TORONTO CITY CLERK

Consolidated Clause in Works Committee Report 7, which was considered by City Council on July 19, 20, 21 and 26, 2005.

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Hogg's Hollow Stormwater Management and Road Improvement Study

City Council on July 19, 20, 21 and 26, 2005, adopted this Clause without amendment.

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The Works Committee recommends that:

(a) City Council adopt the staff recommendations in the Recommendations Section of the report (June 14, 2005) from the Executive Director, Technical Services;

(b) the Acting General Manager, Transportation Services be directed to defer enactment of parking recommendations for reconstructed roads until after the completion of Priority Area "A", which will be subject to consultation with the Fire Chief and discussion at North York Community Council;

(c) at the commencement of the Design Phase, the Acting General Manager, Transportation Services, in co-operation with the local Councillor, convene a meeting of the community to consider alternative curbing styles and that, specifically, curbing discussed in the June 13, 2005 meeting be permitted as an option, and that staff assist in reaching a community consensus on curbing; and

(d) the Acting General Manager, Transportation Services, in consultation with residents of the community, be requested to consider variable road widths exceeding 7.2 metres on selected roads during the detailed design phase and, where wider road widths are considered, the principle of tree preservation continue to be paramount.

Purpose:

To report on the findings and recommendations of the Class Environmental Assessment Study for the Hogg's Hollow Stormwater Management and Road Improvement Study and to request authorization to file the Study Report in the public record in accordance with the requirements of the Municipal Class Environmental Assessment process.

Financial Implications:

There are no immediate financial implications arising from the adoption of this report. However, since the majority of the roads and the associated roadside drainage systems in the Hogg's Hollow area are in a state of disrepair, and should be reconstructed with a new storm drainage

system within the next five to ten years, reconstruction of these roads, along with the installation of new storm water drainage infrastructure, will have to be programmed for implementation within the context of City-wide needs and priorities in the Transportation Services and Toronto Water Capital Works Programs from 2006 onwards. The estimated construction cost based on preliminary designs is approximately $15,000,000.00.

Recommendations:

It is recommended that:

(1) the preferred solution identified through the Hogg's Hollow Stormwater Management and Road Improvement Class Environmental Assessment study process, the principal elements of which are as follows, be endorsed;

- implementation of a series of source control measures on private property as documented in the Hogg's Hollow Stormwater Management and Road Improvement Study Report, through a public education campaign;

- implementation of a long term road and stormwater drainage improvement program, which involves reconstruction of the road network in conjunction with the installation of a storm sewer system capable of conveying the 100-year storm and a storm infiltration system for water quality purposes, as documented in the Hogg's Hollow Stormwater Management and Road Improvement Study Report; and

- enhancing the municipal operations and maintenance program for the area;

(2) authority be granted to the Executive Director, Technical Services to file the Environmental Project File for the Hogg's Hollow Stormwater Management and Road Improvement Study, which is in the form of a Project Study Report, with the City Clerk, and to give public notification of such filing in accordance with the requirements of the Municipal Class Environmental Assessment process; and

(3) the appropriate City officials be authorized and directed to take the necessary action to give effect thereto.

Background:

Hogg's Hollow is a unique area located within the West Don River watershed. The approximate boundaries are Yonge Street to the west, York Mills Road to the north, Highland Crescent/ Bayview Ridge Crescent to the east and Doncliffe Drive/Rosedale Golf Course lands to the south (see Figure 1). The study area is largely located within the valley land of, and straddles the West Don River. The area was originally developed in the 1950s and early 1960s.

The original road and drainage system within the area has been upgraded only to a limited degree over the years. In general, the public roads within this community remain unimproved and are in a state of disrepair. There are approximately 7 km of public roads within this area. Less than

1 km has been paved with hot laid asphalt. The remaining roads have rural cross-section consisting of surface treated pavements with some ditches to convey stormwater.

On most of the unimproved roads the existing roadside drainage systems are poor to non-existent. There are, in a number of areas, no continuous paths for stormwater to flow during rainfall events. Some parts of the area have storm sewers, which were built over the years but incompletely address local problems while the rest of the area is served either by ditches which are often plugged or by no ditch system at all. As a result, a significant number of homes in the area experience flooding problems. Furthermore, a number of properties are located within the floodplain of the West Don River. Therefore, the potential exists for water to back up from the river into the existing storm sewer outfalls, thus aggravating flooding conditions.

Flooding problems have been reported from the Hogg's Hollow area since the early 1980s. There have been a number of complaints from residents living across the Hogg's Hollow area since that time. Based on a survey carried out in 2002 for this study, approximately 25 percent of the residences in the area have experienced some form of flooding. Past attempts to solve these problems through local remedial work were only partially successful, largely due to the dispersion of the problem over the entire Hogg's Hollow area.

A proper stormwater drainage system for the entire area had been contemplated by staff for some time. The impetus for the Hogg's Hollow Stormwater Management and Road Improvement Study originated in early 2001 with a motion by the local ward Councillor. In the motion to the Works Committee the following points were noted:

- drainage systems are in a state of disrepair;

- residents are experiencing severe flooding problems;

- issues of potential liability have been identified;

- it is expensive and poor planning to continue with patchwork/piecemeal repairs; and

- problems relating to drainage, flooding, road improvements, sewer capacities and outlets and natural water courses need to be identified throughout the entire valley area and solutions proposed.

As a result of this motion, in February 2002, Technical Services initiated the Hogg's Hollow Stormwater Management and Roads Improvements Study, a Class Environmental Assessment (EA) Study, with the purpose defined as: "To determine the extent and causes of flooding within the Hogg's Hollow area, and to define a program consisting of stormwater management, drainage and road improvement works to alleviate flooding."

This study falls under Schedule B of the Class Environmental Assessment process and was jointly undertaken by Toronto Water and Transportation Services, with Technical Services managing the study.

Comments:

Study Process:

The Hogg's Hollow Stormwater Management and Roads Improvement Study has fulfilled the requirements of a Schedule 'B' project under the Municipal Class Environmental Assessment (Class EA). Due to considerable public interest and involvement in the project, a consultation process that exceeds the Class EA requirements for a Schedule 'B' project (two mandatory points of public contact) was carried out. The resulting level of detail covered in the study also exceeds the requirements of the Class EA for a Schedule 'B' project. As a result, a detailed report has been prepared instead of the required maintenance of a Class EA project file. Therefore, it is intended that if the City of Toronto Council endorses this study, the Study Report (SR) will be filed in the public record for a minimum 30-day review period, as required under the Class EA process. Since this 30-day review period would fall over the summer months, a 60-day public review period will be used by the City to allow residents adequate time for review.

The phases of the process set out by the Class EA for a Schedule B project are:

- Phase 1 – identification of the problem or opportunity;

- Phase 2 – identification and evaluation of alternative solutions; and selection of preferred solution;

- Notice of Completion, Study Report placed on Public Record, and Finalization of Class EA Process; and

- Implementation Phase, which involves detailed design, construction and operation of the project, and monitoring of impacts, in accordance with the terms of finalizing EA study process.

Phase 2 of the process has been completed. Subject to authorization by City Council through this staff report, the Study Report will be filed for a 60-day public review period and the Class EA process completed, prior to proceeding to detailed design and construction.

The Class EA study was carried out with the assistance of technical consultants Aquafor Beech Limited, and supported by a Technical Advisory Committee comprised of staff from Technical Services, Toronto Water, Transportation Services and Urban Forestry. Toronto Fire Services and Urban Development Services staff have also been involved in the process.

Public Consultation Process:

Public involvement and consultation is an integral and ongoing part of the study process. The requirement for one optional point of public contact and one mandatory point of public contact after the initial problem has been identified and solutions have been considered, as required in the Class EA, were not only met but significantly surpassed. Four Public Meetings and Open Houses were held. Several additional meetings were also held with local residents, the York Mills Valley Association and the local ward Councillor. The second mandatory point of public

contact, through the "Notice of Completion" and placing the study on the Public Record, has not yet occurred, and will occur after the City Council endorses the recommendations of this Staff Report.

The first Public Meeting and Open House was held on December 5, 2002, to review the problem statement, define the study area and discuss study purpose. Approximately 70 residents attended this meeting. Residents were generally supportive of the project. Questions related to the timing of the study, the solutions that would be looked at and the reasons for the flooding problems were addressed.

At the second Public Meeting and Open House, which was held on September 25, 2003, a long list of alternative solutions and evaluation factors for the analysis of the alternatives were presented. The results of field investigations and flooding analysis were also presented. Residents were asked to rank a number of criteria that would be used for evaluating potential solutions.

The third Public Meeting and Open House was held on December 10, 2003. A short-list of three alternative solutions for each of the six drainage areas within the study were presented. This meeting was attended by approximately 45 members of the public. The public response at this Open House indicated no clear consensus as to the preferred alternative for the study area as a whole, as outlined in sub-section 3 of the next section, Environmental Assessment Process and Findings.

A scheduled and advertised fourth public meeting on June 29, 2004, was turned into an informal meeting with residents, because logistics precluded gaining access to the scheduled venue at the designated time.

The evaluation of alternatives and the preliminary preferred design were presented at the fourth and final Public Meeting and Open House, held on October 20, 2004. This meeting was attended by approximately 86 members of the public.

A full description of the public consultation program can be found in Sections 4.6, 5.4, 7.6 and 7.9 of the Study Report.

Environmental Assessment Process And Findings:

The environmental study process required as a part of the Municipal Class Environmental Assessment Guidelines and the study findings are outlined below in three sections: (1) Identification of the Problem or Opportunity, (2) Identification and Evaluation of Alternative Solutions and Selection of Preferred Solution, and (3) The Preferred Solution.

(1) Identification of the Problem or Opportunity:

A brief description of the nature of the study area, the conditions of the roads and storm drainage system and the historical practices and problems are provided in the background section of this report. For the purpose of the study, the area was broken into six drainage areas.

In summary, the primary problems within the context of this study include:

- historical flooding of private property. Types of flooding include:

    - basement flooding due to surcharged storm sewer;
    - basement flooding due to surcharged sanitary sewer;
    - overland runoff entering the property or dwelling;
    - run off from ravine entering the property;
    - backwater from the West Don River;

- substandard road conditions; and

- drainage/road systems that are not capable of conveying stormwater to the streams and result in discharge of untreated stormwater to the Don River.

The standards for design and construction of our road and drainage system has changed significantly since urban development occurred in the study area. Present standards have been improved and the design of road and drainage systems are more integrated.

Therefore, the opportunities include:

- Development of an integrated drainage and road system to current standards, which also meets the requirements of the residents within the study area.

This information was presented at the first open house held on December 5, 2002. Residents were generally supportive of the project. Questions related to the timing of the study, the solutions that would be looked at and the reasons for the flooding problems were addressed.

(2) Identification and Evaluation of Alternative Solutions and Selection of Preferred Solution:

(I) Development of an initial set of solutions and evaluation:

The following five broadly categorized measures were initially developed to address the problem and associated issues:

(1) Residential source control measures that include:

    - Non-structural measures, which focus on improving storm water quality and reducing stormwater runoff (e.g., disconnection of directly connected downspouts, installation of rain barrels; most homeowners are willing to implement a number of such measures).

    - Structural measures, which are intended to reduce or prevent problems associated with basement or surface flooding (e.g., routing foundation drains to a sump pump; some homeowners have already undertaken a variety of such measures).

(2) Alternative conveyance measures that include:

- Installing/upsizing conventional storm sewer.
- Installing storm storage tanks.
- Installing infiltration pipes/tanks.
- Altering the roadway cross-section.
- Upsizing the existing sanitary sewers.

(3) A Public education program that focuses on the implementation of a variety of non-structural source control measures indicated in (1) above by individual property owners based on mutual interest of the owners and the City.

(4) Enhancement to the municipal operations and maintenance measures for the area: a review of the present water infrastructure and current level of operations and maintenance is needed.

(5) End of pipe measures: typically installed at the end of the conveyance system; not found feasible for this study area due to lack of available space and proximity to the flood plain.

This information was presented at the second Open House held on September 25, 2003. The results of field investigations and flooding analysis were also presented. Through a survey, residents ranked a number of criteria that were used for evaluating potential solutions in the next stage of the study.

(II) Development of a set of alternatives for road right-of-way based conveyance control measures and evaluation:

After the initial assessment, a refined set of alternatives were developed and evaluated for conveyance control measures that the City would undertake utilizing capital funds.

The following seven alternative roadway cross-sections were established:

- Alternative 1 – Conventional Curb and Gutter;
- Alternative 2 – Shallow Curb and Gutter;
- Alternative 3 – Reverse Crown with No Curb;
- Alternative 4 – Reverse Crown with Shallow Curb;
- Alternative 5 – Rural Section with Deep Ditch;
- Alternative 6 - Rural Section with Shallow Ditch; and
- Alternative 7 - Rural Section with Shallow Swale.

The alternative solutions were evaluated based on public input received and the following factors:

- their ability to address the concerns identified (i.e., the problem);
- the impact each solution would have on the socio-economic environment;
- the impact each alternative would have on the natural environment; and
- cost.

Detailed descriptions of the alternative solutions and relevant analyses are provided in Chapter 7 of the Study Report.

From the seven alternative road cross-sections above, the following alternative road cross sections were selected in combination with a storm drainage system that would provide a 100-year level of protection against surface and basement flooding:

- Alternative 1 – Conventional Curb and gutter;
- Alternative 2 – Shallow Curb and gutter; and
- Alternative 4 – Reverse Crown with Shallow Curb.

Rural cross-sections with ditches or swales, though preferred by some residents, were not selected due to the required large overall road widths.

The "Do Nothing" Alternative was also considered for each drainage area. This alternative is required to be assessed in all Class EA studies.

These alternatives were presented to the public at the third Public Open House on December 10, 2003. Public response at this Open House indicated no clear consensus as to the preferred alternative for the study area as a whole. They were supportive of the short-list of alternative solutions, but were divided in their opinion on some aspects of the solutions for individual streets. The road cross-section that received the largest degree of support was Alternative No. 2, Shallow Curb and Gutter. Important themes raised by residents included the desire to preserve all trees, use a narrow roadway and small curb (if any). Residents were opposed to the inclusion of sidewalks in the design. As a result, sidewalks were no longer considered within the study.

At the informal meeting with residents in June 2004, key issues that were raised included: a tailor made solution needed for each street; the existing rural character must be maintained; tree loss and damage should be minimized; roads should not be widened. These points were incorporated as far as possible into the preferred solution.

The consequence of public input in the Environmental assessment process, was the recognization that (i) there are technical issues that require the roads to be of a minimum width, which is 'too wide' from a community perspective; and (ii) there are community issues that require the street to be narrow which is 'too narrow' from a technical perspective. Subsequent to the informal public meeting, staff met several times and initiated a field investigation to find a solution/ compromise that addresses the desires of the residents, respects the City's standards and policies for road design, and provides for the community's emergency and servicing needs.

The principle adopted was to maintain essentially the existing foot-print of the existing pavement. Following this principle, a paved road width of 7.2 metres is attained throughout most of the streets of Hogg's Hollow and this meets the City's policies for road design. On some streets, a lesser street width of 6 m or 6.8 m has been adopted which is sufficient to address road design considerations because these are generally on short dead-end streets; these widths maintain essentially the same foot-print of the existing street. On one street, St. Margarets Drive, a width of 6 m pinching down to 4.5 metres is selected to preserve trees, and is proposed to become a one way street to permit emergency and service vehicle access.

This principle serves to maintain the urban character of the area, meets the principle of protecting the tree canopy, and addresses the priorities for the project identified through the public consultation process.

The Preferred Solution:

Based on technical evaluation and comments received through an extensive consultation process, an integrated approach of implementing a series of source control measures on private property (through a public campaign), implementing a long term Road and Stormwater drainage improvement program, and enhancing the municipal operations and maintenance program for the study area was determined to be the best solution to address the identified problems.

The preferred alternative is the combination of A, B and C below:

(A) Implementation of a series of source control measures on private property (through public campaign):

(A.1.) Non-structural source control measures:

- disconnecting roof downspouts which are presently connected to the storm sewer;
- redirecting roof downspout leaders (to ground areas) which presently discharge flows to paved areas;
- installing rain barrels to allow stormwater to be detained and re-used;
- constructing soakaway pits to reduce stormwater runoff and increase groundwater infiltratration;
- replacing impermeable materials (asphalt, concrete) with materials that allow runoff to infiltrate into the ground (i.e., granular material, interlocking stone); and
- landscaping properties to promote infiltration or treatment of runoff.

(A.2.) Structural source control measures include:

- improving existing lot grading;
- routing foundation drains to a sump pump; and
- installing sanitary sewer backflow preventer valves.

(B) Implementation of a long term road and stormwater drainage improvement program which will also include construction of a perforated pipe storm sewer system for water quality purposes.

The preferred solution involves reconstruction of the road network in conjunction with the installation of a storm sewer system capable of conveying the 100-year storm.

Incorporated within this large sewer system will be a storm infiltration system where the ground soil types and conditions permit.

The road system will consist of roads of regular cross sections with shallow curb and gutter and pavement widths of 7.2 metres in general, except for the following streets where the pavement width will be less than 7.2 metres in order to avoid physical removal of mature trees and/or due to certain physical constraints:

- 6 metres with localized reduction to 4.5 metres for St. Margarets Drive;
- 6 metres for Donino Court and Brookefield Road, east of Plymbridge;
- 5.9 to 6.4 metres for Donwoods Drive between Yonge and Donino;
- 6.1 to 6.7 metres for Old Yonge Street;
- 6.8 metres for Donino Avenue south of Donwoods, and parts of Plymbridge Crescent and Donwoods Grove; and
- 6.8 to 7.2 metres for a part of Plymbridge Road near the bridge across Don River.

(C) Enhancing the municipal operations and maintenance program for the area.

The existing sanitary sewers and and watermains in the area would remain in place except where conflicts occur. Where there are no conflicts these sewers and watermains would be relined. Where there are conflicts they will be replaced.

Based on preliminary designs, there would be no physical removal of trees. However, a certain number of trees would be within two or four times the tree diameter from the edge of the proposed construction. These trees will be fertilized in advance and careful construction techniques utilized to prevent tree damage or loss.

It should be noted that Toronto Fire Services and Transportation Services staff have raised concerns that narrow road widths will inhibit effective operations within the neighbourhood. The recommended road widths represent a compromise scenario and represent the minimum acceptable road widths from these perspectives. Further, this position is predicated on the investigation of parking restrictions within the area, once the roads have been built. Transportation Services will be seeking enactment of by-law for “prohibition of on-street parking” when the streets are reconstructed in Hogg’s Hollow during the implementation phase.

The preferred solution was presented to the public at the fourth Public Open House on October 20, 2004. The Toronto Fire Services Chief was also present to illustrate and discuss fire safety issues associated with narrow roadways with residents. Some members of the public were supportive of the overall study approach and the recommendations. Others were dissatisfied with the perceived lack of rationale for the road widths presented. The possibility of parking restrictions was met with significant opposition. Traffic speed issues that may result if the road pavements were wider than at present was another concern. The advantages of the preferred solution and concerns expressed with respect to the widths and associated parking restrictions are fully documented in the Study Report.

City staff subsequently had several internal meetings among representatives of Technical Services, Transportation, Fire Services, City Forestry, and Toronto Water at which it was confirmed that, from a technical perspective, parking restrictions will be sought at the stage of roadway reconstruction, due to the narrow street widths of the preferred solution. As is pointed out in the Project Study report, parking restrictions are subject to the City Council approval at the implementation stage of the project after the project study report is approved to fulfil provincial Environmental Assessment Act requirements. As well, the implementation schedule will be subject to Council approval through the Capital Funding program process.

Next Steps:

Pending approval of this report by City Council, this Study Report will be filed in the public record for a minimum 30-day period. Due to impending summer holiday season, it is recommended that the review period be extended to a 60-day period.

During this review period, members of the public and any other interested individual, interest group, or government agency may review the contents of the report and, if they so desire, request that a Part II order be issued. A Part II order, if granted by the Minister of the Environment, elevates the status of the project from a Class EA Study to an Individual Environmental Assessment depending on the decision of the Minister. If this occurs, the project cannot proceed until the proponent completes an Individual Environmental Assessment and receives approval from the Minister. If a Part II order is not granted or if no requests or objections are received during the filing period, the project is approved under the Environmental Assessment Act and may proceed.

Once EA approval is received, design and construction may proceed as soon as funding is available. Public Consultation will continue through the implementation stage when detailed designs are prepared for each street or groups of streets considered for construction every year until all recommended work have been completed.

Conclusions:

A Municipal Class Environmental Study (Schedule B) was undertaken to identify and evaluate alternative solutions to the flooding problems in the Hogg's Hollow area. Recognizing the level of interest in the study, an extensive public consultation program was carried out, beyond the requirements of the Class EA.

The preferred solution:

- balances the wishes of the public with the City's obligations;

- allows Fire Services, other City operations and various service providers to effectively work in the area;

- solves the existing flood related issues through an improved drainage system; and

- brings area roads up to current standards.

The process for completion of the Environmental Assessment Study and the implementation process are two independent processes. Approval is sought, through this staff report from City Council to both endorse the study report findings and to provide authority for filing the study report to fulfil Provincial Environmental Assessment Act requirements. The provincial process must be completed, before any implementation projects can be designed and constructed. Due to the historical flooding problems, it is absolutely essential that the environmental study phase of the project be completed with due deliberate diligence. Approval for specific components of the implementation phase, including capital funding and possible parking restrictions etc., will be addressed in future staff reports.

The second mandatory point of public contact, through the "Notice of Completion" and placing the study on the "Public Record", has not yet occurred, and will occur, after Toronto City Council endorses this staff report.

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List of Attachments:

Attachment 1-98WC
Attachment 2-98WC
Attachment 3-98WC
Attachment 3-98WC – Figure 7.7.1
Attachment 3-98WC – Figure 7.9.2
Attachment 3-98WC – Figure 7.9.3
Attachment 3-98WC – Figure 7.9.4
Attachment 3-98WC – Figure 7.9.5
Attachment 3-98WC – Figure 7.9.6
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Executive Summary

Executive Summary

Introduction:

Hogg's Hollow is a unique area located within the West Don River watershed in the City of Toronto. The area is characterized by low lying lands with undulating topography. The

approximate boundaries of the study area are Yonge Street to the west, Doncliffe Drive to the south, Bayview Ridge Road to the east and York Mills Road to the north (see figure 1.1).

The area was originally developed in the 1950s and early 1960s. Slightly over 20 percent of the original homes have been renovated or reconstructed.

The original road and drainage system has been upgraded to a limited degree over the years and, in general, the public roads within the community remain unimproved. Within the community there are approximately 7 km of public roads. Less than 1 km have been paved with hot laid asphalt. The remaining roads have a rural cross section consisting of surface treated pavements with some ditches to convey stormwater.

Many of the unimproved roads in the area, including the associated drainage systems are in a state of disrepair or are substandard. On most of the unimproved roads the existing roadside drainage systems which convey stormwater are poor to non-existent. There are, in a number of areas, no continuous paths for stormwater to flow during rainfall events. As a result a significant number of homes in the area experience flooding problems. Furthermore, a number of properties are located within the floodplain of the West Don River. Therefore, the potential exists for water to back up from the river into the existing storm sewer outfalls, thus further aggravating flooding conditions.

This study was carried out under Schedule B of the Municipal Class Environmental Assessment, and is subject to the requirements of the Environmental Assessment Act. However, as a result of considerable public input, the consultation process, and level of detail provided in this report covers a considerable part of the requirements for a Schedule C project.

In total, four public meetings, together with a series of informal meetings were held with local residents, the ratepayers group and the local councilors. Questionnaires were also distributed at key points in the process and information was posted on the City of Toronto website.

Study Purpose:

The study purpose has been defined as follows:

- To determine the extent and causes of flooding within the Hogg's Hollow area, and to define a program consisting of stormwater management, drainage and road improvement works to alleviate flooding.

Phase 1 – Problem And Opportunity Identification:

The design and construction of our road and drainage systems has changed significantly since development was initiated in the Hogg's Hollow area. Whereas past practices and associated standards were limited with respect to the types of materials to construct the road and the size of the pipe or culvert to convey stormwater from the lands to the receiving stream; present standards have been improved and the design of road and drainage systems are more integrated. Furthermore, until the mid-1980s drainage systems were designed on the basis that stormwater should be removed from the lands as quickly as possible without any regards to the impact on the

streams and rivers receiving these flows. More recently, we have began to understand that this practice leads to increased flooding and erosion, degraded water quality and reduction in baseflows which impacts the resident fisheries.

The primary problems within the context of this study include:

- Historical flooding of private property. Approximately 25 percent of the residences have experienced surface or basement flooding problems.

- Substandard road conditions.

- Drainage/road systems which are not capable of conveying stormwater to the streams and result in discharge of untreated stormwater to the Don River.

The opportunities include:

- Development of an integrated drainage and road system to current standards which also meets the requirements of the residents within the study area.

Phase 2 – Evaluation Of Alternative Solutions:

Definition Of Existing Conditions:

A variety of information was collected and reviewed in order to define existing conditions. In addition to collecting and reviewing existing information a significant amount of fieldwork was undertaken in order to better define existing conditions. Programs included field assessments to define the condition of the existing roads, soils type (in order to determine the suitability of infiltrating stormwater runoff), an extensive questionnaire to better define the extent of flooding as well as homeowner responses to implement measures which would alleviate flooding and improve water quality conditions, inspection of the sewer systems to better assess the current condition as well as a field survey to better define drainage patterns and confirm location, size and type of the storm and sanitary sewers.

Flooding:

The City of Toronto maintains a historical record of flooding problems for homeowners who report a problem during or after a rainfall event. In general, the street name and house number is recorded, as is the date on which the flooding occurred together with a summary of whether flooding was a result of storm, sanitary or undetermined discharge.

The City records show that a number of homeowners have experienced flooding problems dating back to the late 1970s. Typically flooding complaints were received for severe rainfall events such as those that occurred in 1977, 1986, 1993, and more recently in 2000. These records were used as a starting point to define the location, frequency and type of flooding problems.

As many homeowners do not inform the City of flooding problems a detailed questionnaire was sent to each house in the study area. The questionnaire included a number of questions relating to flooding as well as other topics (see section 4.6) and was intended to better define the cause and extent of flooding problems.

In total, over 300 questionnaires were returned and of these approximately 25 percent of the respondents reported flooding problems.

The detailed information with respect to the type and general location of flooding was summarized and is illustrated on figure 4.4. This figure illustrates the type of flooding problem; surface, basement and surface and basement as well as the general areas of flooding. Specific locations were not shown in order to be consistent with the Municipal Freedom of Information and Privacy Protection Act.

Road Structure:

A total of 30 borehole samples were undertaken in order to define pavement and subsurface type and thickness.

Based on the subsurface investigation, and in regards to the surficial pavement structure, there was found to be significant variability in the asphalt and granular thickness. The asphalt thickness ranged from 15 to 280 mm. The underlying granular material varied from negligible to up to 700 mm in depth. The pavement subgrade conditions were also quite variable with organic materials being encountered at some locations. These findings, in combination with the existing poor road conditions, lead to the conclusion that full rehabilitation of the pavement structure be undertaken. It was also felt that reconstruction of substandard roads would also facilitate regrading to permit better drainage of surface water.

Soils Investigation:

A soils investigation was undertaken to determine soils type, suitability for use when the roads are reconstructed and permeability of soils. In summary, the subsurface conditions at the site are quite variable, however, silty sand and sand materials are predominant throughout the study area.

The soils were found to be suitable for infiltrating stormwater.

Evaluation Of Alternatives:

The alternative solutions that were initially developed to address the study purpose and associated issues were broadly categorized as follows:

- residential source control measures;
- conveyance control measures;
- public education programs;
- enhanced municipal operation and maintenance measures; and
- end-of-pipe measures.

Source control measures include non-structural measures (disconnection of directly connected downspouts, installation of rain barrels) which focus on improving water quality and reducing stormwater runoff as well as structural measures (routing foundation drains to a sump pump) which are intended to reduce or prevent problems associated with basement or surface flooding.

A variety of alternative conveyance measures were considered in order to address the above noted objectives. The alternative conveyance measures that were considered included:

- installing/upsizing conventional storm sewers;
- installing storm storage tanks;
- installing infiltration pipes/tanks;
- altering the existing roadway cross section; and
- upsizing the existing sanitary sewer.

Public education programs which focused on the implementation of a variety of source control measures were also addressed.

Ongoing municipal operation and maintenance measures were also reviewed.

End of pipe measures, which are typically installed at the end of the conveyance system were also considered but were not found to be feasible due to the lack of available space and proximity to the floodplain.

Once the initial assessment was completed a refined set of alternatives were evaluated.

The initial step in evaluation involved defining level of service for protection from flooding. The objective is to provide a 100-year level of protection against surface and basement flooding.

Following this, a total of seven alternative roadway cross section were established. The intent of this task was to establish a wide range of alternatives, which would assist in addressing the study purpose. Furthermore, the alternatives covered different types of cross sections (i.e., swales, ditches, shallow curbs, conventional systems and reverse crown roads).

The alternative road cross sections are summarized below:

Alternative 1 – Conventional Curb and Gutter;
Alternative 2 – Shallow Curb and Gutter;
Alternative 3 – Reverse Crown with no Curb;
Alternative 4 – Reverse Crown with Shallow Curb;
Alternative 5 – Rural Section with Deep Ditch;
Alternative 6 – Rural Section with Shallow Ditch; and
Alternative 7 – Rural Section with Shallow Swale.

The study area was then divided into six areas.

The drainage areas were defined by determining which areas would drain to a common storm sewer outlet. Once the drainage areas were established three alternative storm drainage and road cross sections were established for each area.

The initial selection of alternatives was based on picking a road width that would result in minimal or no physical removal of trees. Once this criteria was met three alternatives were selected based on existing drainage and road cross section type, existing flooding problems and storm sewer/roadway capacity.

The Do Nothing Alternative was also evaluated for each drainage area.

The alternatives were presented at the third Public Open house on December 10, 2003. The residents were asked to address the questions as outlined below; and to provide general comments:

- What do you like about each alternative?
- What do you dislike about each alternative?
- Should another alternative be considered?
- Which alternative do you prefer?

In summary, for the area as a whole there was no clear consensus as to the preferred alternative. The most popular alternative was Alternative 2 – Shallow Curb and Gutter. However, several residents preferred the Reverse Crown Alternatives (3 and 4) as it was thought that these alternatives would minimize flooding, particularly for properties with poor drainage or reverse sloping driveways. Furthermore, several people; particularly those who wanted to preserve the character of the neighborhood and generally did not experience flooding preferred the Do Nothing Alternative.

In addition, there was a common theme with respect to some of the other comments that were brought up during the Break-Out Group discussions. These comments included preserving trees, use of as narrow a roadway as possible, use of a small curb if possible (which is reflected in the selection of Alternative 2 above) and no construction of sidewalks.

Based on public input and subsequent discussions between the consulting team and City staff a number of items were further discussed. The items included:

- minimum road width;
- process to determine tree loss;
- steps to minimize tree loss; and
- alternative infiltration systems.

Based on input received and discussions between City staff and the consultant team the preferred alternative, which was selected, was:

- pavement width of 7.2m;
- alternative 2 – Shallow Curb and Gutter;

- sewer System generally comprised of a 100-year storm sewer with a second pervious pipe capable of infiltrating 15mm of runoff from the road right-of-way.

The preferred alternative is illustrated in figure 7.7.1. An overview of the reasons for selecting the preferred alternative is provided below.

The pavement width of 7.2 metres was determined to be the minimum width based on the following factors.

- requirements for emergency vehicle access;
- requirements for service vehicle access;
- consideration for pedestrian/vehicle conflicts;
- consideration for safe two way traffic flow; and
- requirements for winter road maintenance.

Furthermore, based on the preliminary design that was completed a 7.2 metre pavement width (and corresponding 8.5 metre construction width) could be implemented without any physical removal of trees.

The Shallow Curb and Gutter Road Cross Section (Alternative 2) was selected in part, as it was the most popular alternative based on public input. Furthermore, it is the minimum curb height feasible to convey flows and provide the level of flood protection for the 100-year storm.

A consistent road cross section throughout the study area was selected for operation and maintenance reasons such as snow ploughing.

A storm sewer system capable of conveying the 100-year storm was selected for the study area.

As shown on figure 7.7.1 a storm infiltration pipe will also be constructed. The purpose of this pipe is to infiltrate stormwater back into the ground thereby replenishing groundwater, reducing flows to the river and removing pollutants to the sewer. The objective, which is consistent with that outlined in the Wet Weather Flow Master Management Plan is to infiltrate 15mm of stormwater runoff from the road right-of-way.

The fourth Public Open House was scheduled for June 29, 2004, at the Agricola Finnish Lutheran Congregation. However, due to an unforeseen situation the venue was not available at the advertised starting time of 6:00 p.m. After discussions between the local Councillor, the President of the York Mills Valley Association, City staff and the Consultant team it was agreed that an informal meeting would be held once access was granted.

Four of the key points that were brought out by the residents at the informal meeting are provided below.

(i) The first point was that a consistent “cookie cutter” approach to road widths for the whole Hogg’s Hollow area was not appropriate or acceptable. Residents requested that each street receive a “tailor made” solution, depending upon variables such as road usage, infrastructure requirements, existing character and number of trees.

(ii) The second item was the strong desire to maintain the existing character of the neighbourhood.

(iii) Item three related to potential tree loss; residents wanted to minimize the impact on existing trees adjacent to the roadways.

(iv) Item four related to sidewalks and proposed road widths; it was noted that the residents request not to install sidewalks in the future also meant that they did not want wider roads.

Based on input received at the informal Public Open House a series of meetings were held between City staff and the consultant team. Representatives from Road Operations, Technical Services, Urban Forestry, Urban Development, Traffic Operations, Transportation Infrastructure Planning and Toronto Water attended the meetings. In addition, representatives from Emergency Services and the Fire Department were also asked to attend.

Based on the meetings that were held it was agreed that representatives from the above noted departments would undertake detailed field investigations in order to determine (or refine) the proposed pavement widths based on a number of criteria that were established by City staff, the Fire Department and the Public.

The primary objectives of the field investigations were to:

- determine, at a number of locations, existing pavement and road widths;

- photograph locations where the proposed edge of pavement would be close to existing trees;

- assess the impact of constructing the proposed road cross section with a 7.2 metre pavement width on the existing character of the neighborhood, and on existing trees; and

- determine areas where a narrower pavement width could be used.

Table 7.9.1 summarizes part of the information that was collected in the field. Included in this table are existing road widths and edge of pavement widths at 72 locations together with the proposed pavement width and road construction width at each location. The location of information that was collected is shown on figure 7.9.1.

Figures 7.9.2 through 7.9.5 illustrate the concept at four locations (Campbell Crescent, Doncliffe Drive, Donino Avenue and Donwoods Drive).

Figure 7.9.6 summarizes the proposed pavement widths for each street in the study area.

In summary, a comparison of existing pavement widths to proposed widths (see table 7.9.1) shows that the proposed pavement width is less than or equal to the existing edge of pavement at 64 of the 72 locations.

A detailed tree inventory was undertaken as part of this study. The inventory identified and located all trees located adjacent to the existing roads. For each tree the species class, tree group health and diameter were identified. The location of each tree was also defined in order to confirm the proximity to the existing and proposed road. Table 7.9.1 shows the potential loss of trees using the pavement widths as illustrated in figure 7.9.6.

Selection Of The Preferred Alternative:

Based on input received from the informal Public Open House held on June 29, 2004, the initial Preferred Alternative was refined. The refinement involved reducing pavement widths, where feasible, to widths less than the standard 7.2 metres. A protocol for minimizing the impact of road construction on potential tree loss was also developed. The refinements were made to address items which were brought out at the informal Public Open House, and in particular, the request that a "tailor made" solution be provided which is dependant upon variables such as road usage, infrastructure requirements, existing character of the neighborhood and the protection of existing trees.

A fourth Public Open House was then held on October 20, 2004. The open house included a presentation by City staff, the Fire Department and the Consultant team. Responses to questions and clarifications raised by the public during the presentation were provided. Break-out groups were formed and asked to address the following questions:

- What do you like about the preferred alternative?
- What don't you like about the preferred alternative?
- Do you have any comments about prioritization of the streets?

A summary of the key input as provided by the residents in attendance is provided below.

- A number of members of the public have indicated that they are more comfortable with the current proposal. Some key factors that contribute to this comfort level include: the preservation of trees; the street-by-street solutions presented; the control of stormwater and reduction of flooding in the study area that will result when the plan is implemented.

- At least an equal number of residents remain dissatisfied with the preferred preliminary design. Some key factors contributing to this dissatisfaction include: lack of strong rational from Works and Emergency Services staff about operational needs for 7.2 metre road alignments; inadequate protection of trees; inadequate consideration of unique nature of area.

- Curb type was considered earlier in this process. There was some desire by many public meeting participants to revisit the type of curb being proposed.

- Restrictions to on-street parking were not favoured by the majority of involved residents. However, restrictions to parking were a key factor in the City presentation of 7.2 metre roads – a width that is narrower than existing standards and felt to be a minimum operational requirement for the adequate provision of various services to the area.

- A number of residents expressed concerns with traffic safety. Motorists who use the area often travel at high speeds. It was felt that newly paved roads in the area would only contribute to this problem.

- The computer images that were presented during the public meeting showed curbs and roads that were "white, pristine and subdivision-like". Residents felt that the current rural cross section of the area should be maintained and/or enhanced by design features such as curb colour and road textures.

A review of these issues reveals:

- Despite a recognition that the City staff and consultants have listened and incorporated many concerns raised in the past, the community is still very much divided regarding the acceptability of the current plan.

- In some cases where there appeared to be an emerging consensus at previous meetings (i.e., with the type of curb), residents who attended this meeting on October 20, 2004, did not reflect this same opinion.

- The last three bullet points above are important "detailed design" considerations. Typically, these items would be considered during the detailed design phase of a project. In this case, the stakeholders and the project team has the advantage of knowing and discussing this information well in advance.

Preliminary Design:

The Preferred Alternative:

In order to achieve the study purpose an integrated approach was undertaken. The preferred alternative solution, which is defined in Chapters 6 and 7 involves:

- Implementation of a series of source control measures on private property in order to reduce the volume of stormwater, replenish the groundwater system and reduce the amount of pollutants entering the West Don River.

- Implementation of a long term road and stormwater drainage improvement program which will also include construction of a perforated storm sewer system to further reduce the amount of pollutants entering the West Don River and, to replenish the groundwater system.

Preliminary design drawings for the Preferred Alternative were prepared and are presented in Chapter 8 and Appendix E. In addition to presenting the preliminary design the following is presented.

- implementation considerations;
- costing information; and
- considerations at the detail design stage.

Implementation:

The phasing of the proposed works was determined based on the following three criteria:

- construction must start from the storm sewer outlet and progress upstream;
- the frequency of existing flooding; and
- the existing condition of the road.

The proposed road and storm drainage works were divided into three groupings; Priority Area A, B and C.

Priority Group A works represent areas near the proposed outlets where frequent flooding occurs and the existing road condition is rated fair to poor. These works should be initiated first.

Priority Area B works represent areas where flooding is less frequent and the existing road condition is rated fair to poor. In some instances these areas are located upstream of Priority Group A Areas.

Priority Area C works represent areas where flooding is less frequent and the road condition is rated fair to good.

Figure 8.1 illustrates the proposed implementation for the proposed works.

The actual timing of construction will be dependant upon availability of funding.

Costing:

Table 8.3 summarizes the construction cost estimates for each street in each of the three Priority Groups. In summary, the construction cost estimates are:

- Priority Group A - $4,400,000.
- Priority Group B - $7,900,000.
- Priority Group C - $2,800,000.

Total - $15,100,000.

Considerations at the Detail Design Stage:

The Hogg's Hollow area is a unique area and a strong desire by the residents was expressed during this study to preserve the character of the area. As was noted, this study was undertaken as a Schedule B project. However, due to public interest the level of consultation and detail provided in this report covers part of what normally would be covered under a Schedule C project. It was also noted in Chapter 7 that several items raised by the public (i.e., curb type, protection of landscaping and parking) could only be addressed at the detail design stage. It was therefore recommended that a comprehensive Public consultation process be undertaken at the Detail Design stage in order to address items which are beyond the scope of this study and to

ensure that the unique character of the Hogg's Hollow area is preserved. Further detail with respect to items which need to be considered at the detail design stage are outlined below.

Tree Preservation:

In order to minimize the potential impact on trees as a result of construction, a number of preventative steps are recommended. These include application of fertilizer at least one full growing season prior to excavation, crown pruning by a qualified arborist, sawcutting and hand digging to protect exposed roots and irrigation during and after construction.

Curb Treatments:

The concepts shown in this study illustrate a traditional shallow (75mm) curb. There are various alternatives to this type of curb, which should be considered at the detail design stage. These include the use of alternative materials such as granite, adding a pigment which will result in different colors or altering the mixture content (i.e., by adding stones or granular material) to provide a rougher older looking product.

Public Consultation:

It is recommended that a comprehensive Public Consultation process be undertaken at the Detail Design stage in order to address items, which are beyond the scope of this study. The public consultation process should include a number of working meetings and would include topics such as:

- changes to the area since this project was undertaken;

- an overview of the design process, construction techniques and timing of construction; and

- resident issues such as protection of landscaping, tree preservation, traffic control, safety, parking, curb treatments, measures to prevent flooding traffic calming and boulevard treatments.

It is anticipated that approximately one working meeting would be required for each street of group of street where construction is undertaken concurrently.

TABLE 7.9.1 - Summary of Existing Road Widths and Edge of Pavement to Proposed Pavement Width and Road Construction Width at Representative Locations

Cross Section No.	Road Name	Existing Road Width (m)	Existing Edge of Pavement (m)	Proposed Road Width (m)	Proposed Road Construction Width (m)	Sheet Number
BFR-1	Brookfield Rd	3.3	4.6	6.0	7.3	E3
BFR-2	Brookfield Rd	5.8	7.9	7.2	8.5	E3
BFR-3	Brookfield Rd	6.1	7.8	7.2	8.5	E3
BFR-4	Brookfield Rd	8.2	8.2	7.2	8.5	E3
CBC-1	Campbell Cres.	7.3	8.2	7.2	8.5	G1
CBC-2	Campbell Cres.	7.3	8.2	7.2	8.5	G1
CBC-3	Campbell Cres.	6.6	7.6	7.2	8.5	G1

Cross Section No.	Road Name	Existing Road Width (m)	Existing Edge of Pavement (m)	Proposed Road Width (m)	Proposed Road Construction Width (m)	Sheet Number
DCD-1	Doncliffe Dr.	7.3	8.5	7.2	8.5	F1
DCD-2	Doncliffe Dr.	6.9	7.4	7.2	8.5	F1
DCD-3	Doncliffe Dr.	5.6	7.8	7.2	8.5	F1
DNA-1	Donino Ave	6.2	7.2	6.8	8.1	B2
DNA-2	Donino Ave	6.7	8.6	6.8	8.1	B2
DNA-3	Donino Ave	6.0	6.9	6.8	8.1	B2
DNA-4	Donino Ave	8.0	9.3	7.2	8.5	B2
DNA-5	Donino Ave	7.5	8.0	7.2	8.5	A5
DNA-6	Donino Ave	6.9	8.7	7.2	8.5	A5
DNA-7	Donino Ave	6.8	9.3	7.2	8.5	E1
DNC-1	Donino Crt	6.2	7.2	6.0	7.3	A6
DWD-1	Donwoods Dr	8.4	10.0	7.2	8.5	C1
DWD-2	Donwoods Dr	6.5	7.4	7.2	8.5	C2
DWD-3	Donwoods Dr	6.6	8.2	7.2	8.5	C2
DWD-4	Donwoods Dr	6.4	7.9	7.2	8.5	C2
DWD-5	Donwoods Dr	6.4	7.4	7.2	8.5	B1
DWD-6	Donwoods Dr	6.7	8.4	7.2	8.5	B1
DWD-7	Donwoods Dr	5.9	5.9	5.9	7.2	A3
DWD-8	Donwoods Dr	5.9	5.9	5.9	7.2	A4
DWD-9	Donwoods Dr	5.9	5.9	5.9	7.2	A3
DWD-10	Donwoods Dr	5.9	7.1	7.2	8.5	A3
DWG-1	Donwoods Ge	5.4	7.2	7.2	8.5	B1
DWG-2	Donwoods Ge	5.3	6.5	6.8	8.1	B1
FGC-1	Forest Glen Cres.	5.7	6.6	7.2	8.5	F2
FGC-2	Forest Glen Cres.	5.6	6.5	7.2	8.5	F2
FGC-3	Forest Glen Cres.	5.8	6.8	7.2	8.5	F2
FGC-4	Forest Glen Cres.	6.8	8.5	7.2	8.5	F2
FGC-5	Forest Glen Cres.	5.4	7.1	7.2	8.5	F2
GVR-1	Green Valley Rd	6.1	7.8	7.2	8.5	I3
GVR-2	Green Valley Rd	5.8	7.4	7.2	8.5	H1
GVR-3	Green Valley Rd	4.5	6.2	7.2	8.5	H1
IVR-1	Ivor Rd	7.2	8.2	7.2	8.5	A1
IVR-2	Ivor Rd	6.2	7.8	7.2	8.5	A2
IVR-3	Ivor Rd	5.6	7.3	7.2	8.5	A2
KWR-1	Knightswood Rd	5.4	7.0	7.2	8.5	C1
KWR-2	Knightswood Rd	6.5	7.7	7.2	8.5	C1
KWR-3	Knightswood Rd	6.6	8.0	7.2	8.5	C1
KWR-4	Knightswood Rd	6.1	8.4	7.2	8.5	C1
MTR-1	Maytree Rd.	6.3	7.5	7.2	8.5	I1
MTR-2	Maytree Rd.	6.0	7.8	7.2	8.5	I1
MTR-3	Maytree Rd.	6.4	7.8	7.2	8.5	I1
OYS-1	Old Yonge St.	6.7	6.7	6.7	8.0	E2
OYS-2	Old Yonge St.	6.1	6.1	6.1	7.4	E2
PBC-1	Plymbridge Cres.	6.0	7.7	7.2	8.5	J3
PBC-2	Plymbridge Cres.	5.1	6.7	6.8	8.1	J2
PBC-3	Plymbridge Cres.	6.8	8.8	7.2	8.5	J3
PBR-1	Plymbridge Rd.	6.6	8.0	7.2	8.5	I2
PBR-2	Plymbridge Rd.	5.9	7.3	7.2	8.5	I2
PBR-3	Plymbridge Rd.	5.8	7.2	7.2	8.5	I2
PBR-4	Plymbridge Rd.	6.3	7.2	7.2	8.5	I2
PBR-5	Plymbridge Rd.	7.5	7.5	7.2	8.5	J1
PBR-6	Plymbridge Rd.	5.6	7.4	6.8	8.1	J1
PBR-7	Plymbridge Rd.	5.9	7.5	7.2	8.5	B3
PBR-8	Plymbridge Rd.	7.0	7.0	7.2	8.5	J1
SMD-1	St. Margaret's Dr.	5.3	7.5	6.0	7.3	D1
SMD-2	St. Margaret's Dr.	4.8	6.7	6.0 (pinch to 4.5)	7.3 (pinch to 5.8)	D1
SMD-3	St. Margaret's Dr.	4.9	7.2	6.0	7.3	D1

Cross Section No.	Road Name	Existing Road Width (m)	Existing Edge of Pavement (m)	Proposed Road Width (m)	Proposed Road Construction Width (m)	Sheet Number
SMD-4	St. Margaret's Dr.	4.8	7.0	6.0	7.3	D1
SMD-5	St. Margaret's Dr.	4.5	6.0	6.0 (pinch to 4.5)	7.3 (pinch to 5.8)	D1
SMD-6	St. Margaret's Dr.	5.6	7.5	6.0 (pinch to 4.5)	7.3 (pinch to 5.8)	D1
SMD-7	St. Margaret's Dr.	5.0	6.1	6.0	7.3	D1
WTD-1	Winton Rd.	6.5	7.8	7.2	8.5	C3
YVR-1	York Valley Rd.	8.6	8.6	7.2	8.5	H2
YVR-2	York Valley Rd.	8.5	8.5	7.2	8.5	H2
YVR-3	York Valley Rd.	8.6	8.6	7.2	8.5	H2

(A copy of each of the attachments, referred to in the report (June 14, 2005) from the Executive Director, Technical Services, was forwarded to all Members of Council with the agenda of the Works Committee for its meeting on June 29, 2005, and a copy is on file in the office of the City Clerk, City Hall.

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Councillor Cliff Jenkins, Ward 25, Don Valley West, appeared before the Works Committee: