ASSET MANAGEMENT PLAN
2014-2023

TOWNSHIP OF PRINCE

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1 EXECUTIVE SUMMARY

The Township of Prince 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 greater 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 a Municipality's existing infrastructure ages and deteriorates, demand grows for better infrastructure facilities. This demand is in response to higher standards of safety, accessibility, health, environmental protection, and government regulations. The solution to this issue is to examine the way the Municipality plans, designs and manages infrastructure to meet these changing demands. This Asset Management Plan is expected to assist:

- Council in making service level and asset investment decisions
- Staff with the planning and management of the assets
- Taxpayers by sustaining and improving the services they receive

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

This Asset Management Plan will address the replacement and any planned expansion priorities for the Municipality, however it is imperative that current maintenance activities be continued. The ability of the Municipality to utilize its knowledge of its infrastructure and apply the best asset management practices at the time will result in positive improvements in the infrastructure condition and level of service. 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, describes how the plan was developed and outlines the goals of the Asset Management Plan. Section three will outline the asset inventory as well as their characteristics, conditions and values. Section four will outline the expected levels of service for each asset which will also provide an indication of the minimum acceptable standards for those assets. 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. Section five will outline

the asset management strategy for each asset type. The strategy will identify a ten year plan for each group of assets with recommendations for updating the plan as needed. The asset management strategy and timing of implementation for the assets has been laid out by establishing planned actions through options analysis and risk assessment to maximize lifespan and minimize cost in a sustainable way.

Section six provides a financing strategy with potential procurement methods to finance the asset management strategies outlined in the previous section. The way capital assets are managed, capital investment is planned and the way infrastructure needs are communicated, must be a priority of the Township of Prince's Council. The focus is to develop, implement and manage the long term asset management and financial means for the Corporation.

Small municipalities like the Township of Prince will face increased financial uncertainty and more planning needs to be done to keep infrastructure in an acceptable condition. Long term asset management and financial plans will be an important and a timely turning point for smaller municipalities in Ontario as they look towards the future.

Municipalities have traditionally focused on meeting infrastructure needs through investment in infrastructure paired with various levels of governments on a leveraged contribution basis, without planning for the long term lifecycle costs associated with the ongoing operation, maintenance and renewal of their tangible capital assets. Municipalities often wait until such funding of infrastructure programs are made available by provincial and federal governments before investing. This type of near term or "wait to see what is out there" focus with respect to municipal infrastructure has placed an overall burden on public finances.

Although this comprehensive Asset Management Plan has been developed to cover a period from 2014 to 2023, it is expected to be a living document that is updated regularly as asset conditions change and priority's shift. 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 out-of-date and of little benefit to the Municipality.

2 INTRODUCTION

This Asset Management Plan (AMP) was prepared by Tulloch Engineering in cooperation with the Township of Prince to meet the requirements of a Municipal Asset Management Plan. This AMP was developed in accordance with the guidance provided in the Ministry of Infrastructure's guideline *Building Together: Guide for Municipal Asset Management Plans*.

Asset management planning is meant to aid municipalities in making cost effective decisions with regards to operating, maintaining, 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 Municipal Vision Statement indicates that "The Corporation of the Township of Prince is a tranquil community, supported by economic development that respects the environment and contributes to businesses, services and programs that enhance our quality of life.". This statement outlines the need for the municipality to determine the quality and condition of infrastructure assets as they help to support economic activity and improve general quality of life. The AMP is not intended to change the municipalities existing processes and procedures with regards to their infrastructure assets but rather to help improve the decision making process by using long range vision to dictate resource allocation and using performance based analyses to determine if desired objectives are being met.

This AMP is developed to cover a ten (10) year period and estimate future costs to maintain infrastructure at the expected levels of service. The AMP will provide guidance to the municipality and is to be a dynamic plan that will be revised as infrastructure conditions change and municipal priorities are adjusted. A key aspect of the AMP is the ongoing evaluation of asset condition that will require tracking in future years. The intent of the AMP is not to constrain the municipality to a rigid plan with excessive reporting requirements but to provide a reasonable approach to asset management.

Prior to the advent of the Public Sector Accounting Board's requirements for municipalities to value and record their tangible capital assets, these assets simply passed through the budgets and financial records in the same manner as common expenditures. The practices used and policies applied to managing assets were broad, from nonexistent to highly detailed and complex.

The accounting for all tangible capital assets, including infrastructure and general assets facilitates better management of assets, development of appropriate maintenance and replacement policies, identification and timely disposal of surplus assets, and better management of risk. Decision makers are

able to better understand the impact of using capital assets when the assets themselves have been identified and amortized.

The requirement to account for tangible capital assets is moving municipalities into a transparent position with senior levels of government and allowing for estimable forecasts. Documenting and reporting on their capital assets and ultimately their means of service delivery provides another starting point. Municipalities have completed stage one of the provincial agenda, what assets and values are delivering services to ratepayer/inhabitants in each municipality.

Recording, capitalization and amortization of historical data provides the initial source any financial forecast. Forecasts and replacement cost projections are used for future planning. Preparation of the AMP followed the Ministry of Infrastructure guideline *Part 3 – The Elements of a Detailed Asset Management Plan* which outlines the following sections:

- Executive Summary
- Introduction
- State of Local Infrastructure
- Expected Levels of Service
- Asset Management Strategy
- Financing Strategy

The guideline outlines what infrastructure assets are to be included in the AMP. Best practice is for all of the assets to be included in the plan but at a minimum the Province outlines that asset management plans should cover roads, bridges, water and wastewater systems and social housing. The assets included within this Municipal AMP are the municipal roads, bridges and road maintenance vehicles & equipment. Each asset was separated into its respective category based on type and was assessed for current condition and replacement cost valuation. The condition of each of the assets was assessed using sound and accepted methods. Reference was made to assets valuated as part of the Public Sector Accounting Board requirements.

In accordance with the guideline, an AMP must cover a minimum period of ten (10) years and be updated regularly. This AMP will cover a period from 2014 to 2023 and it is recommended that detailed capital expenditures plans for roads, bridges and road maintenance vehicles and equipment be updated every two years. The recommendation is that this biennial update of the AMP corresponds with the municipal elections so that the four year term of council will coincide with these regular updates.

Therefore the council elected in 2014 would review and update two year segments of the AMP for 2015-16 and again for 2017-18.

The development of this AMP involved input from municipal staff and council, Municipal Auditor Anthony Rossi of Calam Chartered Accountants LLP and Tulloch Engineering Inc. The policies and strategies presented are based upon discussions with municipal representatives and currently accepted practices for the management of municipal infrastructure assets.

3 STATE OF LOCAL INFRASTRUCTURE

This section of the plan outlines the current age, condition and replacement cost valuation of the municipally owned capital assets included within the AMP. This evaluation is based on field investigations of roads and bridges.

3.1 ROADS

A 10-Year Roads Improvement Plan for roads is included in Appendix A. The Municipality has approximately 29.4 kilometres (km) of public roads within its municipal boundaries of which 22.3 km are maintained year-round and 7.1 km are seasonal. A breakdown of the road lengths by surface type is shown in Table I following.

Table I – Summary of Road Types

Surface Type	Length	Percent
L.C.B. (Surface Treatment)	15.5 km	52.7%
Gravel	13.9 km	47.3%
Total	**29.4 km**	**100.0%**

3.1.1 METHOD OF ROAD CONDITION EVALUATION

The determination of the state of the roads under the Municipality's jurisdiction was based on practices outlined in the MTO Methods and Inventory Manual. The roads are divided into sections, defined by crossroads or physical landmarks, which exhibit uniform performance characteristics. The road condition appraisals were completed on June 22, 2013 with the assistance of the Townships Road Superintendent Brian Evans. A 0.5 km section of Red Rock Road at the Northeast corner of the municipality was excluded from detailed investigation as it is maintained by the City of Sault Ste. Marie.

Each road section has been given a subjective 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 costed. Annual Average Daily Traffic counts were estimated from field observations and discussions with Township representatives.

The anticipated road condition for each section was then projected over ten years to allow for forecasting of required future work. This method of evaluating road surface deterioration relies on estimating the life cycle of various road surfaces.

Surface treated or Low Cost Bituminous (L.C.B.) treated roads typically have a seven to ten year life cycle before their condition rating drops below 5. This is dependent on their use, the structural condition of the road and routine maintenance. Assuming a ten-year life cycle the condition rating for each section of surface treated road would typically drop 0.5 per year. This value was used to determine the year in which the condition rating will drop below 5 and will require resurfacing.

The Methods and Inventory Manual suggests that the condition rating for gravel roads will not change with continued routine loose top maintenance. The condition rating for the ten-year forecast will then be the same as the study year, although severe spring breakup may affect the condition rating and require localized repairs that cannot be anticipated.

The following is a measure of the condition of the existing road system proposed for this AMP.

Average Condition Rating	**System Condition**
8.5 to 10	excellent (very good) structural condition, no improvements required
6.5 to 8.4	good structural condition; some local improvement may be needed
5.0 to 6.4	average (fair) structural condition; continued improvement needed
Less than 5.0	poor structural condition; substantial improvement needed throughout total road system

3.1.2 ROAD CONDITION SUMMARY

A detail summary of the information collected during the investigation is presented in the Roads Plan. This details the condition of the road sections on the basis of a 1 to 10 rating scale. The average condition rating of the three types of road surfaces is as follows on Table II.

Table II – Average Road Condition Rating		
Surface Type	**Length**	**Average Rating**
L.C.B. (Surface Treatment)	15.5 km	7.3
Gravel	13.9 km	4.9
Total	**29.4 km**	**6.2**

3.1.3 DATA VERIFICATION AND CONDITION ASSESSMENT POLICY

This data verification and condition assessment policy details how the municipality will fulfill the requirement to maintain up to date data information on the municipal road conditions. The road condition assessments would be best conducted by the Road Superintendent or other municipal representatives as they would have the most knowledge of the operation and condition of the roads on a regular basis. The road condition would be updated on an annual basis in the fall after any scheduled hard surfacing and road maintenance was completed. This information would be entered into an existing spreadsheet that would then project the condition of the road over a period of several years. The condition would be compared to the projected condition based on the parameters outlined previously. Adjustments to the asset management strategy would be based on actual road conditions. This approach has the advantage of ensuring that the completion of road improvements are done on the basis of actual road condition and can address needs more accurately. This approach is especially advantageous when the road condition may be affected by abnormal external forces such as flooding, truck overloading etc.

3.2 MUNICIPAL STRUCTURES

Section 3 of the Public Transportation and Highway Improvement Act, Ontario Regulation 104/97 – Standards for Bridges, outlines that "the structural integrity, safety and condition of every bridge shall be determined through the performance of at least one inspection in every second calendar year under the direction of a professional engineer and in accordance with the Ontario Structure Inspection Manual".

The Ontario Structure Inspection Manual (OSIM) has been used for bridge inspections in Ontario since 1985 and describes the procedures for carrying out detailed visual inspections. The OSIM outlines that the following structures shall be inspected every two years.

- All bridges, culverts and tunnels with spans over 3 metres
- All retaining walls
- All movable bridges

This OSIM also indicates that for culverts with 3 to 6 metre spans and for retaining walls, the inspection interval can be increased to four years if the culvert or retaining wall is in good condition and the engineer believes that the culvert or retaining wall condition will not change significantly before the next inspection.

The Municipality currently has five (5) structures within its jurisdiction that require inspection in accordance with the OSIM. These structures range in type and size and are summarized below in Table III.

Table III – Municipal Structures

Structure Name	Structure Location	Watercourse	Structure Type
Gagnon Road Bridge	Gagnon Road – 0.8 km S of Highway 550	West Branch of Big Carp River	Reinforced Monolithic Concrete Beam and Slab (7 – 'T' Beam)
Municipal Bridge No. 12	Town Line Road – 0.8 km S of Highway 550	Little Carp River	Reinforced Monolithic Concrete Beam and Slab (7 – 'T' Beam)
Municipal Bridge No. 13	Town Line Road – 1.3 km S of Highway 550	Little Carp River	Reinforced Monolithic Concrete Beam and Slab (7 – 'T' Beam)
Municipal Bridge No. 14	Base Line Road – 0.6 km W of Town Line Road	Big Carp River	Reinforced Monolithic Concrete Beam and Slab (7 – 'T' Beam)
Municipal Bridge No. 15	Base Line Road – 0.8 km W of Town Line Road	Big Carp River	Reinforced Monolithic Concrete Beam and Slab (7 – 'T' Beam)

3.2.1 METHOD OF STRUCTURE CONDITION EVALUATION

The current condition ratings of the municipal structures were established based on the most recent inspections of the structures. The Bridge and Culvert OSIM Inspections can be found in Appendix C of

the 10-Year Roads Improvement Plan. Section 2 of the Public Transportation and Highway Improvement Act, Ontario Regulation 472/10 – Standards for Bridges, allows for inspections methods other than OSIM such as the MTO Municipal Bridge Appraisal Manual and Municipal Culvert Appraisal Manual by stating "the inspection of a bridge may vary from the OSIM if, (a) the variation is not a marked departure from the Ontario Structure Inspection Manual; and (b) the variation does not adversely affect the safety and mobility of people and goods."

In order to more easily express and understand the overall condition of each structure a straight forward condition rating system was developed using information presented within the Municipal Bridge Appraisal forms. The overall condition of the structures considered structure age, component Material Condition Ratings (MCR), component Performance Condition Ratings (PCR) and any recommended needs repairs or replacements.

- Excellent: Typically, these structures were constructed within the past 10 years and have no identified immediate or future needs.
- Good: These structures were constructed within the past 30 years and have no immediate needs and limited needs identified for the next 1 to 5 years. These structures typically have an assumed remaining service life of 20 years or more.
- Fair: These structures are generally greater than 30 years old and many may even be more than 40 years old but are assessed to be in reasonable condition with only minor, non-structural immediate needs, and moderate needs identified for the next 1 to 5 years. These structures may require replacement within approximately 15 to 20 years
- Poor: These structures are generally greater than 40 years old and appear to be in generally poor condition with numerous immediate structural and non-structural needs identified. These structures may require replacement within the next 10 years.

3.2.2 MUNICIPAL STRUCTURE INVENTORY

After detailed review of the 2012 and 2013 inspection reports for the five (5) municipal structures the condition ratings and recommended needs were determined and summarized in Table IV following.

Table IV – Structure Conditions & Needs

Structure Name	Year Constructed	Structure Condition	Structure Needs
Gagnon Road Bridge	1930	Poor	Proper End Treatments, Requires Load Limit Sign, Rebar Cleaning, Concrete Repair & Patching
Municipal Bridge No. 12	1920's	Poor	Bridge Replacement Scheduled, Including Approaches and Roadwork
Municipal Bridge No. 13	1920's	Poor	Bridge Replacement Scheduled, Including Approaches and Roadwork
Municipal Bridge No. 14	1916	Poor	Bridge Replacement Scheduled, Including Approaches and Roadwork
Municipal Bridge No. 15	1916	Poor	Bridge Replacement Scheduled, Including Approaches and Roadwork

3.2.3 DATA VERIFICATION AND CONDITION ASSESSMENT POLICY

As mandated by Section 3 of the Public Transportation and Highway Improvement Act, Ontario Regulation 104/97 – Standards for Bridges, the structures under the municipality's jurisdiction should continue to undergo regular inspections every two years for bridges and every four years for culverts of acceptable condition. These inspections should be reviewed by municipal staff and recommendations should be implemented. The costs for these needs should be accounted for in an updated asset management plan for the bridges and culverts. It is recommended that the type of form used be the standard OSIM form as outlined in the MTO manual and not the alternative Municipal Structure Inspection Form as they are more difficult to determine condition of the structure to the uninformed user. It is understood that the City of Sault Ste. Marie typically arranges for completion of the inspections for the four shared structures, leaving just the Gagnon Road structure the responsibility of the Township of Prince.

3.3 MUNICIPAL ROAD VEHICLES AND EQUIPMENT

The municipality maintains vehicles and equipment to support maintenance activities. The condition of the vehicles and equipment are critical to being available when needed especially as they relate to winter maintenance and addressing emergency needs.

3.3.1 METHOD OF CONDITION EVALUATION

The method of condition evaluation of vehicles and equipment is primarily based on equipment age. The depreciation for vehicles and equipment that are being utilized on a regular basis can be generally projected through the life of the asset. Some variation on depreciation of the asset is dependent on the quality of the original asset, the extent of use and the maintenance performed on the asset.

3.3.2 MUNICIPAL ROAD VEHICLES AND EQUIPMENT CONDITION SUMMARY

Useful life of the asset was determined during completion of the PSAB 3150 requirements and was used to project expected replacement date unless indicated otherwise by municipal staff. A summary of the municipal vehicles and equipment is included in the 10 Year Road Plans included in Appendix A.

3.3.3 DATA VERIFICATION AND CONDITION ASSESSMENT POLICY

The municipality would be required to keep records on all owned road vehicles and equipment. The key information to be recorded is as follows:

- Type
- Make
- Model
- Model Year
- Purchase Date
- Purchase Cost
- Maintenance Records
- Repair Records & Costs

Tracking of this information will allow the municipality to make an informed decision on replacement of the asset.

4 DESIRED LEVELS OF SERVICE

Desired Levels of Service form a key component of the asset management process as they define the way in which the municipality wants their assets to perform. Levels of Service outline measureable targets and timeframes and can serve purposes such as:

- Act as a guide for management and operations staff
- Provide a means of assessing asset performance
- Provide a link between levels of service and costs

Determining the desired levels of service for each asset type was completed with consideration of a number of factors including costs, user expectations and government mandated minimum requirements. 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.

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. For example, 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 may not be feasible. The Municipality attempts to achieve a manageable level of risk by completion of condition reviews and prioritizing of replacement/improvement projects.

To optimize an Asset Management Plan and ensure target levels of service are appropriate, performance measures or indicators are established and tracked. Performance measurement of the assets will provide an indication as to whether the rehabilitation and replacement strategies are effective or whether changes need to be made. Performance benchmarks for the various asset groups are described in the following sections. As much as possible these are tied to the performance measures outlined in the Financial Information Return which is a document on financial and statistical information of Municipalities. The Financial Information Return is a mandated document that municipalities submit on an annual basis to the Ministry of Municipal Affairs and Housing.

4.1 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 through completion of the 10 Year Roads Improvement Plan. In this plan, all road segments have been rated using the MTO Road Appraisal forms. The rating system consists of a number 1 through 10 (where 10 represents a road in excellent 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 7.5 for the road network consisting of roads of 50 AADT (average annual daily traffic) and greater. Roads of less than 50 AADT are often seasonal or rarely used roads and holding them to a minimum standard can be costly. 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 municipal standards.

The following strategies are recommended to achieve the target; however as a general rule when a roadway reaches a condition rating of 5 or less it is scheduled for improvement.

1. Improvements to poor condition roads (<5) with AADT of 50 vehicles per day or more;
2. Hard-top surfacing of loose-top rural high traffic volume arterial roads and of loose-top roads in urban and semi-urban environments;
3. Widening of critically substandard width roads;
4. Improvements to roads with other critical and safety needs (e.g. Grade raise of road in flood plain, sharp horizontal and vertical curves);
5. 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. As was outlined in the 10 Year Roads Improvement Plan, a roads condition 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:

- Gravel Roads → Condition rating is maintained with regular maintenance
- Low Class Bituminous Roads → Condition rating reduced by 0.5 per year

Further detail on how the future ratings are achieved can be found in the 10 Year Roads Improvement Plan completed as part of this planning exercise.

The performance of the road network should be evaluated by completing condition assessments on a biennial basis; the actual condition ratings collected 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.

The Performance Measures: Effectiveness for paved roads is outlined on line 2152 of Schedule 92 of the Financial Information Return for Roadways. This performance measure takes the number of paved lane kilometres where the condition is rated as good to very good and divides by the total number of lane kilometres. The determination of the definition of good and very good in relation to the numbered condition rating system is important. Given that the municipality will knowingly let the road system for paved roads drop to a rating of 5 before scheduling a repair/replacement then it can be expected that the entire road system will not receive a good to very good rating. The following condition rating standard as it relates to the FIR reporting is proposed with the expectation that 70% of the paved roads within the municipality achieve a good to very good (excellent) rating at the end of the reporting year which will be after any surface improvements are completed. If the percentage falls below this rating then the municipality is falling behind on their restoration of paved roads.

Condition Rating	System Condition
8.5 to 10	very good (excellent)
6.5 to 8.4	good
5.0 to 6.4	fair
Less than 5.0	poor

The following Table V outlines the existing rating of roads and the goal for that class of roads.

Table V – Existing & Target Road Condition Rating

Surface Type	Existing Rating	Target Rating
L.C.B. (Surface Treatment)	7.33	7.5
Gravel	4.9	7.5

The following is recommended for desired levels of service for roads:

- Complete Road Maintenance as mandated by Ontario Regulation 239/02 Minimum Maintenance Standards for Municipal Highways.
- Review & track all accident reports to determine if road condition or alignment contributed to the accident
- Endeavour to achieve an average rating of 7.5 for hard surfaced roads and gravel roads of greater than 50 AADT.

4.2 MUNICIPAL STRUCTURES

Bridges and structural culverts of greater than 3 metre spans consist of many different components with varying life expectancies, generally ranging from 50 to 75 years. The condition of a bridge is evaluated by completing mandatory biennial (every 2 years) OSIM inspections (every 4 years for culverts in good condition) 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 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 and culverts is for structures to achieve the following features with some exceptions for low volume roads as allowed by the *MTO Structural Manual.*

- Hydraulically adequate opening to 1:100 year storm event
- No Load Posting of Structure
- Two lane crossing
- Guiderail protected with proper end treatments
- Good sight lines on the approaches to the water crossing

The ideal scenario is for all structures to meet these requirements. However, bridges on low volume roads of less than 50 vehicles per day would not necessarily require a two lane crossing given the low number of times a conflict for crossing would be expected to occur. This is especially true if the site lines from both directions are good allowing approaching vehicles to stop if needed. If a structure is

load posted but is still functional and able to meet the needs of the municipality it would make economic sense not to replace it until such time as its condition has deteriorated to a level that replacement was necessary to ensure public safety. Finally the need for proper guiderails and end treatments should be considered, typically if the structure will not be up for replacement within ten years.

The following is recommended to meet desired levels of service for structures:

- Complete OSIM inspections as mandated by Ontario Regulation 104/97 Standards for Bridges
- Implement studies and repairs as outlined in OSIM reports
- Evaluate Rehabilitation and Replacement Studies for Structures when they are within five years of the end of their design service life or when the overall condition is poor
- New structures to meet the target requirements with the exceptions of "low volume roads"
- New structures to have a minimum of 75 year design service life
- Use conservative calculations when sizing structures for hydrology and hydraulics given the occurrence of several extreme rain events in the past 5 years

The following Table VI outlines the municipal structures with an evaluation of the parameters present and comments on the future need of replacement.

Table VI – Summary of Bridges Conditions

Bridge Name	Overall Condition	Hydraulics Adequate	Load Posted	Alternate Access Available	No of Lanes	Guiderail Protection
Gagnon Road Bridge	Poor	Okay	16 Tonnes	Yes	1	Inadequate
Municipal Bridge No. 12	Poor	Okay	16 Tonnes	Yes	1	No End Treatments
Municipal Bridge No. 13	Poor	Okay	10 Tonnes	Yes	1	No End Treatments
Municipal Bridge No. 14	Poor	Okay	None	Yes	1	Okay
Municipal Bridge No. 15	Poor	Okay	None	Yes	1	Okay

The Performance Measures: Effectiveness for structures is outlined on line 2165 of Schedule 92 of the Financial Information Return for Bridges & Culverts. This performance measure takes the number of structures where the condition of primary components is rated as good to very good, requiring only repair. The determination of definition of good and very good relating to the OSIM evaluation of bridges and culverts is important. The following summary outlines the comparison of the two rating system as well as the length of time a structure would be anticipated to be at each level. The following condition rating standard as it relates to the FIR reporting is proposed with the expectation that not all bridges and culverts within the municipality will achieve a good to very good rating at the end of the reporting year. There will be a time when a bridge as it nears the end of its design service life will drop into fair or even a poor overall condition. Although the structure is still functional for its purpose, planning for replacement will be undertaken. Therefore a reasonable approach would have a target that 70% of the structures are considered good to very good. If this level is greater than 70% then the overall condition of the municipal structures is above average. If this level is between 50% and 70% then some improvement is necessary. If the performance measure drops below 50% then overall condition of municipal structures is a real concern and should be addressed immediately. The Township of Prince current situation is that 0% of their structures are rated good or very good. However within two years four of the five structures will be replaced bringing the performance level to 80%.

Table VII – Comparison of Structure Condition and System Condition

Overall Condition Rating (OSIM)	Design Life Expectancy Length (Percent)	System Condition (FIR)
Excellent	20%	Very Good
Good	50%	Good
Fair	20%	Fair
Poor	10%	Poor

4.3 MUNICIPAL ROAD MAINTENANCE VEHICLES AND EQUIPMENT

The target level of service for municipal road maintenance vehicles and equipment is to maintain all vehicles such that they are in good repair with minimal breakdowns. To track any equipment failures the municipality should implement a vehicle and equipment log for each municipal asset. This log would record any vehicle or equipment failures, repair documentation including costs and regular maintenance

activities. This log book would be reviewed on an annual basis for each asset to determine those assets that may be considered unreliable for their intended purposes. This is especially relevant for vehicles and equipment that are used in winter maintenance as their unavailability would have a direct impact on public safety. Given the range of assets in type and use it is difficult to assign a minimum reliability standard that would apply to all vehicles and equipment. However a 99% availability rate, defined as the percentage of days an asset is available for use would provide a level of service that would be expected for the assets. Ideally an asset will be available 100% of the time but achieving this level may be cost prohibitive. It is recommended that records be kept of the availability of assets and when the level drops below 99% then an evaluation for the major repair of the asset be undertaken. For availability rates of less than 95% the asset should be replaced.

Availability Rate	**Action**
99% to 100%	Asset Okay
95% to 99%	Asset Repaired
<95%	Asset Replaced

Confirming achievement of this level of service will require the Municipality to keep records and review them on an annual basis at a minimum. Actions resulting from this review would then be implemented in the asset management plan for that asset.

5 ASSET MANAGEMENT STRATEGY

As referenced in the guide, "*the asset management 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 impact on the remaining life and may have operational implications and related costs.

5.1 PLANNED ACTIONS

This section of the asset management plan is intended to provide planned actions towards an asset management strategy as follows:

- Management Solutions (actions or policies that can lower cost and extend asset life)
- Maintenance Activities (regular maintenance and responding to unexpected events)
- Renewal/Rehabilitation Activities (significant repairs to extend the life of an asset)
- Replacement Activities (response to when an asset has reached the end of its useful life)
- Disposal Activities (disposing of an asset when it has reached the end of its useful life)
- Expansion Activities (extending service to unserviced areas or to meet growth demands)

5.1.1 ROADS

A summary of planned actions for roads is included following. It is split up into gravel roads in Table VIII, surface treated roads in Table IX and asphalt roads in Table X. They are dealt with separately as their asset management strategies will vary. Asphalt roads have been included even though the Township of Prince does not currently have them in their inventory. This information is included should asphalt roads become part of the Township road system in the future.

Table VIII – Strategy for Gravel Roads (Rural)	
Asset Life Cycle	With regular maintenance asset is expected to not have an end life
Minimum Municipal Road Standard	Design Speed = 80 km/h (Exceptions to 50 km/h to 70 km/h for Low Volume or Semi Urban Areas based on site conditions and cost) Minimum Right of Way Width– 20m, New Development to have 30 m to provide for clearing requirements for Utilities Road Width = 8.0 metres, Surface Crossfall = 3% Road Subbase = 300mm Granular "B", Subbase Crossfall = 3% (Subject to geotechnical investigations to determine depth & need for geotextile) Road Base = 150mm Granular "A" Minimum Horizontal Radius – 250m (Exceptions to 90m to 190m) Minimum Vertical "k" Factors – Crest = 35m, Sag=30m (Exceptions to as low as Crest = 8m, Sag = 8m for Low Volume or Semi Urban based on site conditions and cost)
Management Solutions	Load Limits of 5 Tonnes/Axle implemented at critical times & strictly enforced. Preventing Heavy Traffic during adjacent highway closures Utilize Amalgamated Tenders for the supply of culverts, gravel and contracted services – e.g. Brushing, Rock ditch blasting etc.
Maintenance Activities	Maintenance at regular intervals – Brushing, Ditch Cleanouts, shoulder stripping Application of 50mm Granular "A" to road surface every 5 to 10 years Road Grading to maintain the crown of road to encourage runoff Application of Calcium Chloride for Dust Control & Reduction in Grading Needs
Renewal/ Rehabilitation	Replacement of Culverts with 75 year Design Service Life (HDPE – 320 kPa) Treatment of Frost Heaves with excavation, nonwoven geotextile & new granulars Complete New ditching in areas to provide proper drainage of the road base
Replacement Activities	Not expected to require replacement if continued as gravel road. Reconstruction of the road base (excavation, new granulars, ditching) may be necessary to ensure proper performance of hard surfacing. Realignment to correct horizontal and vertical deficiencies to bring road to municipal standard of 8m platform width
Disposal Activities	Not expected to be disposed unless realignment creates an abandoned road section. If this is the case utilize granulars from existing road base in project. Dispose of property to adjacent landowner if utilities are relocated onto new right of way
Expansion Activities	Extending road service to be completed to minimum municipal road standard of 8m top width. Provide proper connection with other roads or turnaround sufficient for municipal maintenance equipment

Table IX – Strategy for Surface Treated Roads (Rural)	
Asset Life Cycle	Surface Treatment – 10 years
Minimum Municipal Road Standard	Design Speed = 80 km/h (Exceptions to 50 km/h for Semi Urban Areas and 60 km/h for Rural Areas based on site conditions and cost) Minimum Right of Way Width– 20m, New Development to have 30 m to provide for clearing requirements for Utilities Road Width = 8.0 metres, Shoulder Crossfall = 2% Paved Width = 7.3 metres, Lane Crossfall = 2% Road Subbase = 450mm Granular "B", Subbase Crossfall = 3% (Subject to geotechnical investigations to determine depth & need for geotextile) Road Base = 150mm Granular "A" Surface Treated Roads – Initial Application - Double Course, Follow-up – Single Course Minimum Horizontal Radius – 250m (Exceptions from to 90m to 190m) Minimum Vertical "k" Factors – Crest = 35m, Sag=30m (Exceptions to as low as Crest = 12m, Sag = 12m for difficult areas based on site conditions and cost)
Management Solutions	Load Limits of 5 Tonnes/Axle implemented at critical times & strictly enforced. Preventing Heavy Traffic during adjacent highway closures. Participate in Amalgamated Tendering process for reduced unit costs
Maintenance Activities	Maintenance at regular intervals – Brushing, Ditch Cleanouts, shoulder stripping Patching of potholes/cracks with cold mix to prevent further breakup of road surface Repair of surface treatment breakup along edge using Dynapatch application.
Renewal/ Rehabilitation	Replacement of Culverts with 75 year Design Service Life (HDPE – 320 kPa) Treatment of Frost Heaves with excavation, nonwoven geotextile & new granulars Complete New ditching in areas to provide proper drainage of the road base Application of Single Course S.T. to surface treated roads 10 to 12 years based on when road reaches a condition rating of 5.
Replacement Activities	Consider rehabilitation of surface treated surface after initial double course application and three applications of single course if road cross section has become sufficiently distorted. Road surface would be in place processed, drainage improvements completed and new double course surface treatment applied. For upgrade to hard surfacing, reconstruction of the road base may be necessary to ensure proper performance Realignment to correct horizontal and vertical deficiencies to create road to municipal standard of 8m platform width
Disposal Activities	Not expected to be disposed unless realignment creates an abandoned road section. If this is the case utilize granulars from existing road base in project. Dispose of property to adjacent landowner if utilities are relocated onto new right of way
Expansion Activities	Extending road service to be completed to minimum municipal road standard of 8m top width. Provide proper connection with other roads or turnaround sufficient for municipal maintenance equipment. Subdivision Developments costs for new road to be 100% borne by the Developer.

Table X – Strategy for Asphalt Streets (Semi Urban Area)	
Asset Life Cycle	Asphalt – Low Volume, Light Loading – 30 to 40 years Asphalt – High Volume, Heavy Loading – 25 to 30 years
Minimum Municipal Road Standard	Design Speed = 50 km/h Minimum Right of Way Width– 20m Road Width = 8.0 metres, Shoulder Crossfall = 2% Paved Width = 7.0 metres, Lane Crossfall = 2% Road Subbase = 450mm Granular "B", Subbase Crossfall = 3% (Subject to geotechnical investigations to determine depth & need for geotextile) Road Base = 150mm Granular "A" Asphalt Surface High Volume – 90 mm HL4 Asphalt Surface Low Volume – 50 mm HL4 Minimum Horizontal Radius – 90m Minimum Vertical "k" Factors – Crest = 12m, Sag=12m
Management Solutions	Load Limits of 5 Tonnes/Axle implemented at critical times & strictly enforced. Utilize Amalgamated Tenders for the supply of culverts and contracted services Road work to be coordinated with other work on drainage, sanitary sewer & water supply infrastructure
Maintenance Activities	Maintenance at regular intervals – Brushing, Ditch Cleanouts, shoulder stripping Patching of potholes/cracks with cold mix to prevent further breakup of road surface
Renewal/ Rehabilitation	Culverts/Storm Sewers with 75 year Design Service Life (HDPE & PVC – 320 kPa) Treatment of Frost Heaves with excavation, nonwoven geotextile & new granulars Complete New ditching in areas to provide proper drainage of the road base Repair of Cracks with Rout & Seal 2 to 3 years after asphalt placement Milling of existing asphalt and resurfacing of spot locations of deteriorated asphalt
Replacement Activities	In place processing of the existing asphalt and underlying granular. Restoration of asphalt surface with new asphalt. Coordinate other work related to drainage, sanitary and water supply
Disposal Activities	Not expected to be disposed unless realignment creates an abandoned road section. If this is the case utilize removed asphalt as RAP material. Reuse granulars from road base as fill. Dispose of property to adjacent landowner if utilities are relocated onto new right of way
Expansion Activities	Extending road service to be completed to minimum municipal road standard of 8m top width. Provide proper connection with other roads or turnaround sufficient for municipal maintenance equipment. Subdivision Developments costs for new streets to be 100% borne by the Developer.

5.1.2 STRUCTURES

A summary of planned actions for structures including bridges and culverts are included following in Table XI.

Table XI – Strategy for Structures (Bridges & Culverts)	
Asset Life Cycle	Bridges – 75 years Culverts – 75 years
Municipal Structures Standard	New Bridges & Culverts No of Lanes – Two Lanes, Low Volume Roads – One Lane Load Rating – No Load Limit Hydrology & Hydraulic Design – 100 year Return Storm Design Guidelines – Canadian Highway Bridge Design Code, Guiderail Exception for Low Volume Roads based on MTO Structural Manual Bridge Width – As per CHBDC Culvert Crossing Width (guiderail face to guiderail face – 9 metres) Guiderail End Treatments on all Four Quadrants
Management Solutions	Monitor Bridges with Load Restricted Limits for unauthorized use. OSIM inspections as per legislation – Bridges every 2 years, Culverts every 4 years. (Utilize same Engineering Consultant on follow-up inspections to insure continuity and monitoring of deficiencies)
Maintenance Activities	**Bridges** Complete annual cleanout of expansion joints. Complete removal of sand from surface of deck structure. Replacement of deficient components Remove Debris from inlet to structure **Culverts** Complete removal of granular berm & repair washouts along guide rail posts Remove Debris from inlet to structure
Renewal/ Rehabilitation	**Bridges** Structural Steel Coating Structural Rehabilitation of Concrete Deck / Barrier / Abutments **Culverts** Lining of culvert invert to repair corrosion of invert.
Replacement Activities	Consider realignment of road if reasonable to maintain use of existing structure until new structure is installed. Replacement of single lane crossing with two lane if Road AADT >50
Disposal Activities	Recycling of materials from structure replacement (i.e. steel) Salvaging of components for reuse in other projects (i.e. timbers, concrete fill) Dispose of hazardous materials (creosote wood) in an environmentally safe manner
Expansion Activities	New Water Crossing Structures to be designed in accordance with CHBDC. Cost of Structures required as part of Subdivision Development to be borne by Developer.

5.1.3 ROAD MAINTENANCE VEHICLES & EQUIPMENT

A summary of planned actions for structures including bridges and culverts are included following in Table XII.

Table XII – Strategy for Road Maintenance Vehicles & Equipment	
Asset Life Cycle	Pickup Trucks – 10 years Dump/Plow Truck – 10 years Grader – 15 years Excavator/Backhoe – 15 years Miscellaneous Equipment – 15 years
Minimum Standards	Pickup Trucks – 4 Wheel Drive Dump Trucks – Utilized as Snow Plow Trucks for Winter Maintenance Graders – Utilized as Snow Plows for Winter Maintenance Excavator/Backhoe – Wheel mounted to provide accessibility benefits
Management Solutions	Consider Leasing of Equipment to lower high capital outlay.
Maintenance Activities	Regular Maintenance activities according to Manufacturer Guidelines.
Renewal/ Rehabilitation	Replacement of Brakes Rebuild of Motor if Remainder of Asset is in Good Condition
Replacement Activities	Purchase of New Vehicles & Equipment through Request for Quotation (RFQ) process
Disposal Activities	Sale of Asset to Highest Bidder through Closed Tender Process Consider sale of Asset partway through life expectancy to maximize asset value
Expansion Activities	Consideration purchase of additional equipment to meet expected levels of service or to provide cost benefits to eliminating contracted services requirements

5.2 RISK ASSESSMENT

All assets carry a level of risk in terms of cost for the Municipality. 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 asset management plan.

The management of the asset improvement scheduling took into consideration the risk associated with the volume of use that the assets received. Acceptable levels of risk will vary depending on the frequency and type of use. If a rarely used asset and a frequently used asset do not meet the 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 necessarily financially 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 completing various projects. Consulting Engineers of Ontario recommend that procurement of design engineers should not only be based on design cost but also the qualifications and expertise of the design firm. Best value for the project does not always mean lowest cost. Similarly the tendering of capital projects should make use of an invited tender list of those contractors that are known to have sufficient resources and personnel to complete the project in a timely and quality manner.

The use of amalgamated tenders could allow for a higher volume of service by a supplier or contractor, which would reduce the overall cost for each municipality. This approach is currently being done for the supply of common equipment and construction materials as well as for road resurfacing projects which are short duration and easily divisible by municipality. The use of amalgamated tendering for road reconstructions is unlikely given the construction length of these projects limit work on multiple fronts and site condition differences could lead to unfair sharing of costs. The exception would be related to specialty work that a contractor or supplier from outside of the Algoma Region would provide. This could be a service such as ditch rock drilling and blasting or Dyna-Patching of surface treatment.

5.4 SCHEDULE OF PRIORITIES

This Asset Management Plan provides a schedule of projects based on each 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. It is not intended that this 10 year plan be a rigid plan without flexibility. It is anticipated that it be reviewed and adjusted as conditions and priorities change. The recommendation is that it be updated every two years and would coincide with the municipal council elections that happen every four years. Therefore the plan would be revisited in the late autumn of 2014 and again every two years after that. This schedule will also take advantage of having the most recent OSIM reports on structures available provided they are completed in a time frame that will make them available when reviewing the AMP. As the Municipality is in the midst of plans to replace four structures shared with the City of Sault Ste. Marie in 2014 and 2015, the only remaining older structure will be the one on Gagnon Road.

5.4.1 ROADS

The plan for roads is included in the ***10 year Roads Improvement Plan*** as Appendix A. It is combined with Structures and Road Maintenance Vehicles and Equipment as those are included in the Municipal Roads budget.

5.4.2 STRUCTURES

The plan for structures is included in the ***10 year Roads Improvement Plan*** as Appendix A. It is combined with Roads and Road Maintenance Vehicles and Equipment as those are included in the Municipal Roads budget.

5.4.3 ROAD MAINTENANCE VEHICLES AND EQUIPMENT

The plan for road maintenance vehicles and equipment is included in the ***10 year Roads Improvement Plan*** as Appendix A. It is combined with Roads and Structures as those are included in the Municipal Roads budget.

6 FINANCING STRATEGY

6.1 ASSET MANAGEMENT PLAN COMPONENTS

In order for an Asset Management Plan to fulfill the principles of asset management, the following essential components must be contained in the overall plan:

1. Asset Value

All municipal infrastructure assets have a monetary value. Under PSAB 3150 in fiscal 2009 this was completed through the Tangible Capital Asset processes using PSAB 3150 Guidelines. The replacement cost has been calculated as part of the asset management component.

2. Lifecycle Management

All assets have a life expectancy. The life cycle is dependent on a number of factors: nature of the asset, utilization (frequency), treatment costs and maintenance, technology (obsolesces). A change made at any point in time in the lifecycle of an asset has an effect on the remaining life and may have operational related costs.

3. Sustainability

This definition has been extracted from the “National Guide to Sustainable Municipal Infrastructure”. The Asset Management Plan needs to identify a financial plan over the long term to ensure that sufficient monies are available. These monies provide the resources required to operate, rehabilitate, dispose and ultimately replace the asset at the optimal time with the intention of achieving the lowest lifecycle cost. The plan helps make sure that current users pay a fair share for the service they receive and that future users pay a similar cost for the same level of service which ensures multigenerational equity and fairness.

4. The Goal (Technical) VS. Financial Plans

The goal is to minimize lifecycle costs for the infrastructure while maintaining an adequate and acceptable level of service at the lowest possible level of risk. The financial plan must identify the financial investment required per year for each asset over the long term, including any larger than

normal expenditures to meet the requirements of the plan. Ideally, the two plans should be integrated so the relationship between the level of service and the cost can be quantified.

5. Risk Assessment

Risk should be managed in any decision making process. The owner of the assets should analyze and document acceptable risk tolerance. In the Township's case, the probability of failure is taken into account while the condition of the asset is being analyzed. Risk factors can include financial, environmental, regulatory/legal and public health and safety.

6. Performance Measurement

To optimize an Asset Management Plan, performance of the assets and rehabilitation strategies should be monitored regularly. This can achieve an acceptable balance between cost and the level of service. Benchmarks (for some of the assets) have to be determined in order to determine the performance of the asset.

7. Role of Treatment Costs and Tangible Capital Assets

Treatment costs are costs associated with adequately treating a capital asset, whether it gets replaced or rehabilitated. From a public sector perspective, many municipal decision makers have indicated that using historical cost is meaningless, particularly given the long-lived nature of infrastructure assets. There are three arguments against using historic cost: First, conventional historical cost accounting does not produce meaningful performance measurements in times of changing prices and money values. Over the last five years there has been escalation in contract pricing in housing and non-residential building construction. Second, because infrastructure needs to be replaced on an ongoing basis, the cost of using infrastructure should reflect its current cost, rather than an allocation based on historic cost. Therefore, historic cost may not be the initial source and may not provide the most relevant information for decision makers. Third, is that engineers would argue that what is meaningful is replacement cost as this is what should be budgeted to replace assets. If replacement cost is the metric and not historical costs than municipalities will need to estimate the applicable replacement costs of assets.

This can be completed by using the following two approaches.

Approach 1: Utilize an accumulated Consumer Price Index (CPI) calculation to obtain an estimated today cost of each asset.

Approach 2: Utilize the Non-residential Building Construction Price Index (NRBCPI) to obtain an estimated today cost of each asset. The NRBCPI is a quarterly series measuring the changes in contractors' selling prices of non-residential building construction (i.e. commercial, industrial and institutional). The indexes relate to both general and trade contractors' work and exclude the cost of land, land assembly, design, and development and real estate fees.

6.2 INVESTMENT STRATEGIES

Understanding and making the right decisions about infrastructure investment is challenging and for smaller municipalities involves balancing two questions.

(1) What quantity and quality of infrastructure can the municipality afford and maintain? As affordability depends mainly on the current and future revenue base of the community; and

(2) What quantity and quality of infrastructure is needed? As need is driven by regulation and public expectations, as well as current and future population and consumption patterns.

Municipalities are presently facing an affordability problem as there is an increased demand on capital spending to pay for infrastructure needs. Smaller municipalities with limited growth cannot rely on development charges to pay for infrastructure needs. Presently, there is limited ratepayer affordability in smaller communities as ratepayers become sensitive to property tax increases. As the financial uncertainty in Ontario increases, municipalities are in a position where they will need to potentially increase their borrowing patterns to replace or rehabilitate infrastructure in a timely manner. In most cases this will mean smaller municipalities will need to increase their debt loads to finance capital expenditures. Municipalities will need to be conscious of their debt capacity limits should this be the case. A key indicator of acceptable debt loan on an annual repayment limit is Schedule 81 of the annual Financial Information Return.

Plans must contain an element of financing to be viable plans for municipality’s to consider. Historically, asset management plans have been the responsibility of engineers and the public works department, while the financing of asset management plans have been the responsibility of Council. On many occasions, municipal decision makers have questioned who should pay for the cost of building municipal infrastructure. This touches on the important issue of intergenerational equity. Given that infrastructure has the potential to last for generations, today’s users and ratepayers argue that they should only pay

their share and not the entire amount. To achieve this, municipalities must borrow money upfront indirectly accumulating a debt load that would be paid off gradually over the life of the assets.

Achievable investment models are critical to success. Proper projections enable Council and staff to make more prudent infrastructure decisions. The following strategies have been derived based on the premise that municipal decision makers in smaller municipalities have articulated the challenges of funding capital to address infrastructure needs on an annual basis. The strategies listed below are recommendations based on discussions with practitioners in the sector:

Debenture Strategy
Independent Capital Reserve Account Strategy
Bucket Allocation Strategy
Capital Reserves or Cash to Capital Strategy
Cash in Lieu of Future Needs
Capital-Debt Strategy
Debt Strategy
User Fees
Leasing
Government Funding
Other Tactics

1. Debenture Strategy

A debenture is a type of debt instrument that is available to municipalities. It is used to secure capital and is supported by the general credit worthiness and reputation of the issuer. Many municipalities use debentures to finance large capital projects for general and infrastructure assets. This strategy looks at funding capital though continuing a committed debenture payment upon completion. This strategy rolls funds over that were previously committed to debenture funding straight to support capital program spending, which mitigates the risk of increasing property taxes to fund capital.

This strategy would require the appropriate approvals from Council and MAH to allocate the debenture payments amounts to capital program funding for the preceding year. Municipal decision makers must ensure the proper mechanisms are in place to achieve the debenture amount into the future as directed by Council.

2. Independent Capital Reserve Account Strategy

This proactive strategy looks at creating independent capital reserve accounts to manage future capital needs for a municipality. Public works vehicles, for example typically do not have a long useful life, which means vehicles for the departments fleet are being purchased regularly. This can place significant pressure on a municipality's capital program, for example, when multiple vehicles are due to be replaced in a single year, and the purchases are not adequately planned.

This strategy helps mitigate those types of risks by allocating capital to such specific reserve accounts on an annual basis. In this circumstance a fleet or vehicle replacement reserve account would actively be receiving funds in order to smooth the impact to the tax rate and maintain existing service levels. This strategy can be utilized for many assets. However, proper forecasting methods are encouraged to ensure proper amounts are contained within the specific capital reserve accounts. Capital reserve accounts vary depending on the municipality and the services it is responsible for providing.

3. Bucket Allocation Strategy

This strategy works closely with the municipality's asset management plan in terms of yearly capital requirements by department. The yearly cost by department would represent the assets that appear above the priority threshold meaning that they need to be properly treated to maintain existing service levels and mitigate any risks. In an ideal world, all of these identified assets would be properly treated. Unfortunately, this is not the case for smaller municipalities. This strategy now takes the allocated capital budget for the corporation and allocates the money based on the percentage of the total asset estimated treatment cost by department. Once the capital has been allocated by using the bucket allocation strategy, the individual departments would use their capital to optimize treatments of assets.

4. Capital Reserves or Cash to Capital Strategy

In an effort to smooth out the impacts of variable tax rate funding of capital on a year by year basis, select municipalities have strategically adopted a program of allocating a certain amount each year from the operating fund into a capital reserve account. The annual contribution may be set as a percentage of something such as expected tax levy, or it may be a fixed amount. Fixed amounts should also be indexed to maintain its effectiveness over time. That is to say a price index (inflationary factor) is applied. Adopting such a strategy evens out the fluctuating impacts that capital funding can have on property tax rates.

5. Cash in Lieu of Future Road Needs

This strategy considers charging a fee to developers that purchase land that an existing or future road network attaches to. The fee ideally would be charged on a per metre basis and accounts for the roads future needs; however this would be at the discretion of the municipality. The fee would be a component of the developer's project costs associated with developing in the municipality and would be in addition to any calculated development charges.

The construction of the fee formula would require meticulous consideration from the municipality's engineering department; taking into specific cost considerations and how they are allocated for road treatments. Several alternatives would need to be classified to ensure an accurate fee is being charged based on the present conditions of the road network where a new development borders and the projected costs to maintain and repair that specific road network into the future.

This strategy increases the revenue collected by the municipality and specifically allocates the money to fund future road network maintenance and rehabilitation. It also helps to strengthen the capital program budget allocated to road network projects. For municipalities with a large network of roads infrastructure this can prove to be a valuable proactive revenue tool.

6. Capital-Debt Strategy

This strategy funds as asset management model through a combination of capital and debt. Finding the suitable funding levels for asset management plans is an emerging challenge, especially for smaller municipalities that have minimal capacity. A debt payback plan would accompany this strategy.

7. Debt Strategy

This strategy provides the municipality with the cash necessary to expand and thrive. A debt outline helps a municipality review all factors affecting the creditworthiness, from how much it owes and how it intends to repay outstanding loans to how much it will need to borrow in the future. Finding the appropriate solutions to these types of questions allows the government to progress towards financial sustainability. It is important to note that select municipal Councils take the position of anti-debt, which means this strategy would not apply. This is common for smaller municipalities with limited growth projections.

8. User Fees

The Municipality needs to review user fees related to its tangible capital assets and their lifecycles. User fees are more appropriate for assets such as sewer and water that are not part of the Township of Prince's infrastructure.

9. Leasing

The alternative of utilizing leasing for municipal vehicles and equipment is a consideration. This option would avoid a high capital outlay in a single year. In addition depending on the length of the lease the Township would have the vehicle/equipment during the time that it is most reliable and would not be involved in the disposition of the asset at the completion of the lease.

10. Government Funding

The use of government funding continues to be a potential source of revenue to leverage the municipal monies for specific projects of need. Two examples of projects that are well suited to government funding are bridge replacements and road realignment projects. Typically funding applications require the municipality proving need of the project related to an objective of the program such as public safety and these types of projects can be easily justified. The Township of Prince has been enormously successful in obtaining funding for the replacement of bridges in partnership with the City of Sault Ste. Marie.

11. Other Tactics

The sale of underutilized or surplus assets is an option available to municipalities when an asset is not being used within the municipality's service delivery model. In most cases these underutilized assets generate a financial burden to the ratepayer while delivering minimal value. For example, municipal owned halls can in some cases be classified as an underutilized asset. Redundant rolling stock adds to the municipal operating budget and tie-up capital resources.

6.3 FINANCING PLAN

It is important to recognize that the capital investment (financing strategies) can be and should be based on one or a combination of those outlined above. One must consider the trade-off under the current ten year capital budget process and the current level of service. Can the capital budget process yield a lower cost once we realign the maintainable service level?

Staff will need to continually take advantage of any grant funding programs that may be available today or in the future. It is likely that these programs will be necessary in some format from senior levels of government (i.e. Federal Gas Tax, specifically targeted to infrastructure).

The accompanying spreadsheet template has been tailored to the Townships budget process and is an integral tool of this asset management plan. The template has been setup up as a continuing forecasting document for the next ten years. The template will allow the user to investigate alternative funding strategies that will then generate the corresponding taxation rate required. It is anticipated that municipal staff and council will utilize the template as they create a viable financial plan for the municipality's capital assets.

7 CLOSURE

This asset management plan presented is to fulfill the core requirements as outlined in the Ontario Ministry of Infrastructure's *Building Together, Guide for Municipal Asset Management Plans*. This AMP is intended to be a document that can be built on so that eventually all of the municipal tangible capital assets can be included within the AMP. Tulloch Engineering would like to acknowledge the assistance of municipal staff Brian Evans, Road Superintendent; Peggy Greco, Chief Administrative Officer/Administrator; and Lorraine Mousseau, Deputy Clerk/Treasurer in the preparation of this Asset Management Plan. The contribution of municipal auditor Anthony Rossi of Calam Rossi Chartered Accountants LLP towards completion of the Financing Strategy section of the AMP and preparation of the planning template was invaluable.

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APPENDIX A

10 YEAR ROADS IMPROVEMENT PLAN

10 YEAR ROADS IMPROVEMENT PLAN

2014-2023

TOWNSHIP OF PRINCE

PROJECT NO. 13-2021

Prince TOWNSHIP
Simply Beautiful, Naturally Prince

PREPARED BY:

TULLOCH ENGINEERING

1 INTRODUCTION

The following document was prepared by Tulloch Engineering in conjunction with Township of Prince to act as a ten year roads improvement plan. This plan addresses the following:

- Inventory of the 29.4 kilometres of road system including five municipal bridges.
- Identification of road sections and bridges in need of improvements and costs.
- Inventory of existing major equipment within the roads department and identify recommended replacements and costs.
- Preparation of a ten year recommended improvement program.

These components will aid in the long range financial planning of the Township and outline needs for special project funding.

2 ROAD SYSTEM

2.1 ROAD CONDITION EVALUATION

Determination of the existing condition of the roads under the Townships jurisdiction was completed based on practices outlined in the MTO Methods and Inventory Manual. The road condition appraisals were completed on June 27, 2013 with the assistance of the Townships Road Superintendent, Brian Evans. A 0.5 km section of Red Rock Road at the Northeast corner of the municipality was excluded from detailed investigation as it is maintained by the City of Sault Ste. Marie.

Each road section has been given a subjective evaluation 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 was costed. Annual Average Daily Traffic counts were estimated from field observations and discussions with Township representatives. A summary of information collected during the road appraisal can be found in Appendix A. The anticipated road condition for each section was then projected over the ten year study period considering deterioration and allowing for the forecasting of required improvements. This method of evaluating road surface deterioration relies on estimating the life cycle of various road surfaces.

Surface treated or Low Cost Bituminous (L.C.B.) treated roads typically have a six to ten year life cycle before their condition rating drops below 5. This is dependent on their use, the

structural condition of the road and routine maintenance. After discussion with Township staff and through review of existing surface treatment performance a ten year life cycle was assumed. Based on this assumption the condition rating for each section of surface treated road would typically drop 0.5 per year. This value was used to determine the year in which the condition rating will drop below 5 and will require resurfacing.

The Methods and Inventory Manual suggests that the condition rating for gravel roads will not change with continued routine loose top maintenance. The forecasted future condition ratings will then be the same as the study year, although severe spring breakup may affect the condition rating and require localized base repairs that cannot be anticipated. Using the assumed surface life cycles and accounting for anticipated surface improvements, the condition ratings for the Townships roads were projected over the next ten years and are summarized in Appendix B.

2.2 ROAD IMPROVEMENTS AND COSTING

Required road improvements were assessed based on the projected condition ratings throughout the ten year study period. Typical Improvements were costed using bench mark costs established from industry knowledge and review of recent construction projects. Bench mark costs used for improvements noted within this plan are shown in Appendix C. For road resurfacing projects requiring in-place full depth reclamation, a 50mm depth of Granular “A” ‘sweetener’ was costed to account for assumed base improvements. Costing of road improvements for sections of roads shared with the City of Sault Ste. Marie (i.e. Base Line Road) were assessed at the appropriate amount of the total costs as it was indicated by Prince Township which sections of shared roads each municipality maintains.

3 ROADS EQUIPMENT

3.1 ROADS EQUIPMENT INVENTORY AND REPLACEMENTS

An inventory of the major roads equipment was obtained through correspondence with Township representatives. Anticipated equipment replacements were based on in-service year and the respective depreciable life of the equipment as indicated by the Townships. An inventory of the major roads equipment is presented in the following Table with anticipated replacement years.

Municipal ID	Make & Model	In-Service Year	Depreciable Life	Anticipated Replacement Year
VEH2.0	1999 Chevrolet 4x4	1999	10 Years	2014
VEH3.0	2009 Chevrolet Silverado LS	2009	10 Years	2019
EQP3.0	2010 Mikasa Plate Tamper	2010	15 Years	2025
EQP4.0	2010 24 HP 4" Trailer Wood Chipper	2010	15 Years	2025

3.2 EQUIPIMENT REPLACEMENTS AND COSTING

Replacement costs for the major equipment were estimated based on historical purchase costs and current equivalent equipment values where information was available. The indicated replacements of any of the equipment are to act as a planning tool only and will need to be reassessed and modified based on actual deterioration.

4 MUNICIPAL STRUCTURES

4.1 MUNICIPAL STRUCTURE APPRAISALS

The Ontario Structure Inspection Manual (OSIM) has been used for bridge inspections in Ontario since 1985 and describes the procedures for carrying out detailed visual inspections. The OSIM outlines that the following structures shall be inspected every two years.

- All bridges, culverts and tunnels with spans over 3 metres
- All retaining walls
- All movable bridges

The OSIM also indicates that for culverts with 3 to 6 metre spans and retaining walls, the inspection interval can be increased to four years if the culvert or retaining wall is in good condition and the engineer believes that the culvert or retaining wall condition will not change significantly before the next inspection.

The Township of Prince currently has five (5) structures within its jurisdiction that require inspection in accordance with the OSIM requirements. Tulloch Engineering completed inspections of the four municipal structures on Town Line and Base Line Roads in the fall of 2012 and completed the inspection of the Gagnon Road Bridge in the fall of 2013. A municipal bridge appraisal form was completed for each structure and submitted to the Municipality. Required replacements, repairs and/or improvements were determined after review of the information presented within the appraisal forms and following discussions with Township representatives regarding desired improvements. It should be noted that the appraisal form for the Gagnon Road structure indicated extending and upgrading the guiderail system. Completion of the guiderail work was not included within the recommended work as it would be preferable

that this structure be replaced within the next ten years. The Gagnon Road Bridge is currently at the end of its 50 year life expectancy thus making bridge replacement a more viable option then rehabilitation.

4.2 BRIDGE REPLACEMENTS AND IMPROVEMENTS

Costs relating to improvements were taken directly from the appraisal forms, where applicable, and through estimates based on industry knowledge of similar construction projects. Provisions for the costs associated with required OSIM inspections were also included within this plan based on inspections of bridges every second year and culverts every fourth. If existing bridges are replaced with structural culverts, the required inspection intervals are adjusted accordingly. An estimated cost for an OSIM inspection of $1,000 per structure was included in the projected expenses.

5 IMPROVEMENTS AND RECOMENDATIONS

5.1 TEN YEAR RECOMMENDED IMPROVEMENT PLAN

The overall improvement plan was based on recommended improvements, the year of improvements and associated costs. This information was derived from improvements and replacements of bridges and culverts, roads, and major roads equipment. Where possible the timing of suggested improvements was positioned in an attempt to better balance yearly expenditures. In order to account for increased costs of future improvements an inflation rate of 2% was assumed and used to project future costs from the 2013 bench mark dollar figures. The following table summarizes the proposed activities by year.

Ten Year Improvement Plan

Year 2014

Capital Expenditures

Bridges & Culverts
Municipal

ID	Location	Type		Costs
BR_4	Municipal Bridge No. 14	Replace with Precast Concrete Arch*		$ 97,287.60
BR_5	Municipal Bridge No. 15	Replace with Precast Concrete Arch**		$ 99,613.20
			Subtotal	**$ 196,900.80**

Equipment
Municipal

ID	Type		Costs
VEH2.0-1999 Chevrolet 4x4	Purchase Pickup		$ 25,500.00
		Subtotal	**$ 25,500.00**

Roads

Sect No.	Road Name	From	To	Type	Costs
5	Creek Road	1.4 km up Creek Road from 3rd Line	2.5km long	Replace 6m of 900mm HDPE Pipe	$ 2,100.00
35	Base Line Road	Gagnon Road	Walls Road	1/3 Reclaimation & Surface Treat - Double, 2/3 Surface Treat - Single	$ 44,100.00
				Subtotal	**$46,200.00**

TOTAL **$268,600.80**

* Municipality equally shares the total bridge replacement cost of $1,024,080.00 with the City of Sault Ste. Marie and has received funding of $414,752.40 (81%) through the Small, Northern and Rural Municipal Infrastructure Fund on their half

** Municipality equally shares the total bridge replacement cost of $1,048,560.00 with the City of Sault Ste. Marie and has received funding of $424,666.80 (81%) through the Small, Northern and Rural Municipal Infrastructure Fund on their half

Year 2015

Capital Expenditures

Bridges & Culverts
Municipal

ID	Location	Type	Costs
BR_2	Municipal Bridge No. 12	Replace with Precast Concrete Arch*	$ 73,041.28
BR_3	Municipal Bridge No. 13	Replace with Precast Concrete Arch**	$ 76,599.45
		Subtotal	**$ 149,640.73**

Equipment

None

Roads

None

TOTAL **$149,640.73**

OSIM Inspections
Municipal

ID	Location	Type	Costs
BR_1	Gagnon Road Bridge	OSIM Inspection	$ 1,000.00
		Total	**$ 1,000.00**

* Municipality equally shares the total bridge replacement cost of $768,855.60 with the City of Sault Ste. Marie and has received funding of $311,386.52 (81%) through the Small, Northern and Rural Municipal Infrastructure Fund on their half

** Municipality equally shares the total bridge replacement cost of $806,310.00 with the City of Sault Ste. Marie and has received funding of $326,555.55 (81%) through the Small, Northern and Rural Municipal Infrastructure Fund on their half

Year 2016

Capital Expenditures

Bridges & Culverts
Municipal

ID	Location	Type	Costs
BR_1	Gagnon Road Bridge	Repair Guiderail Bolts & Posts, Rebar Cleaning & Concrete Repair	$ 22,300.00
		Subtotal	**$ 22,300.00**

Equipment

None

Roads

None

TOTAL **$22,300.00**

Year 2017

Capital Expenditures

Bridges & Culverts

None

Equipment

None

Roads

Sect No.	Road Name	From	To	Type	Costs
110	Prince Lake Road	2nd Line Road	Prince Lake Road N (fork)	*Construction of Hill Improvements (10.3% Option) & Hard Surfacing Option C (Asphalt & ST)	$243,600.00
				Subtotal	**$243,600.00**
				TOTAL	**$243,600.00**

OSIM Inspections

Municipal

ID	Location	Type	Costs
BR_1	Gagnon Road Bridge	OSIM Inspection	$ 1,100.00
		Total	**$ 1,100.00**

* Prince Lake Road Improvements a candidate for funding given safety improvements that would result

Year 2018

Capital Expenditures

Bridges & Culverts

None

Equipment

None

Roads

Sect No.	Road Name	From	To	Type	Costs
15	Town Line Road	2nd Line	Base Line	Surface Treatment - Single	$28,300.00
30	Gagnon Road	Base Line	2nd Line	Surface Treatment - Single	$25,200.00
				Subtotal	**$53,500.00**
				TOTAL	**$53,500.00**

Year 2019

Capital Expenditures

Bridges & Culverts

None

Equipment

Municipal

ID	Type	Costs
VEH3.0-2009 Chevrolet Silverado LS	Purchase Pickup	$ 40,000.00
	Subtotal	**$ 40,000.00**

Roads

Sect No.	Road Name	From	To	Type	Costs
50	Mountain View Road	2nd Line	End of Road	30m Reclaimation & Surface Treat - Double, Remainder Surface Treat - Single	$16,400.00
80	Ironside Dr	Douglas Road	Douglas Road	Surface Treatment - Single	$28,400.00
				Subtotal	**$44,800.00**
				TOTAL	**$84,800.00**

OSIM Inspections

Municipal

ID	Location	Type	Costs
BR_1	Gagnon Road Bridge	OSIM Inspection	$ 1,100.00
		Total	**$ 1,100.00**

Year 2020

Capital Expenditures

Bridges & Culverts

None

Equipment

None

Roads

Sect No.	Road Name	From	To	Type	Costs
40	Walls Road	Base Line Road	2nd Line / Hwy 550	Surface Treatment - Single	$22,900.00
60	Marshall Dr	2nd Line	North Gros Cap Road	Surface Treatment - Single	$20,200.00
				Subtotal	**$43,100.00**
				TOTAL	**$43,100.00**

Year 2021

Capital Expenditures

Bridges & Culverts
Municipal

ID	Location	Type		Costs
BR_1	Gagnon Road Bridge	Bridge Replacement*		$ 820,200.00
			Subtotal	**$ 820,200.00**

Equipment

None

Roads

Sect No.	Road Name	From	To	Type	Costs
5	Creek Road	1.4 km up Creek Road from 3rd Line	2.5km long	Granular Placement	$10,500.00
25	Base Line Road	0.7 km up Base Line Road from Airport Rd	Gagnon Road	100m Section Full Width Road Reconstruction with Geotextile	$28,600.00
				Subtotal	**$39,100.00**

TOTAL **$859,300.00**

*Replacement of the Gagnon Road Bridge would be a candidate for capital funding given the high capital cost of replacement.

Year 2022

Capital Expenditures

Bridges & Culverts

None

Equipment

None

Roads

Sect No.	Road Name	From	To	Type	Costs
25	Base Line Road	0.7 km up Base Line Road from Airport Rd	Gagnon Road	Surface Treatment - Single	$16,300.00
45	Deans Road	2nd Line	Walls Road	Surface Treatment - Single	$6,000.00
65	North Gros Cap Road	1.1km up road	3.0 km up Road (End)	Granular Placement	$10,800.00
70	North Gros Cap Road	Marshall Dr	1.1km up Road	Granular Placement	$10,800.00
				Subtotal	**$43,900.00**
				TOTAL	**$43,900.00**

Year 2023

Capital Expenditures

Bridges & Culverts

None

Equipment

None

Roads

Sect No.	Road Name	From	To	Type	Costs
55	Heywood Road	2nd Line	End of Road	Clearing & Grubbing, Ditching and Surface Treatment - Double	$27,200.00
85	Pinder Dr	2nd Line	End of Road	Granular Placement	$1,600.00
90	Harper Dr.	2nd Line	End of Road	Reditching, Granular Placement & Surface Treat - Double	$7,700.00
				Subtotal	**$36,500.00**
				TOTAL	**$36,500.00**

Bridges & Culverts
Municipal

ID	Location	Type	Costs
BR_1	Gagnon Road Bridge	OSIM Inspection	$ 1,100.00
		Total	**$ 1,100.00**

APPENDIX B

FINANCIAL PLANNING TEMPLATE

Excel Spreadsheet provided by: Anthony Rossi

Calam Rossi Chartered Accountants