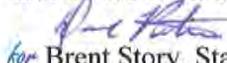


ORIGINAL TO GENERAL FILES

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

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

FILE P.I. #0008430 **OFFICE** Design Policy & Support
CSNHS-0008-00(430)
GDOT District 1 - Gainesville
Barrow County **DATE** March 22, 2012
SR 316/US 29 at SR 11 Interchange

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:

Genetha Rice-Singleton, Program Control Administrator
Bobby Hilliard, State Program Delivery Engineer
Cindy VanDyke, State Transportation Planning Administrator
Angela Robinson, Financial Management Administrator
Glenn Bowman, State Environmental Administrator
Ben Rabun, State Bridge Engineer
Andy Casey, State Roadway Design Engineer
Attn: Neal O'Brien, Design Group Manager (Concept)
Attn: Albert Welch, Design Group Manager (Design)
Kathy Zahul, State Traffic Engineer
Georgene Geary, State Materials & Research Engineer
Lisa Myers, State Project Review Engineer
Jeff Baker, State Utilities Engineer
Ken Thompson, Statewide Location Bureau Chief
Michael Henry, Systems & Classification Branch Chief
Bayne Smith, District Engineer
Robert Mahoney, District Preconstruction Engineer
Allen Ferguson, District Utilities Engineer
Brandon Kirby, Project Manager
BOARD MEMBER - 7th Congressional District

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PROJECT CONCEPT REPORT

Project Number: CSNHS-0008-00(430)

County: BARROW

P. I. Number: 0008430

Federal Route Number: U.S. 29

State Route Number: SR 316 and SR 11

GRADE SEPARATION OF SR 316/US 29 @ SR 11

See page 2 for Location Map

Submitted for approval:

DATE 8-22-11

DATE 9/7/11

DATE 9/2/11

C. Amy Coney
Design Phase Office Head (Roadway Design)

[Signature]
Office Head (Office of Program Delivery)

[Signature]
Project Manager

Recommendation for approval:

DATE _____

* DATE 12/19/2011

* DATE 11/15/2011

* DATE 10/25/2011

* DATE 10/17/2011

DATE _____

* DATE 12/8/2011

DATE _____

Program Control Administrator

GILENN BOWMAN

State Environmental Administrator

KATHY ZAHUL

State Traffic Engineer

RON WISHON

Project Review Engineer

SAL PZARD FOR JEFF BAKER

State Utilities Engineer

District Engineer/District Utilities Engineer

BEN RABUN

State Bridge Design Engineer

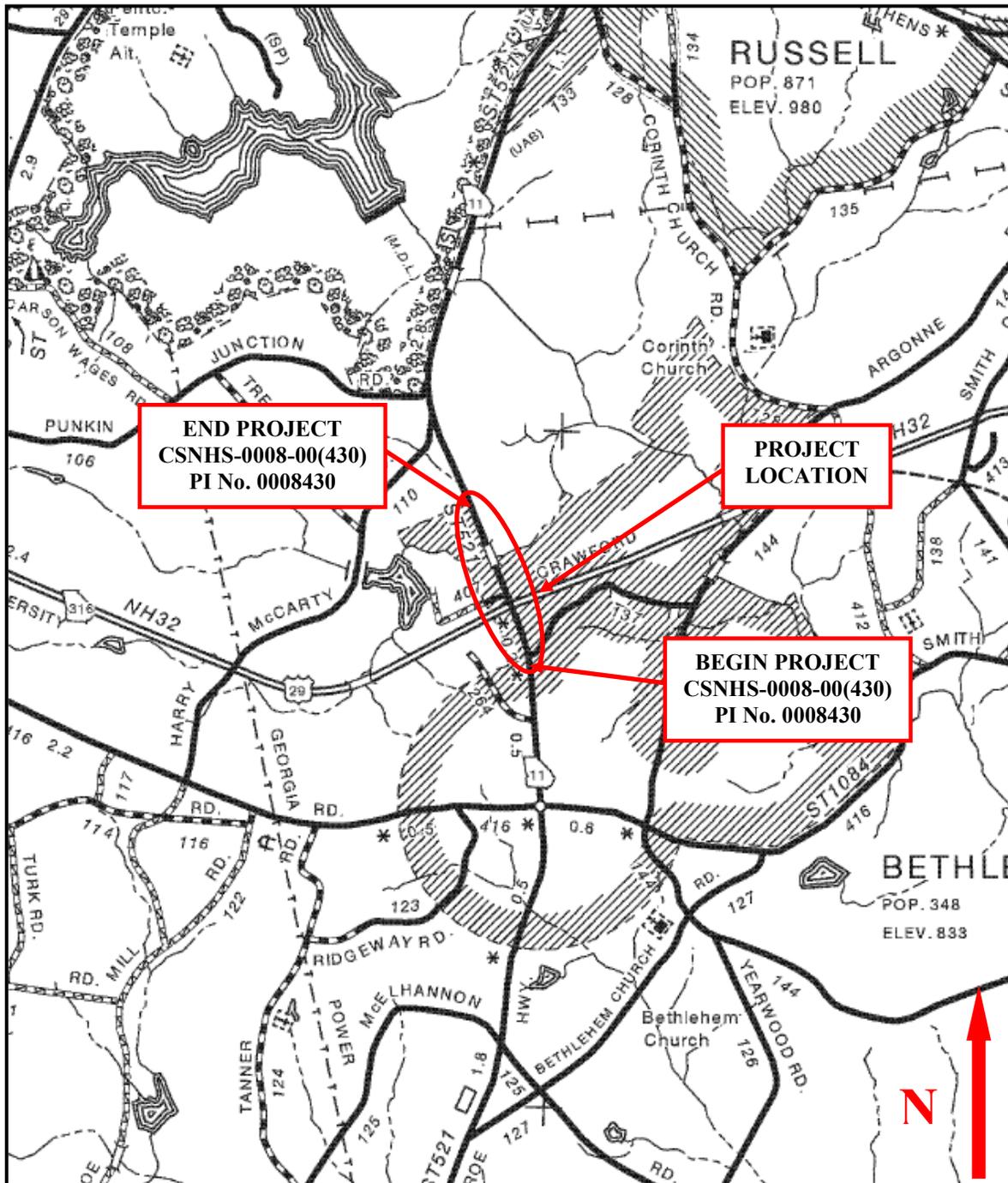
State Transportation Financial Management Administrator

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

* DATE 10/26/2011

MATTHEW FOWLER FOR CYNTHIA VANDRKE
State Transportation Planning Administrator

* RECOMMENDATION ON FILE / [Signature]



(Not to Scale)

Location Map

Justification Statement:

The goal of this project is to reduce crash frequency and severity, and improve traffic operations at the intersection of SR 316 at SR 11.

Approved justification statement for the project is attached to this document as Attachment 3.

Description of the proposed project:

Project CSNHS-0008-00(430) is located in the 7th US Congressional District of the State of Georgia, approximately four miles south of the City of Winder in Barrow County. The project would grade separate the existing at-grade intersection of SR 316 with SR 11. The proposed grade separation would include full interchange access from SR 316 in both directions to SR 11 in both directions and vice-versa. The proposed interchange would not preclude future widening of SR 316.

The tight urban diamond interchange alternative was selected after analysis of eight alternatives for the interchange. The tight urban diamond interchange alternative was preferred due to least amount of impacts to right of way, minimal wetland impacts, and lowest right of way and construction costs. An alternative impacts matrix is attached to this document as Attachment 4.

Project CSNHS-0008-00(430) would construct a tight-urban, diamond interchange (ramp heads spaced 350 feet apart) at the existing at-grade intersection of SR 316 with SR 11, with SR 11 spanning over SR 316 on a bridge structure. SR 11 is an existing two-lane roadway with rural shoulders. SR 11 is proposed to be widened with rural shoulders to provide for left-turn auxiliary lanes on the proposed bridge at the entrance ramps onto SR 316. The work would begin at Mile Post 2.80, approximately 0.21 miles south of the existing SR 316/SR 11 intersection and proceed northward to Mile Post 3.43, a total distance of 0.63 miles. State Route 11 would taper back to a two-lane rural roadway at the northern terminus of the project. The work along SR 316 would be limited to tying in the entrance/exit ramps and erecting guardrail to protect the bridge columns in the median. The work would begin at Mile Post 6.62 and continue westward to Mile Post 7.75, a total distance of 1.13 miles. The length of SR 11 bridge over SR 316 will be set not to preclude future widening of SR 316. The existing two-lane frontage roads from SR 11 located north of SR 316 will be relocated north to maintain current access. Stage construction will be completed using on site detours and lane shifts with temporary paving provided at appropriate locations.

To provide an acceptable Level of Service in the design year of 2032, SR 11 would need to be widened to two lanes in each direction and provide a left-turn auxiliary lane in each direction at the entrance ramps onto SR 316. However, based on the immediate need to reduce vehicle crash occurrence and severity (as noted in Attachment No. 3 - Need and Purpose Statement), the Department proposes to limit the work along SR 11 as noted in the above paragraph.

Project Concept Report page 4
Project Number: CSNHS-0008-00(430)
P.I. Number: 0008430
County: Barrow

Is this project located in a PM 2.5 Non-attainment area? X Yes No

Is this project located in an Ozone Non-attainment area? X Yes No

The proposed project concept matches the conforming plan's model description for grade separation of SR 316 at SR 11.

PDP Classification: Major X Minor

Federal Oversight: Full Oversight (), Exempt (X), State Funded (), Other ()

Functional Classification: SR 316/US 29 – Rural Principal Arterial
SR 11 – Rural Minor Arterial

US Route Number(s): US 29 State Route Number(s): SR 316, SR 11

Traffic (AADT):

Open Year: (2020) – SR 316: 30,000 Design Year: (2040) – SR 316: 44,600
SR 11: 14,500 SR 11: 21,450

Existing design features:

SR 316

- Typical Section: (2) 12 ft. wide travel lanes in each direction, 44 ft. grassed median, 10 ft. outside shoulders and 6 ft. inside shoulders
- Posted speed: 65 mph Minimum radius for curve: N/A
- Maximum super-elevation rate for curve: N/A
- Maximum grade: 3.0 %
- Width of right-of-way: 300 ft
- Major structures: None
- Major interchanges or intersections along the project: Signalized intersection at SR 11
- Existing length of roadway segment and the beginning mile logs for each county segment: 5967 ft. and beginning mile log – 5.47

SR 11

- Typical Section: (1) 12 ft. wide travel lane in each direction, 4 ft. outside shoulders
- Posted speed: 45/55 mph Minimum radius for curve: 2300 ft
- Maximum super-elevation rate for curve: 6.0 %
- Maximum grade: 5.0 %
- Width of right-of-way: 100 ft
- Major structures: None
- Major interchanges or intersections along the project: Signalized intersection at SR 316
- Existing length of roadway segment and the beginning mile logs for each county segment: 3485 ft. and beginning mile log – 2.32

Proposed Design Features:

SR 316: No change to SR 316 Typical Section (Work along SR 316 is limited to tying in ramps and guardrail protection of bridge columns in median)

SR 11

- Proposed typical section(s): (1) 12 ft. wide travel lane in each direction,
10 ft. outside shoulders (6.5 ft. paved, 3.5 ft. grassed)
- Proposed Design Speed: 55 mph
- Proposed Maximum grade: 5.0 %
- Maximum grade allowable: 5.0 %
- Proposed Maximum grade driveway: 11.0 %
- Proposed Minimum radius of curve: 1060 ft
- Minimum radius allowable: 1060 ft
- Maximum allowable superelevation rate: 6.0 %
- Proposed maximum superelevation rate: 6.0 %
- Right-of-Way
 - Width Varies 100 ft – 150 ft
 - Easements: Temporary (), Permanent (), Utility (), Other ()
 - Type of access control: Full (), Partial (), By Permit (), Other ()
 - Number of parcels: 13 Number of displacements:
 - Business: 1 – CITGO Gas Station
 - Residential: 0
 - Mobile Homes: 0
 - Other: 0
- Structures:
 - Bridges: Proposed SR 11 Bridge over SR 316 will be constructed to accommodate one through lane each direction, one turn lane each direction, and 8 ft. outside paved shoulder in each direction. The bridge over SR 316 will be designed to accommodate future widening of both SR 11 and SR 316 .
 - Culvert: Existing Triple 8 ft. x 8 ft. box culvert running across SR 11 located south of Bethlehem Church would have to be replaced.

Access Roads A & B

- Proposed typical section(s): (2) 12 ft. wide lanes tapering to (1) 14 ft. wide lane,
6 ft. outside shoulders (2 ft. paved, 4 ft. grassed)
- Proposed Design Speed: 25 mph
- Proposed Maximum grade: 11.0 %
- Maximum grade allowable: 11.0 %
- Proposed Minimum radius of curve: 144 ft
- Minimum radius allowable: 144 ft
- Maximum allowable superelevation rate: 6.0 %
- Proposed maximum superelevation rate: 6.0 %
- Right-of-Way
 - Width: 24 ft
 - Easements: Temporary (), Permanent (), Utility (), Other ()
 - Type of access control: Full (), Partial (), By Permit (), Other ()

Ramps

- Proposed typical section(s): (1) 16 ft. wide travel lane on each ramp,
 8 ft. inside shoulder (4 ft. paved, 4 ft. grassed)
 12 ft. outside shoulder (10 ft. paved, 2 ft. grassed)
- Proposed Design Speed: 45 mph
- Proposed Maximum grade Ramp: 5.0 %
- Maximum grade allowable: 5.0 %
- Proposed Minimum radius of curve: 643 ft
- Minimum radius allowable: 643 ft
- Maximum allowable superelevation rate: 6.0 %
- Proposed maximum superelevation rate: 6.0 %
- Right-of-Way
 - Width Varies 60 ft – 100 ft from baseline
 - Easements: Temporary (), Permanent (), Utility (), Other ()
 - Type of access control: Full (X), Partial (), By Permit (), Other ()

- Major intersections, interchanges, median openings and signal/intersection control locations: Interchange at SR 316
- Transportation Management Plan Anticipated: Yes () No (X)
- Design Exceptions to controlling criteria anticipated:

	<u>YES</u>	<u>NO</u>	<u>UNDETERMINED</u>
DESIGN SPEED:	()	(X)	()
LANE WIDTH:	()	(X)	()
SHOULDER WIDTH:	()	(X)	()
BRIDGE WIDTH:	()	(X)	()
HORIZONTAL ALIGNMENT:	()	(X)	()
SUPERELEVATION:	()	(X)	()
VERTICAL ALIGNMENT:	()	(X)	()
GRADE:	()	(X)	()
STOPPING SIGHT DISTANCE:	()	(X)	()
CROSS SLOPE:	()	(X)	()
VERTICAL CLEARANCE:	()	(X)	()
LATERAL OFFSET TO OBSTRUCTION:	()	(X)	()
BRIDGE STRUCTURAL CAPACITY:	()	(X)	()

- Design Variances: none anticipated
- Environmental concerns: Stream buffer variance, USACOE NWP 23 and PCN, UST relocation
- Anticipated Level of environmental analysis:
 - Are Time Savings Procedures appropriate? Yes () No (X)
 - Categorical exclusion anticipated (X)
 - Environmental Assessment/Finding of No Significant Impact anticipated (FONSI) ()
 - Environmental Impact Statement (EIS) ()
- Utility involvements: Existing utilities in the project area include communications, power, gas, water and sewer. No underground utility relocation is expected; however, some utility pole relocation may be required.
- VE Study Anticipated: Yes(X) No()
- Benefit/Cost Ratio: 34.92

Project Cost Estimate and Funding Responsibilities:

	PE	ROW	UTILITY	CST*	MITIGATION
By Whom	GDOT	GDOT	GDOT	GDOT	GDOT
\$ Amount	\$500,000	\$3,387,000	\$57,000	11,224,000	TBD

**CST Cost includes: Construction, Engineering and Inspection, and Liquid Asphalt Cement Cost Adjustment:*

Project Activities Responsibilities:

- Design: GDOT
- Right of Way Acquisition: GDOT
- Right of Way funding (real property): GDOT
- Relocation of Utilities: GDOT
- Letting to contract: GDOT
- Supervision of construction: GDOT
- Providing materials pits: Contractor
- Providing detours: Contractor
- Environmental Studies/Documents/Permits: GDOT
- Environmental Mitigation: GDOT

Coordination:

- Initial Concept Meeting date and brief summary: October 25, 2007
- Concept meeting date and brief summary: August 19, 2010
- PAR meetings, dates and results: None Anticipated
- FEMA, USCG, and / or TVA: None Anticipated
- Public involvement: Public Information Open House conducted on February 4, 2010
- Local government comments: Coordination meetings with Barrow County
- Other projects in the area:
 - PI No. 0007268 – SR 316 HOV Lanes from I-85 to Athens – PPI
 - PI No. 0007832 – SR 11 from SR 316/US 29 to Walton County Line
 - PI No. 0008429 – Grade Separation of SR 316 at SR 81
 - PI No. 0008431 – Grade Separation of SR 316 at SR 53
 - PI No. 122870 – SR 316/US 29 @ SR 211/Bethlehem Street
 - PI No. 162490 – SR 316 in Barrow and Oconee counties protective R/W for Interchange
- Railroads: None
- Other coordination to date: GDOT OES and FHWA coordination meeting – February 13, 2008

Scheduling – Responsible Parties’ Estimate:

- | | | |
|---|----------------|--------------|
| • Time to complete the environmental process: | Begin: 5/2012 | End: 8/2013 |
| • Time to complete preliminary construction plans: | Begin: 9/2012 | End: 11/2013 |
| • Time to complete right-of-way plans: | Begin: 12/2013 | End: 3/2014 |
| • Time to complete the Section 404 Permits: | Begin: N/A | End: N/A |
| • Time to complete final construction plans: | Begin: 1/2014 | End: 12/2014 |
| • Time to complete the purchase of right-of-way: | Begin: 3/2014 | End: 3/2015 |
| • List other major items that will affect the project schedule: | Begin: N/A | End: N/A |

Other alternatives considered:

Alternative 1

This alternative consists of a diamond interchange with ramp head spacing set at 1000 ft. The design speed of SR 11 is 55 mph and ramp design speed of 45 mph. The bridge carrying SR 11 over SR 316 would be six lanes wide with two through lanes in each direction and two left turn lanes for the northbound direction and one left turn lane for the southbound direction. This alternative would require four displacements; three residential and one commercial. This alternative would require widening and reconstruction of 0.77 miles of SR 11. The construction and right-of-way costs for this alternative are \$13.0 million and \$9.6 million respectively, with total cost of \$22.6 million.

This alternative was not selected because it adversely impacts the Historic Betty Treadwell property in southeast quadrant of the interchange, requires widening and reconstruction of 0.77 miles of SR 11, and high overall project cost.

Alternative 2

This alternative consists of a partial cloverleaf interchange, where southbound left turns from SR 11 are accommodated through the loop ramp in the southwest quadrant. The design speed for the loop ramp is 30 mph. The bridge carrying SR 11 over SR 316 would be six lanes wide with two through lanes in each direction and two left turn lanes for the northbound direction and one left turn lane for the southbound direction. This alternative would require three displacements; two residential and one commercial. This alternative would require widening and reconstruction of 0.77 miles of SR 11. The construction and right-of-way costs for this alternative are \$13.5 million and \$6.4 million respectively, with total cost of \$19.9 million.

This alternative avoids impacts to the Historic Betty Treadwell property, but it would displace three properties. This alternative was not selected because of its right-of-way impacts and high overall project cost.

Alternative 3

This alternative is a diamond interchange shifted northward to avoid impacts to the historic Betty Treadwell property. The ramp heads are spaced 1,000 ft. apart and the ramp design speed is 45 mph. The bridge carrying SR 11 over SR 316 would be six lanes wide with two through lanes in each direction and two left turn lanes for the northbound direction and one left turn lane for the southbound direction. This alternative would require three displacements; two residential and one commercial, in addition to a cell phone tower in the northwest quadrant of the interchange. This alternative would require widening and reconstruction of 0.77 miles of SR 11. The construction and right-of-way costs for this alternative are \$12.4 million and \$5.8 million respectively, with a total cost of \$18.2 million.

This alternative was not selected because it displaces three properties, in addition to the impact to the cell phone tower, and has high overall cost.

Alternative 4

This alternative requires SR 316 to be elevated over SR 11 with a diamond interchange design. The ramp heads are spaced 700 ft. apart and the design speed of ramps is 45 mph. This alternative would provide a bridge 164 ft. wide to carry proposed typical section of SR 316 and would have a span of 70 ft. over SR 11. This alternative would require two displacements; one residential and one commercial. This alternative would require widening and reconstruction of 0.42 miles of SR 11 and 1.15 miles of SR 316. The construction and right-of-way costs for this alternative are \$15.8 million and \$5.2 million respectively, with an overall cost of \$21.0 million.

This alternative was not selected because of increased impacts on SR 316 and due to difficulty in maintaining access to traffic on SR 316 during proposed construction. Additionally, the construction cost will also increase considerably based on the 1.15 mile of widening and reconstruction on SR 316.

Alternative 5

This alternative requires SR 316 to be partially depressed and SR 11 to be partially elevated over SR 316 with a diamond interchange design. The rationale behind doing this was to decrease the length of construction on SR 11 northward from the existing intersection of SR 316 and SR 11. The ramp heads are spaced 700 ft. apart and the ramp design speed is 45 mph. This alternative would provide a bridge 70 ft. in width and span 164 ft. over proposed SR 316 typical section. This alternative would require two displacements; one residential and one commercial. This alternative would require widening and reconstruction of 0.51 miles of SR 11 and 1.15 miles of SR 316. The construction and right-of-way costs for this alternative are \$16.8 million and \$5.2 million respectively, with a total cost of \$22.0 million.

This alternative was not selected because of increased impact on SR 316 as well as SR 11 and high construction cost due to extensive drainage requirements and increased scope of work on both SR 316 and SR 11.

Alternative 6

This alternative consists of a compressed diamond interchange with the ramp head spacing of 700 ft. The bridge carrying SR 11 over SR 316 would be four lanes wide with one through lane and one left-turn lane for both northbound and southbound direction. This alternative would require displacement of one commercial property (CITGO Gas Station). This alternative would require widening and reconstruction of 0.66 miles of SR 11. The construction and right-of-way costs for this alternative are \$11.9 million and \$5.7 million respectively, with an overall cost of \$17.6 million.

This alternative was not selected because its footprint will have a right-of-way impact of 25.1 acres versus 15 acres for the preferred alternative resulting in high right-of-way acquisition cost.

Alternative 7

A single point urban interchange (SPUI) was considered for this alternative. All through traffic on the SR 11 as well as the left turning volume onto or off the interchange will be controlled by a single set of traffic signals. The bridge carrying SR 11 over SR 316 would be four lanes

wide with one through lane and one left-turn lane for both northbound and southbound direction. This alternative would require the displacement of one commercial property (Citgo Gas Station). This alternative would require widening and reconstruction of 0.66 miles of SR 11. The construction and right-of-way costs for this alternative are \$12.7 million and \$3.9 million respectively, with an overall cost of \$16.6 million.

This alternative was not selected because the major disadvantage of single point urban interchange over preferred alternative is the increased cost due to the need for a longer and wider bridge. Additionally, a SPUI on SR 11 would require a wider bridge over the free-flowing road to make room for the compressed on- and off-ramps. In addition, more free-flow motor vehicle movements (part of what increases the SPUI's capacity) will make it harder for pedestrians to safely cross the interchange.

No Build Alternative

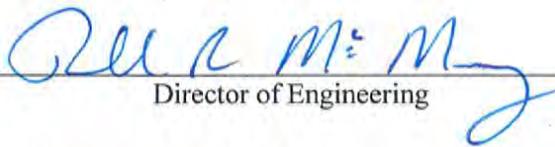
This alternative was deemed not feasible because it does not meet the need and purpose of the project.

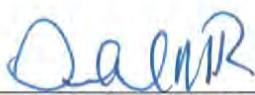
Comments: None

Project Concept Report page 11
Project Number: CSNHS-0008-00(430)
P.I. Number: 0008430
County: Barrow

Attachments:

1. Detailed Cost Estimates:
 - a. Construction including engineering and inspection
 - b. Completed fuel & asphalt price adjustment forms
 - c. Right-of-Way
 - d. Utilities
2. Typical sections
3. Approved need and purpose statement
4. Alternative impact matrix analysis
5. Preferred concept layout
6. Crash summaries
7. Traffic diagrams
8. Capacity analysis summary
9. Minutes of Concept meetings
 - a. Initial concept team meeting
 - b. Concept team meeting
10. Agency coordination meetings
 - a. GDOT OES-FHWA coordination meeting
 - b. GDOT-Barrow county coordination meeting
 - * c. Lighting Commitment Email – Barrow County
11. PIOH synopsis
12. FHWA comments – concept report
13. Benefit Cost Analysis

Concur: 
Director of Engineering

Approve:  Date: 3/22/2012
Chief Engineer

- * 10d. LIGHTING COMMITMENT REQUEST LETTER (GDOT)
- 10e. LIGHTING COMMITMENT REJECTION LETTER
(BARROW COUNTY BOARD OF COMMISSIONERS)
- 10f. INTERCHANGE LIGHTING OMISSION LETTER (GDOT) 

ATTACHMENT 1
DETAILED COST ESTIMATES

DETAILED COST ESTIMATE



Job: 0008430 002

JOB NUMBER: 0008430_002

FED/STATE PROJECT NUMBER CSNHS-0008-00(429)

SPEC YEAR: 01

DESCRIPTION: SR 316/US 129 @ SR 11
INTERCHANGE

ITEMS FOR JOB 0008430 002

10 - ROADWAY

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0001	150-1000	1.000	LS	\$200,000.00	TRAFFIC CONTROL - CSNHS-0008-00(430)	\$200,000.00
0002	153-1300	1.000	EA	\$75,511.58	FIELD ENGINEERS OFFICE TP 3	\$75,511.58
0003	201-1500	1.000	LS	\$200,000.00	CLEARING & GRUBBING - CSNHS-0008-00(430)	\$200,000.00
0005	205-0001	26000.000	CY	\$2.91	UNCLASS EXCAV	\$75,660.00
0004	206-0002	430842.000	CY	\$6.85	BORROW EXCAV, INCL MATL	\$2,951,289.24
0006	310-1101	25689.000	TN	\$23.97	GR AGGR BASE CRS, INCL MATL	\$615,765.33
0010	318-3000	134.000	TN	\$21.06	AGGR SURF CRS	\$2,822.04
0370	402-1812	1000.000	TN	\$68.57	RECYL AC LEVELING, INC BM&HL	\$68,571.22
0015	402-3121	5921.000	TN	\$75.00	RECYL AC 25MM SP, GP1/2, BM&HL	\$444,075.00
0020	402-3130	3188.000	TN	\$75.00	RECYL AC 12.5MM SP, GP2, BM&HL	\$239,100.00
0025	402-3190	4251.000	TN	\$75.00	RECYL AC 19 MM SP, GP 1 OR 2 , INC BM&HL	\$318,825.00
0030	413-1000	2608.000	GL	\$2.40	BITUM TACK COAT	\$6,266.11
0035	430-0220	26767.000	SY	\$68.53	PLN PC CONC PVMT/CL1C/ 12" TK	\$1,834,342.51
0395	433-1000	440.000	SY	\$119.62	REINF CONC APPROACH SLAB	\$52,634.81
0040	436-1000	5700.000	LF	\$11.47	ASPH CONC CURB - 5"	\$65,404.82
0045	446-1100	6000.000	LF	\$3.48	PVMT REF FAB STRIPS, TP2, 18 INCH WIDTH	\$20,882.04
0375	620-0100	1000.000	LF	\$23.30	TEMP BARRIER, METHOD NO. 1	\$23,295.62
0400	632-0003	4.000	EA	\$9,468.33	CHANGEABLE MESS SIGN, PORT, TP 3	\$37,873.33
0365	634-1200	100.000	EA	\$86.14	RIGHT OF WAY MARKERS	\$8,613.69
0050	641-1100	700.000	LF	\$34.37	GUARDRAIL, TP T	\$24,061.24
0055	641-1200	5000.000	LF	\$13.79	GUARDRAIL, TP W	\$68,958.35
0060	641-5001	13.000	EA	\$651.86	GUARDRAIL ANCHORAGE, TP 1	\$8,474.20
0065	641-5012	13.000	EA	\$1,800.11	GUARDRAIL ANCHORAGE, TP 12	\$23,401.44
0405	643-0010	2000.000	LF	\$5.76	FIELD FENCE WOVEN WIRE	\$11,512.20
SUBTOTAL FOR ROADWAY:						\$7,377,339.77

20 - BRIDGE

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0319	543-1100	1.000	LS	\$669,300.00	CONSTR BR-COMP-BOTTOM OF CAP	\$669,300.00
0320	543-9000	1.000	LS	\$1,003,980.00	CONSTR OF BRIDGE COMPLETE - CSNHS-0008-00(430)	\$1,003,980.00
0380	627-1000	640.000	SF	\$57.14	MSE WALL FACE, 0 - 10 FT HT, WALL NO - 2	\$36,569.60
0385	627-1010	5760.000	SF	\$66.02	MSE WALL FACE, 10 - 20 FT HT, WALL NO - 2	\$380,275.20
0390	627-1120	400.000	LF	\$244.76	COPING B, WALL NO - 2	\$97,904.00
SUBTOTAL FOR BRIDGE:						\$2,188,028.80

30 - DRAINAGE

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0075	550-1180	1000.000	LF	\$28.71	STM DR PIPE 18", H 1-10	\$28,714.88
0080	550-1240	500.000	LF	\$37.09	STM DR PIPE 24", H 1-10	\$18,544.43
0085	550-2180	250.000	LF	\$26.07	SIDE DR PIPE 18", H 1-10	\$6,518.32
0090	550-3318	15.000	EA	\$647.41	SAFETY END SECTION 18", STD, 4:1	\$9,711.12
0095	550-3324	10.000	EA	\$927.48	SAFETY END SECTION 24", STD, 4:1	\$9,274.78
0096	550-4218	5.000	EA	\$483.68	FLARED END SECT 18 IN, ST DR	\$2,418.40
0097	550-4224	5.000	EA	\$526.31	FLARED END SECT 24 IN, ST DR	\$2,631.54
0100	668-2100	10.000	EA	\$1,687.95	DROP INLET, GP 1	\$16,879.50
0105	668-5000	10.000	EA	\$1,603.91	JUNCTION BOX	\$16,039.12
SUBTOTAL FOR DRAINAGE:						\$110,732.09

DETAILED COST ESTIMATE



Job: 0008430 002

40 - PERMANENT EROSION CONTROL

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0070	441-0204	1000.000	SY	\$27.58	PLAIN CONC DITCH PAVING, 4 IN	\$27,583.55
0190	603-2180	1000.000	SY	\$29.99	STN DUMPED RIP RAP, TP 3, 12"	\$29,991.71
0195	603-7000	1000.000	SY	\$3.12	PLASTIC FILTER FABRIC	\$3,115.27
0200	700-6910	55.000	AC	\$574.54	PERMANENT GRASSING	\$31,599.89
0205	700-7000	110.000	TN	\$45.73	AGRICULTURAL LIME	\$5,030.70
0215	700-8000	39.000	TN	\$410.63	FERTILIZER MIXED GRADE	\$16,014.74
0220	700-8100	5500.000	LB	\$1.57	FERTILIZER NITROGEN CONTENT	\$8,629.23
0225	715-2200	10000.000	SY	\$1.07	BITUM TRTD ROVING, WATERWAYS	\$10,734.10
0230	716-2000	20000.000	SY	\$0.90	EROSION CONTROL MATS, SLOPES	\$17,918.60
SUBTOTAL FOR PERMANENT EROSION CONTROL:						\$150,617.79

50 - TEMPORARY EROSION CONTROL

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0110	163-0232	28.000	AC	\$284.34	TEMPORARY GRASSING	\$7,961.55
0115	163-0240	798.000	TN	\$145.58	MULCH	\$116,172.66
0120	163-0300	12.000	EA	\$862.05	CONSTRUCTION EXIT	\$10,344.66
0125	163-0503	15.000	EA	\$328.67	CONSTR AND REMOVE SILT CONTROL GATE, TP 3	\$4,930.04
0130	163-0522	100.000	EA	\$63.64	CONSTR AND REM TEMP DCH CK - TP A SLT FN	\$6,363.95
0135	163-0523	100.000	EA	\$168.40	CONSTR AND REM TEMP DCH CK - TP C SLT FN	\$16,840.15
0140	163-0524	100.000	EA	\$274.48	CNST/REM TEMP DCH CK-STN PL RIPRAP/SN BG	\$27,448.09
0145	163-0550	10.000	EA	\$152.75	CONS & REM INLET SEDIMENT TRAP	\$1,527.47
0150	165-0010	10000.000	LF	\$0.51	MAINT OF TEMP SILT FENCE, TP A	\$5,125.90
0155	165-0020	7500.000	LF	\$0.64	MAINT OF TEMP SILT FENCE, TP B	\$4,767.83
0160	165-0040	300.000	EA	\$35.10	MAINT OF EROSION CTRL CHKDAMS/DITCH CHKS	\$10,528.83
0165	165-0087	15.000	EA	\$98.13	MAINT OF SILT CONTROL GATE, TP 3	\$1,471.90
0170	165-0101	12.000	EA	\$431.00	MAINT OF CONST EXIT	\$5,172.03
0175	165-0105	10.000	EA	\$44.96	MAINT OF INLET SEDIMENT TRAP	\$449.59
0181	167-1000	2.000	EA	\$525.82	WATER QUALITY MONITORING AND SAMPLING	\$1,051.64
0182	167-1500	24.000	MO	\$397.24	WATER QUALITY INSPECTIONS	\$9,533.69
0180	171-0010	20000.000	LF	\$1.64	TEMPORARY SILT FENCE, TYPE A	\$32,721.00
0185	171-0020	15000.000	LF	\$1.06	TEMPORARY SILT FENCE, TYPE B	\$15,888.60
SUBTOTAL FOR TEMPORARY EROSION CONTROL:						\$278,299.58

60 - SIGNING AND MARKING

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0335	636-1041	350.000	SF	\$34.50	HWY SIGNS, TP 2MAT, REFL SH TP 9	\$12,074.53
0235	636-1077	500.000	SF	\$28.39	HWY SIGN, ALUM EXT PL, REFL SHT, TP 9	\$14,195.84
0240	636-2070	500.000	LF	\$7.45	GALV STEEL POSTS, TP 7	\$3,726.49
0245	636-2090	500.000	LF	\$7.68	GALV STEEL POSTS, TP 9	\$3,840.64
0250	638-1001	1.000	LS	\$80,600.00	STR SUPPORT OVHD SIGN, TP I, STA 4 NOS.	\$80,600.00
0340	639-2001	3000.000	LF	\$3.18	STEEL WIRE STRAND CABLE, 1/4"	\$9,547.02
0255	653-0120	22.000	EA	\$69.83	THERM PVMT MARK, ARROW, TP 2	\$1,536.24
0260	653-0140	2.000	EA	\$91.30	THERM PVMT MARK, ARROW, TP 4	\$182.60
0265	653-1501	15000.000	LF	\$0.25	THERMO SOLID TRAF ST 5 IN, WHI	\$3,750.00
0270	653-1502	15000.000	LF	\$0.25	THERMO SOLID TRAF ST, 5 IN YEL	\$3,750.00
0285	653-1704	1500.000	LF	\$3.42	THERM SOLID TRAF STRIPE, 24", WH	\$5,124.84
0275	653-1804	1000.000	LF	\$1.81	THERM SOLID TRAF STRIPE, 8", WH	\$1,810.67
0280	653-3501	20000.000	GLF	\$0.16	THERMO SKIP TRAF ST, 5 IN, WHI	\$3,161.20
0286	653-6004	500.000	SY	\$2.91	THERM TRAF STRIPING, WHITE	\$1,453.18
0287	653-6006	500.000	SY	\$2.87	THERM TRAF STRIPING, YELLOW	\$1,434.85
0290	654-1001	250.000	EA	\$3.66	RAISED PVMT MARKERS TP 1	\$914.91
0295	654-1003	150.000	EA	\$3.67	RAISED PVMT MARKERS TP 3	\$551.24
0300	657-1054	250.000	LF	\$4.54	PRF PL SD PVMT MKG, 5", WH, TP PB	\$1,135.78
0305	657-3054	20.000	GLF	\$3.09	PRF PL SK PVMT MKG, 5", WH, TP PB	\$61.83
0310	657-6054	500.000	LF	\$4.39	PRF PL SD PVMT MKG, 5", YW, TP PB	\$2,193.64
SUBTOTAL FOR SIGNING AND MARKING:						\$151,045.50

DETAILED COST ESTIMATE



Job: 0008430_002

70 - SIGNALS

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0345	639-4004	8.000	EA	\$5,279.67	STRAIN POLE, TP IV	\$42,237.38
0330	647-1000	1.000	LS	\$121,927.02	TRAF SIGNAL INSTALLATION NO - 2 NOS.	\$121,927.02
0350	936-1001	2.000	EA	\$4,619.70	CCTV SYSTEM,TYPE B	\$9,239.40
0355	936-8000	1.000	LS	\$10,920.00	TESTING	\$10,920.00
0360	939-4040	2.000	EA	\$4,065.10	TYPE D CABINET	\$8,130.21
SUBTOTAL FOR SIGNALS:						\$192,454.01

TOTALS FOR JOB 0008430_002

ITEMS COST:	\$10,448,517.54
COST GROUP COST:	\$0.00
ESTIMATED COST:	\$10,448,517.54
CONTINGENCY PERCENT:	0.00
ENGINEERING AND INSPECTION:	0.05
ESTIMATED COST WITH CONTINGENCY AND E&I:	\$10,970,943.42

PROJ. NO.	CSNHS-0008-00(030)	CALL NO.
P.I. NO.	0008430	
DATE	2/3/2012	

INDEX (TYPE)	DATE	INDEX
REG. UNLEADED	Jan-12	\$ 3.297
DIESEL		\$ 3.818
LIQUID AC		\$ 578.00

Link to Fuel and AC Index:

<http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx>

LIQUID AC ADJUSTMENTS

PA=[((APM-APL)/APL)]xTMTxAPL

Asphalt					
Price Adjustment (PA)				249002.4	\$ 249,002.40
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	\$	924.80	
Monthly Asphalt Cement Price month project let (APL)			\$	578.00	
Total Monthly Tonnage of asphalt cement (TMT)				718	

ASPHALT	Tons	%AC	AC ton
Leveling	1000	5.0%	50
12.5 OGFC		5.0%	0
12.5 mm	3188	5.0%	159.4
9.5 mm SP		5.0%	0
25 mm SP	5921	5.0%	296.05
19 mm SP	4251	5.0%	212.55
	14360		718

BITUMINOUS TACK COAT

Price Adjustment (PA)				\$ 3,884.72	\$ 3,884.72
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	\$	924.80	
Monthly Asphalt Cement Price month project let (APL)			\$	578.00	
Total Monthly Tonnage of asphalt cement (TMT)				11.2016232	

Bitum Tack		
Gals	gals/ton	tons
2608	232.8234	11.2016232

BITUMINOUS TACK COAT (surface treatment)

Price Adjustment (PA)				0	\$ -
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	\$	924.80	
Monthly Asphalt Cement Price month project let (APL)			\$	578.00	
Total Monthly Tonnage of asphalt cement (TMT)				0	

Bitum Tack	SY	Gals/SY	Gals	gals/ton	tons
Single Surf. Trmt.		0.20	0	232.8234	0
Double Surf. Trmt.		0.44	0	232.8234	0
Triple Surf. Trmt		0.71	0	232.8234	0
					0

TOTAL LIQUID AC ADJUSTMENT **\$ 252,887.12**

DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE PROJECT No. , OFFICE
 DATE

P.I. No.

FROM

TO Ronald E. Wishon, Project Review Engineer

SUBJECT REVISIONS TO PROGRAMMED COSTS

PROJECT MANAGER

MNGT LET DATE

MNGT R/W DATE

PROGRAMMED COST (TPro W/OUT INFLATION)

CONSTRUCTION \$

DATE

RIGHT OF WAY \$

DATE

UTILITIES \$

DATE

REVISED COST ESTIMATES

CONSTRUCTION* \$

RIGHT OF WAY \$

UTILITIES \$

* Costs contain % Engineering and Inspection

REASON FOR COST INCREASE

Increase in Construction Cost due to changes in construction limits and updated pay item prices.
Reduction in ROW Cost Estimate due to reduce ROW requirement.
Increase in Utility Estimate due to inflation.

CONTINGENCY SUMMARY

Construction Cost Estimate:	\$ 10,448,517.54	(Base Estimate)
Engineering and Inspection:	\$ 522,425.88	(Base Estimate x 5 %)
Total Fuel Adjustment	\$	(From attached worksheet)
Total Liquid AC Adjustment	\$ 252,887.12	(From attached worksheet)
Construction Total:	\$ 11,223,830.54	

REIMBURSABLE UTILITY COST

Utility Owner	Reimbursable Cost
Georgia Power	\$57,000

Attachments

Preliminary Right of Way Cost Estimate



Phil Copeland
 Right of Way Administrator
 By: LaShone Alexander

Date: April 29, 2011
Project: CSNHS-0008-00(430) Barrow
Existing/Required R/W: Varies/Varies
Project Termini : Grade Separation of SR 316 @ SR 11
Project Description: Grade Separation of SR 316 @ SR 11

P.L Number: 0008430
No. Parcels: 13

Land:

Res. R/W: 1.0271 acres @ \$ 50,000.00/acre	\$	51,355
Res. easement: 2.04 acres @ \$ 50,000/acre X 50%	\$	51,000
Comm. R/W: 2.23 acres @ \$400,000.00/acre		892,000
Agricultural R/W: 4.2281 acres @ \$ 15,000.00/acre		63,421
Conservation R/W: 5.5236 acres @ \$ 15,000.00/acre		<u>82,854</u>
	\$	1,140,630

Improvements : residence, businesses, signs, landscaping
 misc. site improvements \$ 150,000

Relocation: Residential (0) \$ 00
 Commercial (1) \$25,000
 \$ 25,000

Damage : Proximity (3) \$ 30,000
 Cost to Cure (3) \$ 25,000
 \$ 50,000
 Net Cost \$ 1,365,630

Net Cost \$ 1,365,630
Scheduling Contingency 55 % 751,096
Adm/Court Cost 60 % 1,270,035
 \$ 3,386,762

Total Cost \$ 3,387,000

Note: The Market Appreciation (40%) is not included in the updated Preliminary Cost Estimate.

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE CSNHS-0008-00(430) Barrow OFFICE Gainesville
P.I. No. 0008430
SR 316 at SR 11 DATE September 23, 2010

FROM Allen Ferguson
District Utilities Engineer

TO Brandon Kirby, Project Manager
ATTN Neil O'Brian

SUBJECT PRELIMINARY REIMBURSABLE UTILITY COST (ESTIMATE)

As requested by your office, we are furnishing you with a Preliminary Reimbursable Utility Cost estimate for the subject project.

FACILITY OWNER	NON-REIMBURSABLE	REIMBURSABLE
Georgia Power	\$154,000.00	\$57,000.00
Comcast	\$ 40,000.00	\$ 0.00
Windstream	\$ 63,000.00	\$ 0.00
City of Winder-Water/Gas**	\$300,800.00	\$ 0.00
Total Estimated Reimbursement Cost:		\$57,000.00
Total Estimated Non-Reimbursement Cost: \$557,800.00		

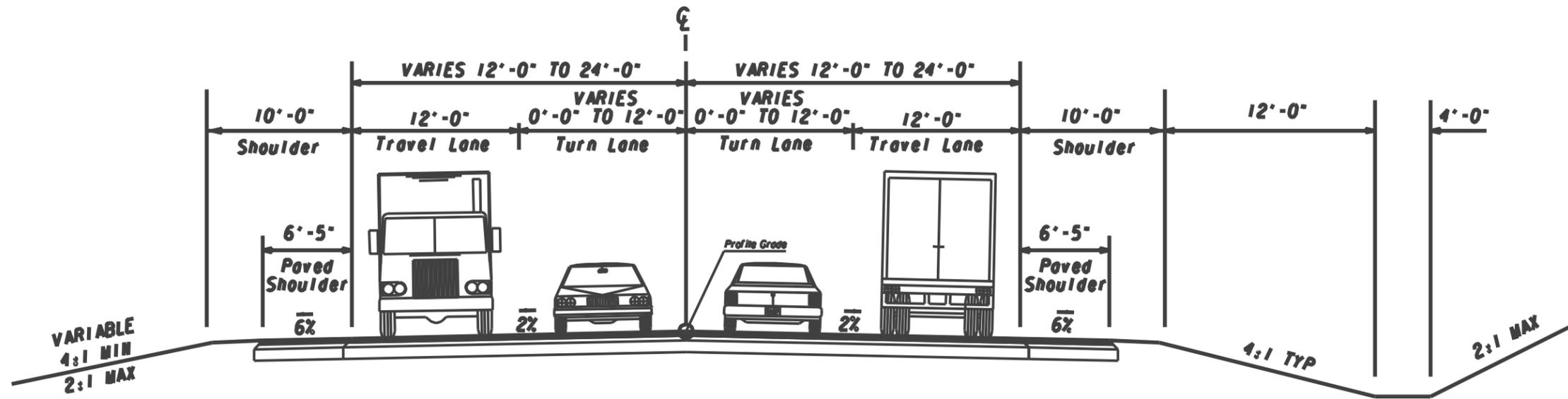
** If the local government requests and is granted Utility Aid the total will need to be added to the Reimbursable costs.

If you have any questions, please contact Allen Ferguson at 770-532-5510.

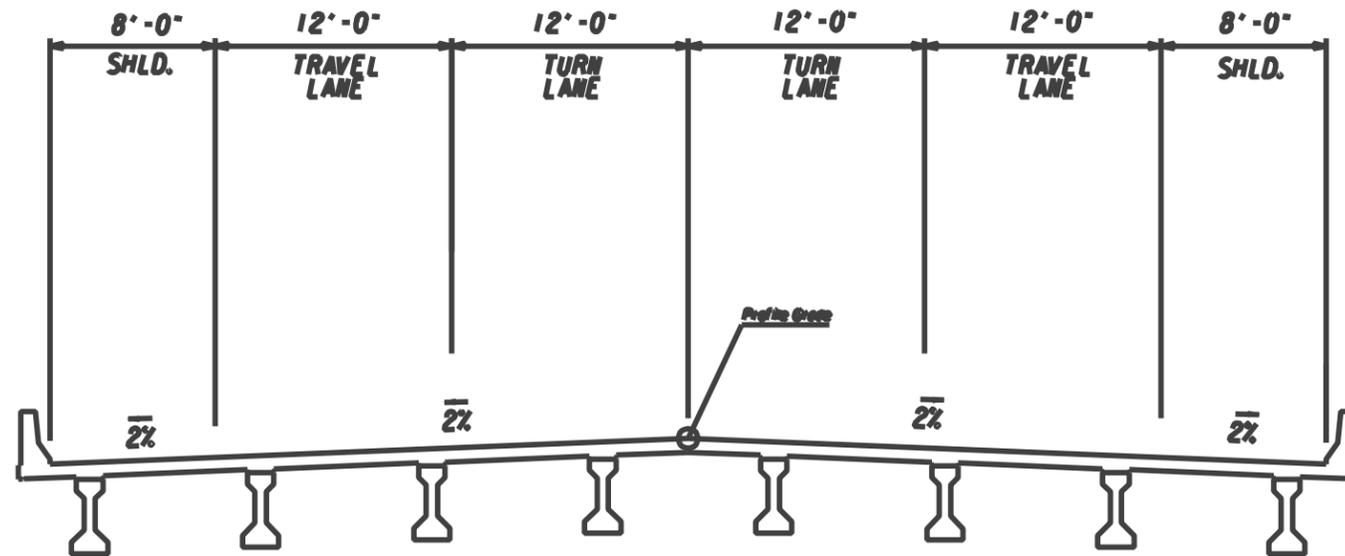
RAF

C: Jeff Baker, State Utilities Engineer
Angie Robinson, Office of Financial Management
Harold Mull, Area Engineer
File

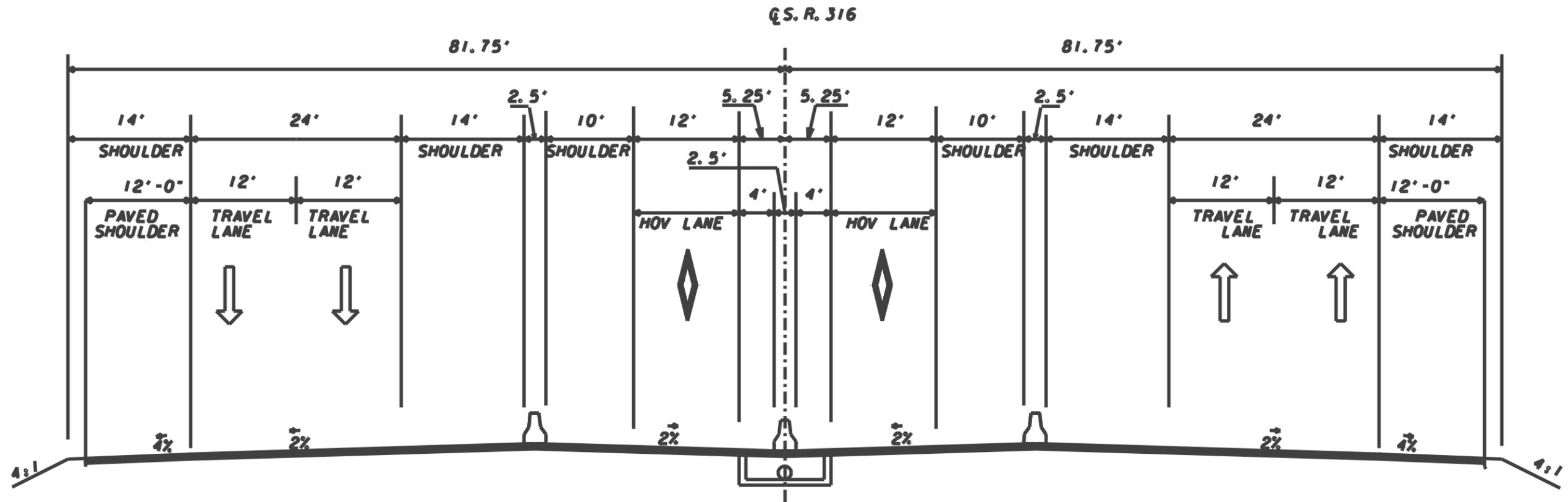
ATTACHMENT 2
TYPICAL SECTIONS



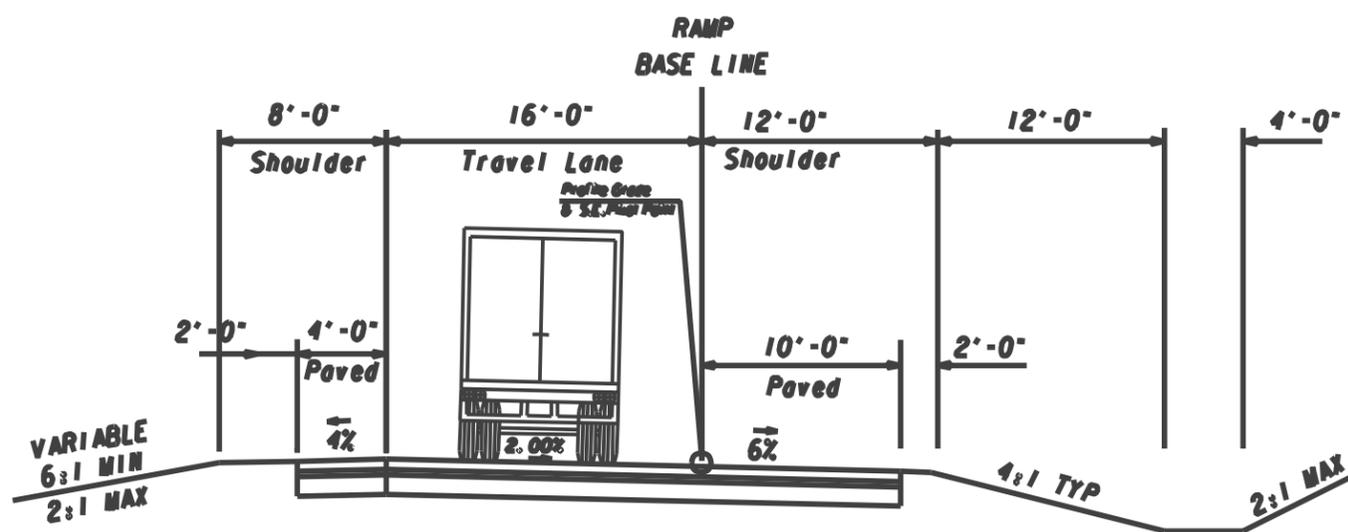
TYPICAL SECTION PROPOSED SR 11



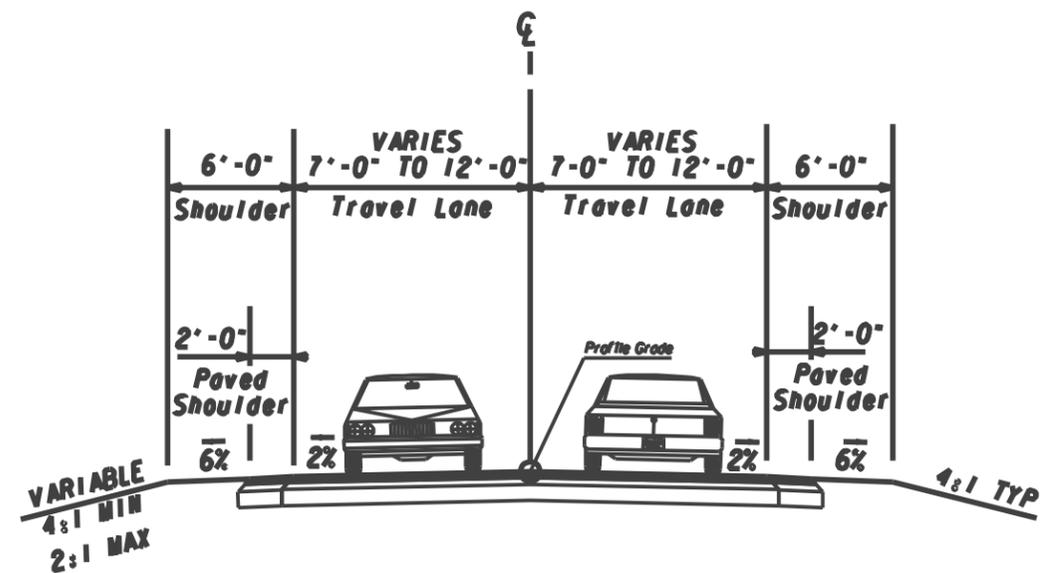
TYPICAL SECTION PROPOSED BRIDGE SR 11



FUTURE TYPICAL SECTION S. R. 316 (BARRIER SEPERATED H. O. V)
 (FOR INFORMATION PURPOSE ONLY)



TYPICAL SECTION PROPOSED RAMPS



TYPICAL SECTION ACCESS ROADS A & B

ATTACHMENT 3
APPROVED JUSTIFICATION STATEMENT

Project Justification Statement
Grade separation of SR 316 @ SR 11
Barrow County PI: 0008430

SR 316 is an important regional roadway and is functionally classified as Rural Principal Arterial. SR 316 intersects SR 11 at a right angle and carries two through lanes, one exclusive left turn lane and one right-turn lane in each direction.

SR 11 runs in the north-south direction and functionally classified as Rural Minor Arterial. It provides one through lane, an exclusive left-turn lane and a channelized right turn lane in each direction. The existing intersection of SR 11 with SR 316 is signalized.

Historical crash data was obtained for the latest available 3 years (2007 – 2009) for both SR 11 and SR 316 in the vicinity of this intersection. The prominent types of accidents along SR 53 and SR 316 are “rear end”, “angle”, and struck object collisions, which is indicative of congestion and high turning movements at the intersection.

As shown in Table 1, the overall crash and injury rates on SR 11 were higher than the statewide average for all three years. Table 2 shows crash and injury rates on SR 316 exceed the statewide average in 2007 and 2008.

Table 1 Crash History and Comparison with Statewide Average (SR 11)									
Year	No. of			All Crashes		Injuries		Fatalities	
	Crashes	Injuries	Fatalities	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average
2007	24	6	0	620	187	155	100	0	2.58
2008	23	5	0	569	181	124	96	0	2.53
2009	34	19	0	8,318	180	4,649	94	0	2.25
Total	81	30	0						

Table 2 Crash History and Comparison with Statewide Average (SR 316)									
Year	No. of			All Crashes		Injuries		Fatalities	
	Crashes	Injuries	Fatalities	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average
2007	30	12	0	377	145	151	79	0	2.21
2008	14	5	0	169	146	60	80	0	1.71
2009	2	0	0	92	141	0	77	0	1.66
Total	46	17	0						

Historic trends indicate a continuing level of growth throughout the study area. Design traffic shows an anticipated growth in ADT on SR 316 from 25,900 (2007) to 55,000 by the design year 2032. Similarly, ADT on SR 11 is anticipated to increase from 13,200 (2007) to 29,700 by the

design year 2032. Currently, the signalized intersection of SR 316/SR 11 is operating at LOS “E” and “D” during AM and PM peak hours respectively. Considering no improvements are made to the intersection of SR 316 at SR 11, the intersection will operate at an overall LOS “F” during both AM and PM peak hour in the design year.

According to the Statewide Transportation Plan, congestion is defined as LOS D and below, although LOS E is sometimes used as the baseline in very large urban areas. The goal of this project is to reduce crash frequency and severity, and improve traffic operations at the intersection of SR 316 at SR 11 that will be operating at an unacceptable level of service in the design year of 2032.

ATTACHMENT 4
ALTERNATIVE IMPACT MATRIX ANALYSIS

Impacts of Proposed Interchange Alternatives For SR-316/SR-11

Impacts on Elements	Alternatives								Remarks/Comments
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8	
Description	Diamond interchange with ramp head spacing set at 1000-ft	Partial cloverleaf interchange, where SB left turns from SR 11 are accommodated through the loop ramp in the SW quadrant	Diamond interchange shifted northward to avoid impacts to the historic Betty Treadwell property	SR 316 to be elevated over SR 11 with a diamond interchange design	SR 316 to be depressed & SR 11 to be elevated over SR 316 with a diamond interchange design	SR 11 to be elevated over SR 316 with a compressed diamond interchange design	Single Point Urban Interchange (SPUI)	SR 11 to be elevated over SR 316 with a Tight Urban Diamond Interchange (TUDI)	
Reconstruction	SR 11 = 0.77 Miles	SR 11 = 0.77 Miles	SR 11 = 0.77 Miles	SR 11 = 0.42 Miles SR 316 = 1.15 Miles	SR 11 = 0.51 Miles SR 316 = 1.15 Miles	SR 11 = 0.66 Miles	SR 11 = 0.66 Miles	SR 11 = 0.66 Miles	Alt. #6, 7, and 8 requires the least reconstruction.
Proposed Lane Configuration of SR 11	4-lane roadway with two lanes in each direction.	4-lane roadway with two lanes in each direction.	4-lane roadway with two lanes in each direction.	Maintain the existing one lane in each direction	Maintain the existing one lane in each direction	Maintain the existing one lane in each direction	Maintain the existing one lane in each direction	Maintain the existing one lane in each direction	
Right-of-Way	Entire Taking = 9 Parcels Strip Taking = 13 Parcels Total Area = 29 Acres	Entire Taking = 6 Parcels Strip Taking = 13 Parcels Total Area = 24 Acres	Entire Taking = 2 Parcels Strip Taking = 16 Parcels Total Area = 25 Acres	Entire Taking = 2 Parcels Strip Taking = 11 Parcels Total Area = 20 Acres	Entire Taking = 2 Parcels Strip Taking = 11 Parcels Total Area = 20 Acres	Entire Taking = 2 Parcels Strip Taking = 12 Parcels Total Area = 25 Acres	Entire Taking = 2 Parcels Strip Taking = 12 Parcels Total Area = 17.5 Acres	Entire Taking = 2 Parcels Strip Taking = 12 Parcels Total Area = 15 Acres	Alt. # 8 requires least amount of Right-Of-Way acquisition.
Displacements	Residential = 2 Commercial = 1	Residential = 1 Commercial = 1	Residential = 0 Commercial = 1	Residential = 0 Commercial = 1	Residential = 0 Commercial = 1	Residential = 0 Commercial = 1	Residential = 0 Commercial = 1	Residential = 0 Commercial = 1	Alt. # 3, 4, 5, 6, 7 and 8 have least impacts.
2032 Design Year Level of Service	LOS E or Better	LOS D or Better	LOS E or Better	LOS F (2021 Breakdown Year)	LOS F (2021 Breakdown Year)	LOS F (2021 Breakdown Year)	LOS F (2029 Breakdown Year)	LOS F (2023 Breakdown Year)	Alt. # 2 has the best LOS.
Utilities	1. Gas 2. Water 3. Cable 4. Telecommunications	1. Gas 2. Water 3. Cable 4. Telecommunications	1. Gas 2. Water 3. Cable 4. Telecommunications	1. Gas 2. Water 3. Cable 4. Telecommunications	1. Gas 2. Water 3. Cable 4. Telecommunications	1. Gas 2. Water 3. Cable 4. Telecommunications	1. Gas 2. Water 3. Cable 4. Telecommunications	1. Gas 2. Water 3. Cable 4. Telecommunications	Same
Historic Property	Betty Treadwell House	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	Alt. # 2, 3, 4, 5, 6, 7 and 8 have no impact.
Contaminated Areas	1. BP Gas Station 2. Citgo Gas Station	1. BP Gas Station 2. Citgo Gas Station	1. BP Gas Station 2. Citgo Gas Station	1. BP Gas Station 2. Citgo Gas Station	1. BP Gas Station 2. Citgo Gas Station	1. BP Gas Station 2. Citgo Gas Station	1. BP Gas Station 2. Citgo Gas Station	1. BP Gas Station 2. Citgo Gas Station	Same
Miscellaneous Items	1. Moderate Wetland Impact 2. Stream- No Impact	1. Moderate Wetland Impact 2. Stream - No Impact	1. Moderate Wetland Impact 2. Stream - No Impact	1. Significant Wetland Impact 2. Stream - No Impact	1. Significant Wetland Impact 2. Stream - No Impact	1. Minimal Wetland Impact 2. Stream - No Impact	1. Minimal Wetland Impact 2. Stream - No Impact	1. Minimal Wetland Impact 2. Stream - No Impact	Alt. # 7 and 8 have the least impacts.
Construction Cost	\$13.0 M	\$13.5 M	\$12.4 M	\$15.8 M	\$16.8 M	\$11.9 M	\$12.7 M	\$11.8 M	Alt. # 8 has the least construction cost.
ROW Cost	\$ 9.6 M	\$6.4 M	\$ 5.8 M	\$5.2 M	\$5.2 M	\$5.7 M	\$3.9 M	\$3.4 M	Alt. # 8 has least ROW cost.
Total Cost	\$22.6 M	\$19.9 M	\$18.2 M	\$21.0	\$22.0 M	\$17.6 M	\$16.6 M	\$15.2 M	Alt. # 8 has least cost involved.

Concept Alternative # 8 is recommended as the preferred alternative owing to its lowest overall cost, least displacements, and minimal wetland impacts.

ATTACHMENT 5
PREFERRED CONCEPT LAYOUT

ATTACHMENT 6
CRASH SUMMARIES

Table 1 Crash History and Comparison with Statewide Average (SR 11)									
Year	No. of			All Crashes		Injuries		Fatalities	
	Crashes	Injuries	Fatalities	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average
2007	24	6	0	620	187	155	100	0	2.58
2008	23	5	0	569	181	124	96	0	2.53
2009	34	19	0	8,318	180	4,649	94	0	2.25
Total	81	30	0						

Table 2 Crash History and Comparison with Statewide Average (SR 316)									
Year	No. of			All Crashes		Injuries		Fatalities	
	Crashes	Injuries	Fatalities	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average
2007	30	12	0	377	145	151	79	0	2.21
2008	14	5	0	169	146	60	80	0	1.71
2009	2	0	0	92	141	0	77	0	1.66
Total	46	17	0						

CSNHS-0008-00(430) P.I. Number 0008430 Barrow County, SR 316 @ SR 11

Crash Data for SR 11

Accident No	Date	Time	County	Route Type	Route	Milelog	Intersecting Rt Type	Intersecting Rt	Ramp Section	Injuries	Fatalities	Collision	Location of Impact	Harmful Event	Light	Surface	DirVeh1	DirVeh2	MnvrVeh1	MnvrVeh2
'65300059	12/12/2006	6:10 PM	Barrow	State Route	'001100	2.57	2	'026400		0	0	Sideswipe - Same Direction	On Shoulder	Motor Vehicle in Motion	Dusk	Dry	N	N	Straight	Stopped
'63550387	8/12/2006	4:07 PM	Barrow	State Route	'001100	2.72				0	0	Head On	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	N	Negotiating a Curve	Negotiating a Curve
'62470260	6/28/2006	1:53 PM	Barrow	State Route	'001100	2.78	2	'013700		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'62900298	7/12/2006	8:10 AM	Barrow	State Route	'001100	2.78	2	'013700		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	N	Turning Left	Straight
'64870254	11/14/2006	5:30 PM	Barrow	State Route	'001100	2.78	2	'013700		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dusk	Dry	S	S	Straight	Stopped
'62120025	5/5/2006	2:43 PM	Barrow	State Route	'001100	2.88				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	N	N	Straight	Straight
'62130132	5/15/2006	4:00 PM	Barrow	State Route	'001100	2.95				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'61080287	3/27/2006	6:58 AM	Barrow	State Route	'001100	2.97	1	'031600		2	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	S	Turning Left	Straight
'61080296	3/30/2006	11:24 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	S	W	Straight	Straight
'60860568	2/24/2006	6:35 PM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Dusk	Dry	S	S	Straight	Straight
'61370651	4/16/2006	4:12 PM	Barrow	State Route	'001100	2.97	1	'031600		3	0	Head On	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	S	Turning Left	Straight
'60790477	2/7/2006	7:20 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	E	S	Straight	Turning Left
'61730379	4/4/2006	12:57 PM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	N	Straight	Straight
'61760146	5/1/2006	3:50 PM	Barrow	State Route	'001100	2.97	1	'031600		3	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	N	Straight	Straight
'62470245	6/20/2006	4:07 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Shoulder	Motor Vehicle in Motion	Daylight	Dry	W	S	Turning Left	Straight
'62900355	7/31/2006	9:41 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Turning Left	Turning Left
'62340102	7/1/2006	12:39 PM	Barrow	State Route	'001100	2.97	1	'031600		3	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	S	Turning Left	Straight
'62120099	5/30/2006	6:52 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'62120031	5/6/2006	8:51 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	S	S	Straight	Stopped
'62940007	7/4/2006	2:22 PM	Barrow	State Route	'001100	2.97	1	'031600		2	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'64870301	11/25/2006	7:49 AM	Barrow	State Route	'001100	2.97	1	'031600		2	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	S	Straight	Straight
'64870218	11/7/2006	10:26 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Not A Collision With A Motor Vehicle	On Roadway	Ditch	Daylight	Wet	N		Turning Right	
'65300058	12/12/2006	3:20 PM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'64360450	10/29/2006	10:45 AM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion - In Other Roadway	Daylight	Dry	E	N	Turning Left	Straight
'64360442	10/27/2006	3:28 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Wet	N	N	Straight	Stopped
'63550432	8/29/2006	7:16 PM	Barrow	State Route	'001100	2.97	1	'031600		2	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	E	Turning Left	Straight
'61570628	4/30/2006	7:17 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'60350246	1/26/2006	8:28 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	N	Straight	Changing Lanes
'60310734	1/17/2006	9:40 PM	Barrow	State Route	'001100	3.22				0	0	Not A Collision With A Motor Vehicle	Off Roadway	Overturn	Dark-Not Lighted	Wet	S		Passing	
'63550386	8/12/2006	1:56 PM	Barrow	State Route	'001100	3.47				1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	N	N	Straight	Stopped
'64360426	10/23/2006	5:20 PM	Barrow	State Route	'031600	7.33				1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	W	Turning Left	Turning Left
'70350218	1/6/2007	7:56 AM	Barrow	State Route	'001100	2.48	3	'060103		0	0	Not A Collision With A Motor Vehicle	On Roadway	Animal	Daylight	Wet	S		Straight	
'73800217	8/8/2007	4:28 PM	Barrow	State Route	'001100	2.52				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'70350196	1/1/2007	6:57 PM	Barrow	State Route	'001100	2.78	2	'013700		2	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	S	S	Turning Left	Straight
'73450285	7/14/2007	9:50 AM	Barrow	State Route	'001100	2.84				1	0	Angle	On Roadway	Motor Vehicle in Motion	Dusk	Snowy	W	N	Turning Left	Straight
'75400044	11/16/2007	8:04 AM	Barrow	State Route	'001100	2.93				0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	N	Turning Left	Straight
'75400061	11/21/2007	9:12 AM	Barrow	State Route	'001100	2.93				0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	N	Turning Left	Straight
'73800223	8/10/2007	1:00 PM	Barrow	State Route	'001100	2.93				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'72880493	6/28/2007	6:10 PM	Barrow	State Route	'001100	2.94				0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	N	Turning Right	Straight
'73800193	8/1/2007	3:40 PM	Barrow	State Route	'001100	2.96				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Straight
'70890206	2/7/2007	5:09 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Straight
'73800255	8/23/2007	9:35 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Sideswipe - Same Direction	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	E	Turning Right	Turning Right

CSNHS-0008-00(430) P.I. Number 0008430 Barrow County, SR 316 @ SR 11

Crash Data for SR 11

Accident No	Date	Time	County	Route Type	Route	Milelog	Intersecting Rt Type	Intersecting Rt	Ramp Section	Injuries	Fatalities	Collision	Location of Impact	Harmful Event	Light	Surface	DirVeh1	DirVeh2	MnvrVeh1	MnvrVeh2
'70350255	1/19/2007	8:24 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	N	Straight	Straight
'74200215	9/13/2007	4:20 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Wet	S	E	Straight	Straight
'72880502	6/30/2007	3:52 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'74710563	10/26/2007	8:27 AM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Turning Left
'72290200	5/11/2007	5:00 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'71330509	3/8/2007	5:56 PM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	E	Straight	Turning Left
'70350267	1/26/2007	10:56 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	N	Straight	Straight
'71860530	4/27/2007	6:40 PM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Straight
'70350235	1/12/2007	7:42 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Backing	Stopped
'70350202	1/3/2007	12:13 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Straight
'74710515	10/12/2007	1:06 AM	Barrow	State Route	'001100	3.01	2	'040700		0	0	Not A Collision With A Motor Vehicle	On Roadway	Deer	Dark-Not Lighted	Dry	S		Straight	
'74710572	10/27/2007	9:26 PM	Barrow	State Route	'001100	3.11				0	0	Not A Collision With A Motor Vehicle	On Roadway	Deer	Dark-Not Lighted	Dry	S		Straight	
'71030171	3/24/2007	10:23 PM	Barrow	State Route	'001100	3.32				0	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	S	S	Straight	Straight
'84630045	10/7/2008	1:45 PM	Barrow	State Route	'001100	2.48	3	'060103		0	0	Rear End	On Roadway	Fire/Explosion	Daylight	Dry	S	S	Straight	Straight
'82860070	7/19/2008	10:54 PM	Barrow	State Route	'001100	2.78	2	'013700		1	0	Not A Collision With A Motor Vehicle	Off Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	N	N	Straight	Stopped
'80330260	1/25/2008	8:33 AM	Barrow	State Route	'001100	2.84				0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	W	Passing	Turning Left
'80910020	2/6/2008	8:22 PM	Barrow	State Route	'001100	2.88				0	0	Sideswipe - Opposite Direction	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	N	S	Straight	Straight
'84630080	10/24/2008	2:11 PM	Barrow	State Route	'001100	2.95				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	S	S	Straight	Stopped
'81630149	4/29/2008	7:29 AM	Barrow	State Route	'001100	2.96				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'80910010	2/4/2008	8:11 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'80910019	2/6/2008	2:52 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	N	N	Straight	Stopped
'81180641	3/20/2008	6:42 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dawn	Dry	E	N	Turning Left	Straight
'82100451	5/19/2008	6:48 PM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion - In Other Roadway	Daylight	Dry	E	N	Straight	Stopped
'80330255	1/23/2008	6:53 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	N	N	Turning Left	Turning Left
'80330187	1/3/2008	8:12 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Straight
'84970492	11/24/2008	6:40 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Sideswipe - Same Direction	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Wet	N	W	Turning Left	Straight
'84970430	11/7/2008	4:34 PM	Barrow	State Route	'001100	2.97				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Straight
'84630059	10/13/2008	2:55 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	E	Straight	Straight
'84170059	9/24/2008	9:56 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	N	Turning Left	Straight
'82520290	6/30/2008	8:29 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'82100482	5/30/2008	6:42 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion - In Other Roadway	Daylight	Dry	W	N	Straight	Straight
'81630103	4/14/2008	1:24 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	N	N	Straight	Stopped
'81180671	3/26/2008	11:43 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'81180610	3/10/2008	7:52 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dawn	Dry	W	N	Turning Left	Straight
'84170039	9/17/2008	12:24 PM	Barrow	State Route	'001100	3.01	2	'040700		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Backing	Stopped
'84170041	9/18/2008	8:53 AM	Barrow	State Route	'001100	3.04				3	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped

**CSNHS-0008-00(430) P.I. Number 0008430 Barrow County, SR 316 @ SR 11
Crash Data for SR 316**

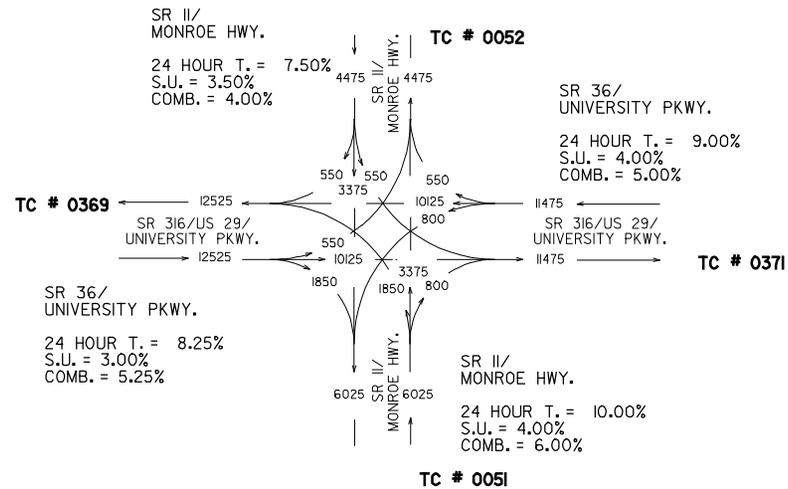
Accident No	Date	Time	County	Route Type	Route	Milelog	Intersecting Rt Type	Intersecting Rt	Ramp Section	Injuries	Fatalities	Collision	Location of Impact	Harmful Event	Light	Surface	DirVeh1	DirVeh2	MnvrVeh1	MnvrVeh2
'60790488	2/10/2006	2:49 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Stopped	Straight
'61570561	4/8/2006	11:20 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'63550385	8/12/2006	1:07 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	E	E	Straight	Straight
'62120070	5/19/2006	5:30 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'62120046	5/10/2006	6:53 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	W	W	Changing Lanes	Stopped
'64870217	11/7/2006	7:33 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	W	W	Straight	Straight
'64360456	10/30/2006	5:31 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dusk	Dry	E	E	Straight	Stopped
'64360427	10/19/2006	5:00 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Not A Collision With A Motor Vehicle	Off Roadway	Highway Traffic Sign Post	Daylight	Wet	E		Straight	
'63890064	9/14/2006	3:25 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	E	Turning Left	Straight
'63890044	9/4/2006	6:32 PM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'63550428	8/31/2006	8:26 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'61730381	4/19/2006	10:06 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Not A Collision With A Motor Vehicle	On Shoulder	Jackknife	Daylight	Wet	W	W	Changing Lanes	Changing Lanes
'61570550	4/5/2006	5:17 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'61370660	4/26/2006	8:40 AM	Barrow	State Route	'001100	2.97	1	'031600		2	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Straight
'60310711	1/9/2006	12:45 AM	Barrow	State Route	'031600	6.73				0	0	Not A Collision With A Motor Vehicle	On Roadway	Deer	Dark-Not Lighted	Dry	E		Straight	
'63480469	9/2/2006	5:40 PM	Barrow	State Route	'031600	6.73				1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Changing Lanes	Negotiating a Curve
'61570543	4/3/2006	1:23 PM	Barrow	State Route	'031600	6.95				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Negotiating a Curve	Negotiating a Curve
'64360434	10/22/2006	10:52 AM	Barrow	State Route	'031600	7.04				1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Straight
'60790518	2/23/2006	12:01 AM	Barrow	State Route	'031600	7.19				0	0	Not A Collision With A Motor Vehicle	Median	Other Non-Collision	Dark-Lighted	Wet	W		Straight	
'63890036	9/1/2006	5:07 PM	Barrow	State Route	'031600	7.42				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Straight
'63550372	8/6/2006	4:38 AM	Barrow	State Route	'031600	7.48				1	0	Not A Collision With A Motor Vehicle	On Shoulder	Guardrail Face	Dark-Not Lighted	Dry	W		Straight	
'75820483	12/12/2007	4:59 AM	Barrow	State Route	'001100	2.97	1	'031600		2	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	W	W	Straight	Straight
'70890228	2/16/2007	11:47 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Straight
'70350278	1/30/2007	6:56 AM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Dawn	Dry	W	W	Changing Lanes	Changing Lanes
'73800269	8/30/2007	11:23 PM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	W	E	Turning Left	Straight
'70890253	2/23/2007	2:09 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'70890210	2/10/2007	6:59 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dawn	Dry	W	E	Turning Left	Straight
'70890209	2/9/2007	3:23 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'74200182	9/7/2007	6:03 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dawn	Dry	W	W	Straight	Straight
'71860468	4/4/2007	7:39 AM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'72880476	6/22/2007	5:23 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Sideswipe - Same Direction	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Changing Lanes	Straight
'72290241	5/22/2007	5:28 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	W	W	Straight	Stopped
'72290203	5/11/2007	7:56 PM	Barrow	State Route	'001100	2.97	1	'031600		2	0	Angle	On Roadway	Motor Vehicle in Motion - In Other Roadway	Daylight	Dry	W	E	Turning Left	Straight
'75820536	12/27/2007	8:45 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'70350245	1/17/2007	7:58 AM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'74710547	10/22/2007	10:37 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'74710541	10/19/2007	6:10 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Straight
'74710524	10/14/2007	1:34 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'74710508	10/10/2007	9:53 AM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Straight

**CSNHS-0008-00(430) P.I. Number 0008430 Barrow County, SR 316 @ SR 11
Crash Data for SR 316**

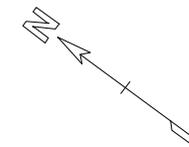
Accident No	Date	Time	County	Route Type	Route	Milelog	Intersecting Rt Type	Intersecting Rt	Ramp Section	Injuries	Fatalities	Collision	Location of Impact	Harmful Event	Light	Surface	DirVeh1	DirVeh2	MnvrVeh1	MnvrVeh2
'74710495	10/5/2007	7:30 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'74710487	10/2/2007	5:21 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'71860471	4/5/2007	4:59 PM	Barrow	State Route	'001100	2.97	1	'031600	2	1	0	Angle	On Shoulder	Motor Vehicle in Motion	Daylight	Dry	E	W	Turning Left	Straight
'75820495	12/14/2007	8:00 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Not A Collision With A Motor Vehicle	On Roadway	Animal	Dark-Not Lighted	Dry	E		Straight	
'75820499	12/17/2007	1:15 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'75820506	12/18/2007	6:58 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dawn	Dry	W	W	Straight	Straight
'75820486	12/12/2007	5:15 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'75400080	11/25/2007	5:54 PM	Barrow	State Route	'001100	2.98	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Wet	E	E	Straight	Straight
'75820473	12/9/2007	3:50 AM	Barrow	State Route	'031600	6.73		'		1	0	Not A Collision With A Motor Vehicle	Off Roadway	Ditch	Dark-Lighted	Dry	W		Negotiating a Curve	
'70890247	2/21/2007	7:47 AM	Barrow	State Route	'031600	7.1		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	E	E	Straight	Straight
'72880448	6/13/2007	4:25 PM	Barrow	State Route	'031600	7.14		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Straight
'74200201	9/10/2007	10:56 AM	Barrow	State Route	'031600	7.42		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Changing Lanes	Straight
'80910034	2/11/2008	2:08 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Straight
'83560311	8/26/2008	7:54 AM	Barrow	State Route	'031600	7.04		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	E	E	Straight	Straight
'80910048	2/16/2008	1:12 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Stopped	Straight
'80330268	1/30/2008	11:17 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'84990169	11/17/2008	11:55 AM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'81180636	3/18/2008	6:40 PM	Barrow	State Route	'001100	2.97	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Straight
'84630062	10/16/2008	4:01 PM	Barrow	State Route	'001100	2.97	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Changing Lanes	Straight
'81180625	3/14/2008	3:20 PM	Barrow	State Route	'031600	7.14		'		2	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	E	E	Straight	Straight
'81180643	3/20/2008	3:44 PM	Barrow	State Route	'031600	7.14		'		0	0	Sideswipe - Same Direction	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Changing Lanes	Straight
'82100456	5/22/2008	6:09 PM	Barrow	State Route	'031600	7.31		'		1	0	Not A Collision With A Motor Vehicle	Median	Overturn	Daylight	Dry	W		Straight	
'81180656	3/23/2008	3:36 PM	Barrow	State Route	'031600	7.33		'		0	0	Not A Collision With A Motor Vehicle	On Shoulder	Ditch	Daylight	Dry	W		Straight	
'84970456	11/14/2008	5:43 AM	Barrow	State Route	'031600	7.42		'		0	0	Not A Collision With A Motor Vehicle	On Roadway	Deer	Dark-Not Lighted	Wet	W		Straight	
'81630279	3/27/2008	7:22 AM	Barrow	State Route	'031600	7.53		'		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Straight
'80330267	1/29/2008	2:08 AM	Barrow	State Route	'031600	7.53		'		0	0	Not A Collision With A Motor Vehicle	On Roadway	Deer	Dark-Not Lighted	Dry	E		Straight	

ATTACHMENT 7
TRAFFIC DIAGRAMS

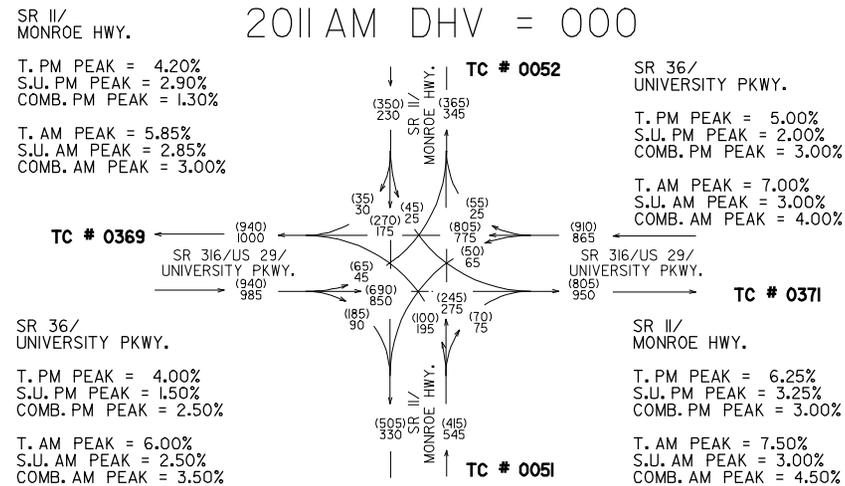
EXISTING 2011 ADT



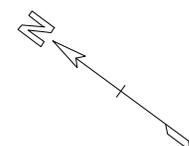
BARROW COUNTY



2011 PM DHV = (000) 2011 AM DHV = 000



BARROW COUNTY



CSNHS-0008-00(430)
P.I.# 0008430
BARROW COUNTY
SR 316/US 29 @
CR II/MONROE HWY.

NOT TO SCALE

MTW
11/11

2020 DHV = (000)
2020 DHV = 000

SR II/
MONROE HWY.

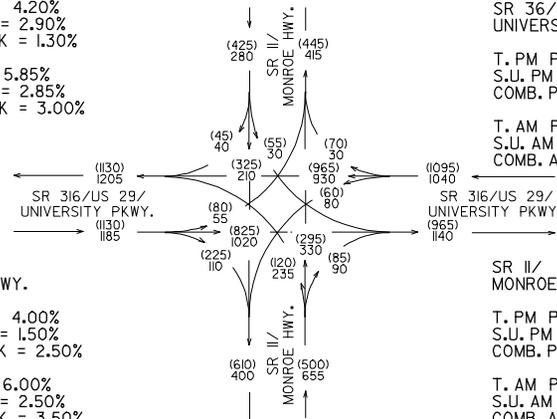
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COMB. PM PEAK = 1.30%

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COMB. AM PEAK = 3.00%

SR 36/
UNIVERSITY PKWY.

T. PM PEAK = 5.00%
S.U. PM PEAK = 2.00%
COMB. PM PEAK = 3.00%

T. AM PEAK = 7.00%
S.U. AM PEAK = 3.00%
COMB. AM PEAK = 4.00%



SR 36/
UNIVERSITY PKWY.

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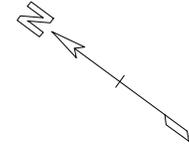
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SR II/
MONROE HWY.

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S.U. PM PEAK = 3.25%
COMB. PM PEAK = 3.00%

T. AM PEAK = 7.50%
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COMB. AM PEAK = 4.50%

BARROW COUNTY



2040 DHV = (000)
2040 DHV = 000

SR II/
MONROE HWY.

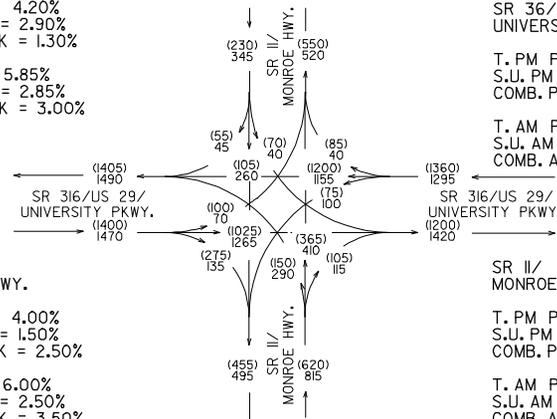
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SR 36/
UNIVERSITY PKWY.

T. PM PEAK = 5.00%
S.U. PM PEAK = 2.00%
COMB. PM PEAK = 3.00%

T. AM PEAK = 7.00%
S.U. AM PEAK = 3.00%
COMB. AM PEAK = 4.00%



SR 36/
UNIVERSITY PKWY.

T. PM PEAK = 4.00%
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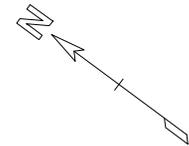
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SR II/
MONROE HWY.

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COMB. PM PEAK = 3.00%

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S.U. AM PEAK = 3.00%
COMB. AM PEAK = 4.50%

BARROW COUNTY



NO BUILD

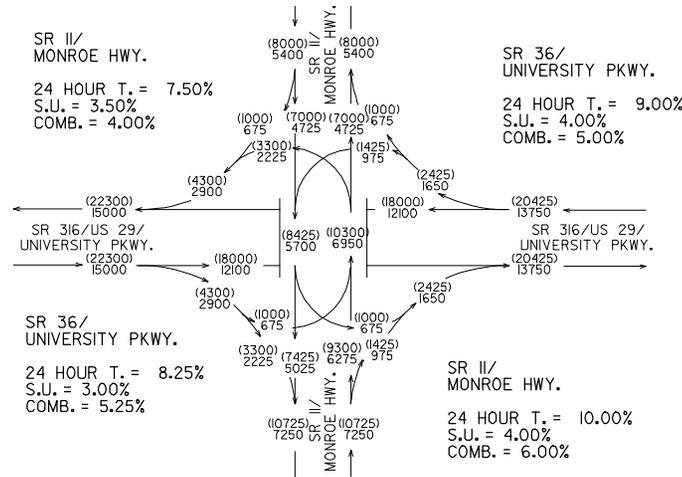
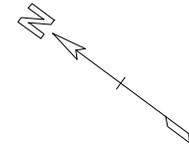
CSNHS-0008-00(430)
P.I.# 0008430
BARROW COUNTY
SR 316/US 29 @
CR II/MONROE HWY.

NOT TO SCALE

MTW
11/11

2040 ADT = (000)
2020 ADT = 000

BARROW COUNTY



BUILD

CSNHS-0008-00(430)
P.I.# 0008430
BARROW COUNTY
SR 316/US 29 @
CR 11/MONROE HWY.

NOT TO SCALE

MTW
11/11

2020 DHV = (000)
2020 DHV = 000

SR 11/
MONROE HWY.

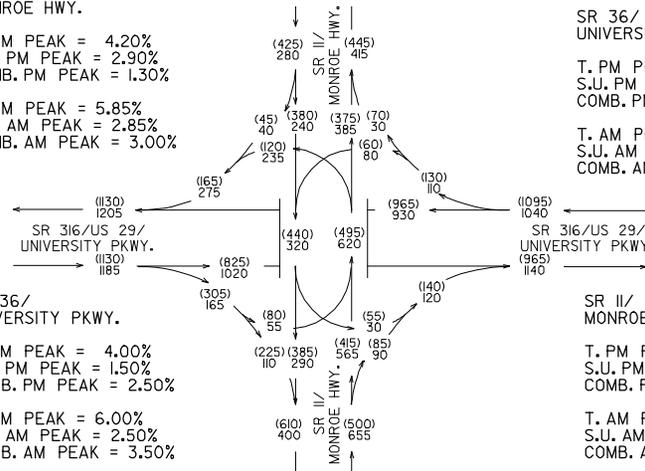
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COMB. PM PEAK = 1.30%

T. AM PEAK = 5.85%
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COMB. AM PEAK = 3.00%

SR 36/
UNIVERSITY PKWY.

T. PM PEAK = 4.00%
S.U. PM PEAK = 1.50%
COMB. PM PEAK = 2.50%

T. AM PEAK = 6.00%
S.U. AM PEAK = 2.50%
COMB. AM PEAK = 3.50%



SR 36/
UNIVERSITY PKWY.

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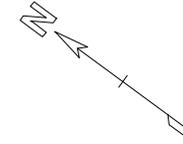
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SR 11/
MONROE HWY.

T. PM PEAK = 6.25%
S.U. PM PEAK = 3.25%
COMB. PM PEAK = 3.00%

T. AM PEAK = 7.50%
S.U. AM PEAK = 3.00%
COMB. AM PEAK = 4.50%

BARROW COUNTY



2040 DHV = (000)
2040 DHV = 000

SR 11/
MONROE HWY.

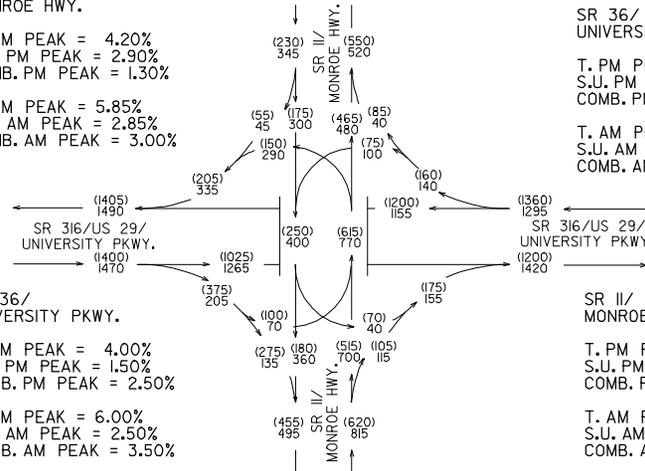
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S.U. PM PEAK = 2.90%
COMB. PM PEAK = 1.30%

T. AM PEAK = 5.85%
S.U. AM PEAK = 2.85%
COMB. AM PEAK = 3.00%

SR 36/
UNIVERSITY PKWY.

T. PM PEAK = 4.00%
S.U. PM PEAK = 1.50%
COMB. PM PEAK = 2.50%

T. AM PEAK = 6.00%
S.U. AM PEAK = 2.50%
COMB. AM PEAK = 3.50%



SR 36/
UNIVERSITY PKWY.

T. PM PEAK = 5.00%
S.U. PM PEAK = 2.00%
COMB. PM PEAK = 3.00%

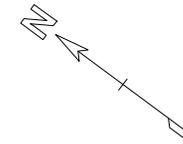
T. AM PEAK = 7.00%
S.U. AM PEAK = 3.00%
COMB. AM PEAK = 4.00%

SR 11/
MONROE HWY.

T. PM PEAK = 6.25%
S.U. PM PEAK = 3.25%
COMB. PM PEAK = 3.00%

T. AM PEAK = 7.50%
S.U. AM PEAK = 3.00%
COMB. AM PEAK = 4.50%

BARROW COUNTY



BUILD

CSNHS-0008-00(430)
P.I.# 0008430
BARROW COUNTY
SR 316/US 29 @
CR 11/MONROE HWY.

NOT TO SCALE

MTW
11/11

ATTACHMENT 8
CAPACITY ANALYSIS SUMMARY

TRAFFIC SUMMARY

1. Capacity Analysis

Capacity analysis was performed for AM and PM peak hours for the opening year (2012) and design year (2032) for the preferred build alternative for the intersection of SR 316 at SR 11.

The preferred alternative consists of a tight urban diamond interchange with the two ramp intersections spacing at 350 feet. The geometric information considered in this alternative includes one through lane for each direction on SR 11 and one left-turn lane from SR 11 northbound approach to SR 316 westbound on-ramp and from SR 11 southbound approach to SR 316 eastbound on-ramp, single left-turn lane and right-turn lane from SR 316 off-ramps to SR 11, and exclusive right-turn lanes at each intersection. The capacity analysis results for the preferred alternative is summarized in Tables 1.

Table 1: Capacity Analysis Results for Preferred Alternative

Year	Peak Hour	Westbound Ramp Intersection		Eastbound Ramp Intersection	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2012	AM	12.6	B	9.0	A
	PM	14.3	B	20.2	C
2032	AM	85.5	F	60.4	E
	PM	120.5	F	179.2	F

The analysis results indicate that in the opening year, SR 316 westbound ramp intersection will operate at LOS B with corresponding delay of 14.3 sec/veh or lower during the peak hours while SR 316 eastbound ramp intersection will operate at LOS A with corresponding delay of 9.0 sec/veh during the AM peak hour and LOS C with corresponding delay of 20.2 sec/veh during the PM peak hour.

In the design year, SR 316 westbound ramp intersection will operate at LOS F with corresponding delay of 120.5 sec/veh or lower during the peak hours while SR 316 eastbound ramp intersection will operate at LOS E with corresponding delay of 60.4 sec/veh during the AM peak hour and LOS C with corresponding delay of 179.2 sec/veh during the PM peak hour.

A breakdown analysis was also performed for the preferred alternative. The analysis indicates that the LOS for eastbound ramp intersection will first drop to F in 2023 which is after eleven years after the opening of the project. The LOS for westbound ramp intersection will drop to F in 2030 which is eighteen years after the opening of the project. Previously analyzed and submitted memoranda and reports for capacity analysis are also provided in Appendix A.

APPENDIX A
PREVIOUS REPORTS

Capacity Analysis Summary For SR 316 at SR 11 Single Point Urban Interchange (SPUI)

April 2009

Capacity analysis was performed for the build alternative of single point urban interchange (SPUI) for SR 316 at SR 11 for opening year (2012) and design year (2032). One through lane and two through lanes for each direction on SR 11 was considered for opening year and design year, respectively. For the scenario of one through lane for each direction on SR 11, breakdown analysis was performed to identify the year during which the intersection would start operating at level of service (LOS) F. Queue length was examined for critical movements at the intersections for opening year and design year. Synchro 7 software was used for capacity analysis and SimTraffic was used for queue length analysis.

The critical geometric information considered in the analysis for design year (2032) included two through lanes for each direction on SR 11, single left-turn lane from SR 11 to SR 316 on-ramps, and single left-turn and single right-turn lane from SR 316 off-ramps to SR 11. Yield control was considered for traffic turning right onto SR 11 northbound from SR 316 westbound off-ramps and SR 11 traffic turning right onto SR 316 on-ramps where they merge with traffic turning left onto the on-ramps from the signal. Free-flow was considered for the right-turn movement from SR 316 eastbound off-ramp to SR 11 southbound direction. The analysis results are summarized in Table 1.

Table 1 Capacity Analysis Results for SR 316 at SR 11 Interchange (2032)

Peak Hour	Measure of Effectiveness	SPUI Signal	Right-Turn Movement Fr SR 316 WB Off-ramp To SR 11 NB (Yield Control)	Right-Turn Movement Fr SR 11 SB To SR 316 WB (Yield Control)	Right-Turn Movement Fr SR 11 NB To SR 316 EB (Yield Control)
AM	Delay (Sec/Veh)	33.4	10.1	12.2	10.0
	LOS	C	B	B	A
PM	Delay (Sec/Veh)	35.7	10.1	11.6	9.6
	LOS	D	B	B	A

The analysis indicated that in the design year, the signal at the SPUI will operate at LOS C and D during the a.m. and p.m. peak hour, respectively. All movements at this intersection will operate at LOS D or better. The turning movements under yield control on the ramps will operate at LOS B or better during the peak hours in the design year. The queue lengths for all movements at the interchange are shown in Figure 1. The maximum queue length for the turning movements is 231 feet which is for the movement turning left onto SR 11 southbound direction from SR 316 westbound off-ramp. The queue length for the through movements on SR 11 is 581 feet and 650 feet for northbound and southbound direction, respectively.

Capacity analysis was also performed for the scenario with one through lane for each direction on SR 11. This analysis addressed the operation of the scenario without widening SR 11 and it was performed for opening year (2012) and intersection breakdown year. The analysis results are summarized in Table 2.

The analysis indicated that, with one through lane for each direction on SR 11, the signal at the SPUI will operate at LOS C during both a.m. and p.m. peak hours in the opening year. All movements at this intersection will operate at LOS D or better. The turning movements under yield control on the ramps will

Capacity Analysis Summary
 For SR 316 at SR 11 Single Point Urban Interchange (SPUI)

operate at LOS B or better during the peak hours in the opening year. The queue lengths for all movements at the interchange are shown in Figure 2. The maximum queue length for the turning movements is 186 feet which is for the movement turning left from SR 11 northbound to SR 316 westbound on-ramp. The queue length for the through movements on SR 11 is 537 feet and 411 feet for northbound and southbound direction, respectively.

With one through lane for each direction on SR 11, the signalized intersection at the SPUI will operate at LOS F in 2029. All movements under Yield control at the unsignalized intersections will operate at C or better.

Table 2 Capacity Analysis Results for SR 316 at SR 11 Interchange (2012 and Breakdown Year)

Year	Peak Hour	Measure of Effectiveness	SPUI Signal	Right-Turn Movement Fr SR 316 WB Off-ramp To SR 11 NB (Yield Control)	Right-Turn Movement Fr SR 11 SB To SR 316 WB (Yield Control)	Right-Turn Movement Fr SR 11 NB To SR 316 EB (Yield Control)
2012	AM	Delay (Sec/Veh)	27.9	12.1	10.0	9.1
		LOS	C	B	B	A
	PM	Delay (Sec/Veh)	29.9	12.1	9.8	9.0
		LOS	C	B	A	A
2029	AM	Delay (Sec/Veh)	63.6	20.6	11.8	9.9
		LOS	E	C	B	A
	PM	Delay (Sec/Veh)	83.2	20.4	11.3	9.6
		LOS	F	C	B	A

It should be noted that currently there is a driveway to a gas station located in the southwest quadrant of the existing intersection of SR 316 at SR 11. The interaction between the traffic entering/exiting the gas station and the traffic turning onto SR 11 southbound from SR 316 eastbound off-ramp shall be further analyzed to determine whether the driveway needs to be relocated towards south or not.

Capacity Analysis Summary

For Grade Separation of SR 316 at SR 11

April 2008

Capacity analysis was performed for the ramp intersections of SR 316 at SR 11 interchange. To determine the minimum spacing needed between the two ramp intersections at this interchange, capacity analysis was performed for design year (2032) AM and PM peak hours with consideration of improvements ensuring that the intersections will operate at an acceptable level of service (LOS). Queue length was examined for each movement at the intersections. Synchro 6 software was used for capacity analysis and SimTraffic was used for queue length analysis.

The critical geometric information considered in the analysis included two through lanes for each direction on SR 11, dual left-turn lanes from SR 11 northbound approach to SR 316 westbound on-ramp, dual left-turn lanes from SR 316 westbound off-ramp to SR 11 southbound approach, dual right-turn lanes from SR 316 eastbound off-ramp to SR 11 southbound approach, one left-turn lane from SR11 southbound approach to SR 316 eastbound on-ramp, and exclusive right-turn lanes at each intersection. The analysis results are summarized in Tables 1 and 2 for westbound ramp intersection and eastbound ramp intersection, respectively. The analysis indicated that both intersections will operate at LOS B during the peak hours in the design year. The maximum queue length for northbound left-turn movement at the westbound ramp intersection and southbound left-turn movement at the eastbound ramp intersection will be 298 feet and 131 feet, respectively. The maximum queue length for northbound through movement at westbound ramp intersection and southbound through movement at eastbound ramp intersection will be 198 feet and 353 feet. With consideration of the critical queue lengths, left-turn lane taper lengths, and intersection width, it is estimated that the minimum spacing needed between the two intersections will be 750 feet, and the minimum left-turn storage length will be 300 feet and 150 feet for the northbound and southbound left-turn movement, respectively.

Table 1 SR 11 at SR 316 Westbound Ramp Intersection

Year	Peak Hour	NBL			NBT			SBT			SBR			WBL			WBR			Intersection Signal Delay (Sec/Veh)	LOS
		Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)		
2032	AM	26.3	C	298	1.4	A	198	21.8	C	342	4.6	A	55	32.5	C	155	12.3	B	109	15.9	B
2032	PM	27.7	C	274	1.8	A	152	22.5	C	308	3.3	A	50	32.2	C	194	7.3	A	109	16.6	B

Table 2 SR 11 at SR 316 Eastbound Ramp Intersection

Year	Peak Hour	NBT			NBR			SBL			SBT			EBL			EBR			Intersection Signal Delay (Sec/Veh)	LOS
		Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)		
2032	AM	16.2	B	575	2.3	A	20	17.4	B	92	0.9	A	311	33.3	C	221	18.6	B	92	11.4	B
2032	PM	25.4	C	384	3.2	A	42	13.4	B	131	7.4	A	353	23.6	C	160	38.3	D	275	19.6	B

With the minimum intersection spacing and the storage length for left-turn lanes determined based on design year traffic analysis, open year (2012) analysis was performed with consideration of one through lane for each direction on SR 11. The analysis results are summarized in Tables 3 and 4 for westbound ramp intersection and eastbound ramp intersection, respectively. In open year, both intersections will operate at LOS C or better during the peak hours, and no queuing issue will present.

However, with one through lane for each direction on SR 11, the eastbound ramp intersection will operate at LOS F during the PM peak hour in the year of 2022. The westbound left-turn movement at the westbound ramp intersection, the southbound through movement and the eastbound right-turn movement at the eastbound ramp intersection will operate at LOS F as well. The queue length for northbound left-turn movement at the westbound ramp intersection and southbound left-turn movement at the eastbound ramp intersection will exceed the storage lane length. The analysis results are summarized in Tables 3 and 4 for westbound ramp intersection and eastbound ramp intersection, respectively.

Table 3 SR 11 at SR 316 Westbound Ramp Intersection

Year	Peak Hour	NBL			NBT			SBT			SBR			WBL			WBR			Intersection Signal Delay (Sec/Veh)	LOS
		Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)		
2012	AM	30.8	C	176	2.3	A	345	21.0	C	345	4.1	A	28	33.7	C	133	8.1	A	68	17.3	B
2012	PM	29.5	C	174	4.7	A	177	24.5	C	476	3.0	A	43	41.0	D	216	9.2	A	69	19.6	B
2022	AM	42.3	D	323	5.0	A	725	33.7	C	998	3.3	A	52	70.5	E	351	11.0	B	68	28.0	C
2022	PM	44.4	D	335	4.5	A	425	52.6	D	1000	2.0	A	526	102.4	F	446	11.5	B	68	39.1	D

Table 4 SR 11 at SR 316 Eastbound Ramp Intersection

Year	Peak Hour	NBT			NBR			SBL			SBT			EBL		EBR			Intersection Signal Delay (Sec/Veh)	LOS	
		Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS	Max Queue (ft)	Delay (Sec/Veh)	LOS			Max Queue (ft)
2012	AM	14.1	B	267	2.1	A	27	2.2	A	70	1.8	A	180	33.5	C	95	7.6	A	112	8.9	A
2012	PM	23.4	C	395	3.1	A	46	5.2	A	108	11.4	B	712	26.8	C	157	38.5	D	408	20.3	C
2022	AM	22.2	C	805	1.5	A	42	22.1	C	175	1.8	A	616	55.4	E	196	21.4	C	237	15.2	B
2022	PM	59.1	E	1321	2.8	A	526	21.6	C	164	102.6	F	734	33.7	C	1455	137.1	F	545	86.4	F

ATTACHMENT 9
MINUTES OF CONCEPT MEETINGS

Initial Concept Team Meeting Summary

October 25, 2007

TO: Meeting attendees (see attached list)

FROM: S. Sajid Iqbal, Parsons

SUBJECT: CSNHS-0008-00(429), (430) & (431), PI NO. 0008429, 0008430, 0008431, SR 316 Grade Separation at SR 81, SR 53, SR 11 Barrow County Initial Concept Team Meeting

An Initial Concept Team meeting was held on October 25, 2007 in the GDOT Urban Design Group Office conference rooms A & B to review project progress to date, identify information needs for the project, and allow for local official input. A list of meeting attendees is attached to these meeting minutes.

Purpose

The purpose of the meeting was:

- 1) Present draft Need and Purpose Statement and concept alternatives,
- 2) Obtain feedback and identify any issues,
- 3) Determine next steps

Notes below summarize discussions and decisions from the meeting.

Neal O'Brien conducted the meeting, and opened the meeting by stating the general project description and asking all present to introduce themselves and their affiliation with the project. Mr. O'Brien stated that the Right-of-Way for this project is scheduled for Fiscal Year 2009 and the Letting Date is Long Range. Sajid Iqbal was then asked to present the N&P statement and the Concept Alternatives:

SR 316 @ SR 81

Need & Purpose – The existing Level of Service (LOS) for this intersection is D & F for AM and PM peak hours respectively. The 2032 No-Build LSO is anticipated to be F for both the AM & PM peak hours. The accident and injury rates on SR316 and SR81 exceed the statewide averages. Therefore this project is needed for operational and safety improvements to SR316 at SR81.

Concept Layouts - Four concept alternatives were presented for the grade separation of this intersection as described below:

Concept Alternative 1 consists of a diamond interchange with the ramp head spacing set at 1000 feet. The bridge structure carrying SR 81 over SR 316 is long enough to span over the future HOV section of SR 316. The bridge will carry 6-lanes, 2-lanes in each direction with two left turn lanes. This layout would require 7 displacements, 2 commercial and 5 residential.

Concept Alternative 2 consists of a partial cloverleaf interchange with diamond ramps providing the turn movements from SR 81 and the two loop ramps providing turns from the SR 316. This layout would require displacement of 5 residential buildings.

Concept Alternative 3 also provides partial clover leaf interchange with loops of 35mph design speed and left-turns from SR 316 are accommodated through the intersection and hence no longer allow uninterrupted flow. This concept would require displacement 6 residential and 2 commercial properties.

Concept Alternative 4 is a combination of diamond and partial clover leaf interchange with a loop ramp providing eastbound turn movements from SR 316. This concept layout would require displacement of 3 residential properties.

Discussion Points:

- Ms. Susan Thomas from Edwards Pitman Environmental, Inc. (EPEI) informed the project team that potential historic property located in the southwest quadrant of the SR316/SR81 intersection was originally determined to be not eligible for the national register of historic properties by EPEI. GDOT Office of Environment Location (OEL) had concurred with this finding. However, State Historic Preservation Office (SHPO) did not concur with this finding. EPEI, GDOT OEL and SHPO are scheduled to meet on Nov. 8, 2007 to discuss this further. Currently all concept alternates are impacting this property. Alternates will be revised as soon as a determination is made regarding its historic eligibility.
- The intersection of SR316 and SR81 is growing rapidly with multiple commercial developments planned in the northeast and southeast quadrants.
- A proposed Walmart-type development is under construction in the northeast quadrant. A temporary access easement has been provided on GDOT owned property to provide access to construction vehicles from SR81. This temporary access easement is located approximately 600 feet north of the existing SR316/SR81 intersection. Upon completion of construction, permanent access will be provided by a new road running south of Carter Hill Road.
- Another commercial/residential development is being planned in the southeast quadrant of the existing SR316/SR81 intersection. Plans for this development are available with City of Gainesville.
- Recent access permit information on all of these locations can be obtained from Mr. Brent Cook of GDOT District 1.

- Barrow County is performing preliminary engineering for intersection improvement at SR81 and Carl Bethlehem Road. This project will add turn lanes and signals to the existing intersection. Barrow County has pedestrian improvement plan for the area.
- Mr. Todd Long from Office of Preconstruction recommended that Parsons should look into a compressed diamond alternative to minimize right of way impacts. Parsons will analyze this alternative after updating design plans by incorporating all proposed developments in the project area.
- Mr. Terry Darragh from Barrow County informed the project team that Carter & Burgess, Inc. has recently completed a comprehensive transportation plan for SR316 in Barrow County. Traffic volumes from this study should be used for performing traffic analysis. Parsons has used traffic data provided by HNTB Corporation who are developing a comprehensive model for SR316. The growth factor used for 2032 design year has been reviewed and approved by GDOT OEL.
- A preferred alternative for this location will be determined at a later date after due coordination with local developers, Barrow County and GDOT District 1.
- Ms. Laura Rish from OEL brought up the possible logical termini problem associated with adding and dropping of lanes on SR 81.

SR 316 @ SR 11

Need & Purpose – The existing Level of Service (LOS) for this intersection is D & E for AM and PM peak hours respectively. The 2032 No-Build LOS is anticipated to be F for both the AM & PM peak hours. The accident and injury rates on SR316 and SR11 are lower than the statewide averages but SR 316 experienced two fatal accidents in the vicinity of the intersection. Therefore this project is needed for operational and safety improvements to SR316 at SR11.

Concept Layouts - Three concept alternatives were presented for the grade separation of this intersection as described below.

Concept Alternative 1 consists of a diamond interchange with ramp head spacing set at 1000-ft. The design speed of SR 11 is 65 mph and ramp design speed of 45 mph. The bridge carrying SR 11 over SR 316 would be 6-lane wide with 2-lanes of through traffic in each direction. This concept would require displacement of 3 residential and 1 commercial property.

Concept Alternative 2 is a combination of diamond and cloverleaf interchange in that SB left turns from SR 11 are accommodated through the loop ramp in the SE quadrant. This concept would require displacement 2 residential and 1 commercial property.

Concept Alternative 3 is also a diamond interchange shifted northward to avoid impact on Betty Treadwell Historic property. The ramp heads are spaced at 1000-ft and the design speed of ramps is 45 mph. This concept layout would require displacement of 2 residential and 1 commercial property.

Discussion Points:

- Ms. Susan Thomas from EPEI informed the Project Team that a potential historic property along Manger Avenue in the southwest quadrant of the SR316/SR11 intersection was originally determined to be not eligible for the national register of historic places by EPEI. GDOT OEL had concurred with this finding. However, SHPO did not concur with this finding. EPEI, GDOT OEL and SHPO are scheduled to meet on Nov. 8, 2007 to discuss this further. Currently, concept alternative #1 and #2 are impacting this property. Alternates will be revised as soon as a determination is made regarding its historic eligibility.
- Significant development has not been planned in the vicinity of this interchange. However, project team recommends coordination with Barrow County and City of Bethlehem.
- On concept alternative #3, access to Greg Dillard property and lake in the northwest quadrant will be cut off from SR11. Project Team recommended that Parsons should further investigate access options for this property.
- Concept alternative #3 is shown to be impacting a cell phone tower in the northwest quadrant. Project Team was of the opinion that this impact could be avoided with refinements to this alternative.
- To avoid this impact it was suggested to consider a loop ramp in the northeast quadrant for the north to west turn movement.
- Overall concept alternative # 3 is the preferred alternate provided impacts can be minimized.
- This intersection is located within the City of Bethlehem and at the moment there is no sewer in this area.
- The Baptist Church is planning to expand /develop their facility south of the existing building. Their proposed expansion plan would not impact this project.
- Ms. Laura Rish brought up the possible logical termini problem associated with adding and dropping of lanes on SR 11.

SR 316 @ SR 53

Need & Purpose – The existing Level of Service (LOS) for this intersection is B for both AM and PM peak hours. The 2032 No-Build LOS is anticipated to be D & F for the AM & PM peak hours respectively. The accident and injury rates on SR53 exceed the statewide averages. However, these rates for SR316 are below the statewide averages. Based on the above information it has been determined that the project is needed for operational and safety improvements to SR316 at SR53.

Concept Layouts - Three concept alternatives were presented for the grade separation of this intersection as described below.

Concept Alternative 1 consists of a diamond interchange with ramp heads spaced at 1000-ft. The design speed of SR 53 is 55 mph and ramp design speed of 45 mph. The bridge carrying SR 53 over SR 316 would provide 1-lane in each direction and a turn lane. This concept layout would require displacement of 1 commercial property.

Concept Alternative 2 is a combination of diamond and cloverleaf interchange. The EB exit ramp from SR 316 is eliminated to avoid impact on Plymart, and a loop ramp is constructed in the SE quadrant to accommodate EB turn movements. Loop ramp design speed is 35 mph. This concept layout would require displacement of 3 residential properties.

Concept Alternative 3 is also a combination of diamond and cloverleaf interchange with a radial exit ramp in the SW quadrant for the EB right-turns and EB left-turns are provided through the loop ramp in SE quadrant. Design speed of loop ramp is 30 mph. This concept layout would require displacement of 3 residential properties.

Discussion Points:

- All conceptual alternatives would avoid impacts to the proposed cultural arts center in the northwest quadrant. Mr. Terry Darragh informed the Project Team that this center would be built in the next 18 months and would have a seating capacity of 5000 and parking space for 1000 cars.
- Additional commercial development is planned in the southwest quadrant. However these will not be adversely impacted by the proposed interchange.
- Mr. Terry Darragh noted that he was unsure about the eligibility of the historic property in the northwest quadrant of this intersection and requested Susan Thomas and GDOT OEL to reconfirm.
- Concept alternative 1 was ruled out of consideration due to the commercial displacement in the southwest quadrant.
- Project Team enquired if an alternate was considered that would realign SR 53 to intersect SR316 at a near perpendicular angle. Sajid Iqbal responded that such an alternate was not considered because it would require large amounts of right of way. As suggested, we will develop another alternative by realigning SR 53 to avoid impact on Plymart and still maintain the diamond interchange configuration.
- Alternative #2 was favored over other alternatives.

Miscellaneous Items:

- Project team inquired if the concept layouts considered future barrier separated HOV on SR 316. Sajid Iqbal responded that GDOT had provided the future typical section on SR 316 and that all alternates were designed to work with future lane configuration on SR316.
- Project team recommended that the concept report should include a commentary on interchange lighting for all interchanges. Lighting costs should be included in the conceptual cost estimate.
- All three projects are currently long range projects and a schedule for preliminary engineering design has not been established yet.

- Mr. Ken Werho of TS&D indicated that ATMS is planned along the SR 316 corridor. He also indicated that there is no existing lighting and hence this will increase utility cost.
- The level of environmental action required will be three separate CE document for each of the three interchanges and no PHOH will be required.

Mr. O’Neal concluded the meeting stating that the consultant will proceed with the Concept Development by incorporating and or addressing applicable comments and recommendations:

Next Steps

- Schedule meeting with Barrow County to obtain additional input regarding planned development at all three intersections.
- Refine concept alternates in coordination with planned development and present to Project Team.
- Prepare for and schedule PIOH – Because of their close proximity to each other, one PIOH will be held for the three interchanges. One PIOH will be scheduled to include all three interchanges and will be coordinated with the City of Bethlehem. Two concept alternates will be displayed for each interchange and preferred alternate will be determine based on PIOH comments.
- Prepare for and schedule Concept Team Meeting after PIOH.
- Meet with FHWA to finalize bridge typical sections.
- Coordinate with Jerry Milligan from GDOT – Right of Way Office to determine preliminary ROW costs.

Meeting Attendees:

Name	Organization	Phone	Email
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Concept Team Meeting Summary

TO: All attendees (See attached list)

FROM: S. Sajid Iqbal, P.E.

SUBJECT: CSNHS-0008-00(429), CSNHS-0008-00(430) and CSNHS-0008-00(431),
P.I. Nos.: 0008429, 0008430 and 0008431; Barrow County
Grade Separation SR 316 @ SR 81, SR 11 and SR 53

DATE: August 19, 2010

TIME: 10:00 AM

PLACE: GDOT District 1 Office
2505 Athens Hwy SE
Gainesville, GA 30507

RECORD BY: Rajeev Shah, EIT

DISCUSSIONS:

A Concept Team meeting was held on August 19, 2010 at the Georgia Department of Transportation District 1 Gainesville Office. The purpose of the meeting was to review the need and purpose statements, draft concept reports for the subject projects and to obtain any feedback. A list of meeting attendees is attached to these meeting minutes.

Notes below summarize discussions and decisions from the meeting.

GDOT Project Manager, Neal O'Brien conducted the meeting, and opened the meeting by providing project background and schedule of the three projects and by asking everyone to introduce themselves.

Parsons Team gave an overview of the three projects, presenting the project's need and purpose, draft concept report and the preferred concept layout for each project. Discussions also included all other concept alternatives considered for these projects along with the reasons for the selection of the preferred alternative.

CSNHS-0008-00(429) – SR 316 Interchange @ SR 81

The project need is for safety and operational improvements of the intersection of SR 316 @ SR 81. The preferred alternative for this project would construct a tight urban diamond interchange (TUDI) at the existing at-grade signalized intersection of SR 316 and SR 81. Proposed ramp heads will be spaced 350 ft apart. Improvements to SR 81 will begin approximately 0.22 miles south of the existing SR 316/SR 81 intersection and continue northerly along SR 81 for a total length of 0.54 miles. Interchange will be designed to accommodate the future widening of SR 316 from existing two general-use lanes in each direction to three lanes including a barrier separated high occupancy vehicle lane in each direction.

Comments and Responses – CSNHS-0008-00(429)

1. Local Govt. (Barrow County/City of Winder/City of Auburn)
 - Ron Griffith (City of Auburn) inquired about the funding availability for construction. Neal O'Brien (GDOT PM) responded that funding for construction is in long range.
 - Dan Yearwood (Barrow County) showed concern about this project being in long range and its impacts to future developments in the vicinity of the proposed interchange. Neal O'Brien (GDOT PM) responded that any future developments, which are proposed to Barrow County or City of Winder should be forwarded to the GDOT PM to determine the impact of the proposed interchange to the development.
 - Dan Yearwood (Barrow County) inquired if any advance acquisition is planned for the future. Neal O'Brien (GDOT PM) responded that right-of-way funding is in long range. There are funds available for advance acquisition through P.I. No 122870, however, FHWA may not allow ROW funding to be set for projects in long range.
 - City of Winder commented that the impacts of the proposed interchange to the existing utilities should be reviewed in detail.
2. Office of Planning
 - It was asked if the need and purpose statement was reviewed by the Office of Planning. Sajid Iqbal responded that the need and purpose statement was reviewed by Office of Planning and comments were incorporated in the revised statement. It was requested from the Consultants to provide documentation of the review/approval of the need and purpose statement.
3. Office of Right-of-Way
 - No comments
4. Office of Utilities
 - No comments
5. Office of Maintenance
 - No comments
6. Office of Construction
 - No comments
7. Office of Materials and Research
 - No comments
8. Office of Environmental Services
 - No comments.

9. Office of Traffic Operations

- Ken Werho commented that Alternate 1, which is conventional diamond interchange with ramp heads spaced at 1,000 ft apart and six lane bridge should be considered as the preferred alternative. The recently constructed NE development, Home Depot, the proposed SE development, and more future developments would generate traffic, which will make the TUDI operate at an unacceptable level of service in the year 2017, which is 15 years before the design year 2032. Neal O'Brien (GDOT PM) responded that the purpose of this project is to provide safety and operational improvements, and not adding capacity. The capacity improvement can be added as separate project when funding is made available.
- Ken Werho also inquired whether a Diverging Diamond Interchange (DDI) option was considered. Sajid Iqbal (Parsons) responded that a DDI option was considered but not selected. A DDI is usually feasible in conditions when there are high left turning volumes and low through volumes, which is not the case for this location.

10. Office of Bridge

- No comments

11. GDOT District 1

- No comments

CSNHS-0008-00(430) – SR 316 Interchange @ SR 11

The preferred alternative for this project would construct a tight urban diamond interchange at the existing at-grade signalized intersection of SR 316 and SR 11. Proposed ramp heads will be spaced 350 ft apart. Improvements to SR 11 will begin approximately 0.21 miles south of the existing SR 316/SR 11 intersection and continue northerly along SR 11 for a total length of 0.66 miles. Interchange will be designed to accommodate the future widening of SR 316 from existing two general-use lanes in each direction to three lanes including a barrier separated high occupancy vehicle lane in each direction.

Comments and Responses – CSNHS-0008-00(430)

1. Local Govt. (Barrow County/City of Winder/City of Auburn)

- No comments.

2. Office of Planning

- No comments

3. Office of Right-of-Way

- GDOT Right-of-Way personnel enquired about the possibility of conducting a VE for this project before the preliminary design. GDOT PM confirmed that a VE study will be conducted prior to preliminary plans.

4. Office of Utilities
 - No comments
5. Office of Maintenance
 - No comments
6. Office of Construction
 - No comments
7. Office of Materials and Research
 - No comments
8. Office of Environmental Services
 - No comments.
9. Office of Traffic Operations
 - Traffic Operations recommends Alternate 1 from the list of alternates that was not chosen. The ramp spacing can be reduced from a 1000' to a minimum of 660' for the urban development. Also, the Access Roads A & B will have to be relocated a second time when a full diamond interchange is required. According to the data provided this interchange as proposed will fail in 2022. Sajid Iqbal (Parsons) indicated that a typical tight urban diamond interchange has a spacing of about 300-400 ft between the ramps and left turn storage bay typically extend beyond the ramp heads. A tight urban diamond interchange was selected for this project because of least right-of-way and environmental impacts and due to its lowest overall cost. The purpose of this project is to provide safety and operational improvements, and not adding capacity. The capacity improvement can be added as separate project when funding is made available.
10. Office of Bridge
 - No comments
11. GDOT District 1
 - No comments

CSNHS-0008-00(431) – SR 316 Interchange @ SR 53

Project CSNHS-0008-00(431) would construct a compressed diamond interchange at the existing at-grade signalized intersection of SR 316 and SR 53. Proposed ramp heads will be spaced 500 ft apart. Improvements to SR 53 will begin approximately 0.22 miles South-East of the existing SR 316/SR 53 intersection and continue northward along SR 53 for a total length of 0.75 miles. The proposed SR 53 will tie in to the existing typical section at both north and south project terminals. Interchange will be designed to accommodate the future widening of SR 316 from existing two general-use lanes in each direction to three lanes including a barrier separated high occupancy vehicle lane in each direction.

Comments and Responses – CSNHS-0008-00(431)

1. Local Govt. (Barrow County/City of Winder/City of Auburn)
 - No comments.
2. Office of Planning
 - No comments
3. Office of Right-of-Way
 - No comments
4. Office of Utilities
 - No comments
5. Office of Maintenance
 - No comments
6. Office of Construction
 - GDOT office of construction suggested changing driveway grades for commercial properties from 16 percent to 11 percent.
7. Office of Materials and Research
 - No comments
8. Office of Environmental Services
 - No comments.
9. Office of Traffic Operations
 - Traffic Operations recommends moving the bridge +/- 150' East of the shown location to stay off of the existing facilities on the Westside. This would allow for the use of the existing intersection during construction. The ramp spacing should be increased to a minimum of 660'. Sajid Iqbal (Parsons) responded that the proposed compressed diamond has a spacing of 500 ft in order to avoid impacts to Athens Lumber in the southwest quadrant and historic property in the northwest quadrant of the interchange.
10. Office of Bridge
 - No comments
11. GDOT District 1
 - No comments

Next Steps

- Parsons will update the concept report to incorporate the comments made during the concept team meeting.

- A final concept report will be submitted to GDOT for approval.
- Parsons will provide documentation of review/approval for the need and purpose statements for these projects.

Meeting Attendees:

Name	Organization	Phone	Email
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CONCEPT TEAM MEETING

SIGN-IN SHEET

PROJECT: CSNHS-0008-00(429)
CSNHS-0008-00(430)
CSNHS-0008-00(431)

DATE: AUGUST 19, 2010

COUNTY: BARROW

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RAJEEV SHAM	PARSONS	678-969-2481	RAJEEV.SHAM@PARSONS.COM
KEN WERHO	GDOT-T.O. TMC	404-635-8144	KWERHO@DOT.GA.GOV
Brandon Kirby	GDOT ODD	678-343-0816	bkirby...
Ron Griffin	City-Auburn	770-963-4002	rgriffin@cityofauburn.ga.gov
TERRY ALLGOOD	WALTON EMC	770-601-2795	tallgood@waltonemc.com
DARREL GREGSON	Barrow	770-867-0664	dgregson@barrowga.org
ALLEN FERGUSON	GDOT-UTILITIES	770-532-5510	aferguson@dot.ga.gov
Nathaniel O'Kelley	GDOT UTILITIES	770-532-5510	noKelley@dot.ga.gov
MIKE JEWELL	CITY OF WINDER	770-867-7629	mike.jewell@cityofwinder.com
REGER WILHELM	CITY OF WINDER	770-867-7978	REGER.WILHELM@CITYOFWINDER.COM
Barry Edgar	City of Winder	678-425-6812	barry.edgar@cityofwinder.com
TOM McQUEEN	GDOT Planning	404-631-1785	tmcqueen@dot.ga.gov

ATTACHMENT 10
AGENCY COORDINATION MEETINGS

OEL/FHWA Meeting Summary

February 13, 2008

TO: Meeting attendees (see attached list)

FROM: S. Sajid Iqbal, Parsons

SUBJECT: CSNHS-0008-00(429), (430) & (431), PI NO. 0008429, 0008430, 0008431, SR 316 Grade Separation at SR 81, SR 53, SR 11
Barrow County
OEL/FHWA Meeting

An OEL/FHWA Team meeting was held on February 13, 2008 at the GDOT Office of Environment/Location (OEL) in Atlanta to introduce projects to FHWA. Project concept alternatives for grade separation of SR 316 at SR 81, SR 53, and SR 11 were presented during this meeting. A list of meeting attendees is attached to these meeting minutes.

Purpose

The purpose of the meeting was:

- Present project need and purpose, and Concept Alternatives and preferred concept alternatives
- Obtain feedback and identify any issues,
- Determine next steps

Notes below summarize discussions and decisions from the meeting.

Laura Rish, GDOT OEL conducted the meeting, and opened the meeting by stating the general project description and asking all present to introduce themselves. She then handed over the presentation to Neal O'Brien, GDOT Office of Urban Design who introduced the projects of grade separation of SR 316 at SR 81, SR 53, and SR 11. Parsons then presented project need and purpose and various concept alternatives developed for the projects.

The purpose of these projects is to support the state and regional economic development goals and to alleviate congestion by improving traffic flow through the intersections of SR 316 at SR 81, SR 11 & SR 53. These projects will improve traffic operations and safety of the intersection.

Comments

- GDOT PM indicated that the Department is currently considering ways to limit impacts/improvements on cross roads. He stated that the department would like to determine whether the bridge can be widened to full width of six lanes as per the preferred alternatives for SR 316 @ SR 81 and SR 11. Additionally, SR 81 needs to be reduced from two lanes in each direction to one lane in each direction in order to reduce impacts and project cost. FHWA commented that the proposed changes may affect the need and purpose statement of the projects, which might need to be revised.
- GDOT PM indicated that three State Routes including, SR 81, SR 11, and SR 53 were selected based on the recommendations from Barrow County to be improved first.
- It was discussed and decided that only one PIOH will be conducted at one location for all three locations including SR 81, SR 11, and SR 53. Additionally, alternative layouts for these three locations will be presented together during the PIOH.
- The Consultant team commented that after reviewing the alternative layouts for SR 316 @ SR 81, SR 11, and SR 53 respectively, it was observed that based on the impacts to the surrounding properties, a 4(f) section is not expected.
- The Consultant design team inquired about preparing one Categorical Exclusion (CE) document for all three locations since one project concept report is prepared for three locations. FHWA recommended having separate CE documents for each project and similarly separating concept reports for each one, which was based on the fact that the three projects have independent utility and can hold on its own. Additionally, FHWA suggested that adjacent project information should be included in the environmental document.
- GDOT PM indicated that Carl Bethlehem Road west of SR 81 (which is not a part of these projects) will likely be grade separated as a part of another project with no access off SR 316. In response, FHWA wanted to confirm whether the improvement to SR 81 would in anyway worsen conditions at Carl Bethlehem Road. Consultant design team assured FHWA that based on the traffic study, the improvement on SR 81 will not only improve conditions on SR 81 but will also help reduce congestion on Carl Bethlehem Road by shifting traffic away from Carl Bethlehem Road to SR 81. Additionally, GDOT design team added that improvements to Carl Bethlehem Road are part of a completely different project and not associated with these projects.
- FHWA suggested that there is a need to revisit the traffic study in order to determine whether the ramps from SR 316 to SR 81 would back up due to

reduction of proposed SR 81 typical section from two lanes in each direction to one lane in each direction.

- FHWA suggested that only preferred alternatives be presented during PIOH and to the Value Engineering (VE) study after PIOH comments have been addressed. FHWA further explained that the Department should only present to the public an alternative which could be actually built, if we know that we need a narrow bridge, we should not then show a more expensive bridge that cannot be built.
- As the meeting progressed, FHWA concurred that the need and purpose of these projects addresses safety and traffic operational issues. Additionally, future projects would include grade separating and adding HOV lanes to the corridor.

Action Items

- GDOT Office of Urban Design to provide direction regarding extent of improvements on cross-roads.
- Update preferred alternatives based on GDOT's directives.
- Schedule and Hold PIOH in May/June 2008.
- Schedule and Hold VE Study

Meeting Attendees:

Name	Organization	Phone	Email
Neal O'Brien	GDOT – Urban Design	404-656-5442	nobrien@dot.ga.gov
Jill Franks	GDOT – Urban Design	404-656-5442	jfranks@dot.ga.gov
Kelly Wade	FHWA	404-562-3584	kelly.wade@fhwa.dot.gov
Jennifer Mathis	GDOT – OEL	404-699-4408	jmathis@dot.ga.gov
Laura Rish	GDOT – OEL	404-699-4439	lrish@dot.ga.gov
Jill Baur	EPEI – Environmental	770-333-9484	jbaur@edwards-pitman.com
Susan Thomas	EPEI – Environmental	770-333-9484	stthomas@edwards-pitman.com
Alan Hunley	Parsons	678-969-2304	Alan.Hunley@parsons.com
Sajid Iqbal	Parsons	678-969-2368	Sajid.Iqbal@parsons.com
Rajeev Shah	Parsons	678-969-2481	Rajeev.Shah@parsons.com

Barrow County-GDOT Meeting Summary

November 19, 2009

TO: Meeting attendees (see attached list)

Record: Rajeev Shah, Parsons

SUBJECT: CSNHS-0008-00(429), (430) & (431), PI NO. 0008429, 0008430, 0008431, SR 316 Grade Separation at SR 81, SR 11, SR 53
Barrow County
Concept Review Meeting with Barrow County and GDOT

A review meeting was held on November 19, 2009 at the Barrow County Administration Building in Winder, Georgia. Project concept alternatives for grade separation of SR 316 at SR 81, SR 53, and SR 11 were presented during this meeting. A list of meeting attendees is attached to these meeting minutes.

Need and Purpose

The purpose of these projects is to improve safety, capacity and level of service of SR 316 @ SR 81, SR 11 and SR 53 through the grade separation of these intersections.

Notes below summarize the proceedings of the meeting.

SR 316 @ SR 81 Intersection

Seven concept alternatives were presented by Parsons as follows:

Alternative 1: Spread diamond interchange with ramp heads spaced at 1000 ft. This alternative would widen the existing SR 81 to 4-lane roadway with two lanes in each direction. The total right-of-way requirement would be 50.6 acres with 5 residential displacements. This alternative would impact proposed development in the northeast quadrant and also the existing commercial development in the southeast quadrant. The design year level of service would be E or better for this alternative and it would have moderate open water impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$25.8 Million.

Alternative 2: Partial clover leaf interchange with continuous flowing loops of 30 mph design speed. This alternative would also widen the existing SR 81 to 4-lane roadway with two lanes in each direction. The total right-of-way requirement would be 33.8 acres with 3 residential and 1 commercial displacements. This alternative accommodates proposed development in the northeast quadrant, but would impact the existing commercial development in the southeast

quadrant. The design year level of service would be E or better this alternative and it would have moderate open water impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$24.0 Million.

Alternative 3: Partial cloverleaf interchange with diamond ramps providing turn movements from SR 81 and two loop ramps with design speed of 35 mph. This alternative would also widen the existing SR 81 to 4-lane roadway with two lanes in each direction. The total right-of-way requirement would be 44.1 acres with 4 residential and 2 commercial displacements. This alternative accommodates proposed development in the northeast quadrant, but would impact the existing commercial development in the southeast quadrant. The design year level of service would be D or better for this alternative and it would have significant open water impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$27.4 Million.

Alternative 4: Combination of a diamond and partial clover leaf interchange with a loop ramp providing EB turn movements from SR 316. This alternative would also widen the existing SR 81 to 4-lane roadway with two lanes in each direction. The total right-of-way requirement would be 38.3 acres with 3 residential displacements. This alternative accommodates proposed development in the northeast quadrant, but would impact the existing commercial development in the southeast quadrant. The design year level of service would be E or better for this alternative and it would have significant open water impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$23.0 Million.

Alternative 5: Single Point Urban Interchange. This alternative would maintain the existing one lane in each direction on SR 81. The total right-of-way requirement would be 16 acres with 3 residential displacements. This alternative accommodates both proposed development in the northeast quadrant, and existing commercial development in the southeast quadrant. The design year level of service would be F with breakdown year being 2016 for this alternative and it would have minimal open water impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$15.2 Million.

Alternative 6: Compressed Diamond interchange with the ramp head spacing set at 750 feet. This alternative would maintain the existing one lane in each direction on SR 81. The total right-of-way requirement would be 46.1 acres with 3 residential displacements. This alternative accommodates both proposed development in the northeast quadrant, and existing commercial development in the southeast quadrant. The design year level of service would be F with breakdown year being 2017 for this alternative and it would have minimal open water impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$14.4 Million.

Alternative 7: Tight Urban Diamond interchange with the ramp head spacing set at 350 feet. This alternative would maintain the existing one lane in each direction on SR 81. The total right-of-

way requirement would be 19 acres with 3 residential displacements. This alternative accommodates both proposed development in the northeast quadrant, and existing commercial development in the southeast quadrant. The design year level of service would be F with breakdown year being 2017 for this alternative and it would have minimal open water impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$13.8 Million.

Of all the alternatives presented, Alternative 7 - Tight Urban Diamond interchange with the ramp head spacing set at 350 feet was recommended to be the preferred alternative owing to its lowest overall cost, least displacements, and minimal impacts to open water.

SR 316 @ SR 11 Intersection

Eight concept alternatives were presented by Parsons as follows:

Alternative 1: Spread diamond interchange with ramp heads spaced at 1000 ft. This alternative would widen the existing SR 11 to 4-lane roadway with two lanes in each direction. The total right-of-way requirement would be 29 acres with 2 residential and 1 commercial displacements. This alternative would impact the historic property of Betty Treadwell in the southeast quadrant. The design year level of service would be E or better for this alternative and it would have moderate wetland impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$22.6 Million.

Alternative 2: Partial cloverleaf interchange, where SB left turn from SR 11 is accommodated through the loop ramp in the SW quadrant. This alternative would also widen the existing SR 11 to 4-lane roadway with two lanes in each direction. The total right-of-way requirement would be 24 acres with 1 residential and 1 commercial displacement. This alternative has no impact on any historical property. The design year level of service would be E or better this alternative and would have moderate wetland impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$19.9 Million.

Alternative 3: Diamond interchange shifted northward to avoid impacts to the historic Betty Treadwell property. This alternative would also widen the existing SR 11 to 4-lane roadway with two lanes in each direction. The total right-of-way requirement would be 25 acres with 1 commercial displacement. This alternative has no impact on any historical property. The design year level of service would be E or better for this alternative and it would have moderate wetland impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$18.2 Million.

Alternative 4: SR 316 to be elevated over SR 11 with a diamond interchange design. This alternative would maintain the existing one lane in each direction on SR 11. The total right-of-way requirement would be 20 acres with 1 commercial displacement. This alternative has no impact on any historical property. The design year level of service would be F with 2021 being

the breakdown year for this alternative and it would have significant wetland impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$21.0 Million.

Alternative 5: SR 316 to be partially depressed & SR 11 to be partially elevated over SR 316 with a diamond interchange design. This alternative would maintain the existing one lane in each direction on SR 11. The total right-of-way requirement would be 20 acres with 1 commercial displacement. This alternative has no impact on any historical property. The design year level of service would be F with breakdown year being 2021 for this alternative and it would have significant wetland impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$22.0 Million.

Alternative 6: SR 11 to be elevated over SR 316 with a compressed diamond interchange design and ramp head spacing set at 700 feet. This alternative would maintain the existing one lane in each direction on SR 11. The total right-of-way requirement would be 25 acres with 1 commercial displacement. This alternative has no impact on any historical property. The design year level of service would be F with breakdown year being 2021 for this alternative and would have minimal wetland impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$19.1 Million.

Alternative 7: Single Point Urban Interchange (SPUI). This alternative would maintain the existing one lane in each direction on SR 11. The total right-of-way requirement would be 17.5 acres with 1 commercial displacement. This alternative has no impact on any historical property. The design year level of service would be F with breakdown year being 2029 for this alternative and would have minimal open water impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$18.9 Million.

Alternative 8: SR 11 to be elevated over SR 316 with a Tight Urban Diamond Interchange (TUDI) and ramp head spacing set at 350 feet. This alternative would maintain the existing one lane in each direction on SR 11. The total right-of-way requirement would be 15 acres with 3 residential displacements. This alternative has no impact on any historical property. The design year level of service would be F with breakdown year being 2023 for this alternative and would have minimal open water impact. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$15.6 Million.

Off all eight alternatives presented, Alternative 8 - Tight Urban Diamond interchange with the ramp head spacing set at 350 feet was recommended to be the preferred alternative owing to its lowest overall cost, least displacements, and minimal wetland impacts.

SR 316 @ SR 53 Intersection

Five concept alternatives were presented by Parsons as follows:

Alternative 1: Spread diamond interchange with ramp heads spaced at 1000 ft. This alternative would widen the existing SR 53 to 4-lane roadway with two lanes in each direction. The total right-of-way requirement would be 14 acres with 1 commercial displacement. This alternative has impact to Athen's Lumber (formerly Plymart) property. The design year level of service would be B or better for this alternative. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$30.8 Million.

Alternative 2: Combination of diamond and cloverleaf interchange. This alternative would also widen the existing SR 53 to 4-lane roadway with two lanes in each direction. The total right-of-way requirement would be 10 acres with 4 residential displacements. This alternative has no impact to Athen's Lumber (formerly Plymart) property. The design year level of service would be B or better this alternative. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$18.2 Million.

Alternative 3: Combination of diamond and cloverleaf interchange with a radial exit ramp in the SW quadrant for the EB right-turns. This alternative would also widen the existing SR 53 to 4-lane roadway with two lanes in each direction. The total right-of-way requirement would be 12 acres with 4 residential displacements. This alternative has no impact to Athen's Lumber (formerly Plymart) property. The design year level of service would be B or better for this alternative. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$18.3 Million.

Alternative 4: Single Point Urban Interchange. This alternative would maintain the existing one lane in each direction on SR 53. The total right-of-way requirement would be 9 acres with no displacements. This alternative has no impact to Athen's Lumber (formerly Plymart) property. The design year level of service would be D or better for this alternative. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$13.6 Million.

Alternative 5: Compressed Diamond interchange with ramp heads spaced at 500-ft. This alternative would maintain the existing one lane in each direction on SR 53. The total right-of-way requirement would be 12 acres with no displacements. This alternative has no impact to Athen's Lumber (formerly Plymart) property. The design year level of service would be C or better for this alternative. The overall cost including both right-of-way and construction cost for this alternative would be approximately \$12.2 Million.

Off all five alternatives presented, Alternative 5 - Compressed Diamond interchange with ramp heads spaced at 500-ft was recommended to be the preferred alternative owing to its lowest overall cost and least displacements.

Comments

- At SR 316 @ SR 81 grade separation, Barrow County had some apprehension about the proposed Chick-Fil-A restaurant in the northeast quadrant and whether adequate access would be provided to it off of SR 81. Based on the preferred alternative at SR81 and the minimum limit of access from the WB Ramps, a right-in right-out access off SR 81 can be provided. A full access may be provided from the proposed realignment of access road of the proposed northeast development.
- Barrow County inquired about plans to convert the existing SR 316 to a limited access highway and whether it would be a toll road. GDOT mentioned that conceptual layout plans have been developed, however this project is in long range. Regarding it being a toll road, GDOT mentioned that most recently the Department has made a policy of levying tolls on new lanes.
- Barrow County also inquired about time period when the grade separation projects would be constructed. GDOT mentioned that these projects are in the department's long range plan.

Action Items

- GDOT would make a request to schedule and hold PIOH in January 2009.

Meeting Attendees:

Name	Organization	Phone	Email
Neal O'Brien	GDOT – Urban Design	404-631-1725	nobrien@dot.ga.gov
Robert W. Mahoney	GDOT – District 1 Preconstruction	770-532-5520	rmahoney@dot.ga.gov
Daniel Yearwood Jr.	Barrow County	770-867-6551	dyearwood@barrowga.org
Darrell Greeson	Barrow County	770-867-0664	dgreeson@barrowga.org
Xuejun Fan	Parsons	678-969-2304	Xuejun.Fan@parsons.com
Sajid Iqbal	Parsons	678-969-2368	Sajid.Iqbal@parsons.com
Rajeev Shah	Parsons	678-969-2481	Rajeev.Shah@parsons.com

PARSONS

5390 Triangle Parkway • Suite 100 • Norcross, Georgia 30092 • (770) 446-4900 • Fax: (770) 446-4910

**GRADE SEPARATION OF SR 316 @ SR 81, SR 11 & SR 53,
BARROW COUNTY**

Sign In Sheet
BARROW COUNTY- GDOT Meeting
Date: 11-19-2009 Time: 10:30 am

Name	Organization	E-mail	Telephone
Daniel Verrardo Jr.	BDC	dverardo@barrowga.org	770-867-6551
DARRELL GREESON	BARROW CO.	dgreeson@barrowga.org	770-867-0664
ROBERT W. MANNING	GDOT - DA GREESON ENG	RMANNING@DOT.GA.GOV	770-590-5500
Neal O'Brien	GDOT - Roadway Design	nobrien@dot.ga.gov	
S. SAJID IQBAL	PARSONS	SAJID.IQBAL@PARSONS.COM	678-969-2368
RAJEEV SHAH	PARSONS	RAJEEV.SHAH@PARSONS.COM	697-969-2481
XUEJUN FAN	PARSONS	XUEJUN.FAN@PARSONS.COM	678-969-2322

O'Brien, Neal

From: Danny Yearwood [dyearwood@barrowga.org]
Sent: Thursday, December 08, 2011 9:22 AM
To: Kirby, Brandon
Subject: RE: 0008429, 0008430, 0008431, Interchange lighting

Yes I understand I will get with provider when time comes see about cost.

From: Kirby, Brandon [mailto:bkirby@dot.ga.gov]
Sent: Thursday, December 08, 2011 8:22 AM
To: Danny Yearwood
Subject: 0008429, 0008430, 0008431, Interchange lighting

Commissioner Yearwood,

As we recently discussed on the phone, you indicated Barrow County is interested in roadway lighting at the interchanges on SR 316 at SR 11, SR 81, and SR 53. The Department will need to conduct a warrant study in order to validate the feasibility of lighting. In order to schedule this study, the Department will need confirmation from you that Barrow County understands the County will be responsible for all maintenance and operational costs from installation forward.

Should the lighting be added to the projects, the Department will prepare a lighting agreement to be executed by the County.

Please respond to this email for confirmation.

Thanks,

Brandon Kirby, P.E.
Project Manager
678.343.0816



January 9, 2012

Daniel Yearwood, Jr., Chairman
Barrow County Board of Commissioners
233 East Broad Street
Winder, GA 30680

RE: *Lighting required for 3 grade-separated interchanges;
GDOT Projects CSNHS-0008-00(429)(430)(431); Barrow County;
P.I. No's. 0008429/0008430/00008431*

Dear Mr. Yearwood,

The above referenced projects are now approaching Preliminary Plans stage of GDOT's Plan Development Process. The Project Concept Reports have been submitted. For these projects, the warranting conditions for interchange lighting -- based on the Illuminating Engineering Society of North America (IESNA) and American Association of State Highway and Transportation Officials (AASHTO) guidelines -- have been met.

At this time, the Department is requesting a written commitment from the County. This commitment should state that the County is willing to share in the costs of the Lighting by funding the Energy, Operation and Maintenance of the installed Lighting systems. The Department's responsibility shall be the design and construction costs, including all materials. Currently, the Department estimates the monthly cost to power each interchange to be approximately \$2,000/month per interchange.

If Barrow County agrees to share in the costs for the installed Lighting systems, please reply to Scott MacLean, Office of Design Policy & Support, within the next 30 days. If the Department does not receive a written response, it will be assumed that the County cannot fund or participate in the energy, operation and maintenance costs of the installed Lighting systems. In the event that Barrow County does not commit to funding the energy, operation and maintenance of the installed Lighting systems, the Department may elect to change the scope of the project and/or suspend development of the Preliminary Plans.

Thank you for your cooperation. Should you have any questions or need any additional assistance, please contact Scott MacLean at (404) 631-1551.

Sincerely,

A handwritten signature in blue ink that reads "Brent A. Story".

Brent A. Story, P.E.
State Design Policy Engineer

BAS:BRE:sm

cc: Rudy Bowen, Transportation Board Member, Congressional District 7
Todd McDuffie, District Engineer
Russell McMurry, Director of Preconstruction



Barrow County Board of Commissioners

233 East Broad Street Winder Georgia 30680 Phone: (770) 307-3010 Fax: (770) 307-3141

Daniel Yearwood, Jr.
Chairman

Larry Joe Wilburn
District 1

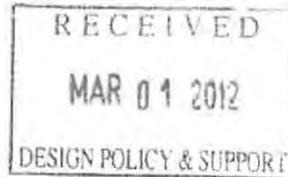
Eva S. Elder
District 2

Steve Worley
District 3

Isaiah Berry
District 4

Billy E. Parks
District 5

Ben Hendrix
District 6



February 29, 2012

Scott MacLean
Office of Design Policy & Support
Georgia Department of Transportation
One Georgia Center
600 West Peachtree Street, NW
Atlanta, Georgia 30308

RE: Lighting required for 3 grade-separated interchanges;
GDOT Projects CSNHS-0008-00 (429) (430) (431); Barrow County;
P.I. No's. 008429/008430/0008431

Dear Mr. MacLean,

I'm sorry to inform you that the Board of Commissioners voted not to fund or participate in the energy, operation and maintenance costs of the installed lighting systems.

Should you have any questions please feel free to contact me.

Sincerely,

Daniel Yearwood, Jr.
Chairman

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

DATE March 8, 2012

FROM ^{BAS} Brent A. Story, P.E., State Design Policy & Support Engineer
TO Russell R. McMurry, P.E., Division Director of Engineering
SUBJECT Interchange Lighting ~ P.I. No.'s 0008429, 0008430 and 0008431

In Reference to:

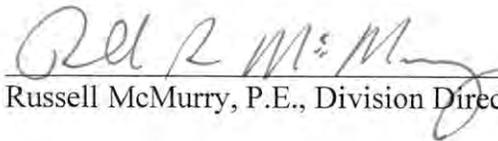
*CSNHS-0008-00(429) Barrow County P.I. No. 0008429 (SR 316 @ SR 81)
CSNHS-0008-00(430) Barrow County P.I. No. 0008430 (SR 316 @ SR 11)
CSNHS-0008-00(431) Barrow County P.I. No. 0008431 (SR 316 @ SR 53)*

On January 9, 2012 the Department sent a letter to Barrow County requesting a written commitment to share in the costs for interchange Lighting at 3 locations along SR 316. In this letter, the Department informed the County that the warranting conditions – based on IESNA and AASHTO guidelines – were met.

In a reply letter dated Feb. 29, 2012 (attached), the Barrow County Board of Commissioners voted *not* to fund or participate in the costs of interchange Lighting for P.I. No.'s 0008429, 0008430 and 0008431.

Given that Barrow County is unable to fund the energy, operation and maintenance costs of the Lighting systems, the Office of Design Policy & Support recommends that interchange lighting be omitted from the projects at this time.

CONCUR:



Russell McMurry, P.E., Division Director of Engineering

BAS:JSS:SAM
attachment

ATTACHMENT 11
PIOH SYNOPSIS



August 12, 2010

Alan Ashley
369 Ashton Way
Winder, Georgia 30680

Re: Projects CSNHS-0008-00(429), (430), and (431); Barrow County - P.I. Nos. 0008429, 0008430, and 0008431 – The proposed projects would construct grade separated interchanges at the existing at-grade intersections of SR 316 with SR 81, SR 11, and SR 53.

Dear Alan Ashley,

Thank you for your comments concerning the proposed projects referenced above. We appreciate all of the input that was received as a result of the February 4, 2010 Public Information Open House (PIOH), and every comment will be made part of the official project records. On behalf of the Georgia Department of Transportation (GDOT), please accept our sincere apologies for the delay in sending this response.

A total of 149 people attended the PIOH. Of the comments we received regarding Project CSNHS-0008-00(429), SR 316 at SR 81, 36 were in support of the project, 3 were opposed to the project, 5 were uncommitted, and 4 expressed conditional support for the project. Of the comments we received regarding Project CSNHS-0008-00(430), SR 316 at SR 11, 29 were in support of the project, one was opposed to the project, three were uncommitted, and three expressed conditional support for the project. Of the comments we received regarding Project CSNHS-0008-00(431), SR 316 at SR 53, 26 were in support of the project, five were opposed to the project, five were uncommitted, and three expressed conditional support for the project.

The attendees of the PIOH and those persons sending in comments afterwards raised the following questions and concerns. Georgia DOT has prepared this one response letter that addresses all comments received so that everyone can be aware of the concerns raised and the responses given. Please find the comments summarized below (*in italics*) followed by our response.

Several comments were received that were either straightforward support or non-support for the projects. We appreciate all comments since these projects will ultimately be funded with taxpayer money. The support and non-support comments help us to prioritize projects and make changes as needed.

Project CSNHS-0008-00(429), SR 316 at SR 81, P.I. No. 0008429

- 1. The overpass needs to be built wider to accommodate north-south traffic on SR 81. It would be cheaper now instead of later.*
- 2. SR 81 needs to be four lanes between SR 316 and Carl Bethlehem Road.*
- 3. Make SR 81 five lanes with two turning lanes on each side of the SR 316 intersection.*

4. *Make SR 81 five lanes with a turn lane in the middle from Carter Hill Christian Church across SR 316 to Carl Bramlett Road then let people merge. This will get more people through the intersection.*
5. *SR 81 north of SR 316 into Winder needs to be four lanes for big truck traffic on the truck route.*

At this time, GDOT proposes to design a four-lane bridge over SR 316 providing one through lane plus left-turn lanes in each direction. The proposed improvement is expected to operate at an acceptable level of service (LOS). The need to widen SR 81 will need to be determined under a separate project. The proposed bridge for this project can be widened in the future when SR 81 is widened.

6. *Improvements are needed at Punkin Junction Road for easier access to SR 81 such as a traffic signal, straightening the road, and adding turn lanes.*
7. *Close the intersection of Punkin Junction Road and SR 81.*

While this intersection is within in the project limits, it is not included in the scope of the current project to reconfigure this intersection. As design progresses, GDOT will review the need to make improvements to the intersection.

8. *Better access is needed to the Chic-Fil-A.*

Access is provided via Exchange Boulevard. Access will be limited from the ramp to Exchange Boulevard, with no driveways permitted in this area.

9. *Improvements and turn lanes are needed at Carter Hill Drive. Widen Carter Hill Church Road for access onto SR 81.*

The intersection of Carter Hill Drive is within the project limit but it is not included in the scope of the current project. Carter Hill Church Road is outside the limit of this project.

10. *Upgrade the lighting. There is no lighting on SR 316 and SR 81.*

The design development is conceptual at this time. Georgia DOT will evaluate the need and incorporate lighting into the project if warranted. Any aesthetic lighting installed would be operated and maintained by Barrow County via formal Lighting Agreement. When funding is made available for the project, GDOT along with Barrow County will consider the possibility of adding lighting.

11. *The property owner would like DOT to purchase the property.*

Land acquisition for transportation purposes is strictly governed by numerous state and federal laws and regulations. Since it is not appropriate to discuss individual impacts and compensation in this format, GDOT's right-of-way office will send out letters under separate cover to those property owners who would be affected by land acquisition for the proposed project. For additional information, please contact Troy Byers at (404) 347-0176.

12. The proposed interchange will eliminate access to parcels. The plans incorrectly identify the ownership of the parcels. The plans diminish the marketability of the property.

The proposed interchange responds to the need to improve operations by limiting access at the interchange. The plans will be corrected to reflect the current owner. Additionally, as mentioned above, land acquisition for transportation purposes is strictly governed by numerous state and federal laws and regulations.

13. Left-turn arrows are needed from SR 81 onto SR 316.

14. Turn lanes and a turn light to get onto SR 316 are needed now.

15. The traffic trying to cross SR 316 at SR 81 is increasing phenomenally. At certain times of the day, cars have to sit through five light cycles.

The grade-separated interchange is being evaluated as a long-term solution to congestion at this intersection. This comment has been forwarded to Todd McDuffie, the GDOT District 1 Engineer. If there are questions about other projects, please contact Todd McDuffie at (770) 532-5526.

16. Traffic is already ridiculous, and the project is just going to make matters worse.

There will be impacts to traffic during construction, but once construction is complete the proposed project would grade separate the existing at-grade intersection and improve traffic flow.

17. Construct the project soon, this project is overdue. This needs to be started before the area gets too developed to keep costs down. The shopping center will increase traffic.

The schedule for the right-of-way acquisition and construction phases is dependent upon available funding. Funding has not been identified to begin right-of-way acquisition or construction for this project. Georgia DOT is developing the project concept design so that the project may advance to the right-of-way acquisition phase when funding is identified. The planning process for project development and prioritization takes anticipated traffic levels associated with existing and planned development into consideration.

18. Funding needs to be identified. Consider a penny sales tax SPLOST option like the Sugarloaf Extension in Gwinnett County. Ask for money from the government.

As mentioned above, funding has not been identified to begin right-of-way acquisition or construction for this project. The development of a Special Purpose Local Option Sales Tax, or SPLOST, is at the discretion of the Barrow County Government and voters. You may forward your request to the Barrow County Government. You may contact the county government directly by calling (770) 307-3000.

19. This intersection needs improved first before SR 11 or SR 53.

20. Constructing the SR 81 interchange could help bring in more tax revenue to help complete the other interchanges.

Part of the purpose of this project is to support state and regional economic development goals. However, the use of tax revenue from any future development at the proposed interchange has not been identified as a source of funding for the construction of other transportation projects. It is anticipated that the funding for improvements at this intersection as

well as improvements to the SR 316 intersections with SR 11 and SR 53 would be funded by 80 percent federal motor fuel tax funds and 20 percent state motor fuel tax funds.

21. *All at-grade intersections with SR 316 should be closed or reconstructed as grade separated interchanges.*
22. *Building a good road between Atlanta and Athens needs to be a top DOT priority, especially with the growth at the University and the medical school moving from Augusta to Athens.*

The purpose of this project is to address the intersection of SR 316 and SR 81. This is part of the plan to improve SR 316 from I-85 to Athens.

23. *Put proposals online first to view prior to meeting.*

The project displays were posted on the GDOT website the day of the PIOH. The displays are still available for review via the website at www.dot.ga.gov. You may access the displays by clicking **Public Outreach** from the **Information Center** dropdown menu at the top right side of the page.

24. *The proposed project damages cultural/historical resources.*

In compliance with Section 106 of the National Historic Preservation Act, the project was surveyed for archaeological and historic structural resources that may be affected by the proposed project. The State Historic Preservation Office concurred that this project would not affect any archaeological or historic structural resources eligible for the National Register of Historic Places. These findings will be reevaluated as the project design develops.

25. *I am directly affected by this project, but I received no notice of this project. Even people vaguely affected by zoning projects receive better notice than this.*

Notification of the PIOH was provided by advertisements in the local newspaper and by signs posted in the project vicinity. This project is conceptual in development. When the project advances to the right-of-way phase, individual property owners directly affected by the project will be contacted by GDOT right-of-way agents to discuss the project and the potential impacts.

Project CSNHS-0008-00(430), SR 316 at SR 11, P.I. No. 0008430

1. *The project looks like it would alleviate a lot of the traffic back-ups experienced every day.*

The purpose of the project is to improve operations and safety at the intersection of SR 316 and SR 11. The project is anticipated to alleviate congestion by improving traffic flow through the intersection.

2. *The overpass needs to be built wider to accommodate north-south traffic that is surely going to get heavier as the years go by. It would be cheaper now instead of later.*
3. *Need five lanes, two through lanes and a turn lane to past Gifton Thomas Road.*

At this time, GDOT proposes to design a four-lane bridge over SR 316 providing one through lane plus left-turn lanes in each direction. The proposed improvement is expected to operate at an acceptable level of service (LOS). The need to

widen SR 11 will be determined under a separate project. The proposed bridge for this project can be widened in the future when SR 11 is widened.

4. *There is a drop-off on the right going north before you get to the church that is a hazard to cars pulling off on the shoulder.*

This comment has been forwarded to Todd McDuffie, the GDOT District 1 Engineer. If there are questions about other projects in the area, please contact Todd McDuffie at (770) 532-5526.

5. *SR 316 should have two left-turn lanes.*

The project scope is to improve traffic operations and safety by grade separating the intersection of SR 316 at SR 11 and SR 316 acting as a limited access arterial with free flow traffic. At-grade improvements of the intersection will not satisfy the design year traffic.

6. *Have land that would like to sell DOT.*

As discussed above, land acquisition for transportation purposes is strictly governed by numerous state and federal laws and regulations. Since it is not appropriate to discuss individual impacts and compensation in this format, GDOT's right-of-way office will send out letters under separate cover to those property owners who would be affected by land acquisition for the proposed project. For additional information, please contact Troy Byers at (404) 347-0176.

7. *The time schedule is what is important – get roads established before development.*

8. *Construct the project soon, this project is overdue.*

9. *Funding needs to be identified.*

The planning process for project development and prioritization takes anticipated traffic levels associated with existing and planned development into consideration. However, the schedule for the right-of-way acquisition and construction phases is dependent upon available funding. Funding has not been identified to begin right-of-way acquisition or construction for this project. Georgia DOT is developing the project concept design so that the project may advance to the right-of-way acquisition phase when funding is identified.

10. *All at-grade intersections with SR 316 should be closed or reconstructed as grade separated interchanges. An interchange is needed at Highway 20.*

11. *Building a good road between Atlanta and Athens needs to be a top DOT priority, especially with the growth at the University and the medical school moving from Augusta to Athens.*

The purpose of this project is to address the intersection of SR 316 and SR 11. This is part of the plan to improve SR 316 from I-85 to Athens.

Project CSNHS-0008-00(431), SR 316 at SR 53, P.I. No. 0008431

1. *SR 53 should tunnel under SR 316 at the bottom of the hill rather than building a bridge.*

Creating an underpass under SR 316 will pose difficulty in maintaining access to the heavy traffic on SR 316 during proposed construction. Additionally, there will be a considerable increase in the construction cost due to extensive drainage requirements and increased scope of work on both SR 316 and SR 53. At this time, GDOT does not consider this alternative feasible.

2. *The overpass needs to be built to accommodate future north-south traffic and traffic for the proposed conference center. It would be cheaper now instead of later.*

The current design of a four-lane bridge over SR 316 providing one through lane plus left-turn lanes in each direction is expected to accommodate 2032 design year traffic (based on GDOT's projected traffic counts out to the year 2032).

3. *Make this five lanes through the intersection, kill the right-turn lane out, put two turn lanes and a median.*

The project scope is to improve traffic operations and safety by grade separating the intersection of SR 316 at SR 53. At grade improvements of the intersection will not satisfy the 2032 design year traffic.

4. *This project is not needed as much as the interchanges at SR 81 and SR 11.*

5. *There is not enough traffic there now to support all of the construction inconvenience.*

The need to improve safety and operations has been identified based on crash data and projected traffic volumes.

6. *Funding needs to be identified. How will this project be paid for?*

Funding has not been identified to begin right-of-way acquisition or construction for this project. Typically, roadway projects that are on the state system are funded 80 percent by federal motor fuel tax funds and 20 percent state motor fuel tax funds. Georgia DOT will continue to search for ways to fund this project.

7. *Other intersection improvements are needed at SR 211 and at Barber Creek Road.*

The improvements associated with this proposed project are limited to the vicinity of the intersection and are not designed to address improvements needed outside of the immediate project area. However, this comment has been forwarded to Todd McDuffie, GDOT District 1 Engineer. If there are questions about other projects, please contact Todd McDuffie at (770) 532-5526. Information about other GDOT projects is also available on the GDOT website at www.dot.ga.gov. The link to **TransPi** in the lower right corner allows searches for information on projects.

8. *Construct the project soon.*
9. *All at-grade intersections with SR 316 should be closed or reconstructed as grade separated interchanges.*
10. *Building a good road between Atlanta and Athens needs to be a top DOT priority, especially with the growth at the University and the medical school moving from Augusta to Athens.*

The purpose of this project is to address the intersection of SR 316 and SR 53. This is part of the plan to improve SR 316 from I-85 to Athens.

11. *Georgia consistently underestimates traffic, perhaps because no highways can handle present traffic making it hard to predict future traffic if improvements are made. Transportation is the basis of civilizations – the Atlanta area is stagnated because highway systems are 50 years behind the need.*

The proposed project is being designed to accommodate the predicted traffic volumes at acceptable Level of Service for a minimum of 20 years after completion of the project. Future traffic volumes at the intersection were predicted using traffic models that incorporated past growth rates and planned development in the area.

Comments that were repeated for all projects: Projects CSNHS-0008-00(429), CSNHS-0008-00(430), CSNHS-0008-00(431)

1. *Please use maximum sediment and erosion control measures to avoid adding additional sediment to streams and wetlands in the area. Please rework elevation so that the detention basin structure isn't an eyesore. If the goal for that area is to detain runoff, then a working wetland would be more beneficial.*

Collection, conveyance, and discharge of stormwater falling within or travelling through the limits of the project will be designed in accordance with state and federal rules and regulations. Erosion, Sedimentation, and Pollution Control plans will be designed in accordance to the Best Management Practices stipulated in the Stormwater Discharge Permit issued by the Georgia Environmental Protection Division.

2. *Multi-lane roundabouts would solve the problems at much less cost.*

The grade-separated interchange is being evaluated as a long-term solution to congestion at this intersection. Roundabouts are typically better for lower volume intersections. A roundabout at this location would not sufficiently accommodate the traffic in the design year.

3. *Put money toward beautification and landscape the land surrounding the ramps and bridges.*

The design development is conceptual at this time. The areas around the proposed ramps and bridges in the project have the potential for various landscaping options, but the options must comply with federal and state policies regarding safety. Any landscaping installed by the project would be maintained by Barrow County via formal Landscaping Maintenance Agreement. When funding is made available for the project, GDOT along with Barrow County will consider the possibility of adding landscaping.

August 12, 2010

Page 8 of 8

4. *The state has already picked what they want and not what the tax payers want. To me, we waste a lot of money.*

The project development is still in the conceptual phase. The purpose of the PIOH was to alert the public to the project development and to gather information from concerned citizens. All comments received as a result of the PIOH become part of the project record that is reviewed as part of the environmental decision-making process. Final decisions have not been made concerning the project's conceptual design or funding, and all comments are extremely important in making the final decisions. The comments related to the project design are further taken into consideration in the more detailed project design phase which occurs later in the process.

5. *Please stage the three projects; don't try to do them all at the same time.*

Georgia DOT will evaluate the scheduling and construction staging of these three projects in order to reduce impacts to the community.

Thank you again for your comments. Should you have any further questions concerning this project, please call the GDOT project manager Neal O'Brien at (404) 631-1725 or Laura B. Rish of the Office of Environmental Services at (404) 631-1415.

Sincerely,



Glenn Bowman, P.E.
State Environmental Administrator

GB/LBR/jeb

cc: Neal O'Brien, Georgia DOT Project Manager
Todd McDuffie, Georgia DOT District One Engineer
Todd Long, Georgia DOT Transportation Planning Director

ATTACHMENT 12
FHWA COMMENTS – CONCEPT REPORT

Shah, Rajeev

From: O'Brien, Neal [nobrien@dot.ga.gov]
Sent: Tuesday, August 24, 2010 3:47 PM
To: Iqbal, Sajid; Shah, Rajeev
Subject: FW: CSNHS-0008-00(429), CSNHS-0008-00(430),CSNHS-0008-00(431), PI , 0008429, 0008430, 0008431 Barrow County

FHWA provided the following comments on the draft concept report.

Neal O'Brien

Design Engineer Group Manager

Roadway Design

600 West Peachtree St.

27th Floor

Atlanta, GA 30308

Phone: 404-631-1725

Fax: 404-631-1947

From: Kelly.Wade@dot.gov [mailto:Kelly.Wade@dot.gov]

Sent: Tuesday, August 24, 2010 3:44 PM

To: O'Brien, Neal

Cc: Kendra.Bunker@dot.gov

Subject: CSNHS-0008-00(429), CSNHS-0008-00(430),CSNHS-0008-00(431), PI , 0008429, 0008430, 0008431 Barrow County

Hi Neal,

Kendra and I have reviewed the concept reports for the SR 316 Grade separation projects in Barrow County and we have the following comments:

CSNHS-0008-00(429), PI 0008429:

1. Page 3 – Barrow County is nonattainment for PM 2.5.
2. It is unclear why 2012 is used as the base year and 2032 is the design year , when based on my review of ARC's TIP/LRTP (processed 6/4/2010) ROW and construction dollars are in Long Range (2021-2030). The TIP/LRTP show 2030 as the open year. We expect the documents to be consistent.
3. Because the project as proposed would begin to operate at an unacceptable LOS fairly quickly (2018), it was my understanding that the department was going to make a case that this is much needed safety project. Page 3 and attachment 4, page 5 both discuss operational improvements first as if it is the primary purpose. I remember when FHWA and GDOT met (2/2010) on these projects there was discussion of modifying the purpose and need to clearly show the safety benefits of the project. I believe we discussed driver expectancy and you explained that these are first series of at grade intersections on the way to Athens?

4. In our 2/13/2008 meeting I asked GDOT to determine if the ramps from SR 316 to SR 81 would back up due to the reduction of the SR 81 typical section. If the ramps do not have sufficient storage, there could be additional safety concerns as well as operational issues.
5. Attachment 4- Table 1 – It is unclear why 2007 ‘existing’ is given, this should be updated.
6. Attachment 4, Table 2 and 3 – Please provide build and no build data.
7. Please include a discussion on how the project will alleviate the types of crashes shown in the crash history.
8. Include LOS for the ramps.
9. Include a more detailed explanation of why one of the alternatives that would not fail before the design year was not selected.

CSNHS-0008-00(430), PI 0008430

1. Page 3 – Barrow County is nonattainment for PM 2.5.
2. It is unclear why 2012 is used as the base year and 2032 is the design year , when based on my review of ARC’s TIP/LRTP (processed 6/4/2010) ROW and construction dollars are in Long Range (2021-2030). The TIP/LRTP show 2030 as the open year. We expect the documents to be consistent.
3. Because the project as proposed would begin to operate at an unacceptable LOS fairly quickly (2022) please add some additional information to the purpose and need to clearly show the safety benefits of the project.
4. Attachment 4- Table 1 – It is unclear why 2007 ‘existing’ is given, this should be updated.
5. Attachment 4, Table 2 and 3 – Please provide build and no build data.
6. Please include a discussion on how the project will alleviate the types of crashes shown in the crash history.
7. Include LOS for the ramps.
8. Include a more detailed explanation of why one of the alternatives that would not fail before the design year was not selected.

CSNHS-0008-00(431), PI 0008431

1. Page 3 – Barrow County is nonattainment for PM 2.5.
2. It is unclear why 2012 is used as the base year and 2032 is the design year , when based on my review of ARC’s TIP/LRTP (processed 6/4/2010) ROW and construction dollars are in Long Range (2021-2030). The TIP/LRTP show 2030 as the open year. We expect the documents to be consistent.
3. Attachment 4- Table 1 – It is unclear why 2007 ‘existing’ is given, this should be updated.

4. Attachment 4, Table 2 and 3 – Please provide build and no-build data.
5. Add some additional information on the safety aspect of the project.
6. Please include a discussion on how the project will alleviate the types of crashes shown in the crash history.
7. Include LOS for the ramps.
8. Include a more detailed explanation of why one of the alternatives that would not fail before the design year was not selected.

Kelly Wade

Environmental Specialist

Federal Highway Administration

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Atlanta, GA 30303

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Kelly.Wade@fhwa.dot.gov

ATTACHMENT 13
BENEFIT COST ANALYSIS

Benefit/Cost Analysis Report

Projects

- **PI 0008429 – SR 316 @ SR 81**
- **PI 0008430 – SR 316 @ SR 11**
- **PI 0008431 – SR 316 @ SR 53**

Barrow County, Georgia

Prepared for:



Prepared by:

JACOBS™

March 2011

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Appendix A: CORSIM Output

1. Introduction

The purpose of this report is to calculate the Benefit Cost (B/C) ratio for three interchange projects in Barrow County, Georgia. This report provides a description of each project, the analysis methodology used to prepare the Benefit Cost analysis, and the results of the Benefit Cost analysis.

2. Projects Analyzed

2.1 PI 0008429 – SR 316 @ SR 81

Project Description

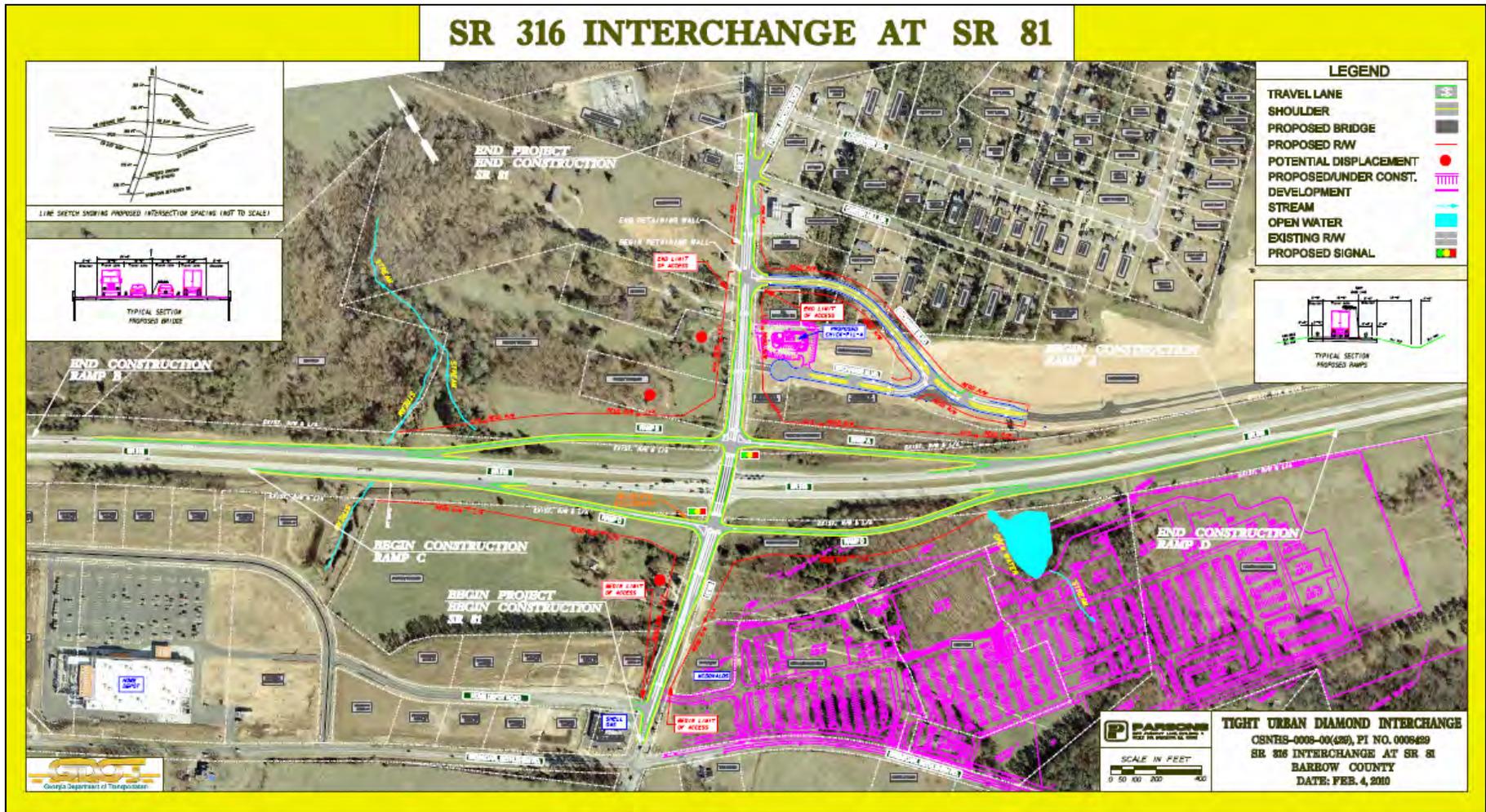
The proposed project is located in Congressional District 7 and approximately 4.00 miles southwest of downtown Winder, Georgia in Barrow County. This project involves the grade separation of existing at-grade intersection of SR 316 and SR 81. The proposed grade separation will include provision of a full interchange providing access to and from SR 316 to the cross road of SR 81. This interchange would be designed to accommodate the future widening of SR 316. Figure 1 presents a layout of the proposed project.

Project CSNHS-0008-00(429) would construct a tight urban diamond interchange at the existing at-grade signalized intersection of SR 316 and SR 81. Proposed ramp heads will be spaced 350 ft apart. Improvements to SR 81 will begin at mile point 1.01 approximately 0.22 miles south of the existing SR 316/SR 81 intersection and continue northerly along SR 81 to mile point 1.55 for a total length of 0.54 miles approximately. Similarly, improvements to SR 316 will begin at mile point 3.58 and continue eastward along SR 316 to mile point 4.63 for a total length 1.05 miles approximately. SR 81 will taper down to a two-lane section to match existing typical section at project terminals. In order to accommodate the 2032 design year traffic the bridge carrying SR 81 over SR 316 would require a six lane bridge with two through lanes in each direction plus two left turn lanes. However, based on the immediate need to address serious safety deficiency as noted in the Need and Purpose, the Department proposes to design a four-lane bridge carrying SR 81 providing one through lane in each direction plus left turn lanes. This project will address the immediate safety needs and improve operations of the intersection of SR 316 @ SR 81.

Need and Purpose

The project need is for safety and operational improvements to intersection of SR 316 @ SR 81. This is based on analysis of crash data for year 2006 through year 2008 and base year (2012) and design year (2032) evaluation of traffic. The purpose of this project is to reduce crash frequency and severity, and improve traffic operations by grade separating the intersection of SR 316 and SR 81. This project will also support the state and regional economic development goals by improving safety and traffic operations

Figure 1: PI 0008429 – SR 316 @ SR 81 Interchange Layout



2.2 PI 0008430 – SR 316 @ SR 11

Project Description

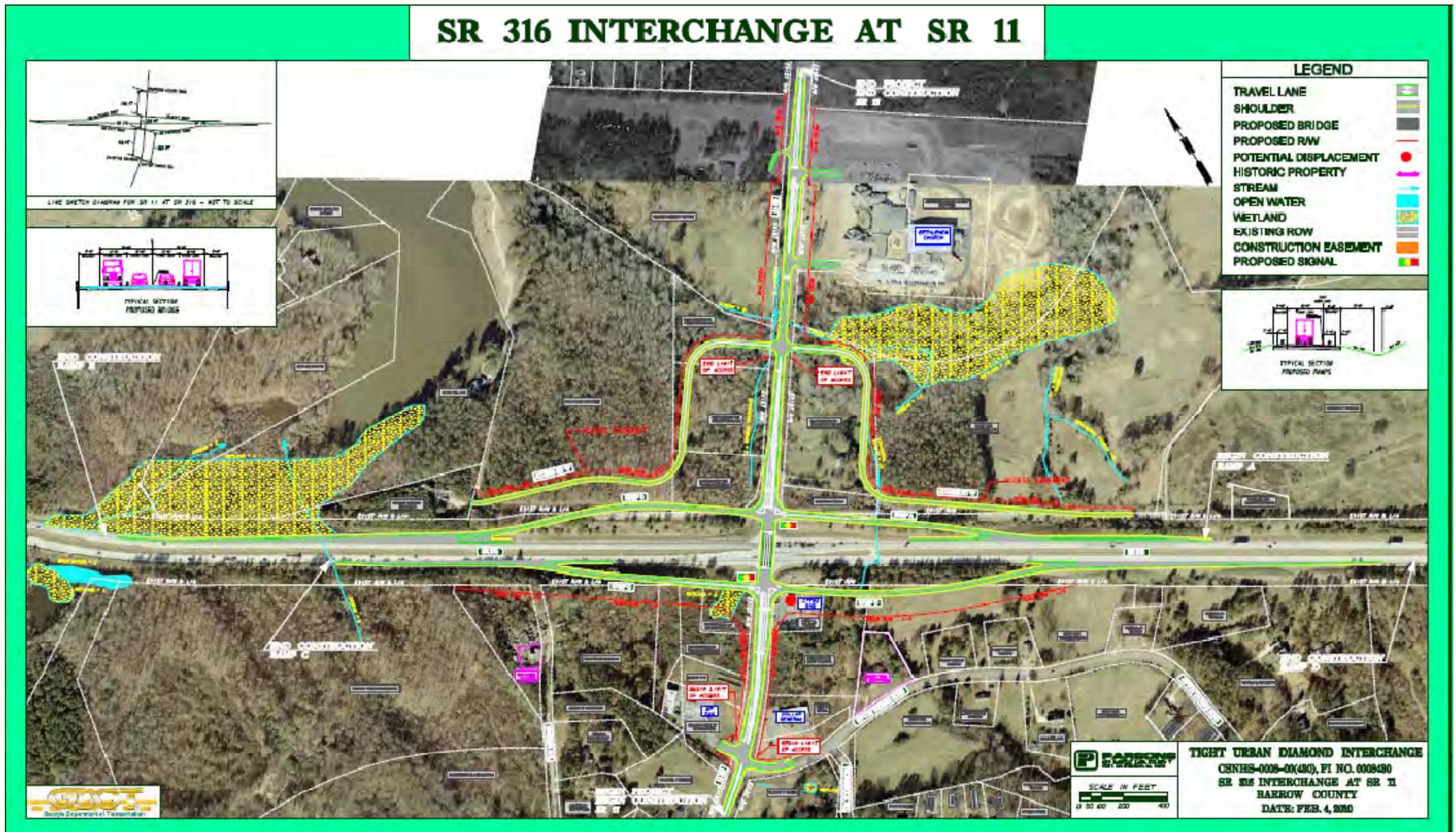
The proposed project is located in Congressional District 7 and approximately 4.00 miles south of downtown Winder, Georgia in Barrow County. This project involves the grade separation of existing at-grade intersection of SR 316 and SR 11. The proposed grade separation will include provision of full interchange providing access to and from SR 316 to SR 11. Interchange will be designed to accommodate the future widening of SR 316.

Project CSNHS-0008-00(430) would construct a tight urban diamond interchange at the existing at-grade signalized intersection of SR 316 and SR 11. Proposed ramp heads will be spaced 350 ft apart. Improvements to SR 11 will begin at mile point 2.32 approximately 0.21 miles south of the existing SR 316/SR 11 intersection and continue northerly along SR 11 to mile point 2.98 for a total length of 0.66 miles. The beginning and ending mile logs on SR 316 are 5.47 and 6.60 respectively. SR 11 will taper down to a two lane section to match existing typical section at the begin project terminal and 0.18 mile northerly from the existing intersection of SR 316 and SR 11. In order to accommodate the 2032 design year traffic the bridge carrying SR 11 over SR 316 would require a six-lane bridge providing two through lanes in each direction plus two left turn lanes. However, based on the immediate need to address serious safety deficiency as noted in the Need and Purpose, the Department proposes to design a four lane bridge carrying SR 11 over SR 316 providing one through lane plus left turn lane in each direction. This project will address the immediate safety needs and improve operations of the intersection of SR 316 @ SR 11.

Need and Purpose

The project need is for safety and operational improvements to intersection of SR 316 @ SR11. This is based on analysis of crash data for year 2006 through year 2008 and base year (2012) and design year (2032) evaluation of traffic. The purpose of this project is to reduce crash frequency and severity, and improve traffic operations by grade separating the intersection of SR 316 and SR 11. This project will also support the state and regional economic development goals by improving safety and traffic operations.

Figure 2: PI 0008430 – SR 316 @ SR 11 Interchange Layout



2.3 PI 0008431 – SR 316 @ SR 53

Project Description

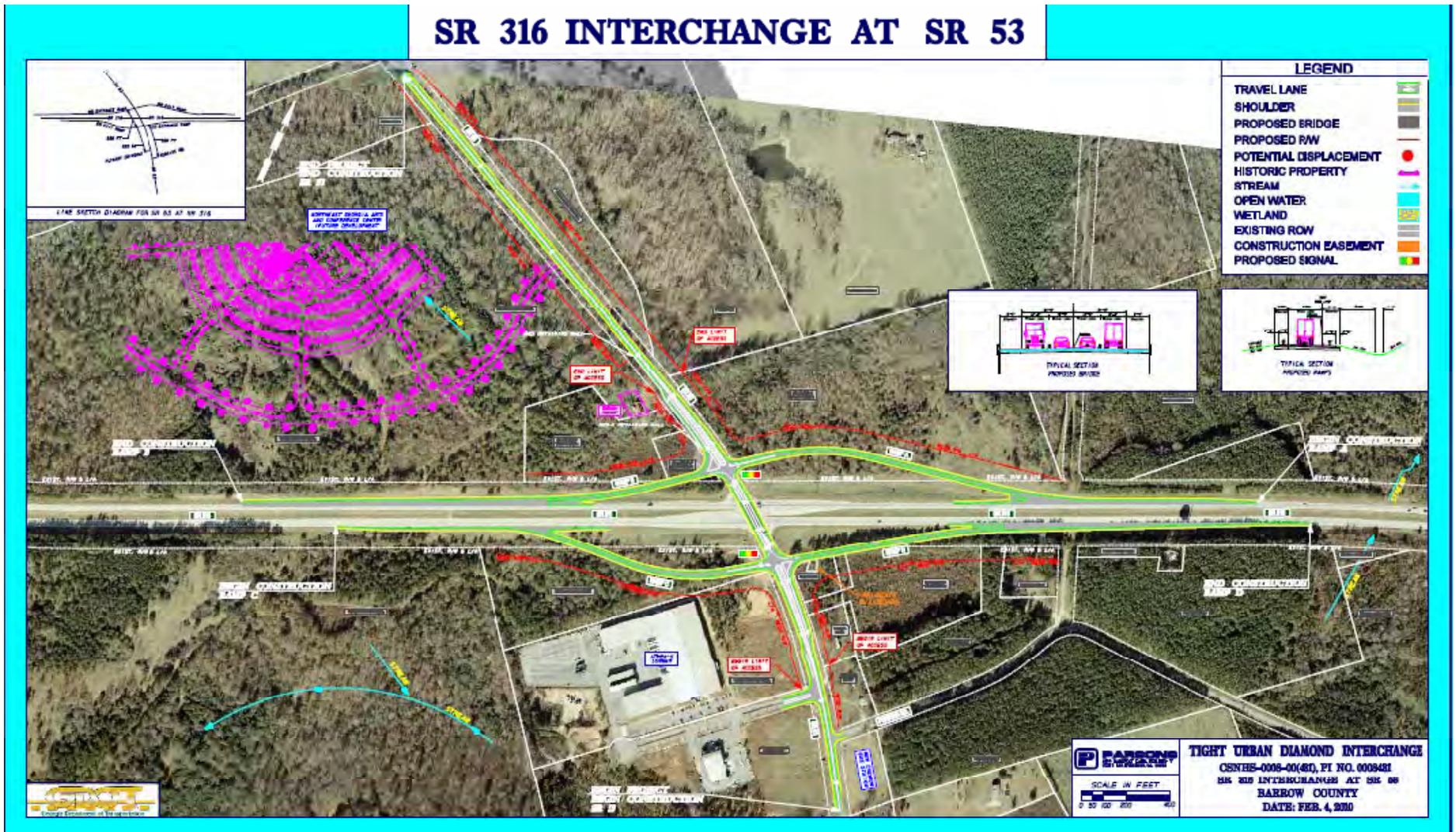
The proposed project is located in Congressional District 7 and approximately 4.75 miles southeast of downtown Winder, Georgia in Barrow County. Based on the immediate need to address serious safety deficiency as noted in the Need and Purpose, the project involves grade separation of existing at-grade intersection of SR 316 and SR 53 to meet the safety needs. The proposed grade separation will include provision of full interchange providing access to and from SR 316 and SR 53. Interchange will be designed to accommodate the future widening of SR 316.

Project CSNHS-0008-00(431) would construct a compressed diamond interchange at the existing at-grade signalized intersection of SR 316 and SR 53. Proposed ramp heads will be spaced 500 ft apart. Improvements to SR 53 will begin at mile point 10.27 approximately 0.22 miles South-East of the existing SR 316/SR 53 intersection and continue northward along SR 53 to mile point 11.02 for a total length of 0.75 miles. The beginning and end mile along SR 316 are 9.87 and 10.80 respectively. The proposed SR 53 will tie in to the existing typical section at both north and south project terminals. The SR 53 Bridge over SR 316 will provide a total of four lanes, one through lane plus one left turn lane in each direction.

Need and Purpose

The project need is for safety and operational improvements to intersection of SR 316 @ SR 53. This is based on analysis of crash data for year 2006 through year 2008 and base year (2012) and design year (2032) evaluation of traffic. The purpose of this project is to reduce crash frequency and improve traffic operations by grade separating the intersection of SR 316 and SR 53. This project will also support the state and regional economic development goals by improving safety and traffic operations.

Figure 3: PI 0008431 – SR 316 @ SR 53 Interchange Layout



3. Benefit Cost Analysis

3.1 Analysis Methodology

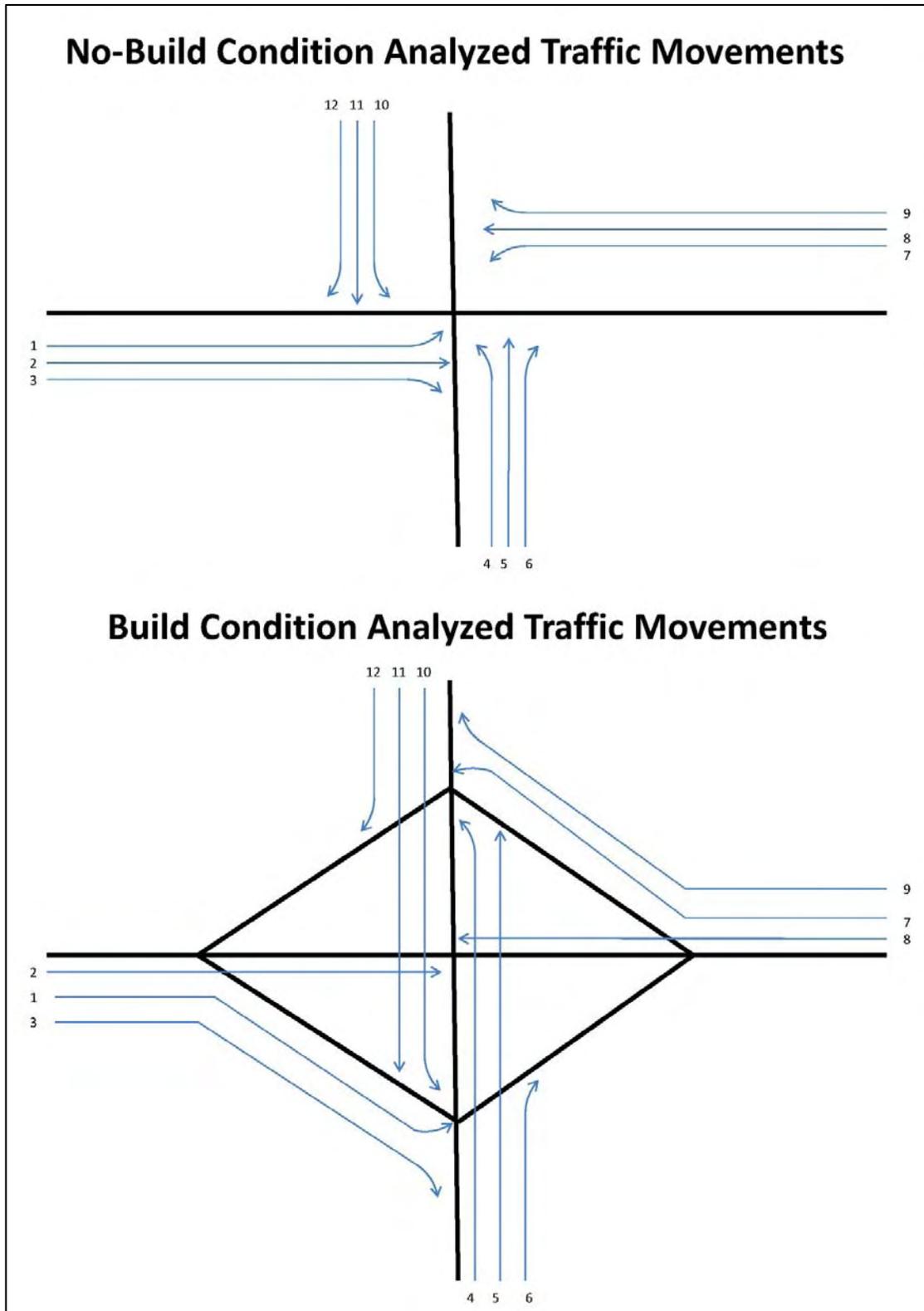
To prepare a Benefit/Cost ratio for each project, it was necessary to calculate the travel time difference for the Build condition versus the No Build condition. Since all three projects are conversions of at-grade intersections to grade separated interchanges, it is necessary to calculate the travel time differences for traffic on SR 316 as well as the cross streets, since both are significantly affected by the proposed projects.

In order to calculate the change in travel times for the Build condition versus the No Build condition for each new interchange, CORSIM was utilized to model each project location. The use of CORSIM was necessary to properly analyze these facilities since SR 316 would be converted to a limited access facility with interchange ramps through the study area. The use of Synchro and the associated Sim Traffic simulation model was investigated, however these models would not calculate and average vehicle speed on the new SR 316 limited access links or ramp links. While Synchro and Sim Traffic models would provide travel times for arterial roadway links and intersections, they would not provide the information needed on the interchange ramps or mainline SR 316, which is where the real benefit of a grade separation project lies.

For each location, a CORSIM model was developed for the existing, future No Build, and future Build conditions. Field observation was utilized to ensure the existing models were calibrated to match actual existing intersection operation. The CORSIM models were utilized to generate travel times for SR 316 as well as the cross streets for the future Build and No-Build conditions. Travel times for all traffic movements were extracted from the CORSIM model in order to account for all affected movements. Since certain traffic movements, such as right and left turning traffic from SR 316 to the side street, would now exit on an interchange ramp then turn at the ramp intersection, travel times from the appropriate model links were taken from the model output.

Figure 4 presents a diagram of the analyzed traffic movements for Build vs No Build conditions for which travel times were generated. The differences in travel times for each movement were then entered into the GDOT B/C spreadsheet along with the ADT's and truck percentages from the design traffic. This information was entered for each analyzed traffic movement to calculate the Person Time Savings Benefit (Tb), Commercial or Truck Time Savings Benefit (CMB), and Fuel Savings Benefit (Fb). The benefits of each movement were then summed to calculate the total congestion benefit for the project. This was then divided by the project cost in order to calculate the Benefit/Cost ratio.

Figure 4: Analyzed Traffic Movements for Calculation of B/C Ratios



3.2 Benefit Cost Analysis Results

The Benefit Cost analysis utilized the methodology described previously and the cost estimates provided in each project Concept Report to calculate the B/C ratio for each project.

3.2.1 Benefit Cost Analysis: PI 0008429 – SR 316 @ SR 81

The benefit cost calculation for this project is presented in Table 1. The B/C ratio for PI 0008429 is **18.42**. While the CORSIM analysis does show significant queuing and congestion at the two interchange ramp intersections, the time benefit gained by grade separating the heavy SR 316 through movements allows this project to achieve a positive B/C ratio.

3.2.1 Benefit Cost Analysis: PI 0008430 – SR 316 @ SR 11

The benefit cost calculation for this project is presented in Table 2. The B/C ratio for PI 0008430 is **34.92**. The CORSIM analysis reveals that this project will significantly improve travel times and congestion when compared to the No Build condition. This allows the project to achieve a high B/C ratio.

3.2.1 Benefit Cost Analysis: PI 0008431 – SR 316 @ SR 53

The benefit cost calculation for this project is presented in Table 3. The B/C ratio for PI 0008431 is **2.81**. The CORSIM analysis reveals that the project will improve travel times and provide some congestion relief. Because of the relatively low projected 2032 traffic volumes, the difference in travel times between the Build and No Build conditions are not as great as with the other two projects, thus the B/C ratio is significantly lower for this project. However, the B/C ratio is still greater than 1, meaning the project benefits are greater than its costs.

Table 2: Benefit/Cost Analysis Worksheet for Project: PI 0008430 – SR 316 @ SR 11

Benefit/Cost Analysis Worksheet													
	Total - All Movements	EBL	EBTH	EBR	NBL	NBTH	NBR	WBL	WBTH	WBR	SBL	SBTH	SBR
Person Time Savings Benefit (Tb)													
*Db (hrs)		0.058	0.087	0.058	0.019	0.019	0.028	0.101	0.127	0.101	0.048	0.048	0.063
ADT		5,800.00	27600	1100	5800	11500	2600	2600	27600	1100	1100	13000	1100
Tb (\$s)	\$269,084,063	\$11,563,750	\$82,541,250	\$2,193,125	\$3,788,125	\$7,510,938	\$2,502,500	\$9,026,875	\$120,491,250	\$3,819,063	\$1,815,000	\$21,450,000	\$2,382,188
Commercial or Truck Time Savings Benefit (Cmb)													
Db (hrs)		0.058	0.087	0.058	0.019	0.019	0.028	0.101	0.127	0.101	0.048	0.048	0.063
% Truck Traffic		0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ADT		5,800.00	27,600	1,100	5,800	11,500	2,600	2,600	27,600	1,100	1,100	13,000	1,100
Cmb	\$184,826,504	\$7,942,825	\$56,695,334	\$1,506,398	\$2,601,960	\$5,159,058	\$1,718,899	\$6,200,314	\$82,762,154	\$2,623,210	\$1,246,674	\$14,733,420	\$1,636,260
Fuel Savings Benefit (Fb)													
ADT		5,800.00	27,600	1,100	5,800	11,500	2,600	2,600	27,600	1,100	1,100	13,000	1,100
Fb (\$s)	\$93,771,719	\$4,029,792	\$28,764,375	\$764,271	\$1,320,104	\$2,617,448	\$872,083	\$3,145,729	\$41,989,375	\$1,330,885	\$632,500	\$7,475,000	\$830,156
Total Congestion Benefit	\$547,682,285	\$23,536,366	\$168,000,959	\$4,463,794	\$7,710,189	\$15,287,444	\$5,093,482	\$18,372,918	\$245,242,779	\$7,773,158	\$3,694,174	\$43,658,420	\$4,848,603
Total Project Cost	\$15,681,824												
B/C Ratio	34.92												

