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**TOWNSHIP OF HOWICK**

**ASSET MANAGEMENT PLAN**

**2013**

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May 23, 2014  
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## TABLE OF CONTENTS

	<b>Executive Summary .....</b>	<b>E1</b>
<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>2.0</b>	<b>STATE OF LOCAL INFRASTRUCTURE .....</b>	<b>3</b>
2.1	Bridges .....	3
2.2	Roads.....	3
2.3	Facilities .....	4
2.4	Fleet.....	4
<b>3.0</b>	<b>LEVEL OF SERVICE SCORING METHOD.....</b>	<b>4</b>
<b>4.0</b>	<b>TARGET LEVELS OF SERVICE .....</b>	<b>6</b>
<b>5.0</b>	<b>ASSET MANAGEMENT STRATEGY.....</b>	<b>7</b>
<b>6.0</b>	<b>FINANCING STRATEGY .....</b>	<b>8</b>
<b>7.0</b>	<b>SUMMARY .....</b>	<b>13</b>
<b>8.0</b>	<b>CONCLUSION .....</b>	<b>14</b>

### List of Tables

Table 1	Asset Condition Assessments .....	2
Table 2	State of Local Bridge Infrastructure .....	3
Table 3	State of Local Road Infrastructure .....	4
Table 4	Future Facility Cost Summary Table .....	4
Table 5	Future Fleet Cost Summary Table .....	4
Table 6	Target Asset Performance Levels .....	7
Table 7	Typical Annual Operating and Available Capital Budget for the Roads and Bridges.....	11
Table 8	Annual Capital Replacement and Budget Summary .....	11
Table 9	2013 Infrastructure Report Card .....	14

### List of Figures

Figure 1	Relationship Between Data Collected and Tracked Parameter Scores.....	5
Figure 2	2013 Distribution of Revenue Sources .....	9
Figure 3	2013 Distribution of Operating Expenses .....	9
Figure 4	Assumed Distribution of Capital Budget.....	10
Figure 5	Anticipated Revenue and Capital Expenditure Forecasts .....	12

## **List of Appendices**

- Appendix A** Bridges  
Appendix A.1 Bridge Strategy  
Appendix A.2 Bridge Inventory Summary by Structure Number  
Appendix A.3 Projected Average Annual Capital Improvement Costs
- Appendix B** Roads  
Appendix B.1 Road Strategy  
Appendix B.2 Road Inventory Summary by Section Number  
Appendix B.3 Projected Future Repair Costs
- Appendix C** SECTION RESERVED FOR FUTURE INCLUSION OF FACILITY ASSETS
- Appendix D** SECTION RESERVED FOR FUTURE INCLUSION OF FLEET ASSETS
- Appendix E** Asset Group Financial and Letter Grade Scoring Methods

## **TOWNSHIP OF HOWICK ASSET MANAGEMENT PLAN**

### **EXECUTIVE SUMMARY**

This Asset Management Plan provides the Township of Howick with a tactical plan to manage their infrastructure assets. If the Township's assets are maintained at an acceptable level of service, it will help support the economic development and quality of life for residents in the community. This plan has been prepared as per the requirements in the Province's Building Together Guide for Municipal Asset Management Plans.

The Township of Howick has 19 bridges, 16 culverts and about 240 km of roads. The replacement cost of these assets was estimated at \$82.15 million. With 1,323 tax paying households in the Township, the replacement cost is about \$62,000 per household. The Township also owns numerous buildings and a fleet of equipment which should be included in future updates to the plan.

This Asset Management Plan includes the following:

- Summary of the existing infrastructure
- Process to score the risks, level of service and theoretical priorities
- Outline of target risks and level of service scores
- Strategies that can help to efficiently manage the assets
- Assessment of available finances
- List of financing options

Information from the recently completed road and bridge needs studies were used to complete this plan. It was generally assumed that the Township wants to maintain the current average condition ratings of the road and bridge assets so they can maintain the current level of service that is being provided by these assets. Within those reports, an average annual cost to address the roads and bridges capital improvement needs was calculated at \$778,000. This is about \$314,100 more than the anticipated average annual capital budget available for the roads and bridges in the Township.

A detailed outline of the Asset Management Strategy to help efficiently manage each major asset class has been included in the report appendices. These may need to be updated in the future to reflect changes in the Township's circumstances, regulatory changes, advances in technology, and asset condition assessments.

Overall grades that take into account the condition ratings, level of services scores, risk scores and financial sustainability scores for the evaluated asset group were calculated as per the procedure and targets outline in the plan. They are shown in the following table.

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Asset Type	Asset Letter Grade
Bridge	C-
Gravel Road	C-
Surface Treated Roads	D
Asphalt Roads	B-

The above summary table suggests that the level of service and/or financing being provided for surface treated roads and bridges are less than the Township's target levels. To address the surface treated roads, additional funds should be directed toward this asset type to improve the condition of these roads. With the bridges, the scheduled work in 2014 should improve the bridge letter grade. The tables within the report show that all asset types are slightly underfunded, but generally have acceptable scores in the level of service and risk categories.

To address the financial shortfall, we recommend the Township implement the management strategies presented in this report, take advantage of grant programs and, if necessary, increase tax revenues slightly. If the recommended strategies are not adequate, and other savings or grants are not obtained, a tax increase will be necessary. To provide a balanced capital funding program within five years, it is estimated a total tax increase of 9.0% above inflation or an average annual increase of about 1.8% in each of the next 5 years will be required.

The Township prefers to follow a pay as you go financing strategy and maintain some money in reserves for emergencies. With the changes proposed, this strategy should be able to maintain the Township's assets at a level of service similar to their current state without drastically reducing the amount of money held in reserves. Alternatively some of the debt financing or project financing options presented in this plan can be implemented, as required, in place of the pay as you go strategy.

## **TOWNSHIP OF HOWICK ASSET MANAGEMENT PLAN 2013**

### **1.0 INTRODUCTION**

The Province of Ontario, Ministry of Infrastructure, wants municipalities to prepare an Asset Management plan for their core assets and in their guide *Building Together-Guide for Municipal Asset Management Plans*, they list the core municipal assets as roads, bridges, water and wastewater systems and social housing. The Township of Howick is a lower-tier municipality within the region of Huron County. The focus of the Township economy is agriculture, with 5 Settlement Areas at Fordwich, Gorrie, Wroxeter, Lakelet and Belmore. At this time, municipal water and wastewater systems do not exist within the Township, and social housing is the responsibility of the County. This plan includes roads and bridges located on local roads and collectors within the Township, arterial roads being the responsibility of the County. Sections have been reserved for the future inclusion of the Township's other key assets related to facilities and fleet of vehicles.

The Township of Howick established an amendment to their Official Plan which came into effect on May 6, 2010. Among other items, the plan establishes that the principal focus of the Township economy is agriculture and the principal Township goal is to *'promote the long term future of agriculture and responsible agriculture practices by protecting the land base and promoting an environment conducive to an integrated agricultural community and economy.'*<sup>1</sup> The plan further specifies for road assets that *'The function of all Township roads is to provide access to agricultural land including field and farm building access points. Where possible, access should be restricted to Township (local) roads.'*<sup>2</sup> This function definition for roads will extend to bridge assets as well.

The Official Plan also identifies that economic development will include provision of municipal and social services which include various goals which may impact the Asset Management Plan, in particular when work is performed in the Settlement Areas. Prior to substantial reconstruction or rehabilitation activities being performed in the Settlement Areas, the work should be assessed to determine whether it will complement the existing commercial services and maintain the character of the settlements. This also includes promoting the settlement areas as residential and social focal points for the surrounding agricultural community and maintaining convenient access from the settlement areas to external goods and services.

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<sup>1</sup> The Township of Howick and the County of Huron Planning and Development Department, *Township of Howick Official Plan*, May 2010, By-Law #5-2010.

<sup>2</sup> Ibid.

The Official Plan identifies some areas as Mineral Aggregate resources, which are expected to have minimal environmental, social and economic impact if extracted in the future. These areas should be considered in road and bridge asset projects to ensure adequate design of road and bridges. Their design will need to consider the potentially greater loads than typical traffic loads due to mineral extraction.

The Official Plan identifies considerations for community facilities with the main focus being expansion of existing facilities and brand new facilities. The Official Plan should be referred to, during the planning process of any new facility, other asset groups which may be impacted by the facility should also be identified at that time.

The Asset Management Plan will be referenced during the annual budget process to determine how proposed funding levels will address the recommended asset work. Any identified budget shortfalls will require a decision by the Township as to whether the work can and will be delayed, and whether alternate funding options will need to be pursued. In the long term the Asset Management Plan will be referenced when deciding taxation and user rates.

The purpose of the Asset Management Plan is to preserve the infrastructure, manage risk and provide satisfactory levels of service to the public in the most cost-effective manner over the asset life-cycle for all assets owned by the Township. The plan considers required integration between different asset groups (i.e. roads and bridges) to minimize duplication of cost and effort for a given location. For example if a road requires re-paving which is expected to last 30 years but a bridge deck is not expected to require work for 2 years the bridge deck repair may be moved up or the road work delayed in order to avoid having to remove new pavement when repairing the bridge deck.

Since the Asset Management Plan includes projected expenses for the next 10 years, it improves the Township's understanding of future budget pressures and assists in predicting future infrastructure funding gaps and provides targets to close the gaps which exist. It also provides the opportunity to achieve cost savings by identifying deterioration early on and taking appropriate action to rehabilitate the asset. This information can then be used by Council when deliberating on budget matters and Township staff when developing capital and maintenance work plans.

The Asset Management Plan contains detailed recommended work lists for the next 10 years. The Township assets included in this plan were last assessed within the years listed in Table 1. The assets and Asset Management Plan will be reviewed and updated about every 5 years at which time the Township will evaluate whether other assets, such as facilities and the maintenance vehicle fleet merit inclusion in the plan. Safety reviews of the bridges will occur every 2 years, in accordance with provincial regulations.

Once per year, capital and key maintenance work completed by the Township should be recorded in order to maintain the accuracy of the current asset inventory.

**Table 1 – Asset Condition Assessments**

Asset	Last year Assessed
Bridges	2012
Roads	2013



This plan provides information on the implementation of Asset Management in the Township of Howick including an overview of the current state of local infrastructure, explanation of the target levels of service or goals, strategies to help maintain the target level of service and track the performance of this plan, explanation of the Township's Financial strategies and a list of current and future work needs identified. However, while this document and appendices include some detail, references to external documents that contain additional information should be referred to when making decisions about a particular asset.

## 2.0 STATE OF LOCAL INFRASTRUCTURE

The asset groups included in this plan are the bridges, and roads owned and maintained by the Township. A summary of these components and description of the state of the local infrastructure follows.

### 2.1 Bridges

Table 2 below summarizes the bridge assets as of December 2013. This information was taken from the Township Bridge Needs Study completed in January 2013. In 2012, all the structures with spans of 3.0m or more, were reviewed and the observations were documented in general accordance with the *Ontario Structure Inspection Manual* (OSIM). Within Appendix A is a more detailed table listing the relevant support documents, goals and strategies to be used with this asset type.

**Table 2 – State of Local Bridge Infrastructure**

Asset Group	Inventory Summary by Structure Type	Condition Summary Average BCI	Replacement Value of Assets (2013 Dollars)
Bridges	19 Bridges 16 Culverts	Bridges – 67.2 Culverts – 58.8	Bridges – \$12.86M <u>Culverts – \$ 2.99M</u> Total - \$15.85M

To provide a common point of reference for the replacement values provided in Table 2, the total replacement value of the bridge assets is approximately \$11,980 per tax- paying household based on 1,323 tax paying households in the Township.

### 2.2 Roads

Table 3 below has been prepared to quantify the amount of road owned and maintained by the Township and indicate the relative condition of these assets. The methodology used to evaluate the roads is in general accordance with that outlined in the Ministry of Transportation's Method and Inventory Manual for Small Lower Tier Municipalities. A further description of the methodology used and the road network within the Township is outlined in the Road Management Study completed in late 2013 and finalized in 2014. Within Appendix B is a more detailed table listing the relevant support documents, goals and strategies to be used with this asset type.

**Table 3 – State of Local Road Infrastructure**

Asset Group	Inventory Summary by Road Surface Type	Condition Summary Average Condition Rating (Length Weighted)	Replacement Value of Assets (2013 Dollars)
Roads	Earth – 4.1 km Gravel – 184.4 km Asphalt – 40.8 km Surface Treated – 11.6 km	Earth – 4.0 Gravel – 7.0 Surface Treated – 5.9 Asphalt – 8.8	Earth - \$0 Gravel - \$49.8M Surface Treated - \$6.1M <u>Asphalt - \$10.4M</u> Total - \$66.3M

To provide a common point of reference for the replacement values provided in Table 3, the total replacement value of the assets is approximately \$50,100 per tax paying household based on 1,323 tax paying households in the Township.

## 2.3 Facilities

RESERVED FOR FUTURE INCLUSION OF FACILITIES

**Table 4 – RESERVED FOR FUTURE INCLUSION OF FACILITIES**

## 2.4 Fleet

RESERVED FOR FUTURE INCLUSION OF FLEET

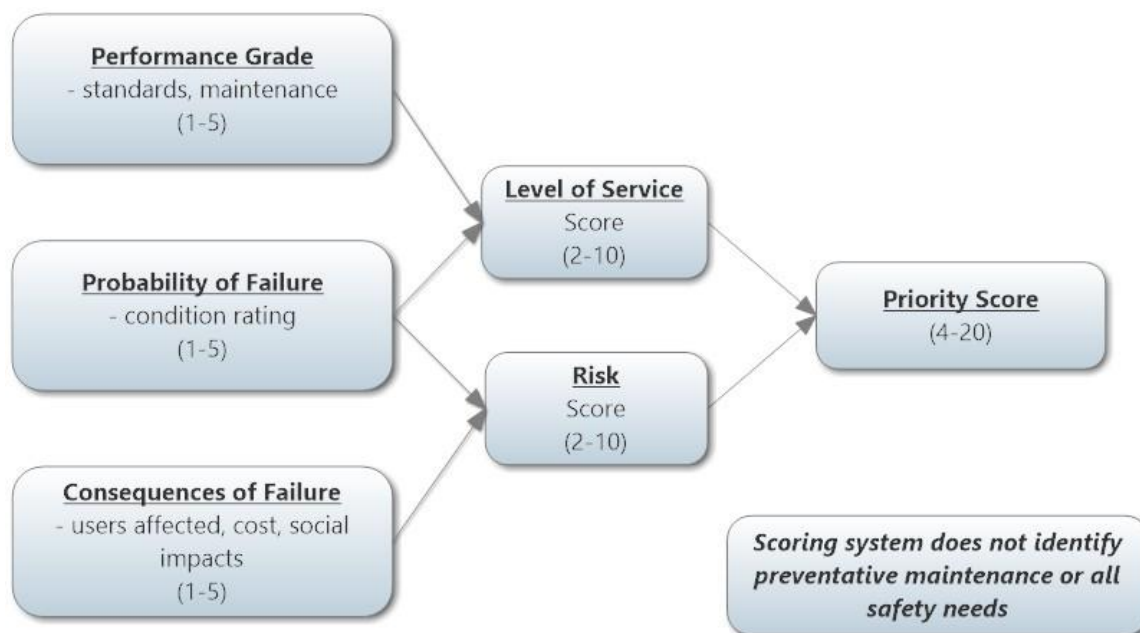
**Table 5 – RESERVED FOR FUTURE INCLUSION OF FLEET**

## 3.0 LEVEL OF SERVICE SCORING METHOD

It is the goal of the Township to ensure their assets provide an acceptable level of service to residents while they are minimizing the risks and costs associated with maintaining that asset. To track the performance of the service being provided by an asset over time, a method to evaluate the level of service being provided and the associated risks is necessary.

When evaluating the performance of individual assets in comparison to the target level of service, we believe there are three key factors that should be taken into consideration; the probability of failure, the consequence of failure and the performance grade. While these factors can include many components, the **probability of failure** factor is generally represented by the condition rating or age of an asset. The **consequence of failure** is a score based on the number of users affected if the asset fails or other social impacts and the cost of the asset. The **performance grade** should incorporate the relative maintenance requirements of the asset and a comparison of how the asset was built versus the appropriate design standard for that particular asset. In a simplified way these components can be used as illustrated in Figure 1 to develop a Level of Service Score, a Risk Score and theoretical Priority Score for the improvements.

**Figure 1**  
**Relationship Between Data Collected and Tracked Parameter Scores**



To explain how the table works, the road assets have been used. When evaluating the roads, the platform width of the road surface and the drainage condition score was used to calculate a performance grade for each road section. A score between 1 and 5 was assigned for each individual road section or asset. If the platform width of a road section is adequate for its application a score of 1 was applied. If the width was somewhat narrow, a score of 3 was applied and if the road was significantly narrower than it should be, a score of 5 was applied. Similarly the good, fair and poor drainage condition ratings were assigned a score of 1, 3 and 5. The average of the platform width score and drainage score were used as the performance grade in the evaluation.

The condition rating was used to assign the probability of failure factor for each asset. When combining the condition rating with the other components as per Figure 1 to prioritize the work, the condition ratings are changed to a score from 1 to 5 where a road section with a condition rating of 1 is in good condition and 5 is ready for reconstruction.

The consequence of failure value has been calculated based on the assumed or supplied traffic volumes on each road section. A score of 1 means it has an average annual daily traffic value of less than 50 and a road with greater than a 1000 vehicles per day would have a score of 5.

Figure 1 suggests that combining the probability of failure rating with the performance standard gives a level of service score and combining the probability of failure and consequence of failure value yields the risk score for each asset. These scores are established by simply adding the two scores together. Although these are just relative numbers, they may be used to define a level of service score or risk score for each road section. The individual scores or the average scores can be monitored and tracked over time for future comparison purposes. With this Asset Management Plan, some suggested target values for different types of roads and other asset types have been provided.

According to the figure, the priority score for each asset is the combined level of service score and the risk score. The theoretical priority score should only be used as a guide to help prioritize improvement work to the assets. As explained in the road and bridge needs studies, there are other factors that should be taken in account when prioritizing asset improvements. Factors including preventative maintenance activities, scheduling tasks to coincide with integrated assets within the same area, financial and timing restraints and other activities taking place within the locale must be considered by staff. It is impossible to take into account all these other factors in a simplified scoring system. For this reason, the calculated theoretical priority score for the individual assets should only be used as a guide and the best sequence for improvements should be established by the Township staff responsible for those asset types. This priority score is not discussed further in this report as prioritizing the individual asset needs is beyond the scope of this plan.

Note, it is important to realize that according to this scoring system, it is desirable to minimize the risk score and minimize the level of service score. In other words, an asset with a low level of service score is in good condition and is able to perform as desired.

#### **4.0 TARGET LEVELS OF SERVICE**

The target levels of service outlined below for the various asset groups are statements of what the Township intends to provide to users of the Township's assets in order to support the Township's goals in a cost efficient manner. These targets are not intended to be binding or unalterable as it is understood that the target levels of service may need to be adjusted as circumstances change in order to deliver a more reasonable and efficient asset system.

In order to measure the applicable condition rating, levels of service and risk scores, each asset group has defined performance indicators which, going forward, will be used to monitor an asset group's performance over a set period of time. The Preventative Maintenance targets will be evaluated as a judgment call by Township staff. It is anticipated that every 5 years the condition ratings and other scores will be updated. These performance indicators are meant to be a simple measurable guide of whether Township asset decisions are having the desired effect on the overall asset inventory. Trends indicating that the performance is not matching the targets can then be examined in more detail to assess possible causes for the deviation.

Where applicable, the target levels of service will include meeting all regulatory requirements for safety, inspection schedules and maintenance. Where assets do not currently meet requirements due to original design; appropriate signage, or possibly appropriate barricades, should be placed until replacement occurs.

The data collected with the bridge and road studies was assembled and reviewed to develop targets and evaluate how the assets within the Township compare with the proposed Target Levels shown in Table 6. To compare the performance of the different road types they have been divided into gravel, surface treatment and asphalt road asset types. The targets are presented here and the current performance level scores and letter grade for all assets are as shown in Section 7.

**Table 6 – Target Asset Performance Levels**

<b>Asset Type</b>	<b>Condition Rating</b>	<b>Level of Service Score</b>	<b>Risk Score</b>	<b>Financial Sustainability Score</b>
Bridge	Average BCI > 60 & Less than 15% with BCI below 40	Average LOS < 5 & Less than 15% above 6	Average Risk < 5 & Less than 15% above 6	Anticipated Costs = or < Available Budget
Roads Gravel	Average CR > 6 & Less than 25% below 5	Average LOS < 5 & Less than 15% above 6	Average Risk < 5 & Less than 15% above 6	Anticipated Costs = or < Available Budget
Roads Surface Treatment	Average CR > 6 & Less than 25% below 6	Average LOS < 5 & Less than 15% above 6	Average Risk < 5 & Less than 15% above 6	Anticipated Costs = or < Available Budget
Roads Asphalt	Average CR > 8 & Less than 25% below 8	Average LOS < 5 & Less than 15% above 6	Average Risk < 5 & Less than 15% above 6	Anticipated Costs = or < Available Budget

**Definitions:**

- BCI, Bridge Condition Index as defined by the Ontario Structural Inspection Manual. Score ranges from 0 to 100, a higher score implies a better condition.
- Road Condition Score as defined in the Ministry of Transportation's Method and Inventory Manual for Small Lower Tier Municipalities. Score ranges from 0 to 10, a higher score implies a better condition.
- Road scores are all weighted based on the length of the road section when calculating averages.
- Targets have not been set for earth roads, safety concerns will be addressed as required.
- LOS is Level of Service score as defined and described in Section 2 of this report, a lower score implies a higher level of service, Score ranges from 2 to 10
- Risk Score as defined and described in Section 2 of this report, a higher score implies a higher risk. Score ranges from 2 to 10.
- The evaluation of financial sustainability is a score out of 10 as outlined in Appendix F, where 10 implies good financial sustainability. The preventative maintenance score is a subjective score out of 10 assigned by Township staff.

External factors such as changes to existing and new legislation requirements, and environmental changes may also have an impact on performance level targets. Adjustments should be made to the performance level targets, as required, in future revisions of the plan if external factors dictate or there is a desire to improve or an acceptance to decrease one or more target levels.

## **5.0 ASSET MANAGEMENT STRATEGY**

The asset management strategy for each asset group is outlined in Appendices A, B, C and D. The Township strategy for all asset groups includes a preventative maintenance program that enables planned reaction to minor repairs rather than a delayed reaction resulting in a more significant repair and a higher cost. Integration of asset repairs over the various assets is also included in the strategies for the different asset groups, this will reduce duplication of effort at the same geographic location for the different groups. Complete elimination of duplication may not be possible in all cases, such as in the case of emergency repairs.

Disposal of assets will generally take place as part of a rehabilitation or replacement project. Costs for this aspect of the project will be included in cost projections for the work. Where disposal of the asset involves the sale of the asset to a third party or the exchange of assets with an upper tier of government, the asset will be removed from the Township inventory. The change will be noted wherever the removal of the asset may cause confusion in the asset management report (ie in comparison tables or graphs which may be affected by the assets removal).

Asset repair or rehabilitation projects will be fulfilled in accordance with the Township procurement policy as outlined in the *Corporation of the Township of Howick Procurement Policies and Procedures, By-law 40-2004*. Completion of a repair or rehabilitation of an asset with a high priority score will generally have the desired effect of decreasing the level of service score and reducing the risk score; however, sometimes there are other factors that should be used to help prioritize the asset improvement schedule within the Township. While there are recommendations within the road and bridge studies, the Township staff will review those recommendations, other needs of the Township and budget restraints, to establish the priorities of the Township. Should the performance of one asset type appear to be falling further behind the targeted level of service, Township staff will consider applying more funds towards addressing the needs of that asset type. This will be discussed further in Section 7.

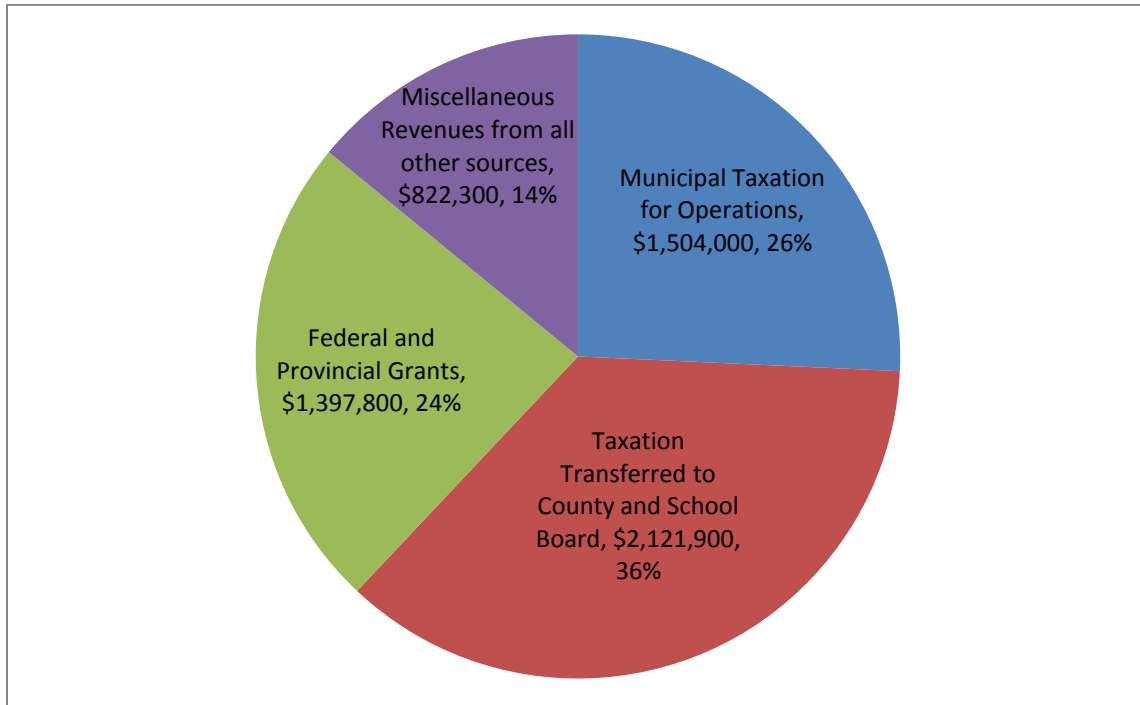
The asset group strategies will be re-evaluated on the same 5 year cycle as the Asset Management Plan or sooner if one asset strategy is found to require significant adjustment. Efficacy of the strategy will be measured by the comparison of future performance target scores to the scores calculated for past versions of the report.

## **6.0 FINANCING STRATEGY**

Financial information, used in this section, was initially prepared using the Township's 2013 draft budget and the 2012 year-end financial report. It was updated in December 2014 to reflect funding cuts and unrecorded transfers from the Reserves. Given there remains to be numerous unknown factors, the financial projections are considered to be only a rough estimate of the available funds to address the capital needs. Through discussion with Township staff, it is their opinion the numbers presented are typical and suitable for use in this plan.

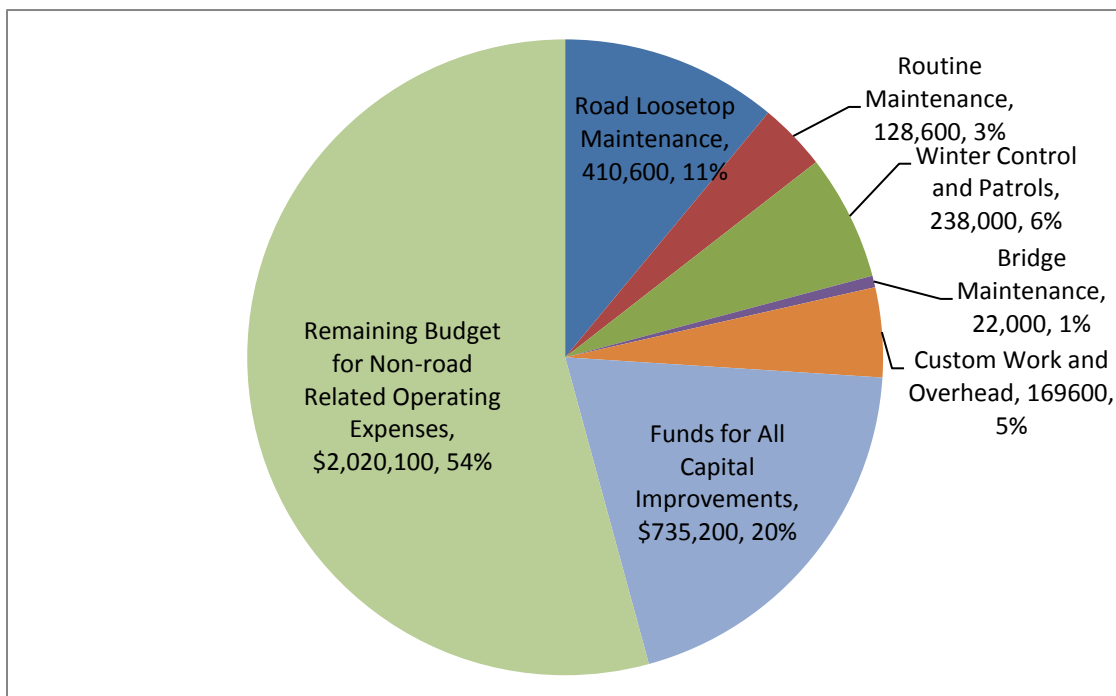
Figure 2 shows the Township's sources of revenue in 2013. The funds included in the miscellaneous revenue includes such things as the user fees, licenses, permits, and other all other revenues. The Federal and Provincial Grant amounts listed in this figure do not include asset specific grants such as the Gas Tax Rebate. In 2013 the Township collected about \$3,626,000 in property taxes which includes the amount used for operations and the amount transferred directly to the County and School Boards.

**Figure 2 – 2013 Distribution of Revenue Sources**



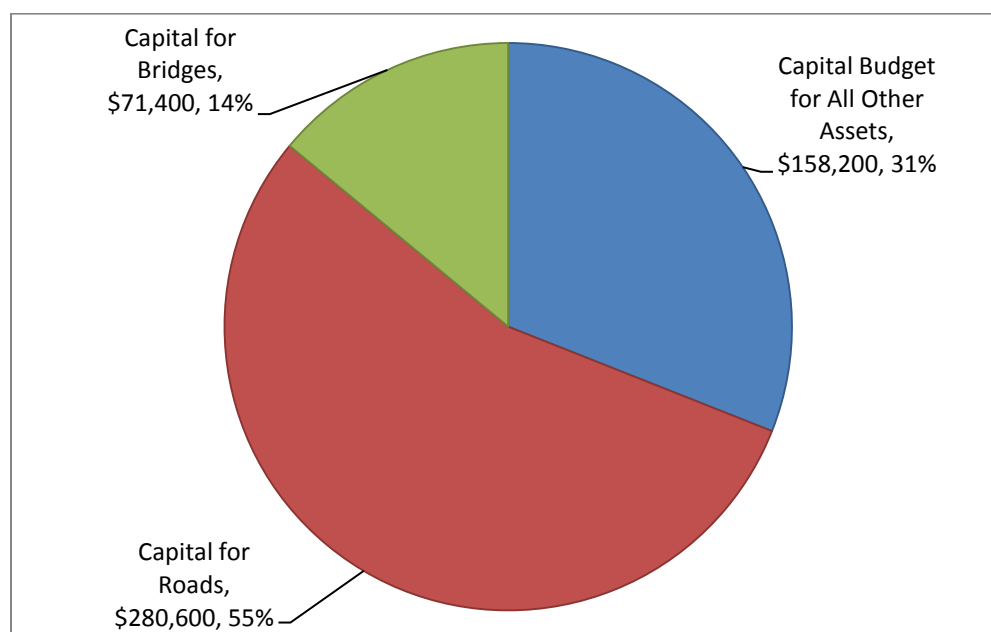
An illustration of how the Township expenses were distributed in 2013 is shown in Figure 3. Note, the values presented in Figure 3 only include the operational revenue. They do not include \$2,121,900 of tax revenue that was directly transferred to the County and School Board.

**Figure 3 – 2013 Distribution of Operating Expenses**



The financial records from the Township were also reviewed to determine how much money is available for capital improvements and the total amount of assets owned by the Township. In 2013 there was \$735,200 available for capital improvements, excluding any dedicated grants. However, as a result of a reduction in unrecorded transfers from Reserves and OMPF funding cuts, the future Township revenues will be reduced about \$225,000. It was calculated by Township staff that the funds available for capital improvement would be only \$510,200. The book value of the Roads and Bridges equaled 55% and 14% respectively of the assets owned by the Township. To determine the funds available for capital improvements of the roads and bridges, it was assumed that these same percentages (55% and 14%) of the money available for capital improvements would be used for the roads and bridges, respectively. Based on these assumptions, the amount of money from tax revenues available for capital improvements is presented in Figure 4.

**Figure 4 – 2013 Assumed Distribution of Capital Budget**



A summary of the typical annual maintenance and capital budget for the roads and bridges is presented in Table 7. The table also shows that the anticipated Gas Tax Rebate, which must be spent on capital improvements of the roads and bridges, is \$112,200. To calculate the total amount of capital funds available, it was split up proportionally to the book value of each asset type and added to the taxation revenue available for capital improvements.



**Table 7 – Typical Annual Operating and Available Capital Budget  
for the Roads and Bridges**

Asset Group	Annual Maintenance Budget	Annual Taxation Revenue for Capital	Annual Gas Tax Rebate used for Capital	Annual Capital Funds Available
Bridges	\$22,000	\$71,400	\$22,700	\$94,100
Roads	\$946,800	\$280,600	\$89,300	\$369,900
Total	\$968,800	\$352,000	\$112,000	\$464,000

\* The typical annual operating and capital budget values were calculated using the assumptions presented earlier. All the custom work and overhead costs were assigned to the roads operating budget.

Table 8, summarizes the replacement costs and the anticipated annual capital improvement costs for the asset groups listed. The replacement costs calculated were based on 2013 dollars and include probable design and construction costs. Typically the costs are based on the existing bridge size and assume it is constructed to current standards. With the road replacement costs, it has been assumed the road would be reconstructed to the current municipal road section for that class of road.

**Table 8 – Annual Capital Replacement Cost and Budget Summary**

Asset Group	2013 Replacement Cost *	Annual Depreciation (2%)	Anticipated Average Annual Expenditure **	Anticipated Average Annual Available Capital Budget***	Annual Surplus (Shortfall)
Bridges	\$15.85M	\$317,000	\$171,900	\$94,100	(\$77,800)
Roads	\$66.28M	\$1,325,600	\$606,200	\$369,900	(\$236,300)
Total	\$82.13M	\$1,642,600	\$778,100	\$464,000	(\$314,100)

\* The replacement cost estimate assumes components are generally reconstructed as per municipal standard road sections and current bridge code standards.

\*\* The anticipated average annual expenditure for bridges is based on the projected required work for the next 40 years. For the roads, it was based on the average projected needs over the next 10 years.

\*\*\* The anticipated annual average capital budget available was calculated using the 2013 budget figures and the assumptions presented earlier.

The Anticipated Average Annual Expenditure listed in Table 8 comes from the road and bridge studies. The anticipated cost for the roads was generated using condition ratings, anticipated deterioration rates and probable cost estimates for the assumed type of improvement work required. The cost provided for the bridges take into consideration costs further into the future and were generated using the assumed service life for the asset indicated in Appendix A and B. Maintenance work on the assets is required to ensure the asset is able to achieve its anticipated life expectancy. Should the capital budget for 2014 be different than the recommended average annual expenditure, it may be necessary to adjust the budget in future years, use money from reserves or rely on using grant money to address the needs and maintain the assets at the Target Levels.

Table 8 shows that there is currently a calculated funding **deficit of \$314,100** per year over the next ten years. Although the Township has approximately \$900,000 in Reserves, it is the Township's opinion that this amount should be maintained as a reserve fund in case of an emergency. If all the anticipated necessary improvements due within 10 years are completed, the Township's reserves will go from a \$900,000 surplus to a \$3.1 million dollar deficit unless there is a tax increase, other funding sources are employed or other cost saving methods are implemented. As the total municipal tax revenue is approximately \$3,627,000 a tax increase of approximately 9% above inflation would be needed to avoid the deficit if no other strategies are employed. Alternatively this increase could be phased in over 5 years to minimize the impact on residents but this would result in a reduction to the Reserves.

**Figure 5 – Anticipated Revenue and Capital Expenditure Forecasts**

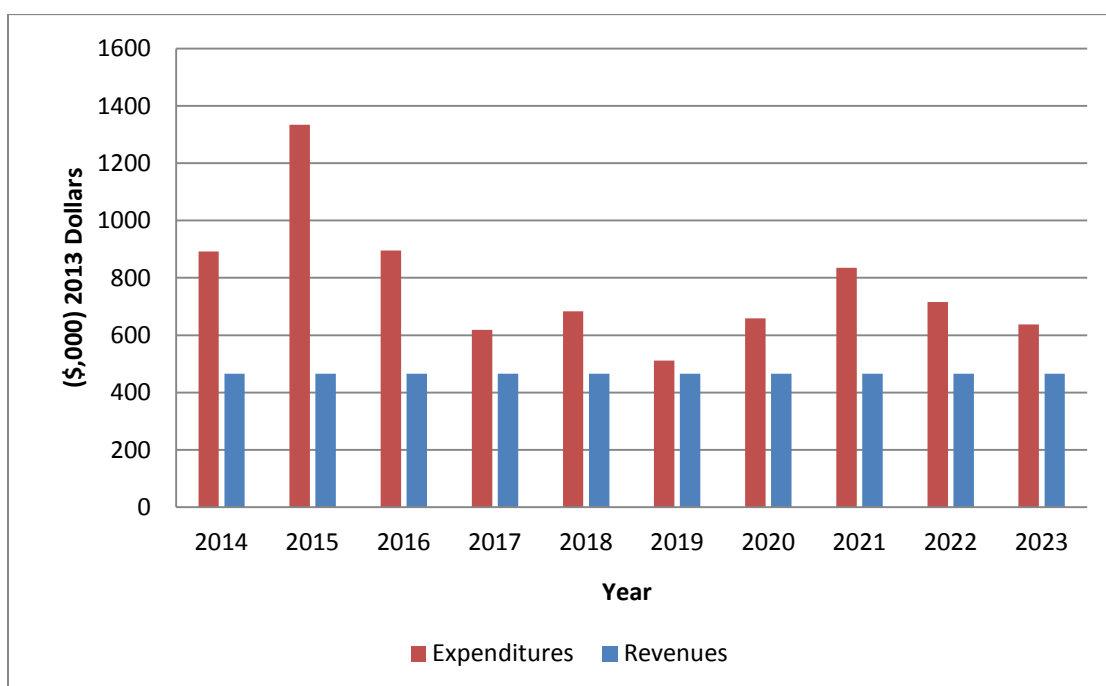


Figure 5 shows the anticipated revenue and capital expenditure forecasts in non-inflated 2013 dollars. To help simplify how the two are compared, it has been assumed that the inflation rate applied to the capital improvements, will be same as the inflation rate that affects the tax revenues. With this assumption applied, all comparisons are made in 2013 dollars and it is assumed that the increases applied to each will cancel each other out.

In September 2012, the Federation of Canadian Municipalities released the first *Canadian Infrastructure Report Card*. The *Canadian Infrastructure Report Card* does not distinguish between roads and bridges, and does not include utilities. It identified that the cost to replace all road sections in Canada that are in fair to very poor condition is \$7,325 per household in Canada. In comparison, the Township of Howick road and bridge infrastructure costs to complete the anticipated work for the next 10 years is \$5,881 per tax paying household based on 1,323 tax paying households in the Township.

The Township principally uses a pay-as-you go system to finance capital and maintenance expenditures. They have also taken advantage of grants to help complete larger capital improvement projects. This has historically allowed the Township to complete asset replacements and improvements when necessary; however, as the number of grants appears to be decreasing, while the service level expectations are increasing and assets age this may become more challenging. The Township plans to continue this strategy into the future for standard capital and maintenance work.

Occasionally the cost for large projects may exceed the capacity of the pay-as-you go strategy. The following strategies are occasionally used by municipalities when they require additional funding:

- applying for grants
- obtaining a loan
- issuing long term bonds
- setting up a public private partnership
- implement a user pay system to help fund the project

It is difficult for the Township of Howick to implement some of these options given its size and the type of capital improvements typically required. The Township will continue applying for grants when they become available and, if necessary, use money from reserves or debt financing to address emergencies. If the opportunity presents itself and it is in the Township's best interest, the Township would consider a public private partnership or implement a user pay system. It is not expected to be cost effective for the Township to issue bonds.

For emergency repairs, it was explained that the Township will use reserves or debt financing to complete the repairs, where warranted, and adjust their following capital budgets as required to cover this repair. The Township has set a new debt financing target of a maximum of **5%** of capital budgets in any 5 year period. This amount will be checked on a yearly basis to ensure that the Township continues to comply with the debt and financial obligation limit of a municipality outlined in the *Municipal Act, Ontario Reg. 799/94 as amended by O. Reg. 403/02 – Debt and Financial Obligation Limits*. If this target would cause the Township to exceed the amount allowed by the regulation it shall be adjusted downward.

For special projects, which lend themselves to public-private partnerships, the Township will entertain perspective partners to complete the work. However, this option is not expected to be practical for most infrastructure assets currently owned or expected to be owned by the Township in the near future.

## **7.0 SUMMARY**

The Tables in this section summarize the current state of the infrastructure and financial budgets of the Township in comparison to the Targets presented in Section 4. The table has been colour coded to illustrate how well the asset groups are meeting their performance targets. Green implies the asset is meeting or exceeding that target, yellow implies it is close to meeting that target and red implies it is not achieving that target.

**Table 9 – 2013 Infrastructure Report Card**

Asset Type	Condition Rating	Level of Service Score	Risk Score	Financial Sustainability Score	Asset Letter Grade
Bridge	Average BCI = 63.1	Average LOS = 4.4	Average Risk = 4.6	55%	C-
	17.1% with BCI below 40	20% above 6	11.5% above 6		
Roads Gravel	Weighted Avg CR = 7.0	Weighted Avg LOS = 4.3	Weighted Avg Risk = 3.9	61%	C
	6.4% with CR below 5	13.6% above 6	0% above 6		
Roads Surface Treatment	Weighted Avg CR = 5.9	Weighted Avg LOS = 5.9	Weighted Avg Risk = 7.1	61%	D
	53.8% with CR below 6	53.8% above 6	82.7% above 6		
Roads Asphalt	Weighted Avg CR = 8.8	Weighted Avg LOS = 2.8	Weighted Avg Risk = 3.5	61%	B -
	25.2% with CR below 8	0% above 6	0% above 6		

Note: 1. Refer to Table 6 for definitions of targets and scoring system.  
2. When reviewing the Level of Service, and the Risk Score, a value out of 10 is applied with a lower score implying the average score for that asset is in relatively good condition and a high score implying it is in poor condition or it represents a higher risk. 3. The Asset Letter Grade is a number out of 100 calculated and converted to a letter grade as outlined in Appendix E.

The Township is currently not meeting their performance level target for the bridges. The Township is planning to replace one structure in 2014 which will result in an improvement in the condition rating and level of service score.

As explained in Section 4, the roads were divided into asphalt, gravel and surface treatment asset types. The Township is currently meeting their performance level targets for the gravel and asphalt roads. The Township is currently not meeting their performance level targets for surface treated roads. It is the intention of the Township to take an aggressive approach to addressing the deficiencies of the surface treated roads within the next five years.

In order for the Township to meet the projected cost of the work required for the next 10 years to maintain their performance level targets, they will need to address the projected financial shortfall. One method to address the shortfall would be to implement a total tax increase of about 9.0%, or 1.8% above inflation in each of the next 5 years. This amount has been calculated based on the annual shortfall amount of \$314,100 divided by the total amount of tax revenues collected in 2013, \$3,626,000. The accuracy of the cost estimates to address the needs and the amount of revenues collected should be monitored and adjustments made as required to avoid significantly reducing the amount in reserves.

## 8.0 CONCLUSION

The Asset Management Plan, as presented in this report, outlines the strategies that will be employed to help meet the target levels of service for the different asset groups, in a cost-effective manner. The target levels of service were set to meet the principal Township goal of promoting the long-term, sustainable practice of agriculture throughout the Township.

The asset groups included in this report are roads and bridges. To better understand the priorities among the road types they were divided into asphalt, surface treatment and gravel roads. Future editions of this plan will evaluate whether facilities and fleet meet the Township's criteria for inclusion in this plan.

The asset inventories for the three groups were completed in 2012 and 2013. Bridges are scheduled to be reviewed every 2 years as per the provincial regulations, all other asset groups will be formally reviewed on a 5 year cycle, and informally reviewed during regular maintenance activities. The Asset Management Plan will be updated about every 5 years and should include a review of the target levels of service to determine whether they are still supporting the goals of the Township or whether they require adjustment.

While all asset types are failing in the financial categories, surface treated roads, and bridges have been identified as not meeting their target performance levels in other categories. Proposed repair work in the next 5 years for the bridge assets will result in them meeting most of their target levels of service. Extra focus on surface treated roads may be required in order to upgrade the inventory to the target level before the next Asset Management Plan review.

Each asset group in the Township has been assigned an overall letter grade. Going forward this grade will be referenced in future reports. This comparison will help to determine whether the strategies are having a positive effect on the Township's assets or if more resources need to be allocated to a particular asset type.

Strategies are outlined for the rehabilitation and repair of each asset group along with the expected cost per year for the next 10 years. Based on the costs presented in the 2013 budget and the anticipated grant funds, it is estimated the Township can apply \$464,900 towards capital improvements to the roads and bridges. This represents about 13% of their operating budget. It is estimated that the Township will encounter an annual financial shortfall of \$348,100 to address the projected capital improvement needs for their roads and bridges. To address this shortfall, the Township will either have to find cost savings, obtain grant funding or implement a tax increase. If no savings or additional grants are found, it is calculated that the Township would have to increase the taxation revenues by about 9% above inflation over to match the anticipated annual capital improvement needs and avoid deviating from the target service levels.

All of which is respectfully submitted for your approval.

B. M. ROSS AND ASSOCIATES LIMITED

ORIGINAL SIGNED BY

Per \_\_\_\_\_  
S. E. Anderson, P. Eng.



Per \_\_\_\_\_  
Ken D. Logtenberg, P. Eng.

:hv

# **APPENDIX A**

## **BRIDGES**

Asset:	Bridges
Asset Goal:	Maintain bridges in accordance with the rehabilitation and replacement criteria and the target level of service in a cost effective manner while satisfying legislative requirements.
Inventory:	35 Structures: 19 Bridges, 16 Culverts (over 3.0m in span)
Anticipated Asset Life Cycle:	<p>Bridges are composed of three broad element categories:  Sub-Structure: consists of footings, wingwalls and abutments  Super-Structure: consists of the deck and its main structural elements, as well as barrier walls  Wearing Surface: consists of asphalt and waterproofing, gravel or exposed concrete</p> <p>Broadly a bridge or concrete culvert in the Township of Howick may be assumed to have a service life of 80 years, prior to requiring replacement. A substantial rehabilitation would be expected to occur approximately every 40 years. An asphalt wearing surface consisting of two lifts of asphalt would be expected to have a life expectancy of 20 years. A corrugated steel pipe culvert may be assumed to have a service life of 50 years.</p> <p>Actual life of a bridge asset will depend on the severity of the environment in which it operates, level of use, and maintenance and rehabilitation activities performed throughout its life cycle.</p>
Integration:	May be integrated with work on the adjacent road sections, not typically integrated with other infrastructure in the Township.
Rehabilitation and Replacement Criteria:	<p>Criteria for prioritizing include safety, level of service, probability of failure and consequence of failure.</p> <p>Bi-annual visual inspections of the bridges are completed which include recommendations on work required to maintain, rehabilitate or repair the asset from the review Engineer. An overall Bridge Condition Index (BCI), a bridge condition rating between 0 and 100, is provided for each bridge. The BCI is a summary of the condition ratings given to all elements of the bridge. A BCI equal to 0 requires immediate removal from service and equal to 100 is a new structure with no observed defects. In practice no structure should reach a BCI of 0 as rehabilitation work or bridge replacement should be performed prior to all structural elements being rated as poor.</p> <p>Generally structures with an inadequate level of service will not have major rehabilitation work performed with a view to replacement at the end of its service life. Regular maintenance activities for these structures will be performed instead and may be more involved than regular maintenance activities performed for other structures. Where the level of service is substantially lower than required, an individual structure will be assessed in more detail and the Township may decide to schedule replacement earlier than merited by the priority score.</p>



Rehabilitation and Replacement Strategy:	<p>Work needs identified during the bi-annual bridge inspections will be assigned a priority score based on the level of service, probability of failure and consequence of failure associated with each structure. Work identified will be scheduled and adjusted, as required, to fit within the Township's annual budget and meet the Township's goals. Safety concerns identified during the bi-annual bridge inspections by the Engineer, irrespective of the priority score, will be addressed in a timely manner, proportional to the associated risk. Cost effective preventative maintenance strategies will be implemented where practical. With bridges this may include waterproofing and paving exposed bridge decks on paved roads, placing rip rap where undesirable erosion is taking place, or providing protective coatings on corrosion sensitive components. For long-term planning the Township has assumed that bridges and concrete culverts will require a major rehabilitation at approximately 40 years of age, and replacement at 80 years of age. For Corrugated Steel Pipe (CSP) culverts the Township will assume that replacement will be required in 50 years with ongoing, periodic maintenance throughout its service life.</p>
Risks Associated with not Implementing Strategy:	<p>Bridges may not be able to accommodate standard traffic loads and load limits may need to be imposed.</p> <p>Asset users may have to follow an alternative route to avoid bridges with load limits or those not providing acceptable levels of service.</p> <p>Costs to maintain the bridges may increase if the work is not completed in a timely manner.</p>
Integrated Asset Priorities:	Integrated with adjacent road work when applicable.
Related Reports on Asset Type:	Bridge Inspection Report - dated January 31, 2013 completed by B.M. Ross and Associates Ltd.
Estimated Cost per year for Strategy Described:	<p>\$171,900/year for capital costs for the next 10 years</p> <p>\$24,400/year for the next 10 years for maintenance costs</p> <p>Costs are to be adjusted, as required in future reports</p>
Review Schedule and Procedure:	<p>Bridge assets are to be reviewed on a bi-annual bases under the supervision of a Professional Engineer, in accordance with mandated Provincial requirements, to the standards of the Ontario Structural Inspection Manual. Bridges were last reviewed in 2012, therefore future reviews should take place in even-numbered years.</p> <p>A Bridge Condition Index (BCI) score will be calculated for each structure every five years when an updated bridge needs study and asset management plan is completed.</p>
Other Information or reference materials:	Township of Howick Official Plan, May 2010



Site Number	BMROSS Number	Structure Type	Structure Name	Road Name	Structure Location	Spans (m)	Year Built	BCI	Probable Cost
01	BR-300	Rectangular Culvert		Salem Rd.	Lot 27, Conc. 12-13	6.7	1973	75	\$58,200
02	BR-714	Hybrid		Malcolm Line	Lot 25-26, Conc. 12	9.5	1940	54	\$7,000
03	BR-115	Rigid Frame, Vertical Legs		Orange Hill Rd.	Lot 19, Conc. 10-11	16.8	1964	74	\$3,500
04	BR-1047	Half-Through Truss	Tollgate Bridge	Tollgate Line	Conc. 10	11.6	1920	64	\$500
05		T-Beam	Wroxeter Bridge	Water Street		16.7-16.7	1930	44	\$71,800
06	BR-266	I-beam or Girders	Zimmerman Bridge	McIntosh Line	Lot 10-11, Conc. 8	27.1-5.9-5.9	1971	74	\$20,000
07	BR-833	Rigid Frame, Vertical Legs		Gough Rd.	Lot 14	30.5	1940	67	\$0
08		Half-Through Truss		Toll Gate Line	Conc. 6	31.2	1930	45	\$34,000
09	BR-003/441	Rigid Frame, Vertical Legs		Gough Rd.	Lot 19, Conc. 6-7	18.3-18.3	1953	66	\$20,000
10	BR-006/493	Rigid Frame, Vertical Legs		Malcolm Line	Lot 25-26, Conc. 6	16.8-16.8	1954	73	\$0
11	BR-020/725	Rigid Frame, Vertical Legs		Spencetown Rd.	Lot 29, Conc. 4-5	18.3-18.3	1958	54	\$171,000
12	BR-001/479	Rigid Frame, Vertical Legs		Mud Lake Line S.	Lot 30-31, Conc. 4	18.3-18.3	1951	74	\$24,000
13	BR-681	I-beam or Girders	Zurbrigg Bridge	Toll Gate Line	Lot 15-16, Conc. 2	13.3	1999	75	\$500
14	BR-197	Rigid Frame, Vertical Legs	Anderson Bridge	Creamery Rd.	Lot 15, Conc. 2-3	18.3	1967	62	\$23,500
15	BR-391	Rigid Frame, Vertical Legs		Toll Gate Line	Lot 15-16, Conc. 4	7.3	1978	75	\$500
16	BR-428/460	Rigid Frame, Vertical Legs		McIntosh Line	Lot 10-11, Conc. 3	14.5	1983	72	\$9,000
17	BR-198	Rigid Frame, Vertical Legs	Jones Bridge East	Creamery Rd.	Lot 3, Conc. 2-3	16.8	1968	75	\$15,000
18	BR-199	Rigid Frame, Vertical Legs	Dunbar Bridge	Creamery Rd.	Lot 2, Conc. 2-3	18.3	1970	75	\$17,000
19	BR-257	Rigid Frame, Vertical Legs	McCallum Bridge	C-Line Rd.	Lot 1, Conc. 3	18.3	1969	75	\$18,000
20	BR-522	I-beam or Girders	Nichol Bridge	Johnston Line	Lot 20-21, Conc. C	23.2	1989	65	\$7,000
21	BR-691	Rectangular Culvert		Creamery Rd.	Lot 11, Conc. 2-3	3.1	1999	100	\$0
22	BR-623	Rectangular Culvert		Spencetown Rd.	Lot 22	5	1995	75	\$0
23		Rectangular Culvert		Creamery Rd.	Lot 22	4.8	1930	7	\$227,000
24		Rectangular Culvert		Creamery Rd.	Lot 25	4.9	1960	68	\$36,000
25	BR-834	Rectangular Culvert		Malcolm Line	Conc. 2	5.3	2005	100	\$0
26	BR-304	Rectangular Culvert		Malcolm Line	Lot 25-26, Conc. 1	6.5	1972	75	\$0
27		Rectangular Culvert		Quarry Line	Conc. 6	4.3	1940	30	\$219,000
28	BR1028	Rectangular Culvert		Gough Rd.	Conc. B	6	2012	100	\$0
29		Rectangular Culvert		Orange Hill Rd.	Lot 17	3	1950	34	\$71,000
30	BR-637	Rectangular Culvert		Salem Rd.	Lot 15-16, Conc. A	7	1996	75	\$500
31		Rectangular Culvert		Forest Line	Conc. 13	6.5	1960	74	\$0
32		Rectangular Culvert		Gorrie Line	Conc. 15	5.45	1940	32	\$47,000
33	BR-767	Rectangular Culvert	Lakelet Culvert	Lakelet Rd.		4.3	1950	50	\$0
34		Rectangular Culvert		Howick-Turnberry Rd.	Lot 30	4.3	1960	30	\$95,700
35	BR-302	Ellipse Culvert		Mud Lake Line N.	Lot 30	3.7	1972	20	\$204,000

Projected Cost of Work in (,000) over 40 Years.

Proposed Timeframe	Bridge	Culvert	Totals	Average Annual
2015 to 2019*	\$243.1	\$753.9	\$997.0	\$199.4
2020 to 2024*	\$321.5	\$204.0	\$525.5	\$105.1
2025 to 2034*	\$1,628.4	\$0.0	\$1,628.4	\$162.8
2035 to 2044*	\$618.3	\$478.0	\$1,096.3	\$109.6
2045 to 2054*	\$2,352.4	\$274.9	\$2,627.3	\$262.7

Bridge Needs Errors

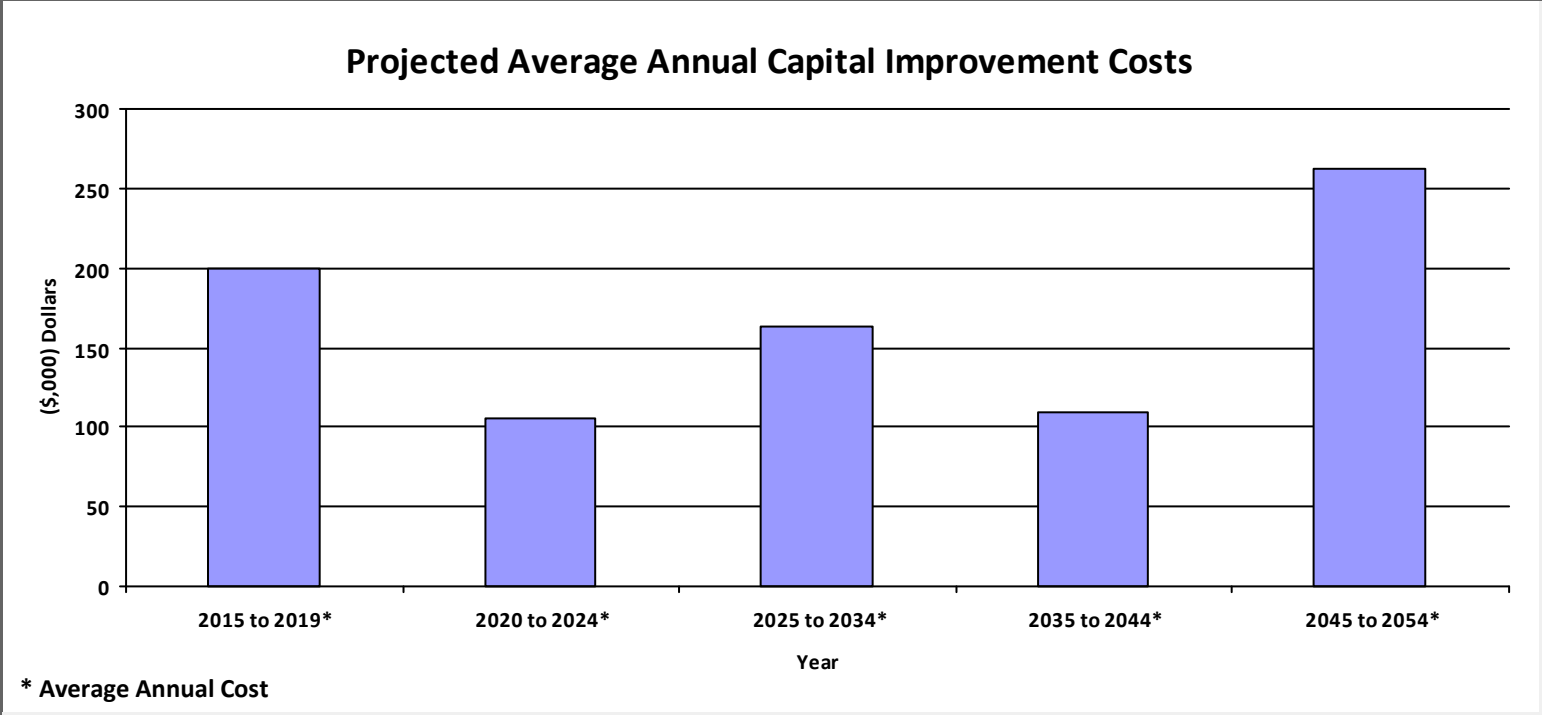
SiteNum	Proposed Year
01	2015
05	2015
08	2015
09	2015
12	2015
23	2015
24	2015
29	2015
32	2015
34	2015

Projected Average Annual Cost Over 40 Years (\$,000): 171.9

Total of all Recommended Maintenance (\$,000): 122.0 Annually (Assuming 5 Year Period) in (\$,000): 24.4

Average Score Summary:

Average BCI	Average Risk	Avergae Level of Service	Average Priority
63.1	4.6	4.4	9.0



## **APPENDIX B**

### **ROADS**

Asset:	Roads
Inventory:	<p>4.1 km of earth roads  184.4 km of gravel roads  11.6 km of surface treated roads  28.1 km of 1-lift paved roads  <u>12.7 km of 2-lifts paved roads</u>  240.9 km total road system</p>
Anticipated Asset Life Cycle:	<p>The probable life expectancy of a road section is affected by design, drainage, traffic volumes and loads, construction quality and climate. It is anticipated that there may be localized repairs and maintenance work such as crack sealing necessary to achieve the probable life expectancy. Generally the expected useful life for roads is: 30 years for a 2-lift paved road, 15 years for a 1-lift paved road, 6 years for a surface treated road, and 100 years for a gravel road. Expected service life decreases as traffic volume per day increases.</p>
Integration:	<p>At this time the Township of Howick does not have buried water, storm or waste water assets. Other assets which may need to be considered during work on a road section include hydro, telephone, natural gas, cable, street lights, and sidewalks.</p> <p>If a road section includes a bridge, that structure should be reviewed to determine if any work needs to be performed prior to paving.</p>
Rehabilitation and Replacement Criteria:	<p>A Condition Rating (CR) is an assessment between one and ten with lower numbers describing roads with the most structural distress. The higher the rating number, the better the condition of the road. The CR takes into consideration the surface condition and structural adequacy of the road section based on the visual inspection. The CR does not consider the road width, vertical and horizontal alignment or an assessment of the road to determine whether it is constructed in accordance with suitable standards.</p> <p>The CR point of rehabilitation for paved and surface treated roads is a CR of between 6 and 8, below 6 roads will require reconstruction. For gravel roads the point of rehabilitation is a CR of 5 and above, reconstruction below 5. Road sections with poor drainage identified will either be reviewed on an individual basis to determine whether drainage issues can be addressed by rehabilitation or whether reconstruction will be required.</p> <p>Earth roads will be reconstructed as gravel roads as warranted by changes in usage.</p> <p>As of the 2013 roads report the length weighted average CR for paved roads was 8.8, 5.9 for surface treated roads and 7.0 for gravel roads.</p>

Rehabilitation and Replacement Strategy:	<p>For gravel roads regular grading and biannual application of 50 mm to 75 mm of granular 'A' will be used on all roads above a CR of 5. Where required, spot maintenance at isolated locations will be performed prior to the application of gravel. It is expected that this will maintain most gravel road sections at a CR of 5 or higher. When the CR of a gravel road falls below 5 and usage warrants reconstruction, the road section will be reconstructed with 450mm of granular B and 150 mm of granular A. Any organic materials present in the sub-base will be removed prior to reconstruction and drainage issues will be addressed. For gravel roads with less than 50 AADT (average annual daily traffic) the CR may be allowed to deteriorate beyond 5 in favour of performing capital works on other, higher traffic, road sections. These lower traffic gravel road sections would have capital improvements performed as the budget permits.</p> <p>For paved roads crack sealing will be performed as a maintenance activity where the deterioration level is not too severe, typically a CR above 8. Depending on road section location, urban, semi-urban, rural and condition of the road section one of the following strategies will be selected: Total reconstruction with 350mm granular B, 150 mm granular A and 40mm to 80mm of hot mix asphalt. Mill and resurface pavement with 32mm to 40mm of hot mix asphalt. Mill and resurface patches of pavement with 50mm of hot mix asphalt.</p> <p>For surface treated roads crack sealing will be performed as a maintenance activity where the CR is above 8. Depending on road section location, and condition of the road section one of the following will be selected: Mill and resurface road or road sections with one to two lift surface treatment. Total reconstruction with 350mm granular B, 150 mm granular A and one to two lifts of surface treatment.</p>
Risks Associated with not Implementing Strategy:	<p>If rehabilitation does not occur at the recommended CR level, road sections will deteriorate further until reconstruction is the only option to restore the level of service, this will result in higher construction costs. If road sections are allowed to deteriorate beyond the threshold for reconstruction, the Township's risk and liability for those road sections will increase.</p>
Integrated Asset Priorities:	<p>Road section rehabilitation and reconstruction forecasts are to be compared to forecasts for bridge and underground utility rehabilitation and reconstruction. The co-ordination of projects will occur internally between Township departments.</p>
Related Reports on Asset Type:	<p>Road Management Study – Spring 2014 by B.M. Ross and Associates</p>
Estimated Cost per year for Strategy Described:	<p>\$606,200/year for the next 10 years for rehabilitation and construction \$42,710/year for the next 10 years for maintenance Costs are to be adjusted as required in future reports</p>
Review Schedule and Procedure:	<p>Road sections shall be reviewed regularly by the Township road crew as part of their routine maintenance activities. Every 5 years a more thorough inventory review will be performed by Township staff or outside consultants in order to assign condition ratings, compare them to the level of service targets, and prepare a more detailed 5 year work plan.</p>
Other Information or reference materials:	<p>Township of Howick Official Plan, May 2010</p>

**Appendix B2 - Road Construction Needs**  
**Sorted by Proposed Year of Need and Priority Score**

**Township of Howick**  
**Road Management Study**

Section ID	Road Name	From	To	Section Length (m)	Surface Type	Traffic Range (vpd)	Road Construction Needs	Theo. Year of Need	Proposed Year of Work	Priority	Probable Costs (\$,000)
551	Spencetown Road	Toll Gate Line	Fordwich Line	2064	Gravel	50-199	Rural Full Reconstruction - Gravel Surface	2023	2014	13	557.4
510	Lakelet Road	Lakelet Road	Fordwich Line	1365	HCB - 1 lift	50-199	Rural Paving (50mm HL-4)	2017	2014	11	150.1
509	Driftwood Beach Road	Dead End	Fordwich Line	515	LCB - 2 lifts	0-49	Surface Treatment - Single surface	2016	2014	8	12.9
503	Huron-Bruce Road	Gorrie Line	McIntosh Line	2056	LCB - 2 lifts	500-999	Rural Full depth pulverize and pave	2014	2015	16	287.8
501	Huron-Bruce Road	Belmore Line	Forest Line	2159	LCB - 2 lifts	200-499	Rural Full depth pulverize and pave	2014	2015	15	302.3
502	Huron-Bruce Road	Forest Line	Gorrie Line	2040	LCB - 2 lifts	200-499	Rural Full depth pulverize and pave	2014	2015	15	285.6
504	Huron-Bruce Road	McIntosh Line	Toll Gate Line	2045	HCB - 1 lift	50-199	Rural Full depth pulverize and pave	2017	2015	11	286.3
520	Howick-Minto Line	Clifford Road	Howick-Turnberry Road	1302	LCB - 2 lifts	200-499	Rural Full depth pulverize and pave	2015	2016	12	182.2
214	Mill Street	Albert Street	Victoria Street	102	HCB - 1 lift	50-199	Semi-Urban Full depth pulverize and pave	2017	2016	12	14.3
521	Howick-Minto Line	Howick-Turnberry Road	Salem Road	2058	LCB - 2 lifts	200-499	Rural Full depth pulverize and pave	2015	2016	12	288.1
208	George Street	Victoria Street	Wellington Street	98	HCB - 1 lift	50-199	Semi-Urban Full depth pulverize and pave	2018	2016	9	13.7
224	John Street	Victoria Street	Wellington Street	102	HCB - 1 lift	50-199	Semi-Urban Hot Mix Resurfacing	2020	2016	8	9.7
209	George Street	Wellington Street	Princess Street	102	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2019	2016	8	14.3
210	George Street	Princess Street	Nelson Street	101	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2019	2016	8	14.1
211	George Street	Nelson Street	East Limit	116	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2019	2016	8	16.2
216	Edward Street	Alma Street	Maitland Street	101	HCB - 1 lift	50-199	Semi-Urban Full depth pulverize and pave	2021	2016	8	14.2
223	John Street	Albert Street	Victoria Street	98	HCB - 1 lift	50-199	Semi-Urban Hot Mix Resurfacing	2020	2016	8	28.9
243	Maitland Street	John Street	James Street	123	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2020	2016	7	17.2
227	John Street	Nelson Street	East Limit	89	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2020	2016	7	55.4
241	Maitland Street	Mill Street	Edward Street	120	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2022	2016	7	16.8
222	John Street	Maitland Street	Albert Street	101	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2022	2016	7	14.2
217	Edward Street	Maitland Street	Albert Street	101	HCB - 1 lift	50-199	Semi-Urban Full depth pulverize and pave	2021	2016	7	14.2
229	James Street	Maitland Street	Albert Street	100	HCB - 1 lift	0-49	Semi-Urban Hot Mix Resurfacing	2023	2016	5	9.5
109	Albert Street	Arthur Street	Patrick Street	199	HCB - 1 lift	0-49	Semi-Urban Full Reconstruction - Base Course of Asphalt	2017	2017	11	63.8
561	Creamery Road	Malcolm Line	Mud Lake Line	2069	Gravel	50-199		2028	2017	10	98.8
560	Creamery Road	Fordwich Line	Malcolm Line	2098	Gravel	50-199		2028	2017	10	85.2
552	Spencetown Road	McIntosh Line	Toll Gate Line	2041	Gravel	50-199		2028	2017	10	33.0
553	Spencetown Road	Gorrie Line	McIntosh Line	2028	Gravel	50-199		2028	2017	10	39.0
562	Creamery Road	Mud Lake Line	Minto Boundary	933	Gravel	50-199		2028	2017	10	20.0
129	Helena Street	Arthur Street	Patrick Street	180	HCB - 1 lift	0-49	Semi-Urban Full Reconstruction - Base Course of Asphalt	2018	2017	9	57.6

**Appendix B2 - Road Construction Needs**  
**Sorted by Proposed Year of Need and Priority Score**

**Township of Howick**  
**Road Management Study**

Section ID	Road Name	From	To	Section Length (m)	Surface Type	Traffic Range (vpd)	Road Construction Needs	Theo. Year of Need	Proposed Year of Work	Priority	Probable Costs (\$,000)
549	Spencetown Road	Malcolm Line	Mud Lake Line	2068	Gravel	50-199		2032	2017	8	30.0
242	Maitland Street	Edward Street	John Street	119	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2020	2017	7	16.7
425	Centre Street	Queen Street	Ann Street	121	LCB - 2 lifts	200-499	Urban Partial depth cold planing and resurfacing	2017	2017	6	25.3
106	Brookhaven Drive	Patrick Street	Victoria Street	490	HCB - 1 lift	50-199	Semi-Urban Hot Mix Resurfacing	2023	2017	5	46.5
506	Huron-Bruce Road	Malcolm Line	Elora Road	2240	HCB - 2 lifts	50-199	Rural Full depth pulverize and pave	2018	2018	11	313.6
403	Queen Street	Marietta Street	Centre Street	204	HCB - 1 lift	50-199	Semi-Urban Full Reconstruction - Base Course of Asphalt	2018	2018	10	163.2
507	Huron-Bruce Road	Elora Road	West Heritage	1381	LCB - 2 lifts	50-199	Surface Treatment - Single surface	2018	2018	5	34.5
579	McIntosh Line	Creamery Road	Perth Road 178	1841	Gravel	0-49		2034	2019	12	65.0
591	Toll Gate Line	Creamery Road	Perth Road 178	1899	Gravel	0-49		2034	2019	11	40.0
581	McIntosh Line	Gough Road	Spencetown Road	2058	Gravel	0-49		2044	2019	9	5.0
420	Marietta Street	Main Street	South Limit	106	HCB - 1 lift	0-49	Semi-Urban Full Reconstruction - Base Course of Asphalt	2019	2019	9	84.8
589	Toll Gate Line	Gough Road	Spencetown Road	2060	Gravel	0-49		2044	2019	9	15.0
613	C-Line Road	McDonald Line	Johnston Line	2052	Gravel	50-199		2037	2019	8	4.0
546	Gough Road	Malcolm Line	Mud Lake Line	2067	Gravel	50-199		2037	2019	8	18.0
600	Malcolm Line	Creamery Road	Perth Road 178	2014	Gravel	0-49		2064	2019	7	20.0
540	Gough Road	McDonald Line	Quarry Line	2084	Gravel	50-199		2032	2019	7	33.0
588	Toll Gate Line	Harriston Road	Gough Road	2043	Gravel	0-49		2054	2019	7	65.0
603	Mud Lake Line	Gough Road	Spencetown Road	2058	Gravel	0-49		2034	2020	12	160.0
554	Spencetown Road	Quarry Line	Gorrie Line	2046	Gravel	50-199		2032	2020	8	30.0
537	Orangehill Road	Mud Lake Line	Howick-Minto Line	1203	Gravel	50-199		2032	2020	8	33.0
602	Mud Lake Line	Spencetown Road	Creamery Road	2056	Gravel	0-49		2054	2020	7	10.0
233	Alma Street	Harriston Road	William Street	172	HCB - 1 lift	0-49	Urban Full Reconstruction - Base Course of Asphalt	2020	2020	7	199.1
431	Vogt Street	Harriston Road	Gibson Street	228	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2020	2020	7	31.9
201	William Street	Alma Street	Victoria Street	303	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2022	2020	6	42.4
601	Mud Lake Line	Creamery Road	Perth Road 178	2059	Gravel	0-49	Rural Full Reconstruction - Gravel Surface	2044	2021	10	555.8
400	Mill Street	Centre Street	Church Street	231	HCB - 1 lift	50-199	Semi-Urban Hot Mix Resurfacing	2021	2021	8	22.0
418	Marietta Street	Queen Street	Ann Street	120	HCB - 1 lift	50-199	Semi-Urban Full Reconstruction - Base Course of Asphalt	2021	2021	8	62.6
111	Albert Street	William Street	East Street	236	HCB - 1 lift	50-199	Semi-Urban Hot Mix Resurfacing	2021	2021	7	22.5
583	Toll Gate Line	Huron-Bruce Road	Glenannon Road	2041	Gravel	0-49		2034	2022	11	250.0
567	Lawrie Street	Orangehill Road	Harriston Road	2054	Gravel	50-199		2032	2022	8	25.0

**Appendix B2 - Road Construction Needs  
Sorted by Proposed Year of Need and Priority Score**

**Township of Howick  
Road Management Study**

Section ID	Road Name	From	To	Section Length (m)	Surface Type	Traffic Range (vpd)	Road Construction Needs	Theo. Year of Need	Proposed Year of Work	Priority	Probable Costs (\$,000)
514	Glenannon Road	Gorrie Line	McIntosh Line	2049	Gravel	50-199		2032	2022	8	50.0
566	Lawrie Street	Salem Road	Orangehill Road	2046	Gravel	50-199		2032	2022	8	25.0
248	Albert Street	Edward Street	John Street	123	HCB - 1 lift	0-49	Semi-Urban Hot Mix Resurfacing	2022	2022	7	36.3
408	Ann Street	Centre Street	Church Street	231	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2022	2022	7	32.4
565	Forest Line	Howick-Turnberry Road	Salem Road	2040	Gravel	0-49		2036	2022	7	65.0
578	Gorrie Line	Orangehill Road	Harriston Road	2062	Gravel	50-199		2046	2022	5	5.0
515	Glenannon Road	Forest Line	Gorrie Line	2046	Gravel	50-199		2041	2022	5	40.0
576	Gorrie Line	Howick-Turnberry Road	Salem Road	2039	Gravel	50-199		2046	2022	5	25.0
531	Orangehill Road	Lawrie Street Line	Gorrie Line	3056	Gravel	50-199		2023	2023	12	250.0
419	Marietta Street	Ann Street	Main Street	102	HCB - 1 lift	50-199	Semi-Urban Full Reconstruction - Base Course of Asphalt	2023	2023	6	81.5
407	Ann Street	Marietta Street	Centre Street	200	HCB - 1 lift	50-199	Semi-Urban Full depth pulverize and pave	2023	2023	6	28.0
417	Allen Street	Main Street	McLaughlin Street	143	HCB - 1 lift	50-199	Semi-Urban Full depth pulverize and pave	2023	2023	5	20.0
225	John Street	Wellington Street	Princess Street	100	HCB - 1 lift	0-49	Semi-Urban Hot Mix Resurfacing	2023	2023	5	9.5
264	Nelson Street	George Street	Dead End	45	HCB - 1 lift	0-49	Semi-Urban Hot Mix Resurfacing	2023	2023	4	4.3
226	John Street	Princess Street	Nelson Street	102	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2023	2023	4	14.2
265	Nelson Street	John Street	James Street	146	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2023	2023	4	20.4
113	Adelaide Street	Arthur Street	Patrick Street	204	HCB - 1 lift	0-49	Urban Paving (40mm HL-4)	2023	2023	4	28.6
252	Wellington Street	Dead End	Martin Street	68	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2023	2023	4	9.6
409	Main Street	Brussels Line	Allen Street	575	HCB - 2 lifts	200-499	Rural Full depth pulverize and pave	2024	2024	8	80.4
406	Ann Street	West Limit	Marietta Street	181	HCB - 1 lift	50-199	Rural Paving (50mm HL-4)	2024	2024	6	19.9
402	Queen Street	Walker Street	Marietta Street	517	HCB - 1 lift	50-199	Semi-Urban Full depth pulverize and pave	2024	2024	5	72.3
249	Albert Street	John Street	James Street	121	HCB - 1 lift	0-49	Semi-Urban Hot Mix Resurfacing	2025	2025	5	35.7
125	Edward Street	Arthur Street	Patrick Street	160	HCB - 1 lift	0-49	Urban Partial depth cold planing and resurfacing	2025	2025	4	33.5
253	Wellington Street	Martin Street	George Street	121	HCB - 1 lift	0-49	Semi-Urban Full depth pulverize and pave	2025	2025	4	16.9
410	Main Street	Allen Street	Marietta Street	122	HCB - 2 lifts	200-499	Semi-Urban Full depth pulverize and pave	2026	2026	9	17.1
124	Edward Street	West Street	Arthur Street	215	HCB - 1 lift	0-49	Urban Partial depth cold planing and resurfacing	2026	2026	4	45.1
130	West Street	Louisa Street	Edward Street	120	HCB - 1 lift	0-49	Urban Partial depth cold planing and resurfacing	2026	2026	4	25.2
527	Salem Road	Gorrie Line	McIntosh Line	2048	Gravel	50-199		2028	2028	10	33.0
411	Main Street	Marietta Street	Centre Street	225	HCB - 2 lifts	200-499	Semi-Urban Full depth pulverize and pave	2028	2028	6	31.5
238	Alma Street	John Street	James Street	120	HCB - 1 lift	0-49	Semi-Urban Full Reconstruction - Base Course of Asphalt	2029	2029	4	96.3



**Appendix B2 - Road Construction Needs  
Sorted by Proposed Year of Need and Priority Score**

**Township of Howick  
Road Management Study**

Section ID	Road Name	From	To	Section Length (m)	Surface Type	Traffic Range (vpd)	Road Construction Needs	Theo. Year of Need	Proposed Year of Work	Priority	Probable Costs (\$,000)
239	Alma Street	James Street	South Limit	135	HCB - 1 lift	0-49	Semi-Urban Full Reconstruction - Base Course of Asphalt	2029	2029	4	107.8
237	Alma Street	Edward Street	John Street	118	HCB - 1 lift	0-49	Semi-Urban Full Reconstruction - Base Course of Asphalt	2029	2029	4	94.2
533	Orangehill Road	McIntosh Line	Toll Gate Line	2048	Gravel	50-199		2032	2032	8	100.0
524	Salem Road	Fordwich Line	Malcolm Line	2081	Gravel	50-199	Rural Full Reconstruction - Gravel Surface	2032	2032	8	91.8
526	Salem Road	McIntosh Line	Toll Gate Line	2052	Earth	50-199		2032	2032	8	23.0
433	Gibson Street	Vogt Street	Howick Street	123	HCB - 2 lifts	50-199	Semi-Urban Full depth pulverize and pave	2032	2032	6	17.2
432	Gibson Street	Harriston Road	Vogt Street	193	HCB - 2 lifts	50-199	Semi-Urban Full depth pulverize and pave	2032	2032	6	27.0
236	Alma Street	Mill Street	Edward Street	115	Gravel	0-49	Semi-Urban Full Reconstruction - Base Course of Asphalt	2034	2034	11	92.0
235	Alma Street	George Street	Mill Street	68	Gravel	0-49	Semi-Urban Full Reconstruction - Base Course of Asphalt	2034	2034	11	54.2
607	Mud Lake Line	Howick-Turnberry Road	Salem Road	2058	Gravel	0-49		2034	2034	11	7.0
568	Church Street	McLaughlin Street	Gough Road	1032	Gravel	50-199		2037	2037	8	13.0
535	Orangehill Road	Fordwich Line	Malcolm Line	2093	Gravel	50-199		2037	2037	7	5.0
517	Howick-Turnberry Road	Fordwich Line	Malcolm Line	2073	Gravel	50-199		2041	2041	6	40.0
586	Toll Gate Line	Salem Road	Orangehill Road	2065	Gravel	0-49		2044	2044	9	17.0
592	Malcolm Line	Huron-Bruce Road	Fordwich Line	2053	Gravel	0-49		2044	2044	9	50.0
118	Water Street	Dead End	Patrick Street	66	Gravel	0-49	Semi-Urban Hot Mix Resurfacing	2044	2044	8	6.3
584	Toll Gate Line	Glenannon Road	Howick-Turnberry Road	2042	Gravel	0-49		2054	2054	7	20.0
608	Mud Lake Line	Fordwich Line	Howick-Turnberry Road	2062	Gravel	0-49	Rural Full Reconstruction - Gravel Surface	2054	2054	7	7.0
596	Malcolm Line	Orangehill Road	Harriston Road	2009	Gravel	0-49		2054	2054	7	17.0

Projected Construction in (,000) over 10 Years.

Proposed Year	Totals	Gravel	HCB - 1 lift	HCB - 2 lifts	LCB - 2 lifts
2015	\$1,162.0		\$286.3		\$875.7
2016	\$723.1		\$252.8		\$470.3
2017	\$446.0	\$236.0	\$184.6		\$25.3
2018	\$511.2		\$163.2	\$313.6	\$34.5
2019	\$339.8	\$255.0	\$84.8		
2020	\$486.4	\$213.0	\$273.4		
2021	\$662.9	\$555.8	\$107.1		
2022	\$543.7	\$475.0	\$68.7		
2023	\$466.0	\$250.0	\$216.0		
2024	\$172.7		\$92.3	\$80.4	

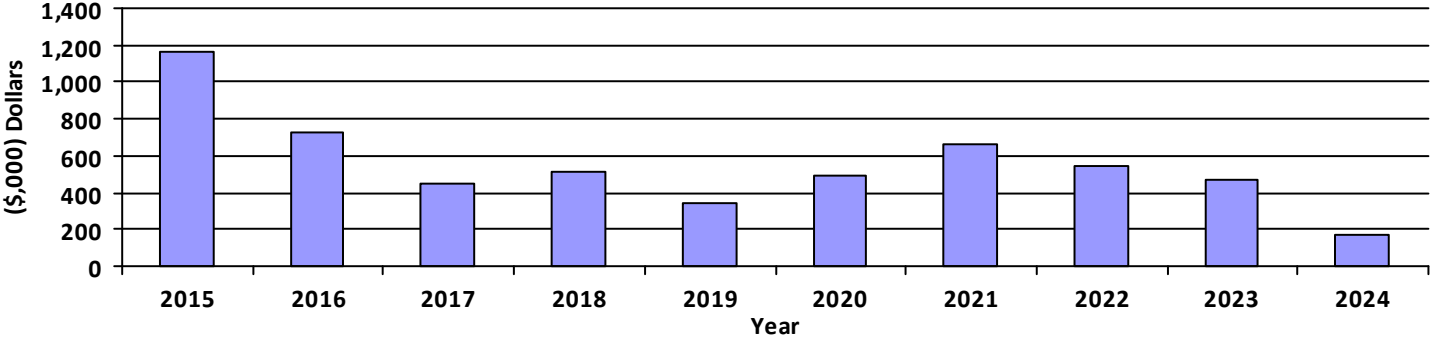
Roads Network Summary (Weighted)

Maintenance Total for all Roads, Next 10 Years(\$,000):

427.1

Surface Type	Length	Road Condition	Level of Service	Risk	Priority
Earth	4.1	4.0	6.5	5.0	11.5
Gravel	184.4	7.0	4.3	3.9	8.2
HCB	40.8	8.8	2.8	3.5	6.3
LCB	11.6	5.9	5.6	7.1	12.7

Future Repair Costs



## **APPENDIX C**

***Reserved for Future Inclusion of Facility Assets***

## **APPENDIX D**

*Reserved for Future Inclusion of Fleet Assets*

## **APPENDIX E**

### **ASSET GROUP FINANCIAL AND LETTER GRADE SCORING METHODS**

## Appendix E - Asset Type Score Calculation

### Bridges

$$\text{Asset Type Score} = \text{BCI}/100 * 20 + (1 - \text{LOS}/10) * 20 + (1 - \text{Risk}/10) * 20 + \text{Financial}/100 * 40$$

### Roads

$$\text{Asset Type Score} = \text{CR}/10 * 20 + (1 - \text{LOS}/10) * 20 + (1 - \text{Risk}/10) * 20 + \text{Financial}/100 * 40$$

### Facilities

$$\text{Asset Type Score} = (1 - \text{FCI}) * 20 + (1 - \text{LOS}/10) * 20 + (1 - \text{Risk}/10) * 20 + \text{Financial}/100 * 40$$

### Financial Score

$\% \text{ Financed} = 100 \times (\text{Yearly Funding Available}) / (\text{Yearly Amount Required to Address Needs})$	Financial Score
= or >100	10
90-99	9
80-89	8
70-79	7
60-69	6
50-59	5
40-49	4
30-39	3
20-29	2
<20	1

### Letter Grades

Asset Type Numerical Score	Asset Type Letter Grade
90-100	A+
85-89	A
80-84	A-
75-79	B+
70-74	B
68-70	B-
64-67	C+
60-63	C
55-59	C-
50-54	D
0-49	E