ORIGINAL TO GENERAL FILES

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

OFFICE OF DESIGN POLICY & SUPPORT
INTERDEPARTMENTAL CORRESPONDENCE

FILE P.I. #0010327 **OFFICE** Design Policy & Support

GDOT District 7 - Metro Atlanta
DeKalb County **DATE** December 14, 2011
CS 2097/N McDonough Rd From SR 10 to CS
2094/W Trinity Pl - LCI Project

FROM for Brent Story, State Design Policy Engineer

TO SEE DISTRIBUTION

SUBJECT **APPROVED CONCEPT REPORT**

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

Attachment

DISTRIBUTION:

Genetha Rice-Singleton, Program Control Administrator
Bobby Hilliard, State Program Delivery Engineer
Cindy VanDyke, State Transportation Planning Administrator
Angela Robinson, Financial Management Administrator
Glenn Bowman, State Environmental Administrator
Kathy Zahul, State Traffic Engineer
Georgene Geary, State Materials & Research Engineer
Ron Wishon, State Project Review Engineer
Jeff Baker, State Utilities Engineer
Ken Thompson, Statewide Location Bureau Chief
Michael Henry, Systems & Classification Branch Chief
Bryant Poole, District Engineer
Scott Lee, District Preconstruction Engineer
Jonathan Walker, District Utilities Engineer
Darrell DeJean, Project Manager
BOARD MEMBER - 4th Congressional District
BOARD MEMBER - 5th Congressional District

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
DRAFT PROJECT CONCEPT REPORT

Project Number: N/A
Counties: DeKalb
P. I. Number: 0010327
Federal Route Number: N/A
State Route Number: N/A

Bicycle, Pedestrian and Streetscape Improvements along N. McDonough Street from East Howard Avenue to Trinity Place, Phase IV Downtown Pedestrian Improvements – City of Decatur, Georgia

Submitted for approval:

DATE 09/15/11 — URS CORPORATION
Design Consultant Name and Firm Name

DATE _____ — _____
Local Government

DATE 9/15/11 — _____
Office Head (Project Manager's Office)

DATE 09/15/11 — _____
Project Manager

Recommendation for approval:

DATE _____ — _____
Program Control Administrator

DATE 9/29/2011 — * Glenn Bowman
State Environmental Administrator

DATE 9/15/2011 — * Kathy Zahul
State Traffic Engineer

DATE 9/19/2011 — * Ron Wishon
Project Review Engineer

DATE 9/16/2011 — * Sal Prizzard
for State Utilities Engineer

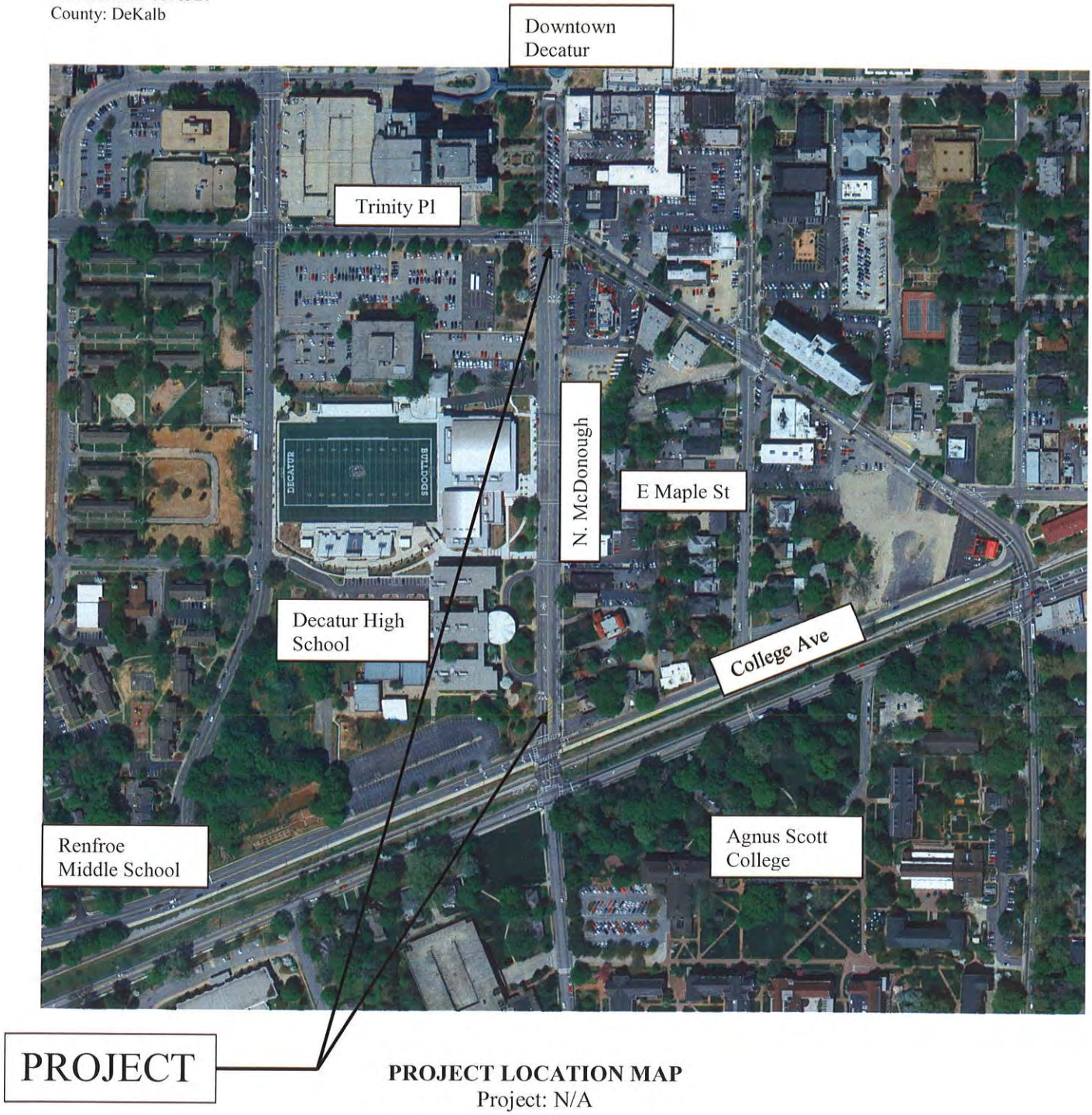
DATE 11/10/2011 — * Bryant Poole
District Engineer

DATE _____ — _____
State Transportation Financial Management Administrator

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

DATE 9/29/2011 — * Cindy VanDyke
State Transportation Planning Administrator

* Recommendation on file



PROJECT LOCATION MAP
Project: N/A
DeKalb County
PI 0010327

Need and Purpose Statement:

The N. McDonough Streetscape Improvements Project is a system of sidewalks, bicycle facilities, pedestrian crosswalks, on street parking, street furniture, street trees, and other improvements on the blocks of N. McDonough Street between Howard Avenue and Trinity Place. The project would improve pedestrian and bicycle mobility by filling in gaps in the existing bike facilities, and upgrading pedestrian facilities to meet current ADA standards.

Existing Bike Facilities:
Currently there is a lack of connectivity between existing bike facilities on either end of N. McDonough Street. On the southern end the existing multi use trail (PATH), a regional trail system connecting Decatur to Lilburn and Stone Mountain, runs along the CSX railroad right-of-way. The northern end of N. McDonough Street is the City of Decatur's Downtown City center. Bike facilities have also been recently constructed along Trinity Place.

Existing Pedestrian Facilities:
Existing sidewalks are present on either side of N. McDonough Street. Wheelchair ramps along these sidewalks lack detectible warnings and do not meet current ADA standards. N. McDonough Street sidewalks connect pedestrian traffic from Renfroe Middle School, Decatur High School, and Agnes Scott College to Decatur's City Center.

Existing On-street Parking
On-street parking exists intermittently throughout the project. The existing lane configurations include wide travel lanes (two in each direction) with on-street parking. The resulting typical section is over 60-feet of curb to curb travel width which is difficult for pedestrians to cross.

The proposed project improvements are based on the elements of Decatur's Community Transportation Plan (CTP) adopted in April 2008. A major goal of the CTP is to encourage healthy lifestyles and active living in Decatur. The improvements will benefit pedestrian and bicyclists by enhancing pedestrian and bicycle access to Agnes Scott College's campus, the Decatur School system, Renfroe Middle School, as well as residential neighborhoods to the City Center and government facilities. The proposed bicycle facilities will link existing facilities on either end of N. McDonough's roadway segment.

The project also encourages alternative modes of transportation within downtown Decatur by reducing N. McDonough Street from a four-lane facility to a two-lane facility. The reduction in travel lanes provides the opportunity to widen sidewalks and landscape buffers to encourage pedestrian foot traffic and also promotes bicycle traffic with the addition of bicycle lanes within the project corridor. Reducing travel lanes also provides an opportunity for on-street parking, which serves to promote alternative modes of travel.

Description of the proposed project:

Existing
The existing lane configuration consists of four 12-foot travel lanes (two in each direction) along N. McDonough Street between Howard Avenue and E. Trinity Place. Parallel parking on both sides of N. McDonough occurs intermittently within the project corridor. The shoulders consist of concrete curb and gutter and sidewalks varying in width from 6 to 15 feet. There are three existing midblock crossings within the project limits which are demarcated with striping. The existing midblock crossings are at E. Maple Street, 100-feet north of E. Maple Street, and 100-feet south of E. Maple Street. ADA upgrades including wheelchair ramps and detectible warning strips are needed at the existing midblock crossings.

Proposed

The project proposes two 11-foot travel lanes (one in each direction) along N. McDonough Street. Parallel parking will be provided on both sides of N. McDonough Street as feasible. Sidewalks on both sides of N. McDonough Street ranging from 5-feet to 10-feet in width will be constructed. The bicycle track will be constructed outside the sidewalk area on the west side of the roadway and will be buffered on both sides with a landscape zone to minimize conflicts with pedestrians and vehicles. Cyclists will have two options: (1) ride in the road with the cars or (2) travel in the dedicated two-way cycle track proposed on the west side of N. McDonough Street. The two way cycle track with setback and landscape buffers from the road and the pedestrian realm will encourage novice cyclists like children and families to cycle in the area. Due to the west side of N. McDonough Street having only two (2) active driveways, the number of potential conflicts for bicyclists is reduced greatly as compared to placing the bicycle path on the east side of the street.

The three existing midblock crossing are proposed to be studied in the design phase and either consolidated into two mid-block crossings or one mid-block crossing. Based upon the engineering study, the proposed mid-block crossing(s) will allow pedestrians access to both sides of N. McDonough Street. Mid-block treatment options will include raised refuge islands, rapid rectangular flashing beacons, striping, and signage.

This project connects to existing bicycle facilities at the south terminus of the project and to a new bicycle facility at Trinity Place at the northern terminus of the project. It appears that there is ample space within the existing right-of-way to provide bicycle parking adjacent to the school. Other bicycle parking areas will be explored within the project limits and adjacent area.

Termini

The southern terminus of the project is the signalized intersection of N. McDonough Street at Howard Avenue. The southern terminus of the project ties to an existing GDOT Transportation Enhancement project (Project Number: CSTEE-0009-00(025), P. I. Number: 0009025) and GDOT signal upgrade project (Project Number: STP-0002-00(669), P.I. Number: 0002669). The project is coordinated with both of the adjacent projects on the southern end. The project ties to the PATH multi-use trail (running east-west) on the southern end, as well as a bicycle route south on McDonough Street, which is designated with "Share the Road" signage.

The northern terminus of the project is the signalized intersection of N. McDonough Street and Trinity Place. The northern terminus of the project ties to an existing City of Decatur bicycle lane project (Project Number: CSTEE-0008-00(118), P. I. Number: 0008118) and a GDOT signal upgrade project (Project Number: STP-0002-00(669), P.I. Number: 0002669). The project is coordinated in the design phase with both of these projects. The project ties to a proposed City of Decatur bicycle route project along Trinity Place, the Decatur MARTA station, and the downtown square.

Is the project located in a PM 2.5 Non-attainment area? **__X___Yes** **_____No.**

Is this project located in an Ozone Non-attainment area? **__X___Yes** **_____No.**

The proposed project is a will not add capacity, the open year per ARC's Transportation Improvement Program is 2014 and the network year is 2016. The proposed project conforms to the plan's model description as a 2 lane facility on North McDonough Street from College Avenue to West Trinity Place.

PDP Classification: Major _____ Minor_____X_____

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

Functional Classification: Urban Local Street

U. S. Route Number(s): NA **State Route Number(s):** NA

Traffic (AADT):

Base Year: (2014) 6,400 Design Year: (2034) 8,500
T%(daily/24hr) 3.8%/4.5%
K Factor 6.8%(AM),10.3%(PM)
Directional Dist. 73.5%(AM), 50%(PM)

Existing design features:

Existing Typical Section:

Two 12 foot travel lanes in each direction (northbound and southbound), on-street parking (both parallel and diagonal parking) intermittently on both sides of the roadway adjacent to header curb. There are existing five to ten foot sidewalks on the west side of the roadway and an existing five foot sidewalk with a two foot landscape strip on the eastern side of the roadway. There are left and right turn lanes at both ends of the project at the signalized intersections.

- Posted speed 25 mph Minimum radius for curve: NA
- Maximum super-elevation rate for curve: NA %
- Maximum mainline grade: 8 %
- Maximum cross road grade: NA %
- Maximum driveway grade: NA %
- Width of right-of-way: VARIES 78 TO 85 ft.
- Major structures: NA
- Major interchanges or intersections along the project: None
- Length of roadway segment: 1,250 ft.

Proposed Design Features:

Proposed typical section:

One 11-foot travel lane in each direction (northbound and southbound). On-street parking throughout the corridor with 10 to 15-foot shoulders on either side of the roadway containing landscape buffers and 5 to 10-foot sidewalks is proposed along each lane. On the west side a 10-foot bike path is proposed between the parking and sidewalk with 5 foot medians between each area. There are up to two mid-block crossings proposed along N. McDonough as well and all pedestrian facilities will be upgraded to meet ADA requirements. There will be left and right turn-lanes provided at both signalized intersections.

Design Variances to lateral obstruction of the streetscape elements (trees, trash receptacles, and light poles) are anticipated.

- Design Speed Mainline __25___mph

- Proposed Maximum super-elevation rate for curve: ____NA____%

- Proposed Maximum grade Mainline__8__% Maximum grade allowable __8__%

- Proposed Maximum grade Side Street _NA__% Maximum grade allowable __NA_%

- Proposed Maximum grade driveway __NA__%

- Proposed Minimum radius of curve _NA_ Minimum radius allowable _NA_

- Right-of-Way
  - Width _78 to 85 Feet__
  - Easements: Temporary (X), Permanent (X), Utility ( ), Other ( ).
  - Type of access control: Full ( ), Partial ( ), By Permit ( ), Other (X).
  - PI No.: 0010327

    Number of parcels: ____18_____ Number of displacements:
    - Business: ____0_____
    - Residences: ___0_____
    - Mobile homes: _0_____
    - Other: _____0_____

    Temporary and permanent easements only are anticipated to be required for construction of the project.

- Structures: Minor retaining walls are anticipated to limit the right of way acquisition. Potential wall locations will be at the back of the sidewalk and will be either concrete gravity walls or granite seat walls.

- Major intersections and interchanges: None

- Traffic control during construction:
  The proposed project can be staged to allow for a minimum of one lane of traffic to remain open during all stages of construction.

- Transportation Management Plan Anticipated: YES ( ) NO (X)

- Design Exceptions to controlling criteria anticipated:

	UNDETERMINED	YES	NO
HORIZONTAL ALIGNMENT:	( )	( )	(X)
LANE WIDTH:	( )	( )	(X)
SHOULDER WIDTH:	( )	( )	(X)
VERTICAL GRADES:	( )	( )	(X)
CROSS SLOPES:	( )	( )	(X)
STOPPING SIGHT DISTANCE:	( )	( )	(X)
SUPERELEVATION RATES:	( )	( )	(X)
VERTICAL ALIGNMENT:	( )	( )	(X)
SPEED DESIGN:	( )	( )	(X)
VERTICAL CLEARANCE:	( )	( )	(X)
BRIDGE WIDTH:	( )	( )	(X)

BRIDGE STRUCTURAL CAPACITY:	( )	( )	(X)
LATERAL OFFSET TO OBSTRUCTION:	( )	( )	(X)

Design Variances: Design Variances to lateral obstruction of the streetscape elements (trees, trash receptacles, and light poles) are anticipated.

- Environmental concerns:
  - No significant environmental issues are anticipated. As a result of the environmental studies undertaken as part of the earlier intersection improvement projects, no ecological resources (i.e., T&E species, state waters, or Jurisdictional Waters of the US), no significant archaeological sites, no churches or cemeteries, and no UST/hazardous waste sites were found at the intersections within the currently proposed project limits. It is anticipated that a Categorical Exclusion (CE) will suffice for the environmental documentation.

  - Within the project area, known environmental resources/issues of concern consist of the National Register listed or eligible South Candler/Agnes Scott College Historic District, Decatur Historic District, and Georgia Railroad. In addition, the Georgia Path Foundation's Stone Mountain Trail, a bike and walking trail, is located along the southeast side of East Howard Avenue. Consequently, the project will have to be designed in such a way as to avoid or minimize impacts to those properties within the district that contribute to its historic significance.

  - The list of contributing properties within the project area includes:

    - 103 N. McDonough Street
    - 107 N. McDonough Street
    - 111 N. McDonough Street
    - 115 N. McDonough Street
    - 117 N. McDonough Street
    - 119 N. McDonough Street
    - 121 N. McDonough Street
    - 215 N. McDonough Street
    - 227 N. McDonough Street
    - 310 N. McDonough Street
    - 409 N. McDonough Street
    - 509 N. McDonough Street
    - 515 N. McDonough Street
    - 114 East Trinity Place
    - 116 East Howard Avenue
    - 120 East Howard Avenue
    - 192 Church Street

- Level of environmental analysis:
  - Are Time Savings Procedures appropriate? Yes (X), No ( )
  - Categorical Exclusion anticipated? Yes (X), No ( )
  - Environmental Assessment/Finding of No Significant Impact (FONSI) ( )
  - Environmental Impact Statement (EIS) ( )

- Utility involvements:
  - Power- GA Power

- Water- DeKalb County
- Sewer- DeKalb County
- Gas- AGL
- Telephone – TBD
- Fiber - TBD
- Cable – TBD

VE Study Required Yes ( ) No (X)

Benefit/Cost Ratio: N/A

Project Cost Estimate and Funding Responsibilities:

PI # 0010327

	PE	ROW	UTILITY	CST	MITIGATION
By Whom	GDOT	GDOT	GDOT	GDOT	GDOT
$ Amount	$0.00	$80,000.00	$0.00	$1,335,867.00	$0.00
By Whom	Local	Local	Local	Local	Local
$ Amount	$300,000.00	$20,000.00	TBD	$333,966.80	TBD
Total Amount	**$300,000.00**	**$100,000.00**	**TBD**	**$1,669,833.80**	**TBD**

Project responsibilities:

- Design – URS Corporation
- Right-of-Way Acquisition –City of Decatur
- Right-of-Way funding (real property) –City of Decatur
- Relocation of Utilities – Utilities
- Letting to contract – City of Decatur
- Supervision of construction – City of Decatur
- Providing material pits - Contractor
- Providing detours – Contractor
- Environmental Studies/Documents/Permits – URS Corporation/City of Decatur
- Environmental Mitigation – None Anticipated; City of Decatur if required

Coordination

- The concept team meeting was held on August 15, 2011 at 10:00am at GDOT's main office at One Georgia Center in the 25th floor conference room
- No PAR meeting is anticipated for this project.
- No FEMA, USCG, and/or TVA meetings are anticipated for this project.
- Public involvement
  A total of approximately 30 people attended the Public Work Session held for the subject project on September 9, 2010. From those attending, 22 comment forms were received. The following is a summary of the responses received:
  Number opposed to streetscape modifications – 0, Number in support of Alternate A - 5, number in support of Alternate B – 3, number in support of Alternate C – 14(Alternative C is the proposed typical section in this report).

  Major concerns included: A major theme of the attendees was that they desire a plan that will provide a high level of safety for bicyclists and pedestrians while maintaining an urban streetscape environment.

- Other projects in the area
  - The southern termini of the project ties to an existing GDOT Transportation Enhancement project (Project Number: CSTEE-0009-00(025), P. I. Number: 0009025) and GDOT signal upgrade project (Project Number: STP-0002-00(669), P.I. Number: 0002669). The project is coordinated with both of the adjacent projects on the southern end and there will be no change to the proposed lane configurations.

  - The northern terminus of the project ties to an existing City of Decatur bike lane project (Project Number: CSTEE-0008-00(118), P. I. Number: 0008118) and GDOT signal upgrade project (Project Number: STP-0002-00(669), P.I. Number: 0002669). The project is coordinated in the design phase with both of these projects and there will be no changes to the lane configurations.

- Railroads – none

- Other Coordination to date: An ARC Kickoff Meeting was held on August 9, 2010 in the City of Decatur Conference Room. URS presented four alternates to meeting attendees. Various ideas, questions, and concerns were addressed at the meeting. The meeting minutes are included in this report as Attachment 6.

  Officials attending the meeting included:
  Hugh Saxon, City of Decatur Project Manager
  Bruce Roaden, City Schools of Decatur
  John F. Madajewski, City of Decatur
  Joe Palladi, ARC Engineering Review
  Amy Goodwin, ARC
  Connie Johnson, MARTA
  John Hegman, Agnes Scott College

Scheduling – Responsible Parties' Estimate

• Time to complete the environmental process:	Begin: June 2011	End: June 2012
• Time to complete preliminary construction plans:	Begin: Oct 2011	End: June 2012
• Time to obtain design variance(s) or exception(s):	Begin: Oct 2011	End: Feb 2011
• Time to complete right-of-way plans:	Begin: July 2012	End: August 2012
• Time to complete the Section 404 Permit:		___NA___
• Time to complete final construction plans:	Begin: July 2012	End: June 2013
• Time to complete to purchase right-of-way:	Begin: July 2012	End: June 2013

- Time to complete CE Re-evaluation, ROW Certification, final bid documents, and execute project management agreements:_____Begin: July 2012 End: June 2013

- List other major items that will affect the project schedule: ___NA___

Other alternates considered:

No Build Alternative: The existing facility along N. McDonough Street is a four-lane roadway with parallel and angled parking intermittently along the street. There is no defined bicycle facility and most of the sidewalk along the East side of N. McDonough Street is inadequate. This alternative does not satisfy the need and purpose of the project.

Alternative A: Alternative A proposes two 11-foot travel lanes (one in each direction) along N.

McDonough Street. This alternative provides a two-way dedicated bicycle track on the west side h side of N. McDonough Street. Parallel parking is provided on both sides of N. McDonough Street as feasible. Sidewalks are provided on both sides of N. McDonough Street ranging from 5-foot to 10-foot in width. The cycle track is buffered by landscape zones to minimize conflicts between pedestrians and vehicles. This alternative gives cyclist two options, they can share the road with vehicles or they can use the dedicated cycle track option. Alternative A is not the preferred alternative because having the bicycle track on the East side of N. McDonough Street introduces a bicycle vs. vehicle conflict at every driveway and the side street. Alternative A also reduces the number of parallel parking spaces and landscaped areas because of the increased sight distance required for vehicles to see the bicyclist when accessing the driveways and side street.

Alternative B: Alternative B proposes two 11-foot travel lanes (one in each direction) along N. McDonough Street. This alternative proposes a dedicated bike path within the street cross section. Parallel parking and diagonal parking is provided on both sides of N. McDonough Street as feasible. Sidewalks are provided on both sides of N. McDonough Street ranging from 5-foot to 10-foot in width. This concept does not have a buffer between the vehicles and the bike lane. This option maximizes parking and provides horizontal traffic calming due to the mix of angled and parallel parking throughout the project corridor. Alternative B is not the preferred alternative because the two-way cycle track provides an inviting bicycling environment for the younger rider and families where as bicycling in the street does not encourage novice riders and families to use the facility. Alternative B also has the horizontal traffic calming element which was not preferred because it alters the character of N. McDonough Street being a gateway to the City Hall and town square. The straight alignment gives the street the sense of order and maintains the character of the area.

Attachments:

1. Cost Estimates:
    a. Construction including E&I,
    b. Asphalt price adjustment,
    c. Right of Way,
    d. Utilities,

2. Sketch location map,
3. Typical sections,
4. Accident summaries,
5. Capacity Analysis summaries,
6. Minutes of ARC Project Kickoff Meeting.
7. Minutes of Concept meeting
8. RTP Plan for ARC Project
9. Conforming plan's network schematics showing thru lanes for RTP Plan
10. Letter of commitment from City of Decatur to maintain and energize the lighting system.

Exempt projects

Concur: _____ Date: 12/11/11
Director of Engineering

Approve: _____ Date: 12/13/11
Chief Engineer

ATTACHMENT 1 –

COST ESTIMATES

Opinion of Probable Costs - October 19, 2011
N. McDonough Street - Decatur, Georgia
Planning Level Estimatem - TWO WAY CYCLE TRACK

		UNIT		Unit Cost	Total Cost
	Roadway				
150-1000	TRAFFIC CONTROL -	LS	1	$ 90,000.00	$ 90,000.00
210-0100	GRADING COMPLETE -	LS	1	$ 180,000.00	$ 180,000.00
310-1101	GR AGGR BASE CRS, INCL MATL	TN	100	$ 35.00	$ 3,500.00
318-3000	AGGR SURF CRS	TN	200	$ 35.00	$ 7,000.00
402-1802	RECYCLED ASPH CONC PATCHING, INCL BITUM MATL &	TN	100	$ 105.00	$ 10,500.00
402-1812	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL &	TN	100	$ 110.00	$ 11,000.00
402-3121	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2,	TN	250	$ 90.00	$ 22,500.00
402-3130	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONL	TN	710	$ 90.00	$ 63,900.00
402-4514	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2,	TN	100	$ 90.00	$ 9,000.00
413-1000	BITUM TACK COAT	GL	2500	$ 3.50	$ 8,750.00
432-0206	MILL ASPH CONC PVMT, 1 1/2 IN DEPTH	SY	8500	$ 3.00	$ 25,500.00
432-5010	MILL ASPH CONC PVMT, VARIABLE DEPTH	SY	1000	$ 8.00	$ 8,000.00
441-0104	CONC SIDEWALK, 4 IN	SY	2100	$ 52.00	$ 109,200.00
441-4030	CONC VALLEY GUTTER, 8 IN	SY	500	$ 32.00	$ 16,000.00
441-5002	CONCRETE HEADER CURB, 6 IN, TP 2	LF	2400	$ 15.00	$ 36,000.00
446-1100	PVMT REINF FABRIC STRIPS, TP 2, 18 INCH WIDTH	LF	500	$ 6.00	$ 3,000.00
500-9999	CLASS B CONC, BASE OR PVMT WIDENING	CY	50	$ 400.00	$ 20,000.00
550-1180	STORM DRAIN PIPE, 18 IN, H 1-10	LF	1200	$ 80.00	$ 96,000.00
611-4001	RECONSTR MINOR DRAINAGE STR	EA	4	$ 4,500.00	$ 18,000.00
611-8040	ADJUST DROP INLET TO GRADE	EA	2	$ 4,500.00	$ 9,000.00
611-8050	ADJUST MANHOLE TO GRADE	EA	4	$ 4,500.00	$ 18,000.00
634-1200	RIGHT OF WAY MARKERS	EA	4	$ 20.00	$ 80.00
668-2100	DROP INLET, GP 1	EA	5	$ 5,000.00	$ 25,000.00
668-2110	DROP INLET, GP 1, ADDL DEPTH	LF	10	$ 500.00	$ 5,000.00
668-4300	STORM SEWER MANHOLE, TP 1	EA	2	$ 4,500.00	$ 9,000.00
668-4312	STORM SEWER MANHOLE, TP 1, ADDL DEPTH, CL 2	LF	10	$ 500.00	$ 5,000.00
0	RETAINING WALL(SEAT WALLS)	LS	1	$ 100,000.00	$ 100,000.00
	EROSION CONTROL				
163-0232	TEMPORARY GRASSING	AC	1	$ 400.00	$ 400.00
163-0240	MULCH	TN	20	$ 500.00	$ 10,000.00
163-0550	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	EA	10	$ 70.00	$ 700.00
165-0010	MAINTENANCE OF TEMPORARY SILT FENCE, TP A	LF	500	$ 2.00	$ 1,000.00
165-0105	MAINTENANCE OF INLET SEDIMENT TRAP	EA	10	$ 30.00	$ 300.00
167-1000	WATER QUALITY MONITORING AND SAMPLING	EA	1	$ 600.00	$ 600.00
167-1500	WATER QUALITY INSPECTIONS	MO	12	$ 500.00	$ 6,000.00
171-0010	TEMPORARY SILT FENCE, TYPE A	LF	1000	$ 3.00	$ 3,000.00
700-7000	AGRICULTURAL LIME	TN	15	$ 100.00	$ 1,500.00
700-7010	LIQUID LIME	GL	10	$ 70.00	$ 700.00
700-8000	FERTILIZER MIXED GRADE	TN	10	$ 400.00	$ 4,000.00
700-8100	FERTILIZER NITROGEN CONTENT	LB	120	$ 30.00	$ 3,600.00
700-9300	SOD	SY	100	$ 12.00	$ 1,200.00
	Hardscape				
754-4000	WASTE RECEPTACLE UNIT	EA	8	$ 2,000.00	$ 16,000.00
754-5000	BENCH	EA	14	$ 3,000.00	$ 42,000.00
754-6000	BICYCLE RACK	EA	7	$ 1,000.00	$ 7,000.00
0	2-WAY CYCLE TRACK	SF	10750	$ 15.00	$ 161,250.00
	Landscape				

702-0559	LIRIOPE MUSCARI - BIG BLUE - 1 GAL	EA	14884	$	7.50	$	111,630.00
702-0905	QUERCUS PHELLOS - HIGH TOWER, 5 " TO 6" CALIP	EA	43	$	1,500.00	$	64,500.00
	Signing and Marking						
636-1020	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	SF	150	$	25.00	$	3,750.00
636-1029	HIGHWAY SIGNS, TP 2 MATL, REFL SHEETING, TP 3	SF	150	$	25.00	$	3,750.00
636-1033	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	SF	100	$	30.00	$	3,000.00
636-1041	HIGHWAY SIGNS, TP 2 MATL, REFL SHEETING, TP 9	SF	100	$	30.00	$	3,000.00
636-2070	GALV STEEL POSTS, TP 7	LF	300	$	8.00	$	2,400.00
636-2080	GALV STEEL POSTS, TP 8	LF	300	$	9.00	$	2,700.00
636-2090	GALV STEEL POSTS, TP 9	LF	150	$	10.00	$	1,500.00
652-5451	SOLID TRAFFIC STRIPE, 5 IN, WHITE	LF	2500	$	0.20	$	500.00
653-0110	THERMOPLASTIC PVMT MARKING, ARROW, TP 1	EA	4	$	100.00	$	400.00
653-0120	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	EA	5	$	100.00	$	500.00
653-1501	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	LF	100	$	1.00	$	100.00
653-1502	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	LF	2400	$	0.30	$	720.00
653-1704	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	LF	200	$	3.00	$	600.00
653-1804	THERMOPLASTIC SOLID TRAF STRIPE, 8 IN, WHITE	LF	800	$	2.00	$	1,600.00
653-3501	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	GLF	100	$	0.50	$	50.00
653-6004	THERMOPLASTIC TRAF STRIPING	SY	500	$	6.00	$	3,000.00
	Lighting						
681-1150	LIGHTING STD, ALUM, 14 FT MH, POST TOP	EA	28	$	3,000.00	$	84,000.00
681-1370	LIGHTING STD, ALUM, 37 FT MH, 8.5 FT TWIN ARM	EA	10	$	3,500.00	$	35,000.00
681-6250	LUMINAIRE, TP 2, 250 W, HP SODIUM, SPECIAL DES	EA	28	$	1,500.00	$	42,000.00
681-6520	LUMINAIRE, TP 5, 150 W, HP SODIUM	EA	10	$	2,400.00	$	24,000.00
682-9000	MAIN SERVICE PICK UP POINT	LS	1	$	1,000.00	$	1,000.00
682-9022	ELECTRICAL JUNCTION BOX, REINFORCED PLASTIC MO	EA	5	$	300.00	$	1,500.00
			0				
	SUB-TOTAL CONSTRUCTION					$	1,559,380.00
	E&I(5%)					$	77,969.00
	TOTAL CONSTRUCTION with E&I					**$**	**1,637,349.00**

Date 5/12/2011

P.I. Number **10327** County **DeKalb**

Project Number

Special Provision, Section 109-Measurement and Payment

FUEL PRICE ADJUSTMENT *(ENGLISH 125% MAX)*

ENTER FPL DIESEL	**4.079**
ENTER FPM DIESEL	**9.178**

ENTER FPL UNLEADED	**3.862**
ENTER FPM UNLEADED	**8.6895**

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

INCREASE ADJUSTMENT
125.00%

INCREASE ADJUSTMENT
125.00%

ROADWAY ITEMS	QUANTITY	DIESEL FACTOR	GALLONS DIESEL	UNLEADED FACTOR	GALLONS UNLEADED	REMARKS
Excavations paid as specified by Sections 205 **(CUBIC YARD)**		0.29		0.15		
Excavations paid as specified by Sections 206 **(CUBIC YARD)**		0.29		0.15		
GAB paid as specified by the ton under Section 310 **(TON)**	100.000	0.29	29.00	0.24	24.00	
Hot Mix Asphalt paid as specified by the ton under Sections 400 **(TON)**		2.90		0.71		
Hot Mix Asphalt paid as specified by the ton under Sections 402 **(TON)**	1460.000	2.90	4234.00	0.71	1036.60	
PCC Pavement paid as specified by the square yard under Section 430 **(SY)**		0.25		0.20		

BRIDGE ITEMS	Quantity	Unit Price	QF/1000	Diesel Factor	Gallons Diesel	Unleaded Factor	Gallons Unleaded	REMARKS
Bridge Excavation (CY) Section 211				8.00		1.50		
Class __Concrete (CY) Section 500				8.00		1.50		
Class __Concrete (CY) Section 500				8.00		1.50		
Class __Concrete (CY) Section 500				8.00		1.50		
Superstru Con Class__(CY) Section 500				8.00		1.50		
Superstru Con Class__(CY) Section 500				8.00		1.50		
Superstru Con Class__(CY) Section 500				8.00		1.50		
Concrete Handrail (LF) Section 500				8.00		1.50		
Concrete Barrier (LF) Section 500				8.00		1.50		

BRIDGE ITEMS	Quantity	Unit Price	QF/1000	Diesel Factor	Gallons Diesel	Unleaded Factor	Gallons Unleaded	REMARKS

Stru Steel Plan Quantity (LB) Section 501				8.00		1.50		
Stru Steel Plan Quantity (LB) Section 501				8.00		1.50		
PSC Beams_____ (LF) Section 507				8.00		1.50		
PSC Beams_____ (LF) Section 507				8.00		1.50		
PSC Beams_____ (LF) Section 507				8.00		1.50		
Stru Reinf Plan Quantity(LB) Section 511				8.00		1.50		
Stru Reinf Plan Quantity(LB) Section 511				8.00		1.50		
Bar Reinf Steel (LB) Section 511				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Drilled Caisson,___ (LF) Section 524				8.00		1.50		
Drilled Caisson,___ (LF) Section 524				8.00		1.50		
Drilled Caisson,___ (LF) Section 524				8.00		1.50		
Pile Encasement,___(LF) Section 547				8.00		1.50		
Pile Encasement,___(LF) Section 547				8.00		1.50		

SUM QF DIESEL=	**4263.00**	**SUM QF UNLEADED=**	**1060.60**

DIESEL PRICE ADJUSTMENT($)	**$19,997.09**
UNLEADED PRICE ADJUSTMENT($)	**$4,710.44**

ASPHALT CEMENT PRICE ADJUSTMENT
(BITUMINOUS TACK COAT 125% MAX)

APPLICABLE TO CONTRACTS/PROJECTS CONTAINING THE 413 SPECIFICATION, SECTION 413.5.01 ADJUSTMENTS
ASPHALT PRICE ADJUSTMENT FOR BITUMINOUS TACK COAT

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

ENTER APL 604 **ENTER APM** 1359

125.00%	INCREASE ADJUSTMENT

L.I.N.	TYPE	TACK (GALLONS)	TACK (TONS)	REMARKS
413-1000		2500	10.7378	

TMT = 10.7378

PRICE ADJUSTMENT($)	$7,782.72

400 / 402 ASPHALT CEMENT PRICE ADJUSTMENT 125% MAX

ENTER APL 604 **ENTER APM** 1359

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

125.00%	INCREASE ADJUSTMENT

L.I.N. / Spec Number	MIX TYPE	HMA	JMF AC%	AC	REMARKS
402-1802	12.5 mm SP		5.00		
402-1812	12.5 mm SP		5.00		
402-3121	25 mm SP		5.00		
402-3130	19 mm SP		5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			TMT =		

PRICE ADJUSTMENT($)	

ASPHALT CEMENT PRICE ADJUSTMENT FOR BITUMINOUS TACK COAT(Surface Treatment 125% MAX)

APPLICABLE TO CONTRACTS CONTAINING THE 413 SPEC. SECTION 413.5.01 ADJUSTMENTS ASPHALT PRICE ADJUSTMENT FOR BITUMINOUS TACK COAT

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

ENTER APL 604 ENTER APM 1359

125.00%	INCREASE ADJUSTMENT

Use this side for Asphalt Emulsion Only

L.I.N.	TYPE	ASPHALT EMULSION (GALLONS)

TMT =

REMARKS:

Use this side for Asphalt Cement Only

L.I.N.	TYPE	TACK (GALLONS)

TMT =

REMARKS:

MONTHLY PRICE ADJUSTMENT($)	

ADJUSTMENT SUMMARY

FUEL PRICE ADJUSTMENT *(ENGLISH 125% MAX)*

DIESEL PRICE ADJUSTMENT($)	$19,997.09
UNLEADED PRICE ADJUSTMENT($)	$4,710.44
ASPHALT CEMENT PRICE ADJUSTMENT (BITUMINOUS TACK COAT 125% MAX)	$7,782.72
400 / 402 ASPHALT CEMENT PRICE ADJUSTMENT 125% MAX	
ASPHALT CEMENT PRICE ADJUSTMENT FOR BITUMINOUS TACK COAT(Surface Treatment 125% MAX)	

REMARKS:

TOTAL ADJUSTMENTS	$32,490.26

DWM 10/08

URS

October 19, 2011

Hugh Saxon
City of Decatur
Deputy City Manager

Re: Preliminary Right of Way Cost Estimate
North McDonough Streetscape Improvements
PI No 0010327

Dear Mr. Saxon:

This is a preliminary Right of Way cost estimate for PI 0010327. The project is located in DeKalb County in the City of Decatur. This estimate is a planning level estimate.

Land:	Easement – 1,000 SF @ $60/FT =	$60,000.00
Improvements:	misc. site improvements	$40,000.00
Relocation:	Residential (0) Commercial (0) .	
Damage:	Cost to Cure (0) parcel Proximity (0) parcel	
	Cost	$100,000.00

Sincerely,

Sean H. Pharr
Senior Project Manager

URS

October 19, 2011

Hugh Saxon
City of Decatur
Deputy City Manager

Re: Preliminary Utility Cost Estimate
North McDonough Streetscape Improvements
PI No 0010327

Dear Mr. Saxon:

This is a preliminary utility cost estimate for PI 0010327. The project is located in DeKalb County in the City of Decatur. This estimate is a planning level estimate. A field inspection was conducted on the above reference project. The following companies have facilities that may occupy the public right of way and should be relocated at no cost to the City of Decatur.

AGL Resources
GA Power Distribution
Comcast
City of Decatur Water and Sewer
AT&T

There were no utilities observed that could that could potentially have prior rights. Therefore, there are no reimbursable utilities at this time. Please note that this estimate was prepared without the certification of right of way and could change when more detailed information is made available.

Sincerely,

Sean H. Pharr
Senior Project Manager

Department of Transportation

State of Georgia

Interdepartmental Correspondence

FILE	R/W Cost Estimate	**OFFICE**	Atlanta
		DATE	December 6, 2011
FROM	Phil Copeland, Right of Way Administrator LaShone Alexander, Right of Way Cost Estimator		
TO	Darrell DeJean, Project Manager		

SUBJECT **Preliminary Right of Way Cost Estimate**
Project: Dekalb County
P.I. No.: 0010327
Description: North McDonough Streetscape Improvements

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

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

`

PC:LA
Attachments
c: file

GEORGIA DEPARTMENT OF TRANSPORTATION
PRELIMINARY ROW COST ESTIMATE SUMMARY

Date: 12/6/2011 Project: City of Decatur
Revised: County: Dekalb
PI: 10327
Description: North McDonough Streetscape Improvements
Project Termini: North McDonough Streetscape Improvements
Existing ROW: Varies
Parcels: 6 Required ROW: Varies

Land and Improvements		$105,000.00
Proximity Damage	*$0.00*	
Consequential Damage	*$0.00*	
Cost to Cures	*$0.00*	
Trade Fixtures	*$0.00*	
Improvements	*$40,000.00*	
Valuation Services		$15,000.00
Legal Services		$41,550.00
Relocation		$12,000.00
Demolition		$0.00
Administrative		$52,000.00
TOTAL ESTIMATED COSTS		$225,550.00
TOTAL ESTIMATED COSTS (ROUNDED)		***$226,000.00***

Preparation Credits	Hours	Signature

Prepared By: CG#: (DATE)
Approved By: [signature] CG#: 0860999 (DATE) 12/06/2011

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

Georgia Department of Transportation
Preliminary ROW Cost Estimate Worksheet

Project/County/PI City of Decatur Dekalb 10327

		A	B	C	D
	Land and Improvements	**Agriculture**	**Residential**	**Commercial**	**Industrial**
1	Estimate Low (ac)	$0.00	$0.00	$0.00	$0.00
2	Estimate High (ac)	$0.00	$0.00	$0.00	$0.00
3	Estimate Used (ac)	$0.00	$0.00	$120,000.00	$0.00
4	Fee Simple Area (ac)	0.00	0.00	0.00	0.00
5	Fee Simple Estimate	$0.00	$0.00	$0.00	$0.00
6	Perm Esmt Area (ac)	0.00	0.00	0.50	0.00
7	Perm Esmt Factor	0%	0%	50%	0%
8	Perm Esmt Estimate	$0.00	$0.00	$30,000.00	$0.00
9	Temp Esmt Area (ac)	0.00	0.00	0.00	0.00
10	Temp East Factor	0%	0%	0%	0%
11	Temp Esmt Estimate	$0.00	$0.00	$0.00	$0.00
12	Proximity Damages	$0.00	$0.00	$0.00	$0.00
13	Consequential Damages	$0.00	$0.00	$0.00	$0.00
14	Cost to Cures	$0.00	$0.00	$0.00	$0.00
15	Improvements	$0.00	$0.00	$40,000.00	$0.00
16	Trade Fixtures	$0.00	$0.00	$0.00	$0.00
17					
18	PROPERTY TYPE TOTALS	$0.00	$0.00	$70,000.00	$0.00
19			SUB TOTAL PROPERTY TYPES		$70,000.00
20			Counter Offers and Condemnation Increases		$35,000.00
21					
22			**GRAND TOTAL LANDS AND IMPROVEMENTS**		$105,000.00

Georgia Department of Transportation
Preliminary ROW Cost Estimate Worksheet

Project/County/PI City of Decatur Dekalb 10327

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

Georgia Department of Transportation
Preliminary ROW Cost Estimate Worksheet

Project/County/PI City of Decatur Dekalb 10327

		A	B	C	D
	Legal Services	**Parcels**	**Estimated Fees**		**TOTALS**
1	Meeting with Attorney	6	$125.00		$750.00
2	Preliminary Titles	6	$200.00		$1,200.00
3	Closing and Final Title	6	$300.00		$1,800.00
4	Recording Fees	6	$50.00		$300.00
5	Condemnation Filing	1	$5,000.00		$5,000.00
6	Litigation Costs	1	$25,000.00		$25,000.00
7	Updates and Incidentials	1	$7,500.00		$7,500.00
8					
9					
10					
11					
12					
13					
14					
15					
16					
17			**GRAND TOTAL LEGAL SERVICES**		$41,550.00

Georgia Department of Transportation
Preliminary ROW Cost Estimate Worksheet

Project/County/PI City of Decatur Dekalb 10327

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

Georgia Department of Transportation
Preliminary ROW Cost Estimate Worksheet

Project/County/PI City of Decatur Dekalb 10327

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

Georgia Department of Transportation
Preliminary ROW Cost Estimate Worksheet

Project/County/PI City of Decatur Dekalb 10327

		A	B	C	D
	Administrative	**Parcels**	**Man hours per Parcel**		**TOTALS**
1	Pre-Acquisition	6	40		$12,000.00
2	Acquisition	6	100		$30,000.00
3	Relocation		50		$0.00
4	Administrative Appeals	2	50		$5,000.00
5	Post-Acquisition	1	100		$5,000.00
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17			**GRAND TOTAL INHOUSE**		$52,000.00

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE **Preliminary Utilities Cost Estimate**
P.I. No. 0010327, DeKalb County
Description: North McDonough Streetscape Improvements

OFFICE District 7
Chamblee

DATE December 7, 2011

FROM **Jonathan Walker**
District Utilities Engineer

TO **Bobby Hilliard P.E., State Program Delivery Engineer**
ATTN **Darrell DeJean, Project Manager**

SUBJECT **PRELIMINARY UTILITY COST (ESTIMATE)**

As requested by your office, we are furnishing you with a Preliminary Utility Cost estimate for each utility with facilities potentially located within the project limits.

FACILITY OWNER	NON-REIMBURSABLE	REIMBURSABLE	GRAND TOTAL
AGL Resources	$0.00		
GA Power Distribution	$0.00		
Comcast	$0.00		
City of Decatur Water and Sewer	$0.00		
AT&T	$0.00		
Totals	**$0.00**	**$0.00**	**$0.00**

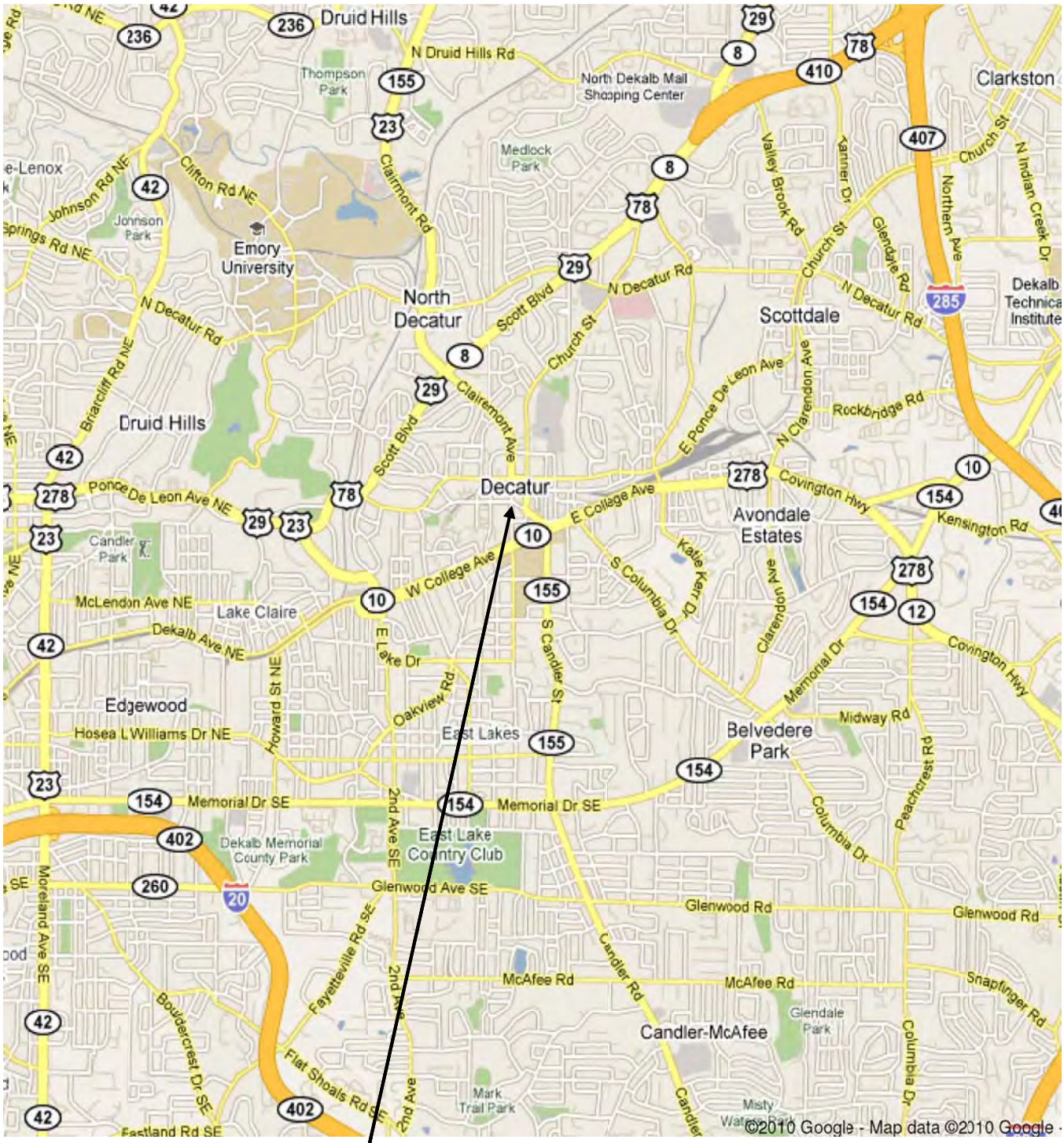
If you have any questions, please contact Yulonda Pride-Foster at 770-986-1117.

BRP/JW/WW

C: Jeff Baker, P.E., State Utilities Engineer
Angela Robinson, Office of Financial Management

ATTACHMENT 2 –

SKETCH LOCATION MAP

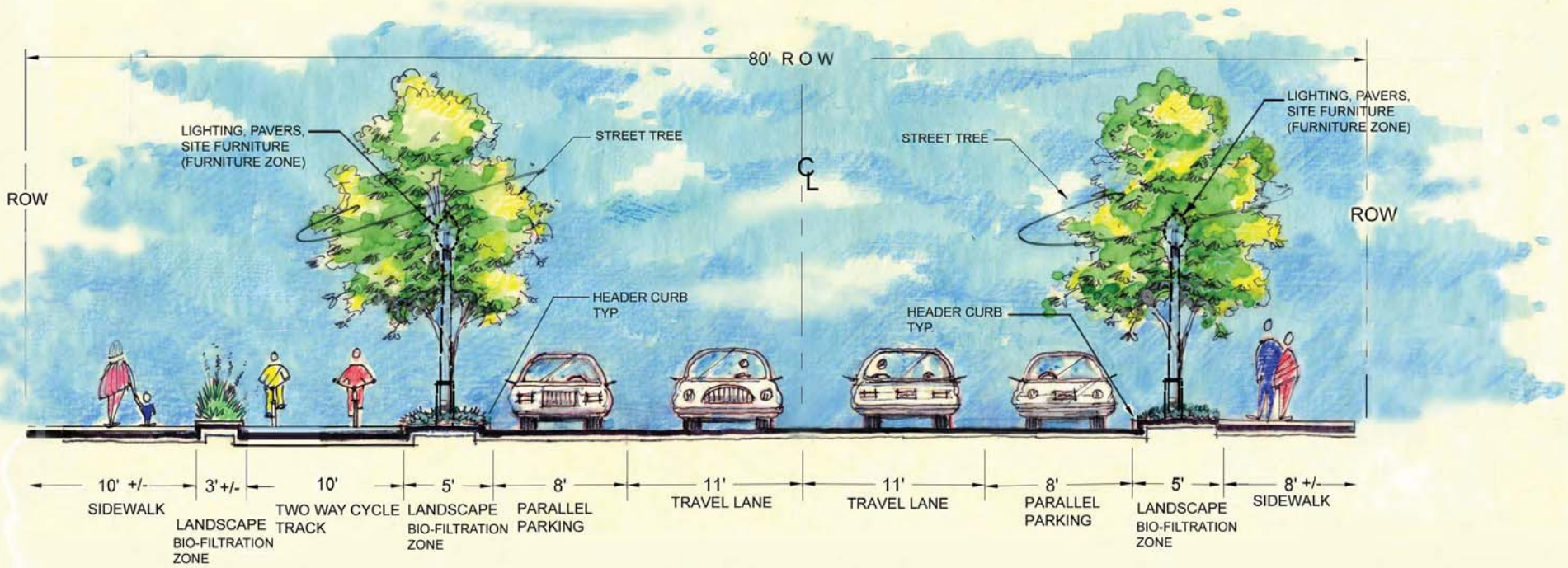


PROJECT

PROJECT LOCATION MAP
Project: N/A
DeKalb County
PI 0010327

ATTACHMENT 3 –

PROPOSED TYPICAL SECTION



TYPICAL SECTION

0' 2' 4' 8'

ATTACHMENT 4 –

ACCIDENT SUMMARIES

ACCIDENT SUMMARIES

Crash data for 2007 through 2009 along the North McDonough Street corridor was obtained from the City of Decatur and determined to not indicate any correctible safety issues or patterns as shown in **Figure 2.1.** A summary of the crash rates along the corridor compared to statewide averages for similar roadways is provided in **the below table**.

2007 – 2009 North McDonough Street and Average Statewide Crash Rates (per million vehicle miles)

Average Crash Rate		Injury Crash Rate		Fatality Crash Rate	
North McDonough Street	Statewide	North McDonough Street	Statewide	North McDonough Street	Statewide
147.297	474.895	0.000	98.438	0.000	1.330

Statewide Rate based on roadways with similar characteristics as North McDonough Street (4 lane local roadway with ~6,200 ADT)

Figure 2.1
North McDonough Street Corridor Crashes (2007-2009)

LEFT TURN

INJURY ○

SIDESWIPE

FATAL •

RIGHT ANGLE

FIXED OBJECT

HEAD ON

REAR END

IMPROPER BACKING

XXXXXXX - DEKALB COUNTY CRASH NUMBER

SEASON	ACC
WINTER (Dec-Feb)	3
SPRING (Mar-May)	1
SUMMER (June-Aug)	3
FALL (Sept-Nov)	4
TOTAL	11

TIME	ACC
0600-1000	3
1000-1600	6
1600-1900	2
1900-2400	0
2400-0600	0
TOTAL	11

TYPE ACC	ACC
SIDESWIPE	4
REAR END	2
RT. ANGLE	0
LEFT TURN	2
LST CONTROL	0
HEAD ON	0
OTHER	3
TOTAL	11

INJURY/FATAL	ACC
INJURY	0
FATAL	0

NORTH

ATTACHMENT 5 ï

CAPACITY ANALYSIS SUMMARY

INTRODUCTION

URS was retained by the City of Decatur to design a streetscape and road diet for North McDonough Street to improve multimodal transportation flow and pedestrian accessibility. This study documents an analysis of vehicular traffic conditions with and without the streetscape alternatives.

1.1 Study Area

The study focuses on North McDonough Street. The following is a list of the intersections under study:

- McDonough Street @ Trinity Place
- McDonough Street @ Maple Street
- McDonough Street @ Howard Avenue

Figure 1.1 shows the study area.

Figure 1.1
Study Area

EXISTING CONDITIONS (2010)

An extensive data collection effort was required to evaluate the existing conditions for the intersections under study. This section describes the data collected and how it was used to evaluate the existing conditions.

2.1 Data Collection

Traffic counts were conducted at several locations within the project limits in 2010. The traffic count program consisted of 24 hour directional tube counts and AM and PM peak period turning movement counts. The turning movement count data included passenger cars, trucks, bicycles and pedestrians.

In addition, design traffic factors for the study area were also determined using the traffic count program. As shown in **Table 2.1,** different K and D values were utilized in the AM and PM peak hours due to a high degree of variability due to the influence of school traffic in the AM peak hour that is not present in the PM peak hour.

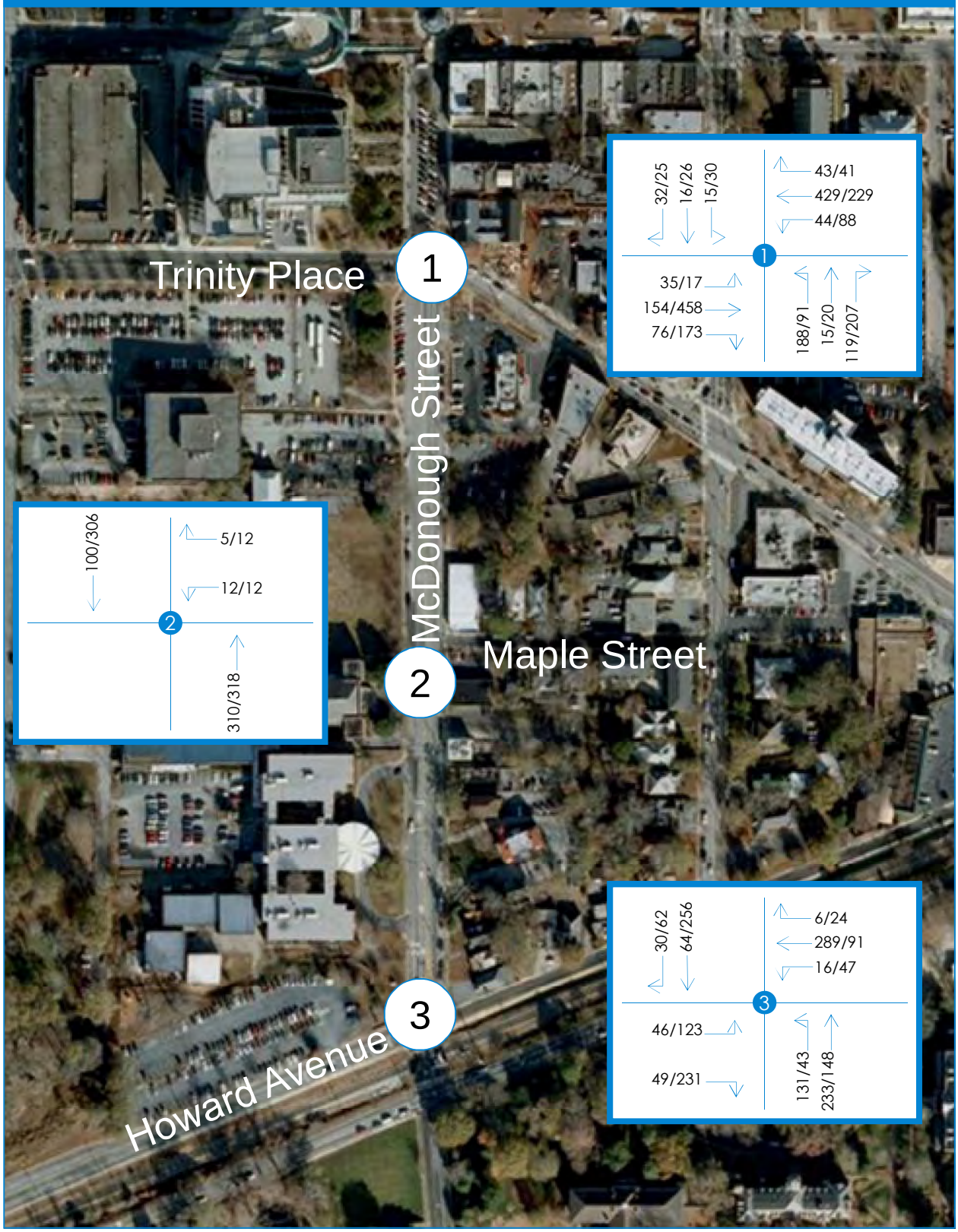
Table 2.1
North McDonough Street Design Traffic Factors

Location	Year	K (%)	D (%)	Daily Truck %	SU Truck %	Comb Truck %	Peak Hour Truck %
North McDonough Street, between Howard Avenue and Trinity Place	2010	6.8% (AM) 10.3% (PM)	73.5%(AM) 50.0%(PM)	3.8%	3.5%	0.3%	4.5%

2.2 Peak Hour Volumes

The AM and PM peak hour volumes for the study area were derived by determining the cumulatively highest four fifteen minute periods counted at each location. The resulting AM and PM peak hour volumes were compared to the peak hour traffic volumes collected by tubes for reasonability. The resulting 2009 AM and PM traffic volumes are provided in **Figure 2.2**.

Figure 2.2
2010 AM and PM Peak Hour Volumes



2.3 Existing Year Operational Analyses

The standard approach to defining traffic congestion is the use of Level of Service (LOS), a quantifiable measure of congestion that is correlated to the delay experienced by the average vehicle. LOS is measured on a letter grade scale from A to F, with LOS A indicating free-flow conditions and LOS F indicating severe congestion as shown in the graphic below. Typically, LOS E and F are defined as undesirable – for the purposes of a transportation impact analysis, evidence of LOS E or F conditions indicates the potential need to provide transportation improvements.

Source: FDOT Quality Level of Service Manual

The standard methodologies for defining LOS are documented in the Highway Capacity Manual (HCM) and vary by the type of intersection being analyzed (signal controlled versus unsignalized). For unsignalized intersections, the HCM defines LOS for each of the individual approaches that are under stop control. For these approaches, the average control delay per vehicle correlates to LOS as shown in **Table 2.2.** The average control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Several factors affect the controlled delay for unsignalized intersections, such as availability and distribution of gaps in the conflicting traffic stream, critical gaps, and follow-up time for a vehicle in the queue.

Table 2.2
Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (sec/veh)
A	≤ 10.0
B	> 10.0 and ≤15.0
C	> 15.0 and ≤25.0
D	> 25.0 and ≤35.0
E	> 35.0 and ≤50.0
F	> 50.0

Source: 2000 Highway Capacity Manual

For signalized intersections, LOS is defined in terms of average control delay per vehicle for all movements, which is composed of initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. **Table 2.3** presents LOS thresholds for signalized intersections.

Table 2.3
Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (sec/veh)
A	≤ 10.0
B	> 10.0 and ≤20.0
C	> 20.0 and ≤35.0
D	> 35.0 and ≤55.0
E	> 55.0 and ≤80.0
F	> 80.0

Source: 2000 Highway Capacity Manual

The analysis was focused on vehicle delay and intersection level of service. Inputs such as existing signal timing, peak hour volumes, and lane configurations were analyzed in Synchro 7.0. The LOS results are presented in **Table 2.4**.

Table 2.4
2010 AM and PM Level of Service

Intersection	2010	
	AM	PM
McDonough Street @ Trinity Place	A	A
McDonough Street @ Maple Street Westbound Approach	B	B
McDonough Street @ Howard Avenue	B	B

2.4 Existing Year Segment Analysis

In addition, a segment analysis was conducted using Synchro 7.0 along McDonough Street. As shown in **Table 2.5**, conditions along McDonough Road are currently at LOS C.

Table 2.5
McDonough Street Segment Level of Service

Direction	2010	
	AM	PM
Northbound	C	C
Southbound	C	C

Opening (2012) and design (2032) year AM and PM peak hour volumes were forecasting utilizing the following two step process.

3.1 Growth Rate Determination

Two methods for growth rate determination were developed. The first method utilized historical traffic growth in the Decatur area to determine any growth trends that appeared reasonable and had a strong R^2 (statistic indicating a strong and valid trend). Unfortunately, no statistically valid and reasonable trends were determined and a second method was utilized. This second method included the use of the Atlanta Regional Commission travel demand model to help determine growth trends. GDOT count locations in the Decatur region were compared to model projected volumes for the base year of the travel demand model (2005). At count location 089-3907 (Howard, west of McDonough) the traffic count and predicted model volume were within four percent indicating this would be a good location to determine a growth rate. Therefore, the model volume from this same location for the year 2030 was compared to the 2005 model volume to estimate a linear growth rate of 1.7 percent per year.

3.2 Development of Traffic Volumes

The 1.7 percent per year growth rate was applied linearly to the 2010 AM and PM peak hour volumes to determine the opening (2012) and design (2032) year peak hour volumes. The resulting AM and PM peak hour volumes are presented in **Figures 3.1** and **3.2**. In addition, Average Daily Traffic volumes are indicated in **Table 3.1**.

Table 3.1
North McDonough Street Average Daily Traffic (2010-2032)

Location	2010 ADT	2012 ADT	2032 ADT
North McDonough Street, between Howard Avenue and Trinity Place	6,200	6,400	8,500

Figure 3.1
2012 AM and PM Peak Hour Volumes

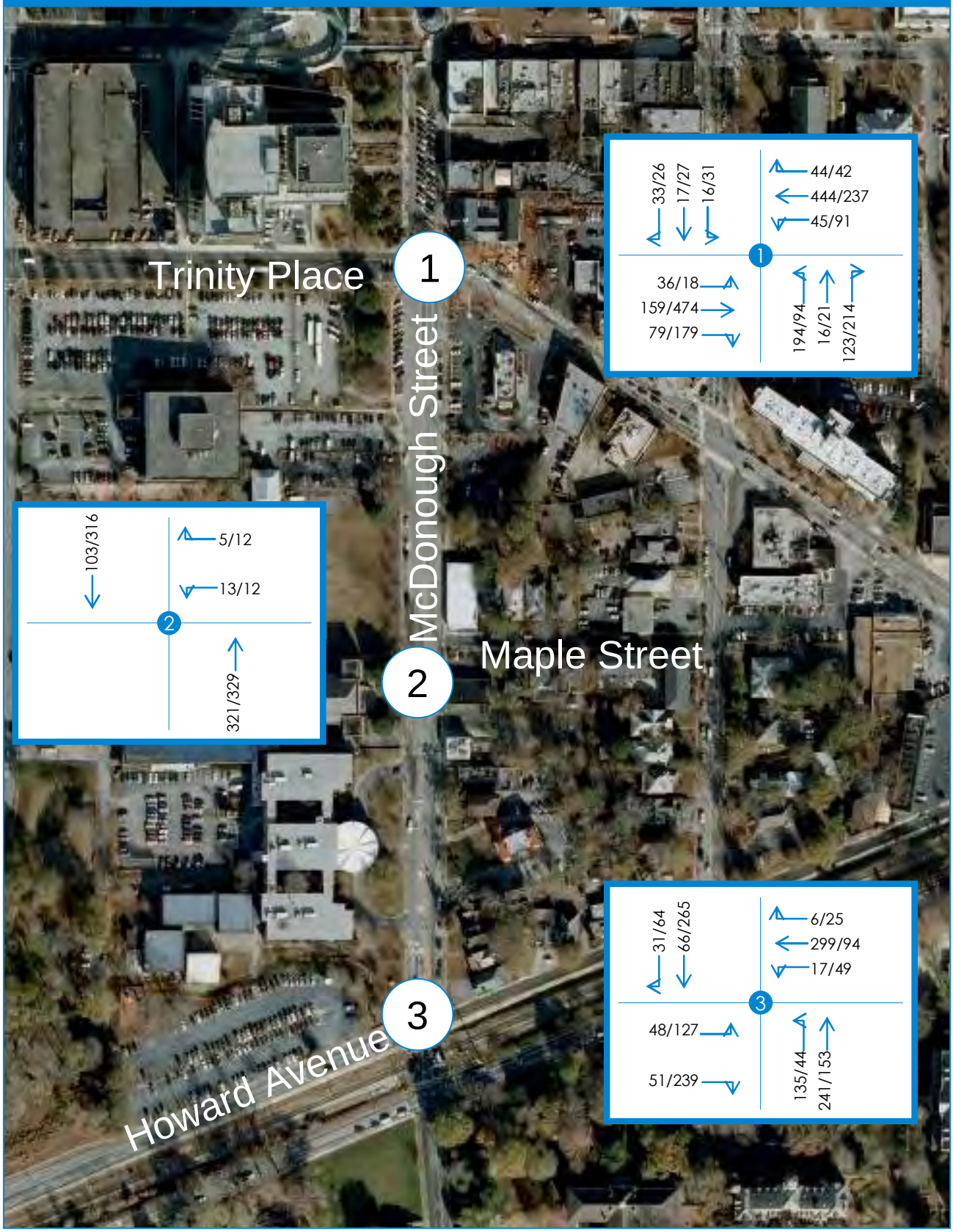
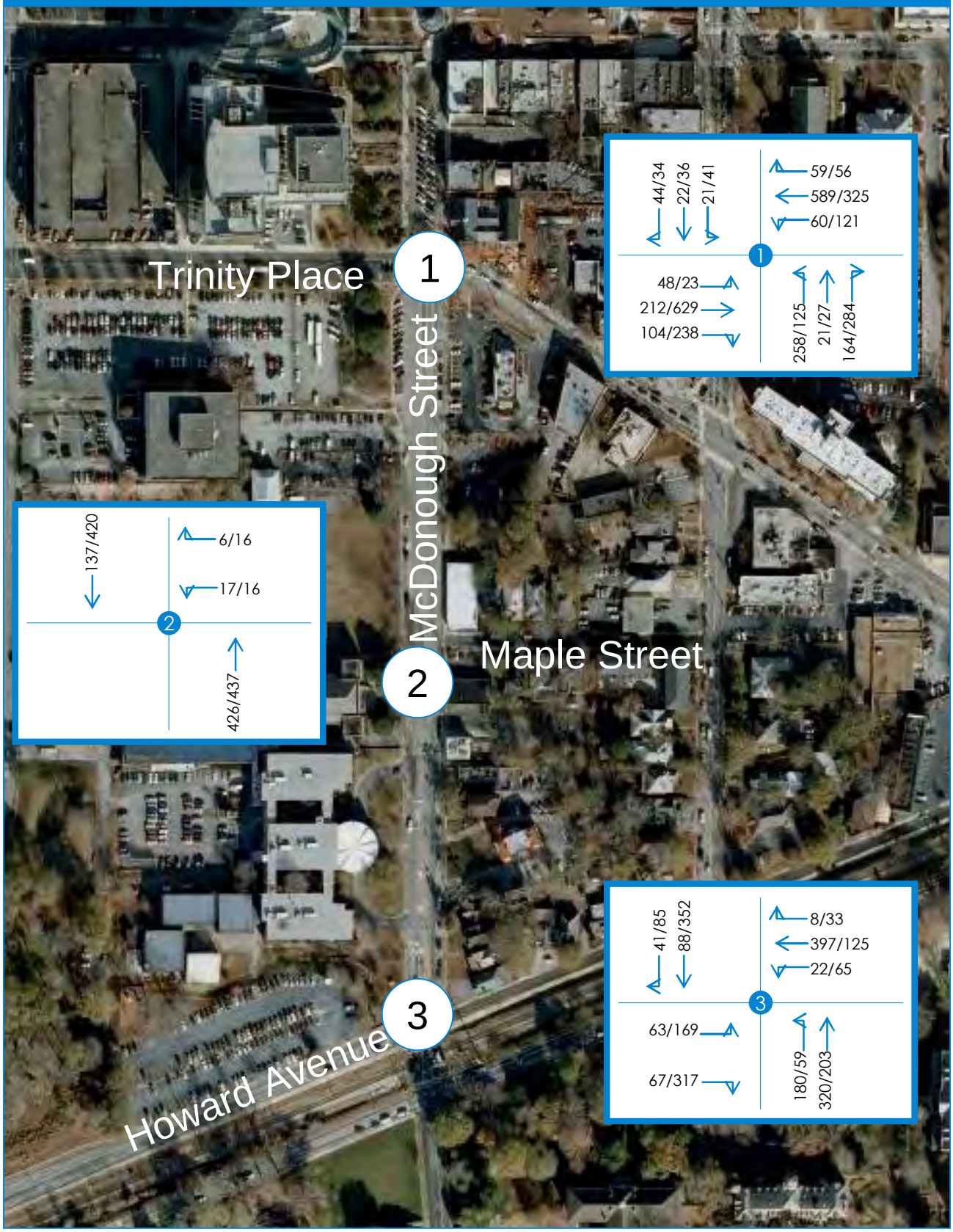


Figure 3.2
2032 AM and PM Peak Hour Volumes



4.1 Future Year Operational Analysis

An operational analysis of No-Build and Build 2012 and 2032 conditions was conducted. As with the operational analysis of existing conditions, this analysis focused on vehicle delay and intersection level of service. For the No-Build condition, existing lane configurations were assumed while the Build condition (representing Alternatives A, B, and C) assumed a road diet that would reduce through capacity on North McDonough Road while retaining the same lane configurations at the signalized intersections at Trinity Place and Howard Avenue. As the LOS results presented in **Tables 4.1 and 4.2** indicate, there is minimal difference in LOS between the No-Build and Build alternatives due to the use of the same lane configurations at the signalized intersections. At the unsignalized intersection of North McDonough Street and Maple Street, the westbound approach does experience minor degradation in LOS due to the reduction of lanes on McDonough Street.

Table 4.1
2012 No-Build and Build AM and PM Level of Service

Intersection	2012 No Build		2012 Build	
	AM	PM	AM	PM
McDonough Street @ Trinity Place	B	A	B	A
McDonough Street @ Maple Street Westbound Approach	B	B	B	C
McDonough Street @ Howard Avenue	B	B	B	B

Table 4.2
2032 No-Build and Build AM and PM Level of Service

Intersection	2032 No Build		2032 Build	
	AM	PM	AM	PM
McDonough Street @ Trinity Place	B	B	B	B
McDonough Street @ Maple Street Westbound Approach	B	C	B	C
McDonough Street @ Howard Avenue	B	B	B	B

4.2 Future Year Segment Analysis

As the intersection LOS results are limited due to the use of the same configuration of lanes at the signalized intersection, a segment analysis was conducted using Synchro 7.0 along McDonough Street to better understand the impacts of the proposed road diet. As shown in **Table 4.3**, segment LOS is anticipated to remain the same with or without the road diet.

Table 4.3
McDonough Street Segment Level of Service

Direction	2012 No Build		2012 Build		2032 No Build		2032 Build	
	AM	PM	AM	PM	AM	PM	AM	PM
Northbound	C	C	C	C	C	D	C	D
Southbound	C	C	C	C	D	D	D	D

4.3 Queue Analysis

In addition, a 95th percentile queue analysis was conducted to determine the turn lane storage that will be needed to avoid spillback into through travel lanes in the design year (2032). The results are indicated in **Table 4.4**.

Table 4.4
95th Percentile Queue Analysis (in feet)

Intersection	2032 No Build		2032 Build	
	AM	PM	AM	PM
McDonough Street @ Trinity Place				
Eastbound Left	**54**	14	**54**	14
Westbound Left	39	**103**	39	**103**
Northbound Left	**210**	125	**210**	125
Northbound Right	32	**136**	32	**136**
McDonough Street @ Howard Avenue				
Northbound Left	**91**	37	**91**	37
Southbound Right	7	**43**	7	**43**

Note: Maximum 95th percentile queue length observed at each location bolded

CONCLUSIONS

While the traditional intersection LOS analysis indicated minimal differences in LOS between the No-Build and Build conditions (due to minimal changes in capacity at the signalized intersections despite the road diet), an additional segment LOS analysis was conducted along McDonough Street. The results of that analysis indicated no degradation in LOS along the corridor as a result of the road diet.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	154	76	44	429	43	188	15	119	15	16	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1805	1900	1553	1770	1855		1787	1900	1599		1736	
Flt Permitted	0.31	1.00	1.00	0.63	1.00		0.70	1.00	1.00		0.95	
Satd. Flow (perm)	592	1900	1553	1174	1855		1312	1900	1599		1676	
Peak-hour factor, PHF	0.88	0.76	0.95	0.58	0.86	0.77	0.72	0.63	0.83	0.75	0.80	0.62
Adj. Flow (vph)	40	203	80	76	499	56	261	24	143	20	20	52
RTOR Reduction (vph)	0	0	43	0	4	0	0	0	92	0	34	0
Lane Group Flow (vph)	40	203	37	76	551	0	261	24	51	0	58	0
Heavy Vehicles (%)	0%	0%	4%	2%	1%	0%	1%	0%	1%	0%	0%	0%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	21.1	21.1	21.1	21.1	21.1		16.0	16.0	16.0		16.0	
Effective Green, g (s)	21.1	21.1	21.1	21.1	21.1		16.0	16.0	16.0		16.0	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.35	0.35	0.35		0.35	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	277	889	727	549	868		465	674	567		595	
v/s Ratio Prot		0.11			c0.30			0.01				
v/s Ratio Perm	0.07		0.02	0.06			c0.20		0.03		0.03	
v/c Ratio	0.14	0.23	0.05	0.14	0.63		0.56	0.04	0.09		0.10	
Uniform Delay, d1	6.8	7.1	6.5	6.8	9.1		11.7	9.5	9.7		9.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.2	0.1	0.0	0.1	1.5		1.6	0.0	0.1		0.1	
Delay (s)	7.1	7.3	6.6	6.9	10.6		13.3	9.5	9.8		9.8	
Level of Service	A	A	A	A	B		B	A	A		A	
Approach Delay (s)		7.1			10.2			11.9			9.8	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	10.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	45.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	5	310	0	0	100
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.71	0.71	0.90	0.90	0.76	0.76
Hourly flow rate (vph)	17	7	344	0	0	132
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			667			624
pX, platoon unblocked						
vC, conflicting volume	410	172			344	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	410	172			344	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	575	848			1226	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	24	172	172	66	66
Volume Left	17	0	0	0	0
Volume Right	7	0	0	0	0
cSH	635	1700	1700	1700	1700
Volume to Capacity	0.04	0.10	0.10	0.04	0.04
Queue Length 95th (ft)	3	0	0	0	0
Control Delay (s)	10.9	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.9	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	0	49	16	289	6	131	233	0	0	64	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00		1.00		1.00		1.00	1.00			0.95	1.00
Frt	1.00		0.85		1.00		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770		1615		1880		1805	1900			3610	1615
Flt Permitted	0.47		1.00		1.00		0.43	1.00			1.00	1.00
Satd. Flow (perm)	876		1615		1880		818	1900			3610	1615
Peak-hour factor, PHF	0.68	0.25	0.77	0.80	0.90	0.50	0.84	0.90	0.50	0.25	0.76	0.54
Adj. Flow (vph)	68	0	64	20	321	12	156	259	0	0	84	56
RTOR Reduction (vph)	0	0	48	0	1	0	0	0	0	0	0	48
Lane Group Flow (vph)	68	0	16	0	352	0	156	259	0	0	84	8
Heavy Vehicles (%)	2%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	custom		Over	Perm			pm+pt					Perm
Protected Phases			5		8		5	2			6	
Permitted Phases	4			8			2					6
Actuated Green, G (s)	14.1		11.1		14.1		21.5	21.5			6.4	6.4
Effective Green, g (s)	14.1		11.1		14.1		21.5	21.5			6.4	6.4
Actuated g/C Ratio	0.32		0.25		0.32		0.49	0.49			0.15	0.15
Clearance Time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	283		411		608		655	937			530	237
v/s Ratio Prot			0.01				0.06	c0.14			0.02	
v/s Ratio Perm	0.08				0.19		0.06					0.01
v/c Ratio	0.24		0.04		0.58		0.24	0.28			0.16	0.03
Uniform Delay, d1	10.8		12.2		12.3		6.3	6.5			16.2	16.0
Progression Factor	1.00		1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.4		0.0		1.3		0.2	0.2			0.1	0.1
Delay (s)	11.3		12.3		13.6		6.5	6.6			16.4	16.0
Level of Service	B		B		B		A	A			B	B
Approach Delay (s)		11.8			13.6			6.6			16.2	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	43.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: NB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Trinity Place	III	35	29.3	12.2	41.5	0.24	21.2	C
Total	III		29.3	12.2	41.5	0.24	21.2	C

Arterial Level of Service: SB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Howard Avenue	III	35	29.3	17.3	46.6	0.24	18.9	C
Total	III		29.3	17.3	46.6	0.24	18.9	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	458	173	88	229	41	91	20	207	30	26	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1805	1900	1583	1787	1818		1770	1900	1599		1795	
Flt Permitted	0.57	1.00	1.00	0.32	1.00		0.84	1.00	1.00		0.90	
Satd. Flow (perm)	1091	1900	1583	601	1818		1556	1900	1599		1643	
Peak-hour factor, PHF	0.71	0.76	0.83	0.96	0.92	0.73	0.84	0.71	0.86	0.75	0.65	0.78
Adj. Flow (vph)	24	603	208	92	249	56	108	28	241	40	40	32
RTOR Reduction (vph)	0	0	100	0	11	0	0	0	175	0	15	0
Lane Group Flow (vph)	24	603	108	92	294	0	108	28	66	0	97	0
Heavy Vehicles (%)	0%	0%	2%	1%	2%	0%	2%	0%	1%	0%	0%	0%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	20.0	20.0	20.0	20.0	20.0		10.6	10.6	10.6		10.6	
Effective Green, g (s)	20.0	20.0	20.0	20.0	20.0		10.6	10.6	10.6		10.6	
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.52		0.27	0.27	0.27		0.27	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	565	984	820	311	942		427	522	439		451	
v/s Ratio Prot		c0.32			0.16			0.01				
v/s Ratio Perm	0.02		0.07	0.15			c0.07		0.04		0.06	
v/c Ratio	0.04	0.61	0.13	0.30	0.31		0.25	0.05	0.15		0.22	
Uniform Delay, d1	4.6	6.6	4.8	5.3	5.3		10.9	10.3	10.6		10.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.1	0.1	0.5	0.2		0.3	0.0	0.2		0.2	
Delay (s)	4.6	7.7	4.9	5.8	5.5		11.2	10.4	10.8		11.0	
Level of Service	A	A	A	A	A		B	B	B		B	
Approach Delay (s)		6.9			5.6			10.9			11.0	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	38.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	12	318	0	0	306
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.60	0.60	0.81	0.81
Hourly flow rate (vph)	16	16	530	0	0	378
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			667			624
pX, platoon unblocked						
vC, conflicting volume	719	265			530	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	719	265			530	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			100	
cM capacity (veh/h)	368	739			1048	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	265	265	189	189
Volume Left	16	0	0	0	0
Volume Right	16	0	0	0	0
cSH	491	1700	1700	1700	1700
Volume to Capacity	0.07	0.16	0.16	0.11	0.11
Queue Length 95th (ft)	5	0	0	0	0
Control Delay (s)	12.8	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.8	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	18.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	0	231	47	91	24	43	148	0	0	256	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00		1.00		1.00		1.00	1.00			0.95	1.00
Frt	1.00		0.85		0.97		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1805		1615		1819		1805	1900			3610	1615
Flt Permitted	0.64		1.00		0.99		0.40	1.00			1.00	1.00
Satd. Flow (perm)	1220		1615		1819		766	1900			3610	1615
Peak-hour factor, PHF	0.77	0.75	0.70	0.78	0.81	0.50	0.83	0.61	0.25	0.25	0.80	0.82
Adj. Flow (vph)	160	0	330	60	112	48	52	243	0	0	320	76
RTOR Reduction (vph)	0	0	272	0	10	0	0	0	0	0	0	57
Lane Group Flow (vph)	160	0	58	0	210	0	52	243	0	0	320	19
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	custom		Over	Perm			pm+pt					Perm
Protected Phases			5		8		5	2			6	
Permitted Phases	4			8			2					6
Actuated Green, G (s)	12.7		7.5		12.7		21.9	21.9			10.4	10.4
Effective Green, g (s)	12.7		7.5		12.7		21.9	21.9			10.4	10.4
Actuated g/C Ratio	0.30		0.18		0.30		0.51	0.51			0.24	0.24
Clearance Time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	364		284		542		577	977			881	394
v/s Ratio Prot			0.04				0.02	c0.13			c0.09	
v/s Ratio Perm	c0.13				0.12		0.03					0.01
v/c Ratio	0.44		0.20		0.39		0.09	0.25			0.36	0.05
Uniform Delay, d1	12.1		15.0		11.9		5.4	5.8			13.4	12.3
Progression Factor	1.00		1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.9		0.4		0.5		0.1	0.1			0.3	0.1
Delay (s)	12.9		15.4		12.3		5.4	5.9			13.6	12.4
Level of Service	B		B		B		A	A			B	B
Approach Delay (s)		14.6			12.3			5.8			13.4	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	12.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	42.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: NB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Trinity Place	III	35	29.3	13.0	42.3	0.24	20.8	C
Total	III		29.3	13.0	42.3	0.24	20.8	C

Arterial Level of Service: SB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Howard Avenue	III	35	29.3	16.0	45.3	0.24	19.4	C
Total	III		29.3	16.0	45.3	0.24	19.4	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	159	79	45	444	44	194	16	123	16	17	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85		0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1805	1900	1553	1770	1855		1787	1900	1599		1738	
Flt Permitted	0.29	1.00	1.00	0.63	1.00		0.70	1.00	1.00		0.95	
Satd. Flow (perm)	559	1900	1553	1168	1855		1308	1900	1599		1676	
Peak-hour factor, PHF	0.88	0.76	0.95	0.58	0.86	0.77	0.72	0.63	0.83	0.75	0.80	0.62
Adj. Flow (vph)	41	209	83	78	516	57	269	25	148	21	21	53
RTOR Reduction (vph)	0	0	44	0	4	0	0	0	95	0	34	0
Lane Group Flow (vph)	41	209	39	78	569	0	269	25	53	0	61	0
Heavy Vehicles (%)	0%	0%	4%	2%	1%	0%	1%	0%	1%	0%	0%	0%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	22.3	22.3	22.3	22.3	22.3		17.0	17.0	17.0		17.0	
Effective Green, g (s)	22.3	22.3	22.3	22.3	22.3		17.0	17.0	17.0		17.0	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.36	0.36	0.36		0.36	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	264	896	732	551	875		470	683	575		602	
v/s Ratio Prot		0.11			c0.31			0.01				
v/s Ratio Perm	0.07		0.03	0.07			c0.21		0.03		0.04	
v/c Ratio	0.16	0.23	0.05	0.14	0.65		0.57	0.04	0.09		0.10	
Uniform Delay, d1	7.1	7.4	6.8	7.1	9.5		12.2	9.8	10.0		10.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.3	0.1	0.0	0.1	1.7		1.7	0.0	0.1		0.1	
Delay (s)	7.4	7.6	6.8	7.2	11.3		13.9	9.9	10.1		10.1	
Level of Service	A	A	A	A	B		B	A	B		B	
Approach Delay (s)		7.4			10.8			12.4			10.1	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	47.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	13	5	321	0	0	103
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.71	0.71	0.90	0.90	0.76	0.76
Hourly flow rate (vph)	18	7	357	0	0	136
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			667			624
pX, platoon unblocked						
vC, conflicting volume	424	178			357	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	424	178			357	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	563	840			1213	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	25	178	178	68	68
Volume Left	18	0	0	0	0
Volume Right	7	0	0	0	0
cSH	620	1700	1700	1700	1700
Volume to Capacity	0.04	0.10	0.10	0.04	0.04
Queue Length 95th (ft)	3	0	0	0	0
Control Delay (s)	11.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	18.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	0	51	17	299	6	135	241	0	0	66	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00		1.00		1.00		1.00	1.00			0.95	1.00
Frt	1.00		0.85		1.00		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770		1615		1880		1805	1900			3610	1615
Flt Permitted	0.46		1.00		1.00		0.43	1.00			1.00	1.00
Satd. Flow (perm)	853		1615		1880		816	1900			3610	1615
Peak-hour factor, PHF	0.68	0.25	0.77	0.80	0.90	0.50	0.84	0.90	0.50	0.25	0.76	0.54
Adj. Flow (vph)	71	0	66	21	332	12	161	268	0	0	87	57
RTOR Reduction (vph)	0	0	49	0	1	0	0	0	0	0	0	49
Lane Group Flow (vph)	71	0	17	0	364	0	161	268	0	0	87	8
Heavy Vehicles (%)	2%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	custom		Over	Perm			pm+pt					Perm
Protected Phases			5		8		5	2			6	
Permitted Phases	4			8			2					6
Actuated Green, G (s)	14.5		11.4		14.5		21.8	21.8			6.4	6.4
Effective Green, g (s)	14.5		11.4		14.5		21.8	21.8			6.4	6.4
Actuated g/C Ratio	0.33		0.26		0.33		0.49	0.49			0.14	0.14
Clearance Time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	279		416		615		656	935			522	233
v/s Ratio Prot			0.01				0.06	c0.14			0.02	
v/s Ratio Perm	0.08				0.19		0.06					0.01
v/c Ratio	0.25		0.04		0.59		0.25	0.29			0.17	0.04
Uniform Delay, d1	10.9		12.3		12.4		6.5	6.7			16.6	16.3
Progression Factor	1.00		1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.5		0.0		1.5		0.2	0.2			0.2	0.1
Delay (s)	11.4		12.4		14.0		6.7	6.8			16.8	16.4
Level of Service	B		B		B		A	A			B	B
Approach Delay (s)		11.9			14.0			6.8			16.6	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	44.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: NB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Trinity Place	III	35	29.3	12.7	42.0	0.24	21.0	C
Total	III		29.3	12.7	42.0	0.24	21.0	C

Arterial Level of Service: SB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Howard Avenue	III	35	29.3	17.8	47.1	0.24	18.7	C
Total	III		29.3	17.8	47.1	0.24	18.7	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	474	179	91	237	42	94	21	214	31	27	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1805	1900	1583	1787	1818		1770	1900	1599		1795	
Flt Permitted	0.57	1.00	1.00	0.31	1.00		0.82	1.00	1.00		0.90	
Satd. Flow (perm)	1080	1900	1583	579	1818		1524	1900	1599		1643	
Peak-hour factor, PHF	0.71	0.76	0.83	0.96	0.92	0.73	0.84	0.71	0.86	0.75	0.65	0.78
Adj. Flow (vph)	25	624	216	95	258	58	112	30	249	41	42	33
RTOR Reduction (vph)	0	0	101	0	10	0	0	0	182	0	15	0
Lane Group Flow (vph)	25	624	115	95	306	0	112	30	67	0	101	0
Heavy Vehicles (%)	0%	0%	2%	1%	2%	0%	2%	0%	1%	0%	0%	0%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	21.3	21.3	21.3	21.3	21.3		10.8	10.8	10.8		10.8	
Effective Green, g (s)	21.3	21.3	21.3	21.3	21.3		10.8	10.8	10.8		10.8	
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53		0.27	0.27	0.27		0.27	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	574	1009	841	308	966		410	512	431		443	
v/s Ratio Prot		c0.33			0.17			0.02				
v/s Ratio Perm	0.02		0.07	0.16			c0.07		0.04		0.06	
v/c Ratio	0.04	0.62	0.14	0.31	0.32		0.27	0.06	0.16		0.23	
Uniform Delay, d1	4.5	6.6	4.8	5.3	5.3		11.6	10.9	11.2		11.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.1	0.1	0.6	0.2		0.4	0.0	0.2		0.3	
Delay (s)	4.5	7.7	4.8	5.8	5.5		11.9	10.9	11.3		11.7	
Level of Service	A	A	A	A	A		B	B	B		B	
Approach Delay (s)		6.9			5.6			11.5			11.7	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	40.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	12	329	0	0	316
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.60	0.60	0.81	0.81
Hourly flow rate (vph)	16	16	548	0	0	390
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			667			624
pX, platoon unblocked						
vC, conflicting volume	743	274			548	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	743	274			548	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	98			100	
cM capacity (veh/h)	355	729			1031	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	274	274	195	195
Volume Left	16	0	0	0	0
Volume Right	16	0	0	0	0
cSH	477	1700	1700	1700	1700
Volume to Capacity	0.07	0.16	0.16	0.11	0.11
Queue Length 95th (ft)	5	0	0	0	0
Control Delay (s)	13.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	13.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	127	0	239	49	94	25	44	153	0	0	265	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00		1.00		1.00		1.00	1.00			0.95	1.00
Frt	1.00		0.85		0.97		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1805		1615		1819		1805	1900			3610	1615
Flt Permitted	0.63		1.00		0.99		0.40	1.00			1.00	1.00
Satd. Flow (perm)	1196		1615		1819		761	1900			3610	1615
Peak-hour factor, PHF	0.77	0.75	0.70	0.78	0.81	0.50	0.83	0.61	0.25	0.25	0.80	0.82
Adj. Flow (vph)	165	0	341	63	116	50	53	251	0	0	331	78
RTOR Reduction (vph)	0	0	282	0	10	0	0	0	0	0	0	56
Lane Group Flow (vph)	165	0	59	0	219	0	53	251	0	0	331	22
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	custom		Over	Perm			pm+pt					Perm
Protected Phases			5		8		5	2			6	
Permitted Phases	4			8			2					6
Actuated Green, G (s)	13.1		7.5		13.1		22.1	22.1			10.6	10.6
Effective Green, g (s)	13.1		7.5		13.1		22.1	22.1			10.6	10.6
Actuated g/C Ratio	0.30		0.17		0.30		0.51	0.51			0.25	0.25
Clearance Time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	363		280		552		571	972			886	396
v/s Ratio Prot			0.04				0.02	c0.13			c0.09	
v/s Ratio Perm	c0.14				0.12		0.03					0.01
v/c Ratio	0.45		0.21		0.40		0.09	0.26			0.37	0.06
Uniform Delay, d1	12.2		15.3		11.9		5.5	5.9			13.5	12.5
Progression Factor	1.00		1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.9		0.4		0.5		0.1	0.1			0.3	0.1
Delay (s)	13.1		15.7		12.4		5.6	6.1			13.8	12.5
Level of Service	B		B		B		A	A			B	B
Approach Delay (s)		14.8			12.4			6.0			13.6	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	43.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: NB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Trinity Place	III	35	29.3	13.9	43.2	0.24	20.4	C
Total	III		29.3	13.9	43.2	0.24	20.4	C

Arterial Level of Service: SB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Howard Avenue	III	35	29.3	16.5	45.8	0.24	19.2	C
Total	III		29.3	16.5	45.8	0.24	19.2	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	55	279	109	103	762	358	33	198	127
v/c Ratio	0.38	0.29	0.13	0.20	0.81	0.73	0.05	0.27	0.19
Control Delay	22.5	12.6	3.0	12.8	24.5	31.6	17.5	4.2	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	12.6	3.0	12.8	24.5	31.6	17.5	4.2	10.0
Queue Length 50th (ft)	14	68	0	24	264	135	9	0	16
Queue Length 95th (ft)	54	119	25	39	493	210	22	32	48
Internal Link Dist (ft)		347			485		544		209
Turn Bay Length (ft)	80			215		135			
Base Capacity (vph)	214	1408	1179	758	1377	809	1171	1062	1055
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.20	0.09	0.14	0.55	0.44	0.03	0.19	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	212	104	60	589	59	258	21	164	21	22	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1805	1900	1553	1770	1855		1787	1900	1599		1737	
Flt Permitted	0.15	1.00	1.00	0.55	1.00		0.70	1.00	1.00		0.95	
Satd. Flow (perm)	290	1900	1553	1022	1855		1313	1900	1599		1667	
Peak-hour factor, PHF	0.88	0.76	0.95	0.58	0.86	0.77	0.72	0.63	0.83	0.75	0.80	0.62
Adj. Flow (vph)	55	279	109	103	685	77	358	33	198	28	28	71
RTOR Reduction (vph)	0	0	53	0	4	0	0	0	123	0	44	0
Lane Group Flow (vph)	55	279	56	103	758	0	358	33	75	0	83	0
Heavy Vehicles (%)	0%	0%	4%	2%	1%	0%	1%	0%	1%	0%	0%	0%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	36.7	36.7	36.7	36.7	36.7		27.2	27.2	27.2		27.2	
Effective Green, g (s)	36.7	36.7	36.7	36.7	36.7		27.2	27.2	27.2		27.2	
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51		0.38	0.38	0.38		0.38	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	148	970	793	522	947		497	719	605		631	
v/s Ratio Prot		0.15			c0.41			0.02				
v/s Ratio Perm	0.19		0.04	0.10			c0.27		0.05		0.05	
v/c Ratio	0.37	0.29	0.07	0.20	0.80		0.72	0.05	0.12		0.13	
Uniform Delay, d1	10.6	10.1	8.9	9.6	14.6		19.1	14.1	14.6		14.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.6	0.2	0.0	0.2	4.9		5.1	0.0	0.1		0.1	
Delay (s)	12.2	10.3	9.0	9.8	19.5		24.2	14.2	14.7		14.7	
Level of Service	B	B	A	A	B		C	B	B		B	
Approach Delay (s)		10.2			18.3			20.4			14.7	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	71.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	17	6	426	0	0	137
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.71	0.71	0.90	0.90	0.76	0.76
Hourly flow rate (vph)	24	8	473	0	0	180
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			667			624
pX, platoon unblocked						
vC, conflicting volume	563	237			473	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	563	237			473	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			100	
cM capacity (veh/h)	461	771			1099	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	237	237	90	90
Volume Left	24	0	0	0	0
Volume Right	8	0	0	0	0
cSH	515	1700	1700	1700	1700
Volume to Capacity	0.06	0.14	0.14	0.05	0.05
Queue Length 95th (ft)	5	0	0	0	0
Control Delay (s)	12.5	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.5	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	93	87	485	214	356	116	76
v/c Ratio	0.36	0.19	0.69	0.33	0.39	0.21	0.24
Control Delay	19.3	6.9	21.6	11.5	12.1	24.8	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	6.9	21.6	11.5	12.1	24.8	9.5
Queue Length 50th (ft)	21	0	126	38	69	17	0
Queue Length 95th (ft)	49	23	293	91	165	40	7
Internal Link Dist (ft)			432		120	587	
Turn Bay Length (ft)							110
Base Capacity (vph)	566	1362	1569	1506	1900	2914	1318
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.06	0.31	0.14	0.19	0.04	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	0	67	22	397	8	180	320	0	0	88	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00		1.00		1.00		1.00	1.00			0.95	1.00
Frt	1.00		0.85		1.00		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770		1615		1880		1805	1900			3610	1615
Flt Permitted	0.36		1.00		1.00		0.47	1.00			1.00	1.00
Satd. Flow (perm)	678		1615		1880		896	1900			3610	1615
Peak-hour factor, PHF	0.68	0.25	0.77	0.80	0.90	0.50	0.84	0.90	0.50	0.25	0.76	0.54
Adj. Flow (vph)	93	0	87	28	441	16	214	356	0	0	116	76
RTOR Reduction (vph)	0	0	65	0	1	0	0	0	0	0	0	64
Lane Group Flow (vph)	93	0	22	0	484	0	214	356	0	0	116	12
Heavy Vehicles (%)	2%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	custom		Over	Perm			pm+pt					Perm
Protected Phases			5		8		5	2			6	
Permitted Phases	4			8			2					6
Actuated Green, G (s)	21.6		14.2		21.6		27.3	27.3			9.1	9.1
Effective Green, g (s)	21.6		14.2		21.6		27.3	27.3			9.1	9.1
Actuated g/C Ratio	0.38		0.25		0.38		0.48	0.48			0.16	0.16
Clearance Time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	257		403		714		657	912			577	258
v/s Ratio Prot			0.01				0.08	c0.19			0.03	
v/s Ratio Perm	0.14				0.26		0.08					0.01
v/c Ratio	0.36		0.05		0.68		0.33	0.39			0.20	0.05
Uniform Delay, d1	12.7		16.2		14.7		8.9	9.5			20.7	20.2
Progression Factor	1.00		1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.9		0.1		2.6		0.3	0.3			0.2	0.1
Delay (s)	13.6		16.3		17.3		9.2	9.8			20.9	20.3
Level of Service	B		B		B		A	A			C	C
Approach Delay (s)		14.9			17.3			9.5			20.7	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: NB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Trinity Place	III	35	29.3	17.5	46.8	0.24	18.8	C
Total	III		29.3	17.5	46.8	0.24	18.8	C

Arterial Level of Service: SB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Howard Avenue	III	35	29.3	24.8	54.1	0.24	16.3	D
Total	III		29.3	24.8	54.1	0.24	16.3	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	32	828	287	126	419	149	38	330	154
v/c Ratio	0.06	0.74	0.27	0.58	0.39	0.47	0.08	0.59	0.36
Control Delay	6.1	13.7	1.6	21.0	7.4	28.0	21.6	14.5	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	13.7	1.6	21.0	7.4	28.0	21.6	14.5	21.9
Queue Length 50th (ft)	4	163	0	21	56	40	9	33	35
Queue Length 95th (ft)	14	311	20	103	157	125	33	136	80
Internal Link Dist (ft)		347			485		544		209
Turn Bay Length (ft)	80			215		135			
Base Capacity (vph)	837	1769	1494	344	1694	716	1090	1003	942
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.47	0.19	0.37	0.25	0.21	0.03	0.33	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	629	238	121	315	56	125	27	284	41	36	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1805	1900	1583	1787	1818		1770	1900	1599		1795	
Flt Permitted	0.47	1.00	1.00	0.20	1.00		0.67	1.00	1.00		0.89	
Satd. Flow (perm)	899	1900	1583	368	1818		1249	1900	1599		1627	
Peak-hour factor, PHF	0.71	0.76	0.83	0.96	0.92	0.73	0.84	0.71	0.86	0.75	0.65	0.78
Adj. Flow (vph)	32	828	287	126	342	77	149	38	330	55	55	44
RTOR Reduction (vph)	0	0	114	0	9	0	0	0	149	0	15	0
Lane Group Flow (vph)	32	828	173	126	410	0	149	38	181	0	139	0
Heavy Vehicles (%)	0%	0%	2%	1%	2%	0%	2%	0%	1%	0%	0%	0%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	34.7	34.7	34.7	34.7	34.7		14.9	14.9	14.9		14.9	
Effective Green, g (s)	34.7	34.7	34.7	34.7	34.7		14.9	14.9	14.9		14.9	
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60		0.26	0.26	0.26		0.26	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	542	1145	954	222	1095		323	491	414		421	
v/s Ratio Prot		c0.44			0.23			0.02				
v/s Ratio Perm	0.04		0.11	0.34			c0.12		0.11		0.09	
v/c Ratio	0.06	0.72	0.18	0.57	0.37		0.46	0.08	0.44		0.33	
Uniform Delay, d1	4.7	8.1	5.1	6.9	5.9		18.0	16.2	17.8		17.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	2.3	0.1	3.3	0.2		1.0	0.1	0.7		0.5	
Delay (s)	4.8	10.4	5.2	10.2	6.1		19.0	16.2	18.6		17.8	
Level of Service	A	B	A	B	A		B	B	B		B	
Approach Delay (s)		8.9			7.0			18.5			17.8	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	57.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	16	16	437	0	0	420
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.60	0.60	0.81	0.81
Hourly flow rate (vph)	21	21	728	0	0	519
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			667			624
pX, platoon unblocked						
vC, conflicting volume	988	364			728	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	988	364			728	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	97			100	
cM capacity (veh/h)	248	638			885	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	43	364	364	259	259
Volume Left	21	0	0	0	0
Volume Right	21	0	0	0	0
cSH	357	1700	1700	1700	1700
Volume to Capacity	0.12	0.21	0.21	0.15	0.15
Queue Length 95th (ft)	10	0	0	0	0
Control Delay (s)	16.4	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	16.4	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	219	453	303	71	333	440	104
v/c Ratio	0.61	0.71	0.46	0.14	0.36	0.49	0.23
Control Delay	23.9	10.0	16.4	9.8	11.2	21.5	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	10.0	16.4	9.8	11.2	21.5	10.4
Queue Length 50th (ft)	53	0	65	10	57	58	7
Queue Length 95th (ft)	123	11	148	37	99	130	43
Internal Link Dist (ft)			432		120	587	
Turn Bay Length (ft)							110
Base Capacity (vph)	1007	1065	1797	976	1809	2324	1066
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.43	0.17	0.07	0.18	0.19	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	0	317	65	125	33	59	203	0	0	352	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00		1.00		1.00		1.00	1.00			0.95	1.00
Frt	1.00		0.85		0.97		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1805		1615		1819		1805	1900			3610	1615
Flt Permitted	0.54		1.00		0.99		0.33	1.00			1.00	1.00
Satd. Flow (perm)	1021		1615		1819		632	1900			3610	1615
Peak-hour factor, PHF	0.77	0.75	0.70	0.78	0.81	0.50	0.83	0.61	0.25	0.25	0.80	0.82
Adj. Flow (vph)	219	0	453	83	154	66	71	333	0	0	440	104
RTOR Reduction (vph)	0	0	378	0	9	0	0	0	0	0	0	55
Lane Group Flow (vph)	219	0	75	0	294	0	71	333	0	0	440	49
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	custom		Over	Perm			pm+pt					Perm
Protected Phases			5		8		5	2			6	
Permitted Phases	4			8			2					6
Actuated Green, G (s)	19.5		9.0		19.5		27.1	27.1			14.1	14.1
Effective Green, g (s)	19.5		9.0		19.5		27.1	27.1			14.1	14.1
Actuated g/C Ratio	0.36		0.16		0.36		0.50	0.50			0.26	0.26
Clearance Time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	365		266		650		507	943			932	417
v/s Ratio Prot			0.05				0.02	c0.18			c0.12	
v/s Ratio Perm	c0.21				0.16		0.05					0.03
v/c Ratio	0.60		0.28		0.45		0.14	0.35			0.47	0.12
Uniform Delay, d1	14.4		20.0		13.5		7.6	8.4			17.1	15.5
Progression Factor	1.00		1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	2.8		0.6		0.5		0.1	0.2			0.4	0.1
Delay (s)	17.1		20.5		14.0		7.7	8.6			17.5	15.6
Level of Service	B		C		B		A	A			B	B
Approach Delay (s)		19.4			14.0			8.5			17.1	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: NB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Trinity Place	III	35	29.3	21.6	50.9	0.24	17.3	D
Total	III		29.3	21.6	50.9	0.24	17.3	D

Arterial Level of Service: SB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Howard Avenue	III	35	29.3	21.5	50.8	0.24	17.3	D
Total	III		29.3	21.5	50.8	0.24	17.3	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	159	79	45	444	44	194	16	123	16	17	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85		0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1805	1900	1553	1770	1855		1787	1900	1599		1738	
Flt Permitted	0.29	1.00	1.00	0.63	1.00		0.70	1.00	1.00		0.95	
Satd. Flow (perm)	559	1900	1553	1168	1855		1308	1900	1599		1676	
Peak-hour factor, PHF	0.88	0.76	0.95	0.58	0.86	0.77	0.72	0.63	0.83	0.75	0.80	0.62
Adj. Flow (vph)	41	209	83	78	516	57	269	25	148	21	21	53
RTOR Reduction (vph)	0	0	44	0	4	0	0	0	95	0	34	0
Lane Group Flow (vph)	41	209	39	78	569	0	269	25	53	0	61	0
Heavy Vehicles (%)	0%	0%	4%	2%	1%	0%	1%	0%	1%	0%	0%	0%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	22.3	22.3	22.3	22.3	22.3		17.0	17.0	17.0		17.0	
Effective Green, g (s)	22.3	22.3	22.3	22.3	22.3		17.0	17.0	17.0		17.0	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.36	0.36	0.36		0.36	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	264	896	732	551	875		470	683	575		602	
v/s Ratio Prot		0.11			c0.31			0.01				
v/s Ratio Perm	0.07		0.03	0.07			c0.21		0.03		0.04	
v/c Ratio	0.16	0.23	0.05	0.14	0.65		0.57	0.04	0.09		0.10	
Uniform Delay, d1	7.1	7.4	6.8	7.1	9.5		12.2	9.8	10.0		10.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.3	0.1	0.0	0.1	1.7		1.7	0.0	0.1		0.1	
Delay (s)	7.4	7.6	6.8	7.2	11.3		13.9	9.9	10.1		10.1	
Level of Service	A	A	A	A	B		B	A	B		B	
Approach Delay (s)		7.4			10.8			12.4			10.1	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	47.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	13	5	321	0	0	103
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.71	0.71	0.90	0.90	0.76	0.76
Hourly flow rate (vph)	18	7	357	0	0	136
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			667			624
pX, platoon unblocked						
vC, conflicting volume	492	357			357	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	492	357			357	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	540	692			1213	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	357	136
Volume Left	18	0	0
Volume Right	7	0	0
cSH	575	1700	1700
Volume to Capacity	0.04	0.21	0.08
Queue Length 95th (ft)	3	0	0
Control Delay (s)	11.6	0.0	0.0
Lane LOS	B		
Approach Delay (s)	11.6	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	26.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	0	51	17	299	6	135	241	0	0	66	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00		1.00		1.00		1.00	1.00			0.95	1.00
Frt	1.00		0.85		1.00		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770		1615		1880		1805	1900			3610	1615
Flt Permitted	0.46		1.00		1.00		0.43	1.00			1.00	1.00
Satd. Flow (perm)	853		1615		1880		816	1900			3610	1615
Peak-hour factor, PHF	0.68	0.25	0.77	0.80	0.90	0.50	0.84	0.90	0.50	0.25	0.76	0.54
Adj. Flow (vph)	71	0	66	21	332	12	161	268	0	0	87	57
RTOR Reduction (vph)	0	0	49	0	1	0	0	0	0	0	0	49
Lane Group Flow (vph)	71	0	17	0	364	0	161	268	0	0	87	8
Heavy Vehicles (%)	2%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	custom		Over	Perm			pm+pt					Perm
Protected Phases			5		8		5	2			6	
Permitted Phases	4			8			2					6
Actuated Green, G (s)	14.5		11.4		14.5		21.8	21.8			6.4	6.4
Effective Green, g (s)	14.5		11.4		14.5		21.8	21.8			6.4	6.4
Actuated g/C Ratio	0.33		0.26		0.33		0.49	0.49			0.14	0.14
Clearance Time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	279		416		615		656	935			522	233
v/s Ratio Prot			0.01				0.06	c0.14			0.02	
v/s Ratio Perm	0.08				0.19		0.06					0.01
v/c Ratio	0.25		0.04		0.59		0.25	0.29			0.17	0.04
Uniform Delay, d1	10.9		12.3		12.4		6.5	6.7			16.6	16.3
Progression Factor	1.00		1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.5		0.0		1.5		0.2	0.2			0.2	0.1
Delay (s)	11.4		12.4		14.0		6.7	6.8			16.8	16.4
Level of Service	B		B		B		A	A			B	B
Approach Delay (s)		11.9			14.0			6.8			16.6	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	44.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: NB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Trinity Place	III	35	29.3	12.7	42.0	0.24	21.0	C
Total	III		29.3	12.7	42.0	0.24	21.0	C

Arterial Level of Service: SB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Howard Avenue	III	35	29.3	17.8	47.1	0.24	18.7	C
Total	III		29.3	17.8	47.1	0.24	18.7	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	474	179	91	237	42	94	21	214	31	27	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1805	1900	1583	1787	1818		1770	1900	1599		1795	
Flt Permitted	0.57	1.00	1.00	0.31	1.00		0.82	1.00	1.00		0.90	
Satd. Flow (perm)	1080	1900	1583	579	1818		1524	1900	1599		1643	
Peak-hour factor, PHF	0.71	0.76	0.83	0.96	0.92	0.73	0.84	0.71	0.86	0.75	0.65	0.78
Adj. Flow (vph)	25	624	216	95	258	58	112	30	249	41	42	33
RTOR Reduction (vph)	0	0	101	0	10	0	0	0	182	0	15	0
Lane Group Flow (vph)	25	624	115	95	306	0	112	30	67	0	101	0
Heavy Vehicles (%)	0%	0%	2%	1%	2%	0%	2%	0%	1%	0%	0%	0%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	21.3	21.3	21.3	21.3	21.3		10.8	10.8	10.8		10.8	
Effective Green, g (s)	21.3	21.3	21.3	21.3	21.3		10.8	10.8	10.8		10.8	
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53		0.27	0.27	0.27		0.27	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	574	1009	841	308	966		410	512	431		443	
v/s Ratio Prot		c0.33			0.17			0.02				
v/s Ratio Perm	0.02		0.07	0.16			c0.07		0.04		0.06	
v/c Ratio	0.04	0.62	0.14	0.31	0.32		0.27	0.06	0.16		0.23	
Uniform Delay, d1	4.5	6.6	4.8	5.3	5.3		11.6	10.9	11.2		11.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.1	0.1	0.6	0.2		0.4	0.0	0.2		0.3	
Delay (s)	4.5	7.7	4.8	5.8	5.5		11.9	10.9	11.3		11.7	
Level of Service	A	A	A	A	A		B	B	B		B	
Approach Delay (s)		6.9			5.6			11.5			11.7	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	40.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	12	329	0	0	316
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.60	0.60	0.81	0.81
Hourly flow rate (vph)	16	16	548	0	0	390
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			667			624
pX, platoon unblocked						
vC, conflicting volume	938	548			548	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	938	548			548	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	97			100	
cM capacity (veh/h)	296	540			1031	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	548	390
Volume Left	16	0	0
Volume Right	16	0	0
cSH	382	1700	1700
Volume to Capacity	0.08	0.32	0.23
Queue Length 95th (ft)	7	0	0
Control Delay (s)	15.3	0.0	0.0
Lane LOS	C		
Approach Delay (s)	15.3	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	127	0	239	49	94	25	44	153	0	0	265	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00		1.00		1.00		1.00	1.00			0.95	1.00
Frt	1.00		0.85		0.97		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1805		1615		1819		1805	1900			3610	1615
Flt Permitted	0.63		1.00		0.99		0.40	1.00			1.00	1.00
Satd. Flow (perm)	1196		1615		1819		761	1900			3610	1615
Peak-hour factor, PHF	0.77	0.75	0.70	0.78	0.81	0.50	0.83	0.61	0.25	0.25	0.80	0.82
Adj. Flow (vph)	165	0	341	63	116	50	53	251	0	0	331	78
RTOR Reduction (vph)	0	0	282	0	10	0	0	0	0	0	0	56
Lane Group Flow (vph)	165	0	59	0	219	0	53	251	0	0	331	22
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	custom		Over	Perm			pm+pt					Perm
Protected Phases			5		8		5	2			6	
Permitted Phases	4			8			2					6
Actuated Green, G (s)	13.1		7.5		13.1		22.1	22.1			10.6	10.6
Effective Green, g (s)	13.1		7.5		13.1		22.1	22.1			10.6	10.6
Actuated g/C Ratio	0.30		0.17		0.30		0.51	0.51			0.25	0.25
Clearance Time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	363		280		552		571	972			886	396
v/s Ratio Prot			0.04				0.02	c0.13			c0.09	
v/s Ratio Perm	c0.14				0.12		0.03					0.01
v/c Ratio	0.45		0.21		0.40		0.09	0.26			0.37	0.06
Uniform Delay, d1	12.2		15.3		11.9		5.5	5.9			13.5	12.5
Progression Factor	1.00		1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.9		0.4		0.5		0.1	0.1			0.3	0.1
Delay (s)	13.1		15.7		12.4		5.6	6.1			13.8	12.5
Level of Service	B		B		B		A	A			B	B
Approach Delay (s)		14.8			12.4			6.0			13.6	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	43.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: NB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Trinity Place	III	35	29.3	13.9	43.2	0.24	20.4	C
Total	III		29.3	13.9	43.2	0.24	20.4	C

Arterial Level of Service: SB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Howard Avenue	III	35	29.3	16.5	45.8	0.24	19.2	C
Total	III		29.3	16.5	45.8	0.24	19.2	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	55	279	109	103	762	358	33	198	127
v/c Ratio	0.38	0.29	0.13	0.20	0.81	0.73	0.05	0.27	0.19
Control Delay	22.5	12.6	3.0	12.8	24.5	31.6	17.5	4.2	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	12.6	3.0	12.8	24.5	31.6	17.5	4.2	10.0
Queue Length 50th (ft)	14	68	0	24	264	135	9	0	16
Queue Length 95th (ft)	54	119	25	39	493	210	22	32	48
Internal Link Dist (ft)		347			485		544		209
Turn Bay Length (ft)	80			215		135			
Base Capacity (vph)	214	1408	1179	758	1377	809	1171	1062	1055
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.20	0.09	0.14	0.55	0.44	0.03	0.19	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	212	104	60	589	59	258	21	164	21	22	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1805	1900	1553	1770	1855		1787	1900	1599		1737	
Flt Permitted	0.15	1.00	1.00	0.55	1.00		0.70	1.00	1.00		0.95	
Satd. Flow (perm)	290	1900	1553	1022	1855		1313	1900	1599		1667	
Peak-hour factor, PHF	0.88	0.76	0.95	0.58	0.86	0.77	0.72	0.63	0.83	0.75	0.80	0.62
Adj. Flow (vph)	55	279	109	103	685	77	358	33	198	28	28	71
RTOR Reduction (vph)	0	0	53	0	4	0	0	0	123	0	44	0
Lane Group Flow (vph)	55	279	56	103	758	0	358	33	75	0	83	0
Heavy Vehicles (%)	0%	0%	4%	2%	1%	0%	1%	0%	1%	0%	0%	0%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	36.7	36.7	36.7	36.7	36.7		27.2	27.2	27.2		27.2	
Effective Green, g (s)	36.7	36.7	36.7	36.7	36.7		27.2	27.2	27.2		27.2	
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51		0.38	0.38	0.38		0.38	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	148	970	793	522	947		497	719	605		631	
v/s Ratio Prot		0.15			c0.41			0.02				
v/s Ratio Perm	0.19		0.04	0.10			c0.27		0.05		0.05	
v/c Ratio	0.37	0.29	0.07	0.20	0.80		0.72	0.05	0.12		0.13	
Uniform Delay, d1	10.6	10.1	8.9	9.6	14.6		19.1	14.1	14.6		14.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.6	0.2	0.0	0.2	4.9		5.1	0.0	0.1		0.1	
Delay (s)	12.2	10.3	9.0	9.8	19.5		24.2	14.2	14.7		14.7	
Level of Service	B	B	A	A	B		C	B	B		B	
Approach Delay (s)		10.2			18.3			20.4			14.7	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	71.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	17	6	426	0	0	137
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.71	0.71	0.90	0.90	0.76	0.76
Hourly flow rate (vph)	24	8	473	0	0	180
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			667			624
pX, platoon unblocked	0.90	0.90			0.90	
vC, conflicting volume	654	473			473	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	563	364			364	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			100	
cM capacity (veh/h)	443	620			1090	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	473	180
Volume Left	24	0	0
Volume Right	8	0	0
cSH	479	1700	1700
Volume to Capacity	0.07	0.28	0.11
Queue Length 95th (ft)	5	0	0
Control Delay (s)	13.1	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.1	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	93	87	485	214	356	116	76
v/c Ratio	0.36	0.19	0.69	0.33	0.39	0.21	0.24
Control Delay	19.3	6.9	21.6	11.5	12.1	24.8	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	6.9	21.6	11.5	12.1	24.8	9.5
Queue Length 50th (ft)	21	0	126	38	69	17	0
Queue Length 95th (ft)	49	23	293	91	165	40	7
Internal Link Dist (ft)			432		120	587	
Turn Bay Length (ft)							110
Base Capacity (vph)	566	1362	1569	1506	1900	2914	1318
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.06	0.31	0.14	0.19	0.04	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	0	67	22	397	8	180	320	0	0	88	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00		1.00		1.00		1.00	1.00			0.95	1.00
Frt	1.00		0.85		1.00		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770		1615		1880		1805	1900			3610	1615
Flt Permitted	0.36		1.00		1.00		0.47	1.00			1.00	1.00
Satd. Flow (perm)	678		1615		1880		896	1900			3610	1615
Peak-hour factor, PHF	0.68	0.25	0.77	0.80	0.90	0.50	0.84	0.90	0.50	0.25	0.76	0.54
Adj. Flow (vph)	93	0	87	28	441	16	214	356	0	0	116	76
RTOR Reduction (vph)	0	0	65	0	1	0	0	0	0	0	0	64
Lane Group Flow (vph)	93	0	22	0	484	0	214	356	0	0	116	12
Heavy Vehicles (%)	2%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	custom		Over	Perm			pm+pt					Perm
Protected Phases			5		8		5	2			6	
Permitted Phases	4			8			2					6
Actuated Green, G (s)	21.6		14.2		21.6		27.3	27.3			9.1	9.1
Effective Green, g (s)	21.6		14.2		21.6		27.3	27.3			9.1	9.1
Actuated g/C Ratio	0.38		0.25		0.38		0.48	0.48			0.16	0.16
Clearance Time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	257		403		714		657	912			577	258
v/s Ratio Prot			0.01				0.08	c0.19			0.03	
v/s Ratio Perm	0.14				0.26		0.08					0.01
v/c Ratio	0.36		0.05		0.68		0.33	0.39			0.20	0.05
Uniform Delay, d1	12.7		16.2		14.7		8.9	9.5			20.7	20.2
Progression Factor	1.00		1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.9		0.1		2.6		0.3	0.3			0.2	0.1
Delay (s)	13.6		16.3		17.3		9.2	9.8			20.9	20.3
Level of Service	B		B		B		A	A			C	C
Approach Delay (s)		14.9			17.3			9.5			20.7	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: NB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Trinity Place	III	35	29.3	17.5	46.8	0.24	18.8	C
Total	III		29.3	17.5	46.8	0.24	18.8	C

Arterial Level of Service: SB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Howard Avenue	III	35	29.3	24.8	54.1	0.24	16.3	D
Total	III		29.3	24.8	54.1	0.24	16.3	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	32	828	287	126	419	149	38	330	154
v/c Ratio	0.06	0.74	0.27	0.58	0.39	0.47	0.08	0.59	0.36
Control Delay	6.1	13.7	1.6	21.0	7.4	28.0	21.6	14.5	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	13.7	1.6	21.0	7.4	28.0	21.6	14.5	21.9
Queue Length 50th (ft)	4	163	0	21	56	40	9	33	35
Queue Length 95th (ft)	14	311	20	103	157	125	33	136	80
Internal Link Dist (ft)		347			485		544		209
Turn Bay Length (ft)	80			215		135			
Base Capacity (vph)	837	1769	1494	344	1694	716	1090	1003	942
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.47	0.19	0.37	0.25	0.21	0.03	0.33	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	629	238	121	315	56	125	27	284	41	36	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1805	1900	1583	1787	1818		1770	1900	1599		1795	
Flt Permitted	0.47	1.00	1.00	0.20	1.00		0.67	1.00	1.00		0.89	
Satd. Flow (perm)	899	1900	1583	368	1818		1249	1900	1599		1627	
Peak-hour factor, PHF	0.71	0.76	0.83	0.96	0.92	0.73	0.84	0.71	0.86	0.75	0.65	0.78
Adj. Flow (vph)	32	828	287	126	342	77	149	38	330	55	55	44
RTOR Reduction (vph)	0	0	114	0	9	0	0	0	149	0	15	0
Lane Group Flow (vph)	32	828	173	126	410	0	149	38	181	0	139	0
Heavy Vehicles (%)	0%	0%	2%	1%	2%	0%	2%	0%	1%	0%	0%	0%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	34.7	34.7	34.7	34.7	34.7		14.9	14.9	14.9		14.9	
Effective Green, g (s)	34.7	34.7	34.7	34.7	34.7		14.9	14.9	14.9		14.9	
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60		0.26	0.26	0.26		0.26	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	542	1145	954	222	1095		323	491	414		421	
v/s Ratio Prot		c0.44			0.23			0.02				
v/s Ratio Perm	0.04		0.11	0.34			c0.12		0.11		0.09	
v/c Ratio	0.06	0.72	0.18	0.57	0.37		0.46	0.08	0.44		0.33	
Uniform Delay, d1	4.7	8.1	5.1	6.9	5.9		18.0	16.2	17.8		17.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	2.3	0.1	3.3	0.2		1.0	0.1	0.7		0.5	
Delay (s)	4.8	10.4	5.2	10.2	6.1		19.0	16.2	18.6		17.8	
Level of Service	A	B	A	B	A		B	B	B		B	
Approach Delay (s)		8.9			7.0			18.5			17.8	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	57.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	16	16	437	0	0	420
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.60	0.60	0.81	0.81
Hourly flow rate (vph)	21	21	728	0	0	519
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			667			624
pX, platoon unblocked	0.90	0.90			0.90	
vC, conflicting volume	1247	728			728	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1220	645			645	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	95			100	
cM capacity (veh/h)	181	429			857	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	43	728	519
Volume Left	21	0	0
Volume Right	21	0	0
cSH	255	1700	1700
Volume to Capacity	0.17	0.43	0.31
Queue Length 95th (ft)	15	0	0
Control Delay (s)	21.9	0.0	0.0
Lane LOS	C		
Approach Delay (s)	21.9	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	219	453	303	71	333	440	104
v/c Ratio	0.61	0.71	0.46	0.14	0.36	0.49	0.23
Control Delay	23.9	10.0	16.4	9.8	11.2	21.5	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	10.0	16.4	9.8	11.2	21.5	10.4
Queue Length 50th (ft)	53	0	65	10	57	58	7
Queue Length 95th (ft)	123	11	148	37	99	130	43
Internal Link Dist (ft)			432		120	587	
Turn Bay Length (ft)							110
Base Capacity (vph)	1007	1065	1797	976	1809	2324	1066
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.43	0.17	0.07	0.18	0.19	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	0	317	65	125	33	59	203	0	0	352	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00		1.00		1.00		1.00	1.00			0.95	1.00
Frt	1.00		0.85		0.97		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1805		1615		1819		1805	1900			3610	1615
Flt Permitted	0.54		1.00		0.99		0.33	1.00			1.00	1.00
Satd. Flow (perm)	1021		1615		1819		632	1900			3610	1615
Peak-hour factor, PHF	0.77	0.75	0.70	0.78	0.81	0.50	0.83	0.61	0.25	0.25	0.80	0.82
Adj. Flow (vph)	219	0	453	83	154	66	71	333	0	0	440	104
RTOR Reduction (vph)	0	0	378	0	9	0	0	0	0	0	0	55
Lane Group Flow (vph)	219	0	75	0	294	0	71	333	0	0	440	49
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	custom		Over	Perm			pm+pt					Perm
Protected Phases			5		8		5	2			6	
Permitted Phases	4			8			2					6
Actuated Green, G (s)	19.5		9.0		19.5		27.1	27.1			14.1	14.1
Effective Green, g (s)	19.5		9.0		19.5		27.1	27.1			14.1	14.1
Actuated g/C Ratio	0.36		0.16		0.36		0.50	0.50			0.26	0.26
Clearance Time (s)	4.0		4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	365		266		650		507	943			932	417
v/s Ratio Prot			0.05				0.02	c0.18			c0.12	
v/s Ratio Perm	c0.21				0.16		0.05					0.03
v/c Ratio	0.60		0.28		0.45		0.14	0.35			0.47	0.12
Uniform Delay, d1	14.4		20.0		13.5		7.6	8.4			17.1	15.5
Progression Factor	1.00		1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	2.8		0.6		0.5		0.1	0.2			0.4	0.1
Delay (s)	17.1		20.5		14.0		7.7	8.6			17.5	15.6
Level of Service	B		C		B		A	A			B	B
Approach Delay (s)		19.4			14.0			8.5			17.1	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: NB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Trinity Place	III	35	29.3	21.6	50.9	0.24	17.3	D
Total	III		29.3	21.6	50.9	0.24	17.3	D

Arterial Level of Service: SB McDonough Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Howard Avenue	III	35	29.3	21.5	50.8	0.24	17.3	D
Total	III		29.3	21.5	50.8	0.24	17.3	D

ATTACHMENT 6 –

ARC PROJECT KICKOFF MEETING MINUTES

URS

Meeting Minutes – Project Kickoff Meeting

MEETING DATE: August 9, 2010, 2:00pm
City of Decatur – Conference Room

North McDonough Streetscape –LCI project, City of Decatur

I. Project Team Introductions/Sign in Sheet

Hugh Saxon – City of Decatur Project Manager	Hugh.Saxon@decaturga.com	678-553-6507
John F. Madajewski – City of Decatur	John. Madajewski@decaturga.com	678-553-6530
Joe Palladi – ARC, Review Engineer	jpalladi@atlantaregional.com	404-261-5788
Amy Goodwin – ARC, Project Manager	agoodwin@atlantaregional.com	404-463-3311
John F. Madajewski – City of Decatur	John.Madajewski@decaturga.com	678-553-6530
Bruce Roaden – City Schools of Decatur	broaden@csdecatur.org	404-370-4440
John Hegman – Agnes Scott College	JHegman@agnusscott.edu	404-471-6278
Connie Johnson– MARTA	cesiddeeg@itsmarta.com	404-848-6122
Jennifer Harper – URS Project Manager	Jennifer_Harper@urscorp.com	678-808-8978
Sean Pharr– URS Design Engineer	Sean_Pharr@Urscorp.com	678-808-8839
Dwayne Tedder– URS Traffic Engineer	Dwayne_Tedder@Urscorp.com	678-808-8840
Mickey O'Brien – URS Urban Design	Mickey_O'Brien@Urscorp.com	678-808-8884
Via Conference Call		
Bruce W. Landis, P.E., AICP	landis@sprinkleconsulting.com	813-949-7449
Theodore A. Petritsch, P.E., PTOE	petritsh@sprinkleconsulting.com	813-949-7400

II. Introductions

Hugh Saxon welcomed the attendees and provided a brief overview of the project; The Cit of Decatur is seeking LCI grant funding to implement a streetscape project along N. McDonough between Howard Avenue and E. Trinity Place in the City of Decatur.

III. Review of Agenda Items(Agenda Attached)

Jennifer Harper provided a description of the existing conditions; the existing roadway consists of 4-travel lanes (two in each direction) local street with on-street parking, curb and gutter and sidewalks. The existing right of way widths varies but in width but is generally 80-feet throughout the corridor.

Sean Pharr, Bruce Landis and Theo Petritsh briefly discussed 4 pre-concept level alternatives that will be explored with the stakeholders, refined and presented at public workshop #1. The typical sections for each alternative are included to the minutes as attachments. The alternatives are described as follows;

1. Alternative 'A' – *One Way Cycle Track; reduce # of travel lanes to one lane in each direction, provide on-street parking, provide a one way cycle track on each side of the*

URS Corporation
400 Northpark Town Center
1000 Abernathy Road, NE
Suite 900
Tel: 678.808.8800
Fax: 678.808.8400
www.urscorp.com

roadway separated by a landscape buffer from the travel way. Sidewalks separated by a secondary landscape buffer are proposed between the cycle track and the pedestrian area.

Advantages:

- Bicyclist are Buffered from Vehicles and Parked Cars
- Sense of Order to the roadway for urban feel
- Great pedestrian space

Disadvantages:

- Vehicles may not be aware of cyclist
- Intersection Vulnerability to cyclist
- Limited Buffer between sidewalk and cycle track
- Bicyclist may chose to go the wrong direction
- Very Low Parking Yield due to site distance

2. Alternative 'B' – *Bike lanes adjacent to travel way, reduce # of travel lanes to one lane in each direction, provide on-street parking, provide bike lanes adjacent to the travel lanes. Separate the pedestrian traffic from the roadway with a landscape buffer.*

   Advantages:

   - Horizontal traffic calming
   - Higher Parking Yield
   - Great pedestrian safety

   Disadvantages:

   - Bicyclist are not buffered
   - Conflicts for Bicyclist with parked cars
   - Reduced streetscape zones

3. Alternative 'C' – *Angled parking in median, reduce the # of travel lanes to one in each direction, provide angled parking in the median of the roadway, provide bike lanes on the outside shoulder adjacent to the vehicular traffic, provide sidewalk with little or no buffer.*

   Advantages:

   - High parking yield
   - No parking conflicts for bikes

   Disadvantages:

   - High School kids in the middle of the road off campus
   - Pedestrian conflicts with bikes and cars
   - Very little opportunity for streetscape

4. Alternative 'D' – *Two-way cycle track, reduce the # of travel lanes to one lane in either direction, provide angled or parallel parking on one side of the roadway, provide a two-way cycle track on the west side of N. McDonough Street which is separated from the travel way by a landscape buffer. Provide pedestrian paths on either side of the roadway separated by landscape buffers.*

   Advantages:

   - Buffer for Cyclist
   - Formality of the street
   - Destination opportunity/PATH

   Disadvantages:

   - Beginning and End must use crosswalk to continue on bicycle
   - Counterflow Bicycle Traffic at intersections
   - Intersections cause conflict for cyclist

Dwayne Tedder noted that the traffic volumes are in the thresholds for the facility to only warrant one-lane, and therefore a road diet should be supported. A detailed traffic study will be performed to explore the road diet option. Traffic Counts will be collected after August 25th when all schools are back in session.

Joe Palladi stated to address the signal timing in the traffic study and noted that interactions between the cyclists and vehicle is a concern with on-street parking, especially angled on-street parking.

Any Goodwin asked when a recommended design alternative will be chosen. Jennifer Harper stated the alternatives will be studied in detail with the stakeholders and that a recommended alternative will be presented in the LCI Scoping Report.

Hugh Saxon expressed the desire from the City is for this facility to be pedestrian and cyclist friendly and that a "road diet" is preferred.

Amy Goodwin questioned how the two way cycle track functioned through existing driveways.

Jennifer Harper responded that the school has closed on of the driveways, and the west side of the roadway was chosen due to the minimal driveway impacts.

Joe Palladi provided the following guidance regarding ARC requirements during the Scoping phase.

- Include typical section graphics in the scoping report
- Include the kick off meeting minutes in the scoping report. The minutes should describe the alternatives presented with their pro's and con's.
- Briefly discuss the recommended alternatives analysis that will be presented to the public.
- The alternatives should include lists of issues in narrative form.

Amy Goodwin noted that one preferred alternative should be presented in the scoping document.

Jennifer Harper gave a brief update of the status of the other projects in the area. The GDOT signal upgrades project PI is 0009025 and the TE project PI is 0002669. The TE project is in the early coordination phase.

Amy Goodwin discussed the following communication channels for the LCI project.

- Amy will be the contact for any LCI project communication
- ARC will do initial reviews prior to submitting for GDOT review.
- Joe Palladi will be reviewing design related reviews for ARC.
- The GDOT project manager will be Robert Hughs.
- Hugh Saxon and Jennifer Harper will be the primary points of contact for the City design team.

Joe Palladi noted that FHWA should not be contacted directly in regards to the LCI project.

Hugh Saxon questioned how right of way would be handled from City entity to City entity.

Joe Palladi noted that the GDOT District 7 right of way liaison would need to provide that answer at the appropriate phase of the project.

Amy Goodwin discussed the following schedule concern; This project may have to be submitted for an update to the ARC regional macro model because it proposes to modify the number of travel lanes from four to two. If the project cannot be exempt a PI number would not get assigned until next spring. An Interagency Panel recommends what projects are exempt.

Joe Palladi recommended that the design team move forward with the traffic study and ensure that delay within the project corridor is addressed. Delay will be paramount to showing if the project would effect the ARC model.

Amy Goodwin questioned if there were mid-block crossings on the project.

Sean Pharr noted there area three existing mid-block crossings in the vicinity of East Maple Street. Each location will be studied in greater detail in the preliminary plan phase.

John Madajewski noted that the northern most midblock may be a eliminated and this would be studied in greater detail.

Amy Goodwin questioned if the existing bus route was going to be eliminated.

Jennifer Harper responded that the bus route could potentially be moved to Trinity Place.

Connie Johnson asked if any coordination regarding the bus route been done with MARTA.

Hugh Saxon noted that no MARTA coordination has been done to date, but none of the proposed improvements should limit MARTA's use of N. McDonough Street as a bus route.

John Madajewski also noted that relocating the bus route to East Trinity would remove three tight turning movements that the bus drivers have to currently make.

Joe Palladi noted that mid-block locations need to be approved by the chief engineer. He also noted that existing and proposed MARTA stops be shown at the public meeting.

Hugh Saxon stated the intent for the City to request all match would be going to construction. Currently it is approved that match is applied toward PE and CONST.

Amy Goodwin stated that the match being applied to 100 percent construction is not an issue.

Amy Goodwin requested the following be shown in the scoping report;

- Detailed Scope
- Detailed Budget
- Detailed Schedule(provide a bar schedule)

Jennifer Harper noted that this project is tied to the adjacent TE project that is currently being coordinated with CSX Railroad and requested the projects be shown at the on public meeting.

Joe Palladi responded that showing both projects at one public meeting is acceptable as long as comments are kept separate.

Jennifer Harper noted that this project lies within a historic district and currently there are no impacts tih adverse effects.

Joe Palladi relayed the following concerns;

- Lighting is sometimes an issue on projects because of force agreements from the utility companies. FHWA has issued guidance that lighting needs to be competitively bid.
- Include the full install of the lighting in the cost estimate for the scoping phase.
- Include Construction supervision in the scoping document and in the cost estimate.

Mickey O'Brien questioned whether a design variance for street lighting would be required.

Joe Palladi responded to seek guidance from GDOT's design policy manual.

Amy Goodwin noted November 19th is the target date to have the scoping document approved by ARC.

Hugh Saxon thanks everyone for their attendance and the meeting was adjourned.

Attachments:

1. **Kick-off Meeting Agenda**
2. **Sign-in sheet**

ATTACHMENT 7 –

MINUTES OF CONCEPT TEAM MEETING

URS

Meeting Minutes – Concept Team Meeting, GDOT PI # 0010327

MEETING DATE: August 15, 2011, 10:00am
GDOT, One Georgia Center - 25 floor conference room

North McDonough Streetscape –LCI project, City of Decatur

I. Project Team Introductions/Sign in Sheet

Robert Hughes – GDOT OPD	rhughes@dot.ga.gov	404-631-1799
Darrell DeJean – GDOT OPD	ddejean@dot.ga.gov	404-631-1650
Jonathan Cox – GDOT OES	jocox@dot.ga.gov	404-631-1197
Dave Peters – GDOT ODP+S	dpeters@dot.ga.gov	404-631-1738
Melanie Hale – GDOT ODP+S	mhale@dot.ga.gov	404-631-1542
Linda Washington – GDOT District 7	lwashington@dot.ga.gov	770-986-1555
Moussa Issa – GDOT	missa@dot.ga.gov	404-631-1657
Hugh Saxon – City of Decatur Project Manager	Hugh.Saxon@decaturga.com	678-553-6507
Amanda Thompson – City of Decatur	Amanda.Thompson@decaturga.com	678-553-6513
Joe Palladi – ARC, Review Engineer	jpalladi@atlantaregional.com	404-261-5788
Sean Pharr– URS Project Manager	Sean_Pharr@Urscorp.com	678-808-8839
Mickey O'Brien – URS Urban Design	Mickey_O'Brien@Urscorp.com	678-808-8884

II. Introductions

Robert Hughes welcomed the attendees and introduced Darrell DeJean as the GDOT OPD project manager for this project going forward.

After introductions, Sean Pharr provided an overview of the project and discussed major elements of the concept report as provided in the agenda items;

III. Review of Agenda Items(Agenda Attached)

Sean Pharr provided a description of the existing conditions; the existing roadway consists of 4-travel lanes (two in each direction) local street with on-street parking, curb and gutter and sidewalks. The posted speed as well as design speed for the roadway is 25 mph. The existing right of way widths varies but in width but is generally 80-feet throughout the corridor.

Sean Pharr briefly discussed the preferred concept as well as alternatives which were presented to the public at a September 9, 2010 public meeting. The alternatives are described as follows;

1. Alternative 'A' – *One Way Cycle Track; reduce # of travel lanes to one lane in each direction, provide on-street parking, provide a one way cycle track on each side of the roadway separated by a landscape buffer from the travel way. Sidewalks separated by a secondary landscape buffer are proposed between the cycle track and the pedestrian area.*

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2. Alternative 'B' – *Bike lanes adjacent to travel way, reduce # of travel lanes to one lane in each direction, provide on-street parking, provide bike lanes adjacent to the travel lanes. Separate the pedestrian traffic from the roadway with a landscape buffer.*

3. Alternative 'C' – *Angled parking in median, reduce the # of travel lanes to one in each direction, provide angled parking in the median of the roadway, provide bike lanes on the outside shoulder adjacent to the vehicular traffic, provide sidewalk with little or no buffer.*

4. Alternative 'D' – *Two-way cycle track, reduce the # of travel lanes to one lane in either direction, provide angled or parallel parking on one side of the roadway, provide a two-way cycle track on the west side of N. McDonough Street which is separated from the travel way by a landscape buffer. Provide pedestrian paths on either side of the roadway separated by landscape buffers.*

The preferred alternative from the public meeting was alternative 'C' which received broad support from attendees at the public meeting.

Sean Pharr noted there is a GDOT TE project PI # 0009025 as well as a signal upgrade project PI 002669, which both fall within the project limits and require coordination. URS is the lead design consultant for both projects.

Mickey O'Brien noted that the city of Decatur should be commended for their adoption of a complete street policy, as well as completion of the Health Impact Assessment for their community. This project is a direct result of the City's efforts to promote healthy choices and alternatives for its citizens. The project is identified in the City's Community Transportation Plan (CTP) which was completed in 2008.

Amanda Thompson added that the project is a gateway into the downtown area and within the project limits is Decatur High School, as well as Renfroe Middle School adjacent to the southern end of the project. Amanda also discussed parking accommodations within the City Center, which is roughly, 8,000 parking spaces. These are accommodated through parking decks, on street parking and private parking lots.

Hugh Saxon noted that Safe Routes to school program should be commended for its efforts in promoting alternatives modes of travel to Decatur schools.

Sean Pharr briefly discussed green infrastructure and went over types of options to treat point source urban runoff in the landscape buffer or in curb bulb outs. These bio-filtration areas would be in addition to a standard storm drainage system which will be design per GDOT standards and for the 25-year design storm.

Hugh Saxon noted the drainage system ultimately outfalls into Peavine Creek a few miles away from the project.

Joe Palladi stated that inlets should be spaced so that gutter spread is half a lane width or less and that the on street parking areas should be considered when located inlets.

Mickey O'Brien noted that the overall impervious area for the project will be reduced due to the addition of landscaping within the project corridor.

Mickey O'Brien also noted that other communities and state DOT's are implementing green street policies specifically NY DOT, as well as the City of Los Angeles. There is additional maintenance cost with bio-filtration beds. The bedding has to be replaced every 6 to 7 years.

Joe Palladi suggested evaluating under drain systems in the areas of bio-filtration to eliminate paving fracture, etc.

Jonathan Cox did not see any issues with the suggested environmental approval date of June 2012, given the current concept.

Joe Palladi requested a bar chart be shown for the schedule in the concept report.

Sean Pharr discussed the intent to consolidate the existing three mid-block crossings into one pedestrian crossing.

Joe Palladi questioned what kind of treatments would be provided for the mid-block, i.e. signals or flashing beacons.

Melanie Hale said to make sure the midblock crossing and location meets the Federal Guidelines.

Sean Pharr stated that would be studied in greater detail in the preliminary phase of the project.

Joe Palladi questioned if concrete pavers required approval of the chief engineer.

Dave Peters noted treatments such as stamped asphalt or other treatments such as pavers will need to be maintained by the local government in a maintenance agreement.

Dave Peters noted that 11' lanes are acceptable per AASHTO guidelines

Dave Peters noted to make sure you include any ROW and or construction easements.

Robert Hughes asked Darrell to check what items require the chief engineer's approval and what items is part of a maintenance agreement.

Joe Palladi noted that approvals and maintenance agreements needed to be in place prior to letting of the project.

Mickey O'Brien stated the design intent of the landscaping, tree locations, lighting will want to provide a formal cadence into downtown Decatur.

Joe Palladi noted the lighting design will require GDOT approval of the photometric layout.

Hugh Saxon noted the City standard light fixture will be requested for use on this project

Joe Palladi replies use of a sole source vendor will require FHWA approval if this item is to be reimbursed under the LCI contract.

Joe Palladi told the team to submit your design exceptions and variances as soon as possible.

Mickey O'Brien stated the intent of the project is to use concrete header curb in lieu of curb and gutter.

Sean Pharr noted that back in angle parking on N. McDonough Street at the south west quadrant of Trinity and McDonough will be studied in the preliminary plan phase.
Amanda Thompson noted the access to Chick-fil-a should not be affected.

Melanie Hale noted the typical described in the concept report should match the graphic representation in the concept report.

Melanie Hale stated that any design variance or exception required should be submitted early in the process, and also noted the attachments should be placed in order in the report.

Moussa Issa stated the asphalt material and paving layers should be identified on the typical section.

Hugh Saxon noted the City has another TE funded project for bike accommodation on Church Street and a major goal of their CTP plan is to get people out of cars.

Amanda Thompson also noted a goal of the Health Impact Assessment is to have a community that is not dependent on people having to drive cars.

Amanda Thompson stated that bike and pedestrian safety is taught in Decatur schools in the 4th grade.

Joe Palladi recommended using bicycle safe drainage grates for the project.

Dave Peters mentioned that projects like N. McDonough Street will be seen more and more.

Sean Pharr will generate and distribute the concept team meeting minutes for comment, and there will be a one week period for revisions to the draft minutes to be sent back for inclusion in the final CTM minutes.

Robert Hughes thanked everyone for their attendance and the meeting was adjourned.

Attachments:

1. **Kick-off Meeting Agenda**
2. **Sign-in sheet**

AGENDA
August 15, 2011 10:00am
CONCEPT TEAM MEETING

Bicycle, Pedestrian and Streetscape Improvements along N. McDonough Street from East Howard Avenue to Trinity Place, Phase IV Downtown Pedestrian Improvements – City of Decatur, Georgia

PROJECT: PI # 0010327

I. INTRODUCTIONS

II. OVERVIEW OF TEAM RESPONSIBILITIES

III. "NEED & PURPOSE"

IV. PROJECT CORRIDOR

V. LOGICAL TERMINI

VI. DESIGN CRITERIA

VII. ENVIRONMENTAL CONCERNS/POSSIBLE PERMITS

VIII. CONCEPT DEVELOPMENT/ALTERNATIVES

IX. PUBLIC INVOLVEMENT

X. GREEN INFRASTRUCTURE

XI. OTHER PROJECTS IN THE AREA

XII. OTHER LOCAL GOVERNMENT COORDINATION

XIII. ADJOURN

Keeping Georgia on the Move

Sign In Sheet

August 15, 2011, 10:00am

Concept Team Meeting - Sign in sheet

PI # 0010327

Name	Organization Project Role	Email Address	Phone
SEAN PHARR	URS - DESIGN	sean-pharr@urscorp.com	678-808-9839
MICKEY O'BRIEN	URS - DESIGN	MICKEY_O'BRIEN@URSCORP.COM	678-808-9884
LINDA WASHINGTON	GDOT - DIST-7 LOC GOV	LWASHINGTON@DOT.GA.GOV	770-986-1555
DARRELL DEJEAN	GDOT - OPD	ddejean@dot.ga.gov	(404) 985-7825
Robert Hughes	GDOT - OPD	rhughes@dot.ga.gov	(404) 631-1799
Melanie Hale	GDOT - ODP+S	mhale@dot.ga.gov	4/6311542
HUGH SAXON	CITY OF DECATUR	hugh.saxon@decaturga.com	678-553-6507
Amanda Thompson	City of Decatur	amanda.thompson@decaturga.com	678 553 6513
Joe Palladi	ARC	jpalladi@atlantaregional.com	4-261-5788
JONATHAN COX	Enviro Services	jocox@dot.ga.gov	4)631-1197
Moussa Issa	DOT	missa@dot.ga.gov	4(631-1657

Keeping Georgia on the Move

Dave Peters	GDOT-Design Policy	dpeters@dot.ga.gov	404-631-1738

ATTACHMENT 8 –

RTP PLAN FOR ARC PROJECT

DK-377

0010327

Programmed

NORTH MCDONOUGH ROAD BICYCLE AND PEDESTRIAN FACILITIES

FROM COLLEGE AVENUE TO WEST TRINITY PLACE

Jurisdiction: DeKalb County

Sponsor: City of Decatur

Service Type: **General Purpose Roadway Capacity**

Existing	Planned	Length (mi.)
4	2	0.2

Analysis: In the Region's Air Quality Conformity Analysis

Network Year: 2016

Open Year: 2014

	Status	Year	Fund Type	Federal	State	Local	Bonds	Total
PE	AUTH	2011	Local Jurisdiction/Municipality Funds	$0,000	$0,000	$0,000	$0,000	$0,000
ROW		2012	STP - Urban (>200K) (ARC)	$80,000	$0,000	$20,000	$0,000	$100,000
CST		2013	STP - Urban (>200K) (ARC)	$1,335,867	$0,000	$333,967	$0,000	$1,669,834
				$1,415,867	$0,000	$353,967	$0,000	$1,769,834

DK-AR-206

713290-

Programmed

I-285 SOUTH

AT SR 155 (FLAT SHOALS PARKWAY)

Jurisdiction: DeKalb County

Sponsor: GDOT

Service Type: **Interchange Capacity**

Existing	Planned	Length (mi.)
2	6	N/A

Analysis: In the Region's Air Quality Conformity Analysis

Network Year: 2020

Open Year: 2017

	Status	Year	Fund Type	Federal	State	Local	Bonds	Total
PE	AUTH	AUTH	National Highway System	$0,000	$0,000	$0,000	$0,000	$0,000
ROW		2012	National Highway System	$3,962,636	$990,659	$0,000	$0,000	$4,953,295
ROW		2013	National Highway System	$12,363,425	$3,090,856	$0,000	$0,000	$15,454,281
CST		LR 2014-2020	General Federal Aid - 2014-2030	$29,864,800	$7,466,200	$0,000	$0,000	$37,331,000
				$46,190,861	$11,547,715	$0,000	$0,000	$57,738,576

DK-AR-207

713300-

Long Range

I-285 SOUTH

AT BOULDERCREST ROAD

Jurisdiction: DeKalb County

Sponsor: GDOT

Service Type: **Interchange Upgrade**

Existing	Planned	Length (mi.)
N/A	N/A	N/A

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

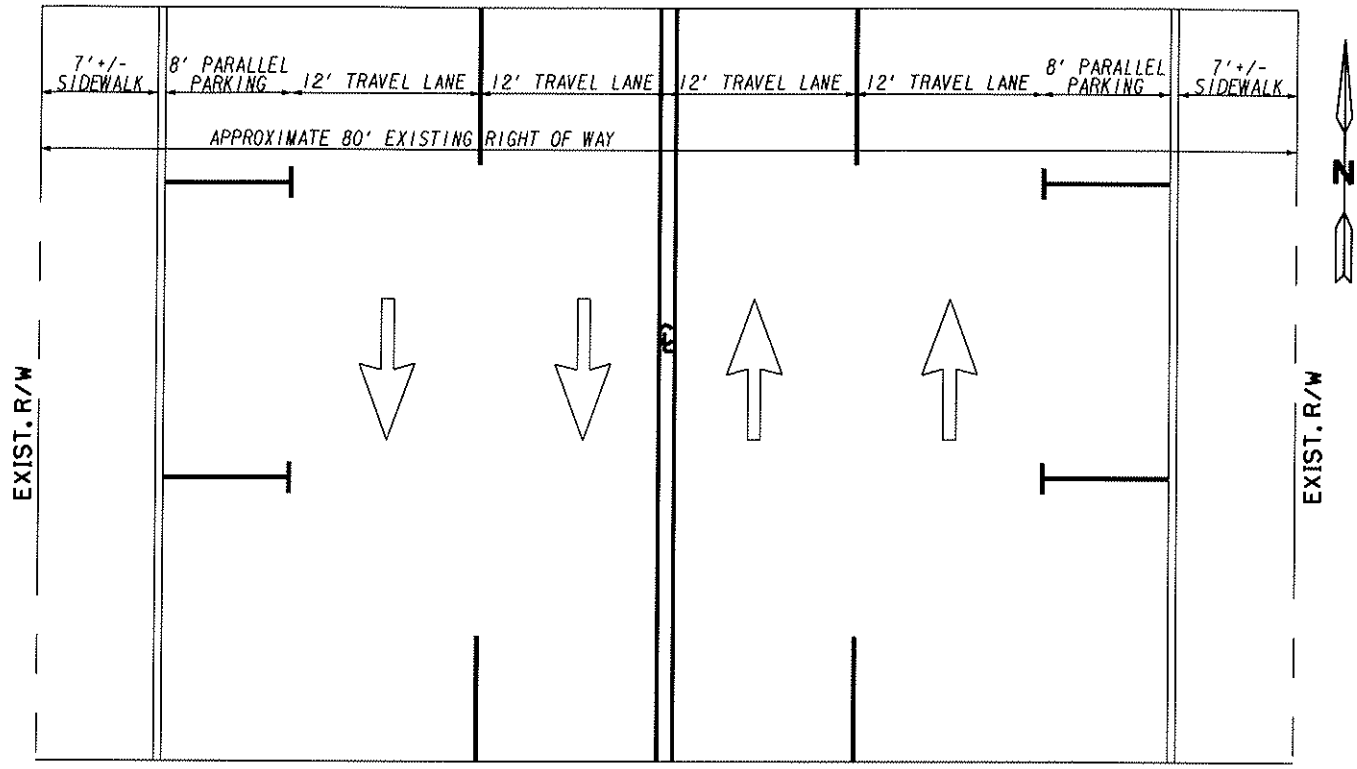
Network Year: 2020

Open Year: 2020

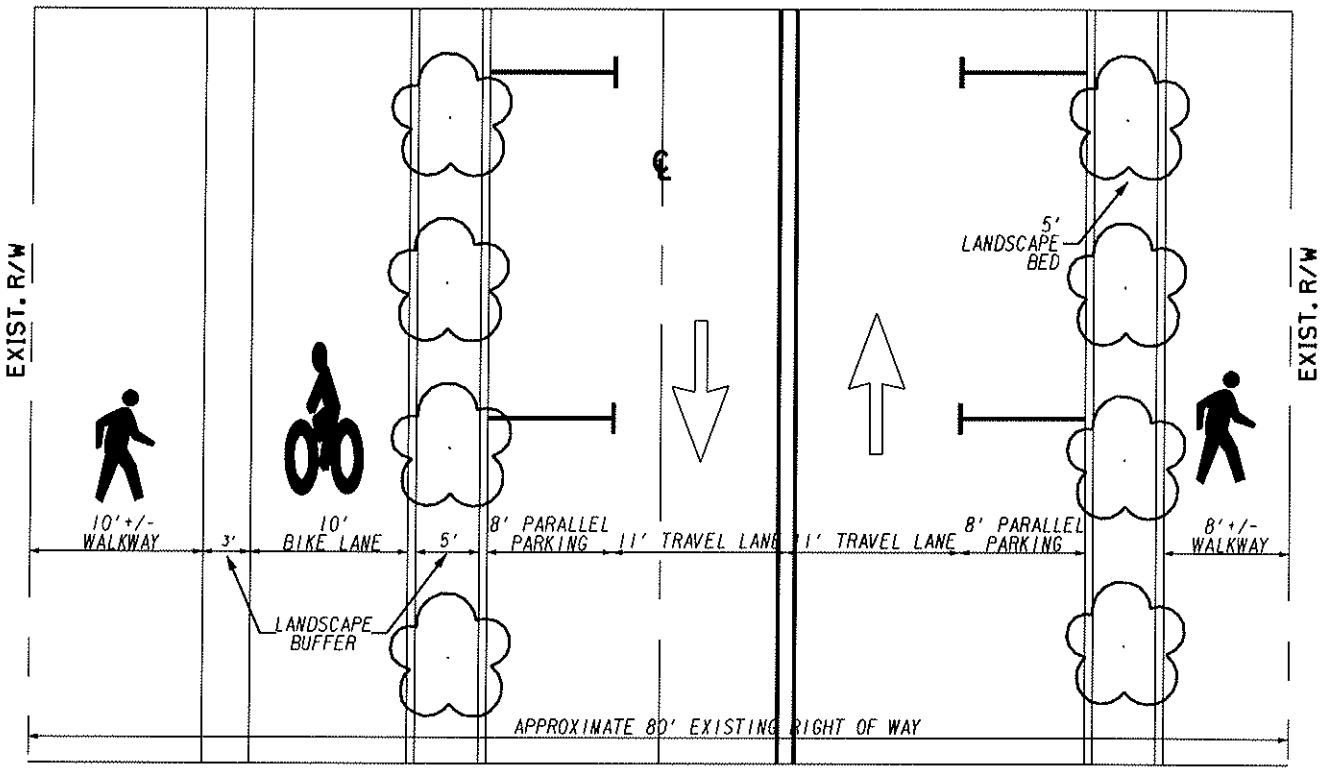
	Status	Year	Fund Type	Federal	State	Local	Bonds	Total
PE	AUTH	AUTH	Interstate Maintenance	$0,000	$0,000	$0,000	$0,000	$0,000
ROW		LR 2014-2020	General Federal Aid - 2014-2030	$14,812,800	$3,703,200	$0,000	$0,000	$18,516,000
CST		LR 2014-2020	General Federal Aid - 2014-2030	$29,198,400	$7,299,600	$0,000	$0,000	$36,498,000
				$44,011,200	$11,002,800	$0,000	$0,000	$55,014,000

ATTACHMENT 9 –

CONFORMING PLAN’S NETWORK SCHEMATICS



EXISTING



PROPOSED

N. McDONOUGH STREET
PLAN NETWORK SCHEMATICS
(NOT TO SCALE)

ATTACHMENT 10 –

LETTER OF COMMITMENT FROM CITYOF DECATUR TO MAINTAIN AND ENERGIZE THE LIGHTING SYSTEM

City of Decatur

509 North McDonough Street
P.O. Box 220
Decatur, Georgia 30031
404-370-4102 ▪ Fax 678-553-6518
www.decaturga.com

October 17, 2011

Mr. Darrell DeJean, Project Manager
Georgia Department of Transportation
Office of Program Delivery
600 West Peachtree Street
Atlanta, Georgia 30308

Re: P.I. No. 0010327, DeKalb County
North McDonough Streetscape Improvements

Dear Mr. DeJean:

The purpose of this letter is to confirm the City of Decatur's commitment to pay for the maintenance and power of the lighting system installed for this project. Please let me know if you need additional information.

Sincerely,

Hugh Saxon
Deputy City Manager