West Martintown Road Corridor Study

City of North Augusta

North Augusta
South Carolina's Riverfront

Project number: 60627475

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Quality information

Prepared by	Checked by	Verified by	Approved by
Fei Yuan, P.E.	Ryan Eckenrode, P.E., PTOE, RSP1		

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Distribution List

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Prepared for:

City of North Augusta
Libby Hodges, AICP
Director of Planning and Development
100 Georgia Avenue
PO Box 6400
North Augusta, SC 29841

Prepared by:

AECOM
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615
aecom.com

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1.0 Executive Summary

Significant growth along West Martintown Road has led to new capacity and safety challenges along the corridor, which is a 1.1 mile section from Knobcone Avenue to just north of Gregory Lake Road, in North Augusta, South Carolina. Population density has been increasing over the past decade with 1,177 residences accessing Bergen Road, which intersects with West Martintown Road. A new regional park is located north of the corridor and there are plans for 900 residential units and close to 300,000 square feet of commercial development. With these new developments brings additional traffic issues requiring new forms of traffic control at key intersections and access management strategies to preserve progression and safety along West Martintown Road. On average, 35 collisions a year occur within the study area limits.

According to the 2019 SCDOT permanent count stations along West Martintown Road, the average daily traffic volumes along the corridor vary from 5,400 vehicles per day (vpd) just north of Gregory Lake Road to 18,300 vpd south of Knobcone Avenue. Using the Augusta Regional Transportation Study (ARTS) model to determine growth rates at these locations, these existing traffic volumes are expected to grow to 6,800 vpd north Gregory Lake Road and 20,800 vpd south of Knobcone Avenue by 2040. While most of the traffic is residential related, a large mixed-use development in the southeast corner of West Martintown Road and I-20 is planned changing traffic flow patterns to / from the interstate.

The purpose of this study is to develop a corridor plan to accommodate future development which includes identifying new forms of traffic control at key intersections, mitigating any existing crash patterns, and improving multimodal connectivity with pedestrian enhancement.

Below is a list of the general sequence of events for the projects identified along West Martintown Road with the 2040 build-out shown in **Figure 5.**

1. Install a traffic signal at Bergen Road – *In progress*
2. Install a traffic signal at I-20 Eastbound Off Ramps – *In progress*
3. Modify traffic signal laneage and phasing at I-20 Eastbound Ramps to accommodate Hamrick Farms Development new leg and signalize off ramp right-turns.
4. Restripe north of I-20 EB Off Ramp / Hamrick Farm Driveway #1 to provide three northbound through lanes ending at the I-20 WB Loop On Ramp.
5. Convert Frontage Road to a reduced conflict intersection and Hamrick Farms Driveway #2 to right-in / right-out.
6. Initially construct Hamrick Farms Driveway #3 right-in / right-out, but leave Old Plantation Road full access (short-term).
7. Install a traffic signal at Knobcone Avenue with dual southbound left-turn lanes once Hamrick Farms Driveway #4 on Knobcone Avenue is complete. One of the left-turn lanes will end at Hamrick Farms Driveway #4.
8. Install a dual lane roundabout at I-20 Westbound Off Ramp.
9. Install a single lane roundabout at Gregory Lake Road.
10. Provide a new connection from Old Plantation Road to Knobcone Avenue and convert Old Plantation Road from full access to a right-in / right-out.
11. Install sidewalks along West Martintown Road between Hammond Ponds Road northward connecting with Knobcone Avenue.
12. Encourage a parallel service road on west side of West Martintown Road connecting River Falls Apartments and Circle K back to Old Plantation Road.

Cost estimates for Near-term, Intermediate-term, and Long-term projects have been identified in **Section 7.0** of this report including development thresholds that trigger improvements along with concepts shown in **Figure 7A, Figure 7B, and Figure 7C.**

2.0 Introduction

West Martintown Road is experiencing significant growth leading to transportation challenges including increased congestion and safety concerns along the corridor. This continued growth is expected to worsen and impact existing traffic patterns in the area by further increasing congestion and creating additional safety issues requiring improvements to the roadway infrastructure. This corridor study recognizes the regional and local importance of the corridor and seeks to address issues and concerns related to safety, connectivity and capacity; and formulate a series of projects and recommendations to address those issues.

Key challenges along the corridor include limited access management, pedestrian accommodations, distance to major unsignalized intersections on both sides on I-20 Off Ramps, and a major commercial development planned in the southeast corner of I-20 and West Martintown Road. AECOM was retained by the City of North Augusta to perform the following tasks along West Martintown Road:

- Conduct a corridor study that included a review of the existing traffic operation and safety conditions along the corridor within the study area,
- Project future traffic conditions based on potential future land use and development plan, and
- Identify potential deficiencies to propose improvement measures.

The study area begins just north of Gregory Lake Road and continues southward for approximately 1.1 miles to Knobcone Avenue as shown **Figure 1**. According 2019 SCDOT permanent count stations along West Martintown Road, the average daily traffic volumes along the corridor vary from 5,400 vehicles per day (vpd) just north of Gregory Lake Road to 18,300 vpd south of Knobcone Avenue. Using the Augusta Regional Transportation Study (ARTS) model to determine growth rates at these locations, these existing traffic volumes are expected to grow to 6,800 vpd north Gregory Lake Road and 20,800 vpd south of Knobcone Ave by 2040.

This study is a culmination of involvement with the community and stakeholders including the city of North Augusta, Augusta Regional Transportation Study (ARTS) Metropolitan Organization (MPO), The South Carolina Department of Transportation (SCDOT) and the Federal Highway Administration (FHWA). It will seek to analyze traffic operations, crash history, growth patterns, and access management strategies to improve safety and traffic flow. These efforts will result in Near-term, Intermediate-term, and Long-term recommendations that local governments and the SCDOT could implement in the future to benefit the corridor.

In addition to increased volumes, approximately 35 crashes per year occurred within the study area limits over a 5.0-year time frame between 2013 to 2017 totaling 175 crashes (18% injury related). By establishing access management strategies, adequate signal spacing, and intersection improvements, the corridor will be able to handle the additional traffic volumes while reducing the severity of collisions.

The project study area includes a 1.1-mile span along West Martintown Road (SC 230) from just north of Gregory Lake Road to Knobcone Avenue. Between these termini points, seven (7) unsignalized intersections as shown in **Figure 1** have been identified to conduct a detailed analysis:

1. SC 230 at Gregory Lake Road (S-582)
2. SC 230 at Bergen Road (S-2180)
3. SC 230 at I-20 Westbound Ramps
4. SC 230 at I-20 Eastbound Ramps
5. SC 230 at Frontage Road (S-2181)
6. SC 230 at Old Plantation Road (Local)
7. SC 230 at Knobcone Avenue (S-1905)

AECOM was tasked with studying traffic conditions during a typical weekday in the AM and PM peak hours for three (3) scenarios:

- Existing 2020: An analysis of existing conditions in the year 2020.
- No-Build 2040: An analysis of future conditions in the year 2040 using historic traffic volume trends in the surrounding area.
- Build 2040: An analysis of the future 2040 conditions if a Build Alternative is constructed for multiple scenarios.

The traffic analysis includes a review of the crash history, Level of Service (LOS), queuing, and volume to capacity ratios for the Existing 2020, No Build 2040, and Build 2040 scenarios. Based on these scenarios, the study will compare the No-Build 2040 scenario to the Build 2040 scenarios and provide roadway recommendations to improve operation, queuing, and volume to capacity ratios.

This report also includes a conceptual design of the proposed improvements between Gregory Lake Road and Knobcone Avenue to accommodate the 2040 projected traffic volumes. Finally, these improvements were separated into Near-term, Intermediate-term, and Long-term along with their associated cost estimates.

FIGURE 1

Study Area Limits

West Martintown Road Corridor Study
North Augusta, SC

AECOM

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Drawing Not to Scale

3.0 Existing Conditions

The West Martintown Road study corridor is approximately 1.1 miles starting from just north of Gregory Lake Road in Edgefield County spanning southward to Knobcone Avenue in Aiken County. While the study only focuses only on 1.1 miles, West Martintown Road does connect Interstate 20 to the City of North Augusta. Within the study area, characteristics such as average daily traffic, number of lanes, edge of pavement, and topography of this minor arterial vary and can be divided into two (2) segments.

- Cross Section #1: Gregory Lake Road to Bergen Road (0.35 miles)
- Cross Section #2: Bergen Road to Knobcone Avenue (0.75 miles)

3.1 Corridor Characteristics

The Gregory Lake Road to Bergen Road typical cross section along West Martintown Road consists of a two-lane undivided flat roadway bordered mainly by woods but also contains a few businesses (West Martintown Business Center, TRUENORTH church, and Gas Plus Convenience Market). This 0.35-mile cross section has 2 foot paved shoulders and edge line rumble strips with a 45 mile per hour posted speed limit.

Gregory Lake to Bergen Road Typical Cross Section #1

Gregory Lake Road intersects West Martintown Road at an angle less than ninety-degrees under two-way stop control as a 3-legged intersection. Gregory Lake Road is a two-lane roadway with a speed limit of 45 mph and carries approximately 2,400 vehicles per day serving primarily residential low density land uses. Bergen Road is also a two-lane roadway intersecting West Martintown Road with a speed limit of 45 mph. Bergen Road, east of West Martintown Road, carries about 4,100 vehicles per day from the dense residential land uses requiring this intersection to be signalized in the near future. Bergen Road, west of West Martintown Road, serves a few residential homes and becomes a dead-end street.

Gregory Lake Road looking west at West Martintown Road

West Martintown Road looking north at Bergen Road (future signal)

It is an uphill positive grade from Bergen Road southward to Knobcone Avenue which consists of a four-lane divided highway with a center two-way left-turn lane. Within this section of the corridor is Interstate 20 as well as few businesses (Circle K, Waffle House, and few firework distributors). This 0.75-mile cross section has curb and gutter with a 45 mile per hour posted speed limit. It should be noted that Bergen Road, Frontage Road, Old Plantation Road, and Knobcone Avenue intersecting with West Martintown Road will be studied on this segment and contain primarily residential land uses with no sidewalk currently in place along this section.

Bergen Road to Knobcone Avenue Typical Cross Section #2

Interstate 20 intersects West Martintown Road as an unsignalized traditional diamond interchange with loops for the I-20 eastbound and westbound on-ramps. Average daily volume on I-20 is 50,400 east of West Martintown Road and 64,300 west of West Martintown Road. There are plans to signalize the I-20 Eastbound Off Ramp as part of the I-20 widening project.

West Martintown Road looking south (uphill) at I-20 Westbound Ramps

The two-lane Frontage Road intersects West Martintown Road approximately 500 feet south of the I-20 Eastbound Off-Ramp. It currently carries minimal traffic volumes serving the CSRA Pain Development business. Frontage Road is expected to carry additional traffic volumes with the approved River Falls Apartment complex.

Frontage Road looking east at West Martintown Road

Old Plantation Road is a two-lane roadway intersecting West Martintown Road at a negative downhill grade. Old Plantation Road extends approximately one mile and serves a large residential community before dead ending at the Savannah River. Old Plantation Road carries 1,000 vehicles per day with no posted speed limit.

Old Plantation Road looking west (uphill) from West Martintown Road

Knobcone Avenue is a two-lane state roadway intersecting West Martintown Road carrying approximately 3,700 vehicles per day. The roadway is rolling with no shoulders. Knobcone Avenue is the primary road serving North Augusta High School.

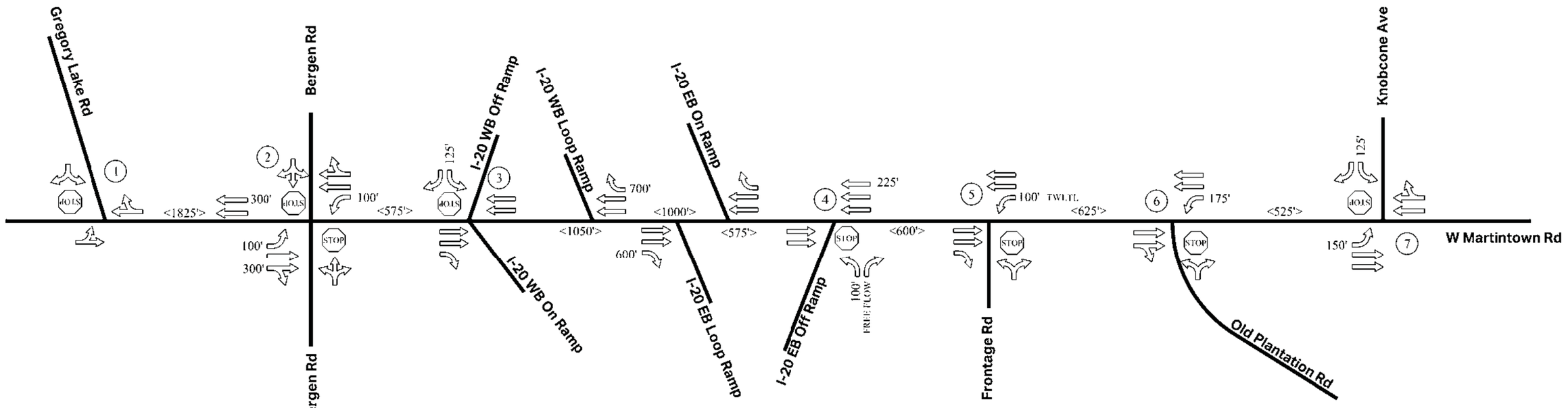
Knobcone Avenue looking west at West Martintown Road

AECOM also conducted another 24-hour vehicular classification traffic count at two locations along West Martintown Road on Tuesday March 3, 2020. Results indicated two percent heavy truck traffic (Class 5 or higher which includes two axle, six-Tire Single Units as the smallest type of truck) north of Interstate 20 and a one percent heavy truck volumes south of Interstate 20.

A field review was performed on March 25, 2020 to record existing laneage, signage, speed limits, and pedestrian accommodations. The following deficiencies in the system were also noted:

- No sidewalks along entire study area
- I-20 Eastbound Off Ramp right-turn lane is free flow and may lead to rear-end / sideswipe collisions.
- Between Old Plantation Road to Bergen Road is a downhill grade.
- Near-term signal at Bergen Road creates future signal spacing issues if I-20 Westbound Off Ramp needs a signal at a later time.
- Limited access management between Old Plantation Road at Frontage Road with multiple driveways serving Circle K and Waffle House.

The existing lane configuration and traffic control is shown on **Figure 2**.



LEGEND

- Existing Laneage
- Existing Signal Control
- STOP Existing Stop Control
- XXX' Storage Length (feet)
- <XXX'> Distance (feet)
- (##) Intersection ID

West Martintown Road Corridor Study

Figure 2 - Existing Lane Configuration

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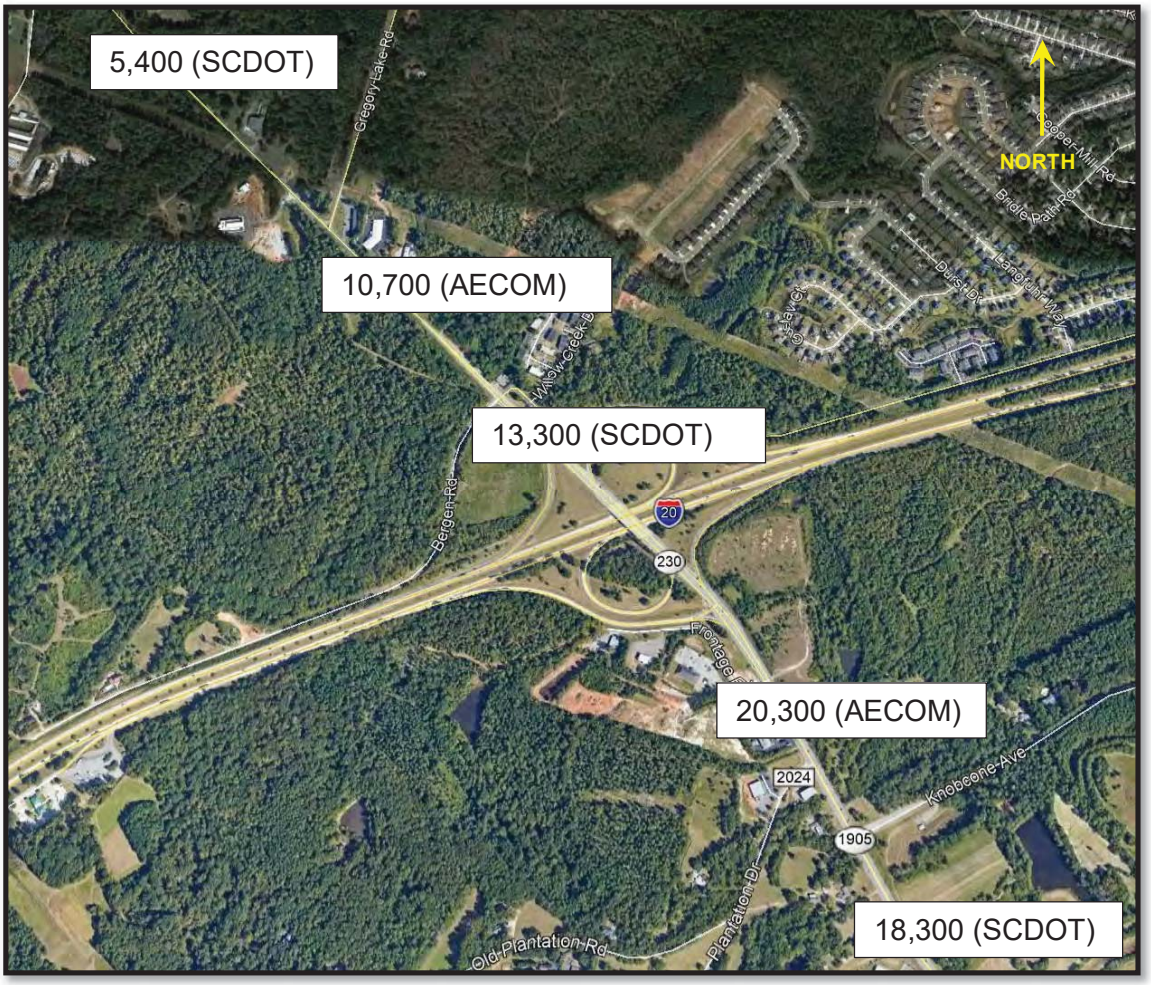
November 2020
North Augusta, SC

3.2 Traffic Count Data

To supplement the SCDOT permanent count stations and to obtain vehicular classification, additional Average Daily Traffic (ADT) volumes were collected on Tuesday March 3, 2020 along West Martintown Road at two (2) locations:

- South of Gregory Lake Road
- North of Old Plantation Road

Results from these traffic counts indicate that typical daily traffic volumes within the study corridor limits range from approximately 10,700 to 20,300 vehicles per day with a one to two percent heavy truck traffic. The image below visually displays the ADT along the corridor using both SCDOT permanent count locations and the two locations collected by AECOM.



Turning movement counts were also collected and obtained by several sources. The following intersections were collected by National Data & Surveying Services, Inc. on Tuesday, March 3, 2020:

- SC 230 at Gregory Lake Road (S-582)
- SC 230 at I-20 Westbound Ramps
- SC 230 at I-20 Eastbound Ramps
- SC 230 at Old Plantation Road (Local)
- SC 230 at Knobcone Avenue (S-1905)

The following intersection was provided by the City of North Augusta collected by Short Counts, LLC. On Tuesday, January 15, 2019:

- SC 230 at Bergen Road (S-2180)

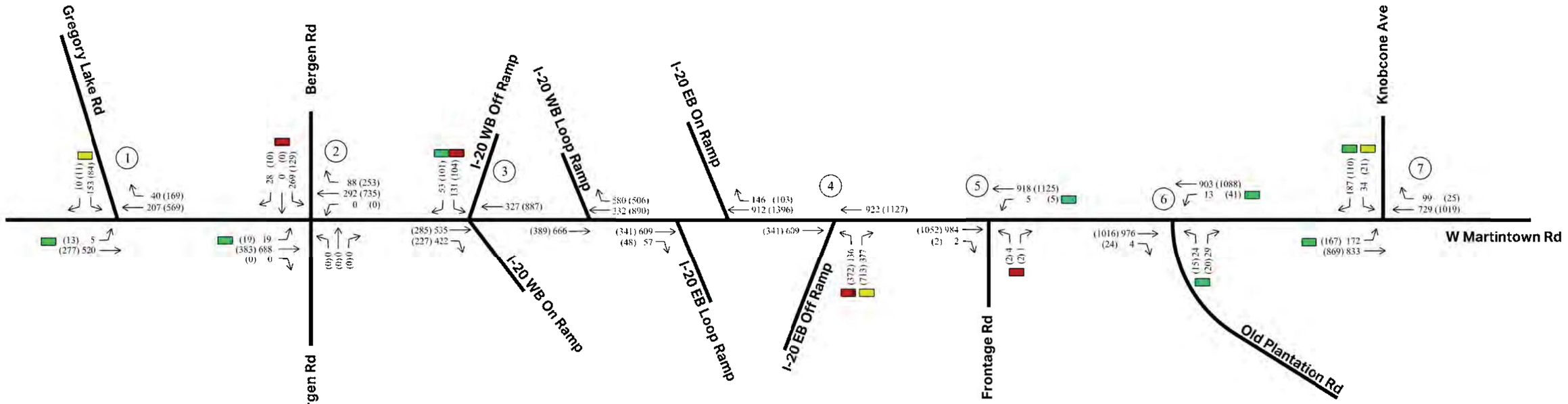
The following intersection was provided by the City of North Augusta collected by Short Counts, LLC. On Thursday, June 7, 2018:

- SC 230 at Frontage Road (S-2181)

The individual peak hours of each intersection varied and were utilized for the analysis. The majority of the study intersections had peak hours of 7:15 AM to 8:15 AM and 5:00 PM to 6:00 PM. SCDOT count stations in Edgefield County (145) and Aiken County (209 and 210) located along West Martintown Road revealed an annual average growth rate of 3.0 to 3.5 percent from 2014 to 2019. Using this trend, a three percent annual growth rate was applied to the 2018 and 2019 raw traffic counts (Bergen Road and Frontage Road intersections) to reflect the 2020 current year condition. Traffic volumes at Frontage Road were further adjusted to balance with the adjacent intersection of I-20 Eastbound Off Ramp.

2020 final peak hour traffic volumes are summarized in **Figure 3**.

Raw count data sheets are included in **Appendix A**. Methodology and calculation on how the 2020 Existing Peak Hour volumes were developed are shown in **Appendix B**.



LEGEND

- ← Volume Movement
- (##) Intersection ID
- ## AM Peak Hour Traffic Volume
- (##) PM Peak Hour Traffic Volume

Unsignalized LOS (Critical Peak Hour)
- LOS E/F
- LOS D
- LOS A/B/C

Signalized LOS (Critical Peak Hour)
- LOS E/F
- LOS D
- LOS A/B/C

West Martintown Road Corridor Study

Figure 3 - Existing 2020 AM / PM Peak Hour Volumes and LOS

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North Augusta, SC

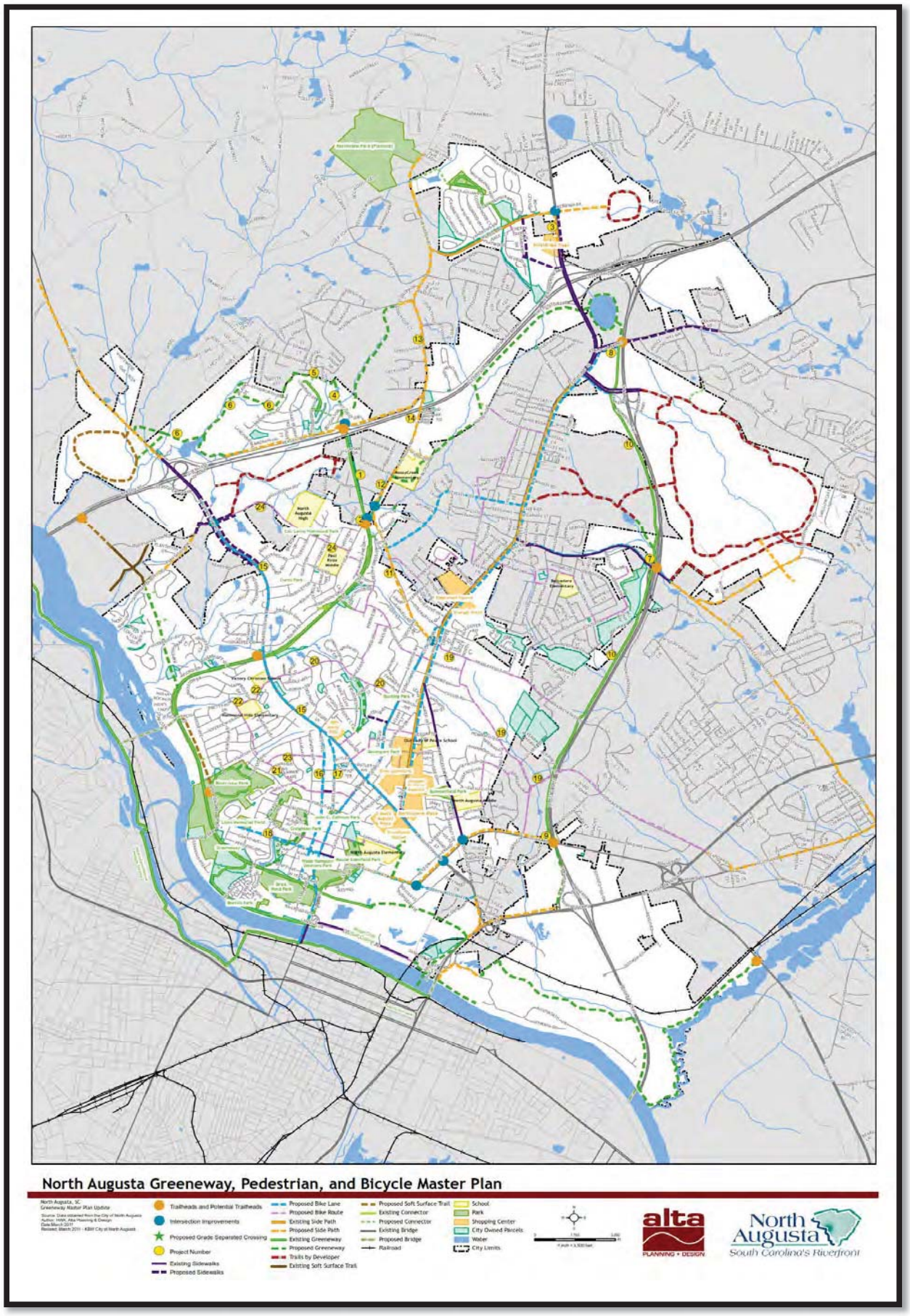
3.3 Multimodal Review

Efficient and well thought out multimodal planning is an essential component of building communities that ensure all citizens have alternatives as part of a cohesive transportation system. Limited resources for transportation improvements at all levels of government are dictating more creative and collaborative approaches to solving and preventing transportation problems. People are increasingly searching for solutions to tight family budgets and time wasted in traffic. As transportation costs and congestion increase, walking, bicycling and transit will continue to grow in importance. These are all viable and vital forms of transportation and are especially important for people who lack access to automobiles. A well thought out and executed Bicycle/Pedestrian Plan and efficient Transit System is essential to optimizing performance within a transportation system. Therefore, this multimodal transportation analysis will seek to go beyond the evaluation of motor vehicle performance to provide a comprehensive focus on methods to improve the mobility, safety, and access of the corridor and surrounding network for all users.

Bicycle and Pedestrian

Based on a review of the multimodal facilities within the corridor by AECOM it appears that there are no sidewalks within the project termini, however there are isolated pockets of sidewalks just south of the project beginning approximately at Hammond Pond Road. Additionally, there are no trail or bike facilities within the study area boundary. The North Augusta Greeneway however does cross West Martintown Road less than one mile south of the end of the project termini. This trail built along an abandoned railroad track, offers a wonderful “green tunnel” experience for much of its length. The main trail is approximately 7 miles long, with several more miles of trails branching off of it. The trail runs through natural terrain, neighborhoods, and the river front of North Augusta. Parking and access to the Greeneway is provided at four locations, while other connections are available through adjacent neighborhoods and parks. The Greeneway is open to the public every day from dawn to dusk and is ADA accessible.

It is also a major component of the North Augusta Greeneway, Pedestrian and Bicycle Master Plan which was adopted in April 2012. This Plan recommends projects that will create a comprehensive system of on-street and off-street bicycle and pedestrian improvements, including Greenway trails, multi-purpose trails, bike lanes and bike routes while enhancing safety, access and mobility. The Plan elements, when implemented, will provide an interconnected network of Greenway trails, sidewalks and bicycle routes throughout the City which will serve residents by offering improved mobility for pedestrians and bicyclists. In addition, the plan will offer North Augusta’s residents, employees and visitor’s new opportunities to connect work, play, shopping and exercise. The addition of a consistent sidewalk network in the West Martintown Road study area corridor would provide numerous benefits for bicyclist and pedestrians from a mobility and outdoor recreation aspect as well as moving closer to providing beneficial access to the North Augusta Greeneway. A map of the North Augusta Greeneway, Pedestrian and Bicycle Master Plan is shown below.


North Augusta Greeneway, Pedestrian, and Bicycle Master Plan
Trailheads and Potential Trailheads
Intersection Improvements
Proposed Grade Separated Crossing
Project Number
Existing Sidewalks
Proposed Sidewalks
Proposed Bike Lane
Proposed Bike Route
Existing Side Path
Proposed Side Path
Existing Greeneway
Proposed Greeneway
Trails by Developer
Existing Soft Surface Trail
Proposed Soft Surface Trail
Existing Connector
Proposed Connector
Existing Bridge
Proposed Bridge
Railroad
School
Park
Shopping Center
City Owned Parcels
Water
City Limits
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Transit

The Best Friend Express is managed by the Lower Savannah Council of Governments and circulates throughout North Augusta every 2 hours as well as offering transfers to the Augusta Transit System. While the service is available in many parts of North Augusta, including a stop on East Martintown Road, it does not currently provide a route or stop along the West Martintown Road corridor. The North Augusta route is a circular route that travels from North Augusta to Aiken Tech every two hours. The route includes stops at the City Municipal Building, service agencies, shopping areas such as Wal-Mart and North Augusta Plaza, and travels to Riverview Park. The route also serves Aiken Tech, USC-Aiken and the Aiken Regional Medical Center. For those wishing to travel to into Augusta the Best Friend Express offers connections to the Augusta Transit. Additionally, one of the benefits of The Best Friend Express is the ability to flag down the bus anywhere along the route, not necessarily at bus stop signs. Passengers can also disembark anywhere along the route that drivers deem safe to stop. The buses are "cut-aways" with the ability to carry up to 20 passengers. With proper verification, people 60 and older, as well as those with a Medicare Card or those with disabilities can ride the Best Friend Express for half fare. The buses are ADA compliant including wheelchair lifts. The routes operate Monday – Friday and begin at approximately 7:00 AM and run until 7:00 PM. The Best Friend Blue Route 1st Run operates between 7:00 AM and 9:00 AM with The Best Friend Blue Route operating between 9:00 AM and 7:00 PM.

The Lower Savannah Council of Governments also offers Paratransit Services for individuals with disabilities. This service is designed for persons with a disability that prevents them from using the regular BFE fixed Route bus service. The service, known as Dial-A- Ride (DAR) complements the Best Friend Express regular fixed routes and offer transportation options for anyone traveling within ¾ mile of the BFE route. This service will pick up someone from a location within ¾ of a mile from the BFE route and take them anywhere within ¾ of a mile of the BFE fixed route (in South Carolina). To apply for this service must complete an application to determine eligibility, which must also be signed by that person's physician and have a DAR Card issued

Multimodal Recommendations

The multimodal recommendations in this study must take into consideration the anticipated residential growth along the West Martintown Road corridor. A March 25, 2020 field review by AECOM reveals an additional 1,098 single family residential and townhouse units and 604 apartment units to be constructed within the study area boundary. Also, approximately 323,395 square feet of commercial and medical facilities are to be constructed. With this additional development comes the potential need for both bicycle and pedestrian facilities as well as increased coverage for the transit system.

A safe and comfortable pedestrian environment generally provides a higher quality of life for residents. The pedestrian has a unique place in the transportation environment as they are the slowest and typically the most vulnerable user. Their experience is more enjoyable if the sidewalks are well maintained and level, the sidewalk is lit in the evening, an adequate number of trees are present to provide shade and traffic isn't too close or loud. A pedestrian's safety is typically compromised by poorly maintained sidewalks and when they must interact with vehicular traffic

at roadway and driveway crossings. Today, there are little to no pedestrian facilities along the corridor. This includes sidewalks, crosswalks, pedestrian signals, and pedestrian-scaled lighting.

Detailed recommendations for improving pedestrian conditions along West Martintown Road include the following:

- Sidewalks should be five feet wide and connected between building entrances to surrounding streets, transit stops, parking lots, and adjacent development;
- Sidewalks should be landscaped with shade trees at an average of one tree every 50 feet; and
- Crosswalks should be designated and coordinated to move people safely to and from buildings and through parking areas.

Given the lack of pedestrian facilities along the corridor, it will be critical to provide internal pedestrian facilities and pedestrian crosswalks and signals at key locations across West Martintown Road and to any future transit stops.

The study area corridor has limited on- road bicycle opportunities. Additions to the on-road bicycle network will improve safety and comfort for bicyclists and may encourage more bicycling.

Recommendations for bicycle facilities include:

- Install bike lanes
- Install shared lane markings
- Seek opportunities to connect to the North Augusta Greeneway

3.4 Crash Analysis

Crash data was provided by the Augusta Regional Transportation Study (ARTS) Metropolitan Organization (MPO) which encompassed the entire region between January 1, 2012 to December 31, 2017. To perform a crash analysis for the West Martintown Road study corridor, AECOM determined a total of 175 crashes were reported for the 1.1-mile section between January 1, 2013 and December 31, 2017. There were no fatalities reported in the study area during this time frame.

Based on this data, the predominant type of crash was rear-end comprising 40% (71 crashes) of all crashes followed by angle crashes at 33% (57 crashes). There were no pedestrian or bicycle related crashes.

Most of the crashes occurred between the hours of 7:00 am to 8:00 pm while only 10% of the crashes occurred in the late evening or middle of the night. The most prevalent crash type is non-injury or property damage only (PDO) at 82 percent of crashes while the remaining 18% resulted in an injury.

Weekdays had the highest number of crashes with the majority occurring on Tuesdays. In contrast, both Saturday and Sunday had the fewest number of crashes. Additionally, the month of October reported the greatest number of crashes with February having the least. There were a significant number of crashes between Frontage Road and Old Plantation Road due to a lack of access management. Numerous driveways within this short segment separated by a two-way left-turn lane serving moderately high volumes between the Circle K gas station and Waffle House likely contributed to this issue.

AECOM also performed a detailed crash review at the 7 study intersections identifying crash types and number summarized in **Table 1.** All crashes reported in the table are within 300 feet of the intersection and make up 125 of the 175 crashes analyzed along the West Martintown Road study corridor.

Table 1: Intersection Crash Summary

Int#	Location	Angle	Head On	Other	Rear End	Side Swipe	Total
1	SC 230 at Gregory Lake Rd	4	0	3	0	2	9
2	SC 230 at Bergen Rd	14	0	3	7	1	25
3	SC 230 at I-20 WB Off Ramp	2	0	1	4	0	7
4	SC 230 at I-20 EB Off Ramp	12	0	2	30	1	45
5	SC 230 at Frontage Rd*	3	0	1	6	2	12
6	SC 230 at Old Plantation Rd	4	0	2	1	1	8
7	SC 230 at Knobcone Ave	9	0	3	7	0	19

*Some of the Frontage Road crashes may be associated with the Circle K driveways to the south

The remaining 50 crashes occurred on West Martintown Road between the study intersections. While one segment of crashes was previously discussed near the Circle K gas station and Waffle House, there also were a significant number of crashes that occurred between Gregory Lake Road and Bergen Road.

It should be noted that all study intersections are currently unsignalized. Bergen Road, I-20 Eastbound Off Ramp and the Knobcone Avenue intersection all had the highest number of angle collisions. There are immediate plans to signalize Bergen Road and the I-20 Eastbound Off Ramp

which may help reduce the number of angles collisions. There have also been discussions to signalize the Knobcone Avenue intersection which may be warranted as part of future development projects.

The 30 rear-end collisions at the existing unsignalized I-20 Eastbound Off Ramp is a concern and may be associated with the free flow right-turn lane onto West Martintown Road that eventually drops a lane at Frontage Road. A signal is not expected to correct this problem unless the right-turns are controlled with a signal removing this weave. A collision diagram was not included as part of this study but these diagrams may help better identify any other specific needs.

All crash data provided by ARTS is shown in **Appendix C**.

4.0 Background Growth and Development

To estimate the future year 2040 traffic volumes, AECOM carefully reviewed the anticipated developments in the vicinity of the West Martintown Road corridor study area. Projects included on the I-20/Martintown Road Corridor Study Development List were assumed to be constructed by 2040 and in full operation as shown in **Appendix D**.

This list was developed in May 2019, therefore; AECOM conducted a field visit on March 25th, 2020 to verify the current status for all the developments. The anticipated new traffic generated by these developments was estimated and distributed to the roadway system based on the Trip Generation Manual (Institute of Transportation Engineers, 10th Edition, 2017), previous traffic impact studies, and engineering judgement. The following is a summary of the trip generations, trip distribution and assignment assumptions:

- **Gregory Landing** is a residential development with 147 single family houses. It is located off Gregory Lake Road approximately 3,000 feet east of West Martintown Road. It was noted during the field visit that 45 houses were constructed, and approximately 39 houses of the 45 constructed houses appeared to be occupied. The remaining were either still on the market or an owner had not moved in yet. ITE land use code 210 Single-Family Detached housing was used to estimate traffic generated by Gregory Landing.

- **Saunders Place PD** is a proposed commercial and residential development. It is located at the northeast quadrant of the intersection of West Martintown Road and Gregory Lake Road and projected to include 19,200 SF of commercial and 4 residential units. ITE land use code 820 Shopping Center and 210 Single-Family Detached Housing were used to estimate traffic generated by Saunders Place PD. It was assumed there would be one driveway off W Martintown Road, and one driveway off Gregory Lake Road. Traffic was assigned to the two driveways assuming all the residential traffic would use the Gregory Lake Road access. The commercial component assumes 30% traffic would use the Gregory Lake Road access, and 70% would use the W Martintown Road access.

- **Dr. Allen Medical Park** is a proposed medical office development located on the westside of W Martintown Road just north of Gregory Lake Road. It consists of a total of 27,292 SF of building area. During a field visit, it was verified Culberson Orthodontics and North Augusta Pediatrics are already in operation. One building in final stages, one under construction, and the areas front W Martintown Road are still vacant. It is assumed one-third of the development is completed which resulted approximately 18,200 SF of ITE land use code 720, Medical-Dental Office Building for trip generation.

- **Residential developments along Bergen Road** are included on the I 20/Martintown Road Corridor Study Development List. These developments are in different stages. After field verification, it is determined that Wando Woodlands, Bergen Village, Bergen Place, Woodstone, and Bergen Ridge were partially developed during the time of traffic data collection. It is expected these developments will have a combined total of approximately 252 units of single-family residential homes and 29 units of townhomes to be constructed. ITE land use code 210 and 220 were used to estimate trips generated by these developments.

- **Hamrick Farms PD** is located east of West Martintown Road and north of Knobcone Road and is planned to consist of single family and multi-family residential, office, and commercial developments. Cranston Engineering conducted a traffic impact study for the multi-family residential and commercial part known as Phase 1 of the development in

September 2020. Trip generation from this study was referenced for Phase 1 of the development. ITE land use 210 Single-Family Detached Housing was used to estimate traffic for Phase 2 which consists of 284 single family lots. A 10 percent internal trip reduction factor was applied to the estimated trip ends for Phase 2.

- **River Falls Apartment** development traffic impact study was completed in June 2019 by Cranston Engineering. Trip generation from the study was referenced for the development.

- **Summerfield residential development** a traffic impact study for the proposed 145 lot was completed by AECOM in October 2018. Trip generation for Summerfield development was referenced from the AECOM study.

- **Rushing Waters residential development** is located east of Five Notch Road, south of I-20. It does not have a direct route connecting to West Martintown Road and is closer to the I-20 Edgefield Road interchange. It is expected to have limited impact on West Martintown Road within the study area, thus, it is not included in the trip generation.

Trip distributions for commercial developments were estimated based on existing traffic patterns along West Martintown Road and surrounding vicinity. The existing traffic patterns were adjusted based on engineering judgement to estimate future trip distribution for the residential developments. **Table 2** provides a summary of the development included in the future traffic volume estimation.

Table 2: Planned Development Summary

Development	Land Use	ITE Code	Size
Gregory Landing (Residential)	Single-Family Detached Housing	210	108 Units
Saunders Place PD (Commercial & Residential)	Shopping Center	820	19.2 KSF
	Single-Family Detached Housing	210	4 Units
Dr. Allen Medical Park	Medical-Dental Office Building	720	18.2 KSF
Wando Woodlands (Residential)	Single-Family Detached Housing	210	100 Units
Bergen Place (Residential)	Single-Family Detached Housing	210	57 Units
Bergen Village (Residential)	Single-Family Detached Housing	210	3 Units
Woodstone (Residential)	Single-Family Detached Housing	210	11 Units
Bergen Ridge (SF & Town home)	Single-Family Detached Housing	210	81 Units
	Multifamily Housing (Low-Rise)	220	29 Units
River Falls Apartments *	Apartment	220	220 Units
Hamrick Farms PD (SF, Apartment, Commercial)	Phase 1 *	Mixed Use	
	Single-Family Detached Housing	210	284 Units
Summerfield *	Single-Family Detached Housing	210	245 Units

* Trip generation referenced from a previous study.

Table 3 provides a summary of the estimated number of trips generated by the anticipate developments.

Table 3: Trip Generation Summary

Land Use	ITE Code	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Gregory Landing	210	1,116	20	61	81	69	40	109
Saunders Place PD	210	54	2	6	8	3	2	5
	820	1,958	11	7	18	77	83	160
	Total	2,012	13	13	26	80	85	165
Dr. Allen Medical Park	720	611	38	11	49	18	46	64
Wando Woodlands	210	1,040	19	57	76	64	38	102
Bergen Place	210	620	11	34	45	37	22	59
Bergen Village	210	42	2	5	7	3	1	4
Woodstone	210	136	3	10	13	8	4	12
Bergen Ridge	210	856	15	47	62	52	31	83
	220	178	4	11	15	13	7	20
	Total	1,034	19	58	77	65	38	103
River Falls Apartments	*	1,949	39	93	132	98	63	161
Hamrick Farms PD	210	2,444	47	139	186	157	93	250
	*	17,711	588	273	861	649	694	1,343
	Total	20,155	635	412	1,047	806	787	1,593
Summerfield	*	1,418	26	78	104	88	52	140
Total		**30,133**	**825**	**832**	**1,657**	**1,336**	**1,176**	**2,512**

* Trip generation referenced from a previous study.

The directional distribution of the anticipated new traffic is a function of population, employment opportunity, existing travel patterns, and traffic conditions on area roadways. In consideration of these factors, the directional distribution of new trips on the study area roadways was determined and summarized in **Table 4**.

Table 4: Trip Distribution Summary

Origin / Destination	Percent
W Martintown Road North	15%
Gregory Lake Road	5%
Bergen Road	7%
I-20 East	7%
I-20 West	30%
Knobcone Avenue	6%
W Martintown Road South	30%
Total	**100%**

AECOM also reviewed the historical Annual Average Daily Traffic (AADT) data. South Carolina Department of Transportation (SCDOT) count station 145 in Edgefield County is located on West Martintown Road north of Gregory Lake Road and the 2010 to 2019 AADT showed a decline at an annual average rate of 1.7%. Station 210 in Aiken County is located on West Martintown Road near the I-20 westbound ramps and the historic AADT reveals an annual average growth rate of 2.3% between 2010 and 2019. Station 209 in Aiken County is located on West Martintown Road near Byrnes Road and the historic AADT reveals an annual average growth rate of 2.1% between 2010 and 2019. **Table 5** shows the AADTs for the past 10 years.

Table 5: Historic AADT

Year	W Martintown Rd N of Gregory Lake (Station 145)	W Martintown Rd at I-20 WB Ramps (Station 210)	W Martintown Rd at Byrnes Rd (Station 209)
2010 AADT	6,300	10,800	15,200
2011 AADT	7,400	10,300	14,000
2012 AADT	5,700	11,000	15,400
2013 AADT	6,200	11,800	15,700
2014 AADT	6,300	11,200	15,400
2015 AADT	6,900	11,400	15,800
2016 AADT	5,700	11,400	16,600
2017 AADT	6,800	12,800	17,600
2018 AADT	6,800	13,400	18,500
2019 AADT	5,400	13,300	18,300
Annual Average Growth	-1.7%	2.3%	2.1%

The Regional Travel Demand Model prepared for the Augusta Regional Transportation Study (ARTS) Metropolitan Planning Organization (MPO) was also reviewed. Annual average growth rate for links within the study area were projected based on comparing the 2015 Base model and the 2050 Existing + Committed model as shown in **Appendix E**. **Table 6** shows the 2015 and 2050 model volumes and the calculated annual average growth rate.

Table 6: ARTS Model Projections

Location	2015 Base Model AADT	2050 Projection AADT	Annual Average Growth
W Martintown Rd @			
North of Gregory Lake Rd	8,344	12,310	1.1%
Gregory Lake Rd to County Line	8,589	14,633	1.5%
County Line to Bergen Rd	9,455	14,976	1.3%
Bridge over I-20	11,734	15,038	0.7%
I-20 to Knobcone Ave	18,912	23,552	0.6%
South of Knobcone Ave	15,899	19,736	0.6%
Gregory Lake Rd	1,033	2,650	2.7%
Knobcone Ave	3,076	3,891	0.7%
I-20 EB Off Ramp	9,845	11,641	0.5%
I-20 EB On Ramp	683	857	0.7%
I-20 EB Loop Ramp	505	453	-0.3%
I-20 WB Off Ramp	3,049	2,349	-0.7%
I-20 WB On Ramp	5,825	4,470	-0.8%
I-20 WB Loop Ramp	6,248	8,311	0.8%

Table 7 provides a comparison of the 2020 counts conducted by AECOM and the 2020 ADT projections based on the ARTS model. At both count locations, the 2020 actual counts indicate that between the year 2015 and 2020, traffic grew in a higher rate than the ARTS model projected assuming a linear growth pattern.

Table 7: Comparison of 2020 ADT vs ARTS Model

Direction	2015 AADT	2020 Daily Counts*	Annual Average Growth	ARTS Model Projected 2020 AADT**	ARTS Annual Average Growth
W Martintown Rd N of Bergen Rd	9,455	10,699	2.5%	10,086	1.3%
W Martintown Rd N of Plantation Dr	18,912	20,282	1.4%	19,486	0.6%

* 24-hour volume collected on Tuesday, March 3rd, 2020

** Based on 2015 Base Volume and projected growth rate in Table 5

Table 8 provides a comparison of the resulted annual average growth rate from actual development project using peak hour traffic volume estimation as detailed in **Appendix F** and the annual average growth rate from the ARTS model.

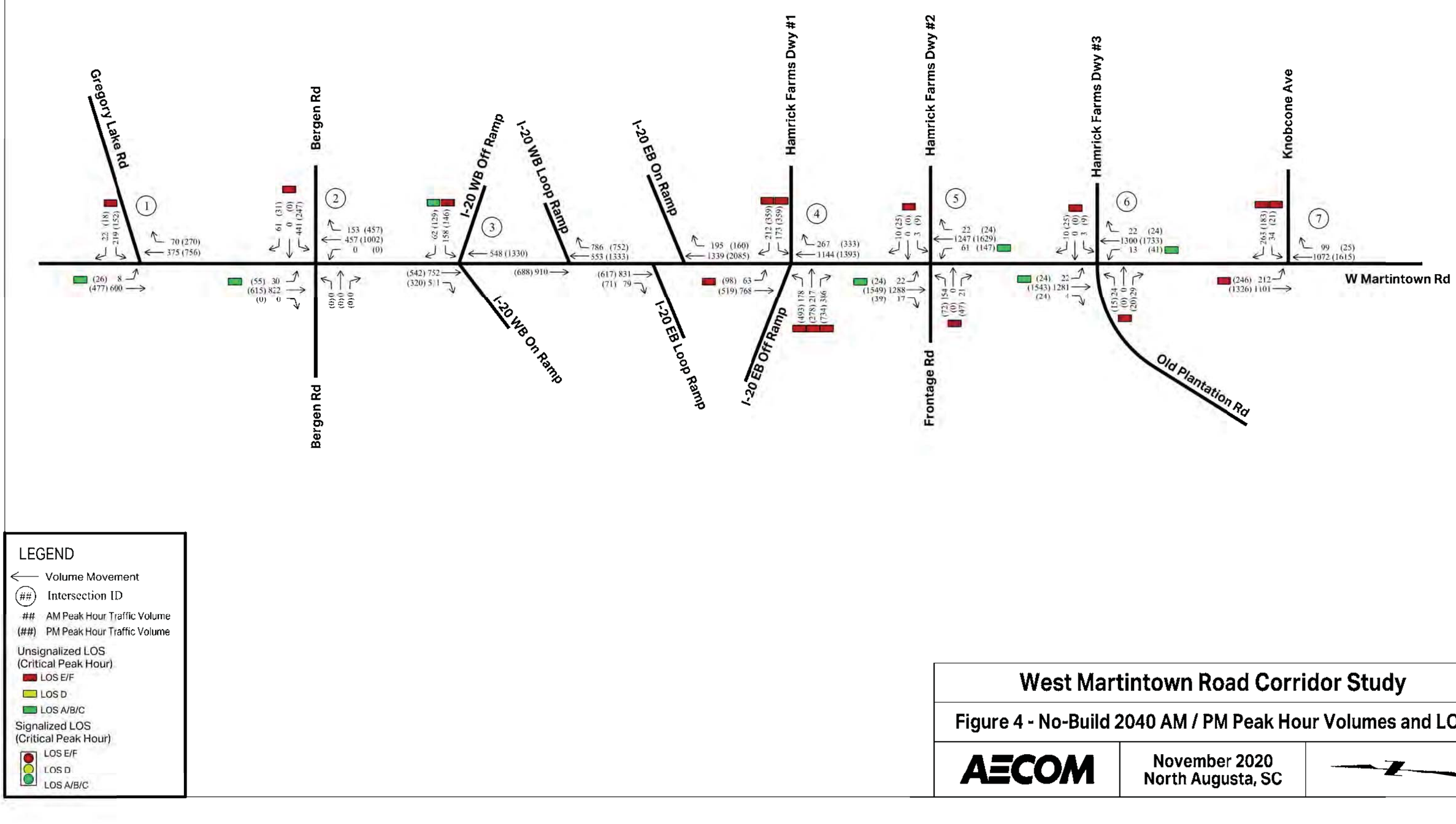
As shown in Table 8, the project-based traffic volume projection is general slightly higher than the ARTS model projection. Based on the development plan in the area, West Martintown Road is in general expected to have an annual average growth rate around 2 percent.

Table 8: Development Based Average Annual Growth vs ARTS Model

Location	AM			PM			ARTS Model
	2020	2040	AAG*	2020	2040	AAG*	
W Martintown Rd @							
North of Gregory Lake Rd	742	1,005	1.5%	870	1,277	1.9%	1.1%
Gregory Lake Rd to County Line	920	1,263	1.6%	1,099	1,655	2.1%	1.5%
County Line to Bergen Rd	1,027	1,370	1.5%	1,147	1,704	2.0%	1.3%
Bridge over I-20	1,578	2,249	1.8%	1,785	2,773	2.2%	0.7%
I-20 to Knobcone Ave	1,908	2,738	1.8%	2,181	3,338	2.2%	0.6%
South of Knobcone Ave	1,695	2,306	1.6%	1,934	2,987	2.2%	0.6%
Gregory Lake Rd	208	319	2.2%	277	466	2.6%	2.7%
Knobcone Ave	492	608	1.1%	323	475	1.9%	0.7%
I-20 EB Off Ramp	513	781	2.1%	1085	1,505	1.6%	0.5%
I-20 EB On Ramp	146	195	1.5%	103	160	2.2%	0.7%
I-20 EB Loop Ramp	57	79	1.6%	48	71	2.0%	-0.3%
I-20 WB Off Ramp	184	220	0.9%	205	275	1.5%	-0.7%
I-20 WB On Ramp	427	516	1.0%	227	323	1.8%	-0.8%
I-20 WB Loop Ramp	580	786	1.5%	506	752	2.0%	0.8%

* Average Annual Growth Rate

The projected 2040 peak hour traffic volumes are shown in **Figure 4**.



LEGEND

- ← Volume Movement
- (##) Intersection ID
- ## AM Peak Hour Traffic Volume
- (##) PM Peak Hour Traffic Volume

Unsignalized LOS (Critical Peak Hour)
- LOS E/F
- LOS D
- LOS A/B/C

Signalized LOS (Critical Peak Hour)
- LOS E/F
- LOS D
- LOS A/B/C

West Martintown Road Corridor Study

Figure 4 - No-Build 2040 AM / PM Peak Hour Volumes and LOS

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November 2020
North Augusta, SC

5.0 Public Involvement

Public involvement is paramount in identifying the needs, goals and priorities of transportation projects. Conducting a substantive and well-planned public outreach effort is essential in determining those priorities. A successful public involvement process increases community support for and ownership of projects and leads to increased trust in local government. Conversely, poor public outreach efforts can cause stakeholders to view the process as merely "checking the box" leading to limited participation as well as community adversity to potential projects.

As the West Martintown Road Corridor Study was initiated a Public Involvement Plan was developed and several goals for the public involvement plan were detailed. These included:

- To engage the public and stakeholders along the West Martintown Road corridor for input that guides the project.
- To manage expectations of a diverse group of citizens.
- To provide information to the public on the project.
- To engage the public in a meaningful way through digital media without holding costly face to face meetings, which potentially may only gain limited input.

With the goals listed above in mind, the West Martintown Road Corridor Study sought to reflect those priorities through use of a West Martintown Road Corridor Study Wiki Map website. Wiki Map is an internet-based mapping platform that allows participants to comment on suggested routes and notate their own specific recommendations on a shared interactive map. A press release was also created announcing the project and the location of the wiki map. This press release was shared with local municipalities within the region for inclusion on their websites. For this study the Wiki Map was specifically tailored to the West Martintown Road Corridor Study and was available for comments from April 9, 2020 thru June 18, 2020.

The use of the West Martintown Road Corridor Study Wiki Map website garnered a large response with a total of approximately 198 visitors to the site including 89 leaving comments. Those comments are provided in **Appendix G**.

Comments and response numbers obtained from the Wiki Map Site are shown **Table 9**.

Table 9: Wiki Map Response Summary

Improvement	Number of Responses
Bergen Road Intersection Issues	29
Traffic Signals Needed (Various Locations)	18
Knobcone Avenue / Old Plantation Road Intersections Issues	14
Grade and Visibility Issues	11
Excessive Speeding	10
I-20 Off Ramp Issues	10
Additional Signage and Medians	6
Additional Turn Lanes	4

*Total comments received and summary of comments do not equal as some commenters listed multiple issues.

Other Issues Mentioned

- Dangerous sharp blind curve on Bergen Road.
- Motorist coming off I-20 Ramp come to sudden stop even with keep moving signage.
- Safety issues surround Circle K Station – examine curb cut locations.
- Excessive speeding on West Martintown Road coming across overpass through Bergen Road intersection.
- Additional residential development creating dangerous traffic conditions.
- Multiple suggestions for the realignment of Knobcone Avenue and Old Plantation Road.
- Traffic light needed at Knobcone Avenue due to high school traffic.

6.0 Capacity Analysis

The traffic carrying ability of an uninterrupted flow roadway is described by levels-of-service (LOS) that range from LOS A to LOS F. LOS A represents unrestricted maneuverability and operating speeds. LOS B represents reduced maneuverability and operating speeds. LOS C represents restricted maneuverability and operating speeds closer to the speed limit. LOS D represents severely restricted maneuverability and unstable, low operating speeds. LOS E represents operating conditions at or near the capacity level. LOS F represents breakdown conditions characterized by stop and go travel. A visual representation of each LOS is shown below.

The Highway Capacity Manual (HCM) 6 also defines LOS at an unsignalized intersection by average control delay per vehicle, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Several factors affect the controlled delay for unsignalized intersections, such as availability and distribution of gaps in the conflicting traffic stream, critical gaps, and follow-up time for a vehicle in the queue. Volume to capacity ratios is a metric used for unsignalized intersections because many stop controlled intersection may have a poor LOS, but do not warrant a traffic signal. Once the volume to capacity ratio exceeds 0.8, long delays and queuing are present.

The Highway Capacity Manual explains that drivers perceive that a signalized intersection is designed to carry higher traffic volumes and therefore expect to experience greater delays at signalized intersections. Unsignalized intersections are assigned a LOS for each minor movement. Typically, LOS C is considered the minimum acceptable level of service at an intersection. **Table 10** presents LOS thresholds for unsignalized and signalized intersections.

Table 10: Level-of-Service Thresholds

LOS	Unsignalized Average Control Delay (sec/veh)	Signalized Average Control Delay (sec/veh)
A	≤ 10.0	≤ 10.0
B	> 10.0 and ≤ 15.0	> 10.0 and ≤ 20.0
C	> 15.0 and ≤ 25.0	> 20.0 and ≤ 35.0
D	> 25.0 and ≤ 35.0	> 35.0 and ≤ 55.0
E	> 35.0 and ≤ 50.0	> 55.0 and ≤ 80.0
F	> 50.0	> 80.0

AECOM calculated the intersection LOS for each of the seven (7) project study intersections for existing and future conditions. The intersections were analyzed using Highway Capacity 6th Edition software and Synchro 10.3 (build 122, Rev 0) software. SIDRA 8.0 was used for any roundabout related analysis. AECOM analyzed Existing 2020, No-Build 2040, and Build 2040 traffic projections for the AM and PM peak hours.

To determine the necessary roadway improvements required for future development, a LOS “C” or better was the target value. According to Highway Capacity Manual (HCM) 6, an acceptable Level-of-Service (LOS) is “C” or better with “A” having the shortest delays and “F” having the longest delays. Turn lane storage recommendations will accommodate the needs of 95th percentile queuing. Sim Traffic was used to estimate storage requirements by using the higher of the maximum or 95th percentile queuing.

6.1 Existing 2020 Analysis

AECOM analyzed the Existing 2020 traffic conditions during the AM and PM peak hours at each study intersection. As shown in **Table 11**, the following capacity issues are noted:

- At the intersection of West Martintown Road and Bergen Road, vehicles exiting the westbound approach on Bergen Road currently experience excessive delays and operate at failing condition (LOS F) during both the AM and PM peak hours.
- Left turn vehicles exiting the I-20 Westbound Off Ramp onto West Martintown Road currently operate at near failing condition with LOS E during the PM peak hour.
- Left turn vehicles exiting the I-20 Eastbound Off Ramp onto West Martintown Road are also operating at LOS F during the PM peak hour.
- Vehicles exiting Frontage Road are also operating at near failing condition (LOS E) during both the AM and PM peak hours. However, the eastbound traffic from Frontage Road is very low, 5 vehicles per hour during the AM peak hour and 4 vehicles per hour during the PM peak hour. It is not unusual to have a side street with low volumes operate at LOS E or LOS F.

The results are summarized in **Table 11** and visually shown in **Figure 3**. Detailed Synchro / Sim Traffic reports are located in **Appendix H.**

Table 11: Existing 2020 LOS and Delay

ID#	Intersection	Approach	AM Peak			PM Peak		
			LOS	Delay	V/C	LOS	Delay	V/C
1	W Martintown Rd at Gregory Lake Rd	WB Approach	D	28.7	0.561	D	25.7	0.368
		SB Left	A	7.8	0.004	A	9.3	0.016
2	W Martintown Rd at Bergen Rd	WB Approach	F	118.6	1.095	F	190.9	1.161
		SB Left	A	8.2	0.018	B	10.9	0.034
3	W Martintown Rd at I-20 WB Ramps	WB Left	C	19.1	0.363	E	41.1	0.540
		WB Right	A	9.8	0.072	B	13.4	0.202
4	W Martintown Rd at I-20 EB Ramps	EB Left	D	33.8	0.541	F	128.7	1.145
		EB Right	C	17.3	0.578	D	33.6	0.896
5	W Martintown Rd at Frontage Rd	EB Approach	E	38.2	0.049	E	35.4	0.036
		NB Left	B	10.6	0.009	B	11.0	0.009
6	W Martintown Rd at Plantation Drive	EB Approach	C	18.7	0.177	C	19.6	0.131
		NB Left	B	10.9	0.022	B	11.1	0.068
7	W Martintown Rd at Knobcone Ave	WB Left	D	29.0	0.197	D	34.7	0.159
		WB Right	C	15.0	0.358	C	15.2	0.254
		SB Left	B	11.2	0.242	B	13.2	0.294

6.2 No-Build 2040 Analysis

AECOM analyzed the No-Build 2040 traffic conditions during the AM and PM peak hours at each study intersection. **Table 12** presents the projected 2040 traffic conditions with existing roadway geometry and traffic control. As shown, all intersections are expected to operate at failing conditions during the 2040 study year without roadway improvements.

The results are summarized in **Table 12** and visually shown in **Figure 4**. Detailed Synchro / Sim Traffic reports are located in **Appendix I.**

Table 12: No-Build 2040 LOS and Delay

ID#	Intersection	Approach	AM Peak			PM Peak		
			LOS	Delay	V/C	LOS	Delay	V/C
1	W Martintown Rd at Gregory Lake Rd	WB Approach	F	187.5	1.248	F	255.1	1.335
		SB Left	A	8.4	0.009	B	10.8	0.042
2	W Martintown Rd at Bergen Rd	WB Approach	F	>300	3.082	F	>300	7.347
		SB Left	A	9.0	0.035	C	15.9	0.159
3	W Martintown Rd at I-20 WB Ramps	WB Left	F	54.6	0.742	F	>300	1.915
		WB Right	B	10.9	0.101	C	19.9	0.367
4	W Martintown Rd at I-20 EB Ramps	EB Left	F	>300	5.15	F	>300	-
		EB Thru	F	>300	10.721	F	>300	37.772
		EB Right	C	22.3	0.670	F	72.8	1.057
		WB Left	F	>300	-	F	>300	-
		WB Right	D	27.6	0.602	F	171.3	1.251
		SB Left	D	27.6	0.302	F	69.9	0.696
5	W Martintown Rd at Frontage Rd	EB Approach	F	>300	10.234	F	>300	26.444
		WB Approach	F	76.5	0.221	F	>300	3.360
		NB Left	B	13.9	0.143	C	23.1	0.455
		SB Left	B	12.9	0.05	C	16.9	0.080
6	W Martintown Rd at Plantation Drive	EB Approach	E	35.8	0.328	F	57.0	0.355
		WB Approach	F	54.9	0.164	F	>300	1.760
		NB Left	B	12.9	0.030	C	15.4	0.112
		SB Left	B	12.9	0.05	C	17.3	0.082
7	W Martintown Rd at Knobcone Ave	WB Left	F	57.3	0.352	F	210.6	0.634
		WB Right	D	28.9	0.667	E	41.0	0.688
		SB Left	C	16.0	0.411	E	42.2	0.766

6.3 Build 2040 Analysis

AECOM analyzed the Build 2040 traffic conditions during the AM and PM peak hours at each study intersection. As indicated, all the study intersections are expected to operate at failing conditions in 2040 if no improvements in the vicinity are constructed. AECOM examined different alternatives to improve the traffic operation within the area. Based on our analysis, the following improvement measures were considered and assumed in the 2040 Build condition as shown graphically in **Figure 5**.

Gregory Lake Road

- Install a single lane roundabout.

Bergen Road

- Install an actuated two-phase traffic control signal.

I-20 Westbound Ramps

- Install a two-lane roundabout.

I-20 Eastbound Ramps / Hamrick Farms Site Driveway #1

- Restripe the northbound right turn lane at the I-20 Eastbound On ramp to a shared through-right turn lane to provide three receiving lanes for the intersection.
- Install an actuated coordinated traffic control signal, three through lanes and one exclusive right turn lane for the northbound approach, one exclusive left turn lane and two through lanes for the southbound approach. Two left turn lanes, one through lane, and two right turn lanes for the I-20 Eastbound Off Ramp approach, and two left turn lanes and one right turn lane for the Hamrick Farms driveway.

Frontage Road/Hamrick Farms Site Drive #2

- Reconfigure Frontage Road to restrict vehicles exiting Frontage to right turn only. Restrict Hamrick Farms Site Driveway # 2 to right in and right out only. Allow left turns and U-turns from northbound using the reduced conflict intersection.

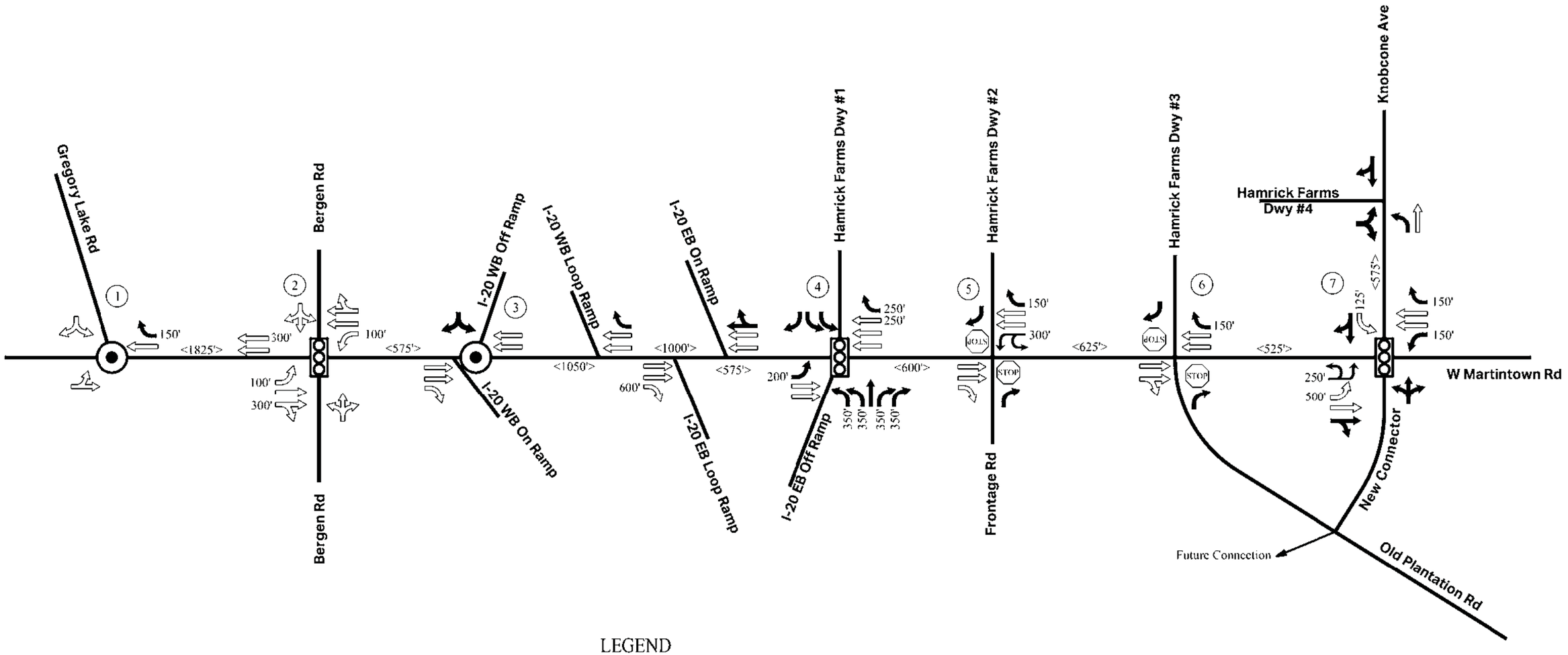
Old Plantation Road/Hamrick Farms Site Drive #3

- Install a raised median to restrict side streets to right in and right out only.
- Construct Old Plantation Road Connector to connect Old Plantation Road to the intersection of Knobcone Avenue as the fourth leg and install an actuated coordinated traffic control signal at the intersection of West Martintown Road and Knobcone Avenue/Old Plantation Road Connector.

Knobcone Avenue

- Install a traffic signal.
- Provide two U-turn/left turn lanes for the southbound approach, one left turn lane along with two through lanes and one right turn lane for the northbound approach. Provide two receiving lanes on Knobcone Avenue and terminate the inside lane as a left turn lane at Hamrick Farms Site Drive #4.

As shown in **Table 13** and visually shown in **Figure 6,** the study intersections are expected to operate at acceptable level of services during 2040 with the improvements outlined. It should be noted that the intersection of West Martintown Road at I-20 Eastbound Ramps / Hamrick Driveway #1 and Frontage Road are the only intersections expected to operate at LOS D. While these intersections are expected to operate at LOS D, the 95th percentile queues are accommodated with a LOS C along West Martintown Road approaches.



LEGEND

- Existing Laneage
- New Laneage
- New Signal
- Stop Control
- New Roundabout
- XXX' Storage Length (feet)
- <XXX'> Distance (feet)
- (##) Intersection ID

West Martintown Road Corridor Study

Figure 5 - Recommended Lane Configuration

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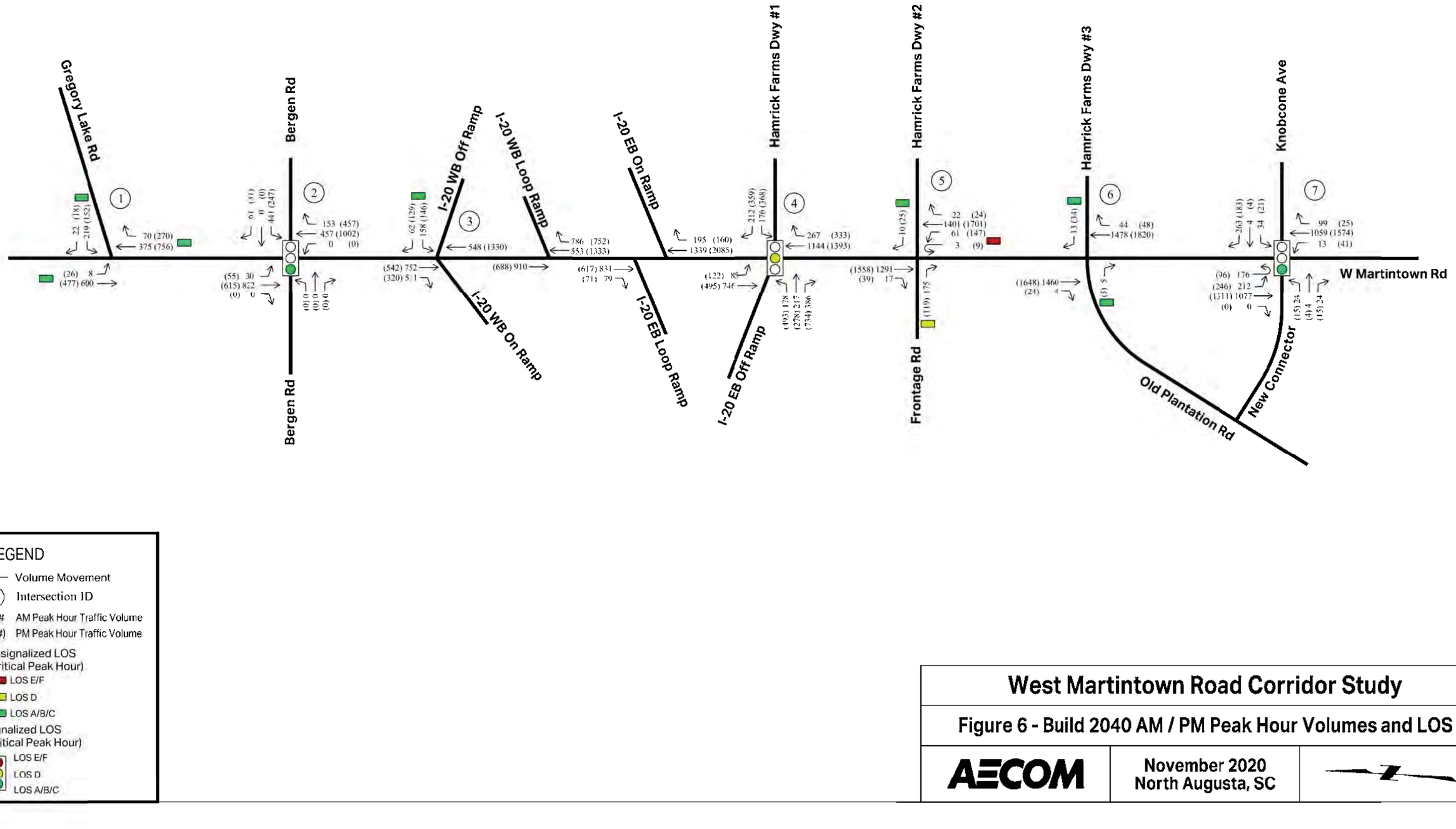
November 2020
North Augusta, SC



West Martintown Road Corridor Study

Figure 6 - Build 2040 AM / PM Peak Hour Volumes and LOS

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November 2020
North Augusta, SC

Table 13: Build 2040 LOS and Delay

ID#	Intersection	Approach	AM Peak			PM Peak		
			LOS	Delay	V/C	LOS	Delay	V/C
1	W Martintown Rd at Gregory Lake Rd (Roundabout)	**Overall**	**A**	**9.1**	**0.67**	**A**	**7.4**	**0.52**
		WB Approach	A	7.0	0.30	A	9.2	0.28
		NB Approach	A	4.5	0.29	A	6.6	0.52
		SB Approach	B	13.3	0.67	A	4.0	0.48
2	W Martintown Rd at Bergen Rd 	**Overall**	**B**	**15.6**	**-**	**B**	**10.4**	**-**
		WB Approach	B	15.0	0.72	B	17.1	0.60
		NB Approach	B	13.4	0.43	A	9.7	0.66
		SB Approach	B	17.1	0.76	A	8.6	0.41
3	W Martintown Rd at I-20 WB Ramps (Roundabout)	**Overall**	**A**	**2.3**	**0.33**	**A**	**7.2**	**0.48**
		WB Approach	A	7.8	0.30	B	12.4	0.46
		NB Approach	A	4.1	0.20	A	7.0	0.48
		SB Approach	A	5.5	0.33	A	4.8	0.27
4	W Martintown Rd at I-20 EB Ramps 	**Overall**	**B**	**18.0**	**-**	**D**	**46.0**	**-**
		EB Approach	D	39.0	0.84	E	68.2	1.11
		WB Approach	D	45.5	0.72	E	70.0	0.91
		NB Approach	A	6.1	0.57	C	29.0	0.93
		SB Approach	B	12.4	0.40	C	24.5	0.51
5	W Martintown Rd at Frontage Rd (Unsignalized/Right Out)	EB Approach	C	24.3	0.516	D	26.0	0.439
		WB Approach	C	16.0	0.032	C	20.3	0.103
		NB Left	C	16.0	0.178	E	35.2	0.605
6	W Martintown Rd at Plantation Drive (Unsignalized/RIRO)	EB Approach	C	15.9	0.016	C	17.8	0.019
		WB Approach	C	16.2	0.042	C	21.6	0.145
7	W Martintown Rd at Knobcone Ave 	**Overall**	**C**	**21.7**	**-**	**C**	**22.8**	**-**
		EB Approach	C	32.6	0.39	D	43.1	0.31
		WB Approach	D	53.4	0.88	E	67.7	0.87
		NB Approach	C	32.4	0.86	C	32.5	0.92
		SB Approach	A	4.2	0.56	A	6.1	0.62

Detailed Synchro / Sim Traffic reports located in **Appendix J** and Sidra reports are in **Appendix K**

7.0 Conclusions and Recommendations

The recommendations developed for West Martintown Road Corridor study focus on traffic operations, safety, and multimodal improvements. With the recommended roadway improvements shown in **Figure 5** and described below, the intersections along West Martintown Road within the study area are expected to operate at acceptable levels of service with the exception of I-20 Eastbound Ramps and Frontage Road as shown in **Table 14**. West Martintown Road at I-20 Eastbound Ramps / Hamrick Driveway #1 and at Frontage Road are the only intersections expected to operate at LOS D; however, the 95th percentile queues are accommodated with a LOS C along West Martintown Road.

Gregory Lake Road

- Install a single lane roundabout. The current stop-controlled intersection is likely to drop to a volume to capacity ratio greater than 0.80 with LOS F the during year 2030 assuming the growth form the nearby development is linear between the year 2020 and 2040. It should be noted that this single lane roundabout may be needed sooner based on the completion date of the Saunders Place PD mixed-use development.

Bergen Road

- Install an actuated two-phase traffic control signal. Vehicles exiting Bergen Road currently already experience excessive delay at operate at LOS F, and signal warrant criteria is already met at this location.

I-20 Westbound Ramps

- Install a two-lane roundabout. The current stop-controlled intersection is likely to drop to a volume to capacity ratio greater than 0.80 with LOS F the during year 2027 assuming the growth form the nearby development is linear between the year 2020 and 2040. This improvement is likely needed with the completion of Hamrick Farms Development; however, this intersection was not analyzed in their traffic impact analysis report.

I-20 Eastbound Ramps / Hamrick Farms Site Driveway #1

- Restripe the northbound right turn lane at the I-20 Eastbound On ramp to a shared through-right turn lane to provide three receiving lanes for the intersection

- Install an actuated coordinated traffic control signal, three through lanes and one exclusive right turn lane for the northbound approach, one exclusive left turn lane and two through lanes for the southbound approach. Two left turn lanes, one through lane, and two right turn lanes for the I-20 Eastbound Off Ramp approach, and two left turn lanes and one right turn lane for the Hamrick Farms driveway.

Both of these improvements should be considered with the Hamrick Farms Development.

Frontage Road/Hamrick Farms Site Drive #2

- Reconfigure Frontage Road to restrict vehicles exiting Frontage to right turn only. Restrict Hamrick Farms Site Driveway # 2 to right in and right out only. Allow left turns and U-turns from northbound using the reduced conflict intersection. The level of service for vehicles exiting Frontage Road (full access) is likely to drop to a volume to capacity ratio greater than 0.80 with a LOS F once Phase 2 of the proposed River Falls Apartment development is complete and occupied. Full access of Frontage Road needs to be removed with the completion of River Falls Apartment development Phase 2 or with the completion of Hamrick Farms Driveway #2.

Old Plantation Road/Hamrick Farms Site Drive #3

- Install a raised median to restrict side streets to right in and right out only. This should be implemented as part of the Hamrick Farms Development.
- Realign Old Plantation Road to connect with Knobcone Avenue as the fourth leg. It is estimated the level of service for vehicles exiting Old Plantation Road would operate at LOS F when Hamrick Farms development is at the stage of 75 percent. At this time the connector should be considered. Once full access is provided to Old Plantation Road connector, vehicles exiting the original Old Planation Road should be restricted to right in and right out only.

Knobcone Avenue

- Install a traffic signal. Based on engineering judgement, a signal warrant for the two conflicting movements of southbound left turns vs northbound through movement will trigger a warrant before it is met on the side street of Knobcone Avenue. It should be noted that this signal is needed with the completion date of the Hamrick Farms mixed-use development.
- Provide two U-turn/left turn lanes for the southbound approach, one left turn lane along with two through lanes and one right turn lane for the northbound approach. Provide two receiving lanes on Knobcone Avenue and terminate the inside lane as a left turn lane at Hamrick Farms Site Drive #4. This laneage is needed as part of the Hamrick Farms full build out plan in particular in the southern part of site.

Table 14: Intersection LOS Summary by Scenario

ID#	Intersection	AM Peak			PM Peak		
		Existing 2020	No-Build 2040	Build 2040	Existing 2020	No-Build 2040	Build 2040
1	W Martintown Rd at Gregory Lake Rd	D	F	A	D	F	A
2	W Martintown Rd at Bergen Rd	F	F	B	F	F	B
3	W Martintown Rd at I-20 WB Ramps	C	F	A	E	F	A
4	W Martintown Rd at I-20 EB Ramps	D	F	B	F	F	D
5	W Martintown Rd at Frontage Rd	C	F	C	E	F	D
6	W Martintown Rd at Old Plantation Rd	C	F	C	C	F	C
7	W Martintown Rd at Knobcone Ave	D	F	C	D	F	C

The construction of a new roadway connecting Old Plantation Road to the intersection of Knobcone Avenue and West Martintown Road as the fourth leg to this intersection (eastbound approach) was proposed as part of a long-term mitigation measure. It is recommended to keep

Old Plantation Road full access until this connection can be made. After this connection is provided, vehicles exiting Old Plantation Road should be restricted to right in and right out only. Hamrick Farms Site Drive #2 and #3 should be restricted to right in and right out with signalized access only at Site Drive #1 and at Knobcone Avenue.

The West Martintown Road corridor currently does not provide any pedestrian facilities along the study area. As more residential, commercial and office spaces develop, pedestrian activities are expected to increase in the area. It is recommended to install pedestrian crosswalks with the installation of the three traffic signals at the intersections of Martintown Road with Bergen Road, I-20 Eastbound Off Ramp/Hamrick Farms Site Drive #1, and Knobcone Avenue. Sidewalks along both sides of Martintown Road should be considered, and walking trails connecting to the communities on the eastside of Martintown Road.

AECOM has developed a prioritized list of projects that aim to improve safety, operation, and multimodal connectivity along the corridor. These projects have been grouped into Near-term (2020-2025), Intermediate-term (2025-2035), and Long-term (2035-2040) as shown in **Table 15**, **Table 16**, and **Table 17**. Notes have been provided in these tables to provide an approximate timeframe of when a particular improvement should be considered. Due to future development unknowns in regard to schedule, AECOM has also provided an approximate year using linear growth trends in the area.

A basic concept showing all of the projects at full build-out is shown in **Figure 7A, Figure 7B, and Figure 7C**.

West Martintown Road Corridor Study

Figure 7A - West Martintown Rd Conceptual Improvements

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Figure 7B - West Martintown Rd Conceptual Improvements

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West Martintown Road Corridor Study

Figure 7C - West Martintown Rd Conceptual Improvements

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Table 15: Near-term (2020-2025) Project Summary

Project # (Figure #)	Location	Consideration	Notes	Cost
N-1 (Figure 7B)	Bergen Road	Install a traffic signal	In progress	$100,000
N-2 (Figure 7C)	I-20 EB Off Ramp	Install a Traffic Signal – Includes dual eastbound left-turn lanes and maintains free flow right-turn lane	In progress	$150,000
N-3 (Figure 7C)	I-20 EB Off Ramp / Hamrick Farms Site Driveway #1	With proposed development, install a 4th leg for the Site Driveway for Hamrick Farms Development to include dual westbound left-turn lanes and one single right-turn lane. I-20 EB Off Ramp approach should have a through lane constructed to access Hamrick Farms driveway and the free flow right-turn lane should be replaced with dual right-turn lanes (350 feet storage). On West Martintown Road, a northbound right-turn lane (250 feet storage) and southbound left-turn lane (200 feet storage) should be provided.	In conjunction with Hamrick Farms development schedule	$2,000,000
N-4 (Figure 7B / Figure 7C)	I-20 EB On Ramp to I-20 WB Loop Ramp	Restripe West Martintown Road northbound right-turn lane onto I-20 EB On Ramp to a shared / through-right-turn lane that end at I-20 WB Loop On Ramp.	In conjunction with Hamrick Farms development schedule	$10,000
N-5 (Figure 7C)	Hamrick Farms Site Driveway #2	Provide a northbound right-turn lane with 150 feet of storage and access to / from Hamrick Farms Driveway #2 should be right-in / right-out (Overhead Utilities will have to be relocated)	In conjunction with Hamrick Farms development schedule	$300,000
N-6 (Figure 7C)	Hamrick Farms Site Driveway #3	Provide a northbound right-turn lane with 150 feet of storage and access to / from Hamrick Farms Driveway #3 should be right-in / right-out. Old Plantation Road should remain full access. (Overhead Utilities will have to be relocated)	In conjunction with Hamrick Farms development schedule	$300,000
Total				$2,860,000

Table 16: Intermediate-term (2025 - 2035) Project Summary

Project # (Figure #)	Location	Consideration	Notes	Cost
I-1 (Figure 7A)	Gregory Lake Road	Install a single lane roundabout	Constructed by 2030 or completion of Saunders Place PD	$2,250,000
I-2 (Figure 7B)	I-20 WB Off Ramp	Install a dual lane roundabout	Constructed by 2027 or completion of Hamrick Farms Development	$2,750,000
I-3 (Figure 7C)	Frontage Road / Hamrick Farms Site Driveway #2	Reconfigure Frontage to a reduced conflict intersection (RCI) and provide a flare out to make northbound U-turns	Constructed with completion of Rivers Falls Apartment Phase 2 or Hamrick Farms Development	$300,000
I-4 (Figure 7C)	Knobcone Avenue	Install a traffic signal with dual southbound left-turn lanes and northbound right-turn lane on West Martintown Road.	Constructed in conjunction with Hamrick Farms development schedule	$1,500,000
I-5 (Figure 7C)	Knobcone Avenue to Hammond Pond Rd	Build a sidewalk on both sides of the road connecting the two intersections (2500 centerline ft, 5000 linear ft of sidewalk, Needs Right of Way)	Provides a connection to multimodal facilities but not directly attributed to one particular development	$800,000
Total				$7,600,000

Table 17: Long-term (2035-2040) Project Summary

Project # (Figure #)	Location	Consideration	Notes	Cost
L-1 (Figure 7C)	Knobcone Avenue	Install a 4th leg connecting to Old Plantation Road	Needed to improve operation at Old Plantation Road once 75% of Hamrick Farms is built out; however Old Plantation Road users could turn right out and U-turn at Knobcone Avenue	$800,000
L-2 (Figure 7C)	Old Plantation Road	Restrict access to Old Plantation Road to right-in / right-out after completing a new connector road to Knobcone Avenue by installing a median that connects to RCI at Frontage Road.	Desirably to install with the new connector from Old Plantation Road to Knobcone Avenue	$100,000
L-3 (Figure 7C)	Frontage Road to Old Plantation Road	Develop a parallel road to the west side West Martintown Road that provides access to River Falls Apartments and Circle K that connects to Old Plantation Road and eventually to the new signal at Knobcone Avenue (approximately 1700 ft)	Should be considered with any future development in the vicinity to help reduce the number of vehicles U-turning / taking left onto Frontage Road	$1,000,000
Total				$1,900,000