ORIGINAL TO GENERAL FILES

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

OFFICE OF DESIGN POLICY & SUPPORT
INTERDEPARTMENTAL CORRESPONDENCE

FILE P.I. # 0010385
Fulton County
GDOT District 7 - Metro Atlanta
Sandy Springs Streetscape – LCI Project

OFFICE Design Policy & Support

DATE 6/18/2015

FROM for Brent Story, State Design Policy Engineer

TO SEE DISTRIBUTION

SUBJECT **APPROVED REVISED CONCEPT REPORT**

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

Attachment

DISTRIBUTION:

Glenn Bowman, Director of Engineering
Joe Carpenter, Director of P3/Program Delivery
Genetha Rice-Singleton, Assistant Director of P3/Program Delivery
Albert Shelby, State Program Delivery Engineer
Darryl VanMeter, State Innovative Delivery Engineer
Bobby Hilliard, Program Control Administrator
Cindy VanDyke, State Transportation Planning Administrator
Hiral Patel, State Environmental Administrator
Ben Rabun, State Bridge Engineer
Andrew Heath, State Traffic Engineer
Angela Robinson, Financial Management Administrator
Lisa Myers, State Project Review Engineer
Charles "Chuck" Hasty, State Materials Engineer
Lee Upkins, State Utilities Engineer
Richard Cobb, Statewide Location Bureau Chief
Kathy Zahul, District Engineer
Scott Lee, District Preconstruction Engineer
Patrick Allen, District Utilities Engineer
Xavier James, Project Manager
BOARD MEMBER - 6th Congressional District

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
REVISED PROJECT CONCEPT REPORT

Project Type:	Sidewalk Enhancement	P.I. Number:	0010385
GDOT District:	Seven	County:	Fulton
Federal Route Number:	N/A	State Route Number:	N/A

Sandy Springs Circle Streetscape – Phase II – Revised typical section and project limits per City of Sandy Springs approved City Center Master Plan

Submitted for approval:

Beth Ann Schwartz, PE – Michael Baker — DATE 3/30/2015

Andrew Thompson, PE – City of Sandy Springs — DATE 3/31/2015

State Program Delivery Engineer — DATE 4/1/2015

GDOT Project Manager — DATE 4/1/2015

Recommendation for approval:

* Recommendation on file

State Environmental Administrator — DATE 5-11-15

State Traffic Engineer — DATE 4-15-15

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

State Transportation Planning Administrator — DATE 4-17-15

PLANNING, APPROVED CONCEPT AND BACKGROUND

Project Justification Statement:

The Sandy Springs Circle Streetscape Phase II project will incorporate infrastructure improvements to the existing pedestrian sidewalk and fill in the gaps to provide a continuous Americans with Disabilities Act (ADA) pedestrian path along Sandy Springs Circle between Hammond Drive, milepost 0.40 and Roswell Road (SR 9), milepost 1.14. The improvements shall address new ADA compliant concrete sidewalks, new concrete curb and gutter, ADA compliant curb ramps, brick paver strips, street lighting, and street landscaping along both sides of the corridor. This project is similar in scope and will connect to the Phase I project which is currently under construction. This area is considered the downtown central business district for the City of Sandy Springs and in the future the City intends to relocate City Hall to recently purchased property along Sandy Springs Circle and make this area the city center. The land use along this road is primarily commercial development with a mixture of residential development and churches which all generate pedestrian traffic. These sidewalks will encourage pedestrians to travel along Sandy Springs Circle to access points on Metropolitan Atlanta Rapid Transit Authority (MARTA) bus routes on Roswell Road, as well as access local shopping districts and places of employment.

The City of Sandy Springs needs this Livable Centers Initiative (LCI) project in order to continue to develop a pedestrian friendly environment for persons in the downtown or central business district. Currently this corridor is lacking sidewalk connectivity, uniformity, and ADA access including adequate crosswalks, therefore the need for this project is to provide pedestrian mobility and to provide a continuous ADA path for all pedestrians. The sidewalk will accommodate existing and future pedestrian traffic and will create connectivity to the mixed-use development. The proposed improvements do meet the Regional Transportation Program (RTP)/State Transportation Improvement Program (STIP). This project is Phase II of the proposed Sandy Springs Circle Streetscape project and will thus complete the full streetscape design along Sandy Springs Circle. These enhancements will also connect to the proposed sidewalk project along Roswell Road (SR 9).

Revision to the Project Justification Statement:

On December 18, 2012, the Sandy Springs City Council adopted its master plan vision for the City's downtown area called City Center which includes Sandy Springs Circle. The City Center Master Plan includes a walkable grid of streets; a mix of retail, dining and housing; and the addition of a network of green spaces. The plan also charts the future for a civic facility to house a multi-purpose city hall and performing arts venue.

The Sandy Springs Circle Streetscape Phase II project will incorporate infrastructure improvements as outlined in the approved City Center master plan which will upgrade pedestrian access, provide a multi-use path (on one side), and fill in the gaps to provide a continuous Americans with Disabilities Act (ADA) pedestrian path along each side Sandy Springs Circle between Hammond Drive, milepost 0.40 and Mt. Vernon Highway, milepost 0.72.

Existing conditions:

Currently, Sandy Springs Circle is a four-lane facility with travel lane widths varying from 11-foot wide to 12-foot wide. The corridor contains 8" x 24" curb and gutter on both sides of the road with intermittent sections of concrete sidewalk. The posted speed of Sandy Springs Circle is 35 mph. The intersections of Sandy Springs Circle at Hammond Drive and Mt. Vernon Highway are both signalized.

Description of the <u>approved</u> concept:

This project is the construction of a 2-foot curb and gutter, a 2-foot brick paver/stamped concrete strip adjacent to Sandy Springs Circle, 9-foot wide concrete ADA compliant sidewalks and a 3-foot wide tree/utility strip to create a 16-foot shoulder. Canopy street trees will be spaced 30 to 40 feet, and light fixtures with brick panels spaced 90 to 100 feet. The project is located along Sandy Springs Circle from north of Hammond Drive (MP 0.40) to Roswell Road/SR 9 (MP 1.14) in the City of Sandy Springs. From Hammond Drive to Hilderbrand Drive, the proposed shoulder on the east side of Sandy Springs Circle will be constructed with 2-foot curb and gutter, 5-foot sidewalk, and 1-foot utility/tree strip to minimize impacts. These proposed Phase II improvements will tie into the Phase I improvements from Cliftwood Drive to Hammond Drive along Sandy Springs Circle which is currently under construction. The proposed typical section will provide a consistent streetscape that will conform to a 10 year old established zoning overlay standard. Utility relocation, other than when a direct conflict exists, is not within the scope of work of this project. The proposed sidewalks will be constructed to provide an ADA accessible path along both sides of the roadway. The existing curb and gutter and drainage will be replaced. The length of the proposed project along Sandy Springs Circle is approximately 0.74 miles. There are two local proposed intersection improvement projects along Sandy Springs Circle at Johnson Ferry Road and at Mount Vernon Highway. The sidewalk improvements will tie into these intersection improvement projects which will include pedestrian crosswalks, ramps and pedestrian signals at these intersections. Also the intersection of Sandy Springs Circle and Hammond Drive are included in the Sandy Springs Circle Phase I project therefore the proposed improvements associated with phase II project will tie into the sidewalk improvements at Hammond Drive currently being constructed in the phase I projects. The existing properties along Sandy Springs Circle contain parking facilities therefore the need for on-street parking is not warranted.

Federal Oversight: ☐ FOS/PoDI ☒ Exempt ☐ State Funded ☐ Other

Projected Traffic as shown in the approved Concept Report: ADT

Open Year (2012): 21,545* Design Year (2032): 26,290*

**ADT shown for full section of Sandy Springs Circle between Hammond Drive and Roswell Road but ADT between Hammond and Mt. Vernon is significantly lower which is noted below in the updated traffic.*

Updated Traffic: ADT

Open Year (2018): 7,960 Design Year (2038): 8,800

Level of Service (LOS):

Per the approved City Center Master Plan, Sandy Springs will be reduced from 4 lanes to 2 lanes with on-street parking between Hammond Drive and Mt. Vernon.

Table 1: Existing Intersection LOS

	Existing Level of Service (delay in sec/veh)	
	AM Peak	PM Peak
Sandy Springs Circle at Hammond Drive	C (30.0)	D (36.1)
Sandy Springs Circle at Mt Vernon Highway	D (47.6)	D (54.3)

Table 2: No Build Intersection LOS

	Existing Level of Service (delay in sec/veh)			
	Open Year 2018		Open Year 2038	
	AM Peak	PM Peak	AM Peak	PM Peak
Sandy Springs Circle at Hammond Drive	C (31.1)	D (38.3)	C (31.7)	D (39.7)
Sandy Springs Circle at Mt Vernon Highway	E (59.1)	E (57.0)	E (97.5)	F (82.2)

Table 3: Build Intersection LOS

	Existing Level of Service (delay in sec/veh)			
	Open Year 2018		Open Year 2038	
	AM Peak	PM Peak	AM Peak	PM Peak
Sandy Springs Circle at Hammond Drive	C (34.1)	D (46.6)	C (34.7)	D (42.9)
Sandy Springs Circle at Mt Vernon Highway	D (41.6)	E (59.9)	D (45.2)	E (78.7)

Functional Classification (Mainline): Urban Collector Street

VE Study anticipated: ☒ No ☐ Yes ☐ Completed – Date:

PROPOSED REVISIONS

Approved Features:	**Proposed Features:**
Typical Section This project is the construction of a 2-foot curb and gutter, a 2-foot brick paver/stamped concrete strip adjacent to Sandy Springs Circle, 9-foot wide concrete ADA compliant sidewalks and a 3-foot wide tree/utility strip to create a 16-foot shoulder. Canopy street trees will be spaced 30 to 40 feet, and light fixtures with brick panels spaced 90 to 100 feet. From Hammond Drive to Hilderbrand Drive, the proposed shoulder on the east side of Sandy Springs Circle will be constructed with 2-foot curb and gutter, 5-foot sidewalk, and 1-foot utility/tree strip to minimize impacts.	*Typical Section* This revised project on the west side of Sandy Springs Circle per the approved City Center Master Plan is the construction of a 2-foot curb and gutter, a 4-foot landscape strip adjacent to Sandy Springs Circle, 12-foot wide multi-purpose path, 6-foot wide landscape/furniture zone, 6-foot wide concrete ADA compliant sidewalks and a 10-foot wide tree/utility strip to create a 44-foot shoulder. Canopy street trees will be spaced 30 to 40 feet, and light fixtures with brick panels spaced 90 to 100 feet on both sides of the road. The proposed shoulder on the east side of Sandy Springs Circle per the approved City Center Master Plan will be constructed with 2-foot curb and gutter, 6-foot wide landscape strip, 10-foot sidewalk, and 2-foot utility/tree strip to minimize impacts. Adjacent to the Heritage Green Park the typical section will contain a 2-foot wide curb and gutter, 2-foot wide paver strip, 8-foot wide sidewalk, and a 2-foot utility/tree strip to minimize impacts. The existing four lane roadway (48-foot width) will be modified to provide one 11-foot wide travel lane in each direction, a 10-foot median/left turn lane, and an 8-foot wide parking lane in each direction for a total roadway width of 48-feet matching the existing.
Project termini The project is located along Sandy Springs Circle from north of Hammond Drive (MP 0.40) to Roswell Road/SR 9 (MP 1.14) in the City of Sandy Springs.	*Project termini* The project is located along Sandy Springs Circle from north of Hammond Drive (MP 0.40) to Mt. Vernon Highway (MP 0.72) in the City of Sandy Springs.

Reason(s) for change:

The Sandy Springs City Council adopted a City Center Master Plan on December 18, 2012 and in January, 2013, the City Council approved plans for Phase I Implementation. The City Center Master Plan requires a revised typical section for the Sandy Springs Circle corridor. The intent of the master plan is to

1. Create a unique, vibrant, walkable City Center rich in amenities desired by the community, such as commercial retail, recreational and cultural facilities.
2. Catalyze significant market-driven private investment in walkable, mixed-use redevelopment that introduces substantial new dining, amenity retail, and entertainment options. This will both achieve City Center development goals and strengthen the district's ability to support Sandy Springs' fiscal

goals.

3. Create an appropriate setting for a new civic/cultural center than functions as a place of community activity and identity.
4. Create a comprehensive infrastructure to support City Center, which would include: walkable streets, stormwater, traffic flow, transit services, bicycling facilities, parking, utilities and signage.
5. Introduce a green space network that accommodates a variety of activities, draws activity from new development, and ties together city Center, Sandy Springs' established neighborhoods and existing open spaces.

Sandy Springs Circle is one element of the overall area included in the adopted master plan. Due to funding and implementation schedule the original project limits were modified from Hammond Drive to Roswell Road/SR9 to Hammond Drive to Mt. Vernon Highway.

Design Variances and/or Exceptions needed: Anticipate design variance for median opening spacing due to less than 660 feet minimum spacing.

ENVIRONMENTAL AND PERMITS

Potential environmental impacts of proposed revision: No anticipated environmental effects. Still maintaining minimal encroachment on the Heritage Green parcel as originally proposed. The CE was previously approved therefore a re-evaluation will be required prior to Right-of-Way plan approval and not affect overall project schedule.

Have proposed revisions been reviewed by environmental staff? ☒ No ☐ Yes

Environmental responsibilities (Studies/Documents/Permits): Sub-Consultant, Edwards Pitman, is responsible for performing the re-evaluation of the approved CE re-evaluation.

Air Quality:

Is the project located in a PM 2.5 Non-attainment area?	☐ No	☒ Yes
Is the project located in an Ozone Non-attainment area?	☐ No	☒ Yes
Is a Carbon Monoxide hotspot analysis required?	☒ No	☐ Yes

The proposed project includes a road diet to convert an existing travel lane into on-street parking as well as the addition of sidewalk and multi-use trail therefore no additional pavement or travel lanes are proposed.

Environmental Comments and Information:

NEPA: *The approved CE will need to be reevaluated due to the revised typical section and project end points.* Heritage Green is a Section 4(f) resource located on land owned by the City of Sandy Springs. The revised project would have a *de minimis* impact on Heritage Green. Coordination with the City is on-going.

Ecology: No habitat for protected species was identified.

Archeology: An archaeological short form for negative findings was approved October 28, 2011. No additional surveys will be required.

History: No resources were identified as eligible; therefore no additional surveys will be required.

Air Quality: No Carbon Monoxide (CO) modeling will be required due to project type. No additional studies are required.

Noise Effects: This project does not require a noise study or abatement of highway noise impacts. A Type III noise screening assessment was previously prepared along with an air assessment.

Public Involvement: Concept will be presented to City Council for public notification.

PROJECT COST AND ADDITIONAL INFORMATION

Item	Estimated Cost	Date of Estimate	Funded By
Base Construction Cost:	$2,798,985.00	2/11/2015	
5% Engineering and Inspection:	$139,949.25	2/11/2015	
5% Contingency	$146,946.71	2/11/2015	
Liquid AC Adjustment:	$32,249.12	6/4/2015	
Total Construction Cost:	$3,118,130.08		GDOT/City of Sandy Springs
Right-of-Way:	$3,866,132.50	2/17/2015	GDOT/City of Sandy Springs
Utilities (reimbursable costs):	$550,000.00	3/17/2015	City of Sandy Springs
Environmental Mitigation:	$0.00	4/2/2014	GDOT/City of Sandy Springs
TOTAL PROJECT COST:	$7,534,262.58		

Recommendation: Recommend that the proposed revision to the concept be approved for implementation.

Attachments:

1. Sketch Map
2. Revision to Programmed Costs Memo
3. Cost Estimate
4. Asphalt & Fuel Index Adjustment Estimate
5. ROW Cost Estimate
6. Utility Cost Estimate
7. Typical Section
8. Conceptual Layout
9. Excerpt from Approved City Center Master Plan – Sandy Springs Circle transformed concept

10. Traffic Study
11. Lighting Commitment Letter – previously included in approved concept

APPROVALS

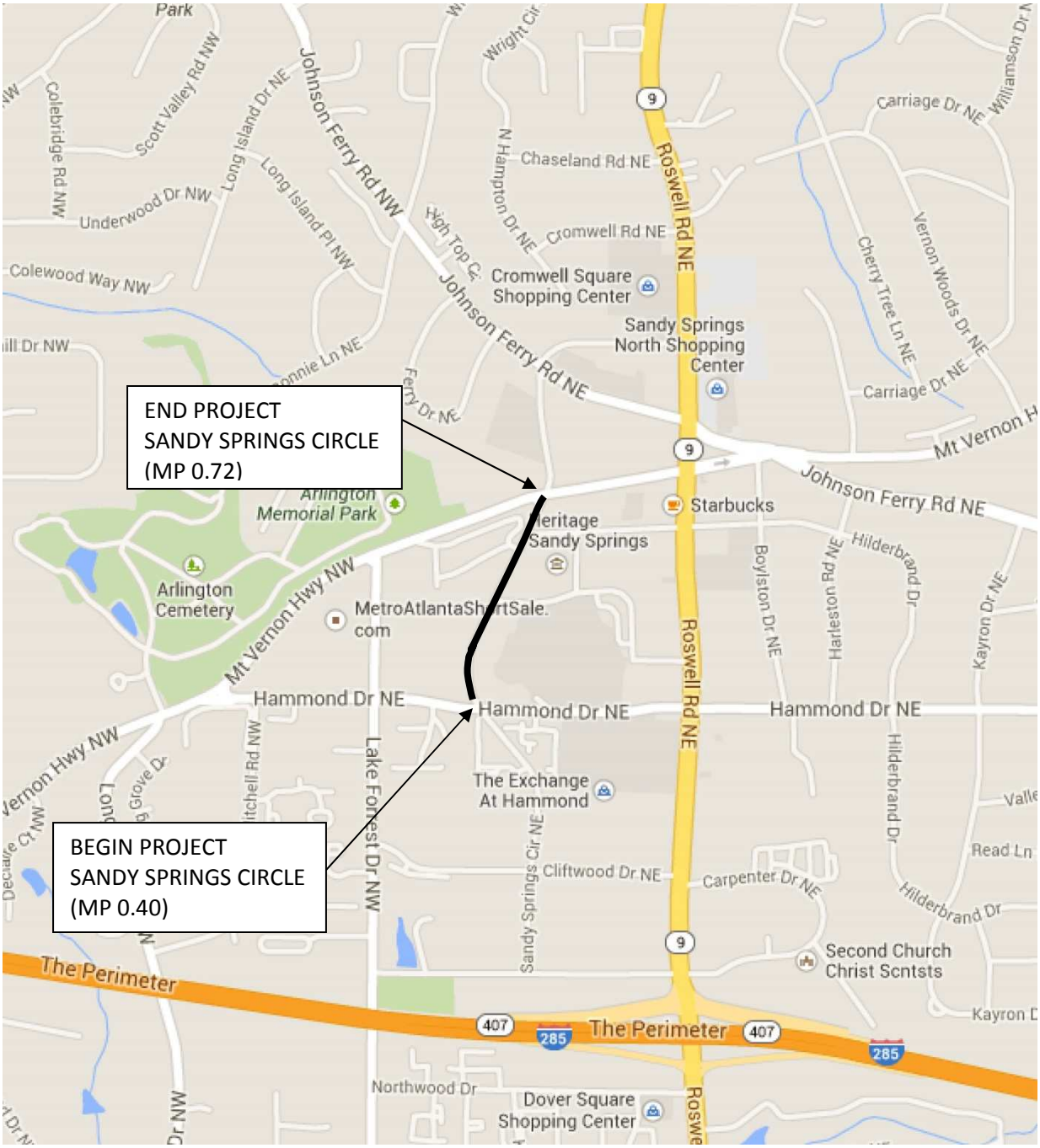
Concur: Glen Bowman
Director of Engineering

Approve: Margaret B. Pickell 6.11.15
Chief Engineer Date

SKETCH MAP

Sandy Springs Circle Streetscape – Phase II

City of Sandy Springs, Georgia



DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE P.I. No. **10385**

OFFICE Program Delivery

PROJECT DESCRIPTION

CS 243/SANDY SPRINGS FM CS 262/HAMMOND DR TO SR 9-PH II-LCI

DATE June 4, 2015

From: Albert V. Shelby III, Program Delivery Engineer

To: Lisa L. Myers, State Project Review Engineer

Subject: REVISIONS TO PROGRAMMED COSTS

PROJECT MANAGER Xavier James

MGMT LET DATE 12/15/2016

MGMT ROW DATE 9/18/2015

PROGRAMMED COSTS (TPro W/OUT INFLATION)			**LAST ESTIMATE UPDATE**	
CONSTRUCTION	$	2,855,306.00	DATE	11/6/2012
RIGHT OF WAY	$	3,011,150.00	DATE	11/6//2012
UTILITIES	$	550,000.00	DATE	11/6/2012

REVISED COST ESTIMATES

CONSTRUCTION*	$	3,118,130.08
RIGHT OF WAY	$	3,866,132.50
UTILITIES	$	550,000.00

*Cost Contains 5 % Contingency

REASONS FOR COST INCREASE AND CONTINGENCY JUSTIFICATION:

Revised project limits and typical section to match the recently approved City of Sandy Springs City Center Master Plan

CONTINGENCY SUMMARY

A.	CONSTRUCTION COST ESTIMATE:	$ 2,798,985.00	Base Estimate From CES		
B.	ENGINEERING AND INSPECTION (E & I):	$ 139,949.25	Base Estimate (A) x	5	%
C.	CONTINGENCY:	$ 146,946.71	Base Estimate (A) + E & I (B) x See % Table in "Risk Based Cost Estimation" Memo	5	%
D.	TOTAL LIQUID AC ADJUSTMENT:	$ 32,249.12	Total From Liquid AC Spreadsheet		
E.	CONSTRUCTION TOTAL:	$ 3,118,130.08	(A + B + C + D = E)		

REIMBURSABLE UTILTY COSTS

UTILITY OWNER	REIMBURSABLE COST
Georgia Power	$ 400,000.00
AGL	$ 50,000.00
City of Atlanta Watershed Management	$ 25,000.00
Comcast	$ 25,000.00
AT&T	$ 50,000.00
TOTAL	$ 550,000.00

ATTACHMENTS:

Construction Cost Estimate for Sandy Springs Circle Streetscape - Phase II
Hammond Drive to Mt. Vernon
P. I. Number: 0010385, Fulton County

6/4/2015

ROADWAY					
ITEM NUMBER	ITEM DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	COST
009-2000	LANDSCAPING WITH IRRIGATION	LS	1	$25,000.00	$ 25,000.00
150-1000	TRAFFIC CONTROL	LS	1	$200,000.00	$ 200,000.00
210-0100	GRADING COMPLETE	LS	1	$450,000.00	$ 450,000.00
310-1101	GR AGGR BASE CRS, INCL MATL	TN	1265	$30.00	$ 37,950.00
318-3000	AGGR SURF CRS	TN	250	$30.00	$ 7,500.00
402-1812	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	TN	750	$75.00	$ 56,250.00
402-3121	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	TN	340	$75.00	$ 25,500.00
402-3130	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM	TN	875	$75.00	$ 65,625.00
402-3190	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	TN	170	$75.00	$ 12,750.00
413-1000	BITUM TACK COAT	GAL	2000	$3.00	$ 6,000.00
432-5010	MILL ASPH CONC PVMT VARIABLE DEPTH	SY	11000	$5.00	$ 55,000.00
441-0104	CONC SIDEWALK, 4 IN (SIDEWALK)	SY	2600	$25.00	$ 65,000.00
441-0104	CONC SIDEWALK, 4 IN (MULTI-USE PATH)	SY	2000	$25.00	$ 50,000.00
441-0018	DRIVEWAY CONCRETE, 8 IN TK	SY	65	$50.00	$ 3,250.00
441-0748	CONCRETE MEDIAN, 6 IN	SY	1850	$50.00	$ 92,500.00
441-4030	CONC VALLEY GUTTER, 8 IN	SY	24	$50.00	$ 1,200.00
441-5002	CONCRETE HEADER CURB	LF	300	$20.00	$ 6,000.00
441-6216	CONC CURB & GUTTER, 8 IN X 24 IN, TP 2	LF	3500	$25.00	$ 87,500.00
500-3110	CLASS A CONCRETE, TYPE P1, RETAINING WALL - GRANITE VENEER	LF	825	$700.00	$ 577,500.00
500-9999	CLASS B CONC, BASE OR PVMT WIDENING	CY	100	$300.00	$ 30,000.00
515-2020	GALV STEEL PIPE HANDRAIL, 2 IN, ROUND	LF	900	$35.00	$ 31,500.00
550-1180	STORM DRAIN PIPE, 18 IN, H 1-10	LF	200	$35.00	$ 7,000.00
550-1240	STORM DRAIN PIPE, 24 IN, H 1-10	LF	10	$45.00	$ 450.00
573-2006	UNDDR PIPE INCLUDE DRAINAGE AGGR, 6 IN	LF	300	$15.00	$ 4,500.00
607-1000	MORTAR RUBBLE MASONRY	CY	600	$500.00	$ 300,000.00
611-5550	RESET SIGNS	LS	1	$2,000.00	$ 2,000.00
611-8000	ADJUST CATCH BASIN TO GRADE	EA	2	$2,200.00	$ 4,400.00
611-8040	ADJUST DROP INLET TO GRADE	EA	2	$1,500.00	$ 3,000.00
634-1200	RIGHT OF WAY MARKERS	EA	14	$85.00	$ 1,190.00
668-1100	CATCH BASIN, GP 1	EA	10	$2,500.00	$ 25,000.00
668-2000	DROP INLET, GP 1	EA	4	$2,200.00	$ 8,800.00
668-3300	SAN SEWER MANHOLE, TP 1	EA	8	$2,500.00	$ 20,000.00
682-6222	CONDUIT, NONMETL, TP 2, 2 IN	LF	5,000	$10.00	$ 50,000.00
900-0039	BRICK PAVERS	SF	2125	$10.00	$ 21,250.00
920-0027	LIGHT FIXTURES	EA	30	$7,500.00	$ 225,000.00
702-0886	STREET TREES	EA	60	$600.00	$ 36,000.00
				SECTION SUBTOTAL:	**$ 2,594,615.00**

SIGNING & MARKING					
ITEM NUMBER	ITEM DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	COST
636-1020	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	SF	50	$15.00	$ 750.00
636-1033	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	SF	50	$20.00	$ 1,000.00
636-2070	GALV STEEL POSTS, TP 7	LF	100	$10.00	$ 1,000.00
636-2090	GALV STEEL POSTS, TP 9	LF	100	$10.00	$ 1,000.00
652-5801	SOLID TRAFFIC STRIPE, 8 IN, WHITE	LF	3650	$2.00	$ 7,300.00
653-1501	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	LF	4,200	$0.50	$ 2,100.00
653-1502	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	LF	3,350	$0.50	$ 1,675.00
653-1704	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	LF	100	$4.00	$ 400.00
653-0120	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	EA	5	$75.00	$ 375.00
653-0130	THERMOPLASTIC PVMT MARKING, ARROW, TP 3	EA	2	$75.00	$ 150.00
				SECTION SUBTOTAL:	**$ 11,475.00**

EROSION CONTROL					
ITEM NUMBER	ITEM DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	COST
163-0232	TEMPORARY GRASSING	AC	1	$300.00	$ 300.00
163-0240	MULCH	TN	30	$150.00	$ 4,500.00
163-0300	CONSTRUCTION EXIT	EA	1	$925.00	$ 925.00
163-0520	CONSTRUCT AND REMOVE TEMPORARY PIPE SLOPE DRAIN	LF	100	$15.00	$ 1,500.00
163-0550	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	EA	26	$150.00	$ 3,900.00
165-0030	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	LF	2500	$1.00	$ 2,500.00
165-0101	MAINTENANCE OF CONSTRUCTION EXIT	EA	1	$450.00	$ 450.00
165-0105	MAINTENANCE OF INLET SEDIMENT TRAP	EA	26	$55.00	$ 1,430.00
167-1000	WATER QUALITY MONITORING AND SAMPLING	EA	1	$425.00	$ 425.00
167-1500	WATER QUALITY INSPECTIONS	MO	12	$550.00	$ 6,600.00
171-0030	TEMPORARY SILT FENCE, TP C	LF	2500	$3.00	$ 7,500.00
700-6910	PERMANENT GRASSING	AC	1	$700.00	$ 700.00
700-7000	AGRICULTURAL LIME	TN	3	$55.00	$ 165.00
700-8000	FERTILIZER MIXED GRADE	TN	1	$400.00	$ 400.00
700-8100	FERTILIZER NITROGEN CONTENT	LB	50	$3.00	$ 150.00
700-9300	SOD	SY	200	$6.00	$ 1,200.00
716-2000	EROSION CONTROL MATS, SLOPES	SY	250	$1.00	$ 250.00
999-9999	RECONSTRUCT EXIST POND	EA	2	$80,000.00	$ 160,000.00
				SECTION SUBTOTAL:	**$ 192,895.00**

TOTAL ESTIMATE COST:	**$**	**2,798,985.00**
5% CEI	$	139,949.25
5% Construction Contgiency	$	146,946.71
Fuel & Asphalt Price Adjustment	$	32,249.12
TOTAL CONSTRUCTION COST ESTIMATE	**$**	**3,118,130.08**
Right of Way (Land Only)		$3,667,207.50
Right of Way (administration)		$198,925.00
subtotal Right of Way		$3,866,132.50
Relmb. Utilities (subject to prior rights claim)		$550,000.00
TOTAL PROJECT ESTIMATE		**$7,534,262.58**

PROJ. NO.		CALL NO.
P.I. NO.	00103085	
DATE	6/4/2015	

INDEX (TYPE)	DATE	INDEX
REG. UNLEADED	Jun-15	$ 2.681
DIESEL		$ 2.867
LIQUID AC		$466

Link to Fuel and AC Index:
http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx

LIQUID AC ADJUSTMENTS

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

Asphalt

Price Adjustment (PA)				**29847.3**	**$**	**29,847.30**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	745.60		
Monthly Asphalt Cement Price month project let (APL)			$	466.00		
Total Monthly Tonnage of asphalt cement (TMT)				106.75		

ASPHALT	Tons	%AC	AC ton
Leveling	750	5.0%	37.5
12.5 OGFC		5.0%	0
12.5 mm	875	5.0%	43.75
9.5 mm SP		5.0%	0
25 mm SP	340	5.0%	17
19 mm SP	170	5.0%	8.5
	2135		**106.75**

BITUMINOUS TACK COAT

Price Adjustment (PA)			**$**	**2,401.82**	**$**	**2,401.82**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	745.60		
Monthly Asphalt Cement Price month project let (APL)			$	466.00		
Total Monthly Tonnage of asphalt cement (TMT)				8.590201844		

Bitum Tack Gals	gals/ton	tons
2000	232.8234	8.59020184

PROJ. NO.		CALL NO.	
P.I. NO.	00103085		
DATE	6/4/2015		

BITUMINOUS TACK COAT (surface treatment)

Price Adjustment (PA)				**0**	**$ -**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	745.60	
Monthly Asphalt Cement Price month project let (APL)			$	466.00	
Total Monthly Tonnage of asphalt cement (TMT)				0	

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

TOTAL LIQUID AC ADJUSTMENT	**$**	**32,249.12**

GEORGIA DEPARTMENT OF TRANSPORTATION
PRELIMINARY ROW COST ESTIMATE SUMMARY

Date: 2/17/2015 Project:
Revised: County: Fulton
PI: 0010385
Description: Sandy Springs Circle Streetscape - Phase II
Project Termini: Hammond Drive to Mt. Vernon

Existing ROW: 75-85
Parcels: 11 Required ROW: 75-112

Land and Improvements		$3,667,207.50
Proximity Damage	*$0.00*	
Consequential Damage	*$0.00*	
Cost to Cures	*$0.00*	
Trade Fixtures	*$0.00*	
Improvements	*$0.00*	
Valuation Services		$0.00
Legal Services		$82,425.00
Relocation		$22,000.00
Demolition		$0.00
Administrative		$94,500.00
TOTAL ESTIMATED COSTS		$3,866,132.50
TOTAL ESTIMATED COSTS (ROUNDED)		***$3,867,000.00***

Preparation Credits	Hours	Signature

Prepared By: Brittany Schwartz CG#: 2/17/2015 (DATE)
Approved By: LaShone Alexander CG#: 286999 03/03/2015 (DATE)

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

Preliminary Utility Cost (Estimate)

Date: 3/17/2015

P.I. Number: 0010385

County: Fulton County

Project Description: Sandy Springs Circle Streetscape – Phase II

Below is a preliminary utility cost estimate for each utility with facilities potentially located within the project limits on Sandy Springs Circle from Hammond Drive to Mt. Vernon Highway.

Facility Owner	Type of Relocation	Non-Reimbursable	Reimbursable
Georgia Power	Overhead to underground		$400,000
Georgia Power Transmission	N/A		
Atlanta Gas Light	Gas Main		$50,000
City of Atlanta Watershed Management	Fire Hydrant, Water Meter Boxes, Valve Boxes		$25,000
Comcast	Fiber		$25,000
AT&T	Fiber		$50,000
Zayo	N/A		
Verizon	N/A		
City of Sandy Springs– traffic signal	N/A		
TOTAL Non-reimbursable Cost		**$0**	
TOTAL Reimbursable Cost			**$550,000**

Prepared By: Beth Ann Schwartz

Beth Ann Schwartz
Michael Baker International

James, Xavier

From: Cunningham, Clyde
Sent: Thursday, April 02, 2015 2:30 PM
To: Thompson, Andrew; Schwartz, Beth Ann
Cc: James, Xavier; Martin, Marty
Subject: RE: PI 0010385 Utility Cost Estimate Concurrence Request

The utility costs on the estimate appear to be in line with the scope of work for this project.

Thanks,
Clyde

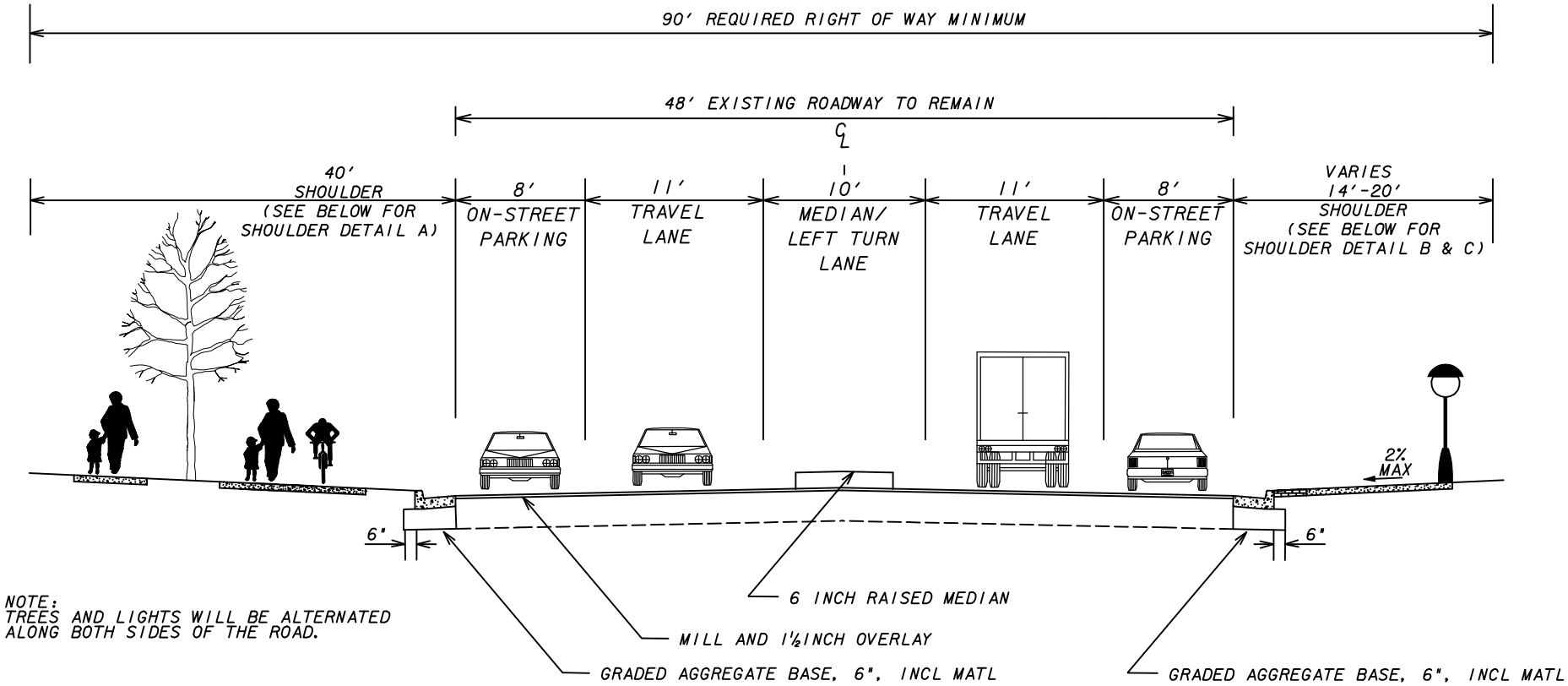
From: Thompson, Andrew [mailto:AThompson@SandySpringsga.gov]
Sent: Thursday, April 02, 2015 2:24 PM
To: Schwartz, Beth Ann
Cc: Cunningham, Clyde; James, Xavier; Martin, Marty
Subject: Re: PI 0010385 Utility Cost Estimate Concurrence Request

We are still discussing costs with Georgia Power and also the utility costs are currently carried by the City.
Thx
Andrew

Sent from my iPhone

On Apr 2, 2015, at 2:20 PM, "Thompson, Andrew" <AThompson@SandySpringsga.gov> wrote:

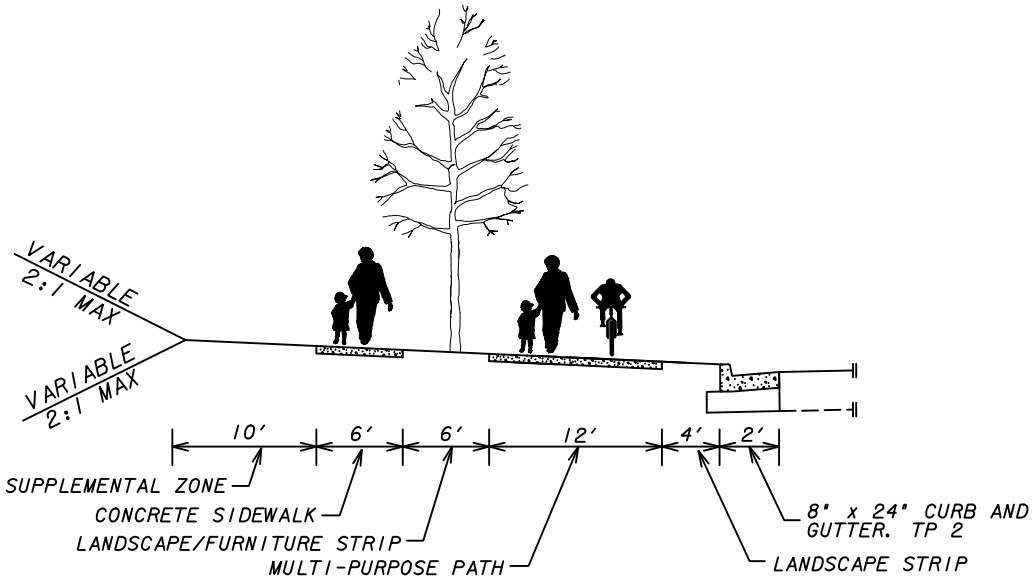
> We have spoken to Georgia Power and their initial cost assessment of the overhead relocation is reimbursable under the franchise agreement.
> Andrew
>
> Sent from my iPhone
>
> On Apr 2, 2015, at 1:44 PM, "Schwartz, Beth Ann" <BSchwartz@mbakerintl.com> wrote:
>
>> Andrew would be better to speak on this issue but it's my understanding it has to do with the city's franchise agreements.
>>
>> Beth Ann
>
> **Beth Ann Schwartz** | Technical Manager | Michael Baker International
> 420 Technology Parkway, Suite 150 | Norcross, GA |30092 | [O] 678-966-6602 | [M] 770-634-6718
> bschwartz@mbakerintl.com | www.mbakerintl.com
>
> <image001.png>
>
> ---
>
> **From:** Cunningham, Clyde [mailto:ccunningham@dot.ga.gov]
> **Sent:** Thursday, April 02, 2015 1:41 PM



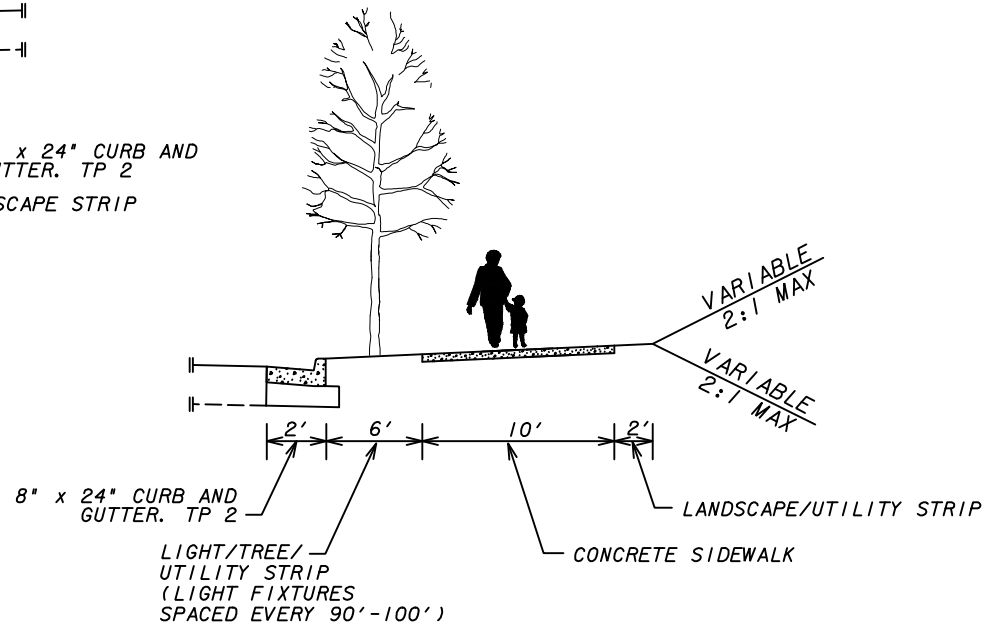
NOTE:
TREES AND LIGHTS WILL BE ALTERNATED ALONG BOTH SIDES OF THE ROAD.

Baker	MICHAEL BAKER JR. INC. 420 TECHNOLOGY PARKWAY SUITE 150 NORCROSS, GEORGIA 30092 (770) 263-9118	NOT TO SCALE	TYPICAL SECTION SANDY SPRINGS CIRCLE STREETSCAPE - PHASE II PI 0010385 CITY OF SANDY SPRINGS

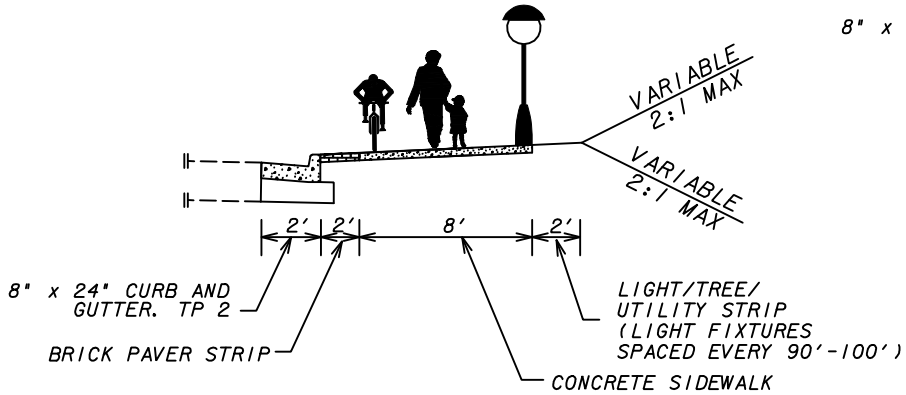
...\Concept\typxs_concept.dgn 2/11/2015 1:03:42 PM



TYPICAL SHOULDER DETAIL A



TYPICAL SHOULDER DETAIL B



TYPICAL SHOULDER DETAIL C
(ADJACENT TO HERITAGE GREEN PARK)

Baker	MICHAEL BAKER JR. INC. 420 TECHNOLOGY PARKWAY SUITE 150 NORCROSS, GEORGIA 30092 (770) 263-9118	NOT TO SCALE	TYPICAL SECTION SANDY SPRINGS CIRCLE STREETSCAPE - PHASE II PI 0010385 CITY OF SANDY SPRINGS

...\Concept\typxs_concept.dgn 2/11/2015 1:04:09 PM

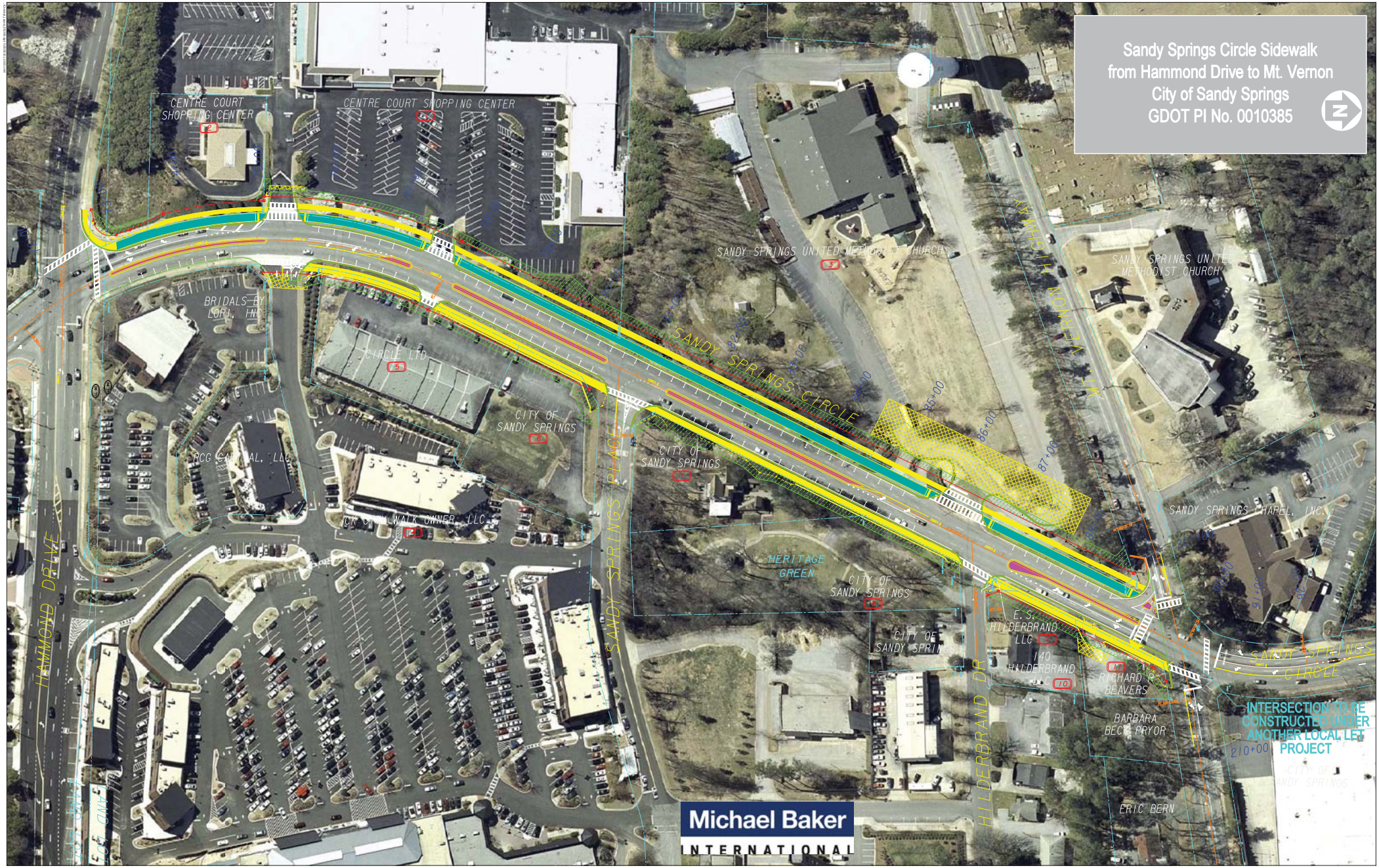
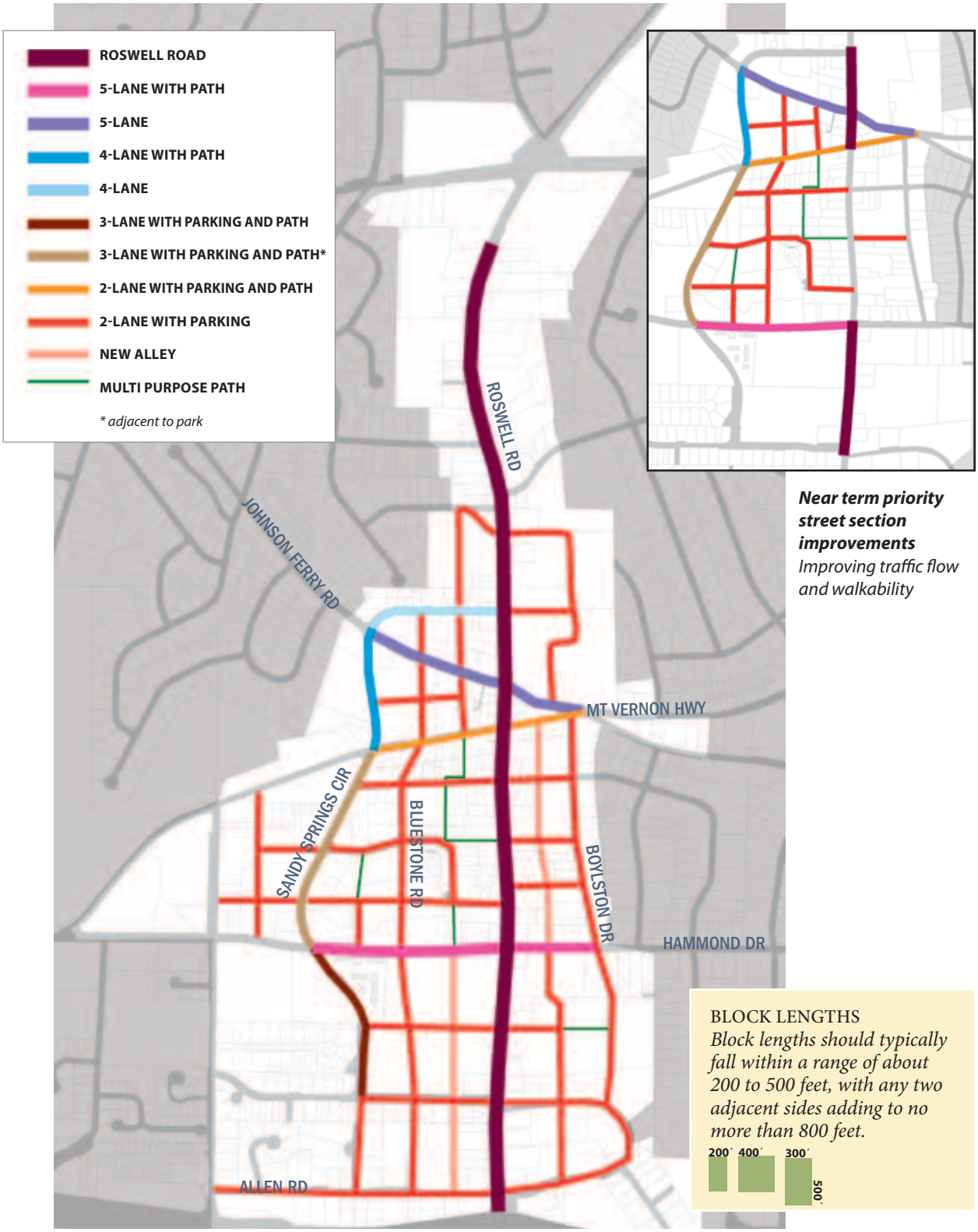

Sandy Springs Circle Sidewalk
from Hammond Drive to Mt. Vernon
City of Sandy Springs
GDOT PI No. 0010385
CENTRE COURT SHOPPING CENTER
CENTRE COURT SHOPPING CENTER
BRIDALS BY LORI, INC
CIRCLE LTD
CITY OF SANDY SPRINGS
RCG CAPITAL, LLC
CK CITY WALK OWNER, LLC
SANDY SPRINGS UNITED METHODIST CHURCH
SANDY SPRINGS UNITED METHODIST CHURCH
SANDY SPRINGS CHAPEL, INC.
SANDY SPRINGS CIRCLE
HAMMOND DRIVE
SANDY SPRINGS PLACE
MT. VERNON HIGHWAY
HILDERBRAND DR
HERITAGE GREEN
CITY OF SANDY SPRINGS
E. S. HILDERBRAND LLC
140 HILDERBRAND
RICHARD R. BEAVERS
BARBARA BECK PRYOR
ERIC BERN
INTERSECTION TO BE CONSTRUCTED UNDER ANOTHER LOCAL LET PROJECT
Michael Baker
INTERNATIONAL

Exhibit 19: Long-Term Illustrative Development Scenario

The long-term illustrative plan adds more detail south of Hammond to reflect developer interest in the area and incorporates an extensive pedestrian network of multipurpose paths and comfortable sidewalks to facilitate connections between areas.

Exhibit 21: Proposed Street Section Key Diagram



Near term priority street section improvements
Improving traffic flow and walkability

Grid network expansion as opportunity allows*—In most cases, new street corridors would be created as part of mixed-use redevelopment on large sites through partnership between the owner and the City. Lines indicate recommended street section type based on existing right of way and design goals.*

Exhibit 22: Street Section Comparison

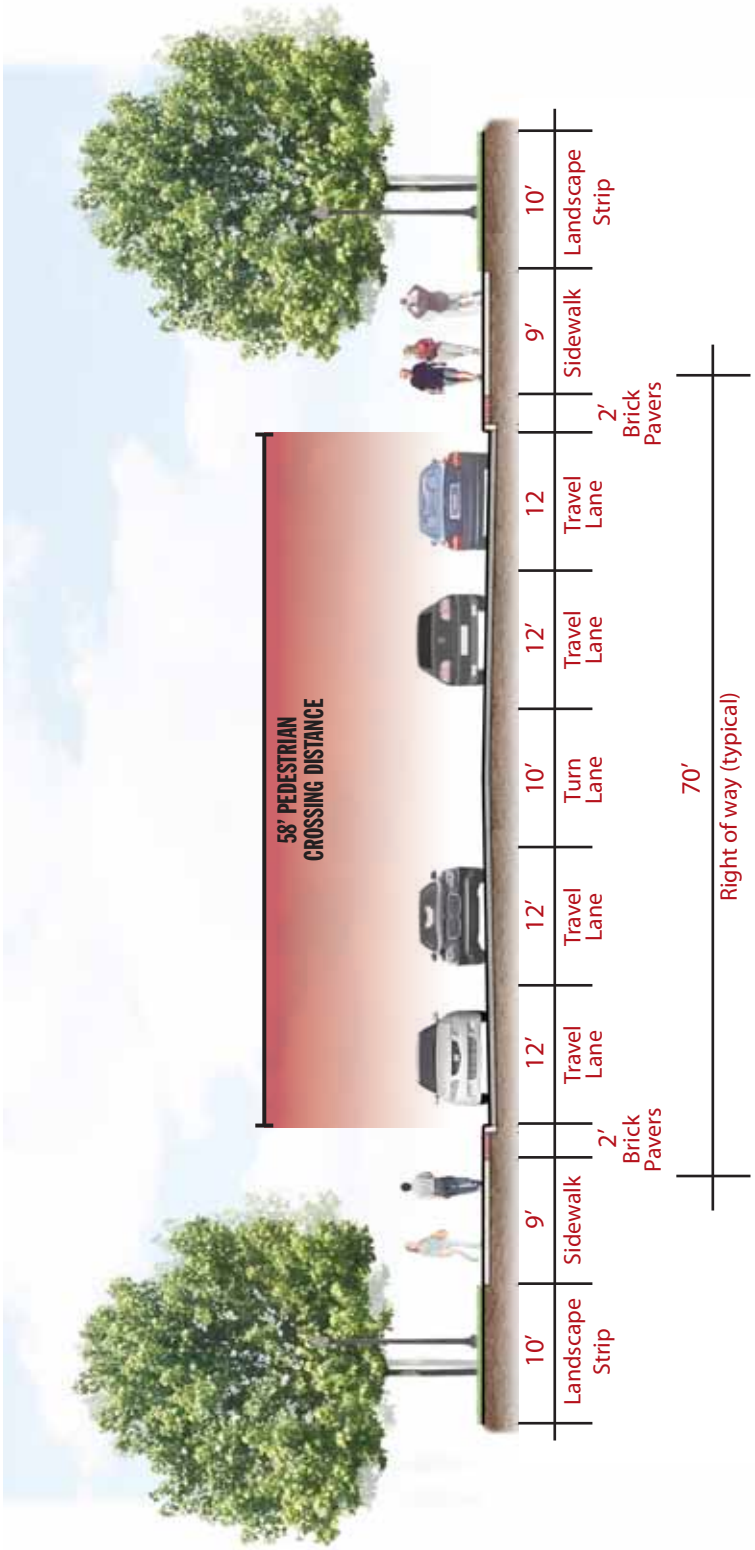
STREET SECTION	ROW WIDTH	TRAVEL LANES	MEDIAN?	BIKE?	MIN PED CROSSING DISTANCE	MAX PED CROSSING DISTANCE	EXAMPLE STREET APPLICATION	SIDE-WALK WIDTH
Roswell Road	65′	4	Yes	No	20′	50′	Roswell Road	9′
5-lane with path	110′	4	No	Off-street path	60′	60′	Sandy Springs Circle, Hammond Drive	10′
5-lane	91′	4	No	No	55′	55′	Johnson Ferry Road	10′
4-lane with path	94′	4	No	Off-street path	48	48′	Sandy Springs Circle	10′
4-lane with path—alternate	76′	4	No	Off-street path	48	48′	Sandy Springs Circle	6′
4-lane	84′	4	No	No	48′	48′	Sandy Springs Circle	10′
3-lane with parking and path*	86′	2	Yes	Off-street path	11′	48′	Sandy Springs Circle	8′
3-lane with parking and path	92′	2	Yes	Off-street path	11′	48′	Sandy Springs Circle	10′
2-lane with parking and path	84′	2	No	Off-street path	20′	36′	Mt. Vernon Highway	10′
2-lane with parking	74′	2	No	Sharrow	22′	38′	Hildebrand Drive	10′
new alley	36′	2	No	No	24′	24′	Where shown on diagram	6′
multipurpose path	20′	N/A	No	Yes	12′	12′	Where shown on diagram	12′

** adjacent to park or green space*

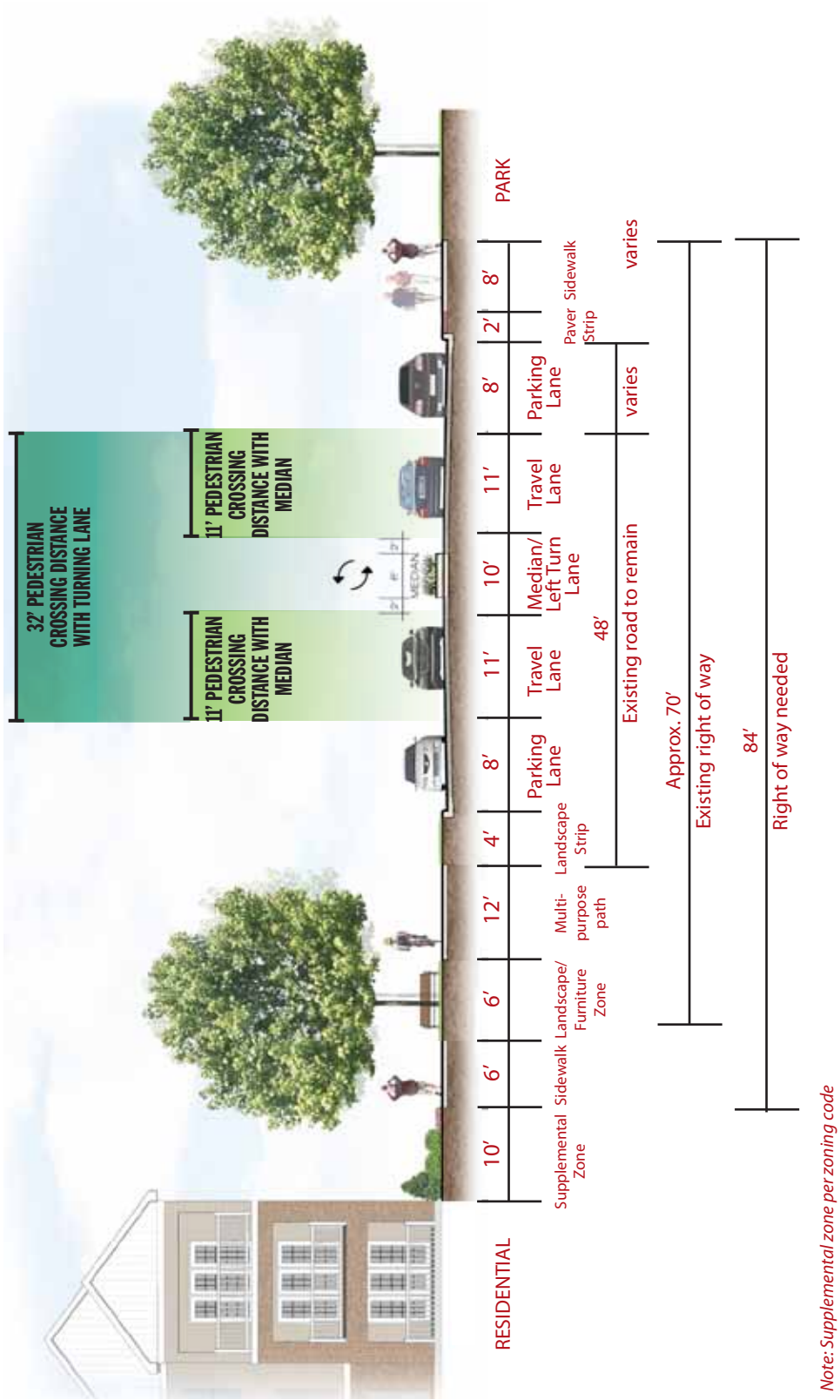
Where possible, City Center will have "Complete Streets," an emerging national best practice that maximizes travel options by accommodating pedestrians, bicycles, cars, and bus transit (in appropriate locations).

NOTE
Street sections contained in this appendix show the typical conditions recommended along selected streets. Application may require minor variations in these elements and dimensions to accommodate right-of-way limitations in some locations, special needs at intersections, or other specific conditions. Transitions between section types along a street or at intersecting streets should emphasize continuity of travel lanes, sidewalks, crosswalks and off-street paths.

Existing Sandy Springs Circle Street Section

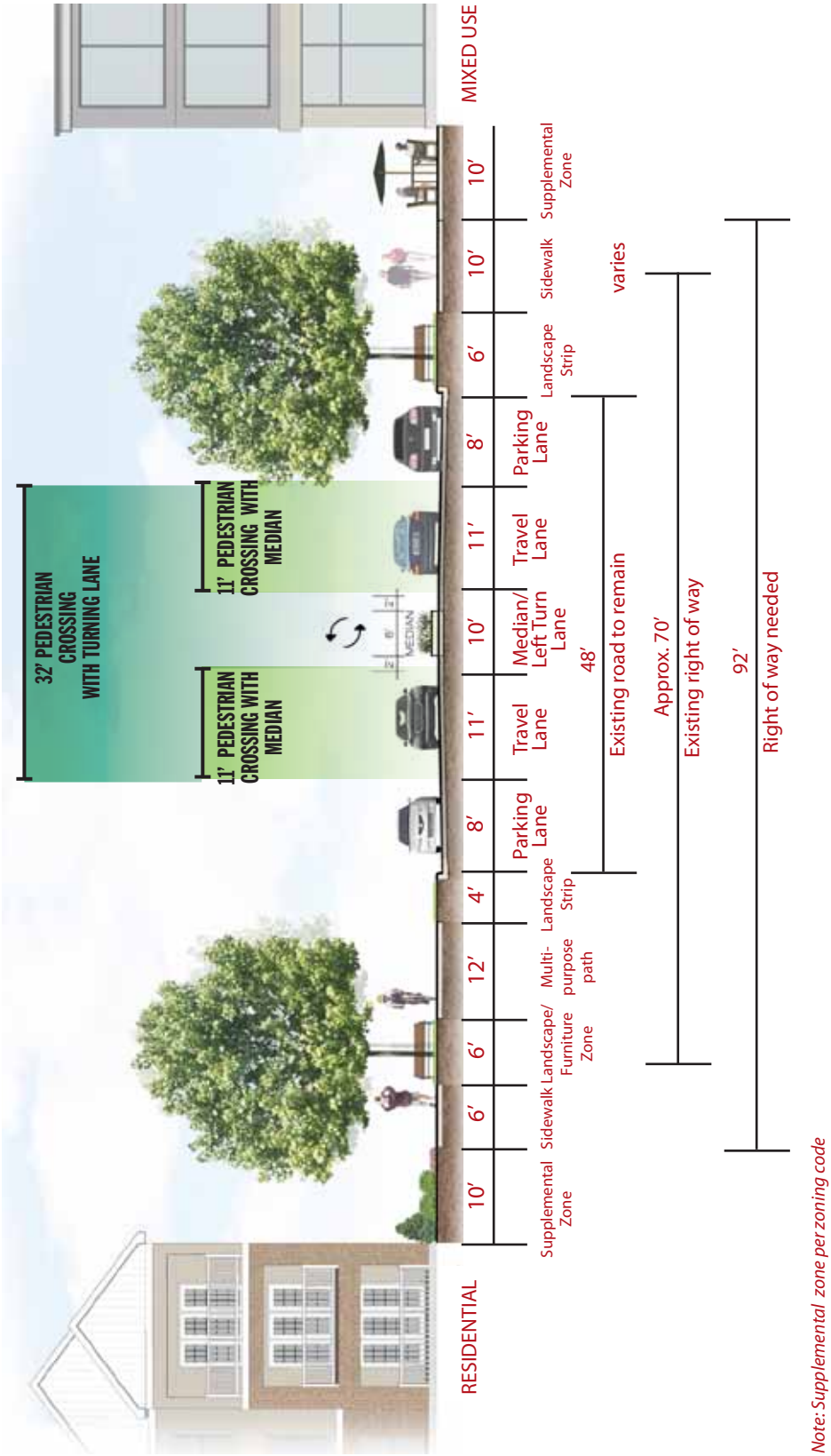


Proposed 3-Lane With Parking And Path (Adjacent to Park) Street Section



Note: Supplemental zone per zoning code

Proposed 3-Lane with parking and path street section



Note: Supplemental zone per zoning code

Michael Baker INTERNATIONAL

MEMORANDUM

TO: Beth Ann Schwartz, P.E.

FROM: Kelly M. Cory, P.E., PTOE
Bill Ruhsam, P.E., PTOE

SUBJECT: Sandy Springs Circle Streetscape Phase II
Revised Concept

DATE: March 25, 2015

This memo documents the brief analysis conducted by Michael Baker International (Baker) regarding the operational impacts of constructing the revised concept of the Sandy Springs Circle Streetscape Phase II project. This revised concept proposes to construct sidewalks, a multi-use trail and on-street parking, which will reduce the number of travel lanes on Sandy Springs Circle between Hammond Drive and Mt Vernon Highway.

Traffic Volumes & Signal Timing

Georgia Department of Transportation approved traffic volumes from February 27, 2015 were used in this analysis. These are included in Appendix A.

As the intersections of Sandy Springs Circle at Hammond Drive and at Mt Vernon Highway are part of coordinated signal systems on Hammond Drive and Mt Vernon, obtaining the existing signal timings for these intersections is essential to providing an accurate operational analysis. A set of existing signal timings for the intersection of Sandy Springs Circle at Mt Vernon Highway had previously been obtained from the City of Sandy Springs in 2010. However, no such data was available for the intersection of Sandy Springs Circle at Hammond Drive.

To proceed with the analysis, the following assumptions were made regarding the existing signal timing at these intersections:

- Sandy Springs Circle at Hammond Drive
    - 180 second cycle length in AM Peak Hour
    - 190 second cycle length in PM Peak Hour

- All Red of 2.0 seconds per phase
- Yellow of 3.5 seconds per phase
- Pedestrian walk time of 7.0 seconds per phase
- Pedestrian clearance time calculated using 3.5 ft/sec walking speed

- Sandy Springs Circle at Mt Vernon Highway
  - Existing signal timing matches that obtained in 2010
    - 180 second cycle length in the AM Peak Hour
    - 190 second cycle length in the PM Peak Hour

Synchro Analysis

Two northbound and three southbound lanes are currently provided on Sandy Springs Circle between Hammond Drive and Sandy Springs Place. Between Sandy Springs Place and Mt Vernon Highway there are two lanes in the northbound and in two lanes the southbound direction of Sandy Springs.

Using the above described geometry, traffic volumes and signal timing assumptions, Existing Conditions *Synchro* models were set up for the study area. The resulting Existing Levels of Service (LOS) for each intersection, for each peak hour, are shown in Table 1. The Synchro reports are contained in Appendix B.

Table 1: Existing Intersection LOS

	Existing Level of Service (delay in sec/veh)	
	AM Peak	PM Peak
Sandy Springs Circle at Hammond Drive	C (30.0)	D (36.1)
Sandy Springs Circle at Mt Vernon Highway	D (47.6)	D (54.3)

Open Year 2018 and Design Year 2038 volumes were then used to create a No Build *Synchro* model with the existing roadway geometry and traffic control, with cycle lengths preserved. The resulting No Build LOS for each intersection, during each peak hour, are presented in Table 2. The Synchro reports are contained in Appendix B.

Table 2: No Build Intersection LOS

	No Build Level of Service (delay in sec/veh)			
	Open Year 2018		Design Year 2038	
	AM Peak	PM Peak	AM Peak	PM Peak
Sandy Springs Circle at Hammond Drive	C (31.1)	D (38.3)	C (31.7)	D (39.7)
Sandy Springs Circle at Mt Vernon Highway	E (59.1)	E (57.0)	F (97.5)	F (82.4)

The Revised Concept of the Sandy Springs Circle Streetscape Phase II project proposes to reduce the number of travel lanes between Mt Vernon Highway and Hammond Drive to one through lane in each direction. At the intersection of Mt Vernon Highway, the southbound approach of Sandy Springs Circle will be revised to provide one exclusive right turn lane, one exclusive through lane and one exclusive left turn lane. The northbound approach of Sandy Springs Circle will include one exclusive left turn lane and one shared through/right turn lane.

At its intersection with Hammond Drive, the southbound approach of Sandy Springs Circle will provide one exclusive right turn lane and one shared through/left turn lane. The lane assignments for the northbound approach of Sandy Springs Circle at Hammond Drive will be revised to provide one shared through/left turn lane and one exclusive right turn lane.

Build Conditions *Synchro* models were developed to evaluate the intersection operations with the proposed geometry. The resulting Build LOS for each intersection, during each peak hour of both the Open Year 2018 and Design Year 2038, are shown in Table 3. The Synchro reports are contained in Appendix B.

Table 3: Build Intersection LOS

	Build Level of Service (delay in sec/veh)			
	Open Year 2018		Design Year 2038	
	AM Peak	PM Peak	AM Peak	PM Peak
Sandy Springs Circle at Hammond Drive	C (34.1)	D (46.6)	C (34.7)	D (42.9)
Sandy Springs Circle at Mt Vernon Highway	D (41.6)	E (59.9)	D (45.2)	E (78.7)

As shown above, in the Open Year 2018 there is no change in LOS for either intersection during the afternoon peak hour with the proposed through lane reduction on Sandy Springs Circle. The LOS in the morning peak hour of the Build condition of Hammond Drive at Sandy Springs Circle also remains unchanged from the No-Build condition in 2018. At the intersection of Sandy Springs Circle at Mt Vernon Highway the LOS improves from E to D during the morning peak hour.

In the Design Year 2038 there is no change is LOS for the intersection of Sandy Springs Circle at Hammond Drive in either the morning or afternoon peak hour. At the intersection of Sandy Springs Circle and Mt Vernon Highway, the LOS for both the morning and afternoon peak hours are improved over the No Build Condition.

Arterial Analysis

The existing average daily traffic (ADT) on Sandy Springs Circle is 7,850 vehicles per day (vpd). This ADT was compared to the Florida Department of Transportation Generalized Service Volumes for interrupted flow, urban facilities. The existing volume corresponds to a LOS C for a two-lane undivided roadway. The ADT will be 8,800 by the Design Year 2038, and will still be comfortably within the LOS C bracket (6,570 to 13,320 vpd), being considerably lower than the LOS D threshold (13,320 vpd) and significantly below the threshold value for LOS E (14,040 vpd). The generalized service table is shown in Appendix C.

Summary

In summary, the reduction in through lanes on Sandy Springs Circle between Hammond Drive and Mt Vernon Road will not have a negative impact on operations of this segment of roadway. In addition, the geometric revisions proposed at the intersection of Sandy Springs Circle and Mt Vernon Highway will actually improve operations during both the morning and afternoon peak hours.

Appendix A – GDOT Approved Traffic Volumes

Department of Transportation
State of Georgia

INTERDEPARTMENT CORRESPONDENCE

FILE Fulton County
P.I. # 0010385

OFFICE Planning

DATE February 27, 2015

FROM Cynthia L. VanDyke, State Transportation Planning Administrator

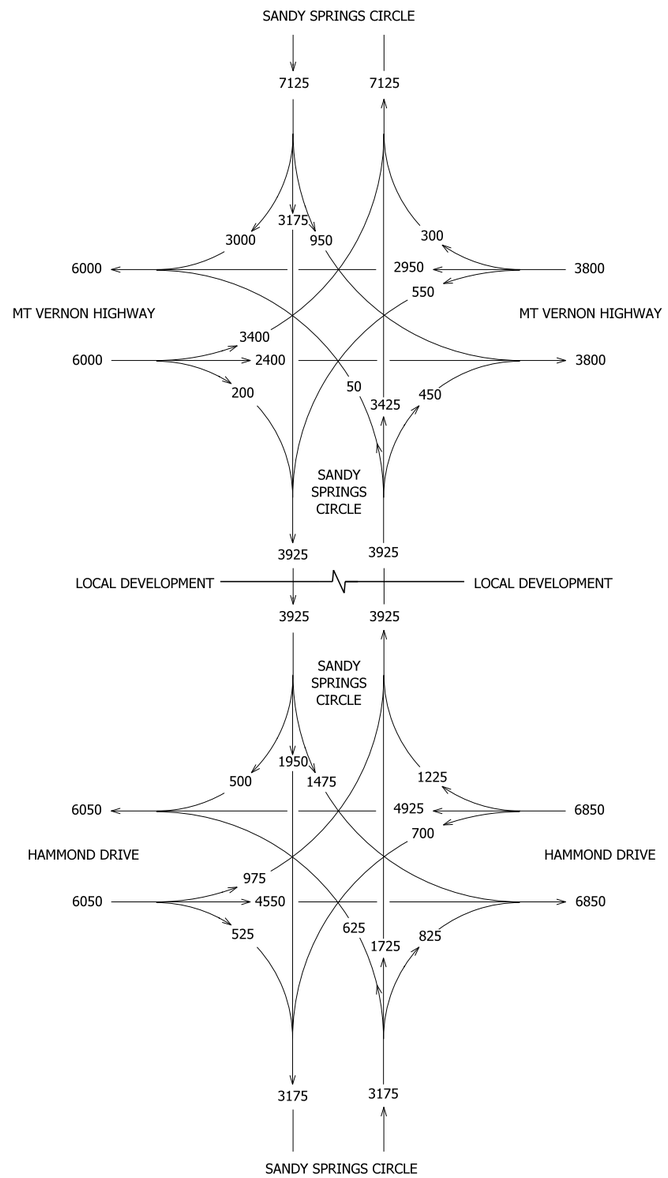
TO Albert Shelby, State Program Delivery Engineer
Attention: Xavier James

SUBJECT **Review Design Traffic** for CS 243/Sandy Springs from CS 262/Hammond Drive to SR 9 – PH II – LCI.

We reviewed Design Traffic for the above project. The Design Traffic is approved based on the information furnished.

If you have any questions concerning this information please contact Abby Ebodaghe at (404) 631-1923.

CLV/AFE



N

Sandy Springs Circle

24-Hr Trucks	1.5%
SU	1.0%
COMB	0.5%

PI 0010385
FULTON CO.
FEB 2015 WMR/KMC

EXISTING 2015 ADT
XXX - ADT

Baker
3595 ENGINEERING DRIVE
NORCROSS, GEORGIA 30092
(770) 263-9118

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION

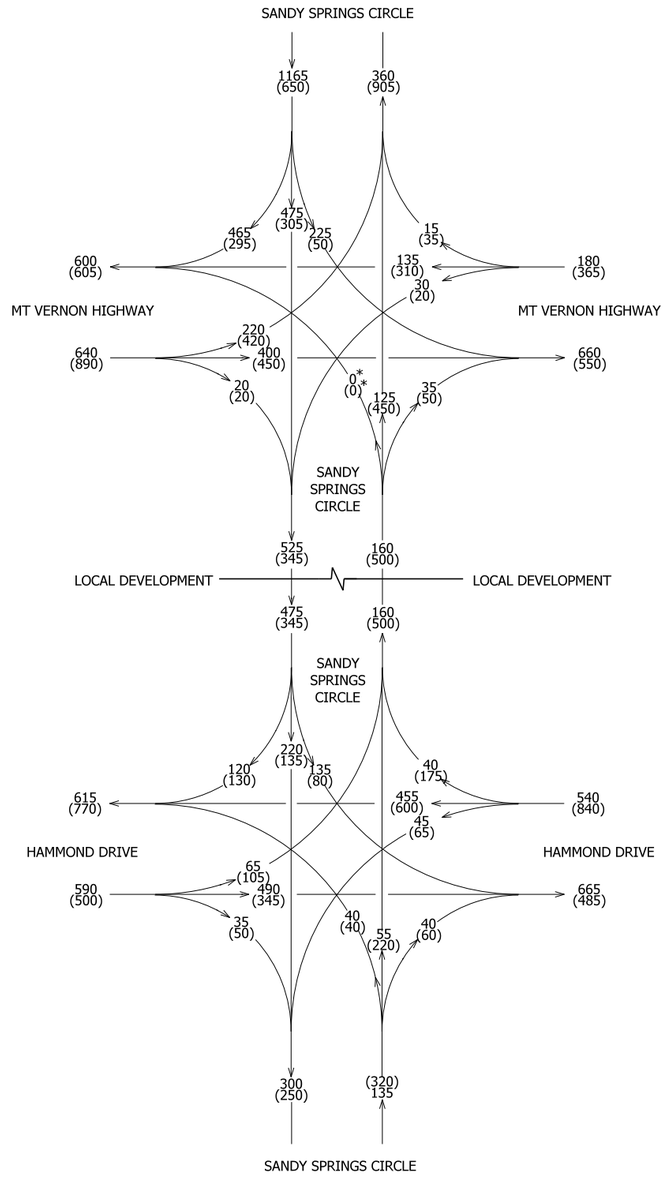
OFFICE:

TRAFFIC DIAGRAM

SANDY SPRINGS CIRCLE
2015 ADT

DRAWING No.
10-001

12/14/2012 GPLN



Sandy Springs Circle

Peak Hr Trucks	2.0%
SU	1.5%
COMB	0.5%

* LEFT TURN MOVEMENT IS PROHIBITED

PI 0010385
FULTON CO.
FEB 2015 WMR/KMC

EXISTING 2015 PEAK HOUR
XXX - AM
(XXX) - PM

Baker
3595 ENGINEERING DRIVE
NORCROSS, GEORGIA 30092
(770) 263-9118

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION

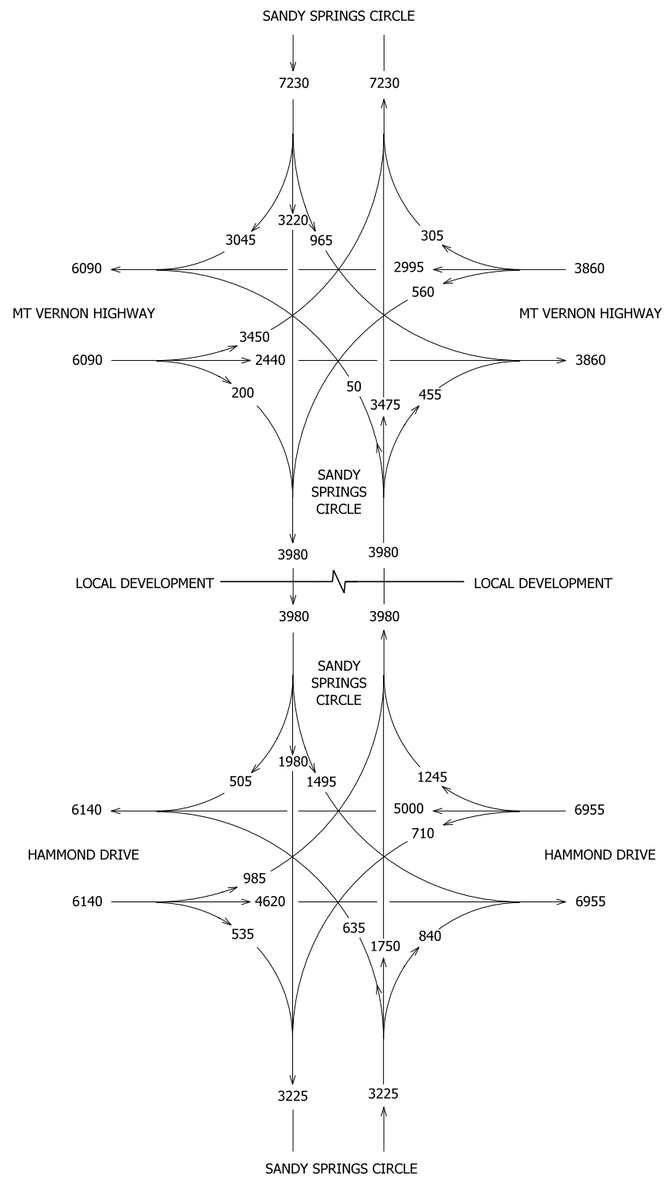
OFFICE:

TRAFFIC DIAGRAM

SANDY SPRINGS CIRCLE
2015 AM/PM PEAK

DRAWING No.
10-002

12/14/2012 GPLN



N

Sandy Springs Circle

24-Hr Trucks	1.5%
SU	1.0%
COMB	0.5%

PI 0010385
FULTON CO.
FEB 2015 WMR/KMC

2018 NO BUILD/BUILD ADT
XXX - ADT

Baker
3595 ENGINEERING DRIVE
NORCROSS, GEORGIA 30092
(770) 263-9118

REVISION DATES

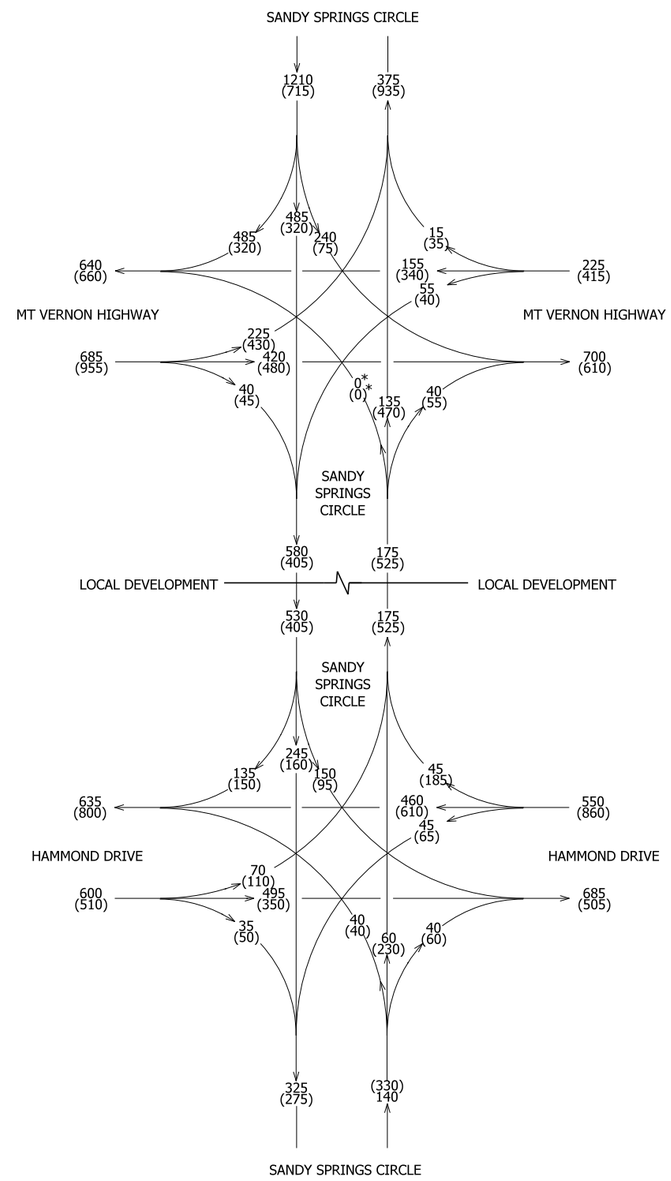
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE:

TRAFFIC DIAGRAM

SANDY SPRINGS CIRCLE
2018 ADT

DRAWING No.
10-003

12/14/2012 GPLN



Sandy Springs Circle

Peak Hr Trucks	2.0%
SU	1.5%
COMB	0.5%

* LEFT TURN MOVEMENT IS PROHIBITED

PI 0010385
FULTON CO.

FEB 2015 WMR/KMC

2018 NO BUILD/BUILD PEAK HOUR
XXX - AM
(XXX) - PM

Baker
3595 ENGINEERING DRIVE
NORCROSS, GEORGIA 30092
(770) 263-9118

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION

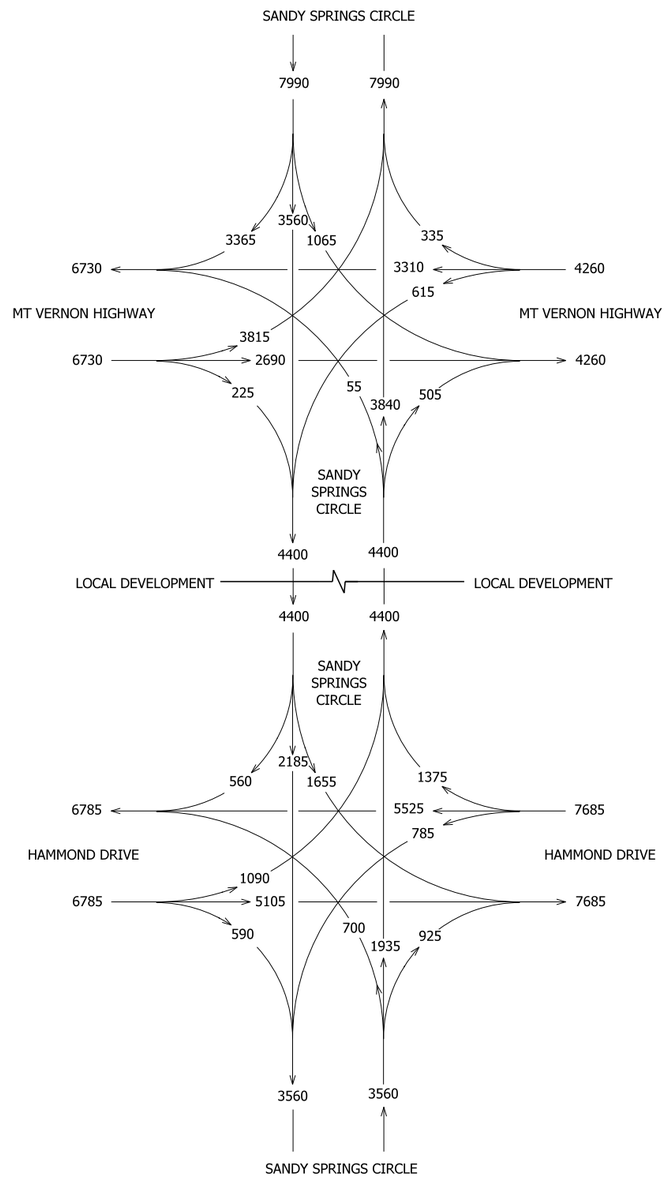
OFFICE:

TRAFFIC DIAGRAM

SANDY SPRINGS CIRCLE
2018 AM/PM PEAK

DRAWING No. 10-004

12/14/2012 GPLN



N

Sandy Springs Circle

24-Hr Trucks	1.5%
SU	1.0%
COMB	0.5%

PI 0010385
FULTON CO.
FEB 2015 WMR/KMC

2038 NO BUILD/BUILD ADT
XXX - ADT

Baker
3595 ENGINEERING DRIVE
NORCROSS, GEORGIA 30092
(770) 263-9118

REVISION DATES

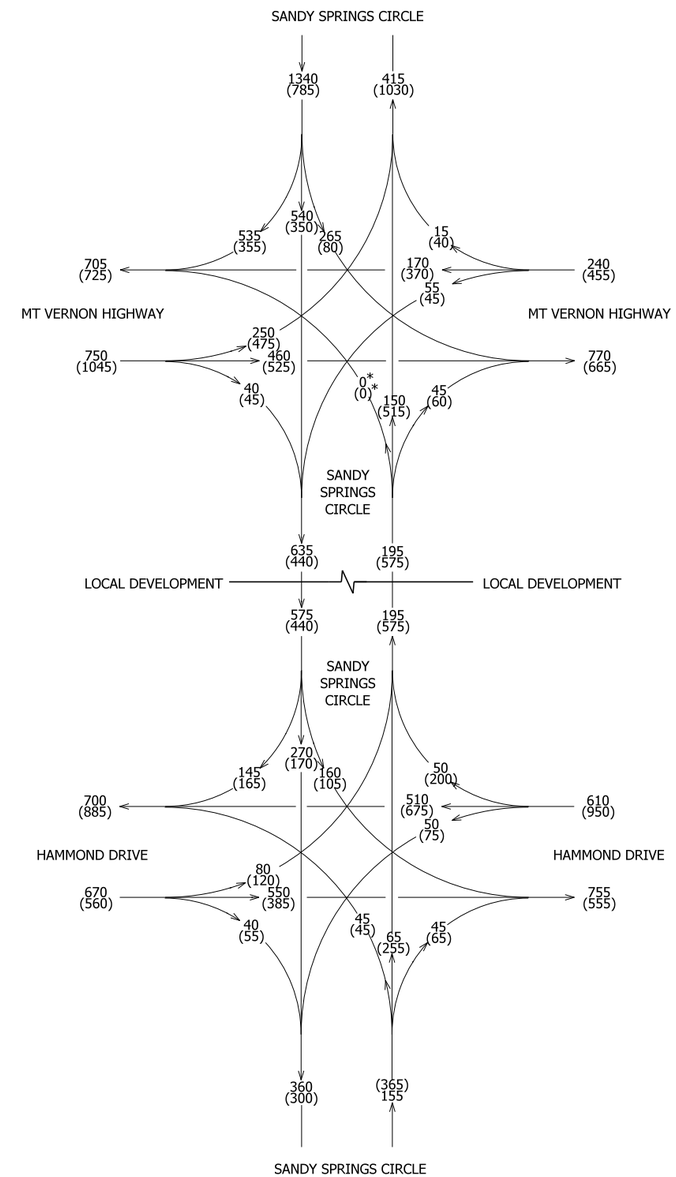
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE:

TRAFFIC DIAGRAM

SANDY SPRINGS CIRCLE
2038 ADT

DRAWING No.
10-005

12/14/2012 GPLN



N

Sandy Springs Circle

Peak Hr Trucks	2.0%
SU	1.5%
COMB	0.5%

* LEFT TURN MOVEMENT IS PROHIBITED

PI 0010385
FULTON CO.
FEB 2015 WMR/KMC

2038 NO BUILD/BUILD PEAK HOUR
XXX - AM
(XXX) - PM

Baker
3595 ENGINEERING DRIVE
NORCROSS, GEORGIA 30092
(770) 263-9118

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION

OFFICE:

TRAFFIC DIAGRAM

SANDY SPRINGS CIRCLE
2038 AM/PM PEAK

DRAWING No. 10-006

12/14/2012 GPLN

Appendix B – Synchro Reports

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	490	35	45	455	40	40	55	40	135	220	120
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	1.00
Frt		0.99		1.00	0.99			0.96			1.00	0.85
Flt Protected		0.99		0.95	1.00			0.99			0.98	1.00
Satd. Flow (prot)		3305		1676	3313			3158			3290	1500
Flt Permitted		0.80		0.39	1.00			0.63			0.77	1.00
Satd. Flow (perm)		2663		694	3313			2033			2567	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	533	38	49	495	43	43	60	43	147	239	130
RTOR Reduction (vph)	0	1	0	0	2	0	0	35	0	0	0	106
Lane Group Flow (vph)	0	641	0	49	536	0	0	111	0	0	386	24
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)		135.3		135.3	135.3			33.7			33.7	33.7
Effective Green, g (s)		135.3		135.3	135.3			33.7			33.7	33.7
Actuated g/C Ratio		0.75		0.75	0.75			0.19			0.19	0.19
Clearance Time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		2001		521	2490			380			480	280
v/s Ratio Prot					0.16							
v/s Ratio Perm		c0.24		0.07				0.05			c0.15	0.02
v/c Ratio		0.32		0.09	0.22			0.29			0.80	0.09
Uniform Delay, d1		7.3		6.0	6.6			62.9			70.0	60.4
Progression Factor		1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2		0.4		0.4	0.2			0.4			9.5	0.1
Delay (s)		7.7		6.3	6.8			63.3			79.4	60.6
Level of Service		A		A	A			E			E	E
Approach Delay (s)		7.7			6.8			63.3			74.7	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	400	20	30	135	15	0	125	35	225	475	465
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.94	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1676	1752		1676	1739			3243			3122	
Flt Permitted	0.50	1.00		0.23	1.00			1.00			0.83	
Satd. Flow (perm)	884	1752		405	1739			3243			2619	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	435	22	33	147	16	0	136	38	245	516	505
RTOR Reduction (vph)	0	1	0	0	3	0	0	10	0	0	45	0
Lane Group Flow (vph)	239	456	0	33	160	0	0	164	0	0	1221	0
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2						4		
Actuated Green, G (s)	72.0	58.4		60.6	53.0			96.4			95.8	
Effective Green, g (s)	72.0	58.4		60.6	53.0			96.4			95.8	
Actuated g/C Ratio	0.40	0.32		0.34	0.29			0.54			0.53	
Clearance Time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Vehicle Extension (s)	3.0	6.0		3.0	6.0			3.0			3.0	
Lane Grp Cap (vph)	413	568		190	512			1736			1393	
v/s Ratio Prot	c0.04	c0.26		0.01	0.09			0.05				
v/s Ratio Perm	0.19			0.05							c0.47	
v/c Ratio	0.58	0.80		0.17	0.31			0.09			0.88	
Uniform Delay, d1	41.1	55.5		42.8	49.3			20.4			36.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.0	11.4		0.4	1.6			0.1			8.0	
Delay (s)	43.0	66.9		43.2	50.9			20.6			44.9	
Level of Service	D	E		D	D			C			D	
Approach Delay (s)		58.7			49.6			20.6			44.9	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	345	50	65	600	175	40	220	60	135	220	120
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	1.00
Frt		0.99		1.00	0.97			0.97			1.00	0.85
Flt Protected		0.99		0.95	1.00			0.99			0.98	1.00
Satd. Flow (prot)		3269		1676	3239			3239			3290	1500
Flt Permitted		0.60		0.44	1.00			0.72			0.61	1.00
Satd. Flow (perm)		1996		770	3239			2345			2062	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	375	54	71	652	190	43	239	65	147	239	130
RTOR Reduction (vph)	0	3	0	0	9	0	0	13	0	0	0	103
Lane Group Flow (vph)	0	540	0	71	833	0	0	334	0	0	386	27
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)		139.4		139.4	139.4			39.6			39.6	39.6
Effective Green, g (s)		139.4		139.4	139.4			39.6			39.6	39.6
Actuated g/C Ratio		0.73		0.73	0.73			0.21			0.21	0.21
Clearance Time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		1464		564	2376			488			429	312
v/s Ratio Prot					0.26							
v/s Ratio Perm		c0.27		0.09				0.14			c0.19	0.02
v/c Ratio		0.37		0.13	0.35			0.69			1.04dl	0.09
Uniform Delay, d1		9.2		7.4	9.1			69.4			73.3	60.6
Progression Factor		1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2		0.7		0.5	0.4			4.0			21.1	0.1
Delay (s)		10.0		7.9	9.5			73.4			94.4	60.7
Level of Service		A		A	A			E			F	E
Approach Delay (s)		10.0			9.4			73.4			85.9	
Approach LOS		A			A			E			F	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	420	450	20	20	310	35	0	450	50	50	305	295
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.99		1.00	0.98			0.99			0.93	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1676	1753		1676	1738			3303			3113	
Flt Permitted	0.28	1.00		0.48	1.00			1.00			0.71	
Satd. Flow (perm)	499	1753		839	1738			3303			2210	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	457	489	22	22	337	38	0	489	54	54	332	321
RTOR Reduction (vph)	0	1	0	0	3	0	0	5	0	0	88	0
Lane Group Flow (vph)	457	510	0	22	372	0	0	538	0	0	619	0
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2						4		
Actuated Green, G (s)	122.2	112.0		69.9	65.7			56.2			55.6	
Effective Green, g (s)	122.2	112.0		69.9	65.7			56.2			55.6	
Actuated g/C Ratio	0.64	0.59		0.37	0.35			0.30			0.29	
Clearance Time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Vehicle Extension (s)	3.0	6.0		3.0	6.0			3.0			3.0	
Lane Grp Cap (vph)	638	1033		327	600			976			646	
v/s Ratio Prot	c0.19	0.29		0.00	0.21			0.16				
v/s Ratio Perm	c0.27			0.02							c0.28	
v/c Ratio	0.72	0.49		0.07	0.62			0.55			0.96	
Uniform Delay, d1	22.4	22.6		38.5	51.8			56.3			66.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.8	1.7		0.1	4.8			0.7			25.2	
Delay (s)	26.2	24.3		38.5	56.5			57.0			91.3	
Level of Service	C	C		D	E			E			F	
Approach Delay (s)		25.2			55.5			57.0			91.3	
Approach LOS		C			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	54.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	495	35	45	460	45	40	60	40	150	245	135
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	1.00
Frt		0.99		1.00	0.99			0.96			1.00	0.85
Flt Protected		0.99		0.95	1.00			0.99			0.98	1.00
Satd. Flow (prot)		3304		1676	3308			3165			3290	1500
Flt Permitted		0.79		0.39	1.00			0.63			0.76	1.00
Satd. Flow (perm)		2625		681	3308			2030			2559	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	538	38	49	500	49	43	65	43	163	266	147
RTOR Reduction (vph)	0	1	0	0	2	0	0	34	0	0	0	117
Lane Group Flow (vph)	0	651	0	49	547	0	0	117	0	0	429	30
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)		131.9		131.9	131.9			37.1			37.1	37.1
Effective Green, g (s)		131.9		131.9	131.9			37.1			37.1	37.1
Actuated g/C Ratio		0.73		0.73	0.73			0.21			0.21	0.21
Clearance Time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		1923		499	2424			418			527	309
v/s Ratio Prot					0.17							
v/s Ratio Perm		c0.25		0.07				0.06			c0.17	0.02
v/c Ratio		0.34		0.10	0.23			0.28			0.81	0.10
Uniform Delay, d1		8.5		6.9	7.7			60.2			68.2	57.9
Progression Factor		1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2		0.5		0.4	0.2			0.4			9.4	0.1
Delay (s)		9.0		7.3	7.9			60.6			77.5	58.0
Level of Service		A		A	A			E			E	E
Approach Delay (s)		9.0			7.9			60.6			72.5	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	420	40	55	155	15	0	135	40	240	485	485
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.94	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1676	1742		1676	1742			3239			3120	
Flt Permitted	0.49	1.00		0.24	1.00			1.00			0.82	
Satd. Flow (perm)	857	1742		426	1742			3239			2594	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	457	43	60	168	16	0	147	43	261	527	527
RTOR Reduction (vph)	0	2	0	0	2	0	0	14	0	0	62	0
Lane Group Flow (vph)	245	498	0	60	182	0	0	176	0	0	1253	0
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2						4		
Actuated Green, G (s)	80.4	65.3		65.8	56.7			88.0			87.4	
Effective Green, g (s)	80.4	65.3		65.8	56.7			88.0			87.4	
Actuated g/C Ratio	0.45	0.36		0.37	0.32			0.49			0.49	
Clearance Time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Vehicle Extension (s)	3.0	6.0		3.0	6.0			3.0			3.0	
Lane Grp Cap (vph)	466	631		218	548			1583			1259	
v/s Ratio Prot	c0.05	c0.29		0.01	0.10			0.05				
v/s Ratio Perm	0.18			0.09							c0.48	
v/c Ratio	0.53	0.79		0.28	0.33			0.11			1.00	
Uniform Delay, d1	33.1	51.2		40.0	47.2			24.9			46.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.1	9.7		0.7	1.6			0.0			24.1	
Delay (s)	34.1	60.9		40.6	48.8			24.9			70.2	
Level of Service	C	E		D	D			C			E	
Approach Delay (s)		52.1			46.8			24.9			70.2	
Approach LOS		D			D			C			E	

Intersection Summary			
HCM 2000 Control Delay	59.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	350	50	65	610	185	40	230	60	95	160	150
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	1.00
Frt		0.99		1.00	0.97			0.97			1.00	0.85
Flt Protected		0.99		0.95	1.00			0.99			0.98	1.00
Satd. Flow (prot)		3269		1676	3236			3242			3292	1500
Flt Permitted		0.60		0.44	1.00			0.74			0.58	1.00
Satd. Flow (perm)		1983		772	3236			2417			1932	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	380	54	71	663	201	43	250	65	103	174	163
RTOR Reduction (vph)	0	3	0	0	9	0	0	13	0	0	0	137
Lane Group Flow (vph)	0	551	0	71	855	0	0	345	0	0	277	26
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)		149.0		149.0	149.0			30.0			30.0	30.0
Effective Green, g (s)		149.0		149.0	149.0			30.0			30.0	30.0
Actuated g/C Ratio		0.78		0.78	0.78			0.16			0.16	0.16
Clearance Time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		1555		605	2537			381			305	236
v/s Ratio Prot					0.26							
v/s Ratio Perm		c0.28		0.09				0.14			c0.14	0.02
v/c Ratio		0.35		0.12	0.34			0.91			1.24dl	0.11
Uniform Delay, d1		6.1		4.9	6.0			78.6			78.6	68.5
Progression Factor		1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2		0.6		0.4	0.4			24.4			28.9	0.2
Delay (s)		6.8		5.3	6.4			103.0			107.5	68.8
Level of Service		A		A	A			F			F	E
Approach Delay (s)		6.8			6.3			103.0			93.2	
Approach LOS		A			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	430	480	45	40	340	35	0	470	55	75	320	320
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.98			0.93	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1676	1742		1676	1740			3300			3112	
Flt Permitted	0.22	1.00		0.45	1.00			1.00			0.68	
Satd. Flow (perm)	387	1742		786	1740			3300			2117	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	467	522	49	43	370	38	0	511	60	82	348	348
RTOR Reduction (vph)	0	1	0	0	3	0	0	4	0	0	77	0
Lane Group Flow (vph)	467	570	0	43	405	0	0	567	0	0	701	0
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2						4		
Actuated Green, G (s)	109.4	96.8		68.0	61.4			69.0			68.4	
Effective Green, g (s)	109.4	96.8		68.0	61.4			69.0			68.4	
Actuated g/C Ratio	0.58	0.51		0.36	0.32			0.36			0.36	
Clearance Time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Vehicle Extension (s)	3.0	6.0		3.0	6.0			3.0			3.0	
Lane Grp Cap (vph)	512	887		312	562			1198			762	
v/s Ratio Prot	c0.20	0.33		0.00	0.23			0.17				
v/s Ratio Perm	c0.32			0.04							c0.33	
v/c Ratio	0.91	0.64		0.14	0.72			0.47			0.92	
Uniform Delay, d1	38.2	34.0		40.2	56.7			46.5			58.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	20.6	3.6		0.2	7.8			0.3			16.3	
Delay (s)	58.7	37.5		40.4	64.5			46.8			74.5	
Level of Service	E	D		D	E			D			E	
Approach Delay (s)		47.1			62.2			46.8			74.5	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	57.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	550	40	50	510	50	45	65	45	160	270	145
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	1.00
Frt		0.99		1.00	0.99			0.96			1.00	0.85
Flt Protected		0.99		0.95	1.00			0.99			0.98	1.00
Satd. Flow (prot)		3303		1676	3308			3161			3292	1500
Flt Permitted		0.76		0.35	1.00			0.61			0.75	1.00
Satd. Flow (perm)		2540		620	3308			1941			2522	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	598	43	54	554	54	49	71	49	174	293	158
RTOR Reduction (vph)	0	2	0	0	3	0	0	30	0	0	0	123
Lane Group Flow (vph)	0	726	0	54	605	0	0	139	0	0	467	35
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)		129.5		129.5	129.5			39.5			39.5	39.5
Effective Green, g (s)		129.5		129.5	129.5			39.5			39.5	39.5
Actuated g/C Ratio		0.72		0.72	0.72			0.22			0.22	0.22
Clearance Time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		1827		446	2379			425			553	329
v/s Ratio Prot					0.18							
v/s Ratio Perm		c0.29		0.09				0.07			c0.19	0.02
v/c Ratio		0.40		0.12	0.25			0.33			0.84	0.11
Uniform Delay, d1		9.9		7.8	8.7			59.1			67.3	56.1
Progression Factor		1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2		0.6		0.6	0.3			0.5			11.3	0.1
Delay (s)		10.6		8.3	8.9			59.5			78.6	56.3
Level of Service		B		A	A			E			E	E
Approach Delay (s)		10.6			8.9			59.5			73.0	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	460	40	55	170	15	0	150	45	265	540	535
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.94	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1676	1744		1676	1744			3237			3121	
Flt Permitted	0.49	1.00		0.22	1.00			1.00			0.81	
Satd. Flow (perm)	859	1744		386	1744			3237			2559	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	500	43	60	185	16	0	163	49	288	587	582
RTOR Reduction (vph)	0	2	0	0	2	0	0	13	0	0	53	0
Lane Group Flow (vph)	272	541	0	60	199	0	0	199	0	0	1404	0
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2						4		
Actuated Green, G (s)	85.0	70.1		72.1	63.2			83.4			82.8	
Effective Green, g (s)	85.0	70.1		72.1	63.2			83.4			82.8	
Actuated g/C Ratio	0.47	0.39		0.40	0.35			0.46			0.46	
Clearance Time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Vehicle Extension (s)	3.0	6.0		3.0	6.0			3.0			3.0	
Lane Grp Cap (vph)	480	679		218	612			1499			1177	
v/s Ratio Prot	c0.05	c0.31		0.01	0.11			0.06				
v/s Ratio Perm	0.22			0.10							c0.55	
v/c Ratio	0.57	0.80		0.28	0.33			0.13			1.19	
Uniform Delay, d1	32.0	48.7		36.9	42.8			27.6			48.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.5	9.4		0.7	1.4			0.0			95.4	
Delay (s)	33.5	58.1		37.5	44.2			27.7			144.0	
Level of Service	C	E		D	D			C			F	
Approach Delay (s)		49.9			42.7			27.7			144.0	
Approach LOS		D			D			C			F	

Intersection Summary			
HCM 2000 Control Delay	97.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	385	55	75	675	200	45	255	65	105	170	165
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	1.00
Frt		0.99		1.00	0.97			0.97			1.00	0.85
Flt Protected		0.99		0.95	1.00			0.99			0.98	1.00
Satd. Flow (prot)		3268		1676	3238			3243			3290	1500
Flt Permitted		0.58		0.41	1.00			0.72			0.56	1.00
Satd. Flow (perm)		1914		724	3238			2363			1881	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	418	60	82	734	217	49	277	71	114	185	179
RTOR Reduction (vph)	0	2	0	0	8	0	0	12	0	0	0	148
Lane Group Flow (vph)	0	606	0	82	943	0	0	385	0	0	299	31
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)		146.2		146.2	146.2			32.8			32.8	32.8
Effective Green, g (s)		146.2		146.2	146.2			32.8			32.8	32.8
Actuated g/C Ratio		0.77		0.77	0.77			0.17			0.17	0.17
Clearance Time (s)		5.5		5.5	5.5			5.5			5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		1472		557	2491			407			324	258
v/s Ratio Prot					0.29							
v/s Ratio Perm		c0.32		0.11				c0.16			0.16	0.02
v/c Ratio		0.41		0.15	0.38			0.94			1.36dl	0.12
Uniform Delay, d1		7.4		5.7	7.1			77.7			77.4	66.4
Progression Factor		1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2		0.9		0.6	0.4			30.7			30.7	0.2
Delay (s)		8.2		6.3	7.6			108.4			108.1	66.6
Level of Service		A		A	A			F			F	E
Approach Delay (s)		8.2			7.5			108.4			92.6	
Approach LOS		A			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	39.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	475	525	45	45	370	40	0	515	60	80	350	355
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.98			0.93	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1676	1744		1676	1739			3301			3109	
Flt Permitted	0.21	1.00		0.24	1.00			1.00			0.68	
Satd. Flow (perm)	367	1744		423	1739			3301			2129	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	516	571	49	49	402	43	0	560	65	87	380	386
RTOR Reduction (vph)	0	2	0	0	3	0	0	4	0	0	72	0
Lane Group Flow (vph)	516	618	0	49	442	0	0	621	0	0	781	0
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2						4		
Actuated Green, G (s)	97.7	84.7		72.8	65.8			80.7			80.1	
Effective Green, g (s)	97.7	84.7		72.8	65.8			80.7			80.1	
Actuated g/C Ratio	0.51	0.45		0.38	0.35			0.42			0.42	
Clearance Time (s)	6.3	6.3		6.0	5.3			5.3			5.9	
Vehicle Extension (s)	3.0	6.0		3.0	6.0			3.0			3.0	
Lane Grp Cap (vph)	371	777		208	602			1402			897	
v/s Ratio Prot	c0.19	0.35		0.01	0.25			0.19				
v/s Ratio Perm	c0.52			0.08							c0.37	
v/c Ratio	1.39	0.80		0.24	0.73			0.44			0.87	
Uniform Delay, d1	37.1	45.2		39.6	54.5			38.7			50.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	191.7	8.3		0.6	7.8			0.2			9.3	
Delay (s)	228.8	53.5		40.2	62.2			38.9			59.5	
Level of Service	F	D		D	E			D			E	
Approach Delay (s)		133.1			60.0			38.9			59.5	
Approach LOS		F			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	82.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	111.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	495	35	45	460	45	40	60	40	150	245	135
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt		0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected		0.99		0.95	1.00			0.98	1.00		0.98	1.00
Satd. Flow (prot)		3304		1676	3308			1730	1500		1732	1500
Flt Permitted		0.78		0.36	1.00			0.50	1.00		0.80	1.00
Satd. Flow (perm)		2582		635	3308			882	1500		1415	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	538	38	49	500	49	43	65	43	163	266	147
RTOR Reduction (vph)	0	2	0	0	3	0	0	0	28	0	0	93
Lane Group Flow (vph)	0	650	0	49	546	0	0	108	15	0	429	54
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)		106.9		106.9	106.9			62.1	62.1		62.1	62.1
Effective Green, g (s)		106.9		106.9	106.9			62.1	62.1		62.1	62.1
Actuated g/C Ratio		0.59		0.59	0.59			0.35	0.35		0.35	0.35
Clearance Time (s)		5.5		5.5	5.5			5.5	5.5		5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1533		377	1964			304	517		488	517
v/s Ratio Prot					0.16							
v/s Ratio Perm		c0.25		0.08				0.12	0.01		c0.30	0.04
v/c Ratio		0.42		0.13	0.28			0.36	0.03		0.88	0.10
Uniform Delay, d1		19.8		16.1	17.8			44.0	39.0		55.4	40.1
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.9		0.7	0.4			0.7	0.0		16.3	0.1
Delay (s)		20.7		16.8	18.1			44.7	39.0		71.8	40.1
Level of Service		C		B	B			D	D		E	D
Approach Delay (s)		20.7			18.0			43.1			63.7	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	420	40	55	155	15	0	135	40	240	485	485
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.3	6.3		6.0	5.3			5.3		5.9	5.9	5.9
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99			0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1742		1676	1742			1705		1676	1765	1500
Flt Permitted	0.44	1.00		0.20	1.00			1.00		0.61	1.00	1.00
Satd. Flow (perm)	772	1742		349	1742			1705		1072	1765	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	457	43	60	168	16	0	147	43	261	527	527
RTOR Reduction (vph)	0	2	0	0	2	0	0	5	0	0	0	182
Lane Group Flow (vph)	245	498	0	60	182	0	0	185	0	261	527	345
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)	72.1	58.4		53.6	45.9			96.3		95.7	95.7	95.7
Effective Green, g (s)	72.1	58.4		53.6	45.9			96.3		95.7	95.7	95.7
Actuated g/C Ratio	0.40	0.32		0.30	0.25			0.53		0.53	0.53	0.53
Clearance Time (s)	6.3	6.3		6.0	5.3			5.3		5.9	5.9	5.9
Vehicle Extension (s)	3.0	6.0		3.0	6.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	414	565		160	444			912		569	938	797
v/s Ratio Prot	c0.07	c0.29		0.02	0.10			0.11			c0.30	
v/s Ratio Perm	0.17			0.10						0.24		0.23
v/c Ratio	0.59	0.88		0.38	0.41			0.20		0.46	0.56	0.43
Uniform Delay, d1	38.8	57.5		48.2	55.8			21.8		26.1	28.1	25.6
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	2.3	17.8		1.5	2.8			0.5		2.7	2.4	1.7
Delay (s)	41.1	75.3		49.7	58.6			22.3		28.8	30.6	27.3
Level of Service	D	E		D	E			C		C	C	C
Approach Delay (s)		64.0			56.4			22.3			28.9	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	350	50	65	610	185	40	230	60	95	160	150
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt		0.99		1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected		0.99		0.95	1.00			0.99	1.00		0.98	1.00
Satd. Flow (prot)		3269		1676	3236			1752	1500		1732	1500
Flt Permitted		0.58		0.42	1.00			0.72	1.00		0.47	1.00
Satd. Flow (perm)		1930		739	3236			1263	1500		827	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	380	54	71	663	201	43	250	65	103	174	163
RTOR Reduction (vph)	0	3	0	0	10	0	0	0	46	0	0	116
Lane Group Flow (vph)	0	551	0	71	854	0	0	293	19	0	277	47
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)		124.3		124.3	124.3			54.7	54.7		54.7	54.7
Effective Green, g (s)		124.3		124.3	124.3			54.7	54.7		54.7	54.7
Actuated g/C Ratio		0.65		0.65	0.65			0.29	0.29		0.29	0.29
Clearance Time (s)		5.5		5.5	5.5			5.5	5.5		5.5	5.5
Vehicle Extension (s)		6.0		6.0	6.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1262		483	2117			363	431		238	431
v/s Ratio Prot					0.26							
v/s Ratio Perm		c0.29		0.10				0.23	0.01		c0.34	0.03
v/c Ratio		0.44		0.15	0.40			0.81	0.04		1.16	0.11
Uniform Delay, d1		15.9		12.6	15.4			62.8	48.8		67.7	49.7
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		1.1		0.6	0.6			12.4	0.0		109.8	0.1
Delay (s)		17.0		13.2	16.0			75.1	48.8		177.5	49.8
Level of Service		B		B	B			E	D		F	D
Approach Delay (s)		17.0			15.8			70.3			130.2	
Approach LOS		B			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	46.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	430	480	45	40	340	35	0	470	55	75	320	320
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.3	6.3		6.0	5.3			5.3		5.9	5.9	5.9
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99			0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1742		1676	1740			1737		1676	1765	1500
Flt Permitted	0.13	1.00		0.45	1.00			1.00		0.15	1.00	1.00
Satd. Flow (perm)	228	1742		794	1740			1737		267	1765	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	467	522	49	43	370	38	0	511	60	82	348	348
RTOR Reduction (vph)	0	2	0	0	2	0	0	2	0	0	0	201
Lane Group Flow (vph)	467	569	0	43	406	0	0	569	0	82	348	147
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)	104.5	92.9		56.0	50.4			73.9		73.3	73.3	73.3
Effective Green, g (s)	104.5	92.9		56.0	50.4			73.9		73.3	73.3	73.3
Actuated g/C Ratio	0.55	0.49		0.29	0.27			0.39		0.39	0.39	0.39
Clearance Time (s)	6.3	6.3		6.0	5.3			5.3		5.9	5.9	5.9
Vehicle Extension (s)	3.0	6.0		3.0	6.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	497	851		260	461			675		103	680	578
v/s Ratio Prot	c0.24	0.33		0.00	0.23			c0.33			0.20	
v/s Ratio Perm	c0.28			0.04						0.31		0.10
v/c Ratio	0.94	0.67		0.17	0.88			0.84		0.80	0.51	0.25
Uniform Delay, d1	52.4	36.9		48.5	66.9			52.8		51.7	44.7	39.7
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	25.7	4.2		0.3	20.7			9.4		33.3	0.7	0.2
Delay (s)	78.1	41.0		48.8	87.6			62.1		85.1	45.3	40.0
Level of Service	E	D		D	F			E		F	D	D
Approach Delay (s)		57.7			83.9			62.1			47.1	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	59.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	101.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	550	40	50	510	50	45	65	45	160	270	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt		0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected		0.99		0.95	1.00			0.98	1.00		0.98	1.00
Satd. Flow (prot)		3487		1770	3492			1825	1583		1829	1583
Flt Permitted		0.74		0.32	1.00			0.44	1.00		0.79	1.00
Satd. Flow (perm)		2581		599	3492			821	1583		1474	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	598	43	54	554	54	49	71	49	174	293	158
RTOR Reduction (vph)	0	2	0	0	3	0	0	0	31	0	0	90
Lane Group Flow (vph)	0	726	0	54	605	0	0	120	18	0	467	68
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)		104.5		104.5	104.5			64.5	64.5		64.5	64.5
Effective Green, g (s)		104.5		104.5	104.5			64.5	64.5		64.5	64.5
Actuated g/C Ratio		0.58		0.58	0.58			0.36	0.36		0.36	0.36
Clearance Time (s)		5.5		5.5	5.5			5.5	5.5		5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1498		347	2027			294	567		528	567
v/s Ratio Prot					0.17							
v/s Ratio Perm		c0.28		0.09				0.15	0.01		c0.32	0.04
v/c Ratio		0.48		0.16	0.30			0.41	0.03		0.88	0.12
Uniform Delay, d1		22.0		17.4	19.2			43.4	37.5		54.2	38.7
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		1.1		1.0	0.4			0.9	0.0		16.1	0.1
Delay (s)		23.2		18.4	19.5			44.3	37.5		70.4	38.8
Level of Service		C		B	B			D	D		E	D
Approach Delay (s)		23.2			19.4			42.3			62.4	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	460	40	55	170	15	0	150	45	265	540	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3		6.0	5.3			5.3		5.9	5.9	5.9
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99			0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1841		1770	1841			1798		1770	1863	1583
Flt Permitted	0.52	1.00		0.33	1.00			1.00		0.53	1.00	1.00
Satd. Flow (perm)	972	1841		608	1841			1798		995	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	500	43	60	185	16	0	163	49	288	587	582
RTOR Reduction (vph)	0	2	0	0	2	0	0	7	0	0	0	245
Lane Group Flow (vph)	272	541	0	60	199	0	0	205	0	288	587	337
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)	101.0	86.6		84.1	75.7			67.4		66.8	66.8	66.8
Effective Green, g (s)	101.0	86.6		84.1	75.7			67.4		66.8	66.8	66.8
Actuated g/C Ratio	0.56	0.48		0.47	0.42			0.37		0.37	0.37	0.37
Clearance Time (s)	6.3	6.3		6.0	5.3			5.3		5.9	5.9	5.9
Vehicle Extension (s)	3.0	6.0		3.0	6.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	634	885		338	774			673		369	691	587
v/s Ratio Prot	c0.05	c0.29		0.01	0.11			0.11			c0.32	
v/s Ratio Perm	0.19			0.07						0.29		0.21
v/c Ratio	0.43	0.61		0.18	0.26			0.30		0.78	0.85	0.57
Uniform Delay, d1	21.2	34.3		27.9	33.9			39.8		50.1	52.0	45.2
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	3.1		0.3	0.8			0.3		10.2	9.6	1.4
Delay (s)	21.7	37.5		28.2	34.7			40.0		60.4	61.6	46.6
Level of Service	C	D		C	C			D		E	E	D
Approach Delay (s)		32.2			33.2			40.0			55.4	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	385	55	75	675	200	45	255	65	105	170	165
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00		0.95	0.95
Frt		0.99		1.00	0.97			1.00	0.85		0.99	0.85
Flt Protected		0.99		0.95	1.00			0.99	1.00		0.98	1.00
Satd. Flow (prot)		3268		1676	3238			1752	1500		1633	1425
Flt Permitted		0.55		0.38	1.00			0.72	1.00		0.51	1.00
Satd. Flow (perm)		1826		666	3238			1267	1500		853	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	418	60	82	734	217	49	277	71	114	185	179
RTOR Reduction (vph)	0	4	0	0	12	0	0	0	46	0	1	83
Lane Group Flow (vph)	0	604	0	82	939	0	0	326	25	0	316	78
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)		110.9		110.9	110.9			68.1	68.1		68.1	68.1
Effective Green, g (s)		110.9		110.9	110.9			68.1	68.1		68.1	68.1
Actuated g/C Ratio		0.58		0.58	0.58			0.36	0.36		0.36	0.36
Clearance Time (s)		5.5		5.5	5.5			5.5	5.5		5.5	5.5
Vehicle Extension (s)		6.0		6.0	6.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1065		388	1889			454	537		305	510
v/s Ratio Prot					0.29							
v/s Ratio Perm		c0.33		0.12				0.26	0.02		c0.37	0.05
v/c Ratio		0.57		0.21	0.50			0.72	0.05		1.04	0.15
Uniform Delay, d1		24.6		18.8	23.2			52.7	39.8		61.0	41.4
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		2.2		1.2	0.9			5.4	0.0		60.9	0.1
Delay (s)		26.8		20.0	24.1			58.0	39.8		121.9	41.5
Level of Service		C		C	C			E	D		F	D
Approach Delay (s)		26.8			23.8			54.8			94.8	
Approach LOS		C			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	42.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	475	525	45	45	370	40	0	515	60	80	350	355
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.3	6.3		6.0	5.3			5.3		5.9	5.9	5.9
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99			0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1744		1676	1739			1737		1676	1765	1500
Flt Permitted	0.07	1.00		0.39	1.00			1.00		0.11	1.00	1.00
Satd. Flow (perm)	130	1744		696	1739			1737		192	1765	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	516	571	49	49	402	43	0	560	65	87	380	386
RTOR Reduction (vph)	0	2	0	0	2	0	0	2	0	0	0	211
Lane Group Flow (vph)	516	618	0	49	443	0	0	623	0	87	380	175
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)	103.1	90.2		56.0	49.1			75.3		74.7	74.7	74.7
Effective Green, g (s)	103.1	90.2		56.0	49.1			75.3		74.7	74.7	74.7
Actuated g/C Ratio	0.54	0.47		0.29	0.26			0.40		0.39	0.39	0.39
Clearance Time (s)	6.3	6.3		6.0	5.3			5.3		5.9	5.9	5.9
Vehicle Extension (s)	3.0	6.0		3.0	6.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	466	827		240	449			688		75	693	589
v/s Ratio Prot	c0.28	0.35		0.01	0.25			0.36			0.22	
v/s Ratio Perm	c0.32			0.05						c0.45		0.12
v/c Ratio	1.11	0.75		0.20	0.99			0.90		1.16	0.55	0.30
Uniform Delay, d1	61.5	40.6		48.7	70.1			54.0		57.6	44.6	39.6
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	74.2	6.1		0.4	39.2			15.4		153.6	0.9	0.3
Delay (s)	135.7	46.8		49.1	109.3			69.4		211.2	45.5	39.9
Level of Service	F	D		D	F			E		F	D	D
Approach Delay (s)		87.1			103.3			69.4			59.9	
Approach LOS		F			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	78.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	109.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Appendix C – Florida DOT Generalized Service Volume (Table 1)

TABLE 1

Generalized **Annual Average Daily** Volumes for Florida's **Urbanized Areas**

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	16,800	17,700	**
4	Divided	*	37,900	39,800	**
6	Divided	*	58,400	59,900	**
8	Divided	*	78,800	80,100	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	7,300	14,800	15,600
4	Divided	*	14,500	32,400	33,800
6	Divided	*	23,300	50,000	50,900
8	Divided	*	32,000	67,300	68,100

Non-State Signalized Roadway Adjustments
(Alter corresponding state volumes by the indicated percent.)
Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment
Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,900	7,600	19,700
50-84%	2,100	6,700	19,700	>19,700
85-100%	9,300	19,700	>19,700	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	2,800	9,500
50-84%	*	1,600	8,700	15,800
85-100%	3,800	10,700	17,400	>19,700

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Core Urbanized

Lanes	B	C	D	E
4	47,400	64,000	77,900	84,600
6	69,900	95,200	116,600	130,600
8	92,500	126,400	154,300	176,600
10	115,100	159,700	194,500	222,700
12	162,400	216,700	256,600	268,900

Urbanized

Lanes	B	C	D	E
4	45,800	61,500	74,400	79,900
6	68,100	93,000	111,800	123,300
8	91,500	123,500	148,700	166,800
10	114,800	156,000	187,100	210,300

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 20,000	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	8,600	17,000	24,200	33,300
4	Divided	36,700	51,800	65,600	72,600
6	Divided	55,000	77,700	98,300	108,800

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

SANDY SPRINGS
GEORGIA

March 26, 2012

Merishia Robinson, E.I.T.
GDOT District 7 - Office of Program Delivery
5025 New Peachtree Rd
Chamblee, GA 30341
(404) 631-1151

RE: Lighting Commitment, Sandy Springs Circle Sidewalk Project, PI# 0010385

Dear Ms. Robinson:

The City will agree to be responsible for installing, locating, providing energy, operating, maintaining and designing the proposed pedestrian lighting associated with the Sandy Springs Circle Sidewalk Project, PI# 0010385.

If you have any questions, please call Andrew Thompson, Project Engineer Manager at 770-206-2556.

Sincerely,

Andrew Thompson

Andrew Thompson, P.E.
Project Engineer Manager
Sandy Springs Public Works
athompson@sandyspringsga.gov
770-206-2556 (office)
404-985-7058 (cell)

cc: Kevin Walters, Director of Public Works
Chet Welch, P.E., Manager of CIP / Stormwater Services
Garrin Coleman, P.E., Capital Program Manager

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: PI 0010385
Fulton County

OFFICE: Planning

DATE: April 7, 2015

FROM: Matthew Fowler for Cynthia L. VanDyke, State Transportation Planning Administrator

TO: Albert V. Shelby III, State Program Delivery Engineer

Attention: Xavier James, Project Manager

SUBJECT: **Project Certification** – PI # 0010385, CS 243/SANDY SPRINGS FM CS 262/HAMMOND DR TO SR 9-PH II - LCI

The Office of Planning is providing this letter of certification as defined in the Plan Development Process Manual of Guidance. Due to its scope of work, this project is included in the Atlanta region's air quality analysis. This project is within the planning boundary for the Atlanta Metropolitan Planning Organization. Based upon this April 7, 2015 review, the project's concept of a road diet and pedestrian enhancements is found to conform to the Transportation Improvement Program (TIP) and Plan. This certification letter is valid for both the Preliminary Field Plan Review and the Final Field Plan Review if there are no changes to the project concept.

Attached is an excerpt from the Atlanta Plan and TIP, a conformity model schematic, and the preconstruction status report for your reference. If any further changes occur to the concept, please notify this office immediately. If you have any questions, please call Julia Billings at 404-631-1774.

CLV: jnb

FN-269

721010-

Programmed

SR 9 (ATLANTA STREET) REVERSIBLE LANE REMOVAL AND WIDENING

FROM MARIETTA HIGHWAY TO RIVERSIDE ROAD/AZALEA DRIVE

Jurisdiction: Fulton County (North)

Sponsor: City of Roswell

Existing	Planned	Length (mi.)	Network Year
2	4	1	2024

Service Type: **Roadway / General Purpose Capacity**

Analysis: In the Region's Air Quality Conformity Analysis

	Status	Year	Fund Type	Federal	State	Local	Bonds	Total
PE		2015	National Highway Performance Program (NHPP)	$400,000	$100,000	$0,000	$0,000	**$500,000**
ROW		2019	STP - Statewide Flexible (GDOT)	$2,784,000	$696,000	$0,000	$0,000	**$3,480,000**
UTL		LR 2020-2030	Local Jurisdiction/Municipality Funds	$0,000	$0,000	$1,500,000	$0,000	**$1,500,000**
CST		LR 2020-2030	General Federal Aid 2020-2040	$12,000,000	$3,000,000	$0,000	$0,000	**$15,000,000**
				$15,184,000	**$3,796,000**	**$1,500,000**	**$0,000**	**$20,480,000**

FN-270

TBD

Long Range

JONES BRIDGE ROAD WIDENING

FROM DOUGLAS ROAD TO MCGINNIS FERRY ROAD

Jurisdiction: Fulton County (North)

Sponsor: City of Johns Creek

Existing	Planned	Length (mi.)	Network Year
2	4	1.4	2030

Service Type: **Roadway / General Purpose Capacity**

Analysis: In the Region's Air Quality Conformity Analysis

	Status	Year	Fund Type	Federal	State	Local	Bonds	Total
ALL		LR 2020-2030	General Federal Aid 2020-2040	$22,400,000	$0,000	$5,600,000	$0,000	**$28,000,000**
				$22,400,000	**$0,000**	**$5,600,000**	**$0,000**	**$28,000,000**

FN-275

0010385

Programmed

SANDY SPRINGS CIRCLE COMPLETE STREET - PHASE II

FROM HAMMOND DRIVE TO MOUNT VERNON HIGHWAY

Jurisdiction: Fulton County (North)

Sponsor: City of Sandy Springs

Existing	Planned	Length (mi.)	Network Year
4	2	0.7	2020

Service Type: **Last Mile Connectivity / Complete Street Retrofit**

Analysis: Exempt from Air Quality Analysis (40 CFR 93)

	Status	Year	Fund Type	Federal	State	Local	Bonds	Total
PE	AUTH	2013	STP - Urban (>200K) (ARC)	~~$340,000~~	~~$0,000~~	~~$85,000~~	~~$0,000~~	**$425,000**
ROW		2016	STP - Urban (>200K) (ARC)	$2,408,920	$0,000	$602,230	$0,000	**$3,011,150**
UTL		2017	Local Jurisdiction/Municipality Funds	$0,000	$0,000	$550,000	$0,000	**$550,000**
CST		2017	STP - Urban (>200K) (ARC)	$2,284,245	$0,000	$571,061	$0,000	**$2,855,306**
				$5,033,165	**$0,000**	**$1,808,291**	**$0,000**	**$6,841,456**

ARC Travel Demand Model 2020 network

cube

(Licensed to Georgia Department of Transportation)