Opelika Road Bicycle & Pedestrian Plan

Dean Road to City Limits

Elizabeth Hammer, Jaime Larzelere, Matthew Anspach, and Nick Vansyoc

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1. Introduction

1.1 Introduction

The section of Opelika Road that spans the length from the intersection of Dean Road to the Auburn city limits is approximately 1.7 miles. The average speed limit along this section of Opelika Road is 45 miles per hour. There are four lanes of travel with a central turn lane along this entire section, making the average width of the road approximately 100 feet with exception to major intersections. Along this section of Opelika Road there are two major intersections at the locations of Dean Road/ Opelika Road and East University/ Opelika Road.

1.2 Background of Study and Region

In the City of Auburn the Opelika Road Corridor is the primary thoroughfare for commercial and retail activity. Out of the approximately 50,000 residents of Auburn, roughly half of the population is students. The large student population attributes a dynamic to the city that is uniquely inclined to pedestrian and bicycle travel modes. However, the student residents on the periphery of the Opelika Road Corridor are restricted by the existing conditions. They must rely heavily upon automobile transportation due to the lack of pedestrian and bicycle infrastructure. This report provides analysis of the existing conditions and proposes potential strategies for implementing pedestrian and bicycle paths in conjunction with the City of Auburn's current Renew Opelika Road project.

1.3 Methodology

Our approach in this report began by determining the pedestrian viability of the corridor. In doing so we determined that there was little to no existing pedestrian and bicycle infrastructure. Therefore, the initial strategy for this project was to implement adequate infrastructure and increase access to the area. This including designing connections to adjacent neighborhoods.

In the analysis of existing conditions we collected GIS data from the city to generate existing conditions maps. The corridor was surveyed to determine the Level of Service for pedestrian and bicycle facilities while photographing the sidewalks and main intersections. The current land use policies of the City were analyzed as well.

The design proposal consisted of comprehensive maps of proposed sidewalk and bicycle paths as well as section depictions of different levels of implementation possible for the corridor.

2. Existing Conditions

2.1 Current Land Use Policies

The current land use for this section of Opelika Road is zoned as Commercial Conservation, which aims at maintaining the commercial retail located there. Below is a table of the Standards for Nonresidential Uses by District for the Commercial Conservation zoning:

Table1: Standards for Nonresidential Uses by District for the Commercial Conservation

Commercial Conservation District	Maximum FAR	Maximum ISR	Minimum Site Area	Minimum Lot Width
Public Service	0.35	0.75	7,500 SF	75 ft
Road Service	0.35	0.90	30,000 SF	100 ft
Conditional Uses	0.50	0.90	7,500 SF	75 ft
All Other Uses	0.70	0.80	7,500 SF	75 ft

Source: City of Auburn (2012)

From this chart detailing the Commercial Conservation District, it is evident that the Road Service is the most prominent element given its significant area minimum of 30,000 SF. This also indicates that a high amount of traffic volume is experienced along this section of Opelika Road. The City of Auburn has classified Opelika Road as an arterial which also indicates that Opelika Road serves as a destination as opposed to purely a commuter road. In addition, the city of Auburn also has Land Use Intensity Class Standards as shown in the tables included below:

Table 2: Land Use Intensity Class Standards, Classes V-IX

Land Use/Maximum Performance Standards		Class V	VI	VII	VIII	IX
Institutional, Indoor Recreation, Special Residential						
	I.S.R.	0.30	0.60	0.70	0.80	
	F.A.R.	0.25	0.50	0.60	0.70	
	Height	35'	40'	45'	50'	
Office						
	I.S.R.	0.30	0.60	0.80	0.90	1.00
	F.A.R.	0.20	0.50	1.20	2.00	3.00
	Height	20'	60'	60'	60'	80'
Performance Residential Development						
	Gross Density		6.00	17.50	34.00	
	I.S.R.		0.32	0.48	0.75	
	Height		----------(See Section 502)----------			
Public Service						
	I.S.R.	0.20	0.50	0.60	0.70	0.80
	F.A.R.	0.15	0.20	0.30	0.35	0.50
	Height	20'	30'	40'	50'	50'
Agriculture Support						
	I.S.R.			0.65	0.80	0.90
	F.A.R.			0.55	0.80	0.90
	Height			40'	50'	60'

Source: City of Auburn (2012)

Table 3: Land Use Intensity Class Standards, Classes I-V

Land Use/Maximum Performance Standards	Class I	II	III	IV	V
Agriculture, Forestry & Nurseries					
Gross Density*	0.33				
I.S.R.	0.05	0.50			
F.A.R.	0.02	0.05			
Height, inhabited	35'	35'			
Height, uninhabited	80'	80'			
Conventional Subdivision					
Gross Density		1.00	3.00	4.00	5.00
I.S.R.		0.15	0.25	0.35	0.35
Height		35'	35'	35'	35'
Performance Residential Development					
Gross Density			2.00		
I.S.R.			0.12		
Height		----------(See Section 502)----------			
Outdoor Recreation					
I.S.R.		0.30	0.40	0.50	0.60
F.A.R.		0.005	0.010	0.015	0.020
Height		20'	25'	30'	30'
Neighborhood Shopping Center					
I.S.R.		0.50	0.60		
F.A.R.		0.30	0.40		
Height		25'	35'		
Recreational Rental Dwellings					
Gross Density				10	
I.S.R.				0.25	
F.A.R.				0.15	
Height				35'	
* residential use permitted only in the Rural (R) district					

Source: City of Auburn (2012)

Table 4: Land Use Intensity Class Standards, Classes VI-X:

Land Use/Maximum Performance Standards	Class VI	VII	VIII	IX	X
Outdoor Recreation					
I.S.R.	0.70	0.80	0.90		
F.A.R.	0.03	0.04	0.05		
Height	30'	35'	40'		
Commercial / Entertainment and Regional Shopping Center					
I.S.R.	0.60	0.80	0.90	1.00	1.00
F.A.R.	0.47	0.77	1.10	1.20	2.00
Height	25'	30'	50'	60'	60'
Road Service					
I.S.R.		0.50	0.80	0.90	
F.A.R.		0.19	0.31	0.35	
Height		25'	40'	40'	
Commercial Support					
I.S.R.	0.40	0.50	0.75	0.90	1.00
F.A.R.	0.30	0.40	0.60	0.80	0.90
Height	30'	35'	45'	45'	45'

Source: City of Auburn (2012)

Table 5: Land Use Intensity Class Standards, Classes IX-XI

Land Use/Maximum Performance Standards	Class IX	X	XI
Commercial Recreation			
I.S.R.	0.70	0.90	
F.A.R.	0.30	0.40	
Site design standard	E	E	
Industrial Uses			
I.S.R.			0.90
F.A.R.			0.94
Site design standard			E
Height			60'
Extraction			
I.S.R.			0.10
F.A.R.			0.10
Site design standard			E
Height			30'

Source: City of Auburn (2012)

2.2 Level of Service Criteria

Included below are the charts that delineated the criteria for our Level of Service Analysis:

Table 6: **Bicycle and Pedestrian Level-of-Service Performance-Measure Point System**

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

[1] Segment Score = sum of points in the six categories
[2] Segment Weight = segment length / corridor length
[3] Adjusted Segment Score = Segment Score x Segment Weight
[4] Corridor Score = sum of the Adjusted Segment Scores in the corridor

Source: Dixon, Linda B. (2012)

Level of Service Criteria for East University Drive to Auburn City Limits

Bicycle and Pedestrian Level-of-Service Performance-Measure Point System

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

[1] Segment Score = sum of points in the six categories

[2] Segment Weight = segment length / corridor length

[3] Adjusted Segment Score = Segment Score x Segment Weight

[4] Corridor Score = sum of the Adjusted Segment Scores in the corridor

Source: Dixon, Linda B. (2012)

2.3 Level of Service Analysis

An analysis of the existing conditions of pedestrian and bicycle facilities began our Analysis of the Level of Service of Opelika Road from Dean Road to the Auburn city limits. The Dean Road/Opelika Road intersection only has one crosswalk, on the east side of the intersection. This intersection does not have a pedestrian signal. Between the Dean Road/Opelika Road and East University Drive/Opelika Road intersections, there are no sidewalks on the north side of Opelika Road. There is a non-continuous sidewalk on the south side of Opelika Road, including a non-grade separated crosswalk passing several driveways for approximately 1,000 feet. The speed limit through this section is 45 miles per hour and there are numerous driveways causing conflicts for pedestrians. There are no bicycle facilities within this section. This section of Opelika Road is 1.06 miles and has 34 curb cuts on the north side and 41 curb cuts on the south side of Opelika Road, resulting in a rate of 71 curb cuts per mile.

The East University Drive/Opelika Road intersection has crosswalks on all approaches but no pedestrian signals. The section between this intersection and the Auburn city limits does not have any sidewalks on either side of Opelika Road. The intersection of Ronald Lane and Opelika Road does not have any crosswalks or pedestrian signals. The intersection of Mall Parkway and Opelika Road has a crosswalk on the east side of the intersection, along with a pedestrian signal and push button. Mall Parkway has a sidewalk on the east side of the road. The speed limit through this section is 45 miles per hour and the section is automobile-oriented. There are no bicycle facilities within this section. This section of Opelika Road is 0.65 miles and has 22 curb cuts on the north side and 17 curb cuts on the south side of Opelika Road, resulting in a rate of 60 curb cuts per mile. There are no crosswalks between any of the signalized intersections within this corridor.

The existing level of service for both pedestrians and bicyclists was determined for Opelika Road between Dean Road and the Auburn city limits. The level of service was determined in accordance to the logic found in a *Transportation Research Record* article written by Linda Dixon. This set of performance measures was developed by the city of Gainesville, Florida and focuses on quantitative attributes in addition to qualitative factors already considered by the *Highway Capacity Manual*.

For the purpose of determining a level of service for the pedestrian and bicycle facilities on Opelika Road, the corridor was divided into two segments: Dean Road to East University Drive and East University Drive to the Auburn city limits (see Figure 32). This was done to account for the differences in the infrastructure on these two segments.

The first segment, Dean Road to East University Drive, received a score of 2 for bicycle facilities and a score of 1.5 for pedestrian facilities. The second segment, East University Drive to the Auburn city limits, received a score of 2 for bicycle facilities and a score of 0.5 for pedestrian facilities. All of these scores resulted in a level of service of F.

2.4 Traffic Analysis

The intersection of East University Drive and Opelika Road was analyzed. This is the most congested intersection along the corridor. The effect of any proposed improvements on this intersection should be studied before any recommendations are made. Data was obtained from both the City of Auburn and the Foresite Group, a local engineering firm.

The traffic counts were collected by the Foresite Group on Wednesday April 18th, 2012. Counts were taken between 7:00 and 9:00 a.m., 11:00 a.m. and 1:00 p.m., and 4:00 and 6:00 p.m. A peak hour was determined during each of these three peak periods. The morning peak hour was between 7:15 and 8:15 a.m. The lunch peak period was between 12:00 and 1:00 p.m. The afternoon peak period was between 4:30 and 5:30 p.m. The traffic data is shown in Diagram 1.

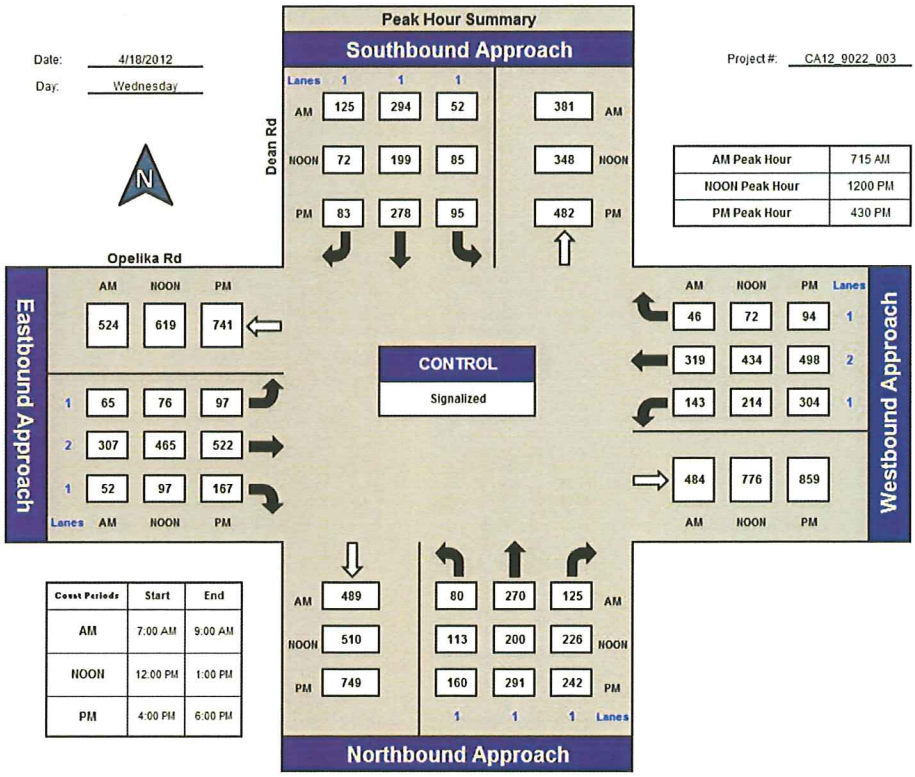


Diagram 1: Intersection Traffic Counts

Source: Foresite Group (2012)

The traffic data was analyzed using HCS+ (Highway Capacity Software). Existing roadway geometry and traffic signal timings were input along with the traffic counts. The software calculated a level of service for the intersection as a whole, a level of service for each approach, and an intersection delay. The existing conditions are shown in Table 7:

Table 8: Existing Intersection Delay and Level of Service

	Intersection Delay (seconds/vehicle)	Level of Service
Morning	44.5	D
Noon	58.9	E
Afternoon	59	E

Source: Table developed by Authors

Currently, each approach has a right turn lane, two through lanes, and a left turn lane. One through lane was removed for each Opelika Road approach to simulate the traffic conditions if the corridor was reduced to a two-lane road. The modified conditions are shown in Table 8.

Table 9: Lane Reduction Intersection Delay and Level of Service

	Intersection Delay (seconds/vehicle)	Level of Service
Morning	47.8	D
Noon	96.9	F
Afternoon	93.4	F

Source: Table developed by Authors

The morning peak period is not nearly as congested as the noon and afternoon peak periods. Therefore, the reduction of a lane on Opelika Road does not have as large of an impact on the morning peak period traffic. The noon and afternoon peak periods are severely affected. However, the traffic signal timings are timed specific to the existing conditions. The signal timings were optimized for the noon and afternoon peak periods to find the best possible intersection delay and level of service. The noon peak period intersection delay was reduced to 82.7 seconds per vehicle, which is still a level of service F. The afternoon peak period intersection delay was reduced to 87.4 seconds per vehicle, a level of service F. Therefore, a two-lane section design on Opelika Road is not feasible due to the increased intersection delay and lower level of service.

2.5 Photographs of Existing Bicycle and Pedestrian Facilities

The following photographs focus on the two main intersections of Dean Road and East University on our section of Opelika Road as well as the current sidewalk conditions. As depicted, the sidewalks are either non- existent or painted on pedestrian paths that do not even qualify as real sidewalks. In addition, we have depicted the one bio swale intact along this section of Opelika Road which is in fair condition. The pictures reveal the defining characteristics of Opelika Road that make them unfavorable for pedestrian or bike travel. There are no pedestrian cross walk signals, no street trees, and the buildings along the road have very large setbacks. These factors greatly discourage pedestrians along Opelika Road. As for bike

travel, there are no bicycle lanes and the lack of pedestrian or bicycle signals are the main factors that discourage bike travel. Thus, as depicted the section of Opelika Road from the intersection of Dean Road to the City limit accommodates automobile travel.

Figure 1: Intersection of Dean and Opelika Roads, facing east. Figure 2: Intersection of Dean and Opelika Roads, facing west. Figure 3: Intersection of Dean and Opelika Roads, facing north. Figure 4: Crosswalk example at intersection of Dean and Opelika Roads. Figure 5: Non-grade separated crosswalk example along Opelika Road, facing east. Figure 6: Continuation of non-grade separated crosswalk, facing west.

Source: Photographs taken by Authors

Figure 7: Non-grade separated crosswalk converting to a sidewalk, facing east. Figure 8: Example of non-maintained sidewalk, facing west. Figure 9: Curb-cut example, facing east. Figure 10: Intersection of Opelika Road and East University Drive, facing east. Figure 11: Example of drainage along north side of Opelika Road, facing west. Figure 12: Intersection of Ronald Lane and Opelika Road, facing east.

Source: Photographs taken by Authors

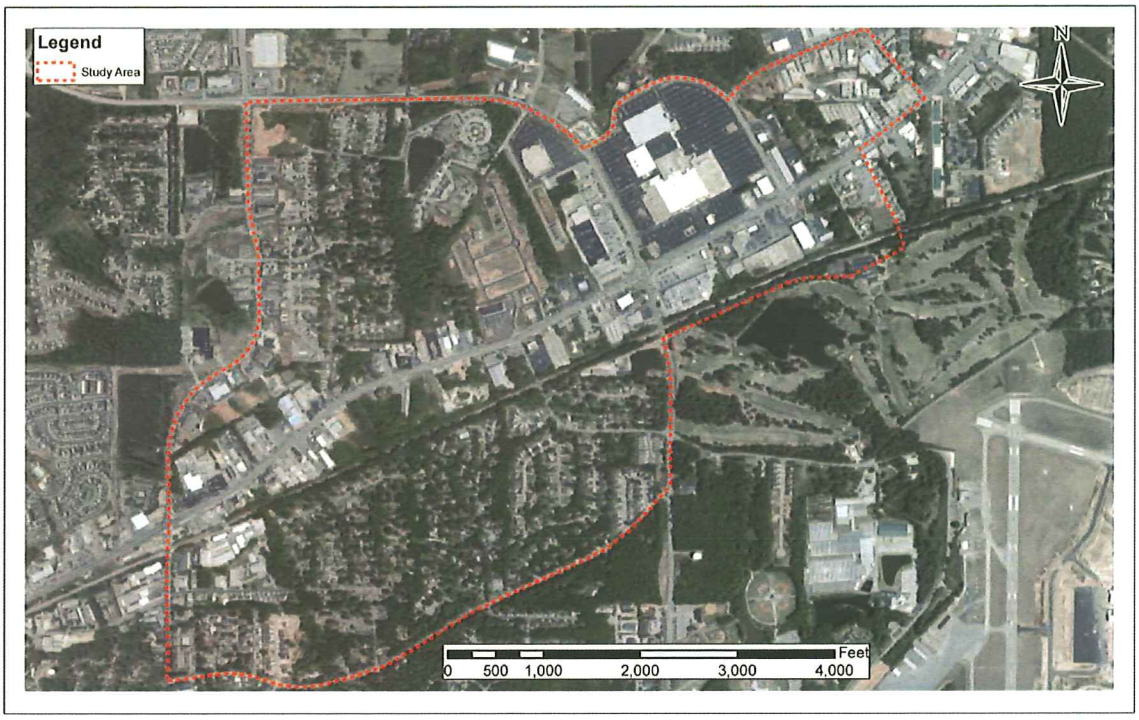
2.6 GIS Analysis of Existing Conditions

Analyses of existing conditions depicted in the GIS maps below provide an aerial depiction of the current infrastructure in place. Through these maps we are provided further insight of the area aside from its structural conditions through the analysis of vacancy opportunities, population and age of local residents, and land use.

Figure 13: Study Area showing Built Structures

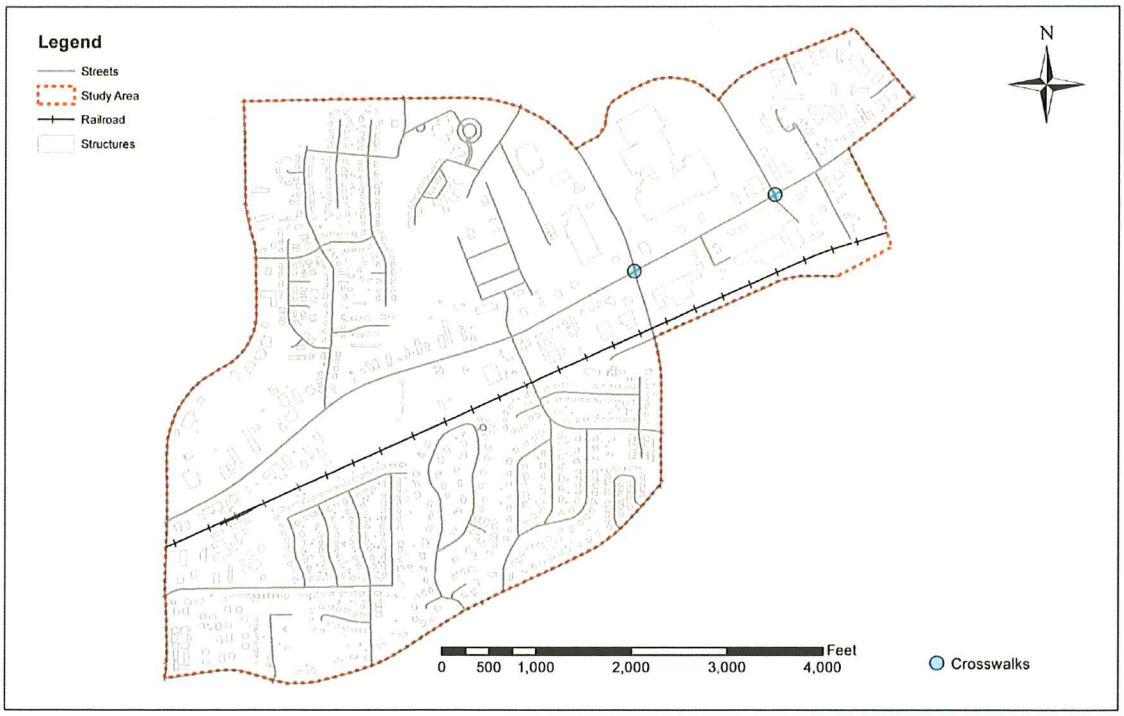
Source: City of Auburn GIS, Assembled by Author

Figure 14: Aerial Image



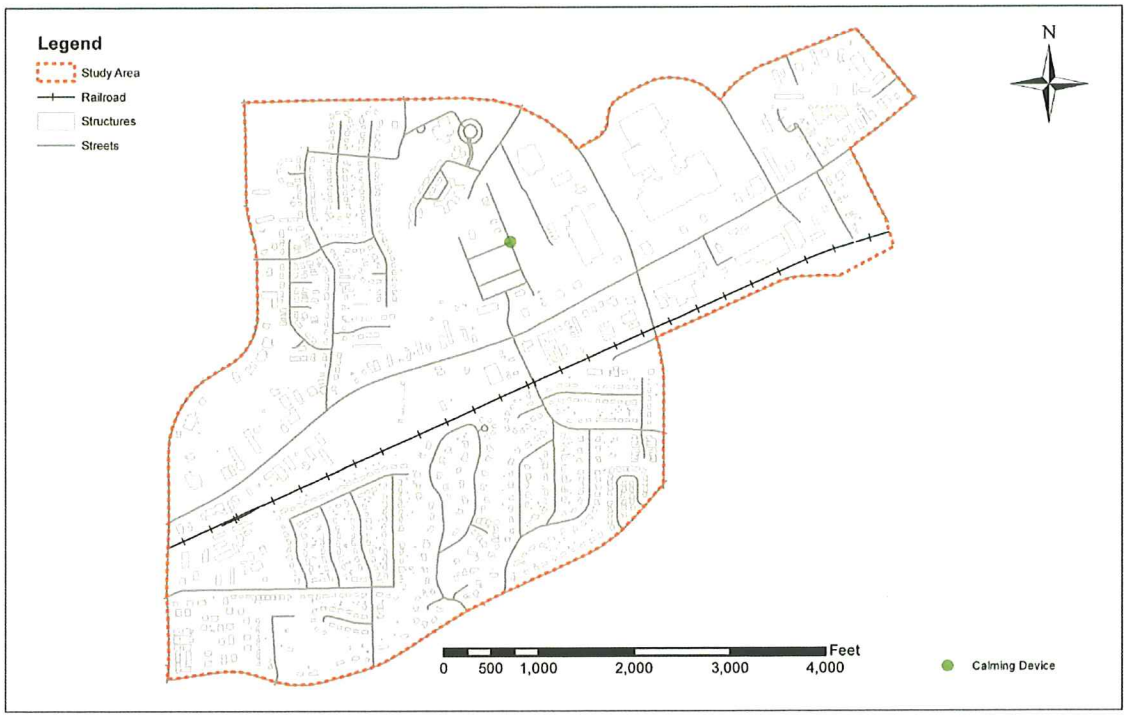
Source: City of Auburn GIS, Assembled by Author

Figure 15: Existing Crosswalk Locations



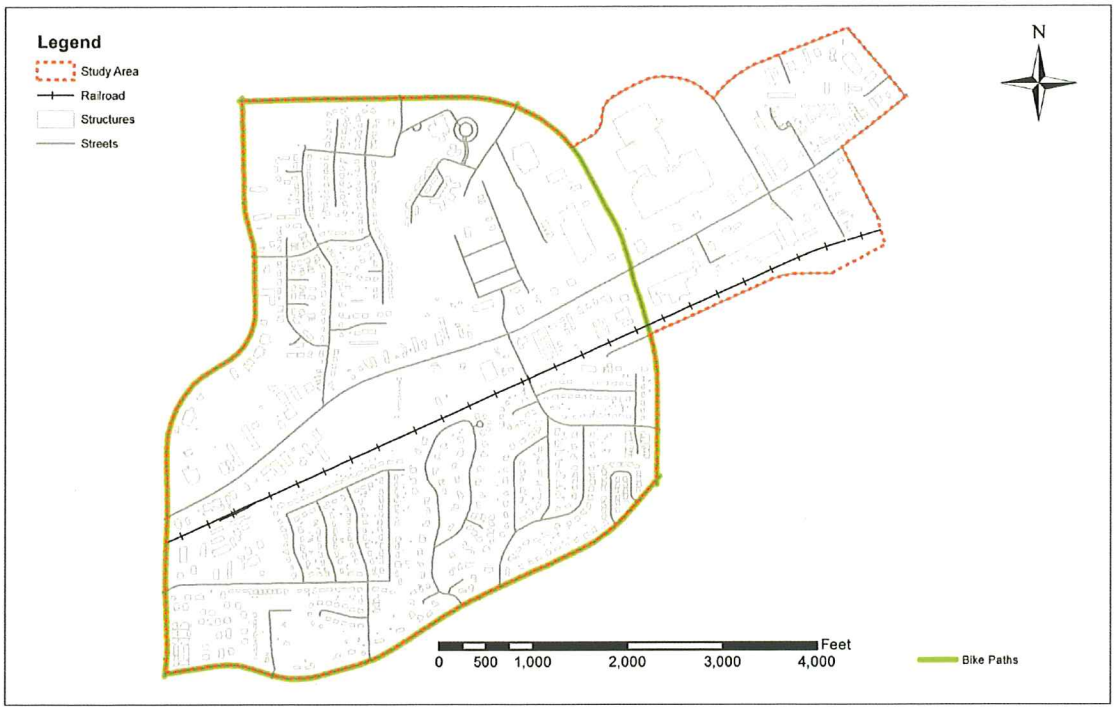
Source: City of Auburn GIS, Assembled by Author

Figure 16: Existing Calming Devices



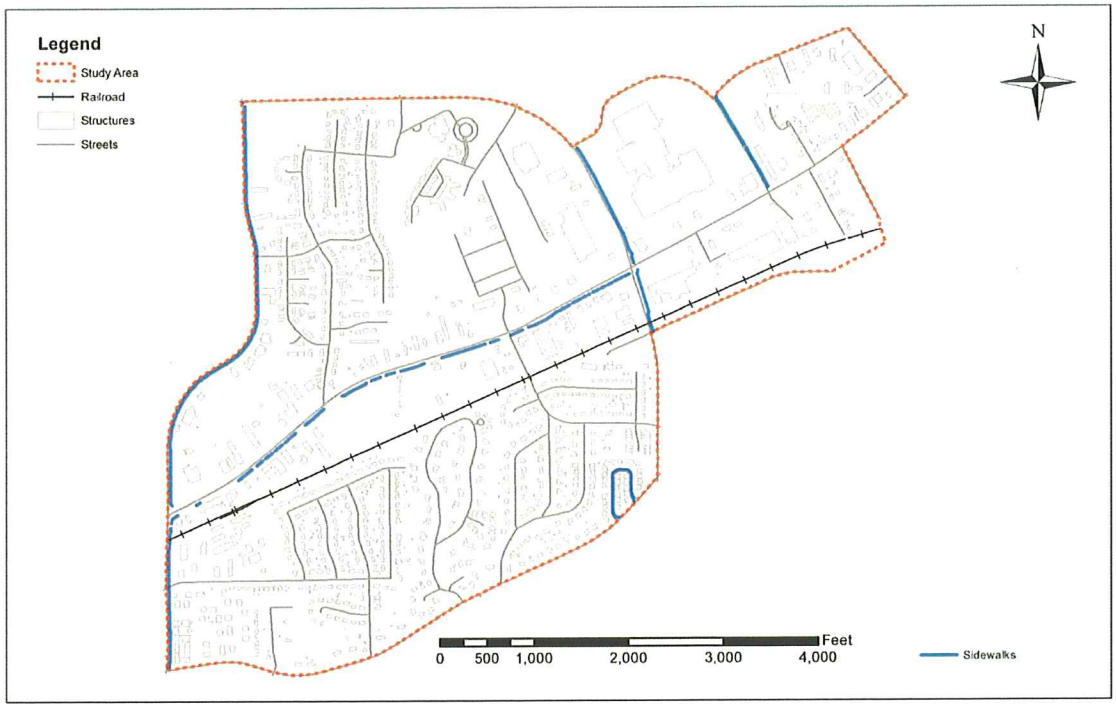
Source: City of Auburn GIS, Assembled by Author

Figure 17: Existing Bike Paths



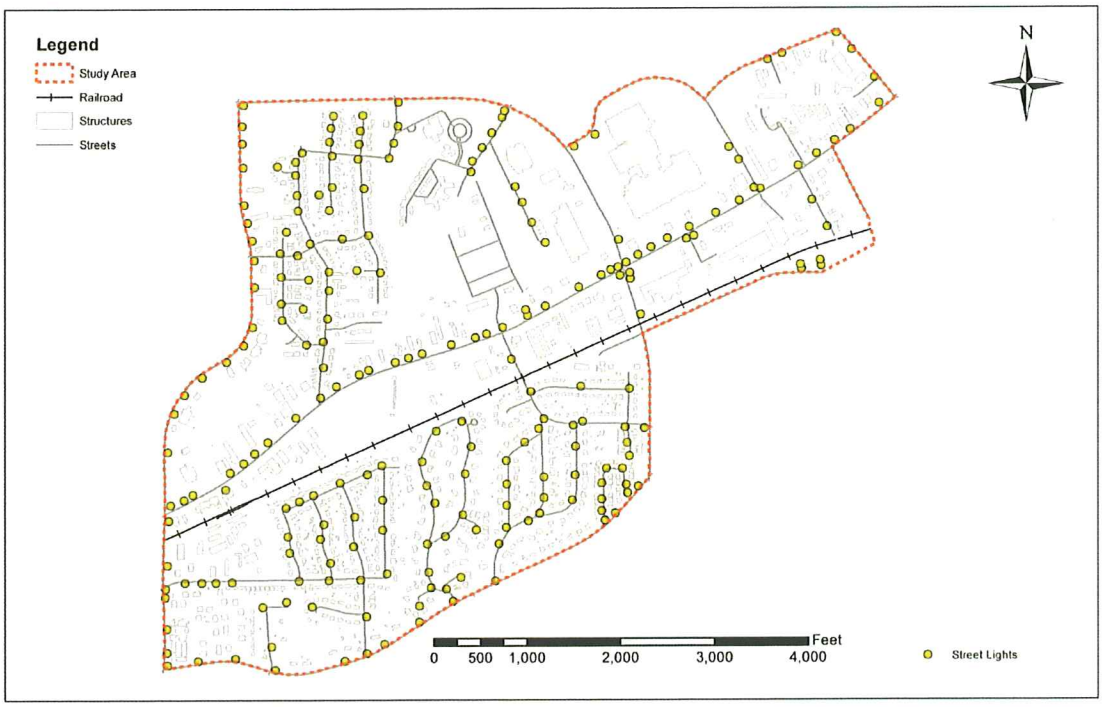
Source: City of Auburn GIS, Assembled by Author

Figure 18: Existing Sidewalks



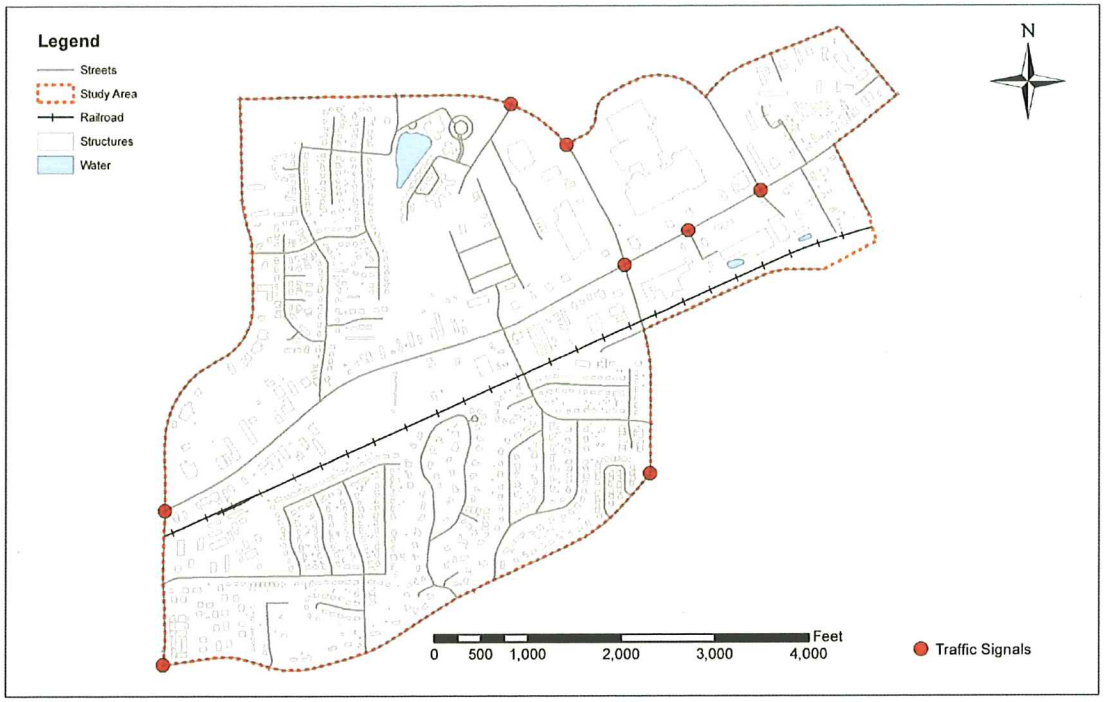
Source: City of Auburn GIS, Assembled by Author

Figure 19: Existing Street Lights



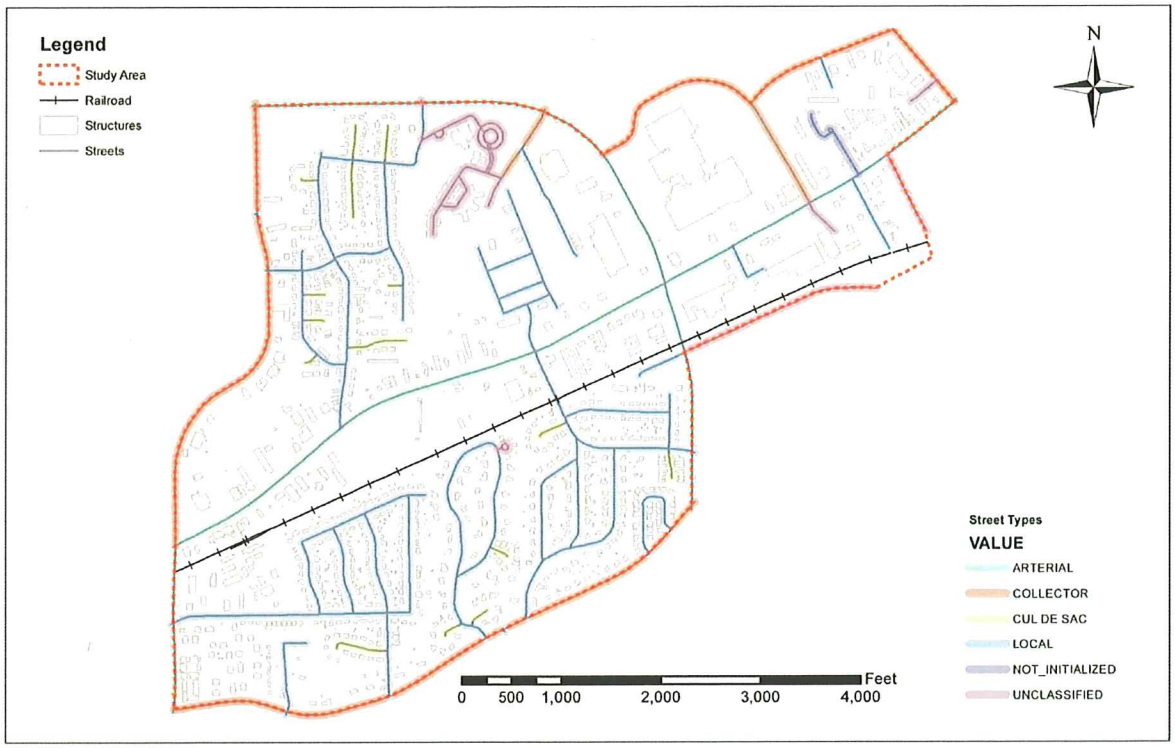
Source: City of Auburn GIS, Assembled by Author

Figure 20: Existing Traffic Signals



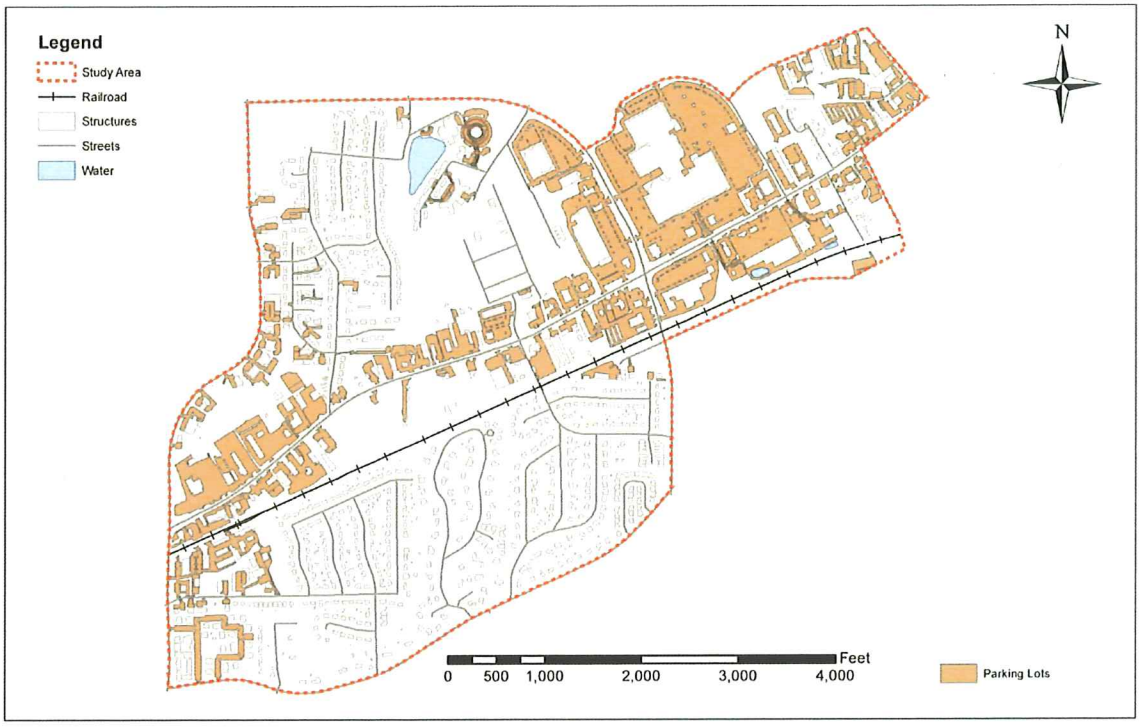
Source: City of Auburn GIS, Assembled by Author

Figure 21: Street Values



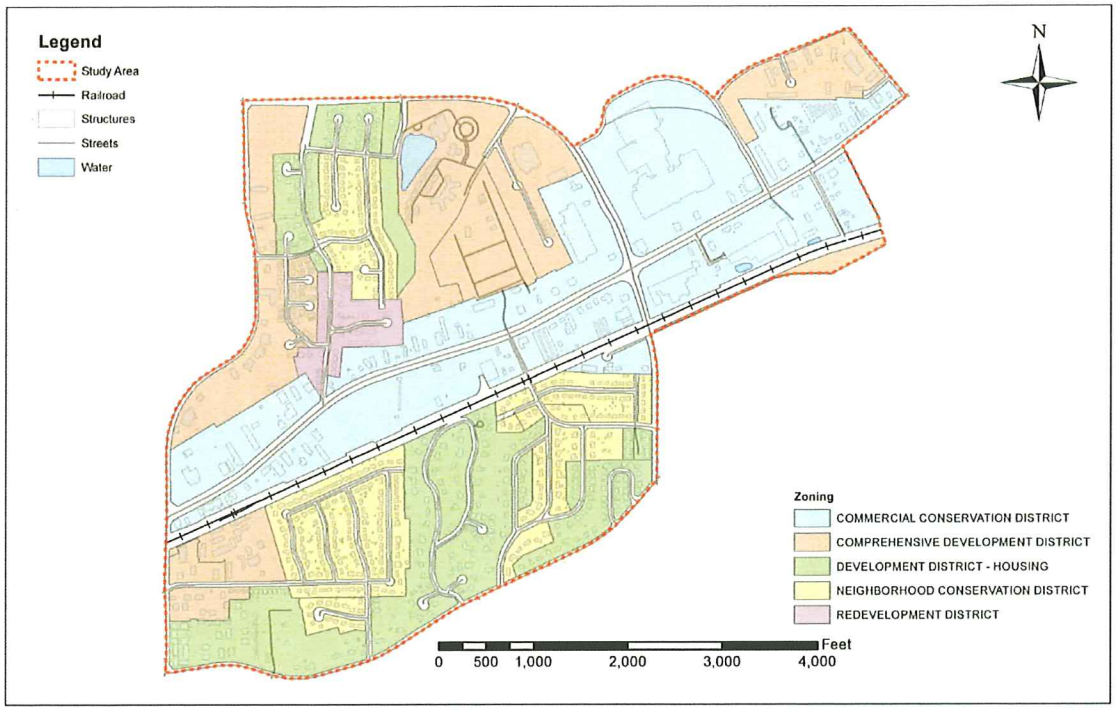
Source: City of Auburn GIS, Assembled by Author

Figure 22: Parking Surfaces



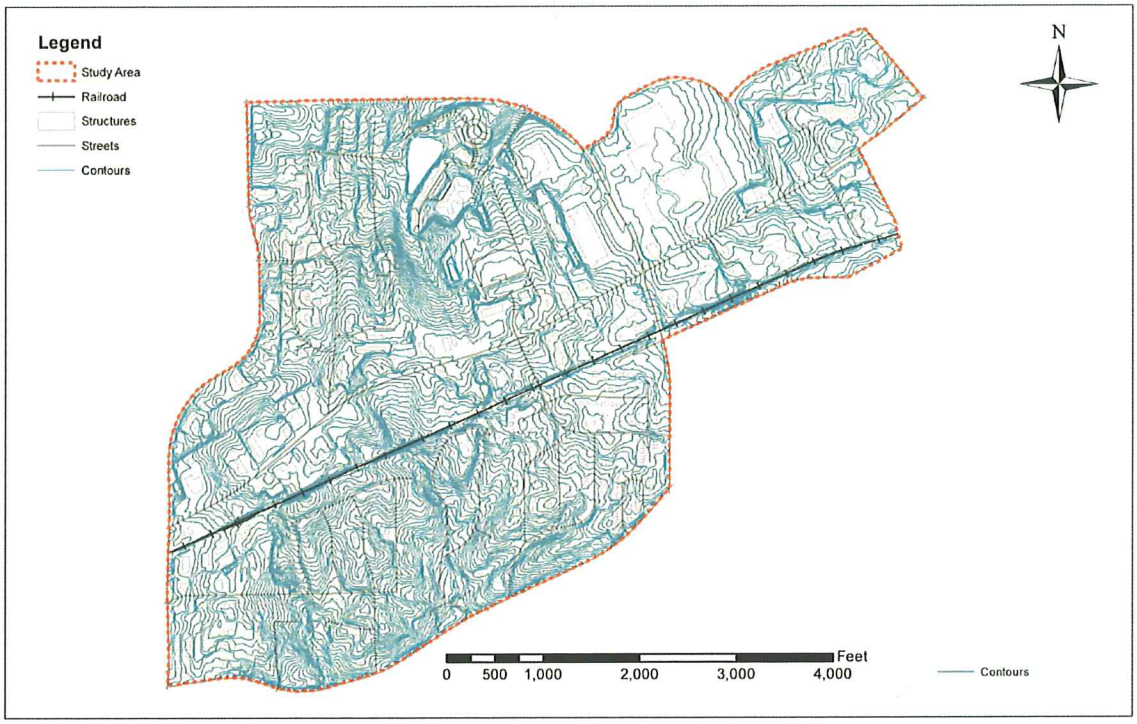
Source: City of Auburn GIS, Assembled by Author

Figure 23: Zoning



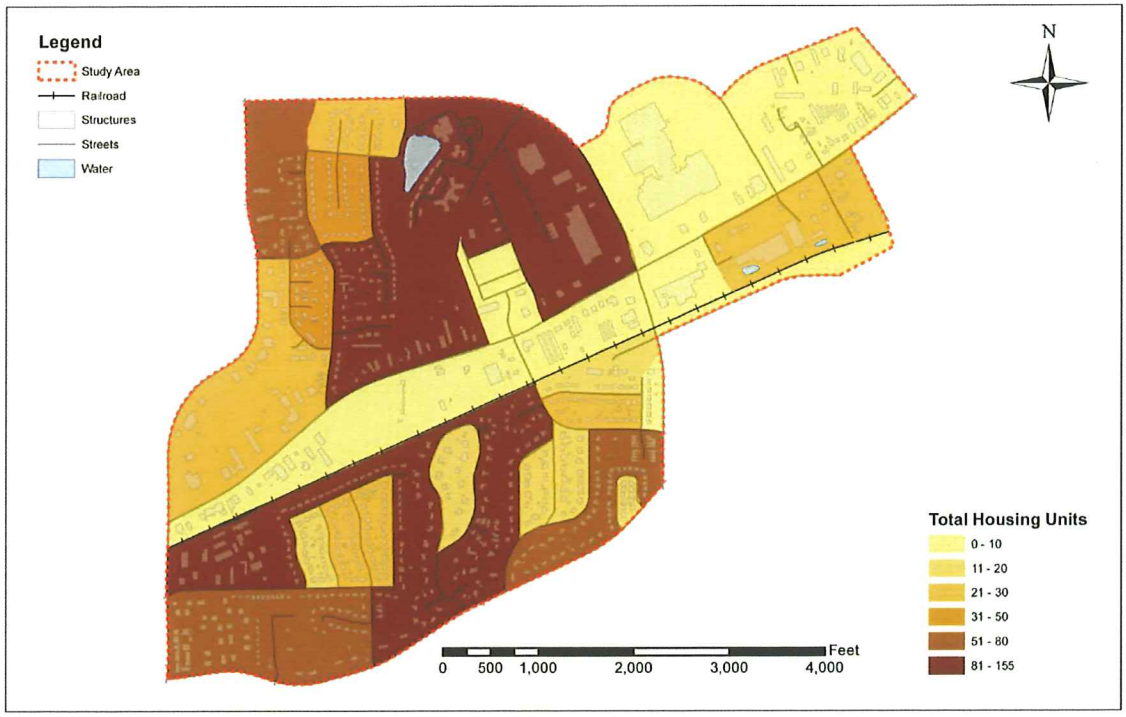
Source: City of Auburn GIS, Assembled by Author

Figure 24: 1-foot Contours



Source: City of Auburn GIS, Assembled by Author

Figure 25: Total Housing Units



Source: City of Auburn GIS, Assembled by Author

Figure 26: Housing Vacancy

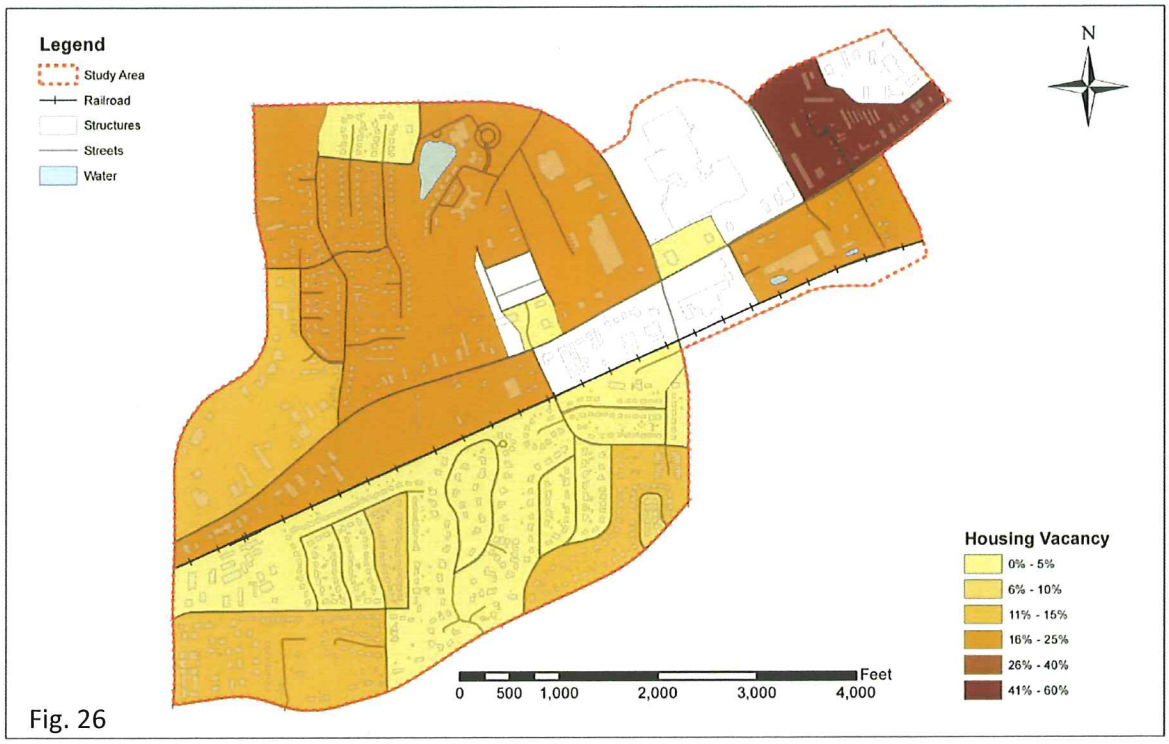


Fig. 26

Source: City of Auburn GIS, Assembled by Author

Figure 27: Median Age

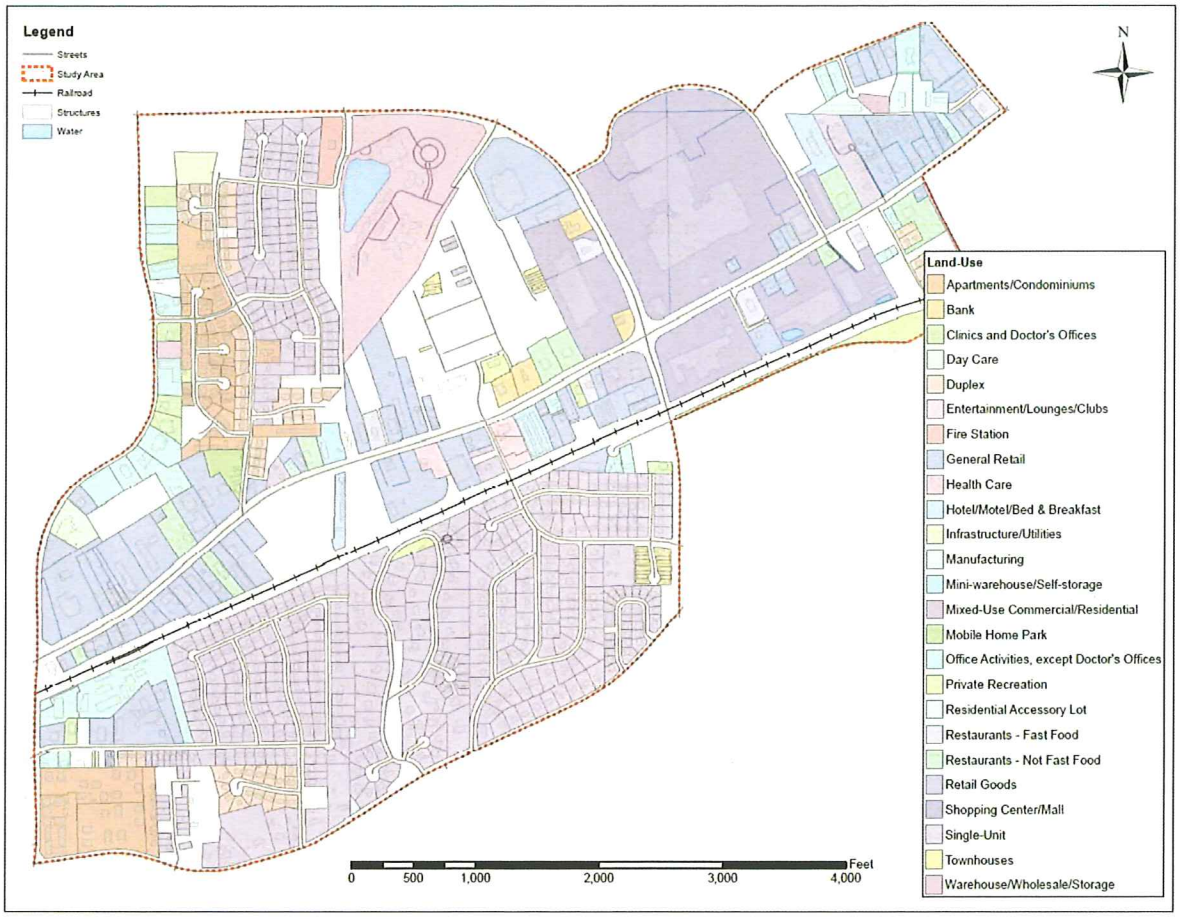
Fig. 27

Source: City of Auburn GIS, Assembled by Author

Figure 28: Apartments

Source: City of Auburn GIS, Assembled by Author

Figure 29: Land Uses



Source: City of Auburn GIS, Assembled by Author

2.7 Findings

Upon completion of our existing conditions analysis of Opelika Road from the intersection of Dean Road to the City line, we have concluded that although the level of service along Opelika road is acceptable, it is not conducive to any bicycle or pedestrian travel at all. The lack of continuity in bike lanes and sidewalks, as well as the poor condition off the existing sidewalks is a great deterrent for these travel modes. In addition, the high speeds and lack of walkable atmosphere along the entire span of Opelika Road from Dean to the City limits discourages bicycle and pedestrian travel. The large setbacks and frequent curb cuts dissuade pedestrian or bicycle travel modes as well. This span of Opelika road accommodates commercial activity via automobile with excessively large parking lots, but the four lane, high-speed characteristics of this section serve best as through traffic travel between the two cities of Auburn and Opelika. In reflection, we feel that the Opelika corridor has potential in its commercial character to become a pedestrian and biking corridor through redesign. The addition of sidewalks and bike lanes would provide access for these forms of travel. However, we believe

that further redesign of this corridor is necessary to not only encourage walking and biking but to successfully develop a walkable and bikeable corridor.

3. Proposed Development and Design

As stated in the City of Auburn's Renew Opelika Road plan, "The purpose is to revitalize and redevelop one of the City's most important corridors. The corridor is currently at an inflection point; intervention now will help us to not only prevent the corridor's further decline, but help to grow the corridor into the vibrant, beautiful, and economically-productive area that it has the potential to be" (City of Auburn 2012, 1). In accordance with the City of Auburn's justifications for necessary renewal of Opelika Road, our proposals focus upon developing the bicycle and pedestrian travel along the corridor as a method in revitalization. Although many other elements must be considered in a corridor plan renewal, we found a great significance in transforming the automobile centered culture along the corridor. Encouragement of pedestrian and bicycle travel along the corridor through the development of fully connected sidewalks and bicycle lanes, multi-use path alleyways, and community scale greenway form the principles of our proposal. The transformation of this corridor into a walkable and bike friendly road will encourage greater commercial opportunities by developing a different shopping culture. In addition, the focus for bicycle and pedestrian travel is significantly motivated by the desire for a more sustainable Auburn. Thus, by offering alternative modes of travel that are inexpensive, safe, and environmentally minded, we are hoping to further impact our community effort to become more sustainable.

In order to propose design changes we have separated our portion of Opelika Road into 2 sections depending on the separate character of the road in each section. The first section, shown in blue in the map below, runs the full length of Opelika Road from Dean to the City limits with the exception of section 2. Section 2, shown in red in the map below, runs in front of the Village Mall from Saugahatchee Road to Commerce Street. The character of Opelika Road from Dean to the City limits is predominately small parcel retail and large parking lots, with the exception of the area included in Section 2. Section 2 is heavily commercial and primarily consists of big box or strip mall shopping with very large parking lots. It will be more of a challenge to establish pedestrian and bicycle travel in Section 2 because more design changes must be implemented to accommodate these travel modes.

3.1 Land Use Policy Changes

In order to encourage bicycle and pedestrian travel along Opelika Road, there are land use policy changes needed. The most significant policy change would be to implement required sidewalk and bike lane or multiuse paths for any new road development. By requiring sidewalks and bicycle travel lanes, this would ensure bicycle and pedestrian connectivity through the area. Encouraging bicycle travel through the allocation for bike facilities such as parking space and racks is essential to boosting ridership. For instance, Opelika corridor is predominantly zoned as a commercial conservation and should allocate 1 bicycle parking space per 4,000 square feet of leaseable space provided by a private developer or property owner.(Tumlin 2012, 101) Also, the City of Auburn should amend their ordinance development standards to include some, or all, of the following bicycle facility requirements (Tumlin 2012, 257):

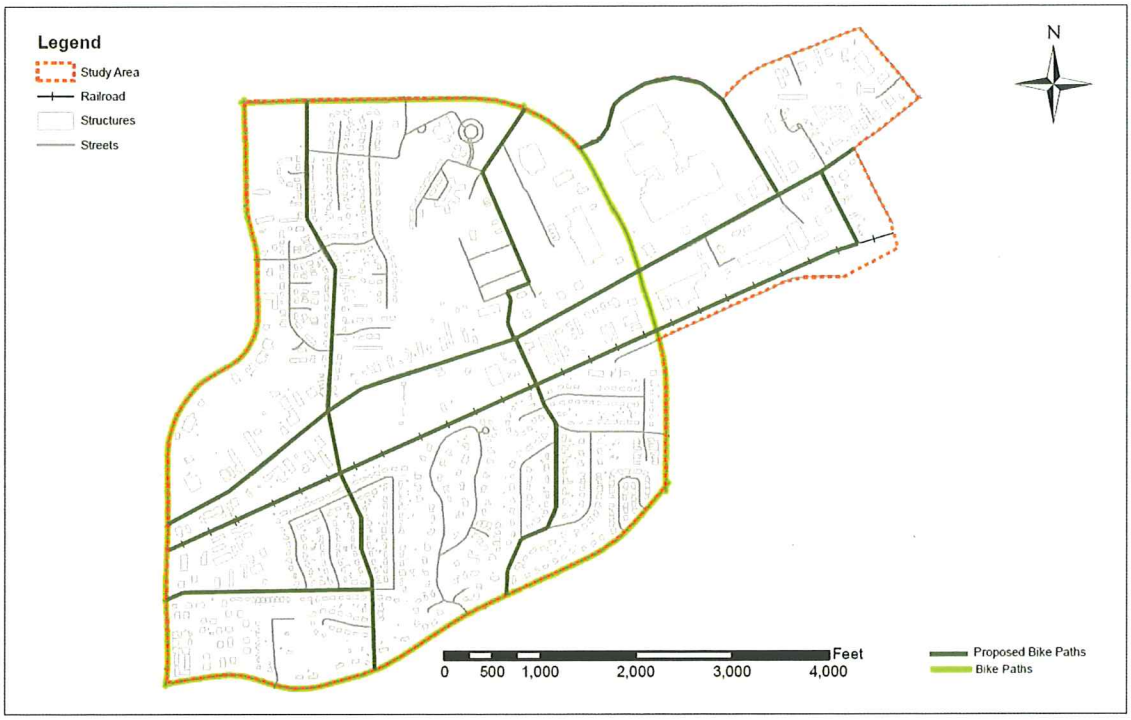
- Bicycle parking to accommodate 10% mode share
- Subsidies for bicycling
- Showers and lockers
- Bicycle safety classes and other bicycle programs

As for encouragement of pedestrian travel through policy modifications, the amendment to the ordinance to require street trees placed at minimum intervals of thirty feet along all sidewalks would provide shade in the hot and humid climate in Auburn. Also, the adjustment of such large setbacks along Opelika Road, particularly in commercial zones, would provide a more urban environment and thus encourage pedestrian travel as well. Consequently we propose to amend the land use ordinance for the Commercial Conservation district with a "strategic zoning" overlay for Opelika Road only, with a maximum setback of thirty feet and a 'performance standard' setback of twelve to fifteen feet. Our justification for a 'performance standard' setback is that the City of Auburn could provide incentives for developers that meet the performance level but still require a similar yet modified setback pattern for developers along Opelika Road.

3.2 Revised Bicycle and Pedestrian Plans:

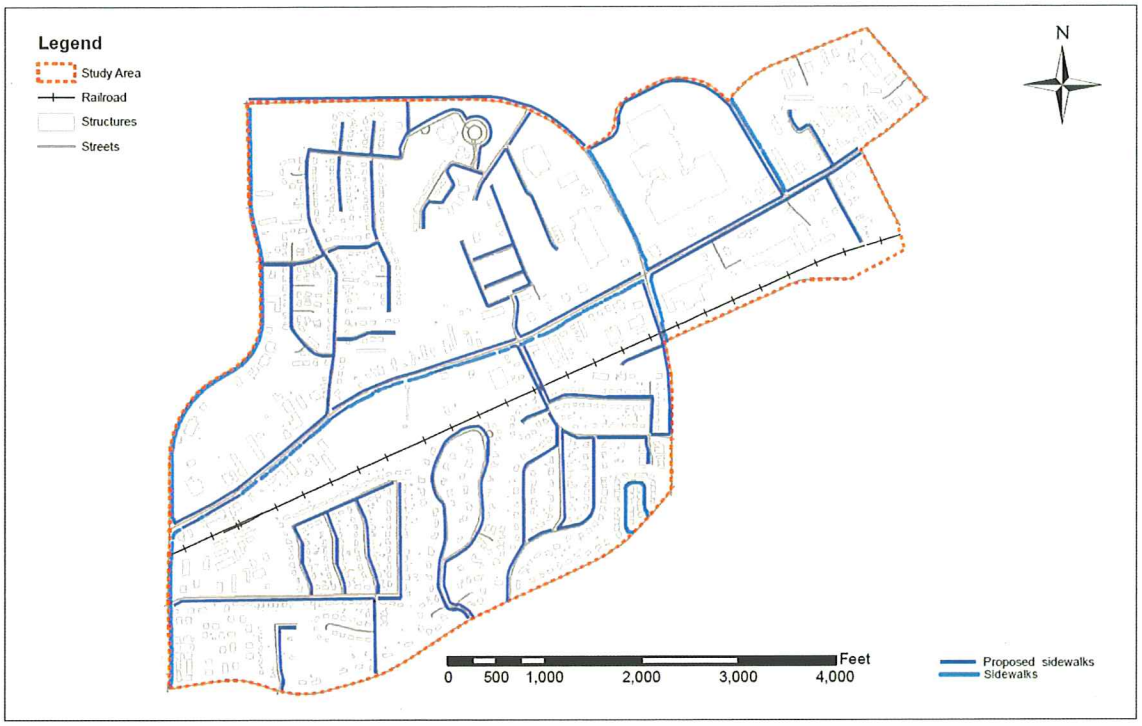
The main goal in the design for our proposed bike paths and proposed sidewalks is to increase the connectivity of the entire area for pedestrians and cyclists. The proposals for bike paths and pedestrian sidewalks will more than double the existing mileage of both in our study area. However, due to the high deficiency or lack of the existing bike lanes and sidewalks, there is a necessity for such substantial additions in order to effectively provide continuity. The approach for our proposed bike paths was to have three main north/ south connections across Opelika Road and the train tracks. In the bike lane map, the dark green delineates the proposed added bike paths, which would at least double the existing bike path mileage. Our approach for sidewalks varied from the bike paths in that we are proposing that sidewalks be incorporated on at least one side of every road greater than a 25 foot (or typical suburban driveway) length. Therefore, we have proposed an extensive network of sidewalks because the area was lacking sidewalks everywhere aside from Opelika Road. In addition, we have proposed to have sidewalks, delineated on the map in dark blue, on both sides of Opelika Road from Dean to the City limits. By including sidewalks along all of the roads and bike paths along the main roads and the three north/south connection paths, our aim is to provide equal access to individuals throughout the area for pedestrian and bicycle travel where desired. The maps depicting the proposed bicycle and sidewalk plans are included below:

Figure 30: Proposed Bike Paths



Source: City of Auburn GIS, Assembled by Author

Figure 31: Proposed Sidewalks

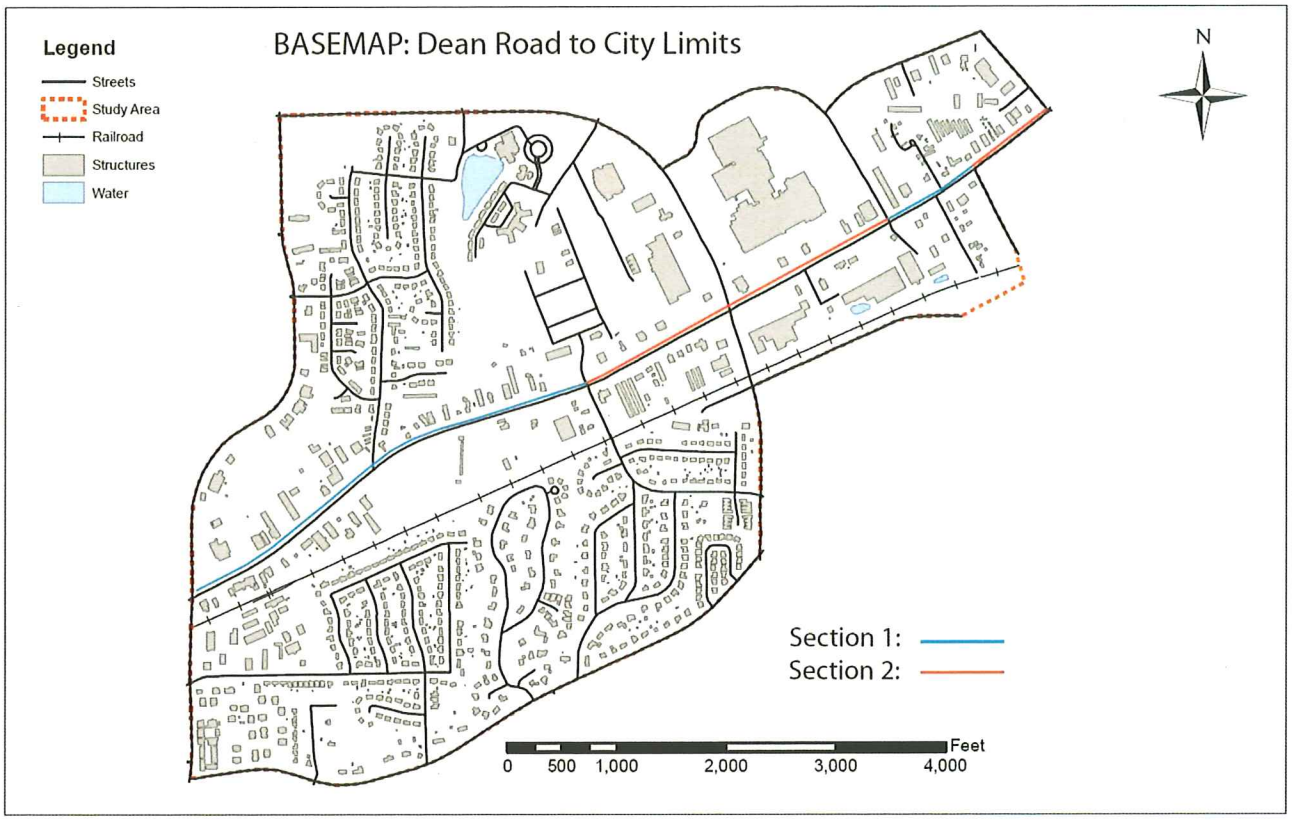


Source: City of Auburn GIS, Assembled by Author

3.3 Design Proposals

In order to propose design changes we have separated our portion of Opelika Road into 2 sections depending on the separate character of the road in each section. The first section, shown in blue in the map below, runs the full length of Opelika Road from Dean to the City limits with the exception of section 2. Section 2, shown in red in the map below, runs in front of the Village Mall from Saugahatchee Road to Commerce Street. The character of Opelika Road from Dean to the City limits is predominately small parcel retail and large parking lots, with the exception of the area included in Section 2. Section 2 is heavily commercial and primarily consists of big box or strip mall shopping with very large parking lots. It will be more of a challenge to establish pedestrian and bicycle travel in Section 2 because more design changes must be implemented to accommodate these travel modes.

Figure 32: Study Area with Study Sections



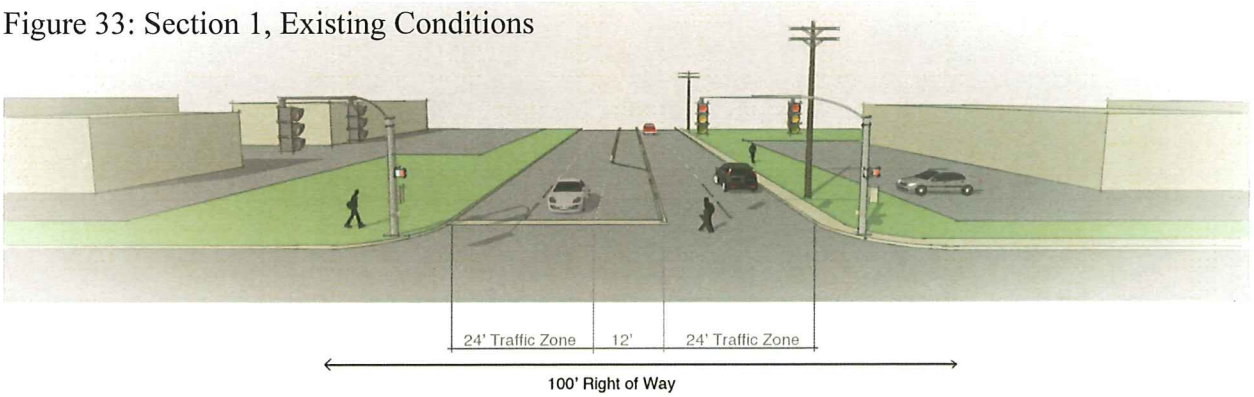
Source: City of Auburn GIS, Assembled by Author

The goal for our design proposals was to incrementally establish a better pedestrian and bicycle environment on the entire stretch of Opelika Road from Dean to the City Limits. In order to communicate the design changes we aim to implement, we have included section depictions that demonstrate the proposed changes. Divided into the two previously delineated sections, we have included depictions in three phases. Phase 0 depicts the existing conditions, phase 1 depicts the base level of additions for accommodating pedestrian and bicycle travel, and phase 2 depicts the ideal outcome for each section to not only accommodate but create a walkable and bike friendly road. Lastly, we have included a proposed multi-use alley way which would be located along the railroad tracks. The multi-use alley would accommodate walking and biking and would provide a separated and more recreational experience for these travel modes in this area.

3.3.1 Section 1

The first section, shown in blue in the map, runs the full length of Opelika Road from Dean to the City limits with the exception of the area surrounding the intersection of Opelika Road and University Drive. The majority of the roadway consists of small commercial with numerous curb cuts for private parking lots. Because of this pedestrian access is limited. However, existing conditions prohibit pedestrian access entirely. As an extension of neighborhood access and the pedestrian node at the Mall intersection, the design of this portion of the roadway will include improvements to pedestrian infrastructure. The first phase would include the addition of buffered sidewalks with streetlights. Over time, trees will be added to improve pedestrian safety, while making the street more pleasant.

Figure 33: Section 1, Existing Conditions



Source: Image by Author

Figure 34: Section 1, Phase 1

Source: Image by Author

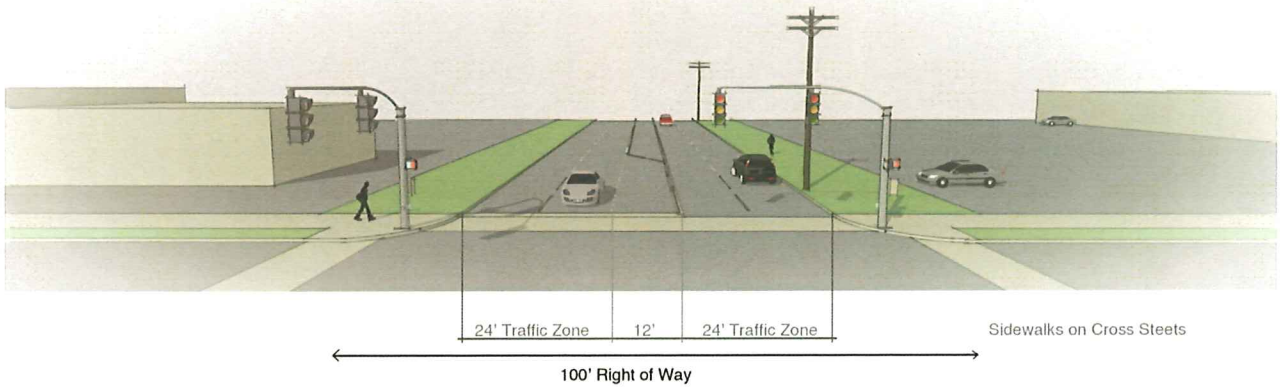
Figure 35: Section 1, Phase 2

Source: Image by Author

3.3.2 Section 2

Section 2 runs in front of the Village Mall from Saugahatchee Road to Commerce Street. As part of the overall pedestrian plan, this area was considered an activity node where preference was to be assigned to pedestrians. To create a pedestrian atmosphere, 2 prerequisites need to be met. First is the addition of pedestrian infrastructure. Sidewalks will be improved where they currently exist and added along Opelika Rd. A multiuse path will provide opportunities for bicycles off of the roadway and street trees and lights will improve the pedestrian atmosphere. The second phase is needed to reduce scale while reducing traffic speeds. Frontage is to be moved closer to the roadway and a median will narrow the roadway to slow traffic.

Figure 36: Section 2, Existing



Source: Image by Author

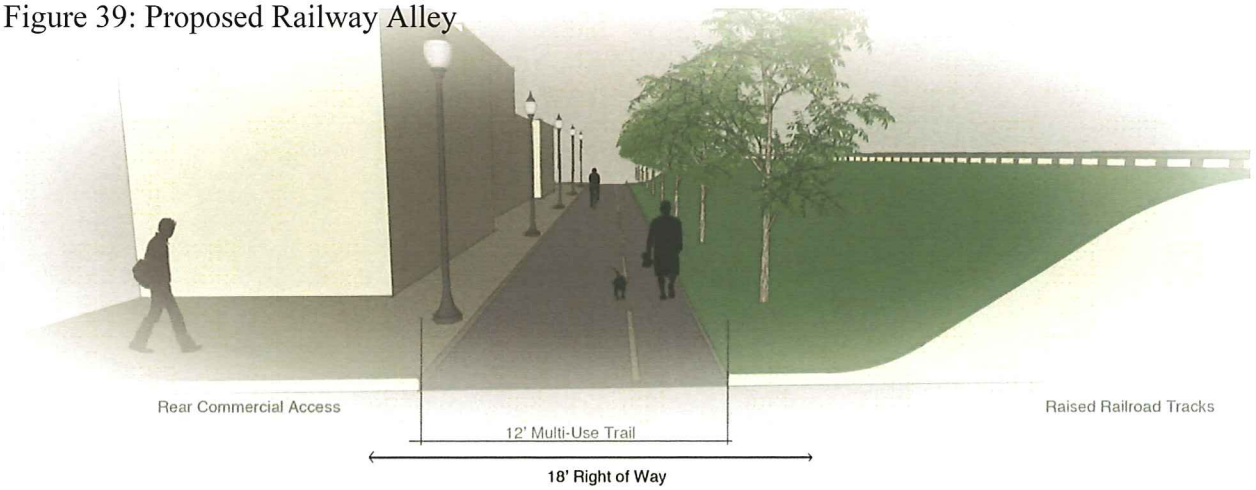
Figure 37: Section 2, Phase 1

Source: Image by Author

Figure 38: Section 2, Phase 2

Source: Image by Author

Figure 39: Proposed Railway Alley



Source: Image by Author

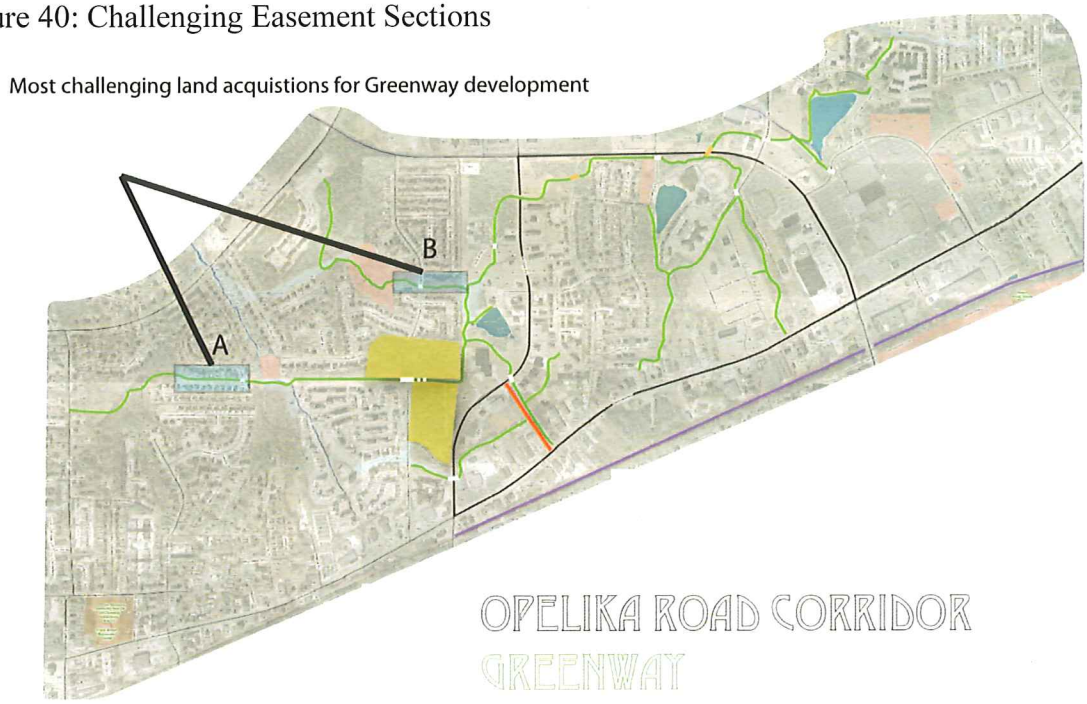
4. Proposed Greenway System

4.1 Property Acquisition

In order to truly combat the transportation ills of the Opelika Road Corridor the city must relegate the importance of the automobile in the area to little or none. The Corridor must become more independent from vehicles and develop a fully more sustainable webbing of transportation via walking, biking, and exercising on interweaving trails and nature parks. A greenway system would provide access from every local neighborhood within the Corridor to all of the major roads and businesses on Opelika Road. The proposed system would eventually branch out and connect all of Auburn independent of the automobile. For now, the proposal will encompass the entire area we have covered from the Auburn City Limits to Dean Road and all the way west to Gay Street, south to the railroad tracks and north to Shelton Mill Road and University Avenue.

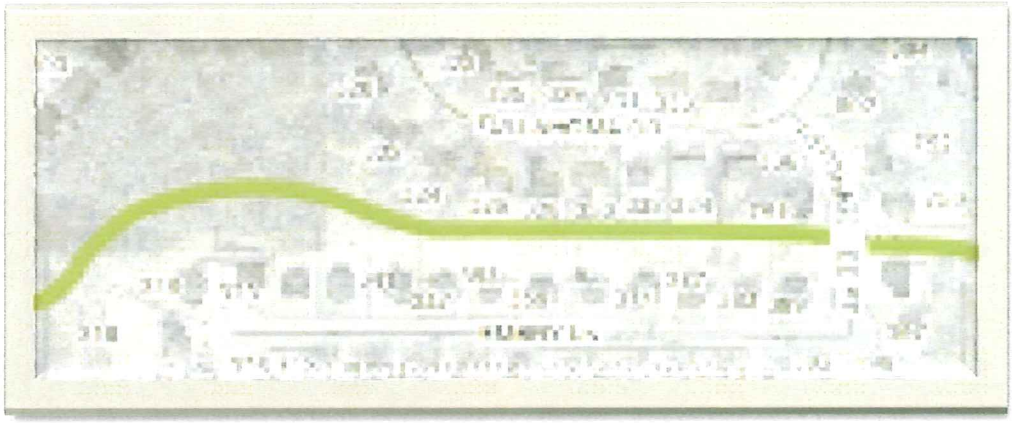
The primary challenge to certain parts of the Greenway would be property acquisition by the city of certain properties and in most cases easements. Much of the land that would be needed to develop the Greenway is either already owned by the city or even the state. This was strategically looked at when deciding on the Greenway path in order to minimize the need for slight incursions into resident's property. All private property acquisitions would be at least 60' from the house on the property with few exceptions, and always in the rear segment. The intimate areas that would be the most challenging due to their potential for diminishing of privacy (on private property) are largely found in the areas illustrated below and on page 31.

Figure 40: Challenging Easement Sections



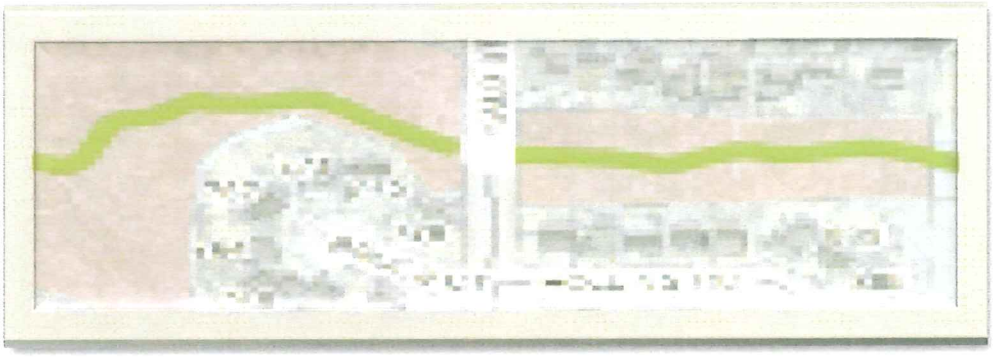
Source: Image by Author

Figure 41: Area Layout Difficulties, "A"



Source: Image by Author

Figure 42: Area Layout Difficulties,"B"



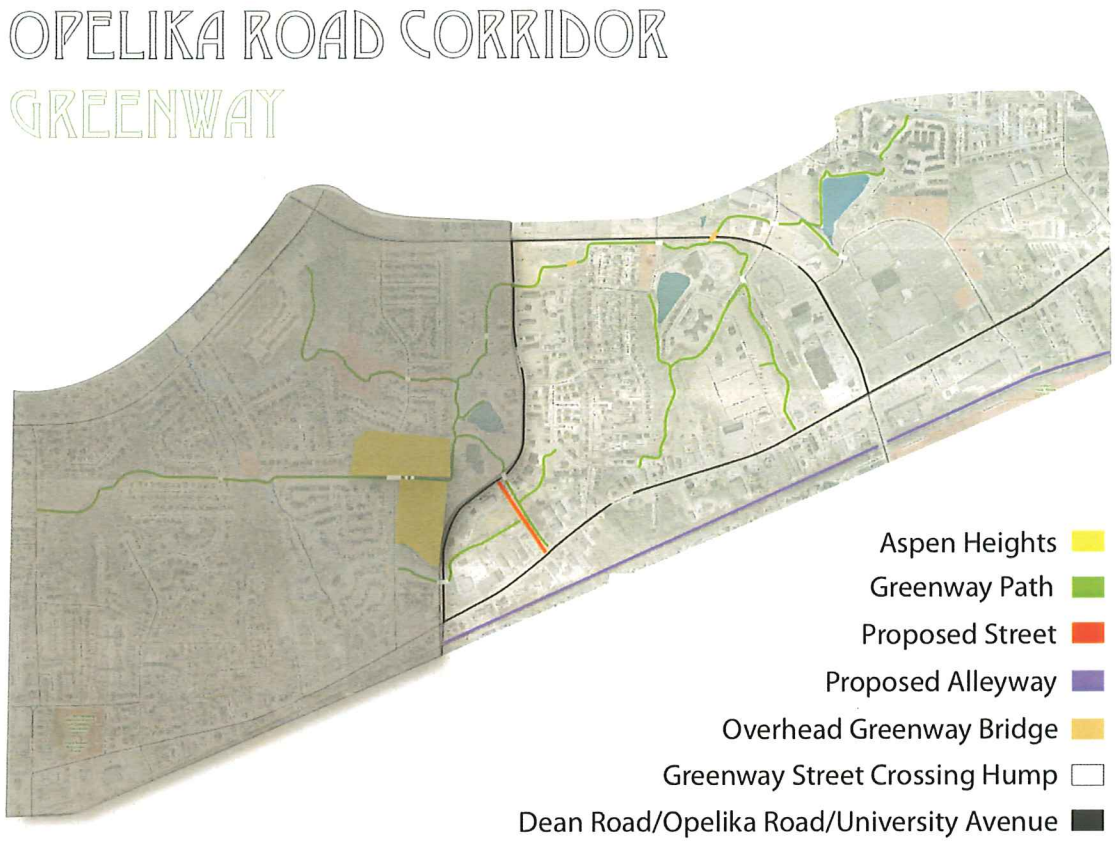
Source: Image by Author

Due to the highly developed and dense nature of the neighborhoods within the area off of Opelika Road, it would be impossible to develop the Greenway without any incursions. Beyond these two dense residential areas, much of the desired land is untamed; for instance, many portions of the Greenway will follow the floodplain. This works well do to the lack of potential for development on a floodplain.

4.2 Greenway System Overview

The Opelika Road Greenway System would be the lifeblood in the revitalization of the Opelika Road Corridor. It would promote the notion that cars are not fully necessary to get around in the Opelika Road area. This would represent a dramatic shift in culture within the Corridor. Once known as an unsightly concrete and asphalt wasteland, Opelika Road would soon be the center for walkability and outdoor activity in Auburn.

Figure 43: West Section (dark gray); East Section (light gray)



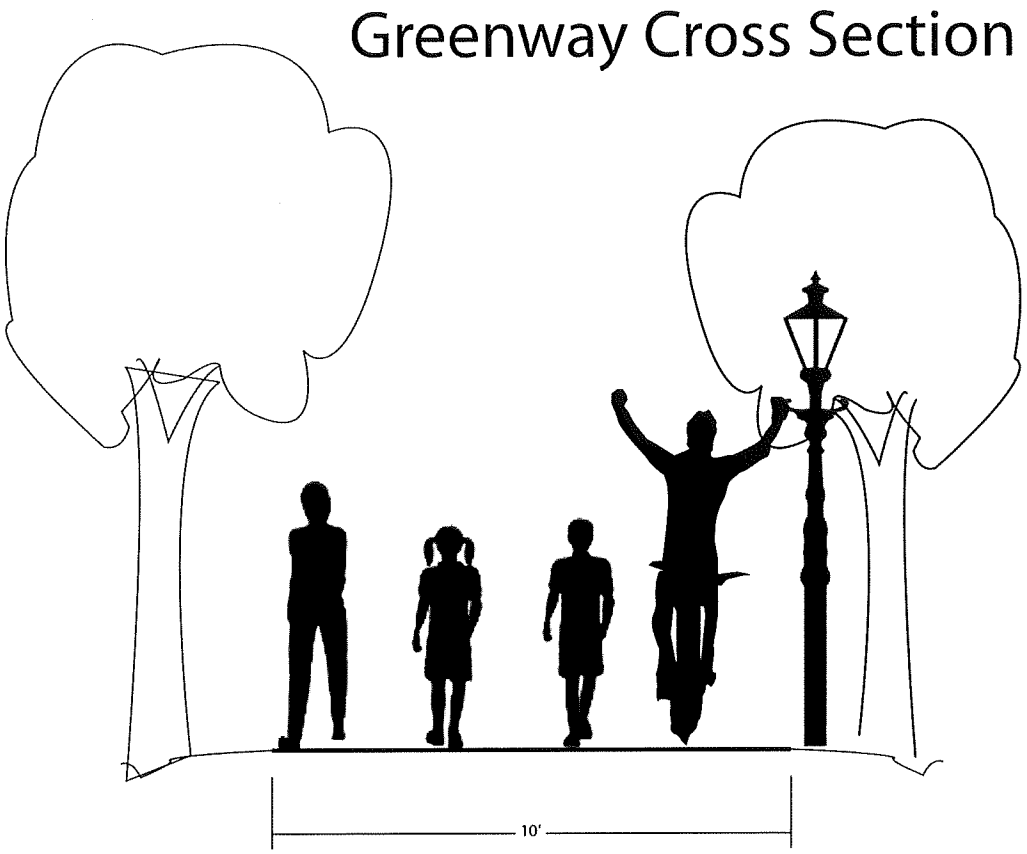
Source: Image by Author

The Greenway would allow for a bicyclist or pedestrian to go from Gay Street to the mall without ever really becoming threatened with any automobile traffic. It would also serve as a respite from the urban environment. Much of the Greenway is completely shutoff from anything but natural elements such as lakes, woods, fields, and rich vegetation. Multiple access points throughout the system would provide entry from popular spots or areas known to attract heavy people traffic. These access points would have small parking lots for those who would like to utilize the trail but maybe are not local to the Corridor.

4.2.1 Section Drawing

The entire Greenway would be supplied with stationary weatherproof waste and recycling cans as well as benches, nature information plaques, and light posts. Ninety percent of the trail would be flanked with trees and shrubs roughly 5' off each side.

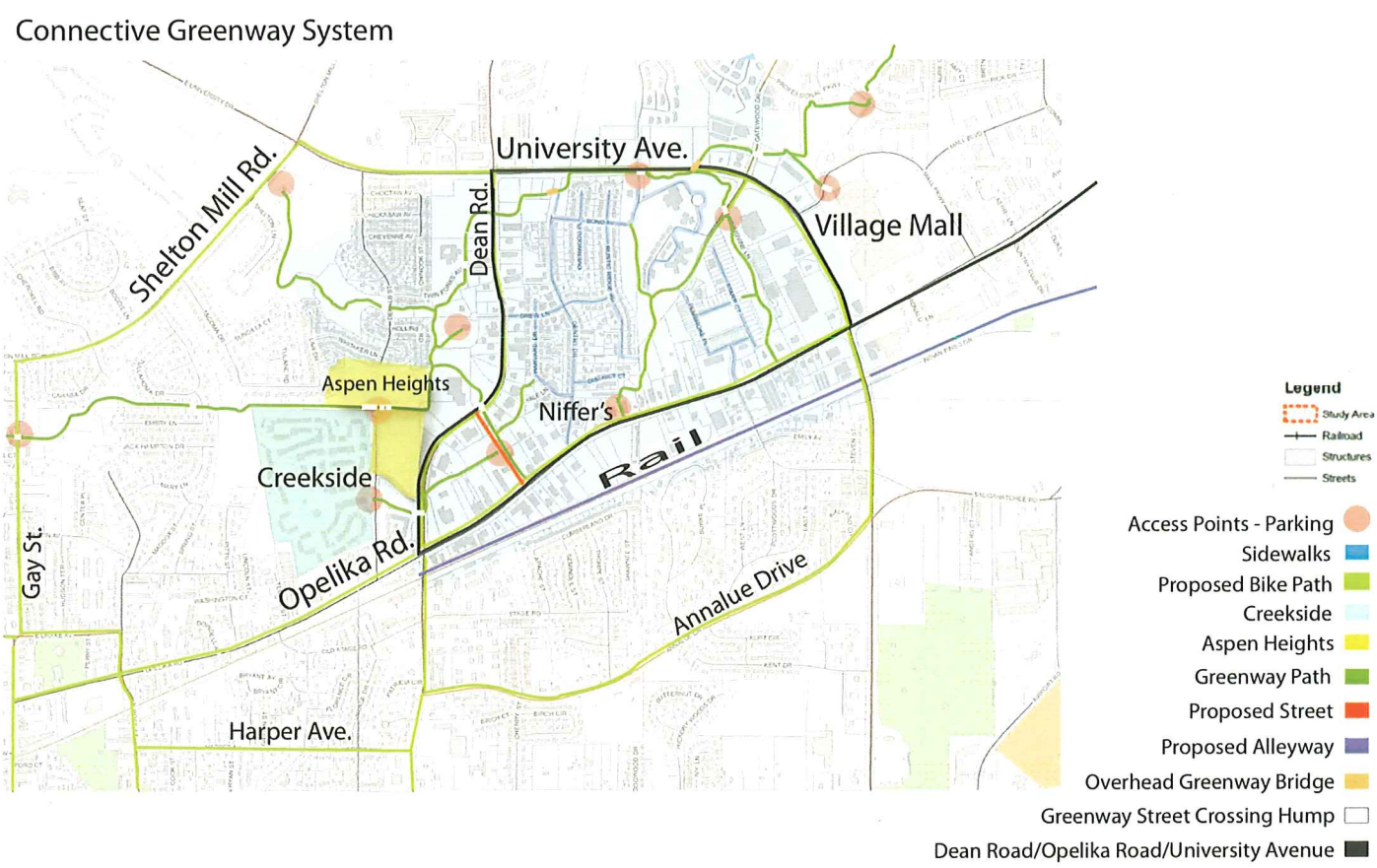
Figure 44: Section Drawing



Source: Image by Author

4.2.2 Graphic Location Map

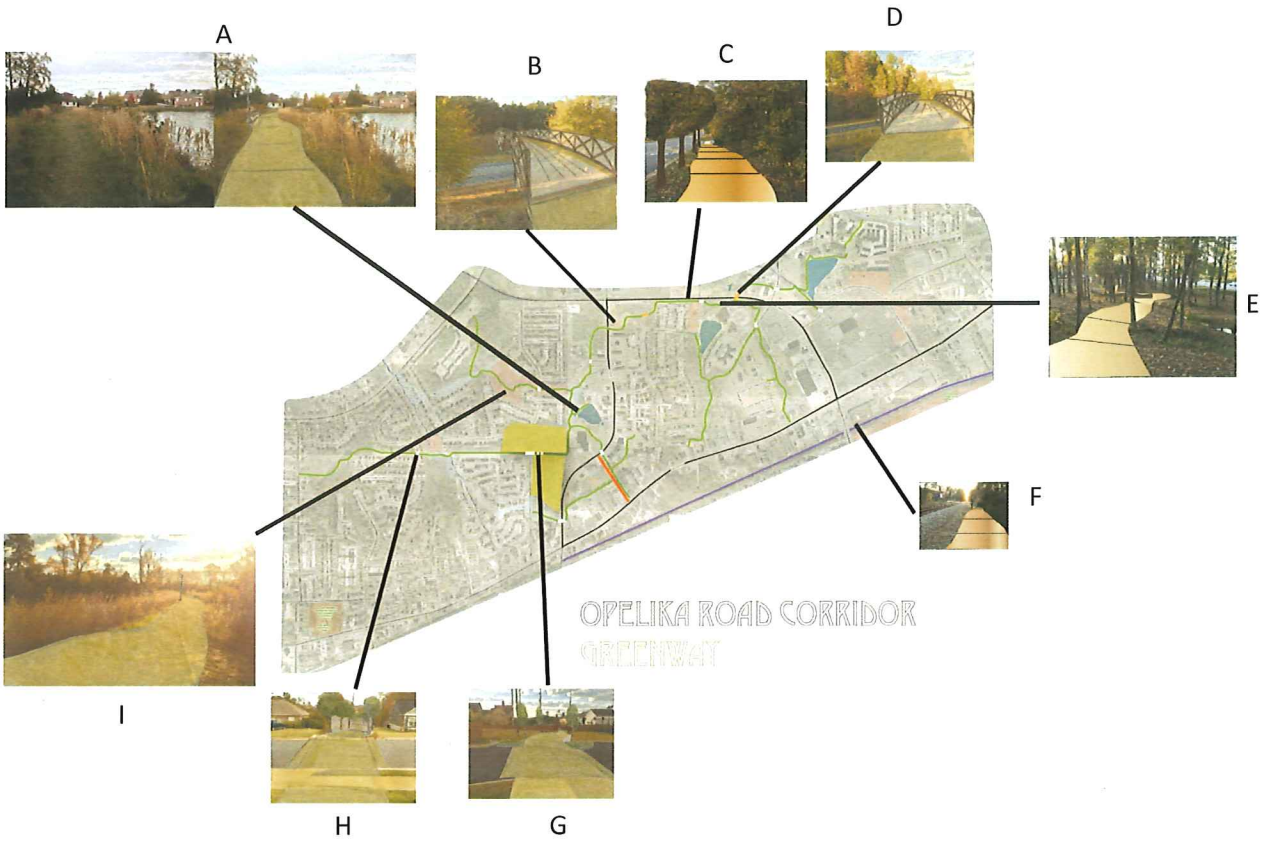
Figure 45: Access and Connectivity



Source: Image by Author

4.2.3 Graphic Illustrations

Figure 46: Location Assignments, A-I



Source: Image by Author

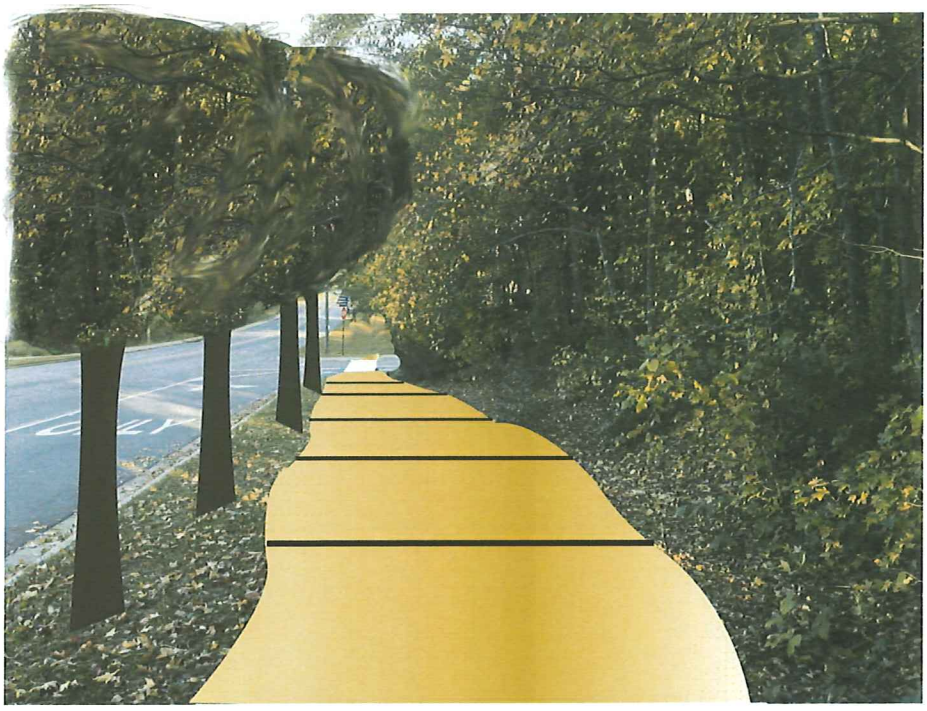
Figure 47: “A”, Dean Road Office Park

Source: Image by Author

Figure 48: “B”, Dean Road Sky Bridge

Source: Image by Author

Figure 49: “C”, University Avenue



Source: Image by Author

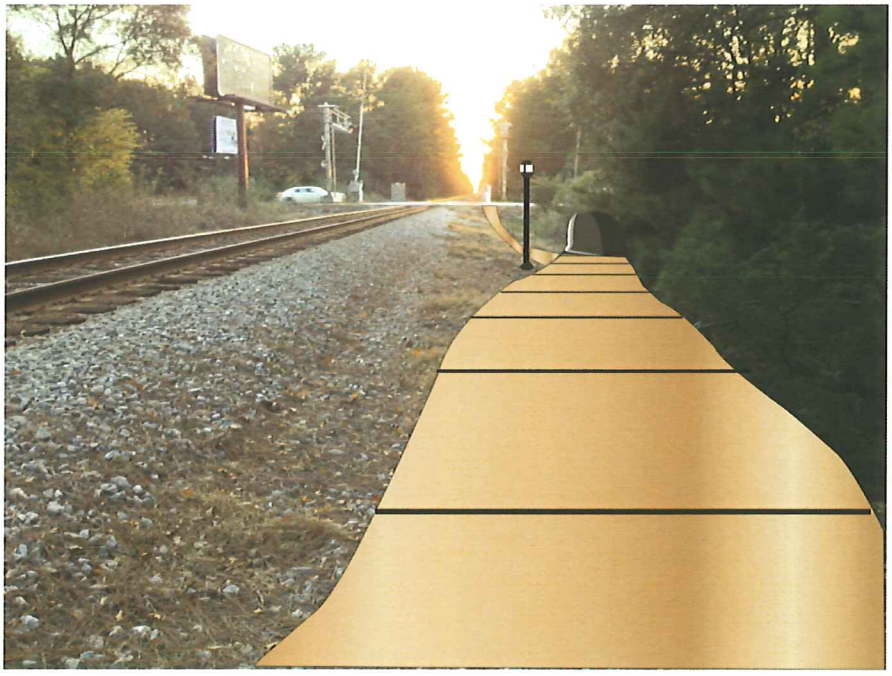
Figure 50: “D”, University Avenue Sky Bridge

Source: Image by Author

Figure 51: "E", Woods near University Avenue

Source: Image by Author

Figure 52: "F", Rail Alleyway/Greenway Path



Source: Image by Author

Figure 53: "G", Aspen Heights Crossing

Source: Image by Author

Figure 54: "H" Neighborhood Crossing

Source: Image by Author

Figure 55: “I” Nature Path

Source: Image by Author

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4. Appendix

4.1 List of Tables

4.2 List of Figures