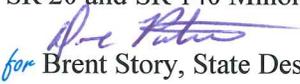


**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

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**OFFICE OF DESIGN POLICY & SUPPORT  
INTERDEPARTMENTAL CORRESPONDENCE**

**FILE** P.I. # 0008947 **OFFICE** Design Policy & Support  
CSSFT-0008-00(947)  
GDOT District 6 - Cartersville  
Cherokee County **DATE** August 2, 2012  
SR 20 and SR 140 Minor Improvements  
**FROM**  for Brent Story, State Design Policy Engineer

**TO** SEE DISTRIBUTION

**SUBJECT** APPROVED CONCEPT REPORT

Attached is the approved Concept Report for the above subject project.

Attachment

**DISTRIBUTION:**

Bobby Hilliard, Program Control Administrator  
Genetha Rice-Singleton, State Program Delivery Engineer  
Cindy VanDyke, State Transportation Planning Administrator  
Angela Robinson, Financial Management Administrator  
Glenn Bowman, State Environmental Administrator  
Andy Casey, State Roadway Design Engineer  
Attn: Mac Cranford, Design Group Manager  
Kathy Zahul, State Traffic Engineer  
Georgene Geary, State Materials & Research Engineer  
Lisa Myers, State Project Review Engineer  
Jeff Baker, State Utilities Engineer  
Ken Thompson, Statewide Location Bureau Chief  
DeWayne Comer, District Engineer  
Mike Haithcok, District Preconstruction Engineer  
Kerry Bonner, District Utilities Engineer  
Cynthia Burney, Project Manager  
BOARD MEMBER - 6th Congressional District

**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA  
PROJECT CONCEPT REPORT**

Project Type: <u>Safety</u>	P.I. Number: <u>0008947</u>
GDOT District: <u>6</u>	County: <u>Cherokee</u>
Federal Route Number: <u>N/A</u>	State Route Number: <u>SR 20, SR 140</u>

<i>Project Description</i> <b>SR 20 FM BARTOW TO FORSYTH &amp; SR 140 FM BARTOW TO FULTON</b>
--

**Submitted for approval:**

<u><i>Mac Crawford</i></u> District Seven Design Engineer	<u>5-22-12</u> DATE
<u><i>Michael Hester</i></u> State Program Delivery Engineer	<u>5-22-12</u> DATE
<u><i>Cynthia C. Burman</i></u> GDOT Project Manager	<u>22 May 2012</u> DATE

**Recommendation for approval:**

<u>Program Control Administrator</u> <u><i>GLENN BOWMAN*/EKP</i></u>	<u>DATE</u> <u>6/7/2012</u>
<u>State Environmental Administrator</u> <u><i>KATHY ZAHUL*/EKP</i></u>	<u>DATE</u> <u>6/25/2012</u>
<u>State Traffic Engineer</u> <u><i>LISA MYERS*/EKP</i></u>	<u>DATE</u> <u>6/5/2012</u>
<u>Project Review Engineer</u> <u><i>PATRICK ALLEN FOR*/EKP</i></u>	<u>DATE</u> <u>6/5/2012</u>
<u>State Utilities Engineer</u>	<u>DATE</u>
<u>District Engineer</u>	<u>DATE</u>
<u>State Transportation Financial Management Administrator</u>	<u>DATE</u>

The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

<u><i>Cynthia A. Vandeputte</i></u> State Transportation Planning Administrator	<u>6-6-12</u> DATE
--	-----------------------

*\* - RECOMMENDATION ON FILE*

### PROJECT LOCATION



\*NOT TO SCALE

*Location Map*

## PLANNING & BACKGROUND DATA

**Project Justification Statement:** The Georgia Department of Transportation is making a concerted effort to develop and strategically implement systemic safety improvements. These improvements vary in size and scope but the objectives remain the same, to reduce fatalities and serious injury crashes. The safety improvements include improved signage and pavement markings; add and/or replace guardrail where appropriate; edgeline and centerline rumble strip installation; and installation of high friction surface treatment where applicable. Listed below are proposed countermeasures and associated crash reduction factors:

Counter Measure	Crash Reduction Factor*
Edgeline Rumble Strips	13%
Centerline Rumble Strips	14%
Post Mounted Delineators/Chevrons	35%
Intersection/Curve Warning Signs	23%
Restriping	38%
Raised Pavement Markers	24%
Object Delineation	38%

\*Source: Federal Highway Administration

State Routes 20 and 140 in Cherokee County, Georgia have been identified as exceeding the statewide crash rates with the predominant crash type involving single vehicle lane departures. The average statewide crash rate was 304 crashes/100 MVMT from 2002-2006 with a corresponding average fatality rate of 1.48 fatalities/100MVMT. S.R. 20 averaged 300 crashes/100 MVMT which was below the statewide average although the average fatality rate (3.15 fatalities/100 MVMT) exceeded the statewide average. Both the average accident and fatality rates for S.R. 140 exceed the statewide average rates, 410 crashes/100 MVMT and 2.52 fatalities/100MVMT, respectively.

State Route 20 in Cherokee County is primarily an east/west Rural Principal Arterial that becomes Urban Principal Arterial through the more densely developed areas. S.R. 140 in Cherokee County is primarily an east/west Major Collector and is classified as an Urban Minor Arterial in areas where there is more development. Land uses vary along these corridors including commercial, industrial, residential, and farm land. The largest commercial density exists near the cities of Canton and Waleska. Information gathered from the Office of Transportation Data revealed a 9% increase in traffic volumes along S.R. 20 from 2004 to 2006 and a 30% growth in traffic volumes on S.R. 140. Both routes currently function at level of service (LOS) D based the Departments highway capacity software.

A large portion of both routes currently have two 12-foot lanes with turning and passing lanes that have been added to the original footprint throughout the years. Both paved and grass shoulders exist along both routes varying from 2-10 feet. In many instances the slopes behind the shoulder drop off significantly due to the hilly terrain. Guardrail has been added in hazardous locations where the terrain allows proper installation. Right of way along these corridors varies from 60 to 300 ft.

**Description of the proposed project:** This project proposes to reduce the crash frequency and severity along the corridors of SR 20 (from Bartow County to Forsyth County) and SR 140 (from Bartow County to Fulton County) in Cherokee County. The project will include upgrading safety enhancements along the combined 53 mile long roadway, by installing edgeline and centerline rumble strips, upgrade existing signage to current standards, post mounted delineators/chevrons, add and/or replace guardrail where appropriate, and installation of high friction surface treatment where applicable.

**Federal Oversight:**  Full Oversight  Exempt  State Funded  Other

**MPO:**  N/A  MPO - Atlanta Regional Commission (ARC)  
 MPO Project TIP # N/A

**Regional Commission:**  N/A  RC – Atlanta Regional Commission (ARC)  
 RC Project ID # N/A

**Congressional District(s):** 6

**Projected Traffic AADT:**  
 Current Year (2010):

SR 140				SR 20		
Beginning MP	Ending MP	AADT		Beginning MP	Ending MP	AADT
0.00	4.22	1,770		0.00	2.16	9,810
4.22	6.88	5,510		2.16	8.12	10,310
6.88	10.75	8,530		8.12	9.49	12,630
10.75	12.18	12,400		9.87	10.64	15,340
12.18	12.92	14,090		12.67	13.56	29,950
12.92	13.88	10,890		13.56	15.99	24,470
16.19	19.49	11,370		15.99	19.25	19,760
19.49	22.23	11,890		19.25	21.34	11,180
22.23	22.57	12,500		21.34	22.54	11,790
22.57	24.94	12,570		22.54	23.88	9,210
24.94	27.01	13,320		23.88	24.96	12,480
				24.96	25.87	9,730

**Functional Classification (Mainline):** Rural Principal Arterial SR 20

**Functional Classification (Mainline):** Urban Minor Arterial Street and Rural Major Collector SR 140

**Is this project on a designated bike route?**  No  YES

**Is this project located on a pedestrian plan?**  No  YES

**Is this project located on or part of a transit network?**  No  YES  
 Cherokee Area Transit System (CATS)

## CONTEXT SENSITIVE SOLUTIONS

Issues of Concern: *N/A*

Context Sensitive Solutions: *N/A*

## DESIGN AND STRUCTURAL DATA

Mainline Design Features: *SR 20/Rural Principal Arterial*

Feature	Existing	Standard*	Proposed
<b>Typical Section</b>			
- Number of Lanes	Varies	N/A	Varies
- Lane Width(s)	12 ft	12 ft	12 ft
- Median Width & Type	N/A	N/A	N/A
- Outside Shoulder Width & Type	Varies	10 ft	Varies
- Outside Shoulder Slope	Varies	N/A	Varies
- Inside Shoulder Width & Type	N/A	N/A	N/A
- Sidewalks	N/A	N/A	N/A
- Auxiliary Lanes	12 ft	12 ft	12 ft
- Bike Lanes	N/A	N/A	N/A
Posted Speed	30-55 mph		30-55 mph
Design Speed	30-55 mph	30-55 mph	30-55 mph
Min Horizontal Curve Radius	N/A	N/A	N/A
Superelevation Rate	N/A	6%	N/A
Grade	N/A	3-5%	N/A
Access Control	By Permit	By Permit	By Permit
Right-of-Way Width	60' to 300'	N/A	N/A
Maximum Grade – Crossroad	N/A	N/A	N/A
Design Vehicle	N/A	WB-40 or WB-62	N/A

\*According to current GDOT design policy if applicable

## DESIGN AND STRUCTURAL DATA

Mainline Design Features: *SR 140/Urban Minor Arterial Street and Rural Major Collector*

Feature	Existing	Standard*	Proposed
<b>Typical Section</b>			
- Number of Lanes	Varies	N/A	Varies
- Lane Width(s)	12 ft	12 ft	12 ft
- Median Width & Type	N/A	N/A	N/A
- Outside Shoulder Width & Type	Varies	10 ft	Varies
- Outside Shoulder Slope	Varies	N/A	Varies
- Inside Shoulder Width & Type	N/A	N/A	N/A
- Sidewalks	N/A	N/A	N/A
- Auxiliary Lanes	12 ft	12 ft	12 ft
- Bike Lanes	N/A	N/A	N/A
Posted Speed	35-55 mph		35-55 mph
Design Speed	35-55 mph	35-55 mph	35-55 mph

<b>Min Horizontal Curve Radius</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>Superelevation Rate</b>	<b>N/A</b>	<b>6%</b>	<b>N/A</b>
<b>Grade</b>	<b>N/A</b>	<b>6-9%</b>	<b>N/A</b>
<b>Access Control</b>	<b>By Permit</b>	<b>By Permit</b>	<b>By Permit</b>
<b>Right-of-Way Width</b>	<b>60' to 300'</b>	<b>N/A</b>	<b>N/A</b>
<b>Maximum Grade – Crossroad</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>Design Vehicle</b>	<b>N/A</b>	<b>WB-40 or WB-62</b>	<b>N/A</b>

\*According to current GDOT design policy if applicable

**Major Structures:** *No changes proposed*

<b>Structure</b>	<b>Existing</b>	<b>Proposed</b>
○ SR 20 over Etowah River	N/A	N/A
○ SR 20 under FAS1375/Marietta	N/A	N/A
○ SR 20 under CR 341/Killian St.	N/A	N/A
○ SR 20 over SR 417/I-575	N/A	N/A
○ SR 20 under RMP I-575 to SR 20	N/A	N/A
○ SR 20 over Smithwick Creek	N/A	N/A
○ SR 140 over Shoal Creek	N/A	N/A
○ SR 140 over Moore Creek	N/A	N/A
○ SR 140 over Sardis Creek	N/A	N/A
○ SR 140 under SR 417/I-575 SBL	N/A	N/A
○ SR 140 under SR 417/I-575 NBL	N/A	N/A
○ SR 140 over Scott Mill Creek	N/A	N/A
○ SR 140 over Mill Creek	N/A	N/A
○ SR 140 over Little River	N/A	N/A

**Major Interchanges/Intersections:**

- SR 20 @ SR 108
- SR 20 @ Marietta Hwy
- SR 20 @ SR 140/SR 5 Bus
- SR 20/SR 140 @ I-575 (south end)
- SR 20 @ I-575 (north end)
- SR 20 @ SR 372
- SR 140 @ SR 108
- SR 140 @ SR 5 Connector
- SR 140 @ SR 5 Bus
- SR 140 @ I-575 (north end)

**Utility Involvements:** *None Anticipated*

**Public Interest Determination Policy and Procedure recommended (Utilities)?**  YES  NO

**SUE Required:**  Yes  No

**Railroad Involvement:** Georgia Northeastern Railroad Company, SR 140 Mile Point 16.82, RRG – 340893G. Coordination is to be determined.

Required Right-of-Way anticipated:  YES  NO  Undetermined  
 Easements anticipated:  Temporary  Permanent  Utility  Other

Anticipated number of impacted parcels: 0  
 Anticipated number of displacements (Total): 0  
 Businesses: 0  
 Residences: 0  
 Other: 0

Location and Design approval:  Not Required  Required

Off-site Detours Anticipated:  No  Yes  Undetermined

Transportation Management Plan Anticipated:  YES  NO

**Design Exceptions to FHWA/AASHTO controlling criteria anticipated:**

FHWA/AASHTO Controlling Criteria	YES	Appvl Date (if applicable)	NO	Undetermined
1. Design Speed	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Lane Width	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Shoulder Width	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Bridge Width	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Horizontal Alignment	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Superelevation	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Vertical Alignment	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Grade	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Stopping Sight Distance	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Cross Slope	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
11. Vertical Clearance	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
12. Lateral Offset to Obstruction	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
13. Bridge Structural Capacity	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Design Variances to GDOT standard criteria anticipated:**

GDOT Standard Criteria	Reviewing Office	YES	Appvl Date (if applicable)	NO	Undetermined
1. Access Control - Median Opening Spacing	DP&S	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Median Usage & Width	DP&S	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Intersection Skew Angle	DP&S	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Lateral Offset to Obstruction	DP&S	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Intersection Sight Distance	DP&S	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Bike & Pedestrian Accommodations	DP&S	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. GDOT Drainage Manual	DP&S	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Georgia Standard Drawings	DP&S	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. GDOT Bridge & Structural Manual	Bridge Design	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Roundabout Illumination - (if applicable)	DP&S	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
11. Rumble Strips/Safety Edge	DP&S	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>

**VE Study anticipated:**  No  Yes  Completed – Date:

**ENVIRONMENTAL DATA**

**Anticipated Environmental Document:**

**GEPA:**  **NEPA:**  Categorical Exclusion  EA/FONSI  EIS

**Air Quality:**

Is the project located in a PM 2.5 Non-attainment area?  No  Yes  
 Is the project located in an Ozone Non-attainment area?  No  Yes  
 The proposed project matches the conforming plan’s model description.

**Environmental Permits/Variations/Commitments/Coordination anticipated:**

Permit/ Variance/ Commitment/ Coordination Anticipated	YES	NO	Remarks
1. U.S. Coast Guard Permit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Forest Service/Corps Land	<input type="checkbox"/>	<input checked="" type="checkbox"/>	OES will coordinate with the Army Corp of Eng for the replacement of the existing guardrail @ SR 20 over Lake Allatoona
3. CWA Section 404 Permit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4. Tennessee Valley Authority Permit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5. Buffer Variance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6. Coastal Zone Management Coordination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7. NPDES	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8. FEMA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
9. Cemetery Permit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
10. Other Permits	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
11. Other Commitments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
12. Other Coordination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

**Is a PAR required?**  No  Yes  Completed – Date:

**NEPA/GEPA:** No significant issues anticipated.

**Ecology:** It is anticipated that there will be no significant ecological issues.

**History:** There are no potential or known historic resources in the survey corridor. A historic survey is required. It is anticipated that a No Historic Properties Affected would be appropriate for this project.

**Archeology:** There are no potential or known archaeological resources present in the survey corridor. An archeology survey is required. It is anticipated that an archeology short form will be appropriate for this project.

**Air & Noise:** Air modeling with be required if traffic signal installation is needed. Noise study is to be determined.

**Public Involvement:** No Public involvement.

**Major stakeholders:** Traveling public

## CONSTRUCTION

**Issues potentially affecting constructability/construction schedule:** None

**Early Completion Incentives recommended for consideration:**  No  Yes

## PROJECT RESPONSIBILITIES

### Project Activities:

Project Activity	Party Responsible for Performing Task(s)
Concept Development	GDOT D7 Design
Design	GDOT D7 Design
Right-of-Way Acquisition	N/A
Utility Relocation	None Anticipated
Letting to Contract	GDOT
Construction Supervision	GDOT D6 Construction
Providing Material Pits	None Required
Providing Detours	None Anticipated
Environmental Studies, Documents, and Permits	GDOT –Office of Environmental Services
Environmental Mitigation	GDOT –Office of Environmental Services
Construction Inspection & Materials Testing	GDOT D6 Construction

**Lighting required:**  No  Yes

**Initial Concept Meeting:** N/A

**Concept Meeting:** Held on April 05, 2012

### Other projects in the area:

- PI 662650, STP00-0012-01(112), SR 20 @ SR 108; CR 17/WHITE RD & CR 13/MT CARMEL LANE, Intersection Improvement, Mgmt Let Date of 03/15/2013

**Other coordination to date:** N/A

**Project Cost Estimate and Funding Responsibilities:**

	<b>Breakdown of PE</b>	<b>ROW</b>	<b>Utility</b>	<b>CST*</b>	<b>Environmental Mitigation</b>	<b>Total Cost</b>
By Whom	GDOT	N/A	N/A	GDOT	N/A	
	\$607,657.21	N/A	N/A	\$1,869,737.49	N/A	\$ 2,477,394.70
Date of Estimate	3/6/2012			6/25/2012		

\*CST Cost includes: Construction, Engineering and Inspection, and Liquid AC Cost Adjustment.

**ALTERNATIVES DISCUSSION**

**Alternative selection:**

<b>Preferred Alternative: Short Term Recommendations from the SR 20 and SR 140 Roadway Safety Study</b>			
<b>Estimated Property Impacts:</b>	<b>None</b>	<b>Estimated Total Cost:</b>	<b>\$1,869,737.49</b>
<b>Estimated ROW Cost:</b>	<b>None</b>	<b>Estimated CST Time:</b>	<b>9 Months</b>
<b>Rationale:</b> Due to budget constraints the short term recommendations are as follows: Edgeline Rumble Strips, Centerline Rumble Strips, upgrade existing sign to current standards, restripe the travel lanes, add Raised Pavement Markers, replace existing guardrail with wood offset blocks, and installation of high friction surface treatment			

<b>No-Build Alternative:</b>			
<b>Estimated Property Impacts:</b>	<b>0</b>	<b>Estimated Total Cost:</b>	<b>\$0</b>
<b>Estimated ROW Cost:</b>	<b>\$0</b>	<b>Estimated CST Time:</b>	<b>0</b>
<b>Rationale:</b> The no-build alternative was not selected as it does not satisfy the need for the project.			

<b>Alternative 1: SR 20 and SR 140 Widening</b>			
<b>Estimated Property Impacts:</b>	<b>Undetermined</b>	<b>Estimated Total Cost:</b>	<b>\$199,000,000</b>
<b>Estimated ROW Cost:</b>	<b>\$164,500,000</b>	<b>Estimated CST Time:</b>	<b>36 Months</b>
<b>Rationale:</b> Due to budget constraints it is not feasible to widen SR 20 and SR 140 because of the construction cost, ROW cost, and potential property impacts.			

**Comments:** N/A

**Attachments:**

1. Detailed Cost Estimates:
2. SR 20 and SR 140 Roadway Safety Study
3. SR 20 and SR 140 Collision Types Table
4. Minutes of Concept Meetings



STATE HIGHWAY AGENCY

JOB DETAIL ESTIMATE

DATE : 06/25/2012  
PAGE : 1

JOB NUMBER : 0008947\_CK SPEC YEAR: 01  
DESCRIPTION: SR 20 FM BARTOW TO FORSYTH & SR 140 FM BARTOW TO FULTON RESURFACING

ITEMS FOR JOB 0008947\_CK

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	150-1000		LS	TRAFFIC CONTROL - PI0008947	1.000	150000.00	150000.00
0009	210-0100		LS	GRADING COMPLETE - PI008947	1.000	200000.00	200000.00
0010	456-2020		GLM	INDENT, EDG LN RUMB STRP - GND-IN-PL(CON)	66.000	670.04	44222.64
0020	456-2025		GLM	INDNT, CNTR LN RUMB STRP - GND-IN-PL(CON)	33.000	860.00	28380.00
0085	632-0003		EA	CHANGEABLE MESS SIGN,PORT,TP 3	4.000	15336.87	61347.50
0088	424-1000		SF	HIGH FRICTION SURF TRT	80000.000	3.35	268000.00
0089	636-1020		SF	HWY SGN,TP1MAT,REFL SH TP3	7680.000	13.19	101346.66
0090	636-2070		LF	GALV STEEL POSTS, TP 7	7200.000	8.30	59771.66
0098	641-5001		EA	GUARDRAIL ANCHORAGE, TP 1	30.000	631.75	18952.77
0099	641-5006		EA	GUARDRAIL ANCHORAGE, TP 6	6.000	426.96	2561.81
0104	641-5012		EA	GUARDRAIL ANCHORAGE, TP 12	30.000	1708.22	51246.80
0109	641-1200		LF	GUARDRAIL, TP W	36960.000	12.56	464234.23
0114	641-1100		LF	GUARDRAIL, TP T	1000.000	47.13	47133.95
0119	653-0120		EA	THERM PVMT MARK, ARROW, TP 2	32.000	75.63	2420.36
0124	647-1000		LS	TRAF SIGNAL INSTALLATION NO - 1	1.000	50000.00	50000.00
0129	639-4004		EA	STRAIN POLE, TP IV	2.000	7082.87	14165.75
0134	653-1704		LF	THERM SOLID TRAF STRIPE,24",WH	862.000	4.01	3457.46
0139	653-1804		LF	THERM SOLID TRAF STRIPE, 8",WH	3555.000	2.49	8868.73
0144	653-2501		LM	THERMO SOLID TRAF ST, 5 IN,WH	66.000	1370.21	90434.31
0149	653-2502		LM	THERMO SOLID TRAF ST, 5 IN YE	50.000	1362.34	68117.09
0154	653-4502		GLM	THERMO SKIP TRAF ST, 5 IN, YEL	17.000	883.39	15017.66
0159	653-6004		SY	THERM TRAF STRIPING, WHITE	17.000	5.15	87.70
0164	654-1001		EA	RAISED PVMT MARKERS TP 1	3490.000	2.69	9412.84
0169	654-1003		EA	RAISED PVMT MARKERS TP 3	364.000	5.05	1840.42
0174	163-0240		TN	MULCH	4.500	398.57	1793.60
0178	163-0232		AC	TEMPORARY GRASSING	1.000	719.87	719.88
0179	165-0030		LF	MAINT OF TEMP SILT FENCE, TP C	3200.000	1.56	4996.51
0184	171-0030		LF	TEMPORARY SILT FENCE, TYPE C	1600.000	3.83	6137.54
0189	700-6910		AC	PERMANENT GRASSING	1.000	735.78	735.79
0194	700-7000		TN	AGRICULTURAL LIME	3.000	72.46	217.41
0199	700-8000		TN	FERTILIZER MIXED GRADE	1.000	380.84	380.85
0204	700-8100		LB	FERTILIZER NITROGEN CONTENT	50.000	3.00	150.45
0209	713-3002		SY	WOOD FIBER BLANKET,TP II,SLOPES	1750.000	2.60	4550.00
ITEM TOTAL							1780702.38
INFLATED ITEM TOTAL							1780702.37

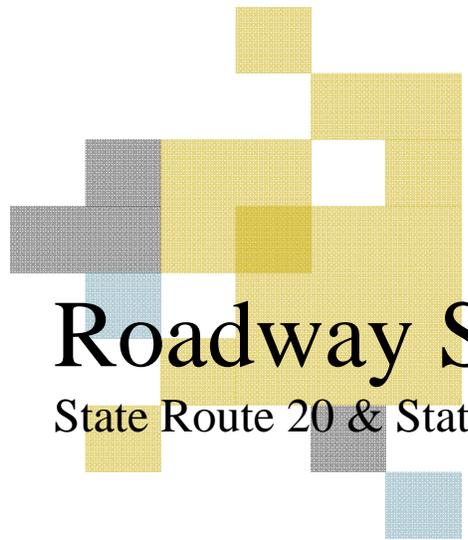
STATE HIGHWAY AGENCY

DATE : 06/25/2012  
PAGE : 2

JOB DETAIL ESTIMATE

TOTALS FOR JOB 0008947\_CK

ESTIMATED COST: 1780702.37  
ENGINEERING AND INSPECTION(5.0): 89035.12  
ESTIMATED TOTAL: 1869737.49



# Roadway Safety Study

State Route 20 & State Route 140—Cherokee County, GA

**Study Conducted By:**

Patrick Allen, E.I.T.

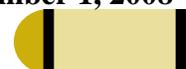
Michael D. Turpeau Jr., E.I.T.

Katherine D'Ambrosio

**Georgia Department of Transportation**

**Office of Traffic Operations**

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## **Objective**

The purpose of this roadway safety study is to investigate State Route 20 (S.R. 20) and State Route 140 (S.R. 140) within Cherokee County, Georgia and provide cost effective solutions to enhance safety along these routes. The investigation focuses on the overall safety of each route through the examination of crash data, roadway maintenance history, and the roadway project history.

## **Background**

S.R. 20 in Cherokee County is primarily an east-west Rural Principal Arterial that becomes Urban Principal Arterial through more densely developed areas. S.R. 140 in Cherokee County is also primarily an east/west Major Collector and is classified as an Urban Minor Arterial in areas where there is more development. There are various types of land use along both corridors including commercial, industrial, residential, and farm land. The largest commercial density exists near the cities of Canton and Waleska. Information gathered from the Office of Transportation Data revealed a 9% increase in traffic volumes along S.R. 20 from 2004 to 2006 and a 30% growth in traffic volumes on S.R. 140. Both routes currently function at level of service (LOS) D based the departments highway capacity software.

S.R. 20 and S.R. 140 were constructed prior to 1940 when guidelines regarding clear zone, shoulder slopes, guardrail, and vertical and horizontal alignments were less stringent. Early roads were often designed and built by a 10-15 man crew with a single engineer, and alignments were often changed as the roadway was being built.

A large portion of both routes currently have two 12-foot lanes with turning and passing lanes that have been added to the original footprint throughout the years. Both paved and grass shoulders exist along both routes varying from 2-10 feet. In many instances the slopes behind the shoulder drop off significantly due to the hilly terrain. Guardrail has been added in hazardous locations where the terrain allows proper installation. Right of way along these corridors varies from 60 to 300 ft.

## **Crash Data**

The crash data used in this evaluation was derived by analyzing the number of crashes and fatalities in relation to the amount of traffic along a given route or at an intersection. These rates are expressed as crashes or fatalities per 100 Million Vehicle Miles Traveled (MVMT). This methodology provides us the opportunity to compare the safety of individual routes or intersections throughout the state.

The average statewide accident rate was 304 crashes/100 MVMT from 2002-2006 with a corresponding average fatality rate of 1.48 fatalities/100MVMT. S.R. 20 averaged 300 crashes/100 MVMT which was below the Statewide average; conversely the average fatality rate (3.15 fatalities/100 MVMT) exceeded the statewide average. Both the average accident and fatality rates for S.R. 140 exceed the Statewide average rates, 410 crashes/100 MVMT and 2.52 fatalities/100MVMT, respectively. Figures 1 and 2 shows graphically, the crash and fatality rates for S.R. 20 and S.R. 140 along with the Statewide crash and fatality rates. These figures are located on pages 11 and 12.

Table 1 shows the average crash and fatality rates for S.R. 20 and S.R. 140 compared to other state routes with similar roadway characteristics and traffic volumes.

**Table 1**

Route Comparison			
Routes	County	Crash Rate Averages (2002 - 2006)	Fatality Rate Averages (2002 - 2006)
S.R. 20	Cherokee	300	3.15
S.R. 140	Cherokee	410	2.52
S.R. 372	Cherokee	235	3.17
S.R. 41	Meriwether	236	1.27
S.R. 34	Coweta	483	1.77
S.R. 109	Troup	222	0.66
Statewide	N/A	304	1.48

Tables 2 and 3 highlight the intersections that experienced the highest number of crashes from 2004-2006. These intersections are referred to as hotspots, and only one of the thirteen was listed on the Top 150 Dangerous Intersection list during the study period. Table 4 illustrates the Statewide Intersection Category Summary which summarizes intersections based on functional classification and types based on crash rates.

Table 2

S.R. 20 2004-06 Intersection "Hotspots"					
Intersection	Classification	Type	Number of Crashes	Number of Fatality	Crash Rate
S.R. 20 at CR 192/Charles Cobb Ln	Rural	Unsignalized	22	1	3.75
S.R. 20 at CR 762/Harmony Dr	Rural	Unsignalized	40	0	5.58
S.R. 20 at CR 765/E Cherokee Dr	Rural	Signalized	35	0	5.92
S.R. 20 at CR 1061/Marietta Hwy	Urban	Signalized	62	0	6.71
S.R. 20 at SR 369/Hightower Rd	Rural	Unsignalized	32	0	6.32
S.R. 20 at SR 372/Ball Ground Rd	Rural	Signalized	30	0	6.33
S.R. 20 at CR 477	Urban	Unsignalized	28	0	6.45

Table 3

S.R. 140 2004-06 Intersection "Hotspots"					
Intersection	Classification	Type	Number of Crashes	Number of Fatality	Crash Rate
S.R. 140 at CR 297/Earney Rd	Urban	Signalized	21	0	3.92
*S.R. 140 at CR 298/Batesville Rd	Rural	Unsignalized	33	0	7.63
S.R. 140 at CR 765/ E Cherokee Dr	Rural	Signalized	71	0	16.23
S.R. 140 at CR 777/Arnold Mill	Urban	Unsignalized	20	0	3.63
S.R. 140 at CR 778/Hickory Rd	Urban	To Be Signalized	27	0	6.65
S.R. 140 at CS 703-03/Hospital Rd	Urban	Unsignalized	23	0	4.61

\* Intersection listed on Georgia's Top 150 Dangerous Intersections from 2004—2006

Table 4

Statewide Intersection Category Summary							
Category		Classification	Type	Crash Rates			
				2004	2005	2006	Avg. ('04 - '06)
1	State Route with State Route	Urban	Signalized	27.99	16.73	26.16	23.63
2	State Route with State Route	Rural	Signalized	11.37	5.60	8.80	8.59
3	State Route with State Route	Urban	Unsignalized	8.94	5.28	7.64	7.29
4	State Route with State Route	Rural	Unsignalized	2.85	1.38	2.52	2.25
5	State Route with Other Route	Urban	Signalized	19.72	12.42	19.89	17.34
6	State Route with Other Route	Rural	Signalized	9.92	5.22	6.79	7.31
7	State Route with Other Route	Urban	Unsignalized	3.95	2.47	3.78	3.40
8	State Route with Other Route	Rural	Unsignalized	0.99	0.35	0.80	0.71

Tables 2 through 4 can be used in conjunction to examine the relative safety of these intersections based on intersection category, classification, and type.

**For example:** S.R. 20 at County Route (CR) 192 had 22 crashes over the three year period producing an average of 7.33 crashes per year. This intersection fits into the statewide category number 8 (state route with other route, rural, unsignalized), which has an average accident rate of 0.71 crashes per year. This shows that this intersection is over ten times more likely to have an accident than another intersection of the same type in the state.

## Maintenance History

The Georgia Department of Transportation (GDOT) uses visual inspection in conjunction with a computerized Pavement Condition Evaluation System (PACES) to determine the condition of the pavement and the need for resurfacing. The PACES program takes into consideration roadway rutting depth, block cracking, and longitudinal cracking to develop a rating for the roadway. Roadways with a rating of 70 or below are determined to need resurfacing. Table 5 shows the PACES Rating for sections of S.R. 20 and S.R. 140.

Table 5

Resurfacing Status			
Route	Location	PACES Rating	Funding Year
S.R. 20	From Bartow County Line to S.R. 5 Business	68	2009
S.R. 20	From I-575 to the Forsyth County Line	70	2007
S.R. 140	From Bartow County Line to S.R. 108	92	N/A
S.R. 140	From State Route 108 to S.R. 5 Business	68	2009
S.R. 140	From I-575 to the Fulton County Line	71	2008

From March 2005 through March 2008 GDOT has spent in excess of \$103,509 in maintenance costs for S.R. 20 and more than \$93,903 in maintenance costs for S.R. 140. Maintenance activities include: striping/restriping, adding/replacing signs, pavement edge rut repair, repair/install guardrail, adding/replacing raised pavement markers, shoulder clipping, shoulder/slope repair, driveways, and unpaved road repair.

## Projects History

Since the original construction of S.R. 20 and S.R. 140 several improvements have been made. These projects included passing lanes, truck climbing lanes, the addition of turn lanes, signal upgrades, intersection improvements, and bridge replacements. Where projects have been implemented the roadway design standards were brought up to the current standards at the time of construction. There are four projects currently under construction: I-575 @ S.R. 20 interchange, S.R. 140 @ Batesville Road, S.R. 140 @ Sugar Pike Road, and SR 140 widening from Arnold Mill Road to Mountain Rd.

There are several other projects proposed for these corridors that will improve the overall safety and functionality of the roadways, many of which are in the Department's Long Range Plan. These projects are listed in Table 6 and Table 7.

**Table 6**  
**SR 20 Proposed Projects**

PI #	Description	Work type	Fiscal Yea	Construction	Right of Way	Length(mi)
0002862	SR 20 from SR 369 in Cherokee to SR 371 in Forysth	Widening	LR	\$ 15,000,000	\$ 80,957,000	6.37
*0003681	SR 20 from I-575 to SR 369	Widening	LR	\$ 25,000,000	\$ 44,000,000	8.64
0007836	SR 20 from I-75 to I 575 in Cherokee	Widening	LR	\$ 46,110,000	\$ 13,832,000	19.41
*0008804	SR 20 from I-575 to SR 369	Widening	2010	N/A	\$ 1,000,000	8.64
632790	SR 20 from I-575 to CR 238- 3 truck Climbing Lanes/Intersection Improvement	Passing lanes	2009	\$ 15,138,000	\$ 7,519,000	4.90
632900	SR 20 @ Etowah River	Bridge	LR	N/A	N/A	N/A
662650	SR 20 @ SR 108; CR 17/White Rd & CR 13/ Mt Carmel Lane	Safety	2011	\$ 1,184,000	\$ 100,000	0.20
M003823	SR 20 from SR5/I-575 to Forsyth County Line	Resurf	2009	\$ 1,888,677	N/A	13.27

**Table 7**  
**SR 140 Proposed Projects**

PI #	Description	Work Type	Fiscal Yea	Construction	Right of Way	Length(mi)
0006036	SR 140 from E Valley Rd(Bartow) to Garland Mtn Trl(Cherokee)	Passing Lanes	LR	\$ 1,306,000	\$ 650,000	3.75
0006037	SR 140 from Little Refuge Rd to Shoal Creek	Passing lanes	LR	\$ 435,000	\$ 200,000	N/A
0006040	SR 140 from CR 765/E Cherokee Dr to I-575	Widening	LR	\$ 42,357,000	\$ 25,460,000	5.63
621240	SR 140 from Cherokee Rd to Mountain Rd	Widening	2013	\$ 25,138,000	\$ 15,901,000	3.29
630942	SR 140 from SR 5 Business(Canton) to CR 766/Lower Burris Rd	Widening	LR	\$ 10,924,000	\$ 23,720,000	3.22
641900	SR 140 from CR 766 to CR 52	Widening	LR	\$ 5,054,000	\$ 280,000	2.89
642040	SR 140 EB MP	Passing lanes	LR	N/A	N/A	N/A
721305	SR 140 from Ranchette Rd to CR 311/Moutnain Rd	Widening	LR	\$ 30,459,000	\$ 8,886,000	3.61
721308	SR 140 over Little River	Bridge	2010	N/A	N/A	N/A

LR- Long Range Projects, programmed beyond six-year plan

\*- Twin Projects

## Conclusion

This roadway safety study examined S.R. 20 and S.R. 140 within Cherokee County, Georgia by evaluating crash data, roadway maintenance history, and roadway construction project history to determine the overall safety of each route.

In only two of the five years examined has the crash rate along S.R. 20 exceeded the statewide average, but the fatality rate has consistently been twice the statewide average. Of the crashes that occurred, 48% were rear end, 24% were not a collision with a motor vehicle, 17% were angle, 9% were sideswipes, and 3% were head on. The high volume of rear-end crashes could result from motorists breaking at unexpected locations which can be attributed to a lack of turn lanes and/or capacity deficiencies that cause back up along the mainline. Crashes coded as not a collision with a motor vehicle are those crashes where vehicles exit the roadway, striking mailboxes, trees, ditches, etc. Due to the terrain, crashes where vehicles exit the roadway are often fatal, which could be a contributing factor of the higher fatality rates. Angle accidents generally occur when sight distance is limited or when motorists take unacceptable gaps for entering and/or exiting the major throughway.

The crash rates for S.R. 140 exceeds the statewide average in each of the study years, and in four of the five years the fatality rate exceed the statewide average. Crashes along S.R. 140 break down as follows: 43% rear end, 28% not a collision with a motor vehicle, 19% angle, 7% sideswipe, and 3% head on. The same contributing factors mentioned for S.R. 20 apply.

Since the original construction the Georgia DOT has taken steps to improve safety along these corridors by improving clear zones, adding improved signage, providing pavement markings, and installing auxiliary lanes. Projects currently programmed are intended to provide the ultimate long term safety and efficiency of these roadways, but there may be opportunities to provide additional safety in the interim.

## Recommendations & Action Plan

Due to budget constraints all of the recommendations are not be feasible at one time, therefore the recommendations are placed in three categories: short, intermediate, and long term. This structure will allow staged implementation which may prove to be more cost effective. Tables 8-11 illustrate some suggested corrective measures and potential benefits of implementation.

Several locations have been highlighted for specific corrective measures and are attached in the appendix. The illustrations detail potential corrective measures for the types of crashes occurring at each location; these recommendations are categorized as intermediate to long term.

The Department is committed to consolidating the short term recommendations into a single project to be completed during the 2009 calendar year. The Department is also committed to retaining the projects that include the modifications to the intersections mentioned in the intermediate recommendations section.

**Table 8**

Short Term Recommendations	Estimated Cost (S.R. 20 & S.R. 140)	Federal Highway Administration Crash Reduction Factor
Edgeline Rumble Stripes	\$200,000	13%
Centerline Rumble Stripes	\$100,000	14%
Post Mounted Delineators/Chevrons	\$50,000	35%
Intersection/Curve Warning Signs	\$150,000	23%
Restriping	\$175,000	38%
Raised Pavement Markers	\$35,000	24%
Object Delineation	\$70/Object Delineator	38%
Tree Removal For Sight Distance	\$1500/Acre	38%
<b>Total: \$1,000,000</b>		

**Table 9**

Intermediate Recommendations	Estimated Cost (S.R. 20 & S.R. 140)	Project Let Year	Federal Highway Administration Crash Reduction Factor
Two Way Left Turn Lan	\$6,000,000	N/A	34%
* SR 20 @ Union Hill/Harmony Rd Realignment	\$425,000	2009	58%
* SR 20 @ Scott Rd/Weaver Cir Realignment	\$285,000	N/A	58%
* SR 20 @ SR 369/Hightower Rd Realignment	\$250,000	2009	58%
Right Turn Lanes @ Skewed Intersections	\$250,000	N/A	58%
SR 140 @ Hospital Rd Improvements	\$365,000	N/A	58%
4' Shoulder Widening	\$2.5M/mil	N/A	25%

**Table 10**

Long Term Recommendations	Estimated Cost		Benefit
	CONST	R/W	
SR 20 Widening	\$86M	\$90M	Added capacity and safety
SR 140 Widening	\$113M	\$74.5M	Added capacity and safety

**Table 11**

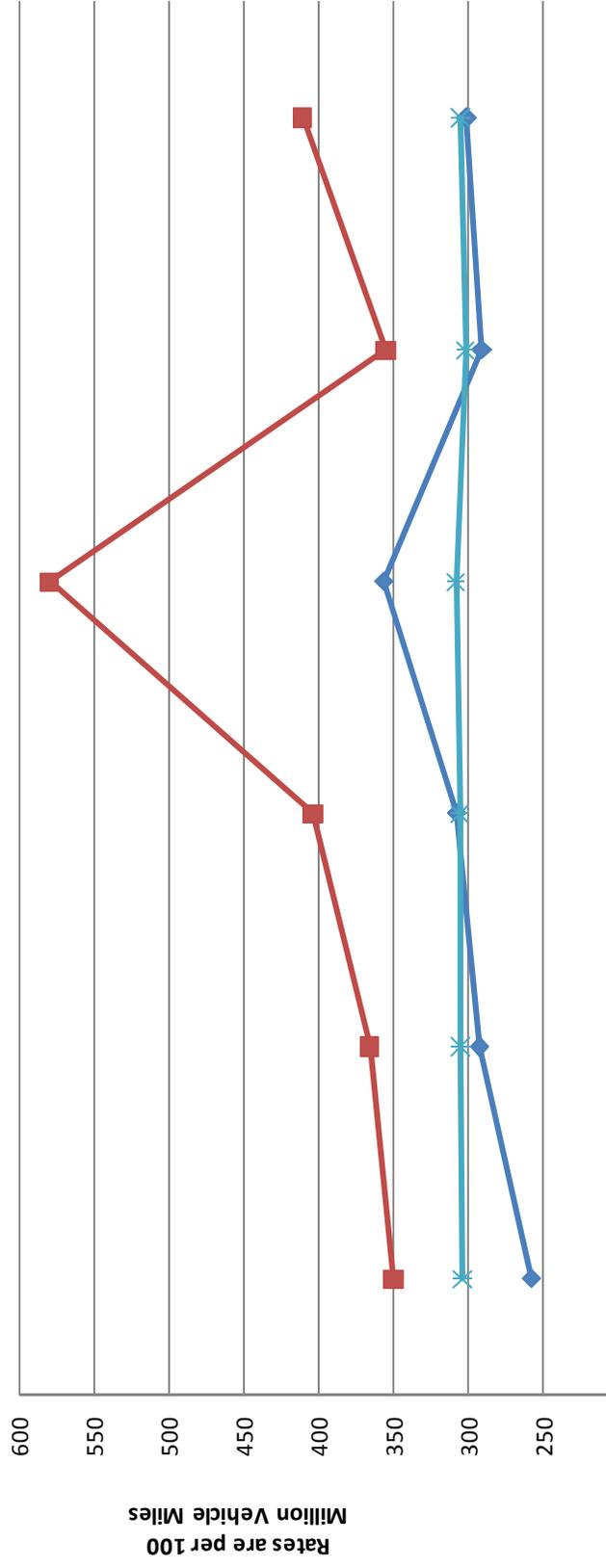
**Crash Reductions Related to Shoulder Widening**

Shoulder Widening per Side (FT)	Reduction in Related Crash Types (%)	
	Paved	Unpaved
2	16	13
4	29	25
6	40	35
8	49	43

\* - Intersections are within the limits of proposed GDOT projects, estimated costs are for work related to the intersection improvements only

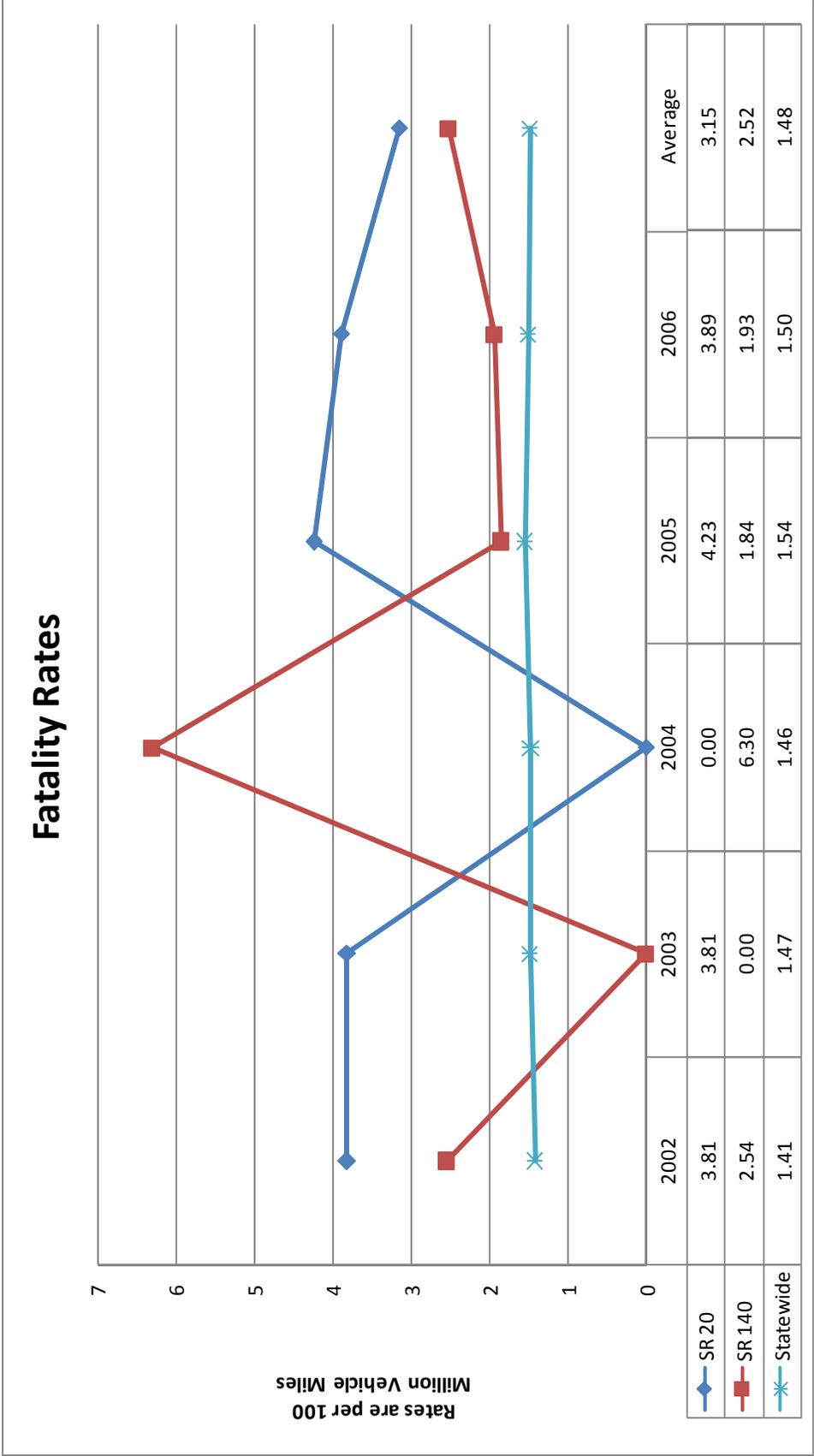
# Appendix

# Crash Rates



Year	2002	2003	2004	2005	2006	Average
SR 20	257	292	307	356	290	300
SR 140	349	365	403	579	354	410
Statewide	303	304	305	307	301	304

**Figure 1: 2002-06 Crash Rates**



**Figure 1: 2002-06 Fatality Rates**

**Collisions Types for SR 20 and SR 140 in Cherokee County from 2006-2011**

<b>SR 20</b>			<b>SR 140</b>	
<b>Collision Type</b>	<b>Number</b>		<b>Collision Type</b>	<b>Number</b>
Angled	272		Angled	252
Head On	43		Head On	29
Not a Collision w/A Motor Vehicle	368		Not a Collision w/A Motor Vehicle	320
Rear End	778		Rear End	590
Sideswipe - Opposite Direction	34		Sideswipe - Opposite Direction	26
Sideswipe - Same Direction	68		Sideswipe - Same Direction	43
			Motor Vehicle in Motion	144
			Other	67



- Lisa Wesley discussed area along the project corridor, where the suggested safety enhancements have already been implemented.
- Mac preceded by going over the layout of SR 20 and SR 140 noting the suggested locations where the improvements would be.
- Cynthia mentioned when using the centerline rumble strips to not break them at every driveway.
- Michael Turpeau discussed adding High Friction Surface Treatment to certain sections of the roadway along the project.
- Two proposed location where High Friction Surface Treatment could be applied is:
  - Knox Bridge Area on SR 20 between MP 4.1 - 5.2
  - SR 140 MP 16.2 - 17.5
- District 6 Traffic Ops discussed locations where some of the proposed safety enhancements were constructed under another project.
- District 6 traffic Ops also proposed a location to install guardrail: SR 140 MP 17.4 – 19.0
- During the discussion of the project it was determined that SR 20 @ Hightower Rd is being realigned under another project.
- Michael Turpeau discussed replacing the existing signs with 48” x 48”.
- Mac discussed the idea of making Hospital Rd @ SR 140 a right out only, and it was determined that there would be disapproval from the public.
- Cynthia asked the CCWSA if they saw any potential conflicts with any of their facilities. And they responded that with the scope and the natural of the project they did not see anything that would cause conflict. But they did want to be informed when all the guardrail locations are finalized.
- Cynthia thanked everyone again for attending the meeting and for their input. Also she stated, that is if anyone thought of any additional locations along the project that could fall under the scope of this project, to let contact her.
- The meeting was adjourned.

This document represents GDOT District 7 Design interpretation of the meeting. Please contact Mac Cranford at [mcranford@dot.ga.gov](mailto:mcranford@dot.ga.gov) or at 770-986-1260 if you have any questions, comments or concerns.