PRECONSTRUCTION STATUS REPORT FOR PI:713760-

PROJ ID :	713760-	**I-85 FM CHAMBLEE-TUCKER RD TO SR 316/GWINNETT-FOR HOV/71376X**				**MGMT LET DATE :**	
COUNTY :	Dekalb, Gwinnett					**MGMT ROW DATE :**	
LENGTH (MI) :	12.08	**MPO:**	Atlanta TMA	**DOT DIST:**	7		
PROJ NO.:	IM000-0085-02(178)	**TIP #:**	AR 073B1	**CONG. DIST:**	6, 4	**SCHED LET DATE :**	
PROJ MGR:	Moskal, Bill	**MODEL YR :**		**BIKE:**	N	**WHO LETS?:**	GDOT Let
OFFICE :	Urban Design	**TYPE WORK:**	HOV Lanes	**MEASURE:**	E	**LET WITH :**	
CONSULTANT:	No Consultant, GDOT In-House Design	**CONCEPT:**	HOV	**NEEDS SCORE:**			
SPONSOR :	GDOT	**PROG TYPE:**	Maintenance	**BRIDGE SUFF:**			
DESIGN FIRM:		**Prov. for ITS:**	N				
		BOND PROJ :					

SCHED START	*SCHED FINISH*	*ACTIVITY*	*ACTUAL START*	*ACTUAL FINISH*	*%*

PROGRAMMED FUNDS

Phase	Approved	Proposed	Cost	Fund	Status	Date Auth
PE	1997	1997	156,000.00	PPL	AUTHORIZED	8/27/1996
CST	1999	1999	56,410,615.14	Q01	AUTHORIZED	8/26/1998

PE Cost Est Amt:	156,000.00	Date:	
CST Cost Est Amt:	56,410,615.14	Date:	5/1/1997

STIP AMOUNTS

Phase	Cost	Fund
PE	0.00	PPL
CST	0.00	Q01

PDD:	AWARD 1/99
Bridge:	NO BRIDGE REQUIRED
Design:	WJM/DVM|PLNS IN CNTRCTS|AMEND INCL IN PLNS
EIS:	TQ- CE APP 7-7-98
LGPA:	SEE AGRMT IN FILE FOR LIGHTING&PIPELINE
Location:	1497E (H27-W/V-29) DTM
Permits:	N/R
Planning:	TIP# R 073 6/93TIP|IF FHWA HAS NOT APPROVED HOV ENFORCEMENT PLAN BY 10-16-98 LET MAY BE DELAYED
Programming:	713760|X|W/713390|COMP 10-31-2001 |PR2/C=4-2-99|#1 2-13-01|#2 1-02|#3 7-02|FA 12-02|FV 3-09
ROW:	@ 1-98
Traffic Op:	KBH:REVSD FINAL S&M PLANS TO URBAN 11/9/98 $*-
Utility:	DJP MRPLANS TO DZN 8/98 (-2)

District Comments

UST N/R

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

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

INTERDEPARTMENTAL CORRESPONDENCE

FILE IM-85-2(178) Dekalb - Gwinnett
PI No.: 713760

OFFICE Atlanta, Georgia

DATE September 28, 1998

FROM Bob Mustin, Project Review Engineer DTM

TO Joseph Palladi, State Urban Design Engineer

SUBJECT **DESIGN EXCEPTION REQUEST**

Attached is an approved design exception request for shoulder widths, lane widths and stopping sight distances on Interstate 85.

DTM

Attachments

FS MUSTIN, GDOT

Department of Transportation

State of Georgia
#2 Capitol Square, S.W.
Atlanta, Georgia 30334-1002

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TREASURER
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August 3, 1998

IM-85-2(178) Dekalb and Gwinnett, P.I. Number 713760

DESIGN EXCEPTION REQUEST

Mr. Larry R. Dreihaup, Division Administrator
Federal Highway Administration
61 Forsyth Street, SW, Suite 17T100
Atlanta, Georgia 30303-3104

Dear Mr. Dreihaup:

Attached is a design exception request for shoulder widths, lane widths and stopping sight distances on Interstate 85 for your review and approval.

It is requested that your response be made as promptly as possible and the original design exception request returned to the attention of the Office of Engineering Services.

Sincerely,

Wayne Shackelford

Wayne Shackelford
Commissioner

WS/dtm

Attachments

c: Joe Palladi

GEORGIA DEPARTMENT OF TRANSPORTATION

REQUEST FOR INTERSTATE DESIGN EXCEPTION

Project Number: IM-85-2 (178), DeKalb and Gwinnett Counties
PI 713760

Description: SR 403 / I-85 - Addition of 11.1 miles of HOV lanes on I-85 from Chamblee Tucker Road to SR 316 in Gwinnett County

The above numbered project involves the extension of the existing HOV (Express) lanes on I-85 from Chamblee Tucker Road to just south of SR 316. The construction consists of milling and inlaying the entire roadway, re-striping to add the HOV lanes, and widening the outside shoulders in Gwinnett County.

Description of Proposed Design Exceptions

We are requesting design exceptions for the following criteria:

1. Width of travel lanes
2. Width of shoulders
3. Sight distance

The proposed design exceptions are explained in more detail below:

1. Width of travel lanes

The proposed project will add the HOV lane by utilizing all the existing travelway and portions of the existing shoulders. This will require reducing lane widths for the HOV lane and the three inner general use lanes to 11 feet. Throughout the majority of the project, lanes 4 and 5 and any auxiliary lanes will remain 12 feet in width. In the northbound direction, the additional outside entrance lane from I-285 westbound will be 12 feet to accommodate the higher volumes of truck traffic entering I-85. However, the additional lane from the entrance ramp from 1-285 eastbound will be 11 feet in order to minimize the encroachment on the mainline ramp shoulder. This lane will widen to 12 feet near the County Line Bridge. In the southbound direction, the two outside lanes and auxiliary lanes will be 12 feet from just south of SR 316 in Gwinnett County to just north of Gwinnett/Dekalb County Line. At this segment there are two 12-foot lanes plus a 12-foot auxiliary lane. South of the County Line, the innermost 12-foot lane will be reduced to 11 feet and the two remaining 12-foot lanes would exit to I-285 westbound and eastbound respectively.

2. Shoulder Widths

In the vast majority of the Gwinnett County portion of the project, additional widening will be constructed to retain the 10-foot inside and 12-foot outside paved shoulders. The exceptions will be where existing bridges are retained at Jimmy Carter, Center Way, and Pleasant Hill. Charts that show the proposed shoulder widths at these bridges are attached.

At Jimmy Carter southbound, there will be about 300 feet of outside shoulder less than 10-foot in width and about 650 feet of inside shoulder less than 4-foot in width. Northbound, there will be about 750 feet of outside shoulder less than 10-foot in width and about 1200 feet of inside shoulder less than 4-foot in width.

At Center Way, there will be as little as a 3.4 foot outside shoulder in the southbound direction. At Pleasant Hill, the inside shoulder will be maintained; however, the outside southbound shoulder will be as little as 3.7 feet and the outside northbound shoulder will be as little as 5.4 feet.

Once again; however, it should be pointed out that these substandard shoulders will be at "spot" locations at existing bridges; the vast majority of the project will be designed to standard or above standard shoulders.

In DeKalb County, a chart is attached that shows the proposed shoulder widths at 50-foot intervals. The minimum inside shoulder width will be 2 feet. In the southbound direction, the 2-foot inside shoulder occurs in the tangent section of the roadway and extends from the entrance ramp from I-285 eastbound to just south of the County Line Bridge for a total of 1.56 miles. In the northbound direction, the 2-foot inside shoulder occurs from just south of the I-285 Bridge overpass in the Moreland Interchange and extends approximately 1.45 miles to just south of the County Line Bridge.

In order to maximize the outside shoulders at some of the restrictive areas, the existing V-gutter at these locations will be removed and paved to the face of the barrier walls therefore increasing the effective existing shoulder width by an additional 3 feet. The design exception requested is for areas where the effective shoulder widths will have effective shoulder widths less than 10 feet. In the southbound direction, approximately 0.59 mile of roadway shoulder will be less than 10 feet. The minimum outside shoulder width in this direction will be 3.57 feet just under Northcrest Bridge overpass. In the northbound direction, the minimum outside shoulder width will be 5.32 feet, which occurs at about 800 feet south of the Pleasantdale Road Bridge. As in the southbound direction, some of the existing V-gutter adjacent to the barrier wall at the narrow shoulder areas will be removed and the shoulder paved to the wall thereby increasing the effective shoulder. Therefore, in the northbound direction, approximately 0.8 mile of the roadway will have effective shoulder widths less than 10 feet.

3. Sight distance

Horizontal stopping sight distance will be less than the minimum at the Jimmy Carter Overpass in both directions: a two degree - one minute (2° 1' 00") curve northbound and a two degree - three minute - thirty-eight second (2° 3' 38") curve southbound. The available stopping sight distances for both of these curves correspond to a design speed of 50 mph. The reduced stopping sight distance will occur for vehicles traveling in the Express Lane going northbound due to the inside barrier and in the outside lane going southbound due to the retaining wall that supports the end bent of the Jimmy Carter Boulevard overpass. The existing posted speed is 65 miles per hour at this location.

Attached are the base year and design year traffic volumes for the project, the measurements for the existing travel lane widths and horizontal clearances. Also attached are is a set of half-size plans of the project, summary of the injuries and fatality rates from 1991 to 1996, cost estimate summary and shoulder width report for DeKalb County and portions of Gwinnett County.

Justification for Requesting the Design Exceptions

Due to physical restraints such as frontage roads, ramps, bridges, and extensive retaining walls in DeKalb County, specifically within the I-85 / I-285 interchange and north to Jimmy Carter, the desirable shoulder widths can not be provided without significant reconstruction of the corridor. This work would require the purchase of additional high-priced right of way (ROW), result in relocations of many businesses, cause major disruptions to frontage road and crossroad traffic, and substantially impact this heavily developed corridor. A description of the costs and problems associated with achieving standard shoulders and lane widths is provided below:

1. The portion of the Moreland Interchange where I-285 crosses over I-85 would have to be reconstructed. This would entail constructing temporary bridges for I-285 traffic to handle the traffic while the existing bridges were replaced in essentially their same location. The temporary bridges would require long-term traffic shifts, which would adversely affect the operations and safety of I-285 during approximately 1½ years of construction. The grade of I-285 would have to be raised to accommodate the deeper bridge beams that would be required. The cost to replace these bridges is estimated at $ 6.8 million.

2. The area of I-85 between I-285 and the County Line Bridge would have to be widened. This would require removal and reconstruction of two bridges and massive retaining walls. It would require additional right-of-way from adjacent property owners. The Northcrest and County Line Bridges would need to be replaced at an estimated cost of $ 4.0 million. Retaining walls would need to be replaced at an estimated cost of $ 2.1 million. Traffic control, pavement structure, and drainage structures that would result from raising the alignment of these bridges would total about $ 4.9 million in construction costs. Effects to traffic and

businesses during the 2 years of construction that would be needed would be substantial. Approximately 17 parcels of ROW valued at $ 5.8 million would need to be obtained. Approximately 16 businesses would need to be relocated.

3. The area from the County Line Bridge to just north of the Jimmy Carter Bridge would have to be widened to provide 10-foot inside shoulders. The Jimmy Carter Bridge and retaining walls would need to be replaced at an estimated cost of $ 7.1 million. Widening I-85 south of Jimmy Carter would cost about $ 6.2 million. Approximately 15 parcels of ROW valued at $ 7.9 million would need to be obtained south of the bridge. About $ 5.0 million of ROW would need to be obtained to construct the new bridge itself. Approximately 13 businesses would need to be relocated. The effects of construction on Jimmy Carter traffic would be substantial. The bridge would have to be substantially longer and deeper, making it impossible to maintain traffic during construction at its present level of operations. As it is today, the I-85/Jimmy Carter Interchange is at level of service "F" during peak hours. Reductions in the capacity of the Jimmy Carter Bridge, which would be required for at least a year during construction, would be intolerable to the drivers of the 60,000 vehicles that utilize this bridge each day.

4. The Pleasant Hill Bridge would have to be widened to obtain standard shoulders. We did not calculate a cost and ROW estimate for this work, but a physical inspection of the interchange would indicate that the cost to bring the interchange up to standards would approximate the $ 7.1 million construction cost and $ 5.0 million ROW cost estimate for the Jimmy Carter Bridge. The effects on traffic would be similar, with Pleasant Hill being the primary arterial serving the Gwinnett Mall.

The Department believes that the proposed 11-foot lanes for the HOV and general use lanes will not have significant impacts on the accident rate in this corridor. Eleven-foot-wide travel lanes currently exist on I-75 / I-85 from south of the Lakewood Freeway to I-75 north at the Chattahoochee River, on I-285 from I-75 to I-85 on the north side of Atlanta, and on I-85 from North Druid Hills Road north to Chamblee Tucker Road. The findings in Technology Sharing Report FHWA-TS-80-203 FREEWAY MODIFICATIONS TO INCREASE TRAFFIC FLOW published in 1980 state that the accident rates for segments with 11-foot lanes do not significantly differ from the accident rates for segments having 12-foot lanes.

The Department has also attempted to analyze accident data of a section of I-85 that is similar to the proposed design for this project. This section of I-85 is from Lenox Road to Chamblee-Tucker. Since this section was opened in 1996, the only full year of accident data available is from 1997. We only have accident numbers, not accident rates, available. The number of angle intersection, rear end, and sideswipe accidents increased from 340 in 1993, to 526 in 1997. This represents a 55 percent increase in the total number of these types of accidents. This is not considered to be a significant increase in accident rates, given the anticipated increases in vehicle

miles traveled and anticipated increases in average statewide accident rates. The Department believes that the proposed design exceptions, along with the mitigation efforts described below, will not adversely affect the safety of the traveling public.

The Department considered an alternative design to convert an existing travel lane into an HOV lane. With this alternative, existing shoulder and lane widths could be maintained. However, this is not an environmentally or operationally prudent alternative. Previous analyses have shown that operations would suffer tremendously and air quality would suffer due to the congestion that would result.

Mitigation

The Department will take all feasible and prudent measures to mitigate the effects of the design exceptions. In particular, the Department commits to the following:

1. The Department will extend the Automated Traffic Management System (ATMS) to SR 316. In the section of DeKalb County that will have the substandard inside shoulders, the ATMS will be augmented by the addition of Video Detection System (VDS) to monitor the HOV lane and inside shoulders and alert the personnel at the Traffic Management Center (TMC) of any incidences and disabled vehicle encroachments into the HOV lane. This system will include additional Dynamic Message Signs to alert motorists of potential hazards.

2. The Department commits to adding and maintaining (or causing to be maintained) highway lighting systems throughout the length of the project. Presently, no such lighting exists in the DeKalb County portion of the project.

3. The Department has extended the HERO program throughout the length of the project.

4. The cross slope of the existing roadway within the project limits ranges between 1.3% and 1.5%. To improve drainage and safety, the Department commits to increasing the cross slopes to a minimum of 2% and a maximum of 2.5%.

5. Realizing that proper drainage will be critical at the locations where shoulders less than 4-feet in width are in the bottom of a superelevated section, the Department commits to appropriate maintenance of these drainage structures.

6. The Department will reduce the posted speed limit from 65 mph to 55 mph from the Dekalb/Gwinnett County line to a point north of Jimmy Carter Boulevard in both directions.

7. If, in the future, the Department replaces any of the structures that contribute to the design exceptions, every feasible and prudent effort will be made to reduce or eliminate the design exceptions.

Summary

The Department believes that the mitigation measures will appropriately address safety concerns in the areas where the design exceptions occur.

The Department believes that the alternative of widening I-85 to meet full desirable shoulder conditions would increase the project cost by $ 61.9 million as shown in the following table. It would create numerous significant hardships daily for tens of thousands of commuters during construction. It would increase construction time of the project by at least two years. It would also result in forced relocation of about 29 businesses.

Location	**ROW Cost (millions)**	**Construction Cost (millions)**
I-285	0	$ 6.8
I-285 to County Line	$ 5.8	$ 11.0
County Line to north of Jimmy Carter	$ 12.9	$ 13.3
Pleasant Hill	$ 5.0	$ 7.1
Totals	**$ 23.7**	**$ 38.2**

Considering the improvements mentioned above and the fact that the current HOV facility is operating efficiently and safely in metro Atlanta, the Georgia Department of Transportation requests that a design exception be granted for the proposed 11-foot lanes, the reduced shoulder widths, and the reduced stopping sight distances.

APPROVED Walter W Boyd III DATE 8/10/98

for: Larry R. Dreihaup
Division Administrator, FHWA

I-85 HOV
Shoulder Width Report
Sta. 311+00 to Sta. 477+00

	SOUTH				NORTH			
BASELINE STATION	V-GUTTER	OUTSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WITH V-GUTTER	INSIDE SHOULDER WIDTHS	INSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WITH V-GUTTER	V-GUTTTER
I-285 BRIDGE VICINTY								
311+00.000	Y	7.81	10.81	4.00	4.00	7.95	10.95	Y
311+50.000	Y	7.85	10.85	4.00	3.84	8.00	11.00	Y
312+00.000	Y	7.89	10.89	4.00	3.81	7.88	10.88	Y
312+50.000	Y	7.88	10.88	4.00	3.48	7.81	10.81	Y
313+00.000	Y	7.85	10.85	4.00	3.55	7.86	10.86	Y
313+50.000	Y	7.77	10.77	4.00	3.62	7.77	10.77	Y
314+00.000	Y	7.74	10.74	4.00	3.94	7.78	10.78	Y
314+50.000	Y	7.68	10.68	4.00	4.10	8.03	11.03	Y
315+00.000	Y	7.51	10.51	4.00	4.03	7.96	10.96	Y
315+50.000	Y	7.51	10.51	4.00	4.09	7.90	10.90	Y
316+00.000	Y	7.71	10.71	4.00	4.07	7.97	10.97	Y
316+50.000	Y	7.85	10.85	4.00	4.04	8.04	11.04	Y
317+00.000	Y	7.52	10.52	4.00	4.02	8.05	11.05	Y
317+50.000	Y	7.58	10.58	4.00	4.04	8.02	11.02	Y
318+00.000	Y	7.62	10.62	4.00	4.08	7.91	10.91	Y
318+50.000	Y	7.81	10.81	4.00	4.04	7.49	7.49	N
319+00.000	Y	7.54	10.54	4.00	4.04	7.37	7.37	N
319+50.000	Y	7.51	10.51	4.00	4.00	8.85	8.85	N
320+00.000	Y	7.50	10.50	4.00	4.02	10.68	10.68	N
320+50.000	Y	7.50	10.50	4.00	3.99	11.11	11.11	N
321+00.000		RAMP	RAMP	4.00	4.00	11.91	11.91	N
321+50.000		RAMP	RAMP	4.00	4.05	11.63	11.63	N
322+00.000		RAMP	RAMP	4.00	4.00	11.54	11.54	N
322+50.000		RAMP	RAMP	4.00	4.04	11.51	14.51	Y
323+00.000		RAMP	RAMP	4.00	4.06	11.40	14.40	Y
323+50.000		RAMP	RAMP	4.00	4.09	11.29	14.29	Y
324+00.000		RAMP	RAMP	4.00	4.05	11.37	14.37	Y
324+50.000		RAMP	RAMP	4.00	4.04	11.26	14.26	Y
325+00.000		RAMP	RAMP	4.00	4.02	11.23	14.23	Y
325+50.000	Y	7.52	10.52	4.00	4.01	10.12	13.12	Y
326+00.000	Y	7.49	10.49	4.00	3.99	9.43	12.43	Y
326+50.000	Y	7.57	10.57	4.00	4.05	8.92	11.92	Y
327+00.000	Y	7.59	10.59	4.00	4.00	8.81	11.81	Y
327+50.000	Y	7.43	10.43	4.00	3.96	8.96	11.96	Y
328+00.000	Y	7.30	10.30	4.00	3.93	9.02	12.02	Y
328+50.000	Y	7.30	10.30	4.00	3.91	8.93	11.93	Y
329+00.000	Y	7.29	10.29	4.00	3.91	8.92	11.92	Y
329+50.000	Y	7.32	10.32	4.00	3.90	9.02	12.02	Y
330+00.000	Y	7.37	10.37	4.00	3.90	8.96	11.96	Y
330+50.000	Y	7.40	10.40	4.00	3.85	8.96	11.96	Y
331+00.000	Y	7.42	10.42	4.00	3.57	8.98	11.98	Y
331+50.000	Y	7.42	10.42	4.00	3.61	9.98	11.98	Y
332+00.000	Y	7.38	10.38	4.00	3.79	8.99	11.99	Y
332+50.000	Y	7.38	10.38	4.00	3.88	8.98	11.98	Y
333+00.000	Y	7.50	10.50	4.00	3.93	9.01	12.01	Y
333+50.000	Y	7.43	10.43	4.00	3.93	9.04	12.04	Y
334+00.000	Y	7.35	10.35	4.00	3.72	9.08	12.08	Y
334+50.000	Y	7.62	10.62	4.00	3.39	9.13	12.13	Y
335+00.000	Y	7.95	10.95	4.00	3.85	9.06	12.06	Y
335+50.000	Y	8.23	11.23	4.00	4.00	8.94	11.94	Y
336+00.000	Y	8.36	11.36	4.00	4.00	8.86	11.86	Y
336+50.000	Y	8.49	11.49	4.00	4.00	8.93	11.93	Y
337+00.000	Y	8.58	11.58	4.00	4.00	8.99	11.99	Y
337+50.000	Y	8.72	11.72	4.00	4.00	8.93	11.93	Y
338+00.000	Y	8.79	11.79	4.00	4.00	8.85	11.85	Y
338+50.000	Y	8.95	11.95	4.00	4.00	8.83	11.83	Y
339+00.000	Y	9.13	12.13	4.00	4.00	8.72	11.72	Y
339+50.000	Y	9.88	12.88	4.00	4.00	8.54	11.54	Y
340+00.000	Y	11.11	14.11	4.00	4.00	8.48	11.48	Y
340+50.000	Y	12.22	15.22	4.00	4.00	8.57	11.57	Y
341+00.000	Y	11.96	14.96	4.00	4.00	8.69	11.89	Y
341+50.000	Y	11.88	14.88	4.00	4.00	8.82	11.82	Y
342+00.000	Y	11.89	14.89	4.00	4.00	9.02	12.02	Y
342+50.000	Y	11.78	14.78	4.00	4.00	9.15	12.15	Y
343+00.000	Y	11.87	14.87	4.00	4.00	9.22	12.22	Y
343+50.000	Y	11.86	14.86	4.00	4.00	9.77	12.77	Y
344+00.000	Y	11.63	14.63	4.00	4.00	10.67	13.67	Y
344+50.000	Y	11.72	14.72	4.00	4.00	11.74	14.74	Y
345+00.000	Y	11.43	14.43	4.00	4.00	10.41	13.41	Y
345+50.000		11.44		4.00	4.00	9.55	12.55	Y
346+00.000		14.43		4.00	4.00	9.25	12.25	Y
346+50.000		14.42		4.08	4.00	9.24	12.24	Y
347+00.000		RAMP		4.50	4.00	9.46	12.46	Y
347+50.000		RAMP		4.50	4.00	9.86	12.86	Y
348+00.000		RAMP		4.51	4.00	9.91	12.91	Y
348+50.000		RAMP		4.51	4.00	9.97	12.97	Y
349+00.000		RAMP		4.51	4.00	9.97	12.97	Y
349+50.000		RAMP		4.52	4.00	9.82	12.82	Y
350+00.000		RAMP		4.52	4.00	9.73	12.73	Y
350+50.000		RAMP		4.52	4.00	9.87	12.87	Y
351+00.000		RAMP		4.52	4.00	9.36	12.36	Y
351+50.000		RAMP		4.52	4.00	18.98	21.98	Y
352+00.000		RAMP		4.52	4.00	17.99	20.99	Y
352+50.000		RAMP		4.52	4.00	17.11	20.11	Y

I-85 HOV
Shoulder Width Report
Sta. 311+00 to Sta. 477+00

	SOUTH				NORTH			
BASELINE STATION	V-GUTTER	OUTSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WITH V-GUTTER	INSIDE SHOULDER WIDTHS	INSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WITH V-GUTTER	V-GUTTTER
353+00.000		RAMP		4.52	4.00	16.12	19.12	Y
353+50.000		RAMP		4.52	4.00	15.14	18.14	Y
354+00.000		RAMP		4.52	4.00	14.35	17.35	Y
354+50.000		5.87		4.52	4.00	13.38	16.38	Y
355+00.000		5.83		4.51	4.00	12.37	15.37	Y
355+50.000		5.81		4.51	4.00	11.45	14.45	Y
356+00.000		6.55		4.51	4.00	10.40	13.40	Y
356+50.000		6.56		4.50	4.00	9.35	12.35	Y
357+00.000		6.94		4.50	4.00	8.31	11.31	Y
357+50.000		7.33		4.50	4.00	7.58	10.59	Y
358+00.000	Y	8.02	11.02	4.50	4.00	7.31	10.31	Y
358+50.000	Y	8.24	11.24	4.50	4.00	7.21	10.21	Y
359+00.000	Y	8.40	11.40	4.50	4.00	7.10	10.10	Y
359+50.000	Y	8.80	11.80	4.41	4.00	6.82	6.82	Y
360+00.000	Y	8.82	11.82	3.92	4.00	7.37	10.37	Y
360+50.000	Y	9.07	12.07	3.42	4.00	7.38	10.38	Y
361+00.000		9.39		2.93	4.00	7.44	10.44	Y
361+50.000		8.82		2.44	4.00	7.46	10.46	Y
362+00.000		RAMP		2.00	4.00	7.46	10.46	Y
362+50.000		RAMP		2.00	4.00	7.46	10.46	Y
363+00.000		RAMP		2.00	4.00	7.37	10.37	Y
363+50.000		RAMP		2.00	4.00	7.98	10.98	Y
364+00.000		RAMP		2.00	4.00	6.67	9.67	Y
364+50.000		RAMP		2.00	4.00	5.75	8.75	Y
365+00.000		RAMP		2.00	4.00	5.63	8.63	Y
365+50.000		RAMP		2.00	4.00	5.44	8.44	Y
366+00.000		RAMP		2.00	4.00	5.43	8.43	Y
366+50.000	Y	10.01		2.00	4.00	5.56	8.56	Y
367+00.000	Y	10.01		2.00	4.00	5.32	8.32	Y
367+50.000	Y	10.01		2.00	4.00	5.00	8.00	Y
368+00.000	Y	10.01		2.00	4.00	5.09	9.09	Y
368+50.000	Y	10.00		2.00	4.00	5.17	8.17	Y
369+00.000	Y	10.00		2.00	4.00	5.14	8.14	Y
369+50.000	Y	10.00		2.00	4.00	4.85	7.85	Y
370+00.000	Y	10.00		2.00	4.00	5.60	8.60	Y
370+50.000	Y	10.00		2.00	4.00	5.78	8.78	Y
371+00.000	Y	10.00		2.00	4.00	5.96	8.96	Y
371+50.000	Y	10.00		2.00	3.85	6.00	6.00	
372+00.000	Y	10.00		2.00	2.29	10.05	10.05	
372+50.000	Y	10.00		2.00	2.00	8.81	11.81	Y
373+00.000	Y	10.00		2.00	2.00	7.82	10.82	Y
373+50.000	Y	10.00		2.00	2.00	6.84	9.84	Y
374+00.000	Y	9.44	12.44	2.00	2.00	5.85	8.85	Y
374+50.000	Y	6.60	9.60	2.00	2.00	4.87	7.87	Y
375+00.000	Y	3.69	6.69	2.00	2.00	3.88	6.88	Y
375+50.000	Y					7.48		N
376+00.000	Y	5.85		2.00	2.00	7.39		N
376+50.000	Y	5.66		2.00	2.00	7.30		N
377+00.000	Y	5.39		2.00	2.00	7.20		N
377+50.000	Y	6.37	9.37	2.00	2.00	7.11	10.11	Y
378+00.000	Y	5.85	8.85	2.00	2.00	7.01	10.01	Y
378+50.000	Y	9.17	12.17	2.00	2.00	2.86	5.86	Y
379+00.000	Y	6.97	12.97	2.00	2.00	3.03	6.03	Y
379+50.000	Y	9.96	12.96	2.00	2.00	5.51	8.51	Y
380+00.000	Y	9.96	12.96	2.00	2.00	11.46	14.46	Y
380+50.000	Y	24.44	27.44	2.00	2.00	12.00	15.00	Y
381+00.000	Y	24.61	27.61	2.00	2.01	12.00	15.00	Y
381+50.000	Y	24.61	27.61	2.00	2.01	12.00	15.00	Y
382+00.000	Y	10.84	13.84	2.00	2.01	12.00	15.00	Y
382+50.000	Y	11.44	14.44	2.00	1.95	12.00	15.00	Y
383+00.000	Y	10.98	13.98	2.00	2.92	12.00	15.00	Y
383+50.000	Y	10.52	13.52	2.00	3.90	12.00	15.00	Y
384+00.000	Y	10.06	13.06	2.00	3.41	12.00	15.00	Y
384+50.000	Y	10.00	13.00	2.00	2.91	12.00	15.00	Y
385+00.000	Y	10.00	13.00	2.00	2.40	10.88	13.88	Y
385+50.000	Y	10.00	13.00	2.00	2.00	10.00	13.00	Y
386+00.000	Y	10.00	13.00	2.00	2.00	10.00	13.00	Y
386+50.000	Y	10.00	13.00	2.00	2.00	10.00	13.00	Y
387+00.000	Y	10.00	13.00	2.00	2.00	10.00	13.00	Y
387+50.000	Y	10.00	13.00	2.00	2.00	10.05	13.05	Y
388+00.000	Y	10.00	13.00	2.00	2.00	10.00	13.00	Y
388+50.000	Y	10.00	13.00	2.00	2.00	10.00	13.00	Y
389+00.000	Y	10.00	13.00	2.00	2.00	10.00	13.00	Y
389+50.000	Y	10.00	13.00	2.00	2.00	10.00	13.00	Y
390+00.000	Y	10.00	13.00	2.00	2.00	10.00	13.00	Y
390+50.000	Y	10.00	13.00	2.00	2.00	10.00	13.00	Y
391+00.000	Y			2.00	2.00	10.00	13.00	Y
391+50.000	Y	10.00	13.00	2.00	2.00			
392+00.000	Y	10.00	13.00	2.00	2.00	10.00		N
392+50.000	Y	10.00	13.00	2.00	2.00	10.00		N
393+00.000	Y	10.00	13.00	2.00	2.00	9.05		N
393+50.000	Y	10.00		2.00	2.00	8.67		N
394+00.000	N	10.00		2.00	2.00	11.05		N
394+50.000	N	10.00		2.00	2.00	10.49		N
395+00.000	N	10.00		2.00	2.00	9.32		N
395+50.000	N	10.00		2.00	2.00	8.24		N

I-85 HOV
Shoulder Width Report
Sta. 311+00 to Sta. 477+00

	SOUTH				NORTH			
BASELINE STATION	V-GUTTER	OUTSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WITH V-GUTTER	INSIDE SHOULDER WIDTHS	INSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WITH V-GUTTER	V-GUTTTER
396+00.000	N	10.00		2.00	2.00	7.08		N
396+50.000		RAMP(GORE AREA)		2.00	2.00	8.00		N
397+00.000		RAMP(GORE AREA)		2.00	2.00	8.00		N
397+50.000		RAMP(GORE AREA)		2.00	2.00	8.00		N
398+00.000		RAMP(GORE AREA)		2.00	2.00	8.00		N
398+50.000		RAMP(GORE AREA)		2.00	2.00	8.00		N
399+00.000	Y	RAMP(GORE AREA)		2.00	2.00	8.00		N
399+50.000	N	12.00		2.00	2.00	8.00		N
400+00.000	N	10.00		2.00	2.00	8.00		N
400+50.000	N	9.00		2.00	2.00	8.00		N
401+00.000	N	9.00		2.00	2.00	8.00		N
401+50.000	N	9.00		2.00	2.00	8.00		N
402+00.000	N	9.00		2.00	2.00	8.00		N
402+50.000	N	9.00		2.00	2.00	8.00		N
403+00.000	N	9.00		2.00	2.00	8.00		N
403+50.000	N	9.00		2.00	2.00	8.00		N
404+00.000	N	9.47		2.00	2.00	8.00		N
404+50.000	N	7.45		2.00	2.00	8.00		N
405+00.000	N	6.58		2.00	2.00	8.00		N
405+50.000	N	5.51		2.00	2.00	8.00		N
406+00.000	N	4.61		2.00	2.00	8.00		N
406+50.000	N	4.60		2.00	2.00	8.00		N
407+00.000	N	4.66		2.00	2.00	8.00		N
407+50.000	N	4.69		2.00	2.00	8.00		N
408+00.000	N	4.25		2.00	2.00	5.50		N
408+50.000	N	3.71		2.00	2.00	5.50		N
409+00.000	N	3.57		2.00	2.00	5.50		N
409+50.000	N	3.59		2.00	2.00	5.50		N
410+00.000	N	4.02		2.00	2.00	5.50		Y
410+50.000	N	4.83		2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
411+00.000	N	4.75		2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
411+50.000	N	4.75		2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
412+00.000	N	4.50		2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
412+50.000	N	3.69		2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
413+00.000	N	3.93		2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
BETWEEN NORTH OF NORTHCREST ROAD BRIDGE AND OFF RAMP								
413+50.000	N	3.93		2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
414+00.000		RAMP(GORE AREA)		2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
414+50.000		RAMP(GORE AREA)		2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
415+00.000		RAMP(GORE AREA)		2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
415+50.000		RAMP(GORE AREA)		2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
416+00.000	N	10.00	RAMP SHOULDER	2.00	2.00	ENTRANCE RAMP	FM I-285 EAST	Y
416+50.000	N	9.00	RAMP SHOULDER	2.00	2.00	10.45		N
417+00.000	N	9.00	RAMP SHOULDER	2.00	2.00	10.71		N
417+50.000	N	8.00	RAMP SHOULDER	2.00	2.00	11.08		N
418+00.000	N	8.00	RAMP SHOULDER	2.00	2.00	11.40		N
418+50.000	N	8.50	RAMP SHOULDER	2.00	2.00	11.29		N
419+00.000	N	6.00	RAMP SHOULDER	2.00	2.00	11.26		N
419+50.000	N	9.82		2.00	2.00	11.33		N
420+00.000	N	10.27		2.00	2.00	12.35		N
420+50.000	N	7.68		2.00	2.00	12.44		N
421+00.000	N	10.98		2.00	2.00	12.63		N
421+50.000	N	11.43		2.00	2.00	12.73		N
422+00.000	N	11.29		2.00	2.00	12.06		N
422+50.000	N	10.35		2.00	2.00	11.00		N
423+00.000	N	9.38		2.00	2.00	9.95		N
423+50.000	N	8.22		2.00	2.00	8.94		N
424+00.000	N	7.23		2.00	2.00	7.88		N
424+50.000	N	6.36		2.00	2.00	7.15		N
425+00.000	N	5.38		2.00	2.00	6.52		N
425+50.000	N	4.81		2.00	2.00	6.03		N
426+00.000	N	5.01		2.00	2.00	5.57		N
426+50.000	N	5.31		2.00	2.00	5.32		N
427+00.000	N	5.31		2.00	2.00	5.16		N
427+50.000	N	5.29		2.00	2.00	7.37		N
428+00.000	N	5.19		2.00	2.00	10.33	13.33	Y
428+50.000	N	4.88		2.00	2.00	11.00	14.00	Y
429+00.000	N	8.14		2.00	2.00	11.00	14.00	Y
429+50.000	N	8.14		2.00	2.00	19.25	22.25	Y
430+00.000	N	11.42		2.00	2.00	23.00	26.00	Y
430+50.000	N	12.00		2.00	2.00	20.27	23.27	Y
431+00.000	N	12.01		2.00	2.00	20.27	23.27	Y
431+50.000	N	12.01		2.00	2.00	10.57	13.57	Y
432+00.000	N	12.01		2.00	2.00	10.54	13.54	Y
432+50.000	N	12.01		2.00	2.00	10.60	13.60	Y
433+00.000	N	12.01		2.00	2.00	10.67	13.67	Y
433+50.000	N	12.00		2.00	2.00	10.74	13.74	Y
434+00.000	N	12.00		2.00	2.00	10.81	13.81	Y
434+50.000	N	12.00		2.00	2.00	10.88	13.88	Y
435+00.000	N	12.00		2.00	2.00	10.95	13.95	Y
435+50.000	N	12.55		2.00	2.00	11.01	14.01	Y
436+00.000	N	11.99		2.00	2.00	11.01	14.01	Y
436+50.000	N	11.99		2.00	2.00	11.01	14.01	Y
437+00.000	N	11.99		2.00	2.00	11.01	14.01	Y
437+50.000	N	12.00		2.00	2.00	11.01	14.01	Y

I-95 HOV
Shoulder Width Report
Sta. 311+00 to Sta. 477+00

	SOUTH				NORTH			
BASELINE STATION	V-GUTTER	OUTSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WITH V-GUTTER	INSIDE SHOULDER WIDTHS	INSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WIDTH	OUTSIDE SHOULDER WITH V-GUTTER	V-GUTTTER
438+00.000	N	12.00		2.00	2.00	11.01	14.01	Y
438+50.000	N	12.00		2.00	2.00	11.01	14.01	Y
439+00.000	N	12.00		2.00	2.00	7.32	10.32	Y
439+50.000	N	12.00		2.00	2.00	7.79	10.78	Y
440+00.000	N	12.00		2.00	2.00	7.82	10.82	Y
440+50.000	N	12.00		2.00	2.00	7.90	10.90	Y
441+00.000	N	12.00		2.00	2.00	7.83	10.83	Y
441+50.000	N	12.00		2.00	2.00	7.79	10.79	Y
442+00.000	N	12.00		2.00	2.00	7.87	10.87	Y
442+50.000	N	RAMP	RAMP	2.00	2.00	7.46	10.46	Y
443+00.000	N	RAMP	RAMP	2.00	2.00	7.48	10.48	Y
443+50.000	N	RAMP	RAMP	2.00	2.00	7.64	10.64	Y
444+00.000	N	RAMP	RAMP	2.00	2.00	7.42	10.42	Y
444+50.000	N	RAMP	RAMP	2.00	2.00	7.46	10.46	Y
445+00.000		RAMP(GORE AREA)		2.49	2.00	7.46	10.46	Y
445+50.000		RAMP(GORE AREA)		3.00	2.00	7.53	10.53	Y
446+00.000		RAMP(GORE AREA)		3.51	2.00	7.51	10.51	Y
446+50.000		9.98		4.01	2.00	7.32	10.32	Y
447+00.000		9.30		4.52	2.00	7.16	10.16	Y
447+50.000		8.79		5.03	2.00	7.21	10.21	Y
448+00.000		8.34		5.53	2.00	7.38	10.38	Y
448+50.000		7.98		5.95	2.00	7.51	10.51	Y
449+00.000		8.08		5.96	2.00	7.46	10.46	Y
449+50.000		7.87		5.96	2.80	7.41	10.41	Y
450+00.000		7.36		5.97	3.00	7.58	10.58	Y
450+50.000		7.80		5.98	3.50	8.15	11.15	Y
451+00.000		7.80		5.98	4.00	8.94	11.94	Y
451+50.000		7.89		5.99	3.03	8.93	11.93	Y
452+00.000		8.02		8.00	2.06	8.25	11.25	Y
		COUNTY LINE BRIDGE						
452+50.000		10.99		8.00	2.38	7.79	10.79	Y
453+00.000		9.60	12.60	8.00	2.94	7.59	10.59	Y
453+50.000		11.52	14.52	8.00	3.90	7.02	10.02	Y
454+00.000		13.87	16.87	8.00	3.86	6.63	9.63	Y
454+50.000		13.73	16.73	8.00	4.00	6.51	9.51	Y
		BEGIN NORTH OF COUNTY LINE BRIDGE						
455+00.000	Y	13.62	16.62	8.00	4.00	6.67	9.67	Y
455+50.000	Y	13.74	16.74	5.99	4.00	6.75	9.75	Y
456+00.000	Y	13.13	18.13	5.99	4.00	6.73	9.73	Y
456+50.000	N	10.07		5.99	4.00	6.43	9.43	Y
457+00.000	N	10.01		5.99	4.00	6.16	9.16	Y
457+50.000	N	10.03		5.99	4.00	6.32	9.32	Y
458+00.000	N	10.05		5.99	4.00	6.39	9.39	Y
458+50.000	N	10.03		5.99	4.00	6.37	9.37	Y
459+00.000	N	10.12		5.99	4.00	6.20	9.20	Y
459+50.000	N	10.12		5.99	4.00	5.99	8.99	Y
460+00.000	N	10.28		5.99	4.00	5.81	8.81	Y
460+50.000	N	10.34		5.99	4.00	5.75	8.75	Y
461+00.000	N	10.38		5.99	4.00	5.78	8.78	Y
461+50.000	N	10.44		5.99	4.00	5.89	8.89	Y
462+00.000	N	10.47		5.99	4.00	5.90	8.90	Y
462+50.000	N	10.37		5.99	4.00	5.77	8.77	Y
463+00.000	N	10.35		5.99	4.00	5.91	8.91	Y
463+50.000	N	10.34		5.99	4.00	5.95	8.95	Y
464+00.000	N	10.27		5.99	4.00	5.79	8.79	Y
464+50.000	N	10.28		5.99	4.00	5.89	8.89	Y
465+00.000	N	10.28		5.99	4.00	5.82	8.82	Y
465+50.000	N	10.12		5.99	4.00	5.89	8.89	Y
466+00.000	N	10.11		5.99	4.00	5.99	8.99	Y
466+50.000	N	10.06		5.99	4.00	6.10	9.10	Y
467+00.000	N	9.97		5.99	4.00	6.22	9.22	Y
467+50.000	N	10.33		6.02	4.00	6.30	9.30	Y
468+00.000	N	10.92		6.49	4.00	6.33	9.33	Y
		END NORTH OF COUNTY LINE						
468+50.000	N	11.70		5.99	4.00	6.22	9.22	Y
469+00.000	N	12.70		7.49	4.00	6.27	9.27	Y
469+50.000	N	13.92		9.00	4.00	9.61	12.61	Y
470+00.000	N	13.53		9.50	4.00	9.68	12.68	Y
470+50.000	N	13.05		9.00	4.00	9.73	12.73	Y
471+00.000	N	12.58		9.50	4.00	9.71	12.71	Y
471+50.000	N	12.09		10.00	4.00	9.81	12.61	Y
472+00.000	N	12.10		10.00	4.00	9.47	12.47	Y
472+50.000	N	12.11		10.01	4.00	9.39	12.39	Y
473+00.000	N	12.11		10.01	4.00	9.47	12.47	Y
473+50.000	N	12.11		10.01	4.00	9.60	12.60	Y
474+00.000	N	12.11		10.01	4.00	9.55	12.55	Y
474+50.000	N	12.10		10.01	4.00	9.70	12.70	Y
475+00.000	N	12.09		10.01	4.00	9.79	12.79	Y
475+50.000	N	12.07		10.02	4.00	9.63	12.63	Y
476+00.000	N	12.05		10.02	4.00	8.70	12.70	Y
476+50.000	N	12.03		10.02	4.00	10.06	13.06	Y
477+00.000	N	12.00		10.02	4.00	10.42	13.42	Y
						NORTH OF COUNTY LINE		

HOV II PROJECT

Chamblee Tucker Rd, to SR 316
P.I. 713760

OUTSIDE SHOULDER WIDTHS UNDER BRIDGES

	STATION	NB	SB
I-285 Bridge	375+50	7.48	
	376+00	7.39	5.65
	376+50	7.30	5.68
	377+00	7.20	5.39
Northcrest Road Bridge	408+00	5.50	4.25
	408+50	5.50	3.71
	409+00	5.50	3.57
	409+50	5.50	3.59
	410+00	5.50	4.02
Pleasantdale Bridge	432+00	13.54	12.01
	432+50	13.60	12.01
	433+00	13.67	12.01
	433+50	13.74	12.00
	434+00	13.81	12.00
County Line Bridge	451+50	11.93	7.89
	452+00	11.25	8.02
	452+50	10.79	11.00
	453+00	10.59	12.60
Jimmy Carter Blvd.	553+00	3.73	7.90
	553+50	2.11	2.34
	554+00	2.01	2.34
	554+50	2.04	2.38
Centerway	592+50	12.00	7.10
	593+00	12.00	3.80
	593+50	12.00	3.40
	594+00	12.00	4.70
Indian Trail	666+50	12.00	6 RAMP
	667+00	12.00	6 RAMP
	667+50	12.00	6 RAMP
	668+00	12.00	6 RAMP
Beaver Run	727+00	12.00	12.50
	727+50	12.00	12.50
	728+00	11.00	12.50
	729+00	11.00	12.50
Steve Reynolds	805+50	12.00	11.80
	806+00	17.30	11.80
	806+50	17.30	11.80
	807+00	12.00	11.80
Pleasant Hill	833+00	5.70	4.00
	833+50	5.40	4.00
	834+00	5.50	4.00
	834+50	5.90	3.70
Old Norcross	888+00	10.20	12.00
	888+50	10.50	12.00
	889+00	10.40	12.00
	890+00	10.50	12.00
	890+50	10.50	12.00

EVALUATION OF ACCIDENT DATA

Most accidents occur in the vicinity of interchange ramps regardless of type. The accident, injury and fatality rates for I-85 mainline data for the years of 1991 through 1997 have been compared to the state wide averages for Urban Interstates.

The rates are based on 100 million vehicle miles. The accident rate varies from 9.4 percent below the average to 26 percent above the statewide average. The injury rate varies from 35 percent below to 9 percent above the statewide average. The fatality rate is well below the statewide average.

SECTION A, ENTIRE PROJECT LENGTH Length 11.67 miles					
	Chamblee Tucker/SR 316 Mainline Rates		Statewide Urban Interstate Mainline Rates		Percent Change + above - below
1991	Accidents	106	Accidents	117	-9.4%
	Injuries	32	Injuries	49	-34.7%
	Fatalities (0)	0.0	Fatalities	.58	
1992	Accidents	131	Accidents	104	+25.9%
	Injuries	47	Injuries	43	+9.3%
	Fatalities (3)	.44	Fatalities	.59	-25.4%
1993	Accidents	131	Accidents	114	+14.9%
	Injuries	52	Injuries	49	+6.1%
	Fatalities (3)	.38	Fatalities	.43	-10.9%
1994	Accidents	N/A	Accidents	125*	
	Injuries	50	Injuries	55	-9%
	Fatalities (2)	.22	Fatalities	.53	-58.5%
1995	Accidents	149	Accidents	130	+14.6%
	Injuries	56	Injuries	59	-5.1%
	Fatalities (2)	.22	Fatalities	.74	-70.3%
1996	Accidents	157	Accidents	138	+13.8%
	Injuries	56	Injuries	63	-11.1%
	Fatalities (3)	.33	Fatalities	.61	-45.9%
1997	Accidents	148	Accidents	N/A	
	Injuries	53	Injuries	N/A	
	Fatalities (7)	.7	Fatalities	N/A	

* Based on 59% complete.
** Incomplete

SECTION B Length 1.71 miles					
	NB Off Ramp at Northcrest to Dekalb/Gwinnett Co. Line Rates		Statewide Urban Interstate Mainline Rates		Percent Change + above - below
1994	Accidents	N/A	Accidents	125*	
	Injuries	122	Injuries	55	+121.8%
	Fatalities (1)	.87	Fatalities	.53	+64%
1995	Accidents	367	Accidents	130	+182.3%
	Injuries	146	Injuries	59	+147.5%
	Fatalities (1)	.94	Fatalities	.74	+27%
1996	Accidents	396	Accidents	138	+186.9%
	Injuries	147	Injuries	63	+133%
	Fatalities (1)	.92	Fatalities	.61	+51%
1997**	Accidents	329	Accidents	N/A	
	Injuries	135	Injuries	N/A	
	Fatalities (2)***	1.54	Fatalities	N/A	

* Based on 59% complete.
** Incomplete
*** One pedestrian.

SECTION B

I-85 South of I-285 to the Dekalb/Gwinnett County Line
Length 1.71 miles

1994 (incomplete)

Accidents-Struck object-median	9
Total accidents	208
Percent total	4.3%

1995

Accidents-Struck object-median	30
Total accidents	389
Percent total	7.7%

1996

Accidents-Struck object-median	19
Total accidents	396
Percent total	4.8%

1997 (incomplete)

Accidents-Struck object-median	26
Total accidents	429
Percent total	6.1%

SECTION C Length 0.44 miles					
	I-285 at Jimmy Carter Blvd. Mainline within interchange Rates		Statewide Urban Interstate Mainline Rates		Percent Change + above - below
1994	Accidents	N/A	Accidents	N/A	
	Injuries	124	Injuries	55	+125%
	Fatalities (0)	0.0	Fatalities	.53	
1995	Accidents	396	Accidents	130	+205%
	Injuries	141	Injuries	59	+139%
	Fatalities (0)	0.0	Fatalities	.74	
1996	Accidents	466	Accidents	138	+223%
	Injuries	127	Injuries	63	+102%
	Fatalities (1)	2.49	Fatalities	.61	+308%
1997**	Accidents	472	Accidents	N/A	
	Injuries	161	Injuries	N/A	
	Fatalities (0)***	0.0	Fatalities	N/A	

** Incomplete
*** One pedestrian

SECTION C

I-85 at Jimmy Carter Blvd (between exit and entrance ramps)
Length 0.44 miles

1994 (incomplete)

Accidents-Struck object-median wall	2
Accidents-Struck object-median wall(on shoulder)	2
Total accidents	90
Percent of total struck median wall	2.2%
Percent of total struck median wall on shoulder	2.2%

1995

Accidents-Struck object-median wall	4
Accidents-Struck object-median wall(on shoulder)	1
Total accidents	154
Percent of total struck median wall	2.6%
Percent of total median on shoulder	0.6%

1996

Accidents-Struck object-median wall	6
Accidents-Struck object-median wall(on shoulder)	3
Total accidents	187
Percent of total struck median wall	3.2%
Percent of total struck median wall on shoulder	1.9%

1997 (incomplete)

Accidents-Struck object-median wall	3
Accidents-Struck object-median wall(on shoulder)	3
Total accidents	200
Percent of total struck median wall	1.5%
Percent of total struck median wall on shoulder	1.5%

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENTAL CORRESPONDENCE

FILE IM-85-2 (178), DeKalb and Gwinnett Counties
SR 403/I-85 – Addition of HOV lanes on I-85
From Chamblee Tucker Road to SR 316 in Gwinnett
PI No.: 713760

OFFICE Urban Design

DATE July 31, 1998

Joseph P. Palladi

FROM Joseph P. Palladi, P.E., State Urban Design Engineer

TO Bob Mustin, P.E., Project Review Engineer

SUBJECT **Design Exception Request**

Attached for submission to FHWA is a request for design exceptions for this project.

If you have any questions, please call Bill Moskal at (404) 656-5442.

JPP:CEC

Attachments: Partial Set of half-size plans
Design Exception Request
Traffic Data
Horizontal Clearance Spreadsheet
Accident Data

cc: Walker W. Scott, Jr.

\\gdot_go_sv20\UD2\713760\Office\Design Exception Request.doc

Managed Lane Separation Whitepaper

Managed Lane Separation Techniques and Cost Estimates for Metro Atlanta

DRAFT

3-16-09

Prepared for,
Georgia Department of Transportation (GDOT)

Prepared by,

JACOBS™

INTRODUCTION

The managed lanes strategy to fight traffic congestion in urban areas has been a popular mitigation approach that uses designated roadway lanes to encourage modes of travel other than the single occupant vehicle. Existing managed lane systems in the US have a variety of common lane separation techniques that separate managed lanes from adjacent general-purpose lanes. Metro Atlanta currently has over 50 centerline miles of High-Occupancy Vehicle (HOV) lanes with thermo-plastic striping separating HOV lanes from adjacent general-purpose lanes. Given metro Atlanta's plans to convert its HOV lanes to High-Occupancy Toll (HOT) lanes, this paper explores separation techniques commonly employed in other managed lane systems and provides cost estimates for each system for application on Atlanta's roadways.

There are three (3) primary types of lane separation systems currently used across the nation: barrier-separated (i.e. concrete barriers), buffer-separated (i.e. plastic pylon markers), and thermo-plastic striping. This paper discuses the functional characteristics and operations for each of the three lane separation techniques and provides planning-level cost estimates for specific application to metro Atlanta.

It is important to note that since this paper drives towards the development of planning-level cost estimates for each lane separation system, the safety attributes for each separation technique is the focus in another whitepaper prepared by Jacobs Engineering for the Georgia Department of Transportation (GDOT), dated March 16, 2009: *Safety and Separation Techniques between Managed Lanes and General-Purpose Lanes.* This paper can be found in *Appendix A*.

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BARRIER-SEPARATED SYSTEMS

Barrier-separated lane systems provide physical separation between managed lanes and general-purpose travel lanes. These systems generally consist of a series of concrete barriers spanning the corridor with designated ingress/egress points. There are two (2) general types of barrier separation systems that are used: fixed-barriers and movable barriers.

Fixed-barriers separate the lanes permanently and are generally used in fixed lane systems. This type is the most common form of barrier system used as it has relatively minimal operations and maintenance costs. Concrete barriers can cost just over $50 per linear foot of placement.

Moveable barriers are more sophisticated and dynamic than the fixed-barrier system. Moveable barriers are typically seen in reversible-flow systems. These systems maximize the existing lane capacity of the roadway in order to better serve traffic demand in the peak period direction. This is accomplished by mobilizing barriers on the travel lanes (that correspond to the non-peak direction of traffic) to temporarily increase lane capacity for the peak direction of travel. Thus, inbound city traffic is served with more capacity in the morning and the same is provided for outbound city traffic in the evening. A moveable barrier system requires trucks and time to re-position the barriers.

Advantages

Barrier-separated systems can provide good access control for managed lane systems. The physical separation of the managed lanes and the general-purpose lanes can be more effective at reducing violations (both occupancy violations and non-designated ingress/egress violations) and maintaining free flowing traffic speeds. Under a moveable system, the barriers can be used to re-designate lane direction and add more lane capacity in the peak direction of travel while utilizing existing roadway infrastructure. This would help reduce recurring congestion for commuters without having to invest in constructing additional travel lanes.

Disadvantages

Barrier-separation is expensive to construct and may require additional right-of-way if existing roadway cross-sections are not adequate. Further, existing bridge structures along the corridor may be impacted. Inclement weather such as snow storms, roadway icing, or flooding can be difficult to manage under barrier-separation. Snow/ice removal can be difficult unless adequate shoulder width is provided. Mitigating floods may be a challenge if proper drainage hasn't been installed and maintained regularly. For the moveable barrier system, while it optimizes the existing roadway width to provide better traffic operations in the peak periods, this effectiveness comes at the cost of substantial maintenance and operation requirements.

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BUFFER-SEPARATED SYSTEMS

Buffer systems separate managed lanes from general-purpose lanes with a buffer area that contains a physical marker that is less durable but more flexible than those used in barrier-separated systems. The buffer areas in buffer-separated systems are generally four-feet in width. There are three (3) common types of markers used in buffer-separated systems: Tubular Markers, Mountable Curb Markers, and Retractable Markers.

Tubular Markers

Tubular markers, pylons, stanchions, or plastic bollards are one type of marker used in buffer-separated systems. They consist of a series of painted lightweight plastic tubes, often with reflecting coating. Tubular markers stand approximately three-feet high and 18-inches in diameter and are generally placed in regular twenty-foot intervals along the length of a buffer area. The Federal Highway Administration's (FHWA) *A Guide for HOT Lane Development* suggests 18-inches of buffer on either side of the tubular marker. These markers are attached to the roadway with adhesive. Although the pylons are not as durable as concrete, they are flexible and they can be hit a certain number of times before they breakdown.

Plastic pylons can cost approximately $60 per unit. If spaced at twenty-foot intervals, one mile of pylons would cost approximately $16,000. Tubular markers generally have a life expectancy of one year and need to be replaced annually.

Advantages

Tubular markers can require less right-of-way compared to barrier systems and thus have a relatively lower implementation cost. Tubular markers can reduce occupancy violations or access violations at non-designated ingress/egress points and can allow emergency and maintenance vehicles to drive over them as necessary in response to incidents.

Disadvantages

Tubular markers need to be replaced annually which adds to the maintenance costs of the system. Tubular marker systems do not provide the physical protection of a barrier. During times of inclement weather, snow/ice removal operations can damage the markers. Roadway debris can build up over time within the buffer and needs to be regularly removed. While tubular markers can deter occupancy violators and non-designated access violators, vehicles have been reported to weave in and out of the tubular markers to avoid tolls and congestion on general-purpose lanes.

Mountable Curb Markers

Mountable curb markers are similar to tubular markers except they are only 4-inches high and 10- to 12-inches wide. These curb markers can be round or flat with reflective sheeting and they rebound when hit by vehicles. The replacement rate for mountable curb markers is approximately 15% per year.

Advantages

Mountable curb markers can require less right-of-way compared to barrier systems and allow emergency and maintenance vehicles to drive over them as necessary in response to incidents. Mountable curb markers provide some physical deterrent for occupancy and access violators. Compared to tubular markers, which have a life expectancy of one year, mountable curb markers are more durable and some systems have experienced an annual replacement rate of 15%.

Disadvantages

Mountable curb markers have not been widely tested in high speed lane separation situations. There is a cost of maintenance and replacement for these markers (annual replacement of 15% of the markers). Inclement weather such as snow or ice storms may be an issue and could make the markers inconspicuous. Snow/ice removal operations could damage the markers. Roadway debris can collectively build up in buffer area needs to be removed on a regular basis. Like tubular markers, vehicles weaving in and out of the mountable markers could occur.

Retractable Markers

Retractable markers are electronically operated pylons that retract into the ground as necessary. Retractable pylons are tubular markers recessed in the roadway and can be raised or lowered from a remote location. Like movable barrier systems, retractable markers can be used in reversible-flow operations or enable daily conversions of the managed lane to a general purpose lane during non-peak hours of traffic. Retractable

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markers cost approximately $25,000 for eight units. For one-mile of retractable markers, at a spacing of twenty-feet per marker, the cost would be $825,000.

Advantages

Like other buffer-separated systems, these markers can require less right-of-way compared to barrier systems. Retractable markers can reduce occupancy violations or access violations at non-designated ingress/egress points. During inclement weather like snow or ice storms, unlike regular tubular markers, these markers can recede into the pavement and avoid damage. The retraction feature can also be advantageous if the lane is open to the general public during non-peak hours and weekends.

Disadvantages

Retractable marker systems are expensive and do not provide the physical protection of a barrier. There can be expensive maintenance and replacement costs for these markers. Roadway debris build-up in the buffer area would increase the need for regular maintenance to prevent damage when the markers retract/rise. Vehicles weaving in and out of the tubular markers can also occur as they do not fully guard against access violations or occupancy violations.

THERMO-PLASTIC STRIPED SYSTEMS

There are two general types of thermo-plastic striped lanes: double stripe (which are currently used on metro Atlanta HOV facilities) and single stripe, where there is continual open access between general-purpose lanes and the managed lane. The thickness of the thermo-plastic striping is generally two-feet, at minimum. Thermo-plastic striping can cost over $20,000 per linear mile.

Advantages

Striped systems are the least expensive form of lane separation between managed lanes and general-purpose lanes. They generally require minimal right-of-way and thus minimal impacts on existing bridge spans and overall cost. As striped systems don't have a physical barrier in place, emergency management services and response units have unhindered accessibility to incidents, which can be a concern with a barrier type system. Maintenance costs associated with thermo-plastic striping is minimal compared to other separation techniques.

Disadvantages

Since thermo-plastic striped separation has no physical barrier or buffer between managed lanes and general-purpose lanes, they are susceptible to both occupancy and access violators.

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FHWA HIGH-OCCUPANCY TOLL (HOT) LANE GUIDANCE

Federal Highway Administration's (FHWA) *A Guide for HOT Lane Development* specifies general HOT lane cross-section guidance for travel lanes, shoulder widths, and separation widths between HOT lanes and general-purpose lanes. The cross-section guidance for HOT lanes are similar to those of HOV lanes and general-purpose lanes. The cross-sectional guidelines for HOT lanes are shown in Table 1:

Table 1. Guidelines for HOT Lane Cross-sections

Cross Section Element	Standard	
Lane Width	12 feet	
Shoulder Width (Right and left)	10 feet	Preferable
	2 feet	Minimum
Separation Width (for non-barrier separated)	4 feet	
	2 feet	Minimum

Source: FHWA, *A Guide for HOT Lane Development*

Figure 1 shows the cross-sectional guidelines for a median-based concurrent flow system. Under desirable and minimal conditions, a 12-foot travel lane is recommended. Shoulders for law enforcement (on the left side of the HOT lane), if they should be provided, are 14-feet. Standard shoulders (desirable) are 10-feet. Minimum shoulders are 2-feet. The desirable buffer between the HOT lane and the adjacent general-purpose lane is 4-feet, which may contain tubular markers. The minimum buffer area between a HOT lane and a general-purpose lane is 2-feet.

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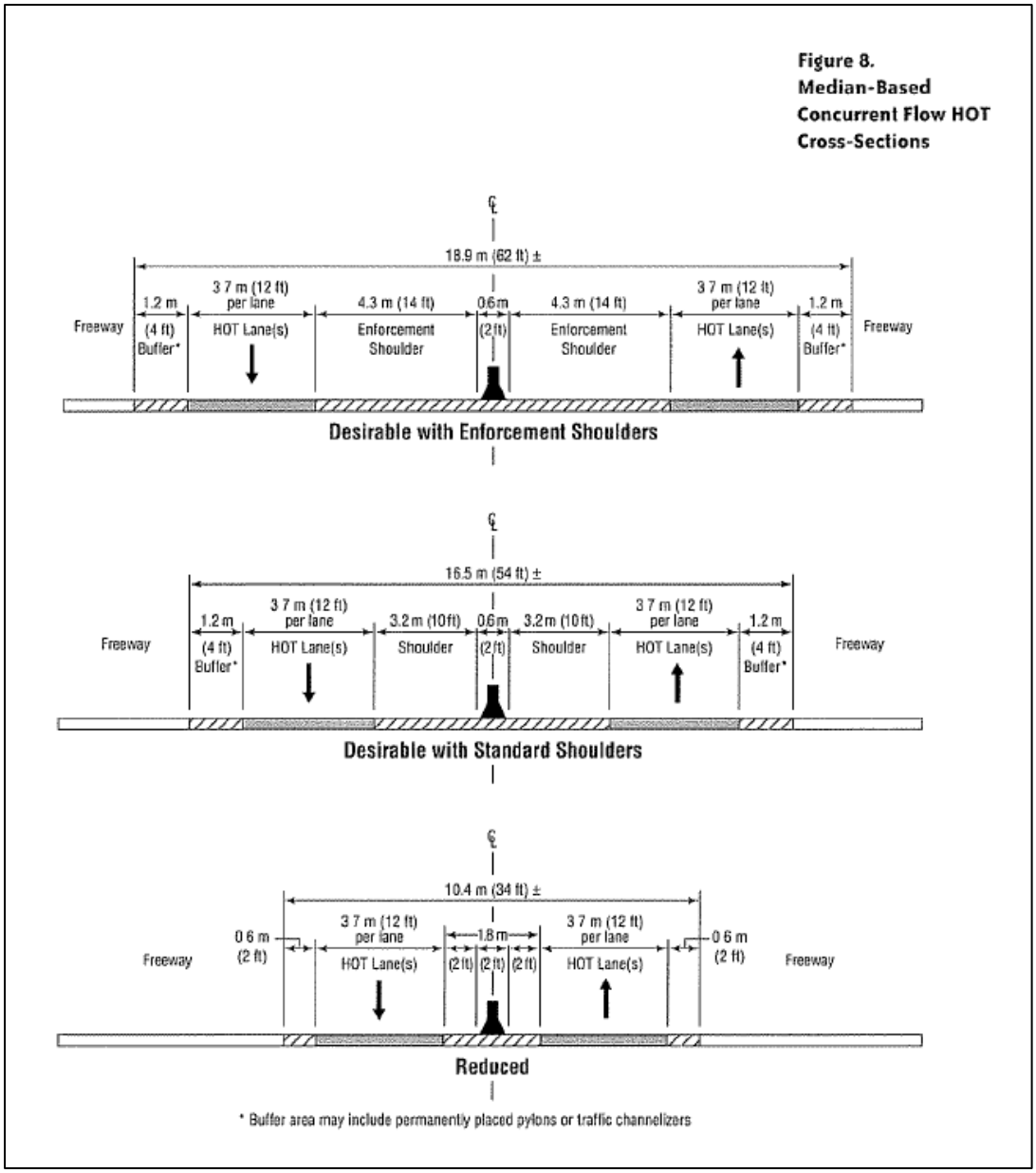
EXISTING HOV SYSTEM IN METRO ATLANTA

Metro Atlanta has over 50 centerline miles of HOV lanes on its interstate system. HOV lanes are identified with diamond pavement markings and overhead signs located on Interstates 20, 75 and 85. Continuous double-white lines separate the HOV lane from the adjacent general-purpose lanes. Motorists have access to the HOV lane where the double-white lines are intermittently broken. The HOV lanes are currently designated for vehicles carrying two or more occupants, certified alternative fuel vehicles, motorcycles and emergency vehicles. The HOV lanes in metro Atlanta are located on the interstate corridors shown in Table 2.

Table 2. Existing HOV Corridors in Metro Atlanta

Facility	Description	Distance (mi)
I-85 North	14th St (Fulton County) to Old Peachtree Rd (Gwinnett County)	23.6
I-75 North	14th St (Fulton County) to Akers Mill Rd (Cobb County)	7.9
I-85/I-75 Connector	14th St (Fulton County) to south split (Fulton County)	7.6
I-75 South	South split (Fulton County) to I-285 (Clayton County)	3.4
I-20 East	Boulveard Dr (Fulton County) to I-285 (DeKalb County)	8.2
	Total Centerline Miles of HOV	**50.7**

Figure 1. FHWA Guidance on Cross-Sections for HOT Lanes



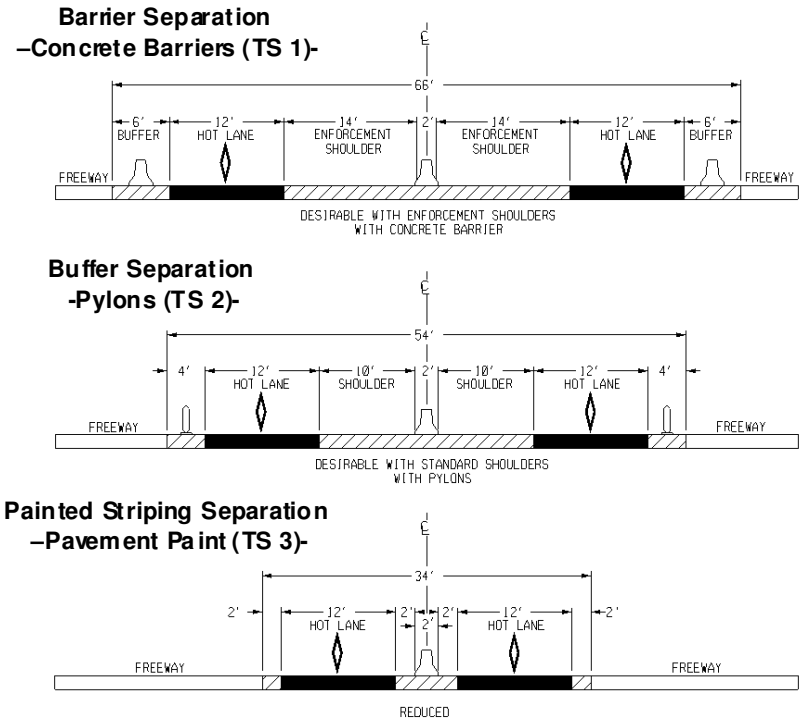
Source: Excerpt from FHWA, *A Guide for HOT Lane Development*

COST ESTIMATES FOR METRO ATLANTA

Cost estimates were developed for the three (3) types of lane separation commonly used in managed lane systems for specific application to metro Atlanta. Figure 2 shows the typical sections assumed for each lane separation system. The cross-section dimensions shown for the separation systems were selected in accordance with Federal Highway Administration's *A Guide for HOT Lane Development*.

Three (3) mutually exclusive cost estimates for potential application on over 50 centerline miles of managed lanes in Metro Atlanta were prepared at a planning-level and include construction costs for roadway widening and resurfacing. These costs also include the cost for concrete barriers (in the barrier separation scenario) and the pylons (in the buffer separation scenario). Impacted interchange/bridge costs and estimated right-of-way costs were also considered at the planning-level. Utility relocations and costs were not assessed for any of the separation systems.

Figure 2. Typical Sections (TS) for Three Lane Separation Techniques



Methodology for Estimating Right-of-Way and Bridge Impact Costs

To determine estimated required right-of-way costs and identify potential bridge impacts, the HOV lanes in metro Atlanta (along I-85, I-75, I-75/85, and I-20) were surveyed. Each corridor was reviewed using existing bridges along each facility as a point of reference for all measurements. The method included measuring the combined existing travel lanes and shoulder widths from aerial photography, and comparing the existing widths to the required overall widths as shown in the three (3) lane separation cross-sections as shown in Figure 2. A locally derived average unit cost of $8.0 million per lane-mile for new roadway construction was assumed. This average unit cost was based on estimated costs from local Georgia roadway projects. The unit cost estimate includes costs for sub-base, base, drainage, grading, earthwork, traffic control, and erosion control. Right-of-way areas were then determined per corridor by averaging the sufficient or deficient calculated widths and multiplying the average calculated widths by the length of each corridor (i.e. resulting in distance-based weighted-average values). It should be noted that the right-of-way values (at market rates) were obtained from appropriate jurisdictions tax assessor data for cost estimation development and were factored up by 2.7 in accordance with standard GDOT general procedures concerning right-of-way value estimates.

In conjunction with right-of-way needs, the number of impacted bridge structures was also determined by comparing the required width for the typical sections to the existing available shoulder width. A margin of error of plus/minus three-feet was assumed in determining the bridge replacement calculations due to the measurements being made from aerial photography and not field surveyed data. Furthermore, some of the interchange locations were considered for a design exception at the bridge by modifying the proposed cross-section. The design exception modifications were accomplished by reducing shoulder and lane widths in order to avoid reconstruction of the bridge and/or the interchange. This approach was consistent for all three (3) lane separation systems under evaluation. Engineering fees were assumed to be 10% of the estimated construction costs. For detailed cost estimate calculations and assumptions, please refer to the *Appendix B* of this paper. The cost estimates for the three (3) lane separation systems considered for metro Atlanta are shown in Table 3.

Table 3. Lane Separation Cost Estimates for HOT Lanes in Metro Atlanta

Barrier Separation	
Typical Section 1 (TS1)	**Cost**
CONSTRUCTION	
Roadway	$626,000,000
Barrier	$27,200,000
Bridge Structures/Interchanges	$240,000,000
Const. Total	**$893,200,000**
RIGHT-OF-WAY	$27,000,000
ENGINEERING	$89,320,000
UTILITY	TBD
TOTAL	**$1,009,520,000**

Buffer Separation with Pylons	
Typical Section 2 (TS2)	**Cost**
CONSTRUCTION	
Roadway	$247,800,000
Pylon	$1,600,000
Bridge Structures/Interchanges	$63,000,000
Const. Total	**$312,400,000**
RIGHT-OF-WAY	$5,200,000
ENGINEERING	$31,240,000
UTILITY	TBD
TOTAL	**$348,840,000**

Thermo-plastic Striping Separation	
Typical Section 3 (TS3)	**Cost**
CONSTRUCTION	
Roadway (Milling and Overlay for HOT Lane)	$2,200,000
Thermo-plastic Striping	$2,040,000
Bridge Structure/Interchange	$0
Const. Total	**$4,240,000**
RIGHT-OF-WAY	$0
ENGINEERING	$424,000
UTILITY	TBD
TOTAL	**$4,664,000**

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FINDINGS

In response to the recurring traffic congestion that impairs metro Atlanta commuters, the Georgia Department of Transportation (GDOT) has plans to provide commuters with an additional transportation modal choice through the conversion of existing HOV lanes to High-Occupancy Toll (HOT) lanes. Existing HOT lane systems in the United States showcase a variety of lane separation techniques that separate managed lanes from adjacent general-purpose lanes. Metro Atlanta has over 50 centerline miles of HOV lanes with thermo-plastic striping separating HOV lanes from adjacent general-purpose lanes. With plans to convert metro Atlanta's existing HOV lanes to HOT lanes, this paper explored the potential application of three (3) different types of lane separation systems currently employed in other systems across the nation: barrier-separated (i.e. concrete barriers), buffer-separated (i.e. plastic pylon markers), and thermo-plastic striping. This paper examined the functional characteristics and operations for these lane separation techniques and developed planning-level cost estimates for specific application to metro Atlanta.

The typical cross-sections assumed for each of the lane separation systems evaluated were developed in accordance with FHWA's *A Guide for HOT Lane Development*. The planning-level cost estimates for each lane separation system are as follows:

- Barrier separation (concrete barriers) cost - $1 billion dollars
- Buffer separation (plastic pylons) cost - $350 million dollars
- Thermo-plastic striping separation cost - $5 million dollars

Thermo-plastic striping lane separation would cost the least of the three (3) separation systems examined for metro Atlanta, at an estimated cost of $5 million dollars. There would be relatively small roadway pavement construction required and no right-of-way costs or impacts to existing bridge structures associated with thermo-plastic striping separation.

The buffer separation scenario would cost approximately $350 million dollars and the barrier separation would be expected to cost over $1 billion dollars. Both these scenarios would require substantial right-of-way and would have impacts on specific bridge structures. It should be noted that the buffer separation with pylons would involve an estimated annual maintenance cost of $1.6 million dollars for pylon replacement. For detailed cost estimate calculations and assumptions, please refer to the *Appendix B* of this paper.

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APPENDIX A

(Safety paper)

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Safety Research Analysis Whitepaper

Safety and Separation Techniques between Managed Lanes and General-Purpose Lanes

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3-16-09

Prepared for,
Georgia Department of Transportation (GDOT)

Prepared by,

JACOBS™

INTRODUCTION

The managed lanes strategy to fight traffic congestion in urban areas has been a popular mitigation approach that uses designated roadway lanes to encourage modes of travel other than the single occupant vehicle. Existing managed lane systems in the US have a variety of common lane separation techniques that separate managed lanes from adjacent general-purpose lanes. This paper explores the vehicular safety aspects of various separation techniques employed for existing managed lane systems in the US.

There are three primary types of lane separation systems currently in use across the nation: barrier-separated (i.e. concrete barriers), buffer-separated (i.e. plastic pylons), and striping. This paper identifies safety issues related to the operations of managed lanes and particularly, identifies safety issues associated with the most common types of separation techniques used in the US. This paper consists of a literature review of safety studies performed on existing managed lane systems; a discussion on High-Occupancy Vehicle (HOV) safety feedback received from transportation professionals around the country; and, an inventory of lane separation techniques for existing and planned High-Occupancy Toll (HOT) systems in the US. This white paper concludes with a review of the potential safety issues associated with each type of lane separation along with a discussion of mitigation strategies that can help minimize each of the potential hazards.

This safety paper can be viewed as a subset of another whitepaper prepared by Jacobs Engineering for the Georgia Department of Transportation (GDOT), dated March 16, 2009: *Managed Lane Separation Techniques and Cost Estimates for Metro Atlanta.*

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LITERATURE REVIEW

Numerous research papers and planning studies on managed lanes (HOV/HOT) from around the country were reviewed, including the Federal Highway Administration's (FHWA) "A Guide for HOT Lane Development", an informational document derived from collective HOT lane experiences in the US. Given the safety focus of this white paper, the following papers and studies were selected from the overall literature review as a good resource on the topic of managed lane safety and the common types of separation used in managed lanes today. Under each resource, a brief summary of the contents follow.

(1) A. Scott Cothron, Stephen E. Ranft, Carol H. Walters, David W. Fenno, and Dominique Lord (May 2004). Crash Analysis of Selected High-occupancy vehicle facilities in Texas: Methodology, Findings, and Recommendation. *Texas Transportation Institute, FHWA/TX-04/0-4434-1.*

This report is a research paper that studied safety issues for barrier-separated and buffer-separated HOV lanes in Texas. Crash reports were reviewed on selected HOV corridors with before-and-after crash data. This paper also included a HOV questionnaire that was sent to transportation professionals across the US.

The findings from the report indicated that the moveable barrier-separated counter flow HOV lane on I-30 did not show a change in injury crash rate. The study discovered that

most of the crashes in the HOV lane on this corridor occurred at the access points. For the barrier-separated system in the Dallas area, they recommend a 10-foot shoulder at minimum.

For the buffer-separated HOV lanes on I-35E North and I-635, an increase in injury crash rates were identified. The study determined that the increase in injury crash rates might be due to the vehicular speed difference between the HOV lane and the adjacent general-purpose lanes. In response to this finding, the report recommended a four-foot minimum width buffer between the HOV lane and general-purpose lanes for the corridors in the Dallas area.

(2) Thomas F. Golob, Wilfred W. Recker, Douglas W. Levine (December 1989). Safety of High-Occupancy Vehicle Lanes Without Physical Separation*. American Society of Civil Engineers, Journal of Transportation Engineering, Vol. 115, No. 6*, pp. 591-607.

This study examined before-and-after crash data for buffer/striped-separated HOV lanes in California. Over one year of crash data with HOV lane operations was compared to six years of crash data prior to the HOV lane opening. The findings from the study indicated that the HOV lane had no adverse effect on safety conditions of the corridors. The crash locations and frequencies were found to be subject to the time and location of traffic congestion along the freeways and not directly attributed to the presence of the HOV lanes.

(3) Kitae Jang, Ching-Yao Chan (2009). High-Occupancy-Vehicle Lane Configurations and Safety Performance of California Freeways: Investigation of Differential Distributions and Statistical Analysis. *University of California, Berkeley.*

This paper investigated the safety for limited-access HOV lanes and continuous-access HOV lanes in California. The study revealed that limited-access HOV lanes may have a "safety performance disadvantage" compared to continuous-access HOV lanes. Several statistical analyses were performed on the crash data: empirical cumulative density function (CDF), Kolmogorov-Smirnov Tests, and comparison of means based on Poisson Distributed Samples. In addition to the statistical tests, the historical crash data for the HOV lanes and the general-purpose lanes were compared and offered supporting evidence that limited-access HOV lanes may have a safety disadvantage compared to continuous-access HOV lanes. Under the limited-access HOV system, crashes tended to be concentrated near the access points.

(4) Sullivan, E C, Devadoss, N (1993). High-Occupancy-Vehicle Facility Safety in California. *TRB Transportation Research Record No. 1394.*

Freeway safety and crash frequencies were examined for facilities with and without HOV lanes on selected California freeways. The purpose of the paper was to determine if HOV lanes have a negative impact on the safety of freeways. The findings from the paper indicated that the crash rates on freeways with HOV facilities are sensitive to variations in traffic congestion - in the same manner that crash rates are influenced by congestion on general-purpose lane facilities. The resulting analysis revealed no systematic differences in the crash locations or other factors that could be attributed

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directly to the presence of HOV facilities. The report concludes that crashes on freeways, with or without HOV facilities, appear to be characterized and driven by the presence of peak period localized congestion.

(5) R.B. Case (1997). The Safety of Concurrent-lane HOV projects. *American Society of Civil Engineers, Traffic Congestion and Traffic Safety in the 21st Century: Challenges, Innovations, and Opportunities,* pp. 410-416.

This research examined the safety effects of various buffer widths between HOV lanes and adjacent general-purpose lanes. Before-and-after crash data were obtained and analyzed for various corridors. The study concluded that the crash rates were higher with the 0'-2' buffer width compared to the other widths. The results for the 3'-8' buffer widths were determined to be inconclusive and the 8' wide or greater buffers had lower crash rates.

(6) Cooner, Scott A; Ranft, Stephen E (2006). Safety Evaluation of Buffer-Separated High-Occupancy Vehicle Lanes in Texas. *TRB Transportation Research Record No. 1959,pp.168-177.*

Vehicular safety was examined for barrier and buffer-separated concurrent-flow HOV lanes on I-35 East and I-635 in Dallas. Injury crash data from each corridor were examined for crash rates and trends. Police reports were also reviewed. The analysis and study considered design elements, including buffer width, shoulder width, and lane width. The corridors in this study showed an increase in crash rates after implementation of the HOV lane. The increase in crashes was primarily focused on the HOV lane and the adjacent general-purpose lane. The research paper recommended a greater cross-sectional width for the HOV facilities (including shoulder and buffer) than currently existing on the two freeways in the Dallas area. For the buffer-separated systems in the Dallas area, the study recommends a 4-foot buffer between the managed lane and the general purpose lane, and a minimum 2-foot shoulder between the concurrent-flow dividing barrier and the managed lane (10-foot is desirable).

(7) Kitae Jang, Koohong Chung, David R. Ragland, Ching-Yao Chan (2009). Safety Performance of High-Occupancy-Vehicle Facilities: Evaluation of HOV Lane Configurations in California. *University of California, Berkeley, CALTRANS, Traffic Safety Center.*

Crash data for freeway corridors in California with continuous access HOV facilities and limited access HOV facilities were examined in this paper. The relationship between collision rates in the HOV lanes was investigated with respect to shoulder width, length of access, and the proximity of access to interchange ramps. The findings from the study indicate that HOV facilities with limited access offer no safety advantages over those facilities with continuous access. Higher crash rates were discovered to be concentrated on the ingress/egress locations of the limited access HOV lanes.

SAFETY FEEDBACK FROM TRANSPORTATION PROFESSIONALS

Issues and attitudes on HOV lane safety from the perspectives of transportation professionals from around the country was compiled and summarized in "Crash Analysis

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of Selected High-occupancy Vehicle Facilities in Texas: Methodology, Findings, and Recommendation", prepared by *Texas Transportation Institute* in 2004. Feedback from these professionals include pertinent anecdotal experiences on safety and the different types of separation systems employed.

There were twenty-three (23) respondents to the safety survey. Approximately half of the respondents were from states that operate buffer/striping-separated HOV lanes; the other half were assumed to be familiar with barrier-separated systems. The problems identified and described for barrier-separated and buffer-separated systems were grouped as follows: ingress/egress difficulty; illegal crossings of the buffer; speed differentials between the HOV lane and the adjacent general-purpose lanes; and narrow inside shoulders.

The ingress/egress concerns typically result from traffic congestion in the adjacent general-purpose lanes. This can occur under barrier-separated and buffer/striped separated systems. In some instances, it can be difficult for vehicles in the managed lane to find an acceptable gap in traffic to merge back into the general-purpose lanes. This merging issue can cause these vehicles to slow or stop in the transition area and affect the flow and speed of traffic in the managed lane. Some of the respondents indicated that this merging issue can be mitigated by lengthening the transition areas at the ingress/egress locations.

Illegal crossings of the buffer (i.e. double solid white lines or plastic pylons) can involve both occupancy violators and non-occupancy violators. These illegal crossings can occur under the buffer/striping-separation system. Violators have been known to illegally cross the buffer into the managed lane to bypass congestion on the general-purpose lanes and then return across the buffer after the adjacent congestion is relieved. These violators may be familiar with typical enforcement practices in the area and may perform illegal lane changes in areas that lack regular enforcement. The survey respondents indicated that an increase in law enforcement, steep fines, and license "points" can be effective mitigation measures to deter illegal crossings.

Speed differential issues involve free-flowing vehicular speeds in the managed lane and slower congested speeds in the adjacent general-purpose lanes. This issue can occur under the buffer/striping-separation system. As indicated in the ingress/egress discussion above, vehicles merging into or out of the managed lane would need adequate access lane length (i.e. transition area) in order to merge safely and find available gaps in congested traffic without holding up the flow and speed of the managed lanes. Another issue with speed differentials can be introduced with violators in the general-purpose lanes who illegally cross the buffer or double white striping to access the faster moving managed lane. This dangerous and illegal maneuver may result in side-swipe or rear-end crashes. The regular presence of law enforcement can minimize and deter violators.

The survey respondents indicated that narrow pavement shoulders on the left side of the HOV lanes can affect the flow and safety of the lane. This can occur under barrier-separated and buffer/striped separated systems. With narrow shoulders, disabled vehicles on the HOV lane may either partially or completely block the lane. Some disabled vehicles have been noted to park in the HOV lane during non-peak hours of traffic. Respondents indicated that adequate shoulder space should be provided to enable emergency vehicles to reach incident locations.

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Lack of enforcement and excessive speeding was an issue identified by some respondents for barrier-separated systems. The design of ingress/egress points in particular for concrete barrier systems were also noted as a safety issue for vehicles potentially crashing head-on into concrete barriers. Barrier separation could cause issues with limited sight distance at access points, particularly during non-daylight hours of the day.

EXISTING AND PLANNED HOT SYSTEMS IN THE U.S.

At the time of this paper, there are ten (10) areas in the US with operational HOT facilities. Excluding Georgia, there are seven (7) other areas with plans to implement HOT lanes. These areas are listed in Table 1, along with their respective corridors and type of HOT lane separation system they have in place (or will have in place).

Table 1. Existing and Planned HOT Systems in the US.

Freeway - Location	Separation Type	
Existing		
SR 91 – Orange County, CA	Plastic Pylons	
I-394 – Minneapolis, MN	Striping	
I-15 – San Diego, CA	Concrete Barrier	Reversible
US 290– Houston, TX	Concrete Barrier	Reversible
I-10– Houston, TX	Plastic Pylons	
I-25, I-36, C-470 – Denver, CO	Concrete Barrier	Reversible
I-15 Express – Salt Lake City, UT	Striping	
SR 167 – Seattle, WA	Striping	
I-95 – Miami, FL	Plastic Pylons	
I-680 and I-880 – Alameda, CA	Striping	
Planned		
I-95 – Maryland	Concrete Barrier	
I-495 – Virginia	Concrete Barrier	
I-595 – Ft. Lauderdale, FL	Concrete Barrier	Reversible
I-40 – Raleigh, NC	Not Decided	
I-30 and I-635 – Dallas, TX	Not Decided	
Hwy 217 – Portland, OR	Not Decided	
Hwy 1 – Santa Cruz, CA	Not Decided	

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As shown in Table 1, of the existing HOT systems, three (3) have concrete barrier separation primarily involving reversible peak flow operations, four (4) have buffer striping, and three (3) have plastic pylon separation. For the HOT systems that will be coming on-line in the near future, three (3) will be separated with a concrete barrier and the remaining areas are undecided.

SAFETY REVIEW

Managed lane safety and the three (3) most common types of lane separation systems typically used in the US were examined. The following discussion summarizes the findings of this research.

For barrier-separated systems, such as concrete barriers, the physically enclosed environment can induce excessive speeding for vehicles traveling in managed lanes. This can be a particular safety hazard if speeds in the managed lane are relatively uniform with exception of a few speeding vehicles. This issue can also be exacerbated in cases where incidents occur within the managed lane in the vicinity of horizontal or vertical curves and limited sight distance. The presence of law enforcement to moderate vehicular speeds in the managed lanes could be an effective mitigation strategy.

Various safety studies indicate that crashes in a managed lane system tend be concentrated near the ingress/egress points. This trend applies to all three types of lane separation systems. Providing adequate transition lengths, especially in areas with horizontal and vertical sight distance issues, should be considered to minimize these ingress/egress crash trends.

Crash severity at the ingress/egress points along a managed lane system with barrier-separation can also be a safety issue if the access points and transition areas are not properly designed and equipped with appropriate safety measures. During peak hour congestion or in the non-daylight hours of the day, vehicles weaving from the managed lane into the general-purpose lanes, or vice versa, may be subject to difficult maneuvering parameters and an unforgiving concrete barrier design may elevate the crash severity in the event of a barrier collision. For concrete barrier designs, a forgiving roadway feature that cushions the ingress points in a concrete barrier system should be considered (i.e. a fully re-directive, non-gating system), in conjunction with providing adequate transition areas for vehicles to enter and exit the managed lane.

Illegal lane weaving between managed lanes and general-purpose lanes can occur under buffer-separated (plastic pylons) systems and striped systems. Vehicles in Florida on I-95 were reported to weave in and out of the plastic pylons in order to avoid congestion and avoid paying the toll fees. An increase in law enforcement would be an effective mitigation strategy to deter violators.

The safety issue with speed differential crashes is a combined effect with illegal lane weaving between managed lanes and general-purpose lanes in striped systems. With no physical barrier separating the managed lanes and the general-purpose lanes, this is a safety concern that could result in severe vehicular crashes proportional to the magnitude of the speed differential. As suggested to minimize illegal lane weaving, an increase in law enforcement would also help reduce the potential for speed differential crashes between managed lanes and adjacent general-purpose lanes.

Emergency vehicles unable to access incidents in a timely fashion in either the general-purpose lanes or managed lanes is a serious safety issue under a concrete barrier system that doesn't provide for sufficient shoulder widths or provide an adequate number of access points along the barrier system that would enable EMS vehicles to conveniently reach an incident. Offering multiple entry/exit points in a barrier system in conjunction with adequate shoulder widths can help minimize this problem.

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For buffer-separated systems, roadway debris, such as blown-out tires and garbage, can accumulate on the buffer area. If such debris is not removed in a regular and timely fashion, it can build up near the edge of traveling lanes and impose a safety hazard for vehicles that may need to swerve in order to avoid hitting such debris. In these cases, debris removal crews should be regularly scheduled to remove such debris in order to lessen the chances of these crash-inducing occurrences.

In cases of inclement weather such as snowfall/icing and flooding, these conditions may be issue under the barrier-separated and buffer-separated systems. Providing adequate shoulder widths or storage bays to store snow (without damaging the barrier and buffer systems from slow plows) would resolve this concern. The installation of proper drainage systems would be necessary especially in areas prone to experience flooding conditions.

Table 2 summarizes the discussion above by categorizing and relating the various safety issues with the three types of separation systems used in managed lanes.

Table 2. Potential Safety Issues for Three Types of Lane Separation

Potential Safety Issues	Barrier-Separated (i.e. Concrete)	Buffer-Separated (i.e. plastic pylons)	Striping Painted
Excessive Speeding			
Crash frequency at ingress/egress locations			
Crash severity at ingress/egress locations			
Illegal lane weaving			
Speed differential crashes			
Incident management accessibility			
Debris collection on buffer area			
Inclement weather (snow, flooding)			

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It should be noted that the above table is a “one-dimensional” comparative chart meant to summarize the key points discussed in the paper. The individual “weight” or significance of each safety issue was not objectively assessed nor was a weighted-comparison analysis performed on the various safety issues. Furthermore, the mitigation measures identified to counter the safety issues were not evaluated for their relative ease and cost of implementation.

CONCLUSIONS

As presented in this white paper, various safety issues have been identified and associated with each of the three common types of separation systems found in managed lane systems within the US. The findings from this review of collective experiences and research papers support the conclusion that the safety of all three lane separation techniques examined are a direct function of a variety of key variables that in sum determine whether a managed lane system is generally “safe”. Such key parameters include, but are not limited to, the overall design of the managed lane system, the inclusion of “forgiving” safety features, the frequency and location of the ingress/egress points, adequate pavement shoulder widths and transition areas, and the presence of law enforcement. While there is no clear separation technique that boasts exceptional safety operations, all three separation techniques can be made safer if the appropriate measures and steps are taken to mitigate any unique or common safety issues associated with them.

Appendix B

(Cost estimation calculations and assumptions)

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COST ESTIMATE

Barrier Separation		
Typical Section 1 (TS1)		**Cost**
CONSTRUCTION		
Roadway		$626,002,538
Barrier		$27,171,144
Bridge Structures/Interchanges		$240,000,000
	Const. Total	**$893,173,682**
RIGHT-OF-WAY		$27,000,000
ENGINEERING		$89,317,368
UTILITY		TBD
	TOTAL	**$1,009,491,050**

Buffer Separation with Pylons		
Typical Section 2 (TS2)		**Cost**
CONSTRUCTION		
Roadway		$247,748,304
Pylon		$1,606,200
Bridge Structures/Interchanges		$63,000,000
	Const. Total	**$312,354,504**
RIGHT-OF-WAY		$5,197,500
ENGINEERING		$31,235,450
UTILITY		TBD
	TOTAL	**$348,787,454**

Thermo-plastic Striping Separation		
Typical Section 3 (TS3)		**Cost**
CONSTRUCTION		
Roadway (Milling and Overlay for HOT Lane)		$2,200,000
Striping		$2,039,509
Bridge Structure/Interchange		$0
	Const. Total	**$4,239,509**
RIGHT-OF-WAY		$0
ENGINEERING		$423,951
UTILITY		TBD
	TOTAL	**$4,663,460**

Construction Cost
(Roadway Summary)

Corridor/Location		Segment Length (mi)	TS1 Avg. Widening Width (ft)	TS2 Avg. Widening Width (ft)	TS1 Cost	TS2 Cost
I-85 North						
	Fulton	3.9	20	8		
	Dekalb	8.4	30	18		
	Gwinnett	11.3	18	6		
					$341,794,665	$165,690,547
I-75 North						
	Fulton	6.5	15	3		
	Cobb	1.4	18	6		
					$77,458,199	$18,566,452
Connector						
	Fulton	7.6	18	6		
					$87,267,513	$30,460,230
I-75 South						
	Fulton	2.6	23	11		
	Clayton	0.8	12	0		
					$42,785,232	$17,688,840
I-20 East						
	Fulton	1.1	14	2		
	Dekalb	7.1	15	3		
					$76,696,929	$15,342,235
	Totals	**50.7**			**$626,002,538**	**$247,748,304**

Adjacent impacts caused by TS1.

85 North						
County	Bridge Location	avl. out. shoulder		rem. out. shoulder		Bridge Required
Fulton		SB	NB	SB	NB	
	14th Street	10	22	2	11	
	17th Street	10	11	5	0	
	I-75	15	15	4	6	
	Peachtree Rd.	11	11	4	2	
	Piedmont Rd.	12	10	1	-1	
	Lenox/ Cheshire	14	8	1	-8	Y
Dekalb						
	N. Druid Hills	9	8	-5	-8	Y
	Clairmont Rd.	9	10	-4	-7	Y
	Shallowford Rd.	8	12	-8	-3	Y
	Cham. Tucker	9	8	-6	-5	Y
	I-285	6	6	-7	-8	Y
	Northcrest Rd.	9	5	-8	-12	Y
	Pleasantdale Rd.	14	11	-1	-6	Y
Gwinnett						
	Jimmy Carter	4	3	-10	-13	Y
	Center Way	6	13	-6	5	Y
	Indian Trail	13	13	5	4	
	Beaver Ruin	14	12	4	4	
	Steve Reynolds	12	12	1	4	
	Pleasant Hill	12	12	4	4	
	Old Norcross Rd.	12	12	4	4	
	Boggs Rd.	12	12	4	4	
	Duluth Hwy	12	12	4	4	
	Sugarloaf	12	12	4	4	

Adjacent impacts caused by TS1.

75 North

County	Bridge Location	avl. out. shoulder		rem. out. shoulder		Bridge Required
Fulton		SB	NB	SB	NB	
	14th Street	10	22	2	11	
	17th Street	15	16	23	22	
	Deering Rd.	14	12	4	2	
	Northside Dr.	7	10	-5	0	Y
	Howell Mill Rd.	14	16	5	6	
	Collier Rd.	19	17	10	8	
	Peachtree Battle	11	16	3	7	
	W. Wesley Rd.	13	23	5	15	
	Moores Mill Rd.	21	23	13	14	
	W. Paces Ferry	19	8	9	0	
	Northside Pkwy	16	17	6	10	
	Mt. Paran Rd.	18	16	10	8	
Cobb						
	Chatt. River	25	13	16	4	
	Cumberland Blvd.	16	13	8	4	

75 South

County	Bridge Location	avl. out. shoulder		rem. out. shoulder		Bridge Required
Fulton		SB	NB	SB	NB	
	I-85	14	10	5	0	
	Cleveland Ave	13	12	4	-1	
	Mt. Zion Rd.	14	13	2	2	
	N. Central/Crown	15	13	3	1	
	Henry Ford	14	14	0	3	
Clayton						
	Aviation Blvd.	10	16	5	9	

Adjacent impacts caused by TS1.

Connector

County	Bridge Location	avl. out. shoulder		rem. out. shoulder		Bridge Required
Fulton		SB	NB	SB	NB	
	14th Street	10	22	2	11	
	10th Street	11	13	2	1	
	5th Street	14	14	5	4	
	N. Ave	7	0	-5	-13	Y
	W. Peachtree	8	9	-3	0	
	Peachtree St.	15	15	6	2	
	Ralph McGill	14	9	2	-3	
	Baker St.	14	9	4	-3	
	International Blvd.	11	19	1	8	
	Ellis St.	11	13	3	2	
	Dobbs Ave	13	14	23	24	
	Auburn Ave.	36	14	28	6	
	Edgewood Ave.	25	11	17	3	
	Bell St.	26	13	19	4	
	Decatur St.	12	15	3	5	
	MLK	16	27	5	18	
	Memorial Dr.	15	9	7	-1	
	I-20	10	22	-3	14	
	Fulton St.	20	21	7	7	
	R.D. Abernathy	12	13	1	3	
	Pryor St.	11	9	3	-3	
	RR Bridge	8	14	-2	4	
	University Ave	14	14	5	5	
	Fair Dr.	13	10	5	2	
	Langford Pkwy.	12	9	3	0	
	I-85	12	11	3	1	

20 East

County	Bridge Location	avl. out. shoulder		rem. out. shoulder		Bridge Required
Fulton		WB	EB	SB	NB	
	Blvd.	11	11	4	4	
	Glenwood	12	10	5	3	
Dekalb						
	Moreland Ave.	9	11	2	3	
	Maynard Terrace	11	10	3	4	
	Clifton St.	7	10	-1	3	
	Glenwood Ave.	9	12	1	5	
	Flat Shoals	10	10	3	1	
	Fayetteville Rd.	11	11	6	3	
	Gresham Rd.	10	8	3	1	
	Flat Shoals	12	11	5	3	
	Lloyd Rd.	11	10	3	2	
	Candler Rd.	13	10	4	3	
	Columbia Dr.	13	10	6	1	
	I-285	8	19	-3	10	

Adjacent impacts caused by TS2.

85 North						
County	Bridge Location	avl. out. shoulder		rem. out. shoulder		Bridge Required
Fulton		SB	NB	SB	NB	
	14th Street	10	22	8	17	
	17th Street	10	11	11	6	
	I-75	15	15	10	12	
	Peachtree Rd.	11	11	10	8	
	Piedmont Rd.	12	10	7	5	
	Lenox/ Cheshire	14	8	7	-2	
Dekalb						
	N. Druid Hills	9	8	1	-2	
	Clairmont Rd.	9	10	2	-1	
	Shallowford Rd.	8	12	-2	3	
	Cham. Tucker	9	8	0	1	
	I-285	6	6	-1	-2	
	Northcrest Rd.	9	5	-2	-6	Y
	Pleasantdale Rd.	14	11	5	0	
Gwinnett						
	Jimmy Carter	4	3	-4	-7	Y
	Center Way	6	13	0	11	
	Indian Trail	13	13	11	10	
	Beaver Ruin	14	12	10	10	
	Steve Reynolds	12	12	7	10	
	Pleasant Hill	12	12	10	10	
	Old Norcross Rd.	12	12	10	10	
	Boggs Rd.	12	12	10	10	
	Duluth Hwy	12	12	10	10	
	Sugarloaf	12	12	10	10	

Adjacent impacts caused by TS2.

75 North

County	Bridge Location	avl. out. shoulder		rem. out. shoulder		Bridge Required
Fulton		SB	NB	SB	NB	
	14th Street	10	22	8	17	
	17th Street	15	16	29	28	
	Deering Rd.	14	12	10	8	
	Northside Dr.	7	10	1	6	
	Howell Mill Rd.	14	16	11	12	
	Collier Rd.	19	17	16	14	
	Peachtree Battle	11	16	9	13	
	W. Wesley Rd.	13	23	11	21	
	Moores Mill Rd.	21	23	19	20	
	W. Paces Ferry	19	8	15	6	
	Northside Pkwy	16	17	12	16	
	Mt. Paran Rd.	18	16	16	14	
Cobb						
	Chatt. River	25	13	22	10	
	Cumberland Blvd.	16	13	14	10	

75 South

County	Bridge Location	avl. out. shoulder		rem. out. shoulder		Bridge Required
Fulton		SB	NB	SB	NB	
	I-85	14	10	11	6	
	Cleveland Ave	13	12	10	5	
	Mt. Zion Rd.	14	13	8	8	
	N. Central/Crown	15	13	9	7	
	Henry Ford	14	14	6	9	
Clayton						
	Aviation Blvd.	10	16	11	15	

Adjacent impacts caused by TS2.

Connector

County	Bridge Location	avl. out. shoulder		rem. out. shoulder		Bridge Required
Fulton		SB	NB	SB	NB	
	14th Street	10	22	9	18	
	10th Street	11	13	8	7	
	5th Street	14	14	11	10	
	N. Ave	7	0	1	-7	Y
	W. Peachtree	8	9	3	6	
	Peachtree St.	15	15	12	8	
	Ralph McGill	14	9	8	3	
	Baker St.	14	9	10	3	
	International Blvd.	11	19	7	14	
	Ellis St.	11	13	9	8	
	Dobbs Ave	13	14	29	30	
	Auburn Ave.	36	14	34	12	
	Edgewood Ave.	25	11	23	9	
	Bell St.	26	13	25	10	
	Decatur St.	12	15	9	11	
	MLK	16	27	11	24	
	Memorial Dr.	15	9	13	5	
	I-20	10	22	3	20	
	Fulton St.	20	21	13	13	
	R.D. Abernathy	12	13	7	9	
	Pryor St.	11	9	9	3	
	RR Bridge	8	14	4	10	
	University Ave	14	14	11	11	
	Fair Dr.	13	10	11	8	
	Langford Pkwy.	12	9	9	6	
	I-85	12	11	9	7	

20 East

County	Bridge Location	avl. out. shoulder		rem. out. shoulder		Bridge Required
Fulton		WB	EB	SB	NB	
	Blvd.	11	11	10.5	10.5	
	Glenwood	12	10	11	9	
Dekalb						
	Moreland Ave.	9	11	8	9	
	Maynard Terrace	11	10	9	10	
	Clifton St.	7	10	5	9	
	Glenwood Ave.	9	12	7	11	
	Flat Shoals	10	10	9	7	
	Fayetteville Rd.	11	11	12	9	
	Gresham Rd.	10	8	9	7	
	Flat Shoals	12	11	11	9	
	Lloyd Rd.	11	10	9	8	
	Candler Rd.	13	10	10	9	
	Columbia Dr.	13	10	12	7	
	I-285	8	19	3	16	

85 North

Existing HOV Facility Width					Proposed Section Widths and REQD R/W for Each					
County	Bridge Location	Measured Width		Total	TS1	REQD R/W	TS2	REQD R/W	TS3	REQD R/W
		SB	NB							
Fulton										
	14th Street	25	22	47	66	19	54	7	33	NA
	17th Street	28	22	50	66	16	54	4	34	NA
	I-75	22	24	46	66	20	54	8	34	NA
	Peachtree Rd.	26	24	50	66	16	54	4	34	NA
	Piedmont Rd.	22	22	44	66	22	54	10	34	NA
	Lenox/ Cheshire	20	17	37	66	29	54	17	34	NA
Dekalb										
	N. Druid Hills	19	17	36	66	30	54	18	34	NA
	Clairmont Rd.	20	16	36	66	30	54	18	34	NA
	Shallowford Rd.	17	18	35	66	31	54	19	34	NA
	Cham. Tucker	18	20	38	66	28	54	16	34	NA
	I-285	20	19	39	66	27	54	15	34	NA
	Northcrest Rd.	17	16	33	66	33	54	21	34	1
	Pleasantdale Rd.	18	16	34	66	32	54	20	34	0
Gwinnett										
	Jimmy Carter	19	17	36	66	30	54	18	34	NA
	Center Way	21	25	46	66	20	54	8	34	NA
	Indian Trail	25	24	49	66	17	54	5	34	NA
	Beaver Ruin	23	25	48	66	18	54	6	34	NA
	Steve Reynolds	22	25	47	66	19	54	7	34	NA
	Pleasant Hill	25	25	50	66	16	54	4	34	NA
	Old Norcross Rd.	25	25	50	66	16	54	4	34	NA
	Boggs Rd.	25	25	50	66	16	54	4	34	NA
	Duluth Hwy	25	25	50	66	16	54	4	34	NA
	Sugarloaf	25	25	50	66	16	54	4	34	NA

Totals									
Distance (ft)	TS1			TS2			TS3		
	Ave. W	SF	AC	Ave. W	SF	AC	Ave. W	SF	AC
1,798	20	414,251	9.5	8	169,775	3.9	0	0	0.0
1,740									
1,268									
9,337									
6,230									
5,914	Ave. W	SF	AC	Ave. W	SF	AC	Ave. W	SF	AC
7,521	30	1,341,176	30.8	18	807,248	18.5	0	6,356	0.1
11,857									
7,136									
6,372									
3,204									
2,490									
11,922	Ave. W	SF	AC	Ave. W	SF	AC	Ave. W	SF	AC
3,913	18	1,098,719	25.2	6	382,163	8.8	0	0	0.0
7,398									
5,876									
7,942									
2,710									
5,574									
6,028									
4,079									
4,271									
Totals	23	2,854,146	65.5	11	1,359,186	31.2	0	6,356	0.1

75 North

Existing HOV Facility Width					Proposed Section Widths and REQD R/W for Each					
County	Bridge Location	Measured Width		Total	TS1	REQD R/W	TS2	REQD R/W	TS3	REQD R/W
		SB	NB							
Fulton										
	14th Street	25	22	47	66	19	54	7	34	NA
	17th Street	41	39	80	66	NA	54	NA	34	NA
	Deering Rd.	23	23	46	66	20	54	8	34	NA
	Northside Dr.	21	23	44	66	22	54	10	34	NA
	Howell Mill Rd.	24	23	47	66	19	54	7	34	NA
	Collier Rd.	24	24	48	66	18	54	6	34	NA
	Peachtree Battle	25	24	49	66	17	54	5	34	NA
	W. Wesley Rd.	25	25	50	66	16	54	4	34	NA
	Moores Mill Rd.	25	24	49	66	17	54	5	34	NA
	W. Paces Ferry	23	25	48	66	18	54	6	34	NA
	Northside Pkwy	23	26	49	66	17	54	5	34	NA
	Mt. Paran Rd.	25	25	50	66	16	54	4	34	NA
Cobb										
	Chatt. River	24	24	48	66	18	54	6	34	NA
	Cumberland Blvd.	25	24	49	66	17	54	5	34	NA

Totals									
Distance (ft)	TS1			TS2			TS3		
	Ave. W	SF	AC	Ave. W	SF	AC	Ave. W	SF	AC
1,837	17	572,059	13.1	6	192,603	4.4	0	0	0.0
2,457									
4,518									
1,877									
2,517									
5,987									
1,056									
1,128									
6,474									
5,751									
894									
4,625	Ave. W	SF	AC	Ave. W	SF	AC	Ave. W	SF	AC
2,621	18	126,805	2.9	6	39,853	0.9	0	0	0.0
Totals	17	698,864	16.0	6	232,456	5.3	0	0	0.0

Connector

Existing HOV Facility Width					Proposed Section Widths and REQD R/W for Each					
County	Bridge Location	Measured Width SB	Measured Width NB	Total	TS1	REQD R/W	TS2	REQD R/W	TS3	REQD R/W
Fulton										
	14th Street	25	22	47	66	19	53	6	33	NA
	10th Street	24	21	45	66	21	54	9	34	NA
	5th Street	24	23	47	66	19	54	7	34	NA
	N. Ave	21	20	41	66	25	54	13	34	NA
	W. Peachtree	22	24	46	66	20	54	8	34	NA
	Peachtree St.	24	20	44	66	22	54	8	34	NA
	Ralph McGill	21	21	42	66	24	54	10	34	NA
	Baker St.	23	21	44	66	22	54	10	34	NA
	International Blvd.	23	22	45	66	21	54	9	34	NA
	Ellis St.	25	22	47	66	19	54	7	34	NA
	Dobbs Ave	43	43	86	66	NA	54	-32	34	NA
	Auburn Ave.	25	25	50	66	16	54	4	34	NA
	Edgewood Ave.	25	25	50	66	16	54	4	34	NA
	Bell St.	26	24	50	66	16	54	4	34	NA
	Decatur St.	24	23	47	66	19	54	7	34	NA
	MLK	22	24	46	66	20	54	8	34	NA
	Memorial Dr.	25	23	48	66	18	54	6	34	NA
	I-20	20	25	45	66	21	54	9	34	NA
	Fulton St.	20	19	39	66	27	54	15	34	NA
	R.D. Abernathy	22	23	45	66	21	54	9	34	NA
	Pryor St.	25	21	46	66	20	54	8	34	NA
	RR Bridge	23	23	46	66	20	54	8	34	NA
	University Ave	24	24	48	66	18	54	6	34	NA
	Fair Dr.	25	25	50	66	16	54	4	34	NA
	Langford Pkwy.	24	24	48	66	18	54	6	34	NA
	I-286	24	23	47	66	19	54	7	34	NA

Totals									
Distance (ft)	TS1			TS2			TS3		
	Ave. W	SF	AC	Ave. W	SF	AC	Ave. W	SF	AC
1,864	19	768,152	17.6	6	247,292	5.7	0	0	0.0
1,678									
2,079									
2,062									
728									
551									
990									
1,090									
386									
549									
1,012									
443									
823									
1,227									
1,024									
933									
979									
1,281									
1,860									
2,542									
1,420									
1,532									
7,508									
2,242									
3,382									
Totals	19	768,152	17.6	6	247,292	5.7	0.0	0	0.0

75 South

Existing HOV Facility Width					Proposed Section Widths and REQD R/W for Each					
County	Bridge Location	Measured Width SB	Measured Width NB	Total	TS1	REQD R/W	TS2	REQD R/W	TS3	REQD R/W
Fulton										
	I-85	24	23	47	66	19	54	7	34	NA
	Cleveland Ave	24	20	44	66	22	54	10	34	NA
	Mt. Zion Rd.	21	22	43	66	23	54	11	34	NA
	N. Central/Crown	21	21	42	66	24	54	12	34	NA
	Henry Ford	19	22	41	66	25	54	13	34	NA
Clayton										
	Aviation Blvd.	28	26	54	66	12	54	0	34	NA

Totals									
Distance (ft)	TS1			TS2			TS3		
	Ave. W	SF	AC	Ave. W	SF	AC	Ave. W	SF	AC
2,697	23	301,484	6.9	11	141,404	3.2	0	0	0.0
3,009									
7,439									
195									
4,428	Ave. W	SF	Acres	Ave. W	SF	Acres	Ave. W	SF	Acres
	12	53,136	1.2	0	0	0.0	NA	0	0.0
Totals	17	354,620	8.1	5	141,404	3.2	#VALUE!	0	0.0

20 East

Existing HOV Facility Width					Proposed Section Widths and REQD R/W for Each					
County	Bridge Location	Measured Width WB	Measured Width EB	Total	TS1	REQD R/W	TS2	REQD R/W	TS3	REQD R/W
Fulton										
	Blvd.	26	26	52	66	14	53	1	33	NA
	Glenwood	26	26	52	66	14	54	2	34	NA
Dekalb										
	Moreland Ave.	26	25	51	66	15	54	3	34	NA
	Maynard Terrace	25	27	52	66	14	54	2	34	NA
	Clifton St.	25	26	51	66	15	54	3	34	NA
	Glenwood Ave.	25	26	51	66	15	54	3	34	NA
	Flat Shoals	26	24	50	66	16	54	4	34	NA
	Fayetteville Rd.	28	25	53	66	13	54	1	34	NA
	Gresham Rd.	26	26	52	66	14	54	2	34	NA
	Flat Shoals	26	25	51	66	15	54	3	34	NA
	Lloyd Rd.	25	25	50	66	16	54	4	34	NA
	Candler Rd.	24	26	50	66	16	54	4	34	NA
	Columbia Dr.	26	24	50	66	16	54	4	34	NA
	I-285	22	24	46	66	20	54	8	34	NA

Totals									
Distance (ft)	TS1			TS2			TS3		
	Ave. W	SF	AC	Ave. W	SF	AC	Ave. W	SF	AC
3,001	14	81,382	1.9	2	8,720	0.2	0	0	0.0
2,812									
	Ave. W	SF	AC	Ave. W	SF	AC	Ave. W	SF	AC
4,567	15	579,389	13.3	3	128,405	2.9	0	0	0.0
811									
1,729									
5,347									
606									
5,573									
1,527									
6,243									
4,136									
6,156									
887									
Totals	15	660,771	15.2	2	137,125	3.1	0	0	0.0

MEETING MINUTES

SUBJECT: I-85 HOV to HOT Lane Conversion
P.I. No. 0009295, 0009296, 0009297
Dekalb and Gwinnett Counties
Initial Team Concept Meeting

MEETING DATE: March 23, 2009

TODAY'S DATE: March 24, 2009

PREPARED BY: Derrick Vincent, PE - Jacobs Engineering Group, Inc.

ATTENDEES:

Name	Agency	Phone	Email
Ted Crabtree	GDOT – Engineering Services	404-631-1767	tcrabtree@dot.ga.gov
Chad Marlow	Georgia Power Co.		X2MARLOW@SOUTHERNCO.COM
Kenneth Austin	Georgia Power Company		KLAustin@southernco.com
Richard Randall	AT & T	770-493-3718	rr9649@att.com
Steven Sheffield	SRTA		
Ben Rabun	GDOT – Assistant to Chief Engineer	404-631-1008	brabun@dot.ga.gov
Michelle Caldwell	GDOT		mcaldwell@dot.ga.gov
Patrick Vu	SRTA	404-893-6130	patrickvu@georgiatolls.com
Ulysses Mitchell	GDOT - Planning	404-631-1746	umitchell@dot.ga.gov
Deborah Collins	Comcast		
Pedro Marin	State Representative HD96		
Gail A D'Avino	GDOT – OEL		gdavino@dot.ga.gov
Laura Rish	GDOT – OEL		lrish@dot.ga.gov
Russell McMurry	GDOT – District 1 Engineer	770-532-5526	rmcmurry@dot.ga.gov
Teri Pope	GDOT – Communications Dist 1	7770-718-3924	tpope@dot.ga.gov
James Harry	GDOT – Construction Dist 1		jharry@dot.ga.gov
Jeff Woodward	GDOT – Construction		jwoodward@dot.ga.gov
Latoya Johnson	FHWA – Urban Transportation Dist 1		Latoya.johnson@dot.gov
Mindy Roberson	FHWA – Urban Transportation Dist 7		Mindy.roberson@dot.gov
Mike Lobdell	GDOT – Preconstruction Dist 7		mlobdell@dot.ga.gov
Vince Edwards	Gwinnett DOT		
Wesley Brock	GDOT – Right of Way Dist 1	770-718-5043	wbrock@dot.ga.gov
Angie Malta	Jacobs	404-478-3900	Angie.malta@jacobs.com
Oliver Brooks	Comcast - Dekalb		
Richard Fangmann	Jacobs	404-478-3900	Richard.fangmann@jacobs.com
Michael Watkins	Southern Company		mtwatkins@southernco.com
Lewis Brooker	GDOT		lbrooker@dot.ga.gov
Sharon Witherspoon	GDOT – Utilities District 1	770-532-5031	switherspoon@dot.ga.gov
Lokesh Hebbani	FHWA – GA Division		Lokesh.hebbani@dot.gov

Name	Agency	Phone	Email
Sabrina David	FHWA – GA Division		Sabrina.david@dot.gov
Monica Luck	GDOT – Communications		mluck@dot.ga.gov
John Gurbal	Dekalb County, Transportation		
Jennifer Giersch	FHWA		Jennifer.giersch@dot.gov
Steve Gafford	GDOT – Utilities	404-631-1359	sgafford@dot.ga.gov
Matt Needham	GDOT		mneedham@dot.ga.gov
Brian Allen	Gwinnett County, Transportation		

LOCATION: GDOT Area Office, Lawrenceville, Georgia

I. Welcome (GDOT – Ben Rabun, Executive Assistant to Chief Engineer)

The meeting was opened by Ben Rabun at 1:02 pm. He made the following statements:

- GDOT signed an agreement with SRTA approximately one year ago.
- $110 Million was received in November 2008 from FHWA/FTA after other agencies were unable to meet their obligations.
- Phase I of the overall proposed plan to convert the HOV system is the conversion of HOV lanes to HOT lanes along I-85 from I-285 to Old Peachtree Road, including the 316 ramps.
- The number of entry/exit locations will be determined based upon an operational standpoint.
- Traffic & Revenue studies are in progress.
- HOT lanes are defined as high occupancy toll lanes. HOT lanes are managed lanes where high occupancy passenger vehicles ride for NO Fee, Buses and vanpool ride for NO Fee, and other users can ride by paying a toll. GDOT's study assumes that vehicles with 3+ passengers will ride free. Vehicles with less than three passengers will likely pay a toll.
- Opening date: January 2011
- Construction begins: Late December 2009 or January 2010

II. Introduction of Each Attendee

The group introduced themselves and their role in the project. The consultant roles were also explained. Jacobs is the GEC for GDOT. The State Road and Toll Authority (SRTA) will be the operator of the system after construction. SRTA has three firms working as consultants. SRF handles the public involvement and public relations. MSX will handle the electronics or system setup.

III. Meeting Purpose (Jacobs- Jeff VanDyke).

Jeff VanDyke stated that the purpose of this meeting was to discuss project issues, at an early stage to produce a better understanding of the project scope and objectives, as well as a higher quality, to produce a more detailed final concept.

IV. Project Overview (Jacobs – Jeff VanDyke / SRTA – Patrick Vu)

Jeff VanDyke stated that the length of the project is approximately 14.5 miles along I-85 north of Atlanta. The project begins at I-285 Chamblee Tucker and ends at Old Peachtree Road.

Patrick Vu stated that the purpose of the project is to better manage current infrastructure by using HOT lanes. Dynamic pricing will be used to provide reliable trip times in the HOT lanes. Eight other states have HOT lanes. The purpose of those lanes is to keep traffic flowing by

adding dynamic pricing. Some issues that are faced with HOT lanes are occupancy enforcement and system evasion. For this project, tolling access will be controlled by gantries and technology. Georgia's HOT lanes face a unique situation. There is no room for widening and there will only be striping separation from general use lanes. To ensure the success of this project, the solutions will be centered on education, enforcement, and engineering.

V. Project Details

a. Need and Purpose Statement (Jacobs – Jeff VanDyke / Richard Fangmann)

The purpose of this project is to provide the most effective use of the managed lanes along congested portions of I-85 north of Atlanta in order to provide reliable travel times in this corridor.

Patrick Vu stated that this project will likely not make money. Federal funding for this project also includes: 36 new buses and 3 park & rides. These projects will be discussed in the HOT lane NEPA document; although, they are not dependent upon each other.

b. Functional Classification (Jacobs – Jeff VanDyke)

I-85 is classified as an urban interstate.

Toll rates will not be established until the traffic and revenue studies are complete.

c. Traffic Study (Jacobs – David Kasbo)

A traffic simulation model has been created that uses opening year 2011 and design year 2031 traffic numbers. We will estimate traffic numbers for the existing HOV lane.

Most accidents/incidents occur at weave locations. Three to four weave locations are being studied on this project.

d. Design Features (Jacobs – Jeff VanDyke)

The existing and proposed design speed is 65 mph. The existing and proposed maximum grade is 4%. The minimum radius is 1480'. ROW varies throughout the corridor.

e. Alternates Considered (Jacobs – Jeff VanDyke)

Alternates considered were: barrier separated, pylon separated, and no build. The barrier separated and pylon separated will be discussed in a white paper. The pylon separated alternate causes many maintenance issues.

f. Preferred Concept Alternate (Jacobs – Jeff VanDyke)

The preferred concept alternate is restriping of HOV lanes.

g. Right of Way Displacements and Relocations (Jacobs – Jeff VanDyke)

There are no ROW issues.

h. Major Structures (Jacobs – Jeff VanDyke)

There will be no changes to existing structures.

i. Staging/Maintenance of Traffic (Jacobs – Jeff VanDyke)

Only the existing HOV lane will be resurfaced. Issues with staging are: construction of footings and timing of construction. It is assumed that construction will occur on nights and weekends. Some special details and specifications will likely be developed for construction.

j. Design Variances and Exceptions (Jacobs – Jeff VanDyke)

Any current design variances or exceptions will be reapplied for.

k. Environmental Concerns/Level of Environmental Analysis (Jacobs –Angie Malta)

Angie Malta gave a brief overview. An environmental assessment will occur. An approved concept report and traffic report is needed for completion.

l. Public Involvement (Jacobs – Richard Fangmann / Angie Malta)

Public meetings are planned for:
March 26th – Gwinnett Center in Salons 4 & 5
March 31st – Gwinnett Fire Academy
March 31st – Senior Connections Community Center
April 2nd – Ashiana's Banquet Hall inside the Global Mall
April 4th – Discover Mills Mall

Two out of the first five meetings are in minority neighborhoods to increase minority participation and address environmental justice concerns.

A second round of public meetings will be held in May or June.

m. Utilities (Jacobs – Jeff VanDyke)

The project will remain on existing ROW; therefore utility conflicts will be minimized. Money is available for SUE work. Access to power the electronic equipment will need to be addressed.

n. Coordination (Jacobs – Bob McDowell)

The project has many concurrent activities, all on a fast-track schedule, therefore coordination is critical. We appreciate the efforts and cooperation of DOT personnel in supporting the HOV to HOT Team. Please call on us to answer your questions and concerns.

o. Other Projects in Area (Jacobs – Jeff VanDyke)

Other projects in the area will be reviewed and inventoried.

p. Project Schedule (GDOT – Ben Rabun / Jacobs – Jeff VanDyke)

Ben Rabun made the following statements:

- January 2011 is opening day.
- The system must be tested before opening day.
- There will be construction issues.
- The procurement method for the infrastructure construction has not been determined. Traditional bid-build and design build are being considered.
- There is a possibility of two contracts for construction
- One for the roadway work.
- One for the toll equipment installation and integration.
- The drop dead date for procurement is Dec 2009/ Jan 2010.

VI. Comments from Attendees

a. Local Government Representatives

The following questions/comments were asked/made by Pedro Marin (State Representative HD96)

- How many states have HOT lanes?
- More information is needed about HOT3.
- What's the existing speed limit? Will buses have to adhere to the speed limit?
- Do not include the toll amount on displays at the public meetings.
- How do we prevent trucks from driving in the HOT lane?
- Are we affecting minority communities? What avenues of communication are being used?

Patrick Vu told Mr. Marin that Gerald Ross (GDOT) and Teresa Slack (SRTA) can brief elected officials if necessary.

b. Engineering Services

The following questions were asked by members of Engineering Services.

Q: Is Jacobs/GDOT/SRTA looking at the overall corridor and the effects of additional phases?
A: Yes. The corridor was chosen based on congestion and acceptable levels of service. Ben Rabun added that MSX will make sure the scalability of the tolling system can be expanded.

Q: How do you plan to handle the issue of footings within the median?
A: Ben Rabun – We hope to utilize as many existing structures/ foundations as possible. Jeff VanDyke – Cantilever signs might be better; however, they require bigger footings. Mast arms don't need bigger footings.

Q: Is wireless an option for electronics of toll structure?
Q: Do electronics have to be hardwired fiber or microwave?
Q: Will cameras be tied into Navigator System?
S: Consideration should be given to variable speed limits for this corridor. The issue is with citations.
A: Most of the existing electronic system is fiber. New technology is available. There is $12.5 million available for ITS funds which can be used for innovative technology. (Sabrina David) Connectability to other systems will be addressed in the design if possible; however, most cameras focus on tags only. If the cameras are able to be tied into the Navigator, it will be a separate system. Enforcement of variable speed limits is very difficult.

Statement: There is a lead time of five to six months on gantries and structural steel.

Q: What's the ITS portion and what's the civil portion of this contract?

A: SRTA would write the specifications for tolling equipment. The contractor can choose equipment based upon the specs. The exact division between tolling and infrastructure is yet to be determined. Meetings are planned to better define duties.

Q: Why change the current system of procurement? The contractor pulling the wire could have issues with the previous contractor.
A: The decision hasn't been made at this time.

Q: Who is responsible for maintenance?
A: SRTA will be looking at maintenance as part of the operator responsibilities.

c. Office of Financial Management
d. Traffic Safety and Design

Q: Have hero assists on the left shoulder been determined during T&R study? There are concerns about the narrow shoulder.
A: Yes, we are looking into it. Approximately 4% of 2007 incidents affected HOV traffic.

S: The FHWA would like to see traffic numbers for just this project. We need to make sure the public is appropriately informed. (FHWA)

e. Environmental/Location

Statement: Information about the system should be explained more clearly. The concept of HOV 3 should be emphasized. (Sabrina David)

Statement: The message needs to be consistent in order to garner more participation at public meetings. (Gail Davino)
Response: Media briefings have been done. (Patrick) We will make that a priority. (Teri Pope)

Statement: People most affected by this project are two people carpoolers.

Q: Where are we in terms of an environmental document?
A: We're in the initial stages: awaiting concept report and traffic study. We hope to submit a FONSI in December. The plan is to have a draft to OEL by the end of July.

f. Planning

Statement: Signs informing the public about public meeting need to be larger.

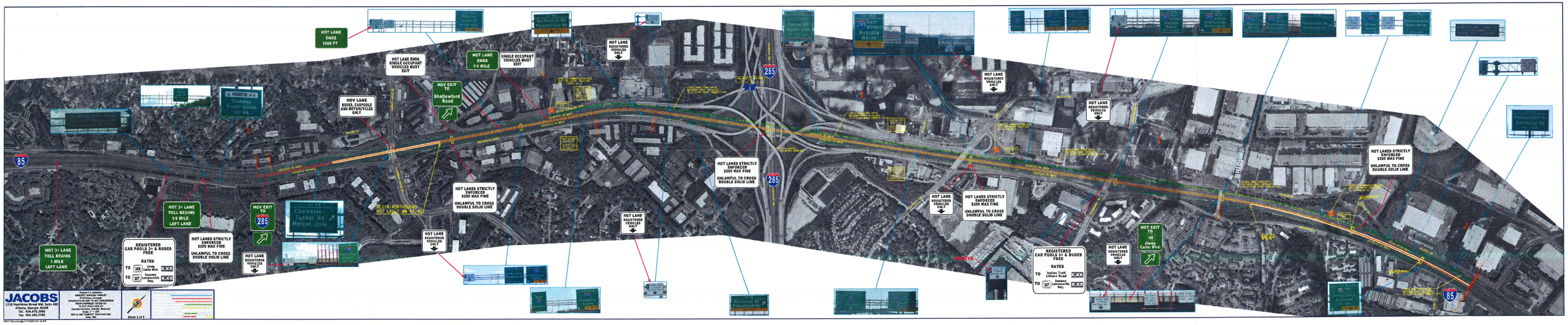
g. District
h. Right of Way
i. Utilities

Statement: There are several power companies with lines within the corridor. We should get the best power prices for the best services. – Steve Gafford

VII. Other Comments or Concerns – Open Discussion

Mindy Roberson: FHWA will require a project management guidance plan. We need to determine a schedule allowing for the amount of flexibility needed for review times.
Sabrina David: FHWA will be diligent with the schedule. Concerns or questions should be forwarded to Ben and/or Patrick.

These meeting minutes reflect the notes and memory of Derrick Vincent, David Kasbo, and Jeff VanDyke. If any additions, deletions, or corrections are necessary, please contact Derrick Vincent at 404-478-3954 or derrick.vincent@jacobs.com If no responses are received within five days, these meeting minutes will be considered final.


HOT LANE ENDS 1000 FT
HOT LANE ENDS SINGLE OCCUPANT VEHICLES MUST EXIT
HOT LANE ENDS 1/4 MILE
SINGLE OCCUPANT VEHICLES MUST EXIT
HOV EXIT TO Shallowford Road
HOV LANE BUSES, CARPOOLS AND MOTORCYCLES ONLY
Chamblee Transit Station
HOT LANE REGISTERED VEHICLES ONLY
HOT LANE REGISTERED VEHICLES ONLY
HOT LANE REGISTERED VEHICLES ONLY
HOT LANE REGISTERED VEHICLES ONLY
HOT LANE REGISTERED VEHICLES ONLY
HOT LANE REGISTERED VEHICLES ONLY
HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
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UNLAWFUL TO CROSS DOUBLE SOLID LINE
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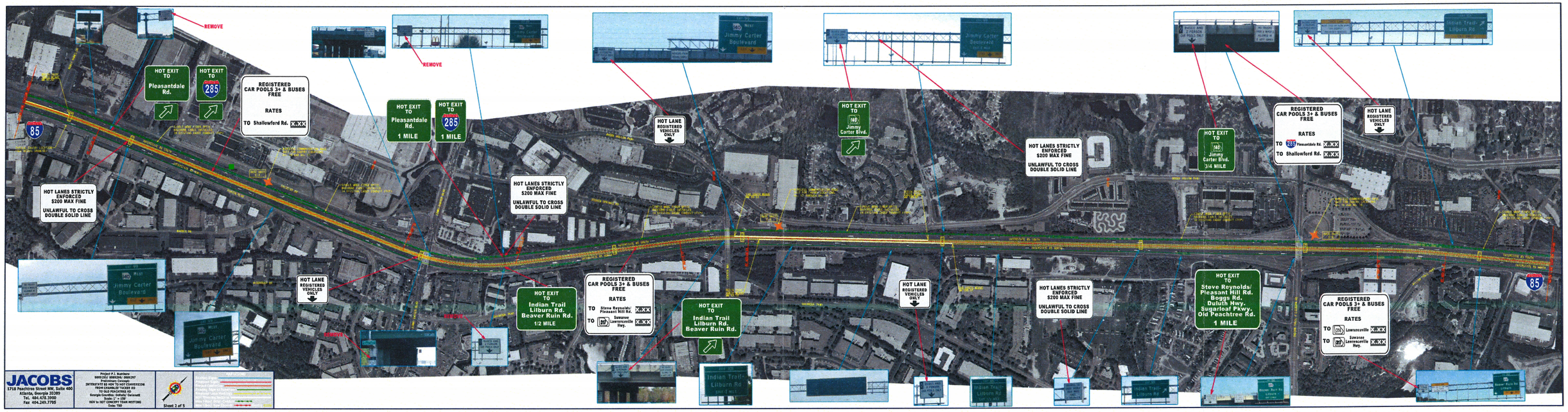
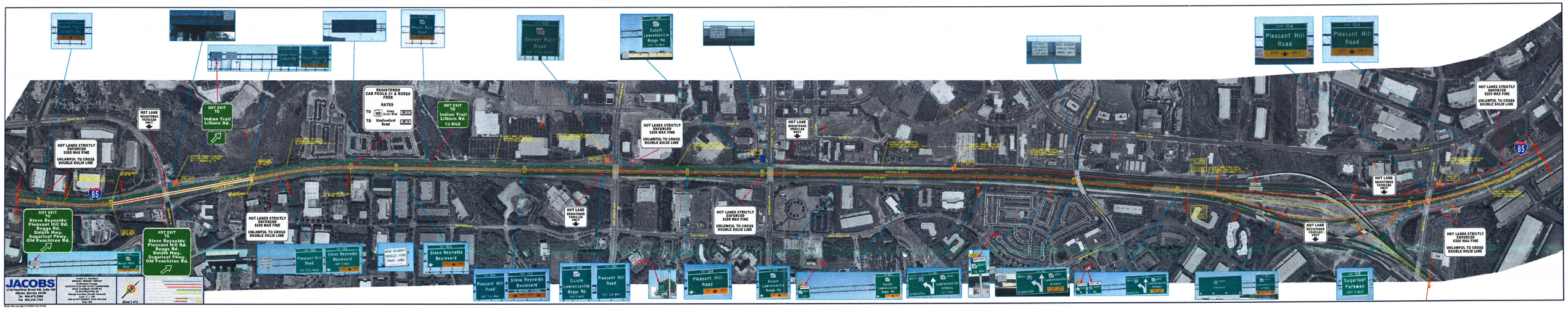
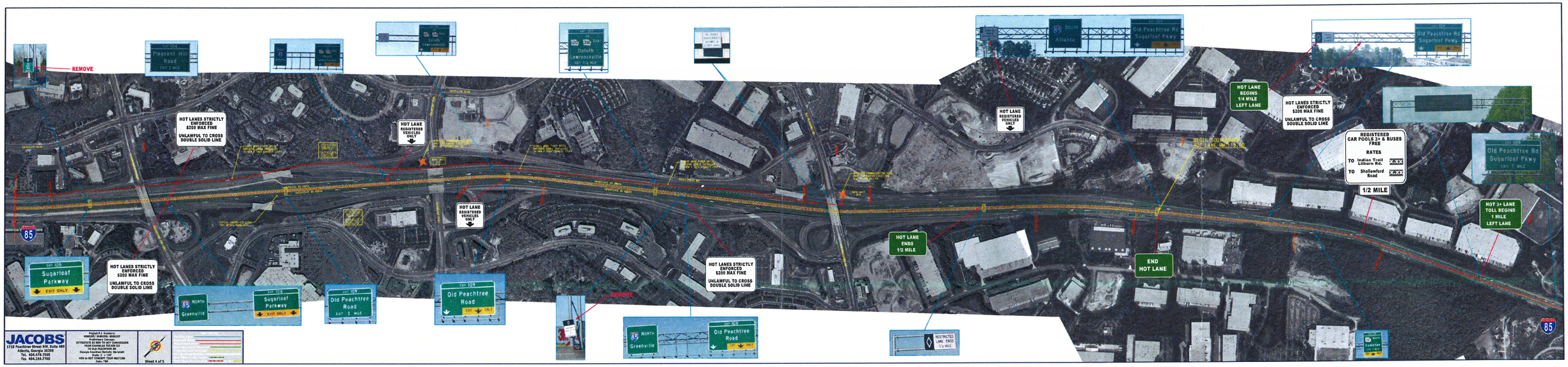
HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
HOT 3+ LANE TOLL BEGINS 1/2 MILE LEFT LANE
HOT 3+ LANE TOLL BEGINS 1 MILE LEFT LANE
REGISTERED CAR POOLS 3+ & BUSES FREE
RATES
TO 142 Jimmy Carter Blvd. XX.XX
TO 317 Sugarloaf Lawrenceville Hwy. XX.XX
REGISTERED CAR POOLS 3+ & BUSES FREE
RATES
TO Indian Trail Lilburn Road XX.XX
TO 317 Sugarloaf Lawrenceville Hwy. XX.XX
HOV EXIT TO 285
HOT EXIT TO 142 Jimmy Carter Blvd.
BEGIN NORTHBOUND HOT LANES MM 94.40
Chamblee-Tucker Rd Mercer Univ
Shallowford Rd
Peachtree Rd
Tucker Rd Clairmont Rd
285 EAST BYPASS Augusta Macon
Chamblee Dunwoody Rd
Ashford Dunwoody Rd
Chamblee Atlanta Rd
Chamblee Doraville Rd
Pleasantdale Rd
Pleasantdale Rd Northeast Dr
Jimmy Carter Blvd
Sugarloaf Rd Lawrenceville Rd
JACOBS
1718 Peachtree Street NW, Suite 400
Atlanta, Georgia 30309
Tel. 404.870.3000
Fax 404.249.7705
Project P.I. Number:
0008251 (HOV/HOT PROJECT)
Project Description:
INTRODUCTION OF HOV TO HOT CONVERSION FROM I-85 NORTH OF I-285 TO SR 400 IN OLD PEACHTREE RD
Georgia Tech/Atlanta Technical Assistance Team
NCM 2a HOT CONCEPT TEAM MEETING
Date: TBD
Sheet 1 of 5


REMOVE
HOT EXIT TO Pleasantdale Rd.
HOT EXIT TO 285
REGISTERED CAR POOLS 3+ & BUSES FREE
RATES
TO Shallowford Rd. X.XX
HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
HOT EXIT TO Pleasantdale Rd. 1 MILE
HOT EXIT TO 285 1 MILE
REMOVE
HOT LANE REGISTERED VEHICLES ONLY
HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
HOT LANE REGISTERED VEHICLES ONLY
HOT EXIT TO Indian Trail Lilburn Rd. Beaver Ruin Rd. 1/2 MILE
REGISTERED CAR POOLS 3+ & BUSES FREE
RATES
TO Steve Reynolds/ Pleasant Hill Rd. X.XX
TO Sawanee Lawrenceville Hwy. X.XX
HOT EXIT TO Indian Trail Lilburn Rd. Beaver Ruin Rd.
HOT EXIT TO 140 Jimmy Carter Blvd.
HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
HOT LANE REGISTERED VEHICLES ONLY
HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
HOT EXIT TO 140 Jimmy Carter Blvd. 3/4 MILE
REGISTERED CAR POOLS 3+ & BUSES FREE
RATES
TO 236 Pleasantdale Rd. X.XX
TO Shallowford Rd. X.XX
HOT LANE REGISTERED VEHICLES ONLY
HOT EXIT TO Steve Reynolds/ Pleasant Hill Rd. Boggs Rd. Duluth Hwy. Sugarloaf Pkwy. Old Peachtree Rd. 1 MILE
REGISTERED CAR POOLS 3+ & BUSES FREE
RATES
TO 120 Lawrenceville X.XX
TO 317 Sawanee Lawrenceville Hwy. X.XX
JACOBS
1718 Peachtree Street NW, Suite 400
Atlanta, Georgia 30309
Tel. 404.478.3900
Fax 404.249.7705
Project P.I. Numbers:
0009250/ 0008296/ 0009297
Project Description:
INTERSTATE NORTH HOV CONVERSION
FROM CHAMBLEE TUCKER RD
TO OLD PEACHTREE RD
Georgia Counties: Dekalb/ Gwinnett
Scale: 1" = 150'
HOV to HOT CONCEPT TEAM MEETING
Date: TBD
Sheet 2 of 5
Legend
Double Solid Line
Pavement Markings
Pavement Arrows
Traffic Signs (Overhead)
Traffic Signs (Ground Mounted)
Web / Hoot Signs (Overhead)
Web / Hoot Signs (Ground Mounted)


HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
HOT LANE REGISTERED VEHICLES ONLY
HOT EXIT TO Indian Trail Lilburn Rd.
REGISTERED CAR POOLS 3+ & BUSES FREE
RATES
TO 316 Jimmy Carter Blvd. 2+ $4.00
TO Shallowford Road 2+ $4.00
HOT EXIT TO Indian Trail Lilburn Rd. 1/2 MILE
HOT EXIT TO Steve Reynolds/ Pleasant Hill Rd. Boggs Rd. Duluth Hwy. Sugarloaf Pkwy. Old Peachtree Rd.
HOT EXIT TO Steve Reynolds/ Pleasant Hill Rd. Boggs Rd. Duluth Hwy. Sugarloaf Pkwy. Old Peachtree Rd.
HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
HOT LANE REGISTERED VEHICLES ONLY
WRONG WRONGDOER VEHICLES FROM TRAVEL LANES
Pleasant Hill Road
Steve Reynolds Boulevard
Duluth Lawrenceville Boggs Rd
Sugarloaf Parkway
85
JACOBS
1718 Peachtree Street NW, Suite 400
Atlanta, Georgia 30309
Tel: 404.475.3000
Fax: 404.249.7705
Sheet 2 of 3


REMOVE
Pleasant Hill Road
HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
HOT LANE REGISTERED VEHICLES ONLY
Duluth
Lawrenceville
HOT LANE REGISTERED VEHICLES ONLY
HOT LANE REGISTERED VEHICLES ONLY
South
Atlanta
Old Peachtree Rd
Sugarloaf Pkwy
HOT LANE BEGINS 1/4 MILE LEFT LANE
HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
REGISTERED CAR POOLS 3+ & BUSES FREE
RATES
TO Indian Trail Lilburn Rd. $0.34
TO Shallowford Road $0.34
1/2 MILE
Old Peachtree Rd
Sugarloaf Pkwy
HOT 3+ LANE TOLL BEGINS 1 MILE LEFT LANE
85
HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
Sugarloaf Parkway
EXIT ONLY
85 NORTH
Greenville
Sugarloaf Parkway
EXIT ONLY
Old Peachtree Road
Old Peachtree Road
EXIT ONLY
REMOVE
HOT LANES STRICTLY ENFORCED $200 MAX FINE
UNLAWFUL TO CROSS DOUBLE SOLID LINE
85 NORTH
Greenville
Old Peachtree Road
HOT LANE ENDS 1/2 MILE
END HOT LANE
RESTRICTED LANE ENDS 1/2 MILE
Swanton
85
JACOBS
1718 Peachtree Street NW, Suite 480
Atlanta, Georgia 30309
Tel. 404.478.3500
Fax. 404.249.7705
Project P.I. Numbers:
0006295/ 0006296/ 0006297
Preliminary Canvas:
INTERSTATE 85 NEW TO EXIT EXPANSION
FROM SUGARLOAF PKWY. TO
THE OLD PEACHTREE RD.
Georgia Counties: Dekalb/ Gwinnett
Cities: Duluth/ Suwanee
HOV to HOT CONCEPT TOUR MEETING
Date: TBD
Sheet 4 of 5

MEETING MINUTES

SUBJECT: I-85 HOV to HOT Lane Conversion
P.I. No. 0009295, 0009296, 0009297
DeKalb and Gwinnett Counties
Concept Team Meeting

MEETING DATE: May 18, 2009

TODAY'S DATE: May 28, 2009

PREPARED BY: Derrick Vincent, PE - Jacobs Engineering Group, Inc.

ATTENDEES:

Name	Agency	Phone	Email
Matt Needham	GDOT – Asst Area Engineer		mneedham@dot.ga.gov
Harold Mull	GDOT – Area Engineer		hmull@dot.ga.gov
Ted Crabtree	GDOT – OEL		tcrabtree@dot.ga.gov
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Teri Pope	GDOT – Communications Dist 1	770-718-3924	tpope@dot.ga.gov
Nathaniel O'Kelley	GDOT	770-532-5510	nokelley@dot.ga.gov
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Jan Phelps	GDOT – Utilities		japhelps@dot.ga.gov
Raymond Chandler	GDOT – Utilities		rchandler@dot.ga.gov
Ulysses Mitchell	GDOT		umitchell@dot.ga.gov
Robert Jack	GDOT – Right of Way Dist 1		rjack@colpipe.com
Angie Malta	Jacobs Engineering Group	678-234-1537	Angie.malta@jacobs.com
Lee Thompson	State Representative		vlt@thompson-sweeny.com
Robert Mahoney	GDOT Dist. 1 Precon Engineer	404-478-3900	rmahoney@dot.ga.gov
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Steven Sheffield	SRTA		ssheffield@georgiatolls.com
Todd Long	GRTA		tlong@grta.org
Ben Rabun	GDOT – Executive Asst to Chief Eng.		brabun@dot.ga.gov
Sabrina David	FHWA – GA Division		Sabrina.david@fhwa.dot.gov
Gail D'Avino	GDOT – OEL		gd'avino@dot.ga.gov
Latoya Johnson	FHWA -		Latoya.johnson@fhwa.dot.gov
Lionel Alexander III	GDOT – Bridge Division		Lionel.Alexander@dot.ga.gov
Patrick Allen	GDOT – Traffic Operations Division		paallen@dot.ga.gov
Patrick Vu	SRTA		patrickvu@georgiatolls.com
Greg Jones	GDOT –		gregm.jones@dot.ga.gov
Derrick Vincent	Jacobs Engineering Group	404-478-3954	Derrick.vincent@jacobs.com
David Kasbo	Jacobs Engineering Group	404-478-3900	David.kasbo@jacobs.com

Name	Agency	Phone	Email
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Tom Kuzmeskus	Jacobs Engineering Group	404-478-3900	Tom.kuzmeskus@jacobs.com
Michael Francis	Jacobs Engineering Group	404-478-3900	Michael.francis@jacobs.com
Richard Fangmann	Jacobs Engineering Group	404-478-3900	Richard.fangmann@jacobs.com
Susan Wynn	Jacobs Engineering Group	404-478-3946	Susan.wynn@jacobs.com
Bob McDowell	Jacobs Engineering Group	404-478-3956	Bob.mcdowell@jacobs.com
Jeff VanDyke	Jacobs Engineering Group	404-478-3950	Jeff.vandyke@jacobs.com

LOCATION: GDOT District 1Area Office, Lawrenceville, Georgia

I. Welcome (GDOT – Robert Mahoney, District 1 Preconstruction Engineer)

The meeting was opened by Robert Mahoney at 1:00 pm.

II. Introduction of Each Attendee

The group introduced themselves and their role in the project. The consultant roles were also explained. Jacobs is the GEC for GDOT. The State Road and Toll Authority (SRTA) will be the operator of the system after construction. SRTA has the following three firms working as consultants: SRF, MSX, and Jacobs Consultancy. SRF handles the public involvement and public relations. MSX will handle the electronics or toll system setup. Jacobs Consultancy is performing the traffic and revenue study.

III. Meeting Purpose (Jacobs- Jeff VanDyke).

Jeff VanDyke stated that the purpose of this meeting was to discuss project issues, present the proposed concept and layout, and verify the preferred concept.

IV. Project Overview (Jacobs – Jeff VanDyke / SRTA – Patrick Vu)

Patrick Vu stated that the lanes would be designated as HOT3 lanes. Motorcycles, transit vehicles, and alternative fuel vehicles will be allowed to use the lane at no cost. Hybrids will not be allowed to use the HOT3 lanes free of charge.

Teri Pope: Has the decision been made by the GDOT Board to classify the lane as HOT3?
Patrick Vu: Yes.

Patrick will send Teri the resolution.

V. Overview of Concept Report

a. Need and Purpose Statement (Jacobs – Jeff VanDyke / Richard Fangmann)

The Concept Report has a Draft version of the Purpose and Need Statement. Once the traffic data has been updated and approved through OEL, a revised version of the Purpose and Need Statement will be included. Currently the P&N is considered a work in progress due to the unique nature of this project.

b. Classification (Jacobs – Jeff VanDyke)

No comments.

c. Design Features (Jacobs – Jeff VanDyke)

Robert Mahoney noted that the design speed shown in the slide show and concept report is different.

d. Additional Details (Jacobs – Jeff VanDyke)

No comments.

e. Utilities (Jacobs – Jeff VanDyke)

Jun Birnkhammer: Who's performing the subsurface utility investigation?
Jeff VanDyke: StreetSmart will be but United is also prequalified to do SUE. SUE will performed as needed in spot (gantry) locations.

This project overlaps another project. GDOT currently has some SUE information. GDOT will forward to Jacobs.

f. Coordination (Jacobs – Jeff VanDyke)

No comments.

g. Other projects in the Area (Jacobs – Jeff VanDyke)

Teri Pope mentioned that there are several projects in the area that received stimulus money. She will forward the list to Jacobs.

h. Scheduling (Jacobs – Jeff VanDyke)

The project will open to traffic January 2011. It should bid December 2009.

i. Alternates Considered (Jacobs – Jeff VanDyke)

Jeff discussed the No Build and Build Alternates. There were three build alternatives considered: Barrier separated, buffer separated, and thermoplastic striping. The disadvantages and advantages of each were discussed. The group was directed to the White Paper concept report attachment.

j. Layouts (Jacobs –Tom Kuzmeskus/ Jim Ingram)

Tom Kuzmeskus gave a brief overview of the layout. The questions and the responses were:
Greg Jones: Do we have to end the HOV lane and begin the HOT3 lane with signage?
Jeff Van Dyke: There are advance warning signs for the toll system. There is some discussion among agencies about the distance of advance warning signage. Jacobs will check the new MUTCD for guidance.

Gail D'Avino: Will toll signs show minimum and maximum rate?

Patrick Vu spoke in more detail about the pricing model, weave sections, and gave a better explanation of possible toll signs.

Matt Needham: How will the toll rate change?
Jeff VanDyke: The toll rate doesn't change for the patron once they enter the HOT3 lane.

Harold Mull: Does the HOT3 lane operate 24/7?
Jeff VanDyke: Yes.

Jun Birnkhammer: Is there a radio station that will have information about toll rates?
Teri Pope: No, GDOT would incur additional costs and would have to manage the information. The changing toll rates would be difficult to convey via radio.
Patrick Vu: There will be a website that shows pricing.

Lionel Alexander: Is there MUTCD guidance or GDOT policy guidance governing multiple changeable message signs on a single structure?
Jeff VanDyke: We will check.

Jim Ingram gave an overview of the wireless system that will be used.
The questions asked were:

- How long has wireless been an option? Three weeks.
- Has going overhead been researched? There are many utility conflicts that could have a negative impact on cost and schedule. Wireless seems to be the best fit.
- Is MSX giving input about the wireless option? MSX was consulted about the wireless option. We will present the information received from this forum and discuss the various options with them following this meeting.

k. Traffic Study (Jacobs – David Kasbo)

David Kasbo gave an overview of the traffic report. He informed everyone that the corridor has a poor LOS with only four weave zones. Additional options are being studied to improve the LOS in the weave zones. This includes shifting, lengthening, deleting, or adding weave zones. These options seem to have had little effect. The poor LOS is due to the high general purpose lane volumes. Jacobs is currently studying the effects of adding a fifth weave section.

The following comments and questions were made/asked:
Jacobs should check the traffic volumes in the slide show vs. the concept report.

Ben Rabun: Did the corridor fail while the threshold was at 1400 vph and 1200 vph in 2031? Was the model using 45mph through the weave section or entire corridor? How many weave sections did we remove during analysis?
David Kasbo: Yes, the threshold was 1400 vph and 1200 vph. 45 mph was used for the entire corridor. The analysis was run with two weave sections removed and with three weave sections removed.

Patrick Vu: In reference to the traffic study, what does "no build" indicate? Is this a peak hour analysis?
David Kasbo: "No build" means the model was run with HOV and weave zones as they exist today. Yes, this is a peak hour analysis.

Sabrina David: When was the data for the incident report recorded? 2007

Gail D'Avino: When was the accident data recorded? 2004-2006

Patrick Allen: Are we forcing vehicles out of the HOT lane at certain points even though their exit is far away?
Ben Rabun: If that's the case, we will need more signs instead of placing six exits on one sign.

Ben Rabun: Where will additional weave sections be located?
David Kasbo: We are still reviewing options.

Patrick Vu: If there are operational issues, they should be addressed and the toll and revenue study should be changed to fit the new design/weave sections.

Teri Pope: Is 2000' long enough for departure from weave sections?
David Kasbo: We will look into it.

Patrick Allen: Are motorists that are in the HOV lane being moved into the general purpose lanes?
Dave Kasbo: Yes.

Greg Jones: Does the model account for the psychological effects of traveling next to general public lanes that are moving much slower?
David Kasbo: The model accounts for psychological effects in some way.

l. Environmental Concerns (Jacobs – Angie Malta)

Angie gave a brief overview of the environmental concerns.

m. Public Involvement (Jacobs – Richard Fangmann)

The dates for the second round of PIOH meetings are:

- June 23rd – Ashiana's Banquet Hall
- June 25th – Gwinnett Center
- June 27th – Mall of Georgia

These meeting minutes reflect the notes and memory of Derrick Vincent, Jeff VanDyke, David Kasbo, and Bob McDowell. If any additions, deletions, or corrections are necessary, please contact Derrick Vincent at 404-478-3954 or derrick.vincent@jacobs.com. If no responses are received within five days, these meeting minutes will be considered final.