

**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

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

**FILE** P.I. # 0007028 **OFFICE** Design Policy & Support  
CSBRG-0007-00(028)  
Cherokee County  
GDOT District 6 - Cartersville **DATE** 11/10/2016  
SR 369 @ Board Tree Creek  
Bridge Replacement

**FROM**  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:**

Hiral Patel, Director of Engineering  
Joe Carpenter, Director of P3/Program Delivery  
Albert Shelby, State Program Delivery Engineer  
Darryl VanMeter, State Innovative Delivery Engineer  
Bobby Hilliard, Program Control Administrator  
Cindy VanDyke, State Transportation Planning Administrator  
Eric Duff, State Environmental Administrator  
Bill DuVall, State Bridge Engineer  
Andrew Heath, State Traffic Engineer  
Angela Robinson, Financial Management Administrator  
Lisa Myers, State Project Review Engineer  
Monica Flournoy, State Materials and Testing Administrator  
Patrick Allen, State Utilities Engineer  
Richard Cobb, Statewide Location Bureau Chief  
Andy Casey, State Roadway Design Engineer  
David Ray, District Design Engineer  
DeWayne Comer, District Engineer  
David Acree, District Preconstruction Engineer  
Jun Birnkammer, District Utilities Engineer  
Debbie Cottrell, Project Manager  
BOARD MEMBER - 11th Congressional District

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

Project Type: Bridge Replacement  
 GDOT District: ~~Seven~~ *Six*  
 Federal Route Number: N/A

PI Number: 0007028  
 County: Cherokee  
 State Route Number: 369

Project Number: CSBRG-0007-00(028)

This project is a bridge replacement on SR 369 over Board Tree Creek. The current bridge is below design standards, contains an unknown substructure foundation, and is classified as functionally obsolete.

**Submitted for approval:**

*Kathleen Ghel*  
 \_\_\_\_\_  
 GDOT Concept Design Phase Office / District Engineer  
 Date: *6-30-16*  
 7/11/16

*Albert Shelby*  
 \_\_\_\_\_  
 State Program Delivery Engineer  
 Date: \_\_\_\_\_  
*7/7/16*  
 Date

*CHP* *Debbie Cottrell C.L.B.*  
 \_\_\_\_\_  
 GDOT Project Manager  
 Date: \_\_\_\_\_  
*7/7/16*  
 Date

**Recommendation for approval:**

★ Eric Duff/KLP  
 \_\_\_\_\_  
 State Environmental Administrator  
 Date: 10-27-2016

★ Christopher Raymond/KLP  
 \_\_\_\_\_  
 For State Traffic Engineer  
 Date: 7-20-2016

★ Bill DuVall/KLP  
 \_\_\_\_\_  
 State Bridge Engineer  
 Date: 7-31-2016

- MPO Area: This project is consistent with the MPO adopted Regional Transportation Plan (RTP)/Long Range Transportation Plan (LRTP).
- Rural Area: This project is consistent with the goals outlined in the Statewide Transportation Plan (SWTP) and/or is included in the State Transportation Improvement Program (STIP).

★ Cindy VanDyke/KLP  
 \_\_\_\_\_  
 State Transportation Planning Administrator  
 Date: 7-15-2016

★ Recommendations on file

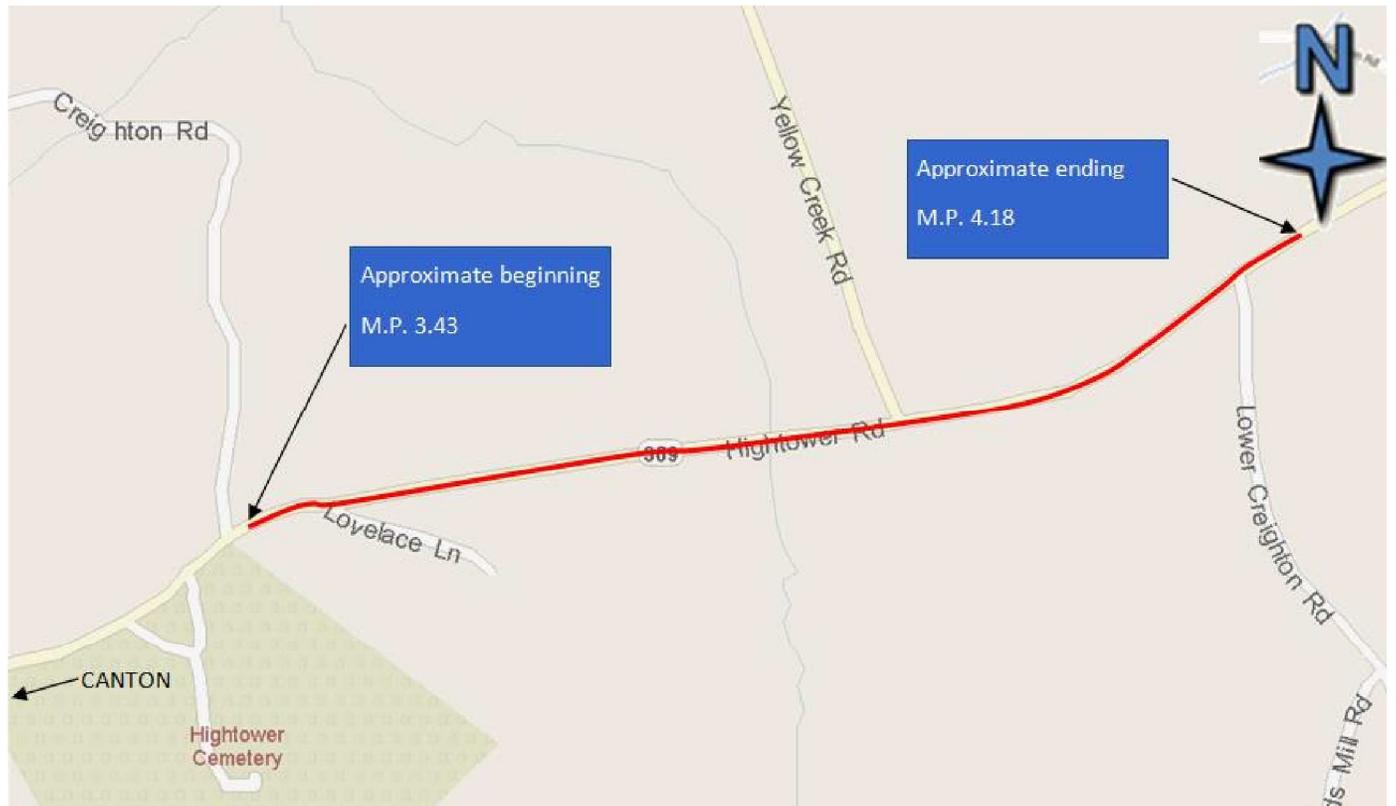
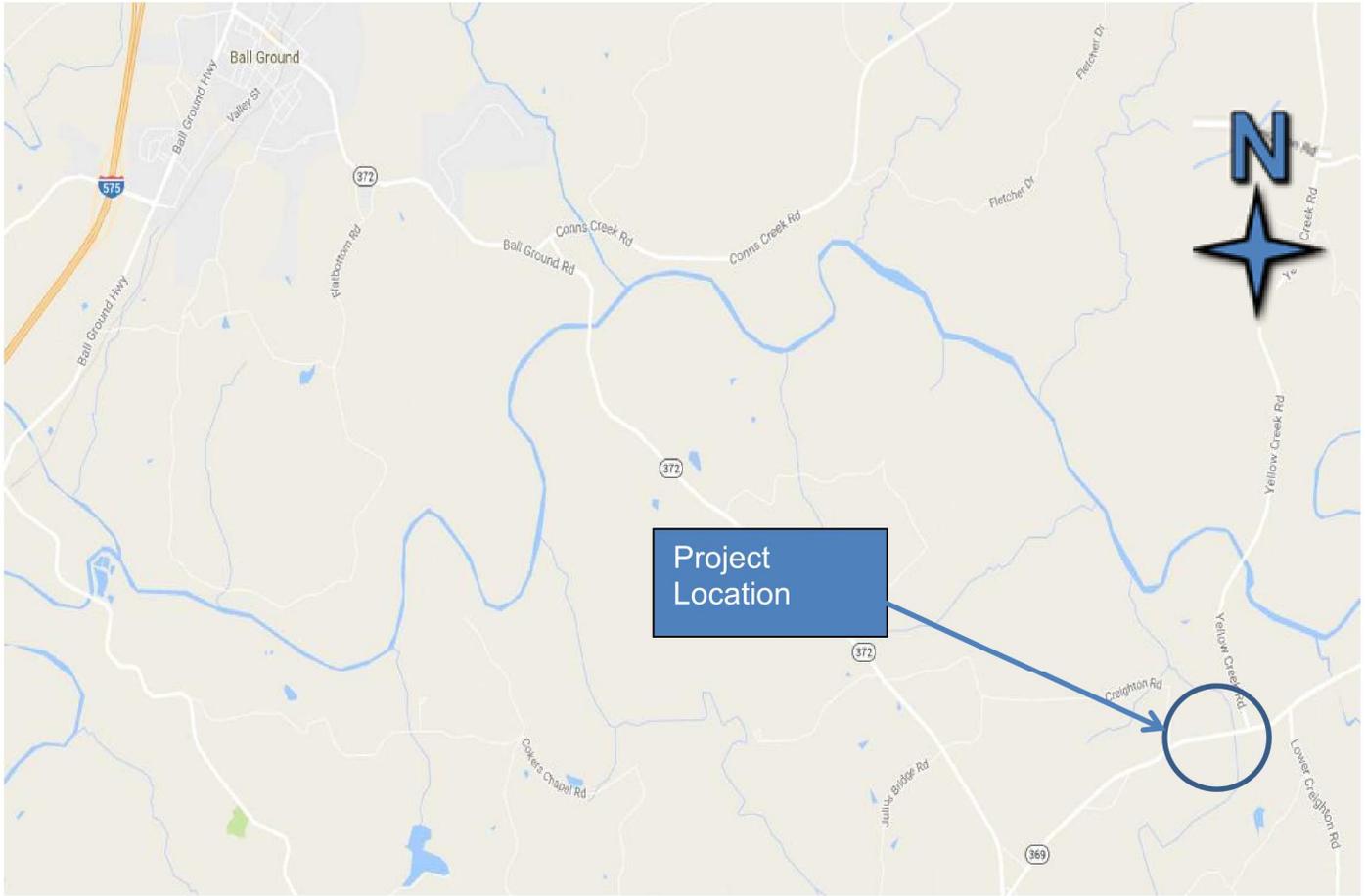
**Approval:**

Concur: *Heidi Bittel*  
 \_\_\_\_\_  
 GDOT Director of Engineering  
 Date: *11-4-2016*

Approve: *Margaret B. Puklo*  
 \_\_\_\_\_  
 GDOT Chief Engineer  
 Date: *11/7/16*

Updates have been made since the original submission to address Office Head comments & template changes

### PROJECT LOCATION MAP



## PLANNING & BACKGROUND DATA

**Project Justification Statement:** Prepared by the Office of Bridge Design

The bridge on SR 369 over Board Tree Creek, Structure ID 057-0034-0, was built in 1960. The bridge consists of three spans of steel beams on pile bents. This bridge was designed using an H-15 vehicle, which is below the current design standards. The overall condition of this bridge would be classified as satisfactory. The bridge currently services 8350 vehicles a day and has only an edge to edge pavement width of 26 feet. The structure is currently considered functionally obsolete due to its deck geometry. The bridge is classified as having an unknown foundation and therefore could be at risk for scour. Due to the structural integrity of the bridge pertaining to the design vehicle, unknown foundation of the substructure, and it being classified as functionally obsolete, replacement of this bridge is recommended.

**Existing conditions:** The project takes place on State Route (SR) 369 over Board Tree Creek near the intersection of SR 369 and Yellow Creek Road. SR 369 consists of two 12-foot travel lanes, one in each direction, with 5-foot shoulders (2 feet paved, 3 feet unpaved) and rural side ditches. The existing right-of-way (ROW) is 100 feet along the centerline of the roadway. There are utility poles located on both sides of the ROW.

**Other projects in the area:**

**MPO:** Atlanta TMA

**TIP #:** CH-225

**Congressional District(s):** 11

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

**Projected Traffic:** AADT 24 HR T: 12.0%  
Current Year (2016): 8350 Open Year (2021): 9200 Design Year (2041): 13700  
Traffic Projections Performed by: *Office of Planning*  
Date approved by the GDOT Office of Planning: 9/16/2016

**Functional Classification (Mainline):** Rural Minor Arterial

**Complete Streets - Bicycle, Pedestrian, and/or Transit Standards Warrants:**

Warrants met: None Bicycle Pedestrian Transit

**Pavement Evaluation and Recommendations**

Initial Pavement Evaluation Summary Report Required? No Yes

Initial Pavement Type Selection Report Required? No Yes

Feasible Pavement Alternatives: HMA PCC HMA & PCC

## DESIGN AND STRUCTURAL

**Description of Proposed Project:** The project proposes to replace the SR 369 bridge over Board Tree Creek between Creighton Rd. and Yellow Creek Rd with a project length of 0.3 miles. The proposed typical section would consist of two 12-foot travel lanes (one in each direction), a 12-foot striped median that becomes a left turn lane onto Yellow Creek Rd, and a dedicated right turn lane onto Yellow Creek Rd. with 10-foot shoulders (4 feet paved, 6 feet unpaved) and rural side ditches. The first alternative (the preferred design alternative) consist of constructing the bridge in stages, allowing traffic to continue to use the existing bridge while a portion of the propose bridge is built South of the existing bridge. Traffic will then be shifted to the newly constructed bridge portion, and the old bridge will be removed and the remaining portion of the proposed bridge will then be constructed. The second alternative is to construct a temporary bridge south of the existing bridge. Traffic would then be

shifted to the temporary bridge while the new bridge is constructed in the same location as the original bridge. The third alternative is to permanently realign the road by constructing a new bridge south of the existing bridge and the use of curves to tie into the existing alignment. An offsite detour is not anticipated during construction.

**Major Structures:**

Structure ID	Existing	Proposed
057-0034-0	Built in 1960; 126' length; 26' roadway width;	126' length; 36' roadway width

**Mainline Design Features:** SR 369/ Hightower Rd

Feature	Existing	Policy	Proposed
<b>Typical Section</b>			
- Number of Lanes	2		2
- Lane Width(s)	12'	12'	12'
- Outside Shoulder Width	5'	10'	10'
- Outside Shoulder Slope		6%	6%
- Bike Accommodations (on bridge)	none		Paved shoulder
Posted Speed	55		55
<b>Design Speed</b>	<b>55</b>	<b>55</b>	<b>55</b>
<b>Minimum Horizontal Curve Radius</b>	<b>1058'</b>	<b>1060'</b>	<b>1100'</b>
<b>Maximum Superelevation Rate</b>	<b>6%</b>	<b>6%</b>	<b>6%</b>
<b>Maximum Grade</b>	<b>6%</b>	<b>6%</b>	<b>6%</b>
Access Control	PERMIT		PERMIT
Design Vehicle	H-15		WB-67
Pavement Type	ASPHALT		ASPHALT

\*According to current GDOT design policy if applicable

**Major Interchanges/Intersections:** None

**Lighting required:**  No  Yes

**Off-site Detours Anticipated:**  No  Undetermined  Yes

**Transportation Management Plan [TMP] Required:**  No  Yes

If Yes: Project classified as:  Non-Significant

TMP Components Anticipated:  TTC

**Is the project located on a NHS roadway?**  No  Yes

**Design Exceptions/Design Variances to FHWA or GDOT Controlling Criteria anticipated:** None anticipated

**Design Variances to GDOT Standard Criteria anticipated:** Intersection skew angle at the intersections of SR369/ Hightower Road and the three connecting roads (Creighton Road, Lovelace Lane, and Lower Creighton Road).

**UTILITY AND PROPERTY**

**Railroad Involvement:** None

**Utility Involvements:** Sawnee EMC, BellSouth, Windstream, AGL Resources, And Cherokee Water

**SUE Required:**  No  Yes

**Public Interest Determination Policy and Procedure recommended?**  No  Yes

**Right-of-Way:** Existing width: 100ft. Proposed width: 130ft.  
Required Right-of-Way anticipated:  None  Yes  Undetermined  
Easements anticipated:  None  Temporary  Permanent  Utility  Other

Anticipated total number of impacted parcels: 5  
Displacements anticipated: Businesses: 0  
Residences: 0  
Other: 0  
Total Displacements: 0

**Impacts to USACE property anticipated?**  No  Yes  Undetermined

**Is Federal Aviation Administration (FAA) coordination anticipated?**  No  Yes

## ROUNDBABOUTS

**Roundabout Lighting Commitment Letter received:**  No  Yes

**Roundabout Planning Level Assessment:** N/A

**Roundabout Feasibility Study:** N/A

**Roundabout Peer Review Required:**  No  Yes  Completed – Date:

## CONTEXT SENSITIVE SOLUTIONS

**Issues of Concern:** None

**Context Sensitive Solutions Proposed:** None

## ENVIRONMENTAL AND PERMITS

**Anticipated Environmental Document:**

**NEPA:**  PCE  CE  EA-FONSI  
**GEPA\*:**  Type A  Type B  None

\*A GEPA document must be prepared only for state funded projects where the project cost meets or exceeds \$100 million. ~~Environmental surveys are required for all state funded projects regardless of project cost.~~ KLP

**Level of Environmental Analysis:**

The environmental considerations noted below are based on preliminary desktop or screening level environmental analysis and are subject to revision after the completion of resource identification, delineation, and agency concurrence.

The environmental considerations noted below are based on the completion of resource identification, delineation, and agency concurrence.

**MS4 Compliance – Is the project located in an MS4 area?**     No             Yes

**Is Protected Species water quality mitigation anticipated?**     No             Yes

**Environmental Permits, Variances, Commitments, and Coordination anticipated:** None Anticipated

**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

Carbon Monoxide hotspot analysis:     Required             Not Required             TBD

**NEPA/GEPA Comments & Information:** All necessary environmental surveys have been completed and despite the presence of the cemetery in the project area, there will be no anticipated impacts to cultural resources.

**COORDINATION, ACTIVITIES, RESPONSIBILITIES, AND COSTS**

**Project Meetings:**

Project Activity	Party Responsible for Performing Task(s)
Concept Development	GDOT
Design	GDOT
Right-of-Way Acquisition	GDOT
Utility Coordination (Preconstruction)	GDOT
Utility Relocation (Construction)	Utility Companies/ GDOT
Letting to Contract	GDOT
Construction Supervision	GDOT
Providing Material Pits	Contractor
Providing Detours	N/A
Environmental Studies, Documents, & Permits	GDOT
Environmental Mitigation	N/A
Construction Inspection & Materials Testing	GDOT

**Other coordination to date:** None

**Project Cost Estimate and Funding Responsibilities:**

	PE Activities		ROW	Reimbursable Utilities	CST*	Total Cost
	PE Funding	Section 404 Mitigation				
Funded By	GDOT	N/A	GDOT	GDOT	GDOT	
\$ Amount	\$320,799		\$443,000	\$75,000	\$3,271,911	\$4,110,710
Date of Estimate	2016		9/2016	7/2016	9/2016	

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

## ALTERNATIVES DISCUSSION

<b>Preferred Alternative #1:</b> Staged construction of the bridge			
<b>Estimated Property Impacts:</b>	<b>5 parcels</b>	<b>Estimated Total Cost:</b>	<b>\$3,271,911</b>
<b>Estimated ROW Cost:</b>	<b>\$443,000</b>	<b>Estimated CST Time:</b>	<b>18 months</b>
<b>Rationale:</b> Minimal impacts and the reduced cost for not using a temporary bridge.			

<b>No-Build Alternative:</b> No Build			
<b>Estimated Property Impacts:</b>	<b>None</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> This is not an acceptable option, the bridge has an unknown foundation of the substructure, and is classified as functionally obsolete.			

<b>Alternative 2:</b> Temporary bridge			
<b>Estimated Property Impacts:</b>	<b>7 parcels</b>	<b>Estimated Total Cost:</b>	<b>\$3,763,925</b>
<b>Estimated ROW Cost:</b>	<b>\$551,000</b>	<b>Estimated CST Time:</b>	<b>18 months</b>
<b>Rationale:</b> Additional impacts to ROW and the cost for a temporary bridge would not be favorable.			

<b>Alternative 3:</b> Re-align road with a new bridge			
<b>Estimated Property Impacts:</b>	<b>6 parcels</b>	<b>Estimated Total Cost:</b>	<b>\$4,082,672</b>
<b>Estimated ROW Cost:</b>	<b>\$561,000</b>	<b>Estimated CST Time:</b>	<b>18 months</b>
<b>Rationale:</b> Impacts to Environmental Sensitive Areas (ESAs) and ROW would not be favorable.			

**Additional Comments/ Information:** None

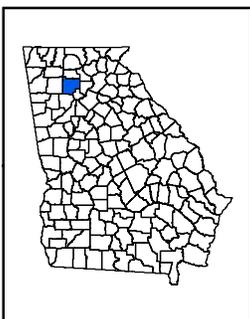
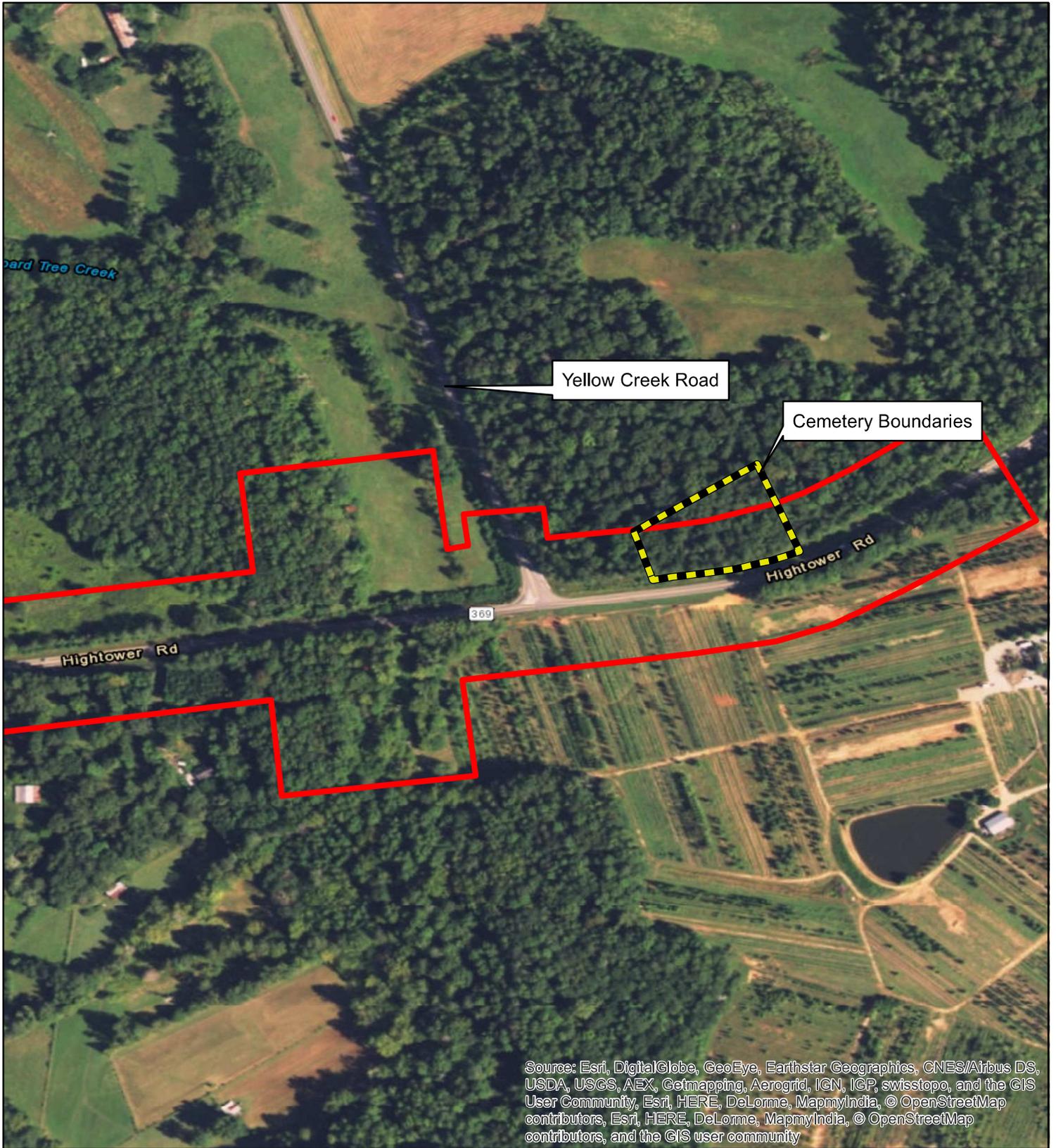
## LIST OF ATTACHMENTS/SUPPORTING DATA

1. Concept Layout Alternative #1
2. Concept Layout Alternative #2
3. Concept Layout Alternative #3
4. Cultural resources/ Section 106
5. MS4 Checklist
6. MS4 Spreadsheet
7. MS4 Drainage Area Map
8. Typical sections
9. Bridge Inventory
10. Cost Estimates
11. Crash summaries
12. Traffic diagrams and projections
13. Capacity analysis summary
14. Meeting Minutes

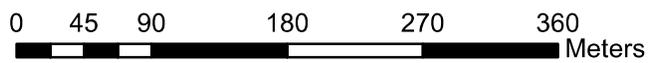








### Cemetery Map



**P.I. # 0007028**  
**Cherokee County**  
**SR 369 Bridge**  
**Replacement**







Project Name: \_Project Name\_  
 Project Number: 0007028  
 Calculated By: Joseph Cavins  
 Date: 10/25/2016  
 Outfall Area ID: Drainage Area #1

**Outfall Area Information**

Denotes Input Cell

Rainfall Depths	NOAA	
Outfall Area Pre ( $A_{Pre}$ )	2.48 ac	Pond/Swamp Area Percentage 0.0 %
Outfall Area Post ( $A_{Post}$ )	2.48 ac	Pond/Swamp Adjustment Factor ( $F_p$ ) 1.00
SCS Curve Number Pre ( $CN_{Pre}$ )	69	
SCS Curve Number Post ( $CN_{Post}$ )	70	
Time of Concentration ( $T_c$ )	6.0 min	

**Water Quality Volume Calculation**

$R_V = 0.05 + 0.009(I)$	$WQ_V = \frac{1.2R_V A}{12}$	
Percent Impervious Pre ( $I_{Pre}$ )	12.10 %	
Percent Impervious Post ( $I_{Post}$ )	15.73 %	
Runoff Coefficient ( $R_V$ )	0.033	(Equals $R_V$ Post- $R_V$ Pre)
Water Quality Volume ( $WQ_V$ )	0.008 ac-ft	
Water Quality Volume ( $WQ_V$ )	353 cf	

**Required Volume Storage Summary**

	CP <sub>V</sub> /1-Year (cf)	25-Year (cf)	100-Year (cf)
Post-Development	479	2844	3828

Channel Protection Volume (CP<sub>V</sub>) Control Required?    Yes    (1-year peak flow greater than 2 cfs)

**Peak Flow Summary**

	1-Year (cfs)	25-Year (cfs)	100-Year (cfs)
Pre-Development	3.42	11.39	15.80
Post-Development	3.68	11.76	16.23
Change (Post - Pre)	0.26	0.37	0.43
Percent Change	7.60%	3.25%	2.72%

Project Name: \_Project Name\_  
 Project Number: 0007028  
 Calculated By: Joseph Cavins  
 Date: 10/25/2016  
 Outfall Area ID: Drainage Area #2

**Outfall Area Information**

Denotes Input Cell

Rainfall Depths	NOAA	
Outfall Area Pre ( $A_{Pre}$ )	4.60 ac	Pond/Swamp Area Percentage 0.0 %
Outfall Area Post ( $A_{Post}$ )	4.60 ac	Pond/Swamp Adjustment Factor ( $F_p$ ) 1.00
SCS Curve Number Pre ( $CN_{Pre}$ )	67	
SCS Curve Number Post ( $CN_{Post}$ )	68	
Time of Concentration ( $T_c$ )	6.0 min	

**Water Quality Volume Calculation**

$R_V = 0.05 + 0.009(I)$	$WQ_V = \frac{1.2R_V A}{12}$	
Percent Impervious Pre ( $I_{Pre}$ )	4.55 %	
Percent Impervious Post ( $I_{Post}$ )	8.27 %	
Runoff Coefficient ( $R_V$ )	0.033	(Equals $R_V$ Post- $R_V$ Pre)
Water Quality Volume ( $WQ_V$ )	0.015 ac-ft	
Water Quality Volume ( $WQ_V$ )	670 cf	

**Required Volume Storage Summary**

	CP <sub>V</sub> /1-Year (cf)	25-Year (cf)	100-Year (cf)
Post-Development	839	4978	6764

Channel Protection Volume (CP<sub>V</sub>) Control Required?    Yes    (1-year peak flow greater than 2 cfs)

**Peak Flow Summary**

	1-Year (cfs)	25-Year (cfs)	100-Year (cfs)
Pre-Development	5.64	19.38	27.70
Post-Development	5.98	20.05	28.50
Change (Post - Pre)	0.34	0.67	0.80
Percent Change	6.03%	3.46%	2.89%

Project Name: \_Project Name\_  
 Project Number: 0007028  
 Calculated By: Joseph Cavins  
 Date: 10/25/2016  
 Outfall Area ID: Drainage Area #3

**Outfall Area Information**

Denotes Input Cell

Rainfall Depths	NOAA	
Outfall Area Pre ( $A_{Pre}$ )	4.58 ac	Pond/Swamp Area Percentage 0.0 %
Outfall Area Post ( $A_{Post}$ )	4.58 ac	Pond/Swamp Adjustment Factor ( $F_p$ ) 1.00
SCS Curve Number Pre ( $CN_{Pre}$ )	72	
SCS Curve Number Post ( $CN_{Post}$ )	71	
Time of Concentration ( $T_c$ )	6.0 min	

**Water Quality Volume Calculation**

$R_V = 0.05 + 0.009(I)$	$WQ_V = \frac{1.2R_V A}{12}$	
Percent Impervious Pre ( $I_{Pre}$ )	10.22 %	
Percent Impervious Post ( $I_{Post}$ )	17.47 %	
Runoff Coefficient ( $R_V$ )	0.065	(Equals $R_V$ Post- $R_V$ Pre)
Water Quality Volume ( $WQ_V$ )	0.030 ac-ft	
Water Quality Volume ( $WQ_V$ )	1301 cf	

**Required Volume Storage Summary**

	CP <sub>V</sub> /1-Year (cf)	25-Year (cf)	100-Year (cf)
Post-Development	-935	3586	5148

Channel Protection Volume (CP<sub>V</sub>) Control Required?    Yes    (1-year peak flow greater than 2 cfs)

**Peak Flow Summary**

	1-Year (cfs)	25-Year (cfs)	100-Year (cfs)
Pre-Development	7.57	23.12	31.60
Post-Development	7.18	22.42	30.79
Change (Post - Pre)	-0.39	-0.70	-0.81
Percent Change	-5.15%	-3.03%	-2.56%

Project Name: \_Project Name\_  
 Project Number: 0007028  
 Calculated By: Joseph Cavins  
 Date: 10/25/2016  
 Outfall Area ID: Drainage Area #4

**Outfall Area Information**

Denotes Input Cell

Rainfall Depths	NOAA	
Outfall Area Pre ( $A_{Pre}$ )	8.96 ac	Pond/Swamp Area Percentage 0.0 %
Outfall Area Post ( $A_{Post}$ )	8.96 ac	Pond/Swamp Adjustment Factor ( $F_p$ ) 1.00
SCS Curve Number Pre ( $CN_{Pre}$ )	68	
SCS Curve Number Post ( $CN_{Post}$ )	69	
Time of Concentration ( $T_c$ )	6.0 min	

**Water Quality Volume Calculation**

$R_V = 0.05 + 0.009(I)$	$WQ_V = \frac{1.2R_V A}{12}$	
Percent Impervious Pre ( $I_{Pre}$ )	7.72 %	
Percent Impervious Post ( $I_{Post}$ )	11.40 %	
Runoff Coefficient ( $R_V$ )	0.033	(Equals $R_V$ Post- $R_V$ Pre)
Water Quality Volume ( $WQ_V$ )	0.030 ac-ft	
Water Quality Volume ( $WQ_V$ )	1292 cf	

**Required Volume Storage Summary**

	CP <sub>V</sub> /1-Year (cf)	25-Year (cf)	100-Year (cf)
Post-Development	1683	10850	13502

Channel Protection Volume (CP<sub>V</sub>) Control Required?    Yes    (1-year peak flow greater than 2 cfs)

**Peak Flow Summary**

	1-Year (cfs)	25-Year (cfs)	100-Year (cfs)
Pre-Development	11.65	39.04	55.52
Post-Development	12.34	41.13	57.08
Change (Post - Pre)	0.69	2.09	1.56
Percent Change	5.92%	5.35%	2.81%

Project Name: \_Project Name\_  
 Project Number: 0007028  
 Calculated By: Joseph Cavins  
 Date: 10/25/2016  
 Outfall Area ID: Drainage Area #5

**Outfall Area Information**

Denotes Input Cell

Rainfall Depths	NOAA	
Outfall Area Pre ( $A_{Pre}$ )	0.97 ac	Pond/Swamp Area Percentage 0.0 %
Outfall Area Post ( $A_{Post}$ )	0.97 ac	Pond/Swamp Adjustment Factor ( $F_p$ ) 1.00
SCS Curve Number Pre ( $CN_{Pre}$ )	74	
SCS Curve Number Post ( $CN_{Post}$ )	81	
Time of Concentration ( $T_c$ )	6.0 min	

**Water Quality Volume Calculation**

$R_V = 0.05 + 0.009(I)$	$WQ_V = \frac{1.2R_V A}{12}$	
Percent Impervious Pre ( $I_{Pre}$ )	27.78 %	
Percent Impervious Post ( $I_{Post}$ )	48.48 %	
Runoff Coefficient ( $R_V$ )	0.186	(Equals $R_V$ Post- $R_V$ Pre)
Water Quality Volume ( $WQ_V$ )	0.018 ac-ft	
Water Quality Volume ( $WQ_V$ )	787 cf	

**Required Volume Storage Summary**

	CP <sub>V</sub> /1-Year (cf)	25-Year (cf)	100-Year (cf)
Post-Development	1629	2414	2979

Channel Protection Volume (CP<sub>V</sub>) Control Required?    Yes    (1-year peak flow greater than 2 cfs)

**Peak Flow Summary**

	1-Year (cfs)	25-Year (cfs)	100-Year (cfs)
Pre-Development	1.78	5.20	7.04
Post-Development	2.55	6.29	8.26
Change (Post - Pre)	0.77	1.09	1.22
Percent Change	43.26%	20.96%	17.33%

Project Name: \_Project Name\_  
 Project Number: 0007028  
 Calculated By: Joseph Cavins  
 Date: 10/25/2016  
 Outfall Area ID: Drainage Area #6

**Outfall Area Information**

Denotes Input Cell

Rainfall Depths	NOAA	
Outfall Area Pre ( $A_{Pre}$ )	4.43 ac	Pond/Swamp Area Percentage 0.0 %
Outfall Area Post ( $A_{Post}$ )	4.43 ac	Pond/Swamp Adjustment Factor ( $F_p$ ) 1.00
SCS Curve Number Pre ( $CN_{Pre}$ )	69	
SCS Curve Number Post ( $CN_{Post}$ )	70	
Time of Concentration ( $T_c$ )	6.0 min	

**Water Quality Volume Calculation**

$R_V = 0.05 + 0.009(I)$	$WQ_V = \frac{1.2R_V A}{12}$	
Percent Impervious Pre ( $I_{Pre}$ )	11.07 %	
Percent Impervious Post ( $I_{Post}$ )	15.59 %	
Runoff Coefficient ( $R_V$ )	0.041	(Equals $R_V$ Post- $R_V$ Pre)
Water Quality Volume ( $WQ_V$ )	0.018 ac-ft	
Water Quality Volume ( $WQ_V$ )	785 cf	

**Required Volume Storage Summary**

	CP <sub>V</sub> /1-Year (cf)	25-Year (cf)	100-Year (cf)
Post-Development	856	5081	6837

Channel Protection Volume (CP<sub>V</sub>) Control Required?    Yes    (1-year peak flow greater than 2 cfs)

**Peak Flow Summary**

	1-Year (cfs)	25-Year (cfs)	100-Year (cfs)
Pre-Development	6.10	20.34	28.22
Post-Development	6.58	21.01	29.00
Change (Post - Pre)	0.48	0.67	0.78
Percent Change	7.87%	3.29%	2.76%

Project Name: \_Project Name\_  
 Project Number: 0007028  
 Calculated By: Joseph Cavins  
 Date: 10/25/2016  
 Outfall Area ID: Drainage Area #7

**Outfall Area Information**

Denotes Input Cell

Rainfall Depths	NOAA	
Outfall Area Pre ( $A_{Pre}$ )	21.39 ac	Pond/Swamp Area Percentage 0.0 %
Outfall Area Post ( $A_{Post}$ )	21.39 ac	Pond/Swamp Adjustment Factor ( $F_p$ ) 1.00
SCS Curve Number Pre ( $CN_{Pre}$ )	66	
SCS Curve Number Post ( $CN_{Post}$ )	66	
Time of Concentration ( $T_c$ )	6.0 min	

**Water Quality Volume Calculation**

$R_V = 0.05 + 0.009(I)$	$WQ_V = \frac{1.2R_V A}{12}$	
Percent Impervious Pre ( $I_{Pre}$ )	1.66 %	
Percent Impervious Post ( $I_{Post}$ )	2.38 %	
Runoff Coefficient ( $R_V$ )	0.006	(Equals $R_V$ Post- $R_V$ Pre)
Water Quality Volume ( $WQ_V$ )	0.014 ac-ft	
Water Quality Volume ( $WQ_V$ )	600 cf	

**Required Volume Storage Summary**

	CP <sub>V</sub> /1-Year (cf)	25-Year (cf)	100-Year (cf)
Post-Development	0	17949	25324

Channel Protection Volume (CP<sub>V</sub>) Control Required?    No    (No change in impervious)

**Peak Flow Summary**

	1-Year (cfs)	25-Year (cfs)	100-Year (cfs)
Pre-Development	24.66	87.01	125.12
Post-Development	24.66	87.01	125.12
Change (Post - Pre)	0.00	0.00	0.00
Percent Change	0.00%	0.00%	0.00%

*In addition to the above charts, attach the Drainage Area Map, drainage basin summary spreadsheets, and cost estimates (if required) to the Concept Report.*

## MS4 Concept Level Feasibility Assessment Workflow

### 1. Project Level Exclusions

If the project has a Project Level Exclusion, no further work is required for the Concept Report. Document the exclusion using the checklist and include in the Concept Report. Please note that the cover of the Post Construction Stormwater Management Report must be completed and submitted during preliminary plans to confirm that the Project Level Exclusion still applies. See page 10-5 in the Drainage Manual for a complete list of the Project Level Exclusions.

### 2. Define Outfall Area Drainage Basins and Calculate Volumes and Peak Flows

Delineate approximate pre-development and post-development drainage basins. Use the MS4 Concept Level Design Spreadsheet to calculate the Water Quality Volume, Required Storage Volume and Peak Flow for each drainage basin. See the spreadsheet instructions for further guidance on this process.

### 3. Outfall Level Exclusions

Using the information from step 2, consider Outfall Level Exclusions 3, 5, and 6 below. Outfall Level Exclusions 1, 2, and 4 require more detail than is available at the concept level. See pages 10-5 and 10-6 in the Drainage Manual for a complete list of the Outfall Level Exclusions.

1. Change in existing roadway alignment that would create a safety concern
2. Installation of BMP causes realignment or piping of a stream
3. Installation of BMP impacts a stream buffer or wetland
4. Discharge exits right-of-way as sheet flow
5. Flows that originate offsite
6. Reduction or no change (or negligible increase) in impervious area

### 4. Infeasibility Criteria

Utilize appropriate Infeasibility Criteria to eliminate drainage areas for treatment. Concentrate on using Criterion 3, 4, 5, 6, 9, and 10 at this stage. After the BMPs are selected the Infeasibility Criteria can be used again to evaluate the suitability of the BMPs.

1. Cost
2. Delay – Starting the planning process at this point should eliminate this as a viable option unless no other right-of-way is going to be acquired on the project.
3. Impact to Threatened or Endangered Species
4. Impact to a Cultural Resource
5. Displacement of Resident or Business
6. Violation of State or Federal Law
7. Site Limitations
8. Limited Hydraulic Conductivity
9. Site Size
10. No Gravity Flow to BMP

### 5. BMP Selection

Basins that have not been excluded in steps 3 and 4 will require BMPs to be selected and sized. Use the results from the MS4 Concept Level Design Spreadsheet to further review basins that have not been excluded in steps 3 and 4. Initially, use the drainage basin area to limit your choices.

BMPs for an individual drainage basin can be selected or excluded based on the size of the drainage area.

Potential BMPs for outfall areas greater than 10 acres:

- a. Stormwater Wetland
- b. Wet Detention Pond
- c. Dry Detention Basin\*

Potential BMPs for outfall areas greater than 5 acres but less than 10 acres:

- a. Sand Filter
- b. Dry Detention Basin\*

Potential BMPs for outfall areas less than 5 acres:

- a. Grass Channel\*
- b. Dry Enhanced Swale
- c. Wet Enhanced Swale
- d. Infiltration Trench
- e. Sand Filter
- f. Bioretention Basin
- g. Dry Detention Basin\*

The bioslope and filter strip\* are not limited by drainage area size.

See Table 10.3-2 of the Drainage Manual for additional BMP screening criteria.

\*These BMPs do not remove 80% of the total suspended solids and must be used in a treatment train.

## **6. Size the BMP**

Refer to the Drainage Manual for sizing the BMP.

## **7. Locate the BMP**

Locate the BMP on the project and estimate right-of-way requirements.

## **8. Reassess Infeasibility Criteria**

All Infeasibility Criteria with the exception of 7 and 8 should be able to be evaluated at this point.

Infeasibility Criteria 1 (cost of the BMP versus the cost of the roadway construction) can be evaluated at this point. This should be a quick analysis with the following parameters:

1. Use a cost per linear foot for roadway cost.
2. Use dollars per square foot or dollars per acre for the right-of-way cost.
3. Estimate the cost of the BMP.

## **9. Document Results in the Concept Report**

Complete the Drainage Area Summary and BMP Selection and Feasibility Summary charts shown on page 1 of these Guidelines and include as an attachment to the Concept Report. Also attach an Outfall Area Summary sheet (from MS4 Concept Level Design Spreadsheet) for each drainage basin along with a Drainage Area Map, and cost estimates (if required).

## BMP Sizing Criteria for Concept Reports

Refer to Chapter 10 of the GDOT Manual on Drainage Design for Highways (Drainage Manual) for detailed information. Equations included in the MS4 Concept Level Design Spreadsheet are intended to estimate the conceptual-level worst case BMP size and should not be used for preliminary or final BMP sizing.

### Filter Strip

The table below provides minimum filter strip sizing recommendations based on the amount of pervious or impervious area with a slope perpendicular to the roadway of 2% to 6%. If the calculated minimum filter strip length, using Equation 10.4.1-3 from the Drainage Manual, is less than the table value, the table value will be used as a design minimum. Table values are otherwise not meant to replace calculated values from the equation. The filter strip does not achieve the required 80% total suspended solids (TSS) removal and must be used in conjunction with another BMP.

**Minimum Filter Strip Length (Perpendicular to the Roadway) Sizing Recommendations**

Parameter	Impervious Area		Pervious Area (Lawns, etc.)	
	Maximum inflow approach length (ft)	35	75	75
Filter strip minimum length (ft)	15	25	12	18

### Grass Channel

The grass channel should be sized to treat the peak discharge for the water quality storm. The grass channel does not achieve the required 80% TSS removal and must be used in conjunction with another BMP.

### Enhanced Dry Swale

The enhanced dry swale should be sized so that the volume above the filter can contain the water quality volume and, if required, the channel protection volume.

### Enhanced Wet Swale

The enhanced wet swale should be sized so that the volume of the swale can contain the water quality volume and, if required, the channel protection volume.

### Infiltration Trench

The infiltration trench should not be used for planning purposes. At the concept stage there will not be enough utility and soils information to determine if the infiltration trench is feasible.

### Bioslope

Use Equation 10.4.5-1 from the Drainage Manual to determine the required width of the bioslope. The length is typically the entire length of the drainage area. For planning purposes you can assume that the width of the bioslope will be added to the typical shoulder width.

### Sand Filter

Use Equation 10.4.6-1 from the Drainage Manual to determine the required filter area. The sand filter should have a 2:1 length to width ratio. While most BMPs require pre-treatment, the sand filter has very

specific requirements. Use Equation 10.4.6-2 to determine the required area for the sedimentation chamber for the sand filter.

### **Bioretention Basin**

Use Equation 10.4.7-1 from the Drainage Manual to determine the required filter area.

### **Dry Detention Basin**

Using the sum of the required water quality volume, channel protection volume, and 25-year volume and an assumed depth, size the dry detention basin. The dry detention basin should have a 2:1 length to width ratio. The dry detention basin does not achieve the required 80% TSS removal and must be used in conjunction with another BMP.

### **Wet Detention Pond**

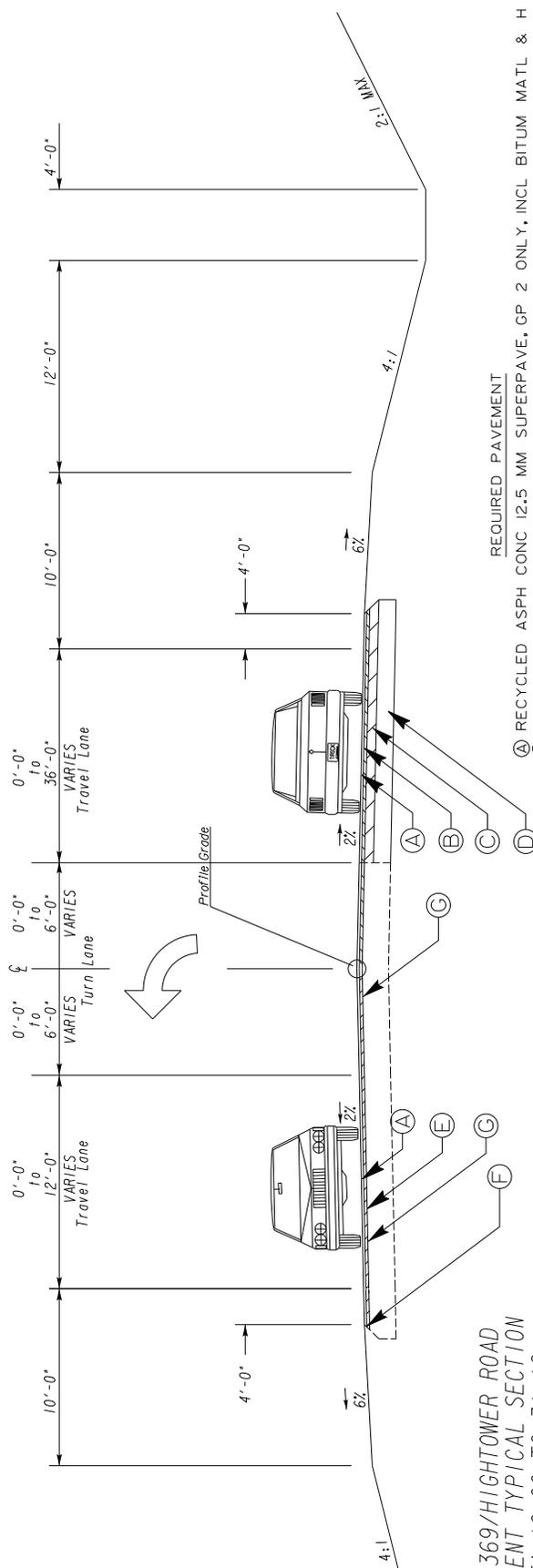
Using the sum of the required water quality volume, channel protection volume, and 25-year volume and an assumed depth, size the wet detention pond. The wet detention pond should have a 2:1 length to width ratio.

### **Stormwater Wetland**

The stormwater wetland requires 2% to 3% of the entire drainage area.

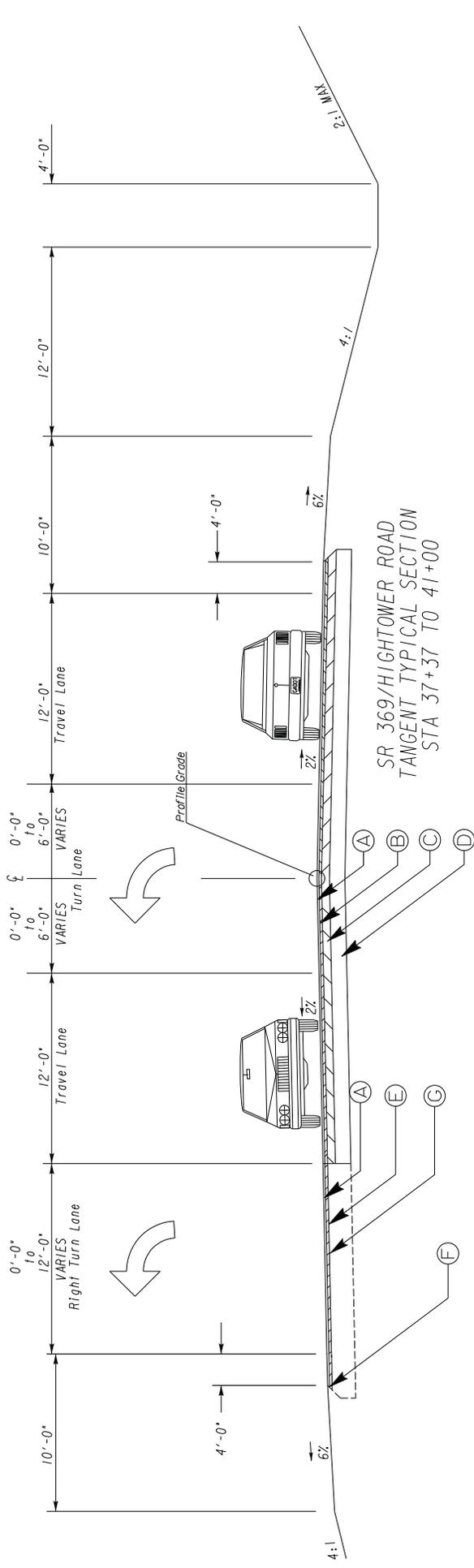
### **Open Graded Friction Course (OGFC)**

Use of OGFC must be approved by the GDOT Pavement Committee. In a road widening scenario TSS removal rate of 50% can be claimed for installing OGFC or PEM as long as enough existing OGFC or PEM is present to account for the shoulder width.



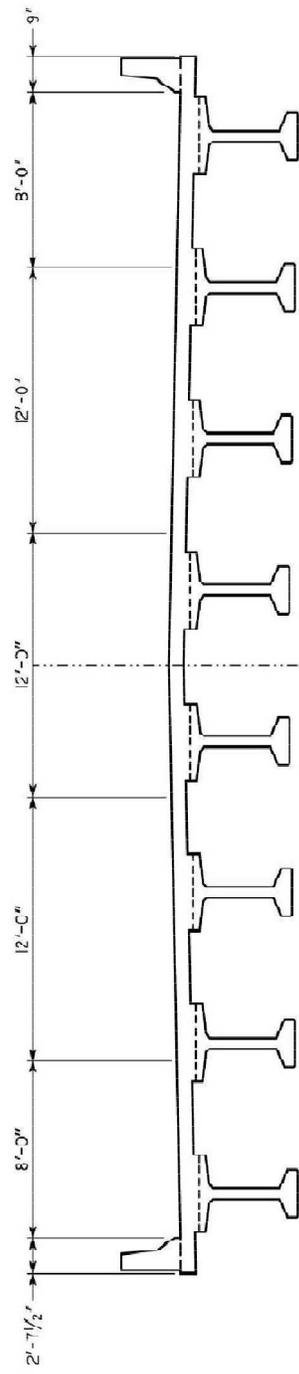
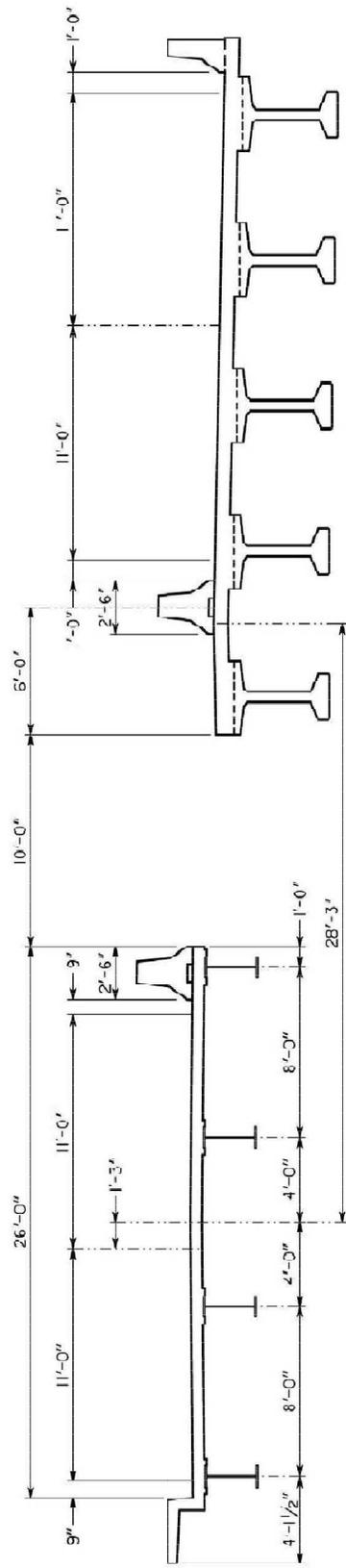
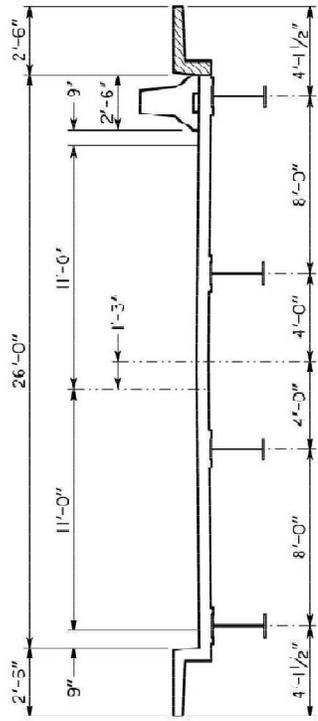
SR 369/HIGHTOWER ROAD  
 TANGENT TYPICAL SECTION  
 STA 10+00 TO 31+12  
 STA 33+00 TO 37+37  
 STA 41+00 TO 53+00

- REQUIRED PAVEMENT
- (A) RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME
  - (B) RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME
  - (C) RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME
  - (D) GRADED AGGREGATE BASE, 12"
  - (E) MILL ASPHALT CONC PVTMT, VARIABLE DEPTH
  - (F) P-7 EDGE TREATMENT
  - (G) ASPHALTIC CONCRETE LEVELING, AS REQ'D



SR 369/HIGHTOWER ROAD  
 TANGENT TYPICAL SECTION  
 STA 37+37 TO 41+00

## Bridge Typical Sections





# Bridge Inventory Data Listing

## Parameters: Bridge Serial Num

Structure ID: 057-0034-0

Cherokee

SUFF. RATING: 36.90

### Location & Geography

<b>Structure ID:</b>	057-0034-0	<b>*104 Highway System:</b>	0- Inventory Route is not on the NHS	<b>Signs &amp; Attachments</b>	
<b>200 Bridge Information:</b>	07	<b>*26 Functional Classification:</b>	7- Rural - Major Collector	225 Expansion Joint Type:	02- Open or sealed concrete joint (silicone sealant)
<b>*6A Feature Int:</b>	BOARD TREE CREEK	<b>*204 Federal Route Type:</b>	S - Secondary	242 Deck Drains:	1- Open Scuppers.
<b>*6B Critical Bridge:</b>		<b>*105 Federal Lands Highway:</b>	0- Not applicable	243 Parapet Location:	0- None present.
<b>*7A Route No Carried:</b>	SR00369	<b>*110 Truck Route:</b>	0	Height:	0.00
<b>*7B Facility Carried:</b>	SR 369	206 School Bus Route:	1	Width:	0.00
<b>9 Location:</b>	6.7 MI SE OF BALL GROUND	217 Benchmark Elevation:	0000.00	238 Curb Height:	1
<b>2 Dot District:</b>	4841600000 - D6 District Six Centerville	218 Datum:	0- Not Applicable	Curb Material:	1- Concrete.
<b>207 Year Photo:</b>	2012	<b>*19 Bypass Length:</b>	13	239 Handrail	1- Concrete.
<b>*91 Inspection Frequency:</b>	24	<b>*20 Toll:</b>	3- On a Free Road or Non-Highway	*240 Median Barrier Rail:	0- None.
<b>92A Fract Crit Insp Freq:</b>	0	<b>*21 Maintenance:</b>	01-State Highway Agency.	241 Bridge Median Height:	0
<b>92B Underwater Insp Freq:</b>	00	<b>*22 Owner:</b>	01-State Highway Agency.	* Bridge Median Width:	0
<b>92C Other Spc. Insp Freq:</b>	00	<b>*31 Design Load:</b>	2- H 15	230 Guardrail Loc. Dir. Rear:	3- Both sides.
<b>*4 Place Code:</b>	00000	37 Historical Significance:	5- Not eligible for the National Register of Historic Places	Fwd:	3- Both sides.
<b>*5 Inventory Route(O/U):</b>	1	205 Congressional District:	006	Oppo. Dir. Rear:	0- None.
<b>Type:</b>	3 - State	27 Year Constructed:	1960	Oppo. Fwd:	0- None.
<b>Designation:</b>	1- Mainline	106 Year Reconstructed:	0	244 Approach Slab	3- Forward and Rear.
<b>Number:</b>	00369	33 Bridge Median	0-None	224 Retaining Wall:	0- None.
<b>Direction:</b>	0. Not applicable	34 Skew:	0	233 Posted Speed Limit:	55
<b>*16 Latitude:</b>	34.0000- 17.3616 HMMS Prefix:SR	35 Structure Flared:	No	236 Warning Sign:	0.00
<b>*17 Longitude:</b>	84.0000- 16.4556 HMMS Suffix:00	38 Navigation Control:	0- Navigation is not controlled by an Agency	234 Delineator:	1.00
<b>98 Border Bridge:</b>	MP: 3.74	213 Special Steel Design:	0- Not applicable or other	235 Hazard Boards:	1
<b>99 ID Number:</b>	% Shared:00	267 Type of Paint:	5- Waterborne System (Type VI or VII)	237 Utilities Gas:	00- Not Applicable
<b>*100 STRAHNET:</b>	0000000000000000	<b>*42 Type of Service On:</b>	1-Highway	Water:	00- Not Applicable
<b>12 Base Highway Network:</b>	0- The Feature is not a STRAHNET route.	Type of Service Under:	5-Waterway	Electric:	00- Not Applicable
<b>13A LRS Inventory Route:</b>	1	214 Movable Bridge:	0	Telephone:	00- Not Applicable
<b>13B Sub Inventory Route:</b>	571036900	203 Type Bridge:	0 - Multip -N. Steel-C& M. Steel - O. Concrete	Sewer:	00- Not Applicable
<b>*101 Parallel Structure:</b>	0.00	259 Pile Encasement	3	247 Lighting Street:	0
<b>*102 Direction of Traffic:</b>	N. No parallel structure exists	<b>*43 Structure Type Main:</b>	3-Steel	Navigation:	0
<b>*264 Road Inventory Mile Post:</b>	2- Two Way	45 No-Spans Main:	3	Aerial:	0- Not :
<b>*208 Inspection Area:</b>	003.74	44 Structure Type Appr:	0- Other	*248 County Continuity No.:	00
<b>Engineer's Initials:</b>	Area 09	46 No Spans Appr:	0		
<b>* Location ID No:</b>	eep	226 Bridge Curve Horz	0 Vert: 1.00		
	057-00369D-003.74E	111 Pier Protection	N - Navigation Control item coded 0, or Feature not a waterway		
		107 Deck Structure Type:			
		108 Wearing Structure Type:			
		Membrane Type:			
		Deck Protection:			



# Bridge Inventory Data Listing

## Parameters: Bridge Serial Num

### Structure ID: 057-0034-0

#### Programming Data

201 Project No: S-0862 (4)  
 202 Plans Available: 4- Plans in Infomlage.  
 249 Prop Proj No: BRG-0007-00(028)  
 250 Approval Status: 0000  
 251 PI Number: 0007028  
 252 Contract Date: 02/01/1901  
 260 Seismic No: 00007  
 75 Type Work: 34- Widening  
 94 Bridge Imp. Cost: \$492  
 95 Roadway Imp. Cost: \$49

10310 Year: 2011  
 109 % Trucks: 1  
 \* 28 Lanes On: 2 Under: 0  
 210 No. Tracks On: 00 Under: 00  
 \* 48 Max. Span Length: 42  
 \* 49 Structure Length: 126  
 51 Br. Rwdy. Width: 26.00  
 52 Deck Width: 32.30  
 \* 47 Tot. Horiz. Cl: 26

50 Curb / Sidewalk Width: 2.00 / 2.00  
 32 Approach Rdwy. Width: 24  
 \* 229 Shoulder Width: 6.00 Type: 8 - Grass Rt: 6  
 Rear Lt: 6.00 Type: 8 - Rt: 6  
 Fwd. Lt: 6.00 Type: 8 - Grass Rt: 6

1- Work to be done by contract with deck  
 114 Future ADT: 15465 Year: 2031  
 96 Total Imp Cost: \$738  
 76 Imp Length: 337  
 97 Imp Year: 2013

#### Hydraulic Data

215 Waterway Data:  
 High Water Elev: 0000.0 Year: 1900  
 Flood Elev: 0000.0 Freq: 00  
 Avg Streambed Elev: 0000.0  
 Drainage Area: 84391  
 Area of Opening: 000744

113 Scour Critical U. No Load Rating; no scour critical data entered.  
 216 Water Depth: 1.1 Br. Height: 31.1  
 222 Slope Protection: 0  
 221 Spur Dikes Rear 0 Fwd: 0  
 219 Fender System 0- None.  
 220 Dolphin:  
 223 Culvert Cover: 000

Type: 0- Not Applicable  
 No. Barrels: 0  
 Width: 0.00 Height: 0  
 Length: 0 Apron: 0  
 \* 265 U/W Insp. Area 0 Diver: ZZZ  
 \* Location ID No: 057-00369D-003.74E

Act. Odm Dir: 99' 99"  
 Oppo. Dir: 99' 99"  
 Posted Odm. Dir: 00' 00"  
 Oppo. Dir: 00' 00"  
 55 Lateral Undercl. Rt: N- Feature not a highway or railroad. 0.00  
 56 Lateral Undercl. Lt: 0.00  
 \* 10 Max Min Vert Cl: 99' 99" Dir: 0  
 39 Nav Vert Cl: 000 Horiz: 0  
 116 Nav Vert Cl Closed: 000  
 245 Deck Thickness Main Deck Thick Approach: 6.50  
 246 Overlay Thickness: 0.00

212 Year Last Painted: Sup: 2001 Sub: 2001  
 253 Notification Date: 02/01/1901  
 258 Fed Notify Date: 02/01/1901

Measurements:  
 65 Inventory Rating Method: 2- Allowable Stress (AS)  
 63 Operating Rating Method: 2- Allowable Stress (AS)  
 66 Inventory Type: 2 - HS loading. Rating: 21  
 64 Operating Type: 2 - HS loading. Rating: 33  
 231 Calculated Loads:  
 H-Modified: 20 0  
 HS-Modified: 25 0  
 Type 3: 25 0  
 Type 3s2: 38 0  
 Timber: 36 0  
 Piggyback: 40 0

261 H Inventory Rating: 15  
 262 H Operating Rating: 21  
 67 Structural Evaluation: 4  
 58 Deck Condition: 5 - Fair Condition  
 59 Superstructure Condition: 7 - Good Condition  
 \* 227 Collision Damage:  
 60A Substructure Condition: 5 - Fair Condition  
 60B Scour Condition: 5 - Fair Condition  
 60C Underwater Condition: N - Not Applicable  
 71 Waterway Adequacy: 9 - Superior to present desirable criteria.  
 61 Channel Protection Cond.: 7  
 68 Deck Geometry: 2  
 69 UnderClr. Horz/Vert: N  
 72 Appr. Alignment: 8 - No reduction of vehicle operating speed required.  
 62 Culvert: N - Not Applicable

Posting Data  
 70 Bridge Posting Required: 5. Equal to or above legal loads  
 41 Struct Open, Posted, CL: A. Open, no restriction  
 \* 103 Temporary Structure: 0  
 232 Posted Loads  
 H-Modified: 00  
 HS-Modified: 00  
 Type 3: 00  
 Type 3s2: 00  
 Timber: 00  
 Piggyback: 00

253 Notification Date: 02/01/1901  
 258 Fed Notify Date: 02/01/1901

# DETAILED COST ESTIMATE

**JOB NUMBER:** 0007028\_AJ

**FED/STATE PROJECT NUMBER:** N/A

**SPEC YEAR:** 13

**DESCRIPTION:** SR 369 AND BOARD CREEK BRIDGE REPLACEMENT  
WITH STAGE CONSTRUCTION BRIDGE

**Assigned Control Group:** DISTRICT 7

## ITEMS FOR JOB 0007028\_AJ

### 0010 - ROADWAY

LINE NUMBER	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0005	210-0100	1.00	LS	\$1,000,000.00000	GRADING COMPLETE -	\$1,000,000.00
0010	310-1101	5881.00	TN	\$27.62475	GR AGGR BASE CRS, INCL MATL	\$162,461.15
0015	402-3121	2956.00	TN	\$80.88470	RECYL AC 25MM SP,GP1/2,BM&HL	\$239,095.17
0020	402-3130	739.00	TN	\$108.76599	RECYL AC 12.5MM SP,GP2,BM&HL	\$80,378.07
0025	402-3190	985.00	TN	\$93.07882	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	\$91,682.64
0030	413-0750	2690.00	GL	\$2.89100	TACK COAT	\$7,776.79
0035	432-5010	310.00	SY	\$9.79732	MILL ASPH CONC PVMT,VARB DEPTH	\$3,037.17
0135	150-5010	1.00	EA	\$8,090.27842	TRAF CTRL,PORTABLE IMPACT ATTN	\$8,090.28
0140	402-1802	20.00	TN	\$179.80691	RECYL AC PATCHING, INCL BM&HL	\$3,596.14
0145	402-1812	50.00	TN	\$78.62512	RECYL AC LEVELING,INC BM&HL	\$3,931.26
0155	433-1000	240.00	SY	\$198.70246	REINF CONC APPROACH SLAB	\$47,688.59
0160	620-0100	200.00	LF	\$35.38563	TEMP BARRIER, METHOD NO. 1	\$7,077.13
0165	634-1200	8.00	EA	\$127.82931	RIGHT OF WAY MARKERS	\$1,022.63
0170	641-1100	100.00	LF	\$71.32514	GUARDRAIL, TP T	\$7,132.51
0175	641-1200	300.00	LF	\$19.79848	GUARDRAIL, TP W	\$5,939.54
0180	641-5012	4.00	EA	\$2,288.99144	GUARDRAIL ANCHORAGE, TP 12	\$9,155.97
<b>ROADWAY Total</b>						<b>\$1,678,065.04</b>

### 0020 - SIGNING AND MARKING

LINE NUMBER	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0040	636-1033	72.00	SF	\$14.90373	HWY SIGNS, TP1MAT,REFL SH TP 9	\$1,073.07
0045	636-2070	96.00	LF	\$8.45191	GALV STEEL POSTS, TP 7	\$811.38
0050	653-1501	8000.00	LF	\$0.54130	THERMO SOLID TRAF ST 5 IN, WHI	\$4,330.40
0055	653-1502	8000.00	LF	\$0.60382	THERMO SOLID TRAF ST, 5 IN YEL	\$4,830.56
0060	654-1001	300.00	EA	\$4.38857	RAISED PVMT MARKERS TP 1	\$1,316.57
0225	653-1704	12.00	LF	\$11.81076	THERM SOLID TRAF STRIPE,24,WH	\$141.73
0230	657-1085	350.00	LF	\$7.82412	PRF PL SD PVT MKG,8,B/W,TP PB	\$2,738.44
0235	657-6085	350.00	LF	\$7.73651	PRF PL SD PVMT MKG,8,B/Y,TPPB	\$2,707.78
<b>SIGNING AND MARKING Total</b>						<b>\$17,949.93</b>

### 0030 - EROSION CONTROL

LINE NUMBER	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0065	150-1000	1.00	LS	\$50,000.00000	TRAFFIC CONTROL -	\$50,000.00
0070	163-0232	3.00	AC	\$790.14112	TEMPORARY GRASSING	\$2,370.42
0075	163-0240	30.00	TN	\$260.57268	MULCH	\$7,817.18
0080	163-0300	2.00	EA	\$1,621.26597	CONSTRUCTION EXIT	\$3,242.53
0085	171-0030	4700.00	LF	\$3.62781	TEMPORARY SILT FENCE, TYPE C	\$17,050.71
0090	165-0030	2350.00	LF	\$0.53812	MAINT OF TEMP SILT FENCE, TP C	\$1,264.58
0095	700-7000	4.00	TN	\$144.71259	AGRICULTURAL LIME	\$578.85
0100	700-8000	4.00	TN	\$658.36497	FERTILIZER MIXED GRADE	\$2,633.46
0130	163-0527	60.00	EA	\$349.87749	CNST/REM RIP RAP CKDM,STN P RIPRAP/SN BG	\$20,992.65
0185	163-0529	200.00	LF	\$6.17293	CNST/REM TEMP SED BAR OR BLD STRW CK DM	\$1,234.59
0190	163-0550	2.00	EA	\$209.84557	CONS & REM INLET SEDIMENT TRAP	\$419.69
0195	165-0071	200.00	LF	\$3.45650	MAINT OF SEDIMENT BARRIER - BALED STRAW	\$691.30
0200	165-0101	1.00	EA	\$530.44755	MAINT OF CONST EXIT	\$530.45
0205	165-0105	2.00	EA	\$50.86749	MAINT OF INLET SEDIMENT TRAP	\$101.73
0210	167-1000	2.00	EA	\$417.54447	WATER QUALITY MONITORING AND SAMPLING	\$835.09
0215	167-1500	12.00	MO	\$953.90160	WATER QUALITY INSPECTIONS	\$11,446.82

LINE NUMBER	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0220	700-6910	3.00	AC	\$1,516.10271	PERMANENT GRASSING	\$4,548.31
<b>EROSION CONTROL Total</b>						<b>\$125,758.36</b>

***0040 - DRAINAGE***

LINE NUMBER	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0275	603-2181	15.00	SY	\$66.26856	STN DUMPED RIP RAP, TP 3, 18	\$994.03
0280	441-0301	2.00	EA	\$2,004.14075	CONC SPILLWAY, TP 1	\$4,008.28
<b>DRAINAGE Total</b>						<b>\$5,002.31</b>

***0050 - BRIDGE***

LINE NUMBER	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0115	511-3000	1.00	LS	\$940,000.0000 0	SUPERSTR REINF STEEL, BR NO -	\$940,000.00
0125	211-0300	500.00	CY	\$31.36000	BR EXCAV, STREAM CROSSING	\$15,680.00
0240	500-2100	400.00	LF	\$65.22632	CONCRETE BARRIER	\$26,090.53
0245	603-2024	722.00	SY	\$70.12902	STN DUMPED RIP RAP, TP 1, 24	\$50,633.15
0250	603-7000	737.00	SY	\$4.15858	PLASTIC FILTER FABRIC	\$3,064.87
<b>BRIDGE Total</b>						<b>\$1,035,468.55</b>

***0060 - MISC***

LINE NUMBER	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0255	610-0100	243.00	LF	\$6.00000	REM BARBED WIRE FENCE	\$1,458.00
0260	632-0003	3.00	EA	\$7,896.24853	CHANGEABLE MESS SIGN,PORT,TP 3	\$23,688.75
0265	643-0050	243.00	LF	\$5.00000	TEMPORARY FIELD FENCE	\$1,215.00
0270	643-0105	243.00	LF	\$7.50000	FIELD FENCE BARWIRE, 5 STRANDS	\$1,822.50
<b>MISC Total</b>						<b>\$28,184.25</b>

TOTALS FOR JOB 0007028\_AJ

ITEMS COST:	\$2,890,428.44
COST GROUP COST:	\$0.00
ESTIMATED COST:	\$3,007,201.75
CONTINGENCY PERCENT:	2.00%
ENGINEERING AND INSPECTION:	5.00%
ESTIMATED COST WITH CONTINGENCY AND E&I:	\$3,220,713.07

File Location: Div of Preconstruction > CES

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**GEORGIA DEPARTMENT OF TRANSPORTATION  
PRELIMINARY ROW COST ESTIMATE SUMMARY**

Date: 9/22/2016  
Revised:

Project: CSBRG-0007-00(028)  
County: Cherokee  
PI: 0007028

Description: SR 369 Hightower Rd. over Board Tree Creek  
Project Termini: \*Preferred Alternate #1

Parcels: 5 Existing ROW: Varies  
Required ROW: Varies

Land and Improvements \$326,199.00

Proximity Damage	\$0.00
Consequential Damage	\$0.00
Cost to Cures	\$0.00
Trade Fixtures	\$0.00
Improvements	\$125,000.00

Valuation Services \$18,750.00

Legal Services \$40,875.00

Relocation \$11,250.00

Demolition \$0.00

Administrative \$45,000.00

TOTAL ESTIMATED COSTS \$442,074.00

**TOTAL ESTIMATED COSTS (ROUNDED) \$443,000.00**

Preparation Credits	Hours	Signature

Prepared By:  CG#: \_\_\_\_\_ (DATE) \_\_\_\_\_  
 Approved By:  CG#: 272564 (DATE) 9-22-16

**NOTE: No Market Appreciation is included in this Preliminary Cost Estimate**

GEORGIA DEPARTMENT OF TRANSPORTATION  
PRELIMINARY ROW COST ESTIMATE SUMMARY

Date: 9/22/2016  
Revised:

Project: CSBRG-0007-00(028)  
County: Cherokee  
PI: 0007028

Description: SR 369 Hightower Rd. over Board Tree Creek  
Project Termini: Alternate #2 (Not Preferred)

Parcels: 6 Existing ROW: Varies  
Required ROW: Varies

Land and Improvements \_\_\_\_\_ \$421,212.00

Proximity Damage	\$0.00
Consequential Damage	\$0.00
Cost to Cures	\$0.00
Trade Fixtures	\$0.00
Improvements	\$125,000.00

Valuation Services \_\_\_\_\_ \$22,500.00

Legal Services \_\_\_\_\_ \$41,550.00

Relocation \_\_\_\_\_ \$13,500.00

Demolition \_\_\_\_\_ \$0.00

Administrative \_\_\_\_\_ \$52,000.00

TOTAL ESTIMATED COSTS \_\_\_\_\_ \$550,762.00

**TOTAL ESTIMATED COSTS (ROUNDED) \_\_\_\_\_ \$551,000.00**

Preparation Credits	Hours	Signature

Prepared By: \_\_\_\_\_ CG#: \_\_\_\_\_ (DATE) \_\_\_\_\_  
 Approved By: Belum AB CG#: 272564 (DATE) 9-22-16

**NOTE: No Market Appreciation is included in this Preliminary Cost Estimate**

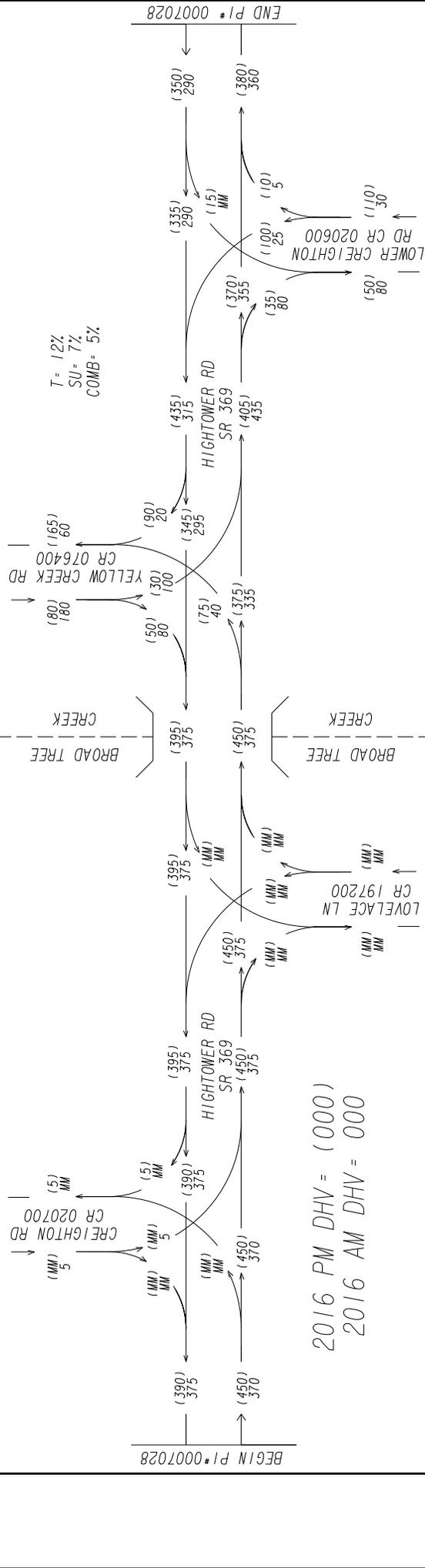
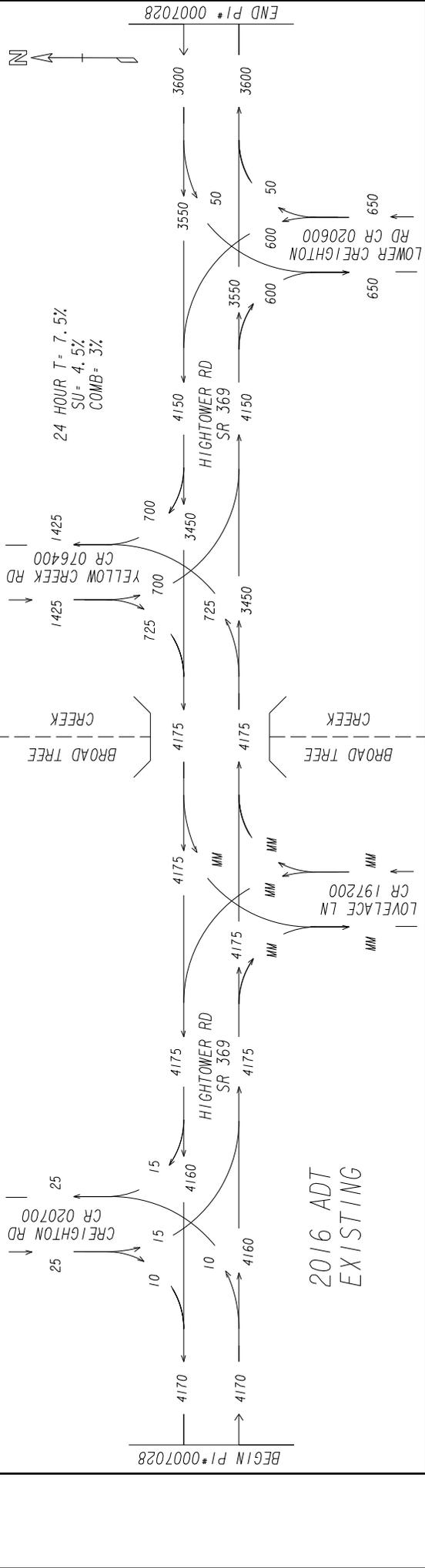




## Crash Summaries

### SR 369 near Yellow Creek Road

Date	Route	Intersecting Route	Injuries	Fatalities	Manner Of Collision	Location Of Impact	First Harmful Event	DirVeh 1	U1Factors
3/10/2011	SR 369	YELLOW CREEK RD	0	0	Not A Collision with Motor Vehicle	Off Roadway	Over Turn	East	No Contributing Factors
4/25/2012	HIGHTOWER RD	YELLOW CREEK RD	0	0	Not A Collision with Motor Vehicle	Off Roadway	Ditch	West	Misjudged Clearance
7/14/2012	HIGHTOWER RD	YELLOW CREEK RD	0	0	Not A Collision with Motor Vehicle	On Roadway	Tree	East	No Contributing Factors
8/9/2012	SR 369	YELLOW CREEK RD	2	0	Collision NON-Fixed Object	On Roadway	Motor Vehicle NOT In Motion	East	Vehicle #1 failed to stop and struck vehicle #2
5/16/2013	GA 369 MM 3	YELLOW CREEK ROAD	0	0	Sideswipe- Opposite Direction	On Roadway	Motor Vehicle In Motion	East	D.U.I.,Mechanical Or Vehicle Failure
6/11/2015	GA 369	YELLOW CREEK RD	1	0	Not A Collision with Motor Vehicle	On Shoulder	Over Turn	East	No Contributing Factors



**CSBRG-0007-001(028)**  
PI# 0007028  
CHEROKEE COUNTY  
SR 369 AT BROAD TREE CREEK

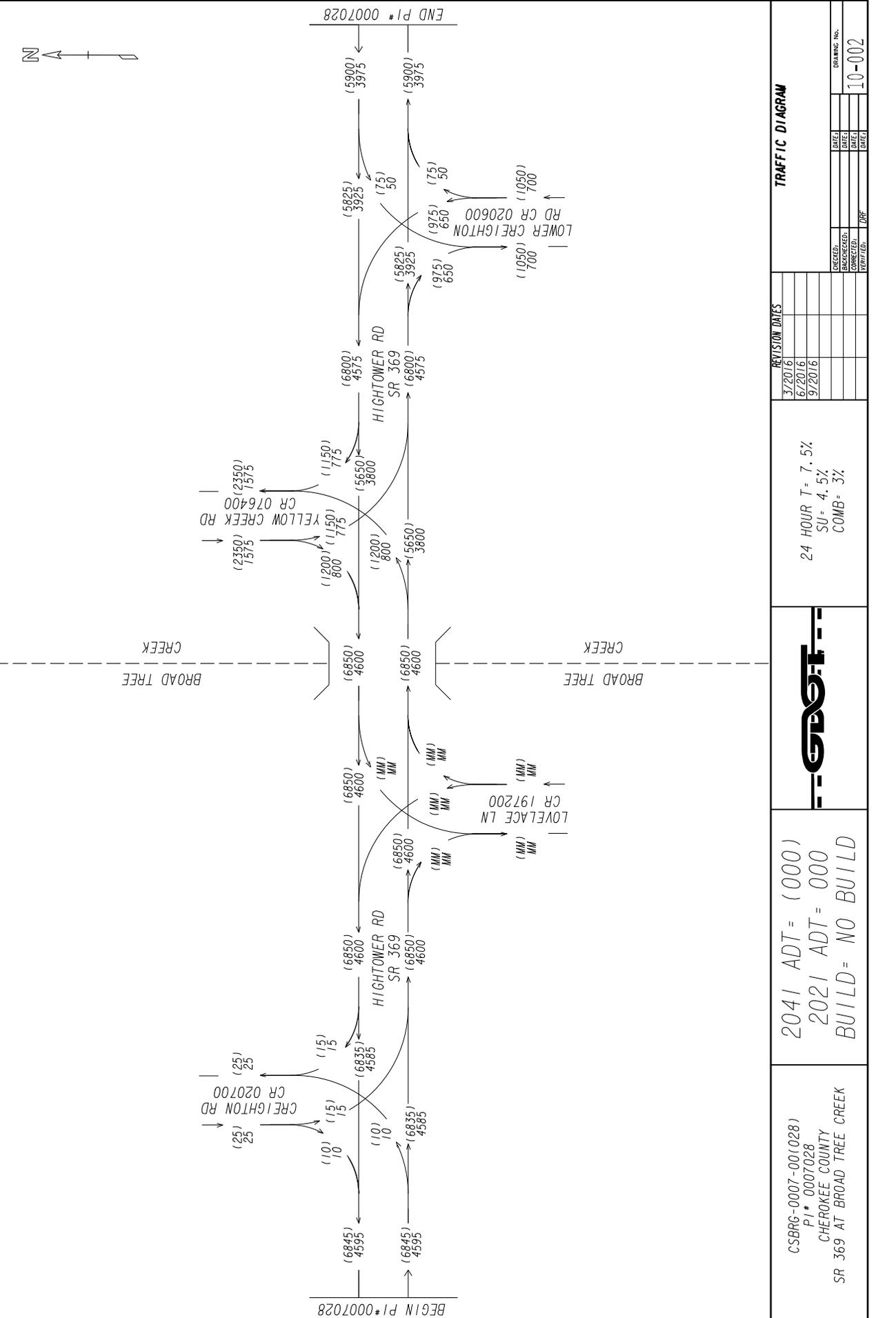
**BUILD= NO BUILD**

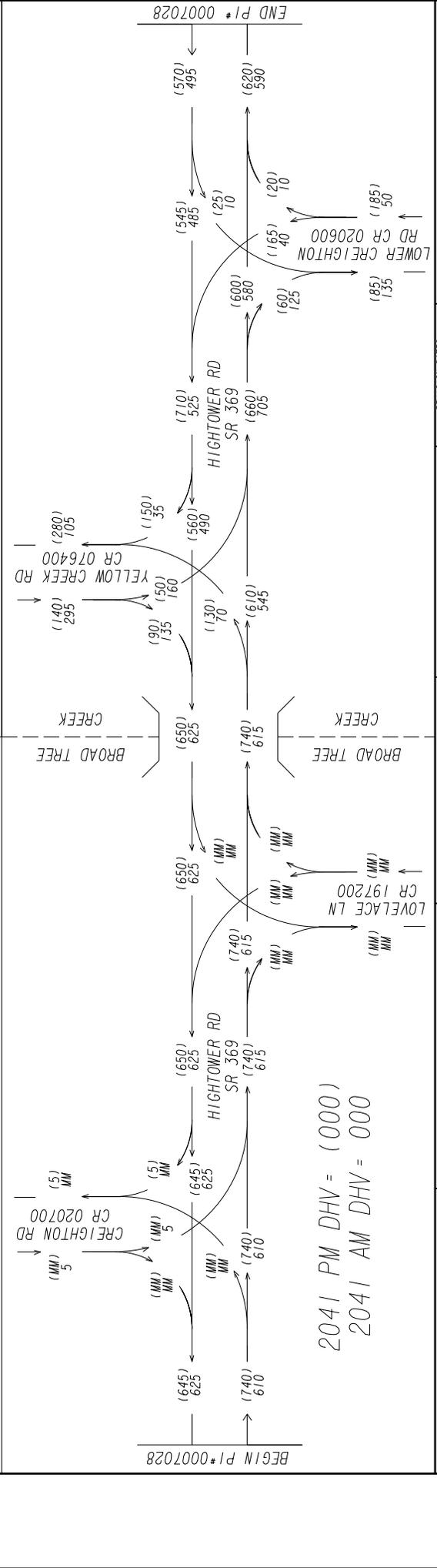
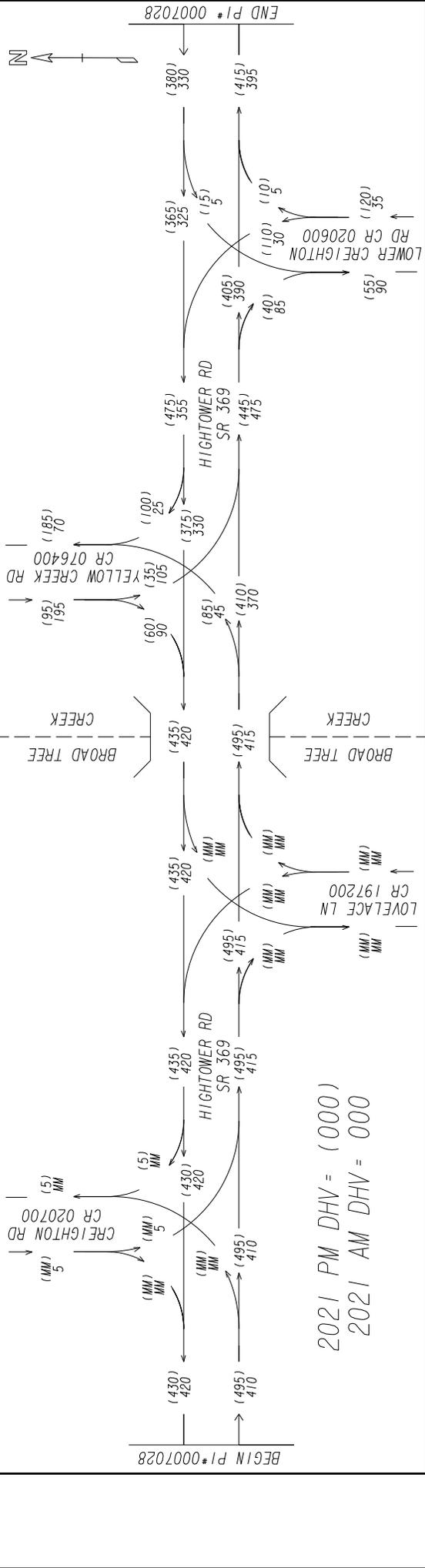
**TRAFFIC DIAGRAM**

REVISION DATES	
3/2016	
6/2016	
9/2016	

CREATED:	DATE:	BY:
CHECKED:	DATE:	BY:
APPROVED:	DATE:	BY:

DRAWING NO. 10-001





**CSBRG-0007-001028**  
PI# 0007028  
CHEROKEE COUNTY  
SR 369 AT BROAD TREE CREEK

**BUILD = NO BUILD**

**TRAFFIC DIAGRAM**

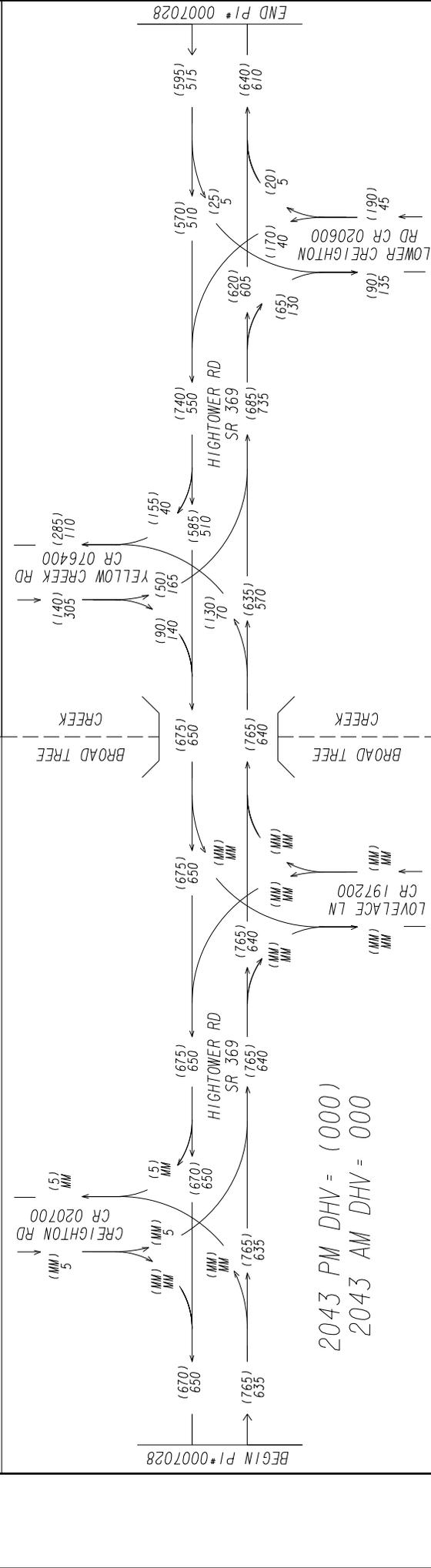
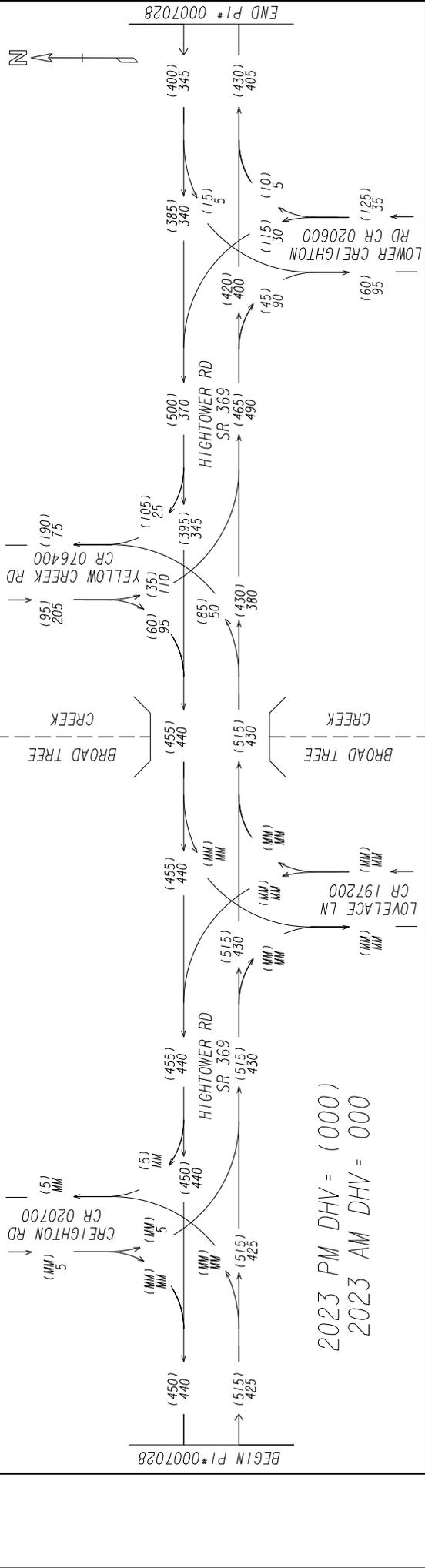
T = 12%  
SU = 7%  
COMB = 5%

REVISION DATES	
3/2016	
6/2016	
9/2016	

CREATED:	DATE:	DATE:	DATE:
DESIGNED:	DATE:	DATE:	DATE:
CHECKED:	DATE:	DATE:	DATE:
VERIFIED:	DATE:	DATE:	DATE:

DRAWING NO. 10-003





CSBRG-0007-001(028)  
PI# 0007028  
CHEROKEE COUNTY  
SR 369 AT BROAD TREE CREEK

**BUILD = NO BUILD**

T = 12%  
SU = 7%  
COMB = 5%

**TRAFFIC DIAGRAM**

REVISION DATES	
3/2016	
6/2016	
9/2016	

CREATED:	DATE:	BY:
CHECKED:	DATE:	BY:
APPROVED:	DATE:	BY:

DRAWING NO. 10-005

Phone: Fax:  
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst BUCKLEY  
Agency/Co. GDOT  
Date Performed 6/14/2016  
Analysis Time Period PEAK  
Highway SR 369 BOARD TREE CREEK  
From/To  
Jurisdiction CHEROKEE  
Analysis Year 2016  
Description BRIDGE REPLACEMENT

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.88
Shoulder width	10.0 ft	% Trucks and buses	12 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	0.3 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Rolling	% Recreational vehicles	7 %
Grade: Length	- mi	% No-passing zones	40 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 450 veh/h  
Opposing direction volume, Vo 395 veh/h

Average Travel Speed

Direction	Analysis (d)	Opposing (o)
PCE for trucks, ET	1.8	1.9
PCE for RVs, ER	1.1	1.1
Heavy-vehicle adj. factor, (note-5) fHV	0.907	0.897
Grade adj. factor, (note-1) fg	0.95	0.92
Directional flow rate, (note-2) vi	593 pc/h	544 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed, (note-3) S FM	-	mi/h
Observed total demand, (note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, (note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width, (note-3) fLS	0.0	mi/h
Adj. for access point density, (note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSD	47.7	mi/h
Percent Free Flow Speed, PFFS	82.3	%

Percent Time-Spent-Following

Direction	Analysis (d)	Opposing (o)	
PCE for trucks, ET	1.2	1.4	
PCE for RVs, ER	1.0	1.0	
Heavy-vehicle adjustment factor, fHV	0.977	0.954	
Grade adjustment factor, (note-1) fg	0.96	0.93	
Directional flow rate, (note-2) vi	545 pc/h	506 pc/h	
Base percent time-spent-following, (note-4) BPTSFd	54.5	%	
Adjustment for no-passing zones, fnp	31.9		
Percent time-spent-following, PTSFd	71.0	%	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.38	
Peak 15-min vehicle-miles of travel, VMT15	38	veh-mi
Peak-hour vehicle-miles of travel, VMT60	135	veh-mi
Peak 15-min total travel time, TT15	0.8	veh-h
Capacity from ATS, CdATS	1542	veh/h
Capacity from PTSF, CdPTSF	1594	veh/h
Directional Capacity	1542	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	47.7	mi/h
Percent time-spent-following, PTSFd (from above)	71.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	511.4
Effective width of outside lane, We	32.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.71
Bicycle LOS	D

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If  $v_i$  ( $v_d$  or  $v_o$ )  $\geq 1,700$  pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for  $v > 200$  veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:  
E-Mail:

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Directional Two-Lane Highway Segment Analysis

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Analyst BUCKLEY  
Agency/Co. GDOT  
Date Performed 6/14/2016  
Analysis Time Period PEAK  
Highway SR 369 BOARD TREE CREEK  
From/To  
Jurisdiction CHEROKEE  
Analysis Year 2021  
Description BRIDGE REPLACEMENT

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Input Data

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Highway class	Class 3	Peak hour factor, PHF	0.88	
Shoulder width	10.0 ft	% Trucks and buses	12	%
Lane width	12.0 ft	% Trucks crawling	0.0	%
Segment length	0.3 mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling	% Recreational vehicles	7	%
Grade: Length	- mi	% No-passing zones	40	%
Up/down	- %	Access point density	8	/mi

Analysis direction volume, Vd 495 veh/h  
Opposing direction volume, Vo 435 veh/h

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Average Travel Speed

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Direction	Analysis (d)	Opposing (o)
PCE for trucks, ET	1.7	1.8
PCE for RVs, ER	1.1	1.1
Heavy-vehicle adj. factor, (note-5) fHV	0.917	0.907
Grade adj. factor, (note-1) fg	0.96	0.95
Directional flow rate, (note-2) vi	639 pc/h	574 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed, (note-3) S FM - mi/h  
Observed total demand, (note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed, (note-3) BFFS 60.0 mi/h  
Adj. for lane and shoulder width, (note-3) fLS 0.0 mi/h  
Adj. for access point density, (note-3) fA 2.0 mi/h

Free-flow speed, FFSd 58.0 mi/h

Adjustment for no-passing zones, fnp 1.3 mi/h  
Average travel speed, ATSD 47.3 mi/h  
Percent Free Flow Speed, PFFS 81.5 %

Percent Time-Spent-Following

Direction	Analysis (d)	Opposing (o)	
PCE for trucks, ET	1.2	1.4	
PCE for RVs, ER	1.0	1.0	
Heavy-vehicle adjustment factor, fHV	0.977	0.954	
Grade adjustment factor, (note-1) fg	0.97	0.96	
Directional flow rate, (note-2) vi	594 pc/h	540 pc/h	
Base percent time-spent-following, (note-4) BPTSFd	57.7 %		
Adjustment for no-passing zones, fnp	29.9		
Percent time-spent-following, PTSFd	73.4 %		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.41	
Peak 15-min vehicle-miles of travel, VMT15	42 veh-mi	
Peak-hour vehicle-miles of travel, VMT60	149 veh-mi	
Peak 15-min total travel time, TT15	0.9 veh-h	
Capacity from ATS, CdATS	1542 veh/h	
Capacity from PTSF, CdPTSF	1594 veh/h	
Directional Capacity	1542 veh/h	

Passing Lane Analysis

Total length of analysis segment, Lt	0.3 mi
Length of two-lane highway upstream of the passing lane, Lu	- mi
Length of passing lane including tapers, Lpl	- mi
Average travel speed, ATSD (from above)	47.3 mi/h
Percent time-spent-following, PTSFd (from above)	73.4
Level of service, LOSd (from above)	C

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	- mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	- mi
Adj. factor for the effect of passing lane on average speed, fpl	-
Average travel speed including passing lane, ATSpl	-
Percent free flow speed including passing lane, PFFSpl	0.0 %

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	- mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	- mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-
Percent time-spent-following including passing lane, PTSFpl	- %

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E
Peak 15-min total travel time, TT15	- veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	562.5
Effective width of outside lane, We	32.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.76
Bicycle LOS	D

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If  $v_i$  ( $v_d$  or  $v_o$ )  $\geq 1,700$  pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for  $v > 200$  veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:  
E-Mail:

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Directional Two-Lane Highway Segment Analysis

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Analyst BUCKLEY  
Agency/Co. GDOT  
Date Performed 6/14/2016  
Analysis Time Period PEAK  
Highway SR 369 BOARD TREE CREEK  
From/To  
Jurisdiction CHEROKEE  
Analysis Year 2041  
Description BRIDGE REPLACEMENT

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Input Data

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Highway class	Class 3	Peak hour factor, PHF	0.88	
Shoulder width	10.0 ft	% Trucks and buses	12	%
Lane width	12.0 ft	% Trucks crawling	0.0	%
Segment length	0.3 mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling	% Recreational vehicles	7	%
Grade: Length	- mi	% No-passing zones	40	%
Up/down	- %	Access point density	8	/mi

Analysis direction volume, Vd 740 veh/h  
Opposing direction volume, Vo 650 veh/h

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Average Travel Speed

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Direction	Analysis (d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.1	1.1
Heavy-vehicle adj. factor, (note-5) fHV	0.948	0.937
Grade adj. factor, (note-1) fg	0.99	0.98
Directional flow rate, (note-2) vi	896 pc/h	804 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed, (note-3) S FM - mi/h  
Observed total demand, (note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed, (note-3) BFFS 60.0 mi/h  
Adj. for lane and shoulder width, (note-3) fLS 0.0 mi/h  
Adj. for access point density, (note-3) fA 2.0 mi/h

Free-flow speed, FFSd 58.0 mi/h

Adjustment for no-passing zones, fnp 0.8 mi/h  
Average travel speed, ATSD 44.0 mi/h  
Percent Free Flow Speed, PFFS 75.8 %

Percent Time-Spent-Following

Direction	Analysis (d)	Opposing (o)	
PCE for trucks, ET	1.0	1.0	
PCE for RVs, ER	1.0	1.0	
Heavy-vehicle adjustment factor, fHV	1.000	1.000	
Grade adjustment factor, (note-1) fg	1.00	0.99	
Directional flow rate, (note-2) vi	841	746	pc/h
Base percent time-spent-following, (note-4) BPTSFd	70.7	%	
Adjustment for no-passing zones, fnp	20.9		
Percent time-spent-following, PTSFd	81.8	%	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.56	
Peak 15-min vehicle-miles of travel, VMT15	69	veh-mi
Peak-hour vehicle-miles of travel, VMT60	244	veh-mi
Peak 15-min total travel time, TT15	1.6	veh-h
Capacity from ATS, CdATS	1593	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1593	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	44.0	mi/h
Percent time-spent-following, PTSFd (from above)	81.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	840.9
Effective width of outside lane, We	32.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.97
Bicycle LOS	D

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If  $v_i$  ( $v_d$  or  $v_o$ )  $\geq 1,700$  pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for  $v > 200$  veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

# DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA

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## SUMMARY OF MEETING MINUTES

MEETING DATE: June 30, 2016, 10:00AM at GDOT District 7 Office

PARTICIPANTS: See attached sign in sheet for additional detail:  
Nicole Law, GDOT - OPD  
Sean Pharr, GDOT – OPD  
Adrian Jackson, GDOT D7 Preconstruction  
Mehdi Bashirian - GDOT D7 Preconstruction  
Corey Ghorley - Cherokee County Water  
Erick Rohde – GDOT Engineering Services  
Michael Margut – GDOT - OES  
Austin Alban - GDOT  
Lisa Wesley – GDOT D6 Construction  
Keith Day – GDOT D6 Area Construction  
Jennifer Deems – GDOT D6 Utilities  
Duane Fant – GDOT D6 RW  
Curtis Powell – GDOT D6 Traffic Ops  
Geoff Morton – Cherokee County  
Ted Brown – SEMC  
Pete Hughes – Sawnee EMC

DISCUSSION: SR 369 over Board Creek Bridge Replacement, **Cherokee County, GA**

A Concept Team Meeting with the above listed participants was held on June 30, 2016 in conference room 144/145, GDOT District 7 Office, 5025 New Peachtree Rd, Chamblee, GA 30341. The meeting was held to discuss the concept report and to coordinate expectations and responsibilities for the project going forward.

**Nicole Law** began the Concept Team Meeting (CTM) and everyone made introductions. During introductions it was noted there will be a new GDOT PM for this project Debbie Cottrell, [DCottrell@dot.ga.gov](mailto:DCottrell@dot.ga.gov). This project has been assigned to GDOT's Bridge Program and the Office of Program Delivery's Bridge Program Manager is Sean Pharr; [SPharr@dot.ga.gov](mailto:SPharr@dot.ga.gov).

**Adrian Jackson** provided details from the Limited Scope Concept Report provided to the Team for review. Maddi and Adrian went through some of the challenges of the project, including an alternative which involved a temporary detour bridge.

**Mehdi Bashirian** noted a design variance for substandard radius will be required.

It was discussed GA Power was not in the project limits, Cherokee County Water, Sony EMC, AT&T, Cobb EMC, and AGL would be reflected in the Concept Report.

It was noted SUE was not required at this time.

Transcribed by: shp

**Erik Rohde** noted that the cost as described in the temporary detour bridge alternative was only 100k above that of the cost of the project(with detour), and this discussion should be revisited.

**Mr. Rohde** also noted a number of items were missing from the concept estimates, and a review of the two way highway segment analysis was needed prior to submittal of the concept report.

**Corey Ghorley** provided details of the Cherokee County Water Authorities facilities near the project limits including a 20-foot wide utility easement approximately 125-feet north of the existing bridge.

The group discussed a potential safety improvement project in the area, specifically a left turn lane across the bridge onto Yellow Creek Road. **Adrian Jackson** requested the crash data/analysis completed by the county which shows the need for this improvement. **Geoff Morton** relayed the County's position was for the turn lane to be added.

**Nicole Law** instructed the County to provide GDOT a letter requesting any additional improvements beyond the bridge replacement, as this project scope's funding will be limited to replacing the bridge.

The action items from the meeting are as follows:

**Action Items:**

- a. Return Comments on Draft Minutes by Friday July 8<sup>th</sup>.
- b. Complete R/W Cost Estimate (D7)
- c. Update discussion for Alternative #2
- d. Submit Letter of Request for turn lane (Cherokee County to GDOT – Albert Shelby)
- e. Submitted Concept Report



**Georgia Department of Transportation**  
**DISTRICT SEVEN PRECONSTRUCTION**

**MEETING/CONFERENCE RECORD OF ATTENDEES**

**Purpose:** Concept Team Meeting / SR369 @ Board Tree Creek  
P.I. 0007028

**Location:** District 7

**Date:** June 30, 2016 **Hour:** 10:00 AM **Moderator:** Nicole Law

	<u>Name</u>	<u>Organization</u>	<u>Telephone</u>	<u>Email Address</u>
1.	Adrian Jackson	D7 PRECON	(7) 986-1116	Adjackson1@dot.ga.gov
2.	Mehdi Bashirian	D7 PRECON	(7) 216-3887	mbashirian@dot.ga.gov
3.	Nicole Law	GDOT-OPD	4) 631-1723	nlaw@dot.ga.gov
4.	Corey Ghorley	Cherokee County WATER	(7) 479-1813	coreyghorley@ecwsa.com
5.	Erik Rohde	GDOT-Engineering Services	404-631-1611	erohde@dot.ga.gov
6.	SEAN PHARR	GDOT-OPD	(4) 631-1162	spharr@dot.ga.gov
7.	Michael Margut	GDOT-DES	404-631-1362	mmargut@dot.ga.gov
8.	Austin Alban	GDOT		aalban@dot.ga.gov
9.				
10.				
11.				
12.				
13.				
14.				

NAME	Company	Phone	E-Mail
Lisa Wesley	GDOT D-6 Const	770 387-3609	lwesley@dot...
Keith Day	GDOT D6 AREA Cen	770 387 3680	kday@dot...
Jennifer Deems	GDOT- D6 utilities	678-721-5323	jdeems@dot...
CURTIS POWELL	GDOT- D6 TRAFFIC OPS	678-721-3292	cpowell@dot.ga.gov
Duane Fant	GDOT D6 RW	678 721-5302	dfant@dot.ga.gov
Geoff Morton	CHEROKEE County	678-493-6057	gmorton@cherokee.ga.gov
<del>TED B</del>			
TED BROWN	SEMC	678-455-1552	ted.brown@sawnee.com
Pete Hughes	Sawnee EMC	678-455-1593	Pete.hughes@sawnee.com



**Cherokee County Government**

Public Works Agency  
1130 Bluffs Parkway  
Canton, GA 30114  
678-493-6077  
Fax 678-493-6088

July 6, 2016

Mr. Albert V. Shelby, III  
State Program Delivery Engineer  
Georgia Department of Transportation  
One Georgia Center  
600 West Peachtree Street, NW  
Atlanta, Georgia 30308



Re: SR 369 over Broad Tree Creek Bridge Replacement Project  
PI No. 0007028, Cherokee County

Dear Mr. Shelby:

Cherokee County recently attended the Concept Meeting for the above project. The County supports the replacement of the existing SR 369 bridge over the Broad Tree Creek. One item that was noted during a review of the Concept Report was that the limits of construction of the bridge replacement project extend east through the intersection of SR 369 and Yellow Creek Road (CR 764).

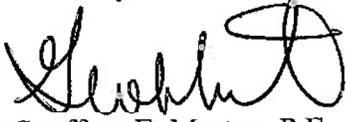
Cherokee County has received numerous requests for improvement at the intersection of SR 369 and Yellow Creek Road (CR 764), specifically the installation of a left-turn lane and right-turn lane from SR 369 to Yellow Creek Road (CR 764). As these improvements are located within the proposed limits of construction of the bridge project, Cherokee County requests that they be constructed in conjunction with the bridge project.

County staff notes that the District 6 Traffic Operations Office also recommend that the installation of the left-turn lane and right-turn lane at Yellow Creek Road be included in the project. Cherokee County concurs with the recommendations made by District 6.

We have included copies of recent accident reports that demonstrate the need for the turn lanes. Additionally the Traffic Diagrams included in the Concept Report also indicate the heavy turning movements, especially the left-turns, at that location. Adding the turn lanes will improve the efficiency of the SR 369 mainline in this location.

Thank you for your consideration of this request. If you have any additional questions, do not hesitate to contact me at 678-493-6057.

Sincerely,



Geoffrey E. Morton, P.E.  
Public Works Agency Director

Attachments

Cc: Meg B. Pirkle, P.E., Chief Engineer  
Nicole S. Law, Office of Program Delivery  
Debbie Cottrell, Office of Program Delivery  
W. Grant Waldrop, P.E., D6 Traffic Engineer  
L.B. "Buzz" Ahrens, Chairman, Cherokee County Board of Commissioners

## DESIGN COORDINATION MEETING MINUTES



**Project Name:** SR 369 @ Broad Tree Creek– Bridge Replacement, Cherokee County

**Date of Meeting:** August 10, 2016

**Time:** 1:30 – 3:30 PM

**PI#:** 0007028

**Meeting Location:** GDOT District 7, Room 144

**Subject:** Design Coordination

### Attendees

Name	GDOT Office	Title
Debbie Cottrell	Office of Program Delivery	Project Manager
Sean Pharr	Office of Program Delivery	Bridge Program Manager
Mehdi Bashirian	D7 Preconstruction	Design Team Leader
Adrian Jackson	D7 Preconstruction	Design Engineer
Abdel Koundaba	D7 Preconstruction	Civil Engineer
Dee Corson	D6 Traffic Operations	District Traffic Operations Manager
Lyn Clements	Office of Bridges and Structures	Assistant State Bridge Engineer
Michael Margut	Office of Environmental Services	NEPA Planner

### Discussion Topics

Topic	Discussion/Action/Response
Current Project Status	Concept Report was submitted on 7/12/16. Comments were received on 7/26/16. Cherokee County has requested right- and left-turn lanes be added from SR 369 onto Yellow Creek. District 6 Traffic Operations is in concurrence with the request. The purpose of the meeting today is to discuss the design options for including the turn lanes, and the potential impacts to the project.
Bridge Design	Lyn Clements provided two staging options for constructing a wider bridge to allow for the left turn lane. Both options are attached for reference. These details may be modified when the H&H study is complete.
Roadway Design	The District Design Office has received the new typical from Lyn Clements in the Bridge office and will modify the plans to coincide with the new typical. Once a new Project Layout is produced, Design will forward a copy to OES along with the Project Change form for their use. At this time, the District will also request any additional/ or revised data from the appropriate offices including Utilities, ROW, Survey, and Planning.
Traffic Operations	Dee Corson confirmed that limiting traffic to one lane for a short time to allow for the barrier installation is acceptable. Dee also confirmed shortly after the meeting that the two intersections just outside the project limits are County Roads (Lovelace Lane to the west of the project, and Creighton Road to the east of the project.)
Environmental	Michael Margut stated that additional field survey for Archeology and Ecology may have to be done if the

	<p>project footprint is increased. The specialists would first do a desktop study to make that determination. OES will need a revised Environment Resource Boundary from Design, as well as a Project Change Form.</p> <p>Michael confirmed with the specialists shortly after the meeting that any additional field surveys and delineations could be completed within two months of receiving the revised boundary.</p>
Budget	The addition of the turn lanes will increase the cost of the project for PE, CST and ROW. A revised layout is required in order to quantify the cost increase.
Schedule	The team is proceeding with the new Concept Report. At this time, the team is in agreement that the baseline schedule can be recovered by PFPR. Refer to the proposed schedule below.
Action Items	<ul style="list-style-type: none"> <li>• Mehdi will contact Engineering Services to inform them of the potential scope change to confirm that a new Concept Report can be submitted, and how the current comments will be addressed.</li> <li>• Adrian will produce the revised layout within a month. They will coordinate with Lyn as needed.</li> <li>• Debbie/Sean will draft a response letter to Cherokee County</li> <li>• Debbie/Sean will work with the Bridge Office and Planning &amp; Program on funding for the increased scope.</li> </ul>

Milestone/Task	Baseline schedule	Proposed schedule
Submit Concept Report	7/14/16	10/7/16
Management Approved Concept Report	8/24/16	11/18/16
Request PIOH	8/25/16	11/21/16
First Submission Utilities	9/9/16	12/30/16
Constructability Review	Not a scheduled task	2/3/17
Preliminary Plans complete	3/31/17	3/31/17
Request PFPR	4/3/17	4/3/17