DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: STP00-0012-01(107)
CSSTP-0009-00(164), Cherokee County
P. I. Nos.: 632790 & 0009164
SR 20 Widening and Truck Climbing Lanes

OFFICE: Engineering Services

DATE: February 17, 2009

FROM: Ronald E. Wishon, Acting Project Review Engineer RW

TO: Kent L. Sager, District Engineer
Attention: DeWayne Comer, Project Manager

SUBJECT: IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES

Recommendations for implementation of Value Engineering Study Alternatives are indicated in the table below. Incorporate alternatives recommended for implementation to the extent reasonable in the design of the project.

SR 20 Widening from I-575 to CR 288/Scott Rd. – CSSTP-0009-00(164), PI No.0009164

ALT No.	Description	Savings PW & LCC	Implement	Comments
ROADWAY (RD)				
RD-6	Use a single multi-use trail in lieu of bike lanes/sidewalk.	$410,633	No	The project limits are within a section that is on the Statewide Bicycle Plan.
RD-7	Use 5' sidewalks in lieu of 8' sidewalks.	Proposed= $737,809 Actual= $141,835	Yes	The additional $595,974 savings was in commercial ROW which will not change due to the coordination with the developer and City of Canton.
RD-11	Use MSE wall in lieu of poured in place GA STD 4948-B retaining wall for wall number one.	Proposed= $29,391 Actual= $39,600	Yes	MSE walls offer savings but impacts historic property boundaries. By using the 4948-C wall instead of 4948-B wall, a savings of $39,600 is realized.
RD-12	Use modular block wall in lieu of poured in place GA STD 4948-B retaining wall for wall number one.	$94,766	No	See above. Already implementing GA STD 4849-C retaining wall for wall number one.

SR 20 Truck Climbing Lanes – STP00-0012-01(107), PI #632790

ALT No.	Description	Savings PW & LCC	Implement	Comments
TRUCK CLIMBING LANES (TCL)				
TCL-3	Use Bi-directional "passing lanes" in lieu of truck climbing lanes.	$508,462	No	According to HCM 2000, the optimal passing lane length for +700 pc/h is 1-2 miles. The VE proposal is two-1,000 foot long passing lanes and the original design calls for one-1.6 mile long passing lane. The project flow rate in 2031 will be 1,850 pc/h.
TCL-4	Do not realign Water Tank Road.	$67,948	No	Right of Way has already been purchased and additional utility impacts would occur.
TCL-5	Reduce side road improvements of Cotton Road and Old Orange Mill Road.	$59,073	No	Construction is necessary to provide intersection sight distance and to meet the new mainline pavement profile which is to be lowered.
TCL-7	Terminate the eastbound two-lane section at Sta. 3105+00 in lieu of Sta. 3120+00.	$247,342	No	According to AASHTO, the ideal design is to extend the passing lane to a point beyond the crest of the vertical curve. The VE team is terminating the lane at a crest vertical curve prior to the highpoint of the roadway.
TCL-9	Coordinate in future with urban design to prevent construction of items which will be obsolete.	Design Suggestion	Yes	This will be done.
TCL-14	Use MSE wall in lieu of poured in place GA Standard.	Proposed= $41,221 Actual= $37,947	Yes	This will be done.
TCL-15	Use modular block wall in lieu of poured in place GA Standard.	$85,993	No	See above. Already implementing MSE wall for wall number one above.

TRUCK CLIMBING LANES (TCL) Continued				
TCL-16	Delete westbound Truck Climbing Lane.	$737,311	No	According to AASHTO 2004. pg. 244, Criterion 3 is satisfied which justifies a Truck Climbing Lane (TCL). Also according to AASHTO, the addition of TCL can defer total roadway reconstruction for many years or indefinitely. The LOS / Delay with the TCL is "E" / 1.85 min. and "F" / 2.31 min. without the TCL.
TCL-17	Shorten the beginning of the eastbound Truck Climbing Lane.	$38,704	No	Right of Way has already been purchased. The VE proposal would reduce the TCL length from 1.0 mile long to 0.9 mile long which is less than the optimum design of 1 -2 miles for a flow rate of +700 pc/h. The project flow rate in 2031 is 1,850 pc/h.

A meeting was held on January 26, 2009 to discuss the above recommendations. DeWayne Comer, Joseph Ciavarro, and Kerric Primus with District 6 Design and Ron Wishon and Douglas Fadool with Engineering Services were in attendance. Additional information was provided by the Project Manager on January 27 and February 3 and 13, 2009.

The results above reflect the consensus of those in attendance and those who provided input.

Approved: Gerald M. Ross **Date:** 2/19/09

Gerald M. Ross, P. E., Chief Engineer

REW/DMF

Attachments

c: Genetha Rice-Singleton
DeWayne Comer
David Moore
Joseph Ciavarro
Kerric Primus
Galen Barrow
James Magnus
Patrick Bowers
Kenny Beckworth
Ken Werho
Lisa Myers
General Files

PRECONSTRUCTION STATUS REPORT FOR PI:0009164,632790-

PROJ ID : 0009164 **SR 20 FROM I-575 TO CR 288/SCOTT ROAD**
COUNTY : Cherokee
LENGTH (MI) : 1.17
PROJ NO.: CSSTP-0009-00(164)
PROJ MGR: Comer, DeWayne
OFFICE : District 6
CONSULTANT:
SPONSOR : GDOT
DESIGN FIRM:

MPO: Atlanta TMA
TIP #: CH-020A3
MODEL YR : 2020
TYPE WORK: Widening
CONCEPT:
PROG TYPE: Reconstruction/Rehabilitation
BOND PROJ :

DOT DIST: 6
CONG. DIST: 6
BIKE: N
MEASURE:
NEEDS SCORE:
BRIDGE SUFF:

MGMT LET DATE : 12/15/2010
MGMT ROW DATE : 06/19/2009
SCHED LET DATE : 1/22/2014
WHO LETS?: GDOT Let
LET WITH :

SCHED START	SCHED FINISH	ACTIVITY	ACTUAL START	ACTUAL FINISH	%
3/27/2009	10/22/2009	Concept Development			0
9/24/2009	9/24/2009	Concept Meeting			0
10/8/2009	10/8/2009	PM Submit Concept Report			0
10/9/2009	10/22/2009	Receive Preconstruction Concept Approval			0
10/22/2009	**10/22/2009**	**Management Concept Approval Complete**			**0**
11/6/2009	11/6/2009	Public Information Open House Held			0
10/23/2009	7/28/2011	**Environmental Approval**			0
3/11/2011	5/5/2011	Pub Hear Held/Comm Resp (EA/FONSI, GEPA)			0
12/11/2009	12/31/2009	Mapping			0
1/4/2010	2/5/2010	Field Surveys/SDE			0
2/8/2010	**11/12/2010**	**Preliminary Plans**			0
10/23/2009	3/4/2010	Underground Storage Tanks			0
12/4/2009	2/18/2010	404 Permit Obtainment			0
8/19/2011	8/22/2011	PFPR Inspection			0
8/23/2011	12/12/2011	R/W Plans Preparation			0
12/13/2011	**1/13/2012**	**R/W Plans Final Approval**			**0**
9/28/2011	9/30/2011	L & D Approval			0
1/16/2012	11/26/2013	R/W Acquisition			0
6/7/2012	6/20/2012	Stake R/W			0
5/17/2010	5/18/2011	Soil Survey			0
10/3/2011	**10/29/2012**	**Final Design**			0
11/20/2012	11/21/2012	FFPR Inspection			0
12/5/2012	12/18/2012	Submit FFPR Responses (OES)			0

PROGRAMMED FUNDS

Phase	Approved	Proposed	Cost	Fund	Status	Date Auth
ROW	2009	2010	7,276,000.00	L240	PRECST	
CST	2009	2011	4,263,367.50	L240	PRECST	

ROW Cost Est Amt: 6,800,000.00 Date: 7/1/2008
CST Cost Est Amt: 3,867,000.00 Date: 7/1/2008

STIP AMOUNTS

Phase	Cost	Fund
ROW	0.00	L240
CST	0.00	L240

Design: JMC/mb
EIS: EA| NoLetDates| GB
LGPA: NOTIFICATION LETTER SENT TO CANTON & CHEROKEE 1-26-09
Programming: SPLIT FROM PI# 632790-
ROW: This project was previously Site 1 of STP-012-1(107) PI 632790

District Comments

Prel. Parcel CT: 59 **Total Parcel in ROW System:** 51 **Cond. Filed:** 0 **Acquired by:** N/R ***DEEDS CT:*** 0
Under Review: 0 **Options - Pending:** 0 **Relocations:** 0 **Acquisition MGR:**
Released: 0 **Condemnations- Pend:** 0 **Acquired:** 0 **R/W Cert Date:**

PRECONSTRUCTION STATUS REPORT FOR PI:0009164,632790-

PROJ ID : 632790-
COUNTY : Cherokee
LENGTH (MI) : 6.08
PROJ NO.: STP00-0012-01(107)
PROJ MGR: Comer, DeWayne
OFFICE : District 6
CONSULTANT: No Consultant, GDOT In-House Design
SPONSOR : GDOT
DESIGN FIRM:

SR 20 FM UNION HILL ROAD TO GREENWOOD COURT - CLIMBING LANES

MPO: Atlanta TMA
TIP #: CH-020A1
MODEL YR : 2020
TYPE WORK: Passing Lanes
CONCEPT:
PROG TYPE: Reconstruction/Rehabilitation
BOND PROJ :

DOT DIST: 6
CONG. DIST: 6
BIKE: N
MEASURE:
NEEDS SCORE: 9
BRIDGE SUFF:

MGMT LET DATE : 08/21/2009
MGMT ROW DATE : 08/15/2005
SCHED LET DATE : 10/1/2009
WHO LETS?: GDOT Let
LET WITH :

SCHED START	SCHED FINISH	ACTIVITY	ACTUAL START	ACTUAL FINISH	%
		Concept Development	6/14/1999	10/19/1999	100
		Concept Meeting	6/25/1999	6/25/1999	100
		PM Submit Concept Report	8/25/1999	9/29/1999	100
		Receive Preconstruction Concept Approval	8/18/1999	8/31/1999	100
		Management Concept Approval Complete	**9/14/1999**	**10/19/1999**	**100**
	3/10/2009	Value Engineering Study	8/15/2008		83
		Public Information Open House Held	5/17/2002	5/19/2002	100
		Environmental Approval	**4/1/2000**	**12/13/2004**	**100**
		Mapping	4/19/2000	5/3/2000	100
		Field Survey/SDE	1/4/2005	1/19/2005	100
		Preliminary Plans	**5/19/2002**	**6/2/2002**	**100**
		Underground Storage Tanks	6/30/2003	12/8/2008	100
2/27/2009	5/14/2009	404 Permit Obtainment			0
		PFPR Inspection	8/22/2005	8/22/2005	100
		R/W Plans Preparation	3/22/2002	6/13/2002	100
		R/W Plans Final Approval	**9/7/2005**	**1/19/2006**	**100**
		L & D Approval	1/20/2006	1/24/2006	100
	8/5/2009	R/W Acquisition	12/1/2005		68
		Stake R/W	9/17/2007	12/31/2007	100
		Soil Survey	6/4/2001	6/6/2001	100
	5/28/2009	**Final Design**	**12/2/2008**		11
6/19/2009	6/22/2009	FFPR Inspection			0
7/6/2009	7/17/2009	Submit FFPR Responses(OES)			0

PROGRAMMED FUNDS

Phase	Approved	Proposed	Cost	Fund	Status	Date Auth
PE	2000	2000	752,675.80	Q76	AUTHORIZED	7/30/1999
ROW	2006	2006	10,911,000.00	L240	AUTHORIZED	7/18/2006
ROW	2009	2009	3,542,000.00	L240	PRECST	
ROW	2003	2003	150,000.00	Q24	AUTHORIZED	7/18/2006
CST	2010	2011	8,268,915.37	L240	PRECST	

PE Cost Est Amt	752,675.80	Date	
ROW Cost Est Amt:	10,911,000.00	Date	7/31/2008
ROW Cost Est Amt	3,542,000.00	Date	7/31/2008
ROW Cost Est Amt:		Date	7/31/2008
CST Cost Est Amt	7,143,000.00	Date	6/25/2008

STIP AMOUNTS

Phase	Cost	Fund
PE	0.00	Q76
ROW		Q24
ROW	0.00	L240
ROW	3,542,000.00	L240
CST	7,143,000.00	L240

PDD: [01R] 12-09-2000 AQE 6/16/00 SEPT99 BOARD ADD ASSIGNED DISTRICT 6 Must RW 05 authorization' 3/11/04.
Bridge: RET WALLS - SWW 10/03/08 (FINAL PLANS SENT 9/08/08)
Design: JMC/kp
EIS: [01-08-09] PCEADVACQ9-13-02| CE12-13-04| R6-30-06 . OnSchedCST: LC| GB
LGPA: CHEROKEE SGN DO UTILITIES 10-26-99|RESCISSION LETTER SENT 4-1-05
Programming: #1 9-02|R/W ADV ACQ 3-03|#2 10-04|PI# 0009164 WAS SPLIT FM THIS PROJECT 7-08 #3 8-08|#4 11-08|#5 1-09 #6 1-09
ROW: PAcq-Lanier, Acq/PM Brown,CC Hill, Only Sites 2 & 3, Site 1 is now 0009164
Traffic Op: CAH|S/M COMNTS TO DIST 0617025 - PFPR sent 8/9/05 sz/nr
Utility: 2nd sub made 9-17-08, 3 of 7 to PM 12-2-08
EMG: 2033 (H85(94)-W/V88)
Engr Services: Supp PFPR required, Speed Limit lowered to45 mph

District Comments

G O ROW Comment Site 1 being redesigned ROW on Hold. Sites 2 & 3 involve total of 135 parcels-ROW active

Prel. Parcel CT:	120	**Total Parcel in ROW System:**	135	**Cond. Filed:**	19	**Acquired by:**	DOT
Under Review:	0	**Options - Pending:**	5	**Relocations:**	16	**Acquisition MGR:**	Brown, Don (C)
Released:	135	**Condemnations- Pend:**	2	**Acquired:**	128	**R/W Cert Date:**	

DEEDS CT: 109

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: **STP00-0012-01(107) and CSSTP-0009-00(164) in Cherokee County PI No.: 632790 & 0009164 SR 20 Widening and Truck Climbing Lanes**

OFFICE: Cartersville

DATE: December 18, 2008
Revision Date: January 30, 2009

FROM: Kent L. Sager, District Engineer

TO: Gerald Ross, P.E., Chief Engineer

SUBJECT: VE Study Responses
SR 20 Roadway Widening, CSSTP-0009-00(164), PI 0009164; SR 20 Truck Climbing Lanes, STP00-0012-01(107), PI 632790 in Cherokee County

This project memorandum has been prepared as a response to the VE Study Recommendations for the referenced projects. For these projects, a VE Study was held on October 28-31, 2008. The VE Study Report of findings and recommendations was prepared and distributed by PBS&J's Value Management Team on November 14, 2008. This report was received by District 6 Road Design Office on November 18, 2008. A summary of the study recommendations with back up calculations were contained in this report. We have reviewed the comments and offer the following responses to these recommendations:

SR 20 Widening from I-575 to CR 288/Scott Rd. - CSSTP-0009-00(164), PI No. 0009164

Alternative No. RD-6
Recommendation: Use a single multi-use trail in lieu of bike lanes/sidewalk for a cost savings of $410,633.
Response: The existence of the bike lane was planned in coordination with the city of Canton surrounding the new 'Canton Marketplace' shopping center which is being built on the south side of the project between stations 1000+00 and 1025+00. Sidewalks one both sides of the roadway and bike lanes are included as part of the developmental plan surrounding the new project. Furthermore, AASHTO generally recommends against using shared use paths adjacent to the roadway because of an increased crash rate with turning vehicles. For this reason, the State Bicycle & Pedestrian Coordinator is also in favor of maintaining the bike lane design.

Alternative No. RD-7
Recommendation: Use 5' sidewalks in lieu of 8' sidewalks for a cost savings of $737,809.
Response: The original design inclusion of 8' sidewalks with 15' shoulders was part of the design coordination with the city of Canton on the 'Canton Marketplace' development. However, with further investigation, we have decided to use the alternative suggested and use 5' sidewalks in lieu of 8' sidewalks. With this change in sidewalk width we're able to have an approximate savings of $141,835.

The additional $595,974 savings suggested in the Alternative Recommendation was in commercial Right-of-Way which will not change do to the coordination with the developer and the City of Canton.

Alternative No. RD-11
Recommendation: Use MSE wall in lieu of poured in place GA STD 4948-B retaining wall for a cost savings of $29,391.
Response: While the GDOT Department of Bridge Design is in agreement that the MSE wall would be more economical (approximate savings: $30,000), the purpose of the wall through this stretch of the project is to prevent violation of a historical property on the north side of the project. Thus, the depth of the MSE wall would undermine that historical boundary. However, further inspection of the wall design by Bridge Design has shown that the correct wall standard to be used would be GA STD 4948-C instead of the shown 4948-B. The change in GA STD will have an approximate savings of $39,600.

Alternative No. RD-12
Recommendation: Use modular block wall in lieu of poured in place GA STD 4948-B retaining wall for a cost savings of $94,766.
Response: As was expressed in the response to Alternative RD-12, the wall type cannot be changed to a type with greater depth due to historical considerations. However, the original wall design is being reviewed after discussion with the Bridge Department to ensure proper design.

SR 20 Truck Climbing Lanes - STP00-0012-01(107), PI No. 632790 in Cherokee County

Alternative No. TCL-3
Recommendation: Use Bi-directional "passing lanes" in lieu of truck climbing lanes for a cost savings of $508,462.
Response: According to the Highway Capacity Manual 2000, passing lanes on two-lane highways range in the lengths of 0.186 to 3.1 miles. The optimal lengths for passing lanes range from 0.5 to 2.0 miles depending on the traffic flow rate. The Directional Flow Rate along SR 20, projected at 1850 pc/h in 2031, is above the 700 pc/h for an optimal passing lane length of 1.0 to 2.0 miles long. The recommendation listed above suggest to construct passing lanes of 1,000-ft long with a 300-ft taper at the beginning and a 600-ft taper at the end at key locations in both directions. This alternative does not meet the optimal passing lane length according to the HCM 2000. Reference attached Appendix A (Highway Capacity Manual 2000: Chapter 12; pg 12_18)

Alternative No. TCL-4
Recommendation: Do not realign Water Tank Road for a cost savings of $67,948.
Response: Looking into this issue. We are waiting on the depth of the valves in the area to be located.

Alternative No. TCL-5
Recommendation: Reduce side road improvements of Cotton Road and Old Orange Mill Road for a cost savings of $59,073.
Response: The realignment of CR/195 Cotton Rd and CR/238 Old Orange Mill Rd are a result of a sight distance issue which has lowered the profile along SR20/Cumming Hwy. This lowering of the profile grade on SR 20 makes a need to realign the profiles of both intersections to coincide with the proposed profile grade along SR 20.

Alternative No. TCL-7
Recommendation: Terminate the east bound two-lane section at Sta. 3105+00 in lieu of Sta. 3120+00 for a cost savings of $247,342.
Response: According to the AASHTO Green Book, the ideal design is to extend a climbing lane to a point beyond the crest (crest high point is at Sta. 3111+92.51), where a typical truck could attain a speed that is within 10 mph of the speed of the vehicles with a desirable speed of at least 40 mph. Additionally, shortening the length of the climbing lane will reduce the passing opportunities of other vehicles around slower truck traffic and substantially increase traffic platooning along this section of SR 20. Reference attached Appendix B (AASHTO Green Book 2004 Edition: Chapter 3 Elements of Design; pg 246)

Alternative No. TCL-9
Recommendation: Co-ordinate with future urban design to prevent construction of items which will be obsolete.
Response: The District office has communicated with the consultants of the future project to help them coordinated with our design.

Alternative No. TCL-14
Recommendation: Use MSE wall in lieu of poured in place GA Standard for a cost savings of $41,221.
Response: The Office of Bridge Design has reviewed the VE Study and has recommended constructing a MSE wall for Wall 1 at Sta. 2087+00 to 2088+00 (SR 20) due the height of the wall. However, Bridge Design would not recommend constructing a MSE wall for Wall 2 at Sta. 71+75 to 72+75 (Beavers Rd) since the wall is only about 4 feet high and is proposed as a standard gravity wall. Reference attached Appendix C (Cost Worksheet for savings on Wall 1).

Alternative No. TCL-15
Recommendation: Use modular block wall in lieu of poured in place GA Standard for a cost savings of $85,993.
Response: The Office of Bridge Design has reviewed the VE Study and has recommended constructing a MSE wall for Wall 1 at Sta. 2087+00 to 2088+00 (SR 20) due the height of the wall. However, Bridge Design would not recommend constructing a MSE wall for Wall 2 at Sta. 71+75 to 72+75 (Beavers Rd) since the wall is only about 4 feet high and is proposed as a standard gravity wall.

Alternative No. TCL-16
Recommendation: Delete West Bound Truck Passing Lane for a cost savings of $737,311.
Response: With the current high traffic volume and the congestion of slower moving trucks along the existing SR 20 corridor, the need for relief justifies the truck climbing (passing) lanes to increase capacity and also improve safety. According to AASHTO, Criterion 3 is justified if the LOS of E or F exists along a two-lane highway. Reference attached Appendix D (LOS Report). Additionally, AASHTO states that on some two-lane highways, the addition of climbing lanes could defer reconstruction for many years or indefinitely. Climbing lanes could make a two-lane highway operate efficiently, whereas a much costly multilane highway would be needed.

Alternative No. TCL-17

Recommendation: Shorten the beginning of the East Bound Truck Passing Lane for a cost savings of $160,533.

Response: Shortening the length of the climbing lane will reduce the passing opportunities of other vehicles around slower truck traffic and substantially increase traffic platooning along this section of SR 20. The optimal lengths for passing lanes range from 0.5 to 2.0 miles depending on the traffic flow rate. The Directional Flow Rate along SR 20 is above the 700 pc/h for an optimal passing lane length of 1.0 to 2.0 miles long. The recommendation listed above suggests shortening the passing lane to approximately 0.8 miles. This alternative does not meet the optimal passing lane length according to the HCM 2000. Additionally, the GAB-10" Inc. Mat'l on the Cost Worksheet has the original estimate at $260,076. It should be 7,467 sy X $20/unit = $149,340 for an above cost savings of $38,704. Reference attached Appendix A (Highway Capacity Manual 2000: Chapter 12; pg 12_18)

EXHIBIT 12-11. DEFAULT VALUES FOR PERCENTAGE OF NO-PASSING ZONES

Terrain Type	No-Passing Zones (%)
Level	20
Rolling	50
Mountainous	80

Base FFS

The base FFS for a two-lane highway is observed at base conditions and ranges from 70 to 110 km/h, depending on the highway's characteristics.

Length of Passing Lane

Passing lanes on two-lane highways range in length from 0.3 to 5.0 km (*8*). Research has shown that the optimal lengths for passing lanes range from 0.8 to 3.2 km, depending on the traffic flow rate, as shown in Exhibit 12-12.

EXHIBIT 12-12. OPTIMAL LENGTHS OF PASSING LANES

Directional Flow Rate (pc/h)	Optimal Passing Lane Length (km)	
100	≤ 0.80	0.50miles
200	>0.80-1.20	0.50mile - 0.75mile
400	>1.20-1.60	0.75mile - 1mile
≥ 700	>1.60-3.20	1mile - 2miles

Source: Harwood and St. John (*8*).

Length of Analysis Period

Refer to the description of the length of analysis period under the required data and estimated values for multilane highways.

PHF

When feasible, the PHF should be determined from local field data. If field data are not available, the factors presented in Exhibit 12-9 may be used for two-way and directional two-lane highway analysis. In general, lower PHFs are typical of rural or off-peak conditions, but higher PHFs are typical of urban or suburban peak-hour conditions. Default PHF values of 0.88 for rural areas and 0.92 for urban areas may be used in the absence of local data.

Directional Split

Directional distribution is defined as 50/50 for base conditions. Most directional distributions on rural two-lane highways range from 50/50 to 70/30. On recreational routes, the directional distribution may be as high as 80/20 or more during holiday or other peak periods. Exhibit 12-13 lists default directional splits that may be used if field-observed data are not available.

EXHIBIT 12-13. DEFAULT VALUES FOR DIRECTIONAL SPLIT ON TWO-LANE HIGHWAYS

Type	Directional Split
Rural Highways	60/40
Urban Highways	60/40
Recreational Highways	80/20

Percentage of Heavy Vehicles

The local HPMS may be used to obtain local information on the percentage of heavy vehicles by facility and area type. When estimates of the traffic mix are not available,

The HCM (14) provides additional details and worksheets to perform the computations needed for analysis in the preceding criteria. This procedure is also available in computer software, reducing the need for manual calculations.

Because there are so many variables involved that hardly any given set of conditions can be properly described as typical, a detailed analysis such as the one described is recommended wherever climbing lanes are being considered.

The location where an added lane should begin depends on the speeds at which trucks approach the grade and on the extent of sight distance restrictions on the approach. Where there are no sight distance restrictions or other conditions that limit speeds on the approach, the added lane may be introduced on the upgrade beyond its beginning because the speed of trucks will not be reduced beyond the level tolerable to following drivers until they have traveled some distance up the grade. This optimum point for capacity would occur for a reduction in truck speed to 60 km/h [40 mph], but a 15 km/h [10 mph] decrease in truck speed below the average running speed, as discussed in the preceding section on "Critical Lengths of Grade for Design," is the most practical reduction obtainable from the standpoint of level of service and safety. This 15-km/h [10-mph] reduction is the accepted basis for determining the location at which to begin climbing lanes. The distance from the bottom of the grade to the point where truck speeds fall to 15 km/h [10 mph] below the average running speed may be determined from Exhibit 3-55 or Exhibit 3-59. Different curves would apply for trucks with other than a weight/power ratio of 120 kg/kW [200 lb/hp]. For example, assuming an approach condition on which trucks with a 120-kg/kW [200-lb/hp] weight/power ratio are traveling within a flow having an average running speed of 110 km/h [70 mph], the resulting 15-km/h [10-mph] speed reduction occurs at distances of approximately 175 to 350 m [600 to 1,200 ft] for grades varying from 7 to 4 percent. With a downgrade approach, these distances would be longer and, with an upgrade approach, they would be shorter. Distances thus determined may be used to establish the point at which a climbing lane should begin. Where restrictions, upgrade approaches, or other conditions indicate the likelihood of low speeds for approaching trucks, the added lane should be introduced near the foot of the grade. The beginning of the added lane should be preceded by a tapered section with a desirable taper ratio of 25:1 that should be at least 90 m [300 ft] long.

The ideal design is to extend a climbing lane to a point beyond the crest, where a typical truck could attain a speed that is within 15 km/h [10 mph] of the speed of the other vehicles with a desirable speed of at least 60 km/h [40 mph]. This may not be practical in many instances because of the unduly long distance needed for trucks to accelerate to the desired speed. In such situations, a practical point to end the added lane is where trucks can return to the normal lane without undue interference with other traffic—in particular, where the sight distance becomes sufficient to permit passing when there is no oncoming traffic or, preferably, at least 60 m [200 ft] beyond that point. An appropriate taper length should be provided to permit trucks to return smoothly to the normal lane. For example, on a highway where the passing sight distance becomes available 30 m [100 ft] beyond the crest of the grade, the climbing lane should extend 90 m [300 ft] beyond the crest (i.e., 30 m [100 ft] plus 60 m [200 ft]), and an additional tapered section with a desirable taper ratio of 50:1 that should be at least 180 m [600 ft] long.

APPENDIX C

COST WORKSHEET

ALTERNATIVE NO: **TCL-14**

DESCRIPTION: **Estimate in using MSE Wall in-lieu of poured-in-place GA Std 4948-B Retaining Wall No. 1**

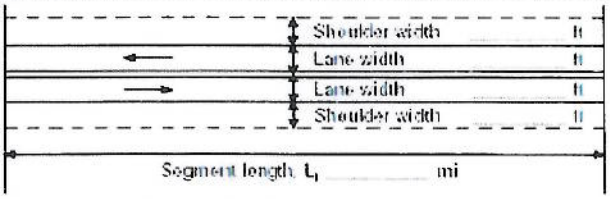
CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST / UNIT	TOTAL	NO. OF UNITS	COST / UNIT	TOTAL
Class B Rtg Wall Concrete	CY	121.75	$673.25	$81,968	0	$673.25	$0
MSE Walls (10 - 20 ft high)	SF	0	$44.88	$0	900	$44.88	$40,392
Coping	LF	0	$70.79	$0	100	$70.79	$7,079
Sub-total				$81,968			$47,471
Mark-up at 10.00%				$8,197			$4,747
TOTAL				**$90,165**			**$52,218**
Estimated Savings							**$37,947**

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Kerric Primus*	Highway / Direction of Travel	*SR 20*
Agency or Company	*D6 Road Design*	From/To	
Date Performed	*1/27/2009*	Jurisdiction	
Analysis Time Period		Analysis Year	*2031*

Project Description: *PI 532790; Cherokee Co.; Truck Climbing Lanes (Westbound)*

Input Data



Analysis direction vol., V_d *1850*veh/h

Opposing direction vol., V_o *1540*veh/h

☐ Class I highway ☐ Class II highway

Terrain ☐ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *1.00*

No-passing zone *0%*

% Trucks and Buses , P_T *12 %*

% Recreational vehicles, P_R *4%*

Access points/ *mi* *11*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 20-9 or 20-15)	*1.5*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9 or 20-17)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.940*	*0.940*
Grade adjustment factor[1], f_G (Exhibit 20-7 or 20-13)	*0.99*	*0.99*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV}*f_G)$	*1988*	*1655*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field measured speed[3], S_{FM}	*mi/h*	Base free-flow speed[3], $BFFS_{FM}$	*45.0 mi/h*
Observed volume[3], V_f	veh/h	Adj. for lane width and shoulder width,[3] f_{LS}(Exh 20-5)	*0.0 mi/h*
Free-flow speed, FFS_d $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points[3], f_A (Exhibit 20-5)	*2.8 mi/h*
Adjustment for no-passing zones, f_{np} (Exhibit 20-19)	*0.0 mi/h*	Free-flow speed, FFS_d (FSS=BFFS-f_{LS}-f_A)	*42.3 mi/h*
		Average travel speed, ATS=FFS-0.00776v_o-f_{np}	*14.0 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 20-10 or 20-16)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10 or 20-16)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], f_G (Exhibit 20-8 or 20-14)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h)=$V_i/(PHF*f_{HV}*f_G)$	*1850*	*1540*
Base percent time-spent-following[4], $BPTSF(\%)=100(1-e^{av_d{}^b})$	*94.3*	
Adj. for no-passing zone, f_{np} (Exhibit. 20-20)	*5.5*	
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{np}$	*97.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 or 20-4)	*F*
Volume to capacity ratio, v/c=V_p/ 1,700	*1.17*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)=0.25L_t(V/PHF)	*1018*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*4070*
Peak 15-min total travel time, TT_{15}(veh-h)=VMT_{15}/ATS	*72.8*

Notes

1. If the highway is extended segment (level) or rolling terrain, fG=1.0 .
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis—the LOS is F.
3. For the analysis direction only.
4. Exhibit 20-21 provides factors a and b.
5. Use alternative Equation 20-14 if some trucks operate at crawl speeds on a specific downgrade.

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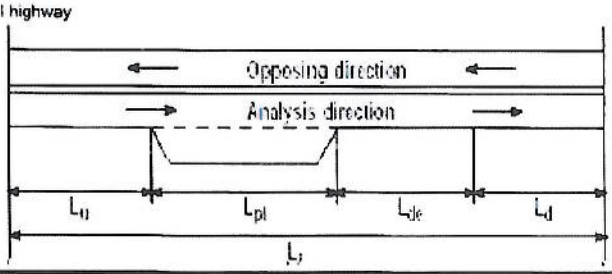
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET WITH PASSING LANE WORKSHEET

General Information		Site Information	
Analyst	*Kerric Primus*	Highway of Travel	*SR 20*
Agency or Company	*D6 Road Design*	From/To	
Date Performed	*1/27/2009*	Jurisdiction	
Analysis Time Period		Analysis Year	*2031*

Project Description: *PI 632790, Cherokee Co.; Truck Climbing Lanes (Westbound)*

Input Data

☐ Class I highway ☐ Class II highway



Total length of analysis segment, L_t (*mi*)	*2.2*
Length of two-lane highway upstream of the passing lane, L_u (*mi*)	*0.3*
Length of passing lane including tapers , L_{pl} (*mi*)	*1.8*
Average travel speed, ATS_d (from Directional Two-Lane Highway Segment Worksheet)	*14.0*
Percent time-spent-following, $PTSF_d$ (from Directional Two-Lane Highway Segment Worksheet)	*97.3*
Level of service[1], LOS_d (from Directional Two-Lane Highway Segment Worksheet)	*F*
Average Travel Speed	
Downstream length of two-lane highway within effective length of passing lane for average travel speed, L_{de} (*mi*) (Exhibit 20-23)	*1.70*
Length of two-lane highway downstream of effective length of the passing lane for avg travel speed, L_d (*mi*) $L_d = L_t - (L_u + L_{pl} + L_{de})$	*-1.60*
Adj. factor for the effect of passing lane on average speed, f_{pl} (Exhibit 20-24)	*1.11*
Average travel speed including passing lane[2], $ATS_{pl} = (ATS_d * L_t) / (L_u + L_d + (L_{pl}/f_{pl}) + (2L_{de}/(1+f_{pl})))$	*15.3*
Percent Time-Spent-Following	
Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, L_{de} (*mi*)(Exhibit 20-23)	*3.60*
Length of two-lane highway downstream of effective length of the passing lane for percent-time-following, L_d (*mi*)$= L_t - (L_u + L_{pl} + L_{de})$	*-3.50*
Adj. factor for the effect of passing lane on percent time-spent-following, f_{pl}(Exhibit 20-24)	*0.62*
Percent time-spent-following including passing lane[3], $PTSF_{pl}$(%) $PTSF_{pl} = PTSF_d[L_u + L_d + f_{pl}L_{pl} + ((1+f_{pl})/2)L_{de}]/L_t$	*65.4*
Level of Service and Other Performance Measures[4]	
Level of service including passing lane LOS_{pl} (Exhibit 20-3 or 20-4)	*E*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15} = VMT_{15}/ATS_{pl}$	*66.6*

Notes

1. If LOS_d=F, passing lane analysis cannot be performed.
2. If L_d <0, use alternative Equation 20-22.
3. If L_d<0 use alternative Equation 20-20.
4. v/c, VMT_{15} and VMT_{60} are calculated on Directional Two-Lane Highway Segment Worksheet.

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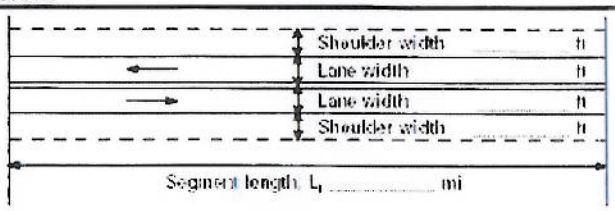
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Kerric Primus	Highway / Direction of Travel	SR 20
Agency or Company	D6 Road Design	From/To	
Date Performed	1/27/2009	Jurisdiction	
Analysis Time Period		Analysis Year	2031

Project Description: PI 632790; Cherokee Co.; Truck Climbing Lanes (Eastbound)

Input Data



Analysis direction vol., V_d 1695veh/h

Opposing direction vol., V_o 1500veh/h

Class I highway Class II highway

Terrain Level Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 1.00

No-passing zone 0%

% Trucks and Buses , P_T 12 %

% Recreational vehicles, P_R 4%

Access points/ *mi* 7

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 20-9 or 20-15)	1.5	1.5
Passenger-car equivalents for RVs, E_R (Exhibit 20-9 or 20-17)	1.1	1.1
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.940	0.940
Grade adjustment factor [1], f_G (Exhibit 20-7 or 20-13)	0.99	0.99
Directional flow rate [2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV}*f_G)$	1822	1612

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field measured speed [3], S_{FM}	mi/h	Base free-flow speed [3], $BFFS_{FM}$	45.0 mi/h
Observed volume [3], V_f	veh/h	Adj. for lane width and shoulder width, [3] f_{LS}(Exh 20-5)	0.0 mi/h
Free-flow speed, FFS_d $FFS=S_{FM}+0.00776(V_f/f_{HV})$	mi/h	Adj. for access points [3], f_A (Exhibit 20-5)	1.8 mi/h
Adjustment for no-passing zones, f_{np} (Exhibit 20-18)	0.0 mi/h	Free-flow speed, FFS_d (FSS=BFFS-f_{LS}-f_A)	43.3 mi/h
		Average travel speed, ATS=FFS-0.00776v_p-f_{np}	16.6 mi/h

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 20-10 or 20-16)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 20-10 or 20-16)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor [1], f_G (Exhibit 20-8 or 20-14)	1.00	1.00
Directional flow rate [2], v_i(pc/h)=$V_i/(PHF*f_{HV}*f_G)$	1695	1500
Base percent time-spent-following [4], $BPTSF(\%)=100(1-e^{-av_d^b})$	92.9	
Adj. for no-passing zone, f_{np} (Exhibit. 20-20)	5.3	
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{np}$	95.7	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 or 20-4)	F
Volume to capacity ratio, v/c=V_p/ 1,700	1.07
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)=0.25L_t(V/PHF)	509
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	2034
Peak 15-min total travel time, TT_{15}(veh-h)=VMT_{15}/ATS	30.7

Notes

1. If the highway is extended segment (level) or rolling terrain, fG=1.0 .
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only.
4. Exhibit 20-21 provides factors a and b.
5. Use alternative Equation 20-14 if some trucks operate at crawl speeds on a specific downgrade.

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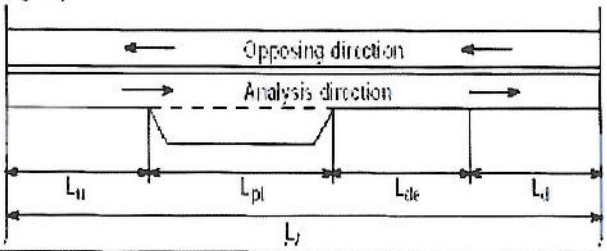
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET WITH PASSING LANE WORKSHEET

General Information		***Site Information***	
Analyst	*Kerric Primus*	Highway of Travel	*SR 20*
Agency or Company	*D6 Road Design*	From/To	
Date Performed	*1/27/2009*	Jurisdiction	
Analysis Time Period		Analysis Year	*2031*

Project Description: *PI 632790: Cherokee Co.; Truck Climbing Lanes (Eastbound)*

Input Data

☐ Class I highway ☐ Class II highway



Total length of analysis segment, L_t (*mi*)	*1.2*
Length of two-lane highway upstream of the passing lane, L_u (*mi*)	*0.0*
Length of passing lane including tapers , L_{pl} (*mi*)	*1.1*
Average travel speed, ATS_d (from Directional Two-Lane Highway Segment Worksheet)	*16.6*
Percent time-spent-following, $PTSF_d$ (from Directional Two-Lane Highway Segment Worksheet)	*95.7*
Level of service[1], LOS_d (from Directional Two-Lane Highway Segment Worksheet)	*F*
Average Travel Speed	
Downstream length of two-lane highway within effective length of passing lane for average travel speed, L_{de} (*mi*) (Exhibit 20-23)	*1.70*
Length of two-lane highway downstream of effective length of the passing lane for avg travel speed, L_d (*mi*) $L_d = L_t - (L_u + L_{pl} + L_{de})$	*-1.60*
Adj. factor for the effect of passing lane on average speed, f_{pl} (Exhibit 20-24)	*1.11*
Average travel speed including passing lane[2], $ATS_{pl} = (ATS_d * L_t) / (L_u + L_d + (L_{pl}/f_{pl}) + (2L_{de}/(1+f_{pl})))$	*18.4*
Percent Time-Spent-Following	
Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, L_{de} (*mi*)(Exhibit 20-23)	*3.60*
Length of two-lane highway downstream of effective length of the passing lane for percent-time-following, L_d (*mi*) $= L_t - (L_u + L_{pl} + L_{de})$	*-3.50*
Adj. factor for the effect of passing lane on percent time-spent-following, f_p (Exhibit 20-24)	*0.62*
Percent time-spent-following including passing lane[3], $PTSF_{pl}$ (%) $PTSF_{pl} = PTSF_d[L_u + L_d + f_{pl}L_{pl} + ((1+f_{pl})/2)L_{de}]/L_t$	*59.4*
Level of Service and Other Performance Measures[4]	
Level of service including passing lane LOS_{pl} (Exhibit 20-3 or 20-4)	*E*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15} = VMT_{15}/ATS_{pl}$	*27.6*

Notes

1. If LOS_c=F, passing lane analysis cannot be performed.
2. If L_d <0, use alternative Equation 20-22.
3. If L_d<0, use alternative Equation 20-20.
4. v/c, VMT_{15} and VMT_{60} are calculated on Directional Two-Lane Highway Segment Worksheet.

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Time of Delay (using 2011 projected traffic)

ALTERNATIVE NO: **TCL - 16**

DESCRIPTION: **Delete westbound truck climbing lane on Section 2**

Time of delay through the segment of SR20 from 2068+00 to 2183+00.

Based on estimated free-flow speed: (From LOS Reports)

- Base free-flow speed ($BFFS_{FM}$) 45.0 mi/h
- Adj. for lane width and shoulder width (f_{LS}) 0.0 mi/h
- Adj. for access points (f_A) 2.8 mi/h
- Adj. for no-passing zone (f_{np}) 0.0 mi/h
- Free-flow speed (FFS_d) 42.2 mi/h
- Average travel speed (ATS_d) 25.1 mi/h
- Average travel speed including passing lane (ATS_{pl}) 27.4 mi/h

So calculating the time it takes to travel through the segment based on the estimated travel speeds from the LOS Report:

2.2 miles / $0.75^{mi}/_{min}$ (45mph) = 2.93 minutes
2.2 miles / $0.42^{mi}/_{min}$ (25.1mph) = 5.24 minutes **w/out passing lane for a delay of 2.31 minutes**
2.2 miles / $0.46^{mi}/_{min}$ (27.4mph) = 4.78 minutes **w/ passing lane for a delay of 1.85 minutes**

ALTERNATIVE NO: **TCL - 17**

DESCRIPTION: **Terminate eastbound two-lane section at station 3105 in-lieu of station 3121**

Time of delay through the segment of SR20 from 3105+00 to 3121+00.

Based on estimated free-flow speed: (From LOS Reports)

- Base free-flow speed ($BFFS_{FM}$) 45.0 mi/h
- Adj. for lane width and shoulder width (f_{LS}) 0.0 mi/h
- Adj. for access points (f_A) 1.8 mi/h
- Adj. for no-passing zone (f_{np}) 0.0 mi/h
- Free-flow speed (FFS_d) 43.3 mi/h
- Average travel speed (ATS_d) 27.2 mi/h
- Average travel speed including passing lane (ATS_{pl}) 30.2 mi/h

So calculating the time it takes to travel through the segment based on the estimated travel speeds from the LOS Report:

0.3 miles / $0.75^{mi}/_{min}$ (45mph) = 0.40 minutes
0.3 miles / $0.45^{mi}/_{min}$ (27.2mph) = 0.67 minutes **w/out passing lane for a delay of 0.27 minutes**
0.3 miles / $0.50^{mi}/_{min}$ (30.2mph) = 0.60 minutes **w/ passing lane for a delay of 0.20 minutes**

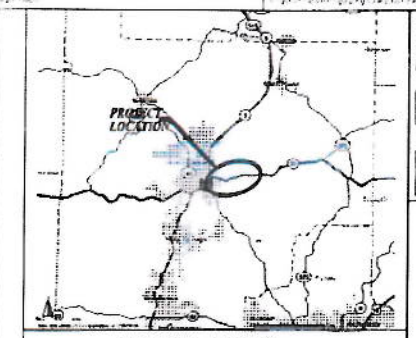
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	CSSTP-0009-00 (164)		

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PLAN AND PROFILE OF PROPOSED
WIDENING SR 20 FROM I-575
TO CR 288/SCOTT ROAD

FEDERAL AID PROJECT
CSSTP-0009-00 (164)
CHEROKEE COUNTY

FEDERAL ROUTE • NONE
STATE ROUTE • 20
P.I.NO. 0009164



LOCATION SKETCH

DESIGN DATA:	
TRAFFIC A.D.T.:	25,000 (2004)
TRAFFIC A.D.T.:	50,000 (2024)
TRAFFIC D.H.V.:	2320
DIRECTIONAL DIST:	50%
% TRUCKS:	12%
24 HR. TRUCKS %:	12%
SPEED DESIGN:	45 MPH

LOCATION & DESIGN APPROVAL DATE: 09/14/1999

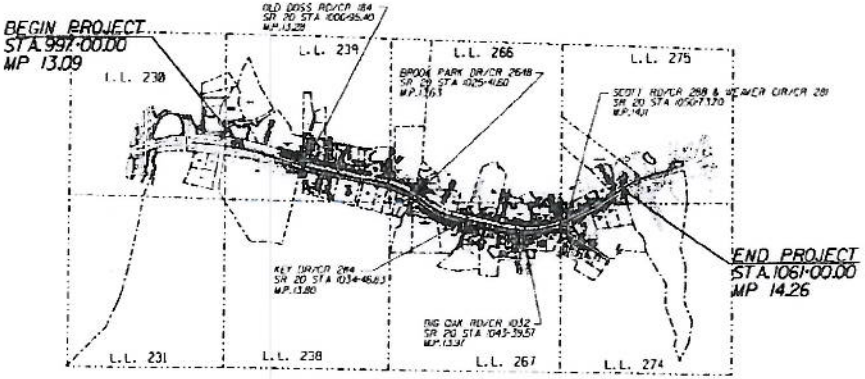
FUNCTIONAL CLASS:
RURAL MINOR ARTERIAL

THIS PROJECT IS 100% IN CHEROKEE COUNTY AND IS 100% IN CONG. DIST. NO. 6.

PROJECT DESIGNATION: EXEMPT
DESIGNED IN ENGLISH UNITS.

THIS PROJECT WAS BEEN PREPARED USING THE HORIZONTAL GEORGIA COORDINATE SYSTEM OF 1994 (NAD 83(93/94) WEST ZONE, AND THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

NOTE:
ALL REFERENCES IN THIS DOCUMENT, WHICH INCLUDES ALL PAPERS, WRITINGS, DOCUMENTS, DRAWINGS, OR PHOTOGRAPHS, USED OR TO BE USED IN CONNECTION WITH THIS DOCUMENT, TO "STATE HIGHWAY DEPARTMENT OF GEORGIA", "STATE HIGHWAY DEPARTMENT", "GEORGIA STATE HIGHWAY DEPARTMENT", "HIGHWAY DEPARTMENT", OR "DEPARTMENT" WHEN THE CONTEXT THEREOF MEANS THE STATE HIGHWAY DEPARTMENT OF GEORGIA, AND SHALL BE DEEMED TO MEAN THE DEPARTMENT OF TRANSPORTATION.



MIDPOINT COORDINATES
STATION 1030+00.00
N 1549149.54
E 2210413.25

PREPARED BY: _____
DESIGN ENGINEER

RECOMMENDED FOR SUBMISSION BY: _____
DISTRICT DESIGN ENGINEER

SUBMITTED BY: _____
STATE ROAD DESIGN ENGINEER

DATE _____ CHIEF ENGINEER

PLANS COMPLETED	
REVISIONS	

LENGTH OF PROJECT	COUNTY No. 057 Project No. 0009164
	MILES
NET LENGTH OF ROADWAY	1.170
NET LENGTH OF BRIDGES	0.000
NET LENGTH OF PROJECT	1.170
NET LENGTH OF EXCEPTIONS	0.000
GROSS LENGTH OF PROJECT	1.170

SCALE IN FEET
0 900 1800 3600

THE DATA, TOGETHER WITH ALL OTHER INFORMATION SHOWN ON THESE PLANS OR IN MANNER INDICATED THEREBY, WHETHER BY DRAWINGS OR NOTES, OR IN ANY OTHER MANNER, ARE BASED UPON FIELD INVESTIGATIONS AND ARE BELIEVED TO BE INDICATIVE OF ACTUAL CONDITIONS, HOWEVER, THE SAME ARE SHOWN AS INFORMATION ONLY, ARE NOT GUARANTEED, AND DO NOT BIND THE DEPARTMENT OF TRANSPORTATION IN ANY WAY. THE ATTENTION OF BIDDER IS SPECIFICALLY DIRECTED TO SUBSECTIONS 102.04, 102.05, AND 104.04 OF THE SPECIFICATIONS.