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July 7, 2009

City of Bloomfield Hills
45 East Long Lake Road
Bloomfield Hills, MI 48304

Attention: Mr. Jay Cravens, City Manager

Re: Road Improvement Program Update
2010-2012 Program Update
City of Bloomfield Hills

HRC Job No. 20080856.21

Dear Mr. Cravens and City Commissioners,

Attached please find the proposed updated 2010-2012 Road Improvement Program update which corresponds to the Phase II bond issuance. Between the first phase of construction (2007-2009) and this proposed three year program, the City will have invested approximately \$11,000,000 in its critical infrastructure which provides the essential services of drinking water, sanitary sewage collection, and transportation facilities to the residents and business owners within the City. It must be clearly noted that this investment has been made with little to no impact on the City's millage rate. Included herein are discussions about the Phase I program, updated Road Condition Survey, and Phase II program recommendations, costs, and program schedule. These discussions are intended to compliment the attached report which will become the City's action plan to complete Phase II of road rehabilitation throughout the City.

Phase I Highlights - The 2007-2009 Phase I Road Improvement Program is scheduled for completion in fall of 2009 and will include the following highlights:

- 17 City roads addressed
- 3.6 miles of road way replacement, repair, or rehabilitation
- 0.3 miles of gravel roads paved (by SAD)
- 5,470 feet of water main replacement
- 36 water service leads replaced to the property line
- \$234,565 (PRV) investment in water system facility upgrades, \$737,900 total water improvements
- 58 sanitary sewer manholes rehabilitated
- 2 sanitary sewer lines replaced or repaired
- 2,470 feet of new storm sewer, 6,710 feet of road underdrain, and 740 feet of ditching installed

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Background

As a matter of background, until 2007 the City of Bloomfield Hills had not done any significant road work since the summer of 2001. Meanwhile, the City's roadways have continued to deteriorate. The recent Road Improvement Program is only the start of the roadway system recovery. The primary reasons for continued street deterioration are as follows:

- Age – many of the roads in the City have not been rehabilitated or replaced since their original construction. Crack sealing and selective patching has only slowed the deterioration process.
- Poor Drainage – The City does not have an extensive roadside ditching or storm sewer inspection and repair program. Maintaining the roadside ditches or underground drainage systems is critical to protecting the sub-base foundation of the road. Selective enclosing of roadside ditches by residents has only made this issue worse.
- Trash Haulers – The residents in the City have their choice of using any of several pre-approved trash haulers for normal residential refuse collection. This means that many different garbage trucks, which are very heavy and typically drive on the edge of the road (which is the weakest section) traverse the City roads on any given trash day or even multiple times throughout the week. If there are five pre-approved haulers, there is five times the truck loading on the City's streets. A similar argument could be made regarding service vehicles such as lawn, pool, contractor, delivery services, etc.
- Lawn Irrigation – Most properties have automated sprinkler systems. These systems sometimes run even when it is raining or when the soil moisture doesn't require more irrigation. Also, many of the sprinkler heads near the street are not set properly and end up watering the pavement. The net effect of this is saturated road base conditions which undermines the stability of the road, magnifying the effects mentioned above.

Public education efforts on lawn watering and drainage matters has been initiated through the City website and newsletters. The City may wish to consider consolidating or regulating trash haulers and requiring on-site parking for all service vehicles including lawn or landscaping contractors.

Pavement Condition Survey

Through the Road Commission for Oakland County (RCOC) the City was again offered the services of their contractor, Stantec, Inc., to perform a Pavement Condition Survey. The City elected to have all roads re-surveyed except those recently completed or to be done in the 2007-2009 Road Improvement Programs. A similar study was done in 2006. Therefore, using both surveys the City can evaluate the deterioration of roads over this time to make better decisions related to the selection of future roads to be repaired, replaced, or rehabilitated.

Stantec's survey provides three numerical road performance indicators. Pavement Quality Index (PQI) is the measure of the overall road surface quality. Ride Comfort Index (RCI) is the "feel" of the road to the motorist. Surface Distress Index (SDI) is the rating of roadway's surface stress and failures.

The City's average for each of the indicators is as follows with the Stantec description:

Indicator	2006 Numerical Classification	2008 Numerical Classification	Related Description
PQI	5.6	5.5	Good/Fair
RCI	5.3	5.3	Marginal
SDI	6.5	6.3	Severe Distress

As shown above, the City's roads had an average Pavement Quality Index of 5.5 compared to Oakland County paved roads which had an average Pavement Quality Index of 6.5. This indicates that the overall the quality of the roads in the City is less than the average quality of the paved RCOG roads. However, the City's average would have been better (higher) if the recently rehabilitated roads were included. **Taking this into account, the City's roadway system appears to be of similar quality to those in the Oakland County System.**

Reviewing the attached Stantec graphical results shows that the PQI indicator slightly skewed with a large number of road sections to be in poor condition. The RCI indicator is generally normally distributed about the average. However, the SDI indicator graph shows that most of the City's roads are in the Severe to Moderately Severe categories. These overall results were not unexpected and show that the City's roads are in reasonable shape. The DPW's maintenance efforts seem to be working to stabilize the road condition averages but continued major road improvements will be needed to offset the continued deterioration to maintain better than average rated roads and provide the highest level of service to the City residents.

To incorporate these results, HRC had to edit a limited amount of the Stantec data. Specifically:

- 1) Stantec divided many of the longer roads into sections for their data collection and reporting software. The City treats each road in its entirety except for a few of the major roads. Therefore, HRC had to consolidate the Stantec sections into one City section. Because the Stantec sections were of similar length, the road indicators were simply averaged.
- 2) Stantec had separated many of the cul de sacs from the adjacent main road (i.e. Kingsley Court and Kingsley Trail). As these cul de sacs would not be improved separate from the adjacent road, HRC combined the data for the separated Stantec section using a weighted average based on road length.

One limitation in this survey is that Stantec's study is a road surface inspection. Their data collection does not take into account the underlying issues with the road such as soil problems, drainage, traffic volume, etc. The survey also does not differentiate between the potential types of improvement needed. Replacing or repairing a road should be a priority over a simple maintenance overlay. To account for these limitations, HRC used the previously prepared road inventory report, which included input from the DPW and City Manager, to adjust for these situations. Because two data points, separated by two years, were available, HRC was also able

to account for roads that were deteriorating faster than others. A point system (1-3 points) was created and used to rank roads higher that appear to be deteriorating more rapidly.

Using the sum total of the three Stantec indices, along with deterioration factor and the HRC/DPW adjustments, the roads were sorted. To sort and rank roads with the same totals, PQI was used as the secondary ranking criteria. This yields a true numerical ranking. This listing should be used to initiate discussion and input from the City Commission and the public prior to preparing the final priority list.

As roads deteriorate at different rates, this ranking should be reviewed and updated each year before the selection process. We would recommend commissioning updated Pavement Condition Surveys by Stantec, or another similarly capable firm, before the final Phase of the three bond issues proposed for this program. However, if budgeting permits, we would recommend surveying every road in the City so a true City wide average can be determined to benchmark the City's efforts against the starting point and Oakland County roads.

Funding Update

The City has previously approved a financing package which includes the sale of bonds, City's General Fund contributions, and State Gas Tax revenues, in addition to utilizing Water & Sewer funds, which can be legally expended only on the water and sewer improvements associated with the various road improvements. The City's financial advisors have provided schedules of payments for the next bond issue and the Finance Director will comment under separate cover detailing the Phase II bonding proposal.

Public Information Meeting

The public information meeting will be scheduled for late July or August. At that meeting HRC will have exhibits and computer mapping showing the road priorities and associated infrastructure work for public viewing and discussion. Prior to each phase of construction and once plans have been developed, additional public meetings will be held where potentially affected residents can meet one on one with City or HRC staff to review the project. This has been successful during the 2008 and 2009 Programs

Lessons Learned

In implementing the 2007-2009 Road Improvement Programs, lessons have been learned that need to be addressed to improve future road programs.

Disseminating information to the public is the most critical factor in delivering a successful project. Improved communication measures have been implemented during the Phase I project and need to continue throughout the next phase(s). During the 2008 Program and from the beginning of the 2009 Program, HRC developed an email notification system where residents can confidentially provide their email of choice, and will received weekly, or more frequently if needed, communications from our office related to the project status. While paper flyers are still

needed to reach everyone in the area, email notification appears to be more reliable and efficient. To expand on this, HRC will discuss with the City the possibility of a web site for each project. The website will send out email notifications when anything is updated, provide drawings, detour information, schedules, special notices such as water shut offs, and project photographs. This has been successfully implemented in other communities but needs to be monitored to see how many residents use it to maintain cost effectiveness.

Easements for work outside the existing Right-of-Way are critical to a construction project moving forward. Decisions must be made early enough in the process so that the project is not delayed due to lack of easements. Condemnation for easements may be required for projects where the property owner is not cooperative. HRC will advance the easement issues forward in the design and permitting process. In addition to identifying easement needs early, should residents seek project changes or request priority ranking changes on roads that need easements, the residents should be asked to assist with the easements or to grant the easements before the work is added to the current year's program.

Finally, each year, the Road Improvement Program provides assistance to the City DPW in making minor road repairs throughout the City. While some repairs are unknown and become emergency situations, normal repairs should be identified, added to the bid documents, and accounted for in the budgeting process earlier in the process. This will help with timing, construction sequencing, and will save money.

Phase II Selection Process

To select the roads within the City to be addressed during this phase, HRC prioritized the roads based on the above discussed Pavement Condition Survey then used the criteria outlined in the 2010-2012 Program Update report to get an initial idea of the roads that could be done within the budget amounts provided by the City. What we found was the priority roads were scattered across the City and usually in areas that should be addressed along with other roads, i.e. subdivisions should be taken care of at the same time. This made the selection process more difficult.

However, location became a secondary concern this past spring when one of the bridges/culverts on a City road failed. The old mill race under Chesterfield Road gave out in mid-April creating an emergency repair situation. Fortunately, the failure which exposed traffic to a six foot diameter hole in the decking of the crossing, was found by a DPS officer and the road immediately shut down. Repairs began within 24 hours and were complete in approximately three weeks. This underscored the need for the City to address the repair needs on all major bridges or culverts within the City. As the critical needs were overlaid on a road condition map, certain areas of focus emerged, such as the Lone Pine and Cranbrook area.

In 2007, HRC completed a comprehensive bridge and culvert inventory which included registering several bridges in the MDOT critical bridge database. Along with collecting the requisite information for MDOT, HRC also provided lists of bridge improvements that should be undertaken by City forces or contractors. The above mentioned emergency repair underscored

our findings and recommendation that bridges and large culverts require the City's attention and should be prioritized in the Phase II Road Improvement Program.

Based on public safety concerns, HRC prioritized roads with necessary bridge or culvert work highest then used location, type of construction, impacts of other infrastructure needs, etc. to rank the roads as shown in the report. Unfortunately, in doing so, there was no clear cut off point and the recommended program exceeds the project budget. However, there are certain unknown costs associated with the bridge and culvert repairs until detailed design is completed. Therefore, HRC is recommending proceeding with the plan with the ability and option to delete roads out of future contracts or defer them until later years. **Therefore, the following Phase II Road Improvement Program recommendations should be considered tentative and based upon available funding.**

2010 ROAD IMPROVEMENT PROGRAM

Roads - Lone Pine East, Lone Pine West, Cranbrook Court, Linda Lane, Knoll, Court, and Cranbrook Road North

Bridges and Culverts - Lone Pine Bridge (near Cranbrook), Cranbrook Road North Bridge, Brady Lane Bridge, Lone Pine Road Culvert, and Cranbrook Court Culvert

Utilities - Water Main Replacement on Linda Lane, Knoll, Court, Water Main Replacements on Lone Pine East and West, and Misc. Sanitary Sewer Rehabilitation

Recommended SAD – Brady Lane

2011 ROAD IMPROVEMENT PROGRAM

Roads - Orchard Ridge Road North, Epping Lane, and Conge Drive

Bridges and Culverts - Orchard Ridge North Culvert

Utilities - Water Main Replacement on Epping Lane, Water Main Replacement on Conge Drive, PRV Rehabilitation at Orchard Ridge and Ridgewood, and Misc. Sanitary Sewer Rehabilitation

Recommended SAD – Ridgewood, Country Club, Pembroke

2012 ROAD IMPROVEMENT PROGRAM

Roads - Chestnut Drive, Circle, Court, Woodwind Drive, Renton Court, and Manorwood Drive

Bridges and Culverts - Hickory Grove Culvert

Utilities - Misc. Water System Improvements and Misc. Sanitary Sewer Rehabilitation

GRAVEL ROADS

Per the Road Improvement Program guidelines and City practice, it is recommended that existing gravel roads adjacent to roads proposed to be repaved be paved at the same time to provide economies of scale and to avoid disruption at a later date to the newly paved sections of road. These are listed in the above section.

Estimated Costs – 2010-2012 Program

Road Improvement Fund	\$3,849,000
Culverts and Bridges	\$ 980,000
<u>SAD</u>	<u>\$ 250,000</u>
Sub-Total Road Improvement BONDS	\$5,079,000
Water Fund	\$1,100,000
<u>Sanitary Sewer Fund</u>	<u>\$ 240,000</u>
<u>TOTAL ESTIMATED PROJECT COSTS -</u>	<u>\$6,419,000</u>

Budgeting and Potential Road Deferment

As mentioned above, the largest unknown cost at this point is the extent of the Lone Pine and Cranbrook (N) Roads bridge and culvert repairs. Based on detailed estimates during design it may be necessary to defer some of the above mentioned roads. If cost estimates or bids are not substantially lower than identified above, the following roads/costs should be deferred until future road improvement programs, in order of recommended deferment:

1) SAD Contributions; 2) Renton Court and Manorwood; 3) Linda Lane, Knoll and Court; 4) Cranbrook Road North and; 5) Conge Drive

Schedule

The schedule below identifies the tasks and approximate deadlines for initiating and implementing this plan.

- July 2009 City Commission Meeting – Commissioners provide input on the ranking and plan, 2010-2012 Road Improvement Program tentatively determined, Commission confirms financing and updated overall Plan
- Late July or August 2009 – Public Information open house held, updated report presented;
- Fall each year – Design started
- Winter each year – Second open house for resident input
- Spring each year – Project bid
- Summer each year - Construction

Map

We will provide mapping at the City Commission meeting that will show the road rankings as they currently stand for both the paved roads and the remaining gravel roads. Once the 2010-2012 roads are selected, we will update the map for placement on the City's website.

Summary

The City of Bloomfield Hills has approximately 28 miles of paved roads and 5 miles of gravel roads to maintain and improve when necessary. It is critical to make the necessary road improvements in an organized and well thought out manner. As such, the City has initiated a comprehensive Road Improvement Program to coordinate road projects in the most logical and cost effective way. This report and the attached information is provided to update the City Commissioners on the progress made thus far and request authorization in proceeding forward with the 2010-2012 Road Improvement Programs.

If you have any questions, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

A handwritten signature in black ink, appearing to read 'James F. Burton', written over a horizontal line.

James F. Burton, P.E., LEED AP, CFM
Environmental Engineering Department Manager

pc: City of Bloomfield Hills; City Commissioners, Chief Rick Matott, Ms. Carolyn Lorenz, Ms. Amy Burton, Mr. Jamie Spivy
HRC; M. Waring, B. Shepler, File