway 84 after road diet

Increasing Walkability



There is currently a lack of pedestrian facilities in this area, giving priority to cars rather than pedestrians. After a field trip, it was discovered that there were many pedestrians entering and passing around the hospital, especially between the hospital and extra parking lots. However, there were not many pedestrian facilities in the entire area. Pedestrians' safety and convenience are often out of the pedestrians' control, so increasing the frequency of parallel striped crosswalks gives visual priority and

increased access to the pedestrian. Increasing walkability generally decreases commuter and non-commuter trips which makes the roads safer for pedestrians and cyclists. Lastly, connecting neighborhoods and cul-de-sacs with cut-through trails for pedestrians and bikes are a new and innovative way of decreasing intrazonal trips.

Highway 84 Corridor: Hospital Node to Medical College

CPLN 6060: Sustainable Transportation Planning

Submitted to:

Sweta Byahut

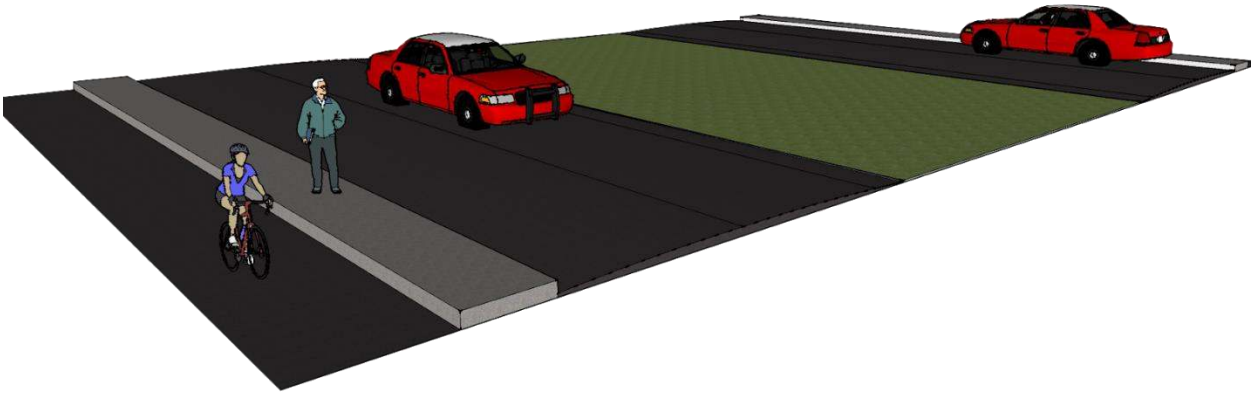
Submitted by:

Katie Bero
Renae Burton
Daniel Butler
David Dixon
James Djamba
Mitch Moody

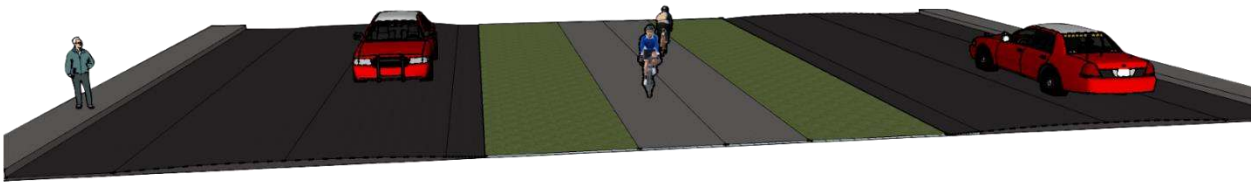
Our group looked at the section of Highway 84 between the hospital node and the medical college node. This area starts at the Ross Clark Cir. intersection and ends at the Cowarts Rd. intersection. This area is about a 2 mile stretch. A lot of the area we focused on is zoned as single-family residential, agriculture conservation, and highway commercial. Highway commercial refers to major retail and services that serve residents, non-residents, and transient traffic (Planning Department, 86). This transient role of our section, is easily seen as it goes from rural sprawl characteristics to more urban traits from the college to the hospital.

This section of Highway 84, or E. Main St., has a lot housing of and education institutes that uses this road at least 5 days a week. The goal of this project is to create a complete street that provides infrastructure for pedestrians and bikers, which currently do not exist on the highway. We believe that a complete street would benefit the families and college students who live along E. Main St. as well as the overall city of Dothan. With traffic passing by our study area and trips starting from the suburbs with in it, we came up with two proposed street designs that are comprised of bike lanes and sidewalks accompanying the already existing vehicle lanes. Both designs strive to have four lanes of traffic dedicated to automobiles, which is the current conditions in a lot of the area, except for the existing turning lanes. These lanes would each be 10 feet wide.

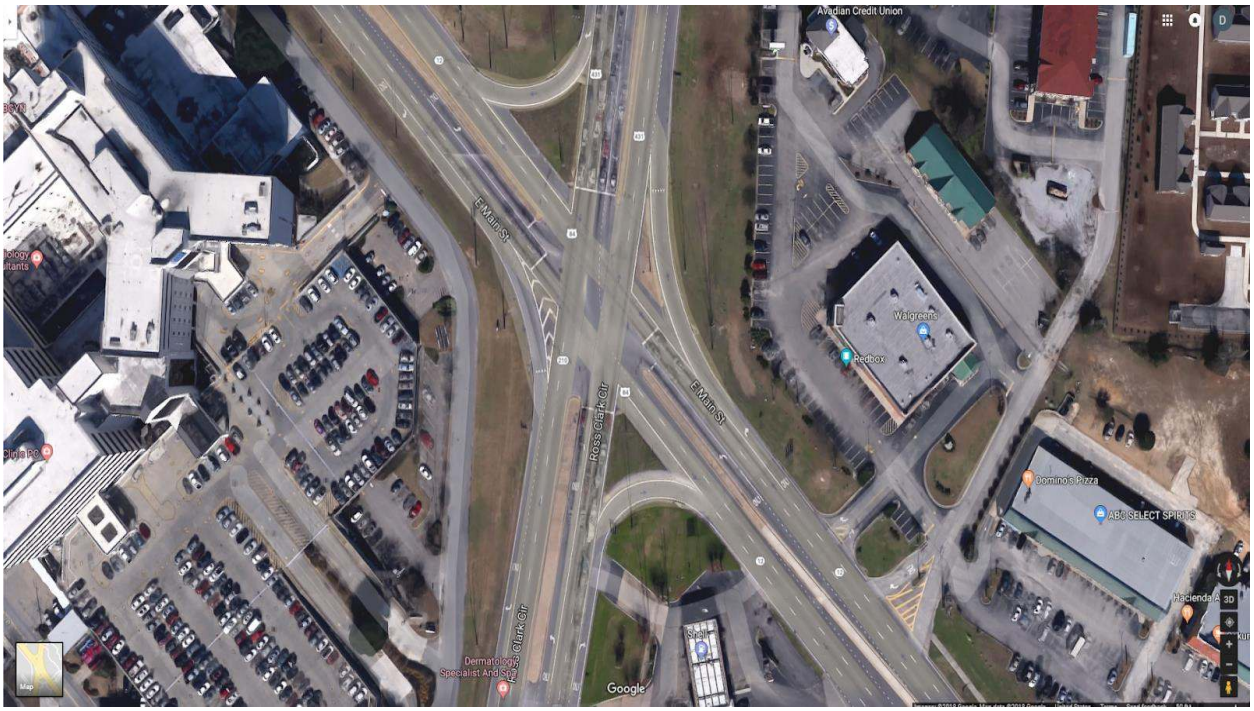
The difference between the two design ideas is the location of the bike lanes. When looking at the current conditions of our section there are areas of conflict or interference between cyclists and drivers. These potential points are the intersecting roads that feed into E. Main St. and the center of the intersections. The two designs look at where interaction between the two modes of transportation would interfere. The first design has bike lanes on the outsides of the roads with elevated sidewalks serving as buffers. This design is different since it puts pedestrians closer to vehicles, but there is a potential benefit to this as the elevated divide would be safe and the buffer dividing cars and bicycles would also serve an additional purpose besides being a barrier. This idea was inspired by bike buffers that are used to provide space between drivers who are exiting their vehicles and cyclists passing by.



The second idea would be to have the bike lane located in the center of the median, which is pictured on the next page. The idea behind this is that cyclists would only have to interact when they get on and off E. Main St. The idea is that if most of the conflicts appear at the intersecting roads feeding into HWY 84, than we should reduce the cyclist's interaction at this point. This would mean that they would only interact at these intersecting roads when they want to get on an off the bike lane. This would also be beneficial since cyclists would not have to deal with crossing traffic going in both directions if they were to make a left turn.



The intersection pictured on the below is the Ross Clark Circle and East Main Street intersection. Being next to a hospital, it is crucial that this intersection, along with the rest of our study area, to be accessible for not only motorists, but also pedestrians and cyclists. Along with the proposed bicycle lanes mentioned in this report, there should intersection crossing markers with dotted lines and colored conflict areas. Colored pavement within a bicycle lane increases the visibility of the facility, identifies potential areas of conflict, and reinforces priority to bicyclists in conflict areas and in areas with pressure for illegal parking. Consistent application of color across a bikeway corridor is important to promote clear understanding for all users.



Above is a rendering of a possible design from NACTO that could be applied to intersections within the city of Dothan

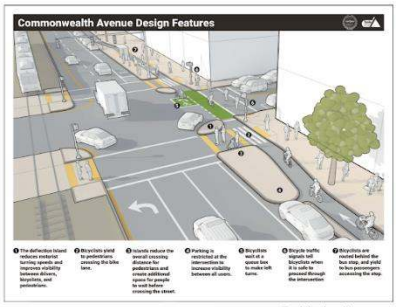
Drivers in the Dothan area are likely to be inexperienced with cyclists and pedestrians so we have prioritized the safety of these crossings The crossing contains a raised crossing platform to slow down approaching traffic and would be placed before the point where North Beverly produces turning lanes, in order to ease crossing of the road and prevent accidents caused by those using the turning lanes. The next page shows examples of the raised platform crossing.

The bike crossing at the intersection of Beverly Road and US-84 is designed in a function similar to a railway crossing.

A red light is placed either above each crossing, or on a signpost in front of the crossing that flashes red when activated indicating for drivers to stop before the raised crossing, these lights can only be activated by cyclists. The light should be timed with the light at the intersection so when the flashing light stops the intersection light turns green, and the flashing light only begins when the intersection light has turned red. First the flashing light should turn on, then the light farthest away from the intersection should turn yellow, then red, the light closest to the flashing light should turn yellow to red a little after the first light in order to move people off of the cross walk. After a few seconds then the cross walk should turn on.

After a crossing period the intersection light should stay green for several additional seconds in order to move traffic that is set back from the intersection because of the crossing. Several meters before each crossing a sign should be placed warning drivers of crossing cyclist and to stop when light is flashing, a stop when flashing sign should also be placed next to the raised intersection as well as a sign that indicates drivers should not block the crossing.

Below is map of the two proposed bike lanes that run along Main Street. The green line signifies a route that would run the shoulder of Main street and up Cowarts road to the Medical Campus. The red line signifies a route that would run in the middle of Main street, incorporated into a median for added protection. There are pros and cons to both proposed routes, the red offer s nice safety buffer for cyclists but at an added cost to the city, the green route is much simpler to implement but is less safe than the other. Also, there is some images from around the country to show what each option would look like after implementation.



Tool Design Group

Bike Portland

Features such as rain gardens and bios wales incorporated into the medians of Highway 84 would help control storm water runoff, erosion, and flooding.

Above is an example of a Bios wales, this one in Detroit, Michigan have been successfully integrated as a storm-water caused wastewater overflow. Not only are they attractive, but they also protect nearby wetlands from possible contamination.

These areas can be as high or low maintenance as you wish. This landscaped bios wale from Davis, California is a good example of a higher maintenance option.

An example of a low maintenance is this wildflower option as seen at the Huntsville Botanical Gardens in Huntsville, Alabama.

In looking at the city of Dothan, any of the various options presented can create a more mobile city and therefore increasing the

Sources

"Bios wale in Detroit, MI." Inframanage, Inframanage.com, 7 July 2015

"Bios wale in David, CA." Alliance for Community Trees, Arbor Day Foundation, 2 Jan. 2018.

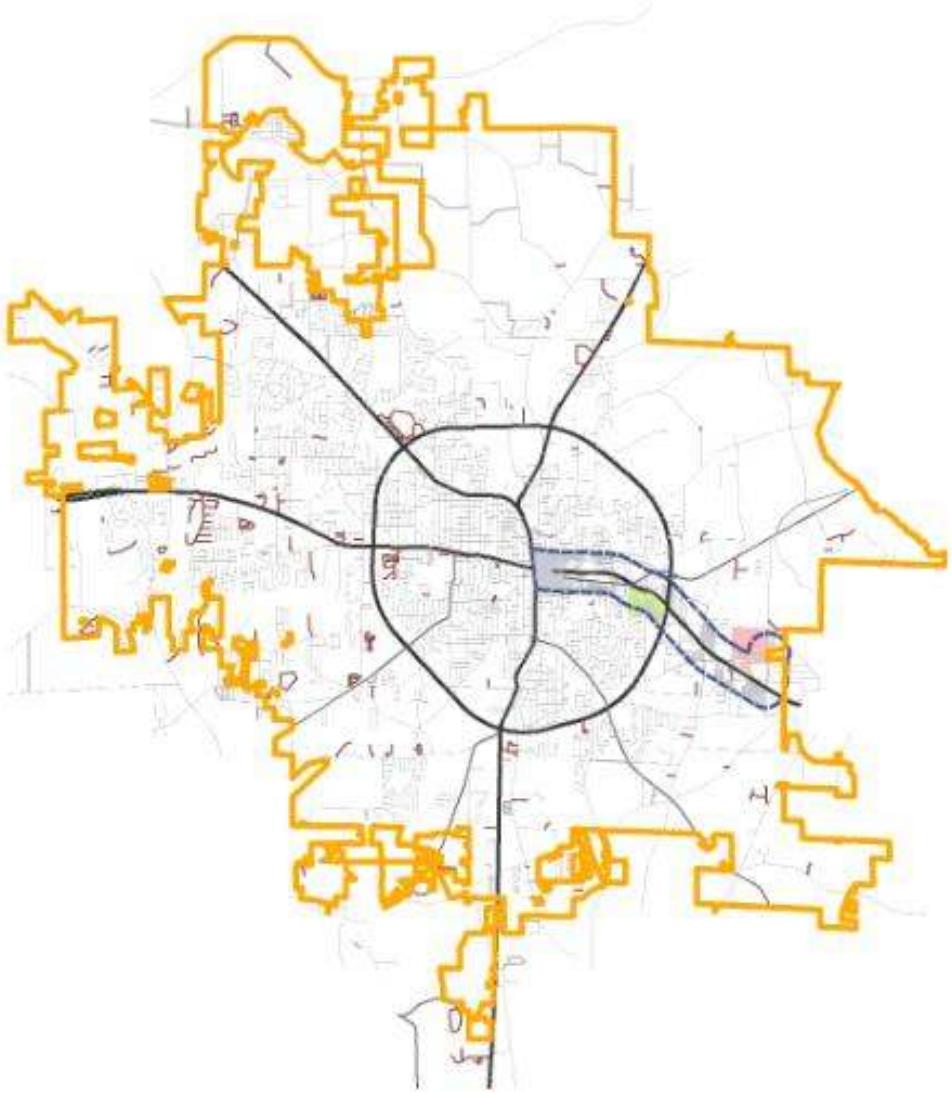
"Common Wealth Avenue Design Features." BOSTON TO IMPLEMENT TOOLE DESIGN GROUP'S PROTECTED BIKE LANE DESIGN, Toole Design Group, 2015, www.tooledesign.com/resources/news/boston-implement-toole-design-groups-protected-bike-lane-design.

Maus, Jonathan. Queens Plaza North. Portland, 12 June 2013.

Ink, Social. "Urban Bikeway Design Guide." National Association of City Transportation Officials, nacto.org/publication/urban-bikeway-design-guide/.

Ink, Social. "Urban Street Design Guide." National Association of City Transportation Officials, nacto.org/publication/urban-street-design-guide/.

"Raised Pedestrian Crossings." Pedestrian Safety Guide and Countermeasure Selection System, www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=7.



Existing Conditions

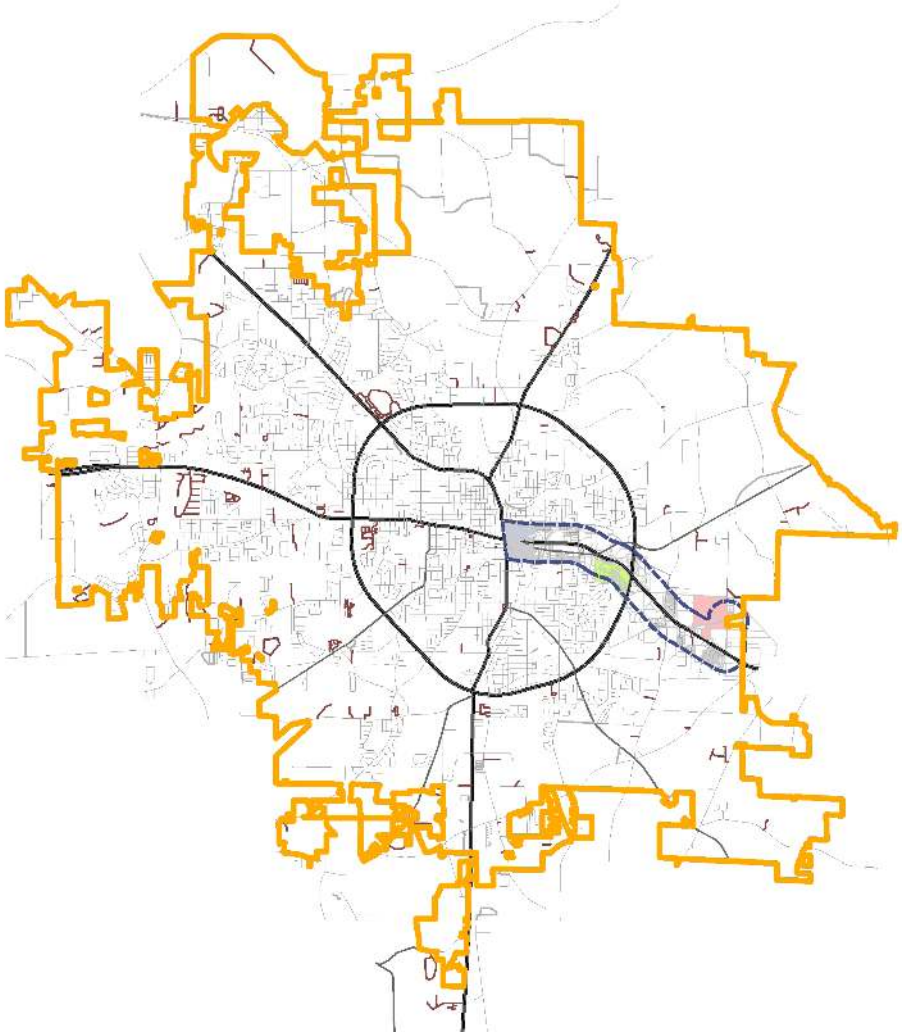
- GIS Mapping and Land Use Analysis
- Transportation Analysis
- Photo-Documentation and Site Analysis
- Parking Utilization
- Review of Plans and Policies

GIS Mapping and Land Use Analysis

HWY 84 E. Corridor Improvement Plan, AL

CPLN 6060: Sustainable Transportation

Master of Community Planning Program, Auburn University

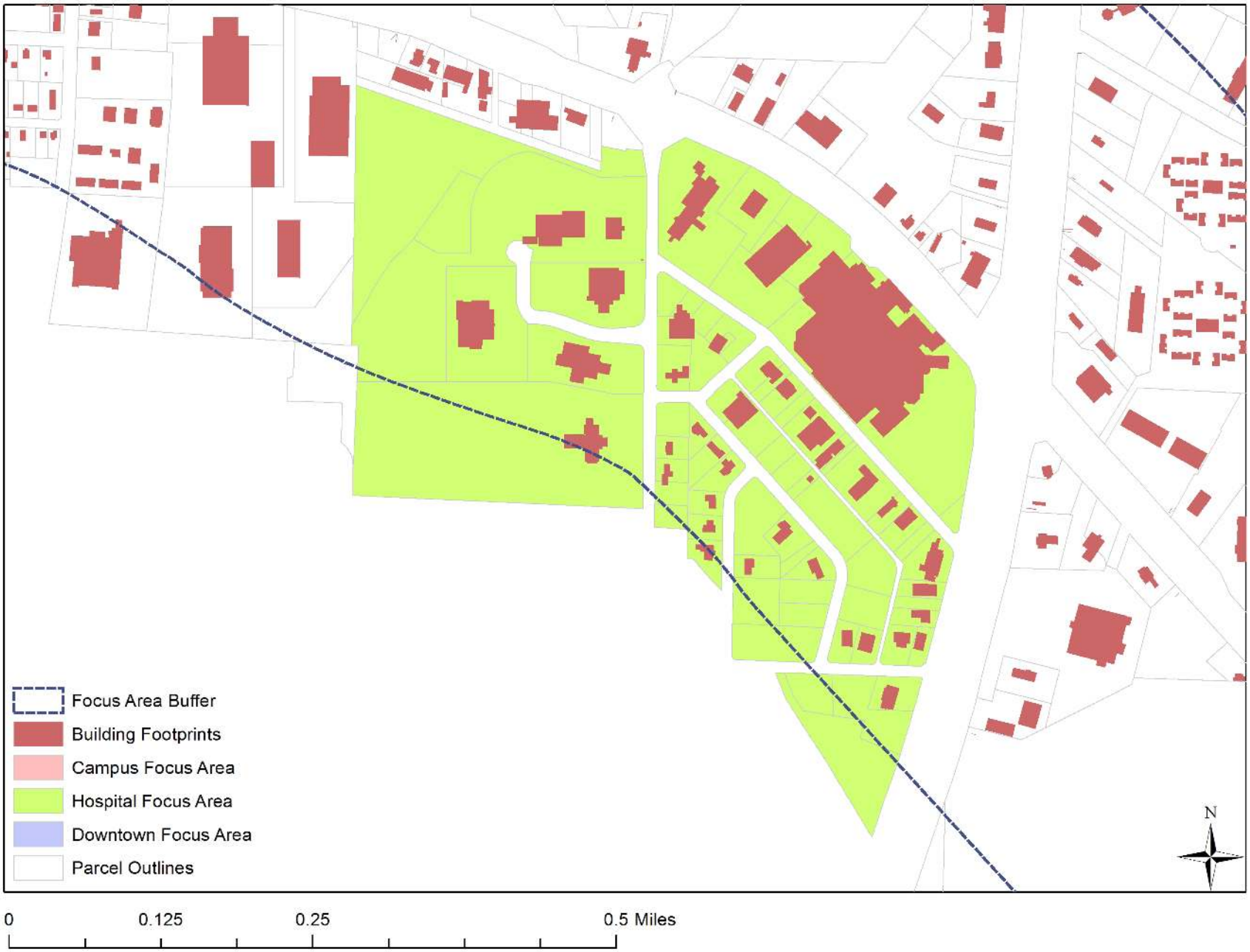


Team: DeAndra Navratil, Xueken Chen, Jaspuneet Kaaur, Yuying Huang, Kyle Jackson

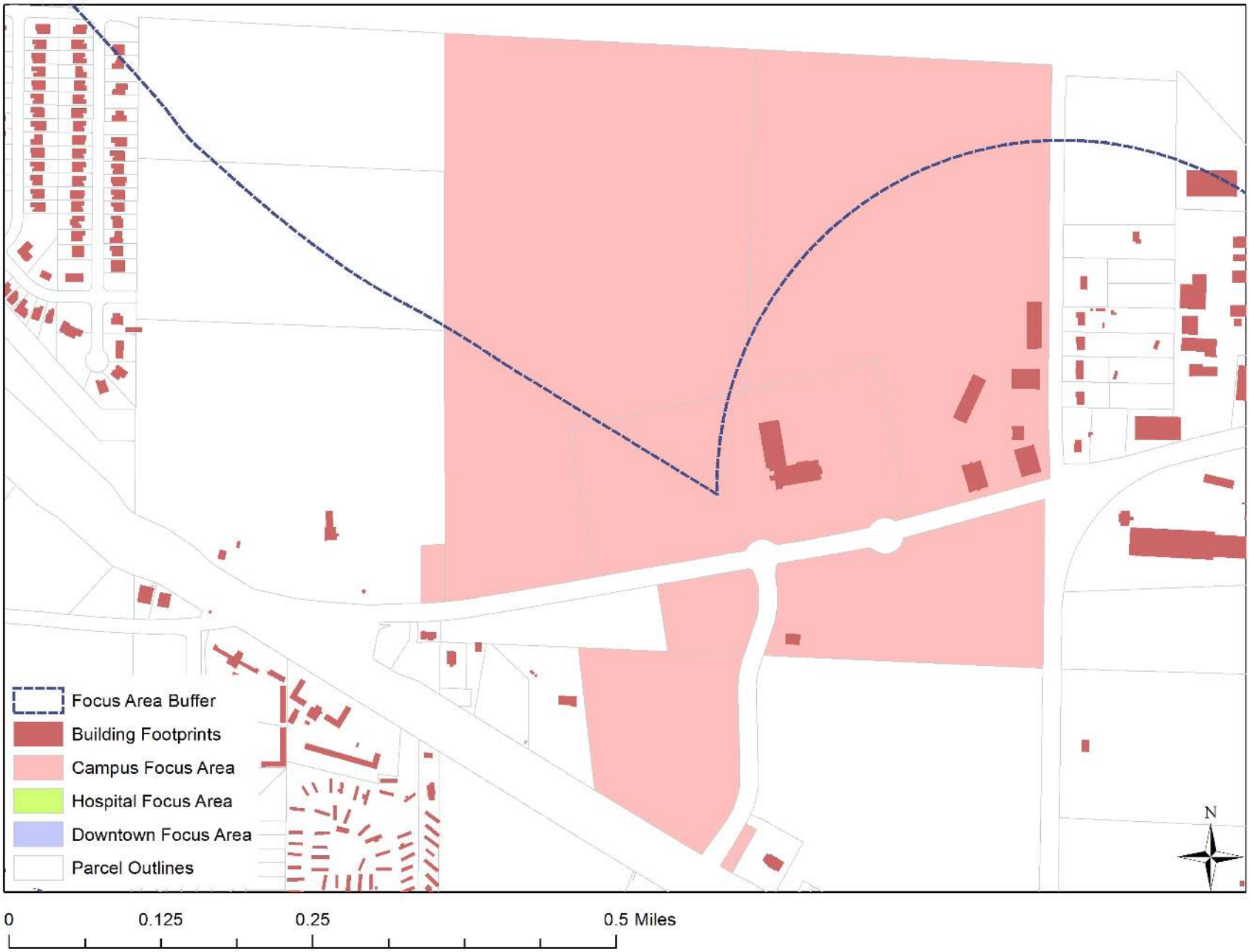
1. Base Map - Hwy 84 E. Corridor and Focus Areas

2. Downtown Focus Area

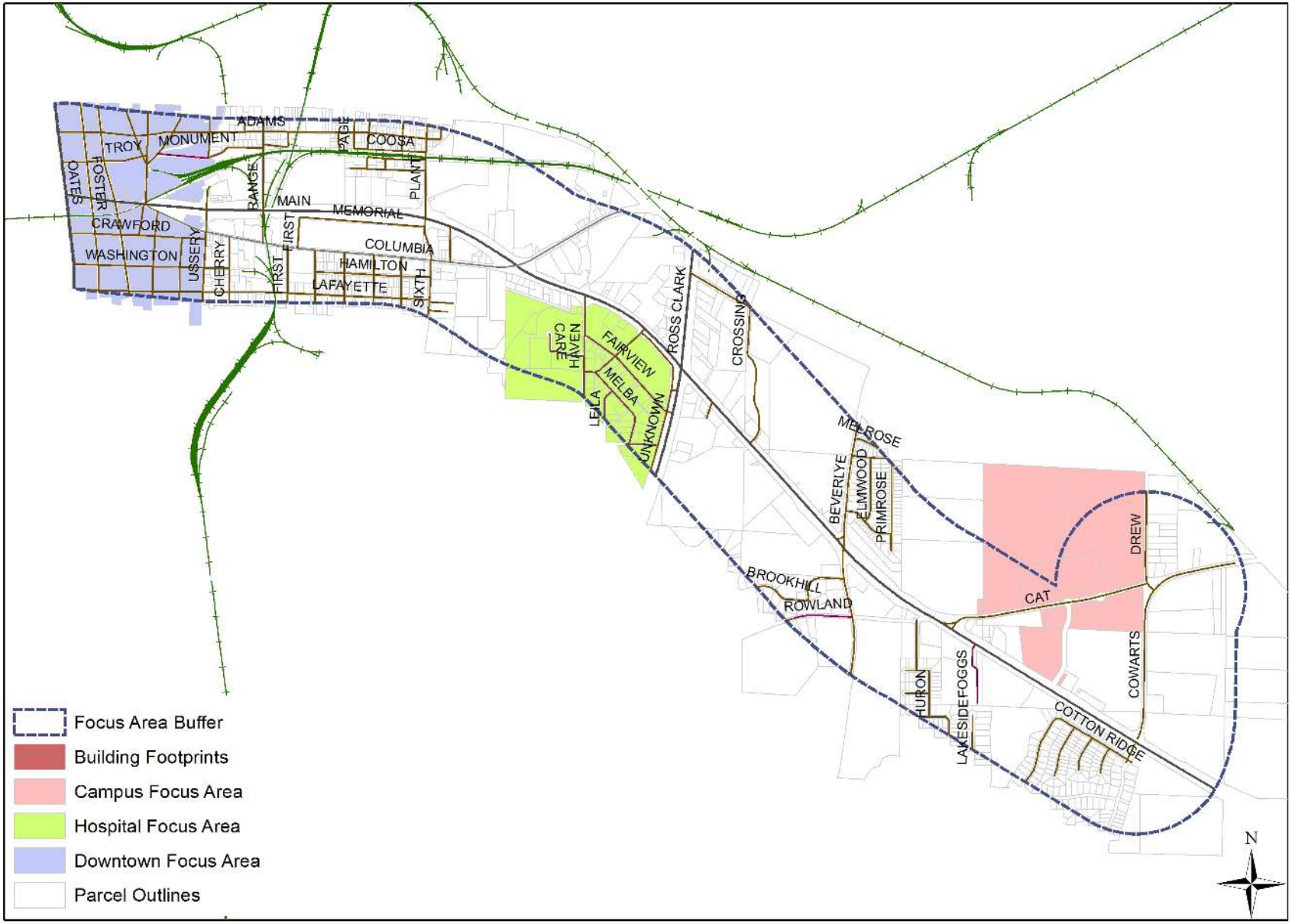
3. Hospital Focus Area



4. Campus Focus Area



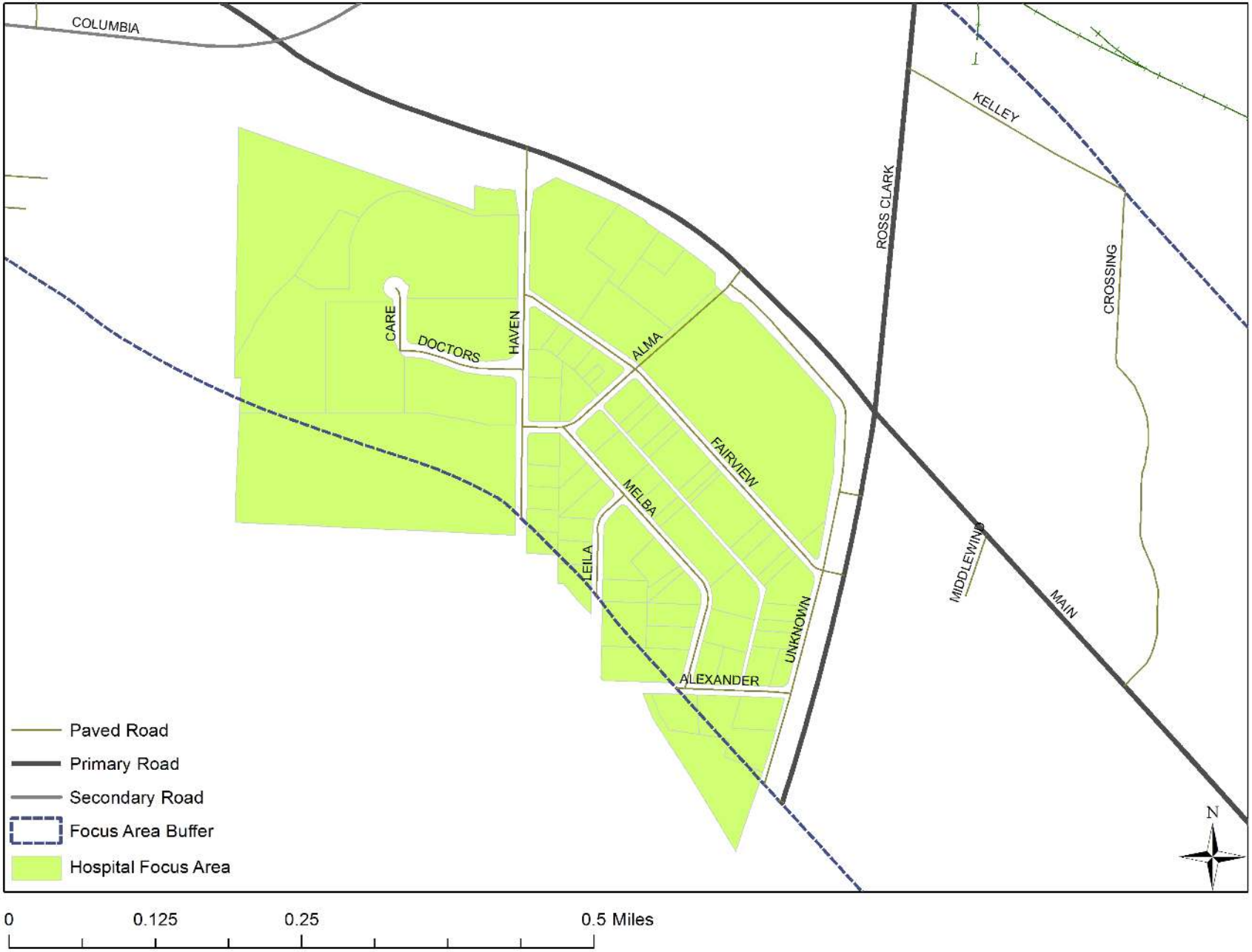
5. Corridor Road Network Hierarchy



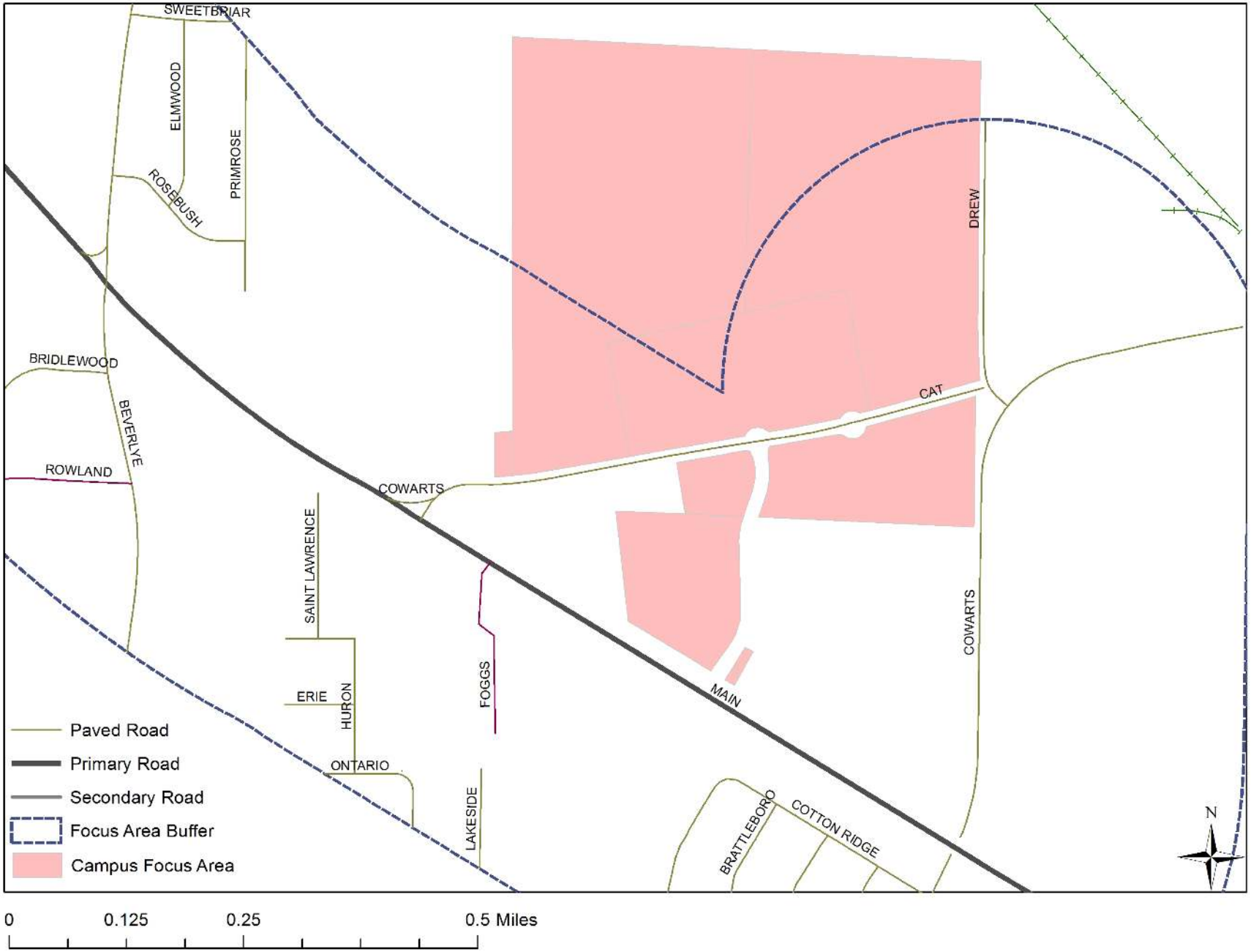
0 0.25 0.5 1 Miles

6. Downtown Road Network Hierarchy

7. Hospital Road Network Hierarchy

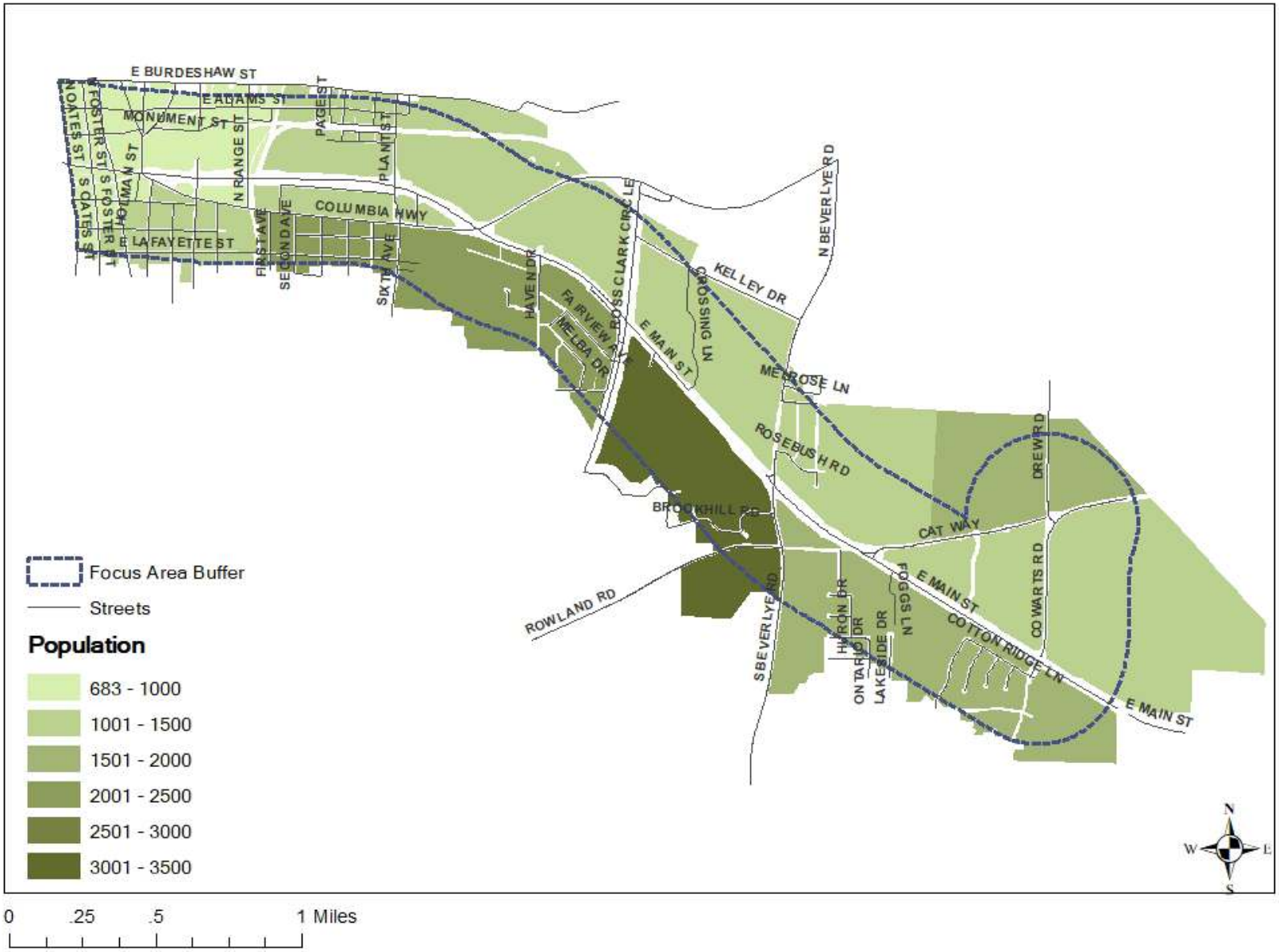


8. Campus Road Network Hierarchy

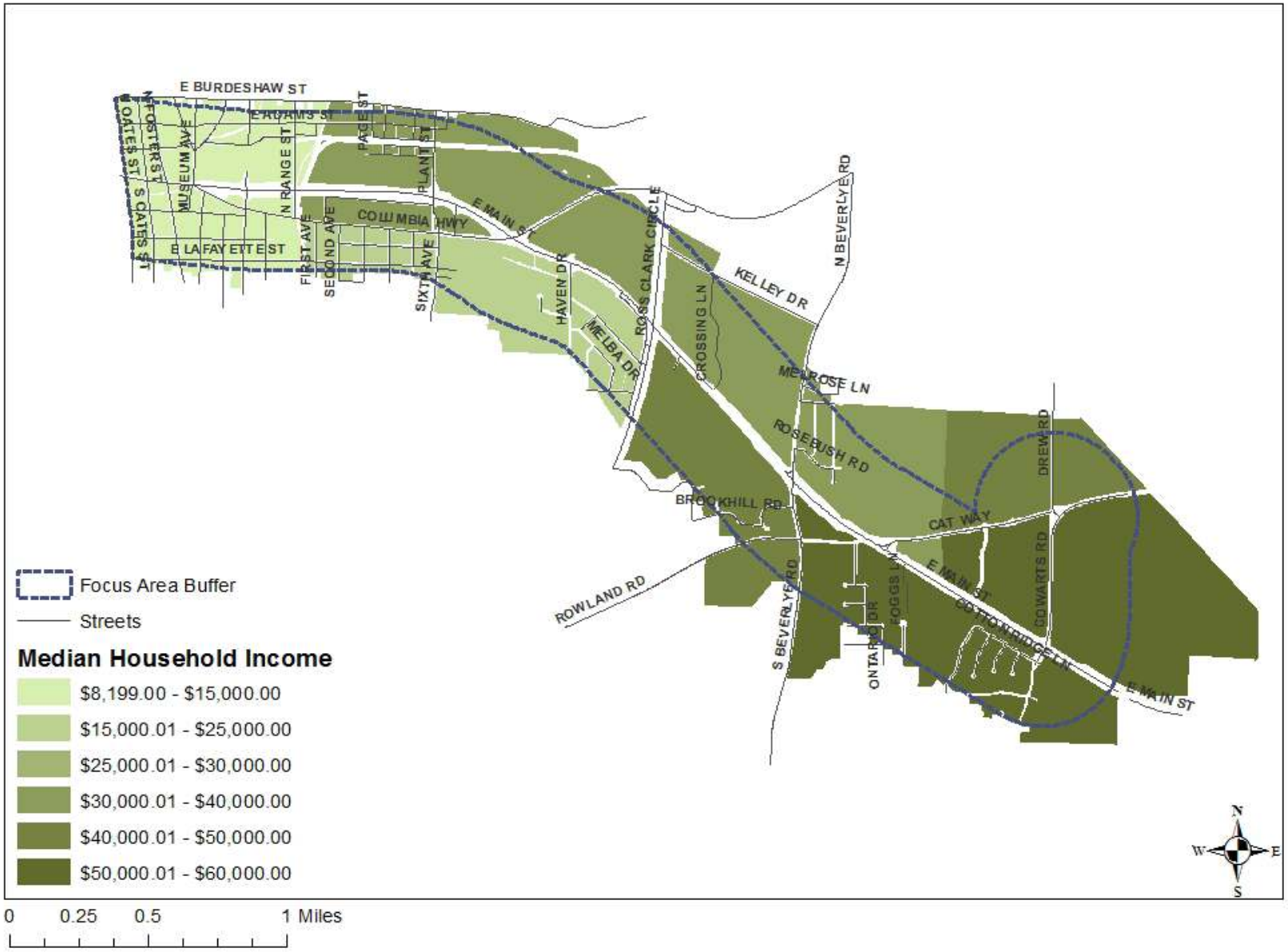


9, Household Density

10. Individual Population Density

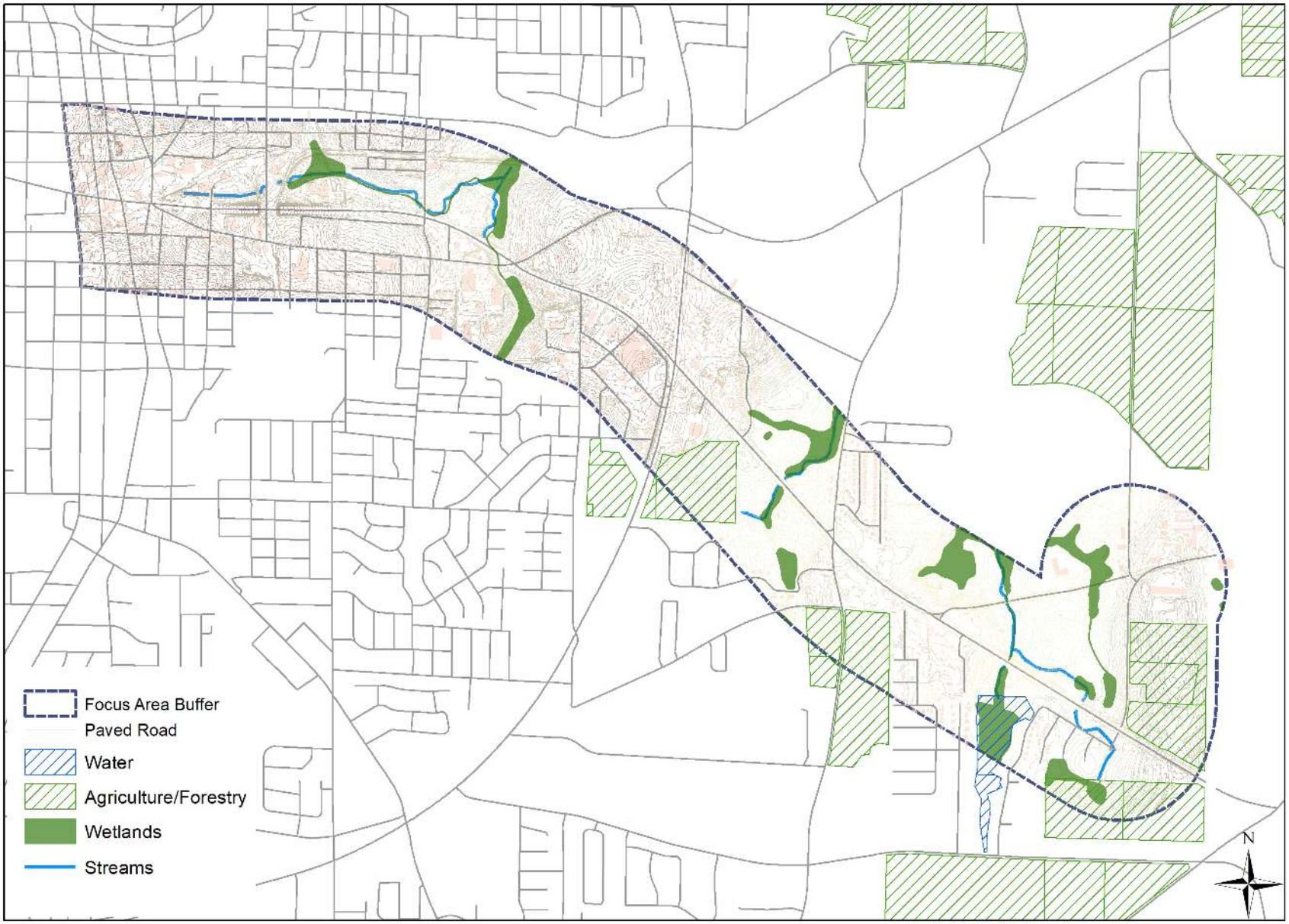


11. Median Household Income

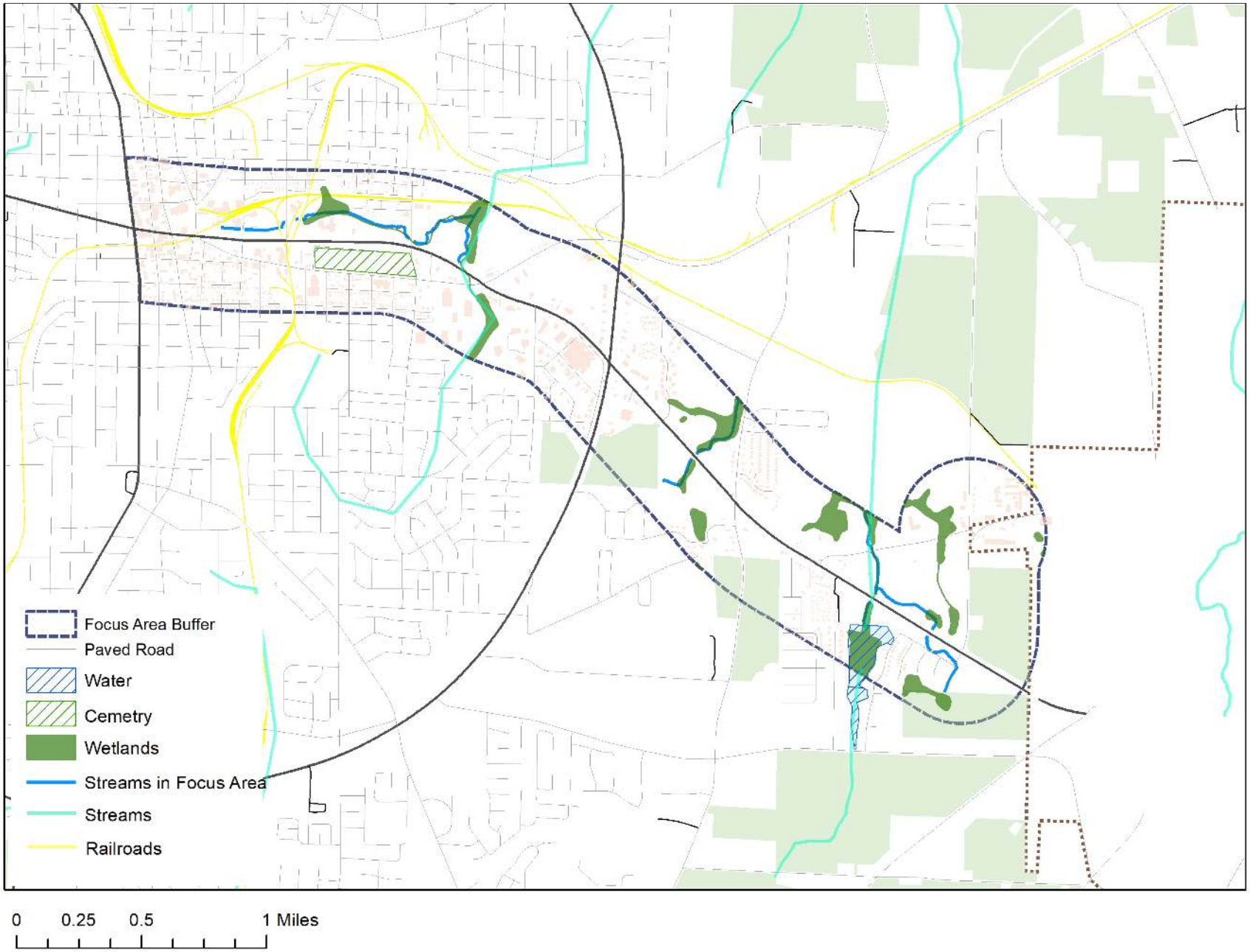


12. Mapping Elevation

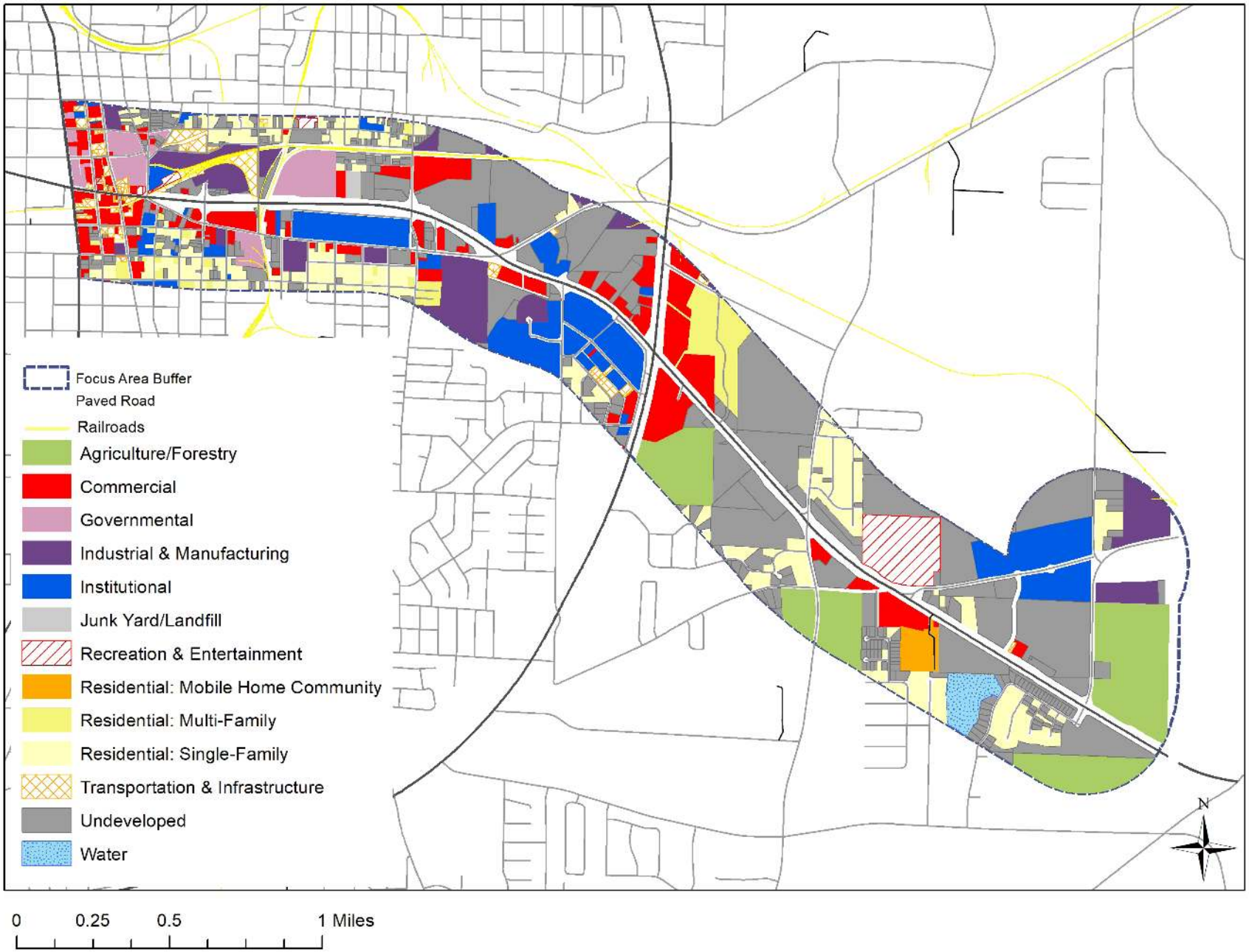
13. Wetland Relationship



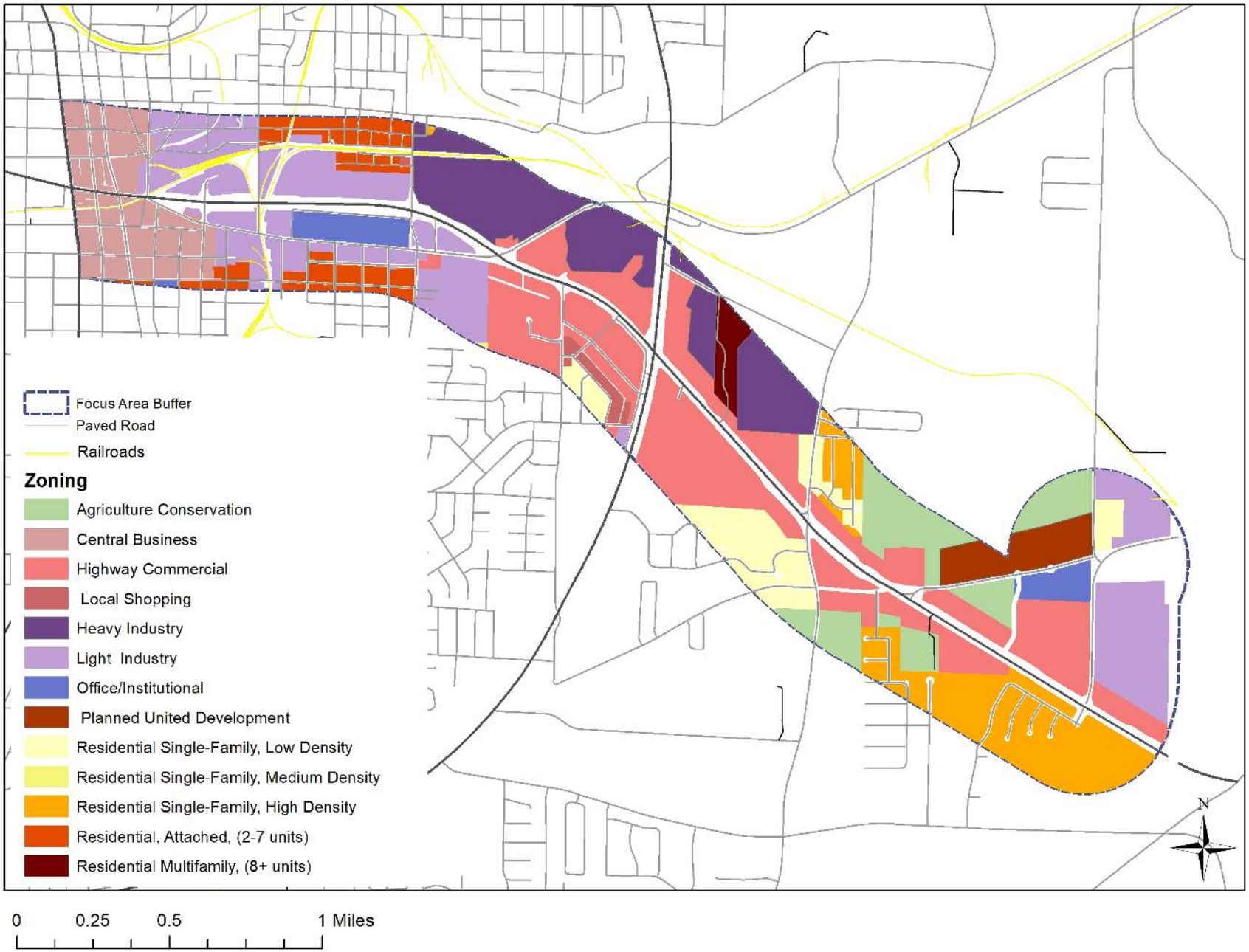
14. Wetland Context



15. Land Use


Focus Area Buffer
Paved Road
Railroads
Agriculture/Forestry
Commercial
Governmental
Industrial & Manufacturing
Institutional
Junk Yard/Landfill
Recreation & Entertainment
Residential: Mobile Home Community
Residential: Multi-Family
Residential: Single-Family
Transportation & Infrastructure
Undeveloped
Water
N
0
0.25
0.5
1 Miles

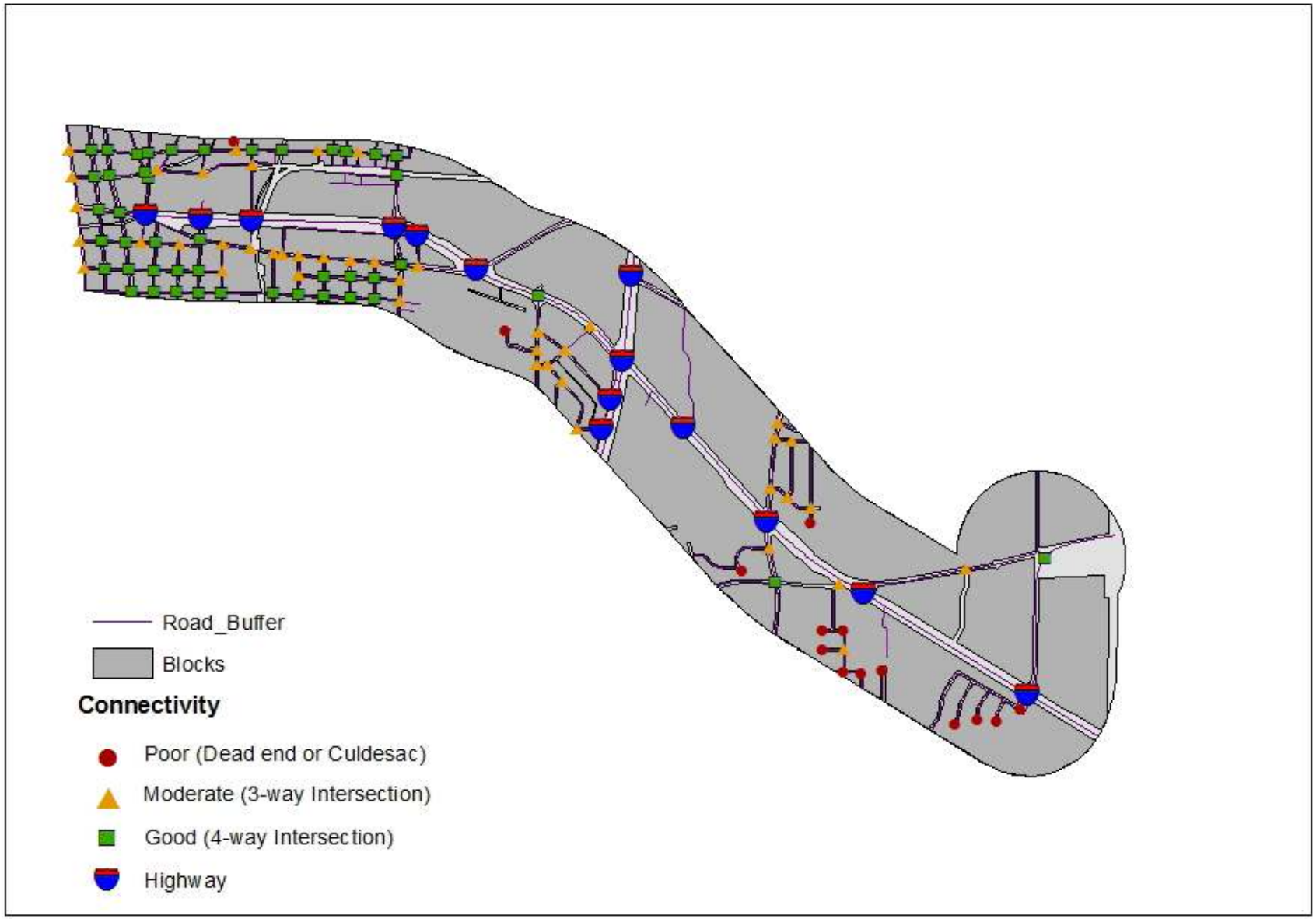
16. Zoning


Focus Area Buffer
Paved Road
Railroads
Zoning
Agriculture Conservation
Central Business
Highway Commercial
Local Shopping
Heavy Industry
Light Industry
Office/Institutional
Planned United Development
Residential Single-Family, Low Density
Residential Single-Family, Medium Density
Residential Single-Family, High Density
Residential, Attached, (2-7 units)
Residential Multifamily, (8+ units)
N
0
0.25
0.5
1 Miles

17. Vacancy


Focus Area Buffer
Paved Road
Railroads
Agriculture/Forestry
Undeveloped
Junk Yard/Landfill
N
0
0.25
0.5
1 Miles

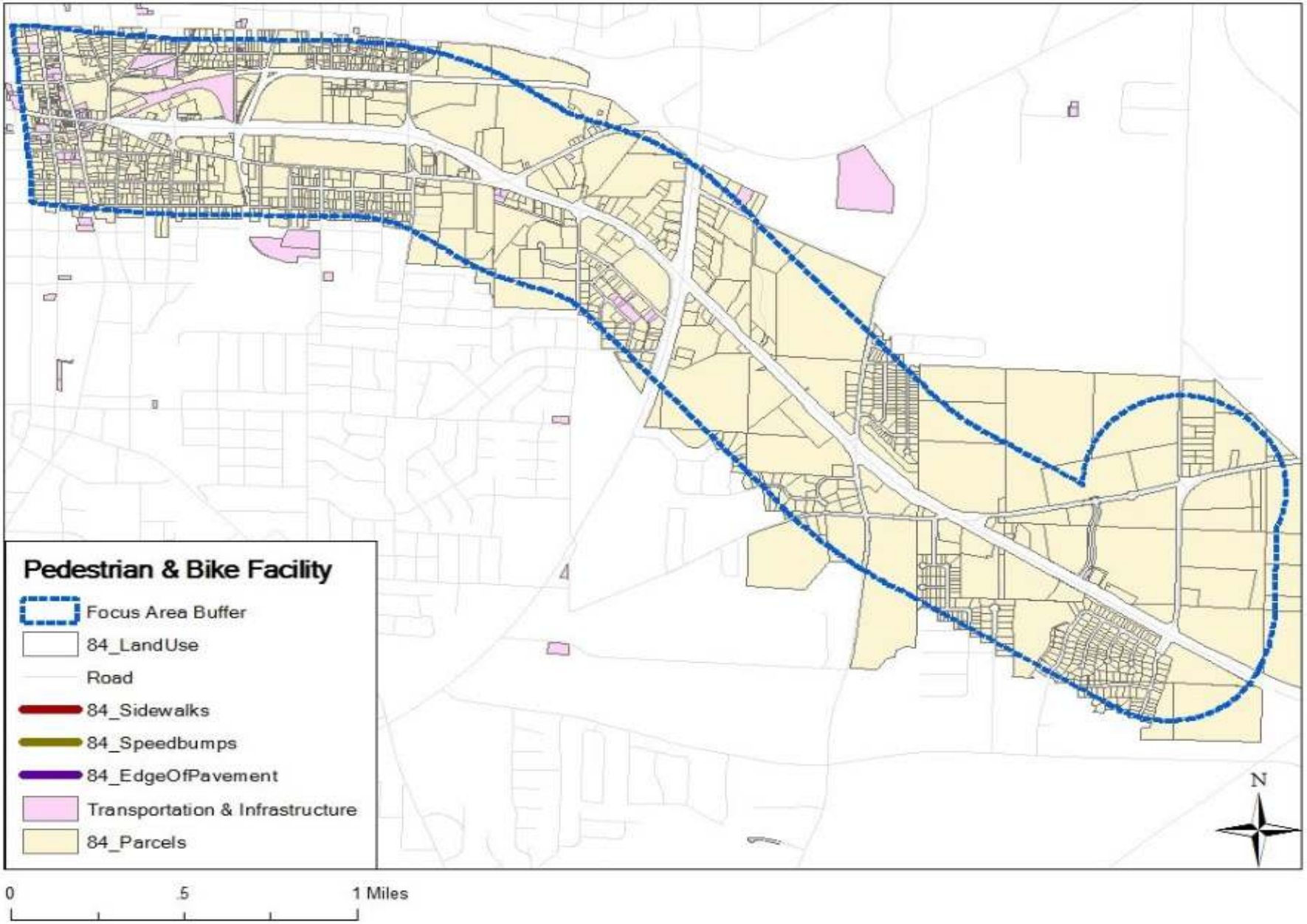
18. Built Form



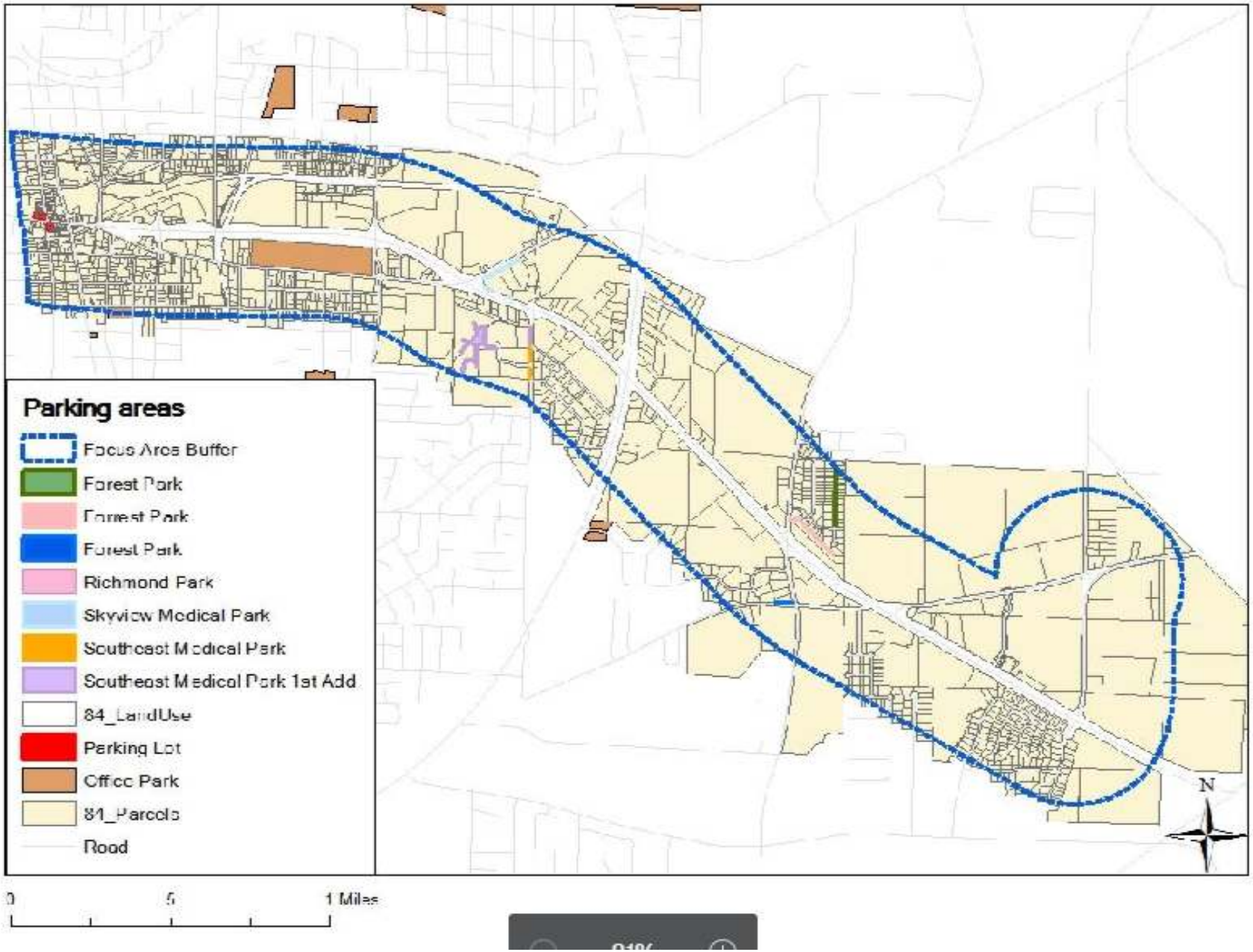
0 0.25 0.5 1 Miles

N

19. Pedestrian & Bike Facilities



20. Parking Areas



Map Descriptions

1. Base Map - Hwy 84 E. Corridor and Focus Areas

Base map containing entire 4 mile corridor with highlighted focus areas. The building footprint also shows the density of buildings along the corridor and within the smaller focus areas.

2 - 4. Downtown, Hospital and Campus Focus Areas

Base map for each focus area. Parcels located within the focus area are highlighted along with building footprints.

5. Corridor Road Network Heirarchy

Highway 84 extends throught the full 4 mile stretch of the corridor and is intersected by another major artery in the corridor center near the hospital. Secondary roads mainly branch outward from the highway.

6-8. Corridor Road Network Heirarchy of Focus Areas

Highway 84 crosses through each focus area. The number of secondary roads decrease on the eastern end of the highway. Private roads exist near the campus.

9. Household Density

The number of households in each blocks indicates more families are located in north and south side of Columbia Highway.

10. Individual Population Density

The highest density of individual people are located in the north side of E Main Street.

11. Median Household Income

The distribution of incomes throughout the region, with a focus on average income level by census block group. This map indicates that census tracts with lower median incomes are located in west and north side of the region.

12. Mapping Elevation

Analyzing contour intervals. The lowest elevation in study area is 230 feet and the highest is 366 feet. The site is generally sloping from west to east with downtown elevation ranging between 320- 350 feet and the campus area situated at an elevational range of 230-260 feet. The hospital is located at a height of 320-350 feet but the area around the hospital slopes considerably essentially forming a mound like topography. Understanding elevational information is important both at macro and micro scale to better comprehend storm water flows during rain events.

12.& 13 Wetland Relationship & Context

This maps analyzes the wetlands in the study area which cover an area of 106 acres. There are about 30 wetlands in the study area with the smallest wetland measuring 0.21 acres and the largest being 19.85 acres. Map 13 on the other hand tries to understand the larger context as it pertains to streams and open, forested areas. Highway 84 and focus area boundaries are intersected by two water bodies Poplar Spring Branch and Golf Creek from west to east respectively. This contextual study helps understand the impact of any green infrastructural intervention in the study area. The spatial connections and possibilities of trail system also become spatially apparent once focus area is in the context of the city.

Map Descriptions Cont.

15 & 16. Land Use & Zoning

There are 13 landuse types in the focus area of which the "undeveloped" seems to be dominant. This is further elaborated and zoomed in Map 16 which shows the underutilized, underdeveloped, vacant and open areas.

17. Vacancy

The total area under the focus area amounts to 6614 acres and zoning class "agriculture conservation with very low residential density" covers about 62.42% with 4128.71 acres. Looking at zoning classes under human use "residential, attached, high, high density (2-7 units)" with 438.45 acres seems to be a dominant zoning class. Since this zoning class is prevalent near downtown It seems to suggest that the city is moving towards a higher density residential style implying a vision for a denser downtown. "Highway Commercial" seems to be the other most dominant use along the highway. This zoning class covers about 387.15 acres in the focus area and provides ample opportunity to plan for mixed use where residential can be combined with office or commercial resulting in a denser edge.

17. Vacancy Cont.

A denser street front will aid in slowing down traffic and along with mid block crossings and other pedestrain centric provision can potentially transform this corridor as the main street.

18. Built Form

Base map showing block size and urban density. The points vary from good to moderate to poor connectivity based on how many streets intersect. 4 way intersections shown as good, 3 way intersections shown as moderate and culdesacs/deadends shown as poor. The west side of the corridor near the urban center has a much higher density of good connectivity points while the east side of the corridor has a more poor connectivity points showing less street connectivity. In addition to this the the west and east sections of the corridor are only connected via highway.

19. Bike & Pedestrian Facilities

Map of Pedestrians and Bike Facility No sidewalks, speedbump, or bike facilities data were found in the document. However, there are some transportation and infrastructure for pedestrians marked on the map.

20. Parking Areas

Map of Parking Areas Most of parking areas are on street among Highway 84. There are only three parking lot marked in the northwestern part of the area, and no garage found.

Department of Community Planning

Auburn University

Existing Conditions of Highway 84 Corridor in Dothan, AL

Submitted to:

Dr. Sweta Byahut

Submitted by:

Jacob Bensinger

Kaylyn Cardinal

Qing Chang

Ramya Rayapureddy

Guanlin Wang

Date and Time:

Thursday, March 22, 2018

11:00 AM

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RESULTS AND DISCUSSION **8**
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CONCLUSION AND RECOMMENDATIONS **10**
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APPENDIX A **A12**

INTRODUCTION

Scope of Work

For the purposes of this report a four mile corridor of Highway 84 East in Dothan, Alabama is being inspected. Maintaining majority of the daily east to west traffic, this four mile corridor crosses through three major activity centers: Downtown Dothan, Southeast Alabama Medical Center, and Alabama College of Osteopathic Medicine. The key roles these activity centers have on the city life of Dothan inspired The City of Dothan to improve the transportation network of the four mile corridor. The City of Dothan aspires to investigate the existing transportation conditions along the four mile section of Highway 84 East to identify recommendations that can potentially aid in flourishing the residential, commercial, and social opportunities within the area.

Objectives of Analysis

Identifying the necessary improvements for the four mile corridor of Highway 84 East requires reviewing the existing conditions of the three activity centers denoted as Downtown, Hospital, and Medical College, as shown in Figure 1. This report details the analysis of the existing conditions of the corridor based on the information provided by the City of Dothan and standard traffic engineering analysis procedures. These existing conditions include analyzing the level of service for the pedestrian, bicycle, and roadway networks. As defined by the current Highway Capacity Manual, level of service (LOS) uses a grading system of A through F to assign quality levels of a transportation network. Using this method will identify the major and minor concerns for improvements for the four mile corridor.

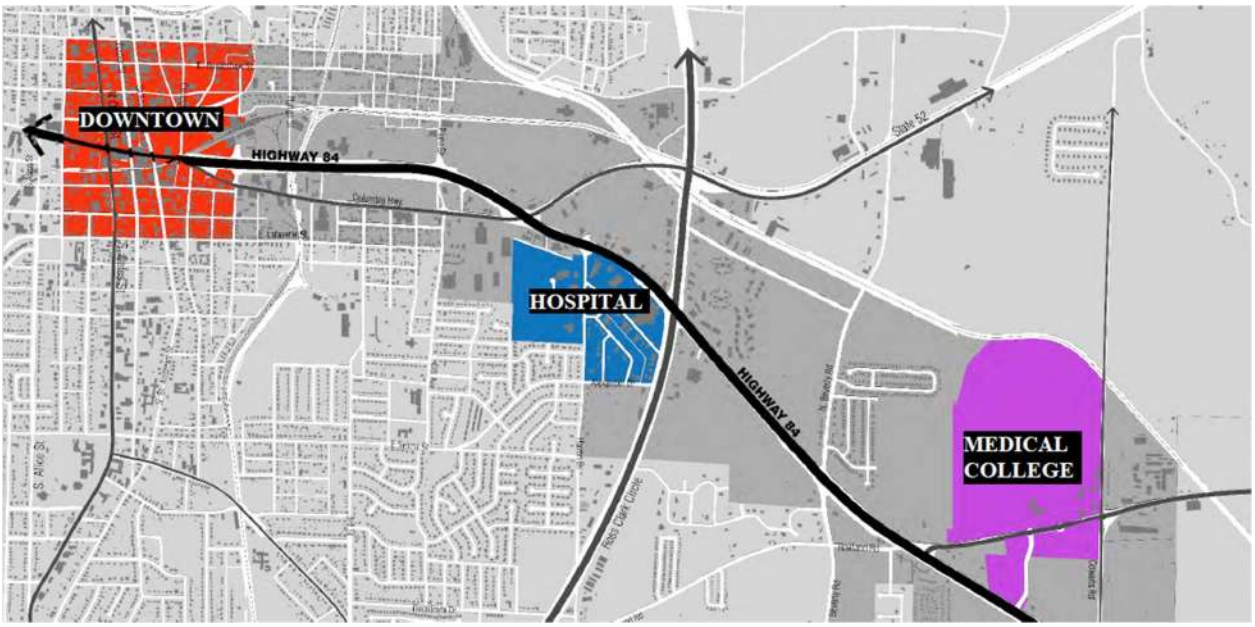


Figure 1 The Three Activity Centers

METHODOLOGY

Data Sources and Collection

Traffic Engineering Analysis

The traffic engineering analysis section details the level of service for the roadway design. For design and operational purposes the current Highway Capacity Manual is used to determine the quality of the roadway based on geometric, signal, and traffic parameters. For planning purposes, the Highway Capacity Manual references the Florida's Department of Transportation (FDOT) Level of Service Handbook. Since this corridor is being studied in terms of planning, the Level Service of Handbook is appropriate to determine the LOS of the roadways. Both the Highway Capacity Manual and FDOT Level of Service Handbook are recognized as reputable standards for analyzing LOS for roadways in the transportation industry.

The Level of Service Handbook is used for planning purposes to quickly identify high risk areas for improvements. It saves time from the calculation intensive Highway Capacity Manual method by generalizing the quality of the roadway through the average daily traffic counts (ADT). The ADTs used to calculate the roadway level of service for the three activity centers are shown in Figure 2. The Level of Service Handbook provides tables based on the road type, class, speed limit, number of lanes, medians, average ADT, and LOS grade, as shown in Figure 3.

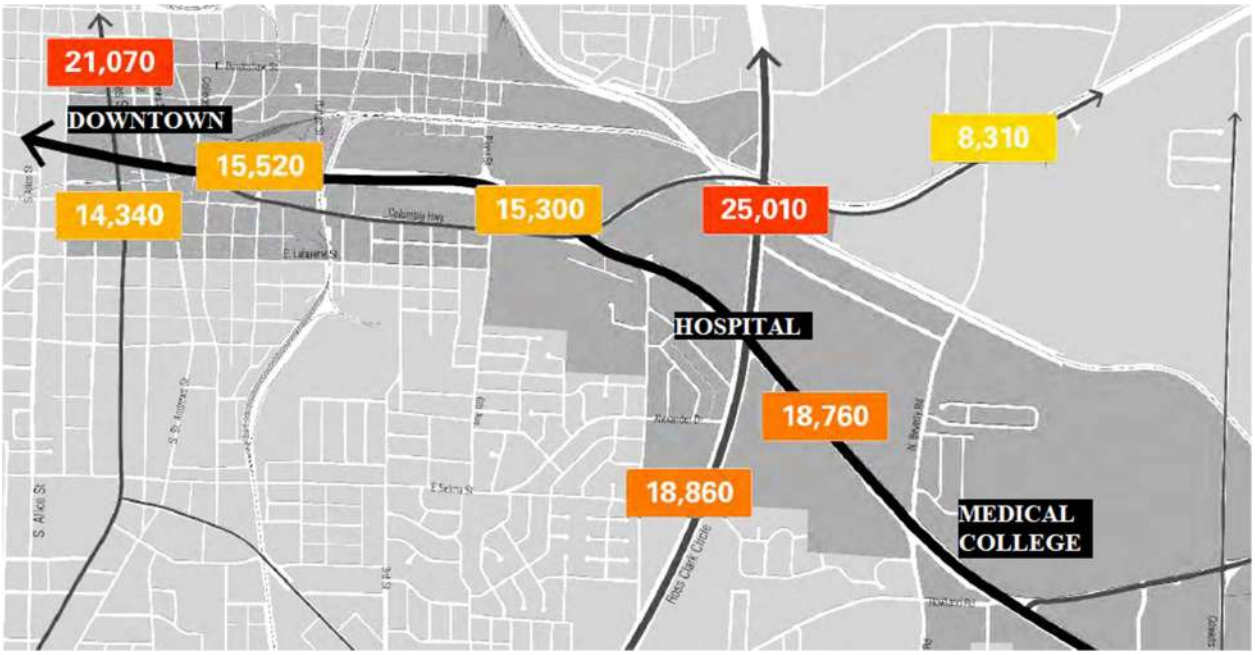


Figure 2 Average Daily Traffic for Activity Centers

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	16,800	17,700	**
4	Divided	*	37,900	39,800	**
6	Divided	*	58,400	59,900	**
8	Divided	*	78,800	80,100	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	7,300	14,800	15,600
4	Divided	*	14,500	32,400	33,800
6	Divided	*	23,300	50,000	50,900
8	Divided	*	32,000	67,300	68,100

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	8,600	17,000	24,200	33,300
4	Divided	36,700	51,800	65,600	72,600
6	Divided	55,000	77,700	98,300	108,800

Figure 3 Level of Service Handbook Tables

Pedestrian and Biking Level of Service

The City of Dothan has already made many improvements in regards to its pedestrian and bicycle networks. The existing pedestrian and bicycle networks are provided in Figure 4. Using the networks provided below and the boundaries of the activity centers, multiple roadways were selected to obtain a level of service. The roadways selected for inspection are detailed in Appendix A in Figures A1 – A10. The main improvements for the pedestrian and bicycle networks occur in the Downtown activity center. Unfortunately, there are minimal improvements in regards to the Hospital and Medical College activity centers.

The method chosen to analyze the level of service for the bicycle and pedestrian networks was the Dixon Method. An example of the Dixon Method and its procedure was found in the Prattville Pedestrian Movement and Parking Management Plan. The method uses a point based system to determine a grade A through F for the roadway selected. The maximum amount of points possible is 21 and the lowest amount of points is 0. Achieving the maximum amount of points receives a grade of A and receiving the lowest amount of points receives a grade of F. This is not an absolute grade, there are ranges of points per each grade. This grading system can be found in Figure 5.

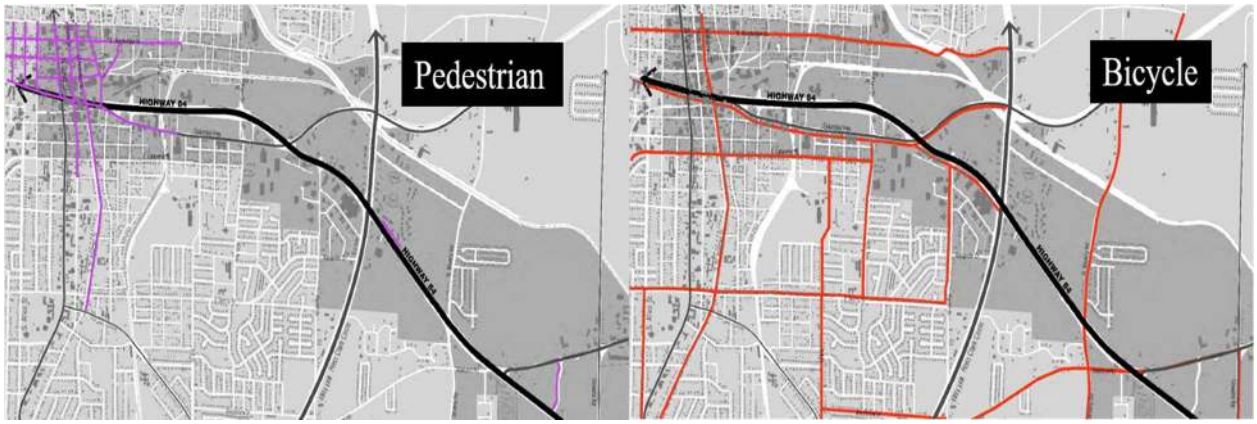


Figure 4 Existing Pedestrian and Bicycle Networks

BICYCLE			PEDESTRIAN		
CATEGORY	CRITERION	POINTS	CATEGORY	CRITERION	POINTS
BICYCLE FACILITY PROVIDED (Max Value = 10)	Outside Lane 3.66m (12')	0	PEDESTRIAN FACILITY PROVIDED (Max Value = 10)	Not Continuous or Non-existent	0
	Outside Lane >3.66m-4.27m (>12'-14')	5		Continuous on One Side	4
	Outside Lane >4.27m (>14')	6		Continuous on Both Sides	6
	Off-Street / Parallel Alternative Facility	4		Min. 1.53m (5') Wide & Barrier Free	2
				Sidewalk Width >1.53m (5')	1
				Off-Street / Parallel Alternative Facility	1
CONFLICTS (Max Value = 4)	Driveways & Sidestreets	1	CONFLICTS (Max Value = 4)	Driveways & Sidestreets	1
	Barrier Free	0.5		Ped Signal Delay 40 Sec. or Less	0.5
	No On-Street Parking	1		Reduced Turn Conflict Implementation	0.5
	Medians Present	0.5		Crossing Width 18.3m (60') or Less	0.5
	Unrestricted Sight Distance	0.5		Posted Speed	0.5
	Intersection Implementation	0.5		Medians Present	1
SPEED DIFFERENTIAL (Max Value = 2)	>48 KPH (>30 MPH)	0	AMENITIES (Max Value = 2)	Buffer Not Less Than 1m (3.5')	1
	40-48 KPH (25-30 MPH)	1		Benches or Pedestrian Scale Lighting	0.5
	24-32 KPH (15-20 MPH)	2		Shade Trees	0.5
MOTOR VEHICLE LOS (Max Value = 2)	LOS = E, F, OR 6 or More Travel Lanes	0	MOTOR VEHICLE LOS (Max Value = 2)	LOS = E, F, OR 6 or More Travel Lanes	0
	LOS = D and < 6 Travel Lanes	1		LOS = D and < 6 Travel Lanes	1
	LOS = A, B, C, and < 6 Travel Lanes	2		LOS = A, B, C, and < 6 Travel Lanes	2
MAINTENANCE (Max Value = 2)	Major or Frequent Problems	-1	MAINTENANCE (Max Value = 2)	Major or Frequent Problems	-1
	Minor or Infrequent Problems	0		Minor or Infrequent Problems	0
	No Problems	2		No Problems	2
TDM / MULTI-MODAL (Max Value = 1)	No Support	0	TDM / MULTI-MODAL (Max Value = 1)	No Support	0
	Support Exists	1		Support Exists	1
CALCULATIONS	Segment Score [1]	21	CALCULATIONS	Segment Score [1]	21
	Segment Weight [2]	1		Segment Weight [2]	1
	Adjusted Segment Score [3]	21		Adjusted Segment Score [3]	21
	Corridor Score [4]	21 = LOS A		Corridor Score [4]	21 = LOS A

Figure 5 Dixon Method Level of Service Point System

Design Assumptions

Traffic Engineering Analysis

Although the main focus of the corridor is Highway 84 East, the surrounding streets are also important to the improvement of the transportation network. There were many assumptions made for the level of service of the roadways due to the lack of geometric, signal, and traffic data for the multitude of pertinent intersections. Since there was a lack of data for individual roadways, the same level of service determined by the ADT for a specific activity center was applied to all the individual roadways in that section. Since the ADTs provided in Figure 2 do not have any for the Medical College activity center, it is assumed that the 18,760 count is carried downstream to the Medical College intersection. This was the ADT used to calculate the LOS for the Medical College activity center.

The assumption made in using the tables in Figure 3 from the Level of Service Handbook was the type of roadway being analyzed, by choosing either state signalized arterials or uninterrupted flow highways. Although the corridor and ADTs provided occurred on a highway, the highway has interrupted flow. The Highway Capacity Manual specifies that true uninterrupted flow only occurs on Freeways. Uninterrupted flow on highways occurs when traffic signals are at a minimum two miles apart from each other. Since the section of Highway 84 occurs in a densely populated area it is not considered uninterrupted flow based on the close proximity of the traffic signals. For the purposes of this analysis the state signalized arterial was mainly used to determine LOS. The uninterrupted flow highway table was used when the data provided could not be applied for the state signalized arterial table in cases of B and E grades.

Corresponding with the tables in Figure 3, adjustment tables were provided for exceptions in the roadway design that impacted the ADT count. Depending on the design, the tables in Figure 6 would dictate a change in the ADT count by a certain percent. This percentage would be applied to the original ADT and then the grade is a reevaluated based on the tables provided in Figure 3.

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

Figure 6 Level of Service Handbook Adjustment Tables

Pedestrian and Biking Level of Service

Majority of the assumptions made were based on the items necessary to provide point values for the different categories in Figure 5. Google Earth was used to determine the measurements for items such as lane widths, sidewalk widths, buffer widths, and speed. Since the measurements have some associated error, any measurements taken were given an error of plus or minus half a foot to achieve the criteria.

For the category of Motor Vehicle LOS, the results of the traffic engineering analysis were used for this section. Since there was not a sufficient amount of data to determine a roadway LOS for every roadway, the LOS representing the entire activity center was applied for each roadway chosen. The maintenance category of the point system was based on damages of the street. These damages were considered potholes, large cracks, sinkholes, or obstructions. The multi-modal category considered that in addition to bicycling or pedestrian systems that the roadway also included support for a mass transit system. This could be identified as mass transit signs representing that a mass transit system stops along the specific roadway or dedicated lanes for mass transit. Barrier Free for the conflict category meant anything that obstructed the pedestrian or bicycle path. This most often was, but not limited to light poles, power line systems, and traffic cones. If there was no sidewalk or bicycle dedicated pathway, the barrier points were automatically zero.

RESULTS AND DISCUSSION

Traffic Engineering Analysis

Using the average daily traffic counts provided in Figure 2, the level of service for the activity centers was determined. The average of all the ADTs provided at the intersections were used to determine each areas grade. Based on the criteria in Figure 3 and Figure 6 the LOS for the activity centers from the Downtown to the Medical College are B, D, and C.

The exceptions described in the assumptions sections for type of roadway and adjustments were used for the Hospital and Downtown section. The Hospital's average ADT was not applicable to the State Signalized Arterial table. Since the State Signalized Arterial was not applicable the second best option was using the uninterrupted flow highway to determine the LOS for this center. The Downtown section had adjustments to its original average ADT of 25,465 to 24,192 due to the one way direction count of the ADTs provided. A summary of the road type, class, speed limit, number of lanes, medians, average ADT, and LOS grade is provided in Table 1 for each of the activity centers.

Table 1 Level of Service for Activity Centers

Activity Center	Downtown	Hospital	Medical College
Road Type	State Signalized Arterial	Uninterrupted Highway Flow	State Signalized Arterial
Class	II	N/A	I
Speed Limit	30	45	55
Number of Lanes	6	4	4
(Un)Divided	Divided	Undivided	Divided
Average ADT	24192	18760	38965
Score	D	B	C

Due to the lack of data for individual streets and intersections this is a best estimate for the entire activity centers for the level of service. For planning purposes this method is appropriate because it shows where the needs are in the community. These grades should not be used for design purposes. They should only be used to determine where the allocation of needs and funds should be applied. Based on the level of service determined for each activity center, the Downtown activity center is the one that needs the most attention.

Pedestrian and Biking Level of Service

Tables were created categorizing the roadways selected within the pedestrian and bicycle networks. These categories were represented by different colors and numbers for each roadway segment. These tables are in Appendix A. The tables included cells to enter the amount of points for each category per roadway segment. The table would sum the points per each roadway segment and respond with a letter grade for the level service depending on the amount of points.

Using the information provided by Google Earth and The City of Dothan for the roadway conditions, the level of service for both the pedestrian and bicycle networks were determined. From the points calculated for each roadway segment within each activity center, an average level of service grade was calculated. For the Downtown activity center, the average LOS for the pedestrian network was C and for the bicycle network is E. Tables A1 – A6 in Appendix A represents the LOS grades of all the roadways for the Downtown activity center. For the Hospital activity center, the average LOS for the pedestrian network was D and for the bicycle network is D. Tables A7 – A8 in Appendix A represents the LOS grades of all the roadways for the Hospital activity center. For the Medical College activity center, the average LOS for the pedestrian network was D and for the bicycle network is D. Tables A9 – A10 in Appendix A represents the LOS grades of all the roadways for the Medical College activity center. The average LOS grades for these networks are summarized in Table 2.

Table 2 Average Level of Service for Activity Centers

Average Level of Service				
Activity Center	**Pedestrian**		**Bicycle**	
Downtown	14	C	6	E
Hospital	8	D	9	D
Medical College	7	D	8	D

Although the average LOS grades summarized in Table 2 are not considered sufficient for the pedestrian and bicycle networks, does not mean that there were no sufficient scoring roadway segments. Table 2 represents which activity centers need more attention. The tables provided in Appendix A show which specific roadway segments or areas within the individual activity centers need improvement. The main reason for the insufficient LOS grades for the activity centers is that majority of the segments are on the Highway 84 roadway. It is not typical for there to be pedestrian and bicycle network systems in a high speed roadway condition. Due to recent developments of the Hospital and Medical College the network systems for those activity centers are not as farther along as the ones in the Downtown area.

CONCLUSION AND RECOMMENDATIONS

Using information from the Highway Capacity Manual, FDOT Level of Service Handbook, Dixon Method, and The City of Dothan, the existing transportation network conditions for the four mile Highway 84 East corridor were determined. Based on the analysis performed it was found that majority of the transportation network is insufficient for the needs of Dothan, Alabama. The only exception to this was the Hospital roadway level of service which had a grade of B. No other portion of the transportation network had a level of service higher than a C based on a grade range of A through F.

In regards to the roadway and bicycle level of service, the Downtown activity center needs the most improvement. For the pedestrian level of service on average, the Medical College activity center needs the most improvement. Based on the overall transportation network level service, The City of Dothan should allocate its resources and funds to the Downtown activity center. The Downtown activity center overall showed the most need for improvement. The next activity center after Downtown would be the Medical College. This recommendation is based solely on the level of service determined for the roadway, pedestrian, and bicycle network systems. This does not consider population density or attraction to these areas. A separate investigation based on the marketability of the individual activity centers would confirm which activity center is most in need of improvements.

RESOURCES

1. City of Dothan Workshop #1 PDF. (n.d.). Retrieved March 22, 2018, from http://www.dothan.org/index.aspx?nid=557

2. Highway Capacity Manual Máster Sergio J. Navarro Hudiel. (n.d.). Retrieved March 22, 2018, from https://sjnavarro.files.wordpress.com/

3. Florida Department of Transportation Level of Service Handbook. (n.d.). Retrieved March 22, 2018, from http://www.fdot.gov/planning/systems/programs/sm/los/

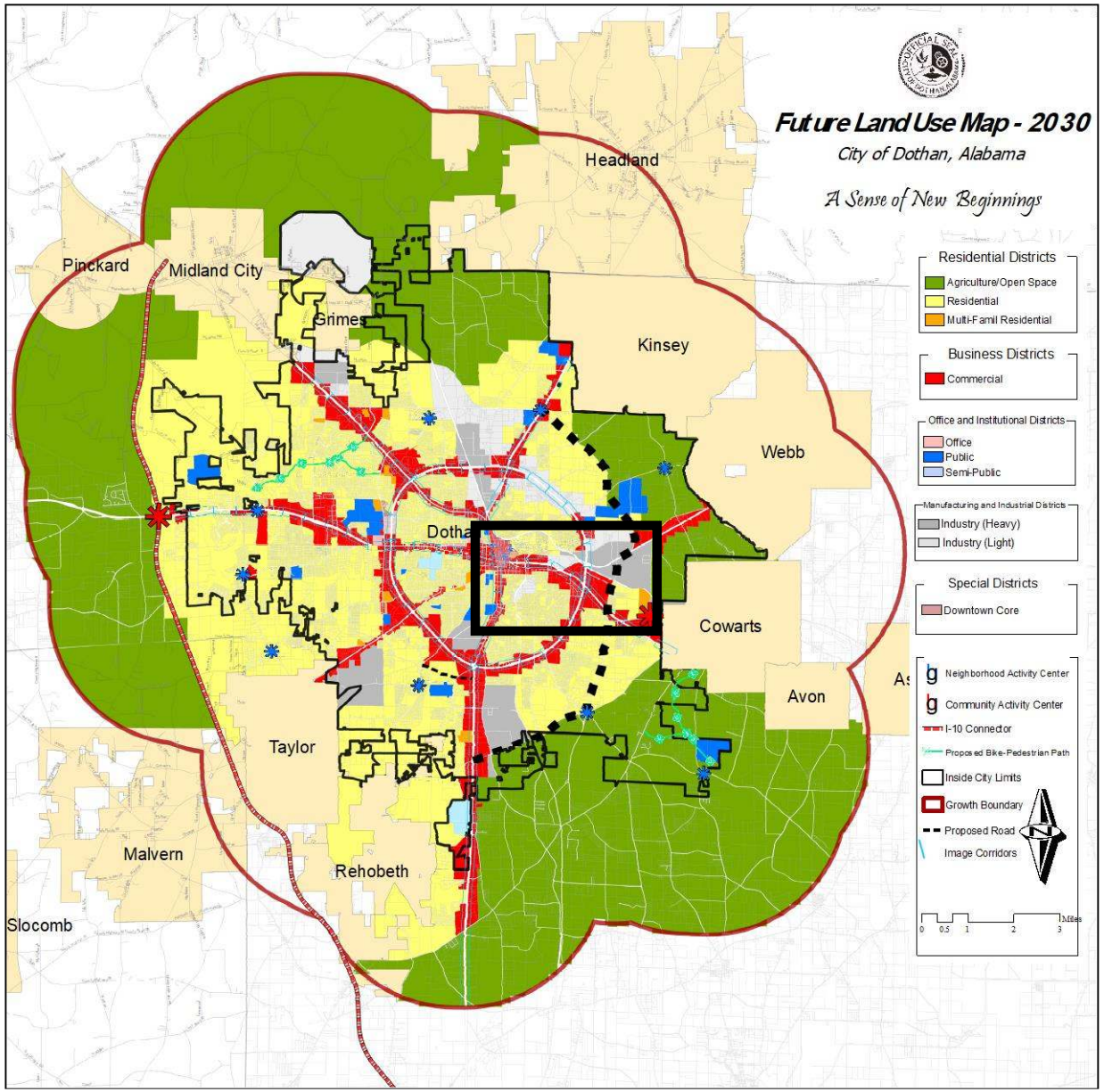
4. Byahut, S. (2017). Pratville Project Plan for the Bike. Canvas, 13-16. Retrieved March 09, 2018.

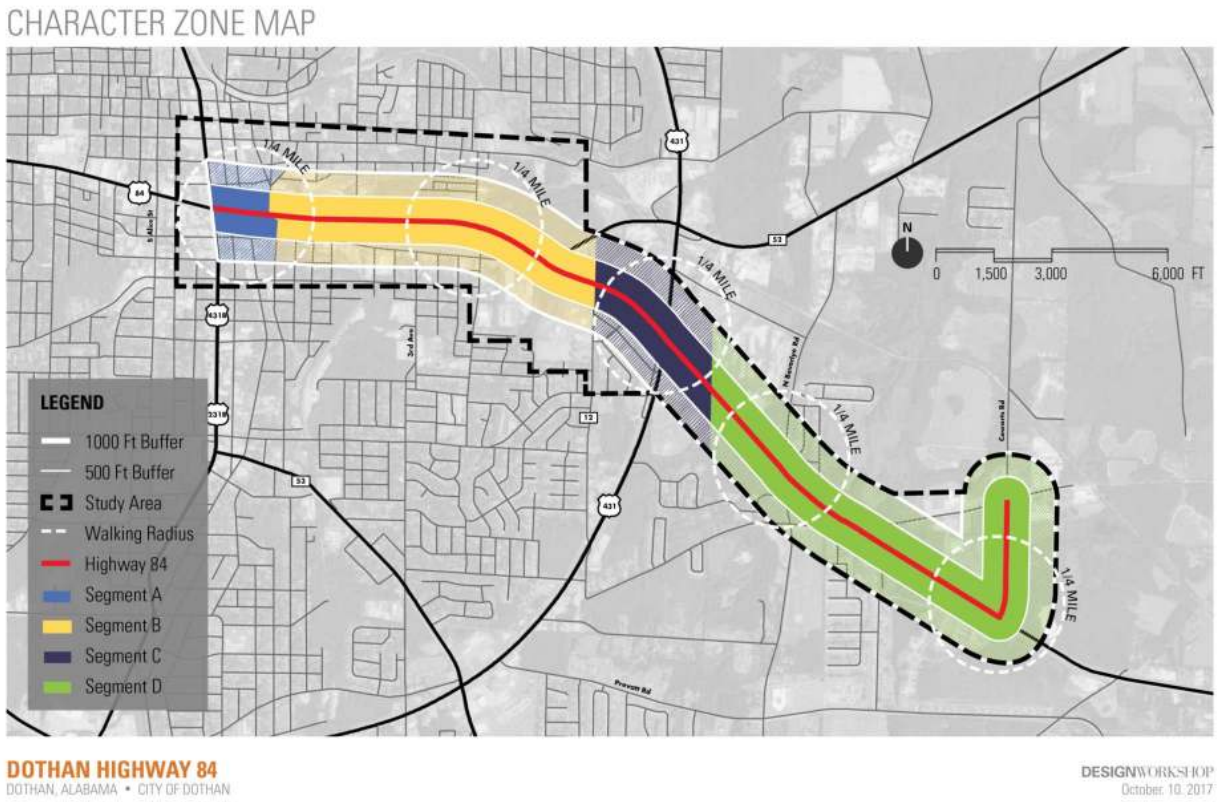
5. (n.d.). Retrieved March 22, 2018, from https://earth.google.com/

Dothan Transportation Plan Photo Documentation and Site Analysis

Daniel Butler, Jacob Ulak, Rajas Bhalerao, Xiaiyu Chen, Ziling Zhu, Kati Bero

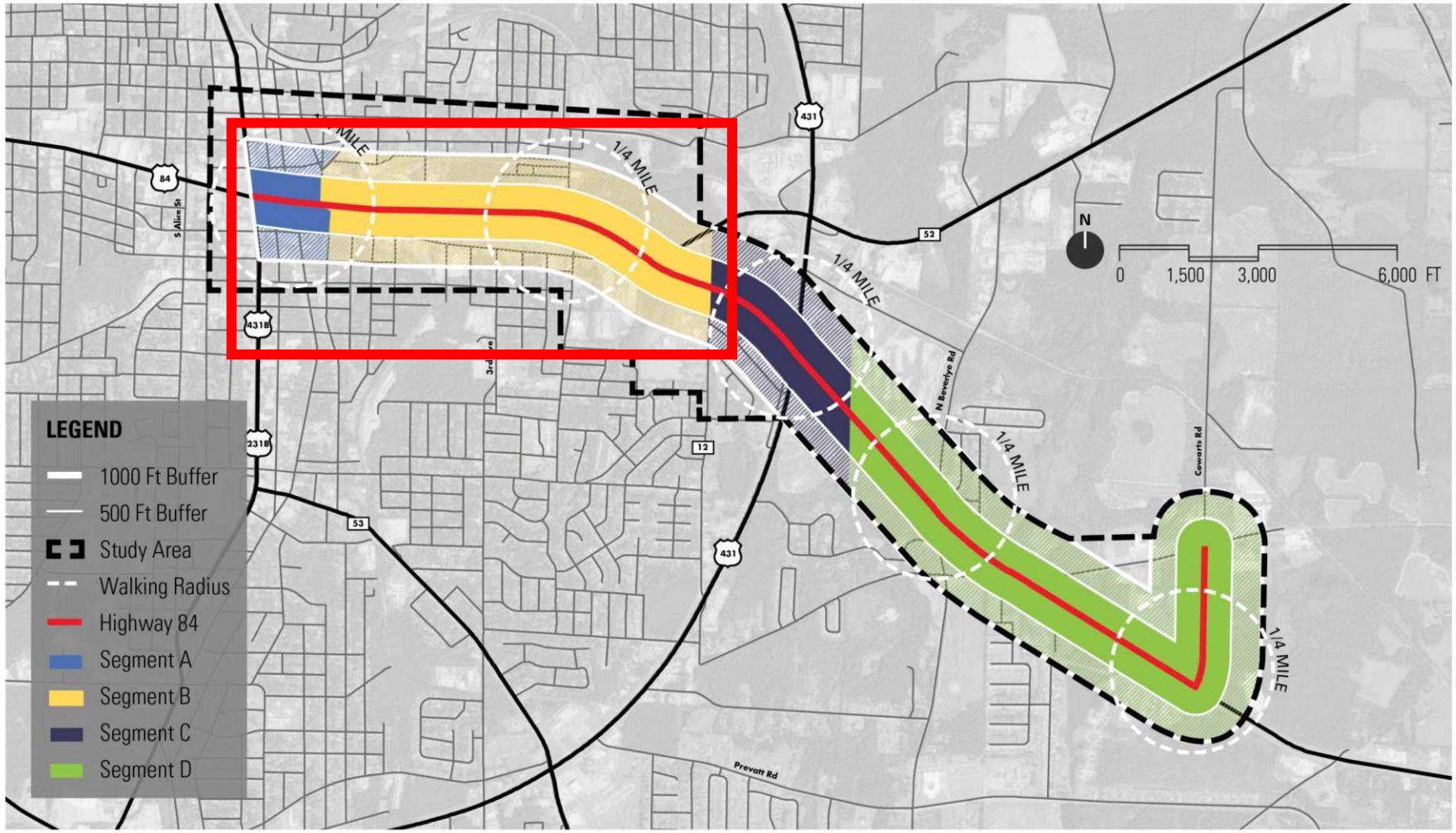
Dothan Land Use Maps





Segments A & B (Downtown)

CHARACTER ZONE MAP



DOTHAN HIGHWAY 84
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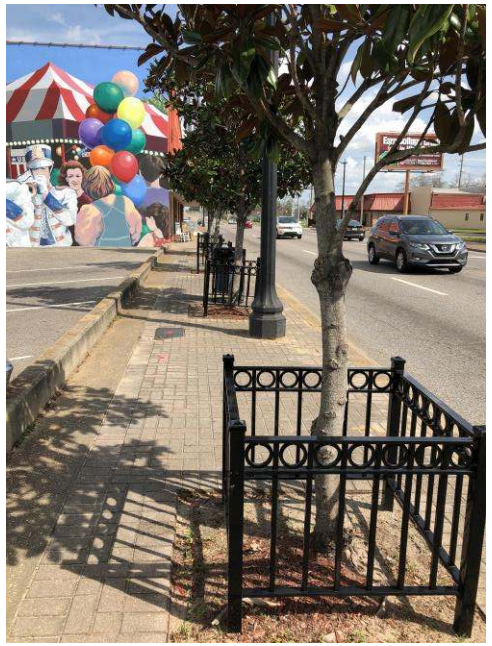
DESIGNWORKSHOP
October. 10. 2017

Segments A & B points of conflict (Downtown)



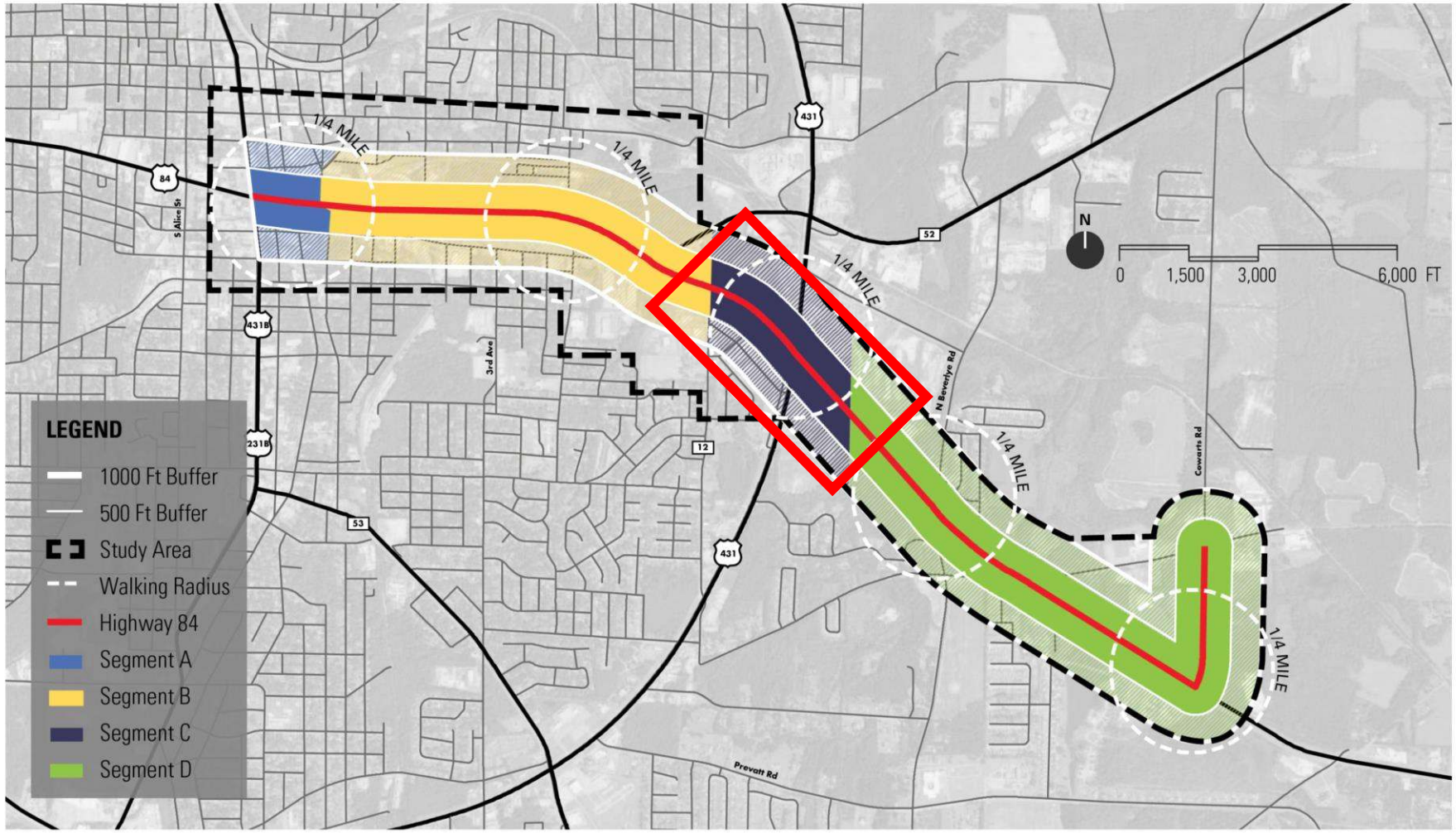
- Narrow sidewalks, uneven pavement, and priority for vehicles rather than pedestrians
- Lack of crosswalks in several locations spread across Downtown
- Poplar park is a major area of conflict due to a large intersection, a railroad, and the presence of pedestrians from the park
- No crosswalks on or near Poplar park or E. Main St.

Segments A & B assets (Downtown)

- Parts of downtown have pedestrian crosswalks with crossing signals.
- The green space downtown is a nice place for citizens to relax and enjoy nature.
- Parts of downtown have nice, spacious sidewalks with planted trees between the pedestrians and road.

Segment C (Hospital)

CHARACTER ZONE MAP



DOTHAN HIGHWAY 84
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DESIGNWORKSHOP
October. 10. 2017

Segment C points of conflict (Hospital)

- Unreasonable design.
- Lack of pedestrian crosswalks between parking lots and hospital.
- Lack of sidewalks.
- Busy intersection with high speed limitation.
- Lack of vegetated medians on the highway.

Segment D (Medical Campus)

CHARACTER ZONE MAP

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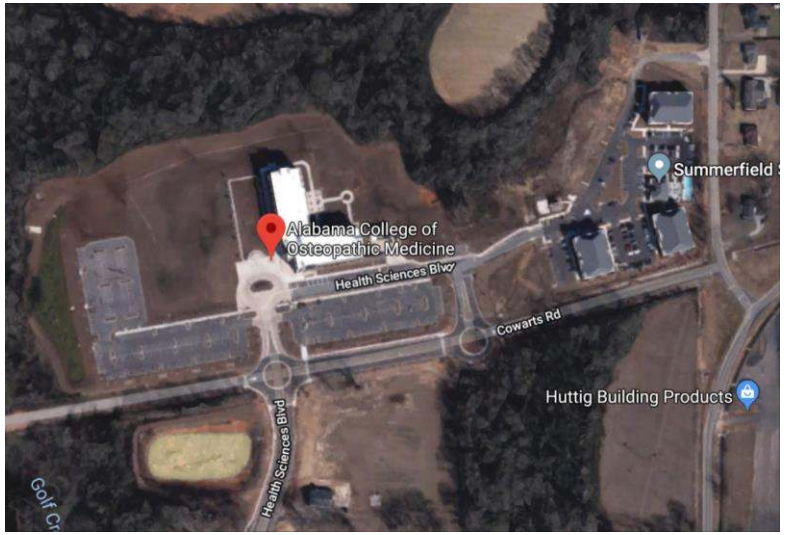
October. 10. 2017

Segment D (Medical Campus) assets



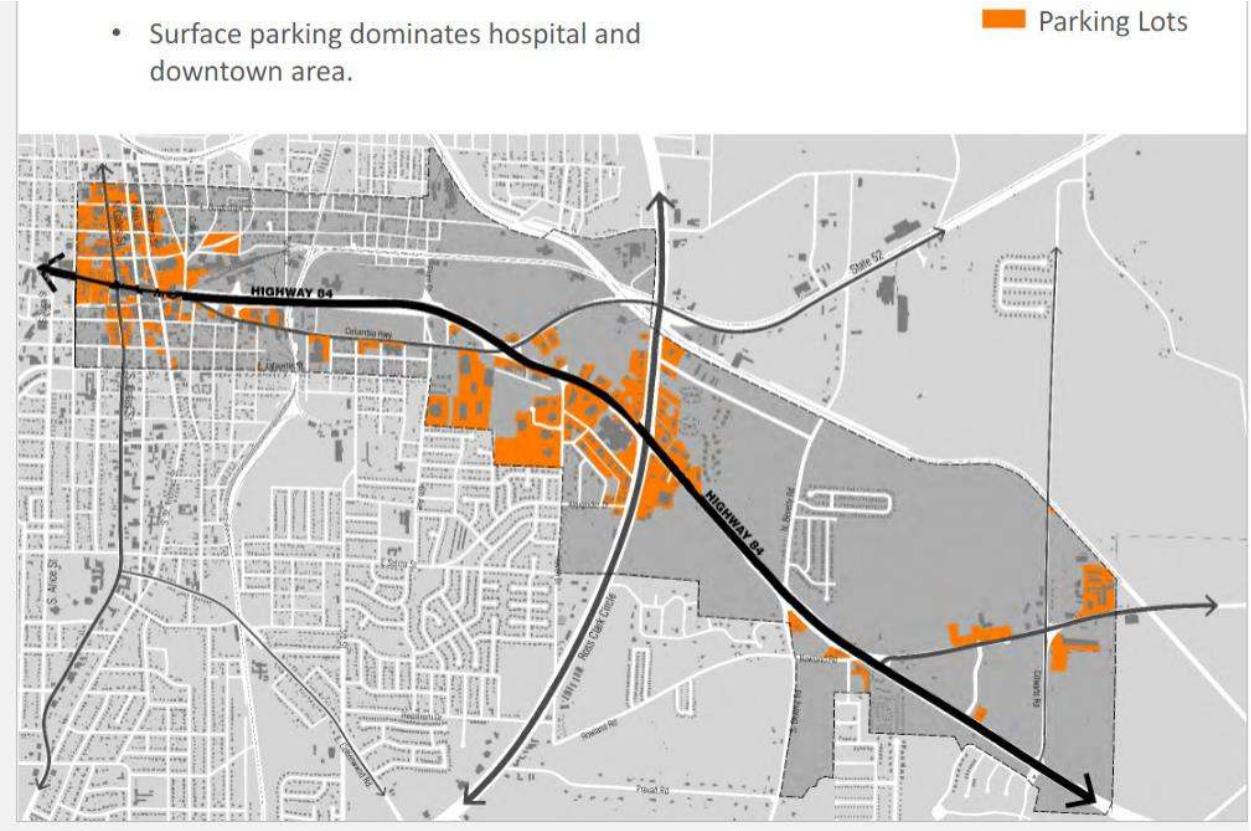
- The roundabout beside/on the campus is a great traffic calming measure.
- Bicycle lanes on the campus allow cyclists to travel safely to and from destinations.

CPLN 6060: Sustainable Transportation Planning

Parking Utilization Overview

Foster Denney, David Dixon, James Djamba, Tianyang Liu, Jingyu Mei, Amanda White

The Highway 84 Corridor plan has three major areas; the medical campus, the Hospital, and downtown. The medical campus parking is strictly used by those people at the school. We felt the most important public parking was in the Hospital area and downtown. Each node has different zones and parking requirements. We drove through these areas and counted the number of spaces as well as the number of vehicles that occupied the spaces. Dothan's Zoning Ordinance actually includes a section on off-street automobile parking and loading requirements. In this section, it declares the zoning regulation of off-street automobile parking and loading



requirements is the basic guideline and standard for proposed development in Dothan. This section is aimed to build a healthy environment that can provide convenience, safety, and accessibility to individuals. And trying to make the off-street automobile parking can incorporate with the physical activity of people.

This zoning regulation is not only designed to create a basic guideline and standard for development, but it also tries to create a safe, attractive, and pedestrian-friendly environment where has the minimal risk of pedestrian injuries, well interaction within neighborhoods, and elderly have safe, convenient pedestrian routes.

The off-street automobile parking and loading requirements shall apply to all parking and loading areas in all districts. And all the parking and loading areas should provide appropriate facilities or else would not be certified. The operator and owner of the land or the structure should joint the responsibility for the maintenance of the off-street parking and loading facilities.

Size, location, and design

The parking space should not be less than nine (9) feet by eighteen (18) feet, exclusive of access or maneuvering area, ramps, and other appurtenance. Parking lot design shall follow the approved engineering standards promulgated by the Institute of Traffic Engineers (ITE) or a similar professional organization**.**

Minimum Parking Space Required

The minimum number of parking spaces required is based on the type of use. Calculating parking requirements/ allowances use the below table as the standard.[1]

Use	Space Required per Unit specified	Queuing Space	Other Standard
Bank/Financial w/o Drive-in	1 per 200 sf GFA	3 per service lane	1 per employee
Bar, lounge, nightclub	1 per 100 sf GFA		1 per employee
Convenience store w/Gas	1 per 150 sf GFA	2 per car wash queue	Pump spaces shall

[1] Dothan official Government, "Zoning Ordinance,2010", charpt 114. page 127- 129

Sales			not be included
Day Care Center	1 per employee on the largest shift	5 per lane	1 loading space per 10 children. Parking or loading spaces designated for children shall be located so that direct pedestrian access is provided into the facility without crossing streets or driveways
Drug store/Pharmacy	1 per 200 sf GFA	3 per lane	-
Grocery Store (Stand-alone)	1 per 250 sf GFA		1 per employee
Medical Clinic	1 per 150 GFA	-	-
Health Club	1 space per 200 sf exercise area	-	1 per employee
Hospital	1 per 1.5 beds	-	1 per 300 sf of office space
Gymnasium	1 space per 200 sf floor area		1 space per 4 fixed seats or 1 space per 8 ft of bench seating
Hotel/Motel	1 space per room plus 1 per employee	-	Parking for accessory use in accordance with the applicable standard
Industrial, Manufacturing, Processing, Wholesale	1 space per 1000 sf manufacturing or warehousing area plus 1 per 300 office	-	1 space per company vehicle stored on site
Nursery	2 spaces per 1000 sf of the outdoor display area	-	1 per employee, 1 per company vehicle
Office uses	1 space per 200 sf GFA	-	-
Residential, Multifamily	1 & 2 bedroom	-	1 space per

	units-1.4 spaces; all other 2 spaces		employee
Residential, Single-family	2 spaces per single-family dwelling unit	-	-
Restaurant, Fast Food	1 space per 40 sf of public floor area	3 from the menu board	1 per employee on the largest shift
Restaurant, Sit Down	1 space per 4 seats	-	1 per employee on the larger shift

Shopping Center, General Retail/Service Not Specified up to 50,000 sf	1 space per 200 sf GFA	-	-
Shopping Center, General Retail/Service Not Specified 50,000–90,000 sf	1 space per 225 sf GFA	-	-
Shopping Center, General Retail/Service Not Specified over 90,000 sf	1 space per 250 sf GFA	-	-
High Bulk Retail	1 space per 300 sf GFA		
Veterinary Office/Clinic	1 space per 500 sf GFA	-	1 per employee
Warehousing/Industrial Processing	1 space per employee on the largest shift	-	1 space per company vehicle stored on the property.

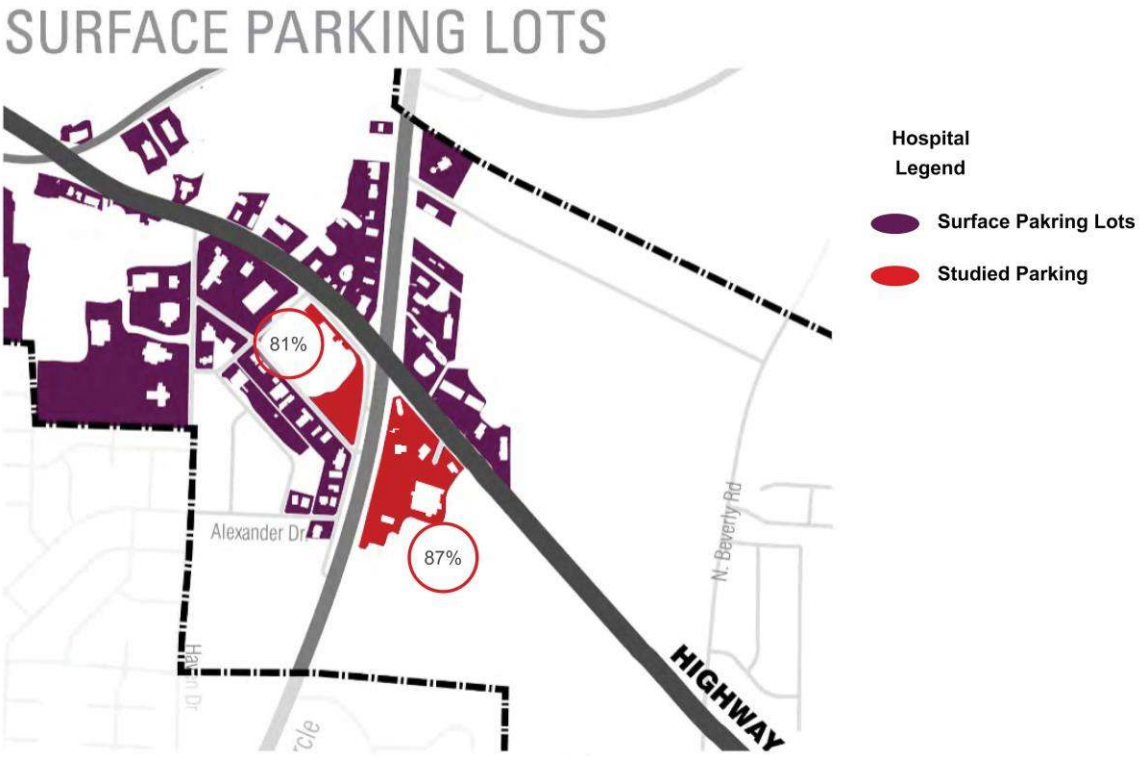
GFA=gross floor area

Sharing Parking

The required parking may reduce fifteen percent (15%) from the amount, and the sharing parking space shall be within six-hundred-sixty (660) feet of the main entrance and should provide the access to pedestrians.

Hospital

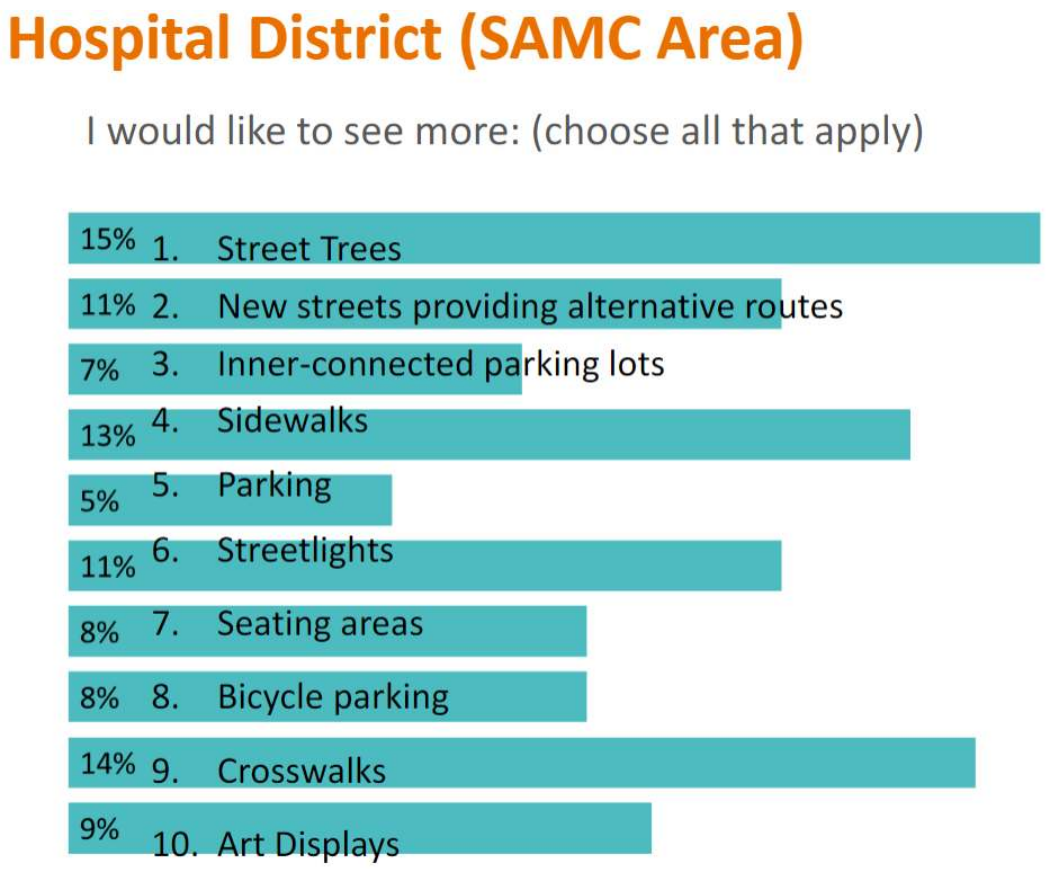
The Hospital node area is an important study area of our project. This area is not only at the central geographic position of the whole focus area, but also this is the where the Dothan hospital is located. As an important public facility location of Dothan, the parking condition is also important. By looking at the Zoning map, almost all of the highway around the area is regulated as the highway commercial. And on the north of this area, there is a large part for heavy industry, a small area at the west of this area is zoned as the residential areas. As the Surface Parking Lots shown, almost all the parking lots are around the cross. At the west to the cross is the hospital facilities, the east to the cross is the commercial area and all these areas have more requirements of parking lots, so the distribution of current Surface Parking Lots is reasonable in this area.



Hospital District (SAMC Area)

Near the Hospital (SAMC) I would like to see / see more :
(choose all that apply)

15% 1. Restaurants
17% 2. Retail Shops
9% 3. Hotels
13% 4. Mixed Use Development (Homes over commercial)
11% 5. Apartments
15% 6. Creative housing types (denser but more affordable)
5% 7. Office Space
12% 8. Park / Sports Parks
2% 9. Parking Lots
1% 10. Other



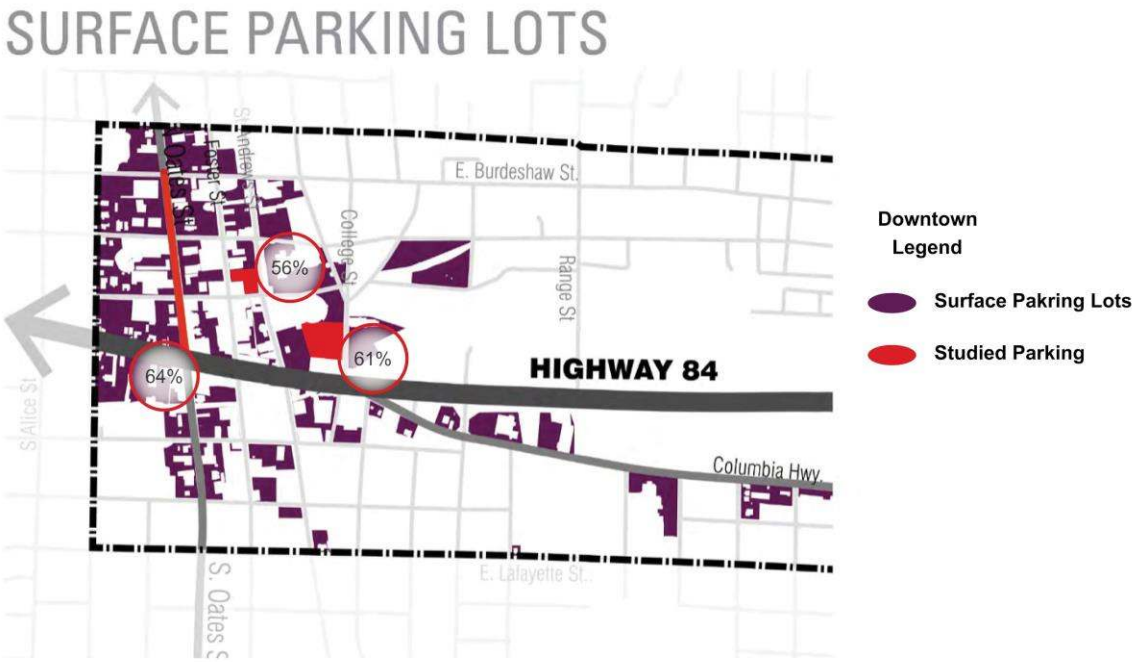
Downtown

The downtown area is the most important study area in our project, so the existing parking condition of the downtown area is crucial for us. We have analyzed that whether the existing surface parking lot is reasonable in the downtown area by using zoning and land use data.

As the downtown zoning map shown, the downtown area actually has been mainly divided into two parts, one is the commercial, and the rest is light industrial.

Almost all parking lots are located in the northeast area as the Surface Parking Lots map shown. Based on the land use map showing, the northeast area of downtown has a large part of industrial & manufacturing, but the west of downtown area most are commercial use and governmental use

which usually required more parking spaces than others. Therefore, The distribution of existing surface parking lots is reasonable in the downtown area.



Downtown

In public spaces downtown (streets, parks, plazas), I would like to see more : (choose all that apply)

16% 1. Street Trees
15% 2. Wider Sidewalks
8% 3. Parking
13% 4. Streetlights
14% 5. Seating Areas
11% 6. Bicycle Parking
13% 7. Crosswalks
11% 8. Art Displays
0% 9. Other (Please fill out comment card)

Downtown

Downtown I would like more :
(choose all that apply)

18% 1. Restaurants
11% 2. Bars / Breweries
9% 3. Art Galleries and Art Displays
16% 4. Retail Shops
4% 5. Hotels
16% 6. Mixed Use Development (residential over commercial)
4% 7. Office Space
15% 8. Park / Plaza Space
6% 9. Parking Lots
1% 10. Other (please leave a comment card)

PARKING

IS THERE ENOUGH PARKING TO ACCESS BUSINESSES ALONG HIGHWAY 84? (CHOOSE ONE)

25%	1.	No, we need more parking.
25%	2.	Sometimes, it depends on time of day, location, etc.
25%	3.	Yes, absolutely.
25%	4.	Other

Review of Plans and Policies

Hwy 84 E. Corridor Improvement Plan

Analysis of Existing Conditions

3/22/2018

Indrani Das, Kimberly Hooper, Renae Burton, Mitch Moody

Summary

This report:

- ◊ Identifies information from Dothan, Alabama's current plans such as: strengths, shortcomings, what policies effect provisions for parking and impact pedestrian movement, street improvements and redesign.
- ◊ Examine the Zoning Ordinance for various zoning districts in the study area, identifying possible barriers to redevelopment and zones that may need to be changed.

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Zoning Review

Indrani Das

Zoning Ordinance:

The zoning ordinance of Dothan, Alabama was first adopted in 21st September,2010 and the last amendment were on 3rd January,2017. This project includes three anchors in the study area. Those are-

- ◊ Downtown
- ◊ Southern Alabama Medical Center
- ◊ Alabama College of Osteopathic Medicine

Downtown:

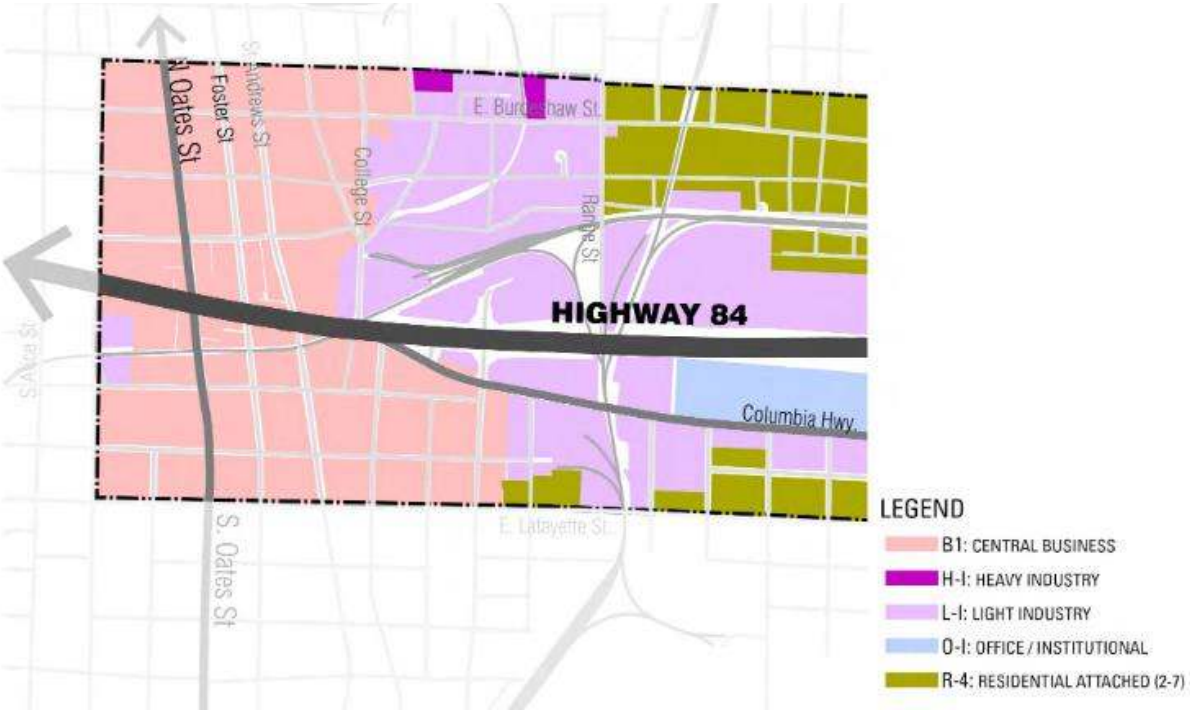
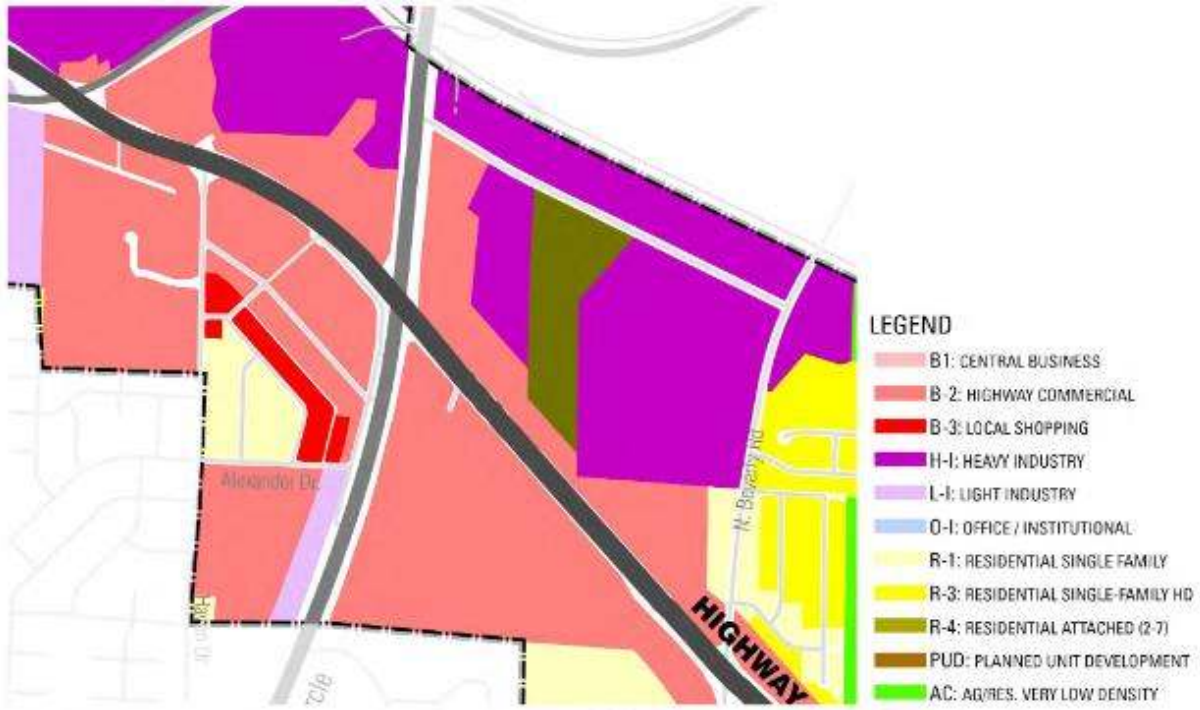


Figure 1 Downtown Existing Zoning

In the first workshop, the participants voted for less industry near the corridor. From the above Figure we can see that, there is sizeable amount of L-I (light industry) zoning along Highway 84. Some of permitted uses in L-I districts are- warehouse, Recycling facility, Railroad yard. Because of the access to major streets and railroads there is also some H-I (heavy industry) zoning in the study area. In the Central Business District (B-1), residential use is permitted above the ground floor of commercial or other uses. All development in B-1, B-2, L-I and H-I are subject to the design and regulations guidelines established in Downtown Overlay District.

Southeast Alabama Medical Center/Hospital District:

Figure 2 Existing Zoning Hospital District



A significant portion of the study area is zoned as Highway Commercial (B-2) and Heavy Industry (H-I). The hospital falls within the B-2 district as it is a permitted use in that district. This particular portion of the study area has a large amount of underdeveloped or vacant land compared to other portions.

Alabama College of Osteopathic Medicine/Campus District:

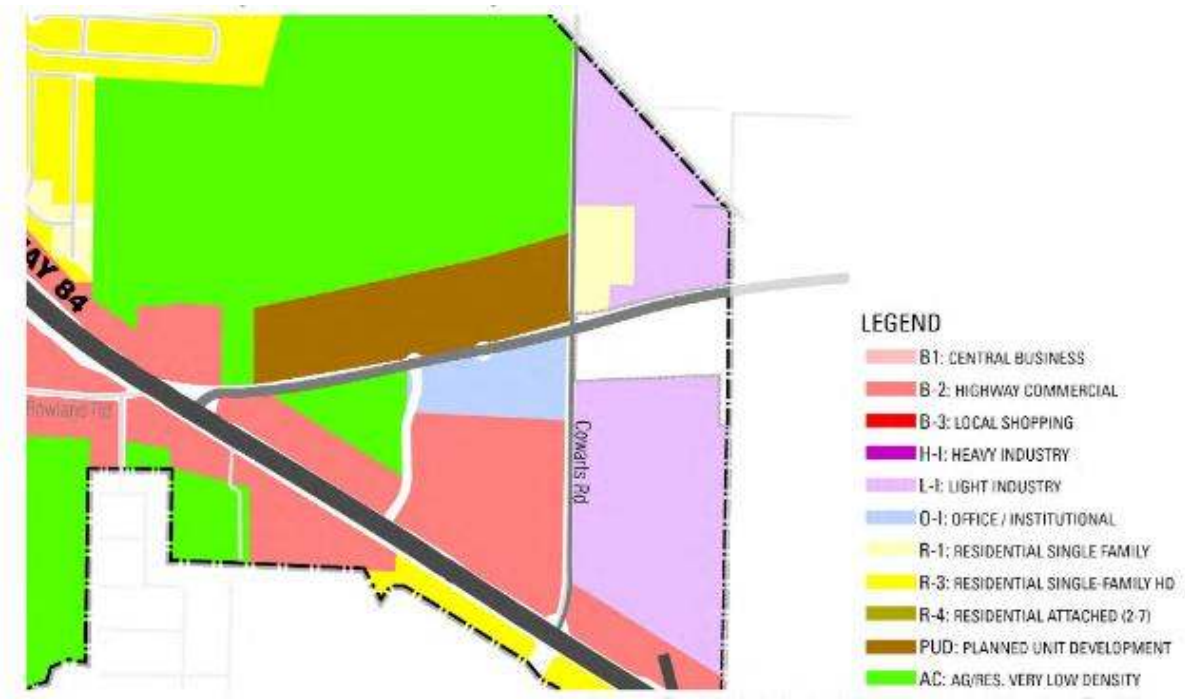


Figure 3 Existing Zoning Campus District

A significant amount in this portion is reserved as Agriculture/very low density residential. This district regulation requires a minimum of one acre lots for site built, stand-alone residential uses. The lot sizes should be minimum 15000 sq. feet in an approved subdivision in this district. Other zoning in this portion are- Highway Commercial, Light Industry and Planned Unit Development. The Alabama College of Osteopathic Medicine is in the Planned Unit Development district (PUD).

Downtown Overlay District:

DOD is established to serve as an overlay to the established base zoning district. Base districts within the DOD include B-1, B-2, L-1 and H-1. The intent of DOD is to-

Accommodate mixed-use buildings and parcels with neighborhood-serving retail, service and other uses on the ground floor and residential on the top of it.

Encourage re use of existing historic buildings

Promote new infill residential and non-residential development

Encourage developments that goes with physical design characteristics and promotes pedestrian oriented storefront-style shopping

Promotes well-being of residents by encouraging physical activity, alternative transportation modes and greater social interaction.

DOD is divided into three subdistricts. Which are- Entertainment district, Historic core & government district and Contemporary/Redevelopment District. Mixed-use development (Urban Planned Unit Development) is not permitted in Entertainment district; permitted in Contemporary/Redevelopment District and special exception in Historic core & government district. Retail sales with gasoline/diesel facility is permitted use in all three districts. Single-family dwellings is permitted in all the three districts.

For the commercial development, building heights in the E and HC/G should not exceed 5 stories or 75 feet. And in the C/R it should be within 10 stories or 145 feet. Building façade must be located within ten feet of the front or side yard lot lines. The minimum rear yard setback is twenty percent of the lot depth. interior setbacks are not required except where overlay zoned property is adjacent to residential zoned property. Parking garages need to incorporate active uses on the ground floor in order to involve pedestrians. Surface parking lots are discouraged unless there is landscaping and architectural treatments to soften the appearance.

Width and Landscape Requirement:

According to the zoning ordinance, all developments need to include a perimeter landscaped area of at least ten feet in depth adjacent to any public right-of-way unless a shallower depth is approved by the planning commission in its approval of the landscaping plan. There is also a provision that, a minimum, four trees and eight shrubs for each one-hundred feet of linear foot frontage along the right-of-way shall be preserved or planted. The remaining area within the perimeter shall be landscaped with grass, ground cover, or other landscape treatment. The width of the buffer and the required plantings within the buffer vary depending on the relative intensities of the adjacent uses. The following figure shows the minimum requirement for buffer. There is no buffer required between land uses in the same classification.

TABLE 1 BUFFER TYPES WIDTH AND LANDSCAPE REQUIREMENTS				
LAND USE	TYPE	WIDTH	CONTENT (Each 100 linear feet along Buffer)	
Between each Use		Minimum Feet	Trees	Shrubbery
Detached Residential & Attached Multi-Family	1	20	7	20
Residential & Non-residential (Up to 25,000 sq. ft. of GFA)	2	25	8	30
Residential & Non-residential (25,001 to 50,000 sq. ft. of GFA)	3	30	8	30
Residential & Non-residential (50,001 to 75,000 sq. ft. of GFA)	4	40	15 Offset double rows	75 Offset double rows
Residential & Non-residential (Greater than 75,000 sq. ft. of GFA)	5	50	15 Offset double rows	75 Offset double rows
Industrial (Up to 25,000 sq. ft. of GFA) & Any Other Use	6	30	8	30
Industrial (25,001 to 50,000 sq. ft. of GFA) & Any Other Use	7	35	8	30
Industrial (50,001 to 75,000 sq. ft. of GFA) & Any Other Use	8	40	15 Offset double rows	75 Offset double rows
Industrial (Greater than 75,000 sq. ft. of GFA) & Any Other Use	9	50	15 Offset double rows	75 Offset double rows

Figure 4 Requirement for Landscape Buffer

Requests for buffer reduction may be approved up to 10 feet by adding 8 feet privacy fence plus a twenty percent increase in plant material.

There is a substantial difference between the current and future land use map. The light industry district in the downtown are changed to commercial and residential which can be favorable for the corridor improvement plan. The heavy industry which were along the corridor are changed to light industry and commercial. The existence of light industry zoning may still pose a problem because of the permitted use. In the hospital district the light industry zoning is changed to residential zoning. The agriculture district in the Eastside of the corridor is changed to residential district in the future land map.

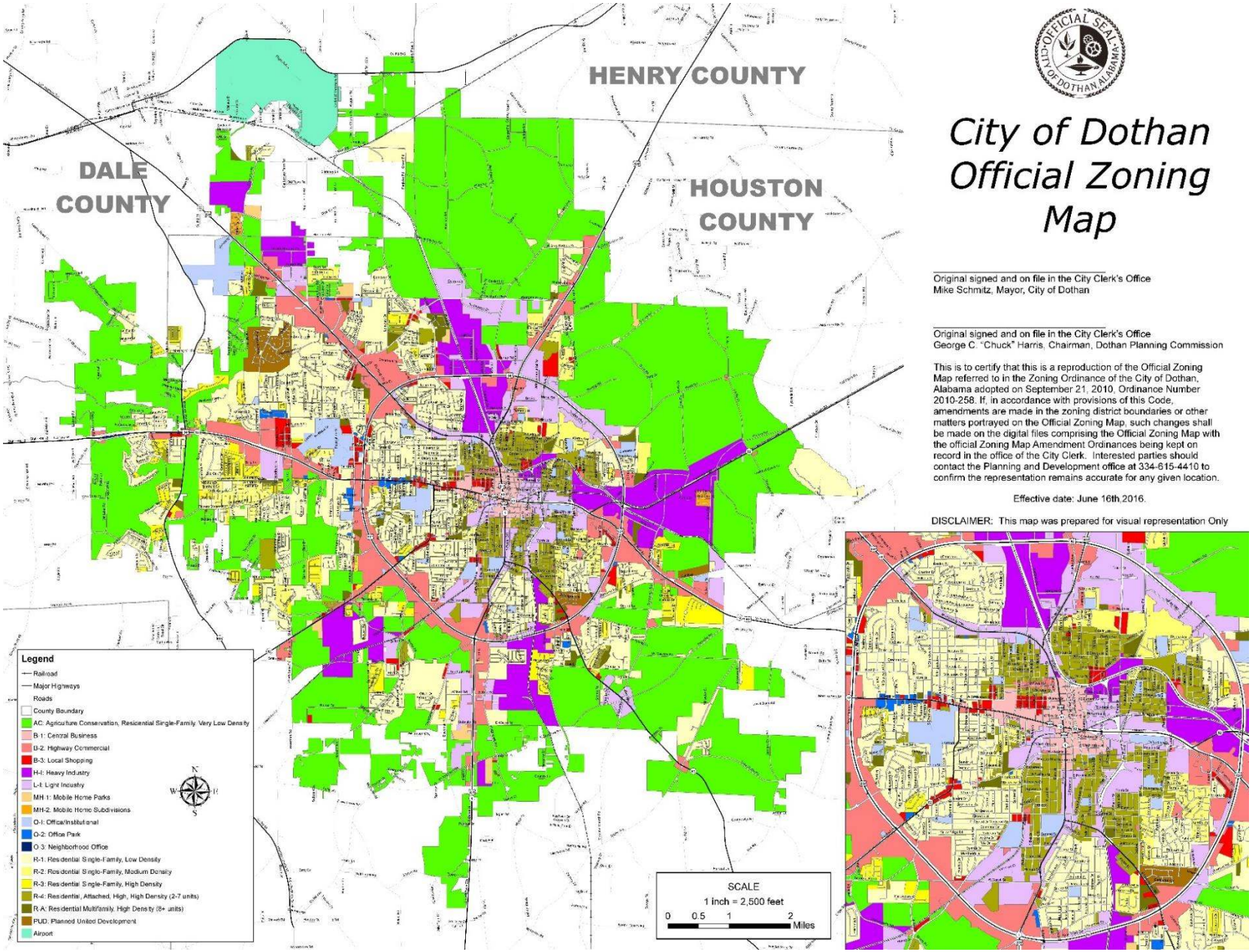


Figure 5 Zoning Map, Dothan

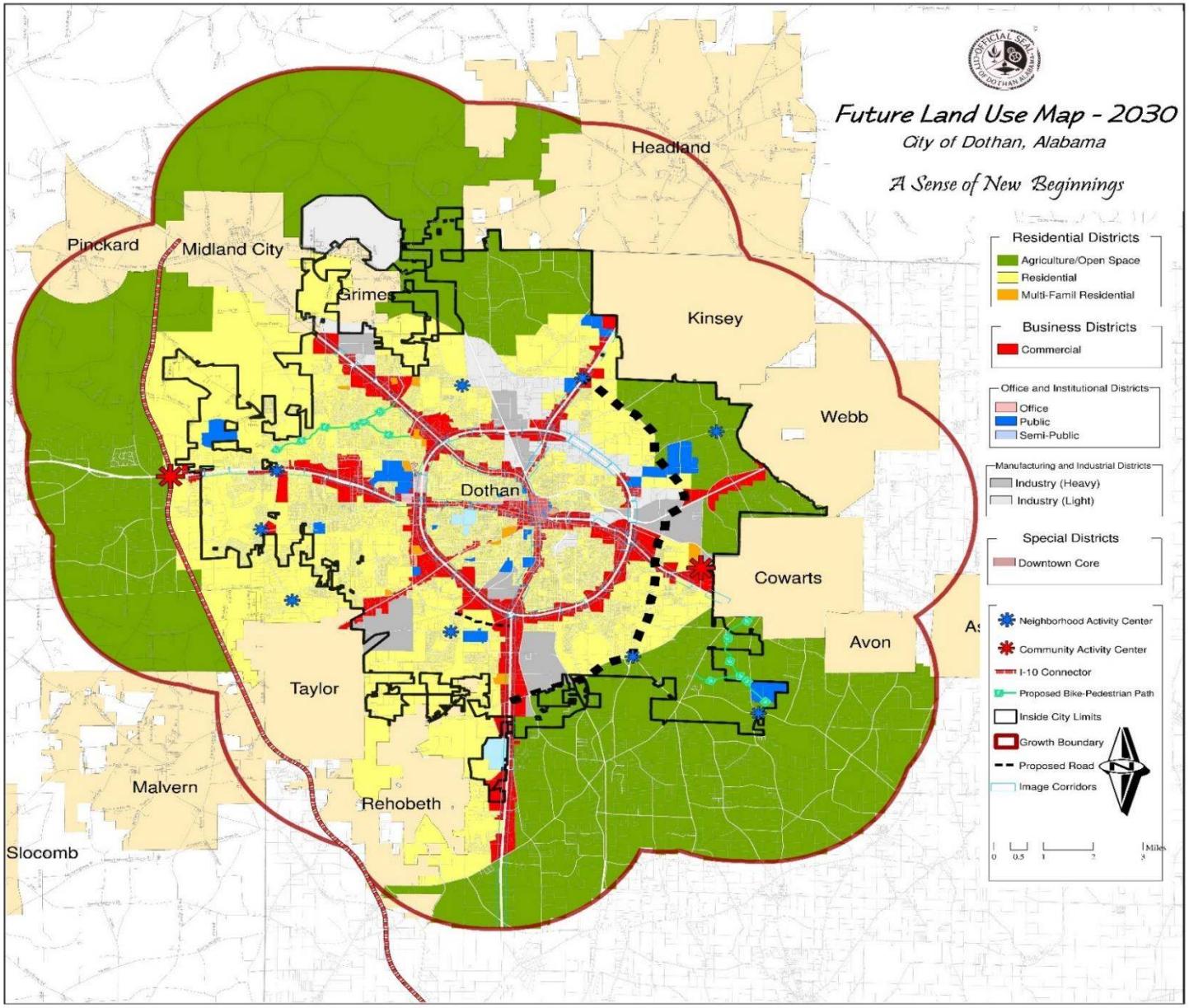


Figure 6 Future Land Use Map

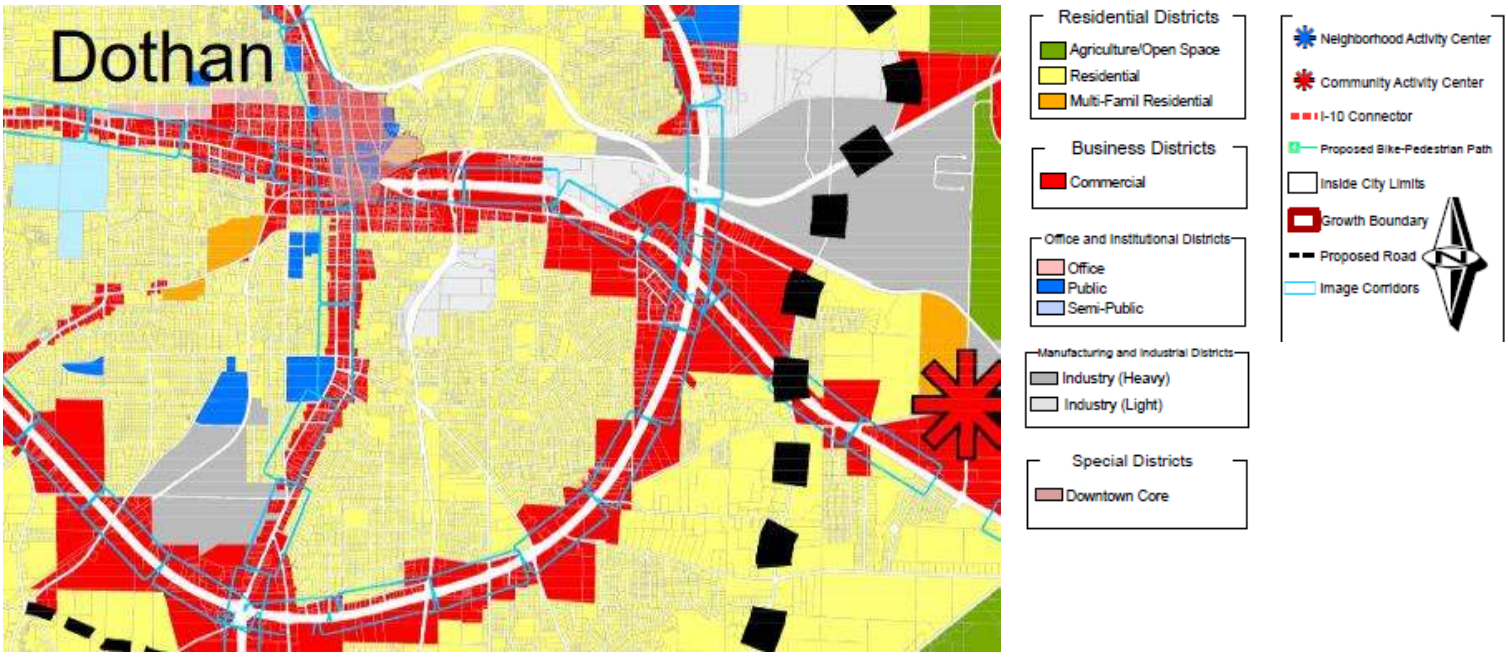


Figure 7 Future Land Use, Study Area

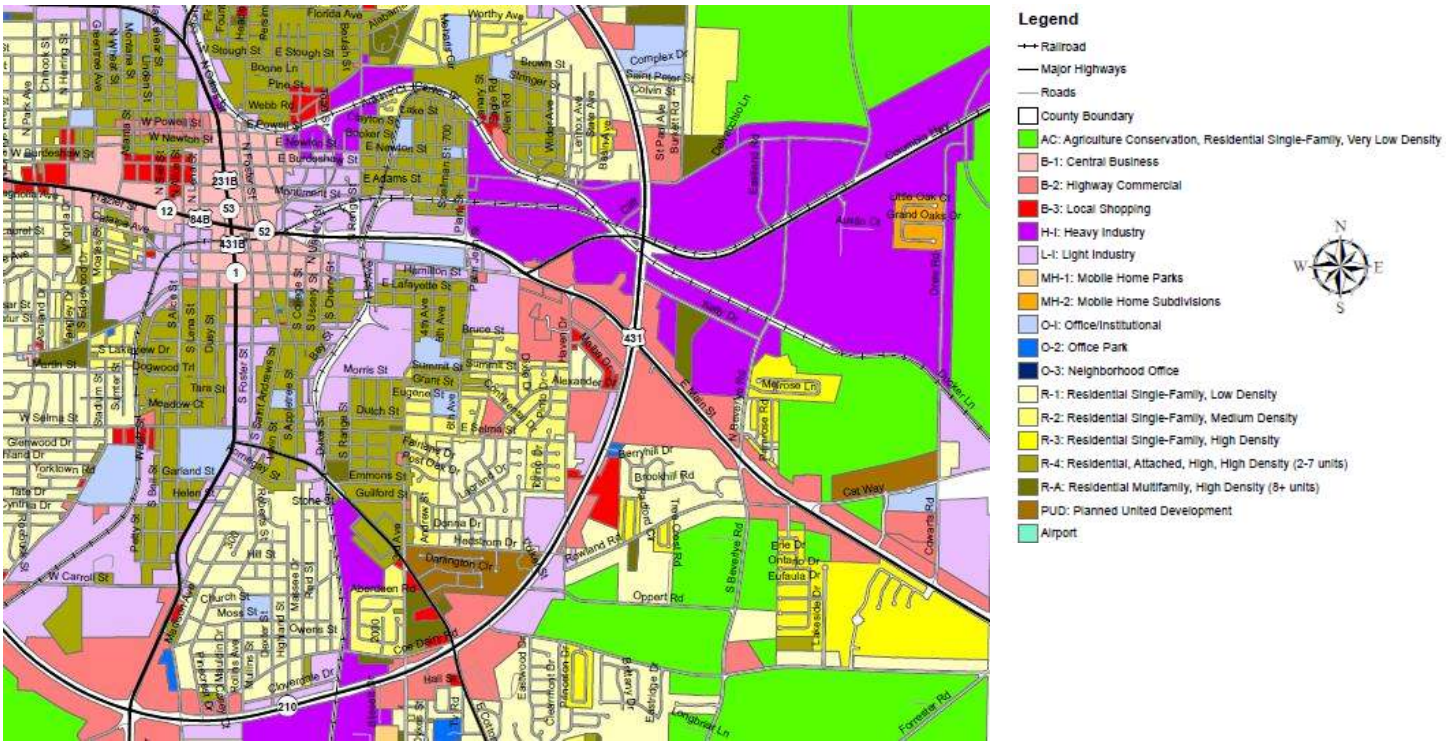


Figure 8 Existing Land use, Study Area

Dothan Business Plan Review

Renae Burton

Summary

The Dothan Business Plan is a functional continuation of an ongoing process to keep Dothan's Strategic Business Plan moving forward incorporating ideas from County department heads, stakeholders in the process, and community members with up to date information on current and ongoing projects. The overall goal of the city of Dothan is to make the city operate more effectively and competently than it has in the past with ongoing updates.

Objectives

One of the main objectives for 2018 were to create an affordable housing study to determine current rates for affordable housing in the city of Dothan, find out what barriers existed and how to overcome those barriers. In looking at affordable housing the city complete a study to find out what was needed to meet the price appropriate housing initiatives that they were striving for. In the report there are indications that single, white, females, making less than $49,000.00 per year were those most in need. Another objectives would be to create a new ADA transportation plans to update sidewalks and curbs to accommodate persons with disabilities. The last evaluation of the ongoing plan was in January of 2018 and the updates are currently listed on the city of Dothan's website as What's New in the city of Dothan. The Transportation Alternatives Program (TAP) was implemented and is ongoing with ideas on how to make Dothan more mobile and a more functional city. Plans are in the works by ALDOT to have this project completed by August 2018. Along with updating TAP, the traffic signals will need to be updated to coordinate with the ongoing improvements in the city. Other objectives include: The GIS Street sign Inventory & Pavement Management Program, the continuation of the Roadway & Pedestrian improvements in Denton Road Widening project, replacing the Brookside Bridge, and to continue providing cost effective solid waste handling which is listed as a top priority to improve mobility in the city of Dothan. Phase III of EPA Administrative Order on Consent (AOC) continues to be a top priority to finish construction of the rehab & replacement of various areas by June of 2018.

The goals of the business plan include but are not limited to:

- ◊ Continuously update the Dothan Plan.
- ◊ Improve service delivery, effectiveness, and efficiency.
- ◊ Monitor positive/negative changes.
- ◊ Set Priorities & Deadlines within the Departments.
- ◊ Identify developers and city land to purchase.
- ◊ Make Dothan more livable.
- ◊ Plan for Dothan's Future.
- ◊ Improve Mobility and access.

Long-Range Goal

Dothan does have a long-range goal that goes through the year of 2030. The long-range goal “A sense of New Beginnings” does have a staff that is involved with neighborhood planning, which directly targets goals of each community. The primary focus will be on quality of life in the future. It examines existing quantitative and qualitative aspects of the community such as housing, demographics, education, transportation infrastructure, public utility infrastructure, land use patterns, regulations governing land development, parks and open spaces, sense of community, and sense of place.

Dothan Downtown Master Plan Review

Kimberly Hooper

Summary

The Dothan Downtown Master plan was prepared May 2007 by HNTB Urban Design & Planning, as a result of a highly interactive eleven-month process between the HNTB team and Dothan Community. The main goal of was to formulate a plan and implement a strategy to guide the Downtown's future, focusing efforts on revitalization and economic development.

There are many important parts of this plan that relate to our project including: the vacant lots located along highway 84, the potential economic development, and the visitor points of interest.

Main Goals

- Stimulate the revitalization of downtown Dothan by promoting private and public-sector investment opportunities
- Foster downtown Dothan as a 'people place' through the development of a safe, clean, compact, and pedestrian-friendly environment
- Strengthen the role of the downtown as the focal point for culture, entertainment, public administration, and business activity in the region
- Provide a framework for the future allocation of financial resources in the downtown area
- Ensure that City planning and development policies are conducive to development in the downtown area
- Create a comprehensive and orderly management systems that balances the demand for long and short-term parking in downtown Dothan
- Cultivate an image of downtown Dothan as an active prosperous focal point of the community by facilitating aesthetic and functional improvements to the area

Challenges

Ross Clark Circle

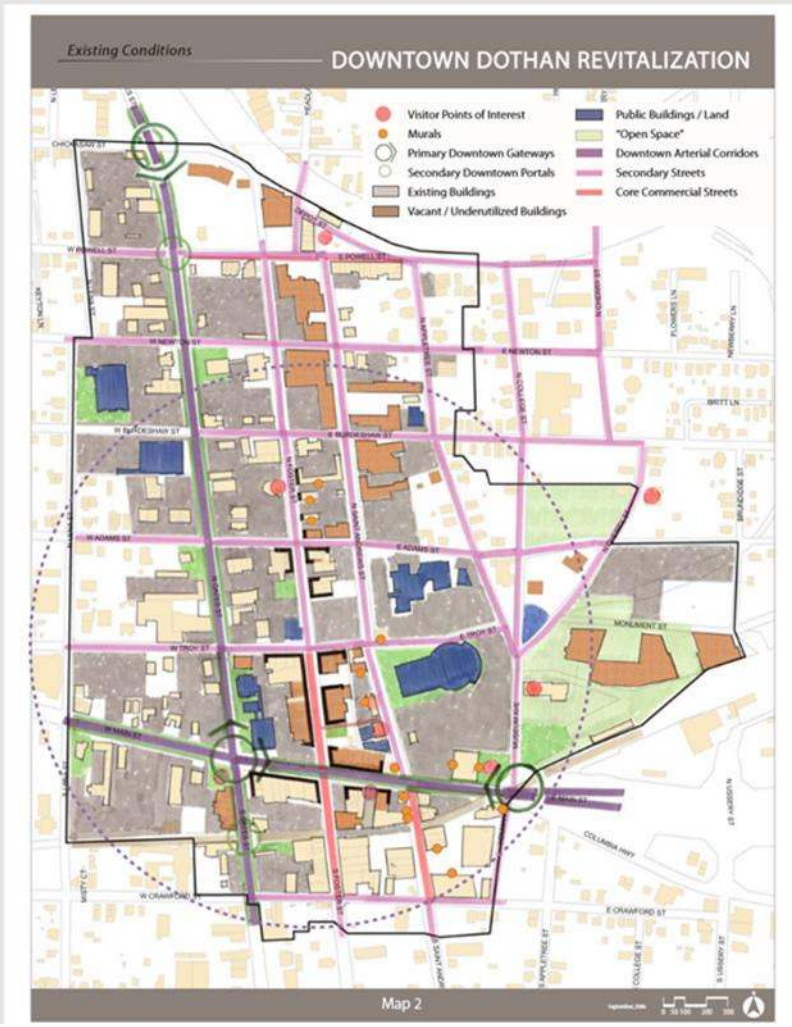
- Its construction has been the most significant event for the downtown area
- Brought development to the edges of the city, it did so to the detriment of the downtown
- Provided a route for traffic around the city rather than through it, which has reduced traffic congestion within the central city, but it has also reduced the potential for business viability along the major routes in and out of the city.

Vacant or Underutilized Buildings

- Some of these are historic structures and have the potential to highlight Dothan's architectural heritage.
- Others are not as architecturally significant and may allow for redevelopment.

Sprawled out Land Use Pattern

- This has ramifications for downtown reinvestment, as Dothan has large concentrations of people removed from the downtown, making the renewal of Downtown Dothan more challenging.



Recommendations

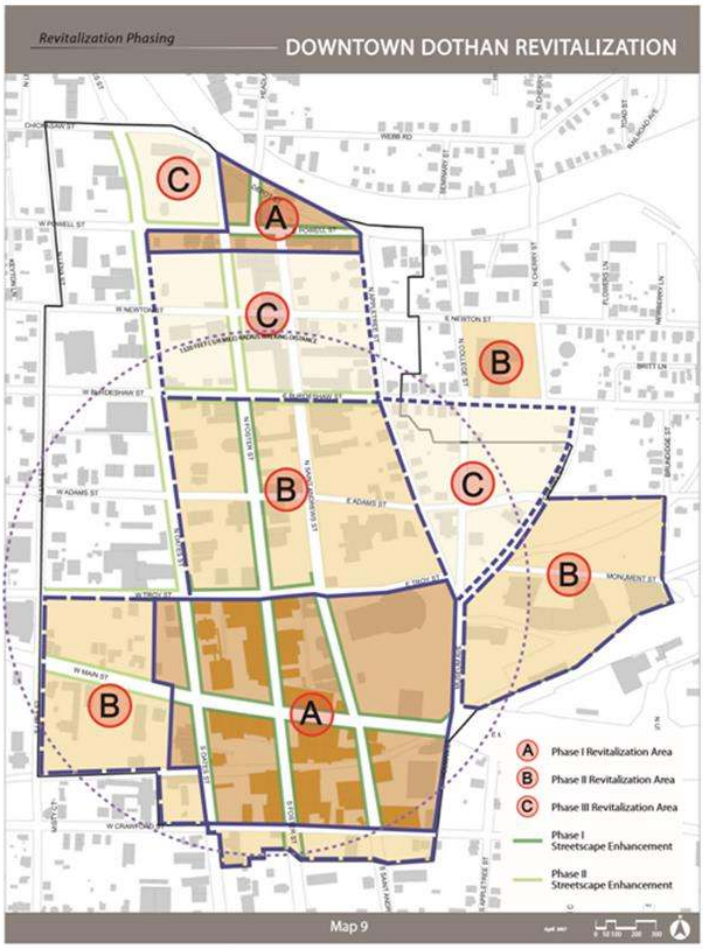
- Strengthening Dothan's Community Image
  Formalize Town Squares, Clean and Safe, Architectural Amenities, Tourism Potential, and Grow Dothan Events
- Stimulating Economic Development
  Downtown Development Districts, Redevelopment Partnerships, Follow-On Strategies, and Targeted Investments.
- Wayfinding and Signage
  Regional Wayfinding, Ceremonial Gateway, Secondary Portals, and Signage
- Public Realm Improvements
  Improvement Elements and Streetscape Initiatives
- Access and Circulation
  Intersection Improvements and Corridor Improvements
- Open Space and Linkages
  Ceremonial Open Spaces, Plaza Areas, and Open Space Linkages
- Parking
- Organizing for the Future
  Partnerships, Priorities, Implementation Tools, and Funding Mechanisms
- Zoning Recommendations
  Downtown Overlay Zone Recommendation and 2 Special Exception Uses

Economic Development

- A one-year startup plan for the Dothan Downtown Development Authority
- Incentives: an economic development tool kit for Dothan, Alabama
- Arts and Culture as an economic development tool
- Duties and responsibilities of downtown management
- Ten Steps to Development Success

Implementation

- Initial investments should be concentrated within the core areas. A “hop-scotch” pattern of reinvestment should be avoided.
- The Foster Street corridor, especially between Main Street and Troy Street, is the key component to downtown redevelopment. This area should be the number one priority for improvements to the downtown.
- The rehabilitation of the train depot provides an opportunity to capitalize on the potential of this point and the large potential some of the adjacent properties have.



City of Dothan Future Land Use Plan (1999, revised 2003)

Kimberly Hooper

- Recommends expanding the historic district to include the Dixie Area and Cherry Street AME Church
- Recommends changing local ordinances to treat poorly maintained buildings as nuisances
- Recommends that downtown revitalization will be a result of public-private partnership in order to:
    - improve streetscape amenities and
    - construct brick sidewalks and
    - revise on-site parking standards in the core area.

Downtown Revitalization and Murals (Undated)

Kimberly Hooper

- Identifies a list of existing incentives for downtown development:
  - historic district property tax relief
  - federal rehabilitation tax credits
  - loan programs: SBA financing, foundation grants, RLF financing, and CDBG funding
- Outlines downtown attractions that can be the focal points of a revitalization project:
  - Civic Center
  - Dothan Opera House
  - Wiregrass Museum of Art

City of Dothan Revitalization Project Plan Draft (Undated)

Kimberly Hooper

Covers five aspects of Dothan, with strategies to improve the downtown area.

- **Infrastructure**
  - the enforcement of parking rates
  - maintaining of government services downtown
- **Public Relations**
  - a marketing plan be developed and implemented for Dothan
- **Resources**
  - a Business Improvement District (BID), Community Development Corporation (CDC), and Downtown Redevelopment Authority
- **Economic Development**
  - the development of a small business incubator and downtown conference center
- **Quality of Life**
  - initiation of a green space plan and the creation of visitor services downtown.

Dothan Bicycle and Pedestrian Plan Review

Mitch Moody

Summary

Dothan is incredibly underdeveloped when it comes to pedestrian and bike infrastructure. Only 17% of streets within incorporated Dothan have sidewalks on at least one side of the road, and all but 5 miles of this sidewalk is located within Downtown Dothan. Even worse there is only 850 feet of designated biking lanes in the entire city.

Recreational infrastructure is more developed. There is a 5.8 mile mountain bike trail at the Troy University Dothan campus, and a 3.28 mile paved bike facility at Westgate park. There is a half mile of paved walking trail, but over 8 miles of unpaved trails within several parks within Dothan.

Most Dothanites, 60%, do not bike or walk. Those who do bike or walk tend to do so only for recreational purposes. The distance between points of interest was marked as the main reason to not use walking or biking as a form of transportation. Less than 2% walk as their commute, or to do an errand.

The future of biking and walking in Dothan will prioritize connectivity between points of high use, such as Westgate Park (the number one biking facility in Dothan), with routes of travel such as Choctaw Street. More off-street walking is prioritized over more sidewalks. More bike lanes will be marked on streets, and bicycle safe loops are planned for the future.

Strategic Plan Report

Dothan's Strategic Plan is a long-term planning document that sets the priorities for Dothan up to the year 2032. As the time-range for planning is so long, much of the plan is indirect and unspecific. The document itself is short, only 26 pages despite including important topics like mobility and economic growth. The document is broken up into 5 goals, each including objectives, short term challenges and opportunities, and actions 2017. Dothan's strategic plan deals with the Highway 84

corridor mostly through Goals 4 and 5, Improve Mobility and Make Dothan More Livable and Inclusive.

Improving Mobility includes several things related to the corridor directly. In Objectives these include insuring adequate parking (and signage) downtown and improved intersections. Short term challenges and opportunities identified in the plan that relate to the corridor are the increased congestion on the roads of Dothan, and the lack of connectivity between sidewalks. None of the actions for 2017 however indicate any immediate improvement for the coordinator.

Making Dothan More Livable and Inclusive also contains some items that address the corridor. Objectives include more attractive streetscapes, public spaces and trees; a revitalized downtown, and upgraded parks. Short term challenges and opportunities include continuing to make downtown Dothan an attractive place to go, dealing with empty buildings, and aging parks and recreation facilities. Actions for 2017 that relate to the corridor include the Opera House renovation, the design of a civic center marquee, and enforcement of the minimum property maintenance ordinance.

Sources

City of Dothan Bicycle and Pedestrian Master Plan
file:///C:/Users/hoope/Dropbox/Dothan%20Zoning/Bicycle%20and%20Pedestrian%20Plan%20-%20Mitch.pdf

City of Dothan Business Plan
file:///C:/Users/hoope/Dropbox/Dothan%20Zoning/City%20of%20Dothan%20Business%20Plan%20-%20Renae.pdf

City of Dothan Official Zoning Map
file:///C:/Users/hoope/Dropbox/Dothan%20Zoning/Zoning%20Map.pdf

City of Dothan Strategic Plan
file:///C:/Users/hoope/Dropbox/Dothan%20Zoning/City%20of%20Dothan%20Strategic%20Plan%20-%20Mitch.pdf

Downtown Dothan Master Plan
http://www.dothan.org/documentcenter/view/201

Future Land Use Map
file:///C:/Users/hoope/Dropbox/Dothan%20Zoning/Future%20Landuse%20Map.pdf

Highway 84 East Corridor Study
file:///C:/Users/hoope/Dropbox/Dothan%20Zoning/Project%20Overview.pdf

Vision Workshop 2 PDF
file:///C:/Users/hoope/AppData/Local/Packages/Microsoft.MicrosoftEdge_8wekyb3d8bbwe/TempState/Downloads/VisionWorkshop%202%20presentation%20and%20results.pdf

Zoning Ordinance
file:///C:/Users/hoope/Dropbox/Dothan%20Zoning/Zoning%20Ordinance.pdf