MULTI-MODAL TRANSPORTATION BOARD THURSDAY, NOVEMBER 20, 2014 6:00 PM CITY COMMISSION ROOM 151 MARTIN STREET, BIRMINGHAM

- A. Roll Call
- B. Introductions
- C. Review of the Agenda
- D. Approval of Minutes, Meeting of October 2, 2014
- E. Oak St. Paving Project
 - Quarton School Section
 - Chesterfield Ave. Intersection
 - Chesterfield Ave. to Lakepark Dr. Section
- F. Meeting Open to the Public for items not on the Agenda
- G. Miscellaneous Communications:
 - 1. Bike Articles
 - 2. W. Maple Rd. Project
 - 3. Transportation Trends Article
- H. Adjournment

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CITY OF BIRMINGHAM MULTI-MODAL TRANSPORTATION BOARD MONDAY, OCTOBER 2, 2014 City Commission Room 151 Martin Street, Birmingham, Michigan

Minutes of the special meeting of the City of Birmingham Multi-Modal Transportation Board held Monday, October 2, 2014. Chairperson Johanna Slanga convened the meeting at 6 p.m.

A. ROLL CALL

- **Present:** Chairperson Johanna Slanga; Board Members Stuart Bordman, Lara Edwards, Amanda Warner
- Absent: Vice-Chairman Andy Lawson; Board Members Jeff Surnow, Adriana Tatuch
- Administration: Lauren Chapman, Asst. City Planner Brendan Cousino, Asst. City Engineer Jana Ecker, Planning Director Paul O'Meara, City Engineer Carole Salutes, Recording Secretary
- **B. INTRODUCTIONS** Representatives from Fleis & Vandenbrink ("F&V"), Transportation Engineering Consultants were introduced. In attendance were Lisa Easterbrook, Mike Labadie, and Rick Stout.
- C. **REVIEW AGENDA** (approved)

D. APPROVAL OF MINUTES, MEETING OF SEPTEMBER 8, 2014

Moved and seconded to approve the Minutes of September 8, 2014 as presented.

Motion carried unanimously, 4-0.

E. OAK ST. PAVING PROJECT

Mr. O'Meara advised that for next construction season the City has budgeted to reconstruct the section between Glenhurst to the west of Quarton School all the way to Lakepark. This board will review the various ways to rebuild the road with the idea of making it better for all modes of transportation.

The Multi-Modal Master Plan recommends the elimination of parking on one side of the street, and the introduction of bike lanes on both sides. The question then

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is which side of the street should the parking be eliminated and is that a good idea. A survey request was mailed out to the residents who live on Oak St. along that stretch and the results were:

Chesterfield to Lakepark

Almost two-thirds of the respondents felt that parking is an important asset and did not want it removed.

Glenhurst to Chesterfield (in front of the school)

- 83% of respondents indicated that having the ability to park on Oak St. is important to them on the north side of the road.
- An idea that came out of discussions with the school is that safety would be improved if there was no parking during the school drop-off and pick-up times so that kids wouldn't have to cross the road.

Ms. Edwards announced that as a parent she would never let her child bike on a street as wide as Oak St. with sharrows. She noticed families have been biking on the sidewalk along Oak St. because of safety concerns.

Mr. O'Meara advised the goal of this board will be to zero in on what it feels is best and that will be advertised as a public hearing at a future meeting. That input will be considered before a final decision is made.

The chairperson opened up discussion to the public at 6:20 p.m.

Ms. Karen Shoenberg, 888 Puritan at Oak St., listed reasons parking along Oak St. is important to her.

Mr. Rick Buckston, 895 Puritan, SW corner of Oak St., said he likes the idea of ways to limit the speed of cars. As a rule, parking is not an issue on this stretch. The parking plan could be changed a few blocks away from the school.

Mr. Gregory Misterovich, 1810 Oak St. between Chesterfield and Glenhurst, said that any way that traffic can be slowed down, such as narrowing the road, would be an improvement.

Ms. Pat Hammer, 1764 Oak St., west of Chesterfield, supported narrowing the drive lanes to slow down traffic. She suggested having limited time parking on the south side of the street and bike lanes with no parking on the north side. Quarton School could be part of the solution by adding on to its parking lot.

Mr. Mike Kennedy, 1712 Oak St. at the NW corner of Chesterfield, supported parking along the whole road. He didn't see the need for a bike lane down Oak St. Families primarily use the sidewalk. Chairperson Slanga advised that bike riding on the sidewalk is actually more dangerous for children and bikers than

riding on the street. Mr. Kennedy appreciated board members taking their personal time to address this problem. The decision that is made needs to keep in mind the peak periods of the school. Overall he finds the street is pretty quiet.

Mr. Misterovich observed that school parkingcreates a large demand on Oak St. and surrounding streets. The school does not contain it on their own property. They offer no parking for visitors or events and they use Oak St. as their parking lot and pick-up area. If the City would ticket illegal parkers along the streets, the parkers would complain and force the school to accommodate the needed parking. He would prefer to have two lanes of traffic and two bike lanes along the street.

Mr. Mike Labadie, F&V, noted that people who live in a neighborhood expect to have street parking. His experience is that it is the residents who are speeding on their own streets. A narrow road reduces speeds. He is not sure that eliminating the parking is the correct solution.

Ms. Ecker summarized the previous comments. Three people agreed the road should be narrowed. Two people didn't say it should be narrowed or left the same but talked about parking versus bike lanes. There was no one that thought the road should be kept as wide as it is or widened. She said bike lanes and parking can be accommodated by having a parking lane on one side and still have bike lanes in both directions along with travel lanes. If parking is wanted on both sides it requires shared lanes. Mr. O'Meara stated if the board wants to designate an area for bikes and parking the road will be as wide as it is now.

Mr. Labadie noted that when white lines are brought in speeds decrease whether cars are parked there or not.

Mr. Bordman did not think it necessary to install a crossing island on Oak St. at Lakepark. It is safe the way it is.

A survey conducted by the Police Dept. indicated there is not a heavy volume of parking on Oak St. Chairperson Slanga led the group through the data and comments one section at a time, heading toward the school along Oak St. From Lakepark to Puritan it would not seem catastrophic if no parking were allowed. The same logic applies from Puritan to Pilgrim. Pilgrim to Suffield starts to enter the area where people park in the afternoon.

Mr. O'Meara pointed out the City is taking this opportunity to talk with the school about the parent loading area. This board can't come to any conclusion until it knows the school's decision for the long term. Also, the City has asked the transportation engineer to conduct a complete study on the traffic signal and to come up with a recommendation that might be different than what exists today.

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Chairperson Slanga took discussion from the audience at 7:08 p.m.

Ms. Karen Shoenberg encouraged taking a study of parking on Oak St. at a peak school time as well as on a random day.

Mr. Gregory Misterovich suggested installing bump-outs to squeeze the road down at all the intersections.

Mr. Mike Kennedy observed that fire trucks use Fairfax and Chesterfield quite often. If parking on Oak is eliminated it will spill over onto the north/south streets.

Mr. Rick Buckston, 895 Puritan, noted it wouldn't be practical to create infrastructure to accommodate the busiest day of the year. For instance, on busy days at Seaholm people park on the grass.

F. GOLFVIEW BLVD. RESIDENTIAL PERMIT PARKING REQUEST

Mr. O'Meara advised the Police Dept. has received a petition from the residents of Golfview Blvd. requesting residential permit parking between Midvale and Argyle. The recommendation of the Multi-Modal Board will be forwarded to the City Commission for review. It was noted that surrounding streets to the west and south have residential permit parking to keep the high school students off of their street.

Mr. Harry Kokinukis, 598 Golfview Blvd., stated there is not a single parking spot available on his street until about 3:30 p.m. Mr. O'Meara said that Mr. Clemence has indicated the Police Dept. is fine with the permit request. Ms. Ecker noted the petition indicates that 87.5% of the residents along the street are in favor.

Motion by Ms. Edwards

Seconded by Mr. Bordman to recommend to the City Commission that they allow Golf View to have permit parking for residents only between Midvale and Argyle.

Motion carried, 4-0.

VOICE VOTE Yeas: Edwards, Bordman, Slanga, Warner Nays: None Absent: Lawson, Surnow, Tatuch

Ms. Edwards announced her willingness to visit Seaholm in order to remind students about the parking pinch and to recommend carpooling and biking to school. Mr. Kokinukis offered that a solution might be to find another lot in the area for parkers.

G. MEETING OPEN TO THE PUBLIC FOR ITEMS NOT ON THE AGENDA (no one spoke)

H. MISCELLANEOUS BUSINESS AND COMMUNICATIONS

- a. **Communications** (not discussed)
- **b. Other Business** (not discussed)

K. ADJOURNMENT

No further business being evident, the chairperson adjourned the meeting at 7:30 p.m.

Jana Ecker, Planning Director

Paul O'Meara, City Engineer

City of	Birmingham	MEMORANDUM
DATE:	November 13, 2014	Engineering Dept.
TO:	Multi-Modal Transportation Board	
FROM:	Paul T. O'Meara, City Engineer	
SUBJECT:	Oak St. Paving Project Glenhurst Dr. to Lakepark Dr.	

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As you know, the MMTB began discussing this 2015 project at its first meeting in July. A survey regarding parking needs was conducted in August, and reviewed in October. In September, the City Commission authorized the selection of Fleis & Vandenbrink (F&V) as the City's Transportation Engineer to assist the MMTB. Staff immediately directed their attention to the study of the ongoing traffic concerns of the use of Oak St. adjacent to Quarton Elementary School, as well as the traffic signal at Chesterfield Ave. Working cooperatively between staff, F&V, and the School District Administrative staff, a new parent pick up and drop off area has been developed. Final concepts of how to revise the Chesterfield Ave. intersection have also been developed.

At this time, it is important that the MMTB begin moving toward finalizing a preferred concept plan for the entire Oak St. project. The regularly scheduled meeting of November 6 was postponed to November 20, to provide opportunity for feedback from the Birmingham Public Schools Board. Additional details are below.

As the days pass, and more is learned about the Oak St. project, it becomes more obvious that the timing of the construction becomes more critical. Reconstructing the block in front of Quarton Elementary School must be accomplished while the school is on summer break. The contractor will have about a nine-week window to complete this work. However, sewer work should be performed from the bottom of the system to the top. This block represents the upstream end of the proposed storm sewer, therefore, substantial sewer work must be done prior to the summer season beginning in mid-June. That said, construction should start about May 1, which means the job should be ready to bid by early March. In order to complete the bidding documents on this schedule, confirming the design of this project must be done no later than December of this year.

With the above time constraints, it is hoped that the MMTB can discuss the proposed plans with staff at the meeting next week (November 20). If a majority of the board agrees with a specific design concept, the plan should then be publicized. A public hearing would be scheduled at the next MMTB meeting on December 4, allowing the City Commission to endorse the conceptual plan at their meeting of December 15.

With the above as a suggested timetable, we will break up the discussion into three main elements, starting from the west end, and moving to the east.

Oak St. - Glenhurst Ave. to Chesterfield Ave.

We first met with the school district staff to discuss the Quarton School situation on September 29, just before the October MMTB meeting. At that time, information was still being gathered, but no good ideas had yet been developed. By this time, F&V had concluded that the current use of Oak St. by the school was problematic. The existing parent drop off area is inadequate and poorly configured. By not providing enough designated space for the amount of vehicles that need to arrive at the beginning and end of the day, drivers get frustrated, and end up using many other means to park or stand in their vehicles while delivering or picking up students. There are too many potential conflicts occurring both Oak St. and adjacent Chesterfield Ave. City staff was advised that the School Board needs to be made aware that this condition is not appropriate, and improvements should be made. Further, if nothing better could be agreed upon, reconstructing the road as it currently is would result in the liability remaining with the City.

Attached for your review are two similar conceptual plans for this block. Plan "A" is the staff recommended version. Plan "B" is similar, but depicts a three lane pavement marking section at Chesterfield Ave., which will be explained below. The design for a separated drop off and pick up lane has been developed. The concept requires Oak St. to be narrowed, losing the ability to park on either side, but adding the concept of bike lanes in both directions. (Should the adjacent homeowners object to the loss of parking, it could be reinstated on the north side if both bike lanes were removed.) In return, the designated parent drop off lane creates several benefits:

- 1. As designed, parents would be allowed to enter the west end of the drop off lane as either westbound or eastbound traffic. They would not have to plan ahead about how to approach the school (as they do now). Once in the lane, parents would be encouraged to drop off students anywhere along the entire length of the zone, so that many cars can load and unload at the same time. Waiting for a spot to open up near the front door would be discouraged. When exiting, vehicles would be required to turn right. This will allow for smoother, safer traffic patterns, and more efficiency in the loading zone area.
- 2. Vehicles wishing to use the school's parking lot would have to enter and exit through the loading zone lanes. This restriction would also increase safety, and reduce the chance of unexpected turning movements. Since most vehicles using the parking lot do not enter during the peak traffic times, we do not see this as being a hardship.
- 3. The dashed line that parallels Oak St. (running through the new drop off area) depicts the right-of-way line. It should be acknowledged that the City would be making this area available to the School District with the hope that a much improved student loading area will be a benefit to the City, the School District, and the general public. In return, the City would request that the School District be responsible for the cost of the drop off lanes, and the adjacent sidewalk area. The cost of this work is estimated at \$215,000, including design, inspection, and a contingency. A refined cost estimate would become available after the job is awarded to a specific contractor, and actual costs are known (approximately April, 2015). The School District would also be responsible for snow removal in this area, and maintenance of the adjacent median island.

City and School District staff met on October 30 to discuss the plan. While some concerns were expressed, overall, they saw it as the best opportunity that will likely become available to make this situation better. The next day, the concept plan was given to School administration to be shared with the School Board for their input. Certain members expressed concerns. A second meeting with both staffs and two school board members was held to review the plan on November 12. At the end of the meeting, members of the School Board requested further review before a decision could be made. At this point, we believe it is best to have the MMTB review and take a position on the concept.

It should also be noted that west of the school area, at the Glenhurst Dr. intersection, the plan depicts the installation of pedestrian bumpouts at all four corners. A large number of pedestrians use this intersection, and having a reduced pavement width for them in all four directions appears appropriate.

Oak St. & Chesterfield Ave. Intersection

F&V has analyzed the current intersection and traffic signal operation. Current traffic counts indicate that a traffic signal is not warranted, even during peak school traffic times. Not only is the signal operation an ongoing expense to the City, it is actually making peak school traffic operations worse. F&V is recommending that the signal be removed, and replaced with a 2-way stop operation, where Oak St. traffic would be given priority, and Chesterfield Ave. traffic would be required to stop. F&V will be in attendance at the meeting, ready to fully review their attached detailed report that spells out how this conclusion has been made. It is possible that there will be public resistance to this idea, therefore, it is important that the Board members understand the rationale that was used to come to this conclusion.

The attached Plan "A" depicts the suggested pavement markings for the west leg of the intersection if a 2-way stop is employed. The 2-way stop configuration allows all eastbound vehicles (including all those exiting from the parent drop off lane) to use the intersection without stopping (unless pedestrians are crossing). Delays would drop dramatically, which in turn helps the new loading zone operation. This is important in that the more efficient the loading zone becomes, the less likely parents will attempt to use other areas (e.g.: Oak St., Chesterfield Ave.) to unload students, which increases safety.

The perceived drawback of a 2-way stop is the lack of opportunities for pedestrians to cross Oak St. A crossing guard is always stationed at this intersection during the beginning and end of the school day, and this would continue in the future. The crossing guard's main priority would be to help students in crossing Oak St. A Rectangular Rapid Flashing Beacon (RRFB) would be installed for both directions, warning Oak St. motorists that pedestrians are crossing (see attached picture). The RRFB would be activated by a push-button operation, and could be used at any time of day.

At the MMTB meeting, F&V will be able to demonstrate how traffic flows would work using traffic simulation software, both for the current traffic signal, as well as the 2-way stop. It can also be made available at the time of the public hearing. However, if public sentiment is strongly against the 2-way stop configuration, the next alternative that should be considered is a 4-way stop. The 4-way stop configuration would make the intersection more predictable for pedestrians crossing. However, it would reduce the efficiency of Oak St. traffic, which in turn

reduces the efficiency of the student loading zone, which would then in turn have a negative effect on pedestrians in other areas if students are being unloaded elsewhere.

Finally, it is acknowledged that there may be strong public sentiment in favor of maintaining the traffic signal. The current traffic signal operation was installed many years ago with a 2-lane traffic configuration. This has proven to be problematic during the school peak traffic hours, which resulted in a NO TURNS ban currently in effect during peak traffic times. Such a ban is inconvenient and unfortunate, resulting in extra traffic for all the surrounding streets as motorists attempt to get to their destination without being able to use the main collector routes of the area. The NO TURNS ban is needed because vehicles waiting to make either left or right turns greatly reduces the number of vehicles that could proceed through the intersection on Oak St., which would then negatively impact the parent loading zone. If the signal should remain, F&V would recommend the installation of a three-lane pavement marking configuration, as shown on the alternate attached Plan "B." On this drawing, the proposed pavement width has not been changed, but the bike lanes have been interrupted at the signal. Bicyclists would be encouraged to use the right traffic lane through the intersection.

No matter what type of traffic control is selected at the intersection, pedestrian bumpouts would be constructed at all four corners to reduce the pavement width at the crosswalks, wherever possible. The bumpouts have not been drawn out on this plan pending further discussion of other elements of the intersection. The east leg of the intersection is also not finalized, as outlined further in the next section of this memo.

Oak St. – Chesterfield Ave. to Lakepark Dr.

Attached for your use are the suggested cross-sections to consider for Oak St. for this six-block segment. At the meeting in October, survey results had tended to indicate that more than half of the residents along this section consider parking a valuable resource that should not be removed. However, sentiment in this regard was mixed at the meeting. If the MMTB chooses to maintain parking on both sides, the road would have to be built very similar to its current configuration. However, if parking is removed, bike lanes could be added to the street, and the pavement in general could be narrowed by 25%.

A hybrid approach would be to build off the fact that the proposed Oak St. alignment in front of the Quarton School would result in pushing through traffic on this street to the north. This alignment could be continued to the east of Chesterfield Ave. for one or more blocks (as determined by the board) to allow the construction of both bike lanes, as well as a parking lane on the south side of the street (no parking would be allowed on the north side). Taking from the comments received to date, since the demand for parking is stronger in the area just east of Chesterfield Ave., it may be wise to consider building one or more blocks with the wider cross-section, then narrowing it down to just travel and bike lanes. Now that N. Eton Rd. is finished with a similar cross-section (two travel lanes, two bike lanes, and one parking lane), I encourage the MMTB members to take a look at that project prior to the meeting to be able to see how such a "hybrid" cross-section would look on Oak St.

If a parking lane is constructed on the south side for several blocks, an opportunity for an improved crosswalk location would also be available, by installing bumpouts on the south side (in the parking lane). This tactic was employed on N. Eton St. We would recommend

bumpouts at Chesterfield Ave., Pilgrim Ave. (a good mid-point for this segment of road), and Lakepark Dr. (at the park). If preferred, the traffic island discussed in the past on the west side of the Lakepark Dr. intersection could be implemented instead of the south side bumpout. Installation of the traffic island at this location would be most effective due to its location at the bottom of a hill, due to it being visible for a long distance in both directions.

<u>Summary</u>

To summarize, the MMTB needs to consider the final suggested elements of the Oak St. project plan, and endorse a final concept. Staff will then finalize a package that can be displayed on the City's website, and send letters to all homeowners on the Oak St. corridor (as well as the neighborhood association) encouraging them to review the plan, and notifying them about a planned public hearing. A suggested resolution is provided below based on what staff sees as the most likely concept:

SUGGESTED RESOLUTION:

The Multi-Modal Transportation Board has endorsed a conceptual plan for the reconstruction of Oak St. from Glenhurst Dr. to Lakepark Dr. featuring the following components:

- 1. Removal of parking from the west City limit to Glenhurst Dr. to allow the installation of bike lanes on the existing pavement.
- 2. Construction of pedestrian bumpouts at the Glenhurst Dr. intersection.
- 3. Construction of a 30 ft. wide street with no parking and bike lanes west of Chesterfield Ave., thereby allowing the construction of a two-lane student loading area in front of Quarton Elementary School (pending approval by the Birmingham School Board).
- 4. Construction of the Chesterfield Ave. intersection with a 2-way stop configuration, Rectangular Rapid Flashing Beacons for Oak St. traffic, and pedestrian bumpouts.
- 5. Construction of a 38 ft. wide street with parking on the south side only, and bike lanes on both sides from Chesterfield Ave. to ______.
- 6. Construction of a 30 ft. wide street with no parking and bike lanes from ______ to Lakepark Dr.
- 7. Construction of crosswalk bumpouts at Pilgrim Ave. (if appropriate).
- 8. Construction of a pedestrian traffic island at the west side of the Lakepark Dr. intersection.

Further, to direct staff to prepare documents for the City of Birmingham website portraying these elements, and advising all adjacent property owners and neighborhood associations of a public hearing to be held by this Board at its regularly scheduled meeting of December 4, 2014.









flashing beacon (RRFB)



VIA FMAII

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То:	Paul O'Meara, PE City of Birmingham
From:	Michael J. Labadie, PE Steven J. Russo, E.I.T. Fleis & VandenBrink
Date:	November 11, 2014
Re:	Summary of Traffic Engineering Analyses for the Oak Street/Chesterfield Avenue Intersection, and
	Information Regarding the Pick –up and Drop-off Zone for Quarton School

Introduction

Fleis & VandenBrink (F&V) has completed various traffic engineering analyses of the Oak Street & Chesterfield Avenue intersection for the Oak Street Concept development. These analyses included an evaluation of the appropriate warrants from the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) for traffic signals, two-way stop, and all-way stop control. Further, level of service (LOS) analyses and simulations were completed for each traffic control option using new AM and PM peak hour) turning movement counts.

Another element of the concept development for Oak Street is the pick-up and drop-off activities at Quarton School. F&V was asked to assist in the development of a concept that would remove the on-street process that is currently being used at the school. F&V assisted the City Engineering Department in the development and evaluation of a concept that mostly fits on the school property, adequately addresses the anticipated demand and will work within the Oak Street concepts under consideration.

Traffic Signal Warrants

The MMUTCD states, "An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location. The investigation of need for a traffic control signal shall include an analysis of factors related to the existing operation and safety at the study location and the potential to improve these conditions, and the applicable factors contained in the following traffic signal warrants".

There are nine warrants, some use traffic volume thresholds as criteria, others use traffic crashes, pedestrian volumes, school crossing, at grade railroad crossing, coordinated signal system or roadway network. The warrants that apply to the intersection of Oak Street and Chesterfield Avenue are traffic volume, pedestrian and school crossing. The results of the evaluation of these warrants are summarized in the following (with the details included in the attachments to this memo):

• None of the traffic or pedestrian volume warrants are met. The intersection traffic and pedestrian volumes are significantly outside of the necessary thresholds.

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- The school crossing warrant is not met. The School Crossing warrant is intended for application where the fact that schoolchildren cross the major street is the principal reason for signalization. In order for this warrant to be met, the frequency of adequate gaps in the vehicular traffic stream during the period when schoolchildren are using the crossing, has to be less than the number of minutes in the same period and there must be a minimum of 20 schoolchildren during the highest crossing hour. The applicable information is; in the AM there is a car traveling on Oak Street in front of the school every 8.5 seconds. In the PM there is a car traveling on Oak Street every 11.1 seconds. The approximate "acceptable gap" time is 13 seconds for the current street width and 10 seconds for the 30' street proposal. There were 97 pedestrians crossing Oak street in the AM and 87 in the PM. The proper use of school crossing guards, etc. is recommended prior to the installation of a traffic signal. From what information is available this procedure was not followed at this location, since a traffic signal is in place at this intersection.
- A Rectangular Rapid Flashing Beacon (RRFB) (see image in attachment) is warranted based on the pedestrian volume criteria for this Beacon. Although not currently in the MMUTCD, the RRFB has been given interim approval by the Federal Highway Administration (FHWA).

Two-Way and All-Way Stop Control Warrants

The MMUTCD uses some of the same criteria to warrant the use of stop and yield intersection control as is used for traffic signals. Traffic, bicycle and pedestrian volume thresholds, crashes, etc. are used. However, information regarding available sight distance and approach speeds are also key elements in this determination. The information provided in the attachments indicates that a two-way stop control, with Chesterfield Avenue stopping for Oak Street is appropriate. This is based on the restricted sight distance looking east from the north and south approaches, and the higher traffic volume on Oak Street.

Pick-up and Drop-off Lane

The stacking space for the pickup / drop-off area should range from 500' to 1,125' depending upon what method is used to determine it. The concept that is shown on the plan (s) has approximately 600' in length. We believe that if used properly this proposed length will adequately serve the school demand.

The concept for the pickup / drop-off area is a one way operation, enter at the west and exit at the east. Left turns in at the west end would be allowed, lefts turn out would not be permitted. Parents park their vehicle against the south curb and their child exits the vehicle on the passenger side. The parent pulls away from the curb and uses the drive lane to exit at the east end. Parents are to park where there is an available space in the drop-off area, not wait in line to drop their child at the front door of the school. Children are not to be dropped off in the drive lane. The lane on the south side could be used for parking during non-pickup or drop-off times. This operation will significantly reduce the potential for pedestrian-vehicle conflicts and thus will be much more safe if it properly followed by the parents.

Level of Service

Descriptions of LOS "A" through "F" as defined in the Highway Capacity Manual (HCM) are attached for signalized and unsignalized intersections. Typically LOS D is considered acceptable, with LOS A representing minimal delay and LOS F indicating failing conditions. The results of the analysis of existing conditions are attached and summarized in Table 1.

Existing peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersections using Synchro (Version 8) traffic analysis software. The results of the analysis of existing conditions were



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based on the existing lane use and traffic control, the existing traffic volumes, and the methodologies presented in the HCM 2000.

Table 1

Existing Intersection Operations

			<u>AM P</u>	<u>eak</u>	<u>PM P</u>	<u>eak</u>
			Delay		Delay	
Intersection	Control	Approach	(s/veh)	LOS	(s/veh)	LOS
1. Oak Avenue	Signalized	EB	10.0	А	9.2	А
& Chesterfield Avenue		WB	8.7	А	8.3	Α
		NB	13.1	В	12.8	В
		SB	<u>13.4</u>	<u>B</u>	<u>12.8</u>	<u>B</u>
		Overall	10.3	В	9.7	Α

The results are what should be expected for this intersection with traffic signal control.

Weekday Traffic on Oak Street

24-Hour bi-directional count information was collected along Oak Street east of Fairfax Street and west of Glenhurst Drive. The count information is attached and summarized in Table 2 below.

Table 224-Hour Count Comparison

		E. of	W. of
Street	Approach	Fairfax	Glenhurst
Oak Avenue	EB WB	1380 <u>1550</u>	1792 <u>1666</u>
	Total	2930	3458

The weekday traffic using Oak Street is within the range that would be expected for a street such as Oak Street.

Attached: Synchro Results Traffic Volume Data MMUTCD Warrant Analyses

Traffic Data Collection, TDC 7504 Sawgrass Drive, Washington, MI 48094 Ph. (586) 786-5407 Traffic Study Performed for: Fleis & Vandenbrink



Project: Chesterfield Ave Location: City of Birmingham Weather: Cloudy, 60's Board: DMM #21 File Name: TMC1_Oak&Chesterfield Site Code: TMC 1 Start Date: 10/8/2014 Page No: 1

						G	roups	Printeo	d- Pass	. Cars - S	Single l	Jnits -	Buses/	Semi's	;						1
		Chest	erfield	Avenu	е		C	ak Str	eet			Chest	erfield	Avenu	е		C	oak Stro	eet		
		Sc	outhbo	und			W	estbo	und			N	orthbo	und			E	astbou	nd		
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	8	2	0	11	2	9	6	0	17	5	4	0	1	10	1	15	0	0	16	54
07:15 AM	2	8	1	0	11	0	19	4	3	26	7	1	2	0	10	2	32	1	2	37	84
07:30 AM	3	3	2	0	8	5	25	1	1	32	6	3	2	0	11	1	32	0	0	33	84
07:45 AM	2	21	4	0	27	2	26	4	0	32	5	0	2	1	8	6	52	0	4	62	129
Total	8	40	9	0	57	9	79	15	4	107	23	8	6	2	39	10	131	1	6	148	351
08:00 AM	0	13	4	2	19	3	50	11	0	64	7	2	8	3	20	3	47	1	0	51	154
08:15 AM	6	20	1	0	27	2	32	5	0	39	6	3	1	6	16	4	49	2	0	55	137
08:30 AM	0	17	0	12	29	0	20	0	3	23	0	13	0	19	32	0	74	0	23	97	181
08:45 AM	0	24	0	20	44	1	27	1	24	53	0	21	0	27	48	0	88	2	47	137	282
Total	6	74	5	34	119	6	129	17	27	179	13	39	9	55	116	7	258	5	70	340	754
**** BREAK **	**																				
03·00 PM	2	7	2	4	15	2	13	5	0	20	4	10	3	1	18	3	31	2	0	36	89
03·15 PM	0	ģ	2	0	11	1	30	5	0	36	7	6	3	0	16	1	21	0	1	23	86
03·30 PM	1	14	0	3 3	18	1	41	q	3	54	0	10	0	8	18	0	21	0	4	25	115
03:45 PM	0	12	1	18	31	0	26	1	23	50	1	16	1	61	70	0	72	0	57	120	280
 Total	3	42	5	25	75	4	110	20	20	160	12	42	7	70	131	4	145	2	62	213	579
Total	0	74	0	20	10	т	110	20	20	100	12	74	'	10	101	т	140	2	02	210	015
04:00 PM	2	7	2	0	11	3	25	5	8	41	6	5	2	16	29	4	40	2	9	55	136
04:15 PM	2	7	1	2	12	2	22	0	0	24	7	8	2	1	18	4	38	1	0	43	97
04:30 PM	1	9	1	1	12	1	28	5	0	34	4	5	2	0	11	2	20	0	2	24	81
04:45 PM	2	6	1	6	15	2	26	5	1	34	6	6	6	3	21	11	33	2	6	52	122
Total	7	29	5	9	50	8	101	15	9	133	23	24	12	20	79	21	131	5	17	174	436
05-00 DM	2	0	n	0	12	5	25	2	٥	22	7	10	0	1	27	1	26	2	0	20	105
05.00 F M	2	9	2	1	0	2	20	0	0	20	0	10	1	1	10	4	20	2	1	JZ 07	105
05.13 FIVI	1	7	1	ו ס	11	1	20	10	0	11	6	9	0	1	19	2	22	1	1	21	104
05.30 FIVI	1	15	1	2	10	ו ס	21	0	2	44 21	0	0	1	1	10	3	20	0	0	20	104
	1	20	1			10	102	20	0	- 31	20	22	11	1	70	4	107	0	- 0	107	400
TOLAI	4	30	4	5	51	10	105	29	Z	144	30	33	11	4	10	14	107	4	Z	127	400
Grand Total	28	223	28	73	352	37	522	96	68	723	101	146	45	151	443	56	772	17	157	1002	2520
Apprch %	8	63.4	8	20.7		5.1	72.2	13.3	9.4		22.8	33	10.2	34.1		5.6	77	1.7	15.7		
Total %	1.1	8.8	1.1	2.9	14	1.5	20.7	3.8	2.7	28.7	4	5.8	1.8	6	17.6	2.2	30.6	0.7	6.2	39.8	
Pass. Cars	28	213	25	73	339	37	516	96	68	717	99	145	45	151	440	55	767	17	157	996	2492
% Pass. Cars	100	95.5	89.3	100	96.3	100	98.9	100	100	99.2	98	99.3	100	100	99.3	98.2	99.4	100	100	99.4	98.9
Single Units	0	10	3	0	13	0	6	0	0	6	2	1	0	0	3	1	4	0	0	5	27
% Single Units	0	4.5	10.7	0	3.7	0	1.1	0	0	0.8	2	0.7	0	0	0.7	1.8	0.5	0	0	0.5	1.1
Buses/Semi's	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Buses/Semi's																					

Comments: Traffic study conducted during typical weekday (Wed) fron 7:00-9:00 AM morning & 3:00-6:00 PM afternoon peak hours while school was in session. Signalized intersection, with ped signals all quadrants, no push buttons. All approaches signed NO TURNS 8:30-9:00 AM & 3:30-4:00 PM.

Traffic Data Collection, TDC <u>7504 Sawgrass Drive, Washington, MI 48094 Ph. (586) 786-5407</u> Traffic Study Performed for: Fleis & Vandenbrink



Project: Chesterfield Ave Location: City of Birmingham Weather: Cloudy, 60's Board: DMM #21 File Name : TMC1_Oak&Chesterfield Site Code : TMC 1 Start Date : 10/8/2014 Page No : 2







Project: Chesterfield Ave Location: City of Birmingham Weather: Cloudy, 60's Board: DMM #21 File Name : TMC1_Oak&Chesterfield Site Code : TMC 1 Start Date : 10/8/2014 Page No : 3

	С	hesterfie	eld Aver	nue		Oak	Street		С	hesterfie	eld Aver	nue		Oak	Street		
		South	bound			west	bound			North	bouna			East	ouna		
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analy	sis Fron	n 07:00 A	AM to 1'	l:45 AM - F	Peak 1 of	1											
Peak Hour for En	tire Inters	ection B	egins at	08:00 AM													
08:00 AM	0	13	4	17	3	50	11	64	7	2	8	17	3	47	1	51	149
08:15 AM	6	20	1	27	2	32	5	39	6	3	1	10	4	49	2	55	131
08:30 AM	0	17	0	17	0	20	0	20	0	13	0	13	0	74	0	74	124
08:45 AM	0	24	0	24	1	27	1	29	0	21	0	21	0	88	2	90	164
Total Volume	6	74	5	85	6	129	17	152	13	39	9	61	7	258	5	270	568
% App. Total	7.1	87.1	5.9		3.9	84.9	11.2		21.3	63.9	14.8		2.6	95.6	1.9		
PHF	.250	.771	.313	.787	.500	.645	.386	.594	.464	.464	.281	.726	.438	.733	.625	.750	.866
Pass. Cars	6	69	5	80	6	126	17	149	12	38	9	59	7	258	5	270	558
% Pass. Cars	100	93.2	100	94.1	100	97.7	100	98.0	92.3	97.4	100	96.7	100	100	100	100	98.2
Single Units	0	5	0	5	0	3	0	3	1	1	0	2	0	0	0	0	10
% Single Units	0	6.8	0	5.9	0	2.3	0	2.0	7.7	2.6	0	3.3	0	0	0	0	1.8
Buses/Semi's	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses/Semi's	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection, TDC 7504 Sawgrass Drive, Washington, MI 48094 Ph. (586) 786-5407 Traffic Study Performed for: Fleis & Vandenbrink



Project: Chesterfield Ave Location: City of Birmingham Weather: Cloudy, 60's Board: DMM #21 File Name : TMC1_Oak&Chesterfield Site Code : TMC 1 Start Date : 10/8/2014 Page No : 4

	C	hesterfie	eld Aver	nue		Oak	Street		С	hesterfie	eld Aver	nue		Oak	Street		
		<u>South</u>	bound		,	West	bound			North	bound			East	bound		
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analy	sis Fron	n 12:00 F	PM to 05	5:45 PM - P	eak 1 of	1											
Peak Hour for En	tire Inters	ection B	egins at	03:30 PM													
03:30 PM	1	14	0	15	1	41	9	51	0	10	0	10	0	21	0	21	97
03:45 PM	0	12	1	13	0	26	1	27	1	16	1	18	0	72	0	72	130
04:00 PM	2	7	2	11	3	25	5	33	6	5	2	13	4	40	2	46	103
04:15 PM	2	7	1	10	2	22	0	24	7	8	2	17	4	38	1	43	94
Total Volume	5	40	4	49	6	114	15	135	14	39	5	58	8	171	3	182	424
% App. Total	10.2	81.6	8.2		4.4	84.4	11.1		24.1	67.2	8.6		4.4	94	1.6		
PHF	.625	.714	.500	.817	.500	.695	.417	.662	.500	.609	.625	.806	.500	.594	.375	.632	.815
Pass. Cars	5	36	2	43	6	113	15	134	13	39	5	57	8	168	3	179	413
% Pass. Cars	100	90.0	50.0	87.8	100	99.1	100	99.3	92.9	100	100	98.3	100	98.2	100	98.4	97.4
Single Units	0	4	2	6	0	1	0	1	1	0	0	1	0	2	0	2	10
% Single Units	0	10.0	50.0	12.2	0	0.9	0	0.7	7.1	0	0	1.7	0	1.2	0	1.1	2.4
Buses/Semi's	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% Buses/Semi's	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0.5	0.2



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Project: Birmingham Quarton School Study Count Type: 24 Hr. ATR Count Weather: Sunny, 60' Degs. Count By: M.Matich Pav't : Asphalt 2 Lanes

Traffic Data Collection, TDC 7504 Sawgrass Drive, Washington MI. 48094 (586) 586-5407. Traffic Study Performed For: Fleis & Vandenbrink

CHESTERFIELDNOAK_VOL Chesterfield Ave. (400' North of Oak Ave.) Station ID: 2-Way Count Site Code: ATR 2SB Date Start: 07-Oct-14

Start	06-Oc	t-14	Τι	ie	W	ed	Th	u	F	ri	Sat	t	Su	n	Week Ave	erage
Time	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	ŇВ
12:00 AM	*	*	*	*	0	3	1	0	*	*	*	*	*	*	0	2
01:00	*	*	*	*	0	0	0	1	*	*	*	*	*	*	0	0
02:00	*	*	*	*	0	0	0	0	*	*	*	*	*	*	0	0
03:00	*	*	*	*	0	0	0	0	*	*	*	*	*	*	0	0
04:00	*	*	*	*	0	0	1	1	*	*	*	*	*	*	0	0
05:00	*	*	*	*	3	0	5	0	*	*	*	*	*	*	4	0
06:00	*	*	*	*	8	5	11	7	*	*	*	*	*	*	10	6
07:00	*	*	*	*	54	15	62	15	*	*	*	*	*	*	58	15
08:00	*	*	*	*	81	53	72	52	*	*	*	*	*	*	76	52
09:00	*	*	*	*	49	33	40	18	*	*	*	*	*	*	44	26
10:00	*	*	*	*	26	26	38	34	*	*	*	*	*	*	32	30
11:00	*	*	*	*	26	28	34	30	*	*	*	*	*	*	30	29
12:00 PM	*	*	35	44	38	36	32	37	*	*	*	*	*	*	35	39
01:00	*	*	35	17	27	19	25	24	*	*	*	*	*	*	29	20
02:00	*	*	37	36	28	30	18	14	*	*	*	*	*	*	28	27
03:00	*	*	53	45	56	49	*	*	*	*	*	*	*	*	54	47
04:00	*	*	47	35	41	35	*	*	*	*	*	*	*	*	44	35
05:00	*	*	42	43	47	47	*	*	*	*	*	*	*	*	44	45
06:00	*	*	28	30	47	41	*	*	*	*	*	*	*	*	38	36
07:00	*	*	30	26	23	25	*	*	*	*	*	*	*	*	26	26
08:00	*	*	14	14	11	30	*	*	*	*	*	*	*	*	12	22
09:00	*	*	8	17	8	7	*	*	*	*	*	*	*	*	8	12
10:00	*	*	4	3	5	4	*	*	*	*	*	*	*	*	4	4
11:00	*	*	2	5	0	4	*	*	*	*	*	*	*	*	1	4
Lane	0	0	335	315	578	490	339	233	0	0	0	0	0	0	577	477
Day	0		650)	106	8	572	2	0		0		0		1054	
AM Peak	-	-	-	-	08:00	08:00	08:00	08:00	-	-	-	-	-	-	08:00	08:00
Vol.	-	-	-	-	81	53	72	52	-	-	-	-	-	-	76	52
PM Peak	-	-	15:00	15:00	15:00	15:00	12:00	12:00	-	-	-	-	-	-	15:00	15:00
Vol.	-	-	53	45	56	49	32	37	-	-	-	-	-	-	54	47
Comb. Total	C)	(650	1	1068		572		0		0		0	10	54
ADT	A	DT 1,055	AA	DT 1,055												

Page 1

Project: Birmingham Quarton School Study Count Type: 24 Hr. ATR Count Weather: Sunny, 60' Degs. Count By: M.Matich Pav't : Asphalt 2 Lanes

Traffic Data Collection, TDC 7504 Sawgrass Drive, Washington MI. 48094 (586) 586-5407. Traffic Study Performed For: Fleis & Vandenbrink

CHESTERFIELDSOAK_VOL Chesterfield Ave. (450' South of Oak Ave.) Station ID: 2-Way Count Site Code: ATR 2NB Date Start: 07-Oct-14

Start	06-Oc	t-14	Τι	e	W	ed	Th	u	Fr	i	Sa	t	Sur	1	Week Ave	rage
Time	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	ŇВ
12:00 AM	*	*	*	*	0	0	0	1	*	*	*	*	*	*	0	0
01:00	*	*	*	*	0	0	0	1	*	*	*	*	*	*	0	0
02:00	*	*	*	*	0	1	0	2	*	*	*	*	*	*	0	2
03:00	*	*	*	*	0	0	1	1	*	*	*	*	*	*	0	0
04:00	*	*	*	*	0	2	1	3	*	*	*	*	*	*	0	2
05:00	*	*	*	*	2	5	5	2	*	*	*	*	*	*	4	4
06:00	*	*	*	*	14	12	13	9	*	*	*	*	*	*	14	10
07:00	*	*	*	*	64	31	79	43	*	*	*	*	*	*	72	37
08:00	*	*	*	*	102	66	84	67	*	*	*	*	*	*	93	66
09:00	*	*	*	*	78	49	62	36	*	*	*	*	*	*	70	42
10:00	*	*	*	*	39	32	50	35	*	*	*	*	*	*	44	34
11:00	*	*	*	*	45	45	50	39	*	*	*	*	*	*	48	42
12:00 PM	*	*	49	43	58	44	51	54	*	*	*	*	*	*	53	47
01:00	*	*	39	29	46	28	43	37	*	*	*	*	*	*	43	31
02:00	*	*	50	54	43	47	37	19	*	*	*	*	*	*	43	40
03:00	*	*	72	67	69	69	*	*	*	*	*	*	*	*	70	68
04:00	*	*	77	46	68	52	*	*	*	*	*	*	*	*	72	49
05:00	*	*	70	55	76	67	*	*	*	*	*	*	*	*	73	61
06:00	*	*	53	41	63	46	*	*	*	*	*	*	*	*	58	44
07:00	*	*	42	30	29	37	*	*	*	*	*	*	*	*	36	34
08:00	*	*	19	16	24	36	*	*	*	*	*	*	*	*	22	26
09:00	*	*	13	13	8	18	*	*	*	*	*	*	*	*	10	16
10:00	*	*	6	5	9	5	*	*	*	*	*	*	*	*	8	5
11:00	*	*	4	3	5	4	*	*	*	*	*	*	*	*	4	4
Lane	0	0	494	402	842	696	476	349	0	0	0	0	0	0	837	664
Day	0		896	6	153	8	825		0		0		0		1501	
AM Peak	-	-	-	-	08:00	08:00	08:00	08:00	-	-	-	-	-	-	08:00	08:00
Vol.	-	-	-	-	102	66	84	67	-	-	-	-	-	-	93	66
PM Peak	-	-	16:00	15:00	17:00	15:00	12:00	12:00	-	-	-	-	-	-	17:00	15:00
Vol.	-	-	77	67	76	69	51	54	-	-	-	-	-	-	73	<u>68</u>
Comb. Total	0)	8	396	1	1538		325		0		0	()	150	1
ADT	AI	DT 1,501	AA	DT 1,501												

Project: Birmingham Quarton School Study Count Type: 24 Hr. ATR Count Weather: Sunny, 60' Degs. Count By: M.Matich Pav't : Asphalt 1 Lane

Traffic Data Collection, TDC 7504 Sawgrass Drive, Washington MI. 48094 (586) 586-5407 Traffic Study Performed For:

Fleis & Vandenbrink

OAKECHESTERFIELD_WB Oak Ave. (225' East of Chesterfield Ave.) Station ID: Westbound Site Code: ATR 02WB Date Start: 07-Oct-14

Start	Mon	Tue	e Wed	Thu	Fri		Average		Sat	Sur		Week		
12:00 AM	<u>06-Oct-14</u>	*		2	*		Day		*	*		Average		
12:00 AIVI	*	*	5	2	*		4		*	*		4		
01:00	*	*	0	2	*		1		*	*				
02:00				2	*		2					12		
03:00	^ 		0	2	^ +		1		^ 	^ 		1		
04:00	*	*	0	0	*		0			*		0		
05:00	*	*	1	1	*		1		*	*		1		
06:00	*	*	19	17	*		18		*	*		18		
07:00	*	*	109	101	×		105		*	*		105		
08:00	*	*	156	137	*		146		*	*		146		
09:00	*	*	66	80	*		73		*	*		73		
10:00	*	*	77	94	*		86		*	*		86		
11:00	*	*	87	107	*		97		*	*		97 📃		
12:00 PM	*	81	91	88	*		87		*	*		87		
01:00	*	61	85	73	*		73		*	*		73		
02:00	*	85	101	*	*		93		*	*		93		
03:00	*	83	147	*	*		115		*	*		115		
04:00	*	120	122	*	*		121		*	*		121		
05:00	*	155	138	*	*		146		*	*		146		
06:00	*	141	136	*	*		138		*	*		138		
07:00	*	87	86	*	*		86		*	*		86		
08:00	*	59	75	*	*		67		*	*		67		
09:00	*	43	34	*	*		38		*	*		38		
10:00	*	14	13	*	*		14		*	*		14		
11:00	*	2	6	*	*		4		*	*		4		
Total	0	931	1555	706	0		1516		0	0		1516		
% Avg.	0.00/	(1 10/	100 / 0/	4/ / 0/	0.00/		100.00/							
WkDay	0.0%	01.4%	102.0%	40.0%	0.0%		100.0%							
% Avg.	0.00/	(1 40/	100 / 0/	4/ /0/	0.00/		100.00/		0.00/	0.00/				
Week	0.0%	01.4%	102.0%	40.0%	0.0%		100.0%		0.0%	0.0%				
AM Peak	-	-	08:00	08:00	-	-	08:00	-	-	-	-	08:00	-	-
Vol.	-	-	156	137	-	-	146	-	-	-	-	146	-	-
PM Peak	-	17:00	15:00	12:00	-	-	17:00	-	-	-	-	17:00	-	-
Vol.	-	155	147	88	-	-	146	-	-	-	-	146	-	-
Total		0 9	31 155	55 70)6	0	1516			0	0	1516		

ADT ADT 1,504

AADT 1,504

Project: Birmingham Quarton School Study Count Type: 24 Hr. ATR Count Weather: Sunny, 60' Degs. Count By: M.Matich Pav't : Asphalt 2 Lanes

Traffic Data Collection, TDC 7504 Sawgrass Drive, Washington MI. 48094 (586) 586-5407. Traffic Study Performed For: Fleis & Vandenbrink

OAKWFAIRFAX_VOL Oak Ave. (200' East of Fairfax St.) Station ID: 2 Way Count Site Code: ATR 3 Date Start: 07-Oct-14

Start	06-Oc	t-14	Τι	le	We	ed	Th	าน	Fi	ri	Sa	t	Su	n	Week Av	erage
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	ŴВ
12:00 AM	*	*	*	*	3	2	2	2	*	*	*	*	*	*	2	2
01:00	*	*	*	*	0	0	1	3	*	*	*	*	*	*	0	2
02:00	*	*	*	*	0	1	1	2	*	*	*	*	*	*	0	2
03:00	*	*	*	*	1	0	0	1	*	*	*	*	*	*	0	0
04:00	*	*	*	*	0	2	0	2	*	*	*	*	*	*	0	2
05:00	*	*	*	*	2	1	4	0	*	*	*	*	*	*	3	0
06:00	*	*	*	*	26	15	31	13	*	*	*	*	*	*	28	14
07:00	*	*	*	*	125	101	135	105	*	*	*	*	*	*	130	103
08:00	*	*	*	*	225	121	209	125	*	*	*	*	*	*	217	123
09:00	*	*	*	*	75	61	65	61	*	*	*	*	*	*	70	61
10:00	*	*	*	*	56	64	60	90	*	*	*	*	*	*	58	77
11:00	*	*	*	*	63	70	83	95	*	*	*	*	*	*	73	82
12:00 PM	*	*	*	*	64	101	66	90	*	*	*	*	*	*	65	96
01:00	*	*	73	54	52	74	55	75	*	*	*	*	*	*	60	68
02:00	*	*	70	85	86	115	48	45	*	*	*	*	*	*	68	82
03:00	*	*	162	129	135	167	*	*	*	*	*	*	*	*	148	148
04:00	*	*	111	157	119	166	*	*	*	*	*	*	*	*	115	162
05:00	*	*	106	140	117	163	*	*	*	*	*	*	*	*	112	152
06:00	*	*	85	131	94	142	*	*	*	*	*	*	*	*	90	136
07:00	*	*	58	74	72	85	*	*	*	*	*	*	*	*	65	80
08:00	*	*	35	51	34	56	*	*	*	*	*	*	*	*	34	54
09:00	*	*	16	34	21	27	*	*	*	*	*	*	*	*	18	30
10:00	*	*	10	12	6	13	*	*	*	*	*	*	*	*	8	12
11:00	*	*	8	3	4	3	*	*	*	*	*	*	*	*	6	3
Lane	0	0	734	870	1380	1550	760	709	0	0	0	0	0	0	1370	1491
Day	0		160	94	293	0	146	9	0		0		0		2861	
AM Peak	-	-	-	-	08:00	08:00	08:00	08:00	-	-	-	-	-	-	08:00	08:00
Vol.	-	-	-	-	225	121	209	125	-	-	-	-	-	-	217	123
PM Peak	-	-	15:00	16:00	15:00	15:00	12:00	12:00	-	-	-	-	-	-	15:00	16:00
Vol.	-	-	162	157	135	167	66	90	-	-	-	-	-	-	148	162
Comb										_		_		_		
Total	C)	1	604	2	930	1	469		0		0		0	28	61
ADT	A	DT 2,871	AA	DT 2,871												

Page 1

Project: Birmingham Quarton School Study Count Type: 24 Hr. ATR Count Weather: Sunny, 60' Degs. Count By: M.Matich Pav't : Asphalt 1 Lane

Traffic Data Collection, TDC 7504 Sawgrass Drive, Washington MI. 48094 (586) 586-5407 Traffic Study Performed For:

Fleis & Vandenbrink

OAKWCHESTERFIELD_EB Oak Ave. (175' West of Chesterfield Ave.) Station ID: Eastbound Site Code: ATR 2EB Date Start: 07-Oct-14

Start	Mon	Tue	e Wed	Thu	Fri		Average		Sat	Sun		Week		
12:00 AM	*	*	3	2	*		2		*	*		2		-
01:00	*	*	0	1	*		0		*	*		0		
02:00	*	*	0	0	*		0		*	*		0		
03:00	*	*	1	0	*		0		*	*		0		
04:00	*	*	0	1	*		0		*	*		0		
05:00	*	*	5	5	*		5		*	*		5		
06:00	*	*	32	33	*		32		*	*		32		
07:00	*	*	148	145	*		146		*	*		146		
08:00	*	*	266	253	*		260		*	*		260		
09:00	*	*	109	86	*		98		*	*		98		
10:00	*	*	80	71	*		76		*	*		76		
11:00	*	*	81	90	*		86		*	*		86 📃		
12:00 PM	*	93	101	102	*		99		*	*		99		
01:00	*	95	72	64	*		77		*	*		77 📃		
02:00	*	80	81	*	*		80		*	*		80		
03:00	*	181	151	*	*		166		*	*		166		
04:00	*	137	151	*	*		144		*	*		144		
05:00	*	118	132	*	*		125		*	*		125		
06:00	*	101	104	*	*		102		*	*		102		
07:00	*	65	74	*	*		70		*	*		70 📃		
08:00	*	34	30	*	*		32		*	*		32		
09:00	*	15	17	*	*		16		*	*		16		
10:00	*	9	5	*	*		7		*	*		7		
11:00	*	10	4	*	*		7		*	*		7		
Total	0	938	1647	853	0		1630		0	0		1630		
% Avg.	0.0%	57.5%	101.0%	52.3%	0.0%	1	100.0%							
WKDay														
% AVg.	0.0%	57.5%	101.0%	52.3%	0.0%	1	00.0%	0.0	1%	0.0%				
			00.00	00.00			00.00					00.00		
AIVI Peak	-	-	00:00	08:00	-	-	08:00	-	-	-	-	00:00	-	-
VOI.	-	-	200 15:00	253	-	-	<u></u> 15:00	-	-	-	-	15:00		-
PIVI PEAK	-	10.00	10.00	12.00	-	-	13.00	-	-	-	-	13.00	-	-
IUV IUV	-	0 0	101	7 QF			1630	-	-		-	1620		-
rular		0 9	104	0	55	U	1050			0	0	1030		
ADT	AD	T 1,623	AAD	T 1,623										

Page 1

Project: Birmingham Quarton School Study Count Type: 24 Hr. ATR Count Weather: Sunny, 60' Degs. Count By: M.Matich Pav't : Asphalt 2 Lanes

Traffic Data Collection, TDC 7504 Sawgrass Drive, Washington MI. 48094 (586) 586-5407. Traffic Study Performed For: Fleis & Vandenbrink

OAKWGLENHURST_VOL Oak Ave. (150' West of Glenhurst Ave.) Station ID: 2 Way Count Site Code: ATR 1 Date Start: 07-Oct-14

Start	06-Oc	t-14	Τι	ie	W	ed	Th	nu	Fr	 i	Sa	t	Su	n	Week Ave	rage
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	ŴВ
12:00 AM	*	*	*	*	2	4	3	3	*	*	*	*	*	*	2	4
01:00	*	*	*	*	0	0	1	2	*	*	*	*	*	*	0	1
02:00	*	*	*	*	1	1	1	2	*	*	*	*	*	*	1	2
03:00	*	*	*	*	1	1	1	3	*	*	*	*	*	*	1	2
04:00	*	*	*	*	1	0	2	0	*	*	*	*	*	*	2	0
05:00	*	*	*	*	11	1	11	1	*	*	*	*	*	*	11	1
06:00	*	*	*	*	42	19	39	18	*	*	*	*	*	*	40	18
07:00	*	*	*	*	192	105	184	102	*	*	*	*	*	*	188	104
08:00	*	*	*	*	238	175	228	149	*	*	*	*	*	*	233	162
09:00	*	*	*	*	107	69	106	90	*	*	*	*	*	*	106	80
10:00	*	*	*	*	87	79	92	101	*	*	*	*	*	*	90	90
11:00	*	*	*	*	95	87	107	116	*	*	*	*	*	*	101	102
12:00 PM	*	*	92	90	99	104	109	99	*	*	*	*	*	*	100	98
01:00	*	*	96	62	78	92	68	75	*	*	*	*	*	*	81	76
02:00	*	*	88	91	101	106	*	*	*	*	*	*	*	*	94	98
03:00	*	*	151	157	133	154	*	*	*	*	*	*	*	*	142	156
04:00	*	*	160	127	155	133	*	*	*	*	*	*	*	*	158	130
05:00	*	*	140	166	165	149	*	*	*	*	*	*	*	*	152	158
06:00	*	*	135	160	125	153	*	*	*	*	*	*	*	*	130	156
07:00	*	*	80	91	83	95	*	*	*	*	*	*	*	*	82	93
08:00	*	*	45	65	46	73	*	*	*	*	*	*	*	*	46	69
09:00	*	*	19	43	21	43	*	*	*	*	*	*	*	*	20	43
10:00	*	*	9	14	8	16	*	*	*	*	*	*	*	*	8	15
11:00	*	*	6	3	1	7	*	*	*	*	*	*	*	*	4	5
Lane	0	0	1021	1069	1792	1666	952	761	0	0	0	0	0	0	1792	1663
Day	0		209	0	345	58	171	3	0		0		0		3455	
AM Peak	-	-	-	-	08:00	08:00	08:00	08:00	-	-	-	-	-	-	08:00	08:00
Vol.	-	-	-	-	238	175	228	149	-	-	-	-	-	-	233	162
PM Peak	-	-	16:00	17:00	17:00	15:00	12:00	12:00	-	-	-	-	-	-	16:00	17:00
Vol.	-	-	160	166	165	154	109	99	-	-	-	-	-	-	158	<u> </u>
Comb																
Total	C)	2	2090	3	3458	1	713		0		0		0	345	55
ADT	AI	DT 3,434	AA	DT 3,434												

	Summary of Warrants		
Spot Number:	0		
Major Street	Oak Avenue	Minor Street	Chesterfield Avenu
Intersection:	Oak Avenue at Chesterfield Av	enue	
Citv/Twp:	Birmingham. MI	0.100	
Date Performed:	10/10/2014	Performed By:	F&V
Date Volumes (Collected: 10/7/2014		
	Warrant	Condition	Is Warrant Met
	Data Has Been Validated		YES
	WARRANT 1: Eight-Hour Vehicular Volume		NO
		Condition A	NO
		Condition B	NO
		Condition A&B	N/A
	WARRANT 2: Four-Hour Vehicular Volume	(100%)	NO
		· · · · · ·	
	WARRANT 3: Peak-Hour Vehicular Volume	(100%)	#N/A
		Condition A	#N/A
		Condition B	NO
	WARRANT 4: Pedestrian Volume	(100%)	NO
		Four Hour	NO
		Peak Hour	NO
	(Threshold)	HAWK	NO
	(Threshold)	RRFB	YES
	WARRANT 5: School Crossing		NO
	WARRANT 6: Coordinated Signal System		NO
	MARINANI V. COOlumateu Signal System		
	WARRANT 7: Crash Experience		NO
		Condition A	NO
		Condition B	NO
	WARRANT 8: Roadway Network		NO
	ARRANT 9. Intersection Near a Grade Crossing		#N/Δ
	A COMPANY OF INCOSOCION NEW A OFACE OFOSSING		
	Issue to Be Addressed by Signalization:		
	0		

				Mic	higan Man Workshe	ual of Unifo	rm Traffic Co Warrants (Se	ontrol Device	es					
					WARRAN	NT 1: Eight-H	our Vehicular	Volume						
Intersection:	Oak Ave	nue @ Chest	erfield Avenue											
Date	10/10/2014	Dy	F&V											
1	: No. of Lanes o	n Major St?								1				
1	: No. of Lanes on Minor St?													
25	25 : Speed limit or 85th Percentile? (MPH)													
NO	NO : Is the intersection within an Isolated community?													
	: if answer 4 is Yes, then what is the of the population isolated community?													
0%	0% : Have other remedial measures been tried?													
	USE 100% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B													
	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?	
Time	E-W	N-S												
00:01 - 01:00	6	0	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
01:00 - 02:00	1	0	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
02:00 - 03:00	2	2	500	150	NO	750	/5 75	NO	N/A	N/A	N/A	N/A	NO	
03.00 - 04.00	0	0	500	150	NO	750	75	NO	N/A	N/A	N/A N/A	N/A	NO	
04:00 - 05:00	6	4	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
06:00 - 07:00	50	10	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
07:00 - 08:00	245	57	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
08:00 - 09:00	422	85	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
09:00 - 10:00	171	44	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
10:00 - 11:00	162	34	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
11:00 - 12:00	183	42	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
12:00 - 13:00	186	47	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
13:00 - 14:00	150	31	500	150	NO	/50	/5	NO	N/A	N/A	N/A	N/A	NO	
14:00 - 15:00	1/3	40	500	150	NO	750	/5 75	NO	N/A	N/A	N/A	N/A	NO	
16:00 - 17:00	200 281	50	500	150	NO	750	75	NO	N/A N/Δ	N/A	N/A N/Δ	N/A N/Δ	NO	
17:00 - 18:00	267	74	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
18:00 - 19:00	240	44	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
19:00 - 20:00	156	34	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
20:00 - 21:00	99	26	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
21:00 - 22:00	54	16	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
22:00 - 23:00	21	5	500	150	NO	750	75	NO	N/A	N/A	N/A	N/A	NO	
	23:00 - 00:00 11 4 500 150 NO 750 75 NO N/A N/A N/A N/A N/A N/A N/A N/A A A A A											NO		
			В.	Is the Interru	ption of Co	ntinuous Tra	ffic Met? (Cor	ndition B)					NO	
				C. Combi	nation of W	arrants A an	d B Criteria M	et?					N/A	











W3 A

Μ	ichigan Ma Worksł WARRA	nual of Uniform Traffic Control Devices neet for Signal Warrants (Section 4C) NT 3 A: Peak-Hour Vehicular Volume	
Spot Number:		0	
Intersection:		Oak Avenue @ Chesterfield Avenue	
Date	10/10/2014	by F&V	
			_
NOT MET	0	: Total Stop Time Delay (hrs)	7
	1	: Minor Street Approach Lanes	
	0	: Total Approaches	
	#N/A	: Minor Approach Volume	
	#N/A	: Total Entering Volume	
	0:00	: Peak Hour	
			-
		Is Warrant 3 A Met?	#N/A





W4 4HR-100%



Μ	ichigan Ma Works	anual of Uniform Traffic Control Devices heet for Signal Warrants (Section 4C) WARRANT 5: School Crossing			
Spot Number:		0			
Intersection:		Oak Avenue @ Chesterfield Avenue			
Date	10/10/2014	by	F&V		
	2000	: Distance to Nearest Signal or Stop Control on N	Major Road		
	0	: Width of Street			
	0	: Number of Children per Group			
	3	: Safe Gap (Seconds)			
	0	: Number of Gaps in Study Period			
	0	0 Study Period (Minutes)			
	0	: Number of School Children			
		Is Warrant 5 Met?			

Michigan Manual of Uniform Traffic Control Devices Worksheet for Signal Warrants (Section 4C) WARRANT 6: Coordinated Signal System										
Spot Number:		0								
Intersection:		Oak Avenue @ Chesterfield Avenue	I							
Date	10/10/2014	by F&V	I							
The Progressive Movement warrant is satisfied when: 1. On a one-way street or a street which has predominantly unidirectional traffic, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle										
 platooning, or 2. On a two-way street, adjacent signals do not provide the necessary degree of a platooning and the proposed or adjacent signals could constitute a progressive signal system. 										
The installation of a signal according to this warrant should not be considered where the resultant signal spacing is less than 1,000 feet.										
		Is Warrant 6 Met?	NO							

Michigan Manual of Uniform Traffic Control Devices Worksheet for Signal Warrants (Section 4C)												
			V	ARRANT 7:	Crash Expe	rience						
Spot Number:		0										
Intersection:	Oak Ave	nue @ Chest	terfield Avenue									
Date	10/10/2014	by	F&V									
										1		
	1	: No. of Lane	es on Major St?							1		
	1	: No. of Lane	es on Minor St?							1		
	0%	: Has adequa	ate trial of remedial m	neasure with a	dequate enfo	rcement been	tried?			1		
	0%	: Have there	been 5 or more crasl	nes susceptibl	e to correctio	on by Signaliz	ation occurred	in a 12 month p	period?			
	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?				
Time	E-W	N-S										
00:01 - 01:00	6	0	400	120	NO	600	60	NO				
01:00 - 02:00	1	0	400	120	NO	600	60	NO				
02:00 - 03:00	2	2	400	120	NO	600	60	NO				
03:00 - 04:00	1	0	400	120	NO	600	60	NO				
04:00 - 05:00	0	2	400	120	NO	600	60	NO				
05:00 - 06:00	6	4	400	120	NO	600	60	NO				
06:00 - 07:00	50	10	400	120	NO	600	60	NO				
07:00 - 08:00	245	57	400	120	NO	600	60	NO				
00:00 - 09:00	422	65	400	120	NO	600	60	NO				
10:00 - 11:00	162	44	400	120		600	60	NO				
11:00 - 12:00	183	42	400	120	NO	600	60	NO				
12:00 - 13:00	186	42	400	120	NO	600	60	NO				
13:00 - 14:00	150	31	400	120	NO	600	60	NO				
14:00 - 15:00	173	40	400	120	NO	600	60	NO				
15:00 - 16:00	285	61	400	120	NO	600	60	NO				
16:00 - 17:00	281	59	400	120	NO	600	60	NO				
17:00 - 18:00	267	74	400	120	NO	600	60	NO				
18:00 - 19:00	240	44	400	120	NO	600	60	NO				
19:00 - 20:00	156	34	400	120	NO	600	60	NO				
20:00 - 21:00	99	26	400	120	NO	600	60	NO				
21:00 - 22:00	54	16	400	120	NO	600	60	NO				
22:00 - 23:00	21	5	400	120	NO	600	60	NO				
23:00 - 00:00	11	4	400	120	NO	600	60	NO				
	Number of Hours that met the warrant 7A = 0 Number of Hours that met the warrant 7B = 0											
	R	Is the Interru	uption of Continuou	IS Traffic Met	Based on (Crash Patter	ns? (Conditio	n B)		NO		
	D. 1		pash of continuot									





Michigan Manual of Uniform Traffic Control Devices Worksheet for Signal Warrants (Section 4C) WARRANT 8: Roadway Network Spot Number 0 Intersection Oak Avenue @ **Chesterfield Avenue** Date 10/10/2014 by F&V The need for a traffic signal control study is applicable when the common intersection of two or more major routes meets one or both of the following criteria : (1) has a total existing, or immediately projected, entering volume of at least 1,000 vehicles during the peak hour and has five-year projected volumes, based on an engineering study, which meet one or more of Warrants 1, 2, and 3 during an average weekday; or (2) has a total existing or immediately projected entering volume of at least 1,000 vehicles for each of any five hours of a non-normal business day (Saturday and/or Sunday). Is Warrant 8 Met? NO

	Michigan Man Workshe WARRANT	ual of Uniform Traffic Control Devices eet for Signal Warrants (Section 4C) 9: Intersection Near a Grade Crossing	
Spot Nur	mber:	0	
Interse	ction:	Oak Avenue @ Chesterfield Avenue	
	Date 10/10/2014	by F&V	
	0	: Clear Storage Distance (ft)	
	0	: Number of Approach Lanes Crossing Tracks	
	0	: Peak Hour	
	#N/A	: Peak Hour Major Street Volume	
	#N/A	: Peak Hour Minor Street Volume	
Adjustment Factors			
fail	0	: Trains per Day	
1	0%	: Percentage High Occupancy Busses	
#N/A	0	: Percentage Tractor Trailers	
	#N/A	: Adjusted Minor Street Volume	
	#N/A	: Is Figure 4C-10 Satisfied?	
	ls	s Warrant 9 Met?	#N/A



Minor Street:	
Minor Street:	
	Chesterfield Avenu
Avenue	
Performed By:	F&V
1	
	YES
Condition	lo Warrapt Mat
Condition	
	NO
	NO
	NO
Volume Criteria	NO
Crash Criteria	NO
Control:	
	Performed By: Condition

Criteria B

Michigan Manual of Uniform Traffic Control Devices Worksheet for Multi-Way STOP Warrants (Section 2B.07) CRITERIA B: CRASH HISTORY

Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.

NO : Have there been 5 or more crashes in a 12 month period susceptible to correction by Multi-way stop installation?

Is Criteria B Met?

NO

Criteria C

	Michigan Manual of Uniform Traffic Control Devices Worksheet for Multi-way STOP Warrants (Section 2B.07)											
			Criter	a C: Minimun	n volumes							
Intersection:	Oak Ave	nue @ Chest	terfield Avenue									
Date	10/21/2014	by	F&V									
NO	: Have there bee	en 5 or more o	crashes in a 12 month	n period susce	otible to corre	ection by Multi-way stop installation?						
1	No. of Lanes on Major St?											
1	No. of Lanes on Minor St?											
25	25 : Speed limit or 85th Percentile? (MPH)											
			USE 1	00% FOR CON								
	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition C Major Volume	Condition C Minor Volume	Warrant Condition C Met?							
Time	E-W	N-S										
00:01 - 01:00	6	0	300	200	NO							
01:00 - 02:00	1	0	300	200	NO							
02:00 - 03:00	2	2	300	200	NO							
03:00 - 04:00	1	0	300	200	NO							
04:00 - 05:00	0	2	300	200	NO							
05:00 - 06:00	6	8	300	200	NO							
11:00 - 12:00	183	72	300	200	NO							
12:00 - 13:00	186	82	300	200	NO							
13:00 - 14:00	150	60	300	200	NO							
14:00 - 15:00	173	68	300	200	NO							
15:00 - 16:00	285	111	300	200	NO							
16:00 - 17:00	281	100	300	200	NO							
17:00 - 18:00	267	120	300	200	NO							
18:00 - 19:00	240	82	300	200	NO	4						
19:00 - 20:00	00	00	300	200		4						
20.00 - 21:00	99 54	30	300	200		4						
21.00 - 22:00	04 21	24	300	200		4						
22:00 - 23:00	11	5	300	200		4						
20.00 - 00.00	11	5	500	200	110	J						
		Nu	mber of Hours that m	et Criteria C =	0]						
			A. Is Cri	iteria C Met?			NO					



Michigan Manual of Uniform Traffic Control Devices Worksheet for Multi-way STOP Warrants (Section 2B.07) Criteria D: 80% of Criteria B, C.1, and C.2 Intersection: Oak Avenue @ Chesterfield Avenue 10/21/2014 Date by F&V NO Have there been 5 or more crashes in a 12 month period susceptible to correction by Multi-way stop installation? No. of Lanes on Major St? 1 1 No. of Lanes on Minor St? 25 Speed limit or 85th Percentile? (MPH) # of crashes in a 12 month period susceptible to correction by Multi-way stop installation? 0 **USE 80% FOR CONDITION D** Major Minor Condition D Warrant **Condition D Major** Volume Volume Minor Condition Volume D Met? (Both Apr.) (One Apr.) Volume E-W Time N-S 00:01 - 01:00 240 160 NO 6 0 01:00 - 02:00 0 240 160 NO 1 02:00 - 03:00 2 2 240 160 NO 03:00 - 04:00 1 0 240 160 NO 04:00 - 05:00 2 240 160 NO 0 10:00 - 11:00 162 66 240 160 NO 11:00 - 12:00 183 72 240 160 NO 12:00 - 13:00 186 82 240 160 NO 13:00 - 14:00 150 60 240 160 NO 14:00 - 15:00 173 68 240 160 NO 15:00 - 16:00 285 240 160 NO 111 16:00 - 17:00 281 100 240 160 NO 17:00 - 18:00 120 160 NO 267 240 18:00 - 19:00 240 82 240 160 NO 19:00 - 20:00 156 60 240 160 NO 20:00 - 21:00 99 38 240 160 NO 21:00 - 22:00 54 24 240 160 NO 22:00 - 23:00 21 9 240 160 NO 23:00 - 00:00 5 240 160 NO 11 Number of Hours that met Criteria C = 0 A. Is the Minimum Vehicular Volume Criteria Met? NO B. Is the crash criteria met? NO C. Is Criteria D met? NO