ASSET MANAGEMENT PLAN

Partial Update

NOVEMBER 2014

PREPARED BY

TULLOCH ENGINEERING

PROJECT No. 14-2054

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

As with most Municipalities across Ontario, the Municipality of Huron Shores has undertaken the development of an Asset Management Plan in response to the Ontario Government's provincial capital funding requirements. The purpose of this Asset Management Plan is to assist with prioritizing needs over wants to ensure that infrastructure funding, whether generated through local or senior levels of government, be applied to projects with the higher needs. This Asset Management Plan has been structured to adhere to the requirement described in the Ontario Ministry of Infrastructure's Building Together, Guide for Municipal Asset Management Plans.

As the following Asset Management Plan will outline, the Municipality's existing infrastructure is aging and deteriorating while demand grows for better infrastructure facilities. This demand is in response to higher standards of safety, accessibility, health, environmental protection, and regulations. The solution to this issue is to examine the way the Municipality plans, designs and manages infrastructure to meet changing demands. This Asset Management Plan is expected to assist:

- Council in making service level and investment decisions;
- Staff with the planning and management of the assets;
- Taxpayers by sustaining value for the services provided.

As presented in this Asset Management Plan, the total replacement cost of the Municipality's assets was calculated to be approximately $24.3 million in 2013 dollars, for assets providing transportation, storm sewers and fire protection services. The Municipality is not required to budget for the full replacement value of all these assets simultaneously, as portions of assets only require an initial investment followed by further re-investment to maintain acceptable levels of service.

With that in mind, it was calculated that the annual reinvestment should be an average of $850,000 per year into various assets as they reach their maximum potential useful lives, in order to sustain existing services at an appropriate level of service. A further reserve investment of $800,000 is recommended to plan for long-term replacement of assets. The actual investment value will vary from year to year depending on the scope and size of the planned capital works. Projects will need to be shuffled from year to year based on the availability of funding.

This plan will address the replacement and planned expansion priorities of the Municipality over the next ten years, however it is imperative that current maintenance activities be continued and expanded as recommended. The ability for the Municipality to leverage its knowledge of infrastructure and by

applying the best Asset Management practices at the time will result in very positive improvements in infrastructure. A brief summary of the sections contained within this report is presented as follows.

Section Two of the Municipality's Asset Management Plan provides an introduction to the assets included in the plan as well as how the plan was developed and the goals of the plan. Section Three will summarize the asset types and quantities as well as their characteristics, condition and value which were quantified by the Municipality's current asset inventory and for some assets, supplemented with visual inspections.

Section Four will outline the expected levels of service for each asset, and provides an indication of the minimum acceptable standards for an asset. Service levels were developed through consideration of industry standards, generally accepted levels of operation and safety, as well as evaluating the risk associated with achieving the targets levels established. Additionally, policy recommendations for condition rating updates for each asset are presented.

The asset management strategy for each asset type is presented in Section Five along with potential procurement methods to finance the strategy. The strategy and scheduling of asset renewal/replacement activities has been laid out by establishing planned actions through options analysis and risk assessment to maximize lifespan and minimize cost in a sustainable way. In addition, the priority assets for each category are presented within this section.

The final section of the plan consists of the financial plan required to support the asset management strategy by summarizing the cost per year, per asset to ensure sustainability of the asset. Comparisons are made to past expenditures and funding sources to identify the funding gaps in the proposed plan.

Although this comprehensive Asset Management Plan has been created beginning in 2014, it is expected to be a living document that is updated regularly as priority's shift or as work is completed. In addition, improvements to the methodologies of data collection for developing more accurate inventory information and evaluation will only serve to bolster the content of the plan. An Asset Management Plan that is not adhered to or not updated will quickly become obsolete and be of absolutely no benefit to the Municipality.

2.0 INTRODUCTION

This Asset Management Plan (AMP) was prepared by Tulloch Engineering Inc. (Tulloch) in cooperation with The Municipality of Huron Shores (Municipality) to meet the requirements of a Municipal Asset Management Plan as presented by the Ontario Ministry of Infrastructure's "Building Together Guide for Municipal Asset Management Plans" (2012).

The intention of the AMP is to provide answers and guidelines to the following questions.

1) What do you have and where is it?
2) What is it worth? (Current and Estimated Replacement Costs)
3) What is its condition and expected remaining service life?
4) What is the level of service expectation?
5) When do you need to do it?
6) How do you ensure long-term affordability?

Asset management planning is meant to aid the Municipality is making cost effective decisions with regards to operating, maintaining, renewing, replacing and disposing of their infrastructure assets. The decisions and directions laid out in the asset management planning process are intended to ensure that the Municipality will be capable of providing the levels of service needed to meet their desired plans, goals and objectives.

The assets considered within this AMP are the following municipal assets:

- Roads
- Structures
- Storm Sewers
- Vehicles, Equipment & Machinery

Each asset was divided into its respective category based type and was assessed for current state, financial accounting valuation and replacement cost valuation. The condition of each of the assets was assessed using sound and accepted methods.

This AMP has been developed to cover a ten (10) year window but is intended to be updated on a regular basis as operating conditions and municipal goals change. A key aspect of this plan is the ongoing evaluation of asset performance and value that will be required in future years. The development of this plan involved continued communication between Tulloch and Municipal Staff. The

policies and strategies presented are based upon discussions with Municipal Representatives and accepted practices for the management of infrastructure assets.

This AMP is a tool to help ensure that measures are taken to maintain an acceptable performance level quality of life for years to come. The quality and condition of infrastructure assets are of great importance as they help to support economic activity and improve general quality of life. This AMP is not intended to change the Municipality's existing processes and procedures with regards to their infrastructure assets but rather improve the decision making process by using long range vision to dictate resource allocation and using performance based analyses to determine if desired goals and objectives are being met.

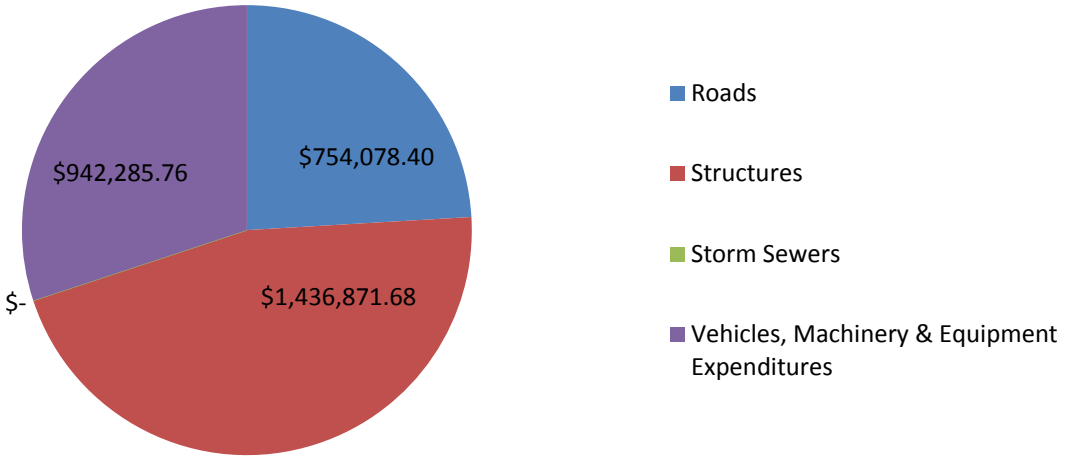
The Municipality's Capital Asset Summary, presents the inventory, current and projected condition ratings, as well as known or projected replacement/rehabilitation costs on a per asset type basis in a digital format.

This AMP is based on capital improvements and does not account for maintenance activities that are currently undertaken by the Municipality. The plan is not intended to replace maintenance procedures and any reports prepared or maintenance practices undertaken should be continued to be followed.

3.0 STATE OF LOCAL INFRASTRUCTURE

This Section of the report outlines the quantity and quality of assets owned and managed by the Municipality. In addition the current age, condition, financial valuation and replacement cost valuation of the assets included is presented.

The two following figures provide a comparison of the Municipality's capital assets based on 2013 Public Sector Accounting Board (PSAB) values and 2013 replacement values. The PSAB values are based on currently accepted historical costs and depreciation values, which were extracted from the Municipality's current inventory presented in the 2012 Capital Asset Depreciation Report. The 2013 replacement values were generated based on the assets physical characteristics and benchmark costs established from recent construction projects. The benchmark costs per asset type are presented in the corresponding asset management spreadsheets.



**Storm Sewers were tracked as part of the road asset under PSAB*

Figure 1 – Capital Asset PSAB 2013 Values ($3.1M)

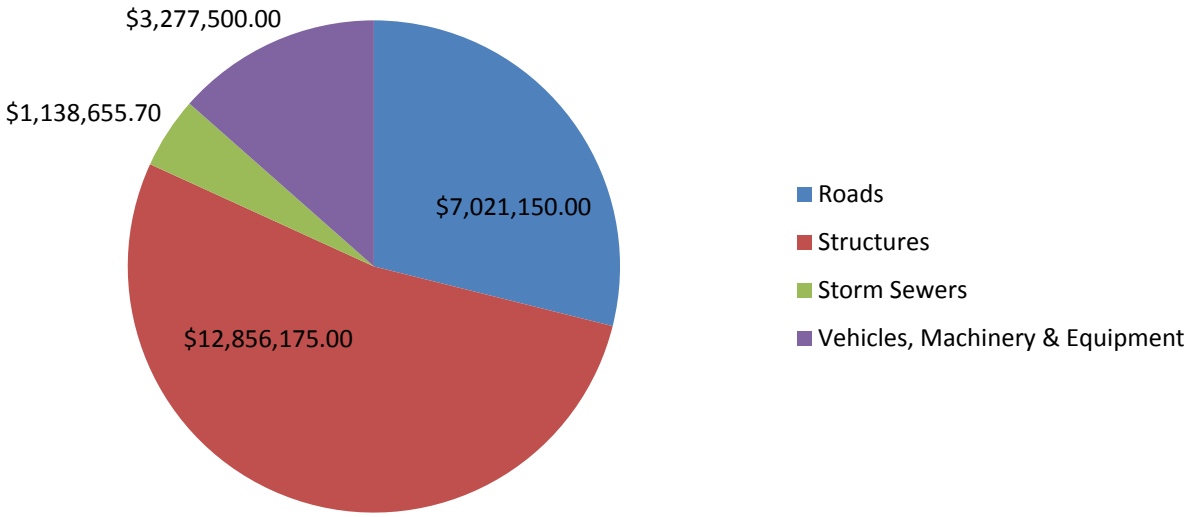


Figure 2 – 2013 Asset Replacement Costs ($24.3M)

3.1 ROADS

The Municipality's road network consists of approximately 237km of roads. The roadway inventory and condition ratings were based on the completion of a road network review undertaken in June 2013 and updated with construction works completed to December 2013. Please note that the emergency repair work caused by the flooding in September of 2013 is not identified in the plan at this time.

3.1.1 METHOD OF CONDITION EVALUATION

Appraisal of the Municipality's local road system was carried out in June of 2013, in accordance with procedures outlined in the MTO Methods and Inventory Manual. The system was divided into 204 road sections and a standard MTO Road Appraisal Sheet was completed for each section. Each road section was identified and assigned a number, and then its location, length, geometrics, roadside environment, and surface type were noted. Traffic volumes were also estimated. The condition of each road section was assessed and improvement needs and associated costs were then identified.

Each road section has been given a subjective Condition Rating from 1 to 10 based on current surface condition, surface type and drainage conditions. Condition Ratings greater than 5 are considered acceptable and are expected to require only normal maintenance. A condition rating less than 5 is considered unacceptable and a road improvement is to be evaluated for cost. The road condition for each section is projected over ten years to allow review of road deterioration and forecasting of required future work. This method of evaluating road surface deterioration relies on estimating the life cycle of various road surfaces.

For the purpose of this AMP, the gravel surface roads do not depreciate with ongoing maintenance. Per the MTO manual, the surface condition rating does not drop from year to year with regular maintenance, however severe spring breakup may affect the condition rating. Surface treated roads typically have a twenty year life cycle before their condition rating drops below 5 and asphalt roads have a forty year life cycle. These life cycles are dependent on their use, the structural condition of the road and routine maintenance. Assuming twenty year and forty year life cycles for surface treated and asphalt roads respectively results in the condition rating for each section typically decreasing 0.25 and 0.125 per year. These values were used to determine the year in which the condition rating will drop below 5 and the road will require resurfacing.

The following is a measure of the condition of the existing road system as outlined in the Methods and Inventory Manual:

Condition Rating	System Condition
8 to 10	good structural condition; some local improvement may be needed
5 to 7	average structural condition; continued improvement needed
Less than 5	poor structural condition; substantial improvement needed throughout total road system

3.1.2 INVENTORY

A summary of the Municipality's road system inventory is presented in the following figures and is based on the Municipality's Inventory, supplemented with information collected during the field inspections. The complete inventory is presented in the Capital Asset Summary, including all assumptions used to arise at the given ratings and projected costs. Please note that L.C.B. denotes surface treatment and H.C.B. denotes asphalt surface. In addition, a weighted condition rating per surface type based on length was generated to accurately reflect the average condition of the respective surface type.

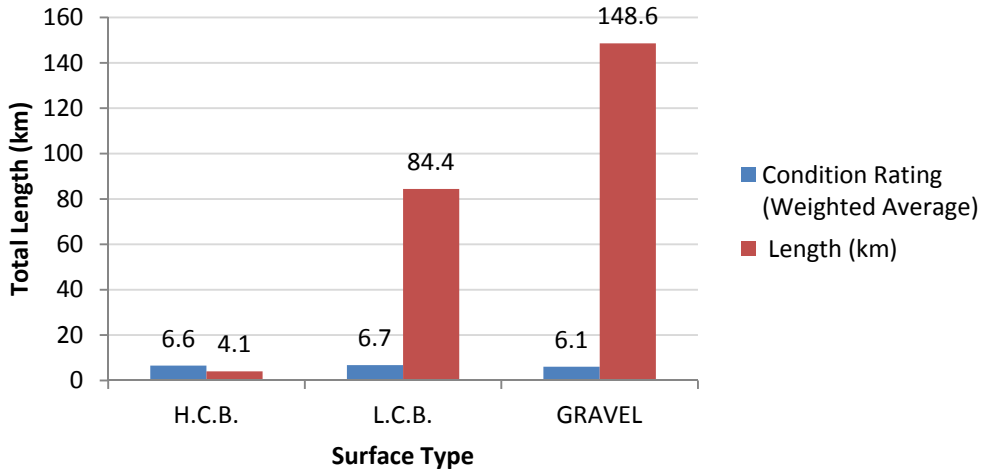


Figure 3 – Road Length by Surface Type

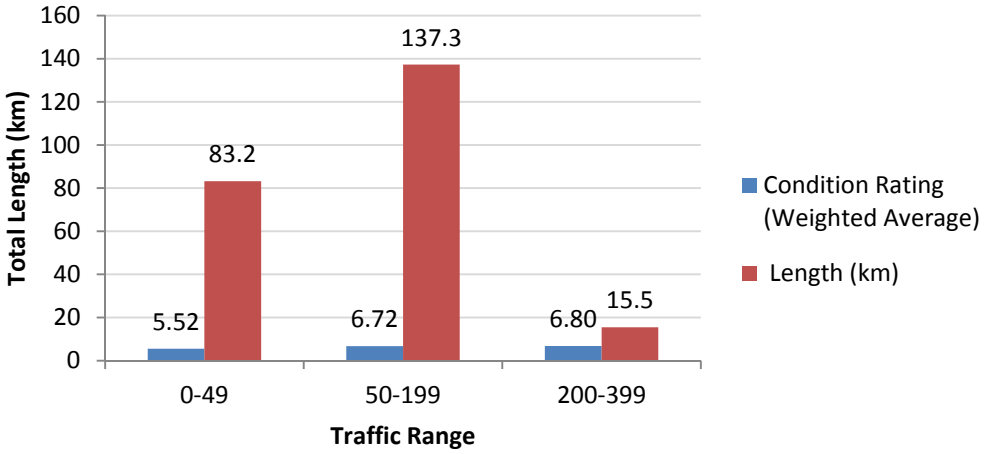


Figure 4 – Road Length by Traffic Volume

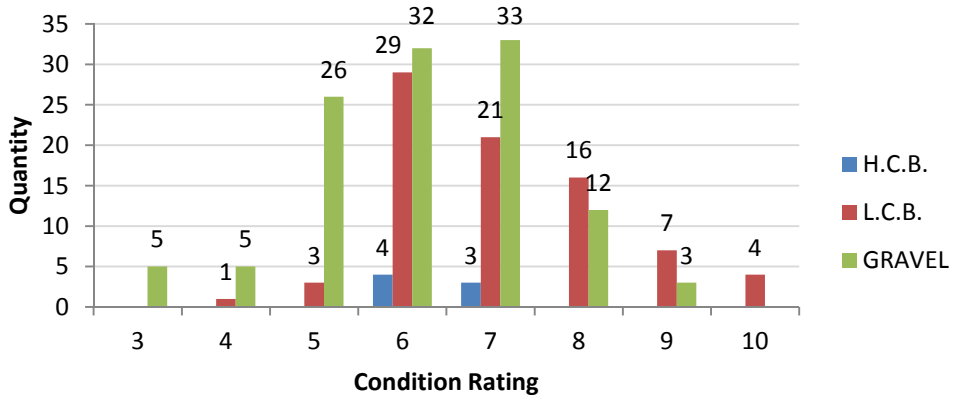


Figure 5 – Condition Rating Summary by Surface Type

3.1.3 POLICIES

In accordance with the Guide, it is recommended that a data verification policy and condition assessment policy be established to outline when and how the Road Asset State of Infrastructure is updated. It is recommended that an annual cycle be established to update condition ratings and cost projections in accordance with the procedures outlined in the MTO Methods and Inventory Manual.

3.2 STRUCTURES

The Municipality's structure inventory consists of fifteen bridges and four culverts. The structure inventory and condition ratings are based on the latest Inspection Forms, as completed by Tulloch Engineering Inc. in 2013.

3.2.1 METHOD OF CONDITION EVALUATION

Appraisal of the Municipality's structures was carried out in October of 2013, in accordance with procedures outlined in the Ontario Structure Inspection Manual. The structures were identified and assigned a number, and then its location, span, rise, roadside environment, and surface type were noted. In addition, the structure was divided into the representative components with the dimensions and general condition of each component identified. For components in need of improvement, the needs and associated timing were also reported.

Each structure has been given a subjective rating of Excellent, Good, Fair or Poor, based on the current overall condition of the structure. A condition rating greater than Poor is considered acceptable and is expected to require only normal maintenance, with the exception of specific component improvements as may be identified. A condition rating of Poor or Replace is considered unacceptable and an improvement or replacement is to be evaluated for cost. Structures were estimated to have a lifespans of 75 years with the exception of the Ansonia Culvert at 40 years, with an average projected condition rating assigned based on age as follows:

Rating	Age
Excellent	Less than 5 years old
Good	Between 5 years old and 50% of its life expectancy
Fair	Between 50% and 75% of its life expectancy
Poor	Between 75% and 100% of its life expectancy
Replace	Beyond its life expectancy

3.2.2 INVENTORY

A summary of the Municipality's structure inventory is presented in the following figures outlining the age and overall condition ratings. The inventory is based on the Municipality's Inventory, supplemented by detailed asset information evaluated through the completion of the OSIM inspections. The complete inventory is presented in the Capital Asset Summary Spreadsheet, including all structure components and assumptions used to arise at the given ratings and projected costs over the ten year range.

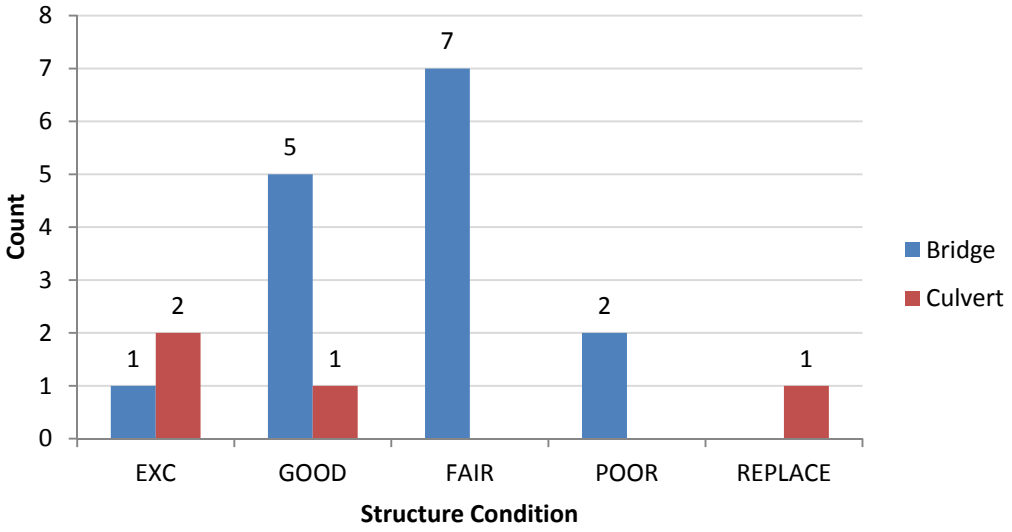


Figure 6 – Condition Rating Summary

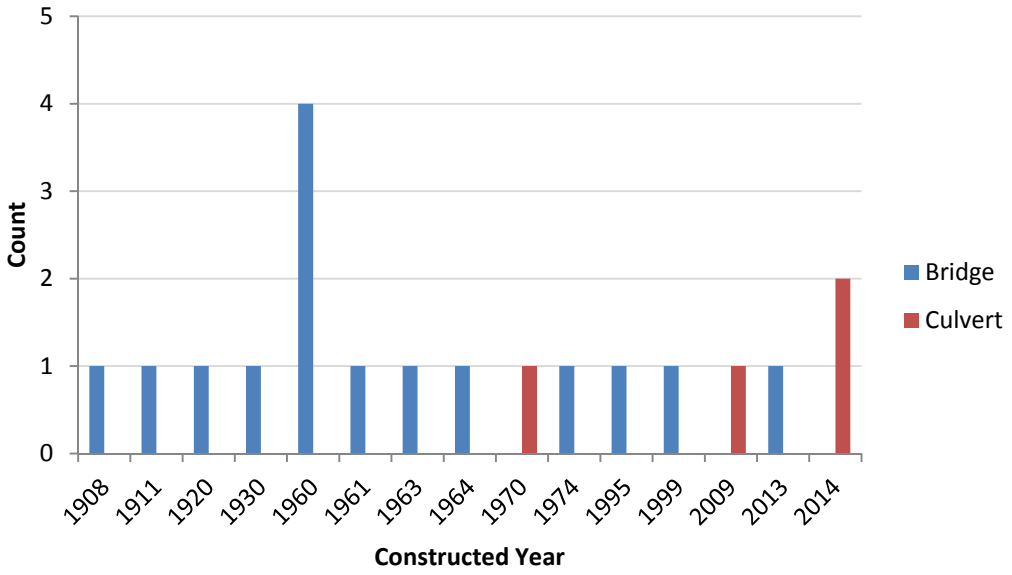


Figure 7 – Year of Construction

3.2.3 POLICIES

In accordance with the Guide, it is recommended that a data verification policy and condition assessment policy be established to outline when and how the structure infrastructure information is updated. As the OSIM Inspection frequency is currently legislated as once every two calendar years, we would recommend that the legislated frequency, as may be amended, be followed. In addition, we would recommend that the inspections be completed with the currently utilized OSIM Inspection Forms to permit equal comparison of subsequent inspection reports.

3.3 STORM SEWERS

The Municipality provides storm sewer collection services within the Village of Iron Bridge, through a subsurface gravity system approximately 1760m in length which is managed and maintained by Municipal Staff.

3.3.1 METHOD OF CONDITION EVALUATION

The Municipality's storm sewer collection system was evaluated based on the as-constructed plans provided by the Municipality. The system was divided into twenty-four gravity storm sewer sections with each section being assigned an identification number, and then its location, length, diameter and year of construction were noted.

Each storm sewer asset has been given a subjective rating of Excellent, Good, Fair or Poor, based on current overall condition of the asset. A condition rating greater than Poor is considered acceptable and is expected to require continued maintenance. A condition rating less than Poor is considered unacceptable and an improvement or replacement is to be evaluated for cost. Storm sewer assets were assigned a life expectancy based on construction material and industry averages, with an average condition rating assigned based on age as follows:

Rating	Age
Excellent	Less than 5 years old
Good	Between 5 years old and 50% of its life expectancy
Fair	Between 50% and 75% of its life expectancy
Poor	Between 75% and 100% of its life expectancy
Replace	Beyond its life expectancy

3.3.2 INVENTORY

A summary of the Municipality's storm sewer inventory is presented in the following figures outlining a summary of the quantity of each. The complete inventory is presented in the Capital Asset Summary Spreadsheet, as well as assumptions used to arise at the giving ratings and projected costs.

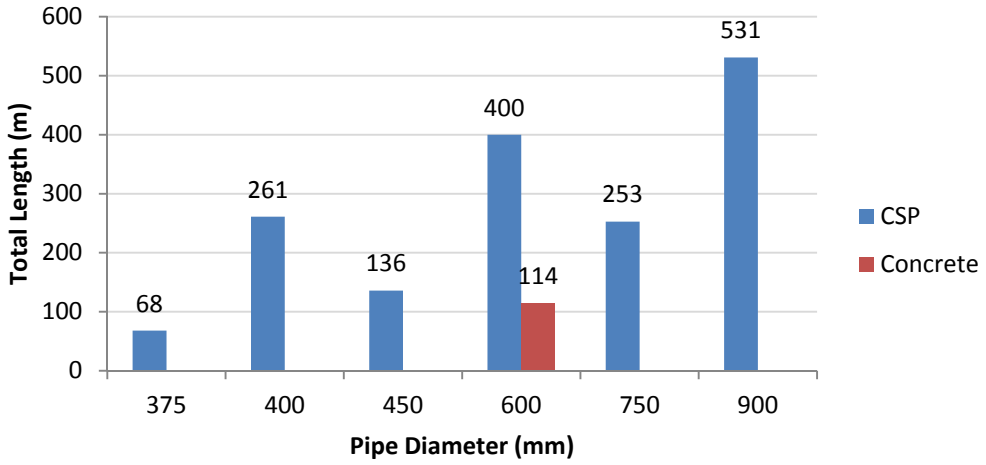


Figure 8 – Storm Sewer Length by Diameter & Material

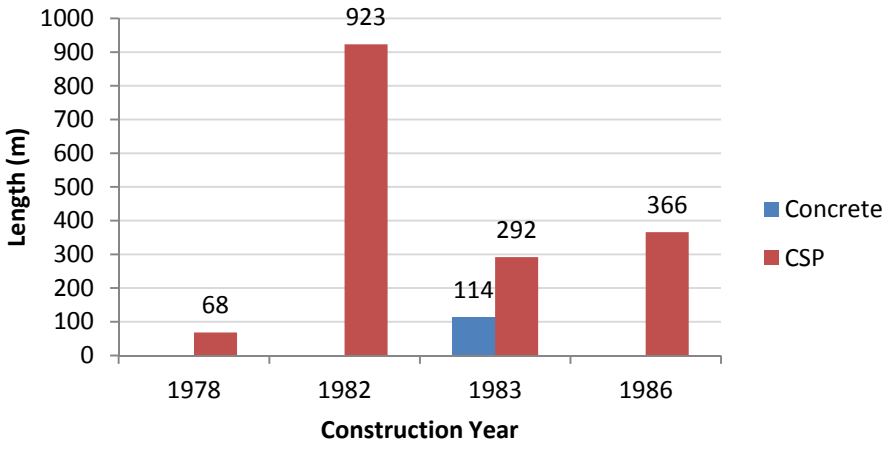


Figure 9 – Storm Sewer Length by Construction Year

3.3.3 POLICIES

In accordance with the Guide, it is recommended that a data verification policy and condition assessment policy be established to outline when and how the storm sewer infrastructure be updated. As there is currently no up to date information available on the condition of the storm sewer collection assets, it is recommended that a camera inspection program be initiated to provide more accurate condition ratings and anticipated lifespan. Depending on maintenance budget available, it would be beneficial to initiate a cycle of inspections such that each section of pipe is visually reviewed every five years.

3.4 VEHICLES, MACHINERY & EQUIPMENT

The Municipality's vehicles, machinery & equipment assets are comprised of twenty-five assets allocated to two departments and are located throughout the Municipality to serve a variety of purposes.

3.4.1 METHOD OF CONDITION EVALUATION

The Municipality's vehicles, machinery & equipment assets were evaluated based on the inventory and information provided by the Municipality. Each of the twenty-five assets was assigned an identification number, along with location, use and year of construction being noted.

Each asset was given a subjective rating of Excellent, Good, Fair or Poor, based on the lifespan of the asset. A condition rating greater than Poor is considered acceptable and is expected to require continued maintenance. A condition rating less than Poor is considered unacceptable and an improvement or replacement is to be evaluated for cost. Assets were subject to varying lifespans which can be reviewed in detail as presented in the Capital Asset Summary Spreadsheet.

Rating	Age
Excellent	Less than 5 years old
Good	Between 5 years old and 50% of its life expectancy
Fair	Between 50% and 75% of its life expectancy
Poor	Between 75% and 100% of its life expectancy
Replace	Beyond its life expectancy

3.4.2 INVENTORY

A summary of the Municipality's vehicles, machinery & equipment inventory is presented in the following figures outlining a summary of the count by department. The complete inventory is presented in the Capital Asset Summary Spreadsheet, including all assumptions used to arise at the given ratings and projected costs.

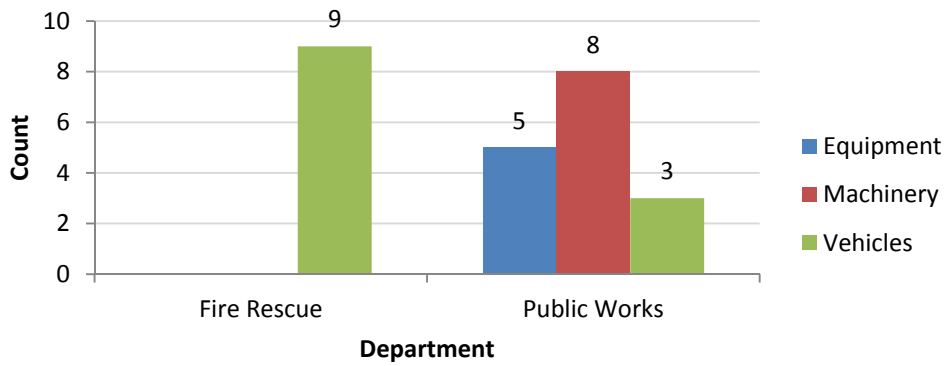


Figure 10 – Asset Summary by Department

3.4.3 POLICIES

In accordance with the Guide, it is recommended that a data verification policy and condition assessment policy is established to outline when and how the vehicles, machinery & equipment information is updated. For each of the assets, it is recommended that a 1 year cycle is established to update condition ratings and cost projections in accordance with applicable safety standards.

4.0 EXPECTED LEVELS OF SERVICE

Levels of Service are statements of service performance delivery which provide an indication of the minimum acceptable standard for an asset.

Desired levels of service within the Municipality of Huron Shores have been developed through consideration of a number of documents and industry recognized standards to meet generally accepted levels of operation and safety. The target levels of service should be reviewed on a regular basis to determine if they are appropriate, and achievable. Consideration should be given to risk, and cost in the development of target levels of service.

4.1 RISK ASSESSMENT

All assets carry a level of risk for their users. Generally when conducting risk assessment, two key factors that come into consideration are frequency of use and cost of improvement. Acceptable levels of risk may vary depending on their frequency of use; e.g. If a rarely used asset and a frequently used asset do not meet today's minimum standards, the risk is higher for the frequently used asset and therefore should be prioritized ahead of a rarely used substandard asset.

It is desirable to limit risk by replacing/improving the condition of all assets to meet today's minimum standards however the cost of doing so is not feasible. The Municipality attempts to achieve a manageable level of risk by completion of condition reviews and prioritizing of replacement/improvement projects.

4.2 PERFORMANCE MEASUREMENT

To optimize an Asset Management Plan and ensure target levels of service are appropriate, performance measures or indicators are established and should be reviewed on a regular basis. Performance measurement of the assets will provide an indication as to whether the rehabilitation and replacement strategies are effective or whether changes needed to be made. Performance benchmarks for the various asset groups are described in the following sections.

4.3 ROADS

The Municipality has established a target level of service for roads by classifying road segments based on their surface type and estimated traffic volume. The municipal road network has been evaluated by Tulloch and in this plan all road segments have been rated using the MTO Road Appraisal Sheets. The rating system utilized consists of a number 1 through 10 (where 10 represents a road in excellent or new condition, and a rating of 5 or less corresponding to poor condition).

The desired level of service for Municipal roads is to maintain an average weighted condition rating of 7.0 for the entire road network. The goal of this level of service is to develop and maintain uniformity for users of the road network and to ensure that roads meet the minimum standards across the Municipality.

The following strategies have been selected to achieve the target however as a general rule, when a roadway reaches a condition rating of 5 or less it is schedule for reconstruction the following year.

1. Higher traffic volume roads are given priority over lower traffic volume roads;

2. For surface treated roads: Roads requiring partial depth reconstruction are given priority over full depth reconstruction, since this provides the best value with limited funds available;
3. For asphalt roads, overlay projects provide the best value for dollars spend, followed by partial depth reconstruction, then lastly full depth reconstruction.
4. Remaining improvements generally prioritized on the basis of condition rating;

These improvements and repairs are incorporated into the road condition inventory spreadsheets which project the condition of road segments over the next 10 years. The condition of a road will degrade with time; the rate of degradation is a function of the adequacy of the roads design, the quality of construction, the traffic volume it serves, the maintenance effort it receives and its surface type.

For the purposes of this study, the following assumptions were made for road deterioration rates:

- Loose Top Roads → Maintains surface condition rating;
- Low Class Bituminous Roads → Condition rating reduced by 0.25 per year until it drops to 5.0;
- High Class Bituminous Roads → Condition rating reduced by 0.125 per year until it drops to 5.0;

The following table describes the current state of the roads compared with the projected conditions over the next ten years.

Condition Rating	Now	Target	2018	2023
Weighted Average	6.3	7.0	6.4	6.9

Further detail on how the future ratings are achieved can be found in the Road Inventory spreadsheets completed as part of this planning exercise. Please note that the above ratings reflect the zero “capital road improvements” for 2014 due to the emergency repair work required to be completed.

The performance of the road network should be evaluated by completing condition assessments on an annual basis. The actual condition ratings collected in 2018 should be compared to the projected ratings to determine whether or not the target level of service is being achieved. Adjustments to the plan should be made as necessary either by increasing the annual budget for road improvements, or by revising the target level of service.

Additionally, the performance measures can be cross checked against the effectiveness measure used in the Financial Information Returns for Adequacy of Roads.

4.4 STRUCTURES

Structures consist of many different components with varying life expectancies. The overall condition of a bridge is evaluated by completing mandatory biennial (every 2 years) OSIM inspections which provide detailed condition ratings of all the components of each structure. The condition of the various components is described by one of four ratings, being Excellent, Good, Fair or Poor.

In general, components of a bridge are recommended for rehabilitation or repair once a large percentage reaches a condition of 'Poor'. If a number of components are rated poor, the structure is typically recommended for a major rehabilitation or replacement within a specified timeframe.

The desired level of service for municipal bridges has been established through review of the current OSIM inspection data. The target level of service for Municipal bridges is to maintain all bridges such that they do not require excessive load limit posting, and that the structure capacity matches associated road traffic volume and intended purpose. This should be achieved by continuing to complete rehabilitation and repair recommendations outlined in the OSIM inspection within the suggested timeframes. Additionally, the performance measures can be cross checked against the effectiveness measure used in the Financial Information Returns for Adequacy of Bridges and Culverts.

Condition ratings over the next ten (10) years have been projected by making the following assumptions;

- Excellent → Component age is less than 5 years old;
- Good → Component age is less than half of its life expectancy;
- Fair → Component age is greater than ½ of its life expectancy;
- Poor → Component age is greater than ¾ of its life expectancy;
- Replace → Component age is beyond its life expectancy;

It should be noted that the results of the biennial inspections should be compared with the forecasted condition of the structure and should supersede the forecasted condition in all cases. All rehabilitations and repairs shall be completed in accordance with the current Canadian Highway Bridge Design Code.

4.5 STORM SEWERS

The desired level of service for storm sewers is to provide adequate drainage of the intended catchment areas. Achievement of the levels of service for the storm sewers is easily determined by reviewing the performance of the existing infrastructure (is the storm sewer serving its intended purpose of providing adequate drainage for the catchment area).

The performance of storms sewers can be linked to controllable factors such as frequency of proper maintenance, and timely replacement of failing pipes; however its performance can also be linked to the frequency and severity of precipitation events. In recent years, the frequency and severity of precipitation events has been above average – causing a strain on the drainage infrastructure. As a result it is increasingly more important to complete regular flushing and inspection of buried infrastructure (suggested strategies are discussed in the later sections of this report).

The primary focus of the Municipality is to maintain an adequate level of service for existing systems. Meeting the desired level of service for storm sewers is achieved by regular maintenance of the systems, and replacement of damaged or failing infrastructure.

The storm sewer system is constructed of corrugated steel or concrete pipes. The lifespan of corrugated steel pipes is relatively short, 40 years in comparison to plastic at 75 years. As a result it is anticipated that the storm sewer system will require major repairs over the next 10-years in order to maintain the desired level of service. These repairs and replacements shall be completed in accordance with the MOE Guidelines for Sewage Works.

The primary focus of the Municipality is to maintain an adequate level of service for existing system. This will be accomplished by continually monitoring the performance of the system using measures such as recording the number of storm sewer back-ups (for rainfall events in excess of the design storm) throughout the year. The desired target is to have no storm sewer back-ups – indicating that the systems are operating and being maintained effectively. This is currently the process applied in in the Financial Information Returns for Adequacy of Stormwater System.

The Municipality has no recorded back-ups to date, however a policy should be implemented as part of the new asset management strategy. Confirming achievement of this level of service will require the Municipality to keep records and review them on an annual basis as a minimum.

4.6 VEHICLES, MACHINERY & EQUIPMENT

The overall condition of the vehicles, machinery & equipment assets is based on its age and useful lifespan and was described by one of five rating as being Excellent, Good, Fair, Poor or Replace as defined below.

- Excellent → Component age is less than 5 years old;
- Good → Component age is less than half of its life expectancy;
- Fair → Component age is greater than ½ of its life expectancy;
- Poor → Component age is greater than ¾ of its life expectancy;
- Replace → Component age is beyond its life expectancy;

The target level of service for these assets is to maintain all assets such that they are in good repair with minimal breakdowns. This should be achieved by continuing to complete regular maintenance and repair recommendations as may be outlined during regular inspections completed during maintenance servicing. All assets with recommended maintenance schedules as part of the manufacturer's warranty service should follow the schedules as described.

Achievement of the levels of service for these assets can be determined by reviewing the performance of the asset, i.e. is the asset operating for its intended purpose without interruption? The municipality currently keep records of the amount of down time for these assets and this policy should be continued as well as recording the scheduled maintenance intervals as part of the new asset management strategy. Confirming achievement of this level of service will require the Municipality to keep records and review them on an annual basis as a minimum.

5.0 ASSET MANAGEMENT STRATEGY

5.1 PLANNED ACTIONS & OPTION ANALYSIS

As referenced in the Guide, "*the asset strategy is the set of planned actions that will enable the assets to provide the desired level of services in a sustainable way."* All assets have a limited life expectancy and to some degree the rate of deterioration can be estimated. A decision made at any point in time in the lifecycle of an asset has an effect on the remaining life and may have operational implications and related costs.

The following sections will summarize the planned actions and option analysis for each asset type to maximize lifespan and minimize costs, in a sustainable way.

5.1.1 ROADS

Roads require regular roadside maintenance activities such as ditching and brushing to ensure adequate drainage of the road subgrade. Poor subgrade drainage will lead to premature deterioration of the road base which will directly impact the deterioration of the surface. Minor brushing and culvert cleanout/flushing activities should also be employed on a regular basis to help prolong the lifespan of the assets.

Maintenance of an asphalt road surface is typically completed through activities such as crack sealing or application of a slurry seal. These maintenance activities are generally not carried out in smaller Municipalities as they can be quite costly and require a large "volume" of work to make the activities economical to undertake. Additionally, a single course asphalt overlay could be applied to extend the assets lifespan, however if the road surface is uneven, the overlay will also be uneven. As such, these maintenance costs which may be possible depending on actual conditions at the time of rehabilitation or replacement were not evaluated at great length. Full resurfacing was considered for cost evaluation and projection of future costs.

Integrated infrastructure planning was considered, as reflected in the prioritizing of projects shown in the later sections of this report and is also reflected in the Capital Asset Summary. The condition of the infrastructure beneath the road surface (storm sewers) was reviewed to ensure that a road was not resurfaced, without prior completion of any required improvements to the corresponding subsurface infrastructure.

5.1.2 STRUCTURES

As with all assets, structures require regular maintenance activities such as sweeping and pressure washing to clear winter sand buildup, as well as debris removal to ensure proper flow hydraulics to minimize erosion and scouring potential.

Renewal and rehabilitation activities of the Municipality's structures are carried out in accordance with the OSIM Inspections Forms, completed by or under the direction of a Professional Engineer. These activities are typically evaluated by the Professional Engineer at the time to ensure the costs are economical.

The following maintenance practices should be employed on a regular basis to help prolong the lifespan of structure assets.

- Annual spring bridge cleaning (deck, deck drains, curbs, bearings);
- Monthly removal of debris from waterway;
- Removal of corrosion from exposed steel surfaces;
- Priming/painting/coating of steel;

Replacement activities are generally considered once maintenance, renewal and rehabilitation activities are no longer feasible or economical to undertake. As can be seen in the Capital Asset Summary Spreadsheet, when replacement is considered, the replacement asset does not need to be identical to the existing asset, such as replacing a single lane concrete bridge with a double lane structural culvert. An increase in level of service should always be considered at the time of replacement.

5.1.3 STORM SEWERS

Storm sewers require regular maintenance activities such as frequent flushing to ensure unimpeded flows, reducing the likelihood of backups and failures. Rehabilitation options for storm sewers are limited to relining. On occasion, storm sewer rehabilitation can be more cost effective than a full replacement however this strategy must be reviewed on a case by case basis. The strategy employed in this plan takes into account the full cost of replacement.

In addition, the following maintenance practices should be employed on a regular basis to help prolong the lifespan of buried assets.

- Suggested annual flushing of 400 metres of storm sewer mains and leads;
- Suggested annual cleaning of associated storm sewer structures, catch basins, ditch inlets, and manholes;
- Suggested annual camera inspection of 400 metres of storm sewer mains and leads;

Camera inspection of the storm sewers would assist in accurately detailing the condition of the asset and subsequent schedule for replacement. Integrated infrastructure planning was also considered, as reflected in the Capital Asset Summary with the subsurface assets being scheduled for replacement prior to road resurfacing. Completing the storm sewer replacement concurrently with the road resurfacing would result in overall costs being less than replacing separately.

5.1.4 VEHICLES, MACHINERY & EQUIPMENT

Vehicle, machinery & equipment assets also require regular maintenance activities such as servicing in accordance with the manufactures operating manuals to minimize potential for breakdowns. In addition, failing to complete these maintenance intervals could void the manufacturer warranty in the event there is a concern.

Major rehabilitation of most vehicles, machinery and equipment will not significantly extend the useful life. Due to the nature of the Municipal operations associated with these assets, the asset is treated similar to a rolling stock that is disposed of at the end of its useful lifecycle and replaced with a new asset. The replacement asset selected would likely be an upgrade to disposed asset as over the course of the disposed assets lifecycle, improvements in technology and efficiency would have been made.

5.2 RISK ASSESSMENT

All assets carry a level of risk in terms of cost for the Municipality. The options above were not only evaluated based on the lifecycle costs and benefits, but also on the potential risks. Due to the uncertainty in assigning a reasonable estimate of probability and cost associated with a risk event, a qualitative approach was applied to the management plan of the assets.

For all of the integrated assets, such as the road surface, structures and storm sewers, no two assets of the same location were expected to reach the end of their service life at the same point in time. Therefore a qualitative approach was applied to reasonably accept the increased risk of letting the road deteriorate beyond the desired level of service to offset the cost of replacing the road asset a second and third time in conjunction with the subsurface assets.

In addition, the management of the asset improvement scheduling took into consideration the risk associated with volume of use that the assets received. Acceptable levels of risk will vary depending on their frequency of use. e.g. If a rarely used asset and a frequently used asset do not meet today's minimum standards, the risk is higher for the frequently used asset and therefore should be prioritized ahead of a rarely used substandard asset.

It is desirable to limit risk by replacing/improving the condition of all assets to meet today's minimum standards however the cost of doing so is not feasible. The Municipality attempts to achieve a manageable level of risk by completion of condition reviews and prioritizing of replacement and improvement projects.

5.3 PROCUREMENT METHODS

The Municipality currently has procurement by-laws in place for use when considering various projects, however additional investigations and discussions could be undertaken to further pool resources with neighboring municipalities. The continuation of the amalgamated tender for resurfacing will continue to allow for a higher volume of service by a supplier, which reduces the overall cost per municipality. This approach potentially could be extended to structure replacement works which are short duration and easily divisible by Municipality.

Alternatively, design-build-finance, or design-build-finance-operate models could be explored for large scale projects which would attract outside interest on a financial rate of return. This approach would be limited to large scale projects where low interest loans would not be available through alternative sources. Loans or financing through alternative financing procedures should be evaluated carefully to ensure the lowest risk and long range costs to the Municipality.

5.4 SCHEDULE OF PRIORITIES

This Asset Management Plan identifies the schedule of projects based on asset type for the next ten years. Options were considered for each type of asset as outlined above, with the options being evaluated for risk and lifecycle costs.

The following is a schedule of priorities by asset type as presented in the Capital Asset Summary found in the Capital Asset Summary Spreadsheet.

5.4.1 ROADS

Asset ID	Asset Name
Works postponed to 2015 to permit capital funding for emergency repairs.	
HUR-RD-465	Ingram Road
HUR-RD-470	Round Barn Road
HUR-RD-651	Dayton Road
HUR-RD-690	Dayton Road
HUR-RD-1000	Eley Road
HUR-RD-1100	Mississagi Crescent

5.4.2 BRIDGES

Asset ID	Asset Name
HUR-BR-009	Ansonia Culvert
HUR-BR-006	Midway Bridge
HUR-BR-003	MacDonald Bridge
HUR-BR-004	Feagan Bridge
HUR-BR-005	Little Rapids Bridge
HUR-BR-008	Dumond Road Bridge
HUR-BR-017	Potomac Bridge
HUR-BR-018	Recreation Bridge

5.4.3 STORM SEWERS

Asset ID	Asset Name
HUR-STM-2100	Bridge Street
HUR-STM-2105	Drainage Easement
HUR-STM-2110	Drainage Easement
HUR-STM-2115	East Street
HUR-STM-2120	John Street
HUR-STM-2210	Warnock Road

5.4.4 VEHICLES, MACHINERY & EQUIPMENT

Asset ID	Asset Name
HUR-VEH-001	Freightliner Tanker
HUR-VEH-008	GMC ½ Ton 4x4 – FPO
HUR-VEH-003	GMC Sierra 4x4 – FS1
HUR-VEH-013	Chevrolet ½ Ton 4x4 – PW#2
HUR-VEH-016	GMC Sierra 4x4 – PW#1

6.0 FINANCING STRATEGY

Establishment of a financial plan is critical to the successful implementation of an asset management plan. The following section will summarize the Municipality's expenditures over the past four years and will detail the financial commitment required in order to keep the Municipality infrastructure at acceptable levels of service.

In conjunction with developing the Asset Management Plan, the replacement cost of all the Municipality's assets was estimated. Replacement costs for linear assets were generated through use of local competitive bid construction costs for projects of similar scope and size. Replacement costs for non-linear assets such as structure, vehicles, machinery and equipment were estimated using recent purchase prices and construction costs for major components (structures).

The total replacement cost of the Municipality's assets was calculated to be approximately $24.3 million (2013 Dollars). A breakdown of the total replacement costs is described in the schematic below.

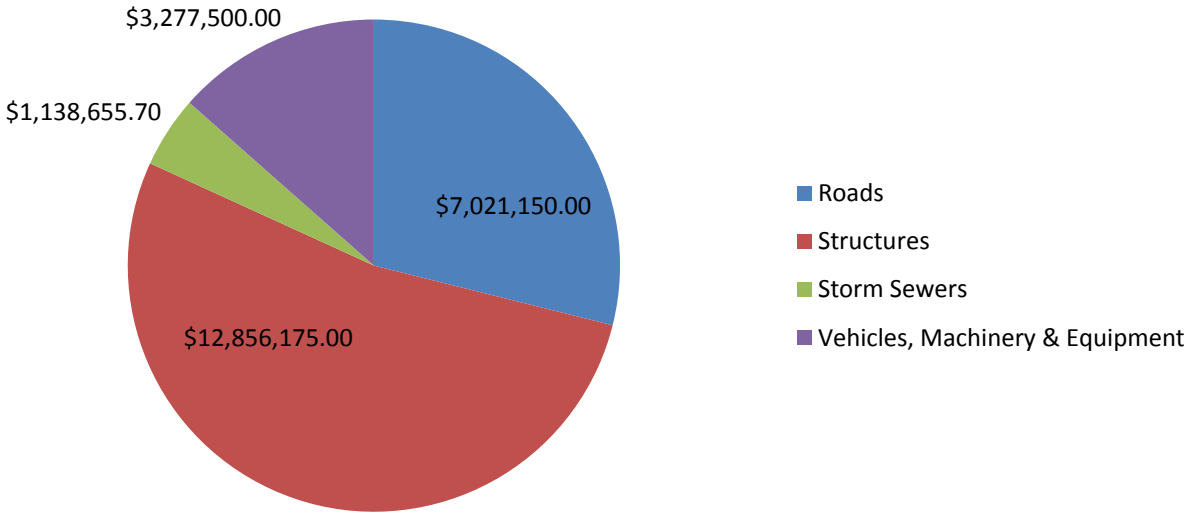


Figure 11 – 2013 Asset Replacement Costs ($24.3M)

The Municipality is not required to budget for the full replacement value of all its assets, as portions of assets only require an initial investment followed by further re-investment to maintain acceptable levels of service.

It was also calculated that the reinvestment should be an average of $850,000 per year over the next ten years into improvement projects as assets reach their maximum potential useful lives. It is recommended that an additional $800,000 per year be put aside into a reserve fund for long term planning purposes, beyond the 10-year plan.

Historically, the Municipality has been investing on average approximately $600,000 per year. The table presented below describes the budgets over the past four years and details the source of the monies allocated to each.

Funding Source	All Assets - Reporting Year			
	2010	2011	2012	2013
Tax Base	$883,648.00	$303,564.00	$338,597.00	$395,081.00
Government Grants	$388,339.00	$150,664.00	$141,042.00	$275,166.00
Reserves	$350,992.00	$166,750.00	$77,475.00	$295,800.00
User Fees	$1,125.00	$1,230.00	$2,317.00	$2,415.00
Loans	$0.00	$0.00	$0.00	$87,000.00
Total Without Grants	***$1,235,765.00***	***$471,544.00***	***$418,389.00***	***$780,296.00***

Using the historic data as a base model for future financial planning purposes, the figure below outlines a forecast of the required annual expenditures into municipal infrastructure for the 10-year period of 2014 through 2023 as well as the anticipated shortfall in required spending for all infrastructures included in this plan. The Projected Funding represents the average spent over the past four years ($600,000/year), excluding government grants which are a non-guaranteed, variable source.

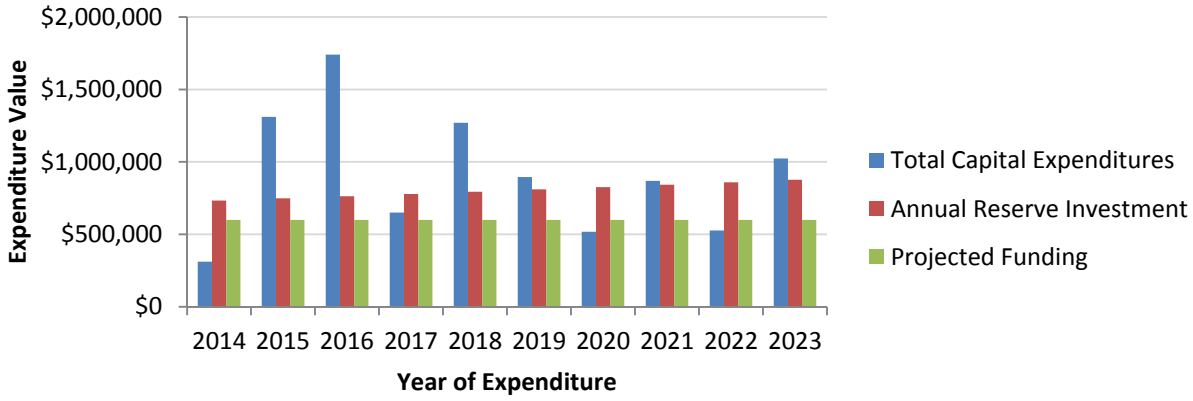


Figure 12 – Municipal Asset 10 Year Capital Expenditures & Reserve Contributions

Note: Figure above was based on partial AMP update completed in November of 2014 and excludes capital investments made with regards to municipal structures in 2014.

The intention of this section of the report is to highlight the recommended expenditures, as well as suggested methods of lessening the shortfall. Suggested ways of decreasing the magnitude of the annual shortfall are listed below, however whether they are implemented or not is a decision to be made by Council.

- Increasing municipal taxes;
- Implementing or increasing user fees;
- Financing projects; or
- Accepting decreased levels of service;

The expected funding shortfall is quite significant; however, the magnitude of this shortfall is exaggerated by the inclusion of the recommended reserve savings. Saving into a reserve fund is one method of financial planning however many Municipality's take the strategy of debentures and financing projects over their useful life. The actual finance strategy will not only vary from year to year but may vary from one asset project to another.

The following sections present a more detailed breakdown of the required reinvestment for each of the asset groups included in this comprehensive asset management plan.

6.1 ROADS

Reinvestment in the Municipality's roads is a required expenditure to maintain an acceptable average condition rating for the entire road network. It was calculated that the Municipality should be reinvesting just over an average of $475,000 per year to reconstruct road infrastructure. It is recommended that an additional $400,000 per year be put aside into a reserve fund for long term planning purposes, beyond the 10-year plan.

Historically, the Municipality has been investing on average approximately $230,000 per year. The table presented below describes the budgets over the past four years and details the source of the monies allocated to each.

Funding Source	Roads - Reporting Year			
	2010	**2011**	**2012**	**2013**
Tax Base	$652,025.00	$53,064.00	$237,394.00	$228,679.00
Government Grants	$351,738.00	$150,664.00	$141,042.00	$35,000.00
Reserves	$107,999.00	$138,240.00	$12,860.00	$0.00
User Fees	$1,125.00	$1,230.00	$2,317.00	$2,415.00
Loans	$0.00	$0.00	$0.00	$0.00
Total Without Grants	***$761,149.00***	***$192,534.00***	***$252,571.00***	***$231,094.00***

Using the historic data as a base model for future financial planning purposes, the figure below outlines a forecast of the required annual expenditures into municipal road infrastructure for the 10-year period of 2014 through 2023 as well as the anticipated shortfall in required spending. The Projected Funding represents the average spent over the past four years ($230,000/year), excluding government grants which are a non-guaranteed, variable source.

Please note that the zero dollars committed to 2014 represents the need to push capital projects into 2015 so the emergency repair works (not included in this plan) can be completed.

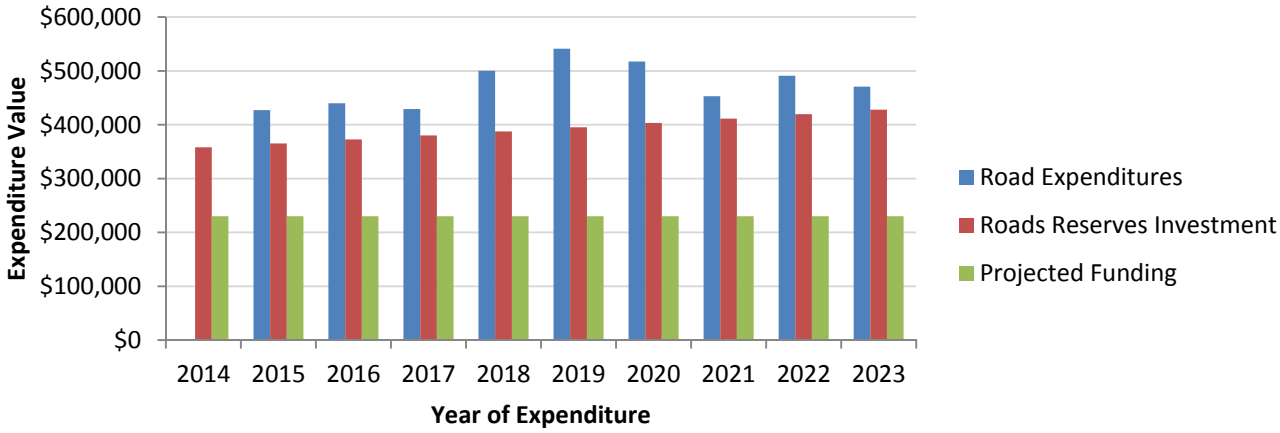


Figure 13 – Road Infrastructure 10 Year Capital Expenditures & Reserve Contributions

A commitment by the Municipality to contribute the required reinvestment into roadway projects will ensure that the road network remains at the established level of service. Failure to make an annual contribution will result in the road network deteriorating below the acceptable level of service.

6.2 STRUCTURES

Reinvestment in the Municipality's bridges and culverts is a required expenditure to maintain their structural integrity for the future. It was determined that several large capital projects need to take place over the next ten years to replace bridge and culvert assets reach their maximum potential useful lives. Required reinvestment levels for scheduled improvements were calculated to be an average of $278,000 per year, however this average is heavily frontloaded over the next three years for a three year average of $663,000.

It is recommended that an additional $195,000 per year be put aside into a reserve fund for long term planning purposes, beyond the 10-year plan. It is also recommended that an annual maintenance budget be established for municipal staff to complete minor works to prolong the life of the structures.

Historically, the Municipality has been investing on average approximately $70,000 per year. The table presented below describes the budgets over the past four years and details the source of the monies allocated to each.

Funding Source	**Structures - Reporting Year**			
	2010	**2011**	**2012**	**2013**
Tax Base	$75,000.00	$75,000.00	$25,000.00	$40,492.00
Government Grants	$0.00	$0.00	$0.00	$240,166.00
Reserves	$0.00	$0.00	$35,818.00	$25,000.00
User Fees	$0.00	$0.00	$0.00	$0.00
Loans	$0.00	$0.00	$0.00	$0.00
Total Without Grants	***$75,000.00***	***$75,000.00***	***$60,818.00***	***$65,492.00***

Using the historic data as a base model for future financial planning purposes, the figure below outlines a forecast of the required annual expenditures into municipal structure infrastructure for the 10-year period of 2014 through 2023 as well as the anticipated shortfall in required spending. The Projected Funding represents the average spent over the past four years ($70,000/year), excluding government grants which are a non-guaranteed, variable source.

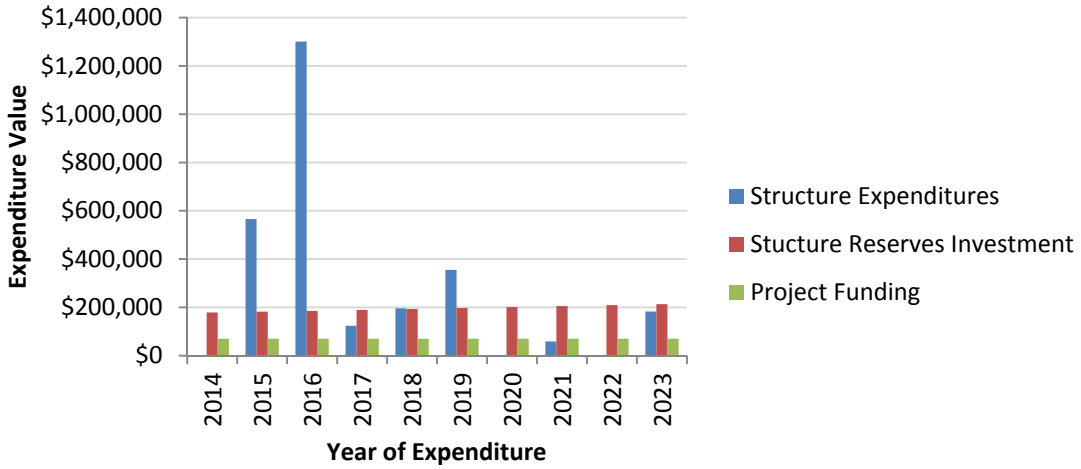


Figure 14 – Structure Infrastructure 10 Year Capital Expenditures & Reserve Contributions

Note: Figure above was based on partial AMP update completed in November of 2014 and excludes capital investments made with regards to municipal structures in 2014.

A commitment by the Municipality to contribute the required reinvestment into structures will ensure that the infrastructure retains in structural integrity. Failure to make the recommended contributions will result in the condition of structures deteriorating below the acceptable standards.

6.3 STORM SEWERS

Reinvestment in the Municipality's storm sewers is a required expenditure to maintain the services for connected properties. It was determined that several large capital projects need to take place towards the end of the ten year plan to replace and upgrade aging infrastructure assets. These projects are based on the current anticipated condition of the storm sewers and are subject to ongoing refinement as camera inspection works are completed. It is recommended that an additional $30,000 per year be put aside into a reserve fund for long term planning purposes, beyond the 10-year plan.

Historically, the Municipality has been investing zero dollars per year into storm sewer capital infrastructure. The figure below outlines a forecast of the required annual expenditures into municipal structure infrastructure for the 10-year period of 2014 through 2023 as well as the anticipated shortfall in required spending. The Projected Funding represents the zero dollars spent over the past four years.

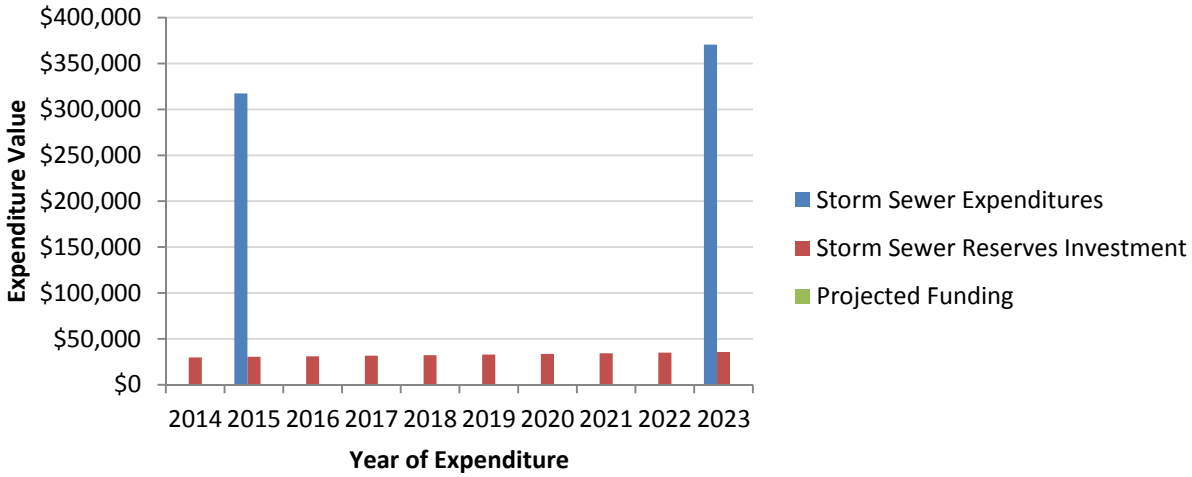


Figure 15 – Storm Sewer 10 Year Capital Expenditures & Reserve Contributions

A commitment by the Municipality to contribute the required reinvestment into storm sewer infrastructure will ensure that the buried pipes, manholes, and catch basins are repaired and replaced as required. Failure to make an annual contribution will result in the condition of buried infrastructure deteriorating beyond its life expectancy and ultimately failing to provide adequate drainage for the roadways and adjacent properties.

6.4 VEHICLES, MACHINERY & EQUIPMENT

Reinvestment in the Municipality's fleet of vehicles, machinery & equipment assets is required to maintain an acceptable service level. It was calculated that the Municipality should be reinvesting an average of $140,000 per year to repair, and replace various assets, however this average is skewed by the replacement of the Fire Station 1 Tanker in 2014 and plow trucks in 2018 and 2021. It is recommended that an additional $180,000 per year be put aside into a reserve fund for long term planning purposes, beyond the 10-year plan.

Historically, the Municipality has been investing on average approximately $300,000 per year. The table presented below describes the budgets over the past four years and details the source of the monies allocated to each.

Funding Source	Vehicles, Machinery & Equipment - Reporting Year			
	2010	2011	2012	2013
Tax Base	$156,623.00	$175,500.00	$76,203.00	$125,910.00
Government Grants	$36,601.00	$0.00	$0.00	$0.00
Reserves	$242,993.00	$28,510.00	$28,797.00	$270,800.00
User Fees	$0.00	$0.00	$0.00	$0.00
Loans	$0.00	$0.00	$0.00	$87,000.00
Total Without Grants	***$399,616.00***	***$204,010.00***	***$105,000.00***	***$483,710.00***

Using the historic data as a base model for future financial planning purposes, the figure below outlines a forecast of the required annual expenditures into municipal vehicles, machinery & equipment infrastructure for the 10-year period of 2014 through 2023 as well as the anticipated shortfall in required spending. The Projected Funding represents the average spent over the past four years ($300,000/year), excluding government grants which are a non-guaranteed, variable source.

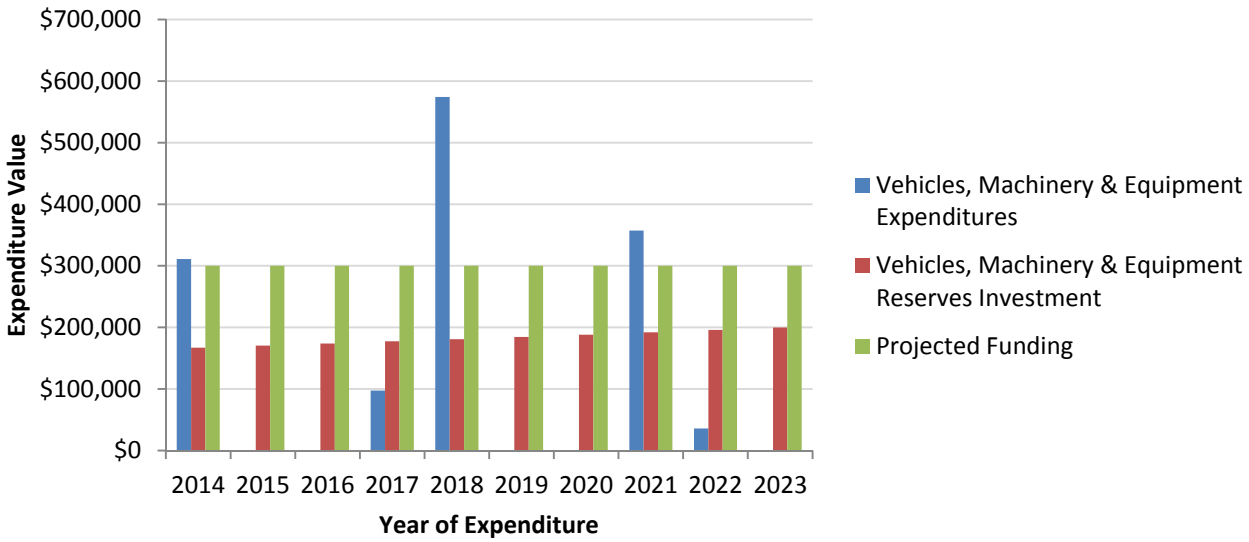


Figure 16 – Vehicles, Machinery & Equipment 10 Year Capital Expenditures & Reserve Contributions

A commitment by the Municipality to contribute the required reinvestment into vehicles, machinery & equipment will ensure that the fleet is maintained adequately. Failure to make the recommended contributions will result in the condition of the fleet deteriorating below the acceptable standards.

7.0 CLOSURE

This comprehensive asset management plan will require on-going updates, and improvements to the methodologies of data collection for developing more accurate inventory information. The ability for the Municipality to leverage its knowledge of infrastructure and by applying the best Asset Management practices at the time will result in very positive improvements in infrastructure. This document will also provide the means to effectively apply for external funding opportunities as they may become available.

The implementation of this plan will require the Municipality to find additional funds from various sources however overall the outlook for municipal infrastructure is promising. The Municipality has maintained infrastructure in a manner that has controlled the backlog of projects to a minimum. Continued contribution of municipal funds, as well as contributions from Government grants into capital projects will ensure the sustainability of the Municipality's infrastructure assets.

8.0 QUALIFICATIONS

This comprehensive asset management plan has been prepared for the exclusive use of the Municipality of Huron Shores by Tulloch Engineering Inc. This plan is intended to be a living document, updated on an annual basis to project future costs and expenditures on a planning basis only. This plan is not intended to establish annual budgets but rather act a guide to identify the priority projects. All cost projections presented in this report must be verified through detailed cost estimation at time of consideration for the works and subsequent budgeting.

9.0 ACKNOWLEDGEMENT

The Municipality of Huron Shores acknowledges the financial support of the Ontario Ministry of Agriculture, Food and Rural Affairs in the preparation of this comprehensive asset management plan. The views expressed in this plan are the views of the Municipality of Huron Shores and do not necessarily reflect those of Ontario Ministry of Agriculture, Food and Rural Affairs.

10.0 DEFINITIONS

AMP – Asset Management Plan

AADT – Average Annual Daily Traffic Count

Expenditure Forecast – Average Annual Historic Expenditure projected over 10 years with inflation;

Guide – Ministry of Infrastructure – *Building Together – Guide for Municipal Asset Management Plans*

HCB – High Class Bituminous Surface (Hot Mix Asphalt)

Historic Expenditure – Average of expenditures made over the past three years

LCB – Low Class Bituminous Surface (Surface Treatment)

OSIM – Ontario Structure Inspection Manual Bridge Inspections

PSAB – Public Sector Accounting Board