

GREEN STREET CORRIDOR STUDY

CITY OF GAINESVILLE

DECEMBER 2017



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Honorable Danny Dunagan, Mayor of City of Gainesville

Frank Norton, The Norton Agency

Deborah Hood, The Norton Agency

Lee Hawkins, Hawkins Family Dentistry

Jim Walters

Jimmy Kemp, Fieldale Farms

Fred Kelly, Kelly & Bell, LLP

Tyler Smith, Smith, Gilliam, Williams & Miles and Quinlan

Ruth Demby, First Baptist Church

Steve McDaniel, Hall County School District & resident

Sue Anne Decker, Georgia DOT District 1

Brandon Kirby, Georgia DOT District 1

Justin Lott, Georgia GDOT District 1

Sam Baker, GHMPO

Joseph Boyd, GHMPO

The opinions, findings, and conclusions in this publication are those of the author(s) and not necessarily those of the Department of Transportation, State of Georgia, or the Federal Highway Administration.

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1 - INTRODUCTION

Green Street/SR 60 is a historic destination within the City of Gainesville, with generations of residents proud of its character. Green Street has transformed over the decades to become a heavily traveled, regionally important street, while also maintaining the historic structures and landscaped properties that owners are proud of. The street infrastructure is in need of upgrades to complement the Green Street properties. The City of Gainesville initiated the Green Street Corridor Study to identify improvements for the state controlled roadway that the community and maintaining agencies can move forward with implementing. **Figure 1** illustrates the limits of the corridor study. Green Street extends from the split of Thompson Bridge Road/Riverside Drive at the north end to Academy Street at the south end.

One of the primary goals of a future infrastructure improvement project is to preserve the historic character of Green Street. The Corridor Study is the first step in a long process to design and construct improvements. The study began the process of identifying the issues and developed initial concepts to carry forward. The Advisory Committee members provided input and assisted in narrowing the alternatives to a preferred option. Upon completion of this study, additional consideration and discussion of the improvements are recommended to occur within the community. A recommended next step is to initiate the concept development phase, during which the preferred concept can be further refined. The concept development phase and design phase will include a public process and many opportunities for community input.



Figure 1 - Project Location



2 - IDENTIFICATION OF CORRIDOR ISSUES

The city invited key stakeholders to be part of an Advisory Committee. The study began with a meeting with the Advisory Committee to understand the issues with the current roadway infrastructure that need to be addressed along Green Street. The committee members helped to identify the following major issues with the existing street:



No separation between the sidewalks and the street; in some places, the sidewalk is the same level as pavement



Traffic congestion is heavy during the AM and PM peak hours; the traffic signal at Ridgewood causes delays



There are lots of constraints – historic properties, buildings, mature trees, hills and short walls



Large mature trees are located along Green Street



High truck volume and narrow travel lanes



Lack of left-turn lanes results in left-turning vehicles stopping in the travel lane



Inadequate drainage along corridor

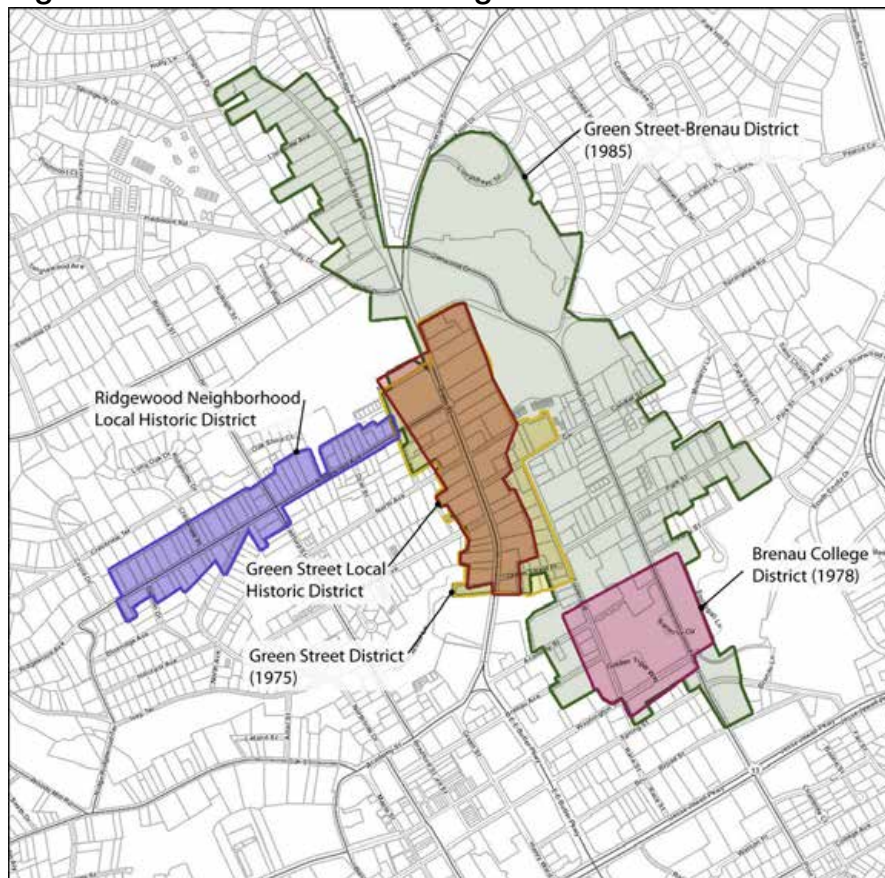


Power poles in middle of sidewalk

The committee members met for a second meeting, where the members continued the discussion of corridor issues and began discussing the street cross-section elements they were most interested in seeing improved along the Green Street corridor. The committee members provided additional concerns and ideas to consider. The meeting minutes from the first two meetings summarize the feedback and is provided in the Appendix. Many of the stakeholders comments are important to consider when the project design begins.

The City performed a Phase 1 study of the corridor in May of 2016. The study sought to identify potential constraints that could impact the feasibility of a future infrastructure improvement project. The study documented the current conditions of infrastructure to inform future decision making. A detailed survey, pavement evaluation, drainage assessment, and environmental screening were conducted. The study identified the current conditions of underground infrastructure. The study found the stormwater infrastructure is undersized and in need of repair/replacement; which contributes to existing flooding and drainage issues. The study found clay pipe in use in the storm sewer and sanitary sewer infrastructure in desperate need of repair. The study analyzed the existing street pavement condition and recommended a future project include a complete rebuild of the roadway pavement. The study included a roadway and property survey, which confirmed the existing right-of-way along Green Street is approximately only 56-feet wide in the narrowest section of the corridor. The study also identified the historic districts, environmental considerations, and natural resources that will impact the design of a future project. **Figure 2** indicates the historic districts along Green Street. The existing infrastructure issues, combined with the narrow existing right of way, limits the ability to implement improvements. Creative solutions must be developed to meet the needs of Green Street.

Figure 2 - Historic Districts along Green Street

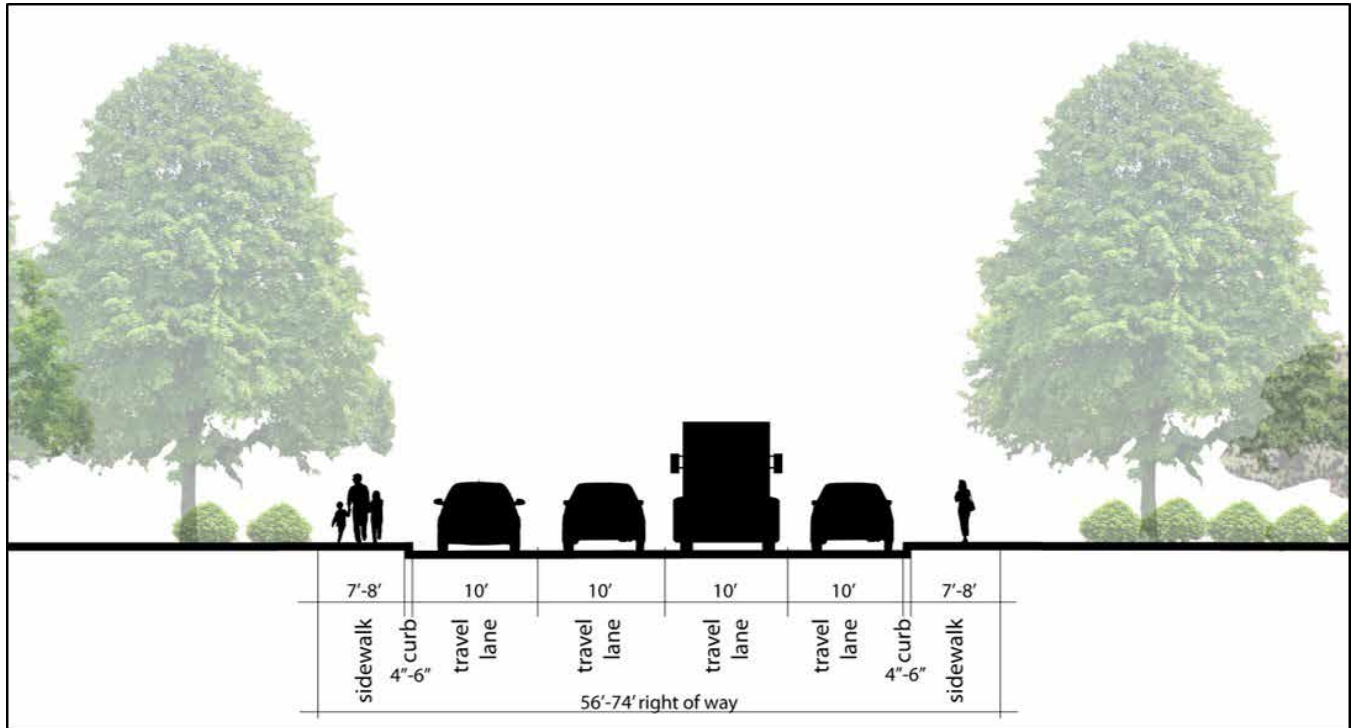


3 - SUMMARY OF EXISTING CONDITIONS

This study sought to further document and analyze the existing conditions along Green Street. The following areas are discussed in this section: Traffic Conditions, Pedestrian and Bicycle Conditions, Freight Conditions, Vehicular Crash Review, and Intersection Capacity.

The predominant typical section for the majority of the corridor is four 10-foot travel lanes (two in each direction), 4 to 6 inch header curb, and 7 to 8 foot wide sidewalks at the back of curb. The existing right-of-way width varies from 56 feet to 74 feet in the middle section of the corridor. **Figure 3** illustrates the existing typical section. As the Phase 1 study indicates, the typical section does not meet the standards for a state route carrying the current traffic volumes.

Figure 3 - Existing Typical Section



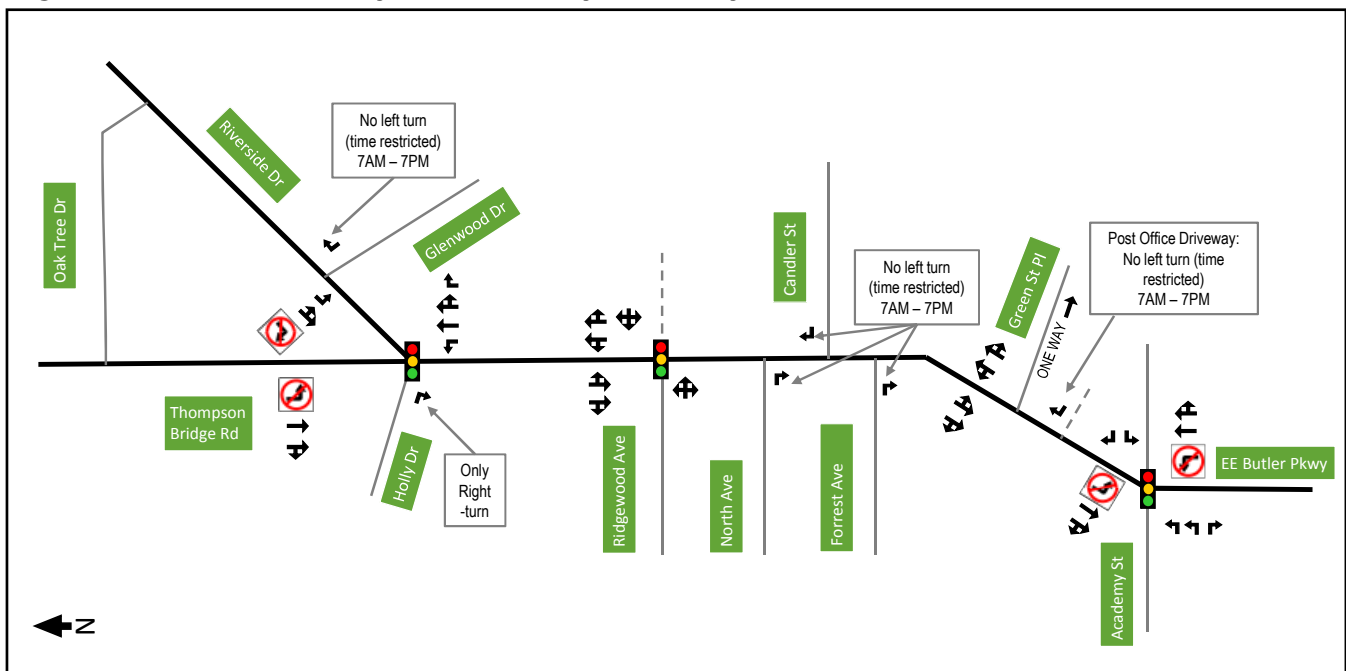
Existing conditions along Green Street and adjacent streets were documented. **Figure 4** illustrates the streets within the study area and key roadway conditions. A summary is as follows:

- SR 60/Green Street is classified as principal arterial by GDOT, with four travel lanes and no median. There are two northbound and two southbound travel lanes, with lane widths of approximately 10 feet. The posted speed limit is 30 mph (from Thompson Bridge Road/Riverside Drive to Academy Street).
- There are three signalized intersections located at Holly Drive/SR 11 BUS/Riverside Drive, Ridgewood Avenue, and Academy Street. The remaining intersections are unsignalized, side-street stop-controlled. The unsignalized streets have posted signs prohibiting left-turns onto Green Street, from 7AM to 7PM, as indicated in Figure 4.
- Characteristics of adjoining streets is indicated in **Table 1**. All other streets are considered 'local' classified streets.
- There are large mature trees located close to the street along the corridor.
- The existing street lighting along Green Street is limited; street lights are attached to the power poles along the south side.

Table 1 - GDOT Street Characteristics for Area Streets

Street	Functional Classification	Speed Limit
SR 60/Thompson Bridge Road	Principal Arterial	40
SR 60 Conn/Oak Tree Drive	Minor Arterial	25
SR 11 BUS/Riverside Drive	Minor Arterial	35
Holly Drive	Minor Arterial	30
Greenwood Drive	Major Collector	25
Ridgewood Avenue	Major Collector	30
Academy Street (west)	Minor Arterial	30
SR 60/EE Butler Pkwy	Principal Arterial	35

Figure 4 - Streets in Study Area and Key Roadway Conditions



TRAFFIC CONDITIONS

To understand the current operating conditions along Green Street, traffic volume counts and field observations were performed. Traffic counts were performed in February of 2017 to capture daily volumes and the AM and PM peak period conditions. A total of 22 daily volume counts (including 4 classification) and 16 intersection turning movement counts were performed for the corridor. Key volume locations along the corridor are indicated in **Figure 5**. The average daily volume along Green Street was approximately 38,500 vehicles per day (vpd). The daily volume was slightly higher north of Ridgewood Avenue.

The traffic volume is highest during the AM, noon, and PM peak periods. During the AM peak period the higher volume direction is southbound. During the PM peak period the higher volume direction is northbound. The volumes indicate Green Street is operating near capacity.

A review of historical growth rates using GDOT count station data and future volume projections from the GHMPO travel demand model indicate the growth in vehicular volume along Green Street is expected to be very low. Since the corridor is operating near capacity, a 0.5% compound annual growth rate may be considered in developing future year traffic volumes during the design phase. This growth rate would indicate some additional volume growth, while recognizing the capacity limitation of four through lanes along Green Street.

Traffic flow diagrams were created for the existing year AM and PM peak hours based on the traffic count data. The traffic flow diagrams are included in the appendix.

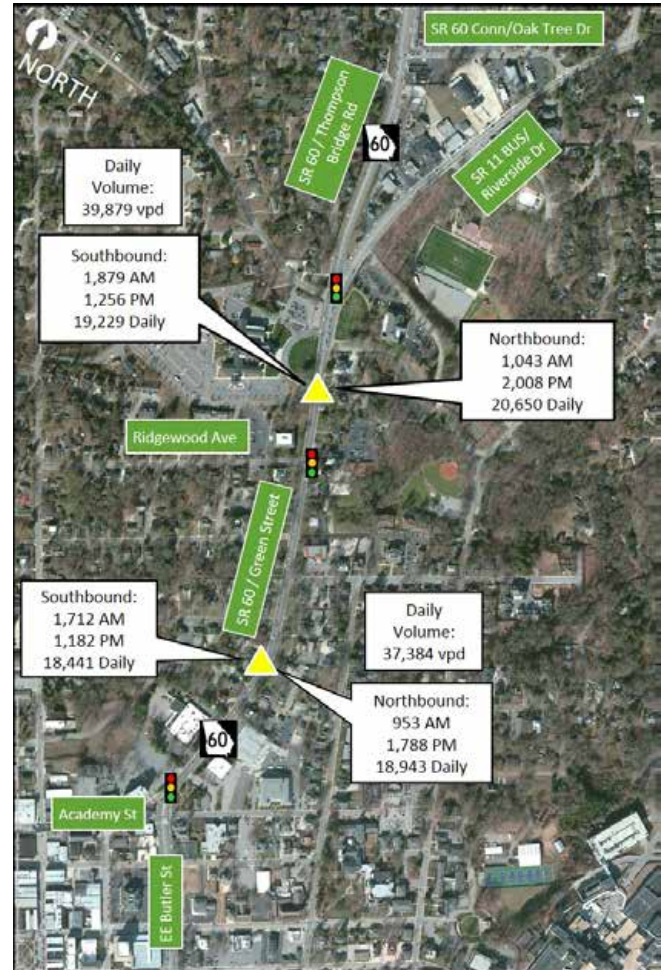
PEDESTRIAN AND BICYCLE VOLUMES

Pedestrians are routinely observed walking along the sidewalks or crossing Green Street. Some bicyclists use the existing sidewalks to travel along Green Street. There are limited designated pedestrian crossings of Green Street. Crosswalks exist at the traffic signals at Academy Street and Ridgewood Avenue; however, no crosswalks exist at Thompson Bridge Road/Riverside Drive. Specific volume counts were not conducted for this study. The stakeholders stated the sidewalks adjacent to the street do not provide a safe and pleasant walking experience.

FREIGHT CONDITIONS

Green Street/SR 60 serves as the primary heavy truck route through this part of the city. Green Street/SR 60 is also a designated route on the National Highway System. Large trucks have difficulty traveling through the narrow travel lanes along Green Street. The truck volume is not preferred by the

Figure 5 - Key Volume Locations



city; however, for many this is the only route for large trucks to use. The heavy vehicle percentages recorded from the traffic count data are indicated in **Table 2**.














Table 2 - Heavy Truck Percentages

Location	Time Period				Total Daily Volume
	AM Peak Hour	PM Peak Hour	Daily (24-hr period)		
			Total	Trucks (with 4 or more axles, single-unit or single trailers)	
SR 60/Thompson Bridge Rd	9.9%	7.8%	8.9%	1.5%	28,809 vpd
SR 11 BUS/ Riverside Dr	9.4%	5.9%	7.7%	0.3%	15,870 vpd
Green Street/ SR 60 (north of Ridgewood Ave)	12.1%	9.8%	11.1%	1.3%	39,879 vpd
Green Street/ SR 60 (north of Ridgewood Ave)	14.4%	15.6%	13.5%	1.6%	37,384 vpd

To understand the volume of trucks, or heavy vehicles, traveling the SR 60 corridor, three classification counts were performed during a 48-hr weekday period. The two-day counts provided the total vehicle volume count, as well as volumes for individual hours of the day, for each direction along SR 60. The data additionally split the vehicle types into the thirteen FHWA vehicle classification types. Table 2 summarizes the total daily vehicle volume, the percentage of total trucks (both single-unit trucks and combination trucks) by time period, and the percentage of trucks (Class 7 and 8: with 4 or more axles, single-unit or single trailers) – the ones most people associate as the large vehicles.

A key observation from reviewing the data is the single-unit heavy vehicles constitute the majority of the total truck volume. Of the thirteen FHWA vehicle classification types (**Figure 6**), single-unit heavy vehicles, class 4 through 6, consist of buses, 2-axle trucks, or 3-axle trucks. The majority of the types of vehicle seen on the corridor include school buses, box-trucks making deliveries, landscape service pick-up trucks with trailers, contractor and service trucks with trailers. Knowing the split in vehicle types traveling along the corridor is beneficial in developing recommended improvements.

Figure 6 - FHWA Vehicle Classifications

1. Motorcycles -2 axles, 2 or 3 tires	
2. Passenger Cars -2 axles, can have 1 or 2 axle trailers	
3. Pickups, Panels, Vans -2 axles, 4-tire single units can have 1 or 2 axle trailers	
4. Buses -2 or 3 axles, full length	
5. Single Unit 2-Axle Trucks -2 axles, 6 tires (Dual rear tires), single unit	
6. Single Unit 3-Axle Trucks -3 axles, single unit	
7. Single Unit 4 or More Axle Trucks -4 or more axles, single unit	
8. Single-Trailer 3 or 4 Axle Trucks -3 or 4 axles, single trailer	
9. Single-Trailer 5 Axle Trucks -5 axles, single trailer	
10. Single-Trailer 6 or More Axle Trucks -6 or more axles, single trailer	
11. Multi-Trailer 5 or Less Axle Trucks -5 or less axles, multiple trailers	
12. Multi-Trailer 6 Axle Trucks -6 axles, multiple trailers	
13. Multi-Trailer 7 or More Axle Trucks -7 or more axles, multiple trailers	

VEHICULAR CRASH REVIEW

An important component of the study involved vehicular crash analysis and identification of mitigation measures to improve the roadway. Crash data was obtained from Georgia DOT Safety Office for a three-year period (2014 to 2016). A specific crash dataset was provided by GDOT and analyzed by Pond for crash trends and types along the corridor.

For the three-year period there were a total of 396 accidents, including 74 injury accidents and zero fatalities. There were no reported pedestrian or bicycle accidents during this period. A heat-map of the crashes along the corridor is presented in **Figure 7**. The crashes occur throughout the corridor, and are more concentrated at intersections.

The first review of the data provided a comparison of accident rates for the corridor versus the statewide average. The accident data was then reviewed by intersection and mid-block locations. Patterns at specific locations were further reviewed in detail.

Accident rate for the corridor

The stretch extending from Holly Drive to Academy Street is about 0.63 miles long and has an AADT of 39,879. The accident analysis for the three-year period indicates this roadway experiences an accident rate more than double the statewide accident rate of 516 (year 2014) for this roadway type. The three-year average crash rate per 100 MVM was calculated to be 1,216. This was based on 337 accidents along this roadway segment.

Accidents by Location

The data was reviewed for patterns and accidents were summarized by location, accident type, and roadway conditions. **Table 3** and the associated charts summarize the accident data.

Throughout the corridor the most prevalent type of accidents are rear end crashes, angle crashes, and sideswipe crashes between vehicles in the same direction. This could be attributed to the number of driveways and unsignalized intersections that are present. Many of the sideswipe crashes could be due to vehicles changing lanes to avoid stopping for a left turning vehicle, because there are no dedicated left-turn lanes along Green Street. Angle crashes between left-turning or right-turning vehicles and through vehicles occurred at unsignalized and signalized intersections.

Figure 7 - Heat Map of Crashes

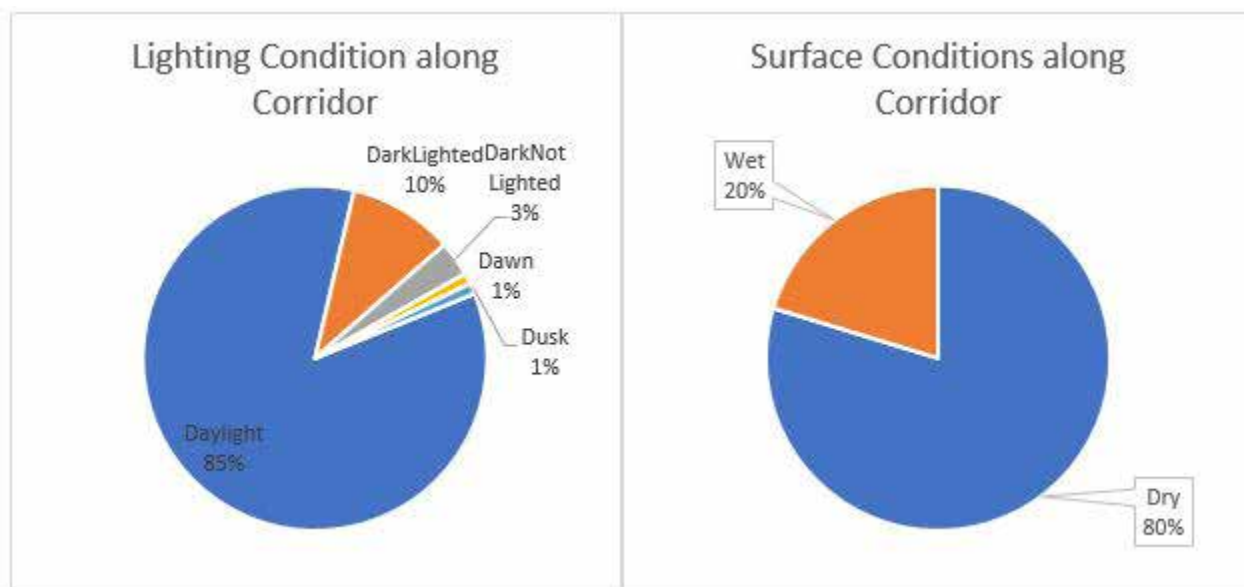
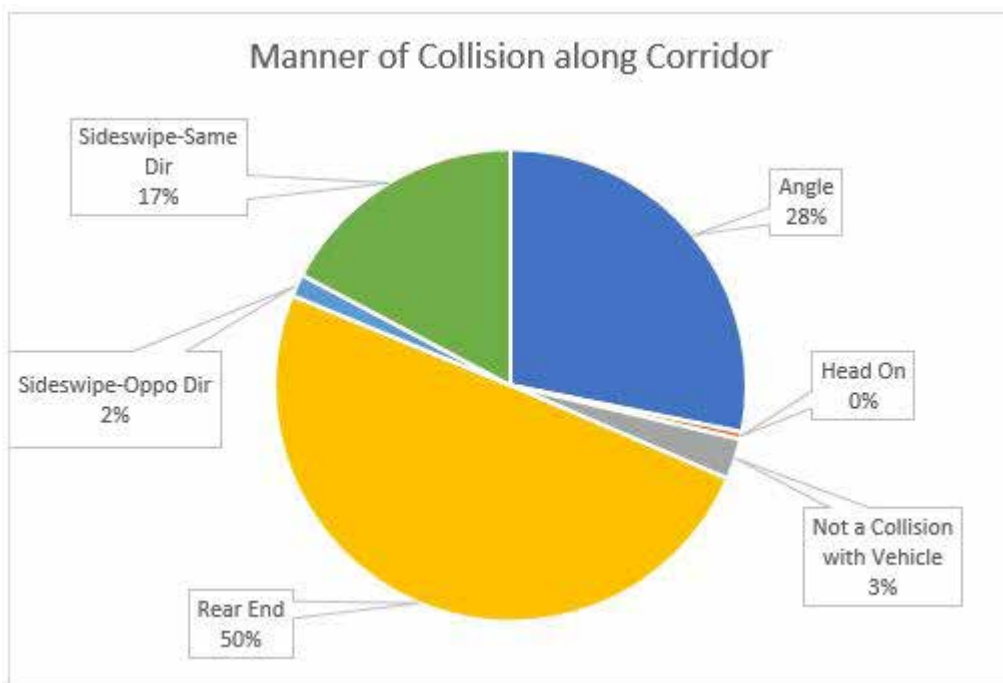


Table 3 - Accident Review Summary (2014-2016)



	Oak Tree Dr and Thompson Bridge Road	Oak Tree Dr and Riverside Drive	Holly Drive and Thompson Bridge Road	Midblock b/w Holly Drive and Ridgewood Avenue	Ridgewood Avenue	Midblock b/w Ridgewood and North Avenue	North Avenue	Candler Street	Forrest Avenue	Midblock b/w Forrest Ave and Green Street Place	Green Street Place	Academy Street	Total along Corridor	Percentage along Corridor
# of Accidents	39	20	47	15	78	4	35	37	17	2	47	55	396	-
Injuries	9	5	9	2	19	1	7	6	4	1	5	6	74	-
Fatalities	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Manner of Collision														
Angle	16	12	12	1	22	2	17	13	4		8	4	111	28.0
Head On					2							1	3	0.8
Not a Collision with Vehicle	1		2	1	2		1				4		11	2.8
Rear End	15	7	28	10	37	1	13	22	12		25	27	197	49.7
Sideswipe- Oppo Dir	1				2			1			2		6	1.5
Sideswipe- Same Dir	6	1	5	3	13	1	4	1	1	2	8	23	68	17.2
Lighting Condition/Time of Day														
Daylight	33	19	32	15	68	4	28	32	15	1	39	50	336	84.8
Not Daylight	6	1	15	0	10	0	7	5	2	1	8	5	60	15.2
Dark/Lighted	4	1	8		7		4	2	1	1	7	4	39	
Dark/Not Lit	2		4		1		1	3			1	1	13	
Dawn			2				1		1				4	
Dusk			1		2		1						4	
Surface Condition														
Dry	31	18	37	13	58	3	29	35	12	1	36	43	316	79.8
Wet	8	2	10	2	20	1	6	2	5	1	11	12	80	20.2

A summary of the accidents by type, time of day/lighting condition, and roadway surface condition are presented below:



Accident Review at Key Intersections

The accident data was further reviewed at key intersections, looking for patterns and potential recommendations to reduce the frequency of crashes. The review is included in the Appendix for the following intersections:

- SR 60/Green St at Holly Drive/Riverside Drive
- SR 60/Green St at Ridgewood Avenue
- SR 60/Green St at North Avenue
- SR 60/Green St at Candler Street
- SR 60/Green St at Green Street Place
- SR 60/Green St at Academy Street

INTERSECTION CAPACITY

The intersection capacity for existing conditions was analyzed to establish a baseline condition. The Synchro Studio 9 software, which utilizes the HCM 2000 methodology, was utilized to perform the capacity analyses at the signalized intersections. The Highway Capacity Manual defines six levels of service, LOS A through LOS F. Level of service A indicates excellent operations with little delay to motorists, while level of service F indicates extremely long delay. Level-of-service at signalized and unsignalized intersections is defined in terms of average control delay per vehicle.

Table 4 summarizes the existing level of service during the AM peak hour and PM peak hour. The results indicate many of the intersections operate at an unacceptable level of service greater than LOS D. The results confirm many unsignalized intersections experience long delays. The results indicate the existing three signalized intersections operate within an acceptable range for *overall* level of service; however, some approaches at the signal operate with long delays and poor level of service. The traffic signal operation is not able to service the demand from all approaches in an efficient manner, and therefore drivers experience delays and queues at these intersections.

Table 4 - Capacity Analysis of Existing Conditions

Intersection	Traffic control	Approach	Existing 2017 Conditions			
			AM		PM	
			LOS	Delay	LOS	Delay
SR 60/Green St & SR 60 Conn/Oak Tree Dr	Stop control	WB	F	**	F	171.1
SR 11 & SR 60 Conn/Oak Tree Dr/ Driveway	Stop control	EB	F	160.3	F	260.5
		WB	D	32.9	A	
SR 11/Riverside Dr & Greenwood Drive	Stop control	WB	A	9.3	B	12.9
SR 60/Green St & Thompson Bridge Rd/Riverside Drive/Holly Dr	Signalized	Overall	C	29.1	C	23.6
		NB	B	13.4	B	13.1
		SB	C	25.2	B	17.1
		EB	D	42.1	E	80
		WB	E	62.3	E	66.1
SR 60/Green St & Church (North) Dwy	Stop control	EB	F	156.3	F	99.4
SR 60/Green St & Church (South) Dwy	Stop control	EB	F	171.8	F	55.9
SR 60/11/SR 60/Green St & Ridgewood Ave/Driveway	Signalized	Overall	B	17.9	C	26.4
		NB	A	6	C	22.6
		SB	B	17.6	A	50
		EB	F	85.2	F	121.7
		WB	D	54.8	D	50.7
SR 60/Green St & North Ave	Stop control	EB	F	290.0	F	94.0
		WB	B	12.0	F	**
SR 60/Green St & Candler St	Stop control	WB	B	12.6	C	22.0
SR 60/Green St & Forrest Ave	Stop control	EB	C	19.9	B	13.1
SR 60/Green St & Green St Pl	none - one-way street	n/a	*	*	*	*
SR 60/Green St & US Post Office (North) Driveway	Stop control	WB	C	24.3	E	43.1
SR 60/Green St & Times (South Driveway)	Stop control	EB	F	106.1	E	35.2
SR 60/Green St & Pinnacle Bank (North Driveway)	Stop control	EB	A	9	B	12.9
SR 60/11 & Academy St	Signalized	Overall	B	18	D	39.1
		NB	A	6.6	B	11.7
		SB	A	9.9	D	35.3
		EB	E	66.9	F	91.8
		WB	D	54	D	46.7

Notes:

* Denotes one-way street

** Delay over 300 secs

Signalized LOS reported from HCM 2000. Unsignalized LOS reported from HCM 2010.

4 - ADJACENT PROJECTS

During the Green Street Corridor Study process, three projects near Green Street were initiated. The three projects, in addition to the Green Street project, are indicated in **Figure 8**. Two projects are in the process of being programmed by Georgia DOT and one design project is underway. The Green Street Corridor Study recommends the City continue to proceed with implementing, or supporting, the three adjacent transportation projects. The recommended solution for Green Street is the implementation of these four improvement projects.

TWO GEORGIA DOT ROUNDABOUT PROJECTS

At the same time the Green Street Corridor Study began, Georgia DOT initiated two Roundabout Feasibility Studies. The locations of the studies were:

- SR 60/Green Street at Thompson Bridge Road/Riverside Road
- SR 60/Green Street at Academy Street

The existing signalized intersections exhibit crash history and poor operations. The intersection deficiencies are in part due to the geometric “Y-split” at both locations. Additionally, both the intersections have movement restrictions, prohibiting some movements due to geometry. The intersection at Thompson Bridge Road also has no pedestrian accommodations to cross any streets.

Georgia DOT performed the feasibility studies to compare the operational and safety performance of a roundabout compared to the existing signalized control. The roundabouts are intended to enhance safety and improve operations at the intersections. The reports concluded both roundabouts are geometrically feasible based on preliminary concept layouts. Both locations would be multi-lane roundabouts and accommodate trucks and large vehicles.

For the Advisory Committee meetings, Pond enhanced the concept layouts in renderings to illustrate what the roundabouts may look like. The renderings illustrate how the roundabouts would transform the intersections and improve the aesthetics at both entrances to Green Street. **Figures 9 through 12** illustrate the roundabout concept layouts. It is important to note the roundabout layout and specifics will be modified as the projects move through design and the public input process. Based on the feasibility study results, GDOT is proceeding with programmed two safety design projects to construct multi-lane roundabouts.

Figure 8 - Recommended Solution: Four Projects Initiated Near Corridor



Figure 9 - Roundabout Concept - At Academy Street

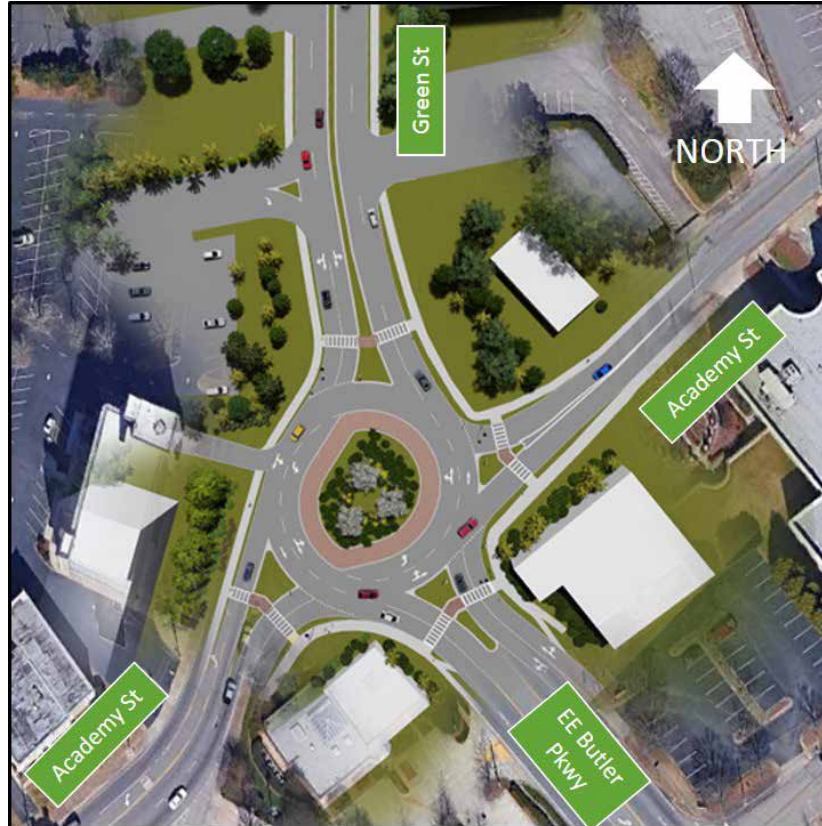


Figure 10 - Roundabout Concept - At Academy Street

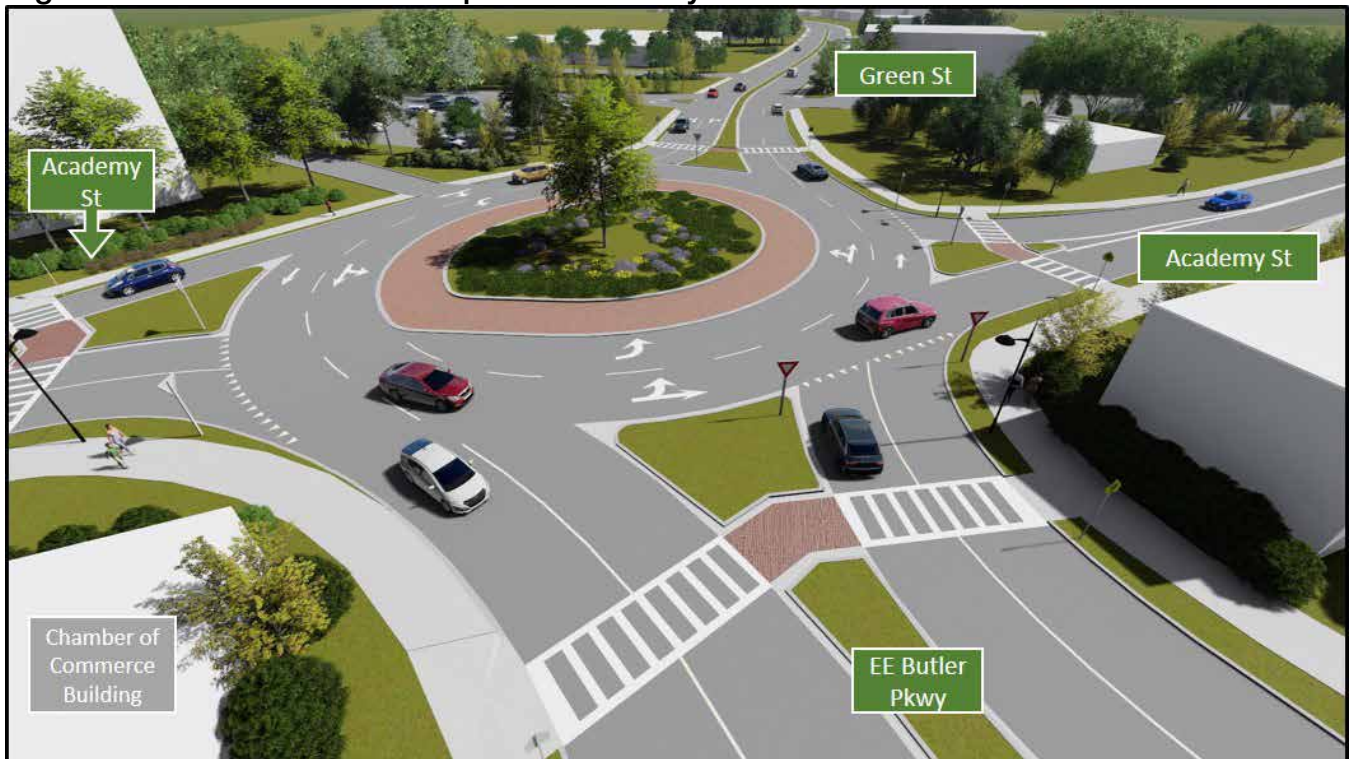


Figure 11 - Roundabout Concept - At Thompson Bridge Road

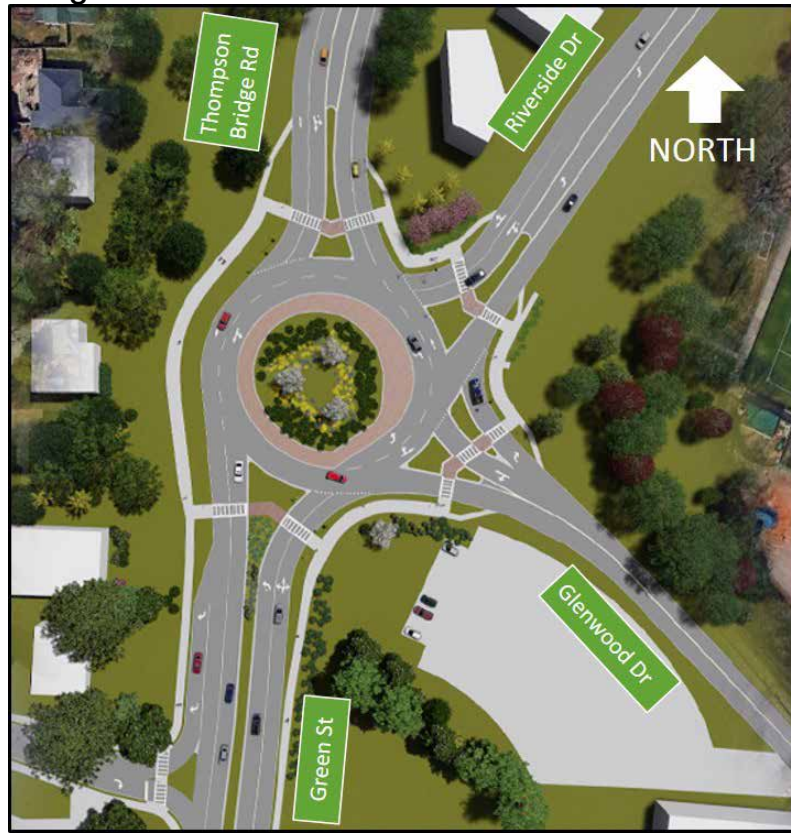


Figure 12 - Roundabout Concept - At Thompson Bridge Road



The proposed roundabouts will provide the benefits to the community of improved safety, reduced accidents, improved traffic flow, and reduced vehicle speeds at the intersection. An additional benefit at both locations is the roundabouts will improve the street network by allowing traffic movements which are currently prohibited at the signalized intersections. Another important benefit is the roundabouts will allow drivers to make u-turns – this is critical for the preferred improvement alternative along Green Street. The proposed roundabouts located at both ends of Green Street are compatible with and allow for any alternative to be considered along Green Street.

SR 60 CONNECTOR/OAK TREE DRIVE PROJECT

During the Green Street Corridor Study, the City of Gainesville initiated the SR 60 Connector/Oak Tree Drive project. This is a Georgia DOT project which has been funded and programmed (PI #0015752). The City has initiated the engineering design process, which will involve a public input process. The initial concept layout was presented at the third Advisory Committee meeting. The project objectives include improving Oak Tree Drive to handle additional traffic volume and improving the roadway to accommodate trucks. SR 60 Conn/Oak Tree Drive provides the connection between SR 60 and SR 11 Business (due to turning movement restrictions at the intersection to the south at SR 60/SR 11 Bus). The SR 60 Connector is a designed truck route; however, due to geometric limitations trucks choose not to utilize the street. **Figure 13** presents the initial concept layout, which will be refined during the design and public input process. The project proposes to install a new traffic signal at the intersection of SR 60 at Oak Tree Drive.

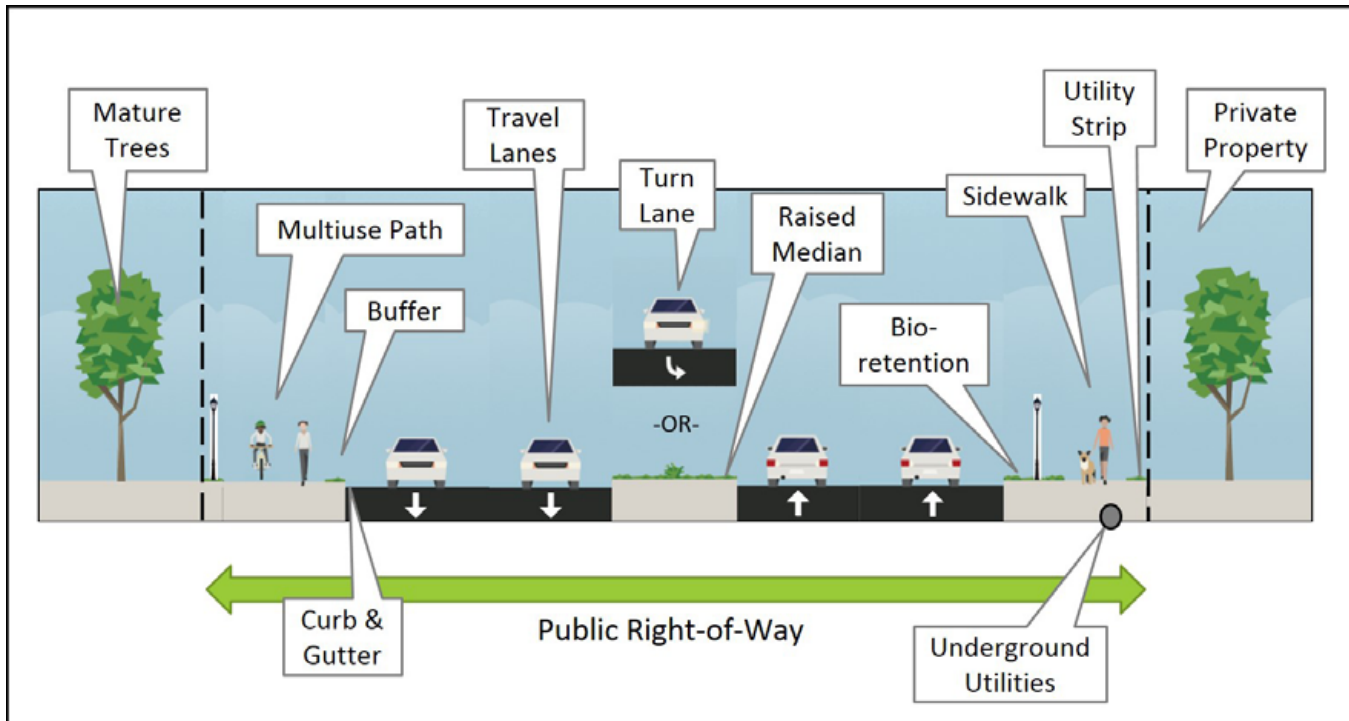
Figure 13 - Initial Concept - SR 60 Connector/Oak Tree Drive



5 - DEVELOPMENT OF ALTERNATIVES

The corridor study included developing alternatives for consideration and then refining the list of alternatives to a preferred option to carry forward. The process began with identifying a full range of alternatives for consideration. Alternatives were brainstormed based upon the issues identified by the Advisory Committee and the existing conditions of the corridor. To begin with, the typical street elements were defined and discussed as to whether they could fit within the street cross-section. **Figure 14** indicates the important elements considered in the alternatives.

Figure 14 - Important Design Elements of the Street Cross-Section



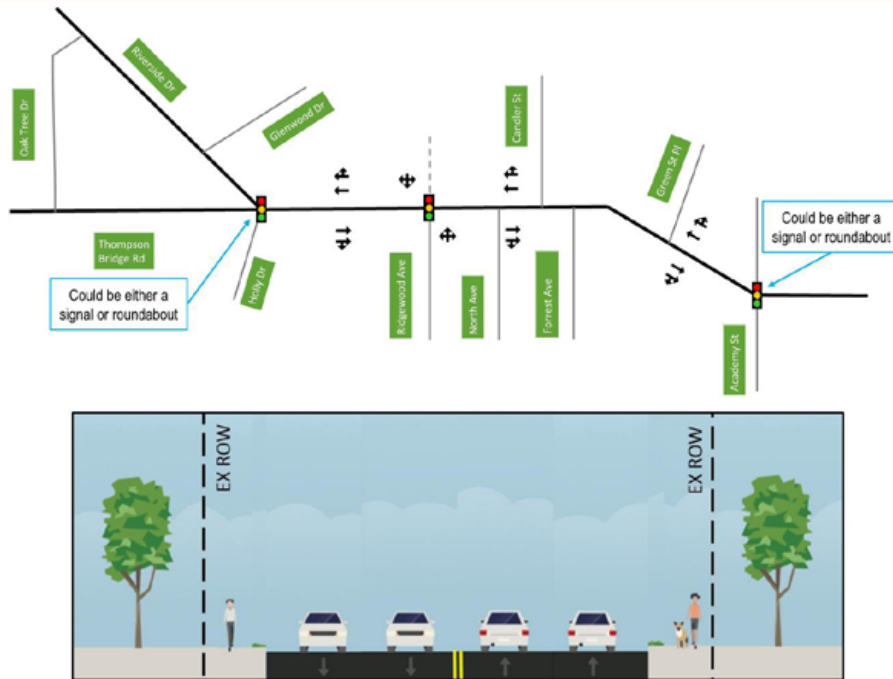
Six alternatives, with one sub-alternative, and the 'no-build' alternative, were identified and presented to City of Gainesville staff and at the second Advisory Committee meeting for consideration. The initial six alternatives included the following:

- Alternative "A" – Four Lane within Existing ROW
- Alternative "B" – Four Lane with Improved Shoulders
- Alternative "C.1" – Four Lane with Roundabouts
- Alternative "C.2" - Four Lane with Teardrop Roundabouts
- Alternative "D" – Five Lane
- Alternative "E" – Four Lane Plus
- Alternative "F" - Four Lane with Turn Restrictions

All of the alternatives included maintaining four through travel lanes along Green Street, and showed the same shoulder design, which consisted of an 8ft multiuse path with a 4ft buffer to the street. The alternatives included varying types of traffic control and access modifications. The alternative that would potentially require the widest cross-section was Alternative D and E, at 86 feet. A network schematic, cross-section, and key aspects for each alternative were presented to the Advisory Committee members in a handout. These handout images are included in **Figure 15** on the following pages.

Figure 15A - Potential Alternate "A"

POTENTIAL ALTERNATE "A" – FOUR LANE WITHIN EXISTING ROW

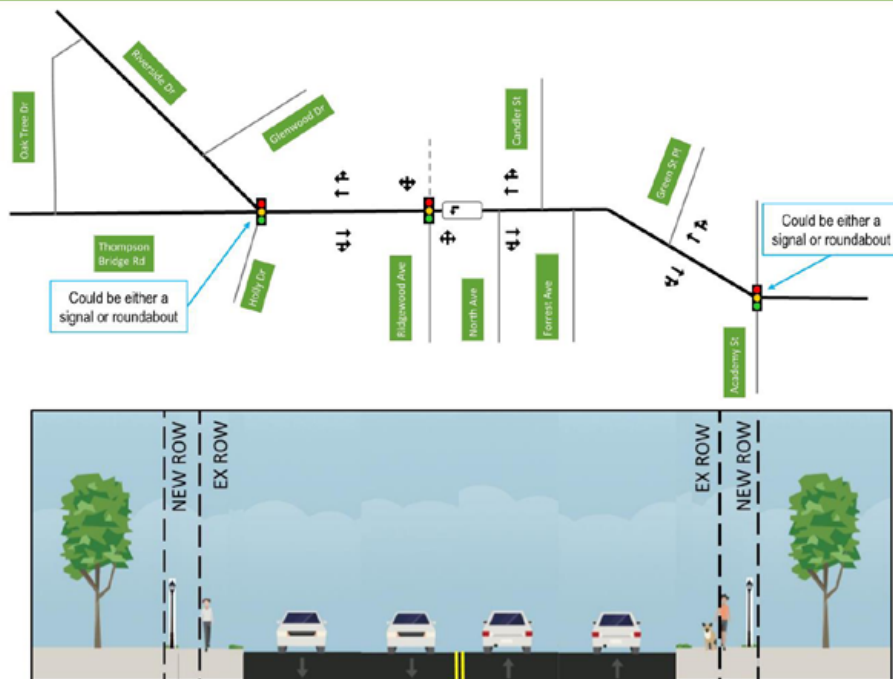


Key Aspects:

- Maintain two travel lanes in both directions
- Left-turns along Green Street from through travel lane
- Maintain Existing 56' ROW
- Maintain 10-foot travel lanes
- *Shoulder modified to include:*
 - 6" header curb
 - 2-foot buffer
 - 5-foot sidewalk

Figure 15B - Potential Alternate "B"

POTENTIAL ALTERNATE "B" – FOUR LANE WITH IMPROVED SHOULDERS



Key Aspects:

- Maintain two travel lanes in both directions
- Left-turns along Green Street from through travel lane
- Possible Cross-Section Width:
 - 65 feet
 - Requires additional 9 feet of ROW (4 or 5 feet on each side)
- This includes:
 - 10-foot travel lanes
 - 30" curb and gutter (GDOT standard)
 - 2-foot buffer
 - 6-foot sidewalk
 - 2-foot utility strip (lighting)
- ***Possibly widen ONLY at Ridgewood Ave for dedicated northbound left-turn lane

Figure 15C.1 - Potential Alternate "C.1"

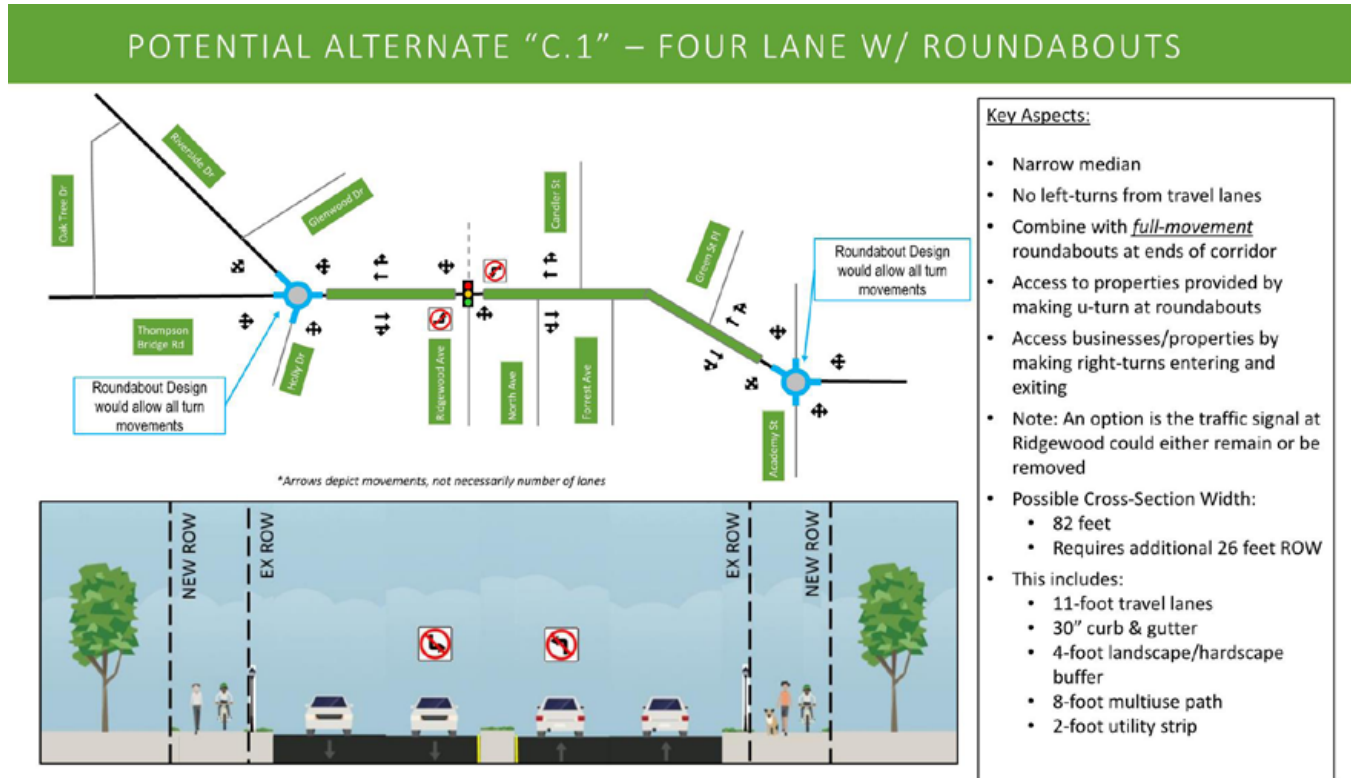


Figure 15C.2 - Potential Alternate "C.2"

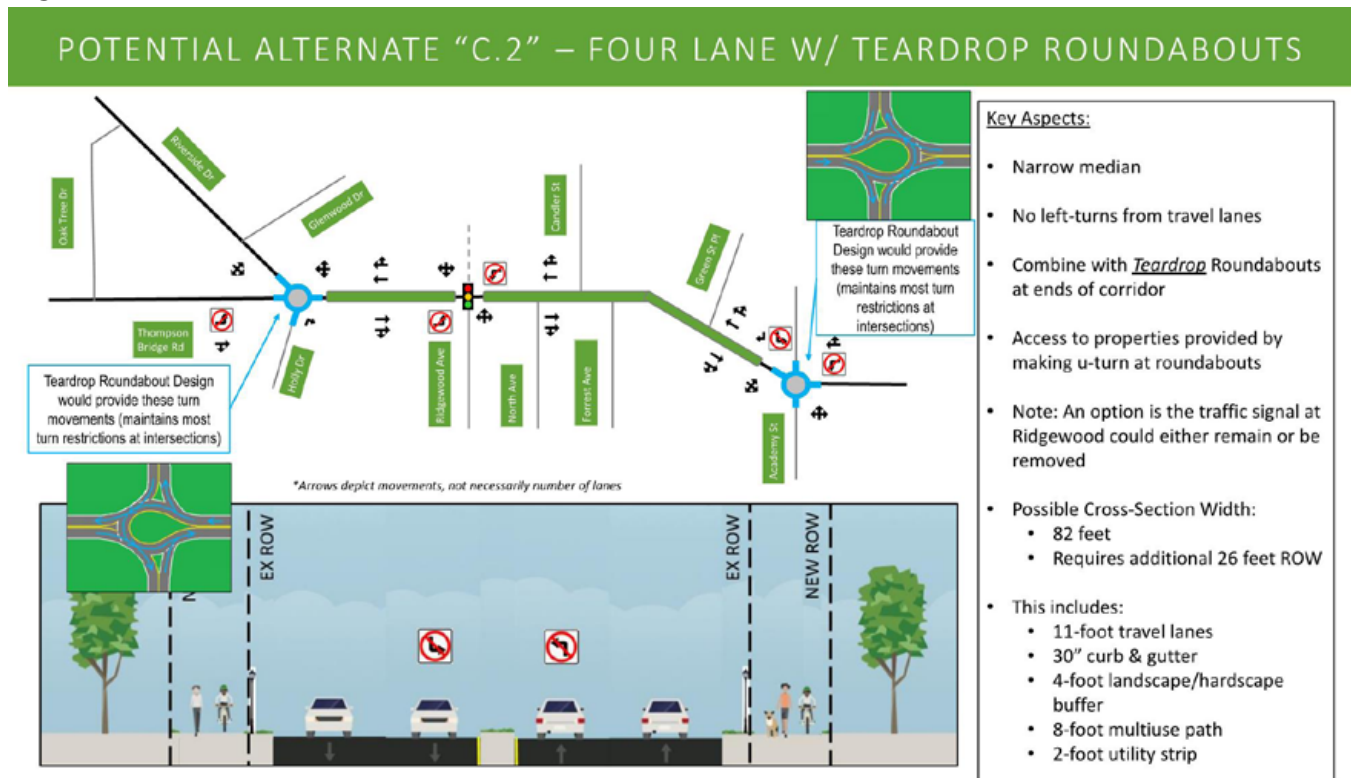


Figure 15D - Potential Alternate “D”

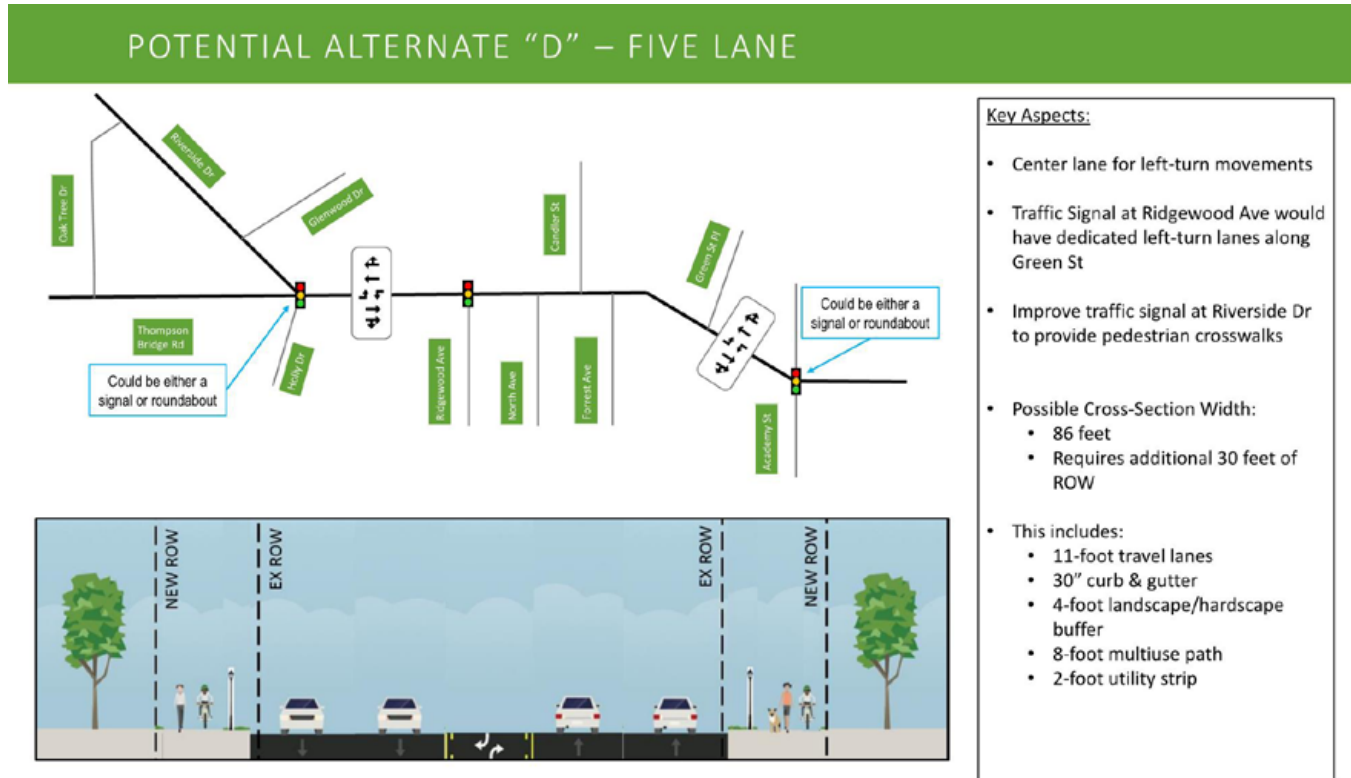


Figure 15E - Potential Alternate “E”

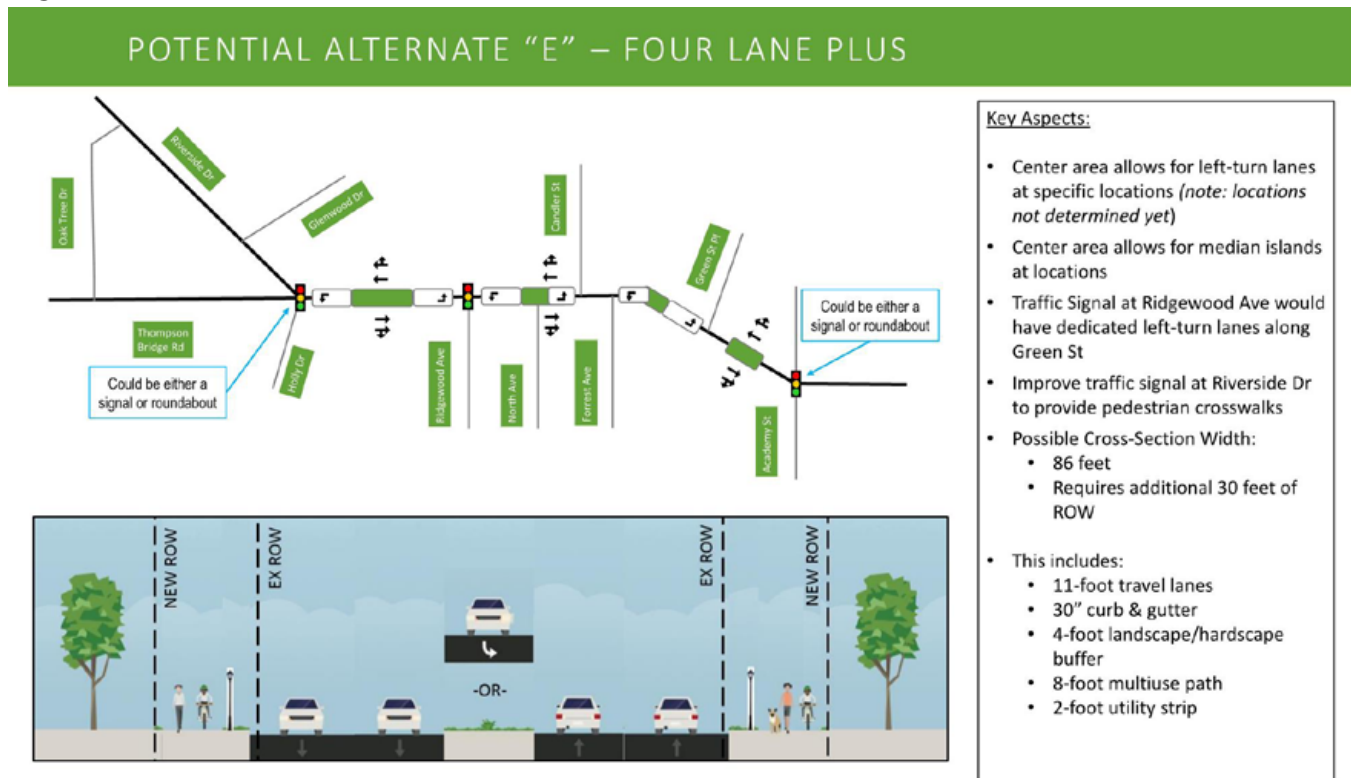
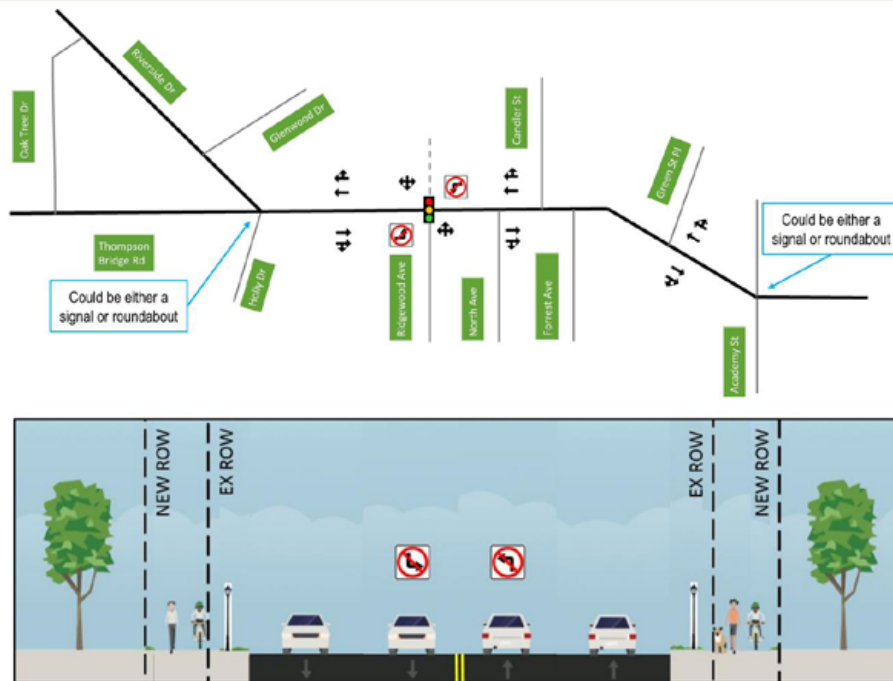


Figure 15F - Potential Alternate “F”

POTENTIAL ALTERNATE “F” – FOUR LANE W/ TURN RESTRICTIONS



Key Aspects:

- No left-turns from travel lanes
 - Time Option:
 - By Time-of-Day
 - OR All-day
 - Location Options:
 - At certain locations
 - OR entire corridor
- Access to properties provided by street grid/inter-parcel access
- Access businesses/properties by making right-turns entering and exiting
- Note: An option is the traffic signal at Ridgewood could either remain or be removed
- Possible Cross-Section Width:
 - 75 feet
 - Requires additional 19 feet of ROW
- Same shoulder elements as Alt “E”

The initial alternatives gave the Advisory Committee members an opportunity to understand options and provide feedback on what were the important elements and widths of elements to focus on for the Green Street corridor. The Advisory Committee members were provided with a one-page list of questions to gauge their preferences on street elements. Five sheets were turned in. **Figure 16** indicates the summary of their responses. This information and the feedback received during the meeting provided guidance for removing alternatives from consideration and revising the alternatives.

Major comments from the Advisory Committee members included the following. Some on the committee indicated a desire to have ‘street’ improvements within the existing 56-foot public right-of-way. The thought was the pavement, drainage, curb and gutter need to stay within the 56-feet. The sidewalk could meander on a permanent easement on private property.

- The committee was interested in a 6-foot wide sidewalk to minimize impacts to private property. If there was more available room, they would want to consider an 8-foot multiuse path on at least one side of the street.
- Some on the committee indicated a meandering sidewalk on private property would be preferred, if allowed. Knowing there are many homes located very close to the street, the sidewalk could be close to the street at these locations. Some in the group stated they would prefer the sidewalk be next to the streets rather than behind trees.
- The committee indicated it is preferred to bury the existing overhead utilities underground.
- There was a desire to provide better pedestrian crossing across Green St, especially near the Civic Center.

The comments sheets received from the Advisory Committee members are included in the Appendix.

Figure 16 - Summary of Advisory Committee Feedback

POND POLL QUESTIONS

MEETING: **Green Street Advisory Committee Meeting #2**

The consultant team would like your input on preferences for:

The Green Street Cross-section Elements:
(please circle your preference / add comments)

Summary of five forms received

- Travel lanes width
 - Keep 10-foot wide (Note: existing condition) ||
 - Widen to 10.5 feet
 - Widen to 11 feet |||
- Left-turn movement
 - Maintain left-turns in through travel lane (note: existing condition) ||
 - Provide separate, dedicated left-turn lane ||
 - Prohibit left-turns in through travel lane |
- Curb & Gutter (Note: Existing curb is minimal or 6" wide)
 - Provide 6" high curb and gutter |||
 - Provide 30" wide curb and gutter (GDOT standard) |
 - Other: —
- Buffer
 - Provide 2-foot landscape/hardscape strip |
 - Provide 4-foot landscape/hardscape strip
 - Other: meander - ||
- Sidewalk/Multi-use Trail (Note: Existing sidewalk varies in width from 7-8 feet wide)
 - Provide 6-foot sidewalk (pedestrians) ||||
 - Provide 8-foot multiuse path (pedestrians and bicycles allowed) |
 - Provide wider path where right-of-way allows
 - Other: —
- Trees
 - Do not remove any large, mature trees ||
 - Only remove large, mature trees if absolutely necessary ||
 - Okay to remove large, mature trees
 - Other: —
 - Meander sidewalk around/behind mature tree if this saves the tree |
- Street width
 - OK to widen right-of-way to improve street and provide better elements
 - Minimize widening of right-of-way ||||
 - Do not widen right-of-way |

Underground Utilities – ||
Alternate for Truck Traffic = |

REFINEMENT OF ALTERNATIVES

The feedback received during the second Advisory Committee meeting provided guidance for removing alternatives from consideration and revising the alternatives. Through a series of meetings with City of Gainesville staff and Georgia DOT District 1 staff, the initial six alternatives were narrowed and refined to two alternatives.

Two Refined Alternatives (renamed)

- Alternative A – Four Lane with Center Raised Median
 - This alternative maintains four travel lanes and installs a center raised median between the two proposed roundabouts
- Alternative B – Four Lane with Turn Lanes
 - This alternative maintains four travel lanes and installs dedicated left-turn lanes at key locations

Figures 17 and 18 include a schematic, cross-section, and key aspects for both alternatives.

The two alternatives meet the objectives of the improvement project and are viable options considering the narrow existing right-of-way, street design standards, and input from the Advisory Committee. Some restrictions on widening the road are the mature trees, existing slopes, and buildings located close to the street. With both alternatives, there may be options to adjust the widths of the street elements, including the travel lane widths, the buffer between the sidewalk and street, the sidewalk width, and the utility strip. In Alternative B, there are opportunities to squeeze in a left-turn lane at a few key locations; however, turn lanes were not proposed at every intersection. The two alternatives may incorporate sustainable elements.

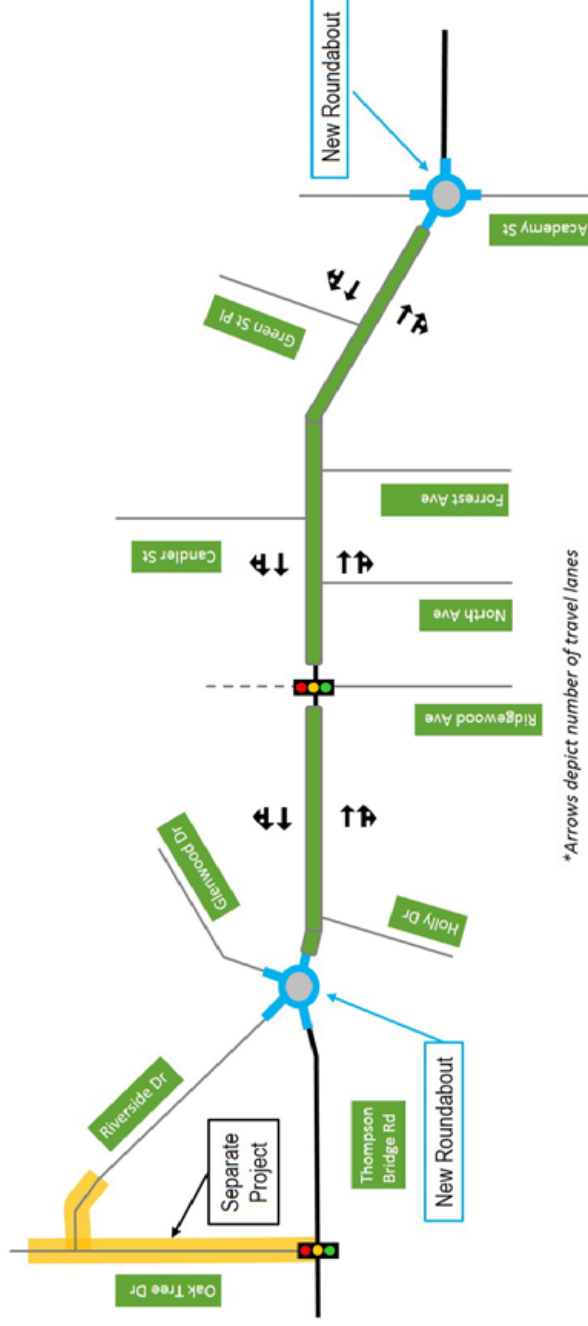
Since Green Street is a State Route and on the National Highway System, the corridor study reviewed the cross-section elements of Alternative A and Alternative B per the GDOT Design Policy Manual. The Design Policy Manual, Chapter 2, defines the roadway standards, guidelines, and design exceptions and variances. Flexibility from these is permitted; however, additional documentation and approvals are required. In summary, three elements may require variances or approvals to vary from the standards. The study also identified some potential options to address these standards. Considering the project location and constraints, the expectation is Georgia DOT may provide flexibility in the design of the Green Street project. The three elements include:

- Cross-Section: Inverted crown (2% slope toward median),
- Cross-Section: No gutter on outside edge (normal crown); only a 6-inch barrier (flat) curb,
- Cross-Section: No Median

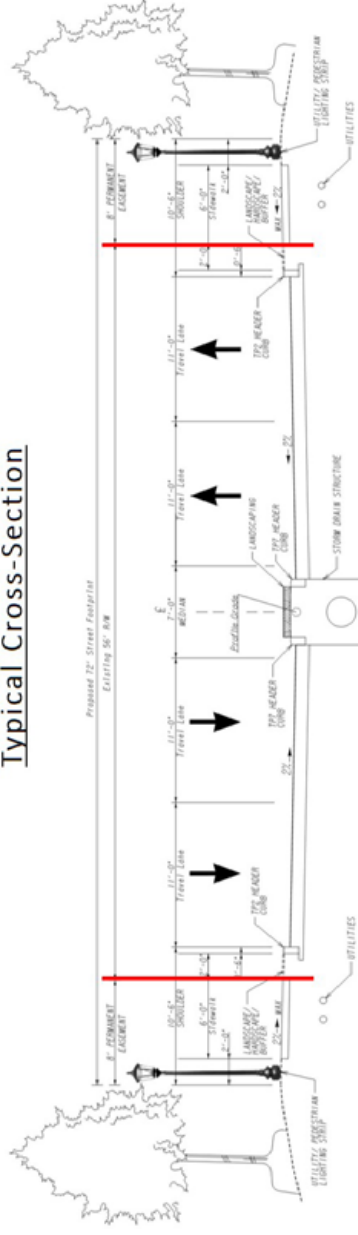
The two alternatives were presented at the third Advisory Committee meeting. In attendance at the meeting were additional property owners along Green Street. This provided an opportunity to explain the purpose of the study and receive additional feedback. The proposed roundabouts and the two alternatives were presented to the attendees. The presentation and exhibits presented at the meeting are included in the Appendix. One of the exhibits presented at the meeting, **Figure 19**, was used to illustrate and explain the potential difference in street dimensions and the limits of construction that could be required to implement the improvements. It is important to understand during construction the area of disturbance to replace and bury utilities, and install the stormwater system, will be greater than the visible extends of the sidewalk. The exhibit indicated the approximate limits of disturbance beyond the existing back of sidewalk.

Figure 17 - Refined Alternative A

ALTERNATIVE A – FOUR LANE W/ CENTER RAISED MEDIAN



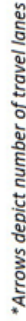
Typical Cross-Section



Notes:

- Narrow median provides landscaping and storm drainage inlets
- No left-turns from travel lanes along Green St
- Combine with *full-movement* roundabouts at both ends of Green St
- Access businesses/properties by making right-turns entering and exiting property
- Access to properties provided by making u-turn at two roundabouts
- Ridgewood Avenue Traffic Signal remains; provides access from side streets
- Proposed Street Footprint Width: 72 feet
- This includes:
 - 5-foot raised median
 - 11-foot travel lanes
 - 6" wide header curb
 - 2-foot landscape/hardscape strip
 - 6' sidewalk
 - 2' utility/pedestrian light strip
- Meandering sidewalk is an option to minimize impacts to existing mature trees

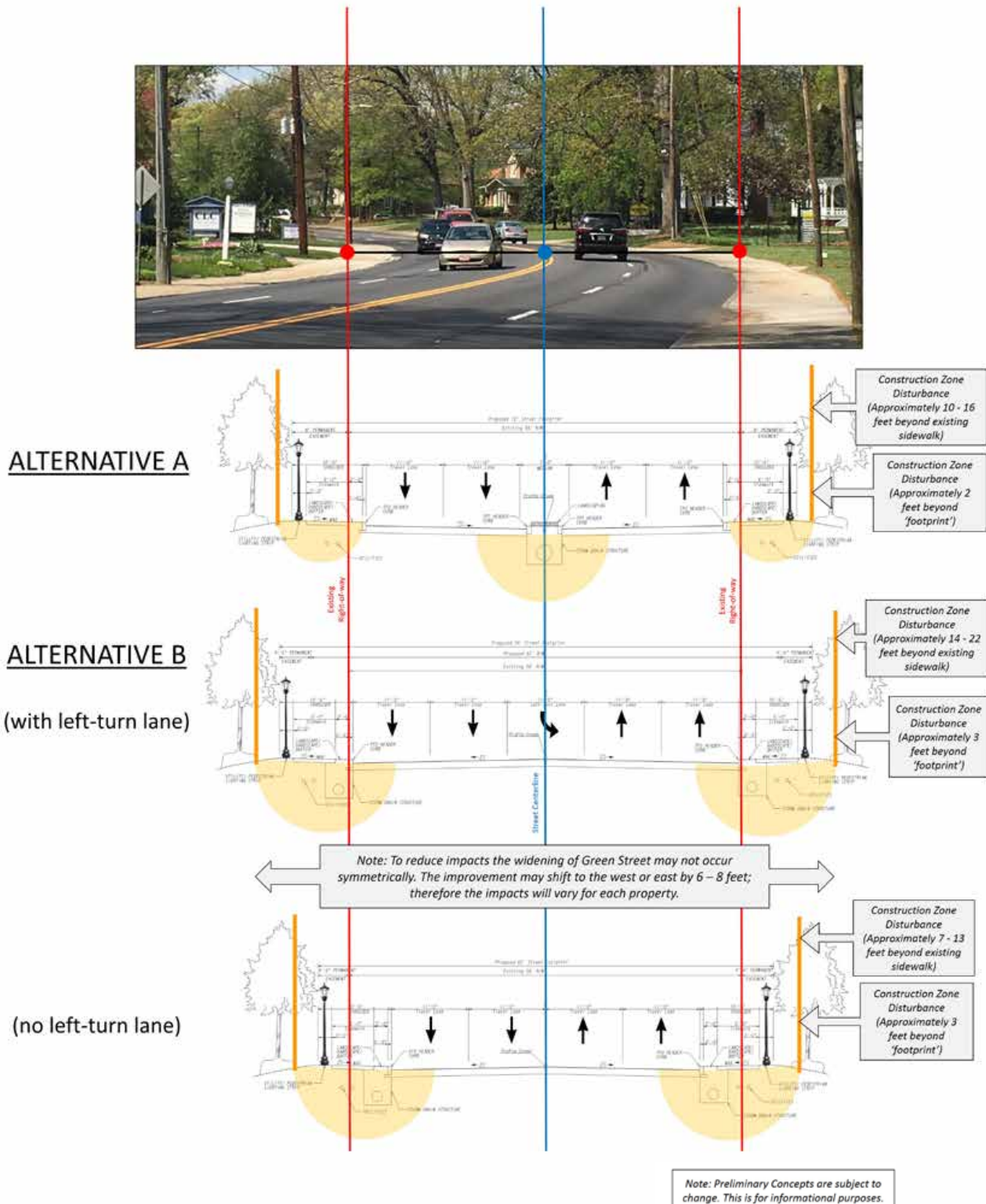
ALTERNATIVE B – FOUR LANE W/ TURN LANES

[illegible]

- Left-turn lanes at specific locations:
 - Post Office
 - Candler Street
 - North Avenue
 - Ridgewood Avenue
 - First Baptist Church
 - Holly Drive
- Median islands at some locations
- Combine with full-movement roundabouts at ends of corridor
- Ridgewood Avenue Traffic Signal remains; provides access from side streets
- Proposed Street Footprint Width: 76 feet where left-turn lanes are located
- This includes:
 - 11-foot left-turn lanes
 - 11-foot travel lanes
 - 6" wide header curb
 - 2-foot landscape/hardscape strip
 - 6' sidewalk
 - 2' utility/pedestrian light strip
- Proposed Street Footprint Width: 65 feet where there is no left-turn lane
- Meandering sidewalk is an option to minimize impacts to existing mature trees

Figure 19 - Green Street Cross-Section Comparison

Green Street – Cross-Section Comparison



The meeting provided the opportunity to explain the alternatives and the tradeoffs between them. The Advisory Committee provided feedback on the proposed roundabouts and the two alternatives. Overall, the members were receptive to the two concepts. Based on the feedback during the meeting and comment sheets received, Alternative A was the preferred option. Seven comment sheets were turned in by the attendees, and all seven indicated their preference was Alternative A. Key comments from the comments sheets included:

- Alternative A would be very attractive and safe.
- Green Street's character, look, and feel need to be prioritized on all projects moving forward. Alternative A looks to be the best alternative to minimally impact the corridor while solving these issues. The median and meandering sidewalks will be a major improvement. I think the time has come to absorb the minimal impacts while providing major improvements.
- Alternative A appears to be the best alternative. Minimize expanding the public right-of-way to keep the historic nature of Green Street.
- In favor of Alternative A. Minimize impacts to property owners.
- Alternative A with meandering sidewalks and roundabouts.
- My strong preference is Alternative A with meandering sidewalks.
- Eliminate Alternative B.

Meandering Sidewalks

Based on the feedback during the Advisory Committee meetings and comment sheets received, the Advisory Committee members and property owners are very interested and supportive of the concept to meander the sidewalk away from the street and around existing mature trees to minimize impacts. The corridor study developed Alternative A and stated meandering sidewalks were compatible with the concept. The cross-section graphics illustrate the minimum dimensions needed if the sidewalk was kept adjacent to the street. The study recognized that it will not be feasible to meander the sidewalks along the entire length of the corridor, due to physical constraints. During the engineering design phase the sidewalk location will be evaluated on an individual property basis. The location of the sidewalk may also be affected by where the underground utilities can be located (if they could only be located under the sidewalk). During the engineering design phase, coordination with the utility owners will determine the proper location for underground utilities and their impact to mature tree root zone will be evaluated.

EVALUATION OF ALTERNATIVES

An evaluation of the three alternatives (including the No-Build Condition) was performed and **Table 5** presented at the third Advisory Committee meeting in December of 2017. Table 5 lists the alternatives and the evaluation criteria. For each criteria, a ranking between 1 and 3 was determined for each alternative relative to the other alternatives. The result of the evaluation is the recommendation to advance Alternative A as the preferred improvement option for Green Street.

Table 5 - Engineering Evaluation of Alternatives

Evaluation Criteria	Alternative		
	A - Four Lane with Center Raised Median	B - Four Lanes with Turn Lanes	C - (No-Build Condition) Four Lane with No Turn Lanes
Safety for Vehicles Improved	1	2	3
Safety for Pedestrians Improved	1	2	2
Traffic Flow Improved	1	2	3
Access to Businesses	2	1	3
Minimize Impacts to Properties	2	3	1
Minimize Impacts to Mature Trees	2	3	1
Improve Drainage	1	1	1
Overall Ranking Result	1	2	3

Note: Ranked Evaluation Criteria from 1 to 3 for all Alternatives. 1 = highest rank.

PLANNING LEVEL COST ESTIMATE

As part of the corridor study, the City requested an initial planning level cost estimate for the project. The project would include reconstructing Green Street between the two proposed roundabouts. The roundabouts programmed by Georgia DOT were not included in the cost estimate. Pond prepared a cost estimate based on the desired infrastructure elements and not design plans. The cost estimate was developed based on a number of assumptions since it was performed prior to concept development. The construction cost estimate (including design, utilities, right-of-way, and construction) may be in the range of \$11-13 million. The city may choose to utilize this cost for budgeting purposes. However, it is important to state that this is an initial planning level cost estimate which will need to be refined during the design process.

6 - REGIONAL TRANSPORTATION IMPROVEMENT PROJECTS

The study included discussions on the state of the regional transportation network and the strategy that it will take more than one project to solve the Green Street corridor issues. Additional strategies could include re-routing traffic to other streets, re-routing truck traffic, and potential new roadways to provide additional route options for the community. The report has already discussed the two proposed roundabouts and the SR 60 Connector/Oak Tree Drive projects. In addition to these projects, the study performed initial evaluation of three additional projects:

- Intersection Improvement at SR 11 BUS/Park Hill Dr at S. Enota Drive
- New Roadway Connection between SR 60/Thompson Bridge Road and SR 53/Dawsonville Highway
- Limestone Parkway Extension, between US 129/Cleveland Highway and SR 60/Thompson Bridge Road

The City may further evaluate these additional projects to determine the benefits and impacts to the community. Additional roadway network improvements will have varying improvement effects on the conditions on Green Street.

7 - RECOMMENDATIONS

The Green Street Corridor Study identified the current infrastructure issues, initiated the community input process, and developed initial alternative concepts for community feedback. This section summarizes the recommendations and considerations for a Green Street improvement project as it moves into the next phase.

Based on the Advisory Committee input and existing infrastructure conditions, the improvements for Green Street, irrespective of alternative, are proposed to include:

Green Street Corridor Improvements
New Storm Drainage System and Inlets
Complete rebuild of roadway pavement
Replace/upgrade aged underground infrastructure (water lines, sewer lines)
Relocate overhead utilities to underground (power and all others)
Add pedestrian lighting
Maintain landscape character of the corridor

The recommended next step is to initiate the concept development phase for Green Street improvements, during which the the geometric design will begin and the preferred alternative can be further refined. The Corridor Study recommends proceeding with the Concept Development for the preferred Alternative A. The preferred Alternative A consists of:

- **Alternative A – Maintain four travel lanes and install a center raised median**
 - The alternative is combined with new roundabouts at both ends of Green Street
 - The proposed street footprint width is 72-feet. This includes:
 - 5-foot raised median (7-foot median total)
 - 11-foot travel lanes
 - 6-inch wide header curb
 - 2-foot landscape/hardscape strip
 - 6-foot sidewalk
 - 2-foot utility/pedestrian light strip
 - Meandering the sidewalk is an option to minimize impacts to existing mature trees, on an individual property basis
 - The preferred alternative is illustrated in Figure 17.

ADDITIONAL RECOMMENDATIONS

Additional Green Street project recommendations include:

1. The concept development phase and design phase should include a public process and opportunities for community input.
2. Perform an environmental documentation process, including environmental surveys and special studies, to support the concept development and selection of a preferred alternative. The appropriate environmental documentation will depend on the project funding source.
3. Prepare the appropriate documentation and review process for effects to historic properties; the recommendation is to include performing an updated historic resources survey of Green Street. Widening the street infrastructure and the impacts to a healthy historic tree root's system may potentially be an adverse effect of the project. (Note: Additional information is provided in the Environmental Considerations document in the Appendix.)
4. Continue outreach to stakeholders and the community

IMPORTANT CONSIDERATIONS FOR DESIGN PROCESS

During the study, the project team identified some important considerations that should be included in future design efforts. The considerations to be aware of as the project progresses include:

1. Stakeholders desired minimizing the street elements (travel lanes, curb, median) to minimize encroaching onto private properties
2. Stakeholders suggested considering a narrowed concrete median to minimize encroaching onto private properties; however, many liked the idea of a landscaped median and would prefer it
3. Stakeholders indicated each property owner will have different opinions on the location of the sidewalk and width of buffer between the street curb and sidewalk
4. Relocating overhead utilities along Green Street
 - Relocate overhead utilities to underground along the shoulders of Green Street
 - Relocate overhead utility line to adjacent public street or re-route service lines to properties so they are not 'feed' from Green Street
 - Consider installing a utility duct bank under one travel lane of Green Street
 - During the design phase discussions with utility companies will need to occur to determine the feasible relocation options
5. Stakeholders requested investigating the feasibility of adding a second eastbound approach lane (provide a separate right-turn lane) along Ridgewood Avenue at Green Street
6. Include design elements of the street that are consistent with the intent of the Gainesville Historic Preservation Manual and Design Guidelines.
7. Coordinate the street design with and receive input, and approval if required, from the Gainesville Historic Preservation Commission, for improvements within the Green Street-Brenau District.
8. The design process needs to accommodate Environmental Considerations, specifically historic resources and the existing mature trees along Green Street
9. Understanding the right-of-way width is not as narrow or as restrictive at both ends of the Green Street corridor, the design may be able to accommodate options such as a wider landscape/hardscape buffer or wider sidewalk

10. To improve access to businesses/properties, provide inter-parcel access and/or rear property connections to other local streets where they do not currently exist
11. Improve visual aids to drivers about which private driveways are two-way, enter only, or exit only; this could take the form of signs, pavement markings, and/or the driveway apron design
12. Include minor improvements to radius returns at side-street intersections; possibly install bulb-outs on side streets to reduce the street width and reduce the crosswalk length

RECOMMENDATIONS ON ADJACENT AND REGIONAL PROJECTS

Additionally, the Green Street Corridor Study recommends the City continue to proceed with implementing, or supporting, the three adjacent transportation projects: the two proposed roundabouts on Green Street and the SR 60 Connector/Oak Tree Drive improvement project. The recommended solution for Green Street is the implementation of these four improvement projects.

The Green Street Corridor Study also recommends the City further consider and investigate the regional transportation improvement projects discussed in Section 6.

8 - CONCLUSION

The historic Green Street deserves a well planned and designed infrastructure improvement. The design needs to consider the historic resources along the corridor, the constraints, and enhance the character of the properties along Green Street. The Green Street Corridor Study builds upon the initial Phase One study and identified a context sensitive preferred alternative. The recommended next step is to initiate the concept development phase for Green Street improvements.

