

**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

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

**FILE** P.I. #0008429 **OFFICE** Design Policy & Support  
CSNHS-0008-00(429)  
GDOT District 1 - Gainesville  
Barrow County **DATE** June 18, 2012  
SR 316/US 29 @ SR 81  
Proposed Interchange/Grade Separation

**FROM**  for Brent Story, State Design Policy Engineer

**TO** SEE DISTRIBUTION

**SUBJECT** APPROVED CONCEPT REPORT

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

Attachment

**DISTRIBUTION:**

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: Jan Hilliard, Design Group Manager  
Kathy Zahul, State Traffic Engineer  
Georgene Geary, State Materials & Research Engineer  
Lisa Myers, State Project Review Engineer  
Jeff Baker, State Utilities Engineer  
Ken Thompson, Statewide Location Bureau Chief  
Michael Henry, Systems & Classification Branch Chief  
Bayne Smith, District Engineer  
Robert Mahoney, District Preconstruction Engineer  
Allen Ferguson, District Utilities Engineer  
Lisa Deaton, District Environmentalist  
Brandon Kirby, Project Manager  
BOARD MEMBER - 7th Congressional

DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

PROJECT CONCEPT REPORT

Project Number: CSNHS-0008-00(429)

County: BARROW

P. I. Number: 0008429

Federal Route Number: U.S. 29

State Route Number: SR 316 and SR 81

GRADE SEPARATION OF SR 316/US 29 @ SR 81

Submitted for approval:

DATE 4/25/12

C. Andy Cunniff  
Design Phase Office Head (Roadway Design)

DATE 5/1/2012

Bobby Hilliard  
Office Head (Office of Program Delivery)

DATE 4/30/12

Paul K...  
Project Manager

Recommendation for approval:

DATE \_\_\_\_\_

Program Control Administrator  
GLENN BOWMAN / off31  
State Environmental Administrator

\* DATE 2/22/2012

DATE \_\_\_\_\_

State Traffic Engineer  
LISA MYERS / off31  
Project Review Engineer

\* DATE 2/21/2012

\* DATE 2/21/2012

PATRICK ALLEN / off31  
State Utilities Engineer

DATE \_\_\_\_\_

District Engineer/District Utilities Engineer  
BEN RABUN / off31  
State Bridge Design Engineer

\* DATE 2/23/2012

DATE \_\_\_\_\_

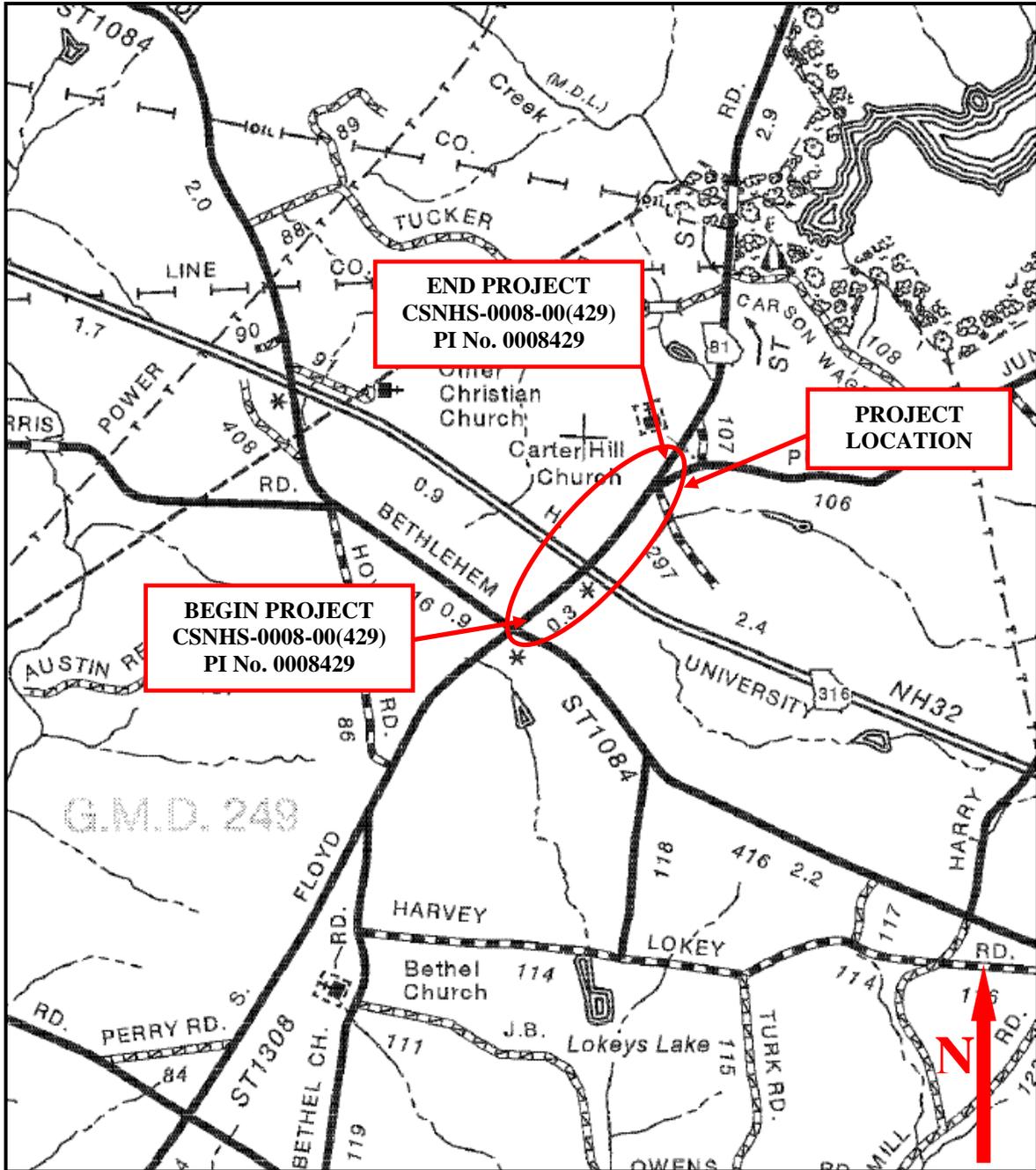
State Transportation Financial Management Administrator

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 2/27/2012

ANTHIA L. VANDERK / off31  
State Transportation Planning Administrator

\* RECOMMENDATION ON FILE



(Not to Scale)

**Location Map**

**Justification Statement: (See the attached Justification Statement)**

**Description of the proposed project:**

Project CSNHS-0008-00(429) is located approximately four miles south of the City of Winder in Barrow County. The project proposes to grade separate the existing at-grade intersection of SR 316 at SR 81. The project proposes to raise SR 81 over SR 316, which would include provisions for a full interchange. The proposed interchange would not preclude the future widening of SR 316.

The tight-urban diamond interchange design, alternative number 7, was selected after the analysis of eight alternatives for the interchange. The tight-urban diamond interchange was the preferred alternate due to its lowest overall cost, least displacements, and minimal impacts to open water. An alternative impact matrix is attached.

On SR 81, the project is proposed to begin approximately 0.22 miles south of the existing SR 316/SR 81 intersection and continue north along SR 81 for a total length of 0.54 miles. The proposed 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. On SR 316, the project is proposed to begin approximately 0.53 miles to the west of the existing SR 316/SR 81 intersection and continue east along SR 316 for a total length of approximately 1 mile.

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

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

The proposed project concept matches the conforming plan's model description for grade separation of SR 316 at SR 81.

**PDP Classification:** Major X Minor    

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

**Functional Classification:** SR 316/US 29 – Rural Principal Arterial  
SR 81 – Rural Major Collector

**US Route Number(s):** US 29 State Route Number(s): SR 316, SR 81

**Traffic (AADT):**

Open Year: (2020 Build) – SR 316: 32,600 Design Year: (2040 Build) – SR 316: 48,350  
SR 81: 19,100 SR 81: 28,300

**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: 8000 ft
- Maximum super-elevation rate for curve: 8.0 %
- 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 81
- Existing length of roadway segment and the beginning mile logs for each county segment: 5544 ft. and beginning mile log – 3.58

### SR 81

- Typical Section: (1) 11.5 ft. wide travel lane in each direction, 4 ft. outside shoulders
- Posted speed: 45 mph Minimum radius for curve: 3750 ft
- Maximum super-elevation rate for curve: 6.0%
- Maximum grade: 6.0 %
- Width of right-of-way: 100 ft.
- Major structures: None
- Major interchanges or intersections along the project : Signalized intersection at SR 316 and at Carl Bethlehem Road
- Existing length of roadway segment and the beginning mile logs for each county segment: 2851 ft. and beginning mile log – 1.01

### 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 81

- Proposed typical section(s): (1) 12 ft. wide travel lane in each direction, 12 ft. urban shoulder with curb and gutter and 5 ft. wide sidewalk in each direction
- Proposed Design Speed Mainline: 45 mph
- Proposed Maximum grade Mainline: 8.0 %
- Maximum grade allowable: 8.0 %
- Proposed Maximum grade Side Street: 8.0 %
- Maximum grade allowable: 11.0 %
- Proposed Maximum grade driveway: 11.0 % Commercial; 28% Residential
- Proposed Minimum radius of curve: 711 ft.
- Minimum radius allowable: 711 ft.
- Maximum allowable superelevation rate: 4.0 %
- Proposed maximum superelevation rate: 4.0 %



- Design Variances: none anticipated
- Environmental concerns: Stream Buffer Variance, USACE NWP 23 and PCN, Special Provisions for Migratory Birds
- 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 Involvement: 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 Required Yes( X ) No( )
- Benefit/Cost Ratio: 18.42

**Project Cost Estimate and Funding Responsibilities:**

	PE	ROW	UTILITY	CST*	MITIGATION
By Whom	GDOT	GDOT	GDOT	GDOT	GDOT
\$ Amount	\$500,000	\$2,414,000	\$145,250	\$13,007,400	TBD

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

**Project Activities Responsibilities:**

- Design: GDOT
- Right of Way Acquisition: 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. M003630 – SR 81/SR 316 Right Turn Lane
  - PI No. M003796 – SR 81 from Walton County Line to SR 8
  - PI No. 0007268 – SR 316 HOV Lanes from I-85 to Athens – PPI
  - PI No. 0008430 – Grade Separation of SR 316/US 29 @ SR 11
  - PI No. 0008431 – Grade Separation of SR 316/US 29 @ SR 53
  - PI No. 122870 – SR 316/US 29 @ SR 211/Bethlehem Street
  - PI No. 162490 – SR 316/US 29 in Barrow and Oconee Counties protective R/W for Interchange
- Railroads: None
- Other coordination to date: GDOT OES & FHWA coordination meeting–Feb.13,2008

**Scheduling – Responsible Parties’ Estimate:**

- Time to complete the environmental process: Begin: 5/2012 End: 9/2013
- Time to complete preliminary construction plans: Begin: 10/2012 End: 10/2013
- Time to complete right-of-way plans: Begin: 10/2013 End: 11/2013
- Time to complete the Section 404 Permits: Begin: N/A End: N/A
- Time to complete final construction plans: Begin: 12/2013 End: 12/2014
- Time to complete the purchase of right-of-way: Begin: 3/2014 End: 4/2015
- 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 the ramp head spacing set at 1,000 ft. The design speed of SR 81 is 55 mph and ramp design speed is 45 mph. This alternative would require five residential displacements. This alternative would require widening and reconstruction of 0.87 miles of SR 81. The construction and right-of-way costs for this alternative are \$15.6 million and \$10.2 million respectively, with a total cost of \$25.8 million. This alternative was not selected because it adversely affects proposed developments in the northeast and southeast quadrant of the interchange, displaces five properties, requires widening and reconstruction of 0.87 miles of SR 81, and has high overall cost.

**Alternative 2**

This alternative consists of a partial cloverleaf interchange with diamond ramps providing the turn movements from SR 81 and two loop ramps with design speed of 30 mph providing uninterrupted turn movements from SR 316. This alternative would require four displacements, three residential and one commercial. This alternative would require widening and reconstruction of 0.88 miles of SR 81. The construction and right-of-way costs for this alternative are \$14.7 million and \$9.3 million respectively, with a total cost of \$24.0 million. This alternative was not selected because it adversely affects proposed development in the southeast quadrant of the interchange, displaces four properties, requires widening and reconstruction of 0.88 miles of SR 81, and has high overall cost.

### **Alternative 3**

This alternative provides a partial cloverleaf interchange with continuous flowing loops of 35 mph design speed. The turn movements from SR 316 are accommodated through the intersection and no longer allow uninterrupted flow as compared to Alternative 2. This alternative would require six property displacements, four residential and two commercial. The construction and right-of-way costs for this alternative are \$15.3 million and \$12.1 million respectively, with a total cost of \$27.4 million. This alternative was not selected because it adversely affects proposed development in the southeast quadrant of the interchange, displaces six properties, requires widening and reconstruction of 0.88 miles of SR 81, and has high overall cost.

### **Alternative 4**

This alternative is a combination of a diamond and a partial cloverleaf interchange with a loop ramp providing eastbound turn movements from SR 316. This alternative would require the displacement of three residential properties. The construction and right-of-way costs for this alternative are \$15.3 million and \$7.7 million respectively, with a total cost of \$23.0 million. This alternative was not selected because it adversely affects proposed development in the southeast quadrant of the interchange, requires widening and reconstruction of 0.88 miles of SR 81, and has high overall cost.

### **Alternative 5**

A single point urban interchange (SPUI) was proposed for this alternative. All through traffic on the SR 81, as well as the left turning volume onto or off the interchange, will be controlled by a single set of traffic signals. This alternative would require the displacement of three residential properties. This alternative would require widening and reconstruction of 0.54 miles of SR 81. The construction and right-of-way costs for this alternative are \$12.8 million and \$3.6 million respectively, with a total cost of \$16.4 million. This alternative was not selected because the major disadvantage of single point urban interchange over the preferred alternative is the increased cost due to the increase in bridge length and bridge width. Additionally, a SPUI on SR 81 will require an increase in bridge width over the free-flowing road to make room for the compressed entrance and exit ramps.

### **Alternative 6**

This alternative consists of a compressed diamond interchange with the ramp head spacing set at 750 ft. This alternative would require three residential displacements. This alternative would require widening and reconstruction of 0.54 miles of SR 81. The construction and right-of-way costs for this alternative are \$11.5 million and \$5.0 million respectively, with a total cost of \$16.5 million. This alternative was not selected because its footprint will have a right-of-way impact of 46.1 acres versus 19 acres of the preferred alternative resulting in high right-of-way acquisition cost.

### **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 9  
Project Number: CSNHS-0008-00(429)  
P.I. Number: 0008429  
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 justification 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
11. PIOH synopsis
12. Benefit cost analysis
13. Conforming plan's network schematics showing thru lanes

Concur:   
Director of Engineering

Approve:   
Chief Engineer

Date: 6/13/2012

**ATTACHMENT 1**  
**DETAILED COST ESTIMATES**

# DETAILED COST ESTIMATE



**Job: 0008429-01**

**JOB NUMBER:** 0008429-01

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

**SPEC YEAR:** 01

**DESCRIPTION:** SR 316/US 129 AT SR 81 INTERCHANGE - BARROW COUNTY

**ITEMS FOR JOB 0008429-01**

**0010 - ROADWAY**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0005	150-1000	1.000	LS	\$1,200,000.00	TRAFFIC CONTROL - CSNHS-0008-00(429)	\$1,200,000.00
0010	153-1300	1.000	EA	\$78,951.71	FIELD ENGINEERS OFFICE TP 3	\$78,951.71
0015	201-1500	1.000	LS	\$500,000.00	CLEARING & GRUBBING - CSNHS-0008-00(429)	\$500,000.00
0020	206-0002	300000.000	CY	\$6.70	BORROW EXCAV, INCL MATL	\$2,009,025.00
0025	310-1101	39878.000	TN	\$22.20	GR AGGR BASE CRS, INCL MATL	\$885,347.83
0030	318-3000	200.000	TN	\$19.17	AGGR SURF CRS	\$3,834.04
0034	402-1812	1000.000	TN	\$81.52	RECYL AC LEVELING, INC BM&HL	\$81,516.22
0035	402-3121	8542.000	TN	\$73.31	RECYL AC 25MM SP, GP1/2, BM&HL	\$626,255.19
0040	402-3130	2453.000	TN	\$78.54	RECYL AC 12.5MM SP, GP2, BM&HL	\$192,657.93
0044	402-3190	8307.000	TN	\$74.18	RECYL AC 19 MM SP, GP 1 OR 2 , INC BM&HL	\$616,250.89
0045	413-1000	4076.000	GL	\$2.26	BITUM TACK COAT	\$9,230.31
0050	430-0220	30531.000	SY	\$61.06	PLN PC CONC PVMT/CL1C/ 12" TK	\$1,864,245.45
0054	433-1100	447.000	SY	\$114.70	REF CONC APPR SL/INCL CURB	\$51,269.26
0055	436-1000	8600.000	LF	\$9.22	ASPH CONC CURB - 4 INCH	\$79,307.91
0064	441-0104	4023.000	SY	\$43.21	CONC SIDEWALK, 4 IN	\$173,824.26
0065	441-0204	850.000	SY	\$42.53	PLAIN CONC DITCH PAVING, 4 IN	\$36,147.53
0074	441-6222	9521.000	LF	\$17.31	CONC CURB & GUTTER/ 8"X30"TP2	\$164,784.04
0075	446-1100	120.000	LF	\$14.86	PVMT REF FAB STRIPS, TP2, 18 INCH WIDTH	\$1,783.35
0078	620-0100	1000.000	LF	\$45.60	TEMP BARRIER, METHOD NO. 1	\$45,602.90
0079	634-1200	60.000	EA	\$99.44	RIGHT OF WAY MARKERS	\$5,966.35
0080	641-1100	100.000	LF	\$64.79	GUARDRAIL, TP T	\$6,478.83
0085	641-1200	8500.000	LF	\$14.42	GUARDRAIL, TP W	\$122,608.34
0090	641-5001	12.000	EA	\$651.39	GUARDRAIL ANCHORAGE, TP 1	\$7,816.70
0095	641-5012	12.000	EA	\$1,844.32	GUARDRAIL ANCHORAGE, TP 12	\$22,131.80
0098	643-1152	8000.000	LF	\$26.36	CH LK FEN, ZC COAT, 6', 9 GA	\$210,864.00
<b>SUBTOTAL FOR ROADWAY:</b>						<b>\$8,995,899.84</b>

**0020 - DRAINAGE**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0100	550-1180	3600.000	LF	\$44.41	STM DR PIPE 18", H 1-10	\$159,890.00
0105	550-1240	1800.000	LF	\$61.91	STM DR PIPE 24", H 1-10	\$111,440.29
0110	550-2180	250.000	LF	\$32.50	SIDE DR PIPE 18", H 1-10	\$8,126.01
0115	550-3318	15.000	EA	\$711.93	SAFETY END SECTION 18", STD, 4:1	\$10,678.93
0120	550-3324	10.000	EA	\$1,156.43	SAFETY END SECTION 24", STD, 4:1	\$11,564.33
0124	668-1100	35.000	EA	\$2,142.04	CATCH BASIN, GP 1	\$74,971.56
0123	668-1200	5.000	EA	\$3,055.25	CATCH BASIN, GP 2	\$15,276.25
0125	668-2100	10.000	EA	\$2,666.03	DROP INLET, GP 1	\$26,660.31
0122	668-4300	5.000	EA	\$2,639.95	STORM SEW MANHOLE, TP 1	\$13,199.76
<b>SUBTOTAL FOR DRAINAGE:</b>						<b>\$431,807.44</b>

# DETAILED COST ESTIMATE



**Job: 0008429-01**

## 0030 - EROSION CONTROL-TEMPORARY

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0135	163-0232	19.000	AC	\$535.88	TEMPORARY GRASSING	\$10,181.68
0140	163-0240	600.000	TN	\$227.52	MULCH	\$136,513.01
0145	163-0300	6.000	EA	\$1,905.19	CONSTRUCTION EXIT	\$11,431.16
0150	163-0503	5.000	EA	\$667.05	CONSTR AND REMOVE SILT CONTROL GATE, TP 3	\$3,335.26
0155	163-0527	100.000	EA	\$86.10	CNST/REM RIP RAP CKDM,STN P RIPRAP/SN BG	\$8,610.00
0160	163-0528	100.000	LF	\$135.39	CONSTR AND REM FAB CK DAM -TP C SLT FN	\$13,539.00
0165	163-0529	100.000	LF	\$158.09	CNST/REM TEMP SED BAR OR BLD STRW CK DM	\$15,809.00
0170	163-0550	45.000	EA	\$368.70	CONS & REM INLET SEDIMENT TRAP	\$16,591.37
0175	165-0010	7500.000	LF	\$0.98	MAINT OF TEMP SILT FENCE, TP A	\$7,326.83
0185	165-0020	3750.000	LF	\$0.89	MAINT OF TEMP SILT FENCE, TP B	\$3,337.50
0184	165-0041	300.000	LF	\$77.68	MAINT OF CHECK DAMS - ALL TYPES	\$23,304.00
0195	165-0087	5.000	EA	\$167.60	MAINT OF SILT CONTROL GATE, TP 3	\$837.99
0200	165-0101	6.000	EA	\$608.13	MAINT OF CONST EXIT	\$3,648.80
0205	165-0105	45.000	EA	\$93.31	MAINT OF INLET SEDIMENT TRAP	\$4,199.10
0209	167-1000	4.000	EA	\$1,640.62	WATER QUALITY MONITORING AND SAMPLING	\$6,562.48
0208	167-1500	24.000	MO	\$1,282.80	WATER QUALITY INSPECTIONS	\$30,787.10
0210	171-0010	15000.000	LF	\$1.91	TEMPORARY SILT FENCE, TYPE A	\$28,576.35
0215	171-0020	7500.000	LF	\$4.22	TEMPORARY SILT FENCE, TYPE B	\$31,650.00
0099	643-8200	1700.000	LF	\$3.79	BARRIER FENCE (ORANGE), 4 FT	\$6,440.60
<b>SUBTOTAL FOR EROSION CONTROL-TEMPORARY:</b>						<b>\$362,681.23</b>

## 0040 - EROSION CONTROL-PERMANENT

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0220	603-2180	300.000	SY	\$37.46	STN DUMPED RIP RAP, TP 3, 12"	\$11,236.70
0225	603-7000	300.000	SY	\$5.28	PLASTIC FILTER FABRIC	\$1,584.44
0230	700-6910	38.000	AC	\$880.96	PERMANENT GRASSING	\$33,476.51
0235	700-7000	115.000	TN	\$75.76	AGRICULTURAL LIME	\$8,712.49
0245	700-8000	34.000	TN	\$337.63	FERTILIZER MIXED GRADE	\$11,479.47
0250	700-8100	1912.000	LB	\$2.69	FERTILIZER NITROGEN CONTENT	\$5,137.41
0255	715-2200	10000.000	SY	\$1.80	BITUM TRTD ROVING, WATERWAYS	\$17,977.70
0260	716-2000	16000.000	SY	\$1.23	EROSION CONTROL MATS, SLOPES	\$19,684.32
<b>SUBTOTAL FOR EROSION CONTROL-PERMANENT:</b>						<b>\$109,289.04</b>

## 0050 - SIGNING & MARKING

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0264	636-1041	350.000	SF	\$24.64	HWY SIGNS,TP 2MAT,REFL SH TP 9	\$8,623.97
0265	636-1077	400.000	SF	\$29.79	HWY SIGN,ALUM EXT PL,REFL SHT,TP 9	\$11,916.66
0270	636-2070	500.000	LF	\$8.72	GALV STEEL POSTS, TP 7	\$4,359.98
0275	636-2090	500.000	LF	\$9.04	GALV STEEL POSTS, TP 9	\$4,520.21
0280	638-1001	1.000	LS	\$80,600.00	STR SUPPORT OVHD SIGN,TP I,STA STATIONS NOT ASSIGNED YET	\$80,600.00
0285	653-0120	22.000	EA	\$76.65	THERM PVMT MARK, ARROW, TP 2	\$1,686.32
0290	653-0140	2.000	EA	\$63.76	THERM PVMT MARK, ARROW, TP 4	\$127.52
0295	653-1501	18000.000	LF	\$0.42	THERMO SOLID TRAF ST 5 IN, WHI	\$7,632.72
0300	653-1502	18000.000	LF	\$0.35	THERMO SOLID TRAF ST, 5 IN YEL	\$6,370.92
0315	653-1704	750.000	LF	\$3.38	THERM SOLID TRAF STRIPE,24",WH	\$2,534.34
0305	653-1804	750.000	LF	\$2.50	THERM SOLID TRAF STRIPE, 8",WH	\$1,877.15
0310	653-3501	18000.000	GLF	\$0.26	THERMO SKIP TRAF ST, 5 IN, WHI	\$4,647.06
0320	653-6004	500.000	SY	\$4.15	THERM TRAF STRIPING, WHITE	\$2,073.35
0325	653-6006	500.000	SY	\$3.50	THERM TRAF STRIPING, YELLOW	\$1,750.60
0330	654-1001	200.000	EA	\$3.87	RAISED PVMT MARKERS TP 1	\$773.13
0335	654-1003	100.000	EA	\$5.07	RAISED PVMT MARKERS TP 3	\$507.34
0340	657-1054	250.000	LF	\$4.43	PRF PL SD PVMT MKG,5",WH,TP PB	\$1,107.98
0345	657-3054	20.000	GLF	\$2.79	PRF PL SK PVMT MKG,5",WH,TP PB	\$55.89
0350	657-6054	500.000	LF	\$4.50	PRF PL SD PVMT MKG,5",YW,TP PB	\$2,247.53
<b>SUBTOTAL FOR SIGNING &amp; MARKING:</b>						<b>\$143,412.67</b>

# DETAILED COST ESTIMATE



**Job: 0008429-01**

**0070 - BRIDGE AND WALL STRUCTURE**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0365	543-9000	1.000	LS	\$1,125,600.00	CONSTR OF BRIDGE COMPLETE - BR NO. 1	\$1,125,600.00
0374	627-1000	640.000	SF	\$57.14	MSE WALL FACE, 0 - 10 FT HT, WALL NO - BR NO. 1	\$36,569.87
0370	627-1010	1875.000	SF	\$65.00	MSE WALL FACE, 10 - 20 FT HT, WALL NO - 1	\$121,875.00
0373	627-1010	5760.000	SF	\$66.02	MSE WALL FACE, 10 - 20 FT HT, WALL NO - BR NO. 1	\$380,265.35
0372	627-1120	400.000	LF	\$244.76	COPING B, WALL NO - BR NO. 1	\$97,905.90
<b>SUBTOTAL FOR BRIDGE AND WALL STRUCTURE:</b>						<b>\$1,762,216.12</b>

**0080 - TRAFFIC SIGNAL**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0380	639-2001	3000.000	LF	\$2.09	STEEL WIRE STRAND CABLE, 1/4"	\$6,274.26
0385	639-4004	8.000	EA	\$6,323.43	STRAIN POLE, TP IV	\$50,587.42
0375	647-1000	1.000	LS	\$75,000.00	TRAF SIGNAL INSTALLATION NO - 1	\$75,000.00
0379	647-1000	1.000	LS	\$75,000.00	TRAF SIGNAL INSTALLATION NO - 2	\$75,000.00
0390	936-1001	2.000	EA	\$6,968.62	CCTV SYSTEM,TYPE B	\$13,937.24
0395	936-8000	1.000	LS	\$10,920.00	TESTING	\$10,920.00
0400	939-4040	2.000	EA	\$4,964.06	TYPE D CABINET	\$9,928.13
<b>SUBTOTAL FOR TRAFFIC SIGNAL:</b>						<b>\$241,647.05</b>

**TOTALS FOR JOB 0008429-01**

<b>ITEMS COST:</b>	<b>\$12,046,953.39</b>
<b>COST GROUP COST:</b>	<b>\$0.00</b>
<b>ESTIMATED COST:</b>	<b>\$12,046,953.39</b>
<b>CONTINGENCY PERCENT:</b>	<b>0.00</b>
<b>ENGINEERING AND INSPECTION:</b>	<b>0.05</b>
<b>ESTIMATED COST WITH CONTINGENCY AND E&amp;I:</b>	<b>\$12,649,301.06</b>

PROJ. NO.

CSNHS-0008-00(429)

CALL NO.

P.I. NO.

0008429

DATE

02/01/12

INDEX (TYPE)

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)

352036.68

\$

352,036.68

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)

1015.1

ASPHALT	Tons	%AC	AC ton
Leveling	1000	5.0%	50
12.5 OGFC		5.0%	0
12.5 mm	2453	5.0%	122.65
9.5 mm SP		5.0%	0
25 mm SP	8542	5.0%	427.1
19 mm SP	8307	5.0%	415.35
	<b>20302</b>		<b>1015.1</b>

BITUMINOUS TACK COAT

Price Adjustment (PA)

\$ 6,071.37

\$

6,071.37

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)

17.50683136

Bitum Tack

Gals	gals/ton	tons
4076	232.8234	17.5068314

PROJ. NO.

CSNHS-0008-00(429)

CALL NO.

P.I. NO.

0008429

DATE

02/01/12

**BITUMINOUS TACK COAT (surface treatment)**

Price Adjustment (PA)						<b>0</b>	\$	-
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

<b>TOTAL LIQUID AC ADJUSTMENT</b>							\$	<b>358,108.05</b>
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**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

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**INTERDEPARTMENT CORRESPONDENCE**

**FILE PROJECT No.** CSNHS-0008-00(429) Barrow  
SR 316 @ SR 81  
P.I. No 0008429

**OFFICE Program Delivery**

**DATE 4/20/2012**

*Bobby Hilliard for*  
**FROM Bobby Hilliard, State Program Delivery Engineer**

**TO Lisa Myers, State Project Review Engineer**

**SUBJECT REVISIONS TO PROGRAMMED COSTS**

**PROJECT MANAGER** Brandon Kirby

**MNGT LET DATE** 9/15/2015

**MNGT R/W DATE** 4/15/2014

**PROGRAMMED COST (TPro W/OUT INFLATION)**

**LAST ESTIMATE UPDATE**

**CONSTRUCTION** \$Enter CST Cost

**DATE** Select Date

**RIGHT OF WAY** \$3,972,000

**DATE** 6/15/2011

**UTILITIES** \$Enter Utility Cost

**DATE** Select Date

**REVISED COST ESTIMATE**

**CONSTRUCTION** \$Enter CST Cost

**RIGHT OF WAY** \$2,414,000

**UTILITIES** \$

**Attachments**

cc: Genetha Rice - Singleton, Program Control Administrator

# Department of Transportation State of Georgia

-----  
Interdepartmental Correspondence

**FILE** R/W Cost Estimate Update **OFFICE** Atlanta  
**DATE** April 19, 2012  
**FROM** Phil Copeland, Right of Way Administrator  
LaShone Alexander, Right of Way Cost Estimator  
**TO** Brandon Kirby, Project Manager  
**SUBJECT** **Preliminary Right of Way Cost Estimate**  
**Project: CSNHS-0008-00(429) Barrow County**  
**P.I. No.: 0008429**  
**Description: Grade Separation of SR 316 @ SR 81**

As per your request, attached is a copy of the approved Preliminary Right of Way Cost Estimates on the above referenced projects.

If you have any questions, please contact LaShone Alexander at One Georgia Center 600 West Parkway Street, NW Atlanta, GA 30308, Right of Way Office at (478) 553-1569 or (478) 232-4045.

PC:LA  
Attachments  
c: File

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

Date: 4/19/2012 Project: CSNHS-0008-00(429)  
 Revised: County: Barrow  
 PI: 0008429

Description: Grade Separation of SR 316 @ SR 81  
 Project Termini: Grade Separation of SR 316 @ SR 81

Existing ROW: Varies  
 Required ROW: Varies  
 Parcels: 18

Land and Improvements \$2,072,310.00

Proximity Damage	\$0.00
Consequential Damage	\$0.00
Cost to Cures	\$0.00
Trade Fixtures	\$0.00
Improvements	\$350,000.00

Valuation Services \$27,500.00

Legal Services \$124,650.00

Relocation \$36,000.00

Demolition \$0.00

Administrative \$153,500.00

TOTAL ESTIMATED COSTS \$2,413,960.00

**TOTAL ESTIMATED COSTS (ROUNDED) \$2,414,000.00**

Preparation Credits	Hours	Signature

Prepared By: Lashare Alexander CG#: 286999 4/19/2012  
 Approved By: Lashare Alexander CG#: 286999 4/19/2012

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

Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet

Project/County/PI

CSNHS-0008-00(429) Barrow

0008429

	A	B	C	D
<b>Land and Improvements</b>	<b>Agriculture</b>	<b>Residential</b>	<b>Commercial</b>	<b>Industrial</b>
1 Estimate Low (ac)	\$0.00	\$0.00	\$0.00	\$0.00
2 Estimate High (ac)	\$0.00	\$0.00	\$0.00	\$0.00
3 Estimate Used (ac)	\$15,000.00	\$50,000.00	\$400,000.00	\$0.00
4 Fee Simple Area (ac)	4.11	14.44	0.62	0.00
5 Fee Simple Estimate	\$61,650.00	\$722,170.00	\$247,720.00	\$0.00
6 Perm Esmt Area (ac)	0.00	0.00	0.00	0.00
7 Perm Esmt Factor	0%	0%	0%	0%
8 Perm Esmt Estimate	\$0.00	\$0.00	\$0.00	\$0.00
9 Temp Esmt Area (ac)	0.00	0.00	0.00	0.00
10 Temp Esmt Factor	0%	0%	0%	0%
11 Temp Esmt Estimate	\$0.00	\$0.00	\$0.00	\$0.00
12 Proximity Damages	\$0.00	\$0.00	\$0.00	\$0.00
13 Consequential Damages	\$0.00	\$0.00	\$0.00	\$0.00
14 Cost to Cures	\$0.00	\$0.00	\$0.00	\$0.00
15 Improvements	\$100,000.00	\$150,000.00	\$100,000.00	\$0.00
16 Trade Fixtures	\$0.00	\$0.00	\$0.00	\$0.00
17				
18 <b>PROPERTY TYPE TOTALS</b>	<b>\$161,650.00</b>	<b>\$872,170.00</b>	<b>\$347,720.00</b>	<b>\$0.00</b>
19	<b>SUB TOTAL PROPERTY TYPES</b>			<b>\$1,381,540.00</b>
20	Counter Offers and Condemnation Increases			\$690,770.00
21				
22	<b>GRAND TOTAL LANDS AND IMPROVEMENTS</b>			<b>\$2,072,310.00</b>

Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet

Project/County/PI

CSNHS-0008-00(429) Barrow

0008429

	A	B	C	D
<b>Valuation Services</b>	<b>Agriculture</b>	<b>Residential</b>	<b>Commercial</b>	<b>Industrial</b>
1 Appraisals (# of Parcels)	5	9	4	0
2 Estimated Fees (per Parcel)	\$1,000.00	\$1,000.00	\$2,000.00	\$0.00
3 <b>TOTAL APPRAISALS</b>	<b>\$5,000.00</b>	<b>\$9,000.00</b>	<b>\$8,000.00</b>	<b>\$0.00</b>
4 Sign Estimates	0	0	0	0
5 Estimated Fees	\$0.00	\$0.00	\$0.00	\$0.00
6 <b>TOTAL SIGN ESTIMATES</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>
7 Specialty Reports	0	0	0	0
8 Estimated Fees	\$0.00	\$0.00	\$0.00	\$0.00
9 <b>TOTAL SPECIALTY REPORTS</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>
10 Septic/Well Reports	0	0	0	0
11 Estimated Fees	\$0.00	\$0.00	\$0.00	\$0.00
12 <b>TOTAL SEPTIC/WELL REPORTS</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>
13				
14				
15				
16 <b>TOTAL VALUATION FEES</b>	<b>\$5,000.00</b>	<b>\$9,000.00</b>	<b>\$8,000.00</b>	<b>\$0.00</b>
17	<b>SUB TOTAL VALUATION SERVICES</b>			<b>\$22,000.00</b>
18	Updates and Incidentals (Min \$2,500 or 25%)			\$5,500.00
19	<b>GRAND TOTAL VALUATION SERVICES</b>			<b>\$27,500.00</b>

**Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet**

Project/County/PI      CSNHS-0008-00(429) Barrow      0008429

	A	B	C	D
	Parcels	Estimated Fees		TOTALS
1	18	\$125.00		\$2,250.00
2	18	\$200.00		\$3,600.00
3	18	\$300.00		\$5,400.00
4	18	\$50.00		\$900.00
5	3	\$5,000.00		\$15,000.00
6	3	\$25,000.00		\$75,000.00
7	3	\$7,500.00		\$22,500.00
8				
9				
10				
11				
12				
13				
14				
15				
16				
17		<b>GRAND TOTAL LEGAL SERVICES</b>		<b>\$124,650.00</b>

Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet

Project/County/PI

CSNHS-0008-00(429) Barrow

0008429

	A	B	C	D
	Displacements	Estimated Costs		TOTALS
1	Business Displacement	\$15,000.00		\$0.00
2	Residential Tenant	\$20,000.00		\$0.00
3	Residential Owner	\$40,000.00		\$0.00
4	Pro-Rata Taxes	18	\$1,000.00	\$18,000.00
5	Property Pin Replacement	18	\$1,000.00	\$18,000.00
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17		<b>GRAND TOTAL RELOCATION</b>		<b>\$36,000.00</b>

Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet

Project/County/PI

CSNHS-0008-00(429) Barrow

0008429

	A	B	C	D
	Demolition	Items/Improvements	Estimated Costs	TOTALS
1	Residential Structures		\$15,000.00	\$0.00
2	Commercial Structures		\$25,000.00	\$0.00
3	Hotels/Apartments		\$60,000.00	\$0.00
4	UST's - Dispensers		\$50,000.00	\$0.00
5	Billboards		\$8,000.00	\$0.00
6	Signs - Light Standards		\$1,500.00	\$0.00
7	Water Vaults		\$15,000.00	\$0.00
8	Gas/Water Service Separation		\$2,500.00	\$0.00
9				
10				
11				
12				
13				
14				
15				
16				
17			<b>GRAND TOTAL DEMOLITION</b>	<b>\$0.00</b>

Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet

Project/County/PI      CSNHS-0008-00(429) Barrow      0008429

	A	B	C	D
	Parcels	Man hours per Parcel		TOTALS
1	18	40		\$36,000.00
2	18	100		\$90,000.00
3		50		\$0.00
4	5	50		\$12,500.00
5	3	100		\$15,000.00
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17		<b>GRAND TOTAL INHOUSE</b>		<b>\$153,500.00</b>

**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

**INTERDEPARTMENT CORRESPONDENCE**

FILE CSNHS-0008-00(429) Barrow OFFICE Gainesville  
P.I. No. 0008429 SB 316 @ SR 81  
*AP* DATE February 21, 2012

FROM Allen Ferguson  
District Utilities Engineer

TO Brandon Kirby, Project Manager

SUBJECT UPDATED 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
Jackson EMC		\$ 127,500.00
Barrow County**	\$175,000.00	
Comcast	\$ 40,750.00	
Windstream Telephone	\$ 48,150.00	\$ 17,750.00
City of Winder – Water/Gas**	\$228,350.00	
Total Non-Reimbursable Cost		
	\$492,250.00	
Total Reimbursement Cost:		\$ 145,250.00

Total estimated reimbursable cost for the above project is **\$ 145,250.00**

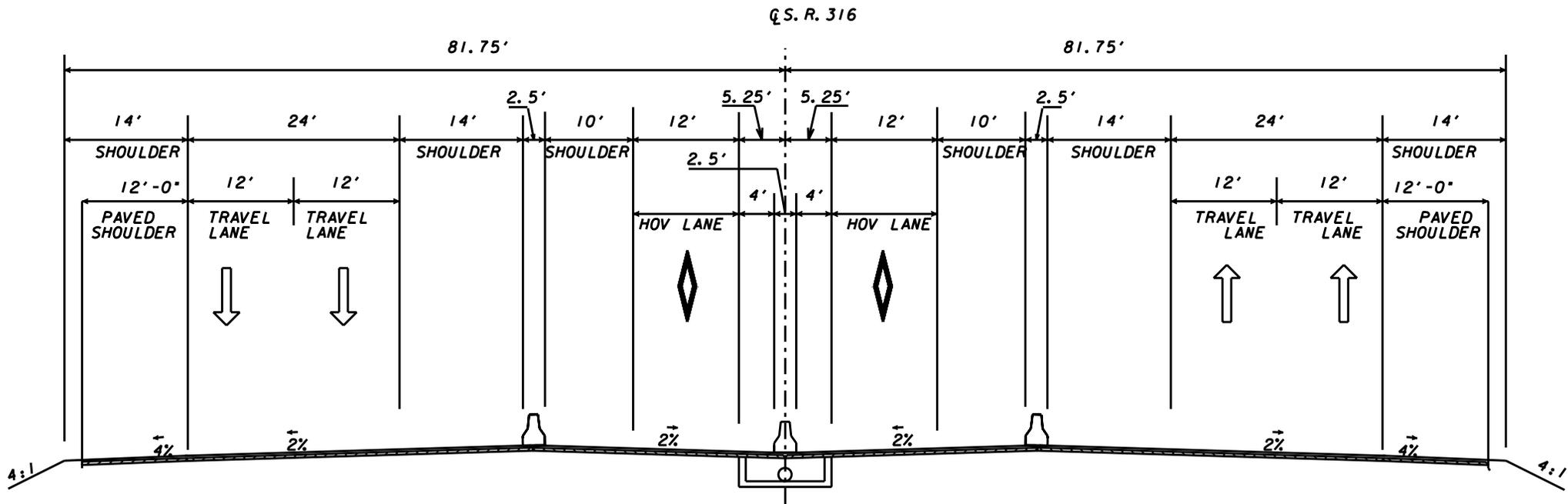
\*\* If the City asks and is granted Utility Aid then \$228,350.00 needs to be added to the Reimbursable Amount.

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

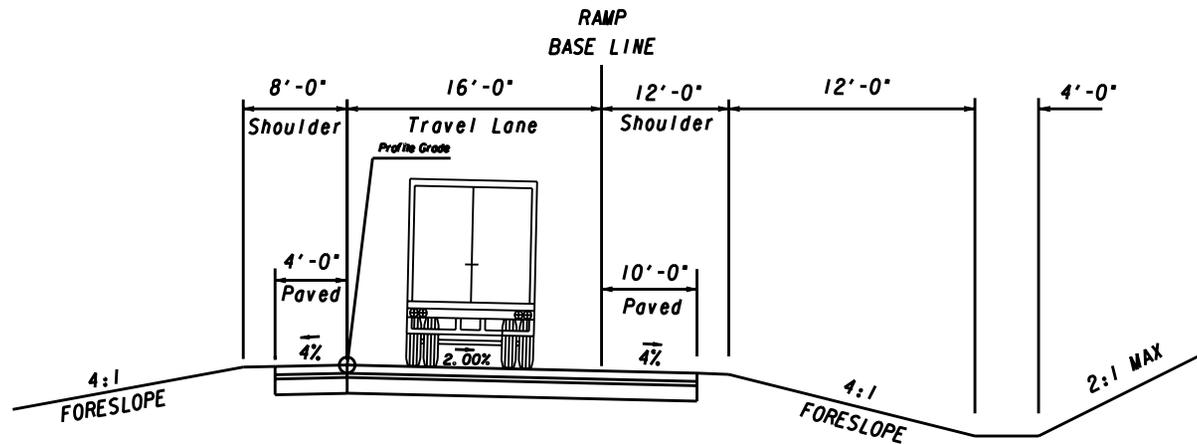
RAF

C: Jeff Baker, State Utilities Engineer (email only)  
Angle Robinson, Office of Financial Management (email only)  
Chris Dills, Area Engineer (email only)  
File

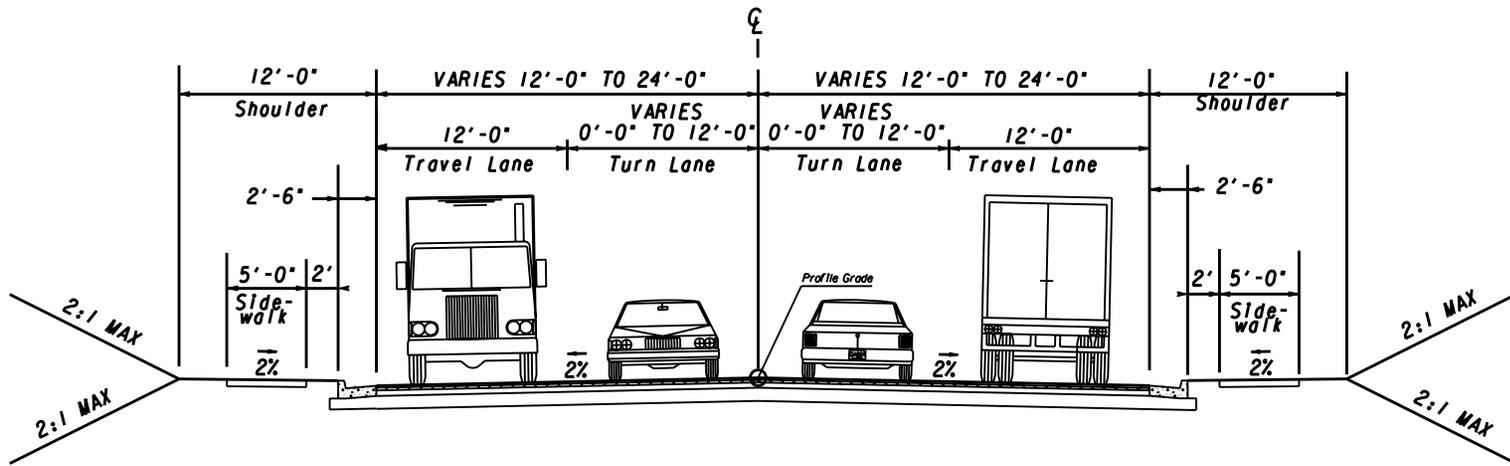
**ATTACHMENT 2**  
**TYPICAL SECTIONS**



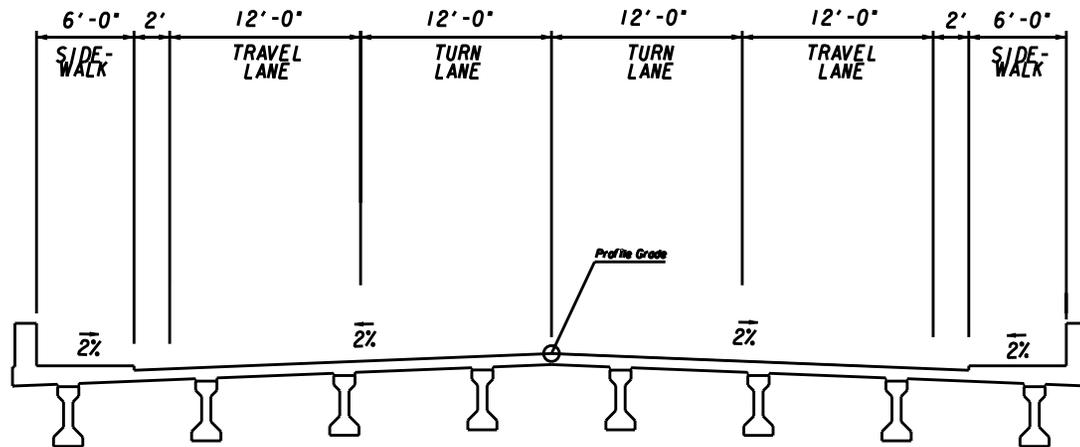
FUTURE TYPICAL SECTION S. R. 316 (BARRIER SEPERATED H. O. V)  
(FOR INFORMATION PURPOSE ONLY)



TYPICAL SECTION PROPOSED RAMPS



TYPICAL SECTION PROPOSED SR 81



TYPICAL SECTION PROPOSED BRIDGE SR 81

**ATTACHMENT 3**  
**APPROVED JUSTIFICATION STATEMENT**

**Project Justification Statement**  
**Grade separation of SR 316 @ SR 81**  
**Barrow County PI: 0008429**

SR 316 is an important regional roadway in Barrow County and is functionally classified as a Rural Principal Arterial. In the project study area SR 316 carries two through lanes, one exclusive left turn lane, and one right turn lane in each direction. The existing intersection of SR 81 with SR 316 is signalized. SR 81 runs in the north-south direction and is functionally classified as a Rural Major Collector. It provides one through lane, an exclusive left-turn lane, and a channelized right turn lane in each direction.

Historical crash data was obtained for the latest available 3 years (2007–2009) for SR 316. The prominent types of crashes along SR 316 are “rear end”, “angle”, and “struck object” collisions, which is indicative of congestion and high turning movements at the intersection. The crash rates for SR 316 are 544, 510, and 640 for the years 2007-2009 respectively. The statewide crash rates for 2007-2009 on a similarly classified corridor are 145, 146, and 141. The data shows that the overall crash rates exceed the statewide averages for all three years.

A continuing level of growth is predicted throughout the study area. Design traffic data shows an anticipated growth in ADT on SR 316 from 27,200 (2011) to 48,350 by the design year 2040. Similarly, ADT on SR 81 is anticipated to increase from 15,900 (2011) to 28,300 by the design year 2040. The intersection of SR 316/SR 81 is operating at LOS “C” during AM and PM peak hours (2011). In a no build scenario in 2040, the design year, the intersection of SR 316 at SR 81 will operate at an overall LOS of “F” during both AM and PM peak hours. The goal of the project is to reduce crash frequency and to provide operational improvements to the intersection of SR 316 at SR 81.

**ATTACHMENT 4**  
**ALTERNATIVE IMPACT MATRIX ANALYSIS**

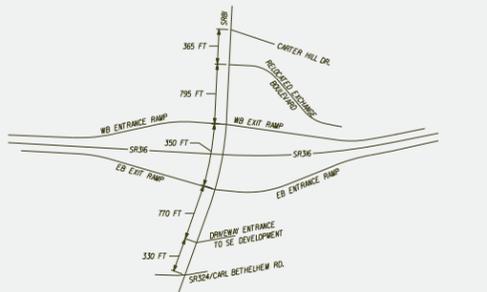
**Impacts of Proposed Interchange Alternatives For SR-316/SR-81**

Impacts on Elements	Alternatives							Remarks
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	
<b>Description</b>	Diamond interchange with the ramp head spacing set at 1,000 feet	Partial clover leaf interchange with continuous flowing loops of 30 mph design speed	Partial cloverleaf interchange with diamond ramps providing turn movements from SR 81 and two loop ramps with design speed of 35 mph	Combination of a diamond and partial clover leaf interchange with a loop ramp providing EB turn movements from SR 316	Single Point Urban Interchange (SPUI)	Compressed Diamond interchange with the ramp head spacing set at 750 feet	Tight Urban Diamond interchange with the ramp head spacing set at 350 feet	
<b>Reconstruction</b>	SR 81 = 0.87 Miles	SR 81 = 0.88 Miles	SR 81 = 0.88 Miles	SR 81 = 0.88 Miles	SR 81 = 0.54 Miles	SR 81 = 0.54 Miles	SR 81 = 0.54 Miles	Alt. #5, 6, and 7 require the least reconstruction
<b>Proposed Lane Configuration of SR 81</b>	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	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	
<b>Right-of-Way</b>	Entire Taking = 3 Parcels Strip Taking = 12 Parcels  Total Area = 50.6 Acres	Entire Taking = 5 Parcels Strip Taking = 9 Parcels  Total Area = 33.8 Acres	Entire Taking = 4 Parcels Strip Taking = 10 Parcels  Total Area = 44.1 Acres	Entire Taking = 4 Parcels Strip Taking = 6 Parcels  Total Area = 38.3 Acres	Entire Taking = 2 Parcel Strip Taking = 10 Parcels  Total Area = 16 Acres	Entire Taking = 4 Parcels Strip Taking = 8 Parcels  Total Area = 46.1 Acres	Entire Taking = 3 Parcels Strip Taking = 9 Parcels  Total Area = 19 Acres	Alternative 5 has the least ROW acquisition.
<b>Displacements</b>	Residential = 5 Commercial = 0	Residential = 3 Commercial = 1	Residential = 4 Commercial = 2	Residential = 3 Commercial = 0	Residential = 3 Commercial = 0	Residential = 3 Commercial = 0	Residential = 3 Commercial = 0	Alternatives 4-7 have least amount of displacement.
<b>2040 Design Year Level of Service</b>	LOS B or Better	LOS B or Better	LOS B or Better	LOS B or Better	LOS D	LOS C	LOS C or Better	
<b>Utilities</b>	1. Gas 2. Water 3. Sanitary Sewer 4. Telecommunications	1. Gas 2. Water 3. Sanitary Sewer 4. Telecommunications	1. Gas 2. Water 3. Sanitary Sewer 4. Telecommunications	1. Gas 2. Water 3. Sanitary Sewer 4. Telecommunications	1. Gas 2. Water 3. Sanitary Sewer 4. Telecommunications	1. Gas 2. Water 3. Sanitary Sewer 4. Telecommunications	1. Gas 2. Water 3. Sanitary Sewer 4. Telecommunications	Same
<b>Historic Property</b>	None	None	None	None	None	None	None	Same
<b>Contaminated Areas</b>	1. Shell Gas Station 2. BP Gas Station	1. Shell Gas Station 2. BP Gas Station	1. Shell Gas Station 2. BP Gas Station	1. Shell Gas Station 2. BP Gas Station	1. Shell Gas Station 2. BP Gas Station	1. Shell Gas Station 2. BP Gas Station	1. Shell Gas Station 2. BP Gas Station	Same
<b>Proposed Development in the NE Quadrant</b>	Impacts the development	Accommodates the development	Accommodates the development	Accommodates the development	Accommodates the development	Accommodates the development	Accommodates the development	Only Alternative 1 impacts the development.
<b>Proposed Development in the SE Quadrant</b>	Impacts the development	Impacts the development	Impacts the development	Impacts the development	No Impacts to the development	No Impacts to the development	No Impacts to the development	Alternatives 5, 6, & 7 do not impact the development.
<b>Miscellaneous Items</b>	1. Moderate Open Water Impact 2. Minimal Stream Impact	1. Moderate Open Water Impact 2. Minimal Stream Impact	1. Significant Open Water Impact 2. Minimal Stream Impact	1. Significant Open Water Impact 2. Minimal Stream Impact	1. Minimal Open Water Impact 2. Minimal Stream Impact	1. Minimal Open Water Impact 2. Minimal Stream Impact	1. Minimal Open Water Impact 2. Minimal Stream Impact	Alternatives 1,2,5,6&7 have the minimal to moderate impact.
<b>2010 Construction Cost</b>	\$15.6 M	\$14.7 M	\$15.3 M	\$15.3 M	\$12.8 M	\$11.5 M	\$11.4 M	Alternative 7 has the least construction cost.
<b>ROW Cost</b>	\$10.2 M	\$9.3 M	\$12.1 M	\$7.7 M	\$3.6 M	\$5 M	\$3.9 M	Alternative 5 has the least ROW cost.
<b>Total Cost</b>	\$25.8 M	\$24.0 M	\$27.4 M	\$23.0 M	\$16.4 M	\$16.5 M	\$15.3 M	Alternative 7 has the least cost involved.

**Concept Alternative # 7 is recommended as the preferred alternative owing to its lowest overall cost, least displacements, and minimal impacts to open water.**

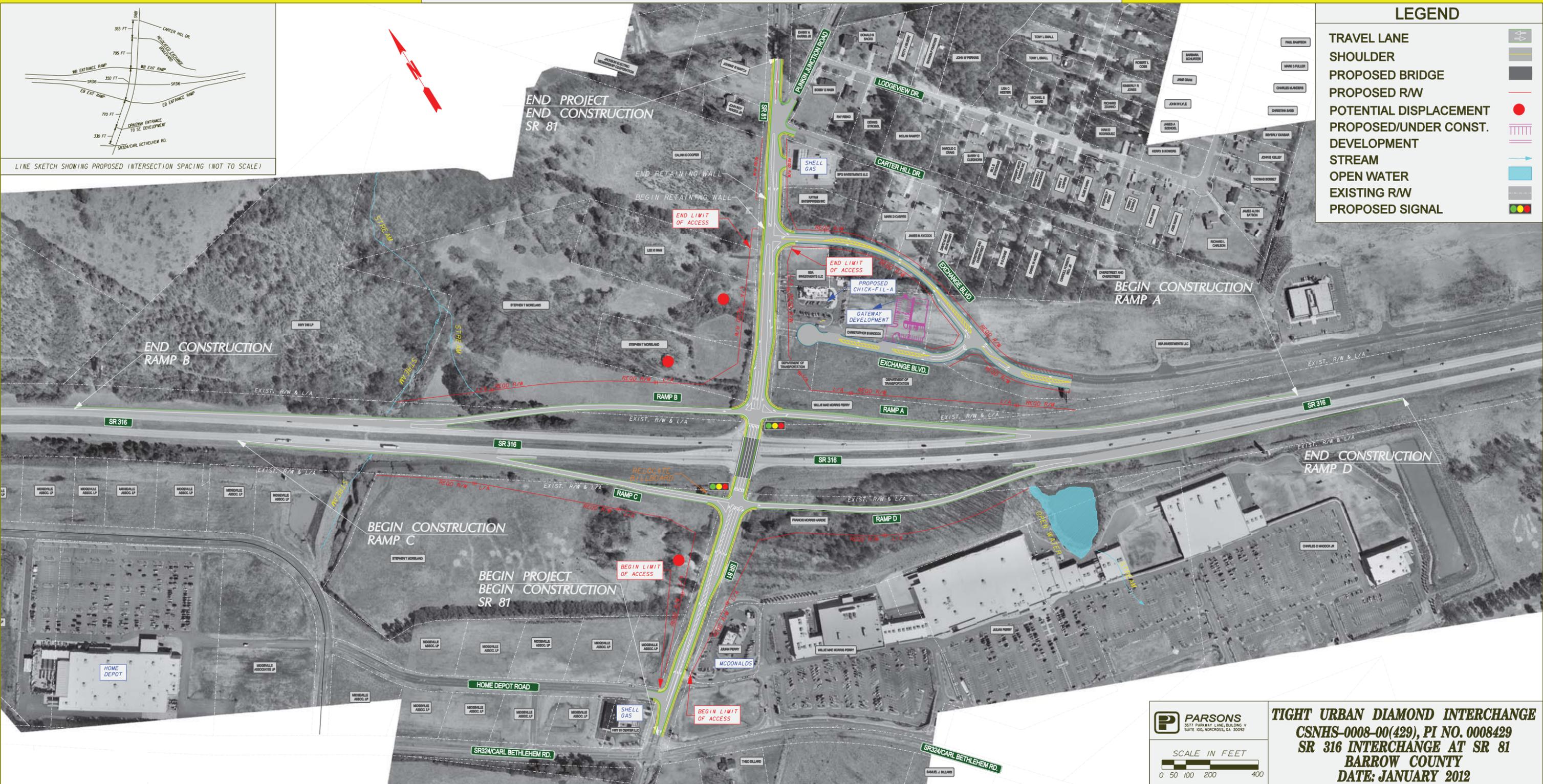
**ATTACHMENT 5**  
**PREFERRED CONCEPT LAYOUT**

# SR 316 INTERCHANGE AT SR 81



## LEGEND

- TRAVEL LANE
- SHOULDER
- PROPOSED BRIDGE
- PROPOSED R/W
- POTENTIAL DISPLACEMENT
- PROPOSED/UNDER CONST. DEVELOPMENT
- STREAM
- OPEN WATER
- EXISTING R/W
- PROPOSED SIGNAL



**PARSONS**  
 3577 PARKWAY LANE, BUILDING V  
 SUITE 400, NORCROSS, GA 30092

SCALE IN FEET  
 0 50 100 200 400

**TIGHT URBAN DIAMOND INTERCHANGE**  
 CSNHS-0008-00(429), PI NO. 0008429  
 SR 316 INTERCHANGE AT SR 81  
 BARROW COUNTY  
 DATE: JANUARY 2012

**ATTACHMENT 6**  
**CRASH SUMMARIES**

## CRASH SUMMARY

Historical crash data was obtained for the latest available 3 years (2006–2008) for both SR81 and SR 316. Within approximately 0.5 mile radius from the intersection, there were a total of 207 crashes including 129 crashes on SR 81 and 78 crashes on SR 316. For the crashes on SR 81, rear end collisions accounted for 55 percent while angle collisions accounted for 35 percent of all crashes. For the crashes on SR 316, rear end collisions accounted for 60 percent of the crashes while struck object collisions accounted for 23 percent of all crashes. Crash history by crash type for SR 81 and SR 316 are summarized in Tables 1 and 2, respectively.

<b>Table 1 Crash History by Crash Type (SR 81)</b>						
<b>Year</b>	<b>Rear End</b>	<b>Angle</b>	<b>Sideswipe</b>	<b>Struck Object</b>	<b>Head On</b>	<b>Total</b>
<b>2006</b>	27	14	1	4	2	48
<b>2007</b>	23	16	3	2	0	44
<b>2008</b>	21	15	0	0	1	37
<b>Total</b>	71	45	4	6	3	129
<b>%</b>	55%	35%	3%	5%	2%	100%

<b>Table 2 Crash History by Crash Type (SR 316)</b>						
<b>Year</b>	<b>Rear End</b>	<b>Angle</b>	<b>Sideswipe</b>	<b>Struck Object</b>	<b>Head On</b>	<b>Total</b>
<b>2006</b>	11	2	2	9	0	24
<b>2007</b>	20	0	2	4	1	27
<b>2008</b>	16	4	1	5	1	27
<b>Total</b>	47	6	5	18	2	78
<b>%</b>	60%	8%	6%	23%	3%	100%

Crash rates were calculated for SR 81 and SR 316 and were compared with statewide averages of state highways with the same functional classification. SR 81 is classified as a Rural Major Collector while SR 316 is classified as a Rural Principal Arterial. The crash data and comparison for SR 81 and SR 316 crash rates with the statewide averages are summarized in Tables 3 and 4, respectively.

Table 3 shows crash history and comparison with statewide averages for crashes that occurred on SR 81 within 0.5 mile north and south of this intersection. The historical crash data indicated that 48, 44, and 37 crashes occurred on SR 81 in 2006, 2007, and 2008, respectively. The data shows that the overall crash rates and injury rates exceed the statewide average significantly. The overall crash rates for 2006, 2007, and 2008 were 5.1 times, 4.5 times, and 3.8 times higher than the statewide average rates. A total of 65 injuries were reported for 2006, 2007, and 2008.

The injury rates for 2006, 2007, and 2008 were 5.7 times, 4 times, and 3 times higher than the statewide average rates. During the three year period, no fatalities occurred on SR 81.

<b>Table 3 Crash History and Comparison with Statewide Average (SR 81)</b>									
Year	No. of			All Crashes		Injuries		Fatalities	
	Crashes	Injuries	Fatalities	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average
<b>2006</b>	48	29	0	1043	203	630	110	0	3.56
<b>2007</b>	44	21	0	913	203	436	109	0	3.55
<b>2008</b>	37	15	0	735	194	298	100	0	3.39
<b>Total</b>	129	65	0						

Table 4 shows crash history and comparison with statewide averages for crashes that occurred on SR 316 within 0.5 mile east and west of this intersection. The historical crash data indicated that 24, 27, and 27 crashes occurred on SR 316 in 2006, 2007, and 2008, respectively. The data shows that the overall crash rates and injury rates exceed the statewide averages except for the injury rate for 2006. The overall crash rates for 2006, 2007, and 2008 were 2.2 time, 1.9 times, and 2 times higher than the statewide average rates. A total of 29 injuries and 1 fatality were reported for 2006,2007,and 2008. The injury rate for 2006 was 41% lower than the statewide average rate while the injury rates for both 2007 and 2008 were 1.7 times higher than the statewide average rates. A fatal crash occurred in 2007 and as a result, the fatality rate for 2007 was 5 times higher than the statewide average rates.

<b>Table 4 Crash History and Comparison with Statewide Average (SR 316)</b>									
Year	No. of			All Crashes		Injuries		Fatalities	
	Crashes	Injuries	Fatalities	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average	Rate (100MVM)	Statewide Average
<b>2006</b>	26	4	0	299	137	46	78	0	1.91
<b>2007</b>	25	12	1	276	145	133	79	11.05	2.21
<b>2008</b>	27	13	0	287	146	138	80	0	2.09
<b>Total</b>	78	29	1						

A detailed tabulation of crashes at this location is also included in the next pages. The historical crash data were categorized by crash location, either SR 81 or SR 316, which was evidenced by moving directions of the vehicles involved in each crash.

**CSNHS-0008-00(429) P.I. Number 0008429 Barrow County, SR 316 @ SR 81  
Crash Data for SR 81**

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
'61080267	3/13/2006	4:33 PM	Barrow	State Route	'008100	2.12				2	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Changing Lanes	Stopped
'62470197	6/1/2006	12:39 PM	Barrow	State Route	'008100	2.27				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Straight
'60310751	1/21/2006	11:53 AM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Wet	S	W	Straight	Straight
'60790522	2/23/2006	12:08 PM	Barrow	State Route	'008100	2.37	2	'041600		3	0	Head On	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	N	Straight	Stopped
'61570601	4/21/2006	7:12 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'61570596	4/20/2006	3:14 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Straight
'62120080	5/23/2006	6:09 AM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	N	Turning Left	Straight
'64360453	10/30/2006	10:23 AM	Barrow	State Route	'008100	2.37	2	'041600		2	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	W	Straight	Straight
'64870281	11/19/2006	9:06 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	S	S	Backing	Straight
'64870197	11/2/2006	11:45 AM	Barrow	State Route	'008100	2.37	2	'041600		1	0	Sideswipe - Opposite Direction	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	E	Straight	Straight
'63570095	8/23/2006	3:07 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'64360393	10/16/2006	7:21 AM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'64360372	10/5/2006	12:05 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	W	Straight	Turning Left
'62910137	7/4/2006	3:30 AM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Not A Collision With A Motor Vehicle	Off Roadway	Other Fixed Object	Dark-Not Lighted	Dry	S		Straight	
'62900328	7/22/2006	2:22 PM	Barrow	State Route	'008100	2.37	2	'041600		5	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	N	N	Straight	Stopped
'62900284	7/5/2006	4:24 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'62470211	6/5/2006	5:58 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Shoulder	Motor Vehicle in Motion	Dawn	Dry	S	S	Straight	Stopped
'62470210	6/5/2006	5:22 PM	Barrow	State Route	'008100	2.37	2	'041600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'60790463	2/2/2006	9:11 AM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion	Dawn	Dry	S	S	Turning Right	Turning Right
'60310722	1/13/2006	9:35 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Parked Motor Vehicle	Daylight	Dry	N	N	Turning Right	Turning Right
'60310773	1/2/2006	6:29 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Wet	S	N	Turning Left	Straight
'62770858	7/28/2006	8:53 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Right
'63570093	8/22/2006	9:33 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'64360419	10/21/2006	5:36 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Left	Changing Lanes
'64360397	10/16/2006	8:34 PM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Wet	N	W	Turning Left	Straight
'64340264	9/2/2006	10:26 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Not A Collision With A Motor Vehicle	Off Roadway	Other Non-Collision	Dark-Not Lighted	Dry	W	N	Straight	Turning Left
'64340263	9/2/2006	10:26 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	N	N	Turning Left	Turning Left
'63550415	8/26/2006	6:38 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	W	Turning Left	Straight
'63550359	8/1/2006	4:35 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Right

**CSNHS-0008-00(429) P.I. Number 0008429 Barrow County, SR 316 @ SR 81  
Crash Data for SR 81**

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
'63920165	9/14/2006	10:39 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	N	Straight	Straight
'60310759	1/24/2006	4:49 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'64870240	11/14/2006	2:32 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Right
'65300082	12/19/2006	6:10 PM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	S	E	Turning Left	Straight
'64870230	11/9/2006	6:26 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	S	S	Backing	Stopped
'64360423	10/23/2006	8:07 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Right
'62470200	6/2/2006	4:44 PM	Barrow	State Route	'008100	2.61	1	'031600		4	0	Head On	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	W	Turning Left	Straight
'62900356	7/31/2006	2:10 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'62120024	5/5/2006	7:45 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Turning Left
'61570542	4/3/2006	12:45 PM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	S	Straight	Straight
'62900333	7/24/2006	8:38 AM	Barrow	State Route	'008100	2.73		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Turning Right	Turning Right
'62120028	5/5/2006	6:12 PM	Barrow	State Route	'008100	2.79		'		4	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'64870319	11/29/2006	2:49 PM	Barrow	State Route	'008100	2.84		'		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	S	S	Straight	Straight
'62900320	7/18/2006	9:44 AM	Barrow	State Route	'008100	2.85		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'61080245	3/1/2006	7:41 AM	Barrow	State Route	'008100	2.87	2	'029700		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Turning Right
'62870065	7/5/2006	10:52 AM	Barrow	State Route	'008100	2.88	2	'010600		0	0	Not A Collision With A Motor Vehicle	Off Roadway	Other Post	Daylight	Dry	N		Straight	
'63550414	8/26/2006	4:08 PM	Barrow	State Route	'008100	2.88	2	'010600		2	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'63550411	8/24/2006	3:47 PM	Barrow	State Route	'008100	2.9		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'60790501	2/17/2006	7:55 AM	Barrow	State Route	'008100	3.08		'		0	0	Not A Collision With A Motor Vehicle	On Roadway	Deer	Daylight	Wet	S		Straight	
'73450314	7/25/2007	9:07 PM	Barrow	State Route	'008100	2.27		'		0	0	Not A Collision With A Motor Vehicle	On Roadway	Deer	Dark-Lighted	Dry	N		Straight	
'71330528	3/14/2007	11:23 AM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'72290233	5/19/2007	6:55 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Roadway	Motor Vehicle in Motion - In Other Roadway	Daylight	Dry	S	N	Turning Right	Turning Left
'74710521	10/13/2007	4:45 PM	Barrow	State Route	'008100	2.37	2	'041600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'74710545	10/21/2007	2:13 AM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	N	N	Straight	Stopped
'73450323	7/28/2007	7:58 AM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Not A Collision With A Motor Vehicle	Off Roadway	Tree	Daylight	Wet	S		Parked	
'70350223	1/7/2007	6:00 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Other Object (Not Fixed)	Dusk	Wet	N	N	Straight	Stopped
'70890256	2/24/2007	8:31 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Roadway	Motor Vehicle in Motion - In Other Roadway	Dark-Lighted	Dry	W	N	Straight	Straight

**CSNHS-0008-00(429) P.I. Number 0008429 Barrow County, SR 316 @ SR 81  
Crash Data for SR 81**

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
'70890213	2/10/2007	3:26 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	W	Straight	Turning Left
'75400034	11/14/2007	3:53 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Sideswipe - Opposite Direction	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	E	Turning Left	Stopped
'74710527	10/15/2007	3:32 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'72290267	5/27/2007	5:10 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Sideswipe - Opposite Direction	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	W	Straight	Straight
'71330542	3/20/2007	3:49 PM	Barrow	State Route	'008100	2.57		'	2	0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	N	Turning Left	Straight
'75820489	12/13/2007	4:06 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Turning Right	Turning Right
'71330557	3/26/2007	9:13 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Angle	Off Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Straight
'72880414	6/3/2007	2:35 PM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	S	Straight	Straight
'75400038	11/15/2007	5:02 AM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	N	W	Turning Left	Straight
'70890232	2/18/2007	1:21 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'70350226	1/8/2007	2:26 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Turning Right	Turning Right
'70310280	1/23/2007	7:47 PM	Barrow	State Route	'008100	2.61	1	'031600		3	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	W	N	Straight	Straight
'73430418	1/16/2007	7:08 AM	Barrow	State Route	'008100	2.61	1	'031600		6	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Wet	S	E	Turning Left	Straight
'72880488	6/26/2007	12:06 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Backing	Turning Right
'74200217	9/13/2007	4:50 PM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	S	S	Turning Right	Turning Right
'75400095	11/29/2007	10:40 AM	Barrow	State Route	'008100	2.61	1	'031600		2	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Right
'75400086	11/27/2007	5:53 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dusk	Dry	S	S	Straight	Straight
'73800266	8/30/2007	10:49 AM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Left
'72880481	6/23/2007	3:11 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Right
'73800252	8/22/2007	1:32 PM	Barrow	State Route	'008100	2.61	1	'031600		2	0	Sideswipe - Opposite Direction	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	E	Turning Left	Straight
'73800242	8/19/2007	1:09 AM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	S	E	Straight	Straight
'73800240	8/18/2007	5:04 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'70890221	2/14/2007	6:35 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dawn	Wet	S	S	Turning Right	Turning Right
'74200242	9/21/2007	9:06 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	S	S	Straight	Straight
'74200240	9/21/2007	1:09 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Right
'74200208	9/11/2007	3:56 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Turning Right	Turning Right
'73590225	7/29/2007	10:30 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Wet	E	S	Backing	Straight
'72880424	6/6/2007	7:05 AM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped

**CSNHS-0008-00(429) P.I. Number 0008429 Barrow County, SR 316 @ SR 81  
Crash Data for SR 81**

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
'72290207	5/14/2007	2:56 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	N	Straight	Straight
'74710560	10/25/2007	4:52 PM	Barrow	State Route	'008100	2.65		'		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	N	Turning Left	Straight
'75400029	11/13/2007	8:41 AM	Barrow	State Route	'008100	2.68		'		0	0	Angle	On Shoulder	Motor Vehicle in Motion	Dawn	Dry	S	S	Straight	Stopped
'74710539	10/19/2007	5:20 PM	Barrow	State Route	'008100	2.72		'		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Straight
'72290198	5/11/2007	9:13 AM	Barrow	State Route	'008100	2.87	2	'029700		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Straight
'70350263	1/23/2007	8:19 PM	Barrow	State Route	'008100	2.87	2	'029700		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	S	S	Straight	Stopped
'70350283	1/31/2007	2:35 PM	Barrow	State Route	'008100	2.87	2	'029700		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	N	Turning Left	Straight
'74710484	10/2/2007	8:05 AM	Barrow	State Route	'008100	2.87	2	'029700		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Left	Straight
'81180618	3/12/2008	1:59 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	N	Straight	Turning Left
'81180660	3/24/2008	7:56 AM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'82100484	5/31/2008	3:51 PM	Barrow	State Route	'008100	2.37	2	'041600		2	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	S	Turning Left	Straight
'81180674	3/27/2008	1:01 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Straight
'84170064	9/30/2008	11:00 AM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	S	Straight	Stopped
'85510346	12/27/2008	2:37 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Wet	S	E	Straight	Straight
'84970419	11/5/2008	3:40 PM	Barrow	State Route	'008100	2.42		'		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Straight
'84170025	9/9/2008	6:35 PM	Barrow	State Route	'008100	2.52		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Straight
'80910027	2/9/2008	3:38 PM	Barrow	State Route	'008100	2.56		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'81630105	4/15/2008	7:48 AM	Barrow	State Route	'008100	2.59		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Straight
'80910017	2/6/2008	6:21 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Wet	S	S	Turning Right	Turning Right
'80910069	2/24/2008	12:04 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Straight	Stopped
'84170062	9/29/2008	4:55 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'84970479	11/20/2008	7:55 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Left	Turning Right
'84970458	11/14/2008	7:50 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Head On	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Wet	S	N	Turning Left	Straight
'84970428	11/7/2008	2:45 PM	Barrow	State Route	'008100	2.61	1	'031600		2	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	W	Turning Left	Straight
'83560289	8/20/2008	7:00 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	N	S	Turning Left	Straight
'80330258	1/24/2008	9:15 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Right
'80330251	1/21/2008	7:55 AM	Barrow	State Route	'008100	2.61	1	'031600		2	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	W	Turning Left	Straight
'82520267	6/17/2008	8:05 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	S	Straight	Straight

**CSNHS-0008-00(429) P.I. Number 0008429 Barrow County, SR 316 @ SR 81  
Crash Data for SR 81**

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
'82520259	6/17/2008	8:08 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion - In Other Roadway	Daylight	Dry	E	N	Straight	Straight
'82520228	6/4/2008	8:47 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Right
'82860034	7/2/2008	8:20 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Right
'82100470	5/27/2008	6:25 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dawn	Dry	S	S	Turning Right	Turning Right
'84630046	10/7/2008	3:44 PM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Stopped	Stopped
'81180648	3/21/2008	6:04 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	N	Turning Right	Turning Right
'81180585	3/1/2008	1:33 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Turning Right
'80910060	2/20/2008	5:06 PM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	N	W	Turning Left	Straight
'84170037	9/15/2008	5:43 PM	Barrow	State Route	'008100	2.62	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Turning Right	Stopped
'85510344	12/26/2008	6:56 PM	Barrow	State Route	'008100	2.62	1	'031600		5	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Wet	W	N	Straight	Straight
'82860051	7/9/2008	5:53 PM	Barrow	State Route	'008100	2.68		'		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dusk	Wet	W	N	Turning Left	Straight
'84970405	11/2/2008	6:43 PM	Barrow	State Route	'008100	2.68		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	N	S	Turning Left	Changing Lanes
'84970429	11/7/2008	3:21 PM	Barrow	State Route	'008100	2.86		'		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	S	Straight	Stopped
'82860045	7/6/2008	3:48 PM	Barrow	State Route	'008100	2.87	2	'029700		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	S	S	Straight	Stopped
'84790043	9/20/2008	11:39 AM	Barrow	State Route	'008100	2.88	2	'010600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	S	N	Turning Left	Turning Right
'84970480	11/20/2008	5:33 PM	Barrow	State Route	'008100	2.88	2	'010600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dusk	Dry	S	S	Turning Left	Straight
'81630076	4/4/2008	6:23 PM	Barrow	State Route	'008100	2.97		'		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dusk	Wet	S	S	Straight	Straight

## CSNHS-0008-00(429) P.I. Number 0008429 Barrow County, SR 316 @ SR 81

## 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
'61120323	3/29/2006	7:02 PM	Barrow	State Route	'008100	2.37	2	'041600		1	0	Sideswipe - Opposite Direction	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	E	W	Turning Left	Backing
'62120015	5/2/2006	4:18 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Straight
'64870293	11/22/2006	6:55 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Not A Collision With A Motor Vehicle	On Roadway	Animal	Dark-Not Lighted	Dry	E		Straight	
'64870198	11/3/2006	9:58 AM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'60790506	2/18/2006	10:23 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	W	W	Stopped	Straight
'61080286	3/26/2006	2:25 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'61730378	3/29/2006	5:10 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Wet	W	W	Straight	Straight
'62130134	5/31/2006	1:24 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Not A Collision With A Motor Vehicle	On Roadway	Other Fixed Object	Daylight	Dry	E		Straight	
'64360394	10/16/2006	7:32 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	W	W	Straight	Stopped
'64360370	10/3/2006	5:24 PM	Barrow	State Route	'008100	2.61	1	'031600		2	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	W	Turning Left	Straight
'63550397	8/17/2006	1:50 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Passing	Straight
'62900340	7/26/2006	9:35 PM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	E	E	Straight	Straight
'64870322	11/30/2006	6:20 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Not A Collision With A Motor Vehicle	Off Roadway	Highway Traffic Sign Post	Dawn	Wet	W		Straight	
'64870243	11/12/2006	7:32 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	E	E	Changing Lanes	Straight
'60790519	2/23/2006	6:10 AM	Barrow	State Route	'031600	4.34				0	0	Not A Collision With A Motor Vehicle	Off Roadway	Embankment	Dark-Not Lighted	Wet	W		Straight	
'63550407	8/21/2006	8:19 AM	Barrow	State Route	'031600	4.41				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Straight
'62120045	5/10/2006	4:50 PM	Barrow	State Route	'031600	4.9				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	E	E	Straight	Stopped
'60790529	2/25/2006	4:02 PM	Barrow	State Route	'031600	4.91				0	0	Not A Collision With A Motor Vehicle	On Roadway	Deer	Daylight	Wet	E		Straight	
'63890097	9/26/2006	7:50 PM	Barrow	State Route	'031600	4.91				0	0	Not A Collision With A Motor Vehicle	On Shoulder	Deer	Dark-Not Lighted	Dry	W		Straight	
'64870324	11/30/2006	7:54 PM	Barrow	State Route	'031600	5.03				0	0	Not A Collision With A Motor Vehicle	On Roadway	Other Fixed Object	Dark-Not Lighted	Dry	E		Straight	
'64870325	11/30/2006	7:54 PM	Barrow	State Route	'031600	5.03				0	0	Not A Collision With A Motor Vehicle	On Roadway	Other Fixed Object	Dark-Not Lighted	Dry	E		Straight	
'63890051	9/8/2006	3:32 PM	Barrow	State Route	'031600	5.03				0	0	Not A Collision With A Motor Vehicle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'64360430	10/24/2006	1:15 PM	Barrow	State Route	'031600	5.03				0	0	Sideswipe - Same Direction	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Changing Lanes	Straight
'62900352	7/29/2006	5:53 PM	Barrow	State Route	'031600	5.34				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'71860500	4/15/2007	6:30 AM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dawn	Wet	E	E	Straight	Stopped
'71860531	4/28/2007	2:07 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Sideswipe - Same Direction	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Turning Left	Straight
'70350213	1/6/2007	12:59 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Wet	W	W	Straight	Straight
'75760024	11/28/2007	4:09 AM	Barrow	State Route	'008100	2.61	1	'031600		0	1	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	W	W	Straight	Straight
'72880432	6/9/2007	4:07 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'74710540	10/19/2007	5:30 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'70890193	2/2/2007	5:16 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Other Object (Not Fixed)	Daylight	Dry	W	W	Turning Right	Stopped
'73450307	7/24/2007	3:46 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Changing Lanes	Straight
'73450261	7/6/2007	1:02 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Straight
'72880500	6/29/2007	6:33 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'75400053	11/18/2007	8:34 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'73800248	8/21/2007	11:58 AM	Barrow	State Route	'008100	2.61	1	'031600		3	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Changing Lanes	Stopped

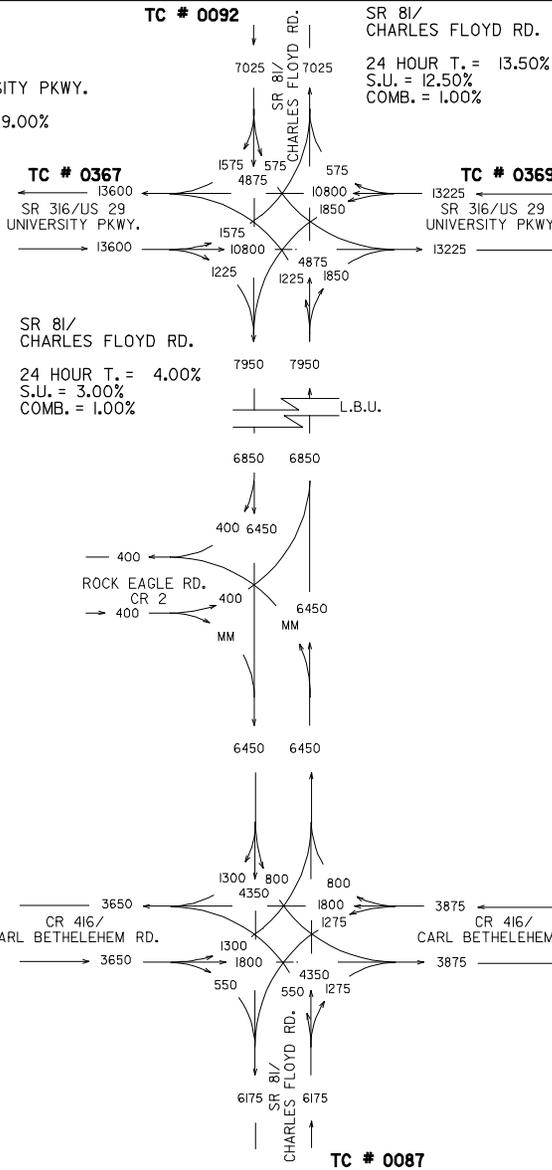
## CSNHS-0008-00(429) P.I. Number 0008429 Barrow County, SR 316 @ SR 81

## 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
'73800247	8/21/2007	11:41 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Straight
'74200223	5/9/2007	7:24 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	W	W	Straight	Stopped
'74200216	9/13/2007	4:30 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	W	W	Straight	Straight
'74200204	9/10/2007	3:57 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Sideswipe - Same Direction	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Straight
'74200180	9/6/2007	5:31 AM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	W	W	Straight	Straight
'74200170	9/3/2007	1:38 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Turning Right	Turning Right
'75400022	11/9/2007	12:07 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'71310286	2/18/2007	7:48 AM	Barrow	State Route	'008100	2.61	1	'031600		5	0	Head On	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	W	Turning Left	Turning Left
'75820520	12/21/2007	12:33 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	W	W	Straight	Stopped
'72880497	6/28/2007	10:20 PM	Barrow	State Route	'031600	4.51				0	0	Not A Collision With A Motor Vehicle	Off Roadway	Guardrail End	Dark-Not Lighted	Dry	E		Straight	
'75400005	11/2/2007	3:34 PM	Barrow	State Route	'031600	4.54				0	0	Not A Collision With A Motor Vehicle	On Roadway	Animal	Daylight	Dry	E		Straight	
'71330548	3/22/2007	2:04 PM	Barrow	State Route	'031600	4.59				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'74710575	10/28/2007	7:33 PM	Barrow	State Route	'031600	4.75				3	0	Rear End	On Roadway	Motor Vehicle in Motion	Dark-Not Lighted	Dry	E	E	Straight	Straight
'74200248	9/28/2007	3:08 AM	Barrow	State Route	'031600	5.16				0	0	Not A Collision With A Motor Vehicle	On Roadway	Deer	Dark-Not Lighted	Dry	W		Straight	
'75400091	11/28/2007	10:02 PM	Barrow	State Route	'031600	5.34				0	0	Not A Collision With A Motor Vehicle	On Roadway	Deer	Dark-Not Lighted	Dry	N		Straight	
'84170015	9/5/2008	9:00 PM	Barrow	State Route	'008100	2.37	2	'041600		0	0	Angle	On Roadway	Motor Vehicle in Motion	Dark-Lighted	Dry	E	E	Straight	Turning Left
'80910053	2/17/2008	5:04 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Wet	W	W	Straight	Straight
'81180605	3/7/2008	1:41 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'81180662	3/24/2008	3:21 PM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Angle	Off Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'81630116	4/18/2008	2:52 PM	Barrow	State Route	'008100	2.61	1	'031600		3	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	W	Turning Left	Straight
'80330246	1/19/2008	2:26 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Icy	E	E	Straight	Straight
'80330228	1/14/2008	8:30 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Turning Right	Stopped
'84970483	11/21/2008	2:06 PM	Barrow	State Route	'008100	2.61				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Turning Right	Turning Right
'84970482	11/21/2008	8:18 AM	Barrow	State Route	'008100	2.61				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Turning Right	Turning Right
'80330261	1/25/2008	5:00 PM	Barrow	State Route	'008100	2.61	1	'031600		1	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'80330247	1/19/2008	5:54 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Head On	On Roadway	Motor Vehicle in Motion	Dawn	Wet	W	E	Turning Right	Turning Left
'83560252	8/3/2008	3:18 PM	Barrow	State Route	'008100	2.61	1	'031600		4	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Straight
'82860057	7/12/2008	10:45 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'81630107	4/16/2008	5:40 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Turning Right	Turning Right
'84170011	9/5/2008	3:14 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Straight	Stopped
'84630073	10/21/2008	3:32 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
'84630044	10/7/2008	7:16 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Dawn	Dry	W	W	Straight	Stopped
'83560315	8/26/2008	8:24 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Not A Collision With A Motor Vehicle	Off Roadway	Other Post	Dark-Not Lighted	Wet	E		Changing Lanes	
'83560312	8/26/2008	11:43 AM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Not A Collision With A Motor Vehicle	Off Roadway	Ditch	Daylight	Wet	W		Straight	
'83560296	8/22/2008	5:44 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Sideswipe - Same Direction	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Changing Lanes	Straight
'81630093	4/11/2008	2:34 PM	Barrow	State Route	'008100	2.61	1	'031600		0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Turning Right	Turning Right
'85510302	12/12/2008	6:00 PM	Barrow	State Route	'008100	2.62	1	'031600		2	0	Rear End	On Roadway	Motor Vehicle in Motion	Dusk	Dry	E	E	Straight	Stopped
'81630106	4/16/2008	5:20 AM	Barrow	State Route	'031600	4.75				0	0	Not A Collision With A Motor Vehicle	Off Roadway	Guardrail Face	Dark-Not Lighted	Dry	W		Straight	
'81630109	4/17/2008	5:58 PM	Barrow	State Route	'031600	4.86				0	0	Rear End	On Roadway	Motor Vehicle in Motion	Daylight	Dry	W	W	Straight	Stopped
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'82520234	6/6/2008	6:35 PM	Barrow	State Route	'031600	5.03				0	0	Angle	On Roadway	Motor Vehicle in Motion	Daylight	Dry	E	E	Changing Lanes	Straight
'80530570	3/1/2008	8:28 PM	Barrow	State Route	'031600	5.14				1	0	Not A Collision With A Motor Vehicle	Off Roadway	Embankment	Dark-Not Lighted	Dry	E		Straight	

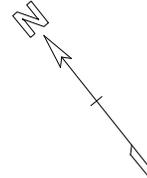
**ATTACHMENT 7**  
**TRAFFIC DIAGRAMS**

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S.U. = 4.00%  
COMB. = 5.00%



US 316/UNIVERSITY PKWY.  
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COMB. = 5.25%

BARROW COUNTY



EXISTING 2011 ADT

CSNHS-0008-00(429)  
P.I.# 0008429  
BARROW COUNTY  
SR 316/US 29 @  
CR 81/  
CHARLES FLOYD RD.  
EXISTING 2011 ADT

NOT TO SCALE

MTW  
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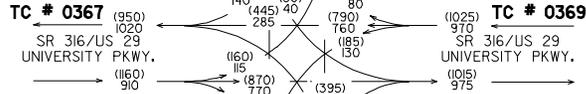
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SR 81/CHARLES FLOYD RD.

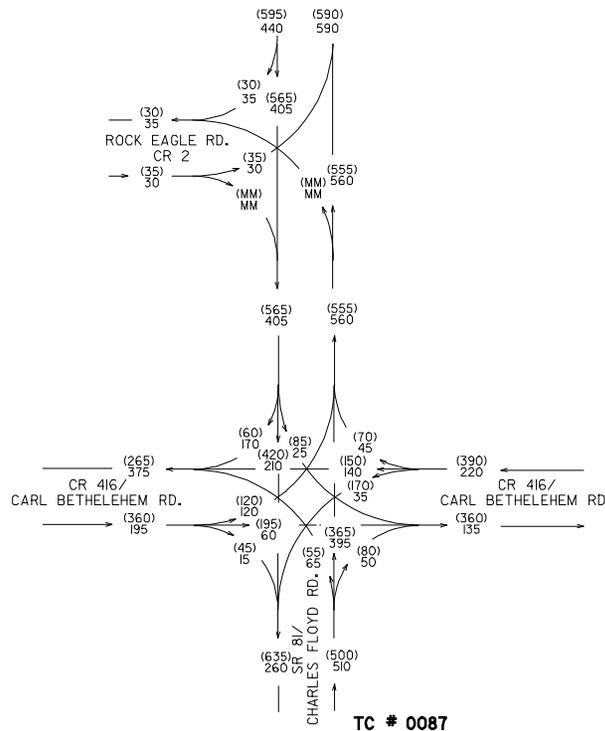
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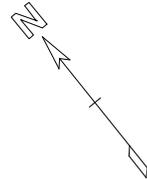
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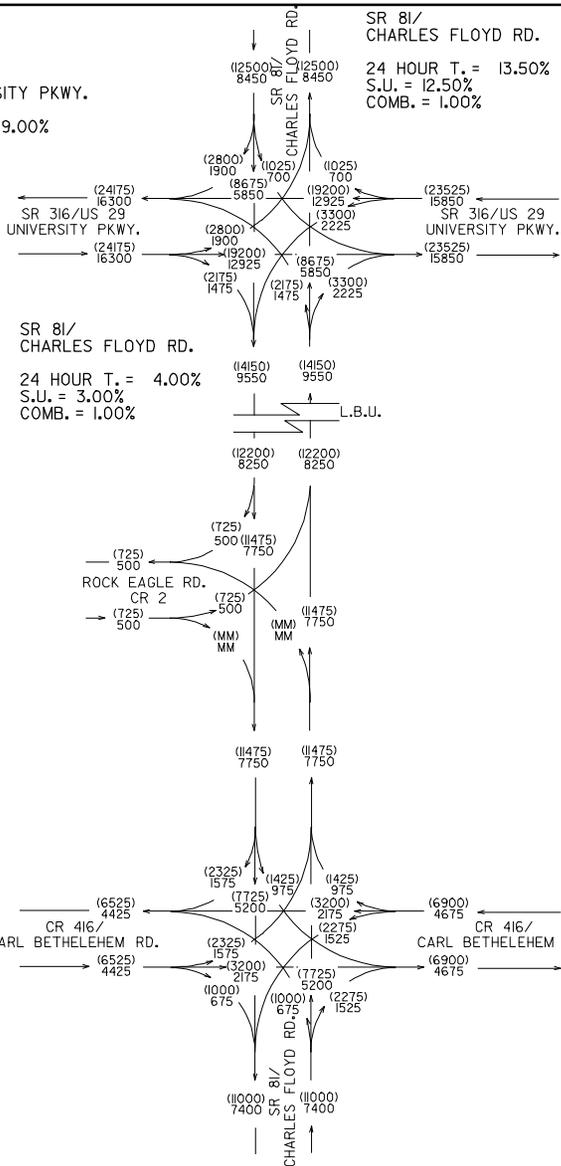
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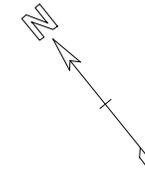
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CHARLES FLOYD RD.

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BARROW COUNTY



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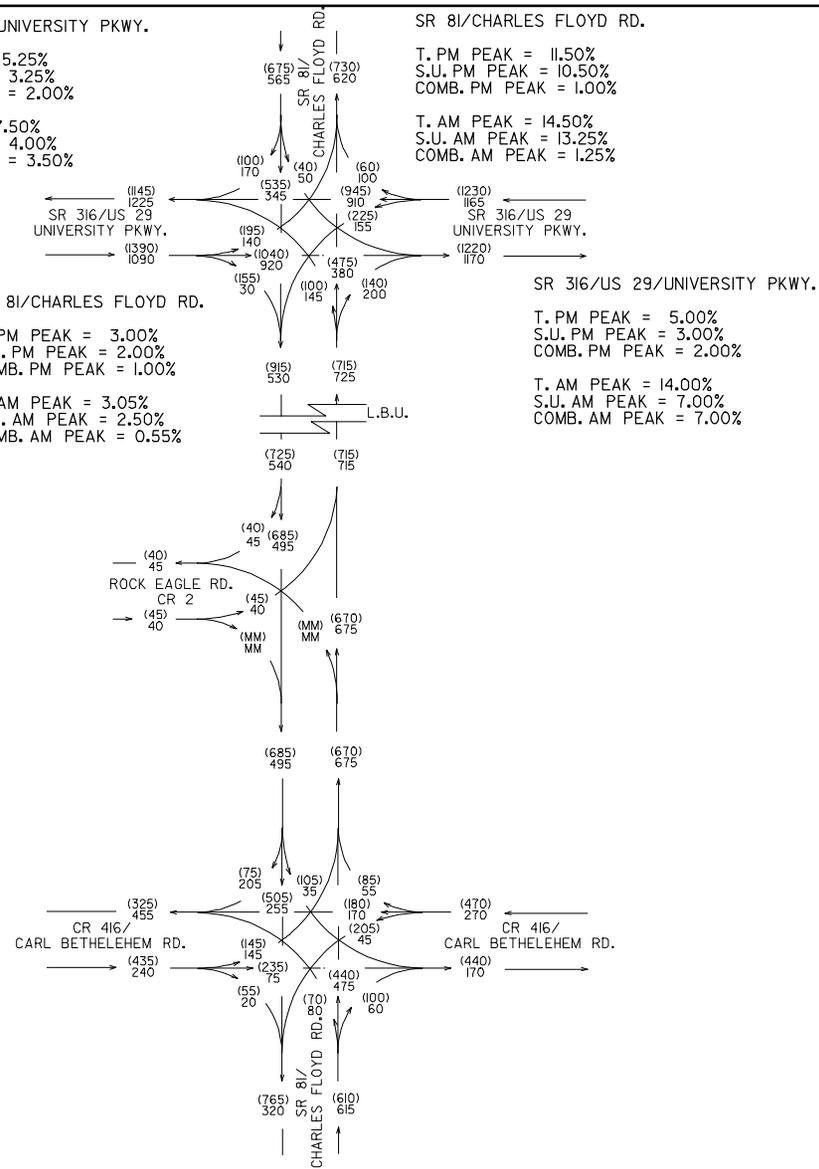
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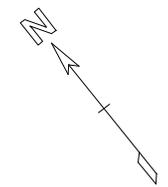
GEORGIA DEPARTMENT OF TRANSPORTATION  
 OFFICE OF PLANNING



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BARROW COUNTY



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 P.I.# 0008429  
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 CR 81/  
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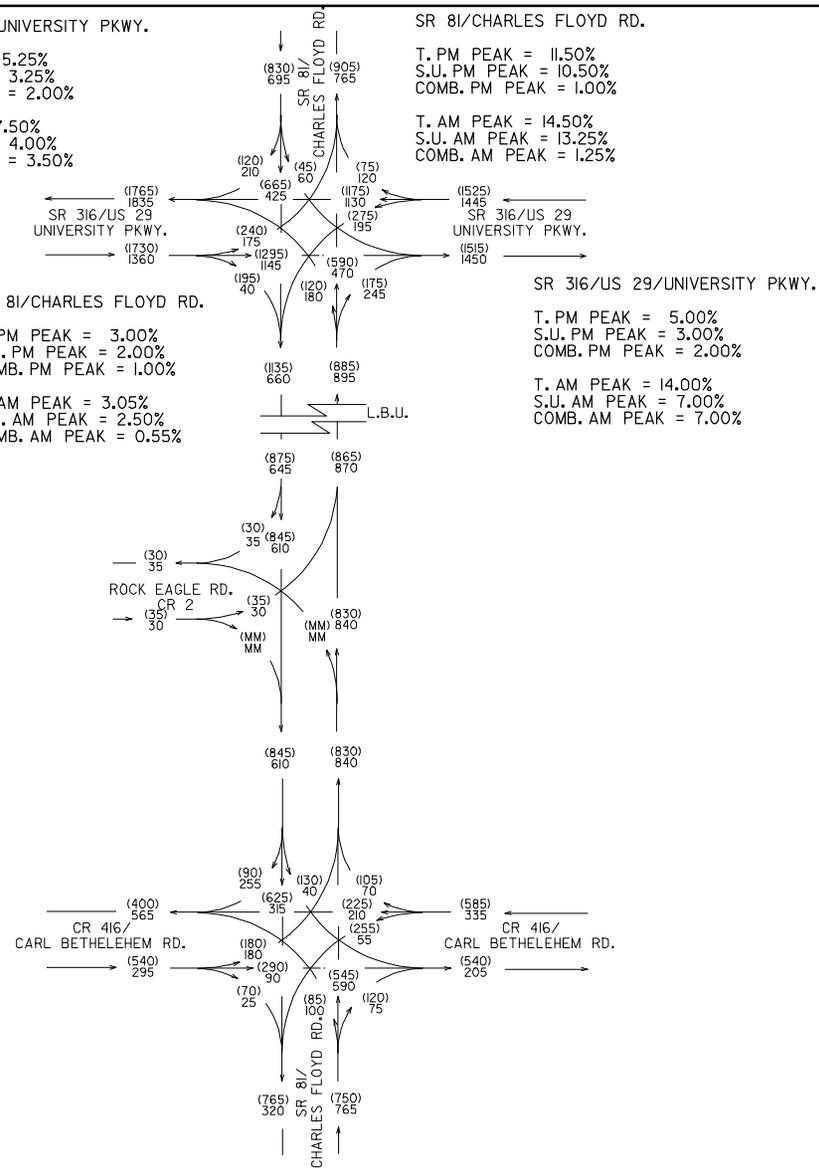
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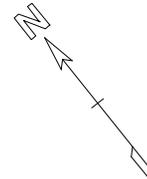
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BARROW COUNTY



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SR 316/US 29 @  
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SR 81/  
CHARLES FLOYD RD.

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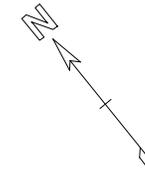
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CHARLES FLOYD RD.

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L.B.U.

ROCK EAGLE RD.  
CR 2

BARROW COUNTY



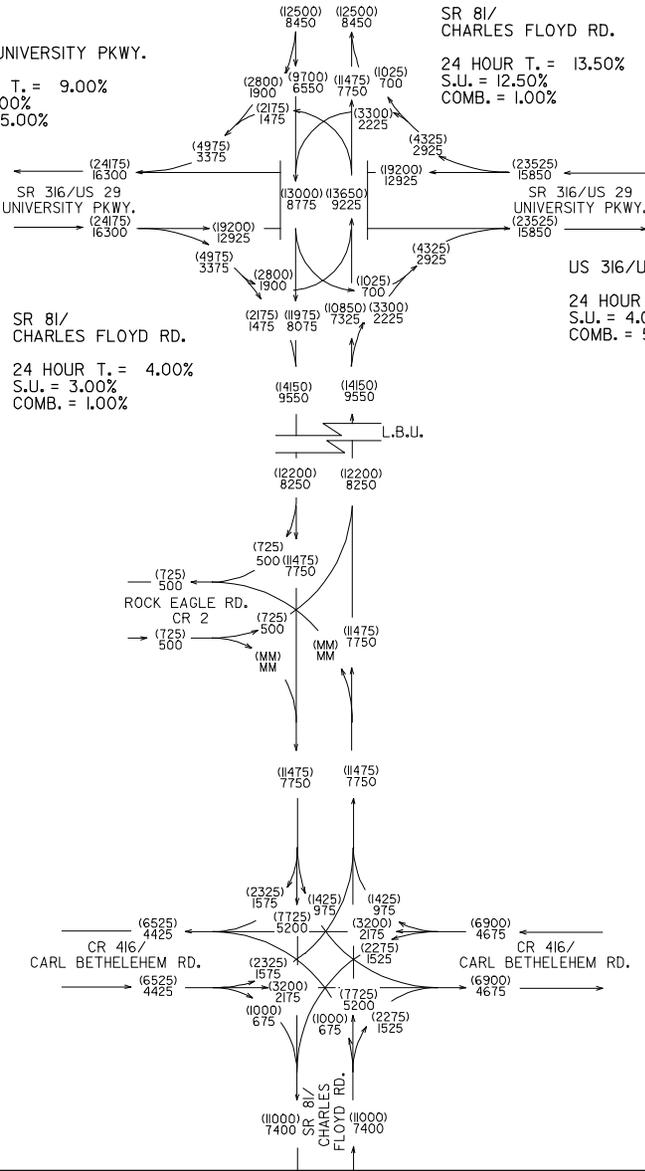
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CSNHS-0008-00(429)  
P.I.# 0008429  
BARROW COUNTY  
SR 316/US 29 @  
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SR 316/US 29  
UNIVERSITY PKWY.

SR 316/US 29  
UNIVERSITY PKWY.

SR 81/CHARLES FLOYD RD.

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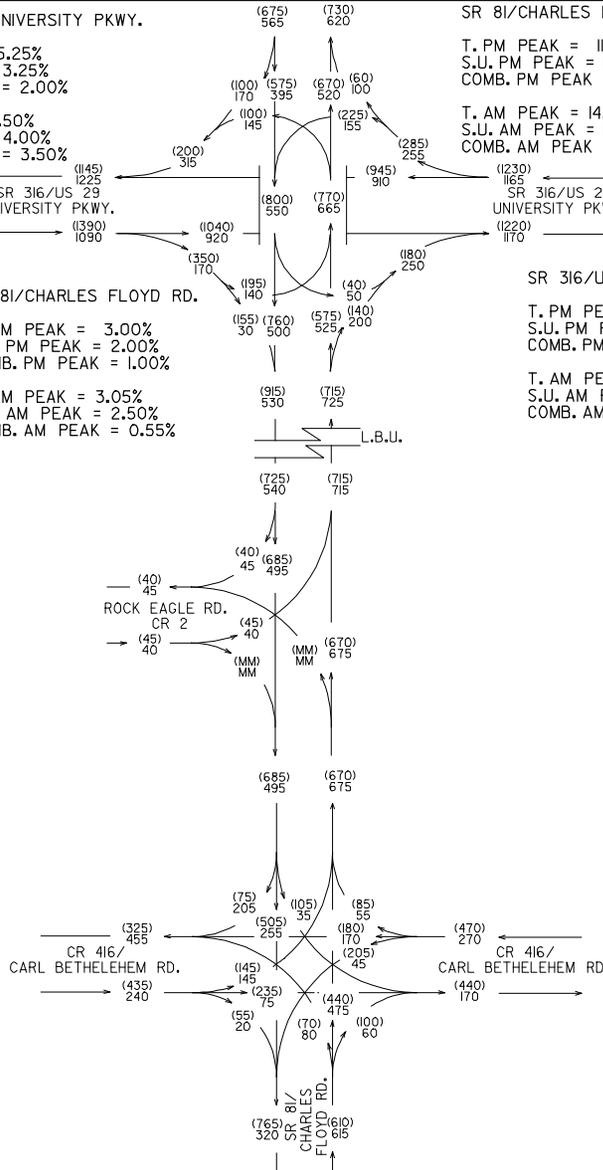
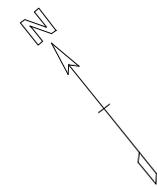
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BARROW COUNTY



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CSNHS-0008-00(429)  
P.I.# 0008429  
BARROW COUNTY  
SR 316/US 29 @  
CR 81/  
CHARLES FLOYD RD.

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SR 316/US 29  
UNIVERSITY PKWY.

SR 81/CHARLES FLOYD RD.

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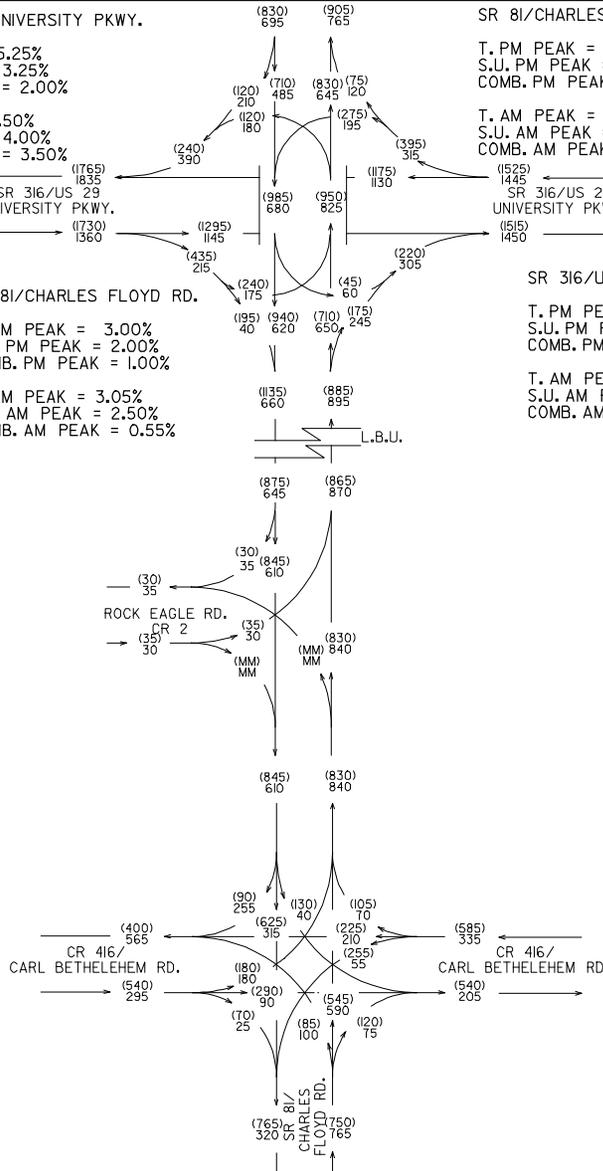
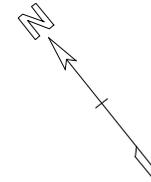
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L.B.U.

BARROW COUNTY



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CSNHS-0008-00(429)  
P.I.# 0008429  
BARROW COUNTY  
SR 316/US 29 @  
CR 81/  
CHARLES FLOYD RD.  
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**ATTACHMENT 8**  
**CAPACITY ANALYSIS SUMMARY**

## TRAFFIC SUMMARY

### 1. Capacity Analysis

Capacity analysis was performed for AM and PM peak hours for the opening year (2020) and design year (2040) for the preferred build alternative for the intersection of SR 316 at SR 81.

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 81, one left-turn lane from SR 81 northbound approach to SR 316 westbound on-ramp and from SR 81 southbound approach to SR 316 eastbound on-ramp, single left-turn lane and right-turn lane from SR 316 off-ramps to SR 81, and exclusive right-turn lanes at each intersection. The capacity analysis results for the preferred alternative are summarized in Table 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
2020	AM	8.1	A	7.1	A
	PM	11.4	B	8.7	A
2040	AM	8.8	A	10.1	B
	PM	20.3	C	14.1	B

**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
Kristy Langdon	GDOT – Traffic Ops	404-635-8150	<a href="mailto:Kristy.Langdon@dot.state.ga.us">Kristy.Langdon@dot.state.ga.us</a>
Emmanuella Myrthil	GDOT – OEL	404-699-6967	<a href="mailto:Emmanuella.Myrthil@dot.state.ga.us">Emmanuella.Myrthil@dot.state.ga.us</a>
Laura Rish	GDOT – OEL	404-699-4439	<a href="mailto:Laura.Rish@dot.state.ga.us">Laura.Rish@dot.state.ga.us</a>
Jerry Milligan	GDOT – R/W	770-986-1541	<a href="mailto:Jerry.Milligan@dot.state.ga.us">Jerry.Milligan@dot.state.ga.us</a>
Steve Gafford	GDOT – Office of Utilities	404-635-8045	<a href="mailto:Steve.Gafford@dot.state.ga.us">Steve.Gafford@dot.state.ga.us</a>
Ken Werho	GDOT – TS&D	404-635-8144	<a href="mailto:Ken.Werho@dot.state.ga.us">Ken.Werho@dot.state.ga.us</a>
Jason Crane	GDOT – Planning	404-463-0010	<a href="mailto:Jason.crane@dot.state.ga.us">Jason.crane@dot.state.ga.us</a>
Todd Long	GDOT – Preconstruction	404-656-5187	<a href="mailto:Todd.Long@dot.state.ga.us">Todd.Long@dot.state.ga.us</a>
Harold D. Mull	GDOT – District 1	770-339-2308	<a href="mailto:Harold.Mull@dot.state.ga.us">Harold.Mull@dot.state.ga.us</a>

Neal O' Brien	GDOT – Urban Design	404-656-5442	<a href="mailto:Neal.Obrien@dot.state.ga.us">Neal.Obrien@dot.state.ga.us</a>
Jill Franks	GDOT – Urban Design	404-656-5442	<a href="mailto:Jill.Franks@dot.state.ga.us">Jill.Franks@dot.state.ga.us</a>
Chuck Hasty	GDOT – Urban Design	404-656-5454	<a href="mailto:Chuck.Hasty@dot.state.ga.us">Chuck.Hasty@dot.state.ga.us</a>
Terry Darragh	Barrow County	770-868-1837	<a href="mailto:tdarragh@barrowga.org">tdarragh@barrowga.org</a>
Garth Lynch	HNTB	404-946-5703	<a href="mailto:glynch@hntb.com">glynch@hntb.com</a>
Xuewen Le	HNTB	404-946-5741	<a href="mailto:xle@hntb.com">xle@hntb.com</a>
Susan Thomas	Edwards Pitman Environmental, Inc.	770-333-9484	<a href="mailto:stthomas@edwards-pitman.com">stthomas@edwards-pitman.com</a>
Sajid Iqbal	Parsons	678-969-2368	<a href="mailto:Sajid.Iqbal@parsons.com">Sajid.Iqbal@parsons.com</a>
Shawn Reese	Parsons	678-969-2457	<a href="mailto:Shawn.Reese@parsons.com">Shawn.Reese@parsons.com</a>
Saurabh Bhattacharya	Parsons	678-969-2315	<a href="mailto:Saurabh.Bhattacharya@parsons.com">Saurabh.Bhattacharya@parsons.com</a>

## 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
Neal O'Brien	GDOT Roadway Design	404-631-1725	<a href="mailto:NObrien@dot.ga.gov">NObrien@dot.ga.gov</a>
Robert Mahoney	GDOT – District 1	770-532-5520	<a href="mailto:RMahoney@dot.ga.gov">RMahoney@dot.ga.gov</a>
Dan Yearwood	Barrow County	770-867-6551	<a href="mailto:dyearwood@barrowga.org">dyearwood@barrowga.org</a>
Jill Brown	Edwards-Pittman	770-333-9484	<a href="mailto:jbrown@edwards-pitman.com">jbrown@edwards-pitman.com</a>
Kris Stephans	GA Power	706-357-6670	<a href="mailto:X2steph@southernco.com">X2steph@southernco.com</a>
Harold D. Mull	GDOT	770-334-2308	<a href="mailto:hmull@dot.ga.gov">hmull@dot.ga.gov</a>
Brent Cook	GDOT	770-532-5563	<a href="mailto:BCook@dot.ga.gov">BCook@dot.ga.gov</a>
Kim Coley	GDOT – District 1	770-532-5530	<a href="mailto:kcoley@dot.ga.gov">kcoley@dot.ga.gov</a>
Todd Sumption	GDOT Traffic Operations	770-532-5532	<a href="mailto:TSumption@dot.ga.gov">TSumption@dot.ga.gov</a>
Lane G. Bulgin	GDOT District 1 R/W	770-718-5046	<a href="mailto:lbulgin@dot.ga.gov">lbulgin@dot.ga.gov</a>
Todd McDuffie	GDOT	770-532-5526	<a href="mailto:tmcduffie@dot.ga.gov">tmcduffie@dot.ga.gov</a>
Kaycee Mertz	GDOT Planning	404-347-0245	<a href="mailto:kmertz@dot.ga.gov">kmertz@dot.ga.gov</a>
Andrew Heath	GDOT Planning	912-682-4574	<a href="mailto:aheath@dot.ga.gov">aheath@dot.ga.gov</a>
Tommy Buchanan	Town of Bethlehem	770-667-4405	
Sandy McNab	Town of Bethlehem	770-307-7013	
Scott Morgan	Town of Bethlehem	404-587-3002	<a href="mailto:banscottsue57@hotmail.com">banscottsue57@hotmail.com</a>
Chuck Hasty	GDOT Roadway Design	404-631-1704	<a href="mailto:chasty@dot.ga.gov">chasty@dot.ga.gov</a>
Sajid Iqbal	Parsons	678-969-2368	<a href="mailto:Sajid.Iqbal@parsons.com">Sajid.Iqbal@parsons.com</a>

<b>Name</b>	<b>Organization</b>	<b>Phone</b>	<b>Email</b>
Xuejun Fan	Parsons	678-969-2322	<a href="mailto:Xuejun.fan@parsons.com">Xuejun.fan@parsons.com</a>
Rajeev Shah	Parsons	678-969-2481	<a href="mailto:Rajeev.shah@parsons.com">Rajeev.shah@parsons.com</a>
Ken Werho	GDOT Traffic Operations	404-635-8144	<a href="mailto:kwerho@dot.ga.gov">kwerho@dot.ga.gov</a>
Brandon Kirby	GDOT OPD	678-343-0816	<a href="mailto:bkirby@dot.ga.gov">bkirby@dot.ga.gov</a>
Ron Griffith	City of Auburn	770-963-4002	<a href="mailto:rgriffith@cityofauburn-ga.org">rgriffith@cityofauburn-ga.org</a>
Darrell Greeson	Barrow County	770-867-0664	<a href="mailto:dgreson@barrowga.org">dgreson@barrowga.org</a>
Terry Allgood	Walton EMC	770-601-2795	<a href="mailto:tallgood@waltonemc.com">tallgood@waltonemc.com</a>
Allen Ferguson	GDOT – Utilities	770-532-5510	<a href="mailto:aferguson@dot.ga.gov">aferguson@dot.ga.gov</a>
Nathaniel O’Kelly	GDOT – Utilities	770-532-5510	<a href="mailto:nokelley@dot.ga.gov">nokelley@dot.ga.gov</a>
Mike Jewell	City of Winder	770-867-7629	<a href="mailto:Mike.jewell@cityofwinder.com">Mike.jewell@cityofwinder.com</a>
Roger Wilhelm	City of Winder	770-867-7978	<a href="mailto:roger.wilhelm@cityofwinder.com">roger.wilhelm@cityofwinder.com</a>
Barry Edgar	City of Winder	678-425-6812	<a href="mailto:barry.edgar@cityofwinder.com">barry.edgar@cityofwinder.com</a>
Tom McQueen	GDOT Planning	404-631-1785	<a href="mailto:tmcqueen@dot.ga.gov">tmcqueen@dot.ga.gov</a>

## 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

NAME	OFFICE	PHONE #	EMAIL
Neal O'Brien	Barrow	4-631-1725	robneiv@dot.ga.gov
Dan Yearwood	Barrow County	770-867-6551	dyearwood@barrowga.org
JH Brown	Edwards-Pitman	770-333-9484	jbrown@edwards-pitman.com
KRIS STEPHENS	GA. Power	706-357-6670	X2KSTEPH@Southawco.com
HAROLD O MULL	GDOT	770-334-2307	hmull@dot.ga.gov
Brent Cook	GDOT	770-532-5563	bcook@dot.ga.gov
ROBERT W. MANNING	GDOT-DI	770-532-5520	R.MANNING@DOT.GA.GOV
Kim Coley	GDOT-DI	770-532-5530	kcoley@dot.ga.gov
TODD SUMPTION	GDOT DOT T.O.	770-532-5532	TSUMPTION@DOT.GA.GOV
LANE G. BULGIN	GDOT-DI-R/W	770-718-5046	lbulgin@dot.ga.gov
TODD McDUFFIE	GDOT	770-532-5526	tmcduffie@dot.ga.gov
Kaycee Mertz	GDOT-Planning	404-347-0245	kmertz@dot.ga.gov
Andrew Heath	GDOT-Planning	404-631-1750	aheath@dot.ga.gov
Tommy Buchanan	Bethlehem	770-667-4405	
Sandy McNabb	Bethlehem	770-307-7013	
Scott Morgan	Bethlehem	404-591-3002	smorgan@bethlehem.com
Chuck Hasty	Barrow	(404) 631-1704	chasty@dot.ga.gov
S. SAJJID IQBAL	PARSONS	678-969-2368	SAJJID.IQBAL@PARSONS.COM
XUEJUN FAN	PARSONS	678-969-2322	XUEJUN.FAN@PARSONS.COM
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 Gni of itz	City-Auburn	770-963-4002	rgni@cityofauburn.com
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	<a href="mailto:nobrien@dot.ga.gov">nobrien@dot.ga.gov</a>
Jill Franks	GDOT – Urban Design	404-656-5442	<a href="mailto:jfranks@dot.ga.gov">jfranks@dot.ga.gov</a>
Kelly Wade	FHWA	404-562-3584	<a href="mailto:kelly.wade@fhwa.dot.gov">kelly.wade@fhwa.dot.gov</a>
Jennifer Mathis	GDOT – OEL	404-699-4408	<a href="mailto:jmathis@dot.ga.gov">jmathis@dot.ga.gov</a>
Laura Rish	GDOT – OEL	404-699-4439	<a href="mailto:lrish@dot.ga.gov">lrish@dot.ga.gov</a>
Jill Baur	EPEI – Environmental	770-333-9484	<a href="mailto:jbaur@edwards-pitman.com">jbaur@edwards-pitman.com</a>
Susan Thomas	EPEI – Environmental	770-333-9484	<a href="mailto:stthomas@edwards-pitman.com">stthomas@edwards-pitman.com</a>
Alan Hunley	Parsons	678-969-2304	<a href="mailto:Alan.Hunley@parsons.com">Alan.Hunley@parsons.com</a>
Sajid Iqbal	Parsons	678-969-2368	<a href="mailto:Sajid.Iqbal@parsons.com">Sajid.Iqbal@parsons.com</a>
Rajeev Shah	Parsons	678-969-2481	<a href="mailto:Rajeev.Shah@parsons.com">Rajeev.Shah@parsons.com</a>

## 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	<a href="mailto:nobrien@dot.ga.gov">nobrien@dot.ga.gov</a>
Robert W. Mahoney	GDOT – District 1 Preconstruction	770-532-5520	<a href="mailto:rmahoney@dot.ga.gov">rmahoney@dot.ga.gov</a>
Daniel Yearwood Jr.	Barrow County	770-867-6551	<a href="mailto:dyearwood@barrowga.org">dyearwood@barrowga.org</a>
Darrell Greeson	Barrow County	770-867-0664	<a href="mailto:dgreeson@barrowga.org">dgreeson@barrowga.org</a>
Xuejun Fan	Parsons	678-969-2304	<a href="mailto:Xuejun.Fan@parsons.com">Xuejun.Fan@parsons.com</a>
Sajid Iqbal	Parsons	678-969-2368	<a href="mailto:Sajid.Iqbal@parsons.com">Sajid.Iqbal@parsons.com</a>
Rajeev Shah	Parsons	678-969-2481	<a href="mailto:Rajeev.Shah@parsons.com">Rajeev.Shah@parsons.com</a>

# 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 Verrando Jr.	BDC	dverrando@bdcbarrowga.org	770-367-6551
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

**ATTACHMENT 11**  
**PIOH SYNOPSIS**

**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

**INTERDEPARTMENT CORRESPONDENCE**

FILE: P. I. No. 0008429 OFFICE: Environmental Services  
*LB-MH* DATE: February 5, 2010  
FROM Glenn Bowman, P.E., State Environmental Administrator  
TO Distribution Below  
SUBJECT PUBLIC INFORMATION OPEN HOUSE SYNOPSIS

PROJECT No. & COUNTY: CSNHS-0008-00(429), Barrow

PROJECT DESCRIPTION: Three interchange projects were presented at this PIOH. P.I. No. 0008429 consists of the reconstruction of SR 316 at SR 81. The other two Interchange projects presented were P.I. No. 0008430 (SR 316 at SR 11) and P.I. No. 0008431 (SR 316 at SR 53).

DATE: February 4, 2010

NUMBER IN ATTENDANCE: 149

FOR: 33

CONDITIONAL: 4

UNCOMMITTED: 4

AGAINST: 1

OFFICIALS IN ATTENDANCE: Eva Elder, Barrow County District 2 Commissioner; Ron Griffith, Auburn City METR; David Hawthorne, Auburn Director of Public Works; Larry Lucas, Auburn City Planner; Steve Worley, Barrow County Commissioner; Dan Yearwood Jr., Barrow County Chairman

Media included Barrow County News, TV-32 Toccoa, and Athens Banner Herald

ADDITIONAL COMMENTS: Written comments indicated that four lanes and a wider bridge are needed on SR 81, Punkin Junction Road intersection at SR 81 needs improved because this project will make traffic there worse, that right-of-way should be purchased now, that a left turn arrows are needed on SR 81, that better access is needed to Chic-Fil-A, that improvements are needed at Carter Hill Drive and SR 81, that the overpass should have been built when SR 316 was built, that the project will improve safety and travel times, that the project elevation needs worked out so that the detention basin on the north side isn't an eyesore,

that making a working wetland would be more beneficial than the detention basin to detain runoff, that maximum sediment and erosion control measures are needed, that this should be done soon, that a penny sales tax SPLOST should be considered for funding, that right now it takes five cycles of the light to make it through, that multi-lane roundabouts would solve the problem and cost less, that this interchange should be reconstructed before SR 11 or SR 53, that this project could be used to generate tax revenue to construct the other interchanges, that other intersections should be closed or reconstructed as interchanges, that construction for this interchange and other interchanges should be staged to reduce construction delays, that SR 81 should be widened to five lanes, that proposals should be available online before the meeting, that the project would boost the economy and create jobs, that the state has already decided what they want and not what tax payers want, and that money should be spent on landscaping.

PREPARED BY:

Susan Thomas, Edwards-Pitman for Laura Rish, GDOT

TELEPHONE No.:

Susan Thomas, (770) 333-9484; Laura Rish (404) 631-1415

cc: Gerald M. Ross  
Ben Buchan  
Russell McMurry  
Todd McDuffie  
Neal O'Brien  
Neil Kantner  
Teri Pope



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](http://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](http://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

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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**  
**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**

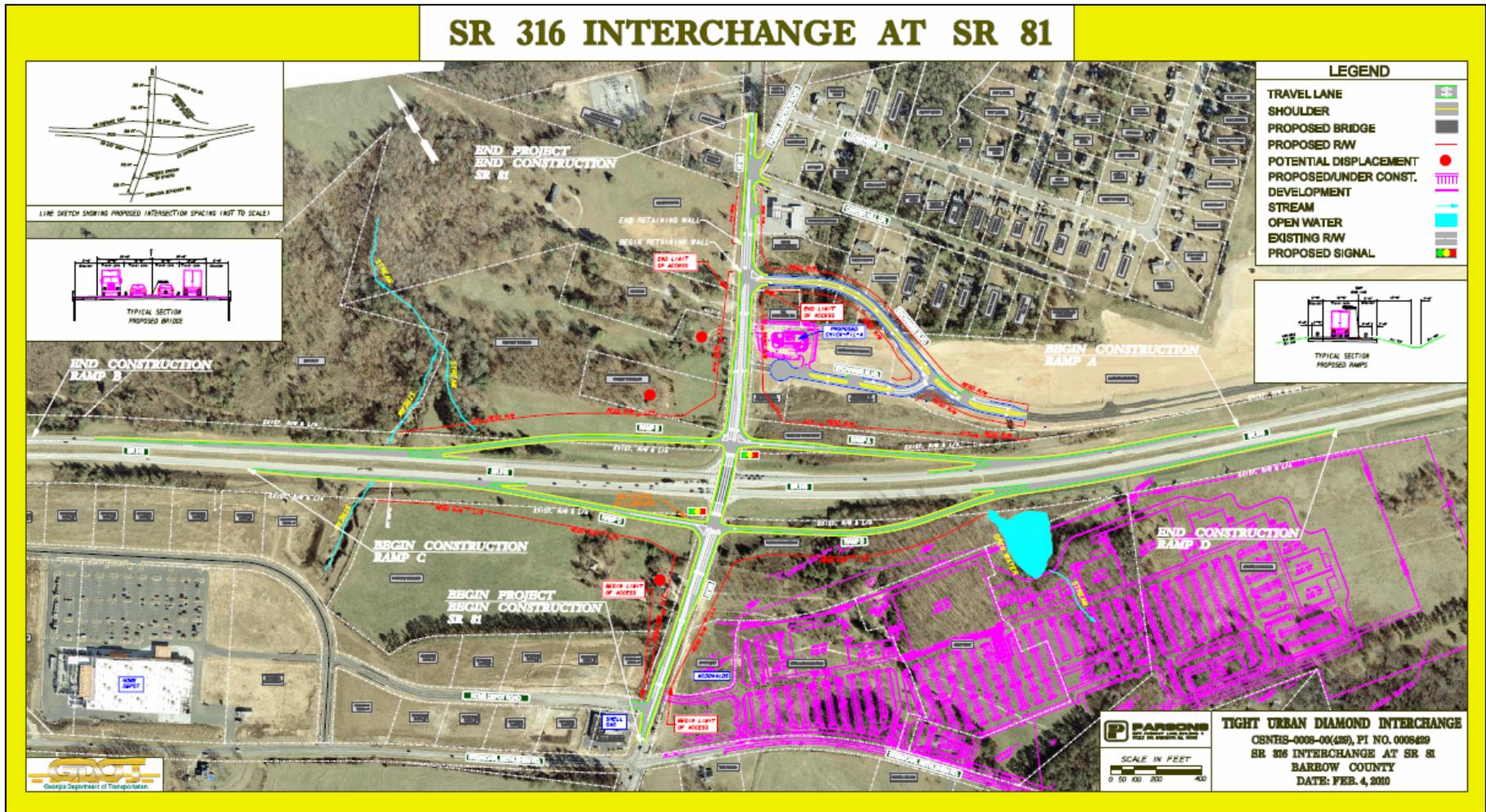
The proposed project is located in Congressional District 7 and approximately 4.00 miles southwest of downtown Winder, Georgia in Barrow County. This project involves the grade separation of existing at-grade intersection of SR 316 and SR 81. The proposed grade separation will include provision of a 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.



## **2.3 PI 0008431 – SR 316 @ SR 53**

### **Project Description**

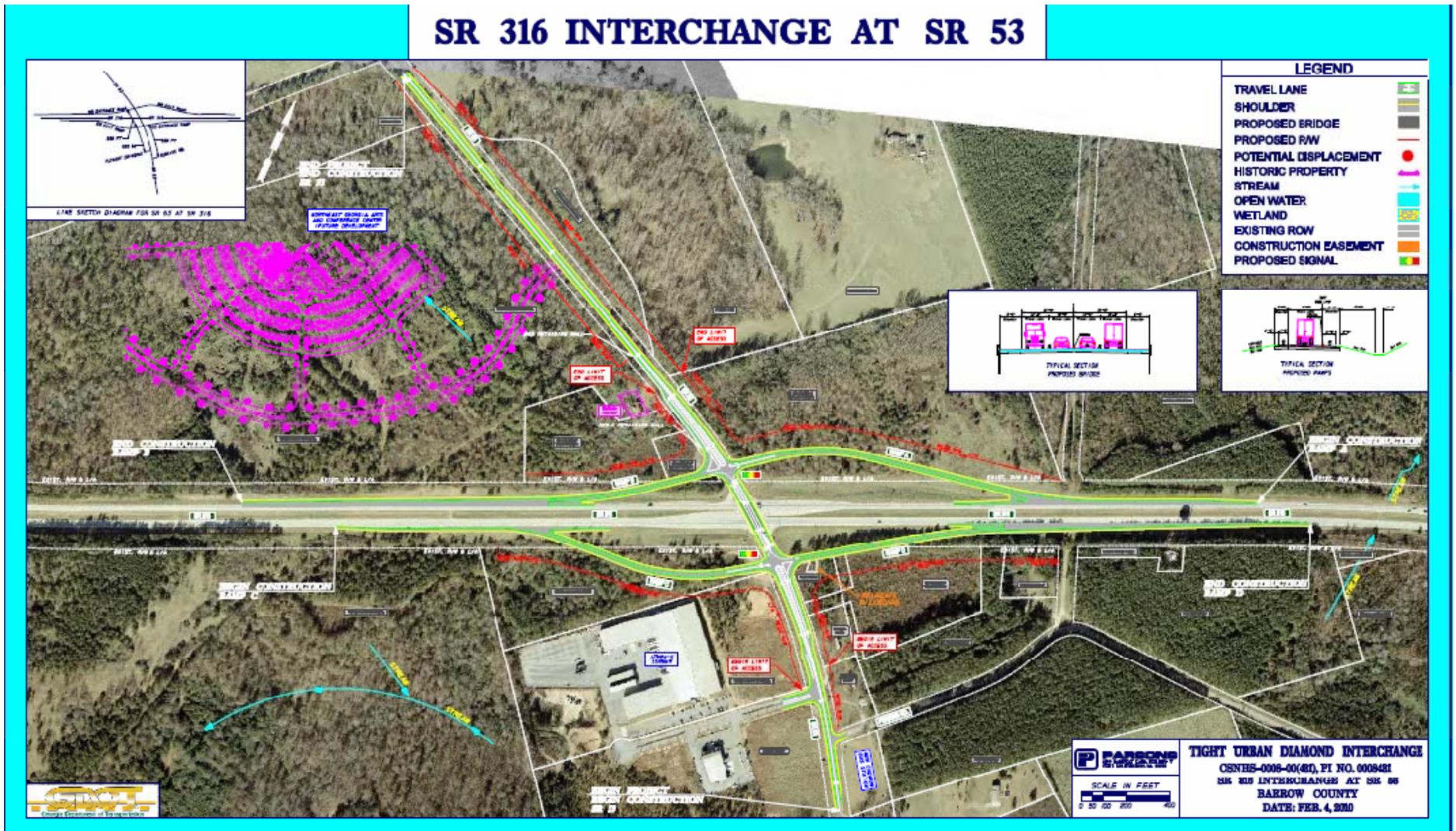
The proposed project is located in Congressional District 7 and approximately 4.75 miles southeast of downtown Winder, Georgia in Barrow County. Based on the immediate need to address serious safety deficiency as noted in the Need and Purpose, the project involves grade separation of existing at-grade 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

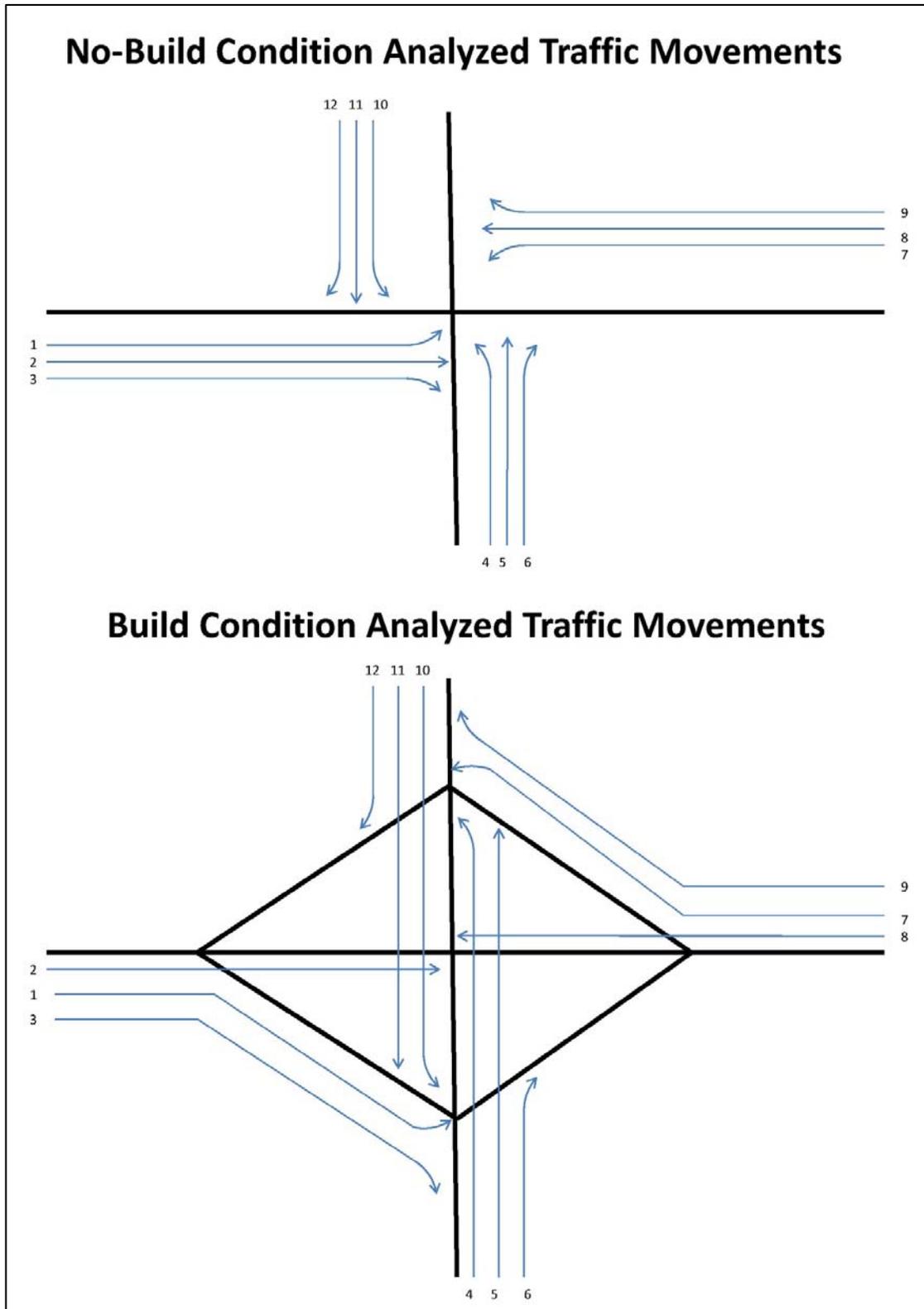
To prepare a Benefit/Cost ratio for each project, it was necessary to calculate the travel time difference for the Build condition versus the No Build condition. Since all three projects are conversions of at-grade intersections to grade separated interchanges, it is necessary to calculate the travel 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**

<b>Benefit/Cost Analysis Worksheet</b>													
	Total - All Movements	EBL	EBTH	EBR	NBL	NBTH	NBR	WBL	WBTH	WBR	SBL	SBTH	SBR
<b>Person Time Savings Benefit (Tb)</b>													
*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)	<b>\$269,084,063</b>	\$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
<b>Commercial or Truck Time Savings Benefit (Cmb)</b>													
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	<b>\$184,826,504</b>	\$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
<b>Fuel Savings Benefit (Fb)</b>													
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)	<b>\$93,771,719</b>	\$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
<b>Total Congestion Benefit</b>	<b>\$547,682,285</b>	\$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	<b>\$15,681,824</b>												
<b>B/C Ratio</b>	<b>34.92</b>												



**ATTACHMENT 13**  
**CONFORMING PLAN'S NETWORK SCHEMATICS**

# Network Schematic of PI 0008429

Barrow County, GA

ARC Plan 2040

