Presented To:	Operations Committee
Presented:	Monday, Apr 14, 2014
Report Date	Wednesday, Mar 26, 2014
Type:	Managers' Reports

Request for Decision

Bouchard Street at Marcel Street All-Way Stop

Recommendation

THAT the City of Greater Sudbury remove the all-way stop at the intersection of Bouchard Street and Marcel Street following the construction of a raised intersection in the Summer of 2014.

AND THAT a by-law be presented to amend Traffic and Parking By-Law 2010-01 in the City of Greater Sudbury to implement the recommended changes in accordance with the report from the General Manager of Infrastructure Services dated March 26, 2014 regarding the Bouchard Street at Marcel Street All-Way Stop.

Signed By

Report Prepared By
Dave Kivi
Co-ordinator of Transportation & Traffic Engineering Services
Digitally Signed Mar 26, 14

Division Review
David Shelsted
Director of Roads & Transportation Services
Digitally Signed Mar 26, 14

Recommended by the Department
Tony Cecutti
General Manager of Infrastructure Services
Digitally Signed Mar 26, 14

Recommended by the C.A.O.
Doug Nadorozny
Chief Administrative Officer
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Background

All-Way Stops were installed at five intersections in the City including Bouchard Street and Marcel Street, in the Spring of 2012. The Operations Committee requested “that the controls be reviewed after a period of one year after installation”.

At the Operations Committee meeting held on October 21, 2013, Staff presented a report dated August 1, 2013, providing the results of follow up studies at all five of the intersections (see Exhibit ‘A’).

In order to determine the impact and effectiveness of the all-way stops, Staff reviewed a number of factors including:

- Delay and Queue Lengths
- Stop Sign Compliance
- Fuel Consumption
- Environmental Impacts
- Speed
- Traffic Volumes
- Safety

- Public Feedback

Based on the follow up review, Staff recommended that the all-way stops be removed at all five intersections. However, the Operations Committee recommended that removal of the all-way stop at Bouchard Street and Marcel Street be deferred until the traffic calming results have been received.

As a result of an infrastructure improvement and resurfacing project on Southview Drive/Bouchard Street in 2013, the traffic calming devices were removed between Marcel Street and the east leg of Cranbrook Crescent. Removal of the devices presented the opportunity to poll the affected residents of the street to determine what, if any, traffic calming devices should be replaced. In December 2013, surveys were sent out requesting that residents vote for one of the following three options:

Option 1 – Restore previous traffic calming features.
Option 2 – Install speed humps and raised intersection.
Option 3 – Do not replace traffic calming features.

Based on the responses received from the residents, the majority preferred Option 2, to install speed humps and a raised intersection at Bouchard and Marcel Streets (see Exhibit 'B').

A raised intersection (including crosswalks) is an intersection constructed at a higher elevation than the adjacent roadways leading to and from the intersection. A raised intersection helps reduce vehicle speeds, better defines crosswalk areas and helps to reduce pedestrian-vehicle conflicts. Similar to a speed hump, a raised intersection will rise 80 mm (3 inches), remain flat for the length of intersection and then drop back down to match adjacent road elevation. The reduced speed will assist pedestrians crossing Bouchard at Marcel Street more safely.

The 4 temporary speed humps will be installed this Summer and removed in the Fall, but the raised intersection will remain for the duration of the winter. During the Winter of 2014/2015, residents will be consulted again whether to reinstate the speed humps permanently and keep the raised intersection, or to remove all the traffic calming features.

Staff recommends that the all-way stop at the intersection of Bouchard Street and Marcel Street be removed following the construction of the raised intersection. Removing the unwarranted all-way stop will allow the proper evaluation of the raised intersection.

Presented To:	Operations Committee
Presented:	Monday, Aug 12, 2013
Report Date	Thursday, Aug 01, 2013
Type:	Managers' Reports

Request for Decision

All-Way Stop Control - One Year Review (1) Bouchard Street at Marcel Street, Sudbury (2) Lansing Avenue at Melbourne Street, Sudbury (3) Hawthorne Drive at Westmount Avenue, Sudbury (4) Madeleine Avenue at Main Street, Sudbury (5) Madeleine Avenue at Alexander Street, Sudbury

Recommendation

THAT all-way stops be removed at the following locations:

1. Bouchard Street at Marcel Street
2. Lansing Avenue at Melbourne Street
3. Hawthorne Drive at Westmount Avenue
4. Madeleine Avenue at Main Street
5. Madeleine Avenue at Alexander Street, and;

THAT the procedure to remove the all-way stop signs as outlined in the report be followed with a communications plan.

Signed By

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Recommended by the C.A.O.
Doug Nadorozny
Chief Administrative Officer
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Background

At the Operations Committee meeting held on January 9, 2012, the Committee approved the installation of all-way stops at the following intersections:

1. Bouchard Street at Marcel Street
2. Lansing Avenue at Melbourne Street
3. Hawthorne Drive at Westmount Avenue
4. Madeleine Avenue at Main Street
5. Madeleine Avenue at Alexander Street

The Committee also requested "that the controls be reviewed after a period of one year after installation".

Exhibit 'I' contains the staff report dated December 23, 2011 that presents the all-way stop analysis for each of the above intersections. None of the intersections reviewed satisfied the minimum vehicle volumes, pedestrian volumes and collision experience required to warrant the installation of an all-way stop under the City's All-Way Stop Control Policy.

The signs and pavement markings required to implement all-way stops at the subject intersections were installed in May and June last year. As directed by City Council, staff has conducted a number of follow-up studies to determine the impact the installation of unwarranted all-way stops has had on traffic operations in the area. Information related to delay, compliance, fuel consumption, environmental impacts, speed, traffic volume, safety and public feedback are presented below.

Delay and Queue Length Studies

One way to measure the impact of installing an all-way stop is to undertake delay and queue length studies on the approaches where the new stop signs were installed. A concern with the installation of all-way stops at intersections where the traffic volume split heavily favors the main street, is the delay that may be introduced to residents who legitimately use the roadway.

A review of the all-way stop warrants shows that less than 10 percent of vehicles entering the intersections of Bouchard Street at Marcel Street and Lansing Avenue at Melbourne Street are coming from the side street. Both Bouchard Street and Lansing Avenue serve as major collector roadways for their areas and are used by residents to access their residential neigbourhoods.

City staff conducted site visits at the intersections of Bouchard Street at Marcel Street and Lansing Avenue at Melbourne Street to record the time it took to clear the intersection from the end of the queue. At the intersection of Bouchard Street and Marcel Street, a total of 23 vehicle runs were completed between 4:00 P.M. and 5:30 P.M., while at the intersection of Lansing Avenue and Melbourne Street, a total of 13 runs were completed between 4:30 P.M. and 5:45 P.M. A summary of the results can be found in the following table:

Intersection	Approach	Average Delay (seconds)	Maximum Observed Delay (seconds)
Bouchard Street at Marcel Street	Eastbound	96	225
	Westbound	23	44
Lansing Avenue at Melbourne Street	Northbound	20	27
	Southbound	13	17

The results from the runs were as expected. On Bouchard Street, where traffic volumes during the afternoon peak hours exceed 1,000 vehicles per hour, significant delays were introduced, particularly in the eastbound direction. On Lansing Avenue, where volume exceeds 500 vehicles per hour, the delay introduced was much less. The increased delay to drivers can also be represented as an annual dollar value by using the following formula:

Total Annual Cost = OCC*W*D*SV*AVD/3600 * Average Canadian Wage

OCC = average person occupancy rate = 1.2
W = weeks in a year = 52
D = number of weekdays in a week = 5
SV = study volume = varies per intersection and approach
AVD = average delay= varies per intersection and approach
Average Canadian Wage (June 2013 - from Statistics Canada) = $24.01

The total annual costs for the study times observed are summarized in the following table:

Intersection	Approach	Average Delay (seconds)	Study Volume	Total Annual Cost
Bouchard Street at Marcel Street	Eastbound	96	814	$162,607.24
	Westbound	23	776	$37,139.81
Lansing Avenue at Melbourne Street	Northbound	20	299	$12,443.58
	Southbound	13	533	$14,418.33

The above dollar figures represent only the annual cost associated with the delay introduced during the period of times studied (4 PM to 5:30 PM on Bouchard Street and 4:30 P.M. to 5:45 P.M. on Lansing Avenue). All delay experienced outside of the study times would add additional dollars to those figures.

While staff was on site at each intersection, the length of the queue of vehicles they observed was also recorded. The observed results are summarized in the table below:

Intersection	Approach	Average Queue Length (metres)	Maximum Observed Queue Length (metres)
Bouchard Street at Marcel Street	Eastbound	174	345
	Westbound	23	66
Lansing Avenue at Melbourne Street	Northbound	31	42
	Southbound	15	21

From the table it is apparent that a significant number of vehicles were queued at the intersection of Bouchard Street and Marcel Street. Within a typical queue, each car takes approximately seven metres of space. For eastbound vehicles on Bouchard Street, the average queue length represents almost 25 vehicles while the maximum observed queue was approximately 50 vehicles long. Additionally, the observed eastbound queue lengths on Bouchard Street were often extended beyond the Bouchard Street at Southview Drive intersection, which in turn created additional delays while left turning vehicles waited for vehicles in the queue to allow them to turn in front of them.

Stop Sign Compliance

One of the ways to measure the effectiveness of a stop sign is to measure the number of drivers that actually come to a complete stop as required by the Highway Traffic Act. Staff conducted compliance studies at all of the five newly created all-way stop intersections as well as two control intersections where all-way stops are warranted. The results are presented below.

Intersection	Stop	Rolling Stop	No Stop	Total Hourly Volume
Bouchard Street at Marcel Street	23%	74%	3%	930
Lansing Avenue at Melbourne Street	31%	66%	3%	509
Westmount Avenue at Hawthorne Drive	35%	64%	1%	411
Madeleine Avenue at Main Street	28%	65%	7%	90
Madeleine Avenue at Alexander Street	20%	50%	30%	53
Average	27.4%	63.8%	8.8%	

Intersection	Stop	Rolling Stop	No Stop	Total Hourly Volume
Regent Street at Douglas Street	71%	28%	1%	1,004
Mackenzie Street at Baker Street	50%	48%	2%	391
Average	60.5%	38%	1.5%	

The compliance studies were completed by setting up a video camera system at the intersection that records all movements of traffic over the four to seven peak hours of the day, depending if the intersection is on a major or minor collector roadway. The videos were then reviewed by staff who recorded whether each vehicle came to a full stop, a rolling stop or did not attempt to stop.

As shown in the chart below, only about 27 percent of drivers came to a full stop at the unwarranted all-way stop intersections compared to 60 percent at the warranted intersections. Approximately 73 percent of drivers at the unwarranted intersections either made a rolling stop or made no attempt to stop at all. At the intersection of Madeleine Avenue and Alexander Street, a full 30 percent of drivers did not attempt to stop. This intersection has the lowest total traffic volume with only 53 vehicles per hour. With such low conflicting traffic, some drivers see no reason to stop.

The high incidence of non-compliance at the unwarranted stop locations is not unexpected. Drivers and pedestrians become less vigilant when there is onus on the other drivers to stop. This behavior can decrease safety at the intersections, especially for young children who expect adults to obey the law. This bad behavior can also spread to other locations where an all-way stop is warranted.

Fuel Consumption

It is estimated that the additional gasoline that is consumed by the installation of an all-way stop on a typical

collector roadway is 125 litres per day or 45,600 litres per year. Expanding this figure for the five intersections, results in a total of 228,000 litres of gas. At a cost of $1.30 per litre, the subject intersections consume an extra **$296,000** worth of fuel each year.

Environmental Impacts

As reported by the Ministry of Municipal Affairs and Housing, at a typical all-way stop location, the following vehicle emissions are released each year:

- 657 kg of hydro carbons
- 8,760 kg of carbon monoxide
- 675 kg of nitrogen oxide
- 65,700 kg of carbon dioxide

Expanding these figures for the five all-way stop locations under review results in the following harmful gas emissions:

- 3,300 kg of hydro carbons
- 43,800 kg of carbon monoxide
- 3,300 kg of nitrogen oxide
- 328,500 kg of carbon dioxide

Besides increasing harmful greenhouse gas emissions, all-way stops also increase the level of noise pollution near the intersections due to the constant braking and acceleration that occurs.

Speed

Often times, all-way stops are requested by residents to try and slow traffic down. Unfortunately, all-way stops are not effective as speed control devices except within close proximity to the sign. To determine if the all-way stops were effective in reducing speed, staff conducted 24 hour speed studies on Southview Drive, Lansing Avenue and Hawthorne Drive. Southview Drive and Hawthorne Drive had speed studies that were taken before the all-way stops were installed that can be used for comparison purposes. The results are indicated below.

Speed Study Results

		Before		After		Difference	
Location	Direction	Average Speed (km/h)	85th Percentile Speed (km/h)	Average Speed (km/h)	85th Percentile Speed (km/h)	Average Speed (km/h)	85th Percentile Speed (km/h)
Southview Drive – 125 Metres West of Bouchard Street	Eastbound	52.1	56.3	47.8	53.1	-4.3	-3.2
	Westbound	53.9	59.5	51.9	56.3	-2.0	-3.2
Lansing Avenue – North of Lamothe Street	Northbound	n/a	n/a	48.7	56.3	n/a	n/a
	Southbound	n/a	n/a	43.4	56.3	n/a	n/a
Lansing Avenue – South of Kelvin Street	Northbound	n/a	n/a	47.3	54.7	n/a	n/a
	Southbound	n/a	n/a	50.9	57.9	n/a	n/a
Hawthorne Drive – East of Sharon Avenue	Eastbound	52.9	59.5	51.0	57.9	-1.9	-1.6
	Westbound	53.2	61.2	58.6	67.6	5.4	6.4

The results of the speed studies show that speeding is still a problem in close proximity to the stop signs. While speeds are lower on Southview Drive, west of Bouchard Street, the difference may be attributed to vehicles slowing as they approach the back of the long queue of vehicles. The studies show that speeding is still a problem on Lansing Avenue, north of Lamothe Street despite there being all-way stops at the adjacent intersections to the north and south.

The largest change in speed occurred on Hawthorne Drive, where the 85th percentile speed for westbound traffic has increased by more than 6 km/h. This may be due to drivers increasing their speed to make up for lost time which is commonly reported at all-way stops.

Traffic Volumes

A common misconception about all-way stops is they will help lower traffic volumes on adjacent roadways by discouraging cut-through traffic. As part of the follow-up review, staff completed new turning movement counts at all five subject intersections. A review of traffic volumes at the intersections before and after the all-way stops were installed revealed that overall traffic volumes did not change significantly. A review of the all-way stop warrants indicates that none of the five intersections currently warrants the installation of an all-way stop.

A closer review of the turning movement count at Bouchard Street and Marcel Street indicates that traffic patterns are changing during the peak hours of the day. The number of left turning vehicles from Marcel Street has increased by 23 percent from the south leg of the intersection and 17 percent from the north leg of the intersection. As previously discussed, a significant delay has been introduced at this intersection since the installation of the all-way stop and queue lengths in the eastbound direction often block the intersection of Bouchard Street and Southview Drive. It is suspected that the increase in traffic on Marcel Street is a result of these vehicles attempting to avoid the long queues and delays on Bouchard Street. The counts show that traffic volumes on Bouchard Street have increased by 6% from the count taken in 2011. It should also be noted that the number of pedestrians that crossed Bouchard Street at Marcel Street has not changed from 2011 to 2013.

Safety

It is difficult to assess the impact that the all-way stops had on safety during the year they have been installed. When reviewing safety at an intersection, it is recommended that a minimum of three years of collision history be reviewed. This wider range of view helps identify if there is a correctable pattern to the collisions or if a rash of collisions may be due to seasonal factors (ie. icy roads).

Typically, the installation of an all-way stop will help reduce the number of angle type collisions at an intersection if they are prevalent. However, the installation of an all-way stop may also increase the frequency of rear end collisions.

The collision history from 2008 to 2012 (pre all-way stop installed) and from 2012 (post all-way stop installed) to June 30, 2013 has been summarized in the table below:

Intersection	Average Number of Collisions per Year		Difference
	Before	After	
Bouchard Street at Marcel Street	0.75	1	+0.25
Lansing Avenue at Melbourne Street	0.5	1	+0.5
Hawthorne Drive at Westmount Avenue	2.25	1	-1.25
Madeleine Avenue at Main Street	0	0	0
Madeleine Avenue at Alexander Street	0	0	0

While Hawthorne Drive at Westmount Avenue has the highest average number of collisions before the all-way stop was installed, a large number of the collisions occurred in 2010. In 2010, three angle type collisions and two rear end collisions were reported. All three angle type collisions involved a northbound vehicle on Westmount Avenue failing to stop and striking a vehicle within the intersection. In 2011, a crosswalk and stop bar were painted on the south leg of Westmount Avenue and a stop bar was painted on the north leg of Westmount Avenue. No additional angle type collisions have occurred since these measures were implemented.

The table shows that none of the intersections were collision prone before the installation of the all-way stops and the collision data does not show a significant change in the past year. In total, three collisions were reported for all five intersections since the all-way stops were installed and all three collisions were rear end type collisions. Additionally, no collisions involving pedestrians have been reported since 2008 at any of the five intersections.

Public Feedback

One of the ways to measure the impact of a change to traffic control is by tracking positive and negative comments that come into the City via email or through 3-1-1. Overall, the City did not receive a significant volume of public feedback. The intersection of Bouchard Street and Marcel Street received the most attention with a total of six complaints and no positive feedback. However, the Ward Councillor has indicated that he has received positive comments from area residents.

The all-way stop at Lansing Avenue and Melbourne Street received one negative comment and the all-way stop at Hawthorne Drive and Westmount Avenue received a single positive comment.

Recommendation

All-way stops are often requested by residents in response to concerns on their street such as vehicle speeding, traffic volume, and safety for pedestrians, children, and cyclists. Road authorities take guidance from the Ontario Traffic Manual when determining when and where to install stop signs. "The purpose of the Ontario Traffic Manual (OTM) is to provide information and guidance for transportation practitioners and to promote uniformity of treatment in the design, application and operation of traffic control devices and systems across Ontario. The objective is safe driving behaviour, achieved by a predictable roadway environment through the consistent, appropriate application of traffic control devices. Further purposes of the OTM are to provide a set of guidelines consistent with the intent of the Highway Traffic Act and to provide a basis for road authorities to generate or update their own guidelines and standards."

The City has adopted a revised warrant for the installation of all-way stop signs, which reduces the thresholds required to meet the requirements for all-way stop approval. The reduced warrant does not change the purpose of a stop sign. "The purpose of the stop sign is to clearly assign right-of-way between vehicles approaching an intersection from different directions when traffic signals are not warranted or not yet installed and it has been determined that a yield sign is inadequate."

In general, "all-way stops should only be considered at the intersection of two relatively equal roadways having similar traffic volume demand and operating characteristics".

As indicated above, the new traffic counts indicate that all-way stops are still not warranted at any of the above intersections. The follow up studies also indicate that there have not been significant changes in any of the concerns that are typically raised by residents, such as speed, volume, and safety. They also result in a significant additional cost to the public in the form of additional delay and fuel consumption. Therefore, Staff recommends that all of the all-way stops be removed.

While Staff are recommending removal of the all-way stop signs, it is recognized that these all-way stop signs were requested for a reason, to address neighbourhood traffic concerns. In May 2010, Council approved the City's Traffic Calming Policy. Traffic calming represents a component of traffic management techniques to reduce the impacts of traffic on neighbourhood communities. Communities throughout North America have experienced significant growth in traffic due to automobile dependence and urban sprawl. These trends in automobile travel have placed considerable strains on the road network and the ability to safely (e.g., perceived or real collision potential) accommodate all road users within the public right-of-way. In many cases, the lack of arterial road capacity has resulted in motorists choosing to use collector and residential roadways to circumvent a congested turning movement, intersection or corridor.

One response to these problems is the self-enforcing option of traffic calming devices. These devices are physical modifications to the road to address the specific issue of concern. Staff recommends that these areas be considered for the Traffic Calming program, if they have not already been considered.

<u>All-Way Stop Removal Procedure</u>

The following process should be followed as prescribed by the Ontario Traffic Manual to remove any of the all-way stops:

1) Install large warning signs stating "Crossing Traffic Does Not Stop" on the approaches where the stop control is to remain. The sign is to be installed at least 15 days before the removal of control.

Install a "New" sign above this sign as well as a sign below indicating "After" stating the month and day when the control on the crossing roadway will be removed.

2) On the appointed date, remove the "Stop Ahead" signs and "Stop" signs on the crossing roadway. Crosswalk lines and stop bars must also be removed on these approaches. The "After" sign with the starting date must also be removed at this time.

3) After an additional period of at least 15 days, the "New" sign and "Crossing Traffic Does Not Stop" warning sign can also be removed.

A communication plan should also be developed to advertise the change in traffic control. Police, Fire and EMS are also to be advised of the change.

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Request for Decision

All-Way Stop Control - Various Intersections

Presented To:	Operations Committee
Presented:	Monday, Jan 09, 2012
Report Date	Friday, Dec 23, 2011
Type:	Managers' Reports

Recommendation

That the current traffic control at the intersections of Bouchard Street at Marcel Street, Lansing Avenue at Melbourne Street, Hawthorne Drive at Westmount Avenue, Madeleine Avenue at Main Street and Madeleine Avenue at Alexander Street be maintained.

Signed By

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Digitally Signed Dec 23, 11

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Background

1. Bouchard Street at Marcel Street, Sudbury

At the March 21, 2011 Traffic Committee meeting, Staff presented a report regarding all-way stop control at the intersection of Bouchard Street and Marcel Street **(see Exhibit A2)**. At the time, Staff reported higher than normal traffic volumes may have been a result of the ongoing construction on Regent Street. A decision to install all-way stop at this intersection was deferred until construction on Regent Street was completed and traffic volumes could be recounted. Subsequently, traffic volumes were recounted on October 4th, 2011.

Bouchard Street at Marcel Street is a cross intersection located west of Regent Street **(see Exhibit B2)**. Currently this intersection is controlled with "Stop" signs facing northbound and southbound traffic on Marcel Street. This portion of Bouchard Street was also part of the Traffic Calming Pilot Project and had a median island installed on the east leg of this intersection.

Applying the data from the October 4th, 2011 turning movement count to the City's new Minimum Volume Warrant indicates that the vehicle and pedestrian volume from the side street meets approximately 43 percent of the volume requirements. The traffic volume split is 91percent on Bouchard Street and 9 percent on Marcel Street. This is outside the ratio of 70/30 warrant for an all-way stop **(see Exhibit C2)**.

Comparing the 2011 turning movement counts to the previous counts from 2010 and 2007, indicates that while volumes on Marcel Street at this intersection have increased from the 2007 volumes, they have

significantly decreased from the 2010 levels. The volumes are summarized below:

	2007	2010	2011
Southbound Trafffic on Marcel Street	222	282	261
Northbound Traffic on Marcel Street	363	738	399

A review of the City's collision information from July 2008 to July 2011 revealed that there were two collisions that may be susceptible to relief through an all-way stop during this three year period. While all collisions are undesirable, the collision experience would not be considered high, and does not show a pattern that could be corrected with an all-way stop. For a major collector roadway, the Collision Warrant requires a minimum of four collisions per year over a three year period.

Councillor Cimino has also expressed concerns about the safety of pedestrians crossing Bouchard Street at this intersection to access Marcel Park. The existing median island on the east leg of this intersection was recommended by IBI Group during the Traffic Calming Pilot Project to "provide a pedestrian refuge that supports a two-stage crossing when traffic volumes make crossing difficult." During the count, we recorded 21 pedestrians crossing Bouchard Street (18 crossing the east leg and 3 crossing the west leg).

Based on the traffic volumes, pedestrian volume and collision history, installing an all-way stop at the intersection of Bouchard Street and Marcel Street is not warranted.

2. Lansing Avenue at Melbourne Street, Sudbury

Councillour Belli requested that a peak hour traffic count be conducted to determine if an all-way stop is warranted at the intersection of Lansing Avenue at Melbourne Street. The Traffic Committee approved the request for a study at its meeting on June 17, 2011.

Lansing Avenue at Melbourne Street is a cross intersection located two blocks north of Lasalle Boulevard in Ward 8 **(see Exhibit D2)**. The east and west approaches of Melbourne Street intersect Lansing Avenue on a skew angle of approximately 60 degrees. Currently this intersection is controlled with "Stop" signs facing eastbound and westbound traffic on Melbourne Street.

Applying the data from the turning movement count that was conducted on September 28th, 2011 to the City's new Minimum Volume Warrant indicates that the vehicle and pedestrian volume from Melbourne Street meets only 20 percent of the requirements. The traffic volume split is 92 percent on Lansing Avenue and 8 percent on Melbourne Street. This is also outside the ratio of 70/30 needed to warrant an all-way stop **(see Exhibit E2)**. During the count, we recorded 10 pedestrians crossing Lansing Avenue at Melbourne Street.

A review of collision information showed this intersection has had two reported collisions in the last 3 years that may be susceptible to relief through an all-way stop. The all-way stop warrant for a major collector road (Lansing Avenue) requires there be a minimum of 4 collisions per year over a 3 year period. While the collision history does not warrant an all-way stop, review indicated that both collisions involved vehicles from the east leg of Melbourne Street not yielding to southbound traffic on Lansing Avenue. There is a private large bush in the northeast corner of the intersection which may be restricting visibility at the intersection. Staff have asked the By-law Department to review and have it trimmed if possible. A crosswalk and stop bar will be painted on the east leg of Melbourne Avenue. These measures will help improve safety at the intersection by highlighting the requirement to stop.

Based on the traffic volumes, pedestrian volume and collision history, installing an all-way stop at the intersection of Lansing Avenue and Melbourne Street is not warranted.

3. Hawthorne Drive at Westmount Avenue, Sudbury

Councillour Belli requested that a peak hour traffic count be conducted to determine if an all-way stop is warranted at the intersection of Hawthorne Drive and Westmount Avenue.

Hawthorne Drive at Westmount Avenue is a cross intersection located between Barry Downe Road and Auger Avenue in Ward 8 **(see Exhibit F2)**. Currently this intersection is controlled with "Stop" signs facing northbound and southbound traffic on Westmount Avenue.

Applying the data from the turning movement count that was conducted on June 16th, 2011 to the City's new Minimum Volume Warrant indicates that the vehicle and pedestrian volume from Westmount Avenue meets only 25 percent of the requirements. The traffic volume split is 88 percent on Hawthorne Drive and 12 percent on Westmount Avenue. This is also outside the ratio of 70/30 needed to warrant an all-way stop **(see Exhibit G2)**. During the count, we recorded 17 pedestrians crossing Hawthorne Drive at Westmount Avenue.

A review of our collision information showed this intersection has had three collisions in the last three years that may be susceptible to relief through an all-way stop. The all-way stop warrant for a major collector road (Hawthorne Avenue) requires there be a minimum of 4 collisions per year over a 3 year period. While the collision history does not warrant an all-way stop, our review indicated that the collisions involved vehicles from Westmount Avenue not yielding to traffic on Hawthorne Drive. A crosswalk and stop bar has been painted on the south leg of Westmount Avenue and a stop bar was also painted on the north leg of Westmount Avenue. These measures will help improve safety at the intersection by highlighting the requirement to stop.

Based on the traffic volumes, pedestrian volume and collision history, installing an all-way stop at the intersection of Hawthorne Drive at Westmount Avenue is not recommended.

4. Madeleine Avenue at Main Street and Madeleine Avenue at Alexander Street, Sudbury

Councillour Landry-Altmann forwarded a petition dated February 16, 2011 from area residents requesting that All-Way Stops be installed at the intersections of Madeleine Avenue at Main Street and Madeleine Avenue at Alexander Street **(see Exhibit H2)** to slow traffic down.

These intersections are both T intersections located south of Lasalle Boulevard in Ward 12 **(see Exhibit I2)**. Currently, both intersections are controlled with a stop sign facing eastbound traffic on Main Street and Alexander Street. Also, Ecole Felix-Ricard has a pedestrian access to its school yard on the east side of the Madeleine Avenue at Main Street entrance. Due to the proximity of the school, turning movement counts were conducted during the school year.

Applying the data from the turning movement count conducted at the Madeleine Avenue at Main Street intersection on June 27, 2011, to the City's new Minimum Vehicle Volume warrant indicates that the vehicle and pedestrian volume from the side street meets only 15 percent of the volume requirements. The traffic volume split is 76 percent on Madeleine Avenue and 24% on Main Street. This is outside the ratio of 70/30 needed to warrant an all-way stop **(see Exhibit J2)**. During this count, we recorded 11 pedestrians crossing Madeleine Avenue at Main Street.

Applying the data from the turning movement count conducted at the Madeleine Avenue at Alexander Street intersection on June 28, 2011, to the City's new Minimum Vehicle Volume warrant indicates that the vehicle and pedestrian volume from the side street meets only 12 percent of the volume requirements. The traffic volume split is 68 percent on Madeleine Avenue and 32 percent on Main Street. This is within the ratio of 70/30 needed to warrant an all-way stop **(see Exhibit K2)**. During this count, we recorded 4 pedestrians crossing Madeleine Avenue.

A review of collision information showed that both intersections had no reported collisions in the last three years. The all-way stop warrant for a minor collector road requires there be a minimum of 3 collisions per year over a 3 year period.

Based on the traffic volumes, pedestrian volume and collision history, installing an all-way stop at the intersection of Madeleine Avenue at Main Street or Madeleine Avenue at Alexander Street is not warranted.

EXHIBIT: A2

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Request for Decision

All Way Stop Control - 1) Bouchard Street at Marcel Street, Sudbury and 2) Balsam Street at Garrow Road and Power Street, Copper Cliff

Presented To:	Traffic Committee
Presented:	Monday, Mar 21, 2011
Report Date	Thursday, Mar 10, 2011
Type:	Managers' Reports

Recommendation

That the intersection of Balsam Street at Garrow Road at Power Street be controlled by an all-way-stop, and;

That a by-law be passed by City Council to amend Traffic and Parking By-Law 2010-1 in the City of Greater Sudbury to implement the recommended change all in accordance with the report from the General Manager of Infrastructure Services dated March 10, 2011.

Signed By

Report Prepared By
Dave Kivi
Co-ordinator of Transportation & Traffic Engineering Services
Digitally Signed Mar 10, 11

Division Review
Robert Falcioni, P.Eng.
Director of Roads and Transportation Services
Digitally Signed Mar 10, 11

Recommended by the Department
Greg Clausen, P.Eng.
General Manager of Infrastructure Services
Digitally Signed Mar 10, 11

Recommended by the C.A.O.
Doug Nadorozny
Chief Administrative Officer
Digitally Signed Mar 10, 11

Background

1) Bouchard Street at Marcel Street

On August 4th, 2010, Councillor Cimino requested that a turning movement count be conducted to determine if an all-way stop would be warranted at the intersection of Bouchard Street and Marcel Street.

Bouchard Street at Marcel Street is a cross intersection located west of Regent Street (**see Exhibit "A"**). There is also a playground located in the southeast corner of the intersection. Currently this intersection is controlled with "stop" signs facing northbound and southbound traffic on Marcel Street. This portion of Bouchard Street was also part of the Traffic Calming Pilot Project, and had a median island installed on the east leg of this intersection.

Applying the data from the turning movement count that was conducted on August 25th, 2010 to the City's new Minimum Volume Warrant indicates that the vehicle and pedestrian volume from the side street meets approximately 75 percent of the volume requirements. The traffic volume split is 80 percent on Bouchard Street and 20 percent on Marcel Street. This is outside the ratio of 70/30 needed to warrant an "all-way" stop (**see Exhibit "B"**).

Comparing the 2010 turning movement count to a previous count conduct in 2007, indicates that volumes at this intersection may be artificially high due to the ongoing construction on Regent Street. Southbound traffic

from Marcel Street has increased by 27 percent (222 in 2007 vs. 282 in 2010) while northbound traffic from Marcel Street has more than doubled (363 in 2007 vs. 738 in 2010).

A review of the City's collision information from 2008 to 2010 revealed that there were no collisions that may be susceptible to relief through an all-way stop during this three (3) year period. For a Major Collector roadway, the Collision Warrant requires a minimum of four (4) collisions per year over a three (3) year period.

Councillor Cimino also expressed concerns about the safety of pedestrians while crossing Bouchard Street at this intersection. The existing median island on the east leg of this intersection was recommended by the IBI Group as part of the Traffic Calming Pilot Project in order to "provide a pedestrian refuge that supports a two-stage crossing for times when traffic volumes make crossing difficult". During the seven (7) hour count, we recorded a total of five (5) pedestrians crossing Bouchard Street at this intersection (four (4) crossing the east leg and one (1) crossing the west leg).

Based on the traffic volumes, pedestrian volume and collision history, staff does not recommend installing an all-way stop at the intersection of Bouchard Street and Marcel Street. Staff will arrange to recount this intersection once construction is completed on Regent Street to ensure that traffic volumes on Marcel Street do not remain high.

2) Balsam Street at Garrow Road at Power Street

Councillor Barbeau requested that a turning movement count be conducted to determine if an all-way stop is warranted at the intersection of Balsam Street at Garrow Road/Power Street.

Balsam Street at Garrow Road/Power Street is a cross intersection located in Copper Cliff (**see Exhibit "C"**). The Copper Cliff Library is located on the northwest corner of the intersection and the McClelland Arena and R.G. Dow Pool are located northeast of the intersection. Currently this intersection is controlled with "stop" signs facing northeast bound traffic on Power Street and southwest bound traffic on Garrow Road.

Applying the data from the turning movement count that was conducted on May 25th, 2010 to the City's new Minimum Volume Warrant indicates that the traffic volume at this intersection meets the minimum vehicle volume requirements (**see Exhibit "D"**). A review of the City's collision information from 2008 to 2010 revealed that there were three (3) collisions that may be susceptible to relief through an all-way stop during this three (3) year period. For a Minor Collector roadway, the Collision Warrant requires a minimum of three (3) collisions per year over a three (3) year period.

Since the traffic volume meets the minimum vehicle volume warrant, staff recommends installing an all-way stop at the intersection of Balsam Street at Garrow Road/Power Street. Also, staff recommends that physical changes be made to the intersection to better define the approaches and to improve safety for pedestrians. These changes will be funded from the 2011 Capital Roads budget.

EXHIBIT: A

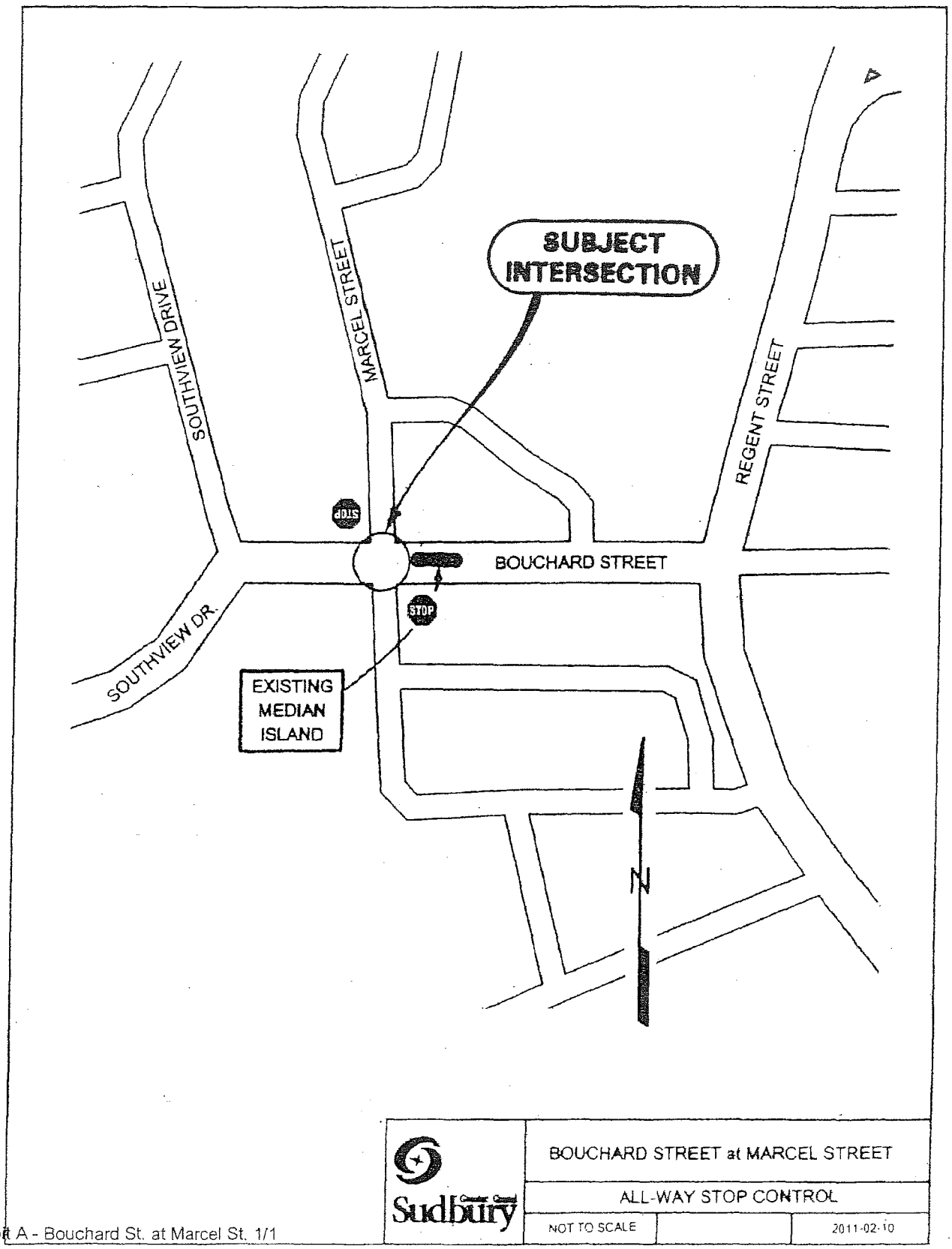

SUBJECT INTERSECTION
MARCEL STREET
SOUTHVIEW DRIVE
REGENT STREET
BOUCHARD STREET
STOP
STOP
SOUTHVIEW DR.
EXISTING MEDIAN ISLAND
N
Sudbury
BOUCHARD STREET at MARCEL STREET
ALL-WAY STOP CONTROL
NOT TO SCALE
2011-02-10

EXHIBIT: B

CITY OF GREATER SUDBURY
ALL-WAY STOP WARRANTS

Location:	Bouchard Street at Marcel Street	Date:	March 3, 2011
Date of TM Count:	August 25, 2010	Analyst:	JR
Type of Intersection:	Cross		
Roadway Type	Arterial/Major Collector		
AADT of Main Road:	10500		

All-Way Stop Warrant Summary

Warrant #1	Minimum Vehicle Volume	63.3	%
Warrant #2	Collision History	0.0	%
Warrant #3	Traffic Control Signals	No	Y/N

All-Way Stop Warranted? **No** Y/N

Warrant #1 - Minimum Vehicle Volume

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Vehicles per hour	Percent Compliance
AADT	> 5000	1000 - 5000	< 1000		
Count Period	7 hours	4 peak hours	4 peak hours		
Total vehicle volume from all approaches is ≥	500/hr	350/hr	250/hr	780	100.0%
Veh + Pedestrian volume from side street is ≥	200/hr	140/hr	N/A	146	73.2%
Traffic Split	70/30	70/30	70/30	81 / 19	53.3%

Warrant #2 - Collision History

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Number of Collisions per year	Percent Compliance
Collisions per Year over 3 year period	4*	3*	2*	0	0.0%

Warrant #3 Traffic Control Signals are warranted and urgently needed, signs to be used as interim measures. **No** Y/N

* Only those collisions susceptible to relief through multi-way stop control must be consider (i.e. right angle and turning types).

- If the intersection meets warrant # 1, then the all-way stop is recommended regardless of the remaining warrants.
- If the intersection does not meet warrant #1 and does not meet warrant #2, then the all-way stop is not recommended.
- If the intersection does not meet warrant #1 and does meet warrant #2, then the all-way stop is recommended.

EXHIBIT: C

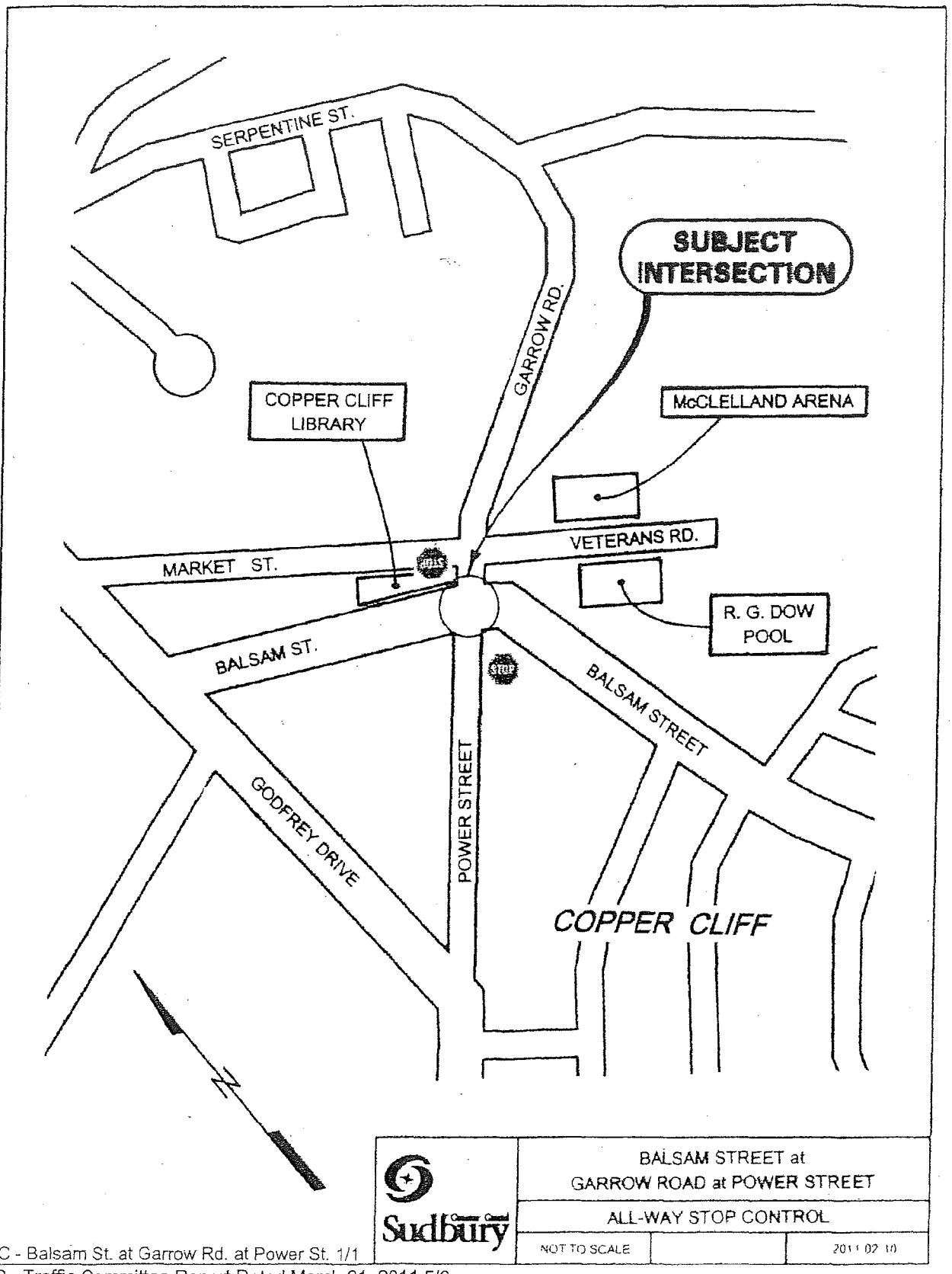

SERPENTINE ST.
SUBJECT INTERSECTION
GARROW RD.
COPPER CLIFF LIBRARY
McCLELLAND ARENA
VETERANS RD.
MARKET ST.
R. G. DOW POOL
BALSAM ST.
STOP
BALSAM STREET
POWER STREET
GODFREY DRIVE
COPPER CLIFF
N
Sudbury
BALSAM STREET at
GARROW ROAD at POWER STREET
ALL-WAY STOP CONTROL
NOT TO SCALE
2011 02 10

EXHIBIT: D

Greater Grand Sudbury

CITY OF GREATER SUDBURY
ALL-WAY STOP WARRANTS

Location:	Balsam Street at Power Street	Date:	March 3, 2011
Date of TM Count:	May 25, 2010	Analyst:	JR
Type of Intersection:	Cross		
Roadway Type	Minor Collector		
AADT of Main Road:	3998		

All-Way Stop Warrant Summary

Warrant #1	Minimum Vehicle Volume	100.0	%
Warrant #2	Collision History	33.3	%
Warrant #3	Traffic Control Signals	No	Y/N

All-Way Stop Warranted? **Yes** Y/N

Warrant #1 - Minimum Vehicle Volume

Roadway Type	Arterial/Major Collector	**Minor Collector**	Local	Vehicles per hour	Percent Compliance
AADT	> 5000	**1000 - 5000**	< 1000		
Count Period	7 hours	**4 peak hours**	4 peak hours		
Total vehicle volume from all approaches is ≥	500/hr	**350/hr**	250/hr	**461**	**100.0%**
Veh + Pedestrian volume from side street is ≥	200/hr	**140/hr**	N/A	**185**	**100.0%**
Traffic Split	70/30	**70/30**	70/30	**62 / 38**	**100.0%**

Warrant #2 - Collision History

Roadway Type	Arterial/Major Collector	**Minor Collector**	Local	Number of Collisions per year	Percent Compliance
Collisions per Year over 3 year period	4*	**3***	2*	**1**	**33.3%**

Warrant #3 **Traffic Control Signals are warranted and urgently needed, signs to be used as interim measures.** **No** Y/N

* Only those collisions susceptible to relief through multi-way stop control must be consider (i.e. right angle and turning types).

- If the intersection meets warrant # 1, then the all-way stop is recommended regardless of the remaining warrants.
- If the intersection does not meet warrant #1 and does not meet warrant #2, then the all-way stop is not recommended.
- If the intersection does not meet warrant #1 and does meet warrant #2, then the all-way stop is recommended.

EXHIBIT: B2

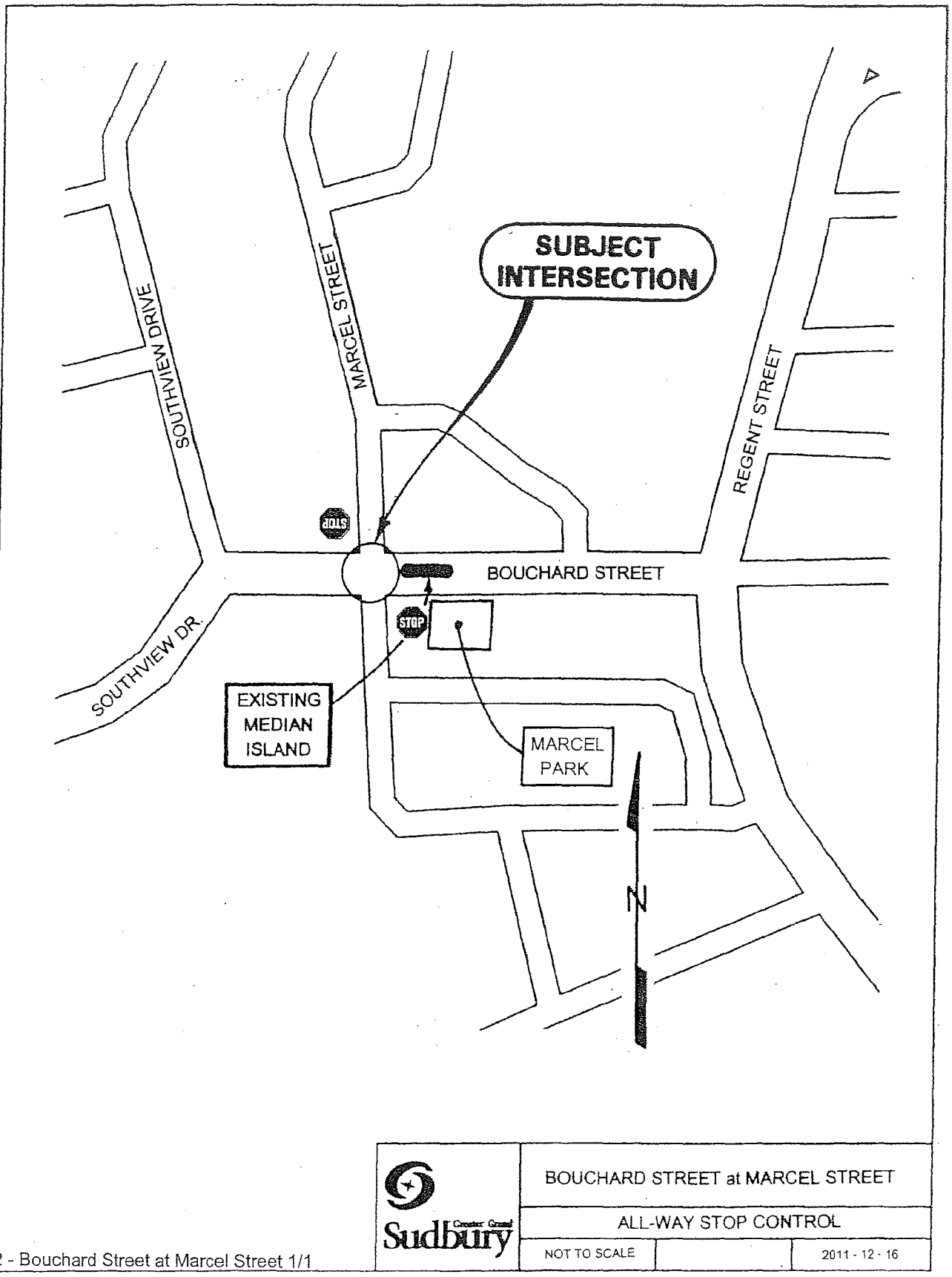

SUBJECT INTERSECTION
MARCEL STREET
SOUTHVIEW DRIVE
REGENT STREET
BOUCHARD STREET
STOP
STOP
SOUTHVIEW DR.
EXISTING MEDIAN ISLAND
MARCEL PARK
N
Sudbury
BOUCHARD STREET at MARCEL STREET
ALL-WAY STOP CONTROL
NOT TO SCALE
2011 - 12 - 16

EXHIBIT: C2

Greater Grand Sudbury

CITY OF GREATER SUDBURY
ALL-WAY STOP WARRANTS

Location:	Bouchard Street at Marcel Street	Date:	October 25, 2011
Date of TM Count:	10/04/2011	Analyst:	JR
Type of Intersection:	Cross		
Roadway Type	Arterial/Major Collector		
AADT of Main Road:	10000		

All-Way Stop Warrant Summary

Warrant #1	Minimum Vehicle Volume	30.0	%
Warrant #2	Collision History	16.7	%
Warrant #3	Traffic Control Signals	No	Y/N

All-Way Stop Warranted? **No** Y/N

Warrant #1 - Minimum Vehicle Volume

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Vehicles per hour	Percent Compliance
AADT	> 5000	1000 - 5000	< 1000		
Count Period	7 hours	4 peak hours	4 peak hours		
Total vehicle volume from all approaches is ≥	500/hr	350/hr	250/hr	930	100.0%
Veh + Pedestrian volume from side street is ≥	200/hr	140/hr	N/A	87	43.4%
Traffic Split	70/30	70/30	70/30	91 / 9	30.0%

Warrant #2 - Collision History

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Number of Collisions per year	Percent Compliance
Collisions per Year over 3 year period	4*	3*	2*	2/3	16.7%

Warrant #3 Traffic Control Signals are warranted and urgently needed, signs to be used as interim measures. **No** Y/N

* Only those collisions susceptible to relief through multi-way stop control must be consider (i.e. right angle and turning types).

- If the intersection meets warrant # 1, then the all-way stop is recommended regardless of the remaining warrants.
- If the intersection does not meet warrant #1 and does not meet warrant #2, then the all-way stop is not recommended.
- If the intersection does not meet warrant #1 and does meet warrant #2, then the all-way stop is recommended.

EXHIBIT: D2

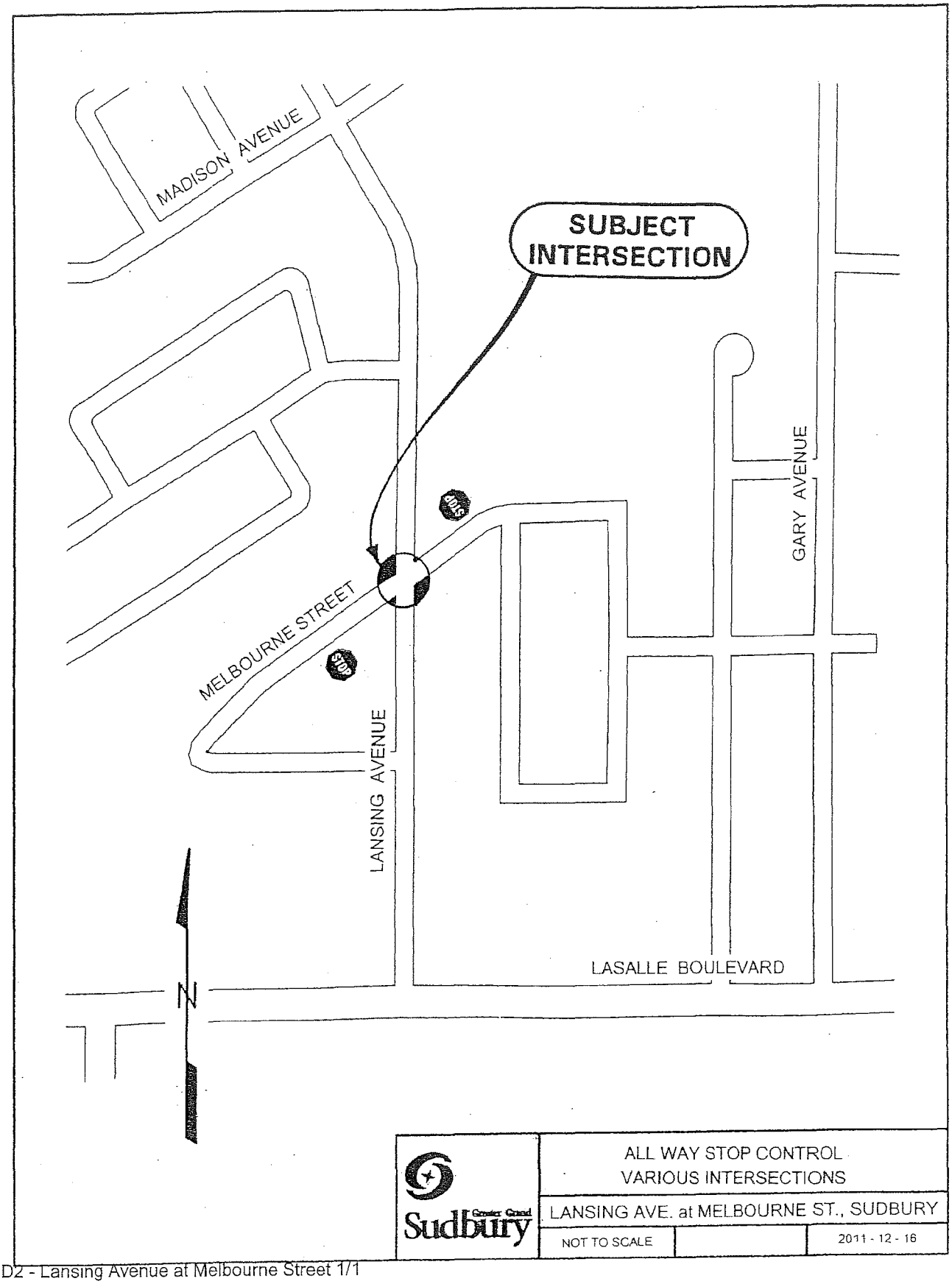


Exhibit D2 - Lansing Avenue at Melbourne Street 1/1

EXHIBIT 'I' - All-Way Stop Control Report 13/25

EXHIBIT A_Bouchard St 22/34

EXHIBIT: E2

Greater Grand Sudbury

CITY OF GREATER SUDBURY
ALL-WAY STOP WARRANTS

Location:	Lansing Avenue at Melbourne Street	Date:	October 4, 2011
Date of TM Count:	09/28/2011	Analyst:	JR
Type of Intersection:	Cross		
Roadway Type	Arterial/Major Collector		
AADT of Main Road:	7300		

All-Way Stop Warrant Summary

Warrant #1	Minimum Vehicle Volume	19.6	%
Warrant #2	Collision History	16.7	%
Warrant #3	Traffic Control Signals	No	Y/N

All-Way Stop Warranted? **No** Y/N

Warrant #1 - Minimum Vehicle Volume

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Vehicles per hour	Percent Compliance
AADT	> 5000	1000 - 5000	< 1000		
Count Period	7 hours	4 peak hours	4 peak hours		
Total vehicle volume from all approaches is ≥	500/hr	350/hr	250/hr	509	100.0%
Veh + Pedestrian volume from side street is ≥	200/hr	140/hr	N/A	39	19.6%
Traffic Split	70/30	70/30	70/30	92 / 8	26.7%

Warrant #2 - Collision History

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Number of Collisions per year	Percent Compliance
Collisions per Year over 3 year period	4*	3*	2*	2/3	16.7%

Warrant #3	Traffic Control Signals are warranted and urgently needed, signs to be used as interim measures.	No	Y/N

* Only those collisions susceptible to relief through multi-way stop control must be consider (i.e. right angle and turning types).

- If the intersection meets warrant # 1, then the all-way stop is recommended regardless of the remaining warrants.
- If the intersection does not meet warrant #1 and does not meet warrant #2, then the all-way stop is not recommended.
- If the intersection does not meet warrant #1 and does meet warrant #2, then the all-way stop is recommended.

EXHIBIT: F2

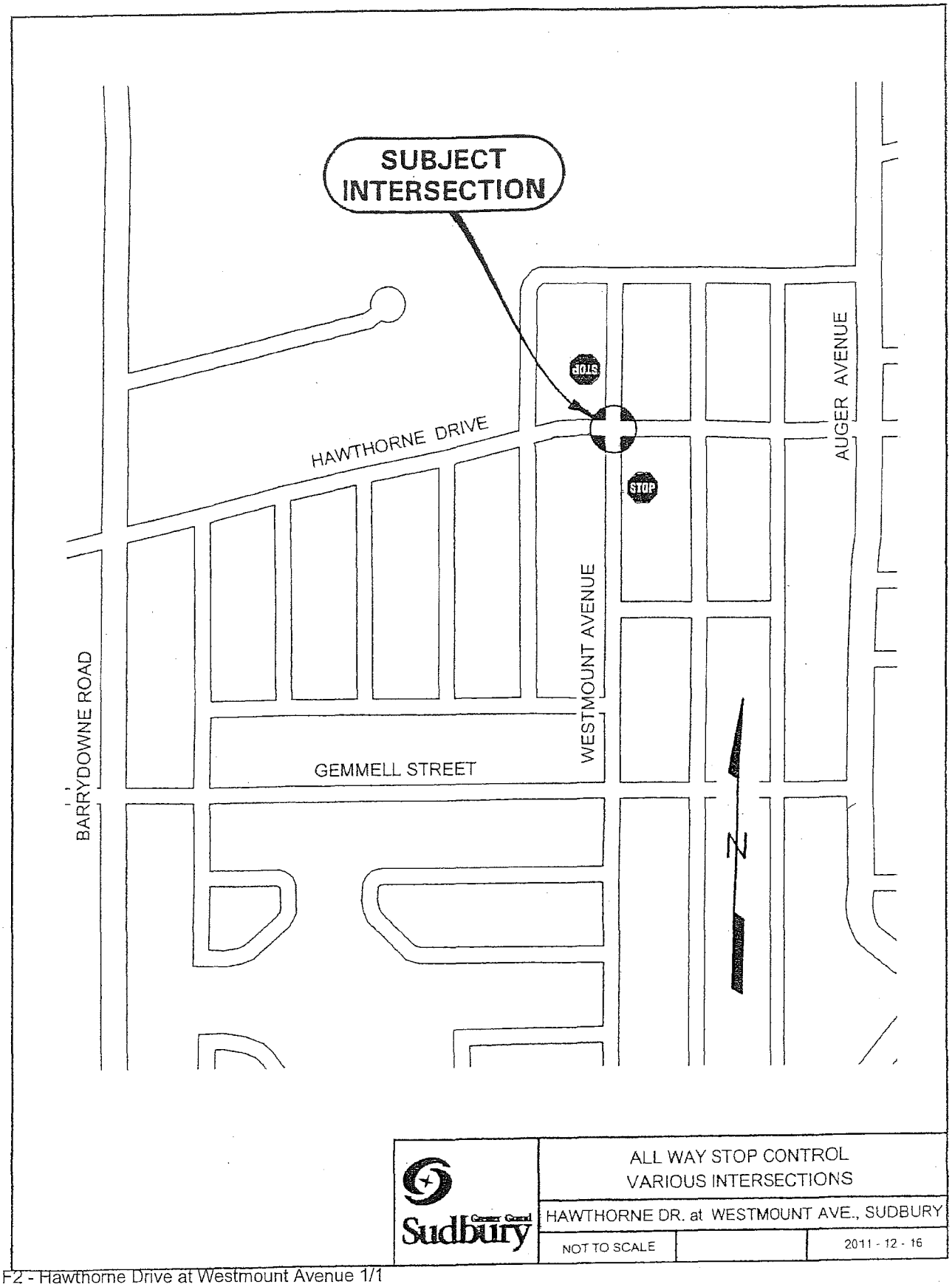

SUBJECT INTERSECTION
STOP
STOP
HAWTHORNE DRIVE
AUGER AVENUE
WESTMOUNT AVENUE
BARRYDOWNE ROAD
GEMMELL STREET
N
Greater Sudbury
ALL WAY STOP CONTROL
VARIOUS INTERSECTIONS
HAWTHORNE DR. at WESTMOUNT AVE., SUDBURY
NOT TO SCALE
2011 - 12 - 16

EXHIBIT: G2

Greater Grand Sudbury

CITY OF GREATER SUDBURY
ALL-WAY STOP WARRANTS

Location:	Westmount Avenue at Hawthorne Drive	Date:	August 9, 2011
Date of TM Count:	06/16/2011	Analyst:	JR
Type of Intersection:	Cross		
Roadway Type	Arterial/Major Collector		
AADT of Main Road:	5600		

All-Way Stop Warrant Summary

Warrant #1	Minimum Vehicle Volume	25.1	%
Warrant #2	Collision History	25.0	%
Warrant #3	Traffic Control Signals	No	Y/N

All-Way Stop Warranted? No Y/N

Warrant #1 - Minimum Vehicle Volume

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Vehicles per hour	Percent Compliance
AADT	> 5000	1000 - 5000	< 1000		
Count Period	7 hours	4 peak hours	4 peak hours		
Total vehicle volume from all approaches is ≥	500/hr	350/hr	250/hr	411	82.3%
Veh + Pedestrian volume from side street is ≥	200/hr	140/hr	N/A	50	25.1%
Traffic Split	70/30	70/30	70/30	88 / 12	40.0%

Warrant #2 - Collision History

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Number of Collisions per year	Percent Compliance
Collisions per Year over 3 year period	4*	3*	2*	1	25.0%

Warrant #3 Traffic Control Signals are warranted and urgently needed, signs to be used as interim measures. No Y/N

* Only those collisions susceptible to relief through multi-way stop control must be consider (i.e. right angle and turning types).

- If the intersection meets warrant # 1, then the all-way stop is recommended regardless of the remaining warrants.
- If the intersection does not meet warrant #1 and does not meet warrant #2, then the all-way stop is not recommended.
- If the intersection does not meet warrant #1 and does meet warrant #2, then the all-way stop is recommended.

EXHIBIT: H2

FEBRUARY 16, 2011

We, the residents of Madeleine, Martin, Main & Alexander Streets are requesting a 3-way Stop Sign at the corner of Madeleine & Main & Madeleine & Alexander Streets. We have serious speeding issues. Local children access the school entrance off of Madeleine and parents also drop off their children at this entrance to avoid congestion on Starlight Ave and turning challenges onto Lasalle Blvd

NAME	ADDRESS	TELEPHONE
[redacted]	Madeleine	[redacted]
[redacted]	Madeleine	
[redacted]	madeleine	
[redacted]	"	
[redacted]	[redacted]	[redacted]
[redacted]	Madeleine	
[redacted]	Madeleine	
[redacted]	Madeleine	
[redacted]	Madeleine	[redacted]
[redacted]	Madeleine	[redacted]
[redacted]	MADELEINE AVE	
[redacted]	Madeleine Ave	[redacted]
[redacted]	madeleine ave	
[redacted]	madeleine	[redacted]
[redacted]	Madeleine	
[redacted]	Madeleine Ave	[redacted]
[redacted]	Madeleine Ave	[redacted]
[redacted]	MADELEINE AVE	[redacted]

FEBRUARY 16, 2011

We, the residents of Madeleine, Martin, Main & Alexander Streets are requesting a 3-way Stop Sign at the corner of Madeleine & Main & Madeleine & Alexander Streets. We have serious speeding issues. Local children access the school entrance off of Madeleine and parents also drop off their children at this entrance to avoid congestion on Starlight Ave and turning challenges onto Lasalle Blvd

NAME	ADDRESS	TELEPHONE
Mike LANDRY	[redacted] MARTIN Ave Sudbury ON	[redacted]
Stephanie LANDRY	MARTIN AVE Sudbury ON	
[illegible]	[redacted] Martin Ave	[redacted]
Julie Valade	[redacted] Madeleine ave	[redacted]
Joan Valade	[redacted] Sagebrush Pl	[redacted]
Janie Valade	[redacted] Madeleine Ave,	[redacted]
R. VALADE	SAGEBRUSH. Pl	
Hestie Desjardins	[redacted] madeline Ave	[redacted]
NORM AUBIN	[redacted] MADELINE ST	[redacted]
[illegible]	[redacted] Madeleine Ave	[redacted]
Diane Bisson	[redacted] Madeleine Ave	[redacted]
MALENA AUDETTE	[redacted] MADELEINE AVE	[redacted]
Richard Audette	[redacted] Madeleine Ave	[redacted]
[illegible]	[redacted] Madeleine	[redacted]
[illegible]	[redacted] Madeleine Ave	[redacted]
[illegible]	[redacted] Madeleine Ave,	[redacted]
[illegible]	[redacted] Madeleine	[redacted]
Nanny + Jim Howard	[redacted] Madeleine Ave	[redacted]

FEBRUARY 16, 2011

We, the residents of Madeleine, Martin, Main + Alexander Streets are requesting a 3-way Stop Sign at the corner of Madeleine + Main + Madeleine + Alexander Streets. We have serious speeding issues. Local children access the school entrance off of Madeleine and parents also drop off their children at this entrance to avoid congestion on Starlight Ave and turning challenges onto Lasalle Blvd

NAME	ADDRESS	TELEPHONE
Ethel Campbell	[redacted] Madeleine St	[redacted]
[redacted]	[redacted] Madeleine St	[redacted]
Rene [redacted]	[redacted] Madeleine St	[redacted]
[redacted]	[redacted] madeleine	[redacted]
[redacted]	[redacted] Madeleine	[redacted]
[redacted]	[redacted] Madeleine	[redacted]
[redacted]	[redacted] Madeleine	[redacted]
[redacted]	[redacted] madeleine Madeleine	[redacted]
[redacted]	[redacted] Madeleine	[redacted]
[redacted]	[redacted] Madeleine	[redacted]
[redacted]	[redacted] Madeleine.	[redacted]
I. [redacted] A. Martin	[redacted] A. Mart	[redacted]
GARY KOIVU	[redacted] MADELEINE AVE.	[redacted]
[redacted]	[redacted] Madeleine Ave	[redacted]
[redacted]	[redacted] madeleine ave	[redacted]
[redacted]	[redacted] Madeleine ave	[redacted]
[redacted]	[redacted] Madeleine Ave	[redacted]
[redacted]	[redacted] Madeleine Ave	[redacted]

FEBRUARY 16, 2011

We, the residents of Madeleine, Martin, Main + Alexander Streets are requesting a 3-way Stop Sign at the corner of Madeleine + Main + Madeleine + Alexander Streets. We have serious speeding issues. Local children access the school entrance off of Madeleine and parents also drop off their children at this entrance to avoid congestion on Starlight Ave and turning challenges onto Lasalle Blvd

NAME	ADDRESS	TELEPHONE
Cecile Duchaine	[redacted] Madeleine Ave	[redacted]
[redacted]	[redacted] Madeleine [redacted] James St	[redacted]
[redacted]	[redacted] MADELEINE ST Madeleine AV [redacted]	[redacted]
GARRY HODGE	[redacted] MADELEINE	[redacted]
Kevin Roy	[redacted] Alexander. St.	[redacted]
[redacted]	[redacted] ALEXANDER ST	[redacted]
[redacted]	[redacted] Martin Ave	[redacted]
[redacted]	[redacted]	[redacted]

FEBRUARY 16, 2011

We, the residents of Madeleine, Martin, Main + Alexander Streets are requesting a 3-way Stop Sign at the corner of Madeleine + Main + Madeleine + Alexander Streets. We have serious speeding issues. Local children access the school entrance off of Madeleine and parents also drop off their children at this entrance to avoid congestion on Starlight Ave and turning challenges onto Lasalle Blvd

NAME	ADDRESS	TELEPHONE
Michel Guerin	[redacted] Martin St	[redacted]
Carole Guerin	Martin St	
JOSEPH PELLETIER	MARTIN AVE	
[illegible]	MARTIN	
[illegible]	[illegible]	
[illegible]	Martin St.	[redacted]
[illegible]	Martin	
[illegible]	Martin	
[illegible]	[illegible]	
[illegible]	[illegible]	
Jeannette Noel	[illegible]	
Matthew Roach	Martin Ave	
Lindsay Roach	Martin Ave	
[illegible]	MADELEINE AVE	
[illegible]	madeleine Ave	
[illegible]	MARTIN AVE	
[illegible]	Martin Ave	
[illegible]		
[illegible]	Martin Ave	[redacted]
[illegible]	Martin Ave	
[illegible]	MARTIN AVE.	[redacted]
[illegible]	MARTIN AVE (UPPER)	
[illegible]	Martin Ave	

FEBRUARY 16, 2011

We, the residents of Madeleine, Martin, Main & Alexander Streets are requesting a 3-way Stop Sign at the corner of Madeleine & Main & Madeleine & Alexander Streets. We have serious speeding issues. Local children access the school entrance off of Madeleine and parents also drop off their children at this entrance to avoid congestion on Starlight Ave and turning challenges onto Lasalle Blvd

NAME	ADDRESS	TELEPHONE
Maxine Lemieux	[redacted] Martin Ave	[redacted]
Paulette Bonin	[redacted] Martin	[redacted]
Jacques Bonin	[redacted] Martin	[redacted]
Pierre G Bonin	[redacted] Main	[redacted]
[redacted]	[redacted] martin ave	[redacted]
[redacted]	[redacted]	
[redacted]	[redacted] MARTIN AVE	[redacted]
[redacted]	[redacted] Martin Ave	
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	
[redacted]	[redacted] Martin Ave	
[redacted]	[redacted] Martin Ave	
[redacted]	[redacted] Main St	[redacted]
[redacted]	[redacted] MAIN ST	[redacted]

EXHIBIT: I2

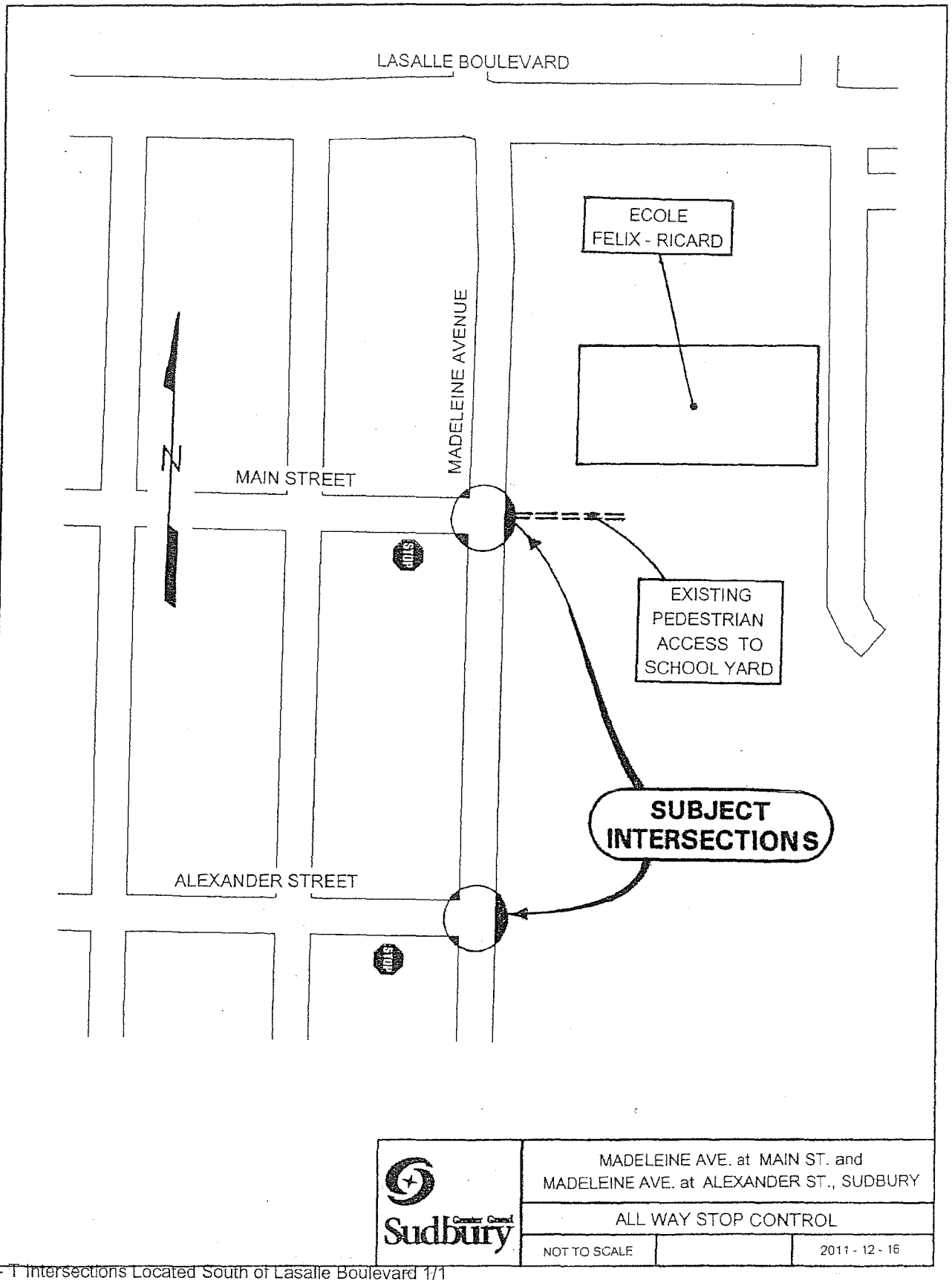

LASALLE BOULEVARD
MADELEINE AVENUE
ECOLE
FELIX - RICARD
N
MAIN STREET
EXISTING
PEDESTRIAN
ACCESS TO
SCHOOL YARD
SUBJECT
INTERSECTIONS
ALEXANDER STREET
Sudbury
MADELEINE AVE. at MAIN ST. and
MADELEINE AVE. at ALEXANDER ST., SUDBURY
ALL WAY STOP CONTROL
NOT TO SCALE
2011 - 12 - 16

EXHIBIT: J2

Greater Grand Sudbury

CITY OF GREATER SUDBURY
ALL-WAY STOP WARRANTS

Location:	Madeleine Avenue at Main Street	Date:	October 3, 2011
Date of TM Count:	06/27/2011	Analyst:	JR
Type of Intersection:	T		
Roadway Type	Minor Collector		
AADT of Main Road:	1500		

All-Way Stop Warrant Summary

Warrant #1	Minimum Vehicle Volume	15.4	%
Warrant #2	Collision History	0.0	%
Warrant #3	Traffic Control Signals	No	Y/N

All-Way Stop Warranted? **No** Y/N

Warrant #1 - Minimum Vehicle Volume

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Vehicles per hour	Percent Compliance
AADT	> 5000	1000 - 5000	< 1000		
Count Period	7 hours	4 peak hours	4 peak hours		
Total vehicle volume from all approaches is ≥	500/hr	350/hr	250/hr	90	25.6%
Veh + Pedestrian volume from side street is ≥	200/hr	140/hr	N/A	22	15.4%
Traffic Split	70/30	70/30	70/30	76 / 24	80.0%

Warrant #2 - Collision History

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Number of Collisions per year	Percent Compliance
Collisions per Year over 3 year period	4*	3*	2*	0	0.0%

Warrant #3	Traffic Control Signals are warranted and urgently needed, signs to be used as interim measures.	No	Y/N

* Only those collisions susceptible to relief through multi-way stop control must be consider (i.e. right angle and turning types).

- If the intersection meets warrant # 1, then the all-way stop is recommended regardless of the remaining warrants.
- If the intersection does not meet warrant #1 and does not meet warrant #2, then the all-way stop is not recommended.
- If the intersection does not meet warrant #1 and does meet warrant #2, then the all-way stop is recommended.

EXHIBIT: K2

Greater Grand Sudbury

CITY OF GREATER SUDBURY
ALL-WAY STOP WARRANTS

Location:	Madeleine Ave at Alexander St	Date:	October 3, 2011
Date of TM Count:	June 28, 2011	Analyst:	JR
Type of Intersection:	T		
Roadway Type	Local		
AADT of Main Road:	500		

All-Way Stop Warrant Summary

Warrant #1	Minimum Vehicle Volume	12.1	%
Warrant #2	Collision History	0.0	%
Warrant #3	Traffic Control Signals	No	Y/N

All-Way Stop Warranted? No Y/N

Warrant #1 - Minimum Vehicle Volume

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Vehicles per hour	Percent Compliance
AADT	> 5000	1000 - 5000	< 1000		
Count Period	7 hours	4 peak hours	4 peak hours		
Total vehicle volume from all approaches is ≥	500/hr	350/hr	250/hr	53	15.1%
Veh + Pedestrian volume from side street is ≥	200/hr	140/hr	N/A	17	12.1%
Traffic Split	70/30	70/30	70/30	68/32	100.0%

Warrant #2 - Collision History

Roadway Type	Arterial/Major Collector	Minor Collector	Local	Number of Collisions per year	Percent Compliance
Collisions per Year over 3 year period	4*	3*	2*	0	0.0%

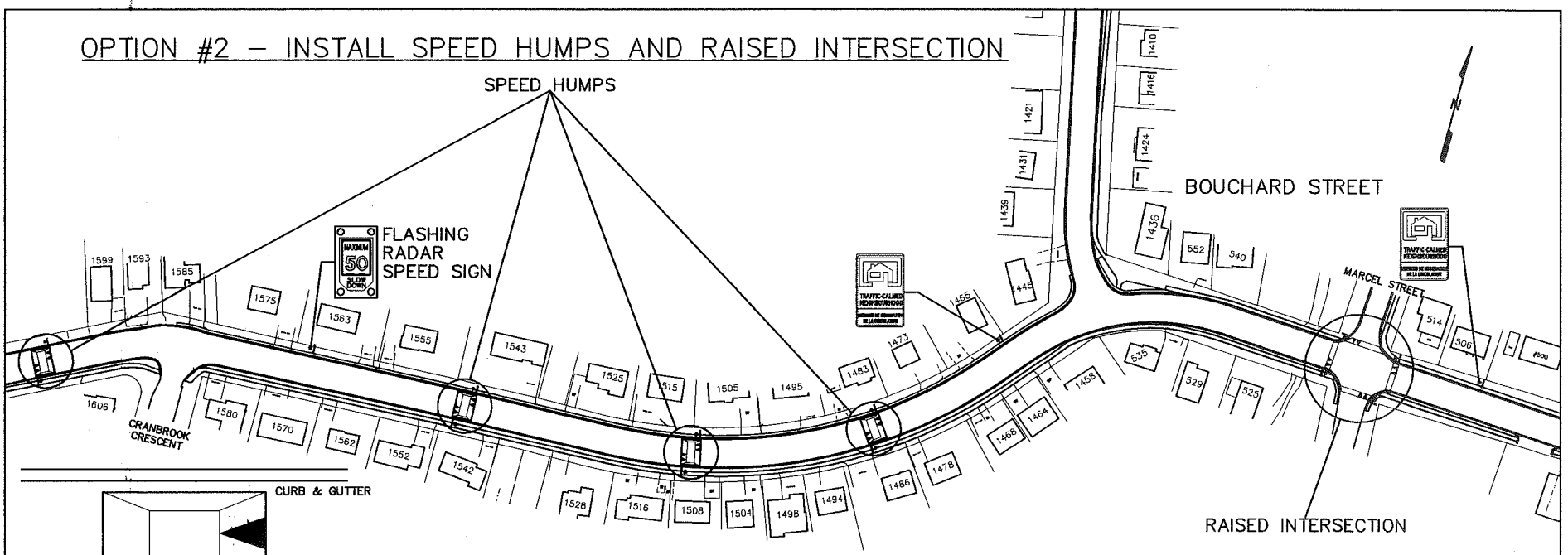
Warrant #3 Traffic Control Signals are warranted and urgently needed, signs to be used as interim measures. No Y/N

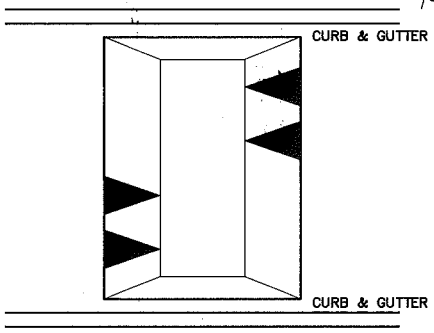
* Only those collisions susceptible to relief through multi-way stop control must be consider (i.e. right angle and turning types).

- If the intersection meets warrant # 1, then the all-way stop is recommended regardless of the remaining warrants.
- If the intersection does not meet warrant #1 and does not meet warrant #2, then the all-way stop is not recommended.
- If the intersection does not meet warrant #1 and does meet warrant #2, then the all-way stop is recommended.

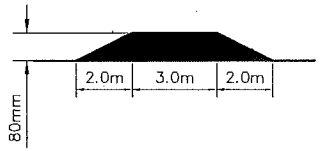
ExhibitB_Southview_Bouchard_Option_2 1/1

OPTION #2 – INSTALL SPEED HUMPS AND RAISED INTERSECTION



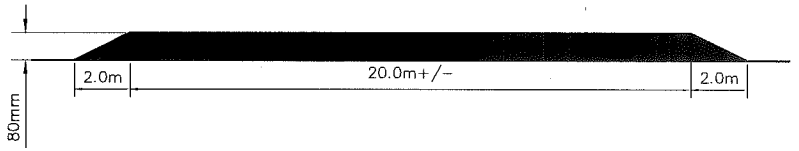


SPEED HUMP (PLAN VIEW)



SPEED HUMP (PROFILE VIEW)

NOTE:
SPEED HUMP SIGN AT EACH HUMP AND RAISED INTERSECTION FACING EACH DIRECTION



RAISED INTERSECTION (PROFILE VIEW)

Sudbury Greater | Grand

SOUTHVIEW DRIVE/
BOUCHARD STREET
2013 TRAFFIC CALMING POLL
OPTION #2

DRAWN BY: BWK	REV No:
DATE: 2013-12-09	REV DATE:
SCALE: NTS	CAD/FILE No.:
APP'D:	