

**MOUNTAIN BROOK CITY COUNCIL  
PRE-MEETING AGENDA  
3928 Montclair Road – City Council Room, Suite 230  
Mountain Brook, AL  
Monday, March 11, 2013  
6:00 p.m.**

1. Meeting with Governor on March 14<sup>th</sup> regarding the Highway 280 modifications by ALDOT.
2. Recognition of Employees of the Year awards from the Police, Fire and Public Works Departments as well as the Chamber of Commerce.
3. Phase 6 Sidewalk project update – Alicia Bailey of Sain Associates. (See attached information.)
4. Phase 9 Sidewalk Preliminary Engineering Agreement along Brookwood Road, Crosshill Road and Oakdale Road – Virginia Smith, Amy Carter & Sam Gaston. (See attached information. This item may be added to the formal agenda.)
5. Turn Lane study for Cahaba Road at Heathermoor Road – Richard Caudle of Skipper Consultants. (See attached information.)
6. Northern Beltline project discussion – Gil Rogers of the Southern Environmental Law Center. (See attached information.)
7. Request by the Mountain Brook Board of Education for waiver of permit fees for field house addition and future projects – Ken Key of the Board of Education. (See attached information. This item may be added to the formal agenda.)
8. UPS bypass/disconnect switch purchase – Steve Boone. (See attached information. This item may be added to the formal agenda.)
9. Executive Session.

Mountain Brook Walkway System Phase 6  
 CMAQ-9802(921)  
 3/6/2013

PROJECT FUNDING SUMMARY PROVIDED BY ALDOT DATED 12/13/11

	TOTAL ESTIMATE	FEDERAL FUNDS	CITY FUNDS
Roadway (Construction Cost plus CE&I)	\$ 1,829,763.10	\$ 1,463,810.48	\$ 365,952.62
Federal Non-Participation	\$ 6,526.54	\$	\$ 6,526.54
Indirect Cost	\$ 250,286.28	\$ 200,229.02	\$ 50,057.25
<b>TOTAL:</b>	<b>\$ 2,086,575.92</b>	<b>\$ 1,664,039.50</b>	<b>\$ 422,536.41</b>

PROJECT COST CHANGES KNOWN AS OF 3/6/13

	CONSTRUCTION TOTAL	CE&I (15% OF CONSTR \$)	GRAND TOTAL	80% FEDERAL	20% CITY	REASON FOR COST CHANGE
Change Order 1	\$ 11,199.50	\$ 1,679.93	\$ 12,879.43	\$ 10,303.54	\$ 2,575.89	Required Erosion Control Items added for ADEM and ALDOT comments, Approved
Change Order 2	\$ (46,806.24)	\$ (7,020.94)	\$ (53,827.18)	\$ (43,061.74)	\$ (10,765.44)	Revised wall design for battered (sloped) face to meet clear zone requirements and for height, length, footer revisions
Change Order 3	\$ 5,007.12	\$ 751.07	\$ 5,758.19	\$ 4,606.55	\$ 1,151.64	Added Magnolia Trees as coordinated by City, NLA, and property owner, Not approved yet
Extra payment to Walker Patton					\$ 474.65	For Mr. Smith landscaping, extra not approved from ALDOT
Anticipated Over/Under-runs	\$ 154,941.60	\$ 23,241.24	\$ 178,182.84	\$ 142,546.27	\$ 35,636.57	Approximate, anticipated over-runs for adjustments to meet field conditions
Knollwood Driveways	\$ 22,935.26	\$ 3,440.29	\$ 26,375.55	\$ 21,100.44	\$ 5,275.11	Approximate, revisions to driveways as required by ALDOT
Deletion of Minor Structure Concrete Walls	\$ (6,775.88)	\$ (1,316.38)	\$ (10,092.26)	\$ (8,073.81)	\$ (2,018.45)	Short walls have been determined to not be needed
Driveway revisions	\$ 45,018.67	\$ 6,752.80	\$ 51,771.47	\$ 41,417.18	\$ 10,354.29	Driveways (B) revisions
Wall J Battered Design	\$ 8,775.88	\$ 1,316.38	\$ 10,092.26	\$ 8,073.81	\$ 2,018.45	Waiting on contractor's official pricing, design is approved
Wall L and O						Will be repriced once redesign for revised heights complete
Cherokee/Overbrook revision						Will be repriced once ALDOT approves design
Handrail						Will be repriced once determine locations
Asphalt Patch						
<b>TOTAL:</b>	<b>\$ 192,295.91</b>	<b>\$ 28,844.39</b>	<b>\$ 221,140.30</b>	<b>\$ 176,912.24</b>	<b>\$ 44,228.06</b>	Approximate

NOTES:

The project funding summary includes the Roadway construction cost, federal non-participation costs, CE&I costs, and indirect costs.  
 Anticipated Over-runs and Under-runs are evaluated monthly.  
 Change Order 1 is approved  
 Change Order 2 is pending, paperwork is in progress, all approvals are obtained  
 Change Order 3 is pending, paperwork is in progress, all approvals are obtained

ESTIMATED SCHEDULE (pending weather and resolving pending issues):

Overcrest Road	March - April
Cherokee Road	March - May
Overbrook Road	March - May
Old Leeds Road	April - June
Shiloh Drive	May - June
Substantial Completion	June
Final Punch, paperwork, and closeout	July



# ALABAMA DEPARTMENT OF TRANSPORTATION

THIRD DIVISION  
OFFICE OF DIVISION ENGINEER  
1020 BANKHEAD HWY. WEST  
P.O. Box 2745

BIRMINGHAM, ALABAMA 35202-2745  
Telephone: (205) 328-5820 FAX: (205) 254-3199

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Robert Bentley  
Governor

John R. Cooper  
Transportation Director

November 5, 2012

The Honorable Lawrence Oden  
Mayor, City of Mountain Brook  
City Hall  
P.O. Box 130009  
Mountain Brook, Alabama 35213-0009

RE: Jefferson County  
Project Number: CMAQ-PE12()  
[Proj. Ref. No. 100056493]  
Mountain Brook Sidewalks – Phase 9  
Along Brookwood Road, Crosshill Road  
and Oakdale Drive in the City of Mountain  
Brook

Dear Mayor Oden,

I have enclosed the original Preliminary Engineering Agreement (and one copy) between the State of Alabama and the City of Mountain Brook, Alabama for the above referenced project.

This Agreement is submitted to the City for approval. After execution by the City Council, please return the original document and the copy, with original signature and the City Seal affixed to both to this office for further handing. A certified resolution, which authorizes the Mayor to sign the Agreement, affixed with the City seal should be included with the original Agreement, as well as with the copy.

If I can supply you with any additional information or clarify any point contained herein, please feel free to contact me at your convenience.

Sincerely,

Brian C. Davis  
Division Engineer

BCD/LAT/SFPB  
Enclosure

C: Mrs. Sandra F. P. Bonner  
File w/Enc.



**ALABAMA DEPARTMENT OF TRANSPORTATION**

1409 Coliseum Boulevard, Montgomery, Alabama 36110



Robert Bentley  
Governor

John R. Cooper  
Transportation Director

October 29, 2012

Mr. Brian C. Davis  
Division Engineer  
Alabama Department of Transportation  
Post Office Box 2745  
Birmingham, Alabama 35202

SUBJECT: CMAQ-PE12( )  
Mountain Brook Sidewalks Phase 9  
Along Brookwood Road, Crosshill Road, and Oakdale Drive  
Mountain Brook, Alabama  
Jefferson County  
Reference Number: 100056493

Dear Mr. Davis:

The enclosed funding agreement between the State and the City of Mountain Brook, Alabama, is to obligate federal funds for preliminary engineering for the referenced project.

Please review this agreement and, if it is acceptable, present it to the city for approval. The agreement should be executed by the city, signed by the mayor with the city seal affixed and a resolution attached authorizing the mayor to be the signatory on behalf of the city. After the agreement is executed by the city, please sign and return this document to this office.

Please contact Mary Lou Crenshaw at 334-353-6439 if you have any questions.

Sincerely,

Robert J. Jilla  
Multimodal Transportation Engineer

By: C.W. Colson, Jr.  
C. W. Colson, Jr.  
Special Programs Engineer

RJJ:CWC:mlc  
Attachment  
c: file

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**AGREEMENT  
FOR  
PRELIMINARY ENGINEERING**

**BETWEEN THE STATE OF ALABAMA  
AND  
THE CITY OF MOUNTAIN BROOK**

**Project CMAQ-PE12( )  
Sidewalks Phase 9  
along Brookwood Road, Crosshill Road and Oakdale Drive  
Mountain Brook, Alabama  
Reference Number:100056493**

THIS AGREEMENT is made and entered into by and between the State of Alabama, acting by and through the Alabama Department of Transportation, hereinafter referred to as STATE; and the City of Mountain Brook, Alabama, hereinafter referred to as CITY, in cooperation with the United States Department of Transportation, Federal Highway Administration, hereinafter referred to as the FHWA; and

WHEREAS, a Transportation Improvement Program has been developed for the Birmingham urbanized area and certain transportation improvements and priorities are listed therein; and

WHEREAS, it is in the public interest for the STATE and the CITY to cooperate toward the implementation of the Transportation Improvement Program; and

WHEREAS, the STATE and the CITY desire to cooperate in a preliminary engineering project to design sidewalks along Brookwood Road, Crosshill Road and Oakdale Drive, Phase 9 of a citywide project, in the City of Mountain Brook, Alabama.

WHEREAS, Federal transportation funds are dedicated specifically to the Birmingham Area by the 2005 Safe, Accountable, Flexible and Efficient Transportation Equity Act-Legacy for Users (SAFETEA-LU), as directed by the Birmingham Metropolitan Planning Organization (MPO), and hereinafter referred to as Congestion Mitigation and Air Quality (CMAQ) Improvement Program funds.

NOW, THEREFORE, the parties hereto, for, and in consideration of the premises stated herein do hereby mutually promise, stipulate, and agree as follows:

- 1) The CITY will perform or have performed all services required to fulfill the purposes of this Agreement. The Third Division of the Alabama Department of Transportation will be the lead agency for the STATE relative to the work under this agreement and will be the point of contact for the CITY. Plans will be by or for the CITY and approved by the STATE.
- 2) This Agreement will cover all aspects of the preliminary engineering phase of the project. The preliminary engineering phase is hereby defined as that work necessary to advance the development of the Project through construction authorization by FHWA. This phase will include all environmental studies and documentation required by FHWA.

- 3) Funding for this Agreement is subject to the availability of Federal Aid funds at the time of authorization by FHWA.
- 4) This Project will be administered by the CITY and all cost will be financed, when eligible for Federal participation, on the basis of 80 percent Federal funds and 20 percent CITY funds. Any rescission mandated by Congress will be applied to the Federal Funds if applicable. The estimated cost and participation by the various parties are as follows:

	<u>Total Estimated Cost</u>	<u>Total Estimated Federal Funds</u>	<u>Estimated Local Funds</u>
Preliminary Engineering	\$ 166,400.00	\$ 133,120.00	\$ 33,280.00
Total	\$ 166,400.00	\$ 133,120.00	\$ 33,280.00

It is understood that the above is an estimate only, and in the event the final cost exceeds the estimate, the CITY will be responsible for its proportional share above noted. The project will commence upon execution of this agreement and upon written authorization to proceed from the STATE directed to the CITY. After obligation, these funds are available until expended.

- 5) It is expressly understood that this is a cost reimbursement program and no federal funds will be provided to the CITY prior to accomplishment of work for which reimbursement is requested.
- 6) The CITY agrees that in the event the FHWA determines, due to rules and/or regulations of FHWA (including but not limited to delay of the projects, or delay of projects contemplated to be developed and accomplished in sequence to the current projects) that Federal funds expended on this project must be refunded to the FHWA, the CITY will reimburse and pay to the STATE a sum of money equal to the total amount of STATE and Federal funds expended under this Agreement.
- 7) The CITY will, when appropriate, submit invoices to the STATE for reimbursement for work performed by or for the CITY in carrying out the terms of this agreement. Requests for reimbursement will be made on forms provide by the STATE and will be submitted through the Division Engineer for payment. The CITY may bill the STATE not more often than once per month for the funds due for work performed under this Agreement. Invoices for payment will be submitted in accordance with state law and will indicate that the payment is due, true, correct, unpaid and the invoice will be notarized. Invoices for any work performed by the CITY under the terms of this agreement will be submitted within twelve (12) months after the completion and acceptance by the STATE for the work. Any invoices submitted after this twelve-month period will not be eligible for payment.
- 8) The performances of the work covered by this Agreement will be in accordance with the current regulations and requirements of the STATE and FHWA.

- 9) Any service of the STATE necessary to carry out the intent of this Agreement will be in accordance with the current regulations and requirements of the STATE and FHWA.
- 10) The STATE will assist the CITY in any public involvement actions that may be required.
- 11) The STATE will provide without cost to the CITY information available from its records that will facilitate the performance of the work.
- 12) Agency to Indemnify: The CITY will be responsible at all times for all of the work performed under this Agreement and the CITY will protect, defend, indemnify and hold harmless the State of Alabama, the Alabama Department of Transportation, the officials, officers, employees in both their official and individual capacities, and their agents and/or assigns, from and against any and all actions, damages, claims, loss, liabilities, including attorney's fees and expenses whatsoever or any amount paid in compromise thereof arising out of or connected with the work performed under this Agreement.  
By entering into this agreement, the CITY is not an agent of the STATE, its officers, employees, agents or assigns. The CITY is an independent entity from the STATE and nothing in this Agreement creates an agency relationship between the parties.
- 13) Agreement Change: The terms of this Agreement may be modified by supplemental agreement duly executed by the parties hereto.
- 14) Termination: Either party has the right to terminate this Agreement at any time by giving thirty (30) days written notice of termination. Said notice will be mailed by certified or registered mail.
- 15) It is clearly understood by both parties that the STATE does not commit any STATE or Federal funds beyond those mentioned herein and that a separate Agreement will be required for the construction of the proposed improvements.
- 16) Arbitration: Any dispute concerning a question of fact in connection with the work not disputed of by this Agreement between the CITY and the STATE will be referred to the director of the State of Alabama Department of Transportation, whose decision will be final.
- 17) Exhibits M and N are hereby attached to and made a part of this Agreement.
- 18) 7/24<sup>th</sup> Law: Nothing shall be construed under the terms of this Agreement by the CITY or the STATE that shall cause any conflict with Section 23-1-63, Code of Alabama, 1975.

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IN WITNESS WHEREOF, the parties hereto cause this Agreement to be executed by those officers, officials and persons thereunto duly authorized, and the Agreement is deemed to be dated and to be effective on the date hereinafter stated as the date of the approval of the Governor of Alabama.

SEAL

ATTEST:

THE CITY OF MOUNTAIN BROOK

BY: \_\_\_\_\_  
City Clerk (Signature)

BY: \_\_\_\_\_  
Mayor (Signature)

\_\_\_\_\_  
Type name of Clerk

\_\_\_\_\_  
Type name of Mayor

APPROVED AS TO FORM:

BY: \_\_\_\_\_  
Jim R. Ippolito, Jr.  
Chief Counsel  
Alabama Department of Transportation

RECOMMENDED FOR APPROVAL:

\_\_\_\_\_  
Brian C. Davis  
Division Engineer

\_\_\_\_\_  
Robert J. Jilla,  
Multimodal Transportation Engineer

\_\_\_\_\_  
G. M. Harper, P.E.  
Acting Chief Engineer

STATE OF ALABAMA  
ACTING BY AND THROUGH THE  
ALABAMA DEPARTMENT OF  
TRANSPORTATION

\_\_\_\_\_  
John R. Cooper, Transportation Director

The foregoing Agreement is hereby executed in the name of the State of Alabama and signed by the Governor on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_  
Robert Bentley  
Governor, State of Alabama



RESOLUTION NUMBER \_\_\_\_\_

BE IT RESOLVED, by the City Council of the City of Mountain Brook, Alabama as follows:

1. That the City enter into an agreement with the State of Alabama, acting by and through the Alabama Department of Transportation for:

Project CMAQ-PE12( ) a preliminary engineering project to design sidewalks along Brookwood Road, Crosshill Road and Oakdale Drive, Phase 9 of a citywide project, in the City of Mountain Brook, Alabama; which Agreement is before this Council.

2. That the Agreement be executed in the name of the City, by its Mayor, for and on its behalf;
3. That the Agreement be attested by the City Clerk and the seal of the City affixed thereto.

BE IT FURTHER RESOLVED that upon the completion of the execution of the Agreement by all parties, that a copy of such Agreement be kept on file by the City Clerk.

Passed, adopted and approved this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

ATTESTED:

\_\_\_\_\_  
City Clerk

\_\_\_\_\_  
Mayor, City of Mountain Brook

I, the undersigned qualified and acting City Clerk of the City of Mountain Brook, do hereby certify that the above and foregoing is a true copy of a resolution passed and adopted by the City Council of the City named therein, at a regular meeting of such Council held on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_ and that such resolution is on file in the City Clerk's Office.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the City on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_  
City Clerk

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CONSULTANT 3/19/90  
REVISED 7/18/90  
REVISED 6/16/11

EXHIBIT M

**CERTIFICATION FOR FEDERAL-AID CONTRACTS: LOBBYING**

This certification is applicable to the instrument to which it is attached whether attached directly or indirectly with other attachments to such instrument.

The prospective participant/recipient, by causing the signing of and the submission of this Federal contract, grant, loan, cooperative AGREEMENT, or other instrument as might be applicable under Section 1352, Title 31, U. S. Code, and the person signing same for and on behalf of the prospective participant/recipient each respectively certify that to the best of the knowledge and belief of the prospective participant or recipient and of the person signing for and on behalf of the prospective participant/recipient, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the prospective participant/recipient or the person signing on behalf of the prospective participant/recipient as mentioned above, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, or other instrument as might be applicable under Section 1352, Title 31, U. S. Code, the prospective participant/recipient shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U. S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The prospective participant/recipient also agrees by submitting this Federal contract, grant, loan, cooperative agreement or other instrument as might be applicable under Section 1352, Title 31, U. S. Code, that the prospective participant/recipient shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such subrecipients shall certify and disclose accordingly.

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CONSULTANT 2/15/95  
REVISED 5/30/02  
REVISED 6/16/11

EXHIBIT N

**FUNDS SHALL NOT BE CONSTITUTED AS A DEBT**

It is agreed that the terms and commitments contained herein shall not be constituted as a debt of the State of Alabama in violation of Article 11, Section 213 of the Constitution of Alabama, 1901, as amended by Amendment Number 26. It is further agreed that if any provision of this AGREEMENT shall contravene any statute or Constitutional provision of amendment, either now in effect or which may, during the course of this AGREEMENT, be enacted, then the conflicting provision in the AGREEMENT shall be deemed null and void.

In any controversy concerning contract terms, or on a question of fact in connection with the work covered by this project, including compensation for such work, the decision of the Transportation Director regarding the matter in issue or dispute shall be final and conclusive on all parties.

For any and all disputes arising under the terms of this contract, the parties hereto agree, in compliance with the recommendations of the Governor and Attorney General, when considering settlement of such disputes, to consider using appropriate forms of non-binding alternative dispute resolution.

**TERMINATION DUE TO INSUFFICIENT FUNDS**

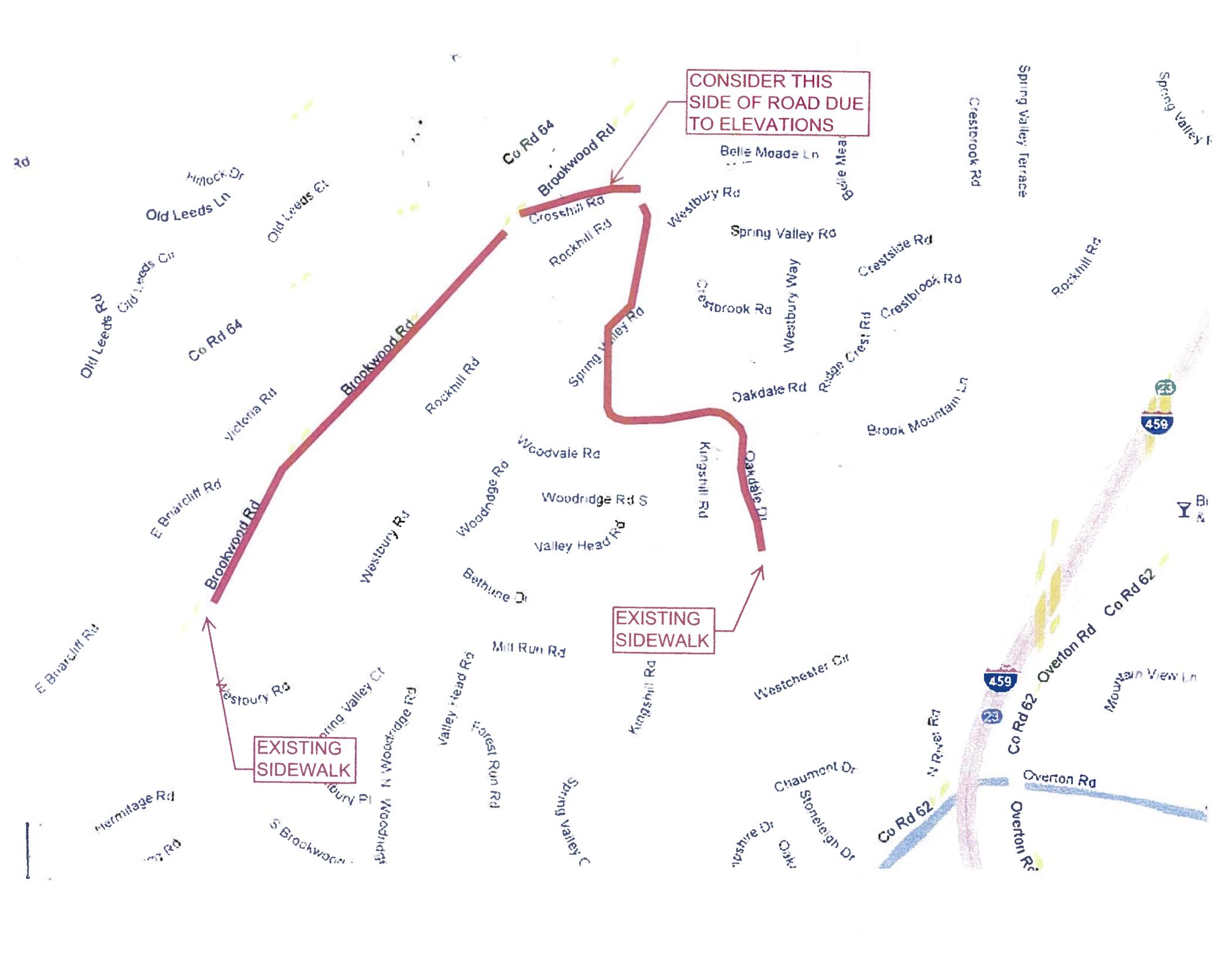
- a. If the agreement term is to exceed more than one fiscal year, then said agreement is subject to termination in the event that funds should not be appropriated for the continued payment of the agreement in subsequent fiscal years.
- b. In the event of proration of the fund from which payment under this AGREEMENT is to be made, agreement will be subject to termination.

**NO GOVERNMENT OBLIGATION TO THIRD PARTY CONTRACTORS**

The STATE and CONSULTANT acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this contract and shall not be subject to any obligations of or liabilities to the STATE, CONSULTANT, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.

The CONSULTANT agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided to FHWA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

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CONSIDER THIS  
SIDE OF ROAD DUE  
TO ELEVATIONS

EXISTING  
SIDEWALK

EXISTING  
SIDEWALK

**Sam Gaston**

---

**From:** Bailey, Alicia  
**Sent:** Friday, January 25, 2013 8:46 AM  
**To:** Sam Gaston  
**Cc:** Meads, Jim  
**Subject:** Mountain Brook Phase 9  
**Attachments:** City to ALDOT letter requesting permission.docx

Sam,

You had given me a copy of the Phase 9 PE funding agreement. Has the Council approved this and the executed copy sent to ALDOT?

If so, the next step is to submit a letter (see attached) to ALDOT requesting permission to select a consultant from the on-call list. Once they provide permission, we send a letter saying you pick Sain from the list. Then ALDOT will send you a letter approving the selection and will tell us that we can enter into an agreement.

**Alicia Bailey, PE**

Team Leader/Transportation

244 West Valley Avenue, Suite 200  
Birmingham, Alabama 35209  
Direct: (205) 263-2169  
Cell: (205) 910-2699

Email: [abailey@sain.com](mailto:abailey@sain.com)

Website: [www.sain.com](http://www.sain.com)

**SAIN**  
associates

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Sain Associates, Inc.  
244 W. Valley Ave. Suite 200  
Birmingham, AL 35209  
205-940-6420

1/25/2013

January 25, 2013

Mr. Brian C. Davis, P.E.  
Division Engineer  
Alabama DOT – 3<sup>rd</sup> Division  
1020 Bankhead Highway West  
Birmingham, AL 35204

SUBJECT: Mountain Brook Sidewalks Phase 9  
CMAQ-PE12( )  
Reference No. 100056493

Attention: Lance Taylor, P.E.

Dear Mr. Taylor:

The City of Mountain Brook is requesting permission to select a consultant from the on-call Design Services list to perform the Preliminary Engineering for the subject project. The City of Mountain Brook will entertain a fee proposal from the Consultant upon written approval from your office and will follow fee proposal procedures in accordance with ALDOT and FHWA guidelines.

If any additional information is required, please feel free to contact me at (205) 802-3803.

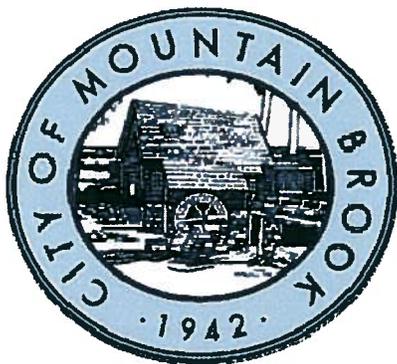
Sincerely,

Sam Gaston  
City Manager

TRAFFIC  
STUDY

# Cahaba Road at Heathermoor Road

Mountain Brook, Alabama



Prepared for:  
**THE CITY OF MOUNTAIN BROOK**

Prepared by:  
**SKIPPER**  
CONSULTING INC.

March, 2013



# Cahaba Road at Heathermoor Road

## Mountain Brook, Alabama

# Traffic Study

Prepared for:

**The City of Mountain Brook**  
P.O. Box 130009  
Mountain Brook, Alabama 35213  
Phone (205) 802-2400 Fax (205) 879-6913

Prepared by:

**Skipper Consulting, Inc.**  
3644 Vann Road, Suite 100  
Birmingham, Alabama 35235  
Phone (205) 655-8855 Fax (205) 655-8825

March, 2013



SIGNED: *Richard Caddle*  
DATE: 3/5/13

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## **APPENDICES**

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## INTRODUCTION

This report documents a traffic study performed for the intersection of Cahaba Road at Heathermoor Road in the City of Mountain Brook, Alabama. The location of the study intersection is shown in Figure 1.

The purposes of this report are to:

- Document background traffic data collected for the project, including:
  - Intersection turning movement traffic counts
  - Machine tube traffic counts
  - Speed surveys
  - Vehicle classification counts
- Analyze existing traffic conditions of the intersection of Cahaba Road at Heathermoor Road, including:
  - Intersection capacity analysis
  - Crash analysis
  - Sight distance analysis
  - Observations
- Analyze future traffic conditions of the intersection of Cahaba Road at Heathermoor Road, including additional traffic from:
  - Historical traffic growth
  - Lane Parke
- Development of roadway improvements, particularly examining the need for a southbound left turn lane on Cahaba Road at Heathermoor Road, including:
  - Alternatives considered
  - Left turn lane warrant analysis
  - Intersection capacity analysis
  - Queue calculations
  - Recommended roadway improvements



Site Location



North

Scale: n.t.s

**Figure 1**  
**Site Location Map**

Cahaba Road at Heathermoor Road  
Mountain Brook, Alabama

FEBRUARY, 2013

1104.016

Sources of information used in this study included: the City of Mountain Brook, the Regional Planning Commission of Greater Birmingham, the Transportation Research Board, the Institute of Transportation Engineers, the American Association of State Highway and Transportation Officials, the National Cooperative Highway Research Program, and office files and field reconnaissance efforts of Skipper Consulting, Inc.

## BACKGROUND INFORMATION

### Roadway Descriptions

Within the study area, Cahaba Road is a two lane urban collector roadway with a posted speed limit of 30 miles per hour. The roadway is striped with four inch solid white edge lines and a four inch double yellow centerline.



Heathermoor Road is a two lane local roadway with a no standard posted speed limit, but with a posted school zone speed limit of 15 miles per hour when children are present. There is a right turn lane from Cahaba Road northbound onto Heathermoor Road; however, there is no left turn lane from Cahaba Road southbound onto Heathermoor Road.



## EXISTING CONDITIONS ANALYSIS

### Existing Intersection Turning Movement Traffic Counts

Intersection turning movement traffic counts were performed at the intersection of Cahaba Road at Heathermoor Road on Wednesday to Thursday, November 7 to 8, 2012 by Traffic Data, LLC on behalf of Skipper Consulting, Inc. The counts were conducted from 7:00 a.m. to 9:00 a.m., 2:30 to 3:30 p.m., and 4:00 p.m. to 6:00 p.m. The intersection turning movement traffic count data is included in Appendix A. The intersection turning movement traffic count data was analyzed to determine the a.m., afternoon school, and p.m. peak hours of traffic flow. The peak hour intersection turning movement traffic count data is depicted in Figure 2.

### Existing Machine Traffic Count

A machine traffic count, including speed and classification, was performed on Cahaba Road immediately south of Heathermoor Road for 24 continuous hours beginning at 1:00 p.m. on Monday, March 4, 2013. The machine traffic count data is included in Appendix B. The data is summarized in Tables 1, 2 and 3.

The existing daily traffic volume on Cahaba Road is approximately 7,600 vehicles per day. The morning peak hour is generally 7:30 a.m. to 8:30 a.m., with a total traffic volume of approximately 720 vehicles per hour. The afternoon peak hour is generally 4:15 p.m. to 5:15 p.m., with a total traffic volume of approximately 700 vehicles per hour.

The posted speed limit on Cahaba Road is 30 miles per hour. The traffic count shows that the average speed of vehicles is approximately 34 miles per hour and the 85<sup>th</sup> percentile speed is 39 miles per hour. The 85<sup>th</sup> percentile speed is the speed at which 85% of all vehicles are traveling at or under and is used for design purposes.

Approximately 3% of the vehicles on Cahaba Road are classified as trucks. This is typical for collector roadways in the Birmingham area. Of these trucks, approximately 15% are heavy trucks (such as tractor-trailers).

Cahaba Road  
ADT = 7,389 veh/day

427(250)[252]  
32(8)[26]

66(61)[12]  
45(52)[20]

Heathermoor Rd.

254(279)[384]  
103(56)[41]

Cahaba Rd.



**LEGEND**  
100(100)[100]  
AM (School)[PM]



Scale: n.t.s

**Figure 2**  
**Existing Traffic Counts**  
Cahaba Road at Heathermoor Road  
Mountain Brook, Alabama

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1104.016

**Table 1**  
**Existing Machine Traffic Count**  
**Cahaba Road south of Heathermoor Road**  
**Monday-Tuesday, March 4-5, 2013**

<i>Time</i>	<i>Cahaba Road</i>		
	<i>Northbound</i>	<i>Southbound</i>	<i>Total</i>
12-1 AM	6	4	10
1-2 AM	0	3	3
2-3 AM	1	4	5
3-4 AM	4	2	6
4-5 AM	9	5	14
5-6 AM	46	30	76
6-7 AM	80	106	186
7-8 AM	263	360	623
8-9 AM	275	359	634
9-10 AM	222	198	420
10-11 AM	245	247	492
11-12 PM	289	281	570
12-1 PM	298	329	627
1-2 PM	256	361	617
2-3 PM	308	286	594
3-4 PM	277	299	576
4-5 PM	384	314	698
5-6 PM	316	301	617
6-7 PM	211	140	351
7-8 PM	127	83	210
8-9 PM	61	56	117
9-10 PM	38	41	79
10-11 PM	16	19	35
11-12 AM	7	8	15
<b>Total</b>	<b>3,739</b>	<b>3,836</b>	<b>7,575</b>
AM Peak	7:15-8:15 AM 297	7:30-8:30 AM 427	7:30-8:30 AM 717
PM Peak	4:15-5:15 PM 393	1:00-2:00 PM 361	4:15-5:15 PM 700

**Table 2**  
**Existing Speed Survey**  
**Cahaba Road south of Heathermoor Road**  
**Monday-Tuesday, March 4-5, 2013**

<b>Speed Range</b>	<b>Cahaba Road</b>		
	<b>Northbound</b>	<b>Southbound</b>	<b>Total</b>
0-14 mph	32	34	66
15-19 mph	17	8	25
20-24 mph	104	35	139
25-29 mph	570	402	972
30-34 mph	1,376	1,532	2,908
35-39 mph	1,233	1,428	2,661
40-44 mph	363	363	726
45-49 mph	38	29	67
50-54 mph	4	1	5
55-59 mph	1	1	2
60-64 mph	1	1	2
65-69 mph	0	0	0
70+ mph	0	2	2
85 <sup>th</sup> %tile	39 mph	39 mph	39 mph
Pace	30-40 mph	30-40 mph	30-40 mph
% in Pace	70%	78%	74%
Average	34 mph	35 mph	34 mph

**Table 3**  
**Existing Vehicle Classification Count**  
**Cahaba Road south of Heathermoor Road**  
**Monday-Tuesday, March 4-5, 2013**

<i>Classification</i>	<i>Thursday-Friday</i>		
	<i>Northbound</i>	<i>Southbound</i>	<i>Total</i>
Motorcycle	6	4	10
Car	2,937	3,176	6,113
2 Axle Long	647	547	1,194
Bus	30	24	54
6 Tire Vehicle (2 axle)	92	69	166
Single Unit Truck (3 axle)	2	1	3
Single Unit Truck (4 axle)	0	0	0
Double Unit Truck (less than 5 axles)	20	15	35
Double Unit Truck (5 axle)	0	0	0
Multi-Unit Truck (greater than 5 axles)	0	0	0
Truck Percentage	4%	3%	3%
% Medium Trucks	85%	85%	85%
% Heavy Trucks	15%	15%	15%

**Existing Intersection Capacity Analysis**

Existing intersection capacity analyses were performed for the peak hours of traffic flow for the intersection of Cahaba Road at Heathermoor Road according to the methodology outlined in the 2010 *Highway Capacity Manual*, published by the Transportation Research Board. Capacities are expressed as levels of service, and range from a level of service "A" (highest quality of service) to a level of service "F" (jammed conditions). As a general rule, operation at a level of service "C" or better is desirable, with a level of service "D" considered acceptable during peak hours of traffic flow. The existing intersection capacity analysis worksheets are included in Appendix C and are summarized in Table 4. As shown in Table 4, all movements at the study intersection currently operate at acceptable levels of service.

**Table 4**  
**Existing Intersection Capacity Analysis**  
**Cahaba Road at Heathermoor Road**

<i>Intersection</i>	<i>Approach</i>	<i>Movement</i>	<i>Level of Service</i>		
			<i>AM Peak</i>	<i>School</i>	<i>PM Peak</i>
Cahaba Road at Heathermoor Road (unsignalized)	Heathermoor Road Westbound	Left/Right	C	C	B
	Cahaba Road Southbound	Left/Through	A	A	A

**Existing Crash Analysis**

Crash reports were obtained for the intersection of Cahaba Road at Heathermoor Road and adjacent roadway segments for calendar years 2010, 2011 and 2012 from the Mountain Brook Police Department. During the three year period, five crashes were reported. The distribution of crashes was as follows:

2010 – 2 crashes

2011 – 0 crashes

2012 – 3 crashes

Of the five reported crashes, only one crash involved vehicles at the intersection of Cahaba Road at Heathermoor Road. The remaining four crashes involved vehicles entering or exiting parking spaces on Cahaba Road and Heathermoor Road (3 crashes) and one crash involving a parked trailer on Cahaba Road south of Heathermoor Road.

The one reported crash at the intersection of Cahaba Road at Heathermoor Road occurred on April 9, 2010 at 2:54 p.m. A vehicle turning left from Heathermoor Road struck a vehicle northbound on Cahaba Road. There were no injuries or fatalities. The weather was dry and clear.

A review of the crash data from 2010 through 2012 does not reveal any patterns which are subject to mitigating measures.

#### **Existing Sight Distance Analysis**

Intersection sight distance measurements were taken from Heathermoor Road entering Cahaba Road by Skipper Consulting, Inc. The available sight distances were then compared to the minimum required sight distances for the 36 mile per hour 85<sup>th</sup> percentile speed on Cahaba Road according to the 2012 *A Policy on Geometric Design of Highways and Streets*, published by the American Association of State Highway and Transportation Officials. Sight distance was determined from three locations: 1) behind the stop line, 2) behind the crosswalk, and 3) behind the edge of the through lane. In both the cases of: 1) behind the stop line and 2) behind the crosswalk, the sight distances were significantly impacted by roadside obstacles, as shown in the following photographs. It was only from behind the edge of the through lane where reasonable sight distances could be achieved.

The results of the data collected for sight distance measurements from behind the edge of the through lane and a comparison with minimum standards is shown in Table 5. As shown in Table 5, the available sight distance for Heathermoor Road is sufficient for the 39 mile per hour 85<sup>th</sup> percentile speed on Cahaba Road.



**Table 5**  
**Existing Sight Distance Analysis**

<i>Intersection</i>	<i>Measured Sight Distance</i>		<i>Required Sight Distance</i>	
	<i>Looking to the Left</i>	<i>Looking to the Right</i>	<i>Left Turn</i>	<i>Right Turn</i>
Heathermoor Road at Cahaba Road	>500'	480'	430'	375'

**Observations**

Traffic patterns at the intersection of Cahaba Road at Heathermoor Road are impacted by the presence of Mountain Brook Elementary School to the east of the study intersection on Heathermoor Road. One of the carpool patterns for drop-off and pick-up involves the intersection of Cahaba Road at Heathermoor Road. The southbound left from Cahaba Road onto Heathermoor Road is prohibited on weekdays from 7:15 to 8:15 a.m. and 2:15 to 3:30 p.m. Vehicles enter the carpool line from Cahaba Road northbound only. Vehicles exiting the carpool line are allowed to turn either north or south on Cahaba Road.

Operation of the carpool line completely blocks use of Heathermoor Road eastbound by users other than carpool during the afternoon pickup time. The carpool line extends into the intersection of Cahaba Road at Heathermoor Road and into the northbound right turn lane, but was never observed to exceed the storage available in the right turn lane (see the following pictures).



## FUTURE CONDITIONS ANALYSIS

### Historical Traffic Growth

Historical traffic counts were obtained for the years 1986 to 1999 for Lane Park Road and Montevallo Road from the Regional Planning Commission of Greater Birmingham. Traffic counts were also conducted in these same locations by Skipper Consulting, Inc. in 2007. An analysis was performed to determine the historical growth rate in traffic across this period. The analysis shows that traffic has been increasing at a rate of +0.8% per year to +1.0% per year since 1986. Therefore, for the purposes of this report, background traffic is increased by +1.0% per year to the year 2018 over existing traffic for future year conditions. The historical traffic growth analysis is shown in Table 6.

**Table 6**  
**Historical Traffic Growth**

<i>Year</i>	<i>Daily Traffic Volume</i>	
	<i>Lane Park Road</i>	<i>Montevallo Road</i>
1986	8,000	10,700
1988	7,000	12,400
1993	6,900	11,200
1999	7,900	16,400
2007	9,400	12,900
<b>Per Year Growth Rate</b>		
	+0.8%	+1.0%

### Trip Generation

In addition to historical traffic growth, additional traffic is expected at the intersection of Cahaba Road at Heathermoor Road due to the Lane Parke development. Year 2018 future traffic conditions for the intersection used in this study include all traffic generated by the proposed Lane Parke development as per the latest traffic impact study for Lane Parke as prepared by Skipper Consulting, Inc. The trip generation of Lane Parke is shown in Table 7. It should be noted that a portion of the traffic generated by Lane Parke will be intercepted trips, that is, trips which are already on the roadway network and would stop at the development while enroute to their final destination.

**Table 7**  
**Trip Generation - Lane Parke**

<i>Time Period</i>	<i>External Trip Generation</i>			<i>Intercept Trip Generation</i>		
	<i>In</i>	<i>Out</i>	<i>Total</i>	<i>In</i>	<i>Out</i>	<i>Total</i>
AM Peak	274	237	511	81	61	142
PM School Peak	507	489	996	171	155	326
PM Peak	634	612	1246	214	194	408

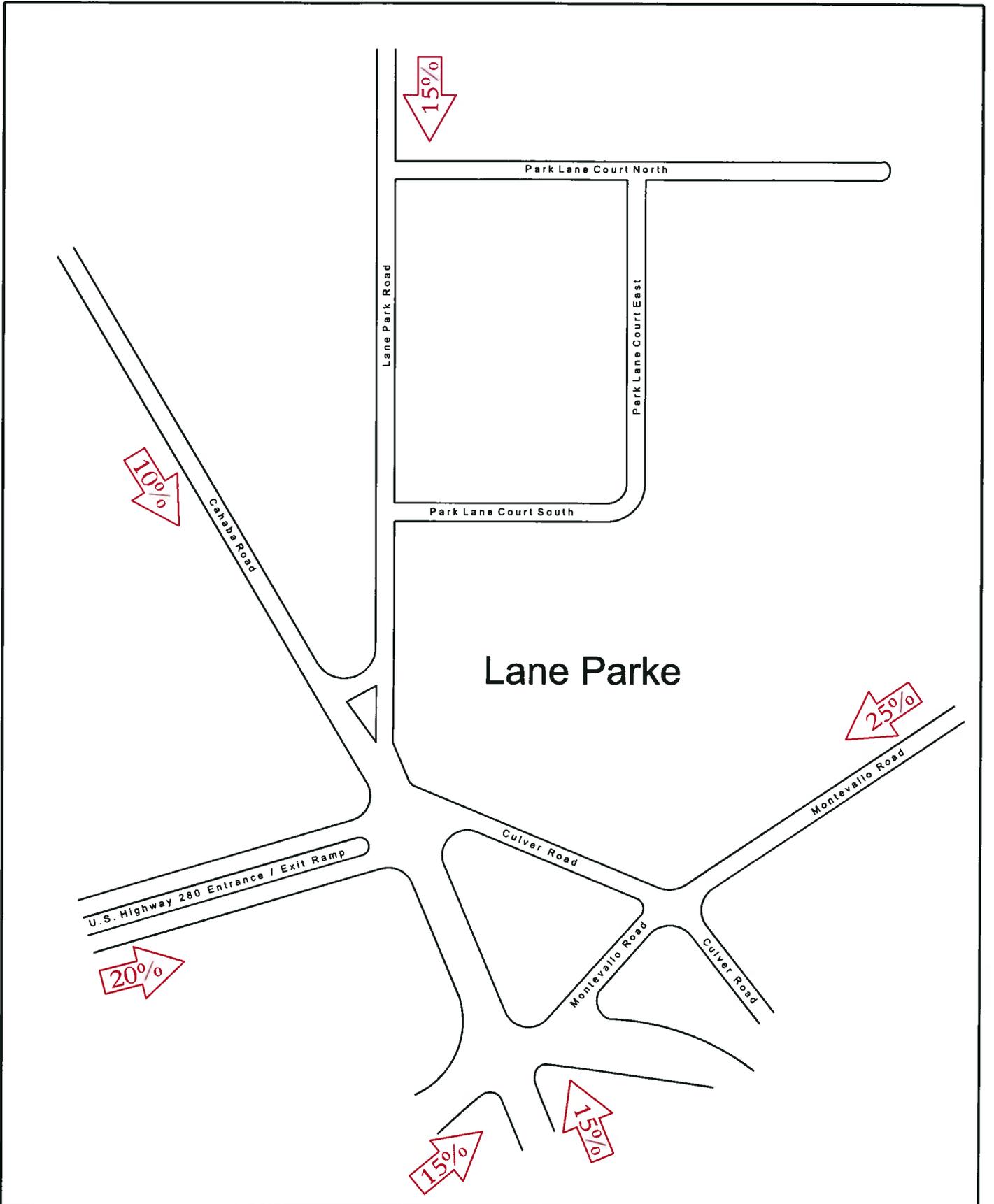
Note: PM School Peak trip generation was estimated at 80% of PM Peak trip generation

### Directional Distribution

The directional distribution of traffic generated by Lane Parke was taken from the most recent traffic impact study for Lane Parke as prepared by Skipper Consulting, Inc. The directional distribution of site generated traffic is shown in Figure 3. Approximately 15% of the traffic generated by Lane Parke is expected to use Cahaba Road south of Mountain Brook Village.

### Traffic Assignment

Historical traffic growth and traffic generated by Lane Parke was assigned to the area roadway network and then added to the existing traffic volumes. The resultant future year traffic volumes are depicted in Figure 4.



North

Scale: n.t.s

**Figure 3**  
**Directional Distribution**

Lane Parke  
Mountain Brook, Alabama

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480(315)[330]  
34(8)[28]

70(65)[13]  
48(55)[21]

Cahaba Rd.

298(349)[470]  
109(59)[43]

Heathermoor Rd.



LEGEND  
100(100)[100]  
AM (School)[PM]



Scale: n.t.s

**Figure 4**  
**Future Traffic Volumes**  
Cahaba Road at Heathermoor Road  
Mountain Brook, Alabama

FEBRUARY, 2013

1104.016

**Future Intersection Capacity Analysis**

Future intersection capacity analyses for the intersection of Cahaba Road at Heathermoor Road (without improvements) were performed for the peak hours of traffic flow according to the methodology outlined in the 2010 *Highway Capacity Manual*, published by the Transportation Research Board. Capacities are expressed as levels of service, and range from a level of service "A" (highest quality of service) to a level of service "F" (jammed conditions). As a general rule, operation at a level of service "C" or better is desirable, with a level of service "D" considered acceptable during peak hours of traffic flow. The future intersection capacity analysis worksheets are included in Appendix D and are summarized in Table 8. As shown in Table 8, all movements at each of the study intersections will continue to operate at acceptable levels of service in the year 2018 after construction of Lane Parke.

**Table 8  
Future Intersection Capacity Analysis  
Cahaba Road at Heathermoor Road**

<i>Intersection</i>	<i>Approach</i>	<i>Movement</i>	<i>Level of Service</i>		
			<i>AM Peak</i>	<i>School</i>	<i>PM Peak</i>
Cahaba Road at Heathermoor Road (unsignalized)	Heathermoor Road Westbound	Left/Right	D	C	C
	Cahaba Road Southbound	Left/Through	A	A	A

## ALTERNATIVE IMPROVEMENT ANALYSIS

The primary purpose of this study is to examine the need for construction of a left turn on Cahaba Road southbound onto Heathermoor Drive. The future intersection capacity analyses do not indicate a poor level of service or excessive delay will be experienced on Cahaba Road southbound in the year 2018 with Lane Parke built out. However, warranting criteria and measures of effectiveness other than delay and level of service should also be considered to determine the need for a left turn lane. Those measures of effectiveness include turn lane warrants and queue length.

### Alternatives Considered

Four alternatives were considered and analyzed for the project:

Alternative 1. This is the “No Build” alternative. The intersection would remain in its current configuration. Analyses for this alternative were presented in the previous section of this report.

Alternative 2. Construct a left turn lane on Cahaba Road southbound but keep the existing left turn prohibition on Cahaba Road southbound during school inbound and outbound peak periods.

Alternative 3. Construct left turn lane and allow left turns from Cahaba Road southbound during school inbound and outbound peak periods.

Alternative 4. Construct left turn lane and allow left turns from Cahaba Road southbound during school inbound and outbound peak periods. Prohibit left turns from Heathermoor Road onto Cahaba Road during the school inbound peak period.

**Traffic Assignment**

Future peak hour intersection traffic volumes would be the same for Alternatives 1 and 2, but would differ for Alternative 3 and Alternative 4. For Alternative 3, it is assumed that: 1) 50% more traffic will use Cahaba Road to access Mountain Brook Elementary School; and 2) 55% of the school traffic will come from the north and 45% from the south (distribution based on the left turn and right turn volumes exiting Heathermoor Road). This will affect traffic volumes only during the a.m. and afternoon school peak hours. The p.m. peak hour traffic volumes will remain unchanged. Alternative 4 traffic would be the same as Alternative 3 traffic, except for all traffic exiting Heathermoor Road during the a.m. peak period would be right turns only. A comparison of future traffic volume projections for each alternative is shown in Figure 5.

**Left Turn Lane Warrant Analysis**

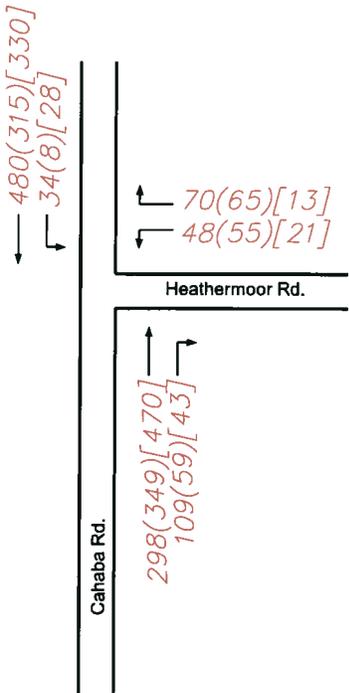
Left turn lane warrant analyses for a southbound left turn lane on Cahaba Road were performed for the future peak hour traffic volumes at the intersection of Cahaba Road at Heathermoor Road for Alternatives 1, 2 and 3 using the methodology included in the Transportation Research Board's National Cooperative Highway Research Program Report 457, *Evaluating Intersection Improvements: An Engineering Study Guide*. The results of the analyses are included in Appendix E and are summarized as follows:

**Alternatives 1 and 2**

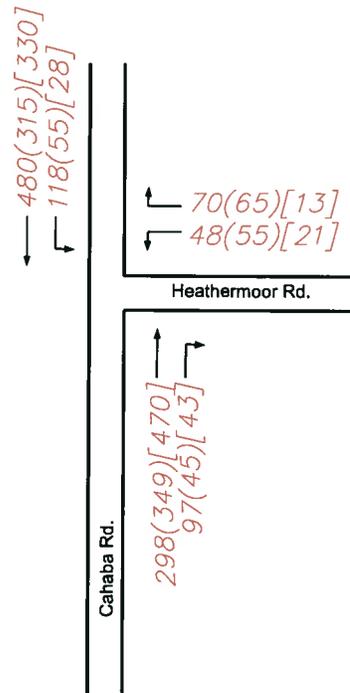
- AM Peak Hour – left turn lane warranted
- PM School Peak Hour – left turn lane not warranted
- PM Peak Hour – left turn lane not warranted

**Alternatives 3 and 4**

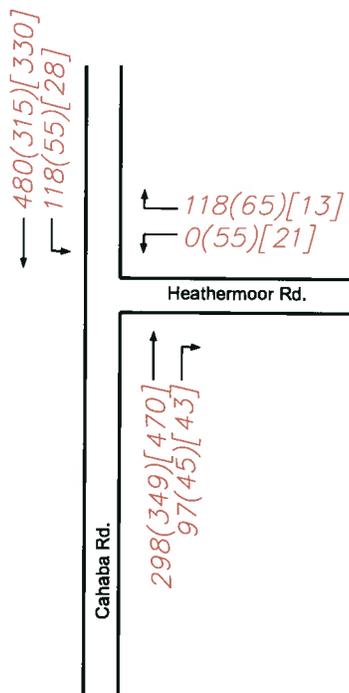
- AM Peak Hour – left turn lane warranted
- PM School Peak Hour – left turn lane warranted
- PM Peak Hour – left turn lane not warranted



Alternatives 1 and 2



Alternative 3



Alternative 4



**LEGEND**  
100(100)[100]  
AM (School)[PM]



Scale: n.t.s

**Figure 5**  
Future Traffic Volumes (Alternatives)  
Cahaba Road at Heathermoor Road  
Mountain Brook, Alabama

FEBRUARY, 2013

1104.016

**Future Intersection Capacity Analysis**

Future intersection capacity analyses for the intersection of Cahaba Road at Heathermoor Road (for Alternatives 2, 3 and 4) were performed for the peak hours of traffic flow according to the methodology outlined in the 2010 *Highway Capacity Manual*, published by the Transportation Research Board. Capacities are expressed as levels of service, and range from a level of service "A" (highest quality of service) to a level of service "F" (jammed conditions). As a general rule, operation at a level of service "C" or better is desirable, with a level of service "D" considered acceptable during peak hours of traffic flow. The future intersection capacity analysis worksheets for Alternative 2 are included in Appendix F, Appendix G for Alternative 3, and Appendix H for Alternative 4. Future intersection capacity analysis results are summarized in Table 9. As shown in Table 9, Alternatives 1 and 2 have comparable levels of service. Alternative 3 would result in degradation of levels of service for Heathermoor Road during the a.m. and p.m. school peak hours. Alternative 4 would improve levels of service for Heathermoor Road during the a.m. peak hour.

**Table 9  
Future Intersection Capacity Analysis (Alternatives)  
Cahaba Road at Heathermoor Road**

<i>Intersection</i>	<i>Approach</i>	<i>Movement</i>	<i>Level of Service</i>		
			<i>AM Peak</i>	<i>School</i>	<i>PM Peak</i>
Cahaba Road at Heathermoor Road (unsignalized)	Heathermoor Road Westbound	Left/Right	D/D/F/B	C/C/D/D	C/C/C/C
	Cahaba Road Southbound	Left	-/A/A/A	-/A/A/A	-/A/A/A
		Through	A/-/-	A/-/-	A/-/-

Legend: Alt. 1 / Alt. 2 / Alt. 3 / Alt. 4

**Queue Calculations**

Queue calculations for the left turn from Cahaba Road southbound onto Heathermoor Road were developed for Alternatives 2, 3 and 4 using a two minute arrival rate. The two minute arrival rate was calculated assuming the majority of southbound traffic would arrive in a 30 minute period before the beginning of school at Mountain Brook Elementary School. The following are the anticipated 95<sup>th</sup> percentile queue lengths:

**Alternative 2**

AM Peak Hour – 60'

PM School Peak Hour – 25'

PM Peak Hour – 50'

**Alternatives 3 and 4**

AM Peak Hour – 195'

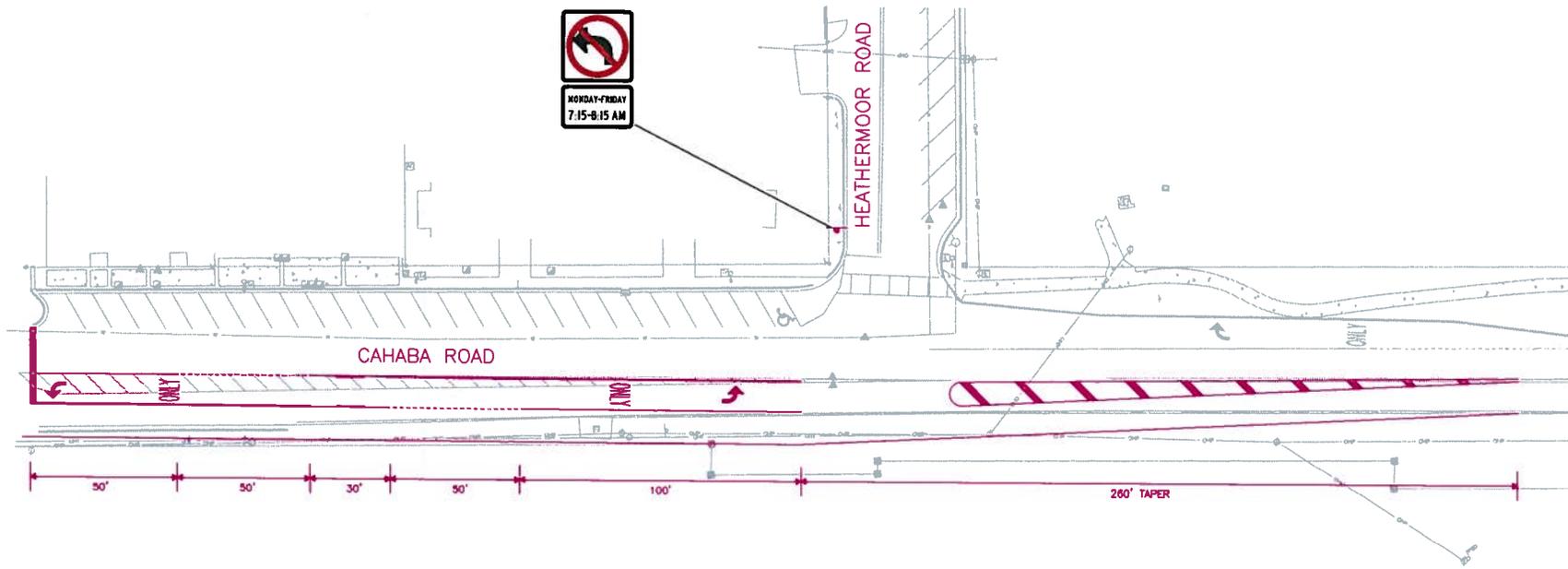
PM School Peak Hour – 95'

PM Peak Hour – 50'

**Recommended Improvements**

Based on the alternatives which have been analyzed in this study, it is recommended that the City install a left turn lane on Cahaba Road at the intersection of Heathermoor Drive. This left turn lane is warranted even with the turn restriction in place during peak school inbound and outbound periods. Since allowing left turn traffic on Cahaba Road southbound during the school inbound and outbound peak periods would have a detrimental impact on delay and level of service on Heathermoor Road during the a.m. peak hour, it is recommended that Alternative 4, which restricts Heathermoor Road traffic to right turns only during the inbound school peak period be implemented. It is recommended that the left turn lane should be designed with a minimum of 195 feet of storage to accommodate future removal of the left turn restriction. In functional design, this would involve widening Cahaba Road to a three lane cross section from Culver Road to Heathermoor Road.

The proposed conceptual design is shown in Figure 6.



0' 20' 40'  
Graphic Scale in Feet



Figure 6  
Conceptual Design  
Cahaba Road at Heathermoor Road  
Mountain Brook, Alabama

FEBRUARY, 2013

1104.016

**Appendix A**  
**Existing Intersection Turning Movement**  
**Traffic Counts**

# TRAFFIC DATA, LLC

1409 Turnham Lane  
Birmingham, AL 35216  
205-824-0125

Mountain Brook, AL

File Name : mtnbrook01  
Site Code : 00000000  
Start Date : 11/07/2012  
Page No : 1

Groups Printed- Unshifted

Start Time	CAHABA RD Southbound		HEATHERMOOR RD Westbound		CAHABA RD Northbound		Int. Total
	Left	Thru	Left	Right	Thru	Right	
02:30 PM	2	78	3	2	59	19	183
02:45 PM	1	71	14	18	73	33	210
<b>Total</b>	<b>3</b>	<b>149</b>	<b>17</b>	<b>20</b>	<b>132</b>	<b>52</b>	<b>373</b>
03:00 PM	2	54	25	35	73	3	192
03:15 PM	3	47	10	6	74	1	141
<b>Total</b>	<b>5</b>	<b>101</b>	<b>35</b>	<b>41</b>	<b>147</b>	<b>4</b>	<b>333</b>
04:00 PM	2	45	12	11	84	9	163
04:15 PM	6	44	9	1	78	10	148
04:30 PM	3	58	5	5	90	9	170
04:45 PM	4	59	4	2	94	6	169
<b>Total</b>	<b>15</b>	<b>208</b>	<b>30</b>	<b>19</b>	<b>346</b>	<b>34</b>	<b>650</b>
05:00 PM	6	68	4	1	107	7	191
05:15 PM	13	69	7	4	93	19	205
05:30 PM	12	68	4	2	75	8	167
05:45 PM	4	61	5	7	50	10	137
<b>Total</b>	<b>35</b>	<b>262</b>	<b>20</b>	<b>14</b>	<b>325</b>	<b>44</b>	<b>700</b>
07:00 AM	2	59	4	5	38	12	120
07:15 AM	0	82	11	17	51	24	185
07:30 AM	4	101	29	36	57	52	279
07:45 AM	9	118	9	17	73	16	242
<b>Total</b>	<b>15</b>	<b>360</b>	<b>53</b>	<b>75</b>	<b>219</b>	<b>104</b>	<b>826</b>
08:00 AM	10	112	3	3	55	18	201
08:15 AM	9	96	4	10	69	17	205
08:30 AM	4	81	1	7	49	8	150
08:45 AM	6	71	1	2	57	4	141
<b>Total</b>	<b>29</b>	<b>360</b>	<b>9</b>	<b>22</b>	<b>230</b>	<b>47</b>	<b>697</b>
<b>Grand Total</b>	<b>102</b>	<b>1438</b>	<b>164</b>	<b>191</b>	<b>1399</b>	<b>285</b>	<b>3579</b>
Apprch %	6.6	93.4	46.2	53.8	83.1	16.9	
Total %	2.8	40.2	4.8	5.3	39.1	8.0	

Start Time	CAHABA RD Southbound			HEATHERMOOR RD Westbound			CAHABA RD Northbound			App. Total	Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total		
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1											
Intersection	04:30 PM										
Volume	26	252	278	20	12	32	384	41	425	0	735
Percent	9.4	90.6		62.5	37.5		90.4	9.6			
05:15 Volume	13	69	82	7	4	11	93	19	112	0	205
Peak Factor										0.896	
High Int.	05:15 PM			05:15 PM			05:00 PM				
Volume	13	69	82	7	4	11	107	7	114		
Peak Factor			0.848			0.727			0.932		

**TRAFFIC DATA, LLC**  
 1409 Turnham Lane  
 Birmingham, AL 35216  
 205-824-0125

File Name : mtnbrook01  
 Site Code : 00000000  
 Start Date : 11/07/2012  
 Page No : 2

Start Time	CAHABA RD Southbound			HEATHERMOOR RD Westbound			CAHABA RD Northbound			App. Total	Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total		
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1											
By Approach	05:00 PM			04:00 PM			04:30 PM			04:00 PM	
Volume	35	262	297	30	19	49	384	41	425	0	
Percent	11.8	88.2		61.2	38.8		90.4	9.6			
High Int.	05:15 PM			04:00 PM			05:00 PM			-	
Volume	13	69	82	12	11	23	107	7	114	-	
Peak Factor	0.905			0.533			0.932			-	
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1											
Intersection	07:30 AM									0	
Volume	32	427	459	45	66	111	254	103	357	0	927
Percent	7.0	93.0		40.5	59.5		71.1	28.9			
07:30 Volume	4	101	105	29	36	65	57	52	109	0	279
Peak Factor										0.831	
High Int.	07:45 AM			07:30 AM			07:30 AM				
Volume	9	118	127	29	36	65	57	52	109		
Peak Factor	0.904			0.427			0.819				
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1											
By Approach	07:30 AM			07:00 AM			07:30 AM			07:00 AM	
Volume	32	427	459	53	75	128	254	103	357	0	
Percent	7.0	93.0		41.4	58.6		71.1	28.9			
High Int.	07:45 AM			07:30 AM			07:30 AM			-	
Volume	9	118	127	29	36	65	57	52	109	-	
Peak Factor	0.904			0.492			0.819			-	

**Appendix B**  
**Existing Machine Traffic Count**

**TRAFFIC DATA, LLC**  
**1409 Turnham Lane, Birmingham, AL 35216**  
**205-824-0125**

Location : CAHABA RD south of HEATHERMOOR RD  
 City, State : MOUNTAIN BROOK, AL  
 Speed Limit : 20 mph

Date: 3/4/2013  
 Monday

24 Hour Volume													
Begin	NB	SB	Combined	Begin	NB	SB	Combined						
1:00 PM	69	256	85	361	154	617	1:00 AM	0	0	1	3	1	3
1:15 PM	66		87		153		1:15 AM	0		2		2	
1:30 PM	64		99		163		1:30 AM	0		0		0	
1:45 PM	57		90		147		1:45 AM	0		0		0	
2:00 PM	59	308	72	286	131	594	2:00 AM	0	1	2	4	2	5
2:15 PM	59		69		128		2:15 AM	0		1		1	
2:30 PM	86		76		162		2:30 AM	0		0		0	
2:45 PM	104		69		173		2:45 AM	1		1		2	
3:00 PM	60	277	99	299	159	576	3:00 AM	0	4	1	2	1	6
3:15 PM	73		78		151		3:15 AM	1		0		1	
3:30 PM	68		60		128		3:30 AM	1		1		2	
3:45 PM	76		62		138		3:45 AM	2		0		2	
4:00 PM	83	384	85	314	168	698	4:00 AM	1	9	1	5	2	14
4:15 PM	110		72		182		4:15 AM	0		0		0	
4:30 PM	106		79		185		4:30 AM	2		2		4	
4:45 PM	85		78		163		4:45 AM	6		2		8	
5:00 PM	92	316	78	301	170	617	5:00 AM	5	46	3	30	8	76
5:15 PM	89		75		164		5:15 AM	7		2		9	
5:30 PM	80		88		168		5:30 AM	23		6		29	
5:45 PM	55		60		115		5:45 AM	11		19		30	
6:00 PM	72	211	38	140	110	351	6:00 AM	13	80	12	106	25	186
6:15 PM	56		29		85		6:15 AM	12		25		37	
6:30 PM	44		39		83		6:30 AM	15		36		51	
6:45 PM	39		34		73		6:45 AM	40		33		73	
7:00 PM	35	127	15	83	50	210	7:00 AM	34	263	56	360	90	623
7:15 PM	39		21		60		7:15 AM	69		70		139	
7:30 PM	27		21		48		7:30 AM	92		113		205	
7:45 PM	26		26		52		7:45 AM	68		121		189	
8:00 PM	19	61	11	56	30	117	8:00 AM	68	275	95	359	163	634
8:15 PM	16		18		34		8:15 AM	62		98		160	
8:30 PM	17		12		29		8:30 AM	84		92		176	
8:45 PM	9		15		24		8:45 AM	61		74		135	
9:00 PM	14	38	15	41	29	79	9:00 AM	55	222	60	198	115	420
9:15 PM	10		12		22		9:15 AM	58		55		113	
9:30 PM	5		7		12		9:30 AM	56		43		99	
9:45 PM	9		7		16		9:45 AM	53		40		93	
10:00 PM	8	16	5	19	13	35	10:00 AM	66	245	54	247	120	492
10:15 PM	4		7		11		10:15 AM	65		57		122	
10:30 PM	4		6		10		10:30 AM	60		69		129	
10:45 PM	0		1		1		10:45 AM	54		67		121	
11:00 PM	2	7	3	8	5	15	11:00 AM	51	289	72	281	123	570
11:15 PM	5		4		9		11:15 AM	87		64		151	
11:30 PM	0		0		0		11:30 AM	82		69		151	
11:45 PM	0		1		1		11:45 AM	69		76		145	
3/5/2013 12:00 AM	1	6	0	4	1	10	12:00 PM	74	298	58	329	132	627
12:15 AM	1		2		3		12:15 PM	76		93		169	
12:30 AM	3		2		5		12:30 PM	70		93		163	
12:45 AM	1		0		1		12:45 PM	78		85		163	

**24 Hour Volume**      **NB** 3739 (49.4%)      **SB** 3836 (50.6%)      **Combined** 7575

**12:00 AM - 12:00 PM**

Count	NB 1440	SB 1599	Combined 3039
Peak Hour	47.4 %	52.6 %	
Volume	7:15 AM 297	7:30 AM 427	7:30 AM 717
Factor	0.81	0.88	0.87

**12:00 PM - 12:00 AM**

Count	NB 2299	SB 2237	Combined 4536
Peak Hour	50.7 %	49.3 %	
Volume	4:15 PM 393	1:00 PM 361	4:15 PM 700
Factor	0.89	0.91	0.95

TRAFFIC DATA, LLC  
 1409 Turnham Lane, Birmingham, AL 35216  
 205-824-0125

Location : CAHABA RD south of HEATHERMOOR RD  
 City, State : MOUNTAIN BROOK, AL  
 Speed Limit : 20 mph

Date: 3/4/2013  
 Monday

24 Hour Speed  
 Channel: NB

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200
1:00 PM	256	2	1	7	39	91	86	25	3	1	1	0	0	0
2:00 PM	308	3	1	9	66	117	86	21	5	0	0	0	0	0
3:00 PM	277	3	0	6	46	108	85	26	3	0	0	0	0	0
4:00 PM	384	6	3	10	80	156	107	20	2	0	0	0	0	0
5:00 PM	316	2	2	21	55	111	95	29	1	0	0	0	0	0
6:00 PM	211	1	0	0	26	97	69	15	3	0	0	0	0	0
7:00 PM	127	0	0	1	16	44	54	11	1	0	0	0	0	0
8:00 PM	61	0	0	0	10	18	22	9	1	1	0	0	0	0
9:00 PM	38	0	0	1	5	8	18	6	0	0	0	0	0	0
10:00 PM	16	0	0	0	2	5	6	3	0	0	0	0	0	0
11:00 PM	7	0	0	0	0	3	1	2	1	0	0	0	0	0
3/5/2013														
12:00 AM	6	0	0	1	1	2	1	1	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	1	0	0	0	0	0	1	0	0	0	0	0	0	0
3:00 AM	4	0	0	0	1	0	2	1	0	0	0	0	0	0
4:00 AM	9	1	0	0	4	3	1	0	0	0	0	0	0	0
5:00 AM	46	0	0	3	16	11	13	3	0	0	0	0	0	0
6:00 AM	80	0	1	1	8	28	30	11	1	0	0	0	0	0
7:00 AM	263	5	2	14	20	100	83	36	1	1	0	1	0	0
8:00 AM	275	5	0	6	32	93	109	27	3	0	0	0	0	0
9:00 AM	222	0	1	3	26	72	85	32	3	0	0	0	0	0
10:00 AM	245	0	2	12	37	83	79	27	5	0	0	0	0	0
11:00 AM	289	2	0	3	36	106	110	29	2	1	0	0	0	0
12:00 PM	298	2	4	6	44	120	90	29	3	0	0	0	0	0
Total	3739	32	17	104	570	1376	1233	363	38	4	1	1	0	0
%		0.9	0.5	2.8	15.2	36.8	33.0	9.7	1.0	0.1	0.0	0.0	0.0	0.0

**Percentile Speeds**  
 (mph)

<u>10 %</u>	<u>15 %</u>	<u>50 %</u>	<u>85 %</u>	<u>90 %</u>
27.9	29.1	34.3	39.1	40.2

**10 mph Pace Speed**  
 Number in Pace

29.5 - 39.5	<b>Average</b>	34.0 mph
2634 (70.4 %)	<b>Minimum</b>	5.0 mph
	<b>Maximum</b>	62.8 mph

**Speeds Exceeded**

<u>10 mph</u>	<u>20 mph</u>	<u>30 mph</u>
99.4 %	98.7 %	80.7 %
Count	3717	3690
		3016





TRAFFIC DATA, LLC  
 1409 Turnham Lane, Birmingham, AL 35216  
 205-824-0125

Location: : CAHABA RD south of HEATHERMOOR RD  
 City, State: : MOUNTAIN BROOK, AL  
 Speed Limit: : 20 mph

Date: 3/4/2013  
 Monday

24 Hour Vehicle Classification  
 Channel: NB

Time	Total	Bike	Cars & Traller	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi
1:00 PM	256	0	194	48	4	8	0	0	2	0	0	0	0	0
2:00 PM	308	0	255	42	2	5	0	0	4	0	0	0	0	0
3:00 PM	277	1	224	46	2	4	0	0	0	0	0	0	0	0
4:00 PM	384	1	290	80	3	8	0	0	2	0	0	0	0	0
5:00 PM	316	1	258	49	3	4	0	0	1	0	0	0	0	0
6:00 PM	211	2	172	33	0	4	0	0	0	0	0	0	0	0
7:00 PM	127	1	109	16	0	1	0	0	0	0	0	0	0	0
8:00 PM	61	0	52	8	0	1	0	0	0	0	0	0	0	0
9:00 PM	38	0	34	4	0	0	0	0	0	0	0	0	0	0
10:00 PM	16	0	13	2	0	1	0	0	0	0	0	0	0	0
11:00 PM	7	0	7	0	0	0	0	0	0	0	0	0	0	0
3/5/2013														
12:00 AM	6	0	3	3	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	4	0	4	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	9	0	6	2	0	1	0	0	0	0	0	0	0	0
5:00 AM	46	0	35	8	0	1	1	0	1	0	0	0	0	0
6:00 AM	80	0	63	11	1	4	0	0	1	0	0	0	0	0
7:00 AM	263	0	203	46	4	7	0	0	3	0	0	0	0	0
8:00 AM	275	0	210	48	2	11	1	0	3	0	0	0	0	0
9:00 AM	222	0	163	47	1	10	0	0	1	0	0	0	0	0
10:00 AM	245	0	186	44	3	11	0	0	1	0	0	0	0	0
11:00 AM	289	0	224	53	1	11	0	0	0	0	0	0	0	0
12:00 PM	298	0	231	57	4	5	0	0	1	0	0	0	0	0
Total	3739	6	2937	647	30	97	2	0	20	0	0	0	0	0
%		0.2	78.6	17.3	0.8	2.6	0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.0

TRAFFIC DATA, LLC  
 1409 Turnham Lane, Birmingham, AL 35216  
 205-824-0125

Location : CAHABA RD south of HEATHERMOOR RD  
 City, State : MOUNTAIN BROOK, AL  
 Speed Limit : 20 mph

Date: 3/4/2013  
 Monday

24 Hour Vehicle Classification  
 Channel: SB

Time	Total	Bike	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi
1:00 PM	361	1	292	60	3	3	1	0	1	0	0	0	0	0
2:00 PM	286	0	239	39	3	4	0	0	1	0	0	0	0	0
3:00 PM	299	0	242	43	4	10	0	0	0	0	0	0	0	0
4:00 PM	314	1	258	44	2	6	0	0	3	0	0	0	0	0
5:00 PM	301	0	244	49	2	5	0	0	1	0	0	0	0	0
6:00 PM	140	1	118	19	0	2	0	0	0	0	0	0	0	0
7:00 PM	83	1	71	10	0	1	0	0	0	0	0	0	0	0
8:00 PM	56	0	50	6	0	0	0	0	0	0	0	0	0	0
9:00 PM	41	0	37	4	0	0	0	0	0	0	0	0	0	0
10:00 PM	19	0	17	2	0	0	0	0	0	0	0	0	0	0
11:00 PM	8	0	8	0	0	0	0	0	0	0	0	0	0	0
3/5/2013														
12:00 AM	4	0	4	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	3	0	3	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	4	0	3	1	0	0	0	0	0	0	0	0	0	0
3:00 AM	2	0	2	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	5	0	4	0	0	1	0	0	0	0	0	0	0	0
5:00 AM	30	0	23	7	0	0	0	0	0	0	0	0	0	0
6:00 AM	106	0	93	11	0	2	0	0	0	0	0	0	0	0
7:00 AM	360	0	306	47	5	0	0	0	2	0	0	0	0	0
8:00 AM	359	0	305	43	2	7	0	0	2	0	0	0	0	0
9:00 AM	198	0	151	38	2	7	0	0	0	0	0	0	0	0
10:00 AM	247	0	193	41	0	10	0	0	3	0	0	0	0	0
11:00 AM	281	0	237	36	0	8	0	0	0	0	0	0	0	0
12:00 PM	329	0	276	47	1	3	0	0	2	0	0	0	0	0
Total	3836	4	3176	547	24	69	1	0	15	0	0	0	0	0
%		0.1	82.8	14.3	0.6	1.8	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0

TRAFFIC DATA, LLC  
 1409 Turnham Lane, Birmingham, AL 35216  
 205-824-0125

Location:: CAHABA RD south of HEATHERMOOR RD  
 City, State: : MOUNTAIN BROOK, AL  
 Speed Limit:: 20 mph

Date: 3/4/2013  
 Monday

24 Hour Vehicle Classification  
 Combined Channels

Time	Total	Blke	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi
1:00 PM	617	1	486	108	7	11	1	0	3	0	0	0	0	0
2:00 PM	594	0	494	81	5	9	0	0	5	0	0	0	0	0
3:00 PM	576	1	466	89	6	14	0	0	0	0	0	0	0	0
4:00 PM	698	2	548	124	5	14	0	0	5	0	0	0	0	0
5:00 PM	617	1	502	98	5	9	0	0	2	0	0	0	0	0
6:00 PM	351	3	290	52	0	6	0	0	0	0	0	0	0	0
7:00 PM	210	2	180	26	0	2	0	0	0	0	0	0	0	0
8:00 PM	117	0	102	14	0	1	0	0	0	0	0	0	0	0
9:00 PM	79	0	71	8	0	0	0	0	0	0	0	0	0	0
10:00 PM	35	0	30	4	0	1	0	0	0	0	0	0	0	0
11:00 PM	15	0	15	0	0	0	0	0	0	0	0	0	0	0
3/5/2013														
12:00 AM	10	0	7	3	0	0	0	0	0	0	0	0	0	0
1:00 AM	3	0	3	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	5	0	4	1	0	0	0	0	0	0	0	0	0	0
3:00 AM	6	0	6	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	14	0	10	2	0	2	0	0	0	0	0	0	0	0
5:00 AM	76	0	58	15	0	1	1	0	1	0	0	0	0	0
6:00 AM	186	0	156	22	1	6	0	0	1	0	0	0	0	0
7:00 AM	623	0	509	93	9	7	0	0	5	0	0	0	0	0
8:00 AM	634	0	515	91	4	18	1	0	5	0	0	0	0	0
9:00 AM	420	0	314	85	3	17	0	0	1	0	0	0	0	0
10:00 AM	492	0	379	85	3	21	0	0	4	0	0	0	0	0
11:00 AM	570	0	461	89	1	19	0	0	0	0	0	0	0	0
12:00 PM	627	0	507	104	5	8	0	0	3	0	0	0	0	0
Total	7575	10	6113	1194	54	166	3	0	35	0	0	0	0	0
%		0.1	80.7	15.8	0.7	2.2	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0

**Appendix C**  
**Existing Intersection Capacity Analysis**  
**Worksheets**

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd			
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook			
Date Performed	2/18/2013			Analysis Year	Existing 2012			
Analysis Time Period	AM Peak Hour							
Project Description								
East/West Street: Heathermoor Road				North/South Street: Cahaba Road				
Intersection Orientation: North-South				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		254	103	32	427			
Peak-Hour Factor, PHF	1.00	0.82	0.82	0.90	0.90	1.00		
Hourly Flow Rate, HFR (veh/h)	0	309	125	35	474	0		
Percent Heavy Vehicles	0	--	--	6	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	1	0	1	0		
Configuration		T	R	LT				
Upstream Signal		0			0			
Minor Street	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				45		66		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.43	1.00	0.43		
Hourly Flow Rate, HFR (veh/h)	0	0	0	104	0	153		
Percent Heavy Vehicles	0	0	0	6	0	6		
Percent Grade (%)		0			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		35		257				
C (m) (veh/h)		1105		473				
v/c		0.03		0.54				
95% queue length		0.10		3.19				
Control Delay (s/veh)		8.4		21.3				
LOS		A		C				
Approach Delay (s/veh)	--	--	21.3					
Approach LOS	--	--	C					

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd		
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook		
Date Performed	2/18/2013			Analysis Year	Existing 2012		
Analysis Time Period	School Peak Hour						
Project Description							
East/West Street: Heathermoor Road				North/South Street: Cahaba Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		279	56	8	250		
Peak-Hour Factor, PHF	1.00	0.79	0.79	0.81	0.81	1.00	
Hourly Flow Rate, HFR (veh/h)	0	353	70	9	308	0	
Percent Heavy Vehicles	0	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	1	0	1	0	
Configuration		T	R	LT			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				52		61	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.47	1.00	0.47	
Hourly Flow Rate, HFR (veh/h)	0	0	0	110	0	129	
Percent Heavy Vehicles	0	0	0	6	0	6	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		9		239			
C (m) (veh/h)		1115		521			
v/c		0.01		0.46			
95% queue length		0.02		2.38			
Control Delay (s/veh)		8.3		17.6			
LOS		A		C			
Approach Delay (s/veh)	--	--		17.6			
Approach LOS	--	--		C			

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd		
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook		
Date Performed	2/18/2013			Analysis Year	Existing 2012		
Analysis Time Period	PM Peak Hour						
Project Description							
East/West Street: Heathermoor Road				North/South Street: Cahaba Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		384	41	26	252		
Peak-Hour Factor, PHF	1.00	0.93	0.93	0.85	0.85	1.00	
Hourly Flow Rate, HFR (veh/h)	0	412	44	30	296	0	
Percent Heavy Vehicles	0	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	1	0	1	0	
Configuration		T	R	LT			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				20		12	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.73	1.00	0.73	
Hourly Flow Rate, HFR (veh/h)	0	0	0	27	0	16	
Percent Heavy Vehicles	0	0	0	6	0	6	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		30		43			
C (m) (veh/h)		1084		423			
v/c		0.03		0.10			
95% queue length		0.09		0.34			
Control Delay (s/veh)		8.4		14.5			
LOS		A		B			
Approach Delay (s/veh)	--	--	14.5				
Approach LOS	--	--	B				

**Appendix D**  
**Future Intersection Capacity Analysis**  
**Worksheets**

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd		
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook		
Date Performed	2/18/2013			Analysis Year	Future 2018 No Build		
Analysis Time Period	AM Peak Hour						
Project Description							
East/West Street: Heathermoor Road				North/South Street: Cahaba Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		298	109	34	480		
Peak-Hour Factor, PHF	1.00	0.82	0.82	0.90	0.90	1.00	
Hourly Flow Rate, HFR (veh/h)	0	363	132	37	533	0	
Percent Heavy Vehicles	0	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	1	0	1	0	
Configuration		T	R	LT			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				48		70	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.43	1.00	0.43	
Hourly Flow Rate, HFR (veh/h)	0	0	0	111	0	162	
Percent Heavy Vehicles	0	0	0	6	0	6	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		37		273			
C (m) (veh/h)		1048		415			
v/c		0.04		0.66			
95% queue length		0.11		4.58			
Control Delay (s/veh)		8.6		28.9			
LOS		A		D			
Approach Delay (s/veh)	--	--	28.9				
Approach LOS	--	--	D				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd		
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook		
Date Performed	2/18/2013			Analysis Year	Future 2018 No Build		
Analysis Time Period	School Peak Hour						
Project Description							
East/West Street: Heathermoor Road				North/South Street: Cahaba Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		349	59	8	315		
Peak-Hour Factor, PHF	1.00	0.79	0.79	0.81	0.81	1.00	
Hourly Flow Rate, HFR (veh/h)	0	441	74	9	388	0	
Percent Heavy Vehicles	0	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	1	0	1	0	
Configuration		T	R	LT			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				55		65	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.47	1.00	0.47	
Hourly Flow Rate, HFR (veh/h)	0	0	0	117	0	138	
Percent Heavy Vehicles	0	0	0	6	0	6	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		9		255			
C (m) (veh/h)		1030		434			
v/c		0.01		0.59			
95% queue length		0.03		3.67			
Control Delay (s/veh)		8.5		24.4			
LOS		A		C			
Approach Delay (s/veh)	--	--	24.4				
Approach LOS	--	--	C				

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd			
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook			
Date Performed	2/18/2013			Analysis Year	Future 2018 No Build			
Analysis Time Period	PM Peak Hour							
Project Description								
East/West Street: Heathermoor Road				North/South Street: Cahaba Road				
Intersection Orientation: North-South				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		470	43	28	330			
Peak-Hour Factor, PHF	1.00	0.93	0.93	0.85	0.85	1.00		
Hourly Flow Rate, HFR (veh/h)	0	505	46	32	388	0		
Percent Heavy Vehicles	0	--	--	6	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	1	0	1	0		
Configuration		T	R	LT				
Upstream Signal		0			0			
Minor Street	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				21		13		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.73	1.00	0.73		
Hourly Flow Rate, HFR (veh/h)	0	0	0	28	0	17		
Percent Heavy Vehicles	0	0	0	6	0	6		
Percent Grade (%)		0			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		32		45				
C (m) (veh/h)		999		337				
v/c		0.03		0.13				
95% queue length		0.10		0.46				
Control Delay (s/veh)		8.7		17.3				
LOS		A		C				
Approach Delay (s/veh)	--	--	17.3					
Approach LOS	--	--	C					

**Appendix E**  
**Left Turn Lane Warrant Analysis Worksheets**

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**Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**

2-lane roadway (English)

INPUT

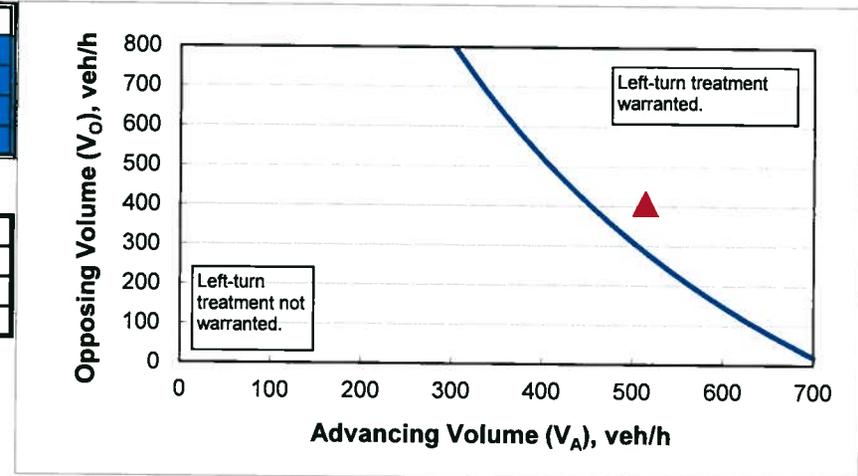
Variable	Value
85 <sup>th</sup> percentile speed, mph:	36
Percent of left-turns in advancing volume ( $V_A$ ), %:	7%
Advancing volume ( $V_A$ ), veh/h:	514
Opposing volume ( $V_O$ ), veh/h:	407

OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	450
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment warranted.</b>	

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9



Alternatives 1 and 2 - AM Peak Hour

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

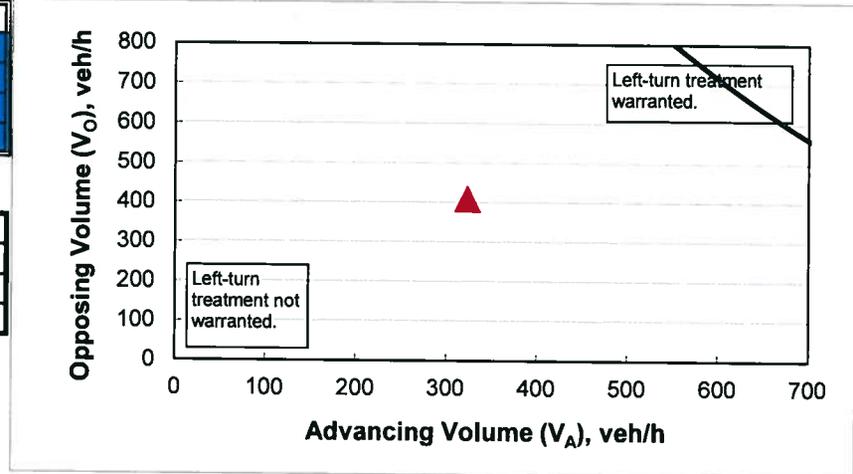
2-lane roadway (English)

INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	36
Percent of left-turns in advancing volume ( $V_A$ ), %:	2%
Advancing volume ( $V_A$ ), veh/h:	323
Opposing volume ( $V_O$ ), veh/h:	408

OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	820
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Alternatives 1 and 2 - PM School Peak Hour

**Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**

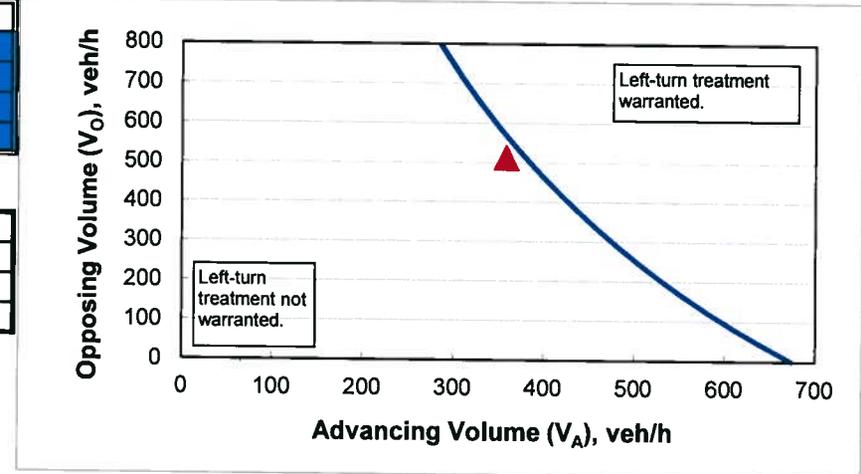
**2-lane roadway (English)**

**INPUT**

Variable	Value
85 <sup>th</sup> percentile speed, mph:	36
Percent of left-turns in advancing volume ( $V_A$ ), %:	8%
Advancing volume ( $V_A$ ), veh/h:	358
Opposing volume ( $V_O$ ), veh/h:	513

**OUTPUT**

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	379
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



**CALIBRATION CONSTANTS**

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Alternatives 1 and 2 - PM Peak Hour

**Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**

**2-lane roadway (English)**

**INPUT**

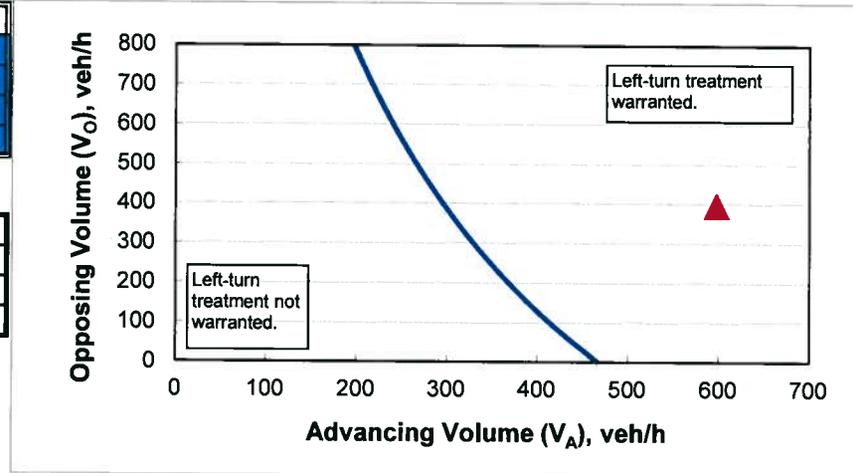
Variable	Value
85 <sup>th</sup> percentile speed, mph:	36
Percent of left-turns in advancing volume ( $V_A$ ), %:	19%
Advancing volume ( $V_A$ ), veh/h:	598
Opposing volume ( $V_O$ ), veh/h:	395

**OUTPUT**

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	297
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment warranted.</b>	

**CALIBRATION CONSTANTS**

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9



Alternatives 3 and 4 - AM Peak Hour

**Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**

2-lane roadway (English)

INPUT

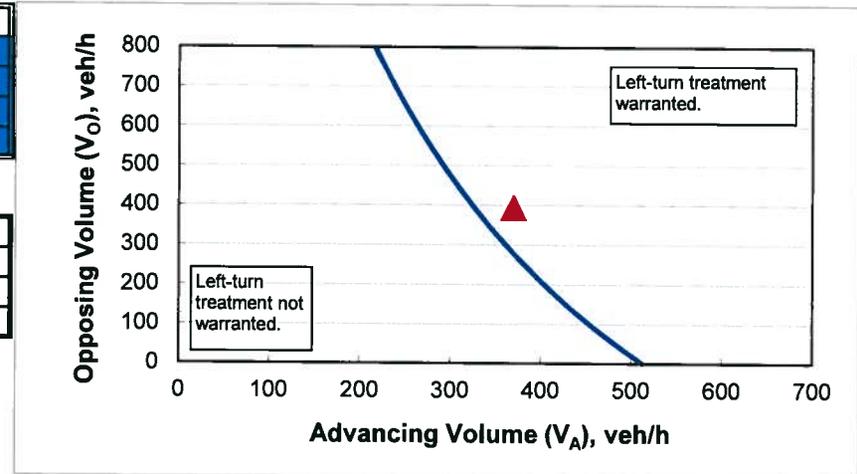
Variable	Value
85 <sup>th</sup> percentile speed, mph:	36
Percent of left-turns in advancing volume ( $V_A$ ), %:	15%
Advancing volume ( $V_A$ ), veh/h:	370
Opposing volume ( $V_O$ ), veh/h:	394

OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	326
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment warranted.</b>	

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9



Alternatives 3 and 4 - PM School Peak Hour

**Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**

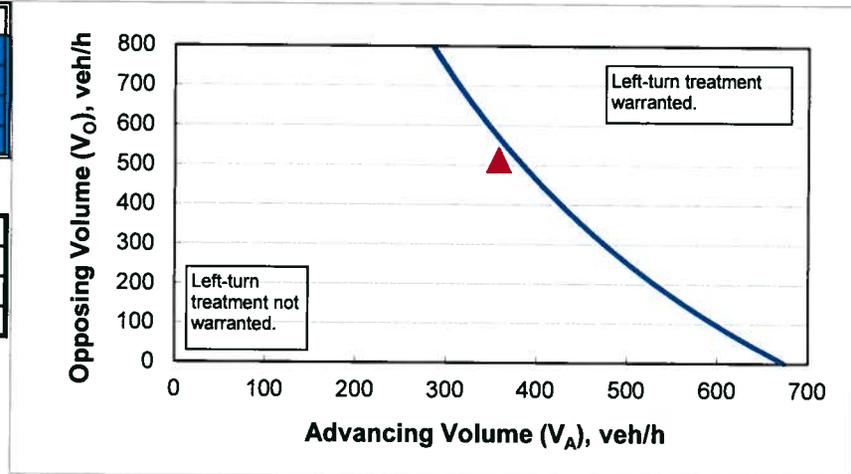
**2-lane roadway (English)**

**INPUT**

Variable	Value
85 <sup>th</sup> percentile speed, mph:	36
Percent of left-turns in advancing volume ( $V_A$ ), %:	8%
Advancing volume ( $V_A$ ), veh/h:	358
Opposing volume ( $V_O$ ), veh/h:	513

**OUTPUT**

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	379
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



**CALIBRATION CONSTANTS**

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Alternatives 3 and 4 - PM Peak Hour

**Appendix F**  
**Future Intersection Capacity Analysis**  
**Worksheets – Alternative 2**

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd			
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook			
Date Performed	2/18/2013			Analysis Year	Future 2018 Alt. 2			
Analysis Time Period	AM Peak Hour							
Project Description								
East/West Street: Heathermoor Road				North/South Street: Cahaba Road				
Intersection Orientation: North-South				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		298	109	34	480			
Peak-Hour Factor, PHF	1.00	0.82	0.82	0.90	0.90	1.00		
Hourly Flow Rate, HFR (veh/h)	0	363	132	37	533	0		
Percent Heavy Vehicles	0	--	--	6	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	1	1	1	0		
Configuration		T	R	L	T			
Upstream Signal		0			0			
Minor Street	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				48		70		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.43	1.00	0.43		
Hourly Flow Rate, HFR (veh/h)	0	0	0	111	0	162		
Percent Heavy Vehicles	0	0	0	6	0	6		
Percent Grade (%)		0			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L		LR				
v (veh/h)		37		273				
C (m) (veh/h)		1048		415				
v/c		0.04		0.66				
95% queue length		0.11		4.58				
Control Delay (s/veh)		8.6		28.9				
LOS		A		D				
Approach Delay (s/veh)	--	--	28.9					
Approach LOS	--	--	D					

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd		
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook		
Date Performed	2/18/2013			Analysis Year	Future 2018 Alt. 2		
Analysis Time Period	School Peak Hour						
Project Description							
East/West Street: Heathermoor Road				North/South Street: Cahaba Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		349	59	8	315		
Peak-Hour Factor, PHF	1.00	0.79	0.79	0.81	0.81	1.00	
Hourly Flow Rate, HFR (veh/h)	0	441	74	9	388	0	
Percent Heavy Vehicles	0	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	1	1	1	0	
Configuration		T	R	L	T		
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				55		65	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.47	1.00	0.47	
Hourly Flow Rate, HFR (veh/h)	0	0	0	117	0	138	
Percent Heavy Vehicles	0	0	0	6	0	6	
Percent Grade (%)	0			0			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		L		LR			
v (veh/h)		9		255			
C (m) (veh/h)		1030		434			
v/c		0.01		0.59			
95% queue length		0.03		3.67			
Control Delay (s/veh)		8.5		24.4			
LOS		A		C			
Approach Delay (s/veh)	--	--	24.4				
Approach LOS	--	--	C				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd		
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook		
Date Performed	2/18/2013			Analysis Year	Future 2018 Alt. 2		
Analysis Time Period	PM Peak Hour						
Project Description							
East/West Street: Heathermoor Road				North/South Street: Cahaba Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		470	43	28	330		
Peak-Hour Factor, PHF	1.00	0.93	0.93	0.85	0.85	1.00	
Hourly Flow Rate, HFR (veh/h)	0	505	46	32	388	0	
Percent Heavy Vehicles	0	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	1	1	1	0	
Configuration		T	R	L	T		
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				21		13	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.73	1.00	0.73	
Hourly Flow Rate, HFR (veh/h)	0	0	0	28	0	17	
Percent Heavy Vehicles	0	0	0	6	0	6	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		L		LR			
v (veh/h)		32		45			
C (m) (veh/h)		999		337			
v/c		0.03		0.13			
95% queue length		0.10		0.46			
Control Delay (s/veh)		8.7		17.3			
LOS		A		C			
Approach Delay (s/veh)	--	--	17.3				
Approach LOS	--	--	C				

**Appendix G**

**Future Intersection Capacity Analysis**

**Worksheets – Alternative 3**

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd		
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook		
Date Performed	2/18/2013			Analysis Year	Future 2018 Alt. 3		
Analysis Time Period	AM Peak Hour						
Project Description							
East/West Street: Heathermoor Road				North/South Street: Cahaba Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		298	97	118	480		
Peak-Hour Factor, PHF	1.00	0.82	0.82	0.90	0.90	1.00	
Hourly Flow Rate, HFR (veh/h)	0	363	118	131	533	0	
Percent Heavy Vehicles	0	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	1	1	1	0	
Configuration		T	R	L	T		
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				48		70	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.43	1.00	0.43	
Hourly Flow Rate, HFR (veh/h)	0	0	0	111	0	162	
Percent Heavy Vehicles	0	0	0	6	0	6	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11 12
Lane Configuration		L		LR			
v (veh/h)		131		273			
C (m) (veh/h)		1061		327			
v/c		0.12		0.83			
95% queue length		0.42		7.29			
Control Delay (s/veh)		8.9		53.1			
LOS		A		F			
Approach Delay (s/veh)	--	--	53.1				
Approach LOS	--	--	F				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd		
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook		
Date Performed	2/18/2013			Analysis Year	Future 2018 Alt. 3		
Analysis Time Period	School Peak Hour						
Project Description							
East/West Street: Heathermoor Road				North/South Street: Cahaba Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		349	45	55	315		
Peak-Hour Factor, PHF	1.00	0.79	0.79	0.81	0.81	1.00	
Hourly Flow Rate, HFR (veh/h)	0	441	56	67	388	0	
Percent Heavy Vehicles	0	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	1	1	1	0	
Configuration		T	R	L	T		
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				55		65	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.47	1.00	0.47	
Hourly Flow Rate, HFR (veh/h)	0	0	0	117	0	138	
Percent Heavy Vehicles	0	0	0	6	0	6	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		L		LR			
v (veh/h)		67		255			
C (m) (veh/h)		1047		378			
v/c		0.06		0.67			
95% queue length		0.20		4.75			
Control Delay (s/veh)		8.7		32.1			
LOS		A		D			
Approach Delay (s/veh)	--	--		32.1			
Approach LOS	--	--		D			

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	RLC			Intersection	Cahaba Rd at Heathermoor Rd		
Agency/Co.	Skipper Consulting			Jurisdiction	City of Mountain Brook		
Date Performed	2/18/2013			Analysis Year	Future 2018 Alt. 3		
Analysis Time Period	PM Peak Hour						
Project Description							
East/West Street: Heathermoor Road				North/South Street: Cahaba Road			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		470	43	28	330		
Peak-Hour Factor, PHF	1.00	0.93	0.93	0.85	0.85	1.00	
Hourly Flow Rate, HFR (veh/h)	0	505	46	32	388	0	
Percent Heavy Vehicles	0	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	1	1	1	0	
Configuration		T	R	L	T		
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				21		13	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.73	1.00	0.73	
Hourly Flow Rate, HFR (veh/h)	0	0	0	28	0	17	
Percent Heavy Vehicles	0	0	0	6	0	6	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		L		LR			
v (veh/h)		32		45			
C (m) (veh/h)		999		337			
v/c		0.03		0.13			
95% queue length		0.10		0.46			
Control Delay (s/veh)		8.7		17.3			
LOS		A		C			
Approach Delay (s/veh)	--	--	17.3				
Approach LOS	--	--	C				

**Appendix H**  
**Future Intersection Capacity Analysis**  
**Worksheets – Alternative 4**

# SOUTHERN ENVIRONMENTAL LAW CENTER

Telephone 205-745-3060

2829 2ND AVENUE SOUTH, SUITE 282  
BIRMINGHAM, AL 35233-2838

Facsimile 205-745-3064

February 22, 2013

Mayor Terry Oden  
City of Mountain Brook  
P. O. Box 130009  
Mountain Brook, Alabama 35213-0009

Dear Mayor Oden:

The Alabama Department of Transportation intends to break ground on the \$4.7 billion Northern Beltline sometime this year. I write to you today to request some time on the agenda at an upcoming meeting to discuss this project in more detail. I have concerns both about this project's impacts on natural resources and about its economic impacts on all communities in the area with transportation infrastructure needs.

In all of the propaganda that has been produced to justify the Northern Beltline, nothing has been said about communities' competing transportation needs. I am including a map showing a sample of unfunded projects that could all be completed for one billion dollars less than the cost of the Northern Beltline. These 63 projects include redesigning Malfunction Junction (the intersection with one of the highest accident rates in the state), widening I-65, improving 280, and widening I-59/20.

The Beltline would be the most expensive road project in Alabama history (and one of the most expensive in the country), at \$90 million per mile (and this cost does not account for other infrastructure improvements that will be needed such as sewer). It will not be completed for over 30 years, if it is ever completed at all. Its route guarantees a very limited transportation benefit, estimated to take only 1-3% of traffic off interstates in downtown Birmingham (to say nothing of addressing the current congestion problems in the southern parts of the Birmingham area). Its job-creation potential is highly speculative and would likely consist of moving existing jobs around within greater Birmingham rather than creating "new" ones. And it will draw federal funding away from dozens of other projects around the area, including safety improvements, bridge replacements, and road resurfacing and widening; each of these projects would also create jobs in the short- and long-term and are vital to the region's economic health. Finally, this project will impact the area's waterways (which include headwaters for most of metro Birmingham's drinking water supply), air quality, wetlands, and forest resources. In summary, the Northern Beltline is a 1960s-era approach to economic growth in a 21st-century world.

I would welcome the opportunity to discuss the Northern Beltline in the near future with you, answer any questions, and would even suggest that you convene a forum that included a spokesperson from the organization pushing this project. Because of the size of this investment and its implications for other needs around Birmingham, your position on this project should be informed by the most complete picture of the project's costs and benefits. As a native of Birmingham, I want to see this area thrive economically with a transportation system that allows us to continue building a world-class metro area that guarantees a high quality of life. This project is not the right investment to achieve those long-term goals.

Thank you very much for your attention.



Gil Rogers  
Senior Attorney

Mayor Oden,  
We look forward to hopefully seeing you soon.  
Sarah



**MAP ID**

**PROJECT DESCRIPTION**

**RANKING**

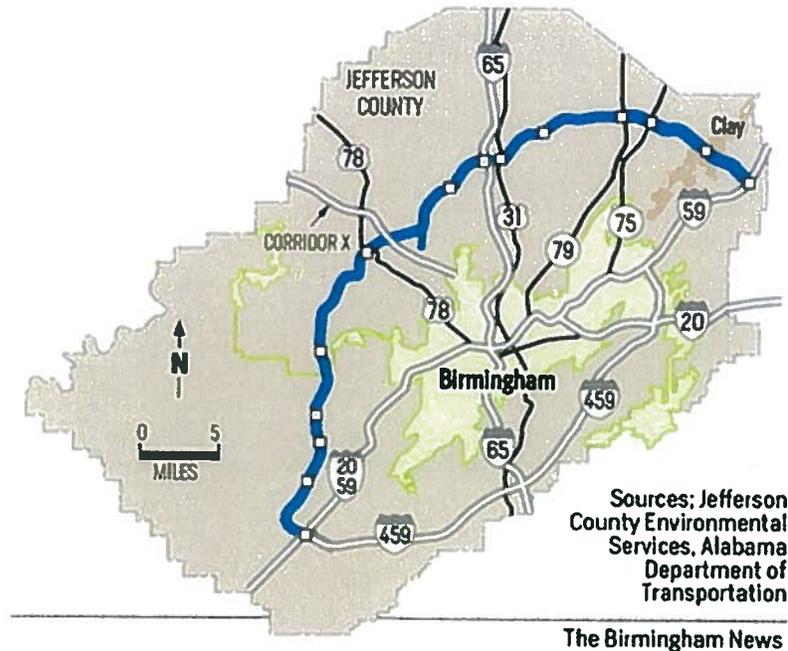
**PE- Preliminary Engineering, RW- Right of Way, UT- Utility Adjustment, CN- Construction**

MAP ID	PROJECT DESCRIPTION	RANKING
7	SR-79 from North end of 4-lane to 1 mile inside Blount County Line (PE, RW, CN)	33
22	I-65 from Exit 242 North to Valleydale Rd (exit 247) - Widen from 4 to 8 lanes (CN)	11*
22	I-65 from US 31(exit 238) North to CR-42 (exit 242) - Widen from 4 to 8 lanes, Phase 2 (CN)	11
33	SR-119 from Jefferson-Shelby County Line to Leeds - Widen from 2 to 4 lanes (PE, RW, CN)	*
34	SR 119 from 2000" south of Lake Purdy Bridge to Jefferson/Shelby County Line - Widen from 2 to 5 lanes (RW, CN)	16
59	US 78 from Pratt Hwy/2nd St. to I-59 - Widen from 4 to 5 or 7 lanes (RW, UT, CN)	23
67	I-59/I-20 West from North of Ave I(Exit 119B) to South of Arkadelphia Rd (Exit 123) - Widen from 8 to 10 lanes (CN)	28*
84	Finley Ave Extension From SR-3(US-31/26th Street) to Fred Shuttlesworth Drive, Phase 2 and Phase 3, Continuing to SR-79 (CN)	*
108	CR-29/Caldwell Mill Rd from CR-370 to Acton Rd - Widen from 2 to 3 lanes and bridge replacement (CN)	14
111	US 31 from CR 52 to I-65 at Alabaster and from CR 105 to Riverchase Pkwy - Widen from 4 to 6 lanes (CN)	*
114	Lakeshore Parkway Extension from SR-150 to I-459 (PE, UT, CN)	*
120	Shelby CR-11 from US-31 to East Weatherly Entrance - Widen from 2 to 3 lanes, resurfacing (PE, UT, RW, CN)	24
132	Parkwood Road Improvements (RW, CN)	*
139	US-411 from East of Dawson Street Connector to End of 4-Lane - Widen from 2 to 4 lanes (RW, CN)	*
162	I-65 South Additional Lanes and Bridge Widening, from Exit 228 at Calera North to Exit 238 at Alabaster (CN)	25*
168	US-31 from Riverchase Parkway to Data Drive and from I-459 to I-65 - Widen from 4 to 6 lanes (RW, CN)	*
271	I-59 from I-459(Exit 106) toValley Rd.(Exit 118) - Widen from 4 to 6 lanes (PE, UT, RW, CN)	*
273	I-65 at 16th St Interchange, add NB on-ramp and SB off-ramp (Exit 262A) (RW, CN)	13*
349	40th St North, From I-59 to 400ft. South of 10th Ave. North, Add left turn lane (UT, RW, CN)	*
351	CR-65 (Hillcrest Rd) From SR-5 (US-78) to Corridor X - Widen from 2 to 4 lanes (PE, UT, RW, CN)	*
361	US-31, from I-65 (Exit 231) North to Alabaster 2.6 Mi -Widen from 2 to 4 Lanes (CN)	*
362	US-31, from I-65(Exit 231) South to 6th Ave (Calera) 2.2 Miles -Widen from 2 to 4 lanes (CN)	*
363	US-31, from 20th St.(Calera) South to Chilton County Line, 2.1 Miles - Widen from 2 to 4 lanes (CN)	*
365	Morgan Rd from South Shades Crest Rd to SR 261 in Helena -Widen from 2 to 5 lanes (CN)	15
383	Springville Road, from CR-10 (Chalkville Mt. Rd.) to CR-32 (Clayton Rd.) - Widen from 2 to 4 lanes (CN)	*
385	I-59 N, from I-459 to Deerfoot Parkway - Widen from 4 to 6 lanes (CN)	*
386	US-31 from SR-119 to Cahaba River (Riverchase Parkway) - Widen from 4 to 6 lanes (CN)	*
387	SR-269 from Maytown CL to Port Birmingham - Widen from 2 to 4 lanes (Intermodal Project) (CN)	*
388	I-459 from I-59 to (CR-52) Morgan Rd - Widen from 4 to 6 lanes (CN)	*
390	Allison-Bonnet Memorial Drive(CR-56), from Hueytown Rd (CR-46) to Brooklane Drive - Widen from 2 to 4 lanes (CN)	*
396	I-20, from I-59 to Montevallo Road (Exit 132B) and Interchange Modifications At I-59- Widen from 4 to 6 lanes (CN)	*
398	I-59 North I-20 Interchange (Exit 130) to 1st Ave North (Exit 132) - Widen from 6 to 8 Lanes (CN)	*
399	I-59 North from Deerfoot Parkway to Jefferson/St.Clair County Line - Widen from 4 to 6 lanes NBL (CN)	*
401	I-59 North from EBS Expressway (Exit 126A) to I-20 Interchange (Exit 130) - Widen from 8 to 10 lanes (CN)	*
403	US-78 from Cherry Ave (CR-105) to Hillcrest Rd (CR-65) - Widen from 4 to 6 lanes (CN)	*
404	US-78 from Hillcrest Rd (CR-65) to Corridor X Interchange Graysville - Widen from 4 to 6 lanes (CN)	*
405	Stadium Trace Parkway from Current Terminus to CR-52 -Extend Existing Roadway (CN)	*
406	Academy Drive from US-11 to Old Tuscaloosa Hwy Widen and Realign from 2 to 3 lanes (CN)	*
406	Academy Drive from Old Tuscaloosa Hwy.To CR-18 (Eastern Valley Rd). New Road 0 to 3 lanes (CN)	*
409	Old Rocky Ridge Rd., from Altadena Rd to Dolly Creek Ln. - Widen from 2 to 4 lanes (CN)	*
410	SR-79 (Tallapoosa St.) from 400' South of I-59/I-20 to East Lake Blvd. Widen and Drainage Correction 4 to 6 lanes (CN)	*
411	I-65, from 6th Ave S to U.S. 31 (north and southbound) - Widen from 6 to 8 and/or add auxiliary lanes (CN)	2, 3
412	SR-269 from Ave. F to Minor Parkway - Widen from 4 to 6 lanes (CN)	*
413	Lakeshore Parkway from Wildwood North to Oxmoor Rd - Widen from 4 to 6 lanes (CN)	*
414	Lakeshore Parkway from Oxmoor Rd. to Industrial Drive - Widen from 4 to 6 lanes (CN)	*
416	Brooklane Drive (CR-51) from Davey Allison Blvd. to Allison-Bonnet Memorial Drive - Widen from 2 to 4-5 lanes (CN)	*
418	US-78 from Pratt Hwy (2nd St.) to Cherry Ave(CR-105) - Widen from 4 to 8 Lanes (CN)	*
420	Interchange Modification on I-65 @ CR-17 (Valleydale Road), (Flyover Ramps) Phase 2 (PE, RW, UT, CN)	*
426	CR-11 from East Weatherly through CR-52 Intersection to CR-36 -Widen from 2 to 4 lanes	30
427	CR-11 from CR-36 to CR-280 -Widen from 2 to 4 lanes	31
428	CR-12 (Smokey Rd) from CR-107 East to CR-87 - Widen from 2 to 4 lanes (CN)	*
431	CR-47 from SR-25 South to SR-145 - Widen 2 to 4 lanes (CN)	*
434	CR-87 from CR-12 North 0.55 miles - Widen 2 to 4 lanes, intermodal access (CN)	27
469	SR-119 From CR-80 (Mission Hills Rd.) North to CR-26 (Fulton Springs Rd.) - Widen from 2 to 5 lanes (CN)	*
535	US-280 Lane Addition from I-459 To CR-17 (Valleydale Road) Including Access Management Improvements (Phase 2)(RW, UT, CN)	1
537	US-11 Additional Lanes from I-459 to Tutwiler Drive - Widen from 4 to 6 lanes (UT, CN)	*
630	Ross Bridge Parkway Extension (parallel roadway of South Shades Crest Road) from SR 150 to CR 52 (CN)	*
631	I-65 from SR-25 (Exit 228) to US-31, North of Calera - Widen from 4 to 8 lanes (CN)	*
643	I-20/59 Reconstruction(Depressing) between ramp of I-65 and ramp of US 31/E.B.Expressway (CN)	*
644	US 280 Corridor Improvements (West Segment) from EB Expressway to Eagle Point Pkwy- Widen from 6 to 8 lanes (CN)	*
645	US 280 Limited Access Road from Eagle Point Pkwy to Shelby & Talladega County Line - Widen from 4 to 6 lanes (CN)	*
662	US 280 Frontage Roads (Eastbound) from Eagle Point Pkwy to Shelby & Talladega County Line (Coosa River) (CN)	*
673	Grants Mill Rd from Old Leeds to Overton Rd, Phase 2 - Widen from 2/4 to 5 lanes (CN)	*

\* Project is not in the 2035 Regional Transportation Plan

## NORTHERN BELTLINE FACTS

### — PROPOSED NORTHERN BELTLINE ROUTE



- The proposed Northern Beltline, a 52-mile 6-lane interstate, will cost taxpayers \$4.7 billion, or \$90 million per mile, and take at least 30 years to build. It would be the most expensive road project in Alabama history.
- As a result of the latest federal transportation bill, this \$4.7 billion can now be spent on other needed roads and bridges around Birmingham. ALDOT could widen I-59, I-20, I-65 south of Birmingham, fix Malfunction Junction, and complete all 50 of the Regional Planning Commission's visionary projects for \$1 billion less than the Northern Beltline would cost. All of these other projects will generate jobs, but they are now competing with the Beltline for limited federal funding.
- The Northern Beltline will only relieve 1-3% of traffic on existing interstates and has been ranked 36<sup>th</sup> in priority by the Regional Planning Commission. Yet half of the federal funding for the region is currently expected to fund this road.
- The Northern Beltline will pull business and growth opportunities away from downtown Birmingham and its inner suburbs.
- Any job that the Northern Beltline does produce will come at a cost to taxpayers of \$456,000 per job, and these jobs will not materialize until (and if) the Beltline is completed – decades from now.

# The Northern Beltline in Birmingham: Will They Come? Myth vs Fact

The speculative economic benefits of the Northern Beltline have been presented to the community as hard facts. But the fact is they are myths articulated in the Alabama Department of Transportation's 2012 reevaluation of the project, in presentations by the Coalition for Regional Transportation, and in the Birmingham Business Alliance's legislative agenda. Much of this information is misleading or false, as detailed by the Ochs Center for Metropolitan Studies in "If You Build It, Will They Come?" found at: [http://www.ochscenter.org/documents/NB\\_Report\\_Final\\_0612.pdf](http://www.ochscenter.org/documents/NB_Report_Final_0612.pdf).

**Myth:** *The funding for the Northern Beltline can only be used for the Northern Beltline.*

**Fact:** The cost of the Northern Beltline is \$4.7 billion, or \$90 million per mile. The July 2012 federal transportation bill, MAP-21, eliminated the separate pot of money that was funding the Northern Beltline, so the Northern Beltline now competes for federal money with other projects in Birmingham and throughout Alabama that are much more critical for transportation, safety and congestion relief. In other words, the billions of dollars that might be spent on the Northern Beltline can now be spent on other transportation projects elsewhere in the state.<sup>1</sup>

**Myth:** *The Northern Beltline will improve traffic flow and reduce traffic congestion caused by limited existing interstate route options through our area.*

**Fact:** The Regional Planning Commission of Greater Birmingham projected that only 1% to 3% of the traffic through downtown Birmingham on I-20/59 would be diverted if the Northern Beltline were built and that the project will not reroute significant truck traffic. Traffic analyses in ALDOT's Reevaluation also do not support the claim that the Beltline will reduce traffic or congestion. The Beltline will actually *increase* traffic on the already heavily congested section of I-59 between the current I-59/I-459 interchange and the planned interchange at I-59 in Trussville.

The anemic traffic volumes projected for the Beltline do not justify the construction of a 6-lane highway (much less ALDOT's plans for an ultimate expansion to 8 lanes). The assumption that some trucks will take a 53-mile detour around the north side of Birmingham to avoid peak hour congestion is baseless, particularly given that the existing and much shorter I-459 already provides such a detour. Not only does the Beltline have limited congestion reduction potential, the RPC has ranked 35 other transportation projects ahead of the Northern Beltline in importance, in large part because of the Beltline's limited ability to reduce congestion.

**Myth:** *The Northern Beltline will be one of the greatest economic development engines ever seen in the Birmingham area.*

**Fact:** Past and projected population growth numbers suggest otherwise, as does the Center for Business and

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<sup>1</sup> U.S. Congressional Research Service, *Surface Transportation Funding and Programs Under MAP-21: Moving Ahead for Progress in the 21<sup>st</sup> Century (P.B. 112-141)* (R42762; Sept. 27, 2012), by Robert S. Kirk, et. al. p.10 <http://www.fas.org/sgp/crs/misc/R42762.pdf>. Accessed October 11, 2012; See also 40 USCS § 14501; 23 USCS § 133.

Economic Research (CBER). According to the CBER's 2010 study, only 372 businesses and 6,527 residents would locate along the Beltline corridor compared to the no-build scenario. The Ochs Center report also predicts that long-term growth will not occur along most of the corridor. This conclusion is consistent with projections from the 2012 ALDOT Reevaluation that predicts construction of the Beltline would attract only 2,208 new residents and 2,842 new jobs by 2030 along its corridor

The CBER's study admits that any growth and development that might be associated with the Northern Beltline is highly dependent upon other infrastructure investments, especially sewer. Project supporters have not identified any funding sources for all the secondary investment that is needed. The economic costs to Jefferson County residents, sewer ratepayers, and property owners in the small cities and unincorporated areas along the Northern Beltline corridor are likely to be substantial.

**Myth:** *Constructing the Northern Beltline will create tens of thousands of jobs.*

**Fact:** The CBER's study concluded that over a 17-year construction period (which is the most optimistic possible timeframe for this project to be built), no more than 4,014 jobs will be created by the Northern Beltline in any one year. However, the Ochs Center analysis shows that the construction phase will actually create, at best, only 2,805 jobs in any one year. The difference is due to the fact that CBER used outdated 2002 data that did not take into account substantial increases in materials and other non-labor construction costs for projects like the Northern Beltline.

In addition, similar jobs can be created by investing in other infrastructure projects that are more beneficial to the area.

**Myth:** *The Northern Beltline will provide accessibility to the northern and western parts of the Birmingham region that will attract businesses and people.*

**Fact:** The Beltline itself is not projected to attract many businesses or residents. Birmingham already has more road and interstate miles than many southeastern cities. Moreover, the relationship between the presence or absence of a beltline and the extent of economic development is not strong—especially in the absence of other necessary infrastructure such as sewer. Bessemer, for example, has ample access to two interstates already, I-20 and I-459, yet has actually lost residents in the last decade. In addition, the CBER study failed to analyze numerous important variables such as school quality, crime data and developable land in its forecasting models. Businesses and residents alike would consider these factors prior to making relocation decisions. Furthermore, because of the overall low projected population growth rates for Jefferson County, any business or person that locate in the Northern Beltline corridor would likely be coming from elsewhere in the Birmingham area; this is thus not “new” growth for the region.

**Myth:** *Birmingham is the only city of its size in the southeast that does not have a complete, connected interstate route around its metropolitan area.*

**Fact:** Many large southern metros such as Orlando, Knoxville, Tampa, and Chattanooga do not have completed interstate routes around their cities. The Ochs Center examined cities around the region and found that the presence of a complete beltline does not automatically translate into economic growth or low unemployment. In many cities, the construction of a beltline corresponded with strong growth pressures that are not present in Jefferson County.

**Myth:** *Appalachian Highway funds are available for the Northern Beltline. These funds represent years of contributions by Alabama taxpayers and should not be allowed to go to other states.*

**Fact:** Alabama, like all other states, is a net recipient—not donor—of federal highway money. Every state receives more from the federal highway trust fund than it pays in federal taxes on gasoline and diesel fuel. In fact, Alabama already receives more return per dollar and a higher relative share than Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee. Current federal budget conditions create tremendous uncertainty about the long-term potential for sustaining the different road funds and thus being able to guarantee money for the Northern Beltline's construction, which ALDOT says would likely take upwards of 30-35 years. Alabama should explore other ways to obtain federal support for sustainable transportation investments that could yield more positive economic growth at a lesser cost. This support could come through the Appalachian Highway funds for projects such as extending Corridor X, or through other federal channels.

**Myth:** *If we don't use the money for the Northern Beltline, we lose the money.*

**Fact:** The new transportation bill allows for the Northern Beltline funding to be spent on a host of other transportation projects through 2014. Nobody can predict what Congress will do when this bill expires in 2014. While this new transportation bill does eliminate the State's 20% match for the Beltline through 2014, there is also no guarantee that this favorable treatment will continue past that date either. This means that if Alabama decides to build the Northern Beltline, the state may still be on the hook for 20% of the project's \$4.7 billion cost after 2014, even though, as State Transportation Director John Cooper recently observed, "we are struggling to preserve our *existing* highway system." Despite the acknowledged need to fix and maintain existing roads and bridges, Alabama currently spends 36% of its transportation funds on new and expanded highway infrastructure compared to a national average of 23%, which is clearly unsustainable as the State's maintenance backlog continues to grow.

Putting the federal contribution aside, Alabamians will still have to fund sewer and water lines, secondary road upgrades, public safety services, schools and other necessary infrastructure to bring any economic development to the Beltline area. With Jefferson County in bankruptcy and other small cities in the project's path strapped for cash, there is no clear indication of ability to pay these additional costs, which are not included in the \$4.7 billion cost of the Beltline.



MOUNTAIN BROOK  
SCHOOLS

February 27, 2013

Mountain Brook City Council  
Mountain Brook City Hall  
56 Church Street  
Mountain Brook, AL 35213

Please place the following request on your March 11, 2013, Council Meeting agenda.

Request exemption of permit fees for site and building work for contracted and locally performed projects at our several campus locations.

Mountain Brook Board of Education maintains a Long Range Capital Replacement and Improvement Plan based on curriculum changes, student enrollment and building assessments. These factors drive the need for additions, renovation and site work projects at different school buildings across the district. While we carefully budget for these projects, and we have not included permit fees in the bid packages or contracts over the last 15-20 years.

We have a project for an addition to the High School Field House planned for this summer. The low bid for this project was \$1,492,100. Based on a fee of \$8.00/thousand, the added cost for this project will be close to \$12,000.

In light of the current economic conditions any savings on our facilities budget would be greatly appreciated.

Sincerely,

Richard C. Barlow  
Superintendent

*effective · challenging · engaging*

# Memorandum

---

**To:** Sam Gaston, City Manager  
**CC:** Mayor and members of the City Council  
**From:** Steven Boone  
**Date:** 3/6/2013  
**Re:** Uninterruptable Power Supply (UPS) bypass/disconnect switch

---

The City has a \$50,000 UPS that will be located in the server room once we move into the municipal complex. The purpose of the UPS is to constantly condition (stabilize) electricity and ensure that the protected equipment is not affected during the instant it takes for power to transfer to the backup generator during a power outage. The protected equipment includes, but not limited to, all computer servers including 911 and the dispatch consoles.

The City's 911 consultant recommends that the City purchase and install a bypass (disconnect) switch that will allow power to bypass the UPS so that the UPS can be replaced without cutting off the power whenever the UPS fails. There is a disconnect switch inside of the UPS which allows for the replacement of batteries without disrupting power. The City does not currently have an external bypass/disconnect nor has one been needed during the last 5-6 years that the UPS has been in operation. The cost of the bypass is \$4,890 plus installation (yet to be determined). The lead time for the bypass is 30 days so a decision is needed as quickly as possible.

Another benefit of installing the bypass is the energizing of the various systems being installed for testing purposes. As designed currently, the server room cannot be energized until the UPS is moved and installed which is scheduled for Monday, April 22. If the bypass is approved, it will enable the electrician to energize the server room earlier to allow the security, telephone equipment, dispatch consoles and other systems to be tested and any issues resolved in advance of the move scheduled for April 24. I am trying to verify that the server room cannot be energized prior to installing the UPS without the bypass and hopefully can report my findings to you Monday night.

Installation quote is \$6000. May  
can be reduced if done on time &  
material basis.