Need and Purpose
SR 20 Improvements from Canton to Cumming
(PI Nos. 0002862, 0003681, 0003682)

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Definitions of Acronyms

Agency Coordination Plan	ACP
Atlanta Regional Commission	ARC
Area of Potential Effect	APE
Citizens Advisory Committee	CAC
Code of Federal Regulations	CFR
Council on Environmental Quality	CEQ
Draft Environmental Impact Statement	DEIS
Economic Impacts Assessment	EIA
Environmental Protection Division (Department of Natural Resources)	EPD
Environmental Impact Statement	EIS
Environmental Procedures Manual	EPM
Final Environmental Impact Statement	FEIS
Federal Highway Administration	FHWA
Georgia Department of Transportation	GDOT
Interstate	I
Moving Ahead for Progress in the 21st Century	MAP-21
National Environmental Policy Act	NEPA
Official Code of Georgia Annotated	OCGA
Public Involvement Plan	PIP
Public Information Open House	PIOH
Record of Decision	ROD
Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users	SAFETEA-LU
State Route	SR
Technical Advisory Committee	TAC
Transportation Improvement Program	TIP

1.0 INTRODUCTION

1.1 Overview

The Georgia Department of Transportation (GDOT) is preparing an Environmental Impact Statement (EIS) National Environmental Policy Act (NEPA) document to identify potential improvements to the State Route (SR) 20 corridor, between the cities of Canton and Cumming, Georgia. The SR 20 Improvements study area extends for approximately 24 miles, between Interstate (I)-575 in Canton and SR 400 in Cumming, as shown in Figure 1, Study Area Map. The corridor currently experiences congestion, limited east/west mobility, and high crash, injury, and fatality rates between I-575 (Canton) and SR 400 (Cumming). The purpose of the proposed project is to alleviate congestion, improve east/west mobility, and reduce crash frequency along SR 20 along the corridor.

1.2 Roadway Characteristics

Between I-575 and SR 400, SR 20 is a primarily undivided facility with two thru lanes and consists of two-, three-, four-, and five-lane sections with intermittent turn lanes at major intersections and rural shoulders. SR 20 is functionally classified as an urban principal arterial from I-575 to Union Hill Road in Cherokee County; a rural principal arterial from Union Hill Road to County Line Road in Cherokee and Forsyth Counties; and an urban principal arterial from County Line Road to SR 400 in Forsyth County.

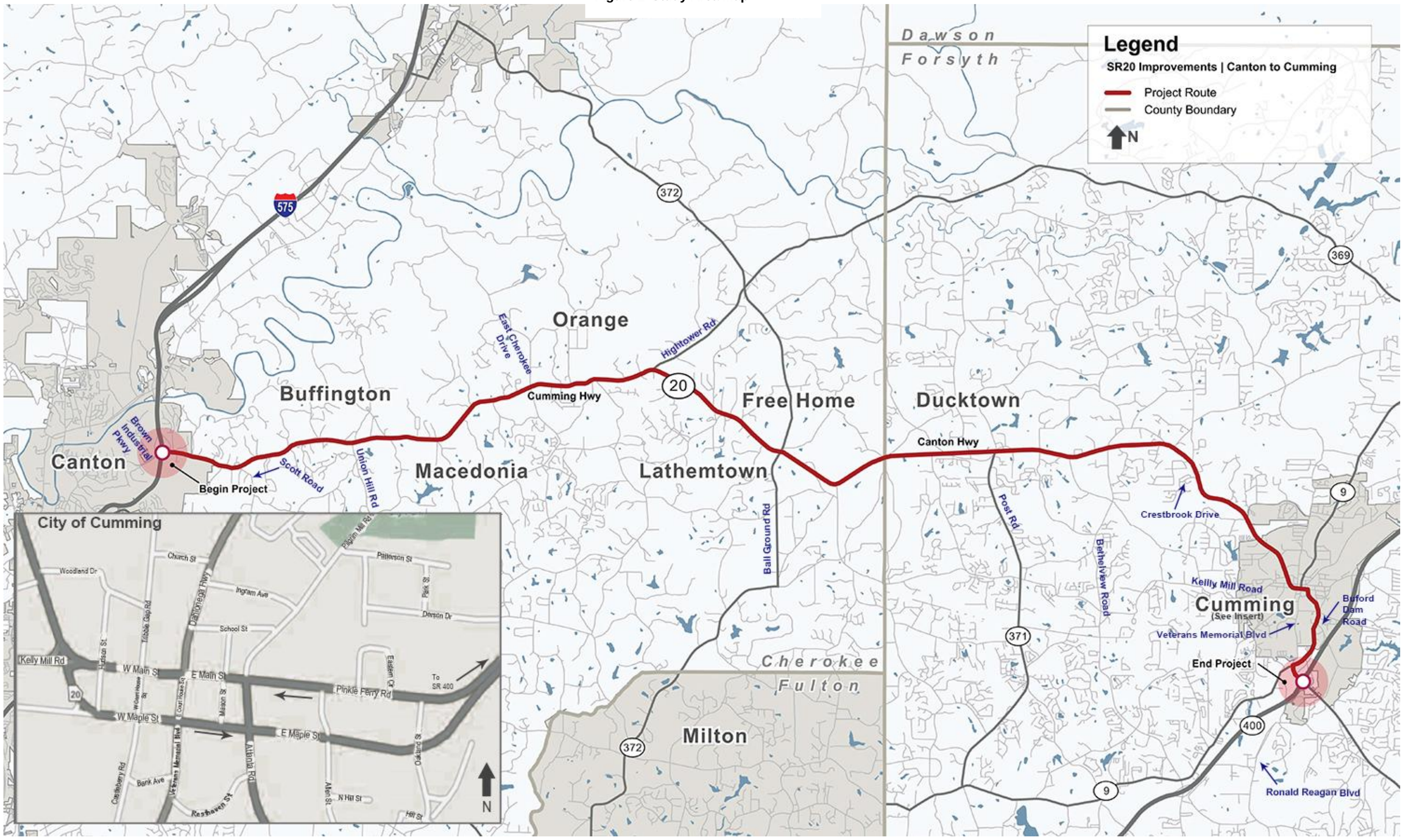
The speed limit along SR 20 varies. Between I-575 and to just west of SR 372, the speed limit is 45 miles per hour (mph). From just west of SR 372 to just east of Bethelview Road, the speed limit increases to 55 mph before dropping to 50 mph for a short distance and then dropping to 25 mph in the city of Cumming. Table 1 shows the existing number of lanes and relevant average annual daily traffic (AADT) volumes for the various segments along SR 20.

Table 1 Existing Traffic Volumes

Segment of SR 20	Number of Through Lanes	Segment Length (miles)	2011 AADT[1]
I-575 to SR 369/Hightower Road	2	8.6	25,650
SR 369/Hightower Road (Cherokee County) to SR 371/Post Road (Forsyth County)	2	6.3	13,550
SR 371/Post Road to Crestbrook Drive	2	3.8	22,400
Crestbrook Drive to SR 400	4	4.7	34,200

Source: GDOT Office of Planning, *Project Justification Statement* (June 18, 2012)
[1]AADT: Average Annual Daily Traffic

Figure 1 Study Area Map



1.3 Need and Purpose Statement

This project is needed due to unacceptable levels of congestion; high crash, injury and fatality rates; and limited mobility for east/west travel movements. The existing and future traffic volumes show that SR 20 is congested and the facility operates with high traffic volumes that exceed its capacity. Long delays are experienced at intersections. The need for reducing congestion is documented in an analysis of the projected traffic, which shows that if no improvements occur by the 2040 design year[1], portions of the project corridor will experience major operational breakdowns, and the majority of the corridor will worsen to unacceptable levels of congestion, which will result in increased travel time. The safety needs are documented in crash, injury, and fatality rates. Within the project study area, the crash, injury, and fatality rates along sections of SR 20 exceed the statewide average rates (2007-2009). According to Atlanta Regional Commission (ARC) Plan 2040[2], the populations in Cherokee and Forsyth Counties are expected to increase between 93.6 and 114 percent by 2040. The ARC is the metropolitan planning organization for the study area. This anticipated growth is likely to increase demand, traffic volumes, and congestion, which will limit the efficient movement of people and goods and access to economic activity centers for commuters, local traffic, and freight. Therefore, the purpose of the project is to improve SR 20 between I-575 in Canton and SR 400 in Cumming to reduce traffic congestion to an acceptable level, address high crash rates, and improve east/west mobility and connectivity between Canton and Cumming.

2.0 PROJECT CONTEXT

2.1 Project Background

The proposed SR 20 Improvements study corridor consists of three projects: STP00-0003-00(681), STP00-0002-00(862), and STP00-0003-00(682) in Cherokee and Forsyth Counties, with Project Identification Numbers (PI Nos.) 0003681, 0002862, and 0003682, respectively. The project limits of these PI Nos. extend from Scott Road to SR 369/Hightower Road under PI 0003681; from SR 369/Hightower Road to SR 371/Post Road under PI 0002862; and from SR 371/Post Road to Veterans Memorial Boulevard under PI 0003682. In 2007, GDOT initiated each of these three projects as independent projects during concept development and began environmental documentation. During an evaluation of the Logical Termini document for PI 0002862, FHWA found that the traffic analysis demonstrated the need to evaluate the SR 20 corridor between logical termini (September 8, 2008). This conclusion suggested that the PI 0002862 did not have independent utility and by association suggested that the limits of the NEPA analyses for PI Nos. 0003681 and 0003682 should also be revisited. The termini for the

[1] The proposed Build and Design years are assumed to be 2020 and 2040, respectively; however, as the project develops these years are subject to change.
[2] ARC Plan 2040

corridor were reevaluated at that time, and the three projects were combined for the purpose of concept development and environmental analysis.

GDOT has a programmed project to widen SR 20 to four lanes between I-575 and Scott Road (PI 0009164) for approximately 1 mile, which is included within the proposed SR 20 Improvements Canton to Cumming project study area. The PI 0009164 between I-575 and Scott Road has its own independent utility, need, and purpose separate from the need and purpose identified for the SR 20 Improvements corridor from Canton to Cumming.

The SR 20 Improvements project is also addressed in the Project Justification Statement (2012, PJS) prepared by the GDOT Office of Planning. The GDOT Office of Planning has a role to manage Georgia's transportation planning program in addition to developing the state transportation improvement program. The PJS concluded that a capacity-adding project along SR 20 from I-575 to Crestbrook Drive, just west of Cumming, is warranted based on planning level traffic data and the need to reduce congestion.

As a result of the individual project descriptions in the PI Nos., the previous FHWA coordination with GDOT, and the PJS, all three PI Nos. between Scott Road and Veterans Memorial Boulevard are now being evaluated in one NEPA document. The NEPA document will cover a study area between I-575 and SR 400 to ensure a sufficiently sized area is reviewed to define potential improvement alternatives and comprehensively account for resources to be considered in the SR 20 Improvements EIS. However, the actual project limits for various alternatives will be defined and evaluated during the NEPA process for their performance to address the congestion, safety, and east/west mobility needs of the project.

2.2 Planning Basis for Action

The planning basis for the proposed project is documented in regional and local transportation planning initiatives. The Atlanta Regional Commission (ARC) is the designated metropolitan planning organization (MPO) for the metro-Atlanta region and is responsible for implementing federal metropolitan transportation planning requirements, which includes the development of a multi-modal, financially constrained transportation plan that meets all transportation planning requirements under the federal regulations. ARC's MPO boundary consists of 18 counties. Both Cherokee and Forsyth Counties are part of the 18-county ARC MPO. Forsyth County is also located in the area covered by the Georgia Mountains Regional Commission.

The FY 2012-2017 Transportation Improvement Program (TIP) is the current adopted plan for the Atlanta region showing the region's highest transportation priorities. It was adopted by the ARC Board on July 27, 2011 and was approved by US DOT on September 6, 2011. The SR 20 Improvements from Canton to Cumming projects are identified in the Atlanta Regional Commission (ARC) Plan 2040 Regional Transportation Plan (RTP) and FY 2012-2017 TIP by reference numbers CH-020B (PI 0003681), FT-061A (PI 0002862), and FT-313 (PI 0003682). Table 2 presents the scheduled phases

Table 2 SR 20 Improvements Canton to Cumming Programming

Project Identification (GDOT PI No/TIP)	Project Limits	Document	Preliminary Engineering (PE) [Year]	Right of Way (ROW) [Year]	Construction (CST) [Year]
0003681/CH020B	Scott Road to SR 369/Hightower Road	ARC RTP, FY 2012-2040[1] & ARC TIP[2], FY 2012-2017	2006	2015 & 2016	LR* 2018-2030
0002862/FT-061A	SR 369/Hightower Road to SR 371/Post Road	ARC RTP, FY 2012-2040 & ARC TIP, FY 2012-2017	2004	2016 & LR 2031-2040	LR 2031-2040
0003682/FT-313	SR 371/Post Road to Veterans Memorial Boulevard	ARC RTP, FY 2012-2040	LR 2018-2030	LR 2018-2030	LR 2018-2030

[1] Atlanta Regional Commission (ARC) Regional Transportation Plan (RTP)
[2] ARC Transportation Improvement Program (TIP)
*LR = Long Range

of project development for the SR 20 Improvements from Canton to Cumming projects according to the ARC RTP and TIP.

There are many studies and documents to provide support for improving the SR 20 corridor between I-575 and SR 400. From the ARC Regional Freight Mobility Plan (2008), the SR 20 corridor is designated as part of the Priority Freight Highway Network and demonstrates "near capacity" or "at capacity/congested" levels of service in the AM and PM peak hours (2005). The Regional Freight Mobility Plan also designates SR 20 between Canton and Cumming as a critical stem route for freight as part of a core transportation system[3]. A 'stem route' is defined as one that "embed(s) the interstates into the commercial community. They travel north-south and east-west cutting a partial path through the dense northern territory, and they link up with each other."[4]

In the ARC's Strategic Regional Thoroughfare Plan, the project corridor from I-575 to its intersection with SR 369/Hightower Road is designated a Level 1 regional thoroughfare, while SR 20 from SR 369 to SR 400 is designated a Level 2 regional thoroughfare. A Level 1 regional thoroughfare indicates primary, highly traveled freeway-to-freeway or interstate connector routes, while a Level 2 regional thoroughfare is a moderately connected freeway-to-activity center or town center connector route.

The Atlanta Strategic Truck Route Master Plan (ASTRoMaP) shows SR 20 as part of the regional priority network[5]. The regional freight priority network is composed of interstate and major state routes that are critical for freight movement throughout the region. The

[3] Regional Freight Mobility Plan 2008, pg. 24
[4] Regional Freight Mobility Plan 2008, pg. 20
[5] ASTRoMaP 2010, pp. 2-2

ASTRoMap also includes SR 20 as an important east to west freight corridor in need of infrastructure improvements[6].

In the currently adopted Comprehensive Transportation Plan (CTP) for Cherokee County (2008-2033), the SR 20 Improvements from Canton to Cumming project is listed as a long-range (2030) widening project. In the CTP for Forsyth County (2011-2031), SR 20 is shown as a long-range (2021-2030) project from the county line to SR 371/Post Road and a short-range project from SR 371/Post Road to SR 400. Forsyth County plans for widening from two to four lanes, while the Cherokee County plans for widening does not specify the anticipated number of lanes.

The GDOT and the Cherokee and Forsyth county officials have several projects that are planned in the project area. Table 3 and Figure 2 illustrate planned and programmed transportation projects near the proposed project. GDOT Project PI No. 0009164 extends from I-575 to Scott Road, which overlaps the proposed SR 20 Improvements project study limits. Table 3 provides the details about GDOT project PI 0009164.

2.3 Land Use and Demographics

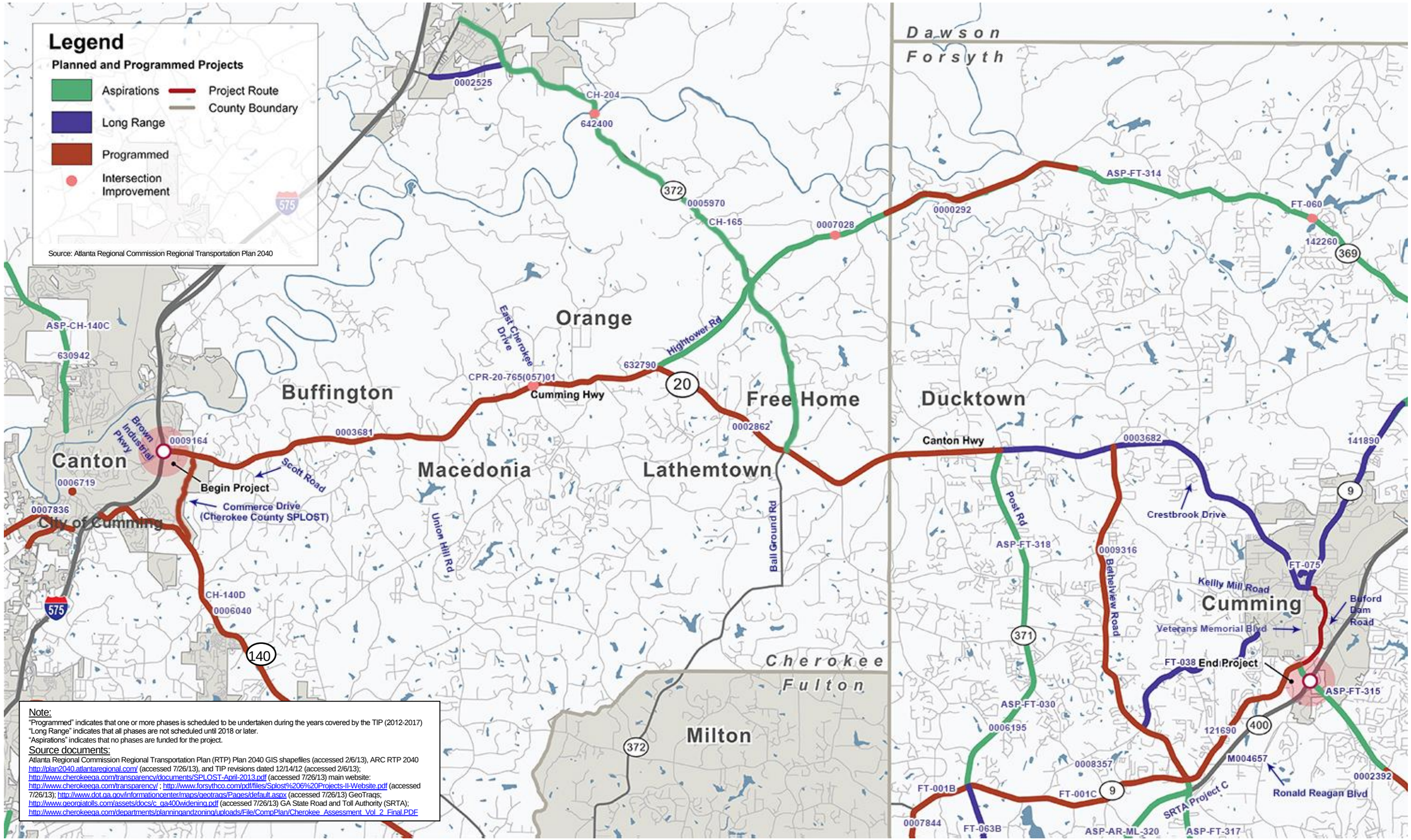
SR 20 is located in unincorporated portions of Cherokee and Forsyth counties and within the city limits of Canton and Cumming. From west to east, jurisdictions along the corridor include the city of Canton; unincorporated communities of Buffington, Macedonia, Orange, and Free Home in Cherokee County; as well as the unincorporated community of Ducktown and the city of Cumming in Forsyth County. Existing land uses along the corridor include a mix of suburban and exurban uses including low-density residential, strip commercial, and agricultural. Large tracts of agricultural land, including pasture, agricultural fields, forested land, equestrian centers, and large single-family subdivisions are prevalent along the proposed SR 20 study corridor. Mixed commercial and residential areas are concentrated at Buffington, Macedonia, and Orange. Concentrated commercial retail centers are present in the Canton area located at the western project limit near I-575 and the city of Cumming at the eastern project limit near SR 400. The areas near Canton and Cumming are more fully developed, while the area between the two cities is more rural and suburban. The terrain along the corridor is rolling with many hills and curves throughout the corridor. SR 20 generally traverses along a ridgeline.

SR 20 historically developed around the poultry industry in the mid-20th century. Over the years, the population has grown and the area has attracted many new residential subdivisions, although several agricultural operations remain intact. The commercial development consists mostly of retail businesses serving the local area.

The 2010 Census populations for Cherokee and Forsyth counties are 214,346 and 175,511 persons, respectively, which represent an increase of 51 percent and 78 percent over the 2000 Census populations for each county, respectively. In the last four

[6] ASTRoMaP 2010, pg. 11-3

Figure 2 Planned and Programmed Projects



Note:
"Programmed" indicates that one or more phases is scheduled to be undertaken during the years covered by the TIP (2012-2017)
"Long Range" indicates that all phases are not scheduled until 2018 or later.
"Aspirations" indicates that no phases are funded for the project.

Source documents:
Atlanta Regional Commission Regional Transportation Plan (RTP) Plan 2040 GIS shapefiles (accessed 2/6/13), ARC RTP 2040 http://plan2040.atlantaregional.com/ (accessed 7/26/13), and TIP revisions dated 12/14/12 (accessed 2/6/13); http://www.cherokeega.com/transparency/documents/SPLOST-April-2013.pdf (accessed 7/26/13) main website: http://www.cherokeega.com/transparency/ ; http://www.forsythco.com/pdf/files/Splost%206%20Projects-II-Website.pdf (accessed 7/26/13); http://www.dot.ga.gov/informationcenter/maps/geotrags/Pages/default.aspx (accessed 7/26/13) GeoTrags; http://www.georgiatolls.com/assets/docs/c_ga400widening.pdf (accessed 7/26/13) GA State Road and Toll Authority (SRTA); http://www.cherokeega.com/departments/planningandzoning/uploads/File/CompPlan/Cherokee_Assessment_Vol_2_Final.PDF

Table 3 Planned and Programmed Projects

GDOT PI / GDOT Project Number/ ARC Project Number/ County Project Number	General Location	Status (Under Construction/ Long Range/ Programmed/ Aspirational)	Dates For Construction	Location (Vicinity/ Adjoining)	Project Type
632790/ STP-012-1(107)/ CH-020A1[1]	SR 20 Truck Climbing Lanes from Union Hill Road to Greenwood Ct.	Under Construction	2010-2012	Adjoining	Roadway Operational Upgrades
0009164/ CSSTP-0009-00(164)/ CH-020A3[1]	SR 20 from I-575 to Scott Road	Programmed	2015	Adjoining	Capacity
0007836/ CSSTP-0007-00(836) CH-020A2[1]	SR 20 from I-75/Bartow to I-575/Cherokee	Programmed	Long Range 2018-2040	Vicinity	Capacity
0007028/ CSBRG-0007-00(028)/ CH-225[1]	SR 369 at Board Tree Creek	Programmed	Long Range 2018-2030	Vicinity	Bridge Replacement
0005970/ CSSTP-0005(00)970/ CH-165[6]	SR 372 from SR 20 to SR 5 Bus	Programmed	Long Range	Adjoining	Reconstruction/ Rehabilitation
N/A/ N/A/ N/A/[2]	Commerce Drive from SR 140 to SR 20	Under Construction	Current (SPLOST)	Adjoining	New Location
0009316/ STP-2348(3)/ FT-008B/ PE07W[1, 3]	Bethelview Road from SR 20 to Castleberry Road	Programmed	2015-2017	Adjoining	Capacity
FT-038[1]	Castleberry Road from Bethelview to Hutchinson Rd	Programmed	Long Range 2031-2040	Vicinity	Capacity
N/A/ N/A/ FT-075[1]	Church Street Ext. New Loc fm Tribble Gap Rd to Hudson/ Woodland St Intersect Cumming	Programmed	Long Range 2018-2030	Vicinity	Capacity
0007844/ CSSTP-0007-00(844)/ FT-001B[1]	SR 9 from McFarland to SR 371	Programmed	Long Range 2018-2030	Vicinity	Capacity
0008357/ CSSTP-0008-00(357)/ FT-001C[1]	SR 9 from SR 371 to SR 141	Programmed	Long Range 2018-2030	Vicinity	Capacity
121690/ STP-1336(11)/ FT-001D[1]	SR 9/Atlanta Highway from SR 141 to SR 20	Programmed	Long Range 2018-2030	Adjoining	Capacity
141890/ STP-1336(13)/ FT-001E[1]	SR 9 (Atlanta Road/Pilgrim Mill Road) from SR 20 to SR 306	Long Range	Long Range 2031 - 2040	Adjoining	Capacity
N/A/ N/A/ ASP-FT-314[1]	SR 369/Matt Highway	Aspirational	To Be Determined	Adjoining	Capacity
0000292/ STP-0000-00(292) FT-086[1]	SR 369/Matt Highway from Cherokee/Forsyth County Line to Hightower Circle	Programmed	Long Range 2018-2030	Vicinity	Passing lanes
N/A / N/A/ ASP-FT-315[1]	SR 20/Buford Highway east of SR 400	Aspirational	To Be Determined	Vicinity	Capacity

Table 3 Planned and Programmed Projects

GDOT PI / GDOT Project Number/ ARC Project Number/ County Project Number	General Location	Status (Under Construction/ Long Range/ Programmed/ Aspirational)	Dates For Construction	Location (Vicinity/ Adjoining)	Project Type
0002392 / STP-0002-00(392)/ FT-061D[1]	SR 20/Buford Highway from Samples Road/Trammel Road to James Burgess Road	Programmed	2014	Vicinity	Capacity
N/A/ N/A/ ASP-FT-318[1]	SR 371 from SR 20 to Kelly Mill Road	Aspirational	To Be Determined	Vicinity	Capacity
0006195/ CSSTP-0006-00(915)/ ASP-FT-030[1]	SR 371/Post Road from SR 9 to Kelly Mill Road	Aspirational	To Be Determined	Vicinity	Capacity
N/A/ N/A/ N/A/ CPR-20-765(057)01[3]	SR 20 and East Cherokee Drive	Programmed (SPLOST)	2014-2015	Adjoining	Intersection Improvement
M004657[4]	SR 9 from of SR 20 to SR 369	Programmed	2013	Adjoining	Maintenance
642400/ BRST-1022(10)/ CH-204[1]	SR 372/Ball Ground Road at Etowah River	Programmed	2014	Vicinity	Bridge Replacement
142260/ BRST-0862(9)/ FT-060[1]	SR 369 over Settingdown Creek	Programmed	2017	Vicinity	Bridge Replacement
0002525/ STP-0002-00(525)/ CH-180[1]	SR 372 Spur/Ball Ground Bypass from SR 5 Bus to SR 372	Programmed	Long Range	Vicinity	Capacity
630942/ STP-0828(19)/ ASP-CH-140C[1]	SR 140 from Lower Burris Road to SR 5 Bus	Aspirational	To be determined	Vicinity	Capacity
0006719	CS 678/Marietta Road @ Hickory Flat Road	Programmed	2012	Vicinity	Intersection Improvement
0006040/ CSSTP-0006-00(40)/ CH-140D[1,2]	SR 140 from I-575 to East Cherokee Drive	Programmed	Long Range 2018-2030	Vicinity	Capacity
ASP-FT-317[1]	SR 141 from McGinnis Ferry Road to SR 9	Aspirational	To be determined	Vicinity	Capacity
ASP-AR-ML-320[1]	SR 400 Managed Lanes from Holcomb Bridge Road to Peachtree Parkway	Aspirational	To be determined	Vicinity	Capacity
SRTA Project C[5]	SR 400 Widening from McFarland Pkwy to SR 20	PE (2013)	To be determined	Adjoining	Capacity
FT-063B[1]	Union Hill Road/Mullinax Road: McFarland to SR 9	Programmed	Long Range (2031-2040)	Vicinity	Capacity

Sources:
[1] Atlanta Regional Commission Regional Transportation Plan (RTP) Plan 2040 GIS shapefiles (accessed 2/6/13), ARC RTP 2040 http://plan2040.atlantaregional.com/ (accessed 7/26/13), and TIP revisions dated 12/14/12 (accessed 2/6/13);
[2] http://www.cherokeega.com/transparency/documents/SPLOST-April-2013.pdf (accessed 7/26/13) main website: http://www.cherokeega.com/transparency/ ;
[3] http://www.forsythco.com/pdf/files/Splost%206%20Projects-II-Website.pdf (accessed 7/26/13);
[4] http://www.dot.ga.gov/informationcenter/maps/geotraqs/Pages/default.aspx (accessed 7/26/13) GeoTraqs;
[5] http://www.georgiatolls.com/assets/docs/c_ga400widening.pdf (accessed 7/26/13) GA State Road and Toll Authority (STRA); and
[6] http://www.cherokeega.com/departments/planningandzoning/uploads/File/CompPlan/Cherokee_Assessment_Vol_2_Final.PDF

decades, the greatest decade of growth as measured in percent change from the previous decade, was between 1980 and 1990 for Cherokee County and between 1990 and 2000 for Forsyth County. The population of the Census Tracts that intersect the SR 20 study area corridor between I-575 and SR 400 is 33,159 in Cherokee County (Census Tracts 905 and 906), and 85,749 (Census Tracts 1303, 1304, and 1305) in Forsyth County, which represents 15.5 percent and 48.8 percent of Cherokee and Forsyth County populations, respectively. According to US Census data, there are 82,360 and 64,052 total housing units (2010) in Cherokee and Forsyth counties respectively, with approximately 18 percent and 13 percent of these designated as renter-occupied in each county, respectively.

Growth and development in and around the project area are guided by several major planning documents:

- the Comprehensive Development Plan (2012-2032) in Forsyth County (March 2012),
- the *Comprehensive Plan: Community Assessment and Community Agenda in the City of Cumming* (July 2011 & February 2012),
- the *Horizon 2030: The Canton Vision Comprehensive Plan* (October 2008) and the *Draft Unified Development Code* (February 2013) in the City of Canton, and
- the *Joint Comprehensive Plan Tenth Year Update* and the Zoning Ordinance in Cherokee County and the cities of Ball Ground and Waleska. Cherokee County's Joint Comprehensive Plan is comprised of the *Community Assessment* (January 2007) and the *Community Agenda* (August 2008).

According to the county's planning documents, the populations of Cherokee and Forsyth counties are anticipated to increase substantially over the coming decades. The population in unincorporated Cherokee County is projected to more than double by 2030 as measured from the 2007 population[7]. Similarly, the population in Forsyth County is projected to increase by approximately 77 percent by year 2030 from 2010 levels[8]. The counties' data are supported by ARC Plan 2040 population forecasts from the Regional Snapshot (2011), which project that between 2010 and 2040, the Cherokee and Forsyth county populations are expected to increase 93.6 and 114 percent, respectively. Also, the ARC employment forecasts for Cherokee and Forsyth counties show 166.3 and 123.6 percent increases between 2010 and 2040. It is anticipated that continued growth in both counties will add demand, which could degrade the levels of service provided by the existing transportation network.

2.4 Roadway Deficiencies

Typical roadway deficiencies along SR 20 can be differentiated between three types: operational, geometric, and roadside safety. Operational deficiencies along the corridor include lack of right and left turn bays at intersections with high-volume driveways and insufficient turn-bay storage and deceleration lengths. Geometric deficiencies along the corridor include low skew-angle intersections (situations exist that violate both AASHTO

[7] Cherokee County Community Assessment/Comprehensive Plan 2040 (January 2007)
[8] Forsyth County Comprehensive Plan 2012-2032 (March 2012)

and GDOT standards), insufficient curve radii for posted speed limit (AASHTO standard), insufficient distance between curves in the same direction (AASHTO and GDOT standards), several locations that may not meet the minimum grade requirement (GDOT Standard), and numerous locations that do not meet minimum K-values for vertical curves (AASHTO Standard). Roadside safety deficiencies that typically occur along the corridor are clear zone violations. Typically, these violations are due to unprotected and unrecoverable slopes, but also include unprotected obstructions like retaining walls and trees. The existing roadway consists of some areas with 0-6 feet of unpaved and 4-6 feet of paved shoulders.

2.5 Crash Rates

Traffic crash data between I-575 and SR 400 were collected for the years 2007-2009 and are presented in Table 4 and categorized by category in Table 5. SR 20 currently alternates between a rural and urban principal arterial roadway. As shown, the crash, injury, and fatality rates for portions of the rural and urban principal arterial segments of the SR 20 corridor exceeded the respective statewide average crash rates (2007-2009). In 2007-2008 fatality rates along one segment of the study corridor exceeded statewide averages.

In addition, according to ASTRoMaP, increased crash rates involving one or more commercial vehicles are experienced along SR 20 from the Bartow-Cherokee county line eastward, past SR 369/Hightower Road, where the number of crashes ranged from 56-82 to 131-213 between 2006-2008.

Along the SR 20 corridor between I-575 and SR 400, rear end crashes accounted for 47 percent and angle crashes accounted for 29 percent of all accidents during the years 2007 to 2009. Collisions with objects other than motor vehicles accounted for approximately 12 percent of crashes for the same years (most collisions were with ditches, trees, animals, and roadside features such as utility poles). According to the FHWA's Highway Safety Improvement Program (HSIP) Crash Reduction Factors (FHWA 2012), the Toolbox of Countermeasures (FHWA 2009), the Desktop Reference for Crash Reduction Factors (FHWA 2008), and FHWA's Proven Safety Countermeasures website (FHWA 2013), these crash types indicate that creating additional capacity, correcting skews and geometry, and improving operations with turn lanes and traffic signals could improve traffic safety along the corridor. Rear end collisions and angle crashes often point to a need for improved access control and access management (e.g. medians), intersection improvements, and a reduction in the number of locations available for vehicles to stop, turn, or slow down. Sideswipes and head-on collisions account for 11 percent of all crashes along SR 20 (2007-2009).

Within the 24-mile project limits, access along SR 20 is currently a combination of uncontrolled residential and commercial driveways, stop sign-controlled intersections, and signalized intersections. Based on GDOT crash records [Critical Accident Reporting Environment (CARE)], high-crash locations along SR 20 within the project study area are identified in the report SR 20 High Crash Location Report (GCA, Inc. 2013). Intersections where a minimum 5 crashes per year or 15 crashes for the 3-year period

Table 4 Crash History (2007-2009)
(per MVMT[1])

SR 20 Segment	Type	2007		2008		2009	
		Statewide Average[2]	SR 20	Statewide Average	SR 20	Statewide Average	SR 20
SR 20 Cherokee County (I-575 to Union Hill Road)/*Urban Principal Arterial*	Crash	445	289	430	259	461	366
	Injuries	174	90	167	123	185	99
	Fatalities	1.49	3.32*	1.33	0.0	1.25	0.0
SR 20 Cherokee County (Upper Union Hill Road to Forsyth County Line Road)/*Rural Principal Arterial*	Crash	114	198*	116	161*	113	143*
	Injuries	63	49	64	77*	62	51
	Fatalities	1.99	0.0	1.47	3.66*	1.45	0.0
SR 20 Forsyth County (Cherokee/Forsyth County Line to SR 400)/*Urban Principal Arterial*	Crash	445	493*	430	415	461	318
	Injuries	174	159	167	120	185	119
	Fatalities	1.49	2.79*	1.33	0.0	1.25	0.0

Source: GDOT, Accident Information System Data Tables provided August 13, 2013. 2007-2009 data are the latest three years for which these data are available along the mileposts of the corridor. More recent year data will be provided as it becomes available.
*indicates greater than statewide average for Rural/Urban Principal Arterials on the NHS, respectively.
[1]MVMT= 100 million vehicle miles traveled
[2] SR 20 is classified as an urban principal arterial from I-575 to Union Hill Road in Cherokee County, a rural principal arterial from Union Hill Road to County Line Road in Forsyth County, and an urban principal arterial from County Line Road to SR 400.

Table 5 Category of Crash (2007-2009)

Category of Crash	2007	2008	2009	Total	Percent of Total
Angle	177	126	111	414	29.26%
Head On	18	14	7	39	2.76%
Not A Collision With A Motor Vehicle	63	55	61	179	12.65%
Rear End	240	230	194	664	46.93%
Sideswipe - Opposite Direction	19	13	9	41	2.90%
Sideswipe - Same Direction	31	25	22	78	5.51%
Grand Total	**548**	**463**	**404**	**1415**	**100.00%**

(2007-2009) occurred are considered a high-crash location[9]. The 9 intersections in Cherokee County and 11 intersections in Forsyth County identified as high-crash locations are listed in Table 6 and in Figure 3. The most common contributing factor to these crashes in the high-crash locations was ”following too close,” followed by ”failure to yield.”

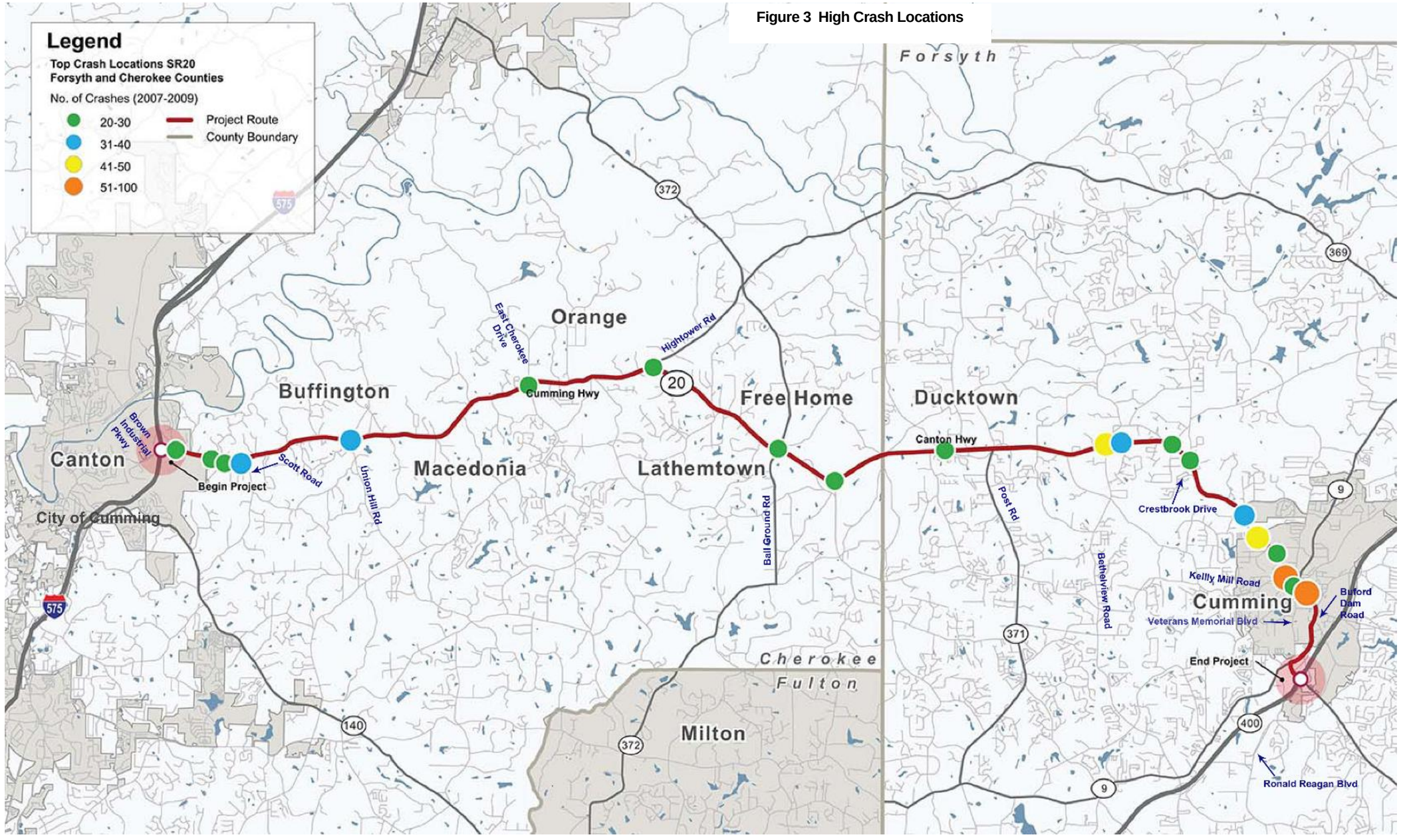
Table 6 High Crash Locations

County	Intersection	Total Crashes
Cherokee	SR 20, Northside Parkway & Governors Way	26
Cherokee	SR 20, Marketplace Drive & Brook Park Drive	23
Cherokee	SR 20 & Key Drive	25
Cherokee	SR 20 & Scott Road	35
Cherokee	SR 20, Harmony Drive & Union Hill Road	36
Cherokee	SR 20 & E. Cherokee Drive	28
Cherokee	SR 20 & SR 369/Hightower Road	21
Cherokee	SR 20 & SR 372/Ball Ground Road	21
Cherokee	SR 20 & Holbrook Campground Road	16
Forsyth	SR 20, Franklin Goldmine Road & Evans Road	21
Forsyth	SR 20, Friendship Circle & Bethelview Road	44
Forsyth	SR 20 & Spot Road Connector	18
Forsyth	SR 20 & Woodland Hills Drive	32
Forsyth	SR 20 & Dr. Bramblett Road	18
Forsyth	SR 20 & Sawnee Drive	33
Forsyth	SR 20 & N. Corners Parkway	43
Forsyth	SR 20 & Elm Street	25
Forsyth	W. Maple Street/Kelly Mill Road & W. Main Street	68
Forsyth	SR 20/W. Maple St, Castleberry Rd, W. Main St & Tribble Gap Rd	22
Forsyth	SR 20/W. Maple Street & Atlanta Road	87

Source: SR 20 High Crash Location Report (GCA, Inc. 2013).
Note: Based on crash data from 2007-2009

[9] The threshold for determining if a location has observed high-crash volumes does not have a universally recognized standard. The *Forsyth County Comprehensive Transportation Plan Needs Assessment Report* map identified that “high-crash locations” consisted of a minimum of 45 crashes in three years. For SR 20 Improvements project, this standard was considered too high and would eliminate some locations worthy of study. Therefore, the standard consisting of five crashes per year or 15 crashes over the three-year period was identified as the minimum to be considered a ”high-crash location.” This metric was developed based on the *Manual on Uniform Traffic Control Devices* (MUTCD), which states that traffic signals are warranted at locations observing a minimum of five crashes in a twelve-month period.

Figure 3 High Crash Locations



2.6 Congestion and Level of Service

Level of Service (LOS) is a quantitative measurement on the efficiency and perceived congestion of a roadway. LOS is defined in terms of the amount of control delay experienced by road users and is rated on a scale of A (excellent) through F (unacceptable). The GDOT Design Policy Manual, AASHTO, the ARC Plan 2040, and the CTPs for Cherokee and Forsyth counties serve as guidance for design criteria for determining acceptable LOS for the SR 20 corridor. Currently, GDOT's Design Policy Manual states that the desirable LOS for rural principal arterials is LOS B and for urban principal arterials in heavily developed urban and suburban areas is LOS D. The ARC's PLAN 2040 and the Forsyth County CTP have identified LOS D is acceptable. The design team has reviewed and taken into consideration the GDOT *Design Policy Manual*, AASHTO, the ARC's *Plan 2040*, the CTPs for Cherokee and Forsyth counties as well as the input from the stakeholders in determining the acceptable LOS to design for in the design year of 2040. Based on the ARC's *Plan 2040* recommendation, LOS D is the goal established for the proposed improvements. For additional guidance, refer to Chapter 11 of the GDOT *Design Policy Manual*.

What is Level of Service?

Roadways are rated for operational effectiveness using a level of service (LOS). LOS is a standard means of classifying traffic conditions associated with various traffic volume levels and traffic flow conditions. There are six levels of service at which a roadway can operate, represented by the letters "A" through "F." Each level is defined by a maximum value for the ratio of traffic volume to facility capacity.

LOS "A" is when volume is well below capacity and traffic is flowing freely. Little or no delay is found at intersections.

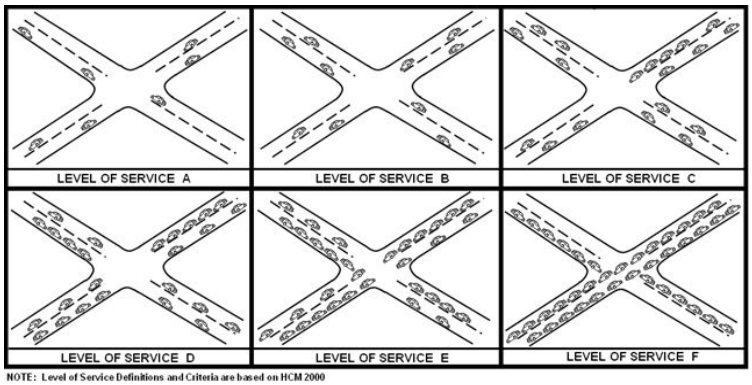
LOS "B" is when traffic flow is steady but the presence of other vehicles begins to be noticeable. Short delays are experienced at intersections.

LOS "C" allows for steady traffic flow, but speeds and maneuverability are more closely controlled by the higher volumes. Average delays are found at intersections.

LOS "D" is approaching an unsteady flow in which speed and maneuverability are severely restricted. Long delays are experienced at intersections.

LOS "E" is when traffic flow is reduced to a slow but relatively uniform speed, and traffic volume is equal to or nearly equal to capacity and maneuverability is extremely difficult. Very long delays are experienced at intersections.

LOS "F" is when the volume greatly exceeds the capacity and lengthy delays occur. Excessive long delays are experienced at intersections.



NOTE: Level of Service Definitions and Criteria are based on HCM 2000

The existing (2011) and future (2020 Build Year and 2040 Design Year) No-Build roadway LOS and traffic volumes (AADT) for roadway segments on SR 20 between the intersection just west of I-575 and the intersection just east of SR 400 were analyzed

and are presented in Table 7. The analysis shows if no improvements are made by 2040, an unacceptable LOS along SR 20 between I-575 and SR 400 is anticipated with two exceptions: the four-lane segment of SR 20 between Crestbrook Drive and Kelly Mill Road in Cumming and the four-lane segment of SR 20 between Veterans Memorial Boulevard and SR 400.

Within the 24-mile project study limits along SR 20, there are approximately 100 intersections, 25 of which are signalized. Table 8 provides the AM and PM peak hour LOS at each signalized intersection in the study area, including the intersections beyond the termini, e.g. west of I-575 at Brown Industrial Way and east of Veterans Memorial Boulevard at the SR 400 interchange and Ronald Reagan Boulevard.

2.7 Mobility

Growth and development along the SR 20 Improvements corridor and in the north Metro Atlanta region in recent decades has contributed to congestion and safety issues between Canton and Cumming as well as hampered regional mobility to points beyond. The need for improved east-west connectivity in north Metro Atlanta has been explored in previous transportation studies including ARC Strategic Regional Thoroughfare Plan, ARC's Plan 2040 RTP, ARC's Regional Freight Mobility Plan, ASTRoMaP, and the currently adopted CTPs of Cherokee and Forsyth counties. These plans show both the critical need for connectivity and east/west mobility that SR 20 provides in the region, as well as the need to reduce congestion. East/west mobility for this project refers to the trips made along SR 20 between Canton and Cumming as it provides a route for trips beyond these limits. Designated arterial routes, such as SR 20, serve the purpose of providing a facility with a high level of mobility for through travel. Arterials emphasize a high level of mobility for through movement[10]. Arterials are expected to provide a high degree of mobility for the longer trip lengths. Therefore, they should provide a high operating speed and LOS. Since access to abutting property is not their major function, some degree of access control is desirable to enhance mobility. Mobility is evaluated on the basis of operating speed or trip travel time. The trip travel time and LOS are measurements of how long it takes to travel between the west end of the SR 20 Improvements corridor in Canton to the east end of the corridor in Cumming. Travel times were evaluated using the Travel Demand Model from the Atlanta Regional Commission in Table 9. Vehicle hours traveled (VHT) and vehicle miles traveled (VMT) are also provided for reference. The analysis in Table 9 shows a continued worsening of travel time and corresponding increase in VMT and VHT under the No-Build condition (2040) based upon the projected traffic volumes presented above. Between 2012 and 2040, travel times along SR 20 between I-575 and SR 400 in both the westbound and eastbound directions during AM and PM peak periods are projected to increase between 4 to 400 percent.

[10] A Guide for Functional Highway Classification, prepared by a joint subcommittee of the American Association of State Highway Officials, the National Association of Counties, and the National Association of County Engineers (1964).

Table 7 Roadway Segment LOS along SR 20

Segment of SR 20 Improvements Corridor	No. of Thru Lanes	2011 Existing			2020 No-Build (Build Year)			2040 No-Build (Design Year)		
		AADT	LOS		AADT	LOS		AADT	LOS	
			AM	PM		AM	PM		AM	PM
Urban Principal Arterial										
Brown Industrial Way to I-575[1]	*4*	*20,250*	*A*	*A*	*25,975*	*A*	*A*	*40,975*	*B*	*B*
I-575 to Scott Road	4	28,900	B	C	37,050	B	C	58,450	D	E
Scott Road to E. Cherokee Drive[2]	2	21,550	E	E	27,650	E	E	43,700	F	F
Rural Principal Arterial										
E. Cherokee Drive to SR 369/Hightower Road	2	14,350	E	E	19,650	E	E	36,850	F	F
SR 369/Hightower Road to SR 372/Ball Ground Road	2	10,650	E	E	14,900	E	E	28,550	E	E
SR 372/Ball Ground Road to SR 371/Post Road[3]	2	13,550	E	E	18,950	E	E	36,300	F	F
Urban Principal Arterial										
SR 371/Post Road to Bethelview Road	2	16,850	E	E	22,650	E	E	42,000	F	F
Bethelview Road to 4-lane section (east of Crestbrook Drive)	2	22,400	E	E	27,150	F	F	44,100	F	F
4-lane section (east of Crestbrook Drive) to Kelly Mill Road	4	22,850	C	B	27,550	C	C	39,150	C	C
Kelly Mill Road to SR 9/Atlanta Road East Bound [4]	2	14,025	E	E	16,750	F	E	21,725	F	F
Kelly Mill Road to SR 9/Atlanta Road West Bound [4]	2	12,975	E	E	15,550	E	F	20,075	E	F
SR 9/Atlanta Road to Buford Dam Road	2	19,550	E	E	23,450	E	E	30,350	E	E
Buford Dam Road to SR 20/Buford Highway/ Veterans Memorial Boulevard	2	14,200	E	E	17,000	E	E	22,000	E	E
SR 20/Buford Highway/ Veterans Memorial Boulevard to SR 400	4	44,200	D	D	52,850	D	D	68,450	D	D
SR 400 to Market Place/Ronald Reagan Blvd. [1]	*4*	*54,200*	*D*	*D*	*64,800*	*D*	*D*	*83,950*	*D*	*D*

[1] Segments located immediately beyond the project study area limits of I-575 and SR 400 are italicized and row is highlighted.
[2] This segment is classified as Urban Principal Arterial from Scott Road to Union Hill Road, which is approximately 3.2 miles west of E. Cherokee Drive. The classification as Rural Principal Arterial begins at Union Hill Road.
[3] This segment is classified as Rural Principal Arterial from SR 369/Ball Ground Road to County Line Road, which is approximately 1.8 miles west of SR 271/Post Road. The transition to Urban Principal Arterial begins at County Line Road.
[4] In downtown Cumming the one-way pairs consist of 2 lanes in each direction for a total of 4 thru lanes.
AADT: Average Annual Daily Traffic
LOS: Level of Service
LOS calculated based on 2011 traffic counts (AADT)

Table 8 Level of Service for Existing Signalized Intersections

Signalized Intersections		2011						2020 No-Build (Build Year)						2040 No-Build (Design Year)					
		LOS		V/C ratio		Secs of Delay		LOS		V/C ratio		Secs of Delay		LOS		V/C ratio		Secs of Delay	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Intersection West of I-575																			
SR 20	Brown Industrial Way*	*B*	*B*	*0.35*	*0.35*	*16.5*	*15.6*	*D*	*B*	*0.46*	*0.43*	*41.9*	*16.8*	*F*	*C*	*0.73*	*0.68*	*141.9*	*25.9*
SR 20 Improvement Corridor																			
SR 20	I-575 Southbound (SB)	D	D	0.51	0.58	52.8	52.4	D	E	0.66	0.71	63.6	65.2	F	F	1.01	1.09	84.9	163.2
SR 20	I-575 Northbound (NB)	B	C	0.51	0.79	14.9	27.6	D	E	0.67	1.05	12.9	50.7	D	F	1.00	1.65	43.9	288.5
SR 20	Northside Parkway/ Governor's Way	B	B	0.43	0.57	16.2	15.6	B	C	0.55	0.74	21.1	20.4	C	E	0.92	1.11	22.9	62.8
SR 20	Commerce Blvd.	B	C	0.33	0.55	18.2	20.2	B	C	0.43	0.67	13.2	20.8	B	F	0.69	1.14	10.9	118.1
SR 20	Brooke Park Dr.	C	F	0.84	1.23	33.9	129.2	E	F	1.12	3.53	58.5	780.6	F	F	2.23	3.40	423.4	899.1
SR 20	Scott Rd.	B	E	0.63	0.96	13.0	56.2	C	F	0.78	1.23	20.5	83.1	F	F	1.23	1.97	107.0	409.2
SR 20	E. Cherokee Dr.	C	C	0.58	0.62	20.3	23.0	C	D	0.84	0.83	32.2	41.8	F	F	1.35	1.50	191.3	237.9
SR 20	Kroger Entrance – Woodmont Village	A	A	0.48	0.56	9.0	9.5	B	B	0.65	0.75	14.0	14.8	D	F	1.02	1.20	51.5	99.0
SR 20	SR 372/Ball Ground Rd.	C	C	0.62	0.60	20.8	20.5	D	D	0.87	0.88	38.0	45.0	F	F	1.61	1.50	230.8	196.6
SR 20	Holbrook Camp Ground Rd.	B	B	0.45	0.53	11.8	13.9	B	C	0.66	0.80	18.7	21.0	F	F	1.20	1.37	84.1	156.3
SR 20	SR 371/Post Road	C	C	0.74	0.81	30.9	34.6	E	E	0.95	1.02	59.0	63.5	F	F	2.20	2.19	350.7	467.0
SR 20	Friendship Circle/ Bethelview Rd./ Sawnee Elementary School	C	B	0.85	0.77	25.4	18.0	E	D	1.21	0.98	69.7	38.0	F	F	2.39	1.96	377.1	302.5
SR 20	Spot Road Connector	C	C	0.85	0.89	26.9	30.3	E	F	1.05	1.08	63.1	90.3	F	F	1.60	1.72	274.3	245.2
SR 20	Dr. Bramblett Rd.	D	D	0.92	1.02	38.8	50.7	F	F	1.10	1.28	80.3	127.4	F	F	1.63	1.94	300.7	368.5
SR 20	Sawnee Dr./ Greenwood Acres Dr.	A	C	0.62	1.01	9.4	27.9	B	E	0.71	1.10	11.7	77.7	D	F	1.05	1.85	44.8	256.6
SR 20	Elm St.	A	A	0.54	0.59	8.4	7.8	A	B	0.62	0.70	9.5	10.1	C	C	0.90	0.95	25.0	31.4
SR 20/ Maple St.**	Castleberry Rd.	D	C	0.76	0.68	40.9	34.3	D	D	0.97	0.92	48.1	40.7	F	F	1.41	1.45	149.5	112.4

Table 8 Level of Service for Existing Signalized Intersections

Signalized Intersections		2011						2020 No-Build (Build Year)						2040 No-Build (Design Year)					
		LOS		V/C ratio		Secs of Delay		LOS		V/C ratio		Secs of Delay		LOS		V/C ratio		Secs of Delay	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
SR 20/ Maple St.**	Veterans Memorial Blvd.	B	C	0.74	0.74	17.3	21.4	C	C	0.90	0.91	23.6	33.0	F	F	1.22	1.20	105.5	82.7
SR 20/ Maple St.**	Pilgrim Mill Rd. /Atlanta Rd.	B	B	0.50	0.70	10.4	16.1	B	B	0.60	0.84	10.6	19.5	B	E	0.78	1.08	12.5	76.5
SR 20/ Main St.**	Kelly Mill Rd.	C	E	0.86	1.15	30.2	75.1	E	F	1.10	1.76	57.7	172.2	F	F	1.74	4.32	185.9	413.7
SR 20/ Main St.**	Castleberry Rd.	B	B	0.59	0.68	14.1	17.9	B	C	0.70	0.84	17.1	30.4	D	E	0.91	1.13	45.1	73.2
SR 20/ Main St.**	Veterans Memorial Blvd.	C	B	0.58	0.69	20.8	18.3	C	C	0.71	0.87	23.9	23.1	C	E	0.71	1.12	23.4	73.1
SR 20/ Main St.**	Pilgrim Mill Rd.	B	A	0.31	0.43	10.4	10.0	B	B	0.38	0.52	11.0	13.3	B	B	0.78	0.71	11.0	17.5
SR 20	Buford Dam Rd.	E	C	0.38	0.78	63.4	23.9	E	F	0.46	1.26	78.3	138.5	F	F	0.60	1.53	157.1	253.3
SR 20	Veterans Memorial Blvd. (just west of SR 400)	C	C	0.69	0.76	25.0	29.3	C	D	0.82	0.94	31.8	40.4	D	E	0.96	1.14	50.3	76.5
East of Veterans Memorial Blvd.																			
SR 20	*Shopping Center*	*B*	*B*	*0.44*	*0.64*	*16.8*	*18.6*	*B*	*C*	*0.54*	*0.85*	*12.2*	*29.1*	*B*	*D*	*0.65*	*1.03*	*13.3*	*52.4*
SR 20	*SR 400 SB*	*C*	*B*	*0.87*	*0.76*	*23.3*	*17.7*	*D*	*C*	*1.01*	*0.91*	*46.5*	*32.2*	*F*	*E*	*1.30*	*1.18*	*114.8*	*75.8*
SR 20	*SR 400 NB*	*A*	*A*	*0.42*	*0.88*	*4.1*	*5.6*	*A*	*C*	*0.49*	*1.05*	*2.5*	*27.1*	*A*	*E*	*0.61*	*1.36*	*3.6*	*65.2*
SR 20	*Ronald Reagan Blvd.**	*C*	*E*	*0.84*	*1.08*	*29.0*	*71.7*	*D*	*F*	*0.96*	*1.38*	*41.7*	*144.3*	*F*	*F*	*1.26*	*1.78*	*110.6*	*280.2*

Note: Shaded cells are those with an unacceptable (failing) level of service (LOS E and F).
*Intersections located beyond the project study area are italicized.
**In downtown Cumming, SR 20 is cosigned with E. Maple Street (eastbound) and Main Street (westbound) and functions as a one-way pair, and crosses Maple and Main both intersect with Castleberry, Veterans Memorial Blvd. and Pilgrim Mill Road. In the eastbound direction, SR 20 is cosigned with E. Maple Street, Atlanta Road, and then Buford Highway.

Table 9 Travel Time Summary[1]

SR 20 Segment	Travel Time in 2010 (minutes)/Vehicle Hours Traveled/Vehicle Miles Traveled					No-Build (2040) Travel Time (minutes)/Vehicle Hours Traveled/Vehicle Miles Traveled							
		AM		PM		AM				PM			
		EB	WB	EB	WB	EB	Change fm 2010	WB	Change fm 2010	EB	Change fm 2010	WB	Change fm 2010
I-575 to Scott Road	VMT	3,292	3,661	4,712	4,568	5,749	75%	5,982	63%	8,091	72%	8,079	77%
	VHT	127	147	226	213	248	95%	218	48%	343	52%	468	120%
	Travel Time	2.50	2.17	4.39	2.68	3.94	58%	7.70	255%	9.96	127%	9.07	238%
Scott Road to E. Cherokee Dr.	VMT	10,683	11,202	14,691	4,568	14,743	38%	15,705	40%	8,091	72%	8,079	77%
	VHT	322	294	403	424	929	189%	627	113%	1,059	163%	1,646	288%
	Travel Time	7.95	7.36	5.14	7.48	8.25	4%	7.66	4%	10.73	109%	8.30	11%
E. Cherokee Dr. to SR 372/Ball Ground Rd.	VMT	11,233	10,081	12,590	13,843	12,429	11%	15,831	57%	18,762	49%	15,894	15%
	VHT	319	269	340	399	416	30%	778	189%	1,264	272%	651	63%
	Travel Time	7.28	5.83	6.96	6.13	14.04	93%	12.69	118%	17.12	146%	17.05	178%
SR 372/Ball Ground Rd. to SR 371/Post Rd.	VMT	8,811	9,082	11,962	11,233	11,750	33%	14,878	64%	17,779	49%	15,294	36%
	VHT	251	247	350	335	514	105%	989	300%	1,804	415%	1,018	204%
	Travel Time	5.20	4.79	5.60	5.50	13.03	151%	9.81	105%	13.84	147%	16.15	194%
SR 371/Post Rd. to Bethelview Rd.	VMT	3,857	3,253	4,347	4,781	4,755	23%	5,553	71%	7,072	63%	6,154	29%
	VHT	102	83	113	127	168	65%	253	205%	448	296%	243	91%
	Travel Time	2.62	2.62	3.17	2.67	9.16	250%	4.61	76%	7.62	140%	6.72	152%
Bethelview Rd. to Kelly Mill Rd.	VMT	11,504	7,052	10,652	13,390	16,045	39%	10,469	48%	14,748	38%	18,981	42%
	VHT	504	207	345	620	1,770	251%	410	98%	883	156%	2,692	334%
	Travel Time	6.99	7.14	6.17	7.18	22.36	220%	18.48	159%	20.66	235%	34.48	380%
Kelly Mill Rd. to SR 400	VMT	5,676	4,030	5,579	6,259	13,240	133%	6,790	68%	10,117	81%	15,359	145%
	VHT	251	138	234	271	970	286%	241	75%	473	102%	1,375	407%
	Travel Time	4.99	5.44	5.77	5.78	19.03	281%	9.35	72%	26.48	359%	18.29	216%
Total Corridor from I-575 to SR 400	VMT	55,056	48,361	64,533	67,788	78,711	43%	75,208	56%	95,928	49%	98,177	45%
	VHT	1,876	1,385	2,011	2,389	5,015	167%	3,516	154%	6,274	212%	8,093	239%
	Travel Time	37.53	35.35	37.20	37.42	89.81	139%	70.30	99%	106.41	186%	110.06	194%

[1]Data from the ARC Regional Travel Demand Model (2010 base year)

3.0 PRELIMINARY LOGICAL TERMINI SCREENING

FHWA regulations (23 CFR 771.111 [f]) require that the project conducts a meaningful evaluation of alternatives and avoids commitments to transportation improvements before they are fully evaluated. According to NEPA and Transportation Decisionmaking (1993), logical termini are defined as rational end points for a transportation improvement and rational end points for a review of the environmental impacts. For purposes of the NEPA documentation, traffic and environmental studies are being conducted between I-575 and SR 400 to ensure that an adequate study area is defined to accommodate congestion, east/west mobility, and safety needs for each alternative. As alternatives are defined and advanced through project development, the specific termini of each alternative will be evaluated to ensure that the criteria for logical termini are met.

What are Logical Termini?

According to 23 CFR 771.111(f) :

- The termini should be of sufficient length to address environmental matters on a broad scope;
- The project should have independent utility or independent significance; i.e. be a usable and reasonable expenditure even if no additional transportation improvements in the area are made;
- The project does not restrict consideration of other reasonably foreseeable transportation improvements.

The preliminary traffic data show that the project limits of Scott Road and Veterans Memorial Boulevard would be sufficient to address environmental matters on a broad scope, accommodate a project with independent utility, and would not restrict consideration of other reasonably foreseeable transportation improvements. As shown in Table 7 above, the segment LOSs along the SR 20 corridor demonstrate an unacceptable LOS between I-575 and Veterans Memorial Boulevard. A separately programmed project is underway to address the failing LOS between I-575 and Scott Road (PI 0009164). The segment LOS beyond the I-575 and Veterans Memorial Boulevard show acceptable LOSs.

For the purposes of east/west mobility and connectivity, I-575 and SR 400 are considered logical ending points because these intersecting roadway facilities are major north/south routes that provide connections to Georgia's interstate system and the Atlanta metropolitan area. At I-575/SR 20 interchange under the existing condition, approximately 16 percent of SR 20 traffic travels through the intersection and 84 percent of westbound SR 20 traffic travels to I-575. At SR 400/SR 20 interchange under the existing condition, 62 percent of traffic travels through the intersection and 38 percent of eastbound SR 20 traffic travels to SR 400. Traffic studies for various alternatives will be conducted to confirm the limits of improvements needed between I-575 and SR 400. While there may be a need for operational and/or capacity improvements along SR 20 beyond the project's study area between I-575 and SR 400, these needs would be addressed by other projects along SR 20, which are currently identified in Table 3. For example, a project to provide capacity improvements to SR 20 east of SR 400 is included in the ARC RTP as an aspirational project. A project to provide improvements to the intersection at Brown's Industrial Way, just west of the SR 20/I-575 interchange, is not currently identified. However, a project to provide improvements along SR 20 west of I-575 has been identified and preliminary engineering is underway. Additionally, I-575

and SR 400 serve as traffic generators for SR 20 traffic traveling away from the project limits. At this time, PI 0009164 is being developed separately from the SR 20 Improvements project since it has independent utility and its own need and purpose, although the study areas for the SR 20 Improvements EIS and PI 0009164 NEPA document overlap. The SR 20 Improvements EIS studies include the section of SR 20 between I-575 and Scott Road for the purposes of evaluating environmental resources and not limiting the logical termini of potential alternatives.

In addition, project alternatives will be evaluated to determine whether they would contribute to poor operational conditions or congestion beyond I-575 and SR 400, thereby increasing the need for improvements beyond the proposed termini. Because there is a reasonably foreseeable need for improvements beyond the proposed eastern terminus in Cumming, a goal of the SR 20 Improvements project is to develop alternatives that would not restrict the consideration of alternatives for avoiding impacts to resources beyond the termini at I-575 and SR 400, in the event that implementation of the SR 20 project alternatives are developed and/or implemented in advance of the other programmed projects.

4.0 MODAL INTERRELATIONSHIPS

Bikes/Pedestrians

According to the Georgia Statewide Bike Map (2010), SR 20 is not designated as a state bicycle route. Cherokee County does not have a bicycle and pedestrian master plan. However, the City of Canton has a master plan, accommodating bicycle and pedestrian connections from the downtown area to commercial and residential neighborhoods within the city limits, which extends into the SR 20 study area just east of I-575 for approximately 2000 feet. The Forsyth County Bicycle Transportation and Pedestrian Walkways 2025 Plan identifies SR 20 through Forsyth County as a proposed sidewalk route. GDOT recently adopted a Complete Streets policy that will result in a much more holistic approach to cycling accommodations along SR 20, which will be incorporated into the project development process.

Transit

Public Transportation in Cherokee County is provided by the Cherokee Area Transportation System (CATS). CATS provides transportation service to rural residents throughout the county, including para-transit services. CATS also operates a fixed route bus system providing service in and around downtown Canton. Express bus service is jointly provided by Cherokee County and the Georgia Regional Transportation Authority (GRTA), which provides a transportation option to commuters between Canton/Woodstock and midtown and downtown Atlanta. There are currently four proposed transit improvements in Cherokee County noted in the March 2008 CTP, including the Canton Intermodal Facility and expansion of CATS and GRTA bus service on SR 20 near the project corridor in Canton. The planned Intermodal Facility would serve as a transfer station for riders transferring between Canton's fixed route trolley/bus system and the CATS Bus Rapid Transit service that would run from SR 20 to downtown Atlanta.

Public transportation in Forsyth County includes the Xpress 400 bus, which offers weekday service between the City of Cumming and the North Springs MARTA rail station near Perimeter Center and direct service to downtown Atlanta. The express bus

service is provided jointly by Forsyth County and GRTA. In the City of Cumming, a park and ride lot is available to commuters wishing to car pool into the city of Atlanta or wishing to utilize the Xpress 400 bus. This park and ride lot is the terminus for the Xpress 400 express bus that travels to the City of Atlanta. Forsyth County also offers a Dial-A-Ride program to meet the needs of county residents, and includes para-transit service. There are no freight or passenger rail lines in Forsyth County.

The ARC has outlined the regional transit vision in Metro Atlanta in Concept 3 (2012). Concept 3 provides for future express bus service along SR 20 between Cumming and Sugar Hill.

Public transportation or transit service along SR 20 between I-575 and SR 400 is not currently available or planned according to the Concept 3 (2012) ARC plan.

5.0 AGENCY COORDINATION AND PUBLIC OUTREACH

As part of the project development, coordination with state and local agencies and the public has been initiated to adequately define the project's need and purpose. Public scoping meetings were held on May 16 and 21, 2014, and an agency scoping meeting was held on May 20, 2013. A total of 361 people attended the public information open houses (PIOHs), with 148 at Otwell Middle School (Cumming) and 213 at Calvary Baptist Church (Ball Ground). In response to the scoping period comment opportunities, 214 formal comments were received. In addition, two Citizen's Advisory Committees (CACs), comprised of local stakeholders and community representatives for Canton and Cumming, and a Technical Advisory Committee (TAC), comprised primarily of agency and resource representatives, have been formed and will meet throughout the development of this project. The CAC held its first meeting on May 13, 2013 and the TAC on May 20, 2013.

Improving east/west mobility was identified during the scoping process as one of the project needs. Based upon information received from the public during the PIOHs in May 2012, travel time is impeded by the lack of turn lanes at many intersections and driveways along SR 20. In addition, comments received at the PIOHs and the CAC stated that poor east/west mobility along SR 20 is a deterrent that causes them to seek out other available routes. For example, users wishing to make the entire trip between Canton and Cumming will often use I-285 rather than SR 20, which is a longer trip in terms of vehicle miles, but nonetheless can take less time. The data in Table 9 support the public input that identifies constrained east/west mobility as a project need.

The priorities identified by the public during the scoping process supported the preliminary needs identified for the project, which consist of congestion relief, reduce crash frequency, and improve east/west mobility and connectivity. These are the same needs outlined in this Need and Purpose Statement.

6.0 ALTERNATIVES EVALUATION

The information provided in this Need and Purpose Statement will be used to evaluate the effectiveness of alternatives that are developed as possible solutions to the problems of high congestion, high crash frequency, and impaired east/west mobility and connectivity. To meet these needs, the following objectives have been identified:

Need: Improve Mobility for People and Goods

Objectives:

- Accommodate local and regional trip movements
- Maximize operational efficiency
- Improve access to regional activity centers for passenger and freight vehicles
- Improve east/west mobility for passenger and freight vehicles

Need: Reduce Congestion

Objectives:

- Accommodate current and future travel demand
- Reduce traveler delay

Need: Address Safety

Objectives:

- Reduce potential for crashes
- Minimize conflicts (e.g., vehicle/vehicle, vehicle/non-vehicle, and access [e.g., intersections, driveways, etc.])

A formal process to evaluate alternatives is established through the alternatives analysis methodology that will identify criteria/performance measures, which will be used to measure the effectiveness of each proposed alternative. A multi-step screening process will guide the alternatives evaluation to reach the eventual recommendation of a Preferred Alternative. The first step of the screening process will be a fatal flaw analysis to evaluate the ability of all potential alternatives (Universe of Alternatives) to meet the stated Need and Purpose for this project. Potential performance metrics to evaluate the alternatives include: travel time savings (related to east/west mobility), level of service and congestion duration (related to congestion relief), and the potential to reduce crashes (related to crash frequency). In addition, the alternatives screening process will incorporate other performance criteria, including consistency with local planning efforts, cost, potential impacts to environmental resources, public input, and accessibility (referring to access to properties along SR 20; i.e. curb cuts, driveways, etc.). The alternatives analysis methodology will be available for the public and agencies to review and comment on prior to its implementation and the results of each step of the alternatives analysis will be shared with the public. Ultimately, an Alternatives Analysis Technical Report will be appended to the Draft Environmental Impact Statement.

7.0 SUMMARY AND CONCLUSIONS

The proposed project is intended to address a variety of deficiencies along SR 20 between I-575 and SR 400 as identified through an analysis of the existing and future travel demand, operational characteristics along SR 20, existing and future population growth and land use patterns, and public involvement with the users of SR 20. To date, the proposed SR 20 Improvements Canton to Cumming EIS would address the following conditions within the project study area:

- high levels of traffic congestion,

- high crash, injury, and fatality rates above statewide averages for urban and rural principal arterials (2007-2009), and
- limited mobility for east/west travel movements.

In summary, analysis of the existing and future No-Build conditions shows that LOS in many segments of the corridor are already at unacceptable levels with conditions expected to further worsen over time. The anticipated growth in the project area is projected to increase traffic volumes and traffic congestion, thereby limiting east/west mobility and creating delays for east/west, commuter, and local traffic through the corridor. The current crash, injury, and fatality rates for sections of urban and rural principal arterials above respective statewide averages demonstrate the need along SR 20 to reduce crash frequency. The purpose of the project is to provide improvements that address the needs to provide congestion relief, improve east/west mobility, and reduce crash/injury/fatality frequencies on SR 20 between I-575 and SR 400.