

D.O.T. 66

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE P. I. No. M002969, Muscogee-Troup-Harris Counties **OFFICE** Preconstruction
CSNHS-M002969
I-185 Milling and Resurfacing **DATE** January 2, 2007
FROM *John K. Rice* Genetha Rice-Singleton, Assistant Director of Preconstruction
TO *for* SEE DISTRIBUTION

SUBJECT APPROVED PROJECT CONCEPT REPORT

Attached for your files is the approval for subject project.

GRS/cj

Attachment

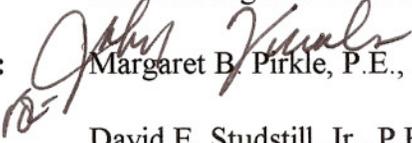
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**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE: P. I. No. M002969 **OFFICE:** Preconstruction
Muscogee-Troup-Harris Counties
CSNHS-M002-00(696)
I-185 Milling and Resurfacing **DATE:** June 19, 2006

FROM:  Margaret B. Pirkle, P.E., Assistant Director of Preconstruction

TO: David E. Studstill, Jr., P.E., Chief Engineer

SUBJECT: PROJECT CONCEPT REPORT

This project is the milling and resurfacing of the existing pavement and shoulders on I-185 from MP 8.25 in Muscogee county (CS 1425/Airport Thruway Road) to the north end (MP 49.3 merge onto I-85) in Troup County, for a total of 41.05 miles. The existing I-185 within the project limits consists of six, 12' lanes (3 in each direction), 14' outside shoulders (10' paved), and 8' paved median shoulder with a concrete median barrier from MP 8.25 to MP 11.22. For the remainder of the project, the roadway consists of four, 12' lanes (2 in each direction) with 10' inside shoulders (4' paved), 14' outside shoulders (10' paved), and a variable (88'-150') depressed median. The project has a total of forth-three (43) existing major structures with sufficiency ratings ranging from 73 to 99.

State Route 411/I-185, an interstate principal arterial, is a primary corridor in west Georgia. The primary purpose of this project is the rehabilitation of the existing roadway to preserve the integrity, serviceability, and safety of the interstate system. The majority of the pavement within the project is in poor to fair condition. The condition will continue to deteriorate as traffic increases. The base year traffic (2009) is 41,000 VPD and the design year traffic (2029) is 61,000 VPD.

The construction proposes the milling and inlay of the existing pavement of the travel lanes and shoulders. The profile grade on the mainline will be raised 2" to provide additional structure. The ramp profile grade will be raised 3/4". The impact on raising the grade 2" on vertical bridge clearances has been reviewed and one bridge will be less than 16.5' after this proposed overlay (Williams Road - 16.05"). The existing guardrail will be upgraded to current standards and vegetation will be cleared according to current guidelines. The roadway will remain open during construction utilizing stage construction.

Environmental concerns include requiring a Categorical Exclusion be prepared; a public hearing open house is not required; time saving procedures are appropriate.

David Studstill

Page 2

P. I. No. M002969, Muscogee-Harris-Troup

June 19, 2006

The estimated costs for this project are:

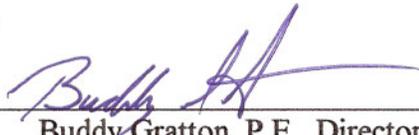
	<u>PROPOSED</u>	<u>APPROVED</u>	<u>FUNDING</u>	<u>PROG DATE</u>
Construction (includes E&C and inflation)	\$55,028,000	\$48,000,000	L010	2007
Right-of-Way & Utilities	-0-	-0-		

This project will enhance safety along this portion of I-185. I recommend this project concept be approved.

MBP:JDQ/cj

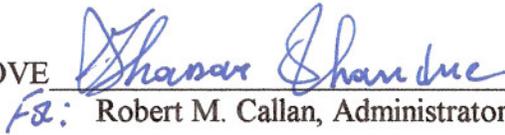
Attachment

CONCUR



Buddy Gratton, P.E., Director of Preconstruction

APPROVE


FR: Robert M. Callan, Administrator, FHWA

see Attached approval letter

APPROVE


David E. Studstill, Jr., P.E., Chief Engineer



U.S. Department
of Transportation

**Federal Highway
Administration**

61 Forsyth St. SW
Atlanta, Georgia 30303

In Reply Refer To:
HTM-GA

Georgia Division
November 17, 2006

Mr. Harold E. Linnenkohl
Commissioner
Georgia Department of Transportation
No. 2 Capitol Square, S.W.
Atlanta, Georgia 30334-1002

Subject: Project CSNHS-M002-00(969)
Muscogee/Harris/Troup Counties
I-185 Milling and Resurfacing Concept Report

Dear Mr. Linnenkohl:

We are approving the subject concept report with the understanding that the changes noted in the attached printed email will be addressed in a revised concept document.

If you have any questions or need additional information regarding these comments, please contact David Painter at (404)562-3658.

Sincerely,

For: Robert M. Callan, P.E.
Division Administrator

File: CSNHS-M003-00(340)



**BUCKLE UP
AMERICA**

Painter, David

From: Casey, Andy [Andy.Casey@dot.state.ga.us]
Sent: Thursday, November 02, 2006 8:51 AM
To: Painter, David
Cc: Story, Brent; McCook, Jason
Subject: CSNHS-M002-00(969) - M002969 - Muscogee/Harris/Troup

RE: CONCEPT REPORT APPROVAL

David,

This email is to wrap up and bring to a closure the Concept Report Phase for the above-mentioned project. As discussed in the meeting yesterday GDOT will include the following items in the Plans.

1. Remove curb and gutter in gores of all interchanges within limits of project.
2. Item for Pavement Reinforcement Fabric will be added.
3. Will extend the PEM over the gore of the ramps and the ramps will be milled down to create a slot for the PEM thus providing a better transition between the mainline and the ramp.

The only other outstanding issue is the installation of some sort of ITS along the project corridor. Jason and I will meet with upper management and discuss the issue once again. If Management decides to include ITS on this project, GDOT will revise the Concept Report at that time.

Thank you for your cooperation in getting the Concept Report approved.

If you have any questions please let me know.

C. Andy Casey, P.E.
Design Group Manager
Georgia Department of Transportation
Phone: 404-656-5406
Fax: 404-657-0653

From: Painter, David [mailto:David.Painter@fhwa.dot.gov]
Sent: Thursday, October 05, 2006 12:55 PM
To: Casey, Andy; Reid, Robert Lee Jr.
Subject: RE: CSNHS-M002-00(969) I-185 Mill and Resurface Concept comments and questions

Andy, I have asked Robert R to talk to you about coordinating boundaries between this project and the (160) Systems level interchange project at I-185/I-85/US27 which has a Jun 08 letting. I think that the systems level interchange at the north end of I-185 is a place that drivers will have to make decisions and need information thus my insistence on ITS at the north end of the 969 project. The same could be said of points north and south of the systems level interchange on I-85 that drivers will have to make decisions and need information. A blanket prohibition on ITS makes little sense to me. How can we add ITS features around this interchange? You don't have to replace the AC Crack Seal. Why don't you add a quantity of Fabric and a note to use it on the worst of the cracks? Let the PM make the decision about precisely where and how much it will be used.

From: Casey, Andy [mailto:Andy.Casey@dot.state.ga.us]
Sent: Thursday, October 05, 2006 9:08 AM
To: Painter, David
Subject: RE: CSNHS-M002-00(969) I-185 Mill and Resurface Concept comments and questions

David,

11/17/2006

We can replace the Crack Seal with the high strength fabric; that is not a problem. The item will be added to the plans. I still can not help you with the ITS on this project. Until I am told otherwise, this project will not have ITS of any type.

Thank you,

C. Andy Casey, P.E.
Design Group Manager
Georgia Department of Transportation
Phone: 404-656-5406
Fax: 404-657-0653

From: Painter, David [mailto:David.Painter@fhwa.dot.gov]
Sent: Tuesday, October 03, 2006 4:21 PM
To: Casey, Andy
Subject: RE: CSNHS-M002-00(969) I-185 Mill and Resurface Concept comments and questions

Andy, I took another look at this. I am now in agreement that no DE will be needed so comments 1 and 2 fall out. Per comment 6 - I would like to allow the PM the option of using high strength fabric rather than AC crack seal. Could we add this as a pay item? Can you help me with comment 8?

From: Casey, Andy [mailto:Andy.Casey@dot.state.ga.us]
Sent: Thursday, September 28, 2006 10:11 AM
To: Painter, David
Subject: RE: CSNHS-M002-00(969) I-185 Mill and Resurface Concept comments and questions

David,

What is the status of the Concept Report Approval?

Thank you,

C. Andy Casey, P.E.
Design Group Manager
Georgia Department of Transportation
Phone: 404-656-5406
Fax: 404-657-0653

From: Painter, David [mailto:David.Painter@fhwa.dot.gov]
Sent: Wednesday, August 02, 2006 4:32 PM
To: Casey, Andy
Subject: RE: CSNHS-M002-00(969) I-185 Mill and Resurface Concept comments and questions

Andy, I have completed my research on Design Exceptions as it involves some differences with GDOT's PDP I have provided this to the FHWA leadership to make some decisions on how to proceed. I would be willing to discuss this with you at your convenience.

From: Casey, Andy [mailto:Andy.Casey@dot.state.ga.us]
Sent: Thursday, July 20, 2006 1:08 PM
To: Painter, David
Subject: RE: CSNHS-M002-00(969) I-185 Mill and Resurface Concept comments and questions

Here is the link to the PDP.

11/17/2006

<http://www.dot.state.ga.us/dot/preconstruction/index.shtml>

The PDP is located at the bottom of the page to the right hand margin. Please refer to Page No. 80.

Thank you,

C. Andy Casey, P.E.
Design Group Manager
Georgia Department of Transportation
Phone: 404-656-5406
Fax: 404-657-0653

From: Painter, David [mailto:David.Painter@fhwa.dot.gov]
Sent: Thursday, July 20, 2006 10:57 AM
To: Casey, Andy
Cc: Shanine, Gus
Subject: RE: CSNHS-M002-00(969) I-185 Mill and Resurface Concept comments and questions

Andy,

Comments 1 and 2 will require a DE. Since this is a 3R project and we would not be implementing current AASHTO standards.

Comment 3 - Will look at this again.

Comment 6 - I still think the PM should have the option of using high strength fabric rather than AC crack seal. I know which I would use if I was concerned about long term durability.

Comment 8 - Could we use my concept comments as an official request to incorporate ITS or is something more needed?

-----Original Message-----

From: Casey, Andy [mailto:Andy.Casey@dot.state.ga.us]
Sent: Monday, July 17, 2006 10:40 AM
To: Painter, David
Cc: Yokaris, Angelo; McCook, Jason; Story, Brent
Subject: RE: CSNHS-M002-00(969) I-185 Mill and Resurface Concept comments and questions

David,

Please see the responses to your comments below.

1. In the 6 lane section the 8' inside shoulders do not meet the Jan 05 AASHTO guidance. Would it be possible to push the mainline out 2' into the 14' (10' paved) outside shoulder to obtain 10' paved inside shoulders? Of course we would still need 10' paved outside shoulders.

Based on the 2nd paragraph of AASHTO's Jan 05 General section, we do not need to meet the new standards since the scope of this maintenance project does not call for complete reconstruction along existing right-of-way. Under the same paragraph instead, it is suggested that the AASHTO standards that were in effect at the time of original construction or inclusion into the interstate system be used for resurfacing of shoulders, restoration and rehabilitation projects such as this. This change would be outside the scope of the Need and Purpose for this project.

2. In the 4 lane section the 3' inside shoulders do not meet the Jan 05 AASHTO guidance. Would it be possible to push the mainline out 1' into the 14' (10' paved) outside shoulder to obtain 4' paved inside shoulders? Of course we would still need 10' paved outside shoulders. See response for No. 1.

3. The existing cross slope is 3/16ths inch per foot. While I have heard it discussed and seen it in the notes I have not seen that changing cross slope from 3/16ths to 1/4 inch per foot is a part of this project. Could we make it a part of this project? The proposed typical sections on the concept report indicate a cross slope of improvement from 3/16"/ft to 2%.

11/17/2006

4. The proposed pavement is 2" thicker, but only 3/4" of this actually provides additional structure per the structural capacity calculations. 1 1/4 inches of the 2 inches will be PEM which is not factored into capacity calculations. This could be used to resolve the transition issue from mainline to ramps noted on page 2 of the Pavement Evaluation Summary. The ramp PGL is also being raised only 3/4". If the PEM is extended over the gore area so that its edge forms a line perpendicular to the ramp then the bump created is relatively easy to negotiate especially if a 1 1/4 deep slot is milled into the ramp surface and the PEM turned down into the slot (PEM can't be feathered). See attached sketch. This makes good sense and we will implement the suggestion into the plans.

5. The Cost Estimate calls for \$800,000 to upgrade gdrail to current standards. At \$15/lf this amounts to about 10 miles of gdrail. Since this project is 41 miles long and much of the gdrail is NCHRP 230 rather than 350 certified gdrail this cost figure could be low. The cost estimate for upgrading guardrail to current standards is \$2,000,000, not \$800,000.

6. Would it be prudent to add a quantity of crack control fabric to apply to cracks that exceed a 1/4 inch in width after milling? There is already an item for asphalt-rubber joint and crack seal, TP M as recommended in the pavement evaluation report.

7. Please include removal of curb and gutter in all interchange gores to the scope of this project. This will be added to the plans.

8. Consider adding a quantity of inexpensive dial-up ITS equipment at the northern and southern ends of this project. Per Buddy Gratton, no ITS will be placed on Interstate Maintenance projects unless it is requested and approved.

Let me know if you have any further comments or questions.

C. Andy Casey, P.E.
Design Group Manager
Georgia Department of Transportation
Phone: 404-656-5406
Fax: 404-657-0653

From: Painter, David [mailto:David.Painter@fhwa.dot.gov]
Sent: Tuesday, July 11, 2006 5:46 PM
To: Casey, Andy
Subject: CSNHS-M002-00(969) I-185 Mill and Resurface Concept comments and questions

I am not sure who the PM is for this project. Please route my comments on this project to the PM too.

1. In the 6 lane section the 8' inside shoulders do not meet the Jan 05 AASHTO guidance. Would it be possible to push the mainline out 2' into the 14' (10' paved) outside shoulder to obtain 10' paved inside shoulders? Of course we would still need 10' paved outside shoulders.

2. In the 4 lane section the 3' inside shoulders do not meet the Jan 05 AASHTO guidance. Would it be possible to push the mainline out 1' into the 14' (10' paved) outside shoulder to obtain 4' paved inside shoulders? Of course we would still need 10' paved outside shoulders.

3. The existing cross slope is 3/16ths inch per foot. While I have heard it discussed and seen it in the notes I have not seen that changing cross slope from 3/16ths to 1/4 inch per foot is a part of this project. Could we make it a part of this project?

4. The proposed pavement is 2" thicker, but only 3/4" of this actually provides additional structure per the structural capacity calculations. 1 1/4 inches of the 2 inches will be PEM which is not factored into capacity calculations. This could be used to resolve the transition issue from mainline to ramps noted on page 2 of the Pavement Evaluation Summary. The ramp PGL is also being raised only 3/4". If the PEM is extended over the gore area so that its edge forms a line perpendicular to the ramp then the bump created is relatively easy to negotiate especially if a 1 1/4 deep slot is milled into the ramp surface and the PEM

turned down into the slot (PEM can't be feathered). See attached sketch.

5. The Cost Estimate calls for \$800,000 to upgrade gdrail to current standards. At \$15/lf this amounts to about 10 miles of gdrail. Since this project is 41 miles long and much of the gdrail is NCHRP 230 rather than 350 certified gdrail this cost figure could be low.

6. Would it be prudent to add a quantity of crack control fabric to apply to cracks that exceed a 1/4 inch in width after milling?

7. Please include removal of curb and gutter in all interchange gores to the scope of this project.

8. Consider adding a quantity of inexpensive dial-up ITS equipment at the northern and southern ends of this project.

<<Exhibit10-59Modified Ver4.gif>>

The .gif sketch comes very small. To expand it put your cursor over it and an orange-center expand button should appear. Click on the expand button.

David Painter
MSE, PE
FHWA, GA Division
Tel: 404 562-3658



DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

Office of Airport and Road Design

PROJECT CONCEPT REPORT

Project Number: CSNHS-M002-00(969)

County: Muscogee/Harris/Troup

P. I. Number: M002969

Federal Route Number: 185

State Route Number: 411



Recommendation for approval:

DATE 5-23-06

C. Andy Casey, P.E.
Project Manager

DATE 5-23-06

Burt A. [Signature], P.E.
Office Head/District Engineer

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

DATE _____

State Transportation Planning Administrator

DATE _____

State Transportation Financial Management Administrator

DATE _____

State Environmental/Location Engineer

DATE _____

[Signature]
State Traffic Safety & Design Engineer

DATE 6/2/06

District Engineer

DATE _____

Project Review Engineer

DATE _____

State Bridge Design Engineer

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

Office of Airport and Road Design

PROJECT CONCEPT REPORT

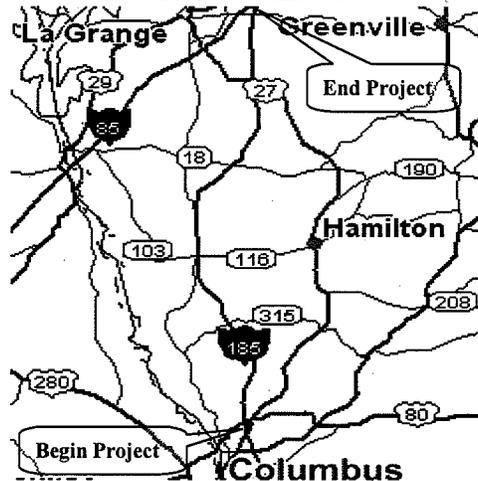
Project Number: CSNHS-M002-00(969)

County: Muscogee/Harris/Troup

P. I. Number: M002969

Federal Route Number: 185

State Route Number: 411



Recommendation for approval:

DATE 5-23-06

C. Andy Casay, P.E.
Project Manager

DATE 5-23-06

Burt A. [Signature], P.E.
Office Head/District Engineer

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

DATE _____

State Transportation Planning Administrator

DATE _____

State Transportation Financial Management Administrator

DATE _____

State Environmental/Location Engineer

DATE _____

State Traffic Safety & Design Engineer

DATE _____

District Engineer

DATE _____

Project Review Engineer

DATE _____

State Bridge Design Engineer

Need and Purpose: The primary need for the project is the resurfacing and maintenance of the existing roadway to preserve the integrity and safety of the system. The majority of the pavement within the project is in fair condition. This condition will continue to deteriorate as traffic grows. This project is the asphalt milling and inlay of the existing asphaltic concrete pavement of the travel lanes and inside shoulders by raising the profile grade line 2", all ramps (raise ramp PGL ¾") and patch/reconstruct outside shoulders as directed, of I-185/SR 411 from approx. 8.25 MP in Muscogee County (CS 1425 / Airport Thruway Rd) to the North End (approx. 49.3 MP merge onto I-85) in Troup County. The existing guardrail will be upgraded to current standards and vegetation will be cleared according to current guidelines.

Description of the proposed project: The project is located within Muscogee, Harris and Troup counties. The project scope is the milling and inlay of the existing pavement of the travel lanes and shoulders, which consist of asphaltic concrete pavement. The project will also upgrade the guardrail to current standards and all vegetation will be cleared according to current guidelines on both southbound and northbound lanes.

Is the project located in a Non-attainment area? ___ Yes X No

PDP Classification: Major on Existing Location

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

Functional Classification: Interstate Principal Arterial

U. S. Route Number: I-185

State Route Number: SR 411

Traffic (AADT):

Current Year: (2004) 35,500 Build Year: (2009) 41,000 Design Year: (2029) 61,000

Existing design features:

From 8.25 MP to 11.22 MP:

- Typical Section: 6-12' lanes (3 in each direction), 14' outside shoulders, and 8' median shoulder with a concrete median barrier.
- Posted speed: 55 mph Maximum degree of curve: 1°30'00"
- Maximum super-elevation rate for curve: 6.00%
- Maximum grade: 2.32%
- Width of right of way: 300 ft

From 11.22 MP to 49.30 MP

- Typical Section: 4-12' lanes (2 in each direction), with 10' inside shoulders, 14' outside shoulders, and a variable width (88'-150') depressed median.
- Posted speed: 70 mph Maximum degree of curve: 1°30'00"
- Maximum super-elevation rate for curve: 7.00%

- Maximum grade: 3.0%
- Width of right of way: 350 ft

- **Major Structures:**

BRIDGES on SR 411/I-185:

- Under SR 1 / US 27 – Veterans Pkwy / Hamilton Rd (Sufficient Rate 90.75%)
- Over Central of Georgia Railroad NBL (Sufficient Rate 92.81%)
- Over Central of Georgia Railroad SBL (Sufficient Rate 92.81%)
- Over CS 1616 – Whittlesey Rd NBL (Sufficient Rate 91.81%)
- Over CS 1616 – Whittlesey Rd SBL (Sufficient Rate 91.81%)
- Under CS 2104 – Double Church Rd (Sufficient Rate 98.14%)
- Under CR 16 – Hubbard Rd (Sufficient Rate 97.95%)
- Over Standing Boy Creek I-185 NBL (Sufficient Rate 84.00%)
- Over Standing Boy Creek I-185 SBL (Sufficient Rate 84.00%)
- Under CR 385 – Mountain Hill Rd (Sufficient Rate 86.59%)
- Over Mulberry Creek I-185 NBL (Sufficient Rate 95.49%)
- Over Mulberry Creek I-185 SBL (Sufficient Rate 95.49%)
- Over CR 393 – Lower Blue Springs Rd NB I-185 NBL (Sufficient Rate 78.85%)
- Over CR 393 – Lower Blue Springs Rd SB I-185 SBL (Sufficient Rate 77.85%)
- Over Mountain Oak Creek I-185 NBL (Sufficient Rate 87.46%)
- Over Mountain Oak Creek I-185 SBL (Sufficient Rate 87.46%)
- Under CR 177 – Dennis Smith Rd (Sufficient Rate 89.25%)
- Under CR 415 – Salem Rd (Sufficient Rate 92.40%)
- Under CR 183 – Oak Grove Rd (Sufficient Rate 83.26%)
- Over CR 181 – Thompson Rd I-185 NBL (Sufficient Rate 93.63%)
- Over CR 181 – Thompson Rd I-185 SBL (Sufficient Rate 93.63%)
- Over Flat Shoals Creek I-185 NBL (Sufficient Rate 95.88%)
- Over Flat Shoals Creek I-185 SBL (Sufficient Rate 96.68%)
- Under CR 408 – Lower Big Springs Rd I-185 SBL (Sufficient Rate 97.64%)
- Under CR 408 – Lower Big Springs Rd I-185 NBL (Sufficient Rate 99.64%)
- Over CSX Railroad – I-185 NBL (Sufficient Rate 90.81%)
- Over CSX Railroad – I-185 SBL (Sufficient Rate 79.16%)
- Under SR 109 – Greenville Rd I-185 SBL (Sufficient Rate 93.62%)
- Under SR 109 – Greenville Rd I-185 NB (Sufficient Rate 93.62%)
- Under SR 29 – US Conn. I-185 SBL (Sufficient Rate 98.00%)
- Over I-85 --- I-185 SBL (Sufficient Rate 94.07%)

BRIDGE CULVERTS on SR 411/I-185:

- Over Roaring Branch (Sufficient Rate 85.00%) – Double 10x6 Box
- Over Heiferhorn Creek Branch (Sufficient Rate 87.63%) – Triple 10x8 Box
- Over Heiferhorn Creek Tributary (Sufficient Rate 90.63%) – Double 10x8 Box
- Over Heiferhorn Creek (Sufficient Rate 84.89%) – Triple 10x10 Box
- Over Mulberry Creek (Sufficient Rate 70.00%) – Double 10x9 Box
- Over House Creek Tributary (Sufficient Rate 83.78%) – Triple 9x8 Box

Over Ingram Creek (Sufficient Rate Unknown) – Double 8x8 Box
Over Turkey Creek (Sufficient Rate 73.99%) – Triple 10x12 Box
Over Polecat Creek (Sufficient Rate 73.99%) – Triple 9x9 Box
Over Panther Creek Tributary (Sufficient Rate 85.00%) – Triple 8x6 Box
Over Panther Creek (Sufficient Rate 85.00%) – Triple 9x7 Box
Over Long Cane Creek (Sufficient Rate 86.45%) – Triple 9x7 Box

- **Major intersections and interchanges:**

I-185 at 8.25 MP over CS 1425 – Airport Thruway Rd in Muscogee County near 8.25 MP (Sufficient Rate 86.57%)

I-185 at 10.15 MP (Exit 10) under US 80 / SR 22 EBL – Columbus Bypass in Muscogee County (Sufficient Rate 94.90%)

I-185 at 10.16 MP (Exit 10) under US 80 / SR 22 WBL – Columbus Bypass in Muscogee County (Sufficient Rate 93.43%)

I-185 at 11.68 MP (Exit 12) under FM CS2249 – Williams Rd in Muscogee County (Sufficient Rate 97.50%)

I-185 NBL at 14.25 MP (Exit 14) over CR 98 – Smith Rd in Muscogee County (Sufficient Rate 90.19%)

I-185 SBL at 14.26 MP (Exit 14) over CR 98 – Smith Rd in Muscogee County (Sufficient Rate 89.19%)

I-185 at 18.83 MP (Exit 19) under SR 315 in Harris County (Sufficient Rate 97.65%)

I-185 NBL at 25.40 MP (Exit 25) over SR 116 in Harris County (Sufficient Rate 95.41%)

I-185 SBL at 25.41 MP (Exit 25) over SR 116 in Harris County (Sufficient Rate 95.41%)

I-185 at 30.04 MP (Exit 30) under CR 388 – Hopewell Church Rd in Harris County (Sufficient Rate 94.20%)

I-185 at 34.11 MP (Exit 34) under SR 18 EBL – Bo Callaway Jr Highway in Harris County (Sufficient Rate 99.88%)

I-185 at 34.13 MP (Exit 34) under SR 18 WBL – Bo Callaway Jr Highway in Harris County (Sufficient Rate 95.87%)

I-185 at 42.03 MP (Exit 42) under SR 1 / US 27 NBL in Troup County (Sufficient Rate 77.94%)

I-185 at 42.13 MP (Exit 42) under SR 1 / US 27 SBL in Troup County (Sufficient Rate 77.94%)

I-185 at 45.76 MP (Exit 46) under CR 411 – Upper Big Spgs Rd in Troup County (Sufficient Rate 96.14%)

I-185 SBL at MP 48 under SR 29 Connector from I-185 NBL in Troup County (Sufficient Rate 98.00%)

I-185 SB Begin Ramp (Exit 21 of I-85 SBL) in Troup County (Sufficient Rate 94.07%)

From 11.22 MP to 49.30 MP

- Proposed typical section: 4-12' lanes (2 in each direction) with 10' inside shoulders, 14' outside shoulders, and a variable width (88'-150') depressed median.
- Proposed Design Speed: 70 mph
- Proposed Maximum grade: 3.0% Maximum grade allowable: 5.0%
- Proposed Maximum super-elevation rate for curve: 7.00%
- Proposed Maximum degree of curve 1°30'00" Maximum degree allowable: 3°00'00"

Right of way

- Width: Utilize existing 300-350ft. of Right-of-Way
- Easements: Temporary (), Permanent (), Utility (), None (X).
- Type of access control: Full Limited(X), Partial (), By Permit (), Other ().
- Number of parcels: 0 Number of displacements:
 - Business: 0
 - Residences: 0
 - Mobile homes: 0
 - Other: 0
- Structures:
 - Bridges: Retain existing bridges. No widening is required on the mainline bridges.
 - Culverts: Retain existing culverts. No lengthening is required.

- Major intersections and interchanges:

I-185 at 8.25 MP over CS 1425 – Airport Thruway Rd in Muscogee County near 8.25 MP

I-185 at 10.15 MP (Exit 10) under US 80 / SR 22 EBL – Columbus Bypass in Muscogee County

I-185 at 10.16 MP (Exit 10) under US 80 / SR 22 WBL – Columbus Bypass in Muscogee County

I-185 at 11.68 MP (Exit 12) under FM CS2249 – Williams Rd in Muscogee County

I-185 NBL at 14.25 MP (Exit 14) over CR 98 – Smith Rd in Muscogee County

I-185 SBL at 14.26 MP (Exit 14) over CR 98 – Smith Rd in Muscogee County

I-185 at 18.83 MP (Exit 19) under SR 315 in Harris County

I-185 NBL at 25.40 MP (Exit 25) over SR 116 in Harris County

I-185 SBL at 25.41 MP (Exit 25) over SR 116 in Harris County

I-185 at 30.04 MP (Exit 30) under CR 388 – Hopewell Church Rd in Harris County

I-185 at 34.11 MP (Exit 34) under SR 18 EBL – Bo Callaway Jr Highway in Harris County

I-185 at 34.13 MP (Exit 34) under SR 18 WBL – Bo Callaway Jr Highway in Harris County

I-185 at 42.03 MP (Exit 42) under SR 1 / US 27 NBL in Troup County

I-185 at 42.13 MP (Exit 42) under SR 1 / US 27 SBL in Troup County

I-185 at 45.76 MP (Exit 46) under CR 411 – Upper Big Spgs Rd in Troup County

I-185 SBL at MP 48 under SR 29 Connector from I-185 NBL in Troup County

I-185 SB Begin Ramp (Exit 21 of I-85 SBL) in Troup County

I-185 NBL End Merge Ramp onto I-85 NBL in Troup County at 49.3 MP

- Traffic control during construction: Stage Traffic Control will be utilized on this project.
- Design Exceptions to controlling criteria anticipated:

	<u>UNDETERMINE</u>	<u>YES</u>	<u>NO</u>
HORIZONTAL ALIGNMENT:	()	()	(X)
ROADWAY WIDTH:	()	()	(X)
SHOULDER WIDTH:	()	()	(X)
VERTICAL GRADES:	()	()	(X)
CROSS SLOPES:	()	()	(X)
STOPPING SIGHT DISTANCE:	()	()	(X)
SUPERELEVATION RATES:	()	()	(X)
HORIZONTAL CLEARANCE:	()	()	(X)
SPEED DESIGN:	()	()	(X)
VERTICAL CLEARANCE:	()	()	(X)
BRIDGE WIDTH:	()	()	(X)
BRIDGE STRUCTURAL CAPACITY:	()	()	(X)

- Design Variances: None
- Environmental concerns:
- Level of environmental analysis:
 - Are Time Savings Procedures appropriate? Yes (X), No (),
 - Categorical exclusion (X),
 - Environmental Assessment/Finding of No Significant Impact (FONSI) (), or
 - Environmental Impact Statement (EIS) ().
- Utility involvements:

Project responsibilities:

- Design, GDOT
- Letting to contract, GDOT
- Supervision of construction, GDOT
- Providing material pits, By Contractor

Coordination

- Initial concept meeting date and brief summary. Mar. 30, 2006
- P. A. R. meetings, dates and results. No meeting to be held
- FEMA, USCG, and/or TVA. No coordination
- Public involvement. None
- Local government comments. No comments at this time
- Other projects in the area. None

Scheduling – Responsible Parties’ Estimate

- Time to complete the environmental process: 4 Months
- Time to complete preliminary construction plans: 3 Months
- Time to complete right of way plans: No right of way plans needed
- Time to complete the Section 404 Permit: 4 Months
- Time to complete final construction plans: 1 Month
- Time to complete to purchase right of way: N/A
- List other major items that will affect the project schedule: N/A

Other alternates considered: None

Comments: None

Attachments:

1. Sketch location map,
2. Accident summary,
3. Cost Estimates:
 - a. Construction including E&C,
4. Minutes of Initial Concept Team meeting(pending)
5. Typical sections
6. Capacity analysis,
7. Pavement Evaluation Summary
8. Traffic Counts

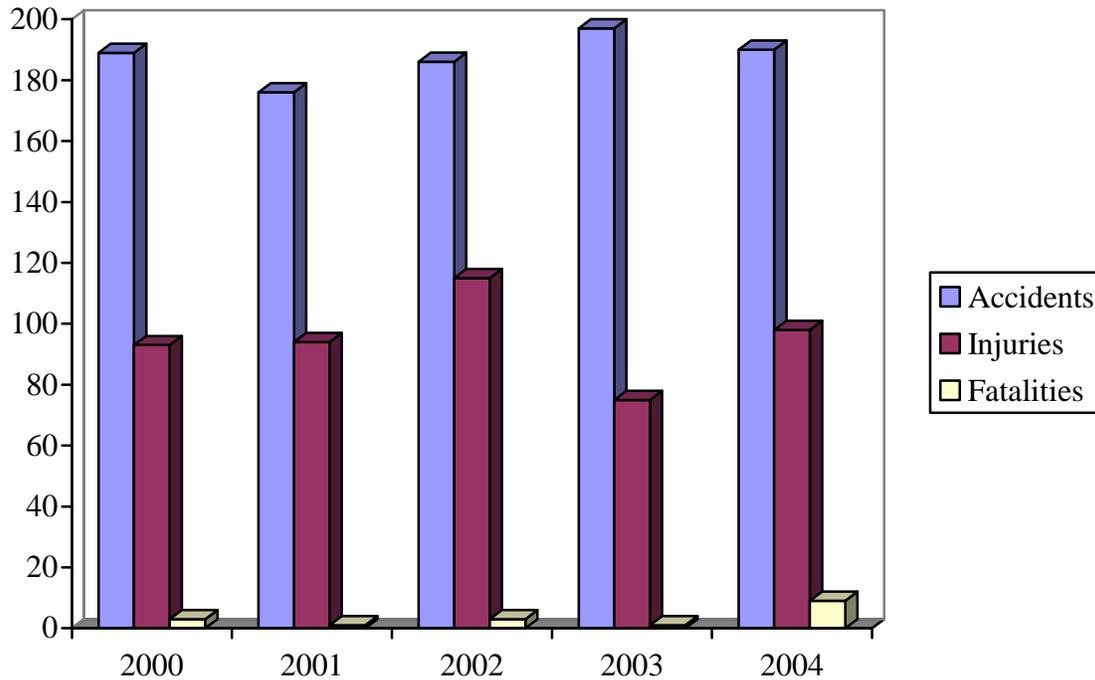
SCORING RESULTS AS PER TOPPS 2440-2

Project Number: CSNHS-M002-00(969)		County: MUSCOGEE/HARRIS/TROUP		PI No.: M002969	
Report Date:		Concept By: DOT Office: ROAD DESIGN			
<input type="checkbox"/> CONCEPT		Consultant:			
Project Type: Choose One From Each Column		<input type="checkbox"/> Major <input type="checkbox"/> Minor	<input type="checkbox"/> Urban <input type="checkbox"/> Rural	<input type="checkbox"/> ATMS <input type="checkbox"/> Bridge <input type="checkbox"/> Building <input type="checkbox"/> Interchange <input type="checkbox"/> Intersection <input type="checkbox"/> Interstate <input type="checkbox"/> New Location <input type="checkbox"/> Widening & Reconstruction <input type="checkbox"/> Miscellaneous	
FOCUS AREAS	SCORE	RESULTS			
Presentation					
Judgement					
Environmental					
Right of Way					
Utility					
Constructability					
Schedule					

**Crash Data
 For
 CSNHS-M002-00(969) Muscogee, Harris & Troup County
 (8.25 MP – 49.30 MP)
 P.I. No. M002969**

<u>Year</u>	<u># of Crashes</u>	<u># of Injuries</u>	<u># of Fatalities</u>	<u>Accident Rate</u>	<u>Injury Rate</u>	<u>Fatality Rate</u>
2000	189	93	3	65	32	1.03
2001	176	94	1	54	29	0.31
2002	186	115	3	59	37	0.96
2003*	197	75	1	63	24	0.32
2004*	190	98	9	64	33	3.03

*Data from these two years are incomplete.



SUMMARY OF PROJECT COST

DATE: February 27, 2006

ESTIMATED LETTING DATE: June, 2006

PREPARED BY: Andy Casey

PROJECT LENGTH (MILES): 41.05

()PROGRAMMING PROCESS (X)CONCEPT DEVELOPMENT ()DURING PROJECT DEV.

PROJECT COST	
A. RIGHT-OF-WAY:	
1. PROPERTY (LAND & EASEMENT)	
2. DISPLACEMENTS; RES:0, BUS;0, M.H.:0	
3. OTHER COST (ADM./COST, INFLATION)	
SUBTOTAL:A	\$ -0-
B. REIMBURSABLE UTILITIES:	
1. RAILROAD	
2. TRANSMISSION LINES	
3. SERVICES	
SUBTOTAL:B	\$ -0-
C. CONSTRUCTION:	
1. MAJOR STRUCTURES	
a. RETAINING WALLS	
b. BRIDGES	
c. DETOURS BRIDGES	
d. BOX CULVERTS	
SUBTOTAL:C-1	\$ -0-
2. GRADING AND DRAINAGE:	
a. EARTHWORK	
SUBTOTAL:C-2	\$ 1,000,000

d. DRAINAGE:		
1) Cross Drain Pipe (exclude box culverts)		
2) Curb and Gutter		
3) Longitudinal System		
SUBTOTAL:C-2		\$ 100,000
3. BASE AND PAVING: (Travel Lanes and Interchange Ramp inlay only)		
a. AGGREGATE BASE		-0-
b. ASPHALT PAVING:	1½" PEM \$58.20x 87,640 tons	\$ 5,100,648
	1½" Interlayer 12.5 mm SMA \$68.50x107,110 tons	\$ 7,337,035
	6", 2.25 & 3" Interlayer 19 mm Super. \$40.00x315,780 tons	\$12,631,200
	1½" Ramp and 2" Shoulder 12.5 mm Super. \$42.10x 38,250 tons	\$ 1,610,325
	Bituminous Tack Coat \$1.00x109,760 GL	\$ 109,760
SUBTOTAL:C-3 b		\$ 26,788,968
SUBTOTAL:C-3		\$ 26,788,968
4. LUMP ITEMS:		
a. TRAFFIC CONTROL		\$ 3,500,000
b. CLEARING AND GRUBBING		\$ 3,000,000
c. LANDSCAPING		\$ -0-
d. EROSION CONTROL		\$ 1,500,000
e. DETOURS		\$ -0-
SUBTOTAL:C-4		\$ 8,000,000
5. MISCELLANEOUS:		
a. LIGHTING		\$ -0-
b. SIGNING - STRIPING - SIGNAL		\$ 2,200,000
c. GUARDRAIL		\$ 2,000,000
d. APPROACH SLABS - MAINLINE BRIDGES		\$ 800,000
SUBTOTAL:C-5		\$ 5,000,000
6. SPECIAL FEATURES:		
a. Mill Asphalt. Conc. Pvmt 6¾" \$8.15x649,120 SY		\$ 5,290,328
b. Mill Asphalt. Conc. Pvmt 3" \$5.00x649,120 SY		\$ 3,245,600
c. Mill Asphalt. Conc. Pvmt 2¾" \$3.00x191,620 SY		\$ 574,860
d. Mill Asphalt. Conc. Pvmt Variable Depth \$1.70x10,000 SY		\$ 17,000
e. Asphalt-Rubber Joint and crack seal, TP M \$0.78x10,000 LF		\$ 7,800
SUBTOTAL:C-6		\$ 9,135,588

ESTIMATE SUMMARY		
A. RIGHT-OF-WAY		\$0.00
B. REIMBURSABLE UTILITIES		\$0.00
C. CONSTRUCTION		
1. MAJOR STRUCTURES	\$	-0-
2. GRADING AND DRAINAGE	\$	1,100,000
3. BASE AND PAVING	\$	26,788,968
4. LUMP ITEMS	\$	8,000,000
5. MISCELLANEOUS	\$	5,000,000
6. SPECIAL FEATURES	\$	9,135,588
SUBTOTAL CONSTRUCTION COST	\$	50,024,556
E. & C. (10%)	\$	5,002,456
INFLATION (5% PER YEAR)	\$	-0-
NUMBER OF YEARS		0
TOTAL CONSTRUCTION COST		\$ 55,027,012
GRAND TOTAL PROJECT COST		\$ 55,027,012

Initial Concept Team Meeting Minutes

Muscogee/Harris/Troup Counties PI#M002969 - CSNHS-M002-00(969)

March 30, 2006; 10:00 am

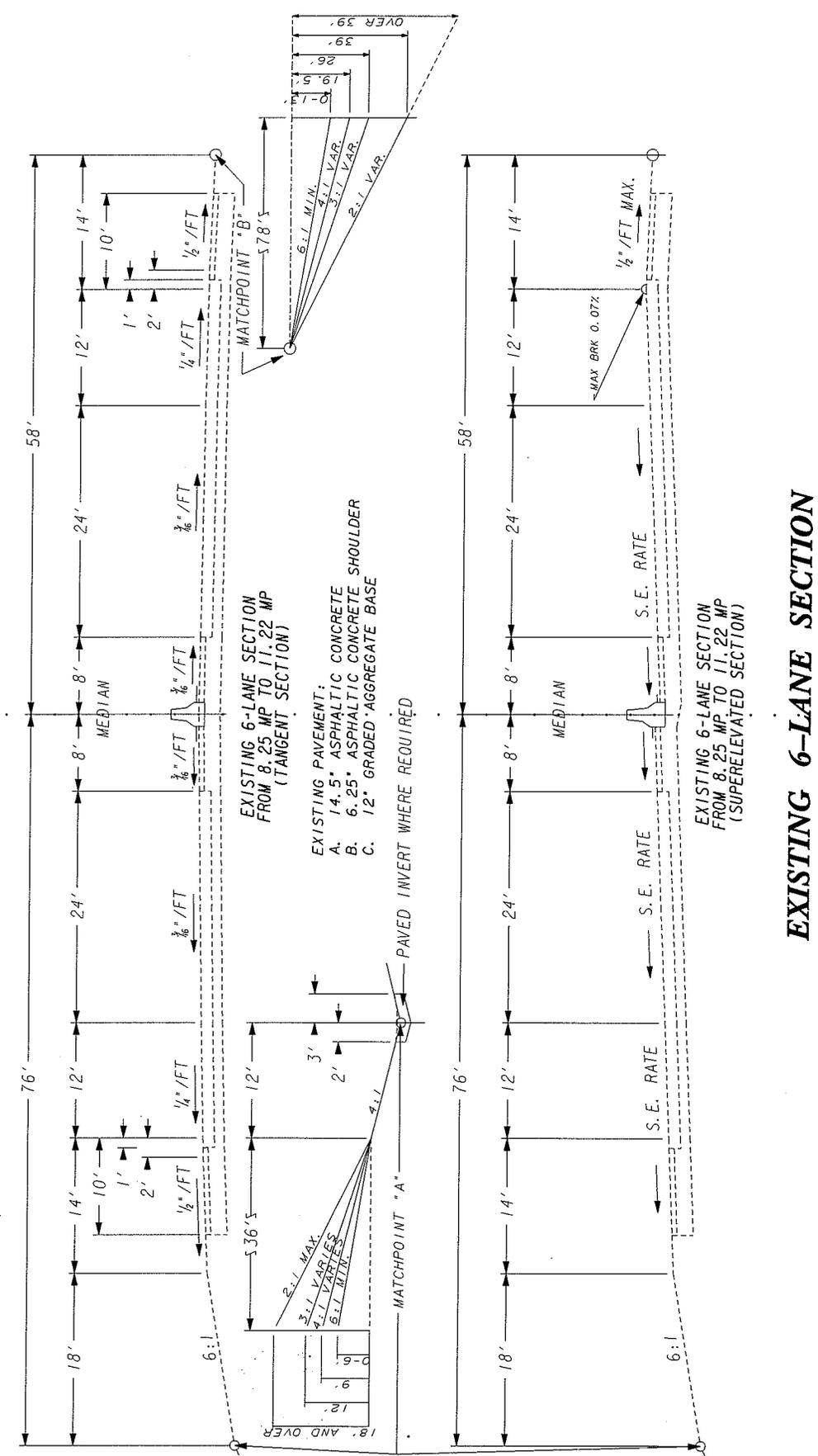
- I-185 Asphalt Mill & Inlay of existing pavement travel lanes and ramps
- Guardrail upgrade to current standards
- Vegetation clearance to current guidelines

Attendees:

NAME	OFFICE	PHONE #	E-MAIL
Andy Casey	GDOT Road Design	404-656-5406	Andy.Casey@dot.state.ga.us
Angelo Yokaris	GDOT Road Design	404-657-9757	Angelo.Yokaris@dot.state.ga.us
Thomas B. Howell	GDOT District 3 Engineer	706-646-6500	Thomas.Howell@dot.state.ga.us
David B. Millen	GDOT District 3 Preconstruction	706-646-6594	David.Millen@dot.state.ga.us
Wayne Pittman	GDOT Columbus Area Engineer	706-568-2165	Wayne.Pittman@dot.state.ga.us
Mark Williams	GDOT Columbus Office Area 7	706-568-2165	Mark.Williams@dot.state.ga.us
Kim Brown	GDOT Thomaston Utilities	706-646-6548	Kim.Brown@dot.state.ga.us
Michael A. Smith	GDOT Columbus AAE/M	706-568-2165	Mike.Smith@dot.state.ga.us
Scott Parker	GDOT District 3 Traffic Ops	706-646-6561	Scott.Parker@dot.state.ga.us
Edsel D. Meachan	Volkert	706-565-7355	

1. Andy Casey presided over the meeting.
2. Andy began by reading through and highlighting the different aspects of the project and the addition of all ramp rehabilitation to the original scope of work.
3. Wayne suggested we put restrictions South of Smith Rd (14MP) to no lane closures between 6 am and 9 pm Monday through Friday. He also suggested 24/7 operation North of Smith Road (14 MP).
4. Thomas agreed to have restrictive hours only in Muscogee County for mainline work. He suggested that any ramp closures take place one at a time. The work should take place between 9 pm and 6 am only after the District is given a 14-day notice.
5. Andy presented the proposed staging plan. Thomas said there was no need for staging plans on this project and there were clearly no constructability issues. He suggested the plans to be left to the contractor, as this can help for a more competitive bid.
6. David agreed construction staging appears straight forward, and staging plans should not be needed without crossovers or shifting traffic across.
7. Andy asked to clarify project limits on Airport Rd. Wayne suggested that scope of work includes rehabilitation of all 4 ramps of Airport Rd interchange and should start just south of the interchange where road surface changes to concrete. There were no concerns or objections.
8. Thomas suggested time restrictions on contractor to cover milling work and sequence of operations. He proposed to cover milling depth within 3 days for safety and drainage purposes.
9. Angelo asked whether everyone was comfortable that the current width of each travel lane being adequate to accommodate traffic on one with a barrel in the middle as the other lane is being constructed, or whether putting any traffic on shoulders during construction could be needed at all. There were no concerns addressed by anyone. Thomas felt there is no need shifting traffic to shoulders, and the current width of the roadway was sufficient for barrels.
10. Thomas wanted to clarify that the inside shoulder would match PGL raised by 2" and build up to adjust cross slope on tangent sections of existing travel lanes from 3/16" per foot, to 2%. It was agreed that inside shoulder be raised 2" as well and slope is adjusted to match slope of travel lanes. That would only be possible in depressed median sections and not in the urban sections with paved shoulder and median barrier.
11. Andy asked how will the grade difference be adjusted, i.e. either during the milling phase or the inlay paving phase. Wayne suggested that difference be adjusted during milling. Angelo agreed and added that adjustment be made at the milling phase with variable milling starting at the minimum depth for each travel lane, as recommended at the pavement evaluation report. There were no objections or concerns.
12. Wayne suggested milling outside shoulder to adjust new grade, and replace with 165 lbs/sy (1½") 12.5 mm superpave.
13. David mentioned he would like to see the SMA surface course extend 1' over onto the outside shoulder. Thomas agreed and suggested 18" extension.

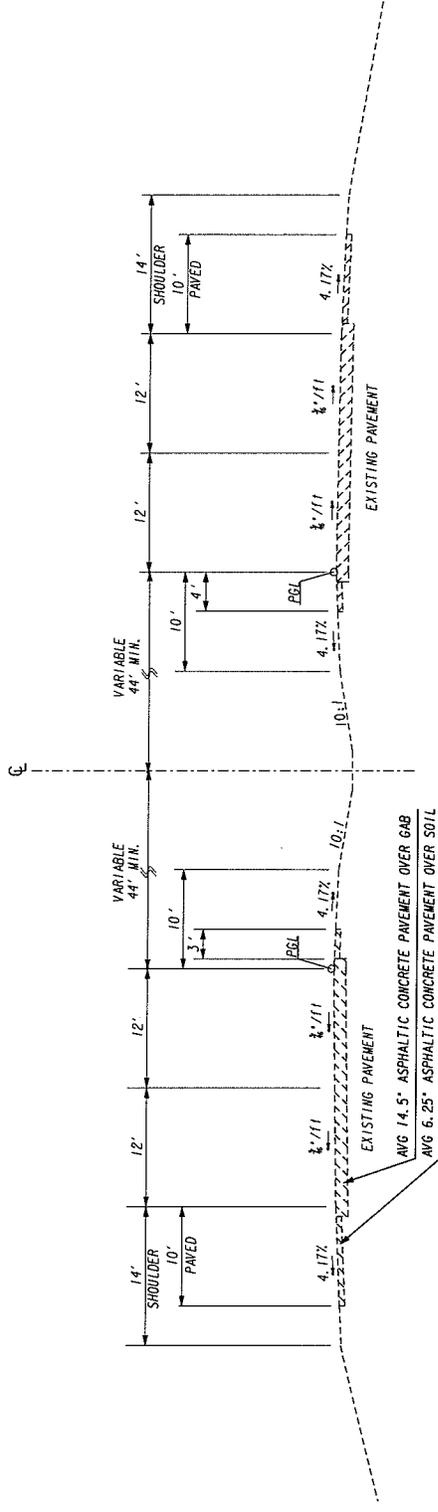
14. Wayne suggested we set up slope paving for underneath the bridges. Andy said it will be considered.
15. Mark addressed the issue of median clearance and median drop inlet repairs. Andy suggested that because of the long length of the project and number of inlets, we specify locations of any such inlets that need to be repaired or reconstructed. Mark said the problem areas will be located and quantified to set up pay item for drop inlet reconstruction, and a file will be sent to Road Design Office.
16. Thomas agreed with Mark that a large portion of the existing vegetation along the median needs to be cleared. It was also recognized that some of this vegetation was serving as glare screen protection along some superelevated sections.
17. Wayne addressed a concern for the deterioration of the existing approach slabs. A recommendation was made to request Bridge Maintenance to inspect and evaluate all approach slabs. Upon findings, we will then set up a pay item for their rehabilitation if needed.
18. Wayne and Mark brought up the paving underneath the new guardrail. Thomas suggested 1.5" asphalt on top of GAB would be more than sufficient since the purpose of the asphalt under the guardrail is to avoid weed and vegetation growth, and not structural.
19. David mentioned the possible need for coordinating with Haithcock and Parsons managing the adjacent project.
20. Andy and everyone introduced themselves.
21. Meeting adjourned.



EXISTING 6-LANE SECTION

STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OFFICE: ROAD AND AIRPORT DESIGN		REVISION DATES		DRAWING NO. 5-02	
TYPICAL SECTIONS		NOT TO SCALE FOR ILLUSTRATION PURPOSES ONLY			
GEORGIA DEPARTMENT OF TRANSPORTATION					

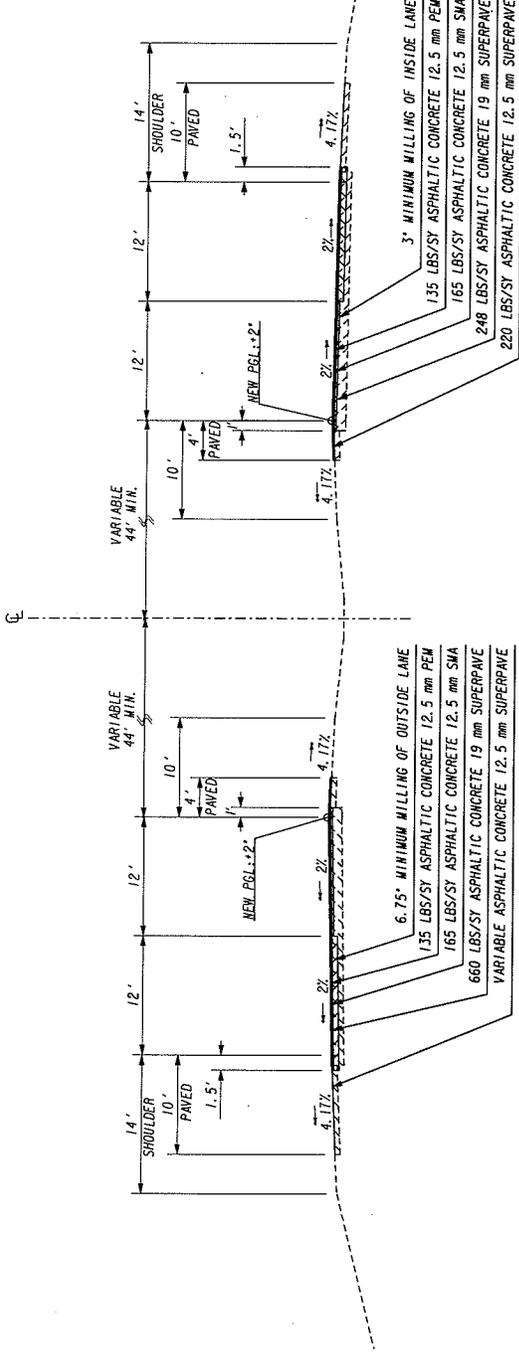
I-185



EXISTING 4-LANE SECTION

<p>GEORGIA DEPARTMENT OF TRANSPORTATION</p>	<p>NOT TO SCALE FOR ILLUSTRATION PURPOSES ONLY</p>	<p>STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OFFICE: ROAD AND AIRPORT DESIGN</p>	<p>CONSTRUCTION STAGING CROSS SECTION</p>
		<p>REVISION DATES</p>	<p>DRAWING NO. 19-00</p>

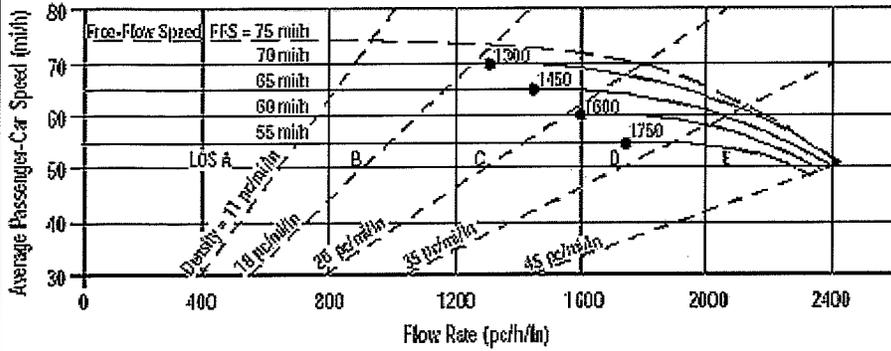
I-185



PROPOSED TYPICAL 4-LANE SECTION

<p>GEORGIA DEPARTMENT OF TRANSPORTATION</p>	<p>NOT TO SCALE FOR ILLUSTRATION PURPOSES ONLY</p>	<p>STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OFFICE: ROAD AND AIRPORT DESIGN CONSTRUCTION STAGING CROSS SECTION</p>	<p>DRAWING NO. 19-01</p>
		<p>REVISION DATES</p>	

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (ff)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p , S, D

General Information		Site Information	
Analyst	Angelo D. Yokaris	Highway/Direction of Travel	I-185 / North-South
Agency or Company	GDOT - Road Design	From/To	MP 10.13-11.65
Date Performed	2.27.2006	Jurisdiction	Muscogee County
Analysis Time Period	N/A	Analysis Year	2004
Project Description SR 411 / I-185 Rehabilitation			

Oper.(LOS)
 Des.(N)
 Planning Data

Flow Inputs			
Volume, V	2307 veh/h	Peak-Hour Factor, PHF	0.90
AADT	35500 veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K	0.10	%RVs, P_R	0
Peak-Hr Direction Prop, D	65	General Terrain:	Level
DDHV = AADT x K x D	2307 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

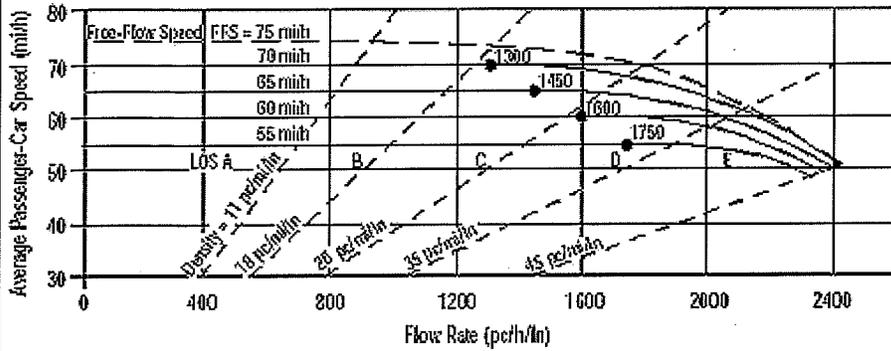
Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.966

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	12.0 ft	f_{LW}	0.0 mi/h
Rt-Shoulder Lat. Clearance	6.0 ft	f_{LC}	0.0 mi/h
Interchange Density	0.70 l/mi	f_{ID}	1.0 mi/h
Number of Lanes, N	3	f_N	3.0 mi/h
FFS (measured)	mi/h	FFS	56.0 mi/h
Base free-flow Speed, BFFS	60.0 mi/h		

LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	884 pc/h/ln	Design LOS	
S	56.0 mi/h	$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h
$D = v_p / S$	15.8 pc/mi/ln	S	mi/h
LOS	B	$D = v_p / S$	pc/mi/ln
		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v _p	LOS, S, D
Design (N)	FFS, LOS, v _p	N, S, D
Design (v _p)	FFS, LOS, N	v _p , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v _p)	FFS, LOS, N	v _p , S, D

General Information

Analyst: Angelo D. Yokaris
 Agency or Company: GDOT - Road Design
 Date Performed: 2.27.2006
 Analysis Time Period: N/A

Site Information

Highway/Direction of Travel: I-185 / North-South
 From/To: MP 10.13-11.65
 Jurisdiction: Muscogee County
 Analysis Year: 2029

Project Description: SR 411 / I-185 Rehabilitation

Oper.(LOS) Des.(N) Planning Data

Flow Inputs

Volume, V	3965 veh/h	Peak-Hour Factor, PHF	0.90
AADT	61000 veh/day	%Trucks and Buses, P _T	7
Peak-Hr Prop. of AADT, K	0.10	%RVs, P _R	0
Peak-Hr Direction Prop, D	65	General Terrain:	Level
DDHV = AADT x K x D	3965 veh/h	Grade %	Length mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.966

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.70	l/mi
Number of Lanes, N	3	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f _{LW}	0.0	mi/h
f _{LC}	0.0	mi/h
f _{ID}	1.0	mi/h
f _N	3.0	mi/h
FFS	56.0	mi/h

LOS and Performance Measures

Operational (LOS)		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1520	pc/h/ln
S	56.0	mi/h
D = v _p / S	27.2	pc/mi/ln
LOS	D	

Design (N)

Design (N)		
Design LOS		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)		pc/h
S		mi/h
D = v _p / S		pc/mi/ln
Required Number of Lanes, N		

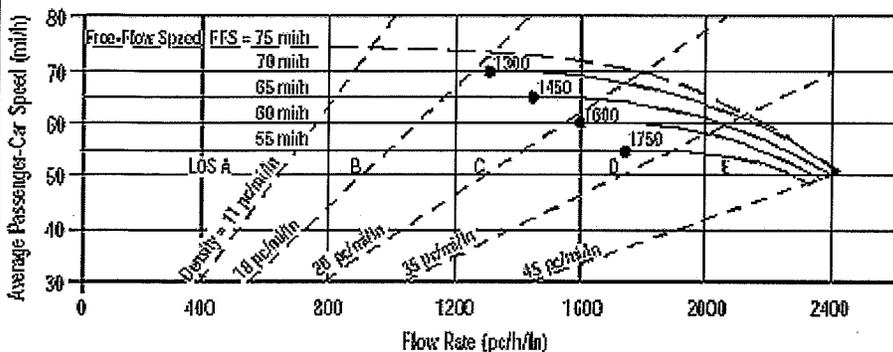
Glossary

N - Number of lanes S - Speed
 V - Hourly volume D - Density
 v_p - Flow rate FFS - Free-flow speed
 LOS - Level of service BFFS - Base free-flow speed
 DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 23-8, 23-10 f_{LW} - Exhibit 23-4
 E_T - Exhibits 23-8, 23-10, 23-11 f_{LC} - Exhibit 23-5
 f_p - Page 23-12 f_N - Exhibit 23-6
 LOS, S, FFS, v_p - Exhibits 23-2, 23-3 f_{ID} - Exhibit 23-7

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p , S, D

General Information

Analyst: Angelo D. Yokaris
 Agency or Company: GDOT - Road Design
 Date Performed: 2.27.2006
 Analysis Time Period: N/A

Site Information

Highway/Direction of Travel: I-185 / North-South
 From/To: MP 11.66-14.26
 Jurisdiction: Muscogee County
 Analysis Year: 2004

Project Description: SR 411 / I-185 Rehabilitation

Oper.(LOS)

Des.(N)

Planning Data

Flow Inputs

Volume, V	2002 veh/h	Peak-Hour Factor, PHF	0.90
AADT	30800 veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K	0.10	%RVs, P_R	0
Peak-Hr Direction Prop, D	65	General Terrain:	Level
DDHV = AADT x K x D	2002 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.966

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	l/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.0	mi/h
f_N	3.0	mi/h
FFS	57.0	mi/h

LOS and Performance Measures

Operational (LOS)		
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1151	pc/h/ln
S	57.0	mi/h
$D = v_p / S$	20.2	pc/mi/ln
LOS	C	

Design (N)

Design (N)		
Design LOS		
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$		pc/h
S		mi/h
$D = v_p / S$		pc/mi/ln
Required Number of Lanes, N		

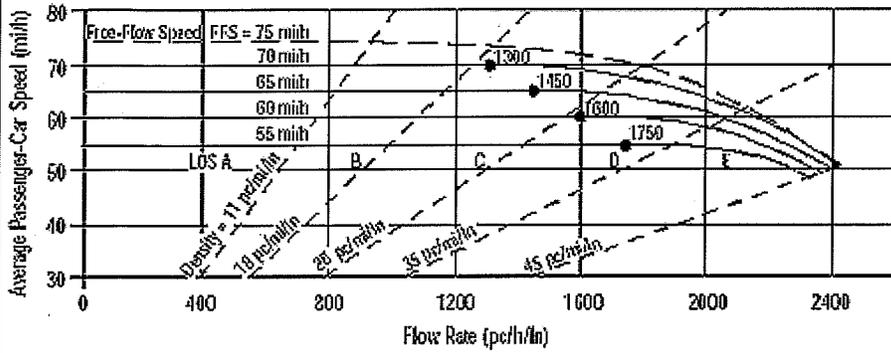
Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v _p	LOS, S, D
Design (N)	FFS, LOS, v _p	N, S, D
Design (v _p)	FFS, LOS, N	v _p , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (#)	FFS, LOS, AADT	N, S, D
Planning (v _p)	FFS, LOS, N	v _p , S, D

General Information

Analyst: Angelo D. Yokaris
 Agency or Company: GDOT - Road Design
 Date Performed: 2.27.2006
 Analysis Time Period: N/A

Site Information

Highway/Direction of Travel: I-185 / North-South
 From/To: MP 11.66-14.26
 Jurisdiction: Muscogee County
 Analysis Year: 2029

Project Description: SR 411 / I-185 Rehabilitation

Oper.(LOS)

Des.(N)

Planning Data

Flow Inputs

Volume, V	3445 veh/h	Peak-Hour Factor, PHF	0.90
AADT	53000 veh/day	%Trucks and Buses, P _T	7
Peak-Hr Prop. of AADT, K	0.10	%RVs, P _R	0
Peak-Hr Direction Prop, D	65	General Terrain:	Level
DDHV = AADT x K x D	3445 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.966

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	l/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f _{LW}	0.0	mi/h
f _{LC}	0.0	mi/h
f _{ID}	0.0	mi/h
f _N	3.0	mi/h
FFS	57.0	mi/h

LOS and Performance Measures

Operational (LOS)

v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1981	pc/h/ln
S	55.9	mi/h
D = v _p / S	35.4	pc/mi/ln
LOS	E	

Design (N)

Design (N)

Design LOS	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h
S	mi/h
D = v _p / S	pc/mi/ln
Required Number of Lanes, N	

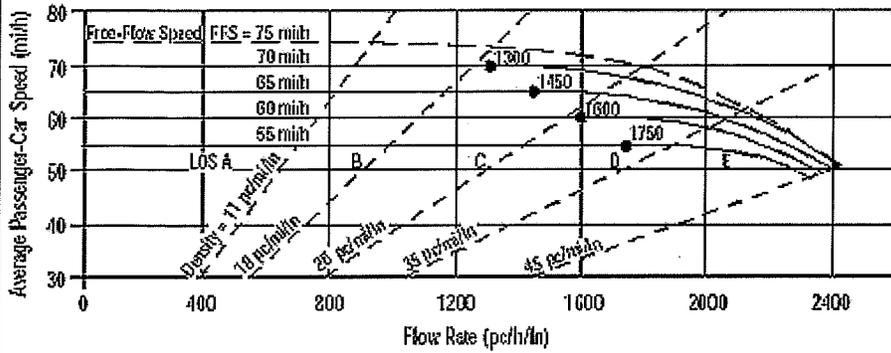
Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v _p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E _R - Exhibits 23-8, 23-10	f _{LW} - Exhibit 23-4
E _T - Exhibits 23-8, 23-10, 23-11	f _{LC} - Exhibit 23-5
f _p - Page 23-12	f _N - Exhibit 23-6
LOS, S, FFS, v _p - Exhibits 23-2, 23-3	f _{ID} - Exhibit 23-7

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v _p	LOS, S, D
Design (N)	FFS, LOS, v _p	N, S, D
Design (v _p)	FFS, LOS, N	v _p , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (ff)	FFS, LOS, AADT	N, S, D
Planning (v _p)	FFS, LOS, N	v _p , S, D

General Information		Site Information	
Analyst	Angelo D. Yokaris	Highway/Direction of Travel	I-185 / North-South
Agency or Company	GDOT - Road Design	From/To	MP 14.60-18.87
Date Performed	2.24.2006	Jurisdiction	Harris County
Analysis Time Period	N/A	Analysis Year	2004

Project Description SR 411 / I-185 Rehabilitation

<input checked="" type="checkbox"/> Oper.(LOS)	<input type="checkbox"/> Des.(N)	<input checked="" type="checkbox"/> Planning Data
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Flow Inputs			
Volume, V	1859 veh/h	Peak-Hour Factor, PHF	0.90
AADT	28600 veh/day	%Trucks and Buses, P _T	7
Peak-Hr Prop. of AADT, K	0.10	%RVs, P _R	0
Peak-Hr Direction Prop, D	65	General Terrain:	Level
DDHV = AADT x K x D	1859 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

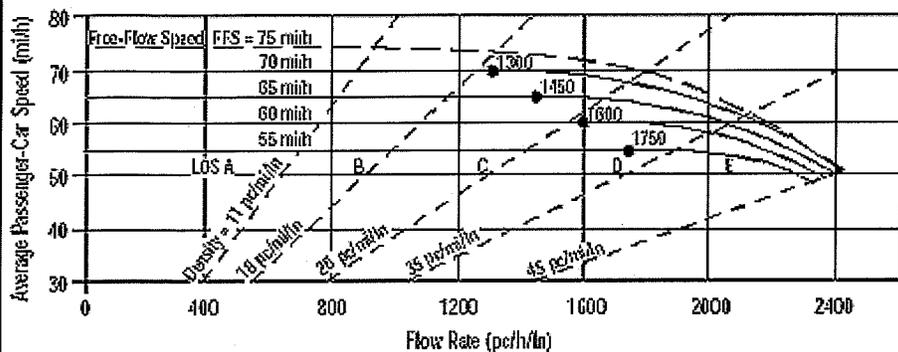
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.966

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	12.0 ft	f _{LW}	0.0 mi/h
Rt-Shoulder Lat. Clearance	6.0 ft	f _{LC}	0.0 mi/h
Interchange Density	0.50 l/mi	f _{ID}	0.0 mi/h
Number of Lanes, N	2	f _N	4.5 mi/h
FFS (measured)	mi/h	FFS	65.5 mi/h
Base free-flow Speed, BFFS	70.0 mi/h		

LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1069 pc/h/ln	Design LOS	
S	65.5 mi/h	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h
D = v _p / S	16.3 pc/mi/ln	S	mi/h
LOS	B	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 23-8, 23-10	f _{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E _T - Exhibits 23-8, 23-10, 23-11	f _{LC} - Exhibit 23-5
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 23-12	f _N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 23-2, 23-3	f _{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v _p	LOS, S, D
Design (N)	FFS, LOS, v _p	N, S, D
Design (v _p)	FFS, LOS, N	v _p , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v _p)	FFS, LOS, N	v _p , S, D

General Information		Site Information	
Analyst	Angelo D. Yokaris	Highway/Direction of Travel	I-185 / North-South
Agency or Company	GDOT - Road Design	From/To	MP 14.60-18.87
Date Performed	2.24.2006	Jurisdiction	Harris County
Analysis Time Period	N/A	Analysis Year	2029

Project Description SR 411 / I-185 Rehabilitation

Oper.(LOS) Des.(N) Planning Data

Flow Inputs			
Volume, V	3198 veh/h	Peak-Hour Factor, PHF	0.90
AADT	49200 veh/day	%Trucks and Buses, P _T	7
Peak-Hr Prop. of AADT, K	0.10	%RVs, P _R	0
Peak-Hr Direction Prop, D	65	General Terrain:	Level
DDHV = AADT x K x D	3198 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

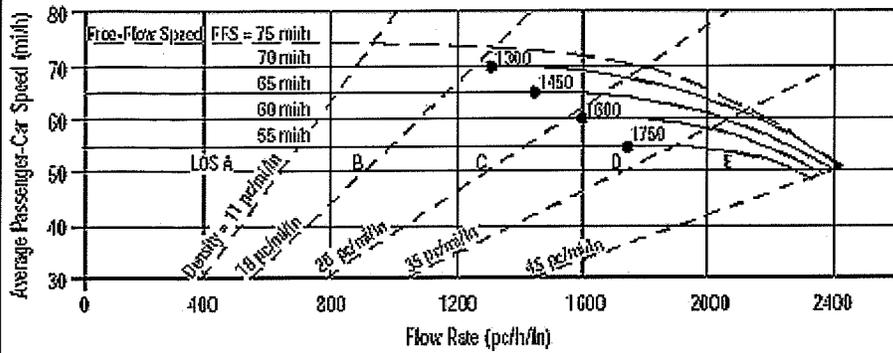
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.966

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft	f _{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f _{LC}	0.0	mi/h
Interchange Density	0.50	l/mi	f _{ID}	0.0	mi/h
Number of Lanes, N	2		f _N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1839	pc/h/ln	Design LOS		
S	64.0	mi/h	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)		
D = v _p / S	28.8	pc/mi/ln	S		
LOS	D		D = v _p / S		
			Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 23-8, 23-10	f _{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E _T - Exhibits 23-8, 23-10, 23-11	f _{LC} - Exhibit 23-5
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 23-12	f _N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 23-2, 23-3	f _{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v _p	LOS, S, D
Design (N)	FFS, LOS, v _p	N, S, D
Design (v _p)	FFS, LOS, N	v _p , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v _p)	FFS, LOS, N	v _p , S, D

General Information		Site Information	
Analyst	Angelo D. Yokaris	Highway/Direction of Travel	I-185 / North-South
Agency or Company	GDOT - Road Design	From/To	MP 18.87-25.43
Date Performed	2.27.2006	Jurisdiction	Harris County
Analysis Time Period	N/A	Analysis Year	2004
Project Description SR 411 / I-185 Rehabilitation			

<input checked="" type="checkbox"/> Oper.(LOS)	<input type="checkbox"/> Des.(N)	<input checked="" type="checkbox"/> Planning Data
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Flow Inputs			
Volume, V	1047 veh/h	Peak-Hour Factor, PHF	0.90
AADT	23800 veh/day	%Trucks and Buses, P _T	20
Peak-Hr Prop. of AADT, K	0.08	%RVs, P _R	0
Peak-Hr Direction Prop, D	55	General Terrain:	Level
DDHV = AADT x K x D	1047 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

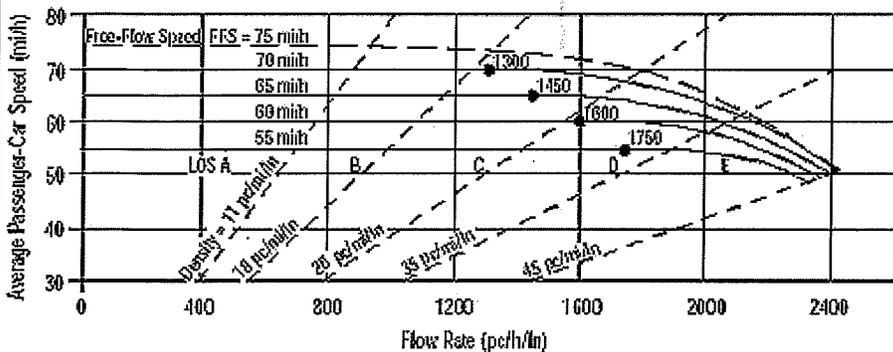
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.909

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	12.0 ft	f _{LW}	0.0 mi/h
Rt-Shoulder Lat. Clearance	6.0 ft	f _{LC}	0.0 mi/h
Interchange Density	0.50 l/mi	f _{ID}	0.0 mi/h
Number of Lanes, N	2	f _N	4.5 mi/h
FFS (measured)	mi/h	FFS	65.5 mi/h
Base free-flow Speed, BFFS	70.0 mi/h		

LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	640 pc/h/ln	Design LOS	
S	65.5 mi/h	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h
D = v _p / S	9.8 pc/mi/ln	S	mi/h
LOS	A	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 23-8, 23-10	f _{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E _T - Exhibits 23-8, 23-10, 23-11	f _{LC} - Exhibit 23-5
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 23-12	f _N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 23-2, 23-3	f _{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (#)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p , S, D

General Information

Site Information

Analyst	Angelo D. Yokaris	Highway/Direction of Travel	I-185 / North-South
Agency or Company	GDOT - Road Design	From/To	MP 18.87-25.43
Date Performed	2.27.2006	Jurisdiction	Harris County
Analysis Time Period	N/A	Analysis Year	2029

Project Description SR 411 / I-185 Rehabilitation

Oper.(LOS)

Des.(N)

Planning Data

Flow Inputs

Volume, V	1804 veh/h	Peak-Hour Factor, PHF	0.90
AADT	41000 veh/day	%Trucks and Buses, P_T	20
Peak-Hr Prop. of AADT, K	0.08	%RVs, P_R	0
Peak-Hr Direction Prop, D	55	General Terrain:	Level
DDHV = AADT x K x D	1804 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.909

Speed Inputs

Calc Speed Adj and FFS

Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.50	l/mi	f_{ID}	0.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures

Design (N)

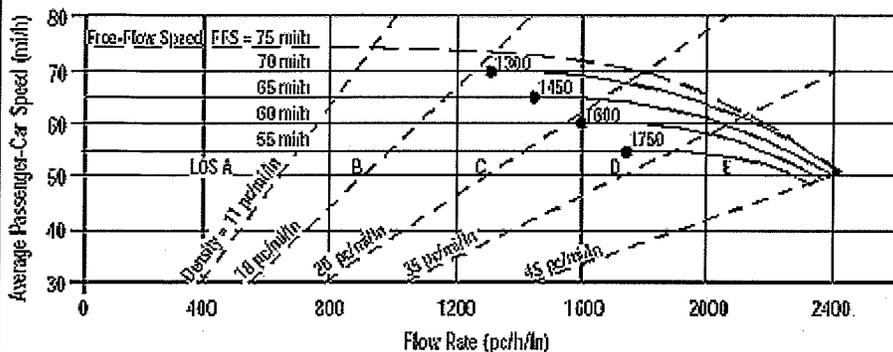
Operational (LOS)			Design (N)	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1102	pc/h/ln	Design LOS	
S	65.5	mi/h	$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h
$D = v_p / S$	16.8	pc/mi/ln	S	mi/h
LOS	B		$D = v_p / S$	pc/mi/ln
			Required Number of Lanes, N	

Glossary

Factor Location

N - Number of lanes	S - Speed	E_R - Exhibits 23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p , S, D

General Information

Analyst: Angelo D. Yokaris
 Agency or Company: GDOT - Road Design
 Date Performed: 2.27.2006
 Analysis Time Period: N/A

Site Information

Highway/Direction of Travel: I-185 / North-South
 From/To: MP 35.31-42.04
 Jurisdiction: Troup County
 Analysis Year: 2004

Project Description: SR 411 / I-185 Rehabilitation

Oper.(LOS) Des.(N) Planning Data

Flow Inputs

Volume, V	814 veh/h	Peak-Hour Factor, PHF	0.90
AADT	18500 veh/day	%Trucks and Buses, P_T	20
Peak-Hr Prop. of AADT, K	0.08	%RVs, P_R	0
Peak-Hr Direction Prop, D	55	General Terrain:	Level
DDHV = AADT x K x D	814 veh/h	Grade %	Length mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.909

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	l/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.0	mi/h
f_N	4.5	mi/h
FFS	65.5	mi/h

LOS and Performance Measures

Operational (LOS)		
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	497	pc/h/ln
S	65.5	mi/h
$D = v_p / S$	7.6	pc/mi/ln
LOS	A	

Design (N)

Design (N)		
Design LOS		
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$		pc/h
S		mi/h
$D = v_p / S$		pc/mi/ln
Required Number of Lanes, N		

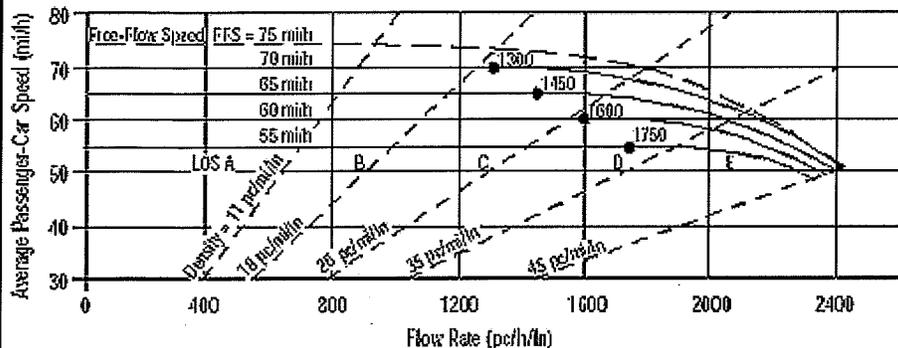
Glossary

N - Number of lanes S - Speed
 V - Hourly volume D - Density
 v_p - Flow rate FFS - Free-flow speed
 LOS - Level of service BFFS - Base free-flow speed
 DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 23-8, 23-10 f_{LW} - Exhibit 23-4
 E_T - Exhibits 23-8, 23-10, 23-11 f_{LC} - Exhibit 23-5
 f_p - Page 23-12 f_N - Exhibit 23-6
 LOS, S, FFS, v_p - Exhibits 23-2, 23-3 f_{ID} - Exhibit 23-7

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v _p	LOS, S, D
Design (N)	FFS, LOS, v _p	N, S, D
Design (v _p)	FFS, LOS, N	v _p , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v _p)	FFS, LOS, N	v _p , S, D

General Information		Site Information	
Analyst	Angelo D. Yokaris	Highway/Direction of Travel	I-185 / North-South
Agency or Company	GDOT - Road Design	From/To	MP 35.31-42.04
Date Performed	2.27.2006	Jurisdiction	Troup County
Analysis Time Period	N/A	Analysis Year	2029
Project Description SR 411 / I-185 Rehabilitation			

Oper.(LOS)
 Des.(N)
 Planning Data

Flow Inputs			
Volume, V	1408 veh/h	Peak-Hour Factor, PHF	0.90
AADT	32000 veh/day	%Trucks and Buses, P _T	20
Peak-Hr Prop. of AADT, K	0.08	%RVs, P _R	0
Peak-Hr Direction Prop, D	55	General Terrain:	Level
DDHV = AADT x K x D	1408 veh/h	Grade %	mi
Driver type adjustment	1.00	Length	Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.909

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	12.0 ft	f _{LW}	0.0 mi/h
Rt-Shoulder Lat. Clearance	6.0 ft	f _{LC}	0.0 mi/h
Interchange Density	0.50 l/mi	f _{ID}	0.0 mi/h
Number of Lanes, N	2	f _N	4.5 mi/h
FFS (measured)	mi/h	FFS	65.5 mi/h
Base free-flow Speed, BFFS	70.0 mi/h		

LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	860 pc/h/ln	Design LOS	
S	65.5 mi/h	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h
D = v _p / S	13.1 pc/mi/ln	S	mi/h
LOS	B	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 23-8, 23-10	f _{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E _T - Exhibits 23-8, 23-10, 23-11	f _{LC} - Exhibit 23-5
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 23-12	f _N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 23-2, 23-3	f _{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

DEPARTMENT OF TRANSPORTATION

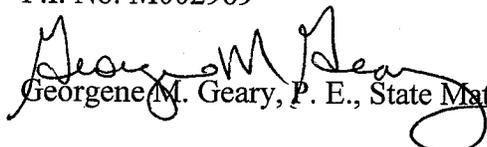
STATE OF GEORGIA

INTERDEPARTMENTAL CORRESPONDENCE

FILE CSNHS-M002-00(969) Muscogee, Harris, and Troup Counties
P.I. No. M002969

OFFICE Materials and Research

DATE February 3, 2006

FROM 
Georgene M. Geary, P. E., State Materials and Research Engineer

TO Brent Story, P.E., State Road and Airport Design Engineer
Attention: Andy Casey, P. E., Project Manager

SUBJECT Pavement Evaluation Summary
Resurfacing and Maintenance of I-185 / SR 411 from CR 2249 / Williams Road / Muscogee County to SR 1 / Troup County

As requested, a Pavement Evaluation has been completed for this project. The results of this work are attached.

If additional information is needed, please contact A.J. Jubran of the Pavement Management Branch at 404-363-7582.

GMG: JTR: AJJ

Attachments

1. Pavement Evaluation Summary
2. Mill and Inlay Design – Passing Lane
3. Mill and Inlay Pavement Design – Truck Lane
4. 1997 Pavement Evaluation
5. 1995 Pavement Evaluation
6. 1992 Pavement Evaluation

Copy: file

Sheila Hines, State Bituminous Construction Engineer, Forest Park
Thomas B. Howell, Jr., P.E., District Engineer, Thomaston
Wayne Pittman, Area Engineer, Columbus
Kenneth D. Crabtree, Jr., Area Engineer, LaGrange
Ben Rabun, P.E., State Bridge Maintenance Engineer, TMC

PAVEMENT EVALUATION SUMMARY

For

CSNHS-M002-00 (969)

SR 411 / I-185 Maintenance in Muscogee, Harris, and Troup Counties

P.I. No. M002969

1. LOCATION / DESCRIPTION

The project consists of the resurfacing and maintenance of SR 411 / I-185 from CR 2249 near MP 11.6 ± to SR 1 near MP 42 ±. This project lies within Troup, Harris, and Muscogee counties.

Mainline

The existing pavement on I-185 consists of two 12 foot wide travel lanes in each direction separated by a grass median. There is a 3 foot wide inside and a 10 foot wide outside paved shoulder in each direction of travel.

The existing pavement on I-185 averaged 14 ½ inches of asphaltic concrete over graded aggregate base (GAB). The outside paved shoulder averaged 6 ¼ inches of asphaltic concrete over soil.

Ramps

The existing ramps averaged 9 ½ inches of asphaltic concrete on soil base. The ramps have not been rehabilitated since their original construction.

2. PAVEMENT CONDITION SUMMARY

The existing pavement is in generally fair condition with localized areas in poor condition.

Lane 2

Layers of the original asphalt concrete pavement were deteriorated to a depth of 6 ¾ ± inches in both directions. The Asphalt Pavement Analyzer was used to assess the condition of mix layers at that depth. Test results confirmed the visual assessment of deterioration.

3. FULL-DEPTH SECTIONS

For this project no full-depth reconstruction are being proposed.

4. OVERLAY SECTIONS

Lane 1 (Inside Lane)

Lane 1 has not been subjected to the same level of loading as lane 2. Lane 1 should be milled 3.0 ± inches and inlayed with 5.0 ± inches. This milling will remove the original B-Mix and the D-Modified mix.

Lane 2 (Outside Lane)

This lane should be milled to a depth of 6 ¾ ± inches to remove the micro-surfacing and all deteriorated layers, then inlayed with 8 ¾ ± inches. The milling depth may be increased between MP 11.6 ± in Muscogee County to MP 25.4 ± in Harris County due to deeper distressed layers. Limits of the deep milling and replacement shall be established in the field.

Outside Shoulders

The base failures on the shoulders have been reported since 1992. It is recommended that approximately 1000 tons of Asphaltic Concrete be set up for patching / reconstructing these areas.

Ramps

Ramps are original construction. It is recommended to mill 2 ¾ inches and inlay with 3 ½ inches.

Note: The profile grade on the mainline is being raised 2 inches to provide additional structure. The ramp profile grade is being raised ¾ inches. The plans should address construction of a transition to accommodate this differential.

Recommended Pavement Structures

The pavement overlay structures, proposed in the tables below, are required to carry the anticipated traffic loadings for the respective lanes of travel. These structures will require raising the existing profile grade by 2 inches. If the existing profile grade is maintained, then the pavement will be under-designed by 21.6%.

The impact of raising the grade 2 inches on vertical overhead bridge clearances has been discussed with the State Bridge Maintenance Engineer. An initial review of the data indicates that the vertical clearance of one bridge will be less than 16.5 feet after this proposed overlay. The bridge is Williams Road located at the beginning of the project at MP 11.6 ±. The vertical clearance after the overlay will be 16 feet 5 inches.

The following mill and inlay designs are recommended for use on this project:

SR 411 / I-185 Lane 2 Mill and Inlay

Pay Item Number	Material	Course	Thickness	Spread Rate
400-3624	12.5 mm PEM	Surface Drainage	1 ¼ inches	135 lbs/yd ²
400-3604	12.5 mm SMA	Surface	1.5 inches	165 lbs/yd ²
402-3190	19 mm Superpave	Binder	6 inches	660 lbs/yd ²

SR 411 / I-185 Lane 1 Mill and Inlay

Pay Item Number	Material	Course	Thickness	Spread Rate
400-3624	12.5 mm PEM	Surface Drainage	1 ¼ inches	135 lbs/yd ²
400-3604	12.5 mm SMA	Surface	1.5 inches	165 lbs/yd ²
402-3190	19 mm Superpave	Binder	2.25 inches	248 lbs/yd ²

SR 411 / I-185 Ramp Mill and Inlay Section

Pay Item Number	Material	Course	Thickness	Spread Rate
402-3141	12.5 mm Superpave	Surface	1.5 inches	165 lbs/yd ²
402-3190	19 mm Superpave	Binder	2.0 inches	220 lbs/yd ²

5. PAVEMENT DISTRESSES

Except for the following, no other distresses were encountered during the field investigation of this project:

Rutting Rutting averaged 1/8 inch throughout the entire project limits on I-185.

Block/ Transverse Cracking Level 1 to 2 block / transverse cracking was observed.

Raveling Areas of raveling were observed with surface deterioration of the micro-surfacing down into the underlying layers of asphalt concrete.

6. COPACES

No COPACES information is included with this evaluation.

7. OTHER INFORMATION

Laboratory testing was conducted on a representative number of core samples using the Asphalt Pavement Analyzer. The results are on file, and support the recommended milling depth of 6 ¾ inches.

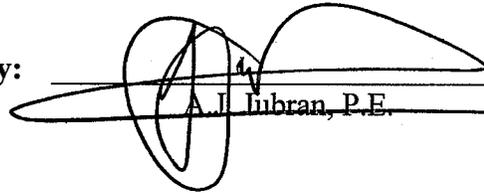
From previous evaluations completed in 1992, 1995 and 1997, the original pavement was slurry sealed in 1990. The pavement was micro-surfaced in 1998, at an application rate of 40 lbs/sq. yd, as a short term preventive measure. These have been the only rehabilitations of pavement.

8. ADDITIONAL RECOMMENDATION

- After milling, a crack filler (Type M) should be applied in cracks that exceed $\frac{1}{4}$ inch in width along SR 411/ I-185. The filler material to be used shall comply with Section 820 of the Standard Specifications, and this work shall be performed in accordance with Section 407.
- Staging should consider that a one foot overlap is needed to stagger the longitudinal joint.

Reported By: Patrick Werho, Pavement Evaluation Engineer

Reviewed By:


A. J. Lubran, P.E.

Core Chart: I-185 / SR 411 from CR 2249 to SR 1

Core Number	Direction	Location	Pavement Structure	Remarks
1	Southbound	Lane 2 MP 33.5 ±	14 ½ inches Asphaltic concrete Over GAB	Deteriorated Layers
2	Southbound	Lane 2 MP 31.2 ±	15 inches Asphaltic concrete Over GAB	Deteriorated Layers
3	Southbound	Shoulder MP 29.9 ±	6 inches Asphaltic concrete Over Soil	
4	Southbound	Lane 2 MP 29.9 ±	13 ¼ inches Asphaltic concrete Over GAB	
5	Southbound	Lane 2 MP 27.8 ±	13 ½ inches Asphaltic concrete Over GAB	
6	Southbound	Lane 2 MP 27.8 ±	13 ½ inches Asphaltic concrete Over GAB	
7	Southbound	Lane 2 Left WP MP 26.7 ±	12 ¼ inches Asphaltic concrete Over GAB	
8	Southbound	Lane 2 MP 26.2 ±	13 ¼ inches Asphaltic concrete Over GAB	
9	Southbound	Outside Shoulder MP 26	6 ½ inches Asphaltic concrete Over Soil Aggregate	Longitudinal Crack to Base
10	Southbound	Lane 2 Left WP MP 25	13 ½ inches Asphaltic concrete Over GAB	Deteriorated down to 8 inches
11	Southbound	SR 116 on Ramp MP 24.9 ±	9 ½ inches Asphaltic concrete Over Soil Aggregate	
12	Southbound	Lane 2 MP 23.8 ±	13 ½ inches Asphaltic concrete Over GAB	Deteriorated Layers
13	Southbound	Lane 2 Right WP MP 23.4 ±	15 inches Asphaltic concrete Over Soil	Deteriorated Layer down to 6 inches
14	Southbound	Lane 2 MP 26.2 ±	17 inches Asphaltic concrete Over Soil	
15	Southbound	Lane 2 MP 18.2 ±	18 inches Asphaltic concrete Over Soil	Deteriorated Lower Layers
16	Southbound	Lane 2 MP 19.2 ±	18 inches Asphaltic concrete Over Soil	Deteriorated Lower Layers

FLEXIBLE PAVEMENT DESIGN ANALYSIS

Project: CSNHS-M002-00(969)
P.I. no.: M002969
Description: SR 411 / I-185 Rehabilitation

County: Harris Troup & Muscogee

Traffic Data (NOTE: AADTs are one-way)

24-hour Truck Percentage: 20.00%
 AADT initial year of design period: 15,180 vpd (2007)
 AADT final year of design period: 22,550 vpd (2027)
 Mean AADT (one-way): 18,865 vpd

Design Loading

Mean AADT	LDF	Trucks	18-K ESAL	Total Daily Loads
18,865 *	1.00 *	0.200 *	1.28 =	4,830

Total predicted design period loading = 4830 * 20 * 365 = 35,259,000

Design Data

Terminal Serviceability Index: 2.50
 Soil Support: 2.50
 Regional Factor: 1.80

PROPOSED FLEXIBLE PAVEMENT STRUCTURE

Material	Thickness Inches	Thickness (mm)	Structural Coefficient	Structural Value
*** OVERLAY ***				
12.5 mm PEM	135 lb/sy	(75 kg/sm)	0.00	0.00
12.5 mm SMA	1.50	(38)	0.44	0.66
19 mm Superpave	3.00	(76)	0.44	1.32
	3.00	(76)	0.30	0.90
*** EXISTING PAVEMENT ***				
Asphaltic Concrete	7.00	(178)	0.30	2.10
Graded Aggregate Base	9.00	(229)	0.16	1.44
Required SN = 7.42			Proposed SN = 6.42	

>>> Proposed pavement is 13.5% Underdesigned <<<

Remarks: Mill 6.75 in Lane 2 & Inlay with 8.75 in, raise PGL 2.0 in

Prepared by	A J Jubran	February 02, 2006
	Pavement Engineer	Date
Recommended	Office Head	Date
Approved	State Pavement Engineer	Date

Dzn

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE I-185 Harris OFFICE Materials and Research
 Forest Park, Georgia
 DATE March 24, 1997

FROM ^{SEW} Wouter Gulden, P.E., State Materials and Research Engineer

TO Steve Henry, State Maintenance Engineer

SUBJECT PAVEMENT EVALUATION - I-185 HARRIS

As requested the Office of Materials and Research has completed an investigation of I-185 in Harris County. This evaluation consisted of a visual inspection of the roadway. This roadway was previously evaluated in June of 1995 and in March of 1992. A copy of the previous reports written in 1992 and 1995 are attached.

The primary distresses of this section of I-185 have not changed. There is still raveling of the slurry seal and pushing and shoving of the Asphaltic Concrete. Rutting was measured at 1/2 inch. There is an increasing number of base failures on the shoulders.

For long-term performance, the recommendation made in 1995 should still be adequate with the exception that 12.5 mm Asphaltic Concrete Superpave mix should be used in lieu of Asphaltic Concrete "E" mix. Stone Matrix Asphalt is not recommended for this route due to materials costs and the very light traffic volumes on this route. The "D-modified" previously recommended should be changed to 90 kg/m² of 12.5 mm OGFC mix.

As a short -term preventive maintenance option, it is recommended that this section of I-185 be overlaid with a scratch course of micro-seal, 15 lbs./s.y., to remove the existing wheel ruts. This work is to be accomplished with a steel screed. I-185 should then be surfaced with 25 lbs./s.y. of micro-seal. The removal of all thermoplastic and raised pavement markers should be done prior to the placement of the scratch course of micro-seal. Maintenance should be responsible for the rehabilitation of all shoulder failures prior to this project being let to contract.

Please call Harry McGaughey at (404)363-7501 if you have any further questions.

WG:HM:ema
 Attachment

Mr. Larry B. Seabrook
I-185 Harris/Troup
June 7, 1995
Page 2

5. The roadway should then be surfaced with 75 lbs./s.y. Asphaltic Concrete "D-Modified" instead of the previously recommended conventional "D" mix. The "D-Modified" mix should extend 18" onto the outside shoulders and 6" onto the inside shoulders. The "D-Modified" mix on ramps should stop at the open end of the gore areas where 10-inch solid white line ends.
6. Extra depth milling (2") should be provided as needed and should be used at the discretion of the Engineer. An extra 10% of original milling quantities should be adequate for the extra depth milling. Asphaltic Concrete "B" mix should be used to inlay for any extra depth milling at 2".

Please call Harry McGaughey at (404) 363-7501 if you have any further questions.

RC:HM:rmg

Attachment

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE *pc* OFFICE Materials and Research
Forest Park, Georgia
DATE March 4, 1992

FROM Ronald Collins, State Materials and Research Engineer

TO Larry B. Seabrook, State Maintenance Engineer

SUBJECT PAVEMENT EVALUATION - I-185 HARRIS/TROUP COUNTIES

As requested, the Office of Materials and Research has completed an investigation of the existing roadway conditions on I-185 in Harris and Troup Counties. This evaluation was requested in order to determine a rehabilitation strategy for this section of roadway, which extends from the Harris-Muscogee County line (milepost 14.5) to U.S. 27 (milepost 42). This investigation consisted of a visual evaluation of the pavement condition, physical testing of roadway cores, a rutting survey and slope measurements.

This section of roadway was originally constructed under three contracts with the following typical sections:

<u>ACI-9-185-1(145)9</u> Harris	<u>I-185-1(146)18</u> Harris	<u>I-185-1(147)28</u> Harris/Troup
60 LB./S.Y. D	60 LB./S.Y. D	60 LB./S.Y. D
2" B	2" B	2" B
15" Base	11" Base	12" Base
12" Select Barrow	9" GAB	12" Crushed Agg. Base

The first project (145) begins at the Muscogee/Harris County line (~milepost 14.5) and extends to approximately S.R. 16 (~milepost 25.5). The second project (146) begins at S.R. 16 and continues to approximately S.R. 18 (~milepost 34) where project (147) begins and continues to approximately U.S. 27 (milepost 42). A visual inspection of the roadway indicated similar distresses for all three sections; therefore, all three projects were evaluated as one project. This section of roadway, excluding ramps, was milled in the Summer of 1990, in order to remove existing ruts and a slurry seal was placed over the milled areas.

Mr. Larry Seabrook
March 4, 1992
Page Two

The primary distress noted on this section of roadway was raveling of the slurry seal. However, there were a few areas of pushing and shoving noted in the outside lanes. There are also some areas with inadequate cross slope which will need to be corrected.

Tests were performed for air voids, tensile strengths, gradations, AC contents and viscosity/penetration of the recovered AC on the top three layers of mixes. Values obtained for air voids and viscosity were reasonable for all three layers tested. However, a visual observation of the cores showed stripping was occurring in all layers.

Approximately 75% of the cores tested had a moderate to severe stripping rating. The tensile strength values also indicate the severity of stripping. The layer of "B" mix, for example, had tensile strengths which averaged 53.6 P.S.I. with values as low as 22.1 P.S.I.

Based on our findings, it is recommended that the outside lanes be milled 2 3/4" to remove the "B" mix and slurry seal, as well as any remaining "D" mix. This area should be inlaid with 220 lbs./s.y. asphaltic concrete "B" mix. The inside lanes, shoulders and ramps should be milled 3/4" to remove the remaining slurry seal and/or "D" mix. The entire roadway, including shoulders, ramps and gore areas, should be overlaid with 165 lbs./s.y. asphaltic concrete "E." The "E" mix placed on the shoulders should include indentation rumble strips.

The roadway should then be surfaced with 60 lbs./s.y. asphaltic concrete "D" mix which should extend 18" onto the outside shoulders and 6" onto the inside shoulders. The "D" mix on ramps should stop at the open end of the gore areas where the 10-inch solid white line ends.

Extra depth milling (2") should be provided as needed and should be used at the discretion of the Engineer. An extra 10% of original milling quantities should be adequate for the extra depth milling. Asphaltic concrete "B" mix should be used to inlay for any extra depth milling at 2".

Although a thorough evaluation of the existing cross-slopes was not made during this investigation, it was noted that there are areas which do not have adequate cross-slopes. Proper cross-slopes need to be re-established in these areas and this should be considered when the plans are being prepared.

Additional test data is on file at the Office of Materials and Research, if needed. Please call Dave Mullis at (404) 363-7501, if you have any further questions.

RC:DM:dm

c: Paul Mullins, Director, Division of Construction
Darrell Elwell, Chief, Planning Data Services

Department of Transportation State of Georgia

INTERDEPARTMENT CORRESPONDENCE

FILE CSNHS- M002-00(969), **OFFICE** Environment/Location
 Muscogee, Harris, and Troup Counties,
 P.I. # M002969 **DATE** June 15, 2005

FROM Harvey D. Keeper, State Environment/Location Engineer

TO Brent Story, Transportation Engineering Administrator for the Office of Road and
 Airport Design.
Attn. Andy Casey, P.E., Design Group Manager

SUBJECT Estimated Traffic Assignments for I-185/SR 411 from CS 2249/Williams
 Rd./Muscogee to SR1/Troup.

We are furnishing estimated traffic assignments for the above project as follows:

Muscogee County

Traffic Count #	Beg Mile-End Mile	Existing 2004 ADT	2009 ADT	2029 ADT	D	K	T	24 HR. T	S.U.	COMB.
0337	10.13-11.65	35500	41000	61000	65%	10%	4%	6.5%	3%	3.5%
0341	11.66-14.26	30800	35700	53000	65%	10%	4%	6.5%	3%	3.5%
0342	14.27-14.60	28600	33100	49200	65%	10%	4%	6.5%	3%	3.5%

Harris County

Traffic Count #	Beg Mile-End Mile	Existing 2004 ADT	2009 ADT	2029 ADT	D	K	T	24 HR. T	S.U.	COMB.
0236	00.00-04.27	28600	33100	49200	65%	10%	4%	6.5%	3%	3.5%
0238	04.28-10.83	23800	27600	41000	55%	8%	18%	20%	5%	15%
0241	10.84-15.46	22300	26000	38600	55%	8%	18%	20%	5%	15%
0243	15.47-19.51	19700	23000	34200	55%	8%	18%	20%	5%	15%
0244	19.52-20.71	18500	21500	32000	55%	8%	18%	20%	5%	15%

Troup County

Traffic Count #	Beg Mile- End Mile	Existing 2004 ADT	2009 ADT	2029 ADT	D	K	T	24 HR. T	S.U.	COMB.
0243	00.00-06.73	18500	21500	32000	55%	8%	18%	20%	5%	15%
0245	06.74-10.32	18450	21400	32000	55%	8%	18%	20%	5%	15%

If you have any questions concerning this information please contact
Rhonda Niles @ 404-699-4460.

HDK/RFN