



CITY of NOVI CITY COUNCIL

Agenda Item 5
July 12, 2010

SUBJECT: Approval to award a construction contract for the Beck Road at Cider Mill Road Traffic Signal Installation project, to Metropolitan Power and Lighting, Inc., the low bidder, in the amount of \$143,432.

SUBMITTING DEPARTMENT: Department of Public Services, Engineering Division

CITY MANAGER APPROVAL:

[Handwritten signature] *BA*

EXPENDITURE REQUIRED	\$143,432
AMOUNT BUDGETED	\$211,710 (Engineering & Construction)
LINE ITEM NUMBER	204-204.00-863.092

BACKGROUND INFORMATION:

As part of the 2007 Beck Road Scoping Study, a traffic signal warrant study (attached) was completed by our traffic consultant at the time, Orchard Hiltz & McCliment (OHM). The study determined that a new traffic signal is warranted at Beck Road and Cider Mill Road because of delays to Cider Mill traffic turning onto Beck Road, primarily during the morning peak hour. Cider Mill is a mid-block collector street that serves several residential neighborhoods on both sides of Beck Road. Although OHM recommended against signal installation at that time, an additional recommendation was made to continue monitoring traffic conditions at the intersection to determine future needs, and to widen the intersection and modify the Cider Mill boulevard medians to accommodate a future signal should installation be considered. These two improvements were made as part of the Beck Road Repaving project later in 2007, but traffic delays on Cider Mill have persisted. Consequently, the project was included in the approved FY 09/10 Capital Improvement Program for construction, following completion of the project's engineering design in early 2010.

In addition to signal installation, the work will also include upgrades to the sidewalk ramps within the intersection to comply with Americans with Disabilities Act standards. The signal construction will be coordinated with Road Commission for Oakland County staff who operate and maintain Novi's traffic signals. A location map has been enclosed for reference.

Three bids were received and opened on June 23, 2010 following a public bid solicitation period. The lowest bidder is Metropolitan Power and Lighting (Metro). Metro's bid is recommended as being in the best interest of the City as it is responsive (i.e., Metro has complied with all requirements of the bidding instructions) and it is the lowest price. (URS's award recommendation letter including the bid tabulation dated June 25, 2010 is attached.) A summary of the three bids is as follows:

Contractor	Total Bid
Metropolitan Power and Lighting	\$143,432
J. Ranck Electric	\$156,450
Rauhorn Electric	\$160,209

Metro successfully completed the 2007 Traffic Signal Upgrades project, which included the intersections at 13 Mile & Meadowbrook Road and 14 Mile & Novi Road.

The approved project budget is \$211,710 of which \$12,197 was awarded for design engineering in September 2009, \$143,432 is recommended for award to Metro for construction, and \$11,907 is recommended for award to URS for construction engineering services (a separate item on this agenda) for total contract awards in the amount of \$167,536.

Construction is scheduled to begin in July/August 2010 and completion is anticipated in September 2010.

RECOMMENDED ACTION: Approval to award a construction contract for the Beck Road at Cider Mill Road Traffic Signal Installation project, to Metropolitan Power and Lighting, Inc., the low bidder, in the amount of \$143,432.

	1	2	Y	N
Mayor Landry				
Mayor Pro Tem Gatt				
Council Member Crawford				
Council Member Fischer				

	1	2	Y	N
Council Member Margolis				
Council Member Mutch				
Council Member Staudt				

MAP INTERPRETATION NOTICE

Map information depicted is not intended to replace or substitute for any official or primary source. This map was intended to meet National Map Accuracy Standards and use the most recent, accurate sources available to the people of the City of Novi. Boundary measurements and area calculations are approximate and should not be construed as survey measurements performed by a licensed Michigan Surveyor as defined in Michigan Public Act 132 of 1970 as amended. Please contact the City GIS Manager to confirm source and accuracy information related to this map.

City of Novi



0 87.5 175 350 525 700
Feet

Beck Road and Cider Mill Signal





June 25, 2010

Mr. Ben Croy, PE
City of Novi
Engineering Department
26300 Delwal Drive
Novi, MI 48375

Reference: Bid Analysis and Contract Award Recommendation
Beck Road and Cider Mill Drive Traffic Signal Installation Project
URS Project Number 12942281

Dear Mr. Croy:

Attached is the Bid Evaluation and Tabulation for the above referenced project. Three (3) bids were received. Competition appears to have been adequate. All bids appeared to be balanced and there were no irregularities noted in the bids.

Metropolitan Power and Lighting, Inc. is the low bidder for this project. We also reviewed the Bidders Qualifications and Experience Statements as submitted. Metropolitan Power and Lighting, Inc. has performed traffic signal installation work for the City of Novi, RCOC as well as many other local agencies.

We therefore recommend award of the contract amount shown in **bold** below to the low bidder, Metropolitan Power and Lighting, Inc.

Beck Road and Cider Mill Drive Traffic Signal Installation Project - **\$143,432.00**

Amount shown above is the total bid price less the total price for Crew Days as estimated by Metropolitan Power and Lighting, Inc..

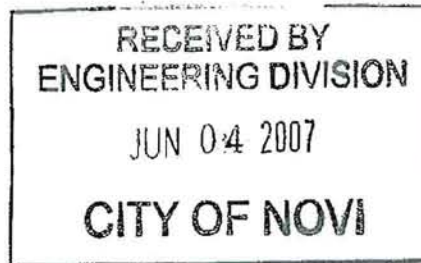
If you have any further questions or comments, please feel free to contact me.

Sincerely,

Matthew G. Klawon, P.E.
URS Project Manager

Beck Road and Cider Mill Drive - Bid Evaluation 06-25-2010

Item No.	Item Description	Qty	Unit	Engineer's Estimate		Metropolitan Power and Lighting		Rauhorn		J. Ranck	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
1	TS, One Way Span Wire Mtd (LED)	8	Ea	\$954.61	\$7,716.88	\$900.00	\$7,200.00	\$840.00	\$6,720.00	\$900.00	\$7,200.00
2	TS, Pedestrian, One Way Bracket Arm Mtd (LED) Countdown	2	Ea	\$958.19	\$1,916.38	\$900.00	\$1,800.00	\$886.00	\$1,772.00	\$1,200.00	\$2,400.00
3	TS, Pedestrian, Two Way Bracket Arm Mtd (LED) Countdown	2	Ea	\$1,582.37	\$3,164.74	\$1,400.00	\$2,800.00	\$1,627.00	\$3,254.00	\$1,600.00	\$3,200.00
4	Span Wire, Box	1	Ea	\$1,500.00	\$1,500.00	\$1,300.00	\$1,300.00	\$1,194.00	\$1,194.00	\$1,500.00	\$1,500.00
5	Pushbutton and Sign, RCOC	2	Ea	\$451.51	\$903.02	\$350.00	\$700.00	\$499.00	\$998.00	\$700.00	\$1,400.00
6	Pushbutton Support Post	2	Ea	\$40.00	\$80.00	\$350.00	\$700.00	\$264.00	\$528.00	\$700.00	\$1,400.00
7	Controller and Cabinet, Solid State Actuated, RCOC	1	Ea	\$1,300.00	\$1,300.00	\$500.00	\$500.00	\$1,205.00	\$1,205.00	\$500.00	\$500.00
8	Strain Pole, Steel, Anchor Base, 40 foot, RCOC	4	Ea	\$5,223.14	\$20,892.56	\$3,100.00	\$12,400.00	\$4,118.00	\$16,472.00	\$4,000.00	\$16,000.00
9	Strain Pole, Steel, Anchor Fdn, RCOC	4	Ea	\$2,626.71	\$10,506.84	\$2,600.00	\$10,400.00	\$2,759.00	\$11,036.00	\$4,000.00	\$16,000.00
10	Autoscope Camera (Solo Terra)	4	Ea	\$2,000.00	\$8,000.00	\$300.00	\$1,200.00	\$521.00	\$2,084.00	\$300.00	\$1,200.00
11	Bracket Arm, 18 feet	2	Ea	\$830.00	\$1,660.00	\$800.00	\$1,600.00	\$720.00	\$1,440.00	\$1,000.00	\$2,000.00
12	Bracket Arm, 15 feet	2	Ea	\$830.00	\$1,660.00	\$700.00	\$1,400.00	\$642.00	\$1,284.00	\$800.00	\$1,600.00
13	Hh, Round	5	Ea	\$803.93	\$4,019.65	\$650.00	\$3,250.00	\$934.00	\$4,670.00	\$800.00	\$4,000.00
14	Serv Disconnect	1	Ea	\$713.41	\$713.41	\$700.00	\$700.00	\$782.00	\$782.00	\$700.00	\$700.00
15	Optical Priority Control System	1	Ea	\$4,500.00	\$4,500.00	\$4,700.00	\$4,700.00	\$3,730.00	\$3,730.00	\$3,000.00	\$3,000.00
16	Case Sign, One Way, 24 inch by 30 inch, Non-Illuminated, RCOC	2	Ea	\$1,230.93	\$2,461.86	\$1,200.00	\$2,400.00	\$1,001.00	\$2,002.00	\$1,000.00	\$2,000.00
17	Pavt Mrkg, Ovly Cold Plastic, 6 inch, Crosswalk	320	Ft	\$1.93	\$617.60	\$3.50	\$1,120.00	\$3.50	\$1,120.00	\$3.50	\$1,120.00
18	Pavt Mrkg, Ovly Cold Plastic, 18 inch, Stop Bar	120	Ft	\$6.60	\$792.00	\$10.50	\$1,260.00	\$10.50	\$1,260.00	\$10.50	\$1,260.00
19	Cable, Sec, 600V, 1, 2/C#4 w/#6 Ground	70	Ft	\$3.00	\$210.00	\$5.00	\$350.00	\$5.60	\$392.00	\$3.00	\$210.00
20	Conduit, DB, 1, 1 1/4 inch	35	Ft	\$7.16	\$250.60	\$12.00	\$420.00	\$16.40	\$574.00	\$6.00	\$210.00
21	Conduit, DB, 2, 3 inch	20	Ft	\$9.82	\$196.40	\$15.00	\$300.00	\$19.60	\$392.00	\$15.00	\$300.00
22	Maintaining Traffic	1	LS	\$10,000.00	\$10,000.00	\$500.00	\$500.00	\$1,600.00	\$1,600.00	\$3,000.00	\$3,000.00
23	Conduit, Directional Bore, 1, 4 inch	50	Ft	\$11.25	\$562.50	\$21.00	\$1,050.00	\$46.00	\$2,300.00	\$25.00	\$1,250.00
24	Sidewalk Ramp, ADA, Modified	700	Sft	\$7.13	\$4,991.00	\$8.00	\$5,600.00	\$15.00	\$10,500.00	\$8.00	\$5,600.00
25	Sidewalk, Conc, 4 inch	75	Sft	\$2.46	\$184.50	\$8.00	\$600.00	\$15.00	\$1,125.00	\$8.00	\$600.00
26	Subbase, CIP	12	Cyd	\$6.68	\$80.16	\$14.00	\$168.00	\$25.00	\$300.00	\$20.00	\$240.00
27	Slope Restoration	155	Syd	\$1.56	\$241.80	\$7.00	\$1,085.00	\$25.00	\$3,875.00	\$3.00	\$465.00
28	Mobilization, Max. _____	1	LS	\$4,000.00	\$4,000.00	\$12,800.00	\$12,800.00	\$13,500.00	\$13,500.00	\$3,000.00	\$3,000.00
29	Sidewalk, Rem	80	Syd	\$4.49	\$359.20	\$10.00	\$800.00	\$9.00	\$720.00	\$10.00	\$800.00
30	RCOC Force Account Fees	1	Dir	\$40,500.00	\$40,500.00	\$40,500.00	\$40,500.00	\$40,500.00	\$40,500.00	\$40,500.00	\$40,500.00
31	Power Co. (Est. Cost to Contractor)	1	Dir	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
32	Controller and Cabinet, Solid State Actuated, Delivered, RCOC	1	Ea	\$12,200.00	\$12,200.00	\$9,600.00	\$9,600.00	\$8,950.00	\$8,950.00	\$20,000.00	\$20,000.00
33	Post, Wood, 6 inch by 8 inch	8	Ft	\$19.67	\$157.36	\$100.00	\$800.00	\$60.00	\$480.00	\$10.00	\$80.00
34	Curb and Gutter, Rem	53	Ft	\$4.25	\$225.25	\$18.00	\$954.00	\$15.00	\$795.00	\$20.00	\$1,060.00
35	Curb and Gutter, Conc, Det B1	26	Ft	\$11.20	\$291.20	\$35.00	\$910.00	\$35.00	\$910.00	\$35.00	\$910.00
36	Curb and Gutter, Conc, Det F5	27	Ft	\$12.20	\$329.40	\$35.00	\$945.00	\$35.00	\$945.00	\$35.00	\$945.00
37	Hand Patching	1	Ton	\$80.00	\$80.00	\$170.00	\$170.00	\$500.00	\$500.00	\$200.00	\$200.00
38	Conc Pavt, Misc, Reinf, 9 inch	3	Syd	\$55.00	\$165.00	\$150.00	\$450.00	\$100.00	\$300.00	\$200.00	\$600.00
39	Crew Days	15	Day	\$615.00	\$9,225.00	\$615.00	\$4,305.00	\$615.00	\$6,765.00	\$615.00	\$6,150.00
TOTAL BASE BID PRICE:					\$166,654.31		\$147,737.00		\$166,974.00		\$162,600.00
TOTAL EXCLUDING CREW DAYS:					\$157,429.31		\$143,432.00		\$160,209.00		\$156,450.00



May 30, 2007

Mr. Rob Hayes, P.E.
Novi City Engineer
45175 W. Ten Mile Road
Novi, MI 48375

Re: Traffic Signal Warrant Study – Beck Road at Cider Mill Boulevard



Dear Mr. Hayes:

Orchard, Hiltz & McCliment, Inc. (OHM) is pleased to submit this traffic signal warrant analysis for the Beck Road at Cider Mill Boulevard intersection between 10 and 11 Mile Roads. Based on our analysis, this location meets one warrant for the installation of a traffic signal. The following represents a summary of the data collected, the procedures used for our analysis and the results compared to the warrants contained in the 2005 edition of Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

Roadway Description

The major road, Beck Road, is a 40 mph, two lane road with one lane for each direction of travel. At the intersection of Cider Mill Boulevard with Beck Road, there is not a dedicated left-turn lane on Beck Road, but there are deceleration and acceleration tapers. The intersection is located approximately 2,330 feet north of 10 Mile Road (a signalized intersection). In addition, the intersection of Beck Road and 11 Mile Road, located approximately 2,925 feet north of the intersection, is also signalized. Beck Road is a relatively flat and straight road between 10 and 11 Mile Roads.

Cider Mill Boulevard at the intersection is a two-lane road with shared through-left and shared through-right lanes on each approach. Thus, we used the warrants associated with two-lane approaches to the major road.

Traffic and Crash Data Collection

24-hour traffic counts were collected for both Cider Mill Boulevard approaches and two-way along Beck Road from Monday, May 21, to Thursday, May 24, 2007. A summary of this data is attached for your information. We noted that the peak period for traffic exiting the site was generally from 7:00 to 8:00 a.m., during which traffic ranged from 99 to 112 for westbound and from 80 to 93 for eastbound Cider Mill Boulevard. During the same period, traffic on Beck Road averaged 1,566 vehicles per hour, total for both directions.

In addition to volume data, a delay study was conducted for both eastbound and westbound Cider Mill Boulevard approaches on Wednesday, May 30, 2007. Data was collected from 7:00 to 8:00 a.m. A summary of this information is also included, and is discussed below in the section on peak hour delay.

Finally, recent crash data for the intersection was obtained from Traffic Improvement Association for the year 2004, 2005 and 2006. Based on the provided crash data, only 9 crashes were reported within the vicinity of the intersection. The crashes consisted of four rear ends, two side-swipes, two single vehicles

and an angle crash. The crashes were dispersed about the intersection. The crash data and collision diagram has been attached.

Traffic Signal Warrants

Having completed the data collection process, we next evaluated the information against the various warrants, or criteria, for the installation of a traffic signal. Traffic signals should not be considered for installation unless one or more of the signal warrants defined in the MMUTCD are met. The warrants and how this location compared are as follows:

Warrant 1 – Eight Hour Vehicular Volume (70% Factor)

Note: If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 40 mph the 70 percent columns from the MMUTCD may be used in place of the 100 percent columns. Due to the 85th-percentile speeds on Beck Road of approximately 45 mph (from previous Beck Road Speed Study by OHM), we are using the 70 percent numbers for Warrants 1, 2 and 3.

The need for a traffic control signal shall be considered if an engineering study finds that one of the following conditions exists for each of any 8 hours of an average day:

- A. The vehicles per hour given in both of the columns of Condition A exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection; or
- B. The vehicles per hour given in both of the columns of Condition B exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection.

In applying each condition the major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of these hours.

Condition A – Minimum Vehicular Volume			
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)	Vehicles per hour on higher-volume minor-street approach (one direction only)
Major Street	Minor Street		
1	2 or more	350	140

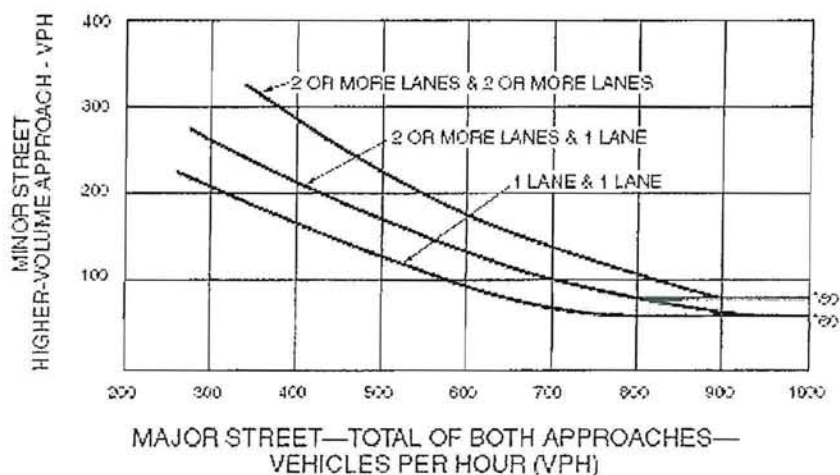
From the data available, we note that at no point does the westbound driveway (higher-volume minor-street approach) exceed the minor thresholds for Condition A.

Condition B – Interruption of Continuous Traffic			
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)	Vehicles per hour on higher-volume minor-street approach (one direction only)
Major Street	Minor Street		
1	2 or more	525	70

From the data available, we note that for only 3 hours does the westbound driveway (higher-volume minor-street approach) exceed the minor thresholds for Condition B. Therefore, Warrant 1 is not met for signalization.

Warrant 2 – Four-Hour Vehicular Volume (70% Factor)

The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) all fall above the applicable curve in the figure below for the existing combination of approach lanes. On the minor street, the higher volume shall not be required to be on the same approach during each of these 4 hours.



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

From the data available, we note that for only 2 hours does the minor-street approach exceed 80 vehicles per hour. Therefore, Warrant 2 is not met for signalization.

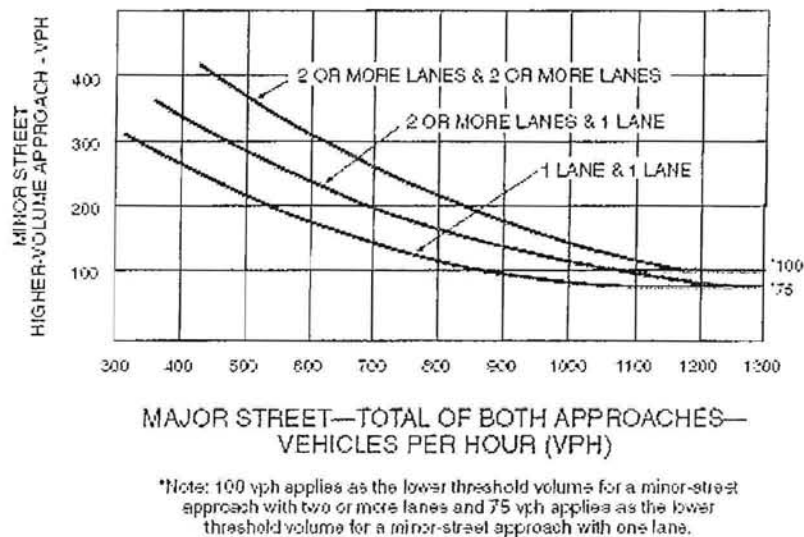
Warrant 3 – Peak Hour (70% Factor)

The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

- A. If all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:
 1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle hours for a two-lane approach, and
 2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
 3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersection with four or more approaches.

From the delay study data, the total vehicles hours of delay during the a.m. peak period is only 0.66 vehicles hours, which is well below the 5 vehicle hours required for a two-lane approach to meet Category A. Therefore, the criteria for Category A are not met.

- B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in the figure below for the existing combination of approach lanes.



From the data available, we note that for 1 hour (7 a.m., WB Cider Mill Boulevard 112, Beck Road 1551) the traffic volumes are above the curve in the figure above. Therefore, the criterion for Category B is met.

Due to the need to only satisfy either Category A or B, Warrant 3 is met for signalization. ✓

Warrant 4 – Pedestrian Volumes

The need for a traffic control signal at an intersection crossing shall be considered if an engineering study finds that both of the following criteria are met:

- The pedestrian volume crossing the major street at an intersection during an average day is 100 or more for each of any 4 hours or 190 or more during any 1 hour; and
- There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular traffic.

This intersection is not a high pedestrian location. The number of pedestrians crossing the major street is less than 100 total per day. Therefore, Warrant 4 is not met for signalization.

Warrant 5 – School Crossing

The need for a traffic control signal shall be considered when an engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of school children at an established school crossing across the major street shows that the number of adequate gaps in the traffic stream during the period when the children are using the crossing is less than the number of minutes in the same period and there are a minimum of 20 students during the highest crossing hour.

This intersection is not a school crossing location. Therefore, Warrant 5 is not met for signalization.

Warrant 6 – Coordinated Signal System

The need for a traffic control signal shall be considered if an engineering study finds that one of the following criteria is met:

- A. On a one-way street or a street that has traffic predominantly in one direction; the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.
- B. On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.

A signal is not required in this location to improve platooning of vehicles for adjacent signals. Therefore Warrant 6 is not met for signalization.

Warrant 7 – Crash Experience

The need for a traffic control signal shall be considered if an engineering study finds that all of the following criteria are met:

- A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.
- B. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and
- C. There has to exist a volume of vehicular and pedestrian traffic no less than 80% of the requirements specified in either Minimum Vehicular Volume, Interruption of Continuous Traffic (Warrant 1) or Pedestrian Volumes (Warrant 3).

The crash frequency at this intersection is three per year with only two personal injury crashes over the 3 year period from 2004 through 2006. Therefore, Warrant 7 is not met for signalization.

Warrant 8 – Roadway Network

The need for a traffic control signal shall be considered if an engineering study finds that the common intersection of two or more major routes meets one or both of the following criteria:

- A. The intersection has a total existing, or immediately projected, entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday and has 5-year projected traffic volumes, based on an engineering study, that meet one or more of Warrants 1, 2, and 3 during an average weekday; or

- B. The intersection has a total existing or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a non-normal business day (Saturday or Sunday).

A major route as used in this signal warrant shall have one or more of the following characteristics:

- A. It is part of the street or highway system that serves as the principal roadway network for through traffic flow; or
- B. It includes rural or suburban highways outside, entering, or traversing a City; or
- C. It appears as a major route on an official plan, such as a major street plan in an urban area traffic and transportation study.

As described above there is only one major route at this intersection (Beck Road). Therefore, Warrant 8 does not apply for this intersection and is not met for signalization.

Analysis

Based on the evaluation of the signal warrants this location meets Warrant 3 -- Peak Hour. This makes it eligible for **consideration** of a signal installation.

Although the Peak Hour Warrant is met, it should be noted that this warrant is intended for use at locations where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. From the delay study, it is apparent that the delay to Cider Mill Boulevard is minimal at this time. For the eastbound Cider Mill Boulevard approach, the approach experiencing the most delay during the peak period, the average stopped time per vehicle is 27 seconds, with the longest single vehicle stopped time of 103 seconds. The average queue was less than 1 vehicle and the maximum queue was only 7 vehicles.

With the installation of a traffic signal, vehicles on eastbound Cider Mill Boulevard would expect to continue experiencing over 20 seconds of delay. Although minimal, the signal would also introduce delay to Beck Road that is not there today.

Also, if a signal were to be installed, the boulevard section along Cider Mill Boulevard may pose a problem for the left turning vehicles. The boulevard section does not allow for the left turn lanes to properly line up across the intersection. When Cider Mill Boulevard receives the green indication, there is a potential for left turn overlap, possibly leading to collisions.

Recommendations

At this time we are recommending against traffic signal installation. We find the delay experienced on Cider Mill Boulevard to be minimal. However, the intersection should continue to be monitored for a possible future signal installation.

If the City determines to proceed with a traffic signal installation at this location, we recommend:

1. The installation to be installed as semi-actuated. Due to this location only needing a signal in the peak hour, the signal should dwell green for Beck Road throughout the day with detection on Cider Mill Boulevard.

May 30, 2007
Mr. Rob Hayes
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2. Left turn lanes should be added along Beck Road at the intersection with Cider Mill Boulevard.
3. The Cider Mill Boulevard medians should be modified to better align the left-turn lanes.

We hope you find this information useful. Please advise if you have any questions.

Sincerely,
ORCHARD, HILTZ & MCCLIMENT, INC.

A handwritten signature in black ink, appearing to read "S. Loveland". The signature is fluid and cursive, with the first letter of the first name being a large, stylized 'S'.

Steven M. Loveland, P.E.
Traffic Project Engineer

APPENDIX A

TRAFFIC VOLUME DATA

Latitude: 0.000

Start Time	21-May-07		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel
12:00 AM	*	*	53	45	0	86	0	102	*	*	*	*	*	*	18	78
01:00	*	*	24	23	0	55	0	64	*	*	*	*	*	*	8	47
02:00	*	*	15	19	0	39	0	27	*	*	*	*	*	*	5	28
03:00	*	*	22	22	0	41	0	41	*	*	*	*	*	*	7	35
04:00	*	*	40	25	0	57	0	71	*	*	*	*	*	*	13	51
05:00	*	*	154	146	0	295	0	292	*	*	*	*	*	*	51	244
06:00	*	*	383	550	29	933	1	667	*	*	*	*	*	*	138	717
07:00	*	*	694	857	694	886	*	*	*	*	*	*	*	*	694	872
08:00	*	*	622	809	661	827	*	*	*	*	*	*	*	*	642	818
09:00	*	*	452	622	484	662	*	*	*	*	*	*	*	*	468	642
10:00	*	*	434	584	442	594	*	*	*	*	*	*	*	*	438	589
11:00	*	*	459	590	438	605	*	*	*	*	*	*	*	*	448	598
12:00 PM	*	*	466	617	483	638	*	*	*	*	*	*	*	*	474	628
01:00	421	621	452	578	470	615	*	*	*	*	*	*	*	*	448	605
02:00	520	738	497	751	599	714	*	*	*	*	*	*	*	*	539	734
03:00	620	802	660	822	702	853	*	*	*	*	*	*	*	*	661	826
04:00	701	928	700	909	758	893	*	*	*	*	*	*	*	*	720	910
05:00	679	917	617	912	766	861	*	*	*	*	*	*	*	*	687	897
06:00	593	782	621	827	0	1376	*	*	*	*	*	*	*	*	405	995
07:00	411	549	134	822	0	940	*	*	*	*	*	*	*	*	182	770
08:00	335	428	0	833	0	900	*	*	*	*	*	*	*	*	112	720
09:00	258	270	1	612	0	617	*	*	*	*	*	*	*	*	86	500
10:00	111	140	0	325	0	348	*	*	*	*	*	*	*	*	37	271
11:00	78	84	0	162	1	175	*	*	*	*	*	*	*	*	26	140
Lane Day	4727	6259	7500	12462	6527	14010	1	1264	0	0	0	0	0	0	7307	12715
AM Peak Volume			694	857	694	933	1	667							694	872
PM Peak Volume	16:00	16:00	701	928	700	912	766	1376							720	995
Comb. Total	10986		19962		20537		1265		0	0	0	0	0	20022		
ADT	Not Calculated															

Latitude: 0.000

Start Time	Mon 21-May-07	Tue 22-May-07	Wed 23-May-07	Thu 24-May-07	Fri 25-May-07	Average Day	Sat 26-May-07	Sun 27-May-07	Week Average
12:00 AM	*	6	1	2	*	3	*	*	3
01:00	*	2	3	1	*	2	*	*	2
02:00	*	0	0	0	*	0	*	*	0
03:00	*	2	1	1	*	1	*	*	1
04:00	*	1	0	1	*	1	*	*	1
05:00	*	21	19	20	*	20	*	*	20
06:00	*	69	79	*	*	74	*	*	74
07:00	*	93	80	*	*	86	*	*	86
08:00	*	78	54	*	*	66	*	*	66
09:00	*	24	24	*	*	24	*	*	24
10:00	*	28	20	*	*	24	*	*	24
11:00	*	29	28	*	*	28	*	*	28
12:00 PM	18	28	35	*	*	27	*	*	27
01:00	29	35	38	*	*	34	*	*	34
02:00	33	35	34	*	*	34	*	*	34
03:00	43	39	46	*	*	43	*	*	43
04:00	42	51	51	*	*	48	*	*	48
05:00	46	48	41	*	*	45	*	*	45
06:00	35	65	42	*	*	47	*	*	47
07:00	36	37	23	*	*	32	*	*	32
08:00	25	22	26	*	*	24	*	*	24
09:00	12	13	17	*	*	14	*	*	14
10:00	12	13	17	*	*	14	*	*	14
11:00	11	4	6	*	*	7	*	*	7
Day Total	342	743	685	25	0	698	0	0	698
% Avg. WkDay	49.0%	106.4%	98.1%	3.6%	0.0%				
% Avg. Week	49.0%	106.4%	98.1%	3.6%	0.0%	100.0%	0.0%	0.0%	
AM Peak Volume		07:00 93	07:00 80	05:00 20		07:00 86			07:00 86
PM Peak Volume	17:00 46	18:00 65	16:00 51			16:00 48			16:00 48
Grand Total	342	743	685	25	0	698	0	0	698
ADT	Not Calculated								

Latitude: 0.000

Start Time	Mon 21-May-07	Tue 22-May-07	Wed 23-May-07	Thu 24-May-07	Fri 25-May-07	Average Day	Sat 26-May-07	Sun 27-May-07	Week Average
12:00 AM	*	2	7	1	*	3	*	*	3
01:00	*	4	5	3	*	4	*	*	4
02:00	*	1	6	4	*	4	*	*	4
03:00	*	3	1	1	*	2	*	*	2
04:00	*	2	5	2	*	3	*	*	3
05:00	*	22	18	18	*	19	*	*	19
06:00	*	48	50	*	*	49	*	*	49
07:00	*	112	99	*	*	106	*	*	106
08:00	*	95	86	*	*	90	*	*	90
09:00	*	56	59	*	*	58	*	*	58
10:00	*	49	37	*	*	43	*	*	43
11:00	*	45	44	*	*	44	*	*	44
12:00 PM	46	60	63	*	*	56	*	*	56
01:00	55	40	41	*	*	45	*	*	45
02:00	39	53	52	*	*	48	*	*	48
03:00	36	54	63	*	*	51	*	*	51
04:00	58	50	54	*	*	54	*	*	54
05:00	93	74	74	*	*	80	*	*	80
06:00	58	60	67	*	*	62	*	*	62
07:00	53	50	53	*	*	52	*	*	52
08:00	33	36	38	*	*	36	*	*	36
09:00	23	22	27	*	*	24	*	*	24
10:00	6	11	17	*	*	11	*	*	11
11:00	8	10	6	*	*	8	*	*	8
Day Total	508	959	972	29	0	952	0	0	952
% Avg. WkDay	53.4%	100.7%	102.1%	3.0%	0.0%				
% Avg. Week	53.4%	100.7%	102.1%	3.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak Volume		07:00 112	07:00 99	05:00 18		07:00 106			07:00 106
PM Peak Volume	17:00 93	17:00 74	17:00 74			17:00 80			17:00 80
Grand Total	508	959	972	29	0	952	0	0	952

ADT Not Calculated

APPENDIX B

DELAY STUDY

OHM, Inc.
 34000 Plymouth Road
 Livonia, MI 48150
Engineering Advisors

File Name : stop delay 700-800
 Site Code : 00000001
 Start Date : 5/30/2007
 Page No : 1

Summary Information:	WB CIDER MILL	EB CIDER MILL
7:00:00 AM - 8:00:00 AM	Lane 1	Lane 2
Total Vehicle Count:	123	87
Delayed Vehicle Count:	123	87
Through Vehicle Count:	0	0
Average Stopped Time:	14.41	26.954
Maximum Stopped Time:	65	103
Min. Secs. for Delay:	0	0
Average Queue:	0.50	0.657
Queue Density:	1.56	1.524
Maximum Queue:	4	7
Delay in Vehicle Hour:	0.51	0.6570468
Total Delay:	1773	2345

APPENDIX C

CRASH DATA

Intersection Crash Report

Dates: 01/01/2004 - 12/31/2006
Roads: Beck Rd / N (2.40 - 2.48)
Cider Mill Dr / E (0 - 0.04)

Criteria:

TIA Traffic Crash Analysis Tool

Report Printed On 5/15/2007

#1
Location: BECK RD (2.45) 0 feet X of CIDER MILL DR **Serial #:** 8942981
Veh Dir Action Prior 1st Event 2nd Event 3rd Event 4th Event Hazard Action Veh Type Damage
 N go straight veh in transpt none none none unable to stop car ctrfrnt
 N slow/stop on rd veh in transpt veh in transpt none none none car ctrfrnt
 N left turn veh in transpt none none none none pickup ctrrear
CVT: 62 Date/Hr/Day: 11/24/2006 / 4pm / Fri **#k/pi:** 0/0 **Wthr:** clear **Rd:** dry **Lt:** day **Area:** strght.unrel **How:** rr-end **HBD:** 0

#2
Location: BECK RD (2.41) 200 feet S of CIDER MILL RD **Serial #:** 8943327
Veh Dir Action Prior 1st Event 2nd Event 3rd Event 4th Event Hazard Action Veh Type Damage
 S go straight veh in transpt none none none unable to stop car ctrfrnt
 S stop on road veh in transpt none none none none car ctrrear
CVT: 62 Date/Hr/Day: 12/01/2006 / 5pm / Fri **#k/pi:** 0/0 **Wthr:** snow **Rd:** wet **Lt:** dark/unltd **Area:** strght.unrel **How:** rr-end **HBD:** 0

#3
Location: BECK RD (2.45) 0 feet X of CIDERMILL RD **Serial #:** 7567940
Veh Dir Action Prior 1st Event 2nd Event 3rd Event 4th Event Hazard Action Veh Type Damage
 N go straight veh in transpt none none none unable to stop car ctrfrnt
 N stop on road veh in transpt none none none none car ctrrear
CVT: 62 Date/Hr/Day: 07/05/2006 / 4pm / Wed **#k/pi:** 0/2 **Wthr:** clear **Rd:** dry **Lt:** unkn **Area:** unkn **How:** rr-lt **HBD:** 0

#4
Location: CIDER MILL DR (0.00) 3 feet E of BECK RD **Serial #:** 8942988
Veh Dir Action Prior 1st Event 2nd Event 3rd Event 4th Event Hazard Action Veh Type Damage
 E right turn loss of control veh in transpt none none left of center pickup ctrfrnt
 W slow/stop on rd veh in transpt none none none none car lftfrnt
CVT: 62 Date/Hr/Day: 12/04/2006 / 5pm / Mon **#k/pi:** 0/0 **Wthr:** snow **Rd:** snowy **Lt:** dark/unltd **Area:** w/i intersection **How:** ss-opp **HBD:** 0

#5
Location: N BECK RD (2.48) 200 feet N of CIDER MILL DR **Serial #:** 6743811
Veh Dir Action Prior 1st Event 2nd Event 3rd Event 4th Event Hazard Action Veh Type Damage
 N go straight animal none none none none none car rtrfrnt
CVT: 62 Date/Hr/Day: 12/20/2004 / 5pm / Mon **#k/pi:** 0/0 **Wthr:** clear **Rd:** slushy **Lt:** dark/unltd **Area:** strght.unrel **How:** single **HBD:** 0

#6
Location: N BECK RD (2.43) 100 feet S of CIDER MILL RD **Serial #:** 8191843
Veh Dir Action Prior 1st Event 2nd Event 3rd Event 4th Event Hazard Action Veh Type Damage
 N change lanes veh in transpt none none none none none car lftside
 S go straight veh in transpt none none none none none van lftside
CVT: 62 Date/Hr/Day: 11/07/2005 / 12am / Mon **#k/pi:** 0/0 **Wthr:** clear **Rd:** unkn **Lt:** day **Area:** strght.unrel **How:** ss-opp **HBD:** 0

#7
Location: N BECK RD (2.45) 0 feet X of CIDERMILL **Serial #:** 8192063
Veh Dir Action Prior 1st Event 2nd Event 3rd Event 4th Event Hazard Action Veh Type Damage
 N go straight animal none none none none none none car lftside
CVT: 62 Date/Hr/Day: 11/20/2005 / 5pm / Sun **#k/pi:** 0/0 **Wthr:** cloudy **Rd:** dry **Lt:** dusk **Area:** w/i intersection **How:** single **HBD:** 0

#8
Location: S BECK (2.45) 20 feet W of CIDERMILL **Serial #:** 8943104
Veh Dir Action Prior 1st Event 2nd Event 3rd Event 4th Event Hazard Action Veh Type Damage
 E unknown none none none none none none car ctrfrnt
 S left turn veh in transpt none none none none none none van rtrear
CVT: 62 Date/Hr/Day: 10/28/2006 / 3pm / Sat **#k/pi:** 0/1 **Wthr:** cloudy **Rd:** wet **Lt:** day **Area:** w/i intersection **How:** angle **HBD:** 0

#9
Location: S BECK RD (2.45) 0 feet X of CIDERMILL ST **Serial #:** 8679765
Veh Dir Action Prior 1st Event 2nd Event 3rd Event 4th Event Hazard Action Veh Type Damage
 S go straight veh in transpt none none none none none none van ctrfrnt
 S stop on road veh in transpt none none none none none none smltruck ctrrear
CVT: 62 Date/Hr/Day: 10/30/2006 / 3pm / Mon **#k/pi:** 0/0 **Wthr:** clear **Rd:** dry **Lt:** day **Area:** strght.unrel **How:** rr-end **HBD:** 0

Crash Type

Count	Type
2	single
1	angle
3	rr-end
1	rr-lt
2	ss-opp
Totals: 9	

Light Condition

Count	Type
1	unkn
4	day
1	dusk
3	dark/unltd
Totals: 9	

Weather

Count	Type
5	clear
2	cloudy
2	snow
Totals: 9	

Road Condition

Count	Type
1	unkn
4	dry
2	wet
1	snowy
1	slushy
Totals: 9	

Vehicle Type

Count	Type
0	unkn
11	car
2	pickup
0	mcycle
0	go-cart
0	orv/atv
0	truck/bus
3	van
1	smltruck
0	moped
0	snowmobile
0	other
Totals: 17	

Crashes By Month

Count	Type
1	July
2	October
3	November
3	December
Totals: 9	

Hazardous Action

Count	Type
11	none
0	too fast
0	too slow
0	fail to yield
0	disrgd traf ctl
0	wrong way
1	left of center
0	improp passing
1	improp lane use
0	improp turn
0	improp/no signl
0	improp backing
4	unable to stop
0	other
0	unknown
0	reck driving
0	negl driving
Totals: 17	

Crash Severity

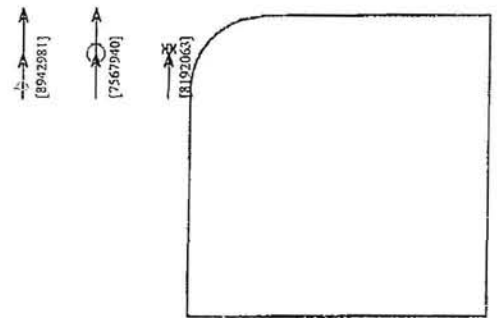
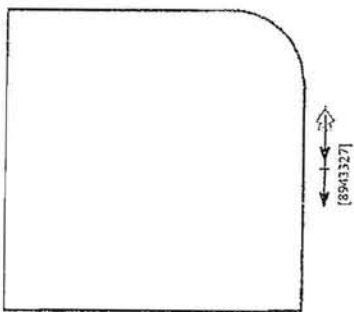
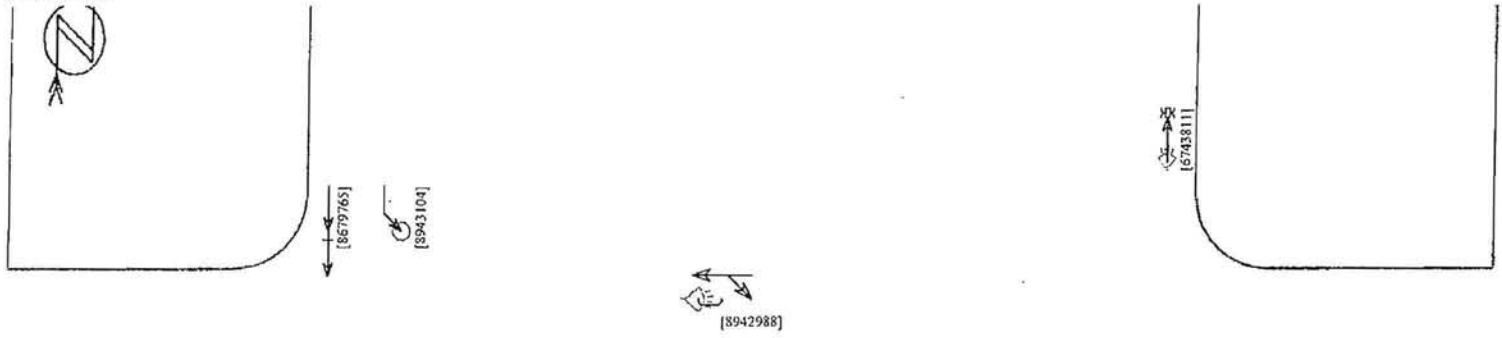
	FATAL	A	B	C	No Inj	Total
Persons	0	0	0	3	25	28
Crashes	0	0	0	2	7	9

Alcohol in Crashes

	FATAL	PI	PD	Total
Drinking	0	0	0	0
Not Drinking	0	2	7	9
Total	0	2	7	9

Time Period	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Unknown	Totals
12a - 1a	0	0	0	0	0	0	0	0	0
1a - 2a	0	0	0	0	0	0	0	0	0
2a - 3a	0	0	0	0	0	0	0	0	0
3a - 4a	0	0	0	0	0	0	0	0	0
4a - 5a	0	0	0	0	0	0	0	0	0
5a - 6a	0	0	0	0	0	0	0	0	0
6a - 7a	0	0	0	0	0	0	0	0	0
7a - 8a	0	0	0	0	0	0	0	0	0
8a - 9a	0	0	0	0	0	0	0	0	0
9a - 10a	0	0	0	0	0	0	0	0	0
10a - 11a	0	0	0	0	0	0	0	0	0
11a - 12p	0	0	0	0	0	0	0	0	0
12p - 1p	0	1	0	0	0	0	0	0	1
1p - 2p	0	0	0	0	0	0	0	0	0
2p - 3p	0	0	0	0	0	0	0	0	0
3p - 4p	0	1	0	0	0	0	1	0	2
4p - 5p	0	0	0	1	0	1	0	0	2
5p - 6p	1	2	0	0	0	1	0	0	4
6p - 7p	0	0	0	0	0	0	0	0	0
7p - 8p	0	0	0	0	0	0	0	0	0
8p - 9p	0	0	0	0	0	0	0	0	0
9p - 10p	0	0	0	0	0	0	0	0	0
10p - 11p	0	0	0	0	0	0	0	0	0
11p - 12a	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0
Totals	1	4	0	1	0	2	1	0	9

9 Crashes



(0) crashes could not be placed in this schematic

- ← Straight
- ←| Stopped
- ← Unknown
- ↔ Backing
- ↔↔ Overtaking
- ↔ Sideswipe

- ▭ Parked
- ↔ Erratic
- ↔ Out of control
- ↗ Right turn
- ↖ Left turn
- ↻ U-turn

- × Pedestrian
- ⊗ Bicycle
- Injury
- ⊙ Fatality
- ⦿ Nighttime
- ⦿ DUI

- Fixed objects:
- General
 - ▣ Signal
 - ⊠ Tree
 - ▣ Pole
 - ⊠ Curb
 - ⊠ Animal
 - ◻ 3rd vehicle
 - ⋆ Extra data