Development Charges Update, 2018 Background Report

Development Charges By-law -2018
Township of Cramahe

March 20, 2018

Prepared for: Craig Brooks, CAO, Township of Cramahe
Prepared by*:* *Clark Consulting Services*

1. Introduction

Clark Consulting Services was retained by the Township of Cramahe to prepare a Development Charges Study and Draft By-law for Council to update the current Development Charges By-law 2013-69. In the process, CCS completed a Background Study and calculations which updated the information from the original study prepared by Clark Consulting Services. The following is a complete report on the updated calculations prepared for this assignment.

The most recent Background Report was completed in 2013 and By-law 2013-69 was adopted by Council on December 17, 2013. Although this By-law has a term of five years Council may adopt a new by-law within the five year term replacing the existing by-law. This background information will provide the basis for a new by-law.

The *Development Charges Act*, as amended, allows Municipalities to pass a By-law to raise revenues from new development to offset the costs incurred by the Municipality as a result of growth.

The *Development Charges Act, 1997* states:

"Unless it expires or is repealed earlier, a Development Charges By-law expires five years after the day it comes into force. (Section 9(I))."

The *Development Charges Act* sets out the process for the passing of a By-law. This process is reviewed in Section 2.3 of this report.

The basic principles of Development Charges according to the *Development Charges Act,* are:

1.1. growth must pay its fair share; and,

1.2. the costs of services should be fairly distributed between new and long-term residents.

Specifically, the legislation reduces the scope of services eligible for funding by Development Charges, "discounts" some services and addresses technical and administrative matters and reporting requirements. This report has been prepared to allow Council to adopt a new By-law and will review how Development Charges have been used in the Municipality and document the changes recommended for the new By-law.

The *Act* puts the onus on the Municipality to pass a By-law which is structured and accountable. As such, careful consideration and detailed accounts of how the Development Charge is calculated must be maintained in order to be defendable if appealed to the Ontario Municipal Board (OMB) or its successor.

This report addresses the mandatory provisions of the *Development Charges Act*, and as such, can be used as the basis and justification for the Development Charges By-law for the Township of Cramahe.

2. DEVELOPMENT CHARGES - PRINCIPLES AND PRACTICE

2.1. Legislative Basis

Section 2, subsection (l) of the *Development Charges Act* states:

"The Council of a municipality may, by By-law, impose Development Charges against land to pay for increased capital costs required because of increased needs for services arising from development of the area."

Subsection (2) states:

"Development Charges may be imposed only for development that requires:

a) the passing of a Zoning By-law or for an amendment thereto under Section 34 of the *Planning Act*;
b) the approval of a Minor Variance under Section 45 of the Planning Act;
c) a conveyance of land to which a By-law passed under Subsection 50 (7) of the Planning Act, applies;
d) the approval of a Plan of Subdivision under Section 51 of the Planning Act;
e) a consent under Section 53 of the Planning Act;
f) the approval of a description under Section 50 of the Condominium Act; or
g) the approval of a permit under the Building Code Act 1992 in relation to a building or structure."

Section 2, subsection (3) of the Act outlines the instances in which a Development Charge may not be applied. An action mentioned in clauses (2) (a) to (g) does not satisfy the requirements of subsection (2) if the only effect of the action is to:

a) permit the enlargement of an existing dwelling unit; or
b) permit the creation of up to two additional dwelling units as prescribed, subject to the prescribed restrictions in prescribed classes of existing residential buildings.

The Act sets out ineligible services such as:

a) cultural or entertainment facilities, including museums, theatres and art galleries but not including public libraries;
b) tourism facilities including convention centres;
c) land for parks;
d) hospitals;
e) waste management services;
f) headquarters for the general administration of municipalities and local boards;
g) other services prescribed in regulation. Regulation 82/98 indicates no further ineligible services. (Section 2 (4)).

Local services to be provided in a plan of subdivision are not eligible for inclusion in a Development Charge (Section 2 (5)).

The *Development Charges Act, 1997* clarifies that a By-law may impose Development Charges for services provided outside the municipality (Section 2 (6)) and a Development Charge may apply to the entire municipality or only part of it. (Section 2 (7)) More than one Development Charge may apply to the same area. (Section 2 (8))"

The *Act* provides the following exceptions:

a) lands owned and used by the municipality;
b) lands owned and used by a Board of Education;
c) enlargements of existing industrial buildings by up to 50% of original building.

2.2. Procedure for Calculation

Section 5 of the *Development Charges Act* sets out an explicit method to be used for the calculation of a Development Charge. The method is outlined as follows:

a) Estimate the amount, type and location of development;
b) Estimate the increase in the need for service attributable to the anticipated development;
c) Council indication that increase in need will be met;
d) Limit on level of service to the average level of service over the preceding 10 year period;
e) Determine the extent to which new development will pay for existing excess capacity;
f) Determine the extent to which existing development will benefit from an increase in service;
g) Estimate of capital cost to provide the increased service reduced by capital grants, subsidies and other contributions. Capital costs to include:
    a. cost to acquire land;
    b. cost to improve land;
    c. cost to acquire, lease, construct or improve facilities including:
        - rolling stock with an estimated useful life of seven years or more;
        - furniture or equipment, other than computer equipment;
        - materials acquired for circulation, reference or information purposes by a library board;
    d. costs to undertake studies;
    e. services related to a highway;
    f. costs of the Development Charges Background Study; and
    g. interest on money borrowed to pay for costs of land, buildings, structures or facilities above.

h) Reduction by 10% of capital cost except for the following services:
   a. water supply services including distribution and treatment;
   b. wastewater services including services and treatment;
   c. stormwater drainage and control services;
   d. service related to highway;
   e. services related to electrical power services;
   f. police services; and,
   g. fire protection services.
i) Rules to determine if a Development Charge is payable;
j) Rules to determine if a Development Charge is payable; and
k) Rules to provide for full or partial exemptions, planning and indexing.

The services to be included in the calculation of Development Charges for the Township of Cramahe are:

a) Administration/General Government
b) Public Works
c) Protection of Persons and Property including:
   - Fire Protection
   - Emergency Management
   - By-law Enforcement
   - Community Policing
d) Recreation and Culture including:
   - Arenas and Parks
   - Libraries
   - Cemeteries.

The existing value of eligible capital facilities, as well as forecasts for capital expenditures were used to update the previous calculation. This updated information has been reviewed and the portion attributed to growth determined.

A review was then conducted of grants and other sources of income including Development Charges Reserve Funds which would be available to the Township to apply toward the various capital costs. Capital costs were subsequently adjusted in order to reflect the net capital costs. The net capital costs are the figures used to calculate the Development Charge and are based on estimates. The actual costs may vary. If the net capital costs are greater or lesser than actual costs the By-law should be amended.

Adjustments to the Development Charges and subsequent amendments to the By-law are important to the Township since the *Development Charges Act* contains provisions which allow for the refund of Development Charges, with interest, to various owners if the Development Charge is too great or based on incorrect information. This may be done through complaint as outlined in Section 20 of the *Development Charges Act* or by appeal to the passing of the By-law as outlined under Sections 13 and 19 of the Act. However, if the Development Charge is less than the actual costs, the Municipality cannot recover the additional costs (Section 18).

The calculations prepared for the Township of Cramahe are presented in Section 5 of this report.

2.3. Approval of By-law

Sections 10-19 of the *Development Charges Act* contain regulations which require a Public Meeting in which any person who attends the meeting may make representation with respect to the Development Charges. A Draft Notice of Public Meeting is attached as *Appendix B-1*. After the passing of the By-law, public notice of passing must be given and any person or organization may appeal the By-law to the Ontario Municipal Board (OMB) or its successor in accordance with the procedures of the Act. A draft notice is attached as *Appendix B-2.*

The Ontario Municipal Board or its successor may hold a hearing or give an early dismissal of the appeal. As a result of the hearing, the Ontario Municipal Board or its successor may:

a) dismiss the appeal;
b) order the Council of the Municipality to repeal the By-law in whole or in part, or to amend the By-law in accordance with Board's order; or
c) repeal the By-law in whole or in part, or amend the By-law in such manner as the Board may determine (Subsection 16 (3)).

However, the Ontario Municipal Board or its successor may not amend or order the amendment of a By-law so as to increase a Development Charge imposed by the Municipality or alter the terms of the By-law to remove or reduce the scope of an exemption, change the phasing to require payment earlier or change the date the By-law will expire.

In addition to the appeal process (40 days after adoption by Council - written notice within 20 days of decision under Subsection 3), there is also the opportunity for a land owner to appeal the Development Charges if it applies to a property via the Complaints Section (Section 20) of the Act. This section states that an owner may complain in writing to the Council of the Municipality with respect to the Development Charge imposed by the Municipality, that:

a) the amount of the Development Charge imposed was incorrectly determined;
b) the amount credited to the owner is incorrect; or,
c) there was an error in the application of the *Development Charges By-law.*

The owner may submit a complaint under Subsection 20 (2) up to 90 days after the Development Charge or any part of the Development Charge is payable.

Council shall give the complainant the opportunity to make representation and the Notice of Hearing shall be mailed to the complainant not less than 14 days before the complaint is to be considered.

After hearing the evidence and submissions of the complainant, the Council may either confirm the Development Charge or amend the charge to the extent that Council believes is justified.

The Clerk of the Municipality shall, no later than 20 days after the date of Council's decision, give written notice by mail to the complainant. The notice shall specify the last day for filing an appeal. That date shall not be sooner than 40 days after the decision is made. The complainant may appeal Council's decision or may appeal Council's inaction if Council has not dealt with the complaint within 60 days after the complaint has been filed with the Clerk. An Ontario Municipal Board (OMB) or its successor hearing will be convened to hear the outstanding matters and the Board will make a ruling based on the evidence received.

2.4. Annual Review/Five Year Duration of By-law

Regulation O. Reg. 82/98 passed under the *Development Charges Act, 1997* allows Municipalities to adjust their Development Charges By-law in accordance with Statistics Canada Quarterly, Construction Price Statistics, catalogue number 62-007.

A regular adjustment will allow the Municipality to factor in the costs associated with inflation so that the actual Development Charges accurately reflect the costs associated with growth. An annual review form is attached to the Draft By-law in *Appendix B*.

Section 9 (l) of the *Development Charges Act* states that a Development Charges By-law expires five years after the date it comes into force. Section 19 (l) of the Act permits the Council of the Municipality that has passed the Development Charges By-law to amend it, although the amendment does not affect the term of the By-law. The By-law may be reviewed in order to determine the accuracy of the charges with regard to the net capital costs, thus avoiding any refunds or shortfalls at a later date.

Although the Development Charges By-law is valid for five years, the Municipality may provide in the By-law for a term of less than five years, or repeal the By-law. Should the Municipality repeal the By-law a new Development Charges By-law must be passed. The passing of a new By-law would require a Council review of the Development Charges Policies of the Municipality including a Public Meeting.

Prior to the end of the five year life of the By-law the Municipality should conduct a review of the Development Charge Policies so that a new Development Charges By-law can be prepared and ready for implementation when the existing By-law expires. If Council agrees to pass a new By-law, the next review of this By-law should take place in 2022 to meet the five year requirement.

2.5. Development Charges Pamphlet

Regulation O. Reg. 82/98, S.14 passed under the *Development Charges Act, 1997,* requires a Municipality that has a Development Charges By-law to prepare a pamphlet setting out:

a) a description of the general purpose for which the Development Charge is being imposed;
b) the rules for determining if a Development Charge is payable in a particular case and for determining the amount of the charge;
c) a list of the services to which the Development Charges relate; and,
d) a description of the general purpose of the statement of the treasurer of the municipality and the place where it may be reviewed by the public.

This regulation also requires that a revised pamphlet be prepared if the Development Charges By-law is amended or a new By-law comes into force. The Clerk of a Municipality

with a Development Charges By-law in force must provide one copy of the pamphlet to any person, upon request, without charge. A draft copy of a pamphlet based upon the proposed Development Charge is attached as *Appendix E*.

2.6. Reserve Funds

The funds collected under the Development Charges By-law must be accounted for in separate reserve funds. Reserve fund balances, as of December 31, 2017 are listed by service in the following table.

Table 1 Reserve Funds, December, 2017.

SERVICE AREA	BALANCE
General Government	**$24,102.20**
Public Works	**$199,862.26**
Transportation	**$77,265.50**
Fire Protection	**$17,763.99**
Emergency Management	**$1,049.99**
By-law Enforcement	**$738.37**

SERVICE AREA	BALANCE
Community Policing	**$1,017.67**
Arena	**$51,072.42**
Rec	**$28,828.87**
Library	**$19,803.03**
Cemeteries	**$3,448.27**
Total Area Wide Development Charges	**$424,952.57**

In creating this table, CCS relied upon the Schedule of Deferred Income - Obligatory Reserve Funds provided by Township Staff and correct as of December 31, 2017. The actual balance may differ due to fund adjustments and interest payments. An annual account of funds collected and expended is required. This report is usually completed as part of the Auditor's Report.

3. Official Plan Policies

The Township of Cramahe is subject to both a County Official Plan and a local Official Plan. These Official Plans are based upon moderate population growth. New residential development is encouraged in the existing settlement areas while residential development outside these settlement areas will be limited in scale and consistent with the rural nature of the Township. Waterfront residential and recreational development is located in shoreline areas particularly

along the Lake Ontario and Little Lake. This form of development will continue. Of importance in the prediction of residential development is the conversion of seasonally occupied dwellings to permanent occupancy.

4. Projected Growth

4.1. Projection

As part of this report, we have prepared a projection of household growth and non-residential floor area. These projections have been developed from a combination of sources including Statistics Canada data for 2001, 2006, 2011, and 2016 for permanent population. The number of households and their characterization as permanent or non-permanent (seasonal) occupancy is based upon Stats Canada, Census information, 2001, 2006, 2011 and 2016.

Commercial/industrial floor area has been developed on the basis of representative estimates of employment and floor area.

4.2. Population Projection

The population forecast by year, shown in Calculation Table 4.1, relies upon a growth in households developed from recent historic trends which saw the annual conversion of non-permanent homes and the construction of new households. Recent approvals of draft plans of subdivisions in the Village of Colborne indicate a dramatic increase in population within the Township compared to historic trends. Because of these factors, an estimate of 50 new permanent households is shown annually in the municipality.

Applying the estimate of household growth with an occupancy rate of between 2.54 to 2.51 people per household, results in a 2027 permanent population of 7,582.

The population forecast of the Township Official Plan predicts the permanent population will increase to 6,990 by the year 2031, which is an increase of 1,000 people over a period of 17 years. With the recent growth in Northumberland County, and in particular the Township of Cramahe, expected growth has every indication to exceed the projections shown in the Official Plan.

4.3. Employment Projection

For this study, local employment is predicted as 40% of the permanent population. This ratio predicts local employment of 3,649 people which will grow to 4,322 people in the year 2027 at an annual rate of between 67 employees per year.

This growth is converted to non-residential floor space on the basis of a ratio of 50 m² per employee, for a predicted growth of 23,500 m² between 2018 and 2027.

5. Capital Cost of Growth

The following pages outline the detailed calculations and cost estimates illustrated on the tables attached to this report. In considering the range and type of facilities to be included, the following principles and assumptions were adopted:

a) The costs are preliminary in nature and include design fees and Township overhead. They reflect 2017 estimated costs. Actual costs are used where projects are already designed or are in progress;

b) All estimates include an allowance for grants from senior levels of government. Should additional grants be included these will be deducted from the estimated cost on which the Development Charge was based, thereby reducing the Development Charge. For the purposes of calculating capital expenditures in this report, the subsidy level has been estimated. Should this level change, the Township may amend the Development Charges By-law;

c) Costs associated with residential development will be assessed on the basis of the number of units to be developed;

d) The calculation provides for two basic types of Development Charges, one for Residential Development and another for Non-Residential developments;

e) The cost estimates are based on past experience with road construction, recreational and community services and have been based on preliminary assessments of work to be included;

f) The engineering services provided for in the Development Charges do not include the provision of hard services, such as municipal water or sanitary services, storm sewers or other drainage facilities, flood control, or any costs associated with installation of services within the lot or subdivision. The Development Charge costs are related to major external road improvements required for the development to proceed and other services. These services include the cost of facilities required to extend the services or result in a reduced life for existing equipment;

g) The ultimate service population for Township of Cramahe is expected to grow by approximately 530 households by the year 2027. The number of households is based on the projections discussed in Section 4 of this report and illustrated in *Table 4A*;

h) The growth in local employment between 2018 and 2027 is estimated at 470 employees. At a ratio of 50 square metres per employee it is calculated that some 23,500 square metres of non-residential floor space would be constructed/converted; and,

i) The most equitable approach to sharing the cost of these services is on an area-wide basis with preliminary costs updated when more accurate costs for these services are determined.

Should "front-end" monies be required in excess of Development Charge funds, the initial shortfall of funds may be provided by a front-end agreement whereby the developer pays the higher initial charges and receive a credit against Development Charges to be collected at a later time, or is compensated when Development Charges are collected by the Township and the initial developer is compensated by the municipality for the initial payment.

Part III of the *Development Charges Act* details the regulations regarding front-ending agreements. It allows the Township to enter into a front-ending agreement or agreements with any or all owners within a benefitting area providing for the payment by those owners of a front-end payment or for the installation of services by the owners, or any combination thereof (Section 44 of *The Act*).

The contents of a "front-ending" agreement are stated in Section 45 (1) of *The Act*. It should also be noted that a "front-ending" agreement may include reasonable costs to the Township

of administering the agreement, including the cost of consultants and studies required in preparation of the agreement.

The procedure for entering into a front-end agreement including giving notice is further detailed in Sections 51 to 57 of *The Act*. Section 56 allows the agreement to be registered against the land in the benefitting area.

6. Method of Calculation

For purposes of this Development Charges Study we have inventoried all eligible Township facilities as illustrated on *Table 1A***.** This inventory includes a description of the size, where applicable, the replacement cost as determined by discussions with Township Staff, calculation of a cost per unit developed from the replacement cost, and the number of units and service standard which reflects a discussion with Staff as to whether or not these units are at capacity or have excess capacity. For those facilities which are at or near capacity, we have used the number of households in 2016 of 6,355. The excess capacity is then estimated based on the service standard and the eligible Development Charges calculated as a proportion of the replacement cost multiplied by the excess capacity.

The eligible Development Charge is distributed between Residential and Non-residential on the basis of the proportion of assessment for each. As of 2016, 91.7% of the assessment was Residential and Farm and the remaining 8.3% was Non-Residential. This provides a distinction between the Residential and Non-Residential share of the Development Charge. It should be noted that the Parks and Recreation, Library Services and Cemeteries are allocated exclusively to the Residential share as Non-Residential does not generally generate a need for these services.

The future Township expenditures have been estimated on the basis of discussion with Township Staff. The estimates include a prediction of the year in which the expenditure will be made and both a gross and a net cost of expenditure. The net cost of expenditure accounts for any grants or other funds which are received by the Township in support of this project. An estimate is then made of the percentage of cost which is due to growth.

Based on this percentage, an estimate of the eligible Development Charge is made based on the net cost and percentage of cost due to growth. The net future costs for the charge are allocated between Residential and Non-residential land uses on the basis of the assessment ratio. Further calculation methods follow this detailed discussion of Township facilities.

7. Existing Facilities (Table 1A)

The inventory of existing facilities was taken from a discussion with Township Staff and includes the following:

a) Administration - General Government

The *Development Charges Act* eliminates:
"the provision of headquarters for the general administration of municipalities....." (Section 2 (4) 6.).

The costs, and associated costs, of preparing the updating the Development Charges By-laws remains as an administrative expense. Other charges include the preparation of Planning documents and the Office Space allocated to this function.

b) Public Works

Table 1A presents an inventory of existing roads, bridges and equipment for the Township. The information on roads and bridges was provided by Staff. In determining the excess capacity, we have assumed the existing road system has the capacity to accommodate future growth of 8.3%. The equipment not slated for replacement during the next 10 years has been assigned an excess capacity of 16.6%. This yields an eligible Development Charge of $4,221,000.

The current storm drainage system in most of the developed urban area of Colborne is storm sewers with limited treatment.

c) Protection of People and Property - Fire Protection

Table 1A presents an inventory of existing Fire Protection facilities and equipment. With the exception of the fire halls and their equipment, the Fire Protection service is currently operating near capacity. From an estimated replacement cost of $1,902,740, $302,120 is eligible for inclusion in the Development Charge calculation.

d) Protection of People and Property - Emergency Management

The current Emergency Management operation has a Command Centre shared with the Fire Department and includes defibrillators and backup generators. These capital items have been included in the existing inventory.

e) Protection of People and Property - By-law Enforcement

The provision of By-law Enforcement is included as an eligible service. It relates to the equipment and office space required to provide this service.

f) Protection of People and Property - Community Policing

Police services are currently provided by contract with the O.P.P. and thus are not eligible. The Township maintains a Community Policing Office in Colborne and traffic speed warning and information signs which have been included as part of the inventory in the calculation.

g) Recreation and Culture

Table 1A provides an inventory of existing Recreation and Culture facilities. An estimate of excess capacity has been prepared using an excess capacity of 16.6% for those facilities for which improvements are not anticipated in the next 10 years. An eligible Development Charge of $763,460 has been calculated.

h) Recreation and Culture - Library

The Township maintains 2 public libraries. The collection and the buildings have been valued at $407,640. Of this, we determine that $61,750 is eligible for inclusion in the Development Charge calculation.

i) Recreation and Culture - Cemeteries

The Township and its Cemetery Boards, maintains 5 cemeteries. Capital assets include equipment, fencing and items such as columbaria. The assets total $128,380 and the eligible Development Charge is $21,370.

j) Environmental Services - Water Works

Municipal water is provided within an area of the Village of Colborne and part of the former Township of Cramahe. The estimated capital value of the components of the water supply system is $3,782,520 of which $ 629,760 is considered eligible for inclusion in the Municipal By-law Charges calculation.

The treatment plant system has a capacity of 3,752 of residential equivalents. The residential component of the capacity is calculated to be 31% of the total capacity.

k) Environmental Services - Wastewater Services

Municipal wastewater services is provided within an area of the Village of Colborne and part of the former Township of Cramahe. The estimated capital value of the components of the wastewater collection and treatment system is $11,368,310 of which $1,892,730 is considered eligible for inclusion in the Municipal By-law Charges calculation. This service has been estimated to have capacity to serve 1,045 household equivalents.

l) Summary of Existing Inventory

Table 1A provides a full listing of these facilities and in some cases only limited excess capacity has been assigned.

8. Allocation between Land Uses (Table 1B)

In order to calculate a Residential and Commercial/Industrial Development Charge, the assessment ratio of Residential/Farm and Commercial/Industrial was used to distribute the eligible Development Charge. An exception remains for Parks, Recreation, Libraries and Cemeteries in which all of the eligible Development Charge is allocated to the Residential share. On this basis *Table 1B* illustrates how the Development Charge of $5,388,510 was allocated as $5,010,540 to Residential Uses and $377,970 to Non-Residential Uses.

Similarly the eligible Municipal Water and Sewer charges of $629,760 and $1,892,730 respectively are divided to Residential and Non-Residential as $577,350 and $52,410 and $1,735,220 and $157,510.

9. Future Municipal Expenditure/Capital Forecast (Tables 2A & 2B)

It is necessary when calculating a Development Charge to look at the capital expenditures the Municipality anticipates over the next 10 years. *Table 2A* provides a capital forecast of all expenditures anticipated together with their anticipated expenditure year, the gross cost and the net cost and an estimate of the percentage due to growth. When combining the net cost with the percentage due to growth, it is possible to calculate an eligible Development Charge for each expenditure.

a) Township Wide Expenditures

On this basis, total expenses in the order of $1,310,120 were identified as eligible for Development Charges and these expenditures were distributed in *Table 2B* with $1,239,360 allocated to Residential and $70,760 allocated to Non-residential.

Water and Wastewater eligible expenditures total $328,200 with $300,890 allocated to Residential and $27,310 allocated to Non-Residential within the municipal By-law.

b) Capital Expenditures by Year (Tables 3A & 3B)

Tables 3A and 3B provide a scheduling of the expenditures identified in *Table 2B.* This schedule, by year, indicates how the net expenditures are allocated. The eligible Development Charges identified for existing facilities have been included in the "existing" column.

A net present value has been calculated which indicates the amount of monies required today to fund the expenditures over the next 10 years. An interest rate of 3.0% has been used to make this calculation.

A total net present value of $9,105,180 has been calculated of which $6,311,890 is eligible for Development Charges and $2,793,290 is eligible for the Water and Sewer By-law. These have been allocated for the distributed Development Charge calculation as $5,890,330 for the Residential portion and $421,570 for the Non-Residential portion, and $2,564,050 for Residential and $229,240 for Non-Residential Water and Sewer.

c) Development Charge Calculation - Residential (Table 4A)

Table 4A provides the calculation for Development Charges for Residential purposes. The population forecast discussed in *Section 4* is included in this table and the growth rates per year have been calculated. A total growth of 1,180 people is forecast between the years 2018 and 2027. This results in a household growth forecast of 530.

The Reserve Funds accumulated from previous Development Charge By-laws must be subtracted from the Net Capital Cost. The calculation applies the reserve funds between Residential and Industrial/Commercial at a ratio of 91.7% to 8.3%.

Using the eligible Residential Development Charge, discounted for existing Development Charge Reserve funds, a Development Charge of $10,362.42 per single detached dwelling was calculated.

For comparative purposes this charge is higher than the current Development Charge for a Single Family Dwelling as illustrated in the following table:

Service Area	Existing Charge	Justified Charge
General Government	$ 127.73	$ 170.03
Public Works	$ 2,849.61	$ 7,339.35
Protection of People and Property:		
- Fire Protection	$ 280.38	$ 714.00
- Emergency Measures	$ 7.34	$ 18.24
- By-law Enforcement	$ 3.60	$ 8.80
- Community Policing	$ 6.42	$ 15.88
Recreation & Culture		
- Arena and Parks	$ 725.88	$ 1,863.84
- Library	$ 68.08	$ 191.04
- Cemeteries	$ 16.97	$ 41.24
Total Township-wide	**$ 4,086.00**	**$ 10,362.42**

For comparative purposes, CCS have collected samples of Residential Development Charges for adjacent municipalities. We have also noted the start year of the By-law.

Municipality	Start Date	Single Detached Home: (Urban/Rural Split where specified)
Municipality of Port Hope	2014	$ 18,938/$8,507
Town of Cobourg	2017	$12,175/East $19,418+County
Hamilton Township	2014	$6,101.00
Alnwick/Haldimand	2017	$9,015.22 + $5,530.73 water
Municipality of Brighton	2014	$8,283/$5,442
Municipality of Trent Hills	2014	$5,600
City of Quinte West	2016	$8,789/$4,141

d) Development Charge Calculation - Non-residential

Local employment has been estimated on the basis of the population forecast developed for the Residential calculation. Local employees represent approximately 40% of the total population. On the ratio of 50 square metres of floor space per employee, a total of 23,500 square metres is projected over the next ten years, with a net capital cost attributable to development of $421,600 (without water and sewer charge). The recommended charge per square metre of Commercial/Industrial development results in a cost of $16.80 m^2 ($1.56 ft²) on a Township-wide basis and $9.75 m² ($0.91 ft²) for water and sewer within the serviced areas. We would suggest that if a Commercial/Industrial Charge is to be made, the Development Charge should be applied to Institutional uses at the rate of 50% of the Commercial/Industrial Charge. Examples of Development Charges, Non-Residential, for adjacent municipalities:

Municipality	Commercial/ Industrial Charge: (Urban/Rural Split where specified)
Municipality of Port Hope	$77.93 m²/$27.77 m² - ($7.37 ft²/$2.58 ft²)
Town of Cobourg	$ 74.92 m² ($6.96 ft²)
Hamilton Township	$ 6.59 m² ($ 0.61 ft²)
Alnwick/Haldimand	$15.93 m² + $ 4.92 m² water
Municipality of Brighton	$53.60 m²/$38.75 m² ($4.98 ft²/$3.60 ft²)
Municipality of Trent Hills	$13.56 m² ($1.26 ft²)
City of Quinte West	$ 45.62 m²/$19.05 m² ($4.24 ft²/$1.77 ft²)

10. Green Energy

The Green Energy Act and the Renewable Energy Act within Ontario provide for the development of facilities to generate electricity and feed that generation into the general power grid. The Development Charges By-law is based on the principle that new development generates the need for additional services and therefore should pay their fair share of the additional costs required to provide these services.

In addition to concerns about impacts on their community, many municipalities are also concerned with the nature of possible impacts on municipal services such as:

- roads (particularly during construction activities as well as site access for emergencies and maintenance. Many sites are remote and are not currently accessed by a Municipal Road of sufficient standard to accommodate construction equipment.)
- fire protection (related to emergency calls, construction incidents and maintenance activities)
- administration (related to approvals and cost of Development Charges By-law Amendment).

10.1. Increased Need for Service

Part II of the Development Charges Act sets out the purpose and conditions warranting a Development Charge. Specifically Section 2(1) states that the Council may impose Development Charges *"against land to pay for increased capital costs required because of increased needs for services arising from development of the area…".* Experience with solar farm installations suggests that the location is often not determined by access but rather by criteria that relate more to the suitability of the site and not to the services currently provided to the site. Many installations are in remote locations which require road upgrades with the attendant ongoing maintenance to assure access both during construction when there is major activity or on-going operation and maintenance. The extension of service has implications for municipal Public Works and Fire Protection. The imposition of a Development Charge includes the administration costs related to the establishment of the Charge and its collection.

A Development Charge may be imposed for development that requires the approval of a permit under the Building Code Act 1992 in relation to a building or structure. In the case of a photo-voltaic installation, the Green Energy Act - Ontario Regulation 15/10 designates renewable energy projects as an energy generation facility that uses solar energy harnessed by photo-voltaic technology as its renewable energy source. Sub-section 2 goes on to stipulate that the project must be installed in compliance with the *Building Code Act, 1992.* The Building Code requires a permit for the inverter buildings but not the solar panels. On this basis, we conclude that a Development Charge can be imposed on Green Energy installations.

From a servicing perspective, the establishment of each facility may generate the need for road improvements and on-going maintenance. Each facility will have its own road construction costs which can be assessed at the time of approval. For those requiring

physical extension of roads, the proponent should be required to construct the connection similar to other development proposals required to construct connections to the existing servicing network. The proponent may consider requesting a Front Ending Agreement where the road connection provides development opportunities for others. This will require a Special Development Charge for the area affected by the road improvement and reflecting the additional development potential created by the road extension.

As referenced above, the increased need for service relates to the following services:

- Public Works, Roads and Bridges
- Fire Protection
- General Government (includes cost of Background Study and Development Charge By-law).

10.2. Photo-voltaic Generating Installations

Industrial sized and commercial solar farms are currently being developed in many areas of rural Ontario. Development Charges against these installations are collected as non-residential charges. Building permits are required for various components of solar installations including solar panels of 5 square metres or greater and buildings as defined in the Ontario Building Code. We propose that smaller installations of 100 kW or less be exempt from Development Charges, and that the Development Charge be calculated on the basis of installed capacity. In view of the limited experience, the approach adopted to calculate the level of the Charge is an equivalency to residential development. The equivalency proposed is that the installed capacity of 500 kW is equivalent to one (1) residential unit. Thus a 10 MW facility, the largest permitted under former FIT programs, would be the equivalent of a 20 unit residential development. The current By-law includes an exemption for the first 250 sq.m. of a non-residential building. Solar installations would be excluded from this exemption.

10.3. Solar Installation Charge

In order to determine an appropriate charge for a PV installation, an equivalency approach to the determination of the Charge and an exemption for the first 100 kW of name plate capacity is proposed. A variety of panel arrangements may be employed for each installation. Therefore, the proposed Charge has been based on the rated electrical generating capacity of the project. This provides the most reliable and fair means upon

which to base the Charge. Based on recent installations, each inverter has a rated capacity of 500 to 1,000 kW. The inverters usually support 5,000 to 20,000 panels depending on the design and mounting arrangements. The equivalent selected is that each 500 kW rated capacity is equivalent to a single detached house. The proposed charge would be equivalent to the total of the residential amount for Public Works, Fire, and General Government, and is allocated to the services of Public Works - Roads, Fire Protection and General Government as follows:

Charge per 500 kW rated capacity:

- Public Works:	$ 7,339.35
- Fire Protection:	$ 714.00
- General Government:	$ 170.03

TOTAL:	**$ 8,223.38**

10.4. Wind Energy

In keeping with the intent of the Province's Green Energy Act, and in particular, "greener" sources of electrical power generation, commercial wind turbines are being built in many communities across Ontario. As these structures are somewhat unique, the establishment of a uniform Development Charge for this type of development has not been addressed specifically. Wind turbine system developments may include a single tower or be arranged in a cluster of two or more towers.

In considering the impacts these structures have on certain municipal services, some municipalities have deemed the impact of one tower and turbine to be similar to the development of one single family home. A specific definition for wind turbine is included in the draft Development Charges By-law. A wind turbine system is defined as comprising one or more turbines, with a combined nameplate generating capacity greater than 500 kilowatts, that converts energy into electricity, and consists of a wind turbine, a tower and associated control or conversion electronics. Smaller generation units may be used for the generation of a smaller amount of electricity and so an exemption is proposed for wind turbine systems generating 100 kW or less.

The proposed Development Charge, as shown below, is allocated to the services of Public Works, Fire Protection and General Government. An exemption for the first 100 kW of name plate capacity is also proposed. The proposed charge would be:

Charge per Turbine:	
- Public Works:	$ 7,339.35
- Fire Protection:	$ 714.00
- General Government:	$ 170.03

TOTAL:	**$ 8,223.38**

11. Implementation

Development Charges may be imposed by the Township in order to pay for services which would be required as a result of growth. Implementation involves ongoing monitoring and accounting of payments and expenditures.

11.1. Effective Date

The Development Charges By-law or amendment comes into force on the date it is passed unless a later date is specified in the By-law, and expires five (5) years after the date it came into force. Council may provide for a term of less than five years or repeal the By-law within that time period. Amendments may be made to the By-law but such amendments do not affect the term. Prior to the passage of a new Development Charges By-law, a review of the Development Charge Study must be conducted.

11.2. Timing of Payment

The Township of Cramahe's Development Charges may be payable at a variety of times. The following should be considered in creating the Development Charges By-law:

a) Plans of Subdivision

The Township may wish to stipulate in their Development Charges By-law that the payment for transportation systems would be payable at the time of registration of the Subdivision Agreement. All other outstanding portions of the Development Charges would be payable at the time of issuance of the building permit.

b) Consents

As a condition of consent it is possible to require the landowner and the Township to enter into an agreement so that the landowner will pay the entire Development Charge prior to the Certificate of Consent being confirmed by the Secretary of the Land Division

Committee. It is also possible to provide for a phased, two-part payment, similar to a Plan of Subdivision. This system is not recommended as it involves a considerable amount of administration to track building permits for which full payment is required and those which have had a portion paid at the time of the granting of consent.

c) Legal Lots of Record

Many municipalities consider exempting existing vacant lots of record. This exemption is not recommended. Each new use places demands on the existing services and facilities of the Township. No distinction should be made based on how or when the lot was established. Provision can be made to acknowledge previous payments of lot levies. The responsibility should rest with the lot owner to request credit for payment of lot levies already paid and provide proof of payment.

d) Service Area Charges

It is possible to establish Development Charges on an area basis. If water and sewer charges are included in the Development Charge By-law, a charge for these services should be required within the area to be connected to each service.

e) Water and Sewage Charges

The Development Charges Act was designed to provide an accountable mechanism for collecting growth related capital cost. In the case of water and sewer charges, an alternative exists. The Municipal Act allows the Township to establish lot levies for water and sewer systems on an area basis. Although it does not offer the same right of appeal or the 5 year limited length it does provide a consistent means of recovering the cost of sewer and water system improvement costs. The Water and Sewer charges are currently collected under this arrangement and may continue as an update under the Water and Sewer By-law.

11.3. Types of Development

Charges will be applicable to any development which require any of the approvals and/or permits listed under the *Development Charges Act.* The list includes the approval of a Plan of Subdivision, a Zoning By-law Amendment, a Consent to a land severance, the approval of a Minor Variance, and issuing of a building permit.

A Development Charge cannot be imposed with respect to the creation of:

a) one or two additional dwelling units in an existing single detached dwelling; or
b) one additional dwelling unit in any other existing residential building.

In cases where the total gross floor area of the additional unit(s) exceed that of the existing dwelling unit, or when it exceeds the gross floor area of the smallest dwelling unit in the residential building, the Development Charge is applicable.

11.4. Exemptions for Non-Residential Development

Several options are available for additional exemptions for Non-Residential uses. The most common is an exemption for development based upon the size of the new construction. This is often justified as balancing the exemption for 50% expansion established in the Development Charges Act. It is recommended that the Municipality consider an exemption for the first 250 m^2 of new development. This would be a one-time exemption and additions or future phases would be subject to the standard 50% exemption for an expansion above the existing gross floor area.

11.5. Agreements

The Township may enter into agreements with property owners with regard to alternate payment schedules or for services in lieu of payment. The Development Charge may be collected earlier than the dates specified while the collection of the Development Charges at a later date is also possible. However, any change in property ownership must be brought to the attention of the Township immediately. The new owner(s) must then consent to the terms of the previous agreement or renegotiate with the Township.

Even though a Development Charge By-law is in place, the Municipality may enter into front end agreements with any or all property owners within a benefitting area(s) for the front-ended payment or installation of services. A front-end payment means a payment required to cover the net capital costs of the services designated in the agreement that are required to enable the land to be developed. The requirements of any front-end agreement may include:

(1) a list of the services for which front-end payments shall be made or services installed by the owner;
(2) the estimated costs of installing services;
(3) the proportion of the front-end payment or the cost of installing the services by each owner who is a party to the agreement;

(4) the agreement of the owners to immediately pay to the Township the actual costs incurred by the Township in the installation of the services in accordance with the proportions determined under Clause c); and/or,
(5) the agreement of the Township to immediately reimburse the owners of the actual cost incurred by the Township if the installation of the services is lower than the estimated cost in accordance with the proportions determined under Clause c).

It is the Township's duty to give notice of the front-ending agreement by either mailing it to all the owners in the benefitting area(s), or by publishing it in a newspaper having general circulation in the Township. A front-ending agreement may be appealed and the regulations regarding this matter are set forth in the *Development Charges Act*, *1997.*

The *Development Charges Act, 1997*, states that;

"an agreement may be registered against the land in the benefitting area, and subject to the Registry Act and the Land Titles Act, the Municipality;

a) may enforce the provisions of the agreement against any and all subsequent owners of the lands owned by the parties thereto; and
b) may enforce the provisions of the agreement made under clauses 2l(2)(d) and (k), subsection 21(4) and Section 26 against any and all owners and subsequent owners of lands in the benefitting area."

The *Development Charges Act, R.S.O., 1990*, requires owners of land in the benefitting area to pay a portion of the front-end payment as a condition of an approval granted during the term of the agreement. The Act deals with the collection and distribution of the funds collected. The Township is responsible for putting such funds into a special account and then distributing these funds to the parties of the front-end agreement.

11.6. Reserve Funds

Payments collected by the Township for Development Charges are to be deposited in a separate reserve fund(s) and are to be used only for the growth-related capital costs for which the Development Charge was imposed. Interest shall be paid on any refunds for overpayment. The Treasurer of the Township is to provide to Council a yearly statement with respect to each reserve fund established for Development Charges.

11.7. Draft By-Law

A Development Charges By-law has been prepared using the information within this report, and is attached as *Appendix B*.

Approval Procedure

The following outlines the approval procedure for a Development Charges By-law.

(a) Posting of Draft Development Charges Background Study at least 60 days before Public Meeting.
(b) Notice of Public Meeting at least 20 days before the Public Meeting.
(c) Public Meeting (at least one). Sufficient information must be available to enable the public to generally understand the Development Charges By-law.
(d) Passing of Development Charges By-law by Council.
(e) Written Notice of Passing of Development Charges By-law (must occur within 20 days of Passing of By-law by Council). The notice must specify the last day of filing a Notice of Appeal (which is 40 days after the By-law is passed).
(f) Appeals must be filed with the Clerk within 40 days of the passing of the By-law and forwarded to the Ontario Municipal Board or its successor within 30 days after the last day of appeal.
(g) If there are no appeals, the By-law comes into force and effect on the date it was passed by Council.

12. Recommendations

Based on our preparation of this Development Charges Study, it is our recommendation that the following items be considered:

- At Council Meeting on March 20, 2018, that Council accept the Development Charges Background Report.
- That Council authorizes Staff to proceed to a Public Meeting where Council will consider the information presented and any comments from the public.

13. COUNCIL DIRECTION

At the Council Meeting on March 20, 2018, Council received the Development Charges Background Report and, by resolution, directed Staff to prepare the necessary documents to

present the Background Report and proposed Development Charges By-law, and associated documents, at a Public Meeting on April 17, 2018, as part of the approvals process.

Respectfully submitted,

Bob Clark, P.Eng, P.Ag., MCIP, RPP, OLE
Principal Planner

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Appendices

Appendix A - Calculation Tables
Appendix B - Development Charges By-law
Appendix B-1 - Notice of Public Meeting
Appendix B-2 - Notice of Passing
Appendix C - Capital Forecast
Appendix D - Service Standards
Appendix E - Pamphlet

Appendix "A"

Calculation Tables

Appendix "B"

Development Charges By-law

Appendix "B-1"

Notice of Public Meeting

Appendix "B-2"

Notice of Passing

Appendix "C"

Capital Forecast

Appendix "D"

Service Standards

Appendix "E"

Pamphlet

Table 1A
Inventory of Township Facilities - Township of Cramahe

(2017 $,000) **Input Data**

Township of Cramahe 2018 2,865 households

Administration Services Development Charges	sq.ft.	Gross Cost	Replacement Cost ($,000)	Per Unit Cost ($,000)	Service Standard	Excess Capacity	Eligible Dev. Charge ($,000)
Office Space	1.0	$10.00	$10.00	$10.00	3342	16.6%	$1.66
Equipment	1.0	$4.00	$4.00	$4.00	3342	16.6%	$0.67
Furniture	1.0	$2.00	$2.00	$2.00	3342	16.6%	$0.33
Subtotal		**$16.00**	**$16.00**				**$2.66**

Table 1A con't
Inventory of Township Facilities - Township of Cramahe

Public Works Road Surface	Lane km	Gross Cost	Replacement Cost ($,000)	Per Unit Cost ($,000)	Service Standard	Excess Capacity	Eligible Dev. Charge ($,000)
Gravel Roads	641	$1,801.56	$1,801.56	$2.81	3342	8.3%	$149.97
Surface Treated	353	$4,607.90	$14,504.50	$13.05	3342	8.3%	$1,207.44
Hot Mixed Paved	67	$3,450.29	$6,119.00	$51.50	3342	8.3%	$509.38
Subtotal		**$9,859.75**	**$22,425.06**				**$1,866.80**
Buildings	No.						
North Garage	1.0	$178.49	$178.49	$178.49	3342	16.6%	$29.72
South Garage	1.0	$251.78	$251.78	$251.78	3342	16.6%	$41.92
North Salt Building	1.0	$158.73	$158.73	$158.73	3342	16.6%	$26.43
Gravel Pit/Sand Dome	1.0	$100.38	$100.38	$100.38	3342	16.6%	$16.71
South salt/sand storage shed	1.0	$31.62	$31.62	$31.62	3342	16.6%	$5.26
Subtotal		**$720.99**	**$720.99**				**$114.78**
Road and Street	No.						
Culverts	2.0	$772.01	$772.01	$386.00	3342	8.3%	$64.27
Bridges	19.0	$12,883.26	$12,883.26	$678.07	3342	8.3%	$1,072.48
Streetlights	506.0	$191.87	$418.30	$0.83	3342	16.6%	$69.64
Sidewalks	15,648.0	$487.44	$1,722.20	$0.11	3342	16.6%	$286.73
Cross Walk	15.0	$24.75	$31.68	$2.11	3342	16.6%	$5.27
Subtotal		**$14,359.33**	**$15,827.45**				**$1,498.40**

Table 1A con't

Inventory of Township Facilities - Township of Cramahe

Public Works con't Rolling Stock & Equipment	No.	Gross Cost	Replacement Cost ($,000)	Per Unit Cost ($,000)	Service Standard	Excess Capacity	Eligible Dev. Charge ($,000)
Pelican S	2006 EL Pelican Sweeper Serial #P-4646-D	1.0	58.51	$58.51	$58.51	3342	16.6%	$9.74
FARM TF	KUBOTA FARM TRACTOR 2004	1.0	65.24	$65.24	$65.24	3342	16.6%	$10.86
KUBOTA	2004 KUBOTA LAWN TRACTOR	1.0	30.28	$30.28	$30.28	3342	16.6%	$5.04
INTERNA	INT'L 2004 SINGLE ALEX TRUCK Lic Plate#AM23 60	1.0	139.53	$139.53	$139.53	3342	16.6%	$23.23
INTERNA	2002 INT'L 2674 TANDEM (02-9)	1.0	176.37	$176.37	$176.37	3342	16.6%	$29.36
INTERNA	2006 INT'L 7600 TANDEM (06-11)	1.0	169.87	$169.87	$169.87	3342	16.6%	$28.28
CHAMPI	1992 740 CHAMPION GRADER	1.0	181.40	$181.40	$181.40	3342	16.6%	$30.20
621B LO	CASE LOADER 1999	1.0	93.50	$93.50	$93.50	3342	16.6%	$15.57
580 SM I	Case Backhoe	1.0	88.79	$88.79	$88.79	3342	16.6%	$14.78
CHEV 35	2005 SILVERADO CHEV 1 TON	1.0	46.41	$46.41	$46.41	3342	16.6%	$7.73
CHEV PI(	2004 SILVERADO CHEV 1/2 TON	1.0	27.89	$27.89	$27.89	3342	16.6%	$4.64
Motor G	John Deere 77G Motor Grader	1.0	229.90	$229.90	$229.90	3342	16.6%	$38.28
2009 Ch	2009 Chev 1500 4WD	1.0	26.36	$26.36	$26.36	3342	16.6%	$4.39
Dodge T	RAM 3500 4x2 Regular Cab - 1 Ton. VIN# 3D6WG4	1.0	27.49	$27.49	$27.49	3342	16.6%	$4.58
Tandem	2010 International 7600 6x4 - VIN# 1HTWXAHT5A	1.0	176.09	$176.09	$176.09	3342	16.6%	$29.32
Tandem	2011 international Truck Twp Tr #539 VIN #1HTW	1.0	178.35	$178.35	$178.35	3342	16.6%	$29.69
Pickup	1998 Ford F150 Truck #890	1.0	18.32	$18.32	$18.32	3342	16.6%	$3.05
Chev Ext	2011 Chev Ext Cab 1/2 Ton Vin #1GCRKREA6BZ128	1.0	27.33	$27.33	$27.33	3342	16.6%	$4.55
Holder 2	Holder 2006 Model #474 Sidewalk Tractor serial #	1.0	54.34	$54.34	$54.34	3342	16.6%	$9.05
Volvo EV	New Volvo EW180D Wheeled Excavator	1.0	269.66	$269.66	$269.66	3342	16.6%	$44.90
2013 To	1/2 Ton Toyota Tundra 4x4 Dbl Cab Vin#5TFUY5F1	1.0	33.83	$33.83	$33.83	3342	16.6%	$5.63
TRAILER	2004 BUILD 80X14 TRAILER	1.0	0.00	$0.00	$0.00	3342	16.6%	$0.00
CHAINSAW		1.0	0.51	$0.51	$0.51	3342	16.6%	$0.08
BUSH HO	ATTACHEMENT FOR KUBOTA FARM TRACTOR	1.0	0.00	$0.00	$0.00	3342	16.6%	$0.00
PRESSURE WASHER		1.0	3.00	$3.00	$3.00	3342	16.6%	$0.50
Water T	2600 USG Slip-in Tank for Pro-line truck body	1.0	13.46	$13.46	$13.46	3342	16.6%	$2.24
Snow Blo	snowthrower serial #0809120885	1.0	1.04	$1.04	$1.04	3342	16.6%	$0.17
Salt & Sa	Salt and Sand Spreader added to 2012 Chev Silver	1.0	5.87	$5.87	$5.87	3342	16.6%	$0.98
Plow	Plow added to 2010 Chev Silverado pickup truck	1.0	4.45	$4.45	$4.45	3342	16.6%	$0.74
Rear Swi	75" Diamond Rear Swing HD Mower S/N #8126	1.0	14.09	$14.09	$14.09	3342	16.6%	$2.35
Catapilla	2014 Backhoe Loader Model 420FIT Serial No. LKH	1.0	92.01	$92.01	$92.01	3342	16.6%	$15.32
Sweeper	Used Sweeper for Holder	1.0	3.39	$3.39	$3.39	3342	16.6%	$0.56
Radios	New Radios	1.0	25.74	$25.74	$25.74	3342	16.6%	$4.29
Diesel Ta	New diesel tank DWV 2200L	1.0	2.04	$2.04	$2.04	3342	16.6%	$0.34
Rogers S	Shed at Rogers Tower for Radios	1.0	$21.59	$21.59	$21.59	3342	16.6%	$3.59
Equipme	Miscellaneous Items	1.0	$122.55	$122.55	$122.55	3342	16.6%	$20.40
Subtotal			**$2,429.19**	**$2,429.19**				**$404.44**
Storm Sewers								
	Linear Storm Sewers	5,089	$3,123.79	$3,123.79	$3,123.79	3342	8.3%	$260.04
	Catch Basins	107	$561.50	$561.50	$561.50	3342	8.3%	$46.74
	Manholes	53	$358.42	$358.42	$358.42	3342	8.3%	$29.84
Subtotal			**$4,043.71**	**$4,043.71**				**$336.62**

Total - Public Works		$31,413.0	$45,446.4				$4,221.0

Protection of Persons and Property Fire Protection	No.	Gross Cost	Replacement Cost	Per Unit Cost	Service Standard	Excess Capacity	Eligible Dev. Charge
Castleton Fire Hall	1.0	$51.21	$51.21	$51.21	3342	16.6%	$8.53
Fire Hall (Colborne)	1.0	$176.25	$176.25	$176.25	3342	8.3%	$14.67
Rogers Shed	1.0	$10.92	$10.92	$10.92	3342	16.6%	$1.82
Cargo Va 2005 CHEV EXPRESS CARGO 2500 TRUCK 891	1.0	24.14	$24.14	$24.14	3342	16.6%	$4.02
America 2006 Freightliner Truck 880	1.0	159.96	$159.96	$159.96	3342	16.6%	$26.63
America 2003 Freightliner Pumper Truck 871	1.0	232.53	$232.53	$232.53	3342	16.6%	$38.71
Superior 1998 Superior Pumper Truck #870	1.0	198.00	$198.00	$198.00	3342	16.6%	$32.97
Tanker 2003 Freightliner FL80 Truck #881	1.0	125.00	$125.00	$125.00	3342	16.6%	$20.81
Pickup 2006 Ford F150 Truck 899	1.0	19.29	$19.29	$19.29	3342	16.6%	$3.21
Bickle Pu Antique	1.0	0.00	$0.00	$0.00	3342	16.6%	$0.00
Pumper "Dependable Crimson" fire truck #872N	1.0	238.44	$238.44	$238.44	3342	16.6%	$39.70
2011 GM 2011 GMC K-CREW CAB VIN #3GTP2UEABG36989	1.0	32.71	$32.71	$32.71	3342	16.6%	$5.45
2009 CH 1500 CHEV SILVERADO	1.0	15.00	$15.00	$15.00	3342	16.6%	$2.50

Protection of Persons and Property Fire Protection	No.	Gross Cost	Replacement Cost	Per Unit Cost	Service Standard	Excess Capacity	Eligible Dev. Charge
GENERA	40KW Low Speed Generator	1.0	25.44	$25.44	$25.44	3342	16.6%	$4.24
Bunker (	5 Sets Bunker Gear	5.0	5.00	$5.00	$1.00	3342	16.6%	$0.83
Bunker (	7 Sets Bunker Gear	7.0	7.00	$7.00	$1.00	3342	16.6%	$1.17
Bunker (	13 Sets Bunker Gear	13.0	13.00	$13.00	$1.00	3342	16.6%	$2.16
Pagers	6 Pagers	6.0	3.00	$3.00	$0.50	3342	16.6%	$0.50
Bunker (	2 Set Bunker Gear	2.0	2.80	$2.80	$1.40	3342	16.6%	$0.47
Pagers	2 Pagers	2.0	1.00	$1.00	$0.50	3342	16.6%	$0.17
Pagers	13 Pagers	13.0	6.50	$6.50	$0.50	3342	16.6%	$1.08
Pagers	6 Pagers	6.0	3.00	$3.00	$0.50	3342	16.6%	$0.50
Pagers	4 Pagers	4.0	2.00	$2.00	$0.50	3342	16.6%	$0.33
Portable	10 Portable Radios	10.0	5.00	$5.00	$0.50	3342	16.6%	$0.83
Portable	2 Portable Radios	2.0	1.40	$1.40	$0.70	3342	16.6%	$0.23
Portable	1 Portable Radio	1.0	0.70	$0.70	$0.70	3342	16.6%	$0.12
Jaws of l	Jaws of Life Hurst Cutting Tool	1.0	11.47	$11.47	$11.47	3342	16.6%	$1.91
Bunker (	1 x Globe Firefighter Trouser	1.0	0.00	$0.00	$0.00	3342	16.6%	$0.00
Bunker (	7 Sets of Bunker Gear	7.0	8.55	$8.55	$1.22	3342	16.6%	$1.42
Kawasak	2012 Kawasaki Teryx 4 seater Model #KRT750ACF	1.0	13.53	$13.53	$13.53	3342	16.6%	$2.25
Utility Tr	72x144 Galv Utility Trailer	1.0	5.32	$5.32	$5.32	3342	16.6%	$0.89
Generat	20kw Generator 5 Year Warranty	1.0	11.23	$11.23	$11.23	3342	16.6%	$1.87
Bunker (	2 Sets of Bunker Gear (Globe)	2.0	2.84	$2.84	$1.42	3342	16.6%	$0.47
Auto Ex	300E 2.0 spreader c/w - S700 2.0 Cutter C/W R421	1.0	37.57	$37.57	$37.57	3342	16.6%	$6.26
BUNKER	2 SETS BUNKER GEAR	2.0	3.09	$3.09	$1.55	3342	16.6%	$0.51
BOOTS	LEATHER BOOTS/GLOBE BOOTS	3.0	1.24	$1.24	$0.41	3342	16.6%	$0.21
CHAINSAW		1.0	0.50	$0.50	$0.50	3342	16.6%	$0.08
BLITZFIR	ACC KIT FOR MASTER STREAM DEVICE	1.0	2.52	$2.52	$2.52	3342	16.6%	$0.42
GROUNI	TFT HIGH ELEVATION OSCILATING BLITZFIRE MON	1.0	2.70	$2.70	$2.70	3342	16.6%	$0.45
HELMET	CAIRNS #644 BLACK HELMET	1.0	0.25	$0.25	$0.25	3342	16.6%	$0.04
PAGER	MINITOR VI	1.0	0.48	$0.48	$0.48	3342	16.6%	$0.08
CHARGE	DOCKING STATION FOR TRUCKS	1.0	0.45	$0.45	$0.45	3342	16.6%	$0.08
DOCKIN(	CHARGER AMP/FLEX ANT CHARGER AMP	1.0	0.14	$0.14	$0.14	3342	16.6%	$0.02
PORTAB	XPR 7550 136-174 5W FKP GPS BT GOB-(4)	4.0	4.22	$4.22	$1.06	3342	16.6%	$0.70
SCBA PA	REFURB AP50, 2216, HUD, PASS, RIC, NO CYLINDE	6.0	11.95	$11.95	$1.99	3342	16.6%	$1.99
Radios p	New Radios-(7) FOR TRUCKS, 15 FOR PERSONS (22	22.0	28.50	$28.50	$1.30	3342	16.6%	$4.75
Globe Bo	Turnout boots-fire gear x1	1.0	0.55	$0.55	$0.55	3342	16.6%	$0.09
Leather	Uniform boots x3	3.0	0.73	$0.73	$0.24	3342	16.6%	$0.12
HELMET	CAIRNS #644 BLACK/RED HELMETS X5	5.0	1.42	$1.42	$0.28	3342	16.6%	$0.24
Bunker (	2 Sets of Bunker Gear (Globe)	2.0	3.49	$3.49	$1.75	3342	16.6%	$0.58
Pelican (	DFIB CASE PELICAN LARGE X2	2.0	0.43	$0.43	$0.22	3342	16.6%	$0.07
DFIB	AED PLUS, PS SERIES-AED CVR, LCD, NO VC RECG	2.0	3.14	$3.14	$1.57	3342	16.6%	$0.52
Gas Pow	Honda Gas Powered Blower 18" PPV	1.0	1.53	$1.53	$1.53	3342	16.6%	$0.25
DFIB	AED PLUS, PS SERIES-AED CVR, LCD, NO VC RECG	1.0	1.53	$1.53	$1.53	3342	16.6%	$0.25
Pelican (	DFIB CASE PELICAN LARGE	1.0	0.22	$0.22	$0.22	3342	16.6%	$0.04
Slip-On F	Slip-On Rancher Unit-65 gallon for grass fires-goes	1.0	3.59	$3.59	$3.59	3342	16.6%	$0.60
Slip-On F	Slip-On Rancher Unit-125 gallon for grass fires-goe	1.0	4.18	$4.18	$4.18	3342	16.6%	$0.70
Scott Sig	Thermal system-masks	2.0	3.79	$3.79	$1.89	3342	16.6%	$0.63
Equipme	Miscellaneous Items	1.0	372.29	$372.29	$372.29	3342	16.6%	$61.98
Subtotal			**$1,902.74**	**$1,902.74**				**$302.12**

Table 1A con't
Inventory of Township Facilities - Township of Cramahe

Protection of Persons and Property Emergency Management Services		No.	Gross Cost	Replacement Cost	Per Unit Cost	Service Standard	Excess Capacity	Eligible Dev. Charge
Office Space, Area within South Fire Hall, Cc	m2	10.0	$10.00	$10.00	$1.00	3342	16.6%	$1.66
Defibrilators (Town Hall)		1.0	$3.00	$3.00	$3.00	3342	16.6%	$0.50
20 kW generator (at South Fire Hall)		1.0	$12.00	$12.00	$12.00	3342	16.6%	$2.00
40KW Low Speed Generator (at Town Hall)		1.0	$25.44	$25.44	$25.44	3342	16.6%	$4.24
Subtotal			**$50.44**	**$50.44**				**$8.40**

Protection of Persons and Property By-law Enforcement		No.	Gross Cost	Replacement Cost	Per Unit Cost	Service Standard	Excess Capacity	Eligible Dev. Charge
Office Space, Area within Township Hall, Co	m2	10.0	$10.00	$10.00	$1.00	3342	16.6%	$1.66
Subtotal			**$10.00**	**$10.00**				**$1.66**

Protection of Persons and Property Community Policing		No.	Gross Cost	Replacement Cost	Per Unit Cost	Service Standard	Excess Capacity	Eligible Dev. Charge
Office Space, Area within Township Hall, Co	m2	61.0	$35.00	$35.00	$0.57	3342	16.6%	$5.83
Radar Sig SPEED SIGN YELLOW/WHITE FACE, SPRADDR1500,		1.0	$1.27	$1.27	$1.27	3342	16.6%	$0.21
Subtotal			**$36.27**	**$36.27**				**$6.04**

Table 1A con't

Inventory of Township Facilities - Township of Cramahe

Recreation and Culture Arenas and Parks	No.	Gross Cost	Replacement Cost	Per Unit Cost	Service Standard	Excess Capacity	Eligible Dev. Charge
Memori: Ball Diamonds	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Memori: Lighting	1.0	$59.13	$59.13	$59.13	3342	16.6%	$9.84
Memori: Infield Clay	1.0	$30.60	$30.60	$30.60	3342	16.6%	$5.09
Memori: Ball Diamond Back Stop/Perimeter Fence	1.0	$11.79	$11.79	$11.79	3342	16.6%	$1.96
Memori: Stands	1.0	$6.28	$6.28	$6.28	3342	16.6%	$1.05
Memori: Outfield Fencing	1.0	$1.06	$1.06	$1.06	3342	16.6%	$0.18
Memori: Canteen Building	1.0	$34.94	$34.94	$34.94	3342	16.6%	$5.82
Rotary C Ball Diamond (A)	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Rotary C Washroom/Canteen Building	1.0	$74.61	$74.61	$74.61	3342	16.6%	$12.42
Rotary C Lighting	1.0	$55.79	$55.79	$55.79	3342	16.6%	$9.29
Rotary C Outfield Fencing	1.0	$1.00	$1.00	$1.00	3342	16.6%	$0.17
Rotary C Infield Caly	1.0	$15.55	$15.55	$15.55	3342	16.6%	$2.59
Rotary C Back Stop/Perimeter Fence	1.0	$22.73	$22.73	$22.73	3342	16.6%	$3.78
Rotary C Stands	1.0	$3.19	$3.19	$3.19	3342	16.6%	$0.53
Memori: Washroom	1.0	$27.26	$27.26	$27.26	3342	16.6%	$4.54
Memori: Landscaping (level, seed/sod, drainage)	1.0	$22.40	$22.40	$22.40	3342	16.6%	$3.73
Rotary C Landscaping (level, seed/sod, drainage)	1.0	$20.94	$20.94	$20.94	3342	16.6%	$3.49
Rotary C Ball Diamond (B)	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Rotary C Backstop.Perimeter Fence	1.0	$22.73	$22.73	$22.73	3342	16.6%	$3.78
Rotary C Outfield Fence	1.0	$1.00	$1.00	$1.00	3342	16.6%	$0.17
Rotary C Lights	1.0	$55.79	$55.79	$55.79	3342	16.6%	$9.29
Rotary C Infield Clay	1.0	$15.55	$15.55	$15.55	3342	16.6%	$2.59
Rotary C Landscaping (level, seed/sod, drainage)	1.0	$20.94	$20.94	$20.94	3342	16.6%	$3.49
Rotary C Stands	1.0	$3.19	$3.19	$3.19	3342	16.6%	$0.53
Memori: Backstop for Ball Diamond C	1.0	$19.81	$19.81	$19.81	3342	16.6%	$3.30
Keeler C Keeler Centre (Arena)	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Keeler C HVAC/Mechanical	1.0	$548.00	$548.00	$548.00	3342	16.6%	$91.24
Keeler C Roofing	1.0	$60.00	$60.00	$60.00	3342	16.6%	$9.99
Keeler C Structure	1.0	$1,922.05	$1,922.05	$1,922.05	3342	16.6%	$320.01
Keeler C Internal Components (elevators, machinery etc)	1.0	$117.50	$117.50	$117.50	3342	16.6%	$19.56
Keeler C External Components - (parking lots, landscaping e	1.0	$140.54	$140.54	$140.54	3342	16.6%	$23.40
Keeler C Ice Plant Components	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Keeler C Ice Making Equipment	1.0	$283.00	$283.00	$283.00	3342	16.6%	$47.12
Keeler C Flooring	1.0	$86.00	$86.00	$86.00	3342	16.6%	$14.32
Keeler C Score Clock	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Keeler C Board System	1.0	$118.50	$118.50	$118.50	3342	16.6%	$19.73
Keeler C Signs	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Keeler C Spectator Seating	1.0	$27.00	$27.00	$27.00	3342	16.6%	$4.50
Keeler C Electrical	1.0	$208.50	$208.50	$208.50	3342	16.6%	$34.71
Keeler C Dishwasher	1.0	$9.57	$9.57	$9.57	3342	16.6%	$1.59
Electrica 2 Weather proof panels with 13 receptacles	1.0	$16.62	$16.62	$16.62	3342	16.6%	$2.77

Recreation and Culture, con't Arenas and Parks	No.	Gross Cost	Replacement Cost	Per Unit Cost	Service Standard	Excess Capacity	Eligible Dev. Charge
Zamboni	1.0	$79.52	$79.52	$79.52	3342	16.6%	$13.24
Marquee Keeler Centre Advertisment Sign	1.0	$18.00	$18.00	$18.00	3342	16.6%	$3.00
JOHN DE BUNKER & FIELD TAKE 1200A	1.0	$10.25	$10.25	$10.25	3342	16.6%	$1.71
2013 Gr Toro Groundmaster 3280D 4WD Serial#31300316	1.0	$21.37	$21.37	$21.37	3342	16.6%	$3.56
Stage Stage for Keeler Center	1.0	$2.18	$2.18	$2.18	3342	16.6%	$0.36
Ape Play Playground Equipment-Durham st	1.0	$55.16	$55.16	$55.16	3342	16.6%	$9.18
Tennis C Tennis Court & Club House (was formly the Lawn B	1.0	$42.50	$42.50	$42.50	3342	16.6%	$7.08
Fence ar 12' high posts, 10' high galv chainlink fence, 10' hig	1.0	$13.26	$13.26	$13.26	3342	16.6%	$2.21
Storagec Storage Bld at the Keeler Centre 80 Division ST	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Structur Structure of Storage Bld at Keeler Centre	1.0	$53.43	$53.43	$53.43	3342	16.6%	$8.90
Roof Steel Roof of Storage Bld at Keeler Centre	1.0	$49.00	$49.00	$49.00	3342	16.6%	$8.16
Tennis C Building at the Tennis Court	1.0	$46.00	$46.00	$46.00	3342	16.6%	$7.66
Equipme Miscellaneous Items	1.0	$131.35	$131.35	$131.35	3342	16.6%	$21.87
Subtotal		**$4,585.56**	**$4,585.56**				**$763.46**

Table 1A con't
Inventory of Township Facilities - Township of Cramahe

Recreation and Culture cont'd Libraries	No.	Gross Cost	Replacement Cost	Per Unit Cost	Service Standard	Excess Capacity	Eligible Dev. Charge
Library Building, 1A Colborne	1.0	$65.44	$65.44	$65.44	2919	7.3%	$4.78
2009 Lib Colborne & Caslteton Library Books & Periodicals	1.0	$38.32	$38.32	$38.32	3342	16.6%	$6.38
2010 bo Books, Movies & Videos, Talking Books, Print Pool	1.0	$37.14	$37.14	$37.14	3342	16.6%	$6.18
2011 Bo 2011 purchase of movies/videos, talking books, pr	1.0	$32.65	$32.65	$32.65	3342	16.6%	$5.44
2012 BO 2012 PURCHASE OF MOVIES/VIDEOS, TALKING BO	1.0	$33.22	$33.22	$33.22	3342	16.6%	$5.53
2013 Lib Books for Colborne and Castleton Library, Movies,	1.0	$34.45	$34.45	$34.45	3342	16.6%	$5.74
2014 Lib Books for Colborne and Castleton Library, Movies,	1.0	$32.80	$32.80	$32.80	3342	16.6%	$5.46
2015 Lib Books for Colborne and Castleton Libraries	1.0	$35.09	$35.09	$35.09	3342	16.6%	$5.84
2016 Lib Books for Colborne and Castleton Libraries	1.0	$35.17	$35.17	$35.17	3342	16.6%	$5.86
2017 Lib Books for Colborne and Castleton Libraries	1.0	$35.00	$35.00	$35.00	3342	16.6%	$5.83
Parking Lot - Colborne Library	1.0	$3.43	$3.43	$3.43	3342	16.6%	$0.57
HVAC/Mechanical - Castleton Townhall	1.0	$1.50	$1.50	$1.50	3342	16.6%	$0.25
Roofing - Castleton Townhall	1.0	$2.82	$2.82	$2.82	3342	16.6%	$0.47
Structure - Castleton Townhall	1.0	$16.13	$16.13	$16.13	3342	16.6%	$2.68
Parking Lot - Castleton Townhall	1.0	$4.48	$4.48	$4.48	3342	16.6%	$0.75
Subtotal		**$407.64**	**$407.64**	**$407.64**			**$61.75**

Cemeteries	No.	Gross Cost	Replacement Cost	Per Unit Cost	Service Standard	Excess Capacity	Eligible Dev. Charge
224 Durl East Colborne Cemetery	1.0	$14.45	$14.45	$14.45	3342	16.6%	$2.41
Burial Grounds	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Scattering Grounds	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Columbarium	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Con 5 Pt Walker Cemetery	1.0	$17.68	$17.68	$17.68	3342	16.6%	$2.94
Burial Ground	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Scattering Grounds	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Columbarium	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Con 1 Pt Woods Cemetery	1.0	$74.76	$74.76	$74.76	3342	16.6%	$12.45
Burial Ground	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Scattering Grounds	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Columbarium	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Carr Roa Carr Cemetery	1.0	$4.06	$4.06	$4.06	3342	16.6%	$0.68
Conc 9 p Red Cloud Cemetery	1.0	$17.43	$17.43	$17.43	3342	16.6%	$2.90
Subtotal		**$128.38**	**$128.38**				**$21.37**

Subtotal Total - Township Wide		**$38,550.0**	**$52,583.4**				**$5,388.5**

Table 1A con't

Inventory of Township Facilities - Township of Cramahe

Waterworks		No.	Gross Cost	Replacement Cost	Per Unit Cost	Service Standard	Excess Capacity	Eligible Dev. Charge
Total Mains		23,844 m						
Watermain	Cast Iron, PVC, Ductile Iron, Poloyethylene	1.0	$2,306.38	$2,306.38	$2,306.38	3342	16.6%	$383.99
Spoolers	Residential Spoolers	1.0	$15.53	$15.53	$15.53	3342	16.6%	$2.58
SCADA	Water Treatment Plant Computer Control System	1.0	$38.30	$38.30	$38.30	3342	16.6%	$6.38
Water Ti	Colborne water storage upgrade	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Water Ti	Storage Tank	1.0	$387.50	$387.50	$387.50	3342	16.6%	$64.52
Water Ti	Upgardes to Tower	1.0	$192.79	$192.79	$192.79	3342	16.6%	$32.10
Water M	Residential, Industrial and Commerical Water Met	1.0	$222.75	$222.75	$222.75	3342	16.6%	$37.09
Water M	Industrial and Commerical Water Meters	1.0	$50.09	$50.09	$50.09	3342	16.6%	$8.34
Generat	100 KW Generator and encolsure for WTP	1.0	$63.16	$63.16	$63.16	3342	16.6%	$10.52
Hydrants		111.0	$70.32	$70.32	$0.63	3342	16.6%	$11.71
Well No	Well No 1	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Well No	Well No 2	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
Electrica	Electrical System Varaiable frequency drive motor	1.0	$20.57	$20.57	$20.57	3342	16.6%	$3.43
Pump	Pump	1.0	$72.78	$72.78	$72.78	3342	16.6%	$12.12
Drilled h	Drilled hole with casing and screen	1.0	$90.46	$90.46	$90.46	3342	16.6%	$15.06
Varaiabl	Electrical System, varaiable frequency drive motor	1.0	$20.32	$20.32	$20.32	3342	16.6%	$3.38
Pump	Pump	1.0	$77.20	$77.20	$77.20	3342	16.6%	$12.85
Drilled h	Driiled hole with casing and screen	1.0	$154.39	$154.39	$154.39	3342	16.6%	$25.70
Total - Waterworks System			**$3,782.52**	**$3,782.52**				**$629.76**

Environmental Services		No.	Gross Cost	Replacement Cost	Per Unit Cost	Service Standard	Excess Capacity	Eligible Dev. Charge
Big Apple Drive	150 mm HDPE DR @ 6.0%	1.0	$267.71	$267.71	$267.71	3342	16.6%	$44.57
Purdy Road	100 mm HDPE DR @ 0.5%	1.0	$203.29	$203.29	$203.29	3342	16.6%	$33.85
Sanitary Sewer	Asbestos Concrete, Concrete, PVC	1.0	$1,211.46	$1,211.46	$1,211.46	3342	16.6%	$201.70
Sanitary	Maintenance Hole	204.0	$1,972.50	$1,972.50	$9.67	3342	16.6%	$328.41
Sewer Tr	Upgrades to the Sewer Treatment Plant and Expar	1.0	$7,551.15	$7,551.15	$7,551.15	3342	16.6%	$1,257.21
Structur	Concrete Structure under ground for eff. flow met	1.0	$9.57	$9.57	$9.57	3342	16.6%	$1.59
HVAC/M	Sewer Treatment Plant	1.0	$5.37	$5.37	$5.37	3342	16.6%	$0.89
Roofing	Sewer Treatment Plant	1.0	$7.17	$7.17	$7.17	3342	16.6%	$1.19
Structur	Sewer Treatment Plant	1.0	$89.56	$89.56	$89.56	3342	16.6%	$14.91
Internal	Transfer Switch, Generator at Sewer Treatment Pl	1.0	$15.40	$15.40	$15.40	3342	16.6%	$2.56
External	Sewer Treatment Plant	1.0	$5.25	$5.25	$5.25	3342	16.6%	$0.87
1108 On	Sewer Treatment Plant	1.0	$0.00	$0.00	$0.00	3342	16.6%	$0.00
External	Sewer Treatment Plant Concrete precast building	1.0	$7.89	$7.89	$7.89	3342	16.6%	$1.31
321 Purc	Main Pump House	1.0	$13.57	$13.57	$13.57	3342	16.6%	$2.26
46 Parlia	Pump House	1.0	$8.42	$8.42	$8.42	3342	16.6%	$1.40
Total - Sewage Collection and Treatment System			**$11,368.31**	**$11,368.31**				**$1,892.73**

Total - Township			**$38,550.02**	**$52,583.44**				**$7,911.00**

Table 1B
Inventory of Township Facilities - Township of Cramahe

Allocation of Eligible Development Charges	Input Data	Residential Share	91.7%
(2017 $,000)		Com/Ind Share	8.3%
Township of Cramahe			

Administration Services Development Charges	**Eligible Dev. Charge**	**Residential Share**	**Non-Res Share**
Office Space	$1.66	$1.53	$0.14
Equipment	$0.67	$0.61	$0.06
Furniture	$0.33	$0.31	$0.03
Subtotal	**$2.66**	**$2.44**	**$0.22**

Table 1B con't
Inventory of Township Facilities - Township of Cramahe

Public Works Road Surface	**Eligible Dev. Charge**	**Residential Share**	**Non-Res Share**
Gravel Roads	$149.97	$137.49	$12.48
Surface Treated	$1,207.44	$1,106.96	$100.48
Hot Mixed Paved	$509.38	$466.99	$42.39
Subtotal	**$1,866.80**	**$1,711.45**	**$155.35**

Buildings			
North Garage	$29.72	$27.24	$2.47
South Garage	$41.92	$38.43	$3.49
North Salt Building	$26.43	$24.23	$2.20
Gravel Pit/Sand Dome	$16.71	$15.32	$1.39
South salt/sand storage shed	$5.26	$4.83	$0.44
Subtotal	**$114.78**	**$105.22**	**$9.55**

Road and Street			
Culverts	$64.27	$58.92	$5.35
Bridges	$1,072.48	$983.23	$89.25
Streetlights	$69.64	$63.85	$5.80
Sidewalks	$286.73	$262.87	$23.86
Cross Walk	$5.27	$4.84	$0.44
Subtotal	**$1,498.40**	**$1,373.70**	**$124.69**

Table 1B con't Inventory of Township Facilities - Township of Cramahe			
Public Works con't Rolling Stock & Equipment	**Eligible Dev. Charge**	**Residential Share**	**Non-Res Share**
Pelican Sweeper	$9.74	$8.93	$0.81
FARM TRACTOR	$10.86	$9.96	$0.90
KUBOTA LAWN TRACTOR	$5.04	$4.62	$0.42
INTERNATIONAL 7400	$23.23	$21.30	$1.93
INTERNATIONAL 2674	$29.36	$26.92	$2.44
INTERNATIONAL 7600	$28.28	$25.93	$2.35
CHAMPION 740 GRADER	$30.20	$27.69	$2.51
621B LOADER	$15.57	$14.27	$1.30
580 SM BACKHOE	$14.78	$13.55	$1.23
CHEV 3500 DUMP	$7.73	$7.08	$0.64
CHEV PICK-UP	$4.64	$4.26	$0.39
Motor Grader	$38.28	$35.09	$3.19
2009 Chev Silverado	$4.39	$4.02	$0.37
Dodge Truck	$4.58	$4.20	$0.38
Tandem Truck	$29.32	$26.88	$2.44
Tandem Truck	$29.69	$27.22	$2.47
Pickup	$3.05	$2.80	$0.25
Chev Ext-Cab	$4.55	$4.17	$0.38
Holder 2006 Model #474 Sidewalk Tractor	$9.05	$8.29	$0.75
Volvo EW180D Wheeled Excavator	$44.90	$41.16	$3.74
2013 Toyota Tundra	$5.63	$5.16	$0.47
TRAILER	$0.00	$0.00	$0.00
CHAINSAW	$0.08	$0.08	$0.01
BUSH HOG	$0.00	$0.00	$0.00
PRESSURE WASHER	$0.50	$0.46	$0.04
Water Tank	$2.24	$2.05	$0.19
Snow Blower	$0.17	$0.16	$0.01
Salt & Sand Spreader	$0.98	$0.90	$0.08
Plow	$0.74	$0.68	$0.06
Rear Swing Mower	$2.35	$2.15	$0.20
Catapillar Backhoe Loader	$15.32	$14.04	$1.27
Sweeper	$0.56	$0.52	$0.05
Radios	$4.29	$3.93	$0.36
Diesel Tank	$0.34	$0.31	$0.03
Rogers Shed	$3.59	$3.30	$0.30
Equipment	$20.40	$18.71	$1.70
Subtotal	**$404.44**	**$370.78**	**$33.66**
Storm Sewers			
Linear Storm Sewers	$260.04	$238.40	$21.64
Catch Basins	$46.74	$42.85	$3.89
Manholes	$29.84	$27.35	$2.48
Subtotal	**$336.62**	**$308.61**	**$28.01**

Total - Public Works	$4,221.04	$3,869.77	$351.27
Protection of Persons and Property Fire Protection	Eligible Dev. Charge	Residential Share	Non-Res Share
Castleton Fire Hall	$8.53	$7.82	$0.71
Fire Hall (Colborne)	$14.67	$13.45	$1.22
Rogers Shed	$1.82	$1.67	$0.15
Cargo Van	$4.02	$3.69	$0.33
American Lafrance Tanker	$26.63	$24.42	$2.22
American Lafrance Pumper	$38.71	$35.49	$3.22
Superior Pumper	$32.97	$30.22	$2.74
Tanker	$20.81	$19.08	$1.73
Pickup	$3.21	$2.94	$0.27
Bickle Pumper	$0.00	$0.00	$0.00
Pumper Truck	$39.70	$36.39	$3.30
2011 GMC K-CREW CAB	$5.45	$4.99	$0.45
2009 CHEV SILVERADO	$2.50	$2.29	$0.21

Protection of Persons and Property Fire Protection	Eligible Dev. Charge	Residential Share	Non-Res Share
GENERATOR	$4.24	$3.88	$0.35
Bunker Gear	$0.83	$0.76	$0.07
Bunker Gear	$1.17	$1.07	$0.10
Bunker Gear	$2.16	$1.98	$0.18
Pagers	$0.50	$0.46	$0.04
Bunker Gear	$0.47	$0.43	$0.04
Pagers	$0.17	$0.15	$0.01
Pagers	$1.08	$0.99	$0.09
Pagers	$0.50	$0.46	$0.04
Pagers	$0.33	$0.31	$0.03
Portable Radio	$0.83	$0.76	$0.07
Portable Radios	$0.23	$0.21	$0.02
Portable Radio	$0.12	$0.11	$0.01
Jaws of Life Hurst Cutting Tool	$1.91	$1.75	$0.16
Bunker Gear	$0.00	$0.00	$0.00
Bunker Gear	$1.42	$1.31	$0.12
Kawasaki Teryx 4-seater	$2.25	$2.06	$0.19
Utility Trailer	$0.89	$0.81	$0.07
Generator	$1.87	$1.71	$0.16
Bunker Gear	$0.47	$0.43	$0.04
Auto Ex Equipment (Jaws for Life)	$6.26	$5.73	$0.52
BUNKER GEAR	$0.51	$0.47	$0.04
BOOTS	$0.21	$0.19	$0.02
CHAINSAW	$0.08	$0.08	$0.01
BLITZFIRE ACC KIT MAX FORCE	$0.42	$0.39	$0.03
GROUND MASTER STREAM DEVICE	$0.45	$0.41	$0.04
HELMET	$0.04	$0.04	$0.00
PAGER	$0.08	$0.07	$0.01
CHARGER	$0.08	$0.07	$0.01
DOCKING FOR PAGERS	$0.02	$0.02	$0.00
PORTABLE RADIOS	$0.70	$0.64	$0.06
SCBA PACKS	$1.99	$1.82	$0.17
Radios portable and mounted	$4.75	$4.35	$0.39
Globe Boots	$0.09	$0.08	$0.01
Leather Boots	$0.12	$0.11	$0.01
HELMETS-x5	$0.24	$0.22	$0.02
Bunker Gear	$0.58	$0.53	$0.05
Pelican Case	$0.07	$0.07	$0.01
DFIB	$0.52	$0.48	$0.04
Gas Powered Blower	$0.25	$0.23	$0.02
DFIB	$0.25	$0.23	$0.02
Pelican Case	$0.04	$0.03	$0.00
Slip-On Rancher Unit 65 gal	$0.60	$0.55	$0.05
Slip-On Rancher Unit 125 gal	$0.70	$0.64	$0.06
Scott Sight Sys.	$0.63	$0.58	$0.05
Equipment	$61.98	$56.83	$5.16
Subtotal	**$302.12**	**$276.98**	**$25.14**

Table 1B con't
Inventory of Township Facilities - Township of Cramahe

Protection of Persons and Property Emergency Management Services	Eligible Dev. Charge	Residential Share	Non-Res Share
Office Space, Area within South Fire Hall, Colborne	$1.66	$1.53	$0.14
Defibrilators (Town Hall)	$0.50	$0.46	$0.04
20 kW generator (at South Fire Hall)	$2.00	$1.83	$0.17
40KW Low Speed Generator (at Town Hall)	$4.24	$3.88	$0.35
Subtotal	**$8.40**	**$7.70**	**$0.70**

Protection of Persons and Property By-law Enforcement	Eligible Dev. Charge	Residential Share	Non-Res Share
Office Space, Area within Township Hall, Colborne	$1.66	$1.53	$0.14
Subtotal	**$1.66**	**$1.53**	**$0.14**

Protection of Persons and Property **Community Policing**	Eligible Dev. Charge	Residential Share	Non-Res Share
Office Space, Area within Township Hall, Colborne	$5.83	$5.34	$0.48
Radar Sign	$0.21	$0.19	$0.02
Subtotal	**$6.04**	**$5.54**	**$0.50**

Table 1B con't
Inventory of Township Facilities - Township of Cramahe

Recreation and Culture Arenas and Parks	Eligible Dev. Charge	Residential Share	Non-Res Share
Memorial Park	$0.00	$0.00	$0.00
Memorial Park	$9.84	$9.84	$0.00
Memorial Park	$5.09	$5.09	$0.00
Memorial Park	$1.96	$1.96	$0.00
Memorial Park	$1.05	$1.05	$0.00
Memorial Park	$0.18	$0.18	$0.00
Memorial Park	$5.82	$5.82	$0.00
Rotary Centennial Park	$0.00	$0.00	$0.00
Rotary Centennial Park	$12.42	$12.42	$0.00
Rotary Centennial Park	$9.29	$9.29	$0.00
Rotary Centennial Park	$0.17	$0.17	$0.00
Rotary Centennial Park	$2.59	$2.59	$0.00
Rotary Centennial Park	$3.78	$3.78	$0.00
Rotary Centennial Drive	$0.53	$0.53	$0.00
Memorial Park	$4.54	$4.54	$0.00
Memorial Park	$3.73	$3.73	$0.00
Rotary Centennial Park	$3.49	$3.49	$0.00
Rotary Centennial Park	$0.00	$0.00	$0.00
Rotary Centennial Park	$3.78	$3.78	$0.00
Rotary Centennial Park	$0.17	$0.17	$0.00
Rotary Centennial Park	$9.29	$9.29	$0.00
Rotary Centennial Park	$2.59	$2.59	$0.00
Rotary Centennial Park	$3.49	$3.49	$0.00
Rotary Centennial Park	$0.53	$0.53	$0.00
Memorial Park Backstop	$3.30	$3.30	$0.00
Keeler Centre	$0.00	$0.00	$0.00
Keeler Centre	$91.24	$91.24	$0.00
Keeler Centre	$9.99	$9.99	$0.00
Keeler Centre	$320.01	$320.01	$0.00
Keeler Centre	$19.56	$19.56	$0.00
Keeler Centre Paved Parking Lot	$23.40	$23.40	$0.00
Keeler Centre	$0.00	$0.00	$0.00
Keeler Centre	$47.12	$47.12	$0.00
Keeler Centre	$14.32	$14.32	$0.00
Keeler Centre	$0.00	$0.00	$0.00
Keeler Centre	$19.73	$19.73	$0.00
Keeler Centre	$0.00	$0.00	$0.00
Keeler Centre	$4.50	$4.50	$0.00
Keeler Centre	$34.71	$34.71	$0.00
Keeler Centre	$1.59	$1.59	$0.00
Electrical Panels	$2.77	$2.77	$0.00

Recreation and Culture, con't Arenas and Parks	Eligible Dev. Charge	Residential Share	Non-Res Share
Zamboni	$13.24	$13.24	$0.00
Marquee Sign	$3.00	$3.00	$0.00
JOHN DEERE FIELD RAKE	$1.71	$1.71	$0.00
2013 Groundmaster 3280D	$3.56	$3.56	$0.00
Stage	$0.36	$0.36	$0.00
Ape Playground Equipment	$9.18	$9.18	$0.00
Tennis Court	$7.08	$7.08	$0.00
Fence around the Tennis Court	$2.21	$2.21	$0.00
Storaged Bld at the Keeler Centre	$0.00	$0.00	$0.00
Structure of Storage Bld	$8.90	$8.90	$0.00
Roof	$8.16	$8.16	$0.00
Tennis Court (former lawn blowling bld)	$7.66	$7.66	$0.00
Equipment	$21.87	$21.87	$0.00
Subtotal	**$763.46**	**$763.46**	**$0.00**

Table 1B con't Inventory of Township Facilities - Township of Cramahe			
Recreation and Culture cont'd Libraries	Eligible Dev. Charge	Residential Share	Non-Res Share
Library Building, 1A Colborne	$4.78	$4.78	$0.00
2009 Library Books & Periodicals	$6.38	$6.38	$0.00
2010 books and periodicals	$6.18	$6.18	$0.00
2011 Books & Periodicals	$5.44	$5.44	$0.00
2012 BOOKS & PERIODICAL	$5.53	$5.53	$0.00
2013 Library Books and Periodicals	$5.74	$5.74	$0.00
2014 Library Books and Periodicals	$5.46	$5.46	$0.00
2015 Library Books & Periodicals	$5.84	$5.84	$0.00
2016 Library Books & Periodicals	$5.86	$5.86	$0.00
2017 Library Books & Periodicals	$5.83	$5.83	$0.00
Parking Lot - Colborne Library	$0.57	$0.57	$0.00
HVAC/Mechanical - Castleton Townhall	$0.25	$0.25	$0.00
Roofing - Castleton Townhall	$0.47	$0.47	$0.00
Structure - Castleton Townhall	$2.68	$2.68	$0.00
Parking Lot - Castleton Townhall	$0.75	$0.75	$0.00
Subtotal	**$61.75**	**$61.75**	**$0.00**

Cemeteries	Eligible Dev. Charge	Residential Share	Non-Res Share
224 Durham St	$2.41	$2.41	$0.00
Burial Grounds	$0.00	$0.00	$0.00
Scattering Grounds	$0.00	$0.00	$0.00
Columbarium	$0.00	$0.00	$0.00
Con 5 Pt Lot 26	$2.94	$2.94	$0.00
Burial Ground	$0.00	$0.00	$0.00
Scattering Grounds	$0.00	$0.00	$0.00
Columbarium	$0.00	$0.00	$0.00
Con 1 Pt Lot 12	$12.45	$12.45	$0.00
Burial Ground	$0.00	$0.00	$0.00
Scattering Grounds	$0.00	$0.00	$0.00
Columbarium	$0.00	$0.00	$0.00
Carr Road	$0.68	$0.68	$0.00
Conc 9 pt Lot 30	$2.90	$2.90	$0.00
Subtotal	**$21.37**	**$21.37**	**$0.00**

Total	**$5,388.51**	**$5,010.54**	**$377.97**

Table 1B con't Inventory of Township Facilities - Township of Cramahe			
Waterworks	Eligible Dev. Charge	Residential Share	Non-Res Share
Watermain Cast Iron, PVC, Ductile Iron, Poloyethylene	$383.99	$352.04	$31.96
Spoolers	$2.58	$2.37	$0.22
SCADA	$6.38	$5.85	$0.53
Water Tower	$0.00	$0.00	$0.00
Water Tower	$64.52	$59.15	$5.37
Water Tower	$32.10	$29.43	$2.67
Water Meters	$37.09	$34.00	$3.09
Water Meters	$8.34	$7.65	$0.69
Generator w Fence WTP	$10.52	$9.64	$0.88
Hydrants	$11.71	$10.73	$0.97
Well No 1	$0.00	$0.00	$0.00
Well No 2	$0.00	$0.00	$0.00
Electrical System	$3.43	$3.14	$0.29
Pump	$12.12	$11.11	$1.01
Drilled hole woth casing and screen	$15.06	$13.81	$1.25
Varaiable frequency drive motor	$3.38	$3.10	$0.28
Pump	$12.85	$11.78	$1.07
Drilled hole with casing and screen	$25.70	$23.57	$2.14
Total	**$629.76**	**$577.35**	**$52.41**

Environmental Services	Eligible Dev. Charge	Residential Share	Non-Res Share
Big Apple Drive 150 mm HDPE DR @ 6.0%	$44.57	$40.86	$3.71
Purdy Road 100 mm HDPE DR @ 0.5%	$33.85	$31.03	$2.82
Sanitary Sewer Asbestos Concrete, Concrete, PVC	$201.70	$184.91	$16.78
Sanitary Maintenance Hole	$328.41	$301.08	$27.33
Sewer Treatment Plant Expansion	$1,257.21	$1,152.59	$104.62
Structure for Eff. Flow Meter	$1.59	$1.46	$0.13
HVAC/Mechanical	$0.89	$0.82	$0.07
Roofing	$1.19	$1.09	$0.10
Structure	$14.91	$13.67	$1.24
Internal Components (transfer switch,generator etc)	$2.56	$2.35	$0.21
External Components(parking lots,landscaping etc)	$0.87	$0.80	$0.07
1108 Ontario St	$0.00	$0.00	$0.00
External Component - Effluient Monitoring Station	$1.31	$1.20	$0.11
321 Purdy Rd	$2.26	$2.07	$0.19
46 Parliament St	$1.40	$1.29	$0.12
Total	**$1,892.73**	**$1,735.22**	**$157.51**

Total	**$7,911.00**	**$7,323.11**	**$587.89**

Table 2A
Future Municipal Expenditures
That Qualify as Growth-Related Under the Development Charges Act
(2017 $,000)

Administration Development Charges	Expend Year	Gross Cost	Net Cost	% due to Growth	Discount	Eligible Dev. Charge
Development Charges Study and By-law	2018	$15.00	$15.00	100.0%	no	$15.00
Development Charges Update	2023	$15.00	$15.00	100.0%	no	$15.00
Growth Related Studies						
Official Plan Update	2020	$50.00	$50.00	100.0%	no	$50.00
Zoning By-law Update	2021	$50.00	$50.00	100.0%	no	$50.00
Fibre Optics	2018	$19.27	$12.53	20.0%	no	$2.51
Subtotal		**$149.27**	**$142.53**			**$132.51**

Public Works	Expend Year	Gross Cost	Net Cost	% due to Growth	Discount	Eligible Dev. Charge
Annual Construction and Equipment Replacement	2018	$440.00	$286.00	20.0%	no	$57.20
Sidewalk Tractor Replacement	2018	$47.30	$30.75	20.0%	no	$6.15
1 Ton Truck Replacement	2018	$72.00	$46.80	20.0%	no	$9.36
Tractor	2018	$220.00	$143.00	20.0%	no	$28.60
Bridge Repairs	2018	$141.50	$91.98	20.0%	no	$18.40
Annual Construction and Equipment Replacement	2019	$440.00	$286.00	20.0%	no	$57.20
Annual Construction and Equipment Replacement	2020	$440.00	$286.00	20.0%	no	$57.20
Annual Construction and Equipment Replacement	2021	$440.00	$286.00	20.0%	no	$57.20
Annual Construction and Equipment Replacement	2022	$440.00	$286.00	20.0%	no	$57.20
Annual Construction and Equipment Replacement	2023	$440.00	$286.00	20.0%	no	$57.20
Annual Construction and Equipment Replacement	2024	$440.00	$286.00	20.0%	no	$57.20
Annual Construction and Equipment Replacement	2025	$440.00	$286.00	20.0%	no	$57.20
Annual Construction and Equipment Replacement	2026	$440.00	$286.00	20.0%	no	$57.20
Annual Construction and Equipment Replacement	2027	$440.00	$286.00	20.0%	no	$57.20
Annual Grants						
Federal Gas Tax	2018	-$175.00	-$113.75	20.0%	no	-$22.75
Federal Gas Tax	2019	-$175.00	-$113.75	20.0%	no	-$22.75
Federal Gas Tax	2020	-$175.00	-$113.75	20.0%	no	-$22.75
Federal Gas Tax	2021	-$175.00	-$113.75	20.0%	no	-$22.75
Federal Gas Tax	2022	-$175.00	-$113.75	20.0%	no	-$22.75
Federal Gas Tax	2023	-$175.00	-$113.75	20.0%	no	-$22.75
Federal Gas Tax	2024	-$175.00	-$113.75	20.0%	no	-$22.75
Federal Gas Tax	2025	-$175.00	-$113.75	20.0%	no	-$22.75
Federal Gas Tax	2026	-$175.00	-$113.75	20.0%	no	-$22.75
Federal Gas Tax	2027	-$175.00	-$113.75	20.0%	no	-$22.75
OCIF	2018	-$50.00	-$32.50	20.0%	no	-$6.50
OCIF	2019	-$50.00	-$32.50	20.0%	no	-$6.50
OCIF	2020	-$50.00	-$32.50	20.0%	no	-$6.50
OCIF	2021	-$50.00	-$32.50	20.0%	no	-$6.50
OCIF	2022	-$50.00	-$32.50	20.0%	no	-$6.50
OCIF	2023	-$50.00	-$32.50	20.0%	no	-$6.50
OCIF	2024	-$50.00	-$32.50	20.0%	no	-$6.50
OCIF	2025	-$50.00	-$32.50	20.0%	no	-$6.50
OCIF	2026	-$50.00	-$32.50	20.0%	no	-$6.50
OCIF	2027	-$50.00	-$32.50	20.0%	no	-$6.50
Subtotal		**$2,630.80**	**$1,710.02**			**$342.00**

Table 2A cont'd
Future Municipal Expenditures - Township of Cramahe

Protection of People and Property - Fire Protection	Expend Year	Gross Cost	Net Cost	% due to Growth	Discount	Eligible Dev. Charge
Annual Equipment Upgrade and Replacement	2018	$82.50	$74.25	20.0%	no	$14.85
Thermal Imaging	2018	$10.00	$9.00	20.0%	no	$1.80
Annual Equipment Upgrade and Replacement	2019	$82.50	$74.25	20.0%	no	$14.85
Annual Equipment Upgrade and Replacement	2020	$82.50	$74.25	20.0%	no	$14.85
Annual Equipment Upgrade and Replacement	2021	$82.50	$74.25	20.0%	no	$14.85
Annual Equipment Upgrade and Replacement	2022	$82.50	$74.25	20.0%	no	$14.85
Annual Equipment Upgrade and Replacement	2023	$82.50	$74.25	20.0%	no	$14.85
Annual Equipment Upgrade and Replacement	2024	$82.50	$74.25	20.0%	no	$14.85
Annual Equipment Upgrade and Replacement	2025	$82.50	$74.25	20.0%	no	$14.85
Annual Equipment Upgrade and Replacement	2026	$82.50	$74.25	20.0%	no	$14.85
Annual Equipment Upgrade and Replacement	2027	$82.50	$74.25	20.0%	no	$14.85
Subtotal		**$835.00**	**$751.50**			**$150.30**

- Emergency management	Expend Year	Gross Cost	Net Cost	% due to Growth	Discount	Eligible Dev. Charge
Equipment Upgrade and Replacement	2018	$2.50	$1.88	20.0%	no	$0.38
Equipment Upgrade and Replacement	2019	$2.50	$1.88	20.0%	no	$0.38
Equipment Upgrade and Replacement	2020	$2.50	$1.88	20.0%	no	$0.38
Equipment Upgrade and Replacement	2021	$2.50	$1.88	20.0%	no	$0.38
Equipment Upgrade and Replacement	2022	$2.50	$1.88	20.0%	no	$0.38
Equipment Upgrade and Replacement	2023	$2.50	$1.88	20.0%	no	$0.38
Equipment Upgrade and Replacement	2024	$2.50	$1.88	20.0%	no	$0.38
Equipment Upgrade and Replacement	2025	$2.50	$1.88	20.0%	no	$0.38
Equipment Upgrade and Replacement	2026	$2.50	$1.88	20.0%	no	$0.38
Equipment Upgrade and Replacement	2027	$2.50	$1.88	20.0%	no	$0.38
Subtotal		**$25.00**	**$18.75**			**$3.75**

Table 2A cont'd
Future Municipal Expenditures - Township of Cramahe

- By-law Enforcement	Expend Year	Gross Cost	Net Cost	% due to Growth	Discount	Eligible Dev. Charge
Equipment Upgrade and Replacement	2018	$6.50	$4.88	10.0%	10.0%	$0.49
Equipment Upgrade and Replacement	2019	$6.50	$4.88	10.0%	10.0%	$0.49
Equipment Upgrade and Replacement	2020	$6.50	$4.88	10.0%	10.0%	$0.49
Equipment Upgrade and Replacement	2021	$6.50	$4.88	10.0%	10.0%	$0.49
Equipment Upgrade and Replacement	2022	$6.50	$4.88	10.0%	10.0%	$0.49
Equipment Upgrade and Replacement	2023	$6.50	$4.88	10.0%	10.0%	$0.49
Equipment Upgrade and Replacement	2024	$6.50	$4.88	10.0%	10.0%	$0.49
Equipment Upgrade and Replacement	2025	$6.50	$4.88	10.0%	10.0%	$0.49
Equipment Upgrade and Replacement	2026	$6.50	$4.88	10.0%	10.0%	$0.49
Equipment Upgrade and Replacement	2027	$6.50	$4.88	10.0%	10.0%	$0.49
Subtotal		**$65.00**	**$48.75**			**$4.88**

- Community Policing	Expend Year	Gross Cost	Net Cost	% due to Growth	Discount	Eligible Dev. Charge
Equipment Upgrade and Replacement	2018	$6.50	$4.88	10.0%	no	$0.49
Equipment Upgrade and Replacement	2019	$6.50	$4.88	10.0%	no	$0.49
Equipment Upgrade and Replacement	2020	$6.50	$4.88	10.0%	no	$0.49
Equipment Upgrade and Replacement	2021	$6.50	$4.88	10.0%	no	$0.49
Equipment Upgrade and Replacement	2022	$6.50	$4.88	10.0%	no	$0.49
Equipment Upgrade and Replacement	2023	$6.50	$4.88	10.0%	no	$0.49
Equipment Upgrade and Replacement	2024	$6.50	$4.88	10.0%	no	$0.49
Equipment Upgrade and Replacement	2025	$6.50	$4.88	10.0%	no	$0.49
Equipment Upgrade and Replacement	2026	$6.50	$4.88	10.0%	no	$0.49
Equipment Upgrade and Replacement	2027	$6.50	$4.88	10.0%	no	$0.49
Subtotal		**$65.00**	**$48.75**			**$4.88**

Subtotal Protection of People and Property		**$3,620.80**	**$2,577.77**			**$505.80**

Table 2A cont'd
Future Municipal Expenditures - Township of Cramahe

Recreation and Culture - Arenas and parks	Expend Year	Gross Cost	Net Cost	% due to Growth	Discount	Eligible Dev. Charge (90%)
Equipment and Facility Upgrade and Replacement	2018	$250.00	$187.50	20.0%	10.0%	$33.75
Keeler Centre LED Lighting, High Bay	2018	$75.00	$56.25	20.0%	10.0%	$10.13
Building Soccer Fields	2018	$50.00	$37.50	20.0%	10.0%	$6.75
		$250.00	$187.50	20.0%	10.0%	$33.75
Equipment and Facility Upgrade and Replacement	2019	$250.00	$187.50	20.0%	10.0%	$33.75
Equipment and Facility Upgrade and Replacement	2020	$250.00	$187.50	20.0%	10.0%	$33.75
Equipment and Facility Upgrade and Replacement	2021	$250.00	$187.50	20.0%	10.0%	$33.75
Equipment and Facility Upgrade and Replacement	2022	$250.00	$187.50	20.0%	10.0%	$33.75
Equipment and Facility Upgrade and Replacement	2023	$250.00	$187.50	20.0%	10.0%	$33.75
Equipment and Facility Upgrade and Replacement	2024	$250.00	$187.50	20.0%	10.0%	$33.75
Equipment and Facility Upgrade and Replacement	2025	$250.00	$187.50	20.0%	10.0%	$33.75
Equipment and Facility Upgrade and Replacement	2026	$250.00	$187.50	20.0%	10.0%	$33.75
Equipment and Facility Upgrade and Replacement	2027	$250.00	$187.50	20.0%	10.0%	$33.75
Subtotal		**$2,875.00**	**$2,156.25**			**$388.13**

- Libraries	Expend Year	Gross Cost	Net Cost	% due to Growth	Discount	Eligible Dev. Charge (90%)
Library Building Improvements	2018	$101.00	$75.75	20.0%	10.0%	$13.64
Improved Collection	2018	$40.00	$30.00	20.0%	10.0%	$5.40
Improved Collection	2019	$40.00	$30.00	20.0%	10.0%	$5.40
Improved Collection	2020	$40.00	$30.00	20.0%	10.0%	$5.40
Improved Collection	2021	$40.00	$30.00	20.0%	10.0%	$5.40
Improved Collection	2022	$40.00	$30.00	20.0%	10.0%	$5.40
Improved Collection	2023	$40.00	$30.00	20.0%	10.0%	$5.40
Improved Collection	2024	$40.00	$30.00	20.0%	10.0%	$5.40
Improved Collection	2025	$40.00	$30.00	20.0%	10.0%	$5.40
Improved Collection	2026	$40.00	$30.00	20.0%	10.0%	$5.40
Improved Collection	2027	$40.00	$30.00	20.0%	10.0%	$5.40
Subtotal		**$501.00**	**$375.75**			**$67.64**

- Cemeteries	Expend Year	Gross Cost	Net Cost	% due to Growth	Discount	Eligible Dev. Charge (90%)
Walker Cemetery - Columbarium			$0.00	10.0%	10.0%	$0.00
Ground Penetrating Radar	2018	$60.00	$45.00	10.0%	10.0%	$4.05
Subtotal		**$60.00**	**$45.00**			**$4.05**

Subtotal Recreation and Culture		**$3,436.00**	**$2,577.00**			**$459.81**

Sub Total		**$9,706.87**	**$6,877.32**			**$1,310.12**

Table 2A cont'd
Future Municipal Expenditures - Township of Cramahe

Environmental Services - Waterworks	Expend Year	Gross Cost	Net Cost	% due to Growth	Discount	Eligible Dev. Charge
Equipment and Facilty Upgrade and Replacement	2018	$100.00	$60.00	20.0%	no	$12.00
Equipment and Facility Upgrade and Replacement	2019	$100.00	$60.00	20.0%	no	$12.00
Equipment and Facility Upgrade and Replacement	2020	$100.00	$60.00	20.0%	no	$12.00
Equipment and Facility Upgrade and Replacement	2021	$100.00	$60.00	20.0%	no	$12.00
Equipment and Facility Upgrade and Replacement	2022	$750.00	$450.00	10.0%	no	$45.00
Equipment and Facility Upgrade and Replacement	2023	$100.00	$60.00	20.0%	no	$12.00
Equipment and Facility Upgrade and Replacement	2024	$100.00	$60.00	20.0%	no	$12.00
Equipment and Facility Upgrade and Replacement	2025	$100.00	$60.00	20.0%	no	$12.00
Equipment and Facility Upgrade and Replacement	2026	$100.00	$60.00	20.0%	no	$12.00
Equipment and Facility Upgrade and Replacement	2027	$750.00	$450.00	10.0%	no	$45.00
Subtotal		**$2,300.00**	**$1,380.00**			**$186.00**

Environmental Services - Wastewater Protection	Expend Year	Gross Cost	Net Cost	% due to Growth	Discount	Eligible Dev. Charge
Equipment and Facilty Upgrade and Replacement	2018	$60.00	$36.00	20.0%	no	$7.20
Sodium Bisulphate building	2018	$55.00	$33.00	20.0%	no	$6.60
Equipment and Facility Upgrade and Replacement	2019	$60.00	$36.00	20.0%	no	$7.20
Equipment and Facility Upgrade and Replacement	2020	$60.00	$36.00	20.0%	no	$7.20
Equipment and Facility Upgrade and Replacement	2021	$60.00	$36.00	20.0%	no	$7.20
Equipment and Facility Upgrade and Replacement	2022	$650.00	$390.00	10.0%	no	$39.00
Equipment and Facility Upgrade and Replacement	2023	$60.00	$36.00	20.0%	no	$7.20
Equipment and Facility Upgrade and Replacement	2024	$60.00	$36.00	20.0%	no	$7.20
Equipment and Facility Upgrade and Replacement	2025	$60.00	$36.00	20.0%	no	$7.20
Equipment and Facility Upgrade and Replacement	2026	$60.00	$36.00	20.0%	no	$7.20
Equipment and Facility Upgrade and Replacement	2027	$650.00	$390.00	10.0%	no	$39.00
Subtotal		**$1,835.00**	**$1,101.00**			**$142.20**

Total Water and Wastewater		**$4,135.00**	**$2,481.00**			**$328.20**

Table 2B
Future Municipal Expenditures
Allocation of Growth-Related Cost to Land Use Type
(2017 $,000)

		a	b	c
Administration Development Charges	Eligible Dev. Charge	Expenditure Year	Residential Share	Non-Res Share
Development Charges Study and By-law	$15.00	2018	$13.75	$1.25
Development Charges Update	$15.00	2023	$13.75	$1.25
Growth Related Studies				
Official Plan Update	$50.00	2020	$45.84	$4.16
Zoning By-law Update	$50.00	2021	$45.84	$4.16
Fibre Optics	$2.51	2018	$2.30	$0.21
Subtotal	**$132.51**		**$121.48**	**$11.03**

Public Works	Eligible Dev. Charge	Expenditure Year	Residential Share	Non-Res Share
Annual Construction and Equipment Replacement	$57.20	2018	$52.44	$4.76
Sidewalk Tractor Replacement	$6.15	2018	$5.64	$0.51
1 Ton Truck Replacement	$9.36	2018	$8.58	$0.78
Tractor	$28.60	2018	$26.22	$2.38
Bridge Repairs	$18.40	2018	$16.86	$1.53
Annual Construction and Equipment Replacement	$57.20	2019	$52.44	$4.76
Annual Construction and Equipment Replacement	$57.20	2020	$52.44	$4.76
Annual Construction and Equipment Replacement	$57.20	2021	$52.44	$4.76
Annual Construction and Equipment Replacement	$57.20	2022	$52.44	$4.76
Annual Construction and Equipment Replacement	$57.20	2023	$52.44	$4.76
Annual Construction and Equipment Replacement	$57.20	2024	$52.44	$4.76
Annual Construction and Equipment Replacement	$57.20	2025	$52.44	$4.76
Annual Construction and Equipment Replacement	$57.20	2026	$52.44	$4.76
Annual Construction and Equipment Replacement	$57.20	2027	$52.44	$4.76
Federal Gas Tax	-$22.75	2018	($20.86)	($1.89)
Federal Gas Tax	-$22.75	2019	($20.86)	($1.89)
Federal Gas Tax	-$22.75	2020	($20.86)	($1.89)
Federal Gas Tax	-$22.75	2021	($20.86)	($1.89)
Federal Gas Tax	-$22.75	2022	($20.86)	($1.89)
Federal Gas Tax	-$22.75	2023	($20.86)	($1.89)
Federal Gas Tax	-$22.75	2024	($20.86)	($1.89)
Federal Gas Tax	-$22.75	2025	($20.86)	($1.89)
Federal Gas Tax	-$22.75	2026	($20.86)	($1.89)
Federal Gas Tax	-$22.75	2027	($20.86)	($1.89)
OCIF	-$6.50	2018	($5.96)	($0.54)
OCIF	-$6.50	2019	($5.96)	($0.54)
OCIF	-$6.50	2020	($5.96)	($0.54)
OCIF	-$6.50	2021	($5.96)	($0.54)
OCIF	-$6.50	2022	($5.96)	($0.54)
OCIF	-$6.50	2023	($5.96)	($0.54)
OCIF	-$6.50	2024	($5.96)	($0.54)
OCIF	-$6.50	2025	($5.96)	($0.54)
OCIF	-$6.50	2026	($5.96)	($0.54)
OCIF	-$6.50	2027	($5.96)	($0.54)
Subtotal	**$342.00**		**$313.54**	**$28.46**

Table 2B cont'd
Future Municipal Expenditures - Township of Cramahe

Protection of People and Property - Fire Protection	Eligible Dev. Charge	Expenditure Year	Residential Share	Com/Ind Share
Annual Equipment Upgrade and Replacement	$14.85	2018	$13.61	$1.24
Thermal Imaging	$1.80	2018	$1.65	$0.15
Annual Equipment Upgrade and Replacement	$14.85	2019	$13.61	$1.24
Annual Equipment Upgrade and Replacement	$14.85	2020	$13.61	$1.24
Annual Equipment Upgrade and Replacement	$14.85	2021	$13.61	$1.24
Annual Equipment Upgrade and Replacement	$14.85	2022	$13.61	$1.24
Annual Equipment Upgrade and Replacement	$14.85	2023	$13.61	$1.24
Annual Equipment Upgrade and Replacement	$14.85	2024	$13.61	$1.24
Annual Equipment Upgrade and Replacement	$14.85	2025	$13.61	$1.24
Annual Equipment Upgrade and Replacement	$14.85	2026	$13.61	$1.24
Annual Equipment Upgrade and Replacement	$14.85	2027	$13.61	$1.24
Subtotal	**$150.30**		**$137.79**	**$12.51**

- Emergency management	Eligible Dev. Charge	Expenditure Year	Residential Share	Com/Ind Share
Equipment Upgrade and Replacement	$0.38	2018	$0.34	$0.03
Equipment Upgrade and Replacement	$0.38	2019	$0.34	$0.03
Equipment Upgrade and Replacement	$0.38	2020	$0.34	$0.03
Equipment Upgrade and Replacement	$0.38	2021	$0.34	$0.03
Equipment Upgrade and Replacement	$0.38	2022	$0.34	$0.03
Equipment Upgrade and Replacement	$0.38	2023	$0.34	$0.03
Equipment Upgrade and Replacement	$0.38	2024	$0.34	$0.03
Equipment Upgrade and Replacement	$0.38	2025	$0.34	$0.03
Equipment Upgrade and Replacement	$0.38	2026	$0.34	$0.03
Equipment Upgrade and Replacement	$0.38	2027	$0.34	$0.03
Subtotal	**$3.75**		**$3.44**	**$0.31**

Table 2B cont'd
Future Municipal Expenditures - Township of Cramahe

- By-law Enforcement	Eligible Dev. Charge	Expenditure Year	Residential Share	Com/Ind Share
Equipment Upgrade and Replacement	$0.49	2018	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2019	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2020	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2021	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2022	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2023	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2024	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2025	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2026	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2027	$0.45	$0.04
Subtotal	**$4.88**		**$4.47**	**$0.41**

- Community Policing	Eligible Dev. Charge	Expenditure Year	Residential Share	Com/Ind Share
Equipment Upgrade and Replacement	$0.49	2018	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2019	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2020	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2021	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2022	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2023	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2024	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2025	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2026	$0.45	$0.04
Equipment Upgrade and Replacement	$0.49	2027	$0.45	$0.04
Subtotal	**$4.88**		**$4.47**	**$0.41**

Subtotal Protection of People and Property	**$505.80**		**$463.71**	**$42.09**

Table 2B cont'd
Future Municipal Expenditures - Township of Cramahe

Recreation and Culture - Arenas and parks	Eligible Dev. Charge	Expenditure Year	Residential Share	Non-Res Share
Equipment and Facility Upgrade and Replacement	$33.75	2018	$33.75	$0.00
Keeler Centre LED Lighting, High Bay	$10.13	2018	$10.13	$0.00
Building Soccer Fields	$6.75	2018	$6.75	$0.00
0	$33.75	0	$33.75	$0.00
Equipment and Facility Upgrade and Replacement	$33.75	2019	$33.75	$0.00
Equipment and Facility Upgrade and Replacement	$33.75	2020	$33.75	$0.00
Equipment and Facility Upgrade and Replacement	$33.75	2021	$33.75	$0.00
Equipment and Facility Upgrade and Replacement	$33.75	2022	$33.75	$0.00
Equipment and Facility Upgrade and Replacement	$33.75	2023	$33.75	$0.00
Equipment and Facility Upgrade and Replacement	$33.75	2024	$33.75	$0.00
Equipment and Facility Upgrade and Replacement	$33.75	2025	$33.75	$0.00
Equipment and Facility Upgrade and Replacement	$33.75	2026	$33.75	$0.00
Equipment and Facility Upgrade and Replacement	$33.75	2027	$33.75	$0.00
Subtotal	**$388.13**		**$388.13**	**$0.00**

- Libraries	Eligible Dev. Charge	Expenditure Year	Residential Share	Non-Res Share
Library Building Improvements	$13.64	2018	$13.64	$0.00
Improved Collection	$5.40	2018	$5.40	$0.00
Improved Collection	$5.40	2019	$5.40	$0.00
Improved Collection	$5.40	2020	$5.40	$0.00
Improved Collection	$5.40	2021	$5.40	$0.00
Improved Collection	$5.40	2022	$5.40	$0.00
Improved Collection	$5.40	2023	$5.40	$0.00
Improved Collection	$5.40	2024	$5.40	$0.00
Improved Collection	$5.40	2025	$5.40	$0.00
Improved Collection	$5.40	2026	$5.40	$0.00
Improved Collection	$5.40	2027	$5.40	$0.00
Subtotal	**$67.64**		**$67.64**	**$0.00**

- Cemeteries	Eligible Dev. Charge	Expenditure Year	Residential Share	Non-Res Share
Walker Cemetery - Columbarium	$0.00	0	$0.00	$0.00
Ground Penetrating Radar	$4.05	2018	$4.05	$0.00
Subtotal	**$4.05**		**$4.05**	**$0.00**

Subtotal Recreation and Culture	**$459.81**		**$459.81**	**$0.00**

Sub Total	**$1,310.12**		**$1,239.36**	**$70.76**

Table 2B cont'd
Future Municipal Expenditures - Township of Cramahe

Environmental Services - Waterworks	Eligible Dev. Charge	Expenditure Year	Residential Share	Non-Res Share
Equipment and Facilty Upgrade and Replacement	$12.00	2018	$11.00	$1.00
Equipment and Facility Upgrade and Replacement	$12.00	2019	$11.00	$1.00
Equipment and Facility Upgrade and Replacement	$12.00	2020	$11.00	$1.00
Equipment and Facility Upgrade and Replacement	$12.00	2021	$11.00	$1.00
Equipment and Facility Upgrade and Replacement	$45.00	2022	$41.26	$3.74
Equipment and Facility Upgrade and Replacement	$12.00	2023	$11.00	$1.00
Equipment and Facility Upgrade and Replacement	$12.00	2024	$11.00	$1.00
Equipment and Facility Upgrade and Replacement	$12.00	2025	$11.00	$1.00
Equipment and Facility Upgrade and Replacement	$12.00	2026	$11.00	$1.00
Equipment and Facility Upgrade and Replacement	$45.00	2027	$41.26	$3.74
Subtotal	**$186.00**		**$170.52**	**$15.48**

Environmental Services - Wastewater Protection	Eligible Dev. Charge	Expenditure Year	Residential Share	Non-Res Share
Equipment and Facilty Upgrade and Replacement	$7.20	2018	$6.60	$0.60
Sodium Bisulphate building	$6.60	2018	$6.05	$0.55
Equipment and Facility Upgrade and Replacement	$7.20	2019	$6.60	$0.60
Equipment and Facility Upgrade and Replacement	$7.20	2020	$6.60	$0.60
Equipment and Facility Upgrade and Replacement	$7.20	2021	$6.60	$0.60
Equipment and Facility Upgrade and Replacement	$39.00	2022	$35.75	$3.25
Equipment and Facility Upgrade and Replacement	$7.20	2023	$6.60	$0.60
Equipment and Facility Upgrade and Replacement	$7.20	2024	$6.60	$0.60
Equipment and Facility Upgrade and Replacement	$7.20	2025	$6.60	$0.60
Equipment and Facility Upgrade and Replacement	$7.20	2026	$6.60	$0.60
Equipment and Facility Upgrade and Replacement	$39.00	2027	$35.75	$3.25
Subtotal	**$142.20**		**$130.37**	**$11.83**

Total Water and Wastewater	**$328.20**		**$300.89**	**$27.31**

3A

ule of Acquisitions By Year

alify as Growth Related

00's)

	Ratio	NPV	Existing	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
on														
l Government	1.91%	$112.22	$2.44	$16.05	$0.00	$45.84	$45.84	$0.00	$13.75	$0.00	$0.00	$0.00	$0.00	$121.48
s	70.35%	$4,143.98	$3,869.77	$82.93	$25.62	$25.62	$25.62	$25.62	$25.62	$25.62	$25.62	$25.62	$25.62	$313.54
People & Property														
otection	6.70%	$394.71	$276.98	$15.26	$13.61	$13.61	$13.61	$13.61	$13.61	$13.61	$13.61	$13.61	$13.61	$137.79
ency management	0.18%	$10.63	$7.70	$0.34	$0.34	$0.34	$0.34	$0.34	$0.34	$0.34	$0.34	$0.34	$0.34	$3.44
Enforcement	0.09%	$5.34	$1.53	$0.45	$0.45	$0.45	$0.45	$0.45	$0.45	$0.45	$0.45	$0.45	$0.45	$4.47
unity Policing	0.16%	$9.35	$5.54	$0.45	$0.45	$0.45	$0.45	$0.45	$0.45	$0.45	$0.45	$0.45	$0.45	$4.47
nd Culture	0.00%													
and Parks	18.13%	$1,067.74	$763.46	$50.63	$33.75	$33.75	$33.75	$33.75	$33.75	$33.75	$33.75	$33.75	$33.75	$354.38
	2.06%	$121.05	$61.75	$19.04	$5.40	$5.40	$5.40	$5.40	$5.40	$5.40	$5.40	$5.40	$5.40	$67.64
eries	0.43%	$25.31	$21.37	$4.05	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$4.05
	100.00%	**$5,890.33**	**$5,010.54**	**$189.19**	**$79.63**	**$125.46**	**$125.46**	**$79.63**	**$93.38**	**$79.63**	**$79.63**	**$79.63**	**$79.63**	**$1,011.25**
al Services														
Works	28.07%	$719.81	$577.35	$11.00	$11.00	$11.00	$11.00	$41.26	$11.00	$11.00	$11.00	$11.00	$41.26	$170.52
vater Services	71.93%	$1,844.25	$1,735.22	$12.65	$6.60	$6.60	$6.60	$35.75	$6.60	$6.60	$6.60	$6.60	$35.75	$130.37
	100%	**$2,564.05**	**$2,312.58**	**$23.65**	**$17.60**	**$17.60**	**$17.60**	**$77.01**	**$17.60**	**$17.60**	**$17.60**	**$17.60**	**$77.01**	**$300.89**
		$8,454.38	**$7,323.11**	**$212.84**	**$97.23**	**$143.07**	**$143.07**	**$156.64**	**$110.98**	**$97.23**	**$97.23**	**$97.23**	**$156.64**	**$1,312.14**

3B

ule of Acquisitions By Year

alify as Growth Related

00's)

ential	Ratio	NPV	Existing	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
on														
l Government	2.8%	$11.73	$0.22	$1.46	$0.00	$4.16	$4.16	$0.00	$1.25	$0.00	$0.00	$4.16	$0.00	$15.19
s	88.5%	$373.29	$351.27	$7.53	$2.33	$2.33	$2.33	$2.33	$2.33	$2.33	$2.33	$2.33	$2.33	$28.46
People & Property														
otection	8.2%	$34.38	$25.14	$1.39	$1.24	$1.24	$1.24	$1.24	$1.24	$1.24	$1.24	$1.24	$1.24	$12.51
ency management	0.2%	$0.93	$0.70	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03	$0.31
Enforcement	0.1%	$0.44	$0.14	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.41
unity Policing	0.2%	$0.80	$0.50	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.41
nd Culture														
and Parks	0.0%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
	0.0%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
eries	0.0%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
	100.00%	**$421.57**	**$377.97**	**$10.48**	**$3.67**	**$7.84**	**$7.84**	**$3.67**	**$4.92**	**$3.67**	**$3.67**	**$7.84**	**$3.67**	**$57.28**
al Services														
Works	27.6%	$63.34	$52.41	$1.00	$1.00	$1.00	$1.00	$3.74	$1.00	$1.00	$1.00	$1.00	$3.74	$15.48
vater Services	72.4%	$165.89	$157.51	$1.15	$0.60	$0.60	$0.60	$3.25	$0.60	$0.60	$0.60	$0.60	$3.25	$11.83
	100%	**$229.24**	**$209.92**	**$2.15**	**$1.60**	**$1.60**	**$1.60**	**$6.99**	**$1.60**	**$1.60**	**$1.60**	**$1.60**	**$6.99**	**$466.47**
		$650.80	**$587.89**	**$12.63**	**$5.27**	**$9.43**	**$9.43**	**$10.66**	**$6.52**	**$5.27**	**$5.27**	**$9.43**	**$10.66**	**$523.75**
es and Non Res		**$9,105.18**	**$7,911.00**	**$225.47**	**$102.50**	**$152.50**	**$152.50**	**$167.30**	**$117.50**	**$102.50**	**$102.50**	**$106.66**	**$167.30**	**$1,835.88**

e 4A
opment Charges Calculation - Residential
owth-Related Capital Cost
,000's)

al		2001	2006	2011	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Forecast by Year															
nent		*5,713*	*5,950*	*6,073*	6,355	6,402	6,520	6,638	6,756	6,874	6,992	7,110	7,228	7,346	7,464
nally Occupied		*840*	*864*	*894*	636	642	651	660	669	678	687	696	705	714	723
th in Perm. Pop. 2018 to 2027	118		*47*	*25*	56	47	118	118	118	118	118	118	118	118	118
r Household															
nent		*2.75*	*2.63*	*2.55*	2.55	2.55	2.54	2.54	2.53	2.53	2.53	2.52	2.52	2.51	2.51
nally Occupied		*3.00*	*3.00*	*3.00*	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Forecast by Year		*2,357*	*2,548*	*2,676*	2,780	2,812	2,865	2,918	2,971	3,024	3,077	3,130	3,183	3,236	3,289
nent		*2,077*	*2,260*	*2,378*	2,568	2,598	2,648	2,698	2,748	2,798	2,848	2,898	2,948	2,998	3,048
nally Occupied		*280*	*288*	*298*	212	214	217	220	223	226	229	232	235	238	241
Households	530														
nent			*37*	*24*	21	30	50	50	50	50	50	50	50	50	50
nally Occupied			*2*	*2*	2	2	3	3	3	3	3	3	3	3	3

nary of Capital Costs Related to Development ($,000)
Fund applied only to Residential

arge	Net Capital Cost ($,000)	Reserve Funds ($,000)	Growth (households)	Cost per hshld ($)	%
tion					
al Government	$112.22	$22.10	530	$170.03	1.64%
rks	$4,143.98	$254.13	530	$7,339.35	70.83%
of People & Property					
rotection	$394.71	$16.29	530	$714.00	6.89%
gency Management	$10.63	$0.96	530	$18.24	0.18%
w Enforcement	$5.34	$0.68	530	$8.80	0.08%
nunity Policing	$9.35	$0.93	530	$15.88	0.15%
and Culture					
s and Parks	$1,067.74	$79.90	530	$1,863.84	17.99%
y	$121.05	$19.80	530	$191.04	1.84%
teries	$25.31	$3.45	530	$41.24	0.40%
ervice Charge	$5,890.33	$398.24		**$10,362.42**	100.0%
ntal Services					
Works	$719.81	$0.00	405	$1,777.30	28.07%
water Services	$1,844.25	$0.00	405	$4,553.69	71.93%
ronmental Service Charge	$2,564.05	$0.00		$6,330.99	100.0%
	$8,454.38	**$398.24**		**$16,693.41**	

e 4B

lopment Charges Calculation - Non-Residential

rowth-Related Capital Cost

,000's)

idential		2001	2006	2011	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	20
Population Forecast by Year		*5,713*	*5,950*	*6,073*	6,355	6,402	6,520	6,638	6,756	6,874	6,992	7,110	7,228	7,346	7,464	7,5
th per Year	1,227				282	47	118	118	118	118	118	118	118	118	118	1
Employees (%		40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0
oyment Forecast		*2,285*	*2,995*	*2,429*	2,542	2,561	2,608	2,655	2,702	2,750	2,797	2,844	2,891	2,938	2,986	3,0
th in Employment (annual)	470		142	(113)	113	19	47	47	47	47	47	47	47	47	47	
th in Floor Sp	50 sq. m./employee		7,098	(5,660)	5,650	950	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,3
se in Floor Space 2018 - 2027 (sq. m.)		23,500														

ary of Capital Costs Related to Development ($,000)

arge	Net Capital Cost ($,000)	Reserve Funds ($,000)	%	/sq. m.	/sq.ft.
ation					
al Government	$11.73	$2.00	2.46%	$0.41	$0.04
rks	$373.29	$23.00	88.71%	$14.91	$1.38
of People & Property					
rotection	$34.38	$1.47	8.33%	$1.40	$0.13
gency management	$0.93	$0.09	0.21%	$0.04	$0.00
w Enforcement	$0.44	$0.06	0.10%	$0.02	$0.00
unity Policing	$0.80	$0.08	0.18%	$0.03	$0.00
and Culture					
s and Parks	$0.00	$0.00	0.00%	$0.00	$0.00
y	$0.00	$0.00	0.00%	$0.00	$0.00
teries	$0.00	$0.00	0.00%	$0.00	$0.00
Service Charge	$421.57	$26.71	100.000%	**$16.80**	**$1.56**
ental Services					
Works	$63.34	$0.00	27.6%	$2.70	$0.25
ewater Services	$165.89	$0.00	72.4%	$7.06	$0.66
ronmental Service Charge	$229.24	$0.00	100.00%	$9.75	$0.91
tal Charges	**$650.80**	**$26.71**		**$26.56**	**$2.47**

Charges By-law, 2018
ion of the Township of Cramahe

ip of Cramahe
e of Development Charges by Service Category
e: Date of Bylaw: April 17, 2018

Land, Buildings or Structures and Designated Development Financing Areas	Residential Development Charge per dwelling unit (Single Detatched & Semi Dwelling)	Residential Development Charge per dwelling unit (Townhouse Dwelling)	Residential Development Charge per dwelling unit (Multi-Unit Dwelling)	Non-Residential Development Charg (per sq. m.)	Green Energy, Sola Development Charg (per 500 kW)	Green Energy, W Development Cha (per Turbine)
stration						
General Government	$170.03	$136.02	$96.35	$0.41	$170.03	$170.03
Works *	$7,339.35	$5,871.48	$4,158.96	$14.91	$7,339.35	$7,339.35
on of People & Property						
Fire Protection	$714.00	$571.20	$404.60	$1.40	$714.00	$714.00
Emergency Measures	$18.24	$14.60	$10.34	$0.04	$0.00	$0.00
By-law Enforcement	$8.80	$7.04	$4.98	$0.02	$0.00	$0.00
Community Policiing	$15.88	$12.70	$9.00	$0.03	$0.00	$0.00
on and Culture						
Arenas and Parks	$1,863.84	$1,491.07	$1,056.18	$0.00	$0.00	$0.00
Library	$191.04	$152.83	$108.25	$0.00	$0.00	$0.00
Cemeteries	$41.24	$32.99	$23.37	$0.00	$0.00	$0.00
Township Development Charge	**$10,362.42**	**$8,289.94**	**$5,872.04**	**$16.80**	**$8,223.38**	**$8,223.38**

ce Services *

AMP2016

www.publicsectordigest.com

The 2016 Asset Management Plan for the

Township of Cramahe

SUBMITTED BY THE PUBLIC SECTOR DIGEST INC. (PSD)
WWW.PUBLICSECTORDIGEST.COM
AUGUST 2017

Contents

List of Figures

List of Tables

Executive Summary

Infrastructure is inextricably linked to the economic, social and environmental advancement of a community. Municipalities own and manage nearly 60% of the public infrastructure stock in Canada. As analyzed in this asset management plan (AMP), the Township of Cramahe's infrastructure portfolio comprises the following asset classes: road network, bridges & culverts, buildings, storm, water, sanitary, machinery & equipment, land improvements, vehicles. The asset classes analyzed in this asset management plan for the municipality had a total 2016 valuation of $119 million, of which sanitary comprised 27%, followed by the road network at 19%.

Strategic asset management is critical in extracting the highest total value from public assets at the lowest lifecycle cost. This AMP, the municipality's second following the completion of its first edition in 2013, details the state of infrastructure of the municipality's service areas and provides asset management and financial strategies designed to facilitate its pursuit of developing an advanced asset management program and mitigate long-term funding gaps.

In addition to observed field conditions, historical capital expenditures can assist the municipality in identifying impending infrastructure needs, and guide its medium- and long-term capital programs. The municipality has continuously invested into its infrastructure over the decades. Investments fluctuated since the 1950s and peaked in the early 1960s. During this time, $20.8 million was invested with $12.6 million put into the water system. Since 2015, $981,000 has been invested with a focus on roads.

Based on 2016 replacement cost, and age-based data, 36% of assets, with a valuation of $43.5 million, are in good to very good condition; 49% are in poor to very poor condition. The municipality is relying on age-based condition data for all assets included within this AMP. 76% of the assets analyzed in this AMP have at least 10 years of useful life remaining. However, 13%, with a valuation of $15 million, remain in operation beyond their established useful life. An additional 4% will reach the end of their useful life within the next five years.

In order for an AMP to be effective, it must be integrated with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow the municipality to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, and projected growth requirements.

The average annual investment requirement for the above categories is $2,243,000. Annual revenue currently allocated to these assets for capital purposes is $983,000 leaving an annual deficit of $1,260,000. To put it another way, these infrastructure categories are currently funded at 44% of their long-term requirements.

In 2017, Cramahe has annual tax revenues of $5,208,000. Our strategy includes full funding being achieved over 20 years by:

- when realized, reallocating the debt cost increases of $75,000 to the infrastructure deficit.
- increasing tax revenues by 1.2% each year for the next 20 years solely for the purpose of phasing in full funding to the tax funded asset classes covered in this AMP.
- allocating the current gas tax and OCIF revenue and scheduled increases to the infrastructure deficit as they occur.

- increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

The average annual investment requirement for wastewater services and water services is $860,000. Annual revenue currently allocated to these assets for capital purposes is $575,000 leaving an annual deficit of $285,000. To put it another way, these infrastructure categories are currently funded at 67% of their long-term requirements.

In 2017, Cramahe has annual wastewater revenues of $638,000 and annual water revenues of $640,000.

To achieve financial sustainability for its wastewater services, we recommend a 20-year option that achieves full funding by:

- when realized, reallocating the debt cost reductions of $185,000 for wastewater services to the applicable infrastructure deficit.
- increasing rate revenues by 2.5% for wastewater services each year for the next 20 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
- increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

For water services, prior to any rate adjustments, it is recommended that condition data be obtained to better determine financial needs and future operational requirements be determined.

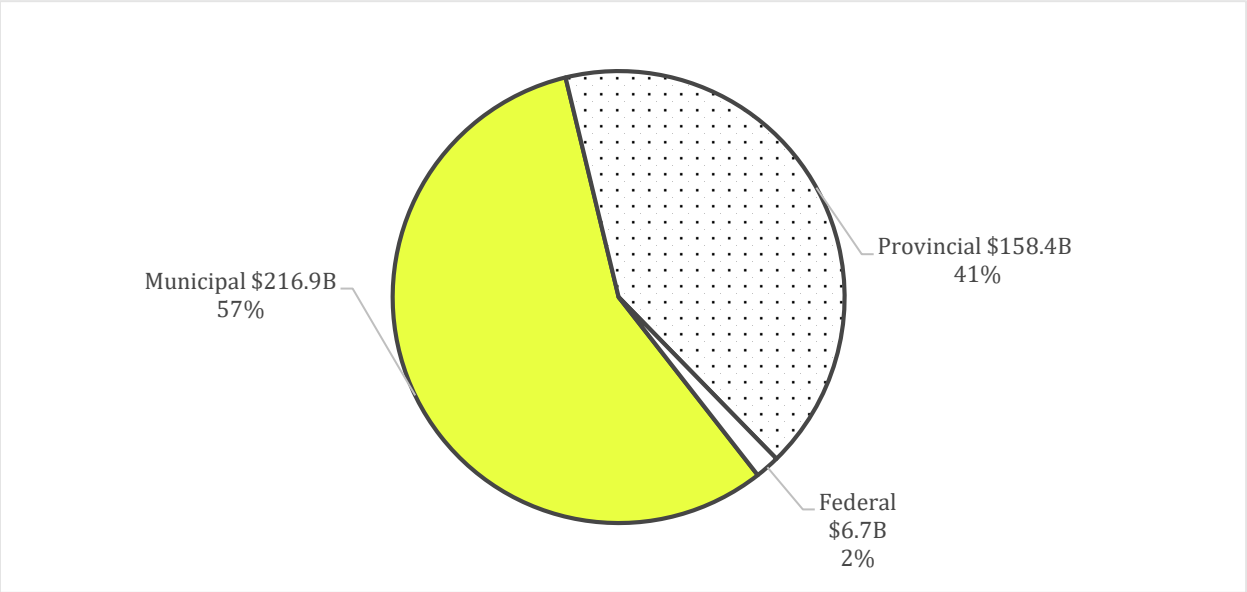
Although our financial strategies allow the municipalities to meet its long-term funding requirements and reach fiscal sustainability, injection of additional revenues will be required to mitigate existing infrastructure backlogs.

A critical aspect of this asset management plan is the level of confidence the municipality has in the data used to develop the state of the infrastructure and form the appropriate financial strategies. The municipality has indicated a high degree of confidence in the accuracy, validity and completeness of the asset data for all categories analyzed in this asset management plan.

I. Introduction & Context

Across Canada, municipal share of public infrastructure increased from 22% in 1955 to nearly 60% in 2013. The federal government's share of critical infrastructure stock, including roads, water and wastewater, declined by nearly 80% in value since 1963.[1]

Figure 1 Distribution of Net Stock of Core Public Infrastructure



Ontario's municipalities own more of the province's infrastructure assets than both the provincial and federal government. The asset portfolios managed by Ontario's municipalities are also highly diverse. The Township of Cramahe's capital assets portfolio, as analyzed in this asset management plan (AMP) is valued at $119 million using 2016 replacement costs. The municipality relies on these assets to provide residents, businesses, employees and visitors with safe access to important services, such as transportation, recreation, culture, economic development and much more. As such, it is critical that the municipality manage these assets optimally in order to produce the highest total value for taxpayers. This asset management plan, (AMP) will assist the municipality in the pursuit of judicious asset management for its capital assets.

[1] Larry Miller, Updating Infrastructure In Canada: An Examination of Needs And Investments Report of the Standing Committee on Transport, Infrastructure and Communities, June 2015

II. Asset Management

Asset management can be best defined as an integrated business approach within an organization with the aim to minimize the lifecycle costs of owning, operating, and maintaining assets, at an acceptable level of risk, while continuously delivering established levels of service for present and future customers. It includes the planning, design, construction, operation and maintenance of infrastructure used to provide services. By implementing asset management processes, infrastructure needs can be prioritized over time, while ensuring timely investments to minimize repair and rehabilitation costs and maintain municipal assets.

Table 1 Objectives of Asset Management

Inventory	Capture all asset types, inventories and historical data.
Current Valuation	Calculate current condition ratings and replacement values.
Lifecycle Analysis	Identify Maintenance and Renewal Strategies & Lifecycle Costs.
Service Level Targets	Define measurable Levels of Service Targets.
Risk & Prioritization	Integrates all asset classes through risk and prioritization strategies.
Sustainable Financing	Identify sustainable Financing Strategies for all asset classes.
Continuous Processes	Provide continuous processes to ensure asset information is kept current and accurate.
Decision Making & Transparency	Integrate asset management information into all corporate purchases, acquisitions and assumptions.
Monitoring & Reporting	At defined intervals, assess the assets and report on progress and performance.

1. Overarching Principles

The Institute of Asset Management (IAM) recommends the adoption of seven key principles for a sustainable asset management program. According to IAM, asset management must be:[2]

Table 2 Principles of Asset Management

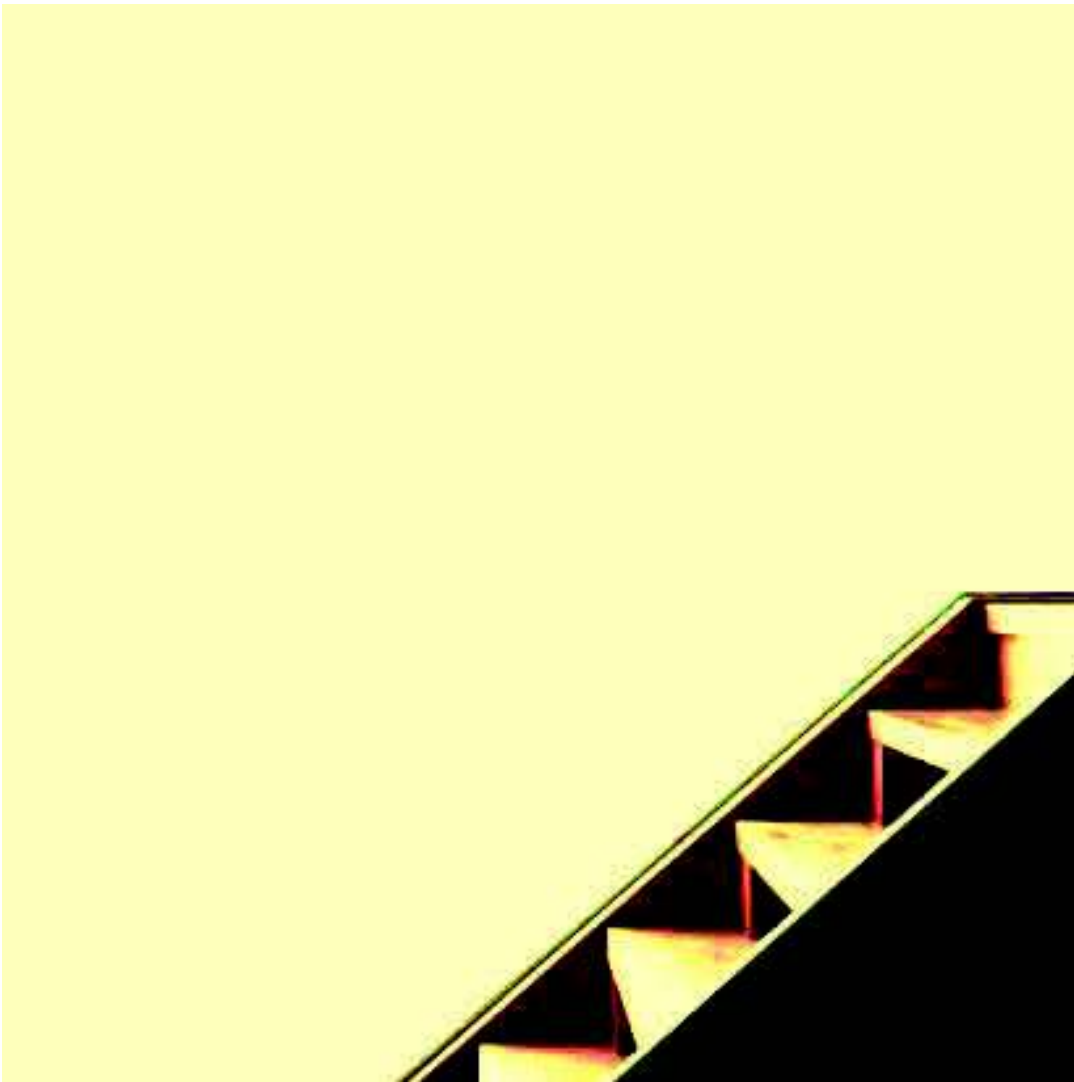
Holistic	Asset management must be cross-disciplinary, total value focused.
Systematic	Rigorously applied in a structured management system.
Systemic	Looking at assets in their systems context, again for net, total value.
Risk-based	Incorporating risk appropriately into all decision-making.
Optimal	Seeking the best compromise between conflicting objectives, such as costs versus performance versus risks etc.
Sustainable	Plans must deliver optimal asset lifecycles, ongoing systems performance, environmental and other long term consequences.
Integrated	At the heart of good asset management lies the need to be joined-up. The total jigsaw puzzle needs to work as a whole - and this is not just the sum of the parts.

[2] "Key Principles", The Institute of Asset Management, *www.iam.org*

III. AMP Objectives and Content

This AMP is one component of Cramahe's overarching corporate strategy. It was developed to support the municipality's vision for its asset management practice and programs. It provides key asset attribute data, including current composition of the municipality's infrastructure portfolio, inventory, replacement costs, useful life etc., summarizes the physical health of the capital assets, enumerates the municipality's current capital spending framework, and outlines financial strategies to achieve fiscal sustainability in the long-term while reducing and eventually eliminating funding gaps.

As with the first edition of the municipality's asset management plan in 2013, this AMP is developed in accordance with provincial standards and guidelines, and new requirements under the Federal Gas Tax Fund (GTF) stipulating the inclusion of all eligible asset classes. The following asset classes are analysed in this document: road network; bridges & culverts; water; wastewater; storm; facilities; machinery & equipment; land improvements; and vehicles.



IV. Data and Methodology

The municipality's dataset for the asset classes analyzed in this AMP are maintained in PSD's CityWide® Tangible Assets module. This dataset includes key asset attributes and PSAB 3150 data, such as historical costs, in-service dates, field inspection data (as available), asset health, and replacement costs.

1. Condition Data

Municipalities implement a straight-line amortization schedule approach to depreciate their capital assets. In general, this approach may not be reflective of an asset's actual condition and the true nature of its deterioration, which tends to accelerate toward the end of the asset's lifecycle. However, it is a useful approximation in the absence of standardized decay models and actual field condition data and can provide a benchmark for future requirements. We analyze each asset individually prior to aggregation and reporting; therefore, many imprecisions that may be highlighted at the individual asset level are attenuated at the class level.

As available, actual field condition data was used to make recommendations more meaningful and representative of the municipality's state of infrastructure. The value of condition data cannot be overstated as they provide a more accurate representation of the state of infrastructure. The type of condition data used for each class is indicated in Chapter V, Section 2.

2. Financial Data

In this AMP, the average annual requirement is the amount, based on current replacement costs, that municipalities should set aside annually for each infrastructure class so that assets can be replaced upon reaching the end of their lifecycle.

To determine current funding capacity, all existing sources of funding are identified and combined to enumerate the total available funding; funding for the previous three years is analyzed as data is available. These figures are then assessed against the average annual requirements, and are used to calculate the annual funding shortfall (surplus) and for forming the financial strategies.

In addition to the annual shortfall, the majority of municipalities face significant infrastructure backlogs. The infrastructure backlog is the accrued financial investment needed in the short-term to bring the assets to a state of good repair. This amount is identified for each asset class.

Only predictable sources of funding are used, e.g., tax and rate revenues, user fees, and other streams of income the municipality can rely on with a high degree of certainty. Government grants and other ad-hoc injections of capital are not included in this asset management plan given their unpredictability. As senior governments make greater, more predictable and permanent commitments to funding municipal infrastructure programs, e.g., the Federal Gas Tax Fund, future iterations of this asset management plan will account for such funding sources.

3. Infrastructure Report Card

The asset management plan is a complex document, but one with direct implications on the public, a group with varying degrees of technical knowledge. To make communications more meaningful and the AMP more accessible, we've developed an Infrastructure Report Card that summarizes our findings in common language that municipalities can use for internal and external distribution. The report card is developed using two key, equally weighted factors: Financial Capacity and Asset Health.

Table 3 Infrastructure Report Card Description

Financial Capacity		A municipality's financial capacity grade is determined by the level of funding available (0-100%) for each asset class for the purpose of meeting the average annual investment requirements.
Asset Health		Using either field inspection data as available or age-based data, the asset health component of the report card uses condition (0-100%) to estimate how capable assets are in performing their required functions. We use replacement cost to determine the weight of each condition group within the asset class.
Letter Grade	Rating	Description
A	Very Good	The asset is functioning and performing well; only normal preventative maintenance is required. The municipality is fully prepared for its long-term replacement needs based on its existing infrastructure portfolio.
B	Good	The municipality is well prepared to fund its long-term replacement needs but requires additional funding strategies in the short-term to begin to increase its reserves.
C	Fair	The asset's performance or function has started to degrade and repair/rehabilitation is required to minimize lifecycle cost. The municipality is underpreparing to fund its long-term infrastructure needs. The replacement of assets in the short- and medium-term will likely be deferred to future years.
D	Poor	The asset's performance and function is below the desired level and immediate repair/rehabilitation is required. The municipality is not well prepared to fund its replacement needs in the short-, medium- or long-term. Asset replacements will be deferred and levels of service may be reduced.
F	Very Poor	The municipality is significantly underfunding its short-term, medium-term, and long-term infrastructure requirements based on existing funds allocation. Asset replacements will be deferred indefinitely. The municipality may have to divest some of its assets (e.g., bridge closures, arena closures) and levels of service will be reduced significantly.

4. Limitations and Assumptions

Several limitations continue to persist as municipalities advance their asset management practices.

- As available, we use field condition assessment data to illustrate the state of infrastructure and develop the requisite financial strategies. However, in the absence of observed data, we rely on the age of assets to estimate their physical condition.

- A second limitation is the use of inflation measures, for example using CPI/NRBCPI to inflate historical costs in the absence of actual replacement costs. While a reasonable approximation, the use of such multipliers may not be reflective of market prices and may over- or understate the value of a municipality's infrastructure portfolio and the resulting capital requirements.

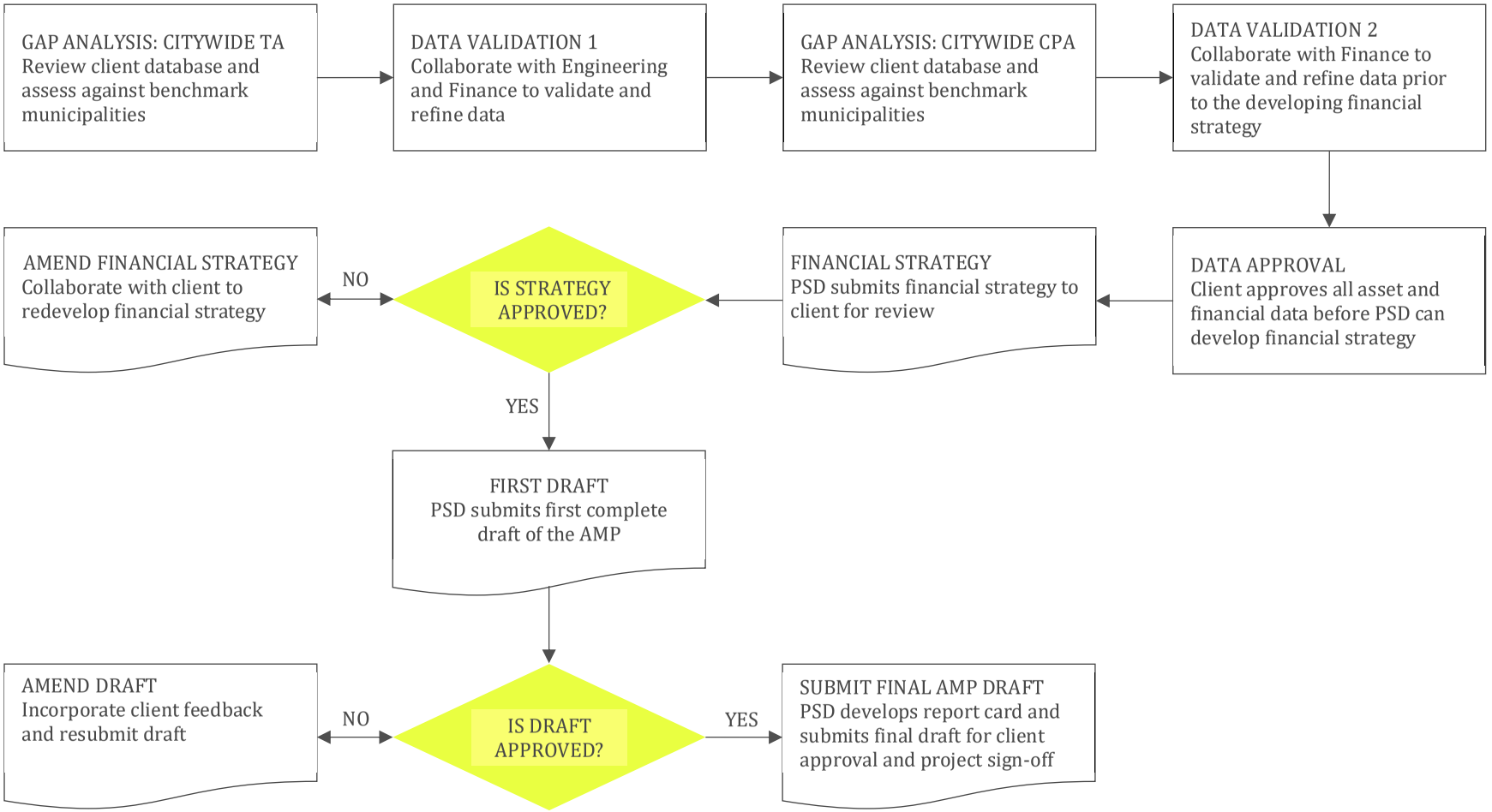
- Our calculations and recommendations will reflect the best available data at the time this AMP was developed.

- The focus of this plan is restricted to capital expenditures and does not capture O&M expenditures on infrastructure.

5. Process

High data quality is the foundation of intelligent decision-making. Generally, there are two primary causes of poor decisions: inaccurate or incomplete data, and the misinterpretation of data used. The figure below illustrates an abbreviated version of our work order/work flow process between PSD and municipal staff. It is designed to ensure maximum confidence in the raw data used to develop the AMP, the interpretation of the AMP by all stakeholders, and ultimately, the application of the strategies outlined in this AMP.

Figure 2 Developing the AMP – Work Flow and Process



6. Data Confidence Rating

Staff confidence in the data used to develop the AMP can determine the extent to which recommendations are applied. Low confidence suggests uncertainty about the data and can undermine the validity of the analysis. High data confidence endorses the findings and strategies, and the AMP can become an important, reliable reference guide for interdepartmental communication as well as a manual for long-term corporate decision-making. Having a numerical rating for confidence also allows the municipality to track its progress over time and eliminate data gaps.

Data confidence in this AMP is determined using five key factors and is based on the City of Brantford's approach. Municipal staff provide their level of confidence (score) in each factor for major asset classes along a spectrum, ranging from 0, suggesting low confidence in the data, to 100 indicative of high certainty regarding inputs. The five factors used to calculate the municipality's data confidence ratings are:

F1	F2	F3	F4	F5
The data is up to date.	The data is complete and uniform.	The data comes from an authoritative source	The data is error free.	The data is verified by an authoritative source.

The municipality's self-assessed score in each factor is then used to calculate data confidence in each asset class using Equation 1 below.

$$Asset\ Class\ Data\ Confidence\ Rating = \sum (Score\ in\ each\ factor)\ \times (\frac{1}{5})$$

V. Summary Statistics

In this section, we aggregate technical and financial data across all asset classes analyzed in this AMP, and summarize the state of the infrastructure using key indicators, including asset condition, useful life consumption, and important financial measurements.

1. Asset Valuation

The asset classes analyzed in this asset management plan for the municipality had a total 2016 valuation of $119 million, of which sanitary comprised 27%, followed by the road network at 19%. The ownership per household (Figure 4) totaled $85,000 based on 2,570 households for all asset categories except for water services with 985 households and wastewater services with 846 households.

Figure 3 Asset Valuation by Class

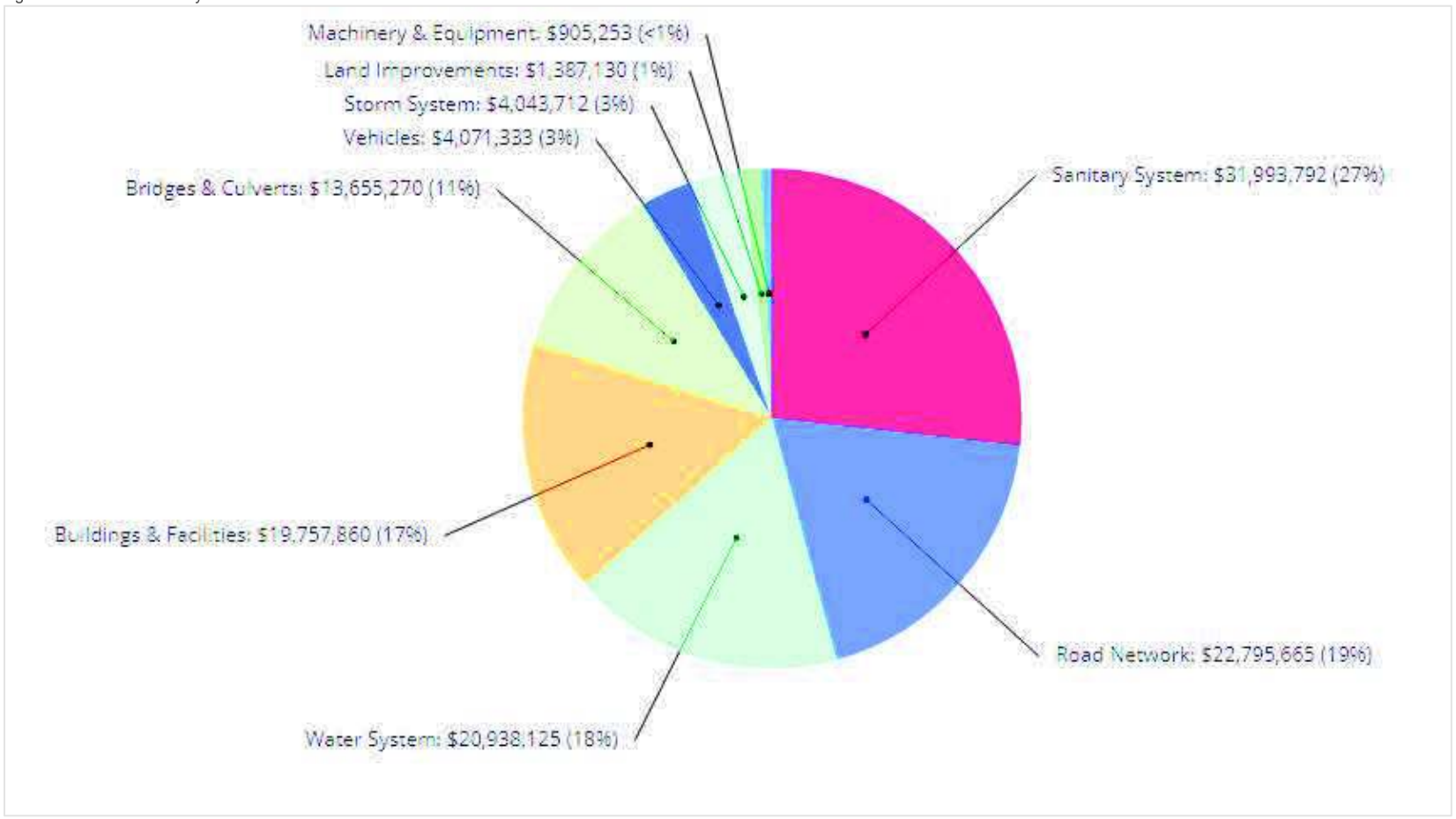
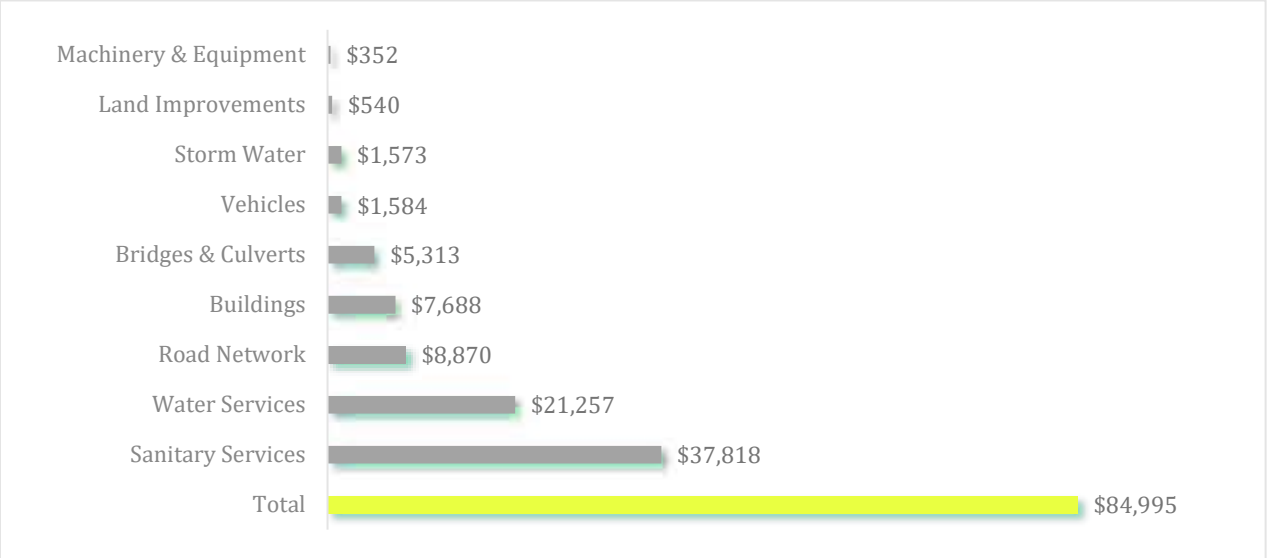


Figure 4 2016 Ownership Per Household



2. Source of Condition Data by Asset Class

Observed data will provide the most precise indication of an asset's physical health. In the absence of such information, the age of capital assets can be used as a meaningful approximation of the asset's condition. Table 4 indicates the source of condition data used for the various asset classes in this AMP. The municipality has used age-based condition for all assets within this AMP.

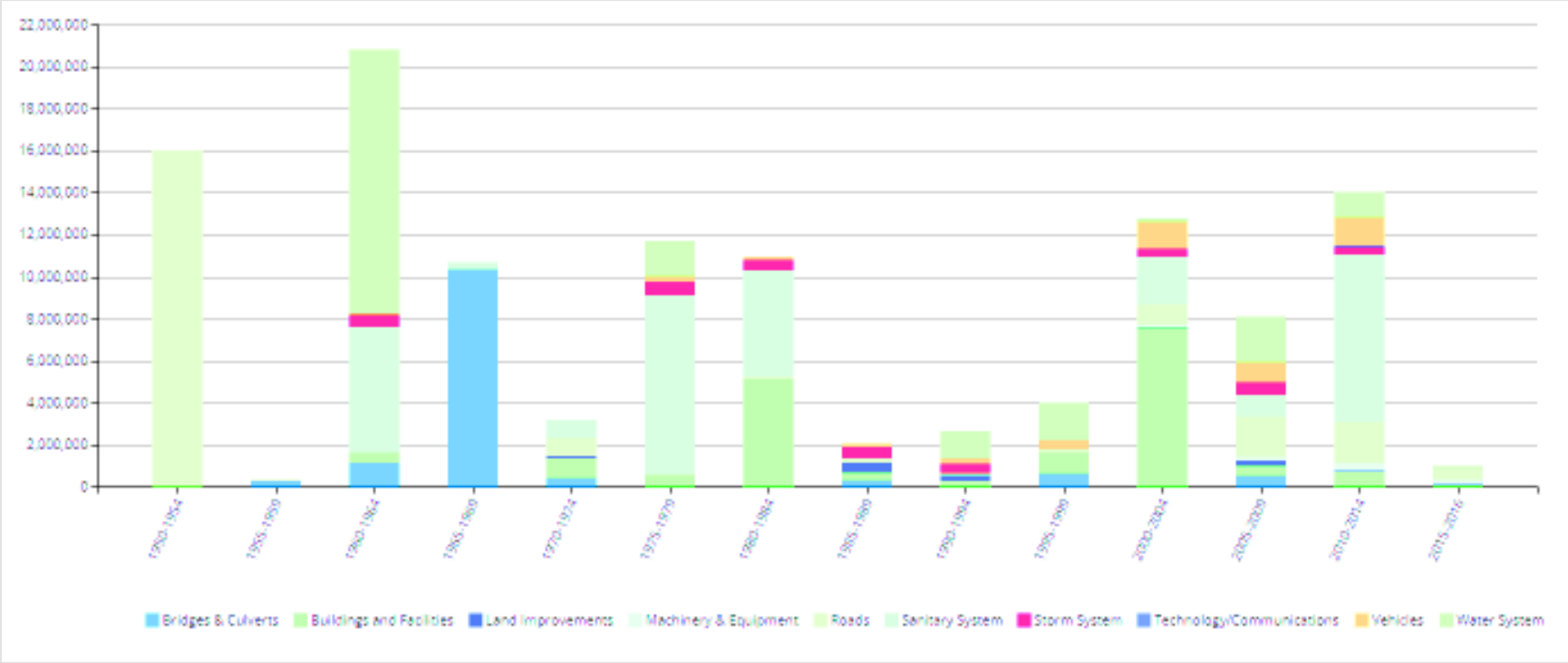
Table 4 Source of Condition Data by Asset Class

Asset class	Component	Source of Condition Data
Roads Network	All	Age-based
Bridges & Culverts	All	Age-based
Water System	All	Age-based
Sanitary Services	All	Age-based
Storm	All	Age-based
Buildings	All	Age-based
Machinery & Equipment	All	Age-based
Land Improvements	All	Age-based
Vehicles	All	Age-based

3. Historical Investment in Infrastructure – All Asset Classes

In conjunction with condition data, two other measurements can augment staff understanding of the state of infrastructure and impending and long-term infrastucture needs: installation year profile, and useful life remaining. Using 2016 replacement costs, Figure 5 illustrates the historical invesments made in the asset classes analyzed in this AMP since 1950. Often, investment in critical infrastructure parallels population growth or other significant shifts in demographics; they can also fluctuate with provincial and federal stimuls programs. Note that this graph only includes the active asset inventory as of December 31, 2016.

Figure 5 Historical Investment in Infrastructure – All Asset Classes

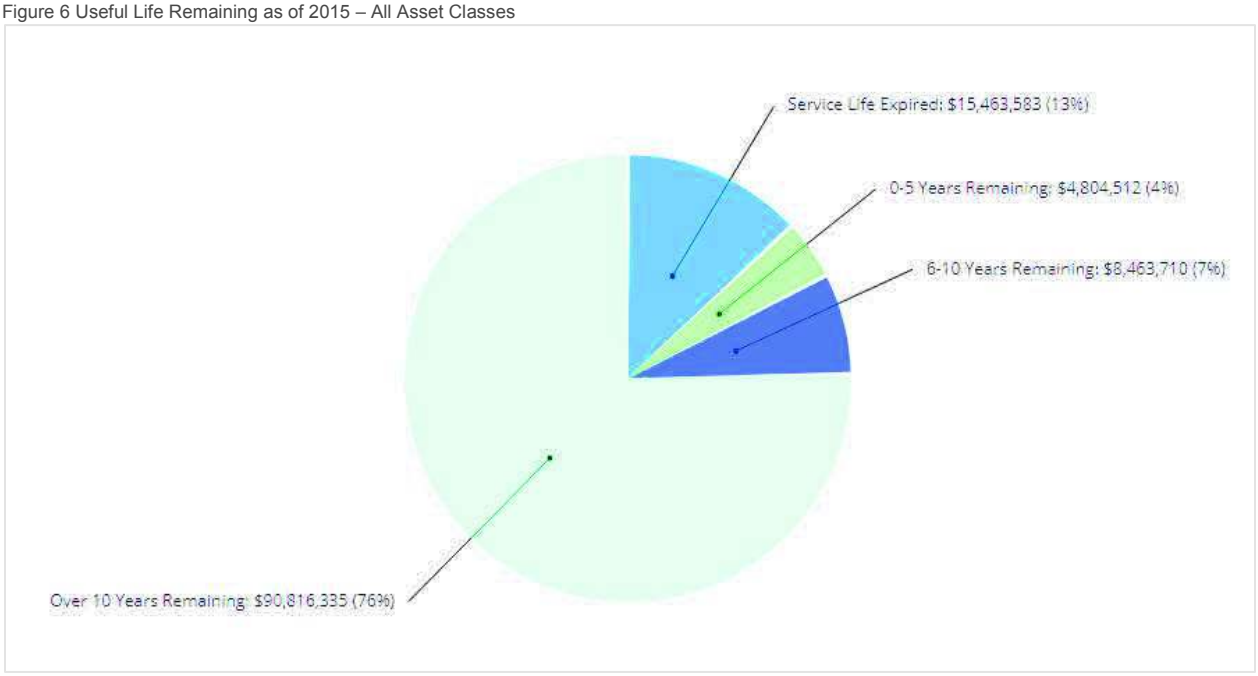


The municipality has continuously invested into its infrastructure over the decades. Investments fluctuated since the 1950s and peaked in the early 1960s. During this time, $20.8 million was invested with $12.6 million put into the water system. Since 2015, $981,000 has been invested with a focus on roads.

4. Useful Life Consumption – All Asset Classes

While age is not a precise indicator of an asset's health, in the absence of observed condition assessment data, it can serve as a high-level, meaningful approxmiation and help guide replacement needs and facilitate strategic budgeting. Figure 6 shows the distibution of assets based on the percentage of useful life already consumed.

Figure 6 Useful Life Remaining as of 2015 – All Asset Classes

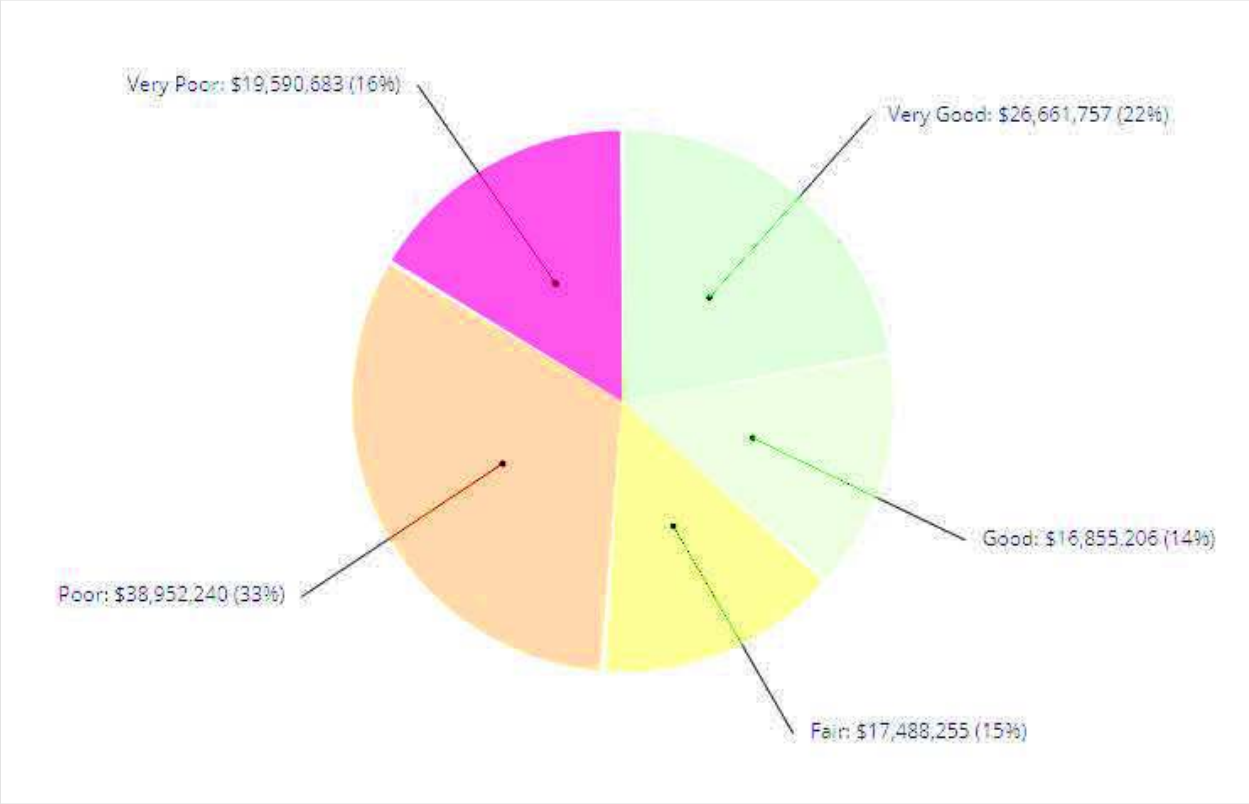


76% of the assets analyzed in this AMP have at least 10 years of useful life remaining. However, 13%, with a valuation of $15 million, remain in operation beyond their established useful life. An additional 4% will reach the end of their useful life within the next five years.

5. Overall Condition – All Asset Classes

Based on 2016 replacement cost, and age-based data, 36% of assets, with a valuation of $43.5 million, are in good to very good condition; 49% are in poor to very poor condition.

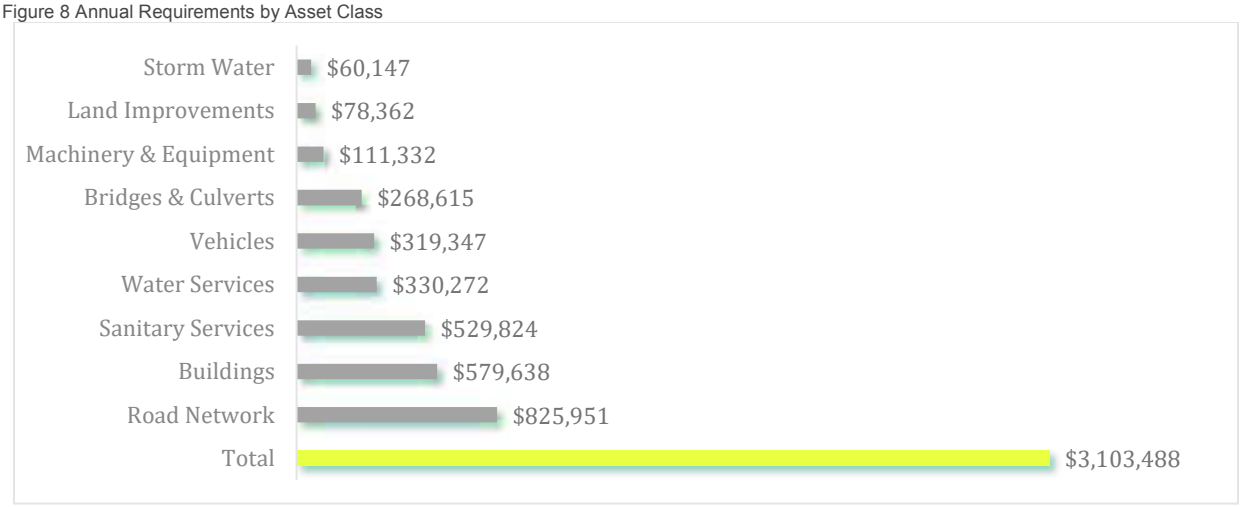
Figure 7 Asset Condition Distribution by Replacement Cost as of 2015 – All Asset Classes



6. Financial Profile

This section details key high-level financial indicators for the municipality's asset classes.

Figure 8 Annual Requirements by Asset Class



The annual requirements represent the amount the municipality should allocate annually to each of its asset classes to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the municipality must allocate $3.1 million annually for the assets covered in this AMP.

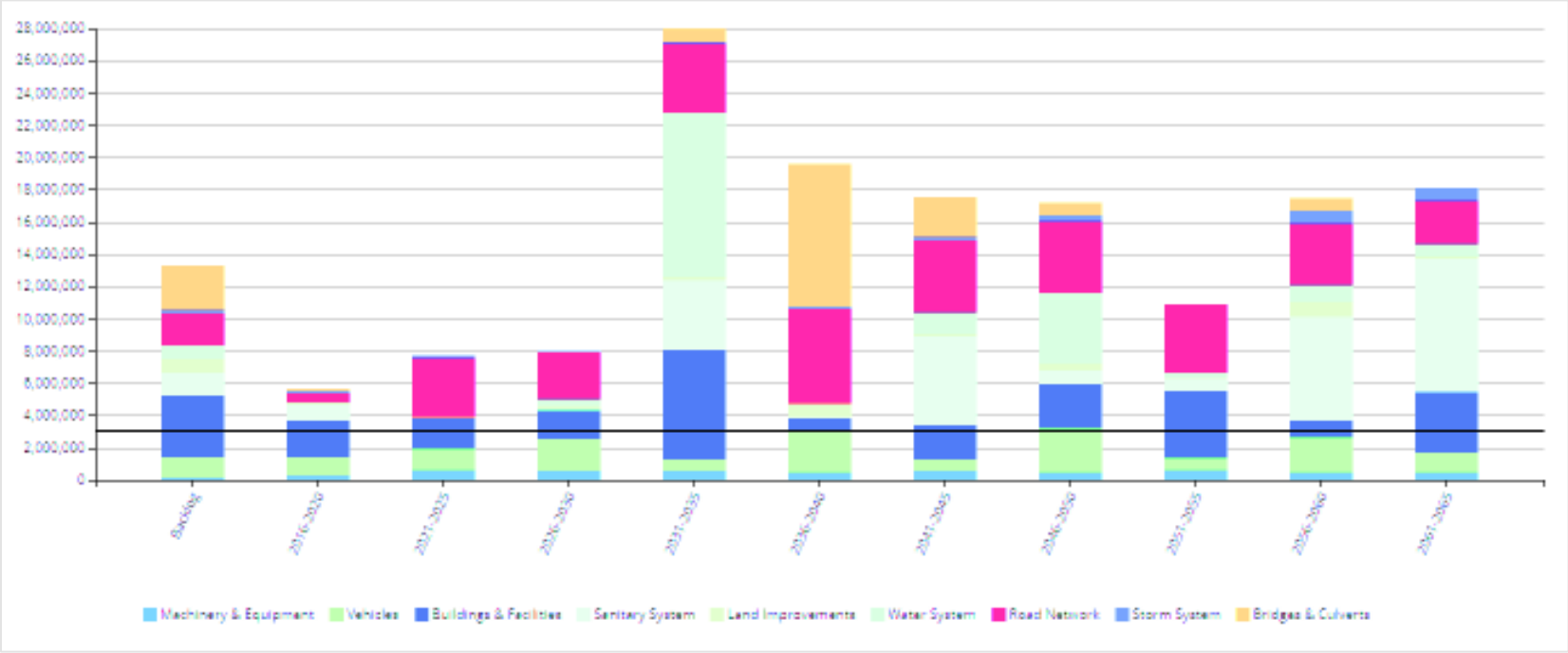
Figure 9 Infrastructure Backlog – All Asset Classes

The municipality has a combined infrastructure backlog of $13.3 million, with buildings & facilities comprising 29%. The backlog represents the investment needed today to meet previously deferred replacement needs. In the absence of assessed data, the backlog represents the value of assets still in operation beyond their established useful life.

7. Replacement Profile – All Asset Classes

In this section, we illustrate the aggregate short-, medium- and long-term infrastructure spending requirements (replacement only) for the municipality's asset classes. The backlog is the total investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 10 Replacement Profile – All Asset Classes



Based on age data, the municipality has a combined backlog of $13.3 million, of which buildings & facilities comprises $3.8 million. Aggregate replacement needs will total $5.6 million over the next five years. An additional $7.6 million will be required between 2021 and 2025. The municipality's aggregate annual requirements (indicated by the black line) total $3.1 million. At this funding level, the municipality would be allocating sufficient funds on an annual basis to meet the replacement needs for its various asset classes as they arise without the need for deferring projects and accruing annual infrastructure deficits. Currently, the municipality is funding 44% of the annual requirements for tax-funded assets and 67% for rate-funded assets. See the 'Financial Strategy' chapter for achieving a more optimal and sustainable funding level. Further, while fulfilling the annual requirements will position the municipality to meet its future replacement needs, injection of additional revenues will be needed to mitigate existing infrastructure backlogs.

8. Data Confidence

The municipality has a high degree of confidence in the data used to develop this AMP, receiving an overall confidence rating of 86%. This is indicative of significant effort in collecting and refining its data set.

Table 5 Data Confidence Ratings

Asset Class	The data is up-to-date.	The data is complete and uniform.	The data comes from an authoritative source.	The data is error free.	The data is verified by an authoritative source.	Average Confidence Rating
Road Network	100%	90%	80%	80%	80%	86%
Bridges & Culverts	100%	90%	80%	80%	80%	86%
Water Services	100%	90%	80%	80%	80%	86%
Sanitary Services	100%	90%	80%	80%	80%	86%
Storm Water	100%	90%	80%	80%	80%	86%
Buildings & Facilities	100%	90%	80%	80%	80%	86%
Machinery & Equipment	100%	90%	80%	80%	80%	86%
Land Improvements	100%	90%	80%	80%	80%	86%
Fleet	100%	90%	80%	80%	80%	86%
					Overall Weighted Average Data Confidence Rating	86%

VI. State of Local Infrastructure

The state of local infrastructure includes the full inventory, condition ratings, useful life consumption data and the backlog and upcoming infrastructure needs for each asset class. As available, assessed condition data was used to inform the discussion and recommendations; in the absence of such information, age-based data was used as the next best alternative.

1. Road Network

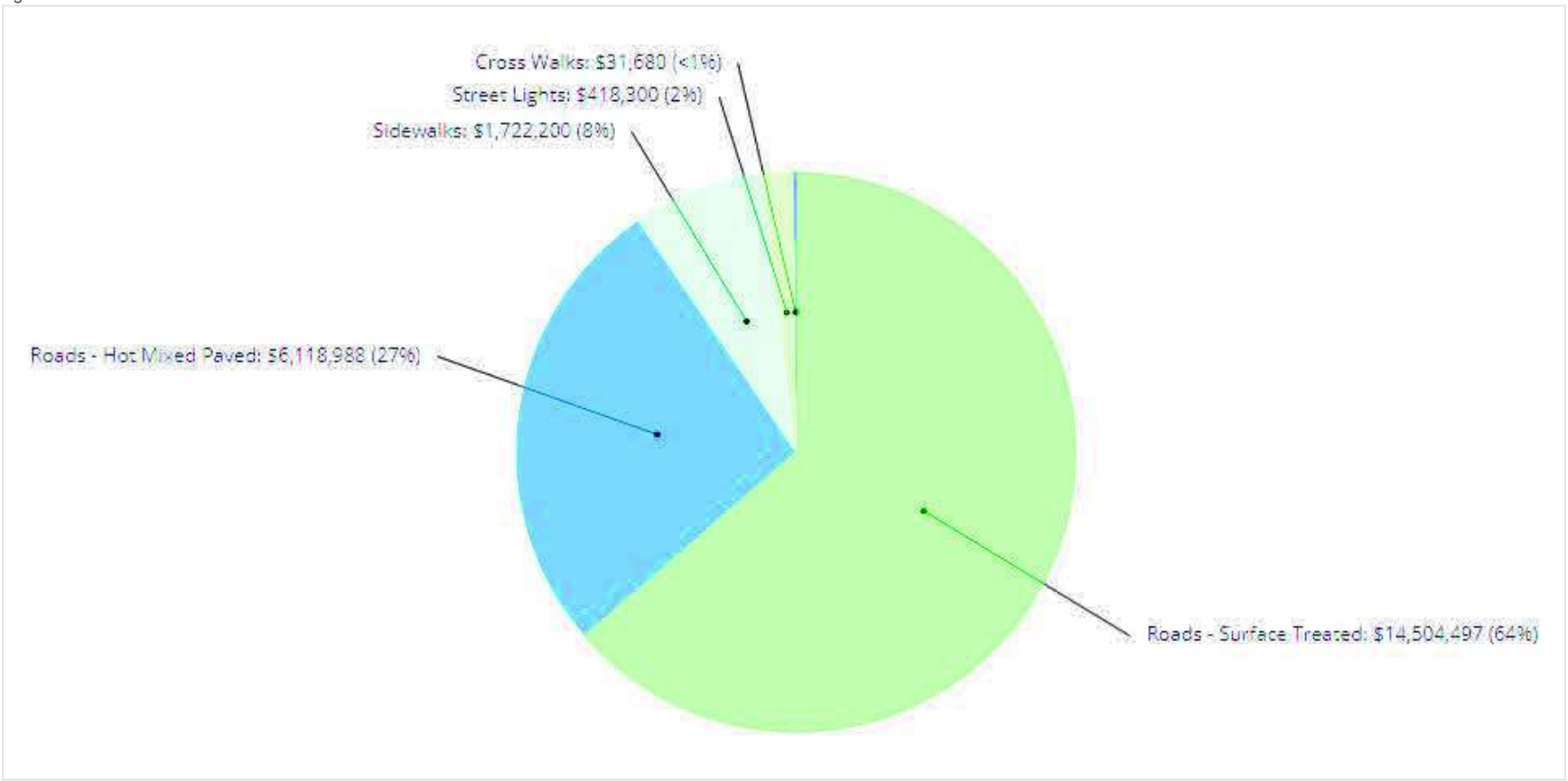
1.1 Asset Portfolio: Quantity, Useful Life and Replacement Cost

Table 6 illustrates key asset attributes for the municipality's road network, including quantities of various assets, their useful life, their replacement cost, and the valuation method by which the replacement costs were derived. In total, the municipality's roads assets are valued at $22.8 million based on 2016 replacement costs. The useful life indicated for each asset type below was assigned by the municipality.

Table 6 Key Asset Attributes – Road Network

Asset Type	Asset Component	Quantity	Useful Life (Years)	2016 Unit Replacement Cost	2016 Overall Replacement Cost
Road Network	Cross Walk	15m	20	User Defined Cost	$31,680
	Gravel	641km	40	Not Planned For Replacement	$0
	Roads – Hot Mixed Paved	67km	30, 40	User Defined Cost/NRBCPI (Toronto)	$6,118,988
	Roads – Surface Treated	353km	15, 40	User Defined Cost/ NRBCPI (Toronto)	$14,504,497
	Sidewalks	15648m	40	User Defined Cost	$1,722,200
	Streetlights	506	10, 20, 30	User Defined Cost/ NRBCPI (Toronto)	$418,300
				Total	**$22,795,665**

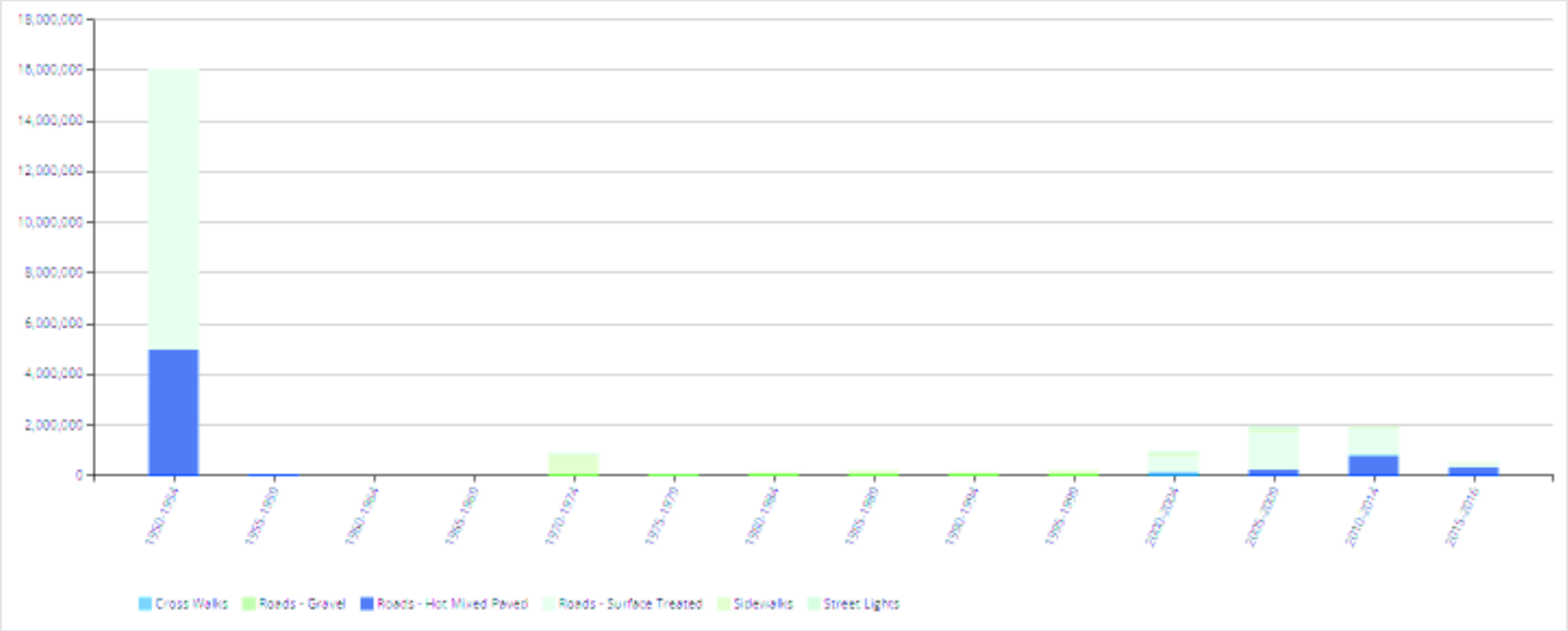
Figure 11 Asset Valuation – Road Network



1.2 Historical Investment in Infrastructure

Figure 12 shows the municipality's historical investments in its road network since 1950. While observed condition data will provide superior accuracy in estimating replacement needs and should be incorporated into strategic plans, in the absence of such information, understanding past expenditure patterns and current useful life consumption levels (Section 1.3) can inform the forecasting and planning of infrastructure needs and in the development of a capital program. Note that this graph only includes the active asset inventory as of December 31, 2016.

Figure 12 Historical Investment – Road Network

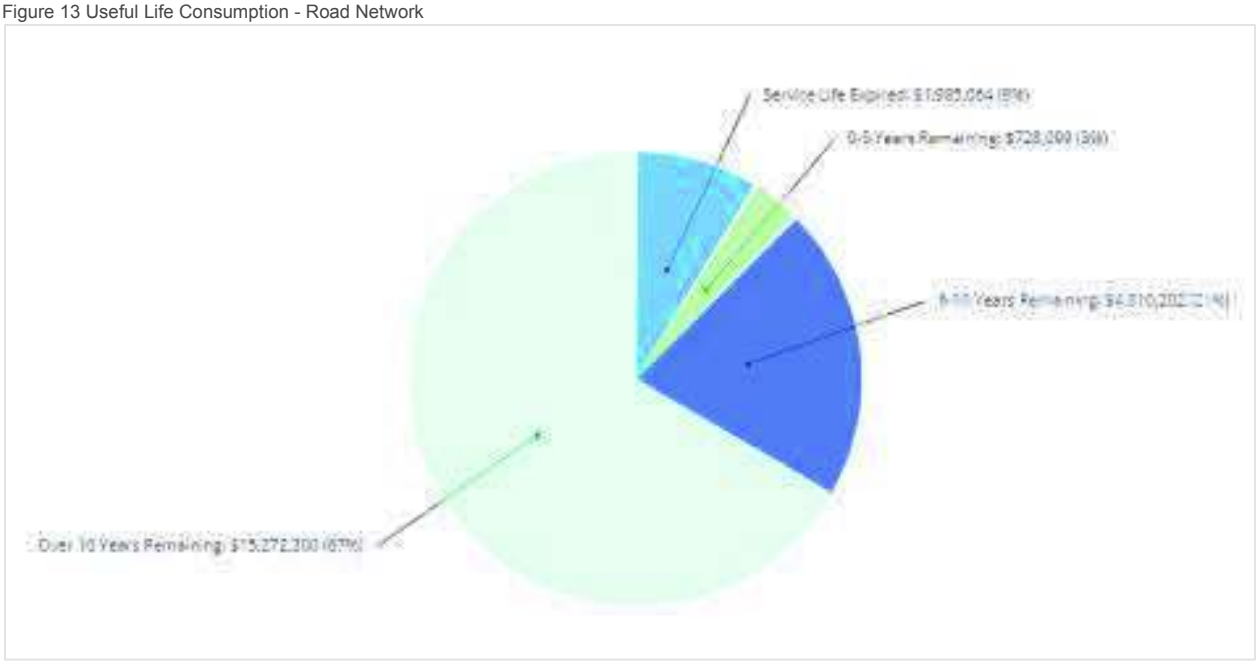


Investments in the municipality's road network mostly occurred in the early 1950s with it being the period of the largest investment at $16 million. Investments began to pick up again in the early 2000s and $525,000 has been invested since 2015.

1.3 Useful Life Consumption

In conjunction with historical spending patterns and observed condition data, understanding the consumption rate of assets based on industry established useful life standards provides a more complete profile of the state of a community's infrastructure. Figure 13 illustrates the useful life consumption levels as of 2016 for the municipality's road network.

Figure 13 Useful Life Consumption - Road Network

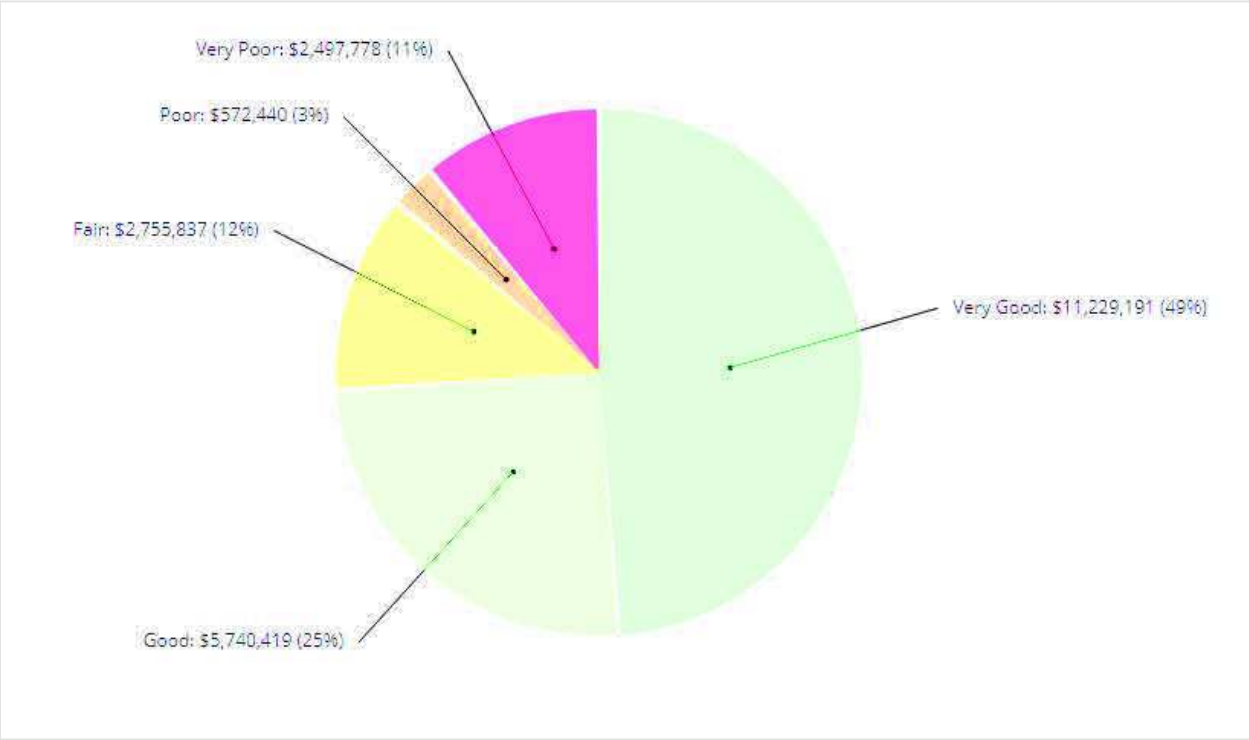


While 67% of the municipality's road network has at least 10 years of useful life remaining, 9%, with a valuation of $2 million, remain in operation beyond their useful life. An additional 3% will reach the end of their useful life within the next five years.

1.4 Current Asset Condition

Using replacement cost, in this section we summarize the condition of the municipality's road network as of 2016. By default, we rely on observed field data as provided by the municipality. In the absence of such information, age-based data is used as a proxy. The municipality has not provided condition data for its road assets. Note that the municipality is completing a roads needs study in 2017 to gather condition data for road surfaces.

Figure 14 Asset Condition – Road Network (Age-Based)

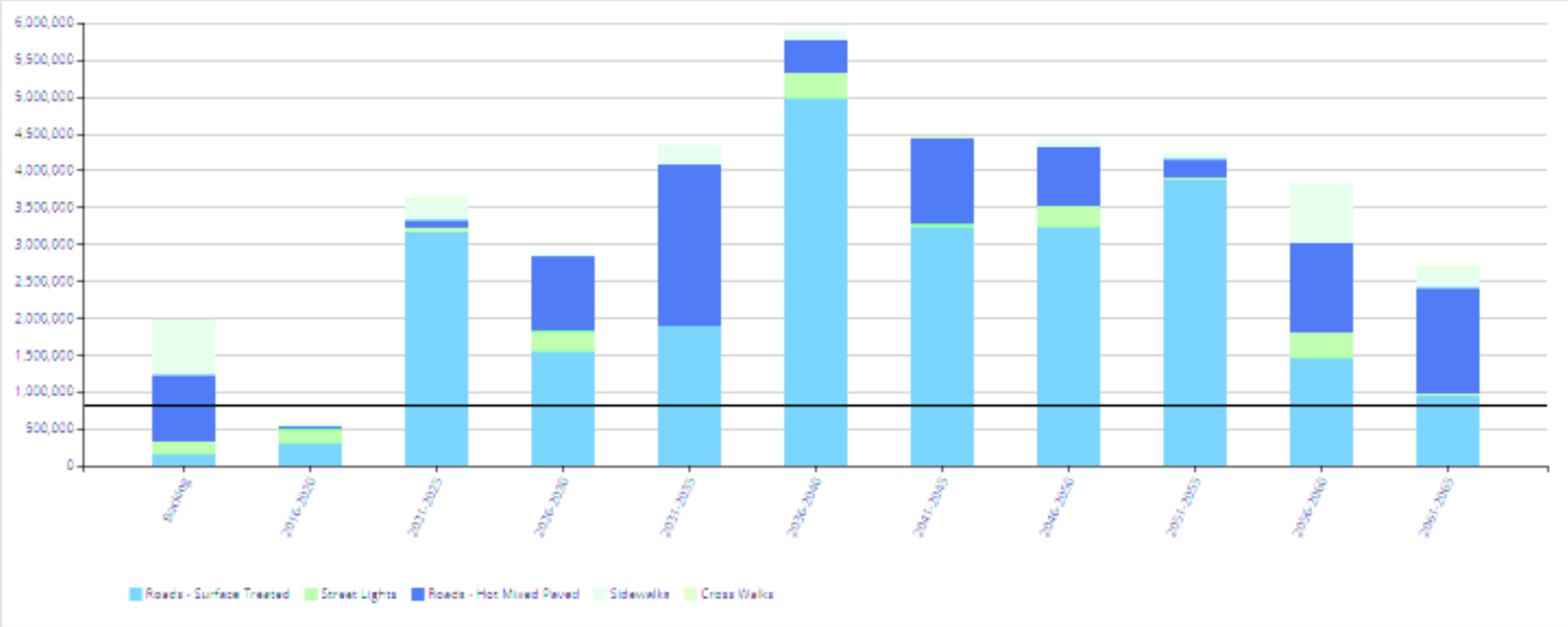


Based on age-based condition data, 74% of assets, with a valuation of $17 million are in good to very good condition; 14% are in poor to very poor condition.

1.5 Forecasting Replacement Needs

In this section, we illustrate the short-, medium- and long-term infrastructure spending requirements (replacement only) for the municipality's road network assets. The backlog is the aggregate investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 15 Forecasting Replacement Needs – Road Network



In addition to a backlog of $2 million, replacement needs are forecasted to be $570,000 in the next five years; an additional $3.6 million is forecasted in replacement needs between 2021-2025. The municipality's annual requirements (indicated by the black line) for its road network total $826,000. At this funding level, the municipality would be allocating sufficient funds on an annual basis to meet replacement needs as they arise without the need for deferring projects and accruing annual infrastructure deficits. However, the municipality is currently allocating $544,000, leaving an annual deficit of $282,000. See the 'Financial Strategy' section for achieving a more optimal and sustainable funding level. Further, while fulfilling the annual requirements will position the municipality to meet its future replacement needs, injection of additional revenues will be needed to mitigate existing infrastructure backlogs.

1.6 Recommendations – Road Network

- Age-based data indicates backlog of $2 million and 10-year replacement needs of $4.1 million. The municipality should implement a condition assessment program for its road network to better estimate financial requirements and field needs. See Section 2, 'Condition Assessment Programs' in the 'Asset Management Strategies' chapter.

- Road network key performance indicators should be established and tracked annually as part of an overall level of service model. See Section 7 'Levels of Service'.

- The municipality is funding 66% of its long-term requirements on an annual basis. See the 'Financial Strategy' section on how to achieve more sustainable funding levels.

2. Bridges & Culverts

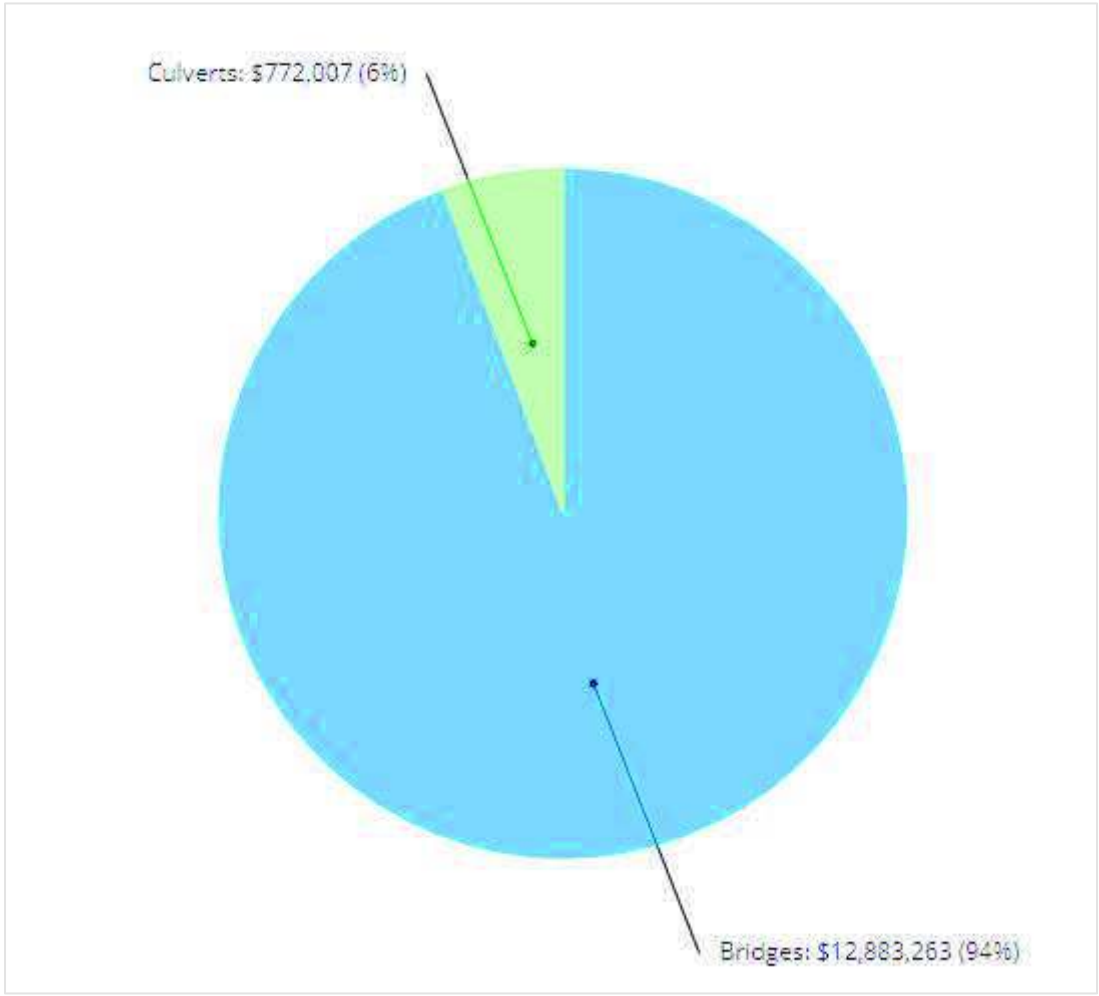
2.1 Asset Portfolio: Quantity, Useful Life and Replacement Cost

Table 7 illustrates key asset attributes for the municipality's bridges & culverts, including quantities of various assets, their useful life, their replacement cost, and the valuation method by which the replacement costs were derived. In total, the municipality's bridges & culverts assets are valued at $13.7 million based on 2016 replacement costs. The useful life indicated for each asset type below was assigned by the municipality.

Table 7 Key Asset Attributes – Bridges & Culverts

Asset Type	Asset Component	Quantity	Useful Life (Years)	2016 Unit Replacement Cost	2016 Overall Replacement Cost
Bridges & Culverts	Bridges	19	25, 75	NRBCPI (Toronto)	$12,883,263
	Culverts	2	30	NRBCPI (Toronto)	$772,007
				Total	**$13,655,270**

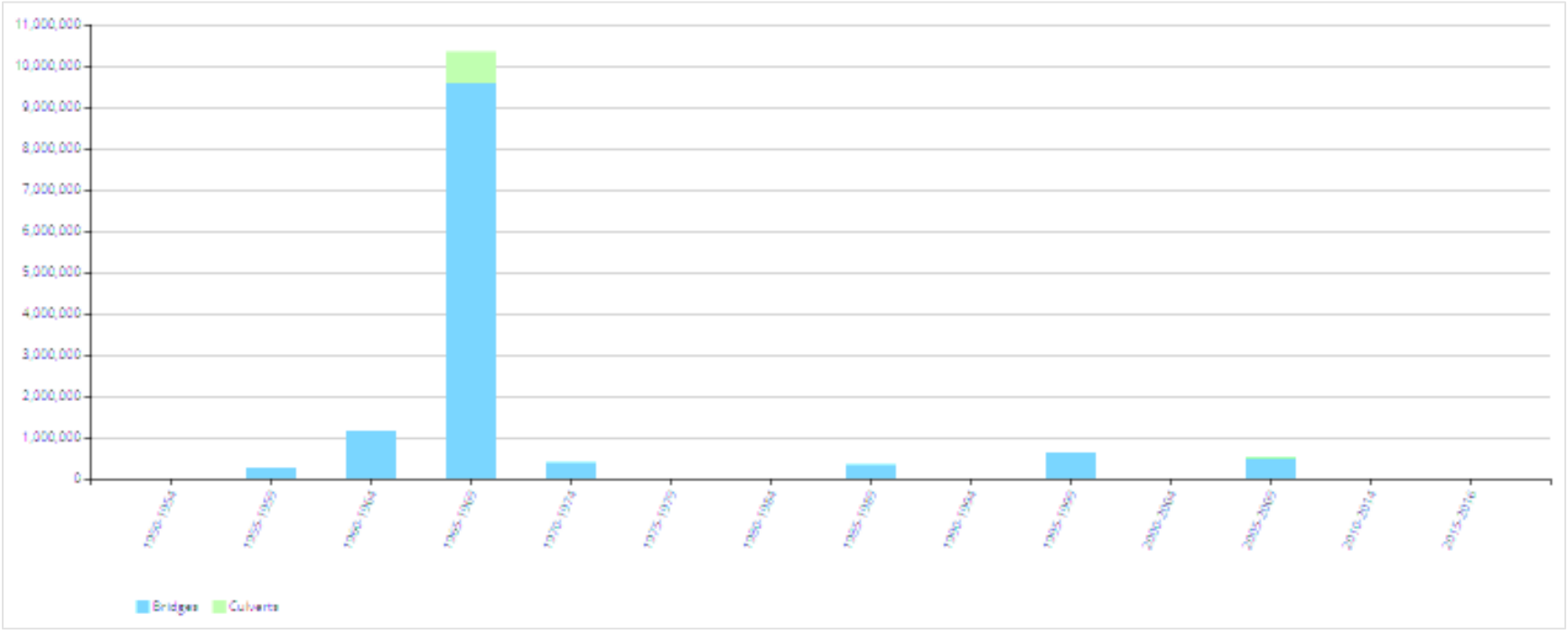
Figure 16 Asset Valuation – Bridges & Culverts



2.2 Historical Investment in Infrastructure

Figure 17 shows the municipality's historical investments in its bridges & culverts since 1950. While observed condition data will provide superior accuracy in estimating replacement needs and should be incorporated into strategic plans, in the absence of such information, understanding past expenditure patterns and current useful life consumption levels (Section 2.3) can inform the forecasting and planning of infrastructure needs and in the development of a capital program. Note that this graph only includes the active asset inventory as of December 31, 2016.

Figure 17 Historical Investment – Bridges & Culverts

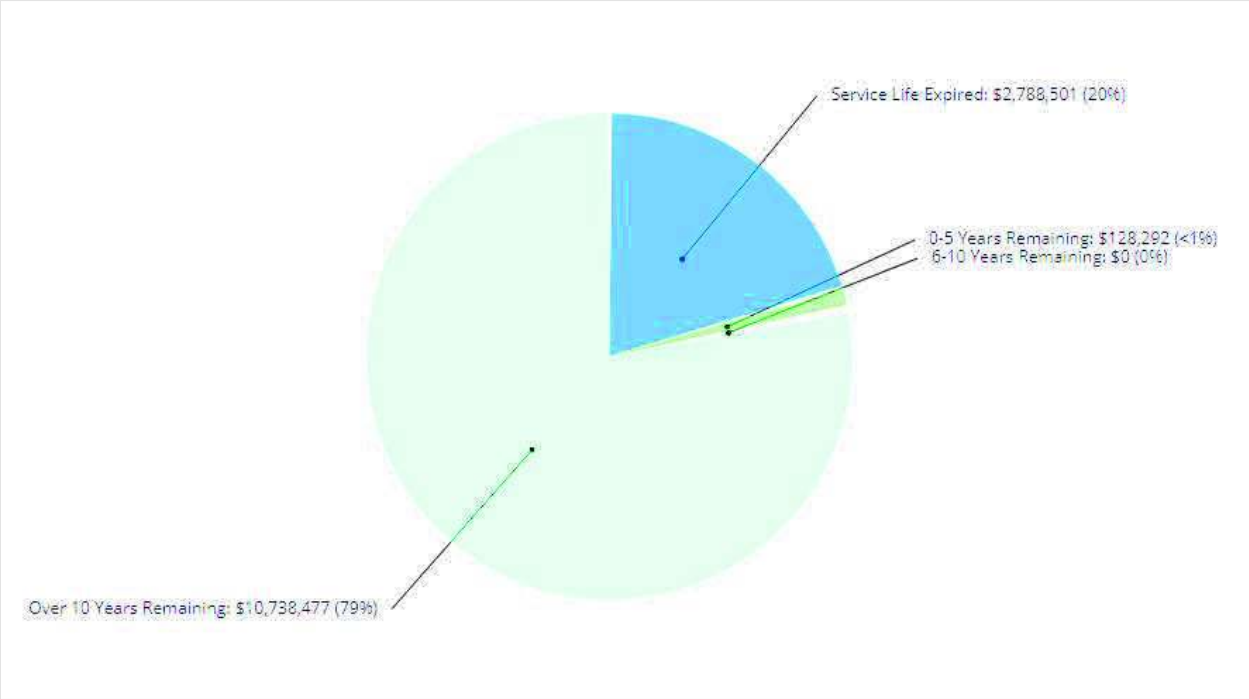


The municipality has invested sporadically in its bridges and culverts since 1950. In the late 1960s, the period of largest investment, $10 million was invested with $9.5 million put into bridges.

2.3 Useful Life Consumption

In conjunction with historical spending patterns and observed condition data, understanding the consumption rate of assets based on industry established useful life standards provides a more complete profile of the state of a community's infrastructure. Figure 18 illustrates the useful life consumption levels as of 2016 for the municipality's bridges & culverts.

Figure 18 Useful Life Consumption – Bridges & Culverts

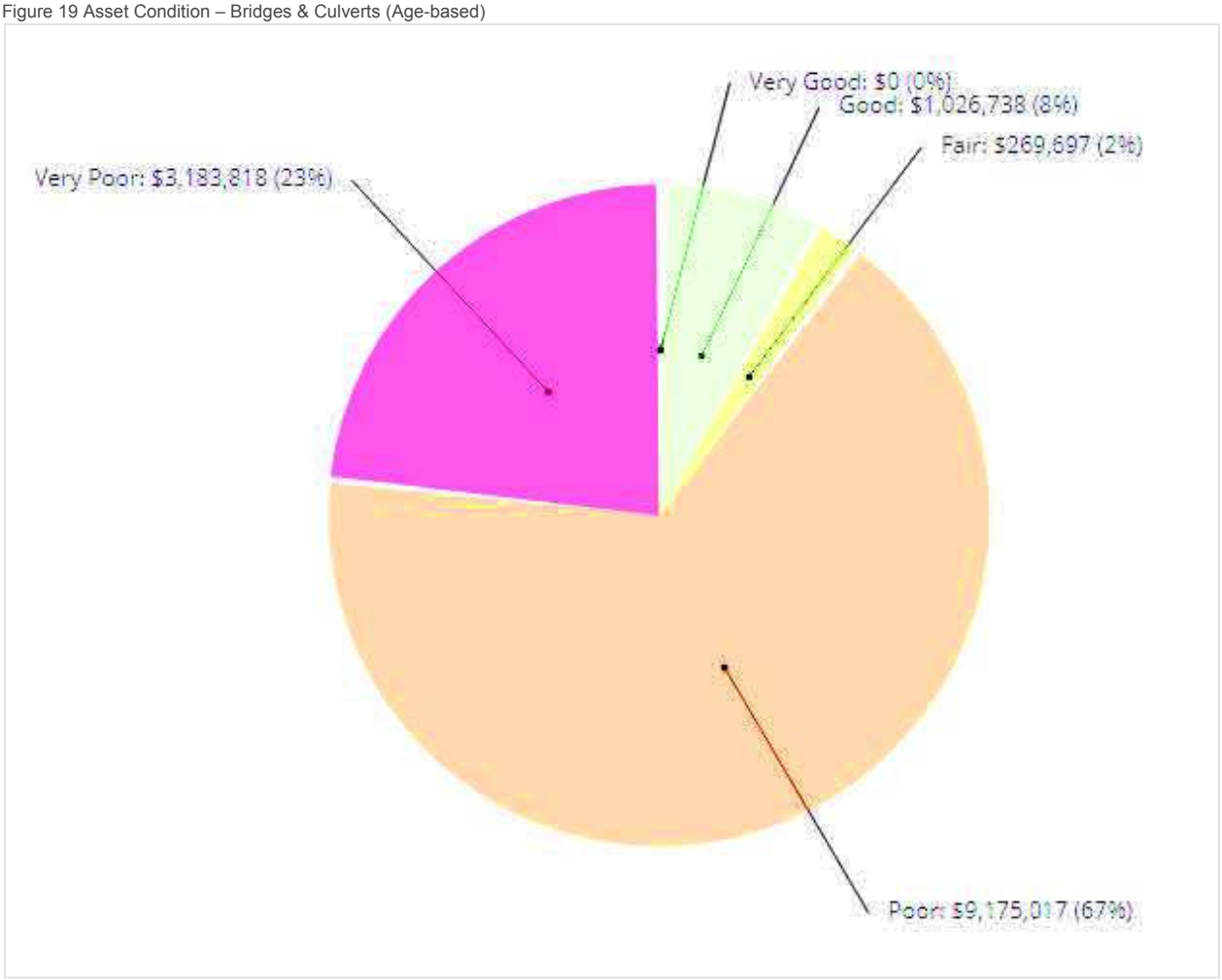


79% of the assets have at least 10 years of useful life remaining while 20%, with a valuation of $2.8 million, remain in operation beyond their useful life. An additional 1% will reach the end of their useful life within the next five years.

2.4 Current Asset Condition

Using replacement cost, in this section we summarize the condition of the municipality's bridges & culverts as of 2016. By default, we rely on observed field data adapted from OSIM inspections as provided by the municipality. In the absence of such information, age-based data is used as a proxy. All assets are based on age-based data.

Figure 19 Asset Condition – Bridges & Culverts (Age-based)

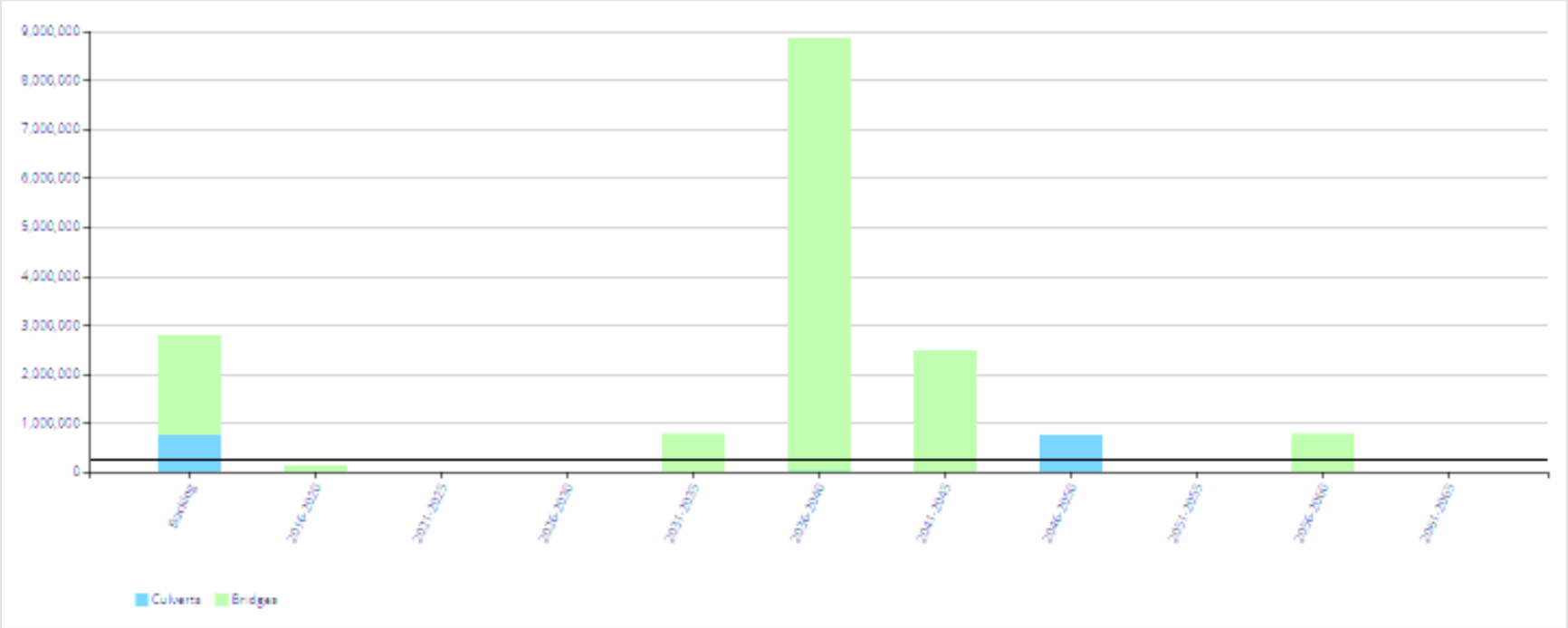


Age-based data indicates that while 8% of the municipality's bridges & culverts are in good condition, 90%, with a valuation of $12.3 million, are in poor to very poor condition.

2.5 Forecasting Replacement Needs

In this section, we illustrate the short-, medium- and long-term infrastructure spending requirements (replacement only) for the municipality's bridges & culverts. The backlog is the aggregate investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 20 Forecasting Replacement Needs – Bridges & Culverts



In addition to a backlog of $2.8 million, replacement needs will total $128,000 in the next five years. The municipality's annual requirements (indicated by the black line) for its bridges & culverts total $269,000. At this funding level, the municipality would be allocating sufficient funds on an annual basis to meet replacement needs as they arise without the need for deferring projects and accruing annual infrastructure deficits. The municipality is currently allocating $20,000, leaving an annual deficit of $249,000. See the 'Financial Strategy' section for achieving a more optimal and sustainable funding level. Further, while fulfilling the annual requirements will position the municipality to meet its future replacement needs, injection of additional revenues will be needed to mitigate existing infrastructure backlogs.

2.6 Recommendations – Bridges & Culverts

- The results and recommendations from the OSIM inspections should be incorporated into the AMP analysis and be used to generate the short-and long-term capital and maintenance budgets for the bridge and large culvert structures. See Section VIII, 'Asset Management Strategies'.

- Bridge & culvert structure key performance indicators should be established and tracked annually as part of an overall level of service model. See Section VII 'Levels of Service'.

- The municipality is funding 7% of its long-term requirements on an annual basis. See the 'Financial Strategy' section on how to achieve more sustainable and optimal funding levels.

3. Water System

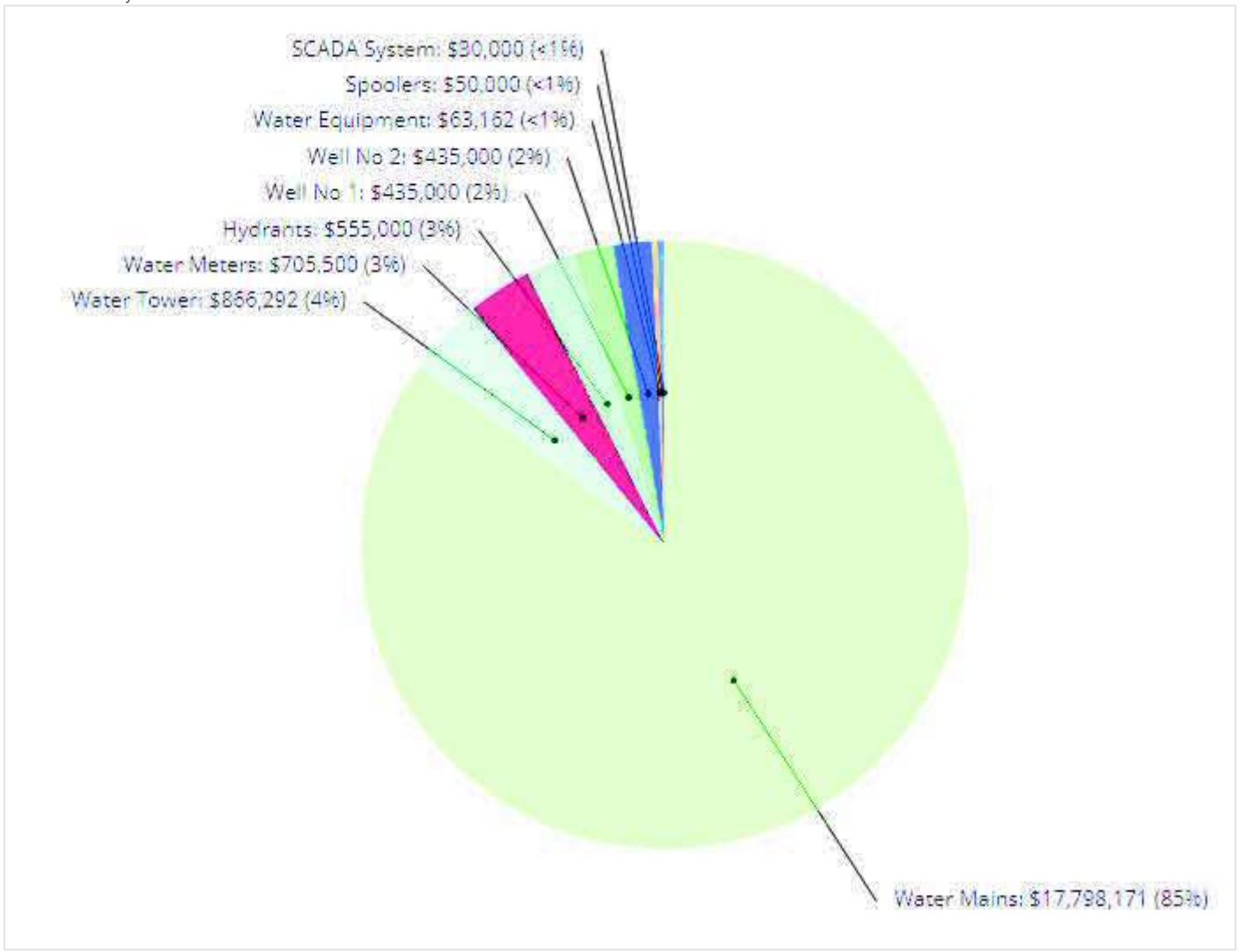
3.1 Asset Portfolio: Quantity, Useful Life and Replacement Cost

Table 8 illustrates key asset attributes for the municipality's water system, including quantities of various assets, their useful life, replacement costs, and the valuation method by which the replacement costs were derived. In total, the municipality's water system assets are valued at $20.9 million based on 2016 replacement costs. The useful life indicated for each asset type below was assigned by the municipality.

Table 8 Key Asset Attributes – Water

Asset Type	Asset Component	Quantity	Useful Life (Years)	2016 Unit Replacement Cost	2016 Overall Replacement Cost
Water System	Mains	23844m	50, 75, 90	User Defined Cost	$17,798,171
	Hydrants	111	40	User Defined Cost	$555,000
	SCADA System	1	20	User Defined Cost	$30,000
	Spoolers	1	50	User Defined Cost	$50,000
	Water Meters	956	15	User Defined Cost	$705,500
	Water Tower	1	40	User Defined Cost	$866,262
	Water Equipment	1	15	User Defined Cost	$63,162
	Wells	2	40, 60	User Defined Cost	$870,000
				Total	**$20,938,125**

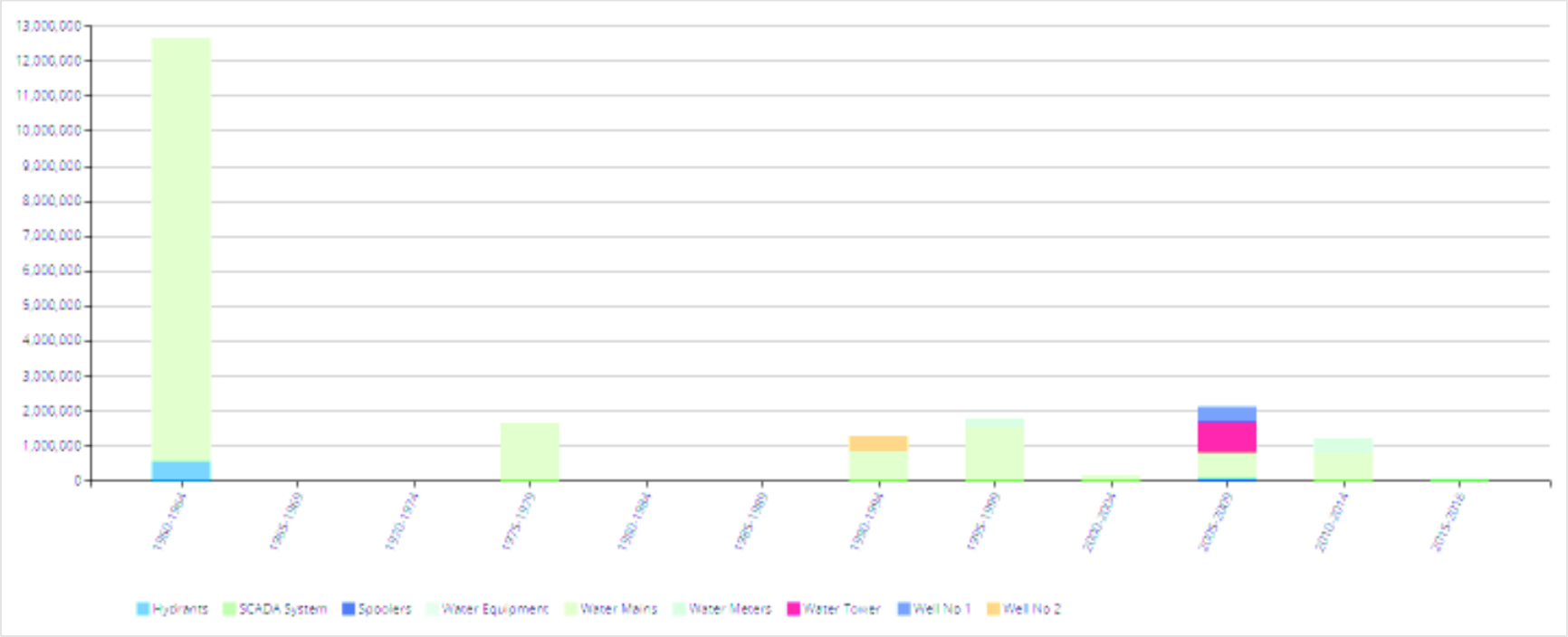
Figure 21 Asset Valuation – Water System



3.2 Historical Investment in Infrastructure

Figure 22 shows the municipality's historical investments in its water system since 1960. While observed condition data will provide superior accuracy in estimating replacement needs and should be incorporated into strategic plans, in the absence of such information, understanding past expenditure patterns and current useful life consumption levels (Section 3.3) can inform the forecasting and planning of infrastructure needs and in the development of a capital program. Note that this graph only includes the active asset inventory as of December 31, 2016.

Figure 22 Historical Investment – Water System

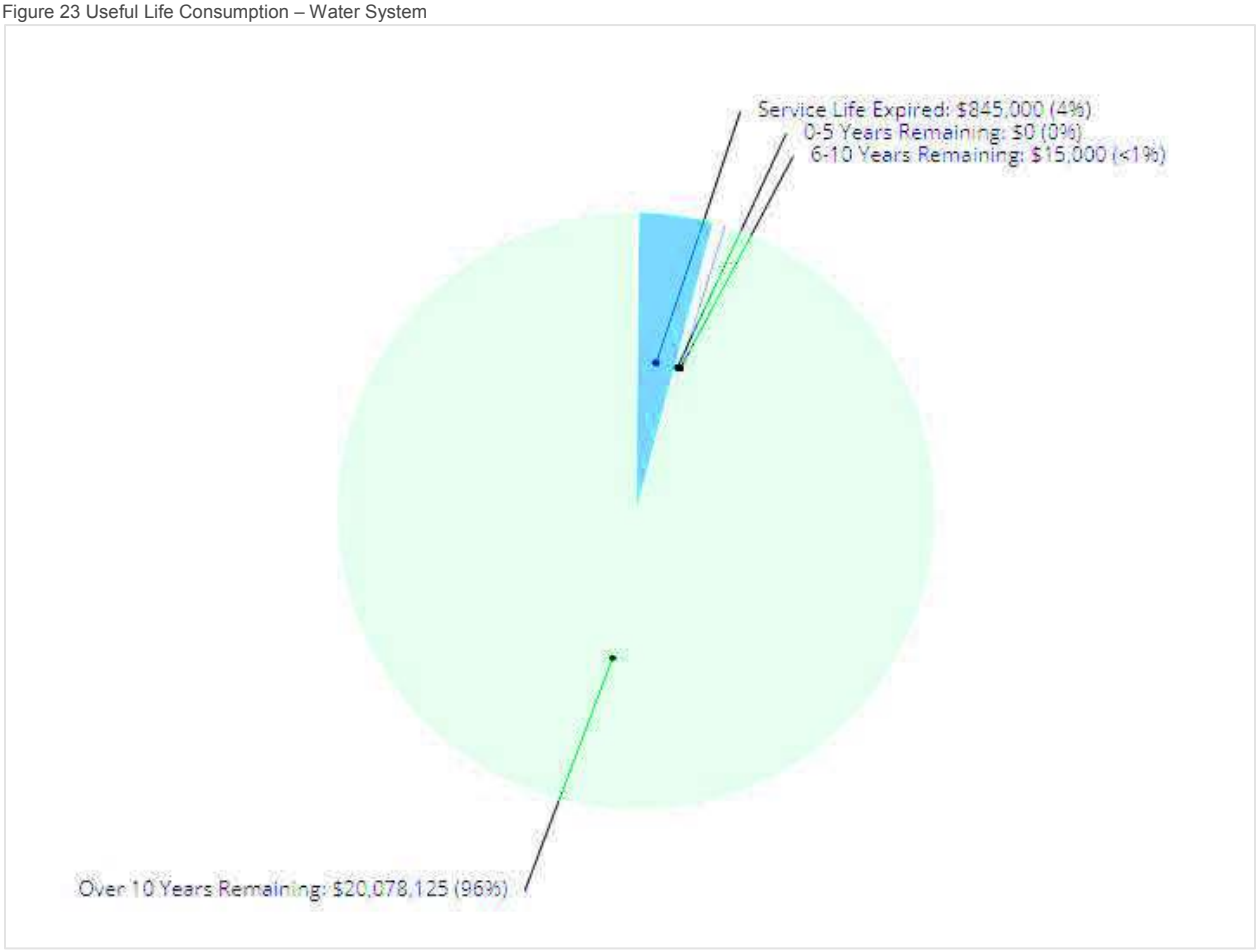


Investments in the water system have been sporadic over the decades. In the early 1960s, the period of largest investment, $12.6 million was invested in the water systems with $12 million put into mains.

3.3 Useful Life Consumption

In conjunction with historical spending patterns and observed condition data, understanding the consumption rate of assets based on industry established useful life standards provides a more complete profile of the state of a community's infrastructure. Figure 23 illustrates the useful life consumption levels as of 2016 for the municipality's water system.

Figure 23 Useful Life Consumption – Water System

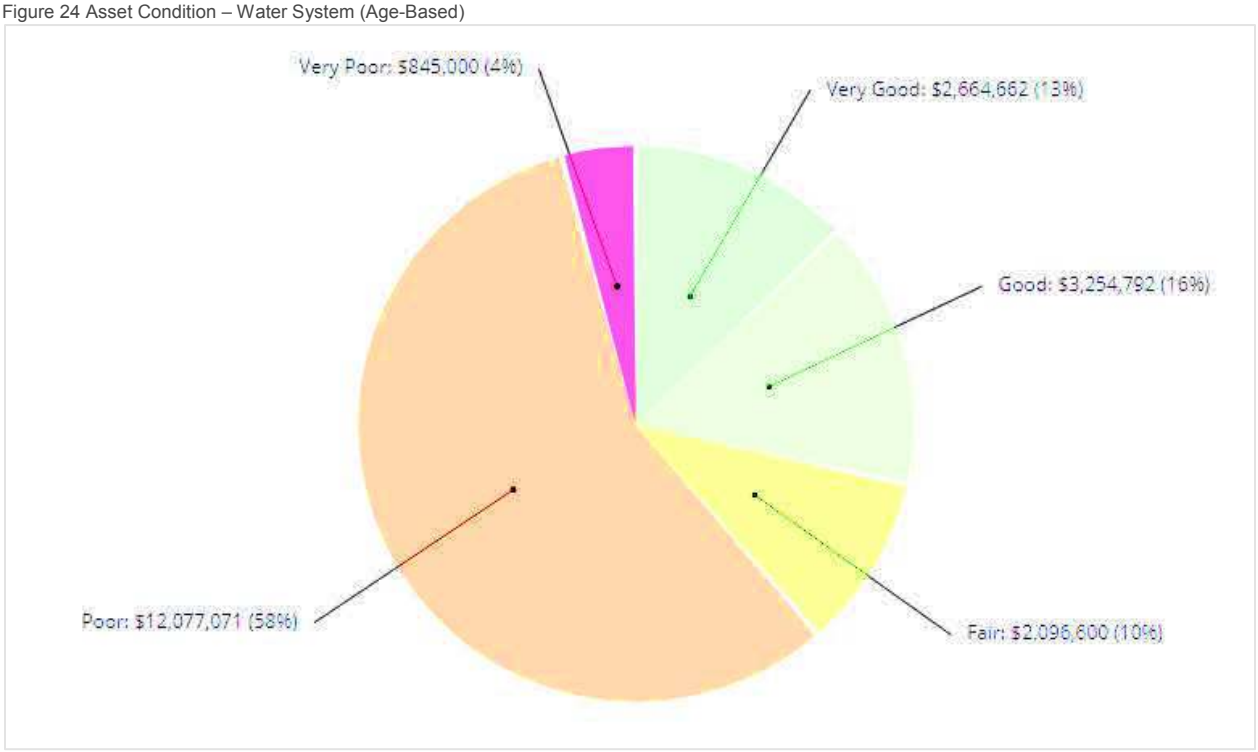


96% of the assets have at least 10 years of useful life remaining while 4%, with a valuation of $845,000, remain in operation beyond their useful life.

3.4 Current Asset Condition

Using replacement cost, in this section we summarize the condition of the municipality's water services. By default, we rely on observed field data as provided by the municipality. In the absence of such information, age-based data is used as a proxy. The municipality has not provided condition data for its water assets.

Figure 24 Asset Condition – Water System (Age-Based)

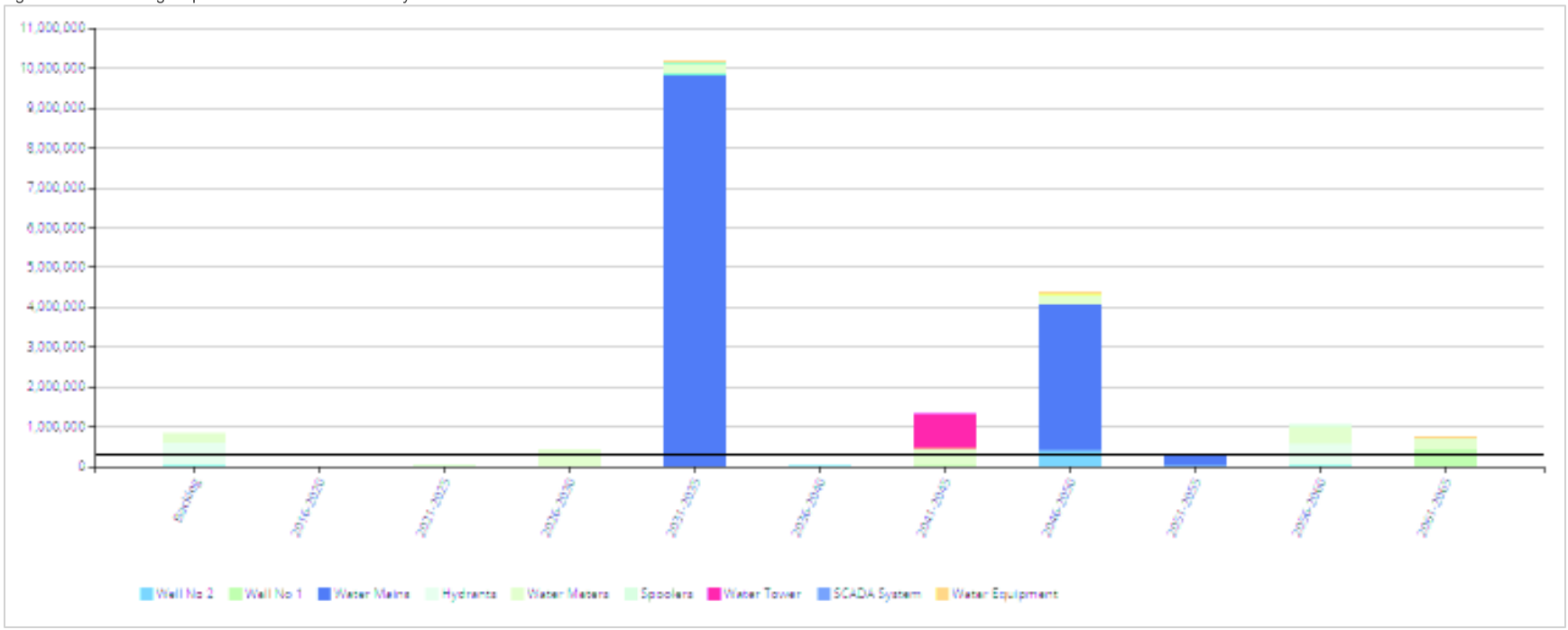


Based on age-based data, 29% of assets are in good to very good condition while 62%, with a valuation of $12.9 million, are in poor to very poor condition.

3.5 Forecasting Replacement Needs

In this section, we illustrate the short-, medium- and long-term infrastructure spending requirements (replacement only) for the municipality's water system assets. The backlog is the aggregate investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 25 Forecasting Replacement Needs – Water System



In addition to a backlog of $845,000, replacement needs will total $15,000 in the next ten years. The municipality's annual requirements (indicated by the black line) for its water system assets total $330,000. At this funding level, the municipality would be allocating sufficient funds on an annual basis to meet replacement needs as they arise without the need for deferring projects and accruing annual infrastructure deficits. However, the municipality is currently allocating $500,000 towards this asset category resulting in an annual surplus of $170,000. See the 'Financial Strategy' section for achieving a more optimal and sustainable funding level. Further, while fulfilling the annual requirements will position the municipality to meet its future replacement needs, injection of additional revenues will be needed to mitigate existing infrastructure backlogs.

3.6 Recommendations – Water System

- In time, the municipality should implement a condition assessment program of its water assets to precisely estimate its financial requirements and field needs. See Section 2, 'Condition Assessment Programs' in the 'Asset Management Strategies' chapter.

- Water distribution system key performance indicators should be established and tracked annually as part of an overall level of service model. See Section VII 'Levels of Service'.

- The municipality should assess its short-, medium- and long-term capital, and operations and maintenance needs.

- An appropriate percentage of the replacement costs should then be allocated for the municipality's O&M requirements.

- The municipality is over funding its long-term requirements on an annual basis. See the 'Financial Strategy' section on how to achieve more sustainable and optimal funding levels.

4. Wastewater Systems

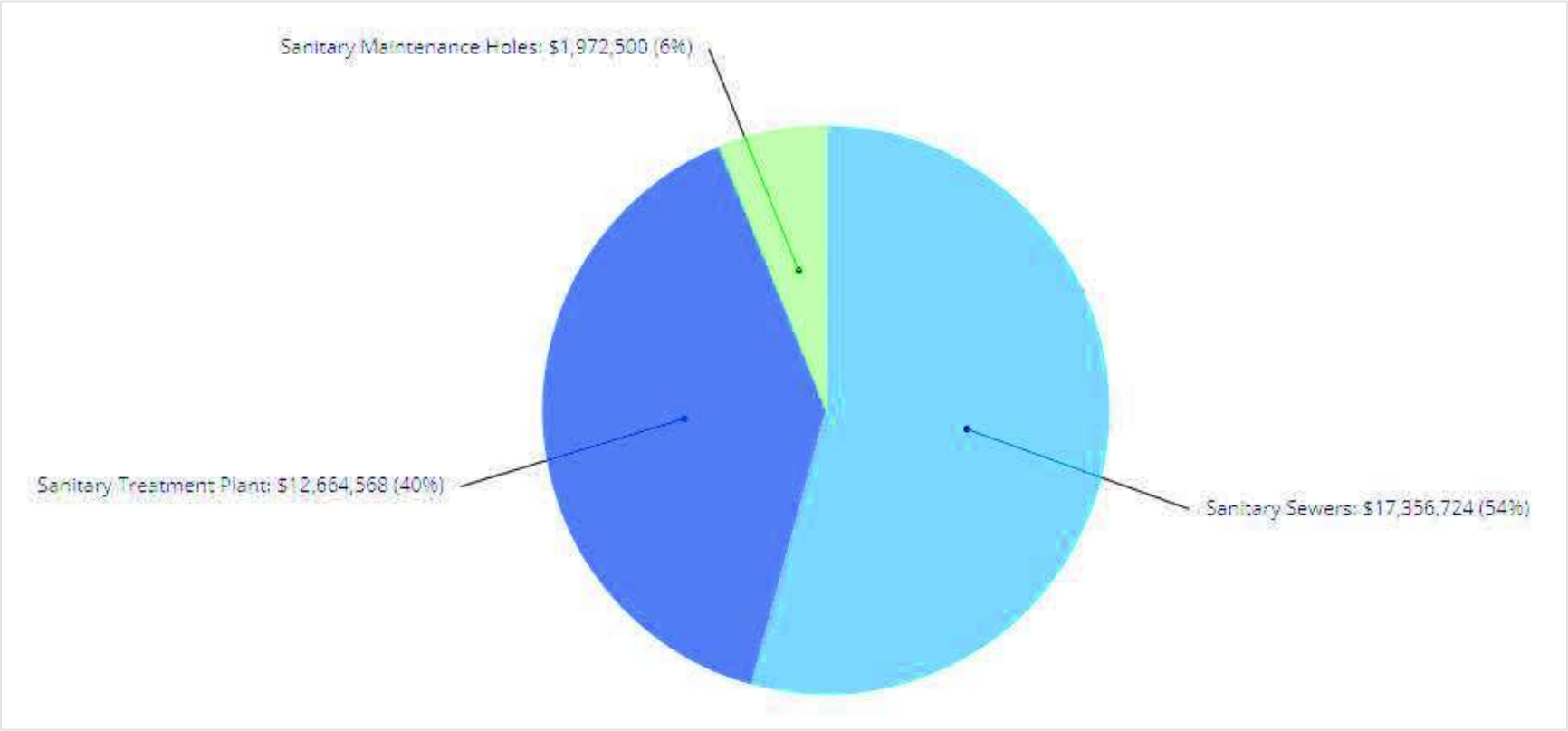
4.1 Asset Portfolio: Quantity, Useful Life and Replacement Cost

Table 9 illustrates key asset attributes for the municipality's wastewater system portfolio, including quantities of various assets, their useful life, replacement costs, and the valuation method by which the replacement costs were derived. In total, the municipality's wastewater system assets are valued at $32 million based on 2016 replacement costs. The useful life indicated for each asset type below was assigned by the municipality.

Table 9 Key Asset Attributes – Wastewater Systems

Asset Type	Asset Component	Quantity	Useful Life (Years)	2016 Unit Replacement Cost	2016 Overall Replacement Cost
Wastewater Systems	Maintenance Holes	204	40	User Defined Cost	$1,972,500
	Sanitary Sewers	17099m	80, 90	User Defined Cost	$17,356,724
	Sewer Treatment Plant (HVAC, Roof, Structure, Internal and External Components)	1	15, 20, 30, 50	User Defined Cost	$12,664,568
				Total	**$31,993,792**

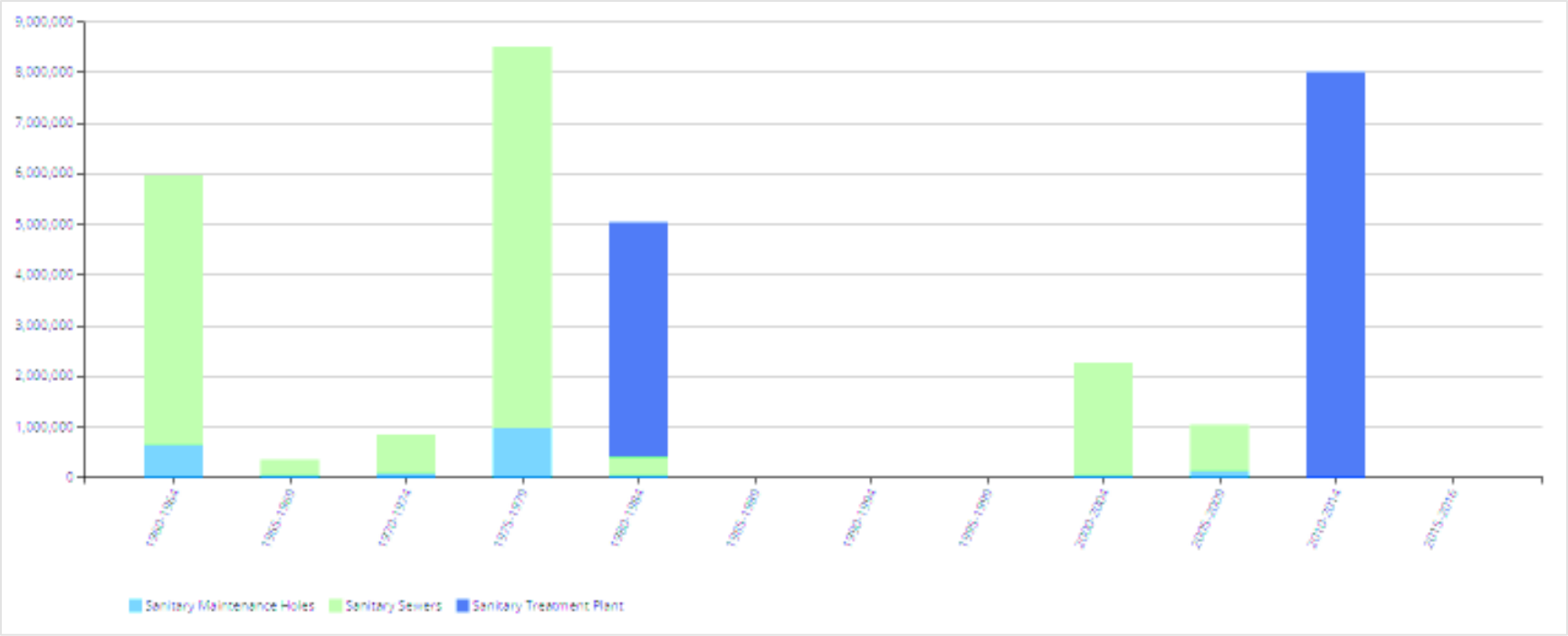
Figure 26 Asset Valuation – Wastewater System



4.2 Historical Investment in Infrastructure

Figure 27 shows the municipality's historical investments in its wastewater system since 1960. While observed condition data will provide superior accuracy in estimating replacement needs and should be incorporated into strategic plans, in the absence of such information, understanding past expenditure patterns and current useful life consumption levels (Section 4.3) can inform the forecasting and planning of infrastructure needs and in the development of a capital program. Note that this graph only includes the active asset inventory as of December 31, 2016.

Figure 27 Historical Investment – Wastewater System

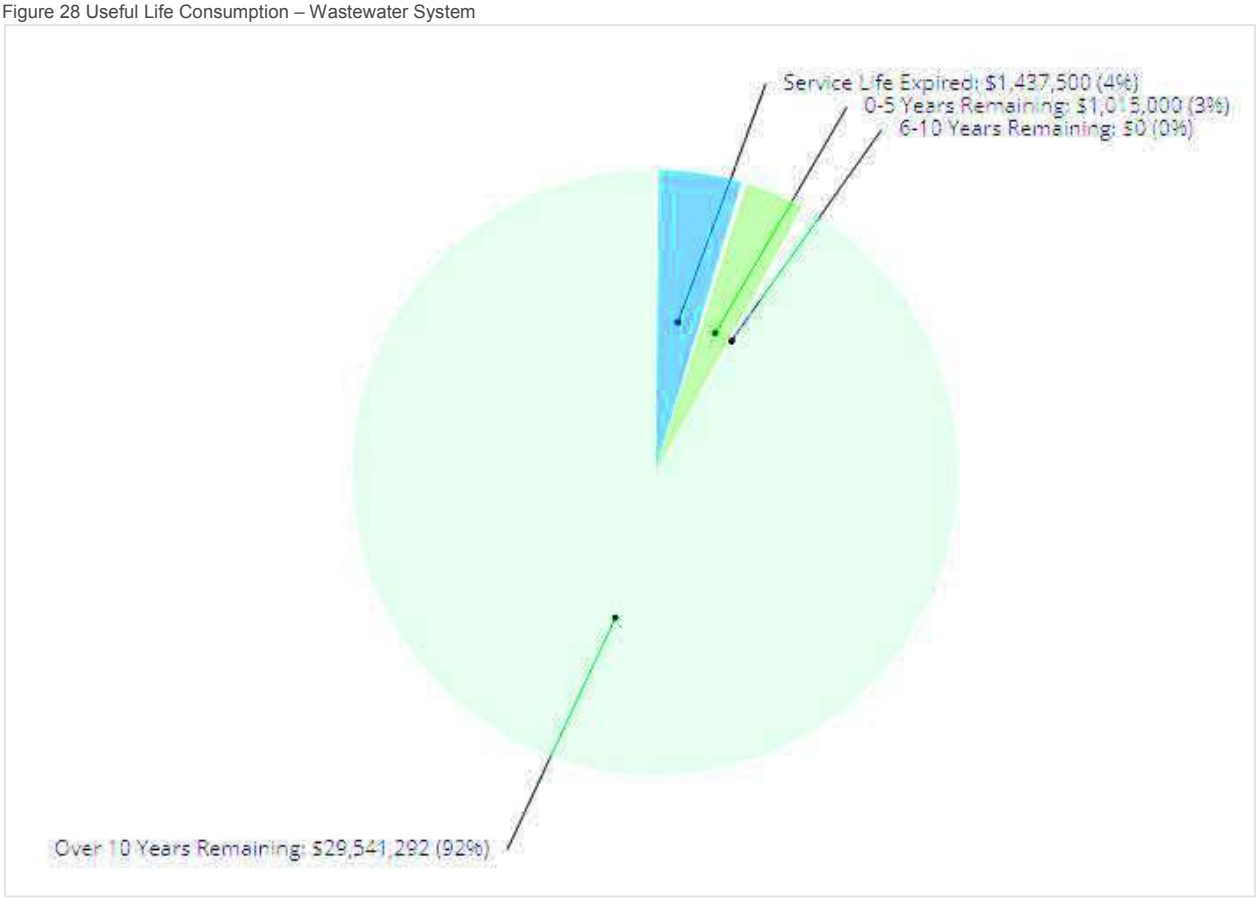


Major investments into the municipality's wastewater assets began in the early 1960s. Investments then fluctuated and peaked in the late 1970s at $8.5 million. During this time $5.3 million was put into sanitary sewers.

4.3 Useful Life Consumption

In conjunction with historical spending patterns and observed condition data, understanding the consumption rate of assets based on industry established useful life standards provides a more complete profile of the state of a community's infrastructure. Figure 28 illustrates the useful life consumption levels as of 2016 for the municipality's wastewater system.

Figure 28 Useful Life Consumption – Wastewater System

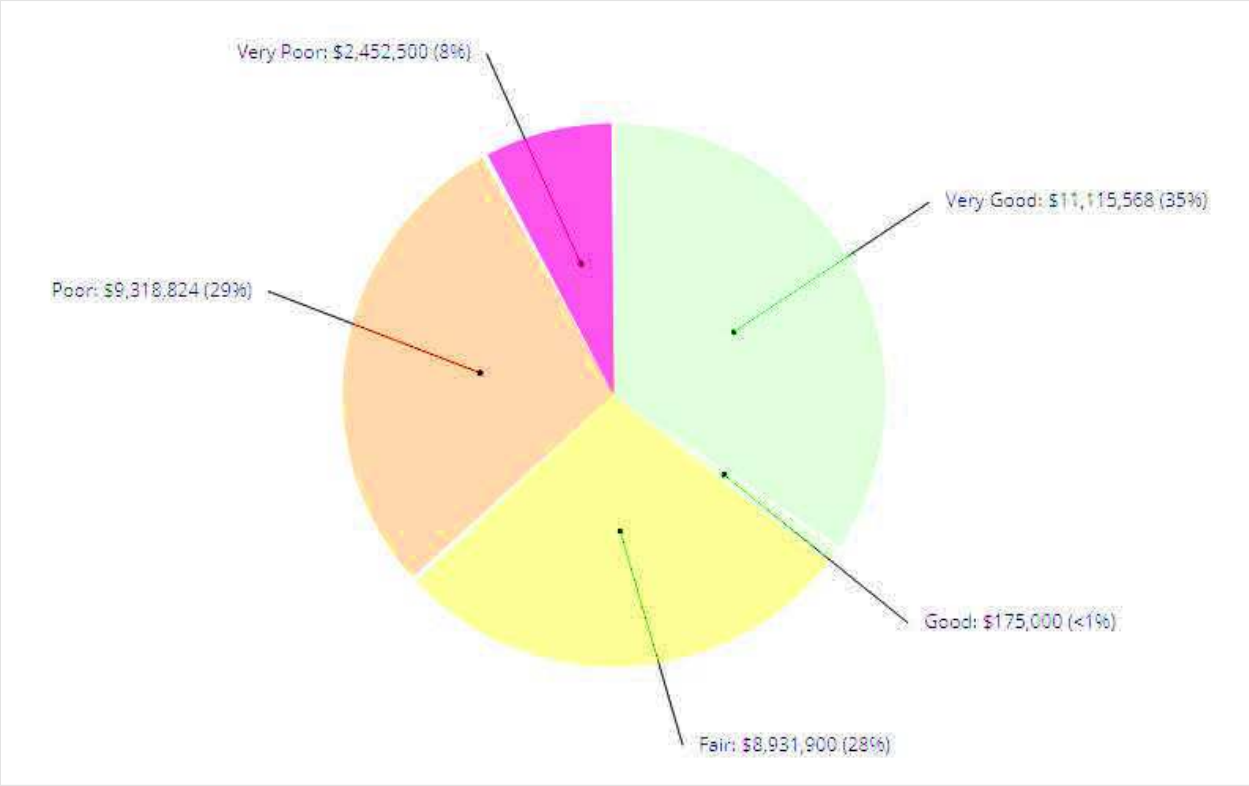


92% of the assets have at least 10 years of useful life remaining while 4%, with a valuation of $1.4 million, remain in operation beyond their useful life. An additional 3% will reach the end of their useful life within the next five years.

4.4 Current Asset Condition

Using replacement cost, in this section we summarize the condition of the municipality's sanitary services as of 2016. By default, we rely on observed field data as provided by the municipality. In the absence of such information, age-based data is used as a proxy. The municipality has not provided condition data for its wastewater system assets.

Figure 29 Asset Condition – Wastewater System (Age-Based)

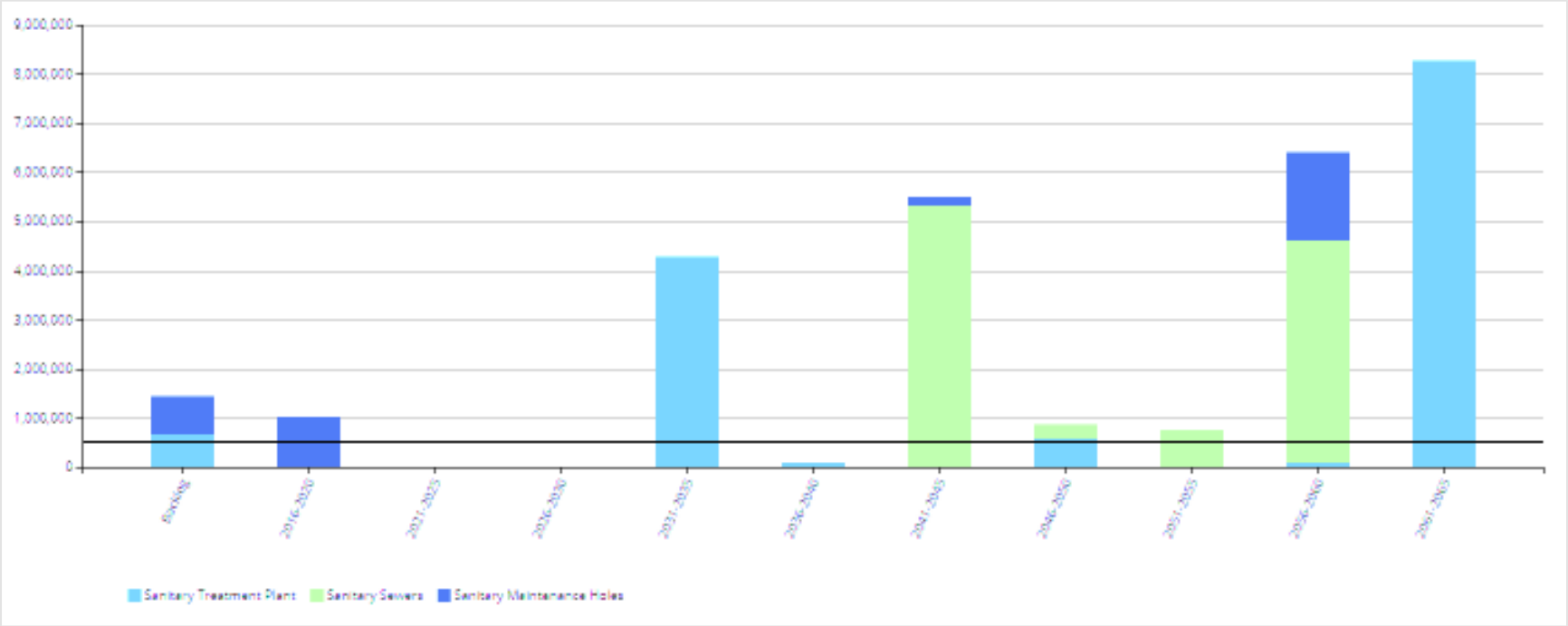


Age-based data indicates that 36% of the assets are in good to very good condition, while 37%, with a valuation of $11.8 million, are in poor to very poor condition.

4.5 Forecasting Replacement Needs

In this section, we illustrate the short-, medium- and long-term infrastructure spending requirements (replacement only) for the municipality's wastewater system assets. The backlog is the aggregate investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 30 Forecasting Replacement Needs – Wastewater System



In addition to a backlog of $1.4 million, replacement needs will total $1 million in the next five years. The municipality's annual requirements (indicated by the black line) for its wastewater system assets total $530,000. At this level, funding would be sustainable and replacement needs could be met as they arise without the need for deferring projects. The municipality is currently allocating $75,000 towards this asset category, leaving an annual deficit of $455,000. See the 'Financial Strategy' section for achieving a more optimal and sustainable funding level. Further, while fulfilling the annual requirements will position the municipality to meet its future replacement needs, injection of additional revenues will be needed to mitigate existing infrastructure backlogs.

4.6 Recommendations – Wastewater System

- Age-based data indicates a backlog of $1.4 million and five-year replacement needs of $1 million. The municipality should implement a condition assessment program of its wastewater assets to precisely estimate its financial requirements and field needs. See Section 2, 'Condition Assessment Programs' in the 'Asset Management Strategies' chapter.

- Wastewater collection system key performance indicators should be established and tracked annually as part of an overall level of service model. See Section VII 'Levels of Service'.

- The municipality should assess its short-, medium- and long-term operations and maintenance needs. An appropriate percentage of the replacement costs should then be allocated for the municipality's O&M requirements.

- The municipality is funding 14% of its long-term requirements on an annual basis. See the 'Financial Strategy' section on how to achieve more sustainable and optimal funding levels.

5. Storm Network

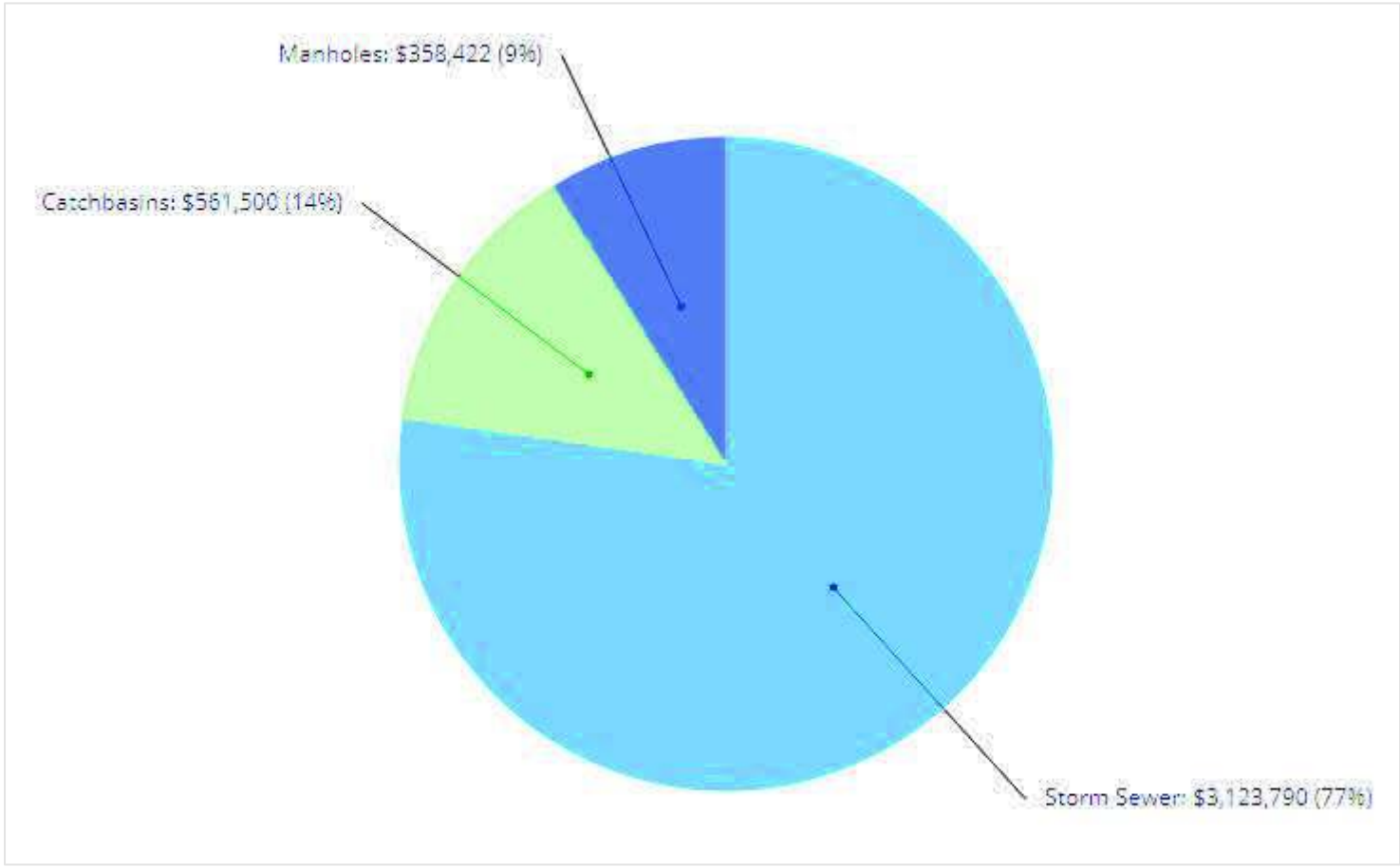
5.1 Asset Portfolio: Quantity, Useful Life and Replacement Cost

Table 10 illustrates key asset attributes for the municipality's storm network, including quantities of various assets, their useful life, their replacement cost, and the valuation method by which the replacement costs were derived. In total, the municipality's storm network assets are valued at $4 million based on 2016 replacement costs. The useful life indicated for each asset type below was assigned by the municipality.

Table 10 Key Asset Attributes – Storm Network

Asset Type	Asset Component	Quantity	Useful Life in Years	Valuation Method	2016 Replacement Cost
Storm Network	Storm Sewer	5089m	80, 90	User Defined Cost	$3,123,790
	Catch basins	107	40	User Defined Cost	$561,500
	Manholes	53	40	User Defined Cost/NRBCPI (Toronto)	$358,422
				Total	**$4,043,712**

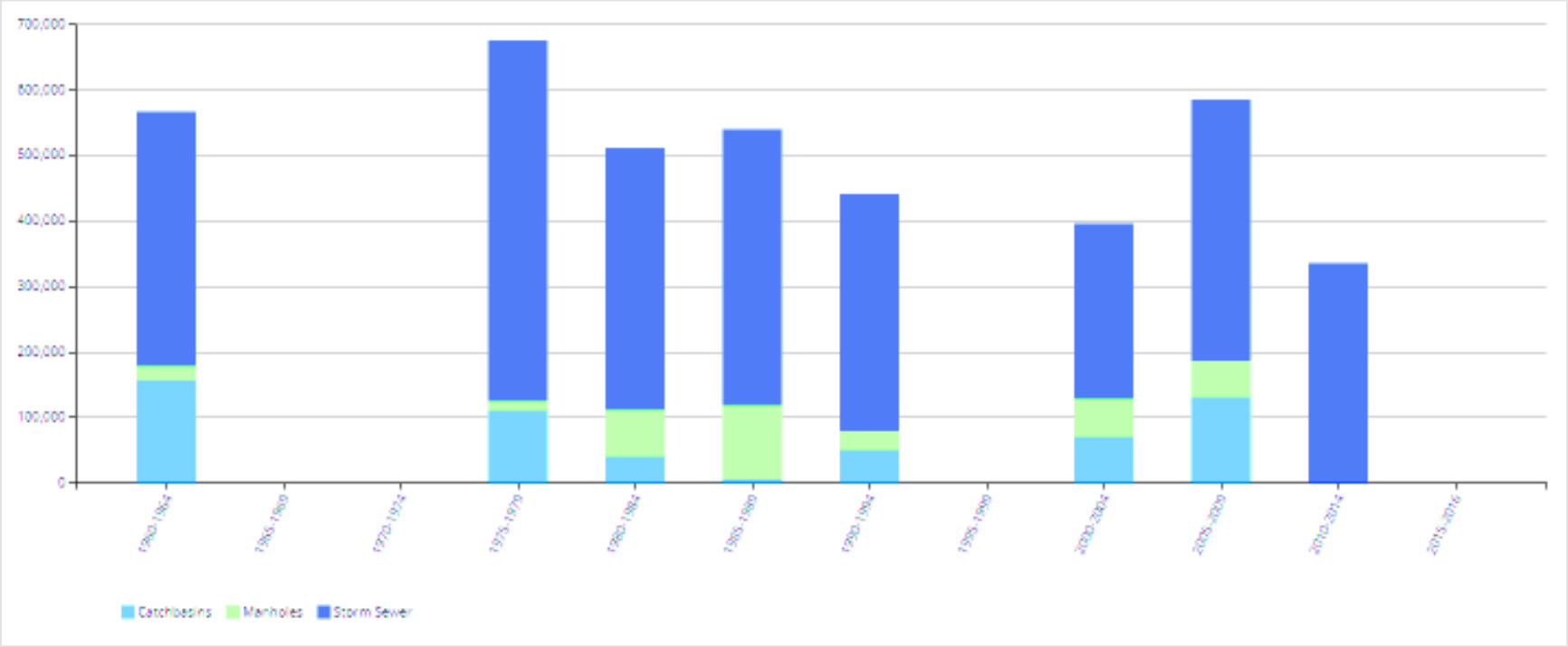
Figure 31 Asset Valuation – Storm Network



5.2 Historical Investment in Infrastructure

Figure 32 shows the municipality's historical investments in its storm network since 1960. While observed condition data will provide superior accuracy in estimating replacement needs and should be incorporated into strategic plans, in the absence of such information, understanding past expenditure patterns and current useful life consumption levels (Section 5.3) can inform the forecasting and planning of infrastructure needs and in the development of a capital program. Note that this graph only includes the active asset inventory as of December 31, 2016.

Figure 32 Historical Investment – Storm Network

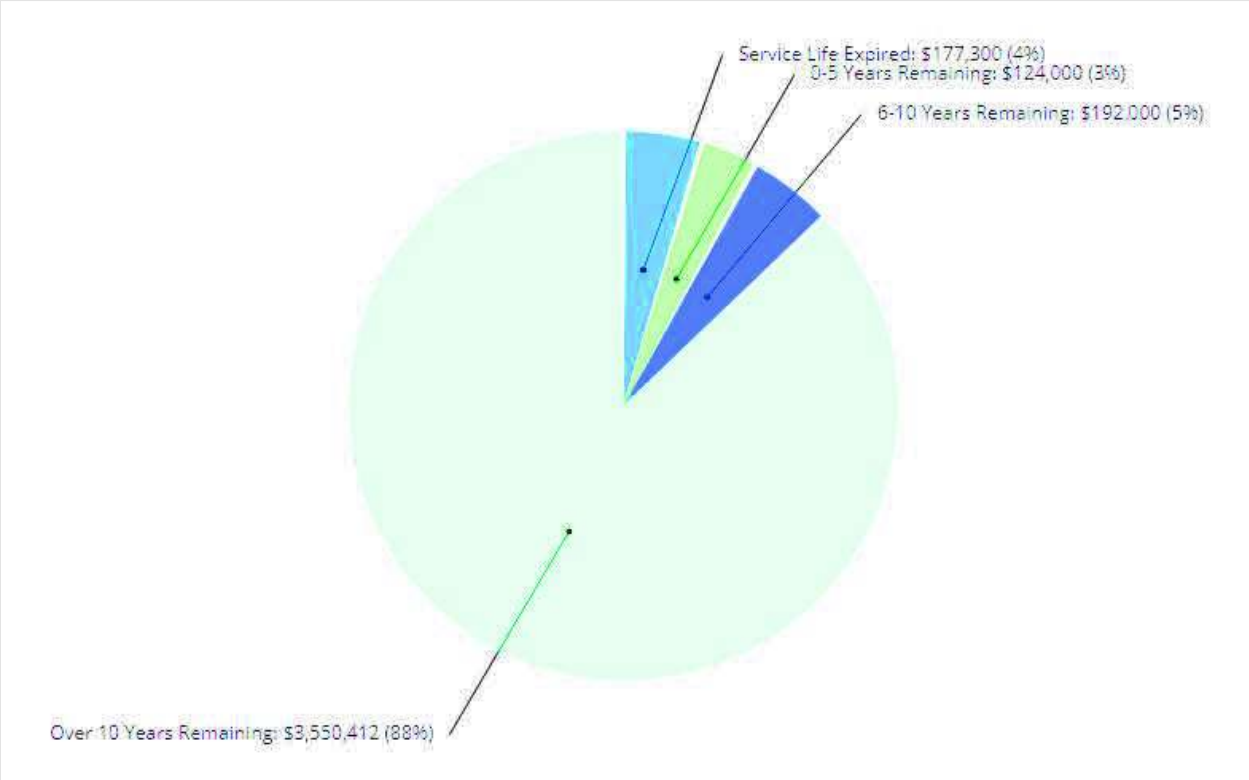


Investments in the storm water network have been fairly consistent over the decades. Between 1975-1979, the period of largest investment, $674,000 was invested with a focus on storm sewer.

5.3 Useful Life Consumption

In conjunction with historical spending patterns and observed condition data, understanding the consumption rate of assets based on industry established useful life standards provides a more complete profile of the state of a community's infrastructure. Figure 33 illustrates the useful life consumption levels as of 2016 for the municipality's storm assets.

Figure 33 Useful Life Consumption – Storm Network

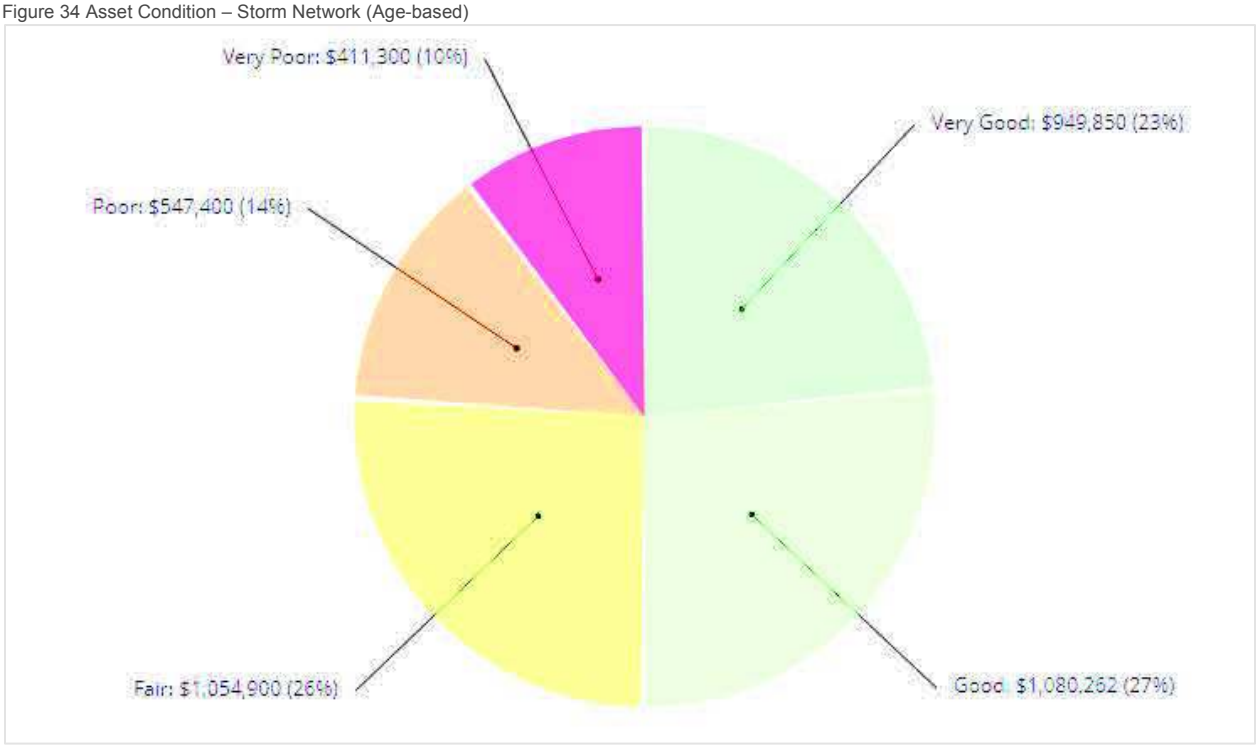


88% of the assets have at least 10 years of useful life remaining while 4%, with a valuation of $177,000, remain in operation beyond their useful life. An additional 3% will reach the end of their useful life within the next five years.

5.4 Current Asset Condition

Using replacement cost, in this section we summarize the condition of the municipality's storm services. By default, we rely on observed field data as provided by the municipality. In the absence of such information, age-based data is used as a proxy. The municipality has not provided condition data for its storm network assets.

Figure 34 Asset Condition – Storm Network (Age-based)

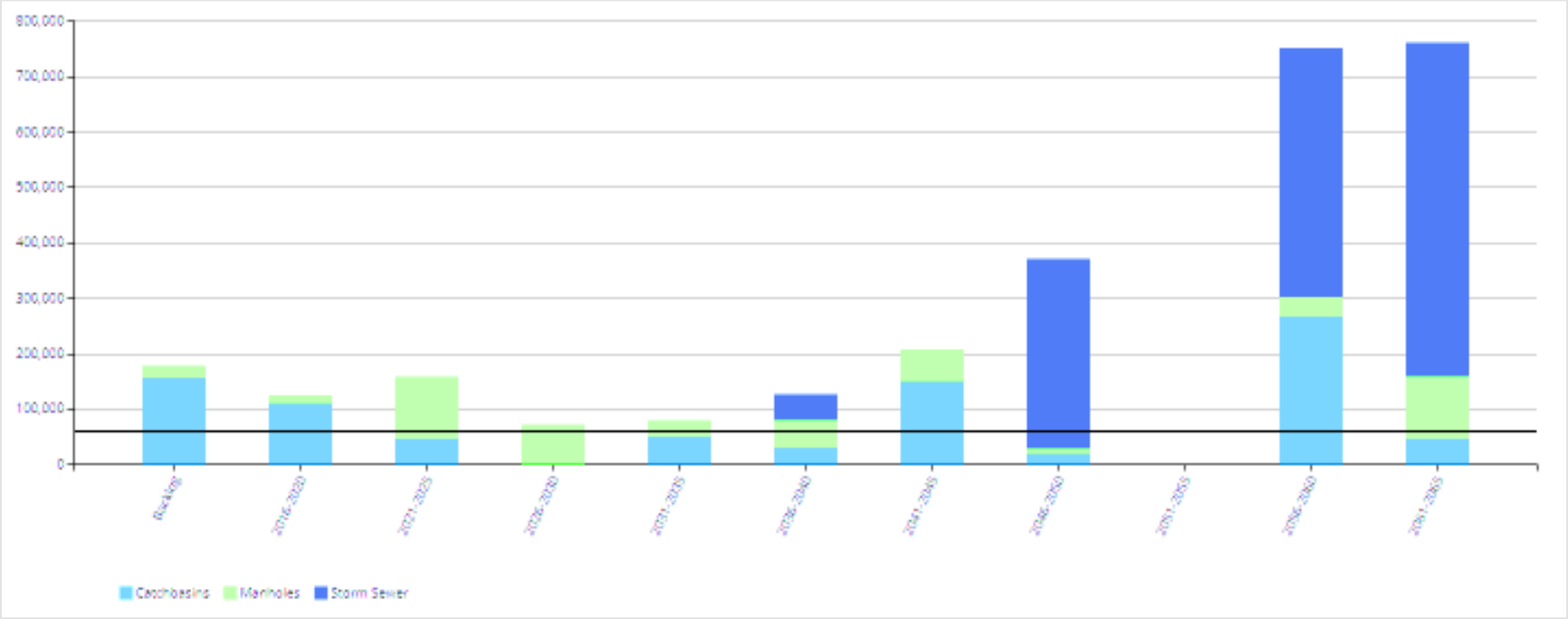


Age-based data indicates that 50% of the assets are in good to very good condition, while 24%, with a valuation of $959,000, are in poor to very poor condition.

5.5 Forecasting Replacement Needs

In this section, we illustrate the short-, medium- and long-term infrastructure spending requirements (replacement only) for the municipality's storm assets. The backlog is the aggregate investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 35 Forecasting Replacement Needs – Storm Network



Age-based data shows a backlog of $177,000 and five-year replacement needs of $124,000. An additional $157,000 will be required between 2021-2025. The municipality's annual requirements (indicated by the black line) for storm assets total $60,000. At this funding level, the municipality would be allocating sufficient funds on an annual basis to meet replacement needs as they arise without the need for deferring projects and accruing annual infrastructure deficits. The municipality is currently not allocating any funding towards this asset category. See the 'Financial Strategy' section for achieving a more optimal and sustainable funding level. Further, while fulfilling the annual requirements will position the municipality to meet its future replacement needs, injection of additional revenues will be needed to mitigate existing infrastructure backlogs,

5.6 Recommendations – Storm Network

- In time, the municipality should implement a condition assessment program of its storm mains to further define field needs and to assist the prioritization of the short and long term capital budget. See Section 2, 'Condition Assessment Programs' in the 'Asset Management Strategies' chapter.

- Using the above information, the municipality should assess its short-, medium- and long-term capital, and operations and maintenance needs.

- An appropriate percentage of the replacement value of the assets should then be allocated for the municipality's O&M requirements.

- Storm network key performance indicators should be established and tracked annually as part of an overall level of service model. See Section VII 'Levels of Service'.

- The municipality is not funding any portion of it long-term requirements on an annual basis. See the 'Financial Strategy' section on how to achieve more sustainable and optimal funding levels.

6. Buildings & Facilities

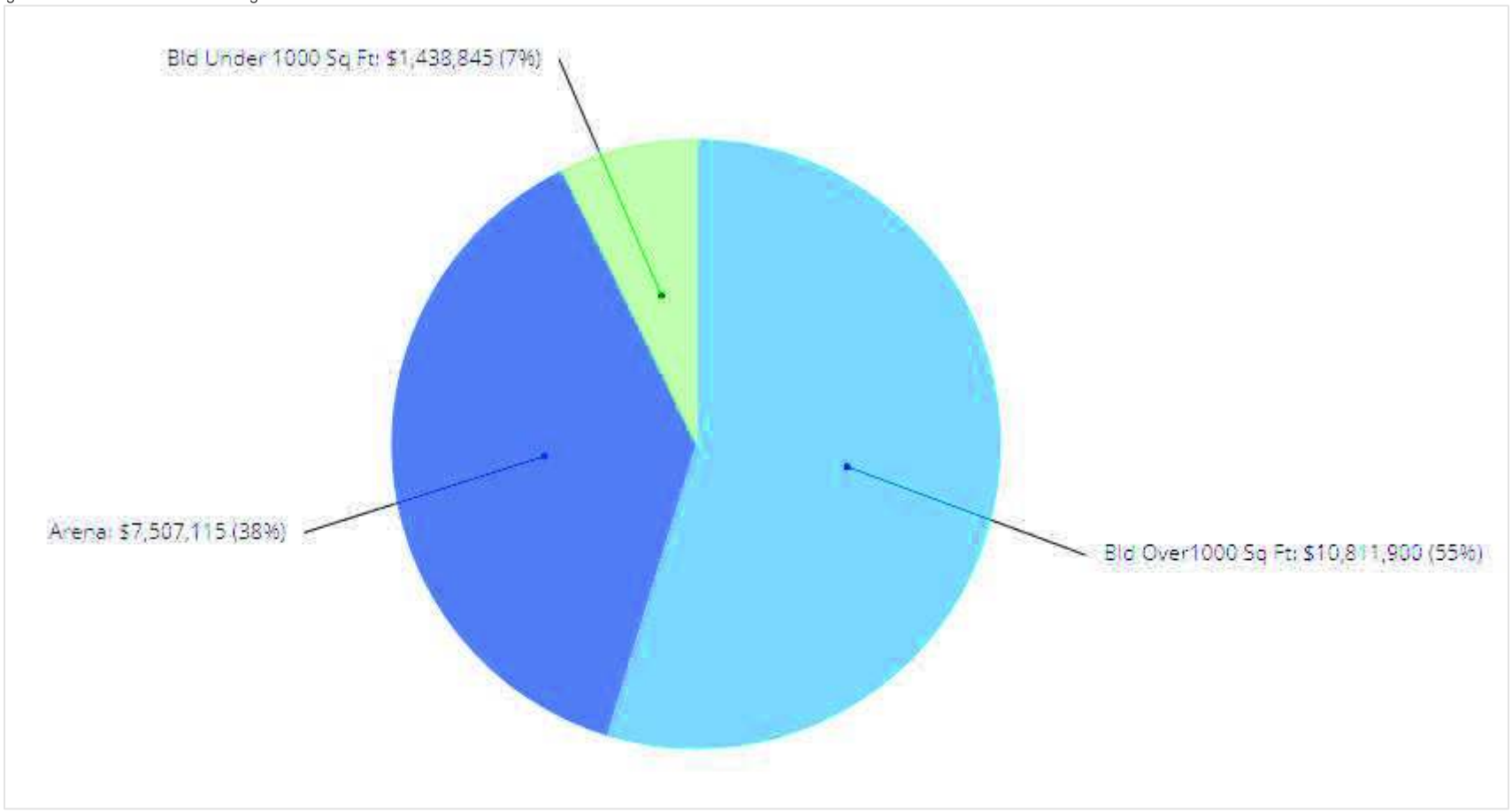
6.1 Asset Portfolio: Quantity, Useful Life and Replacement Cost

Table 11 illustrates key asset attributes for the municipality's buildings & facilities, including quantities of various assets, their useful life, their replacement cost, and the valuation method by which the replacement costs were derived. In total, the municipality's buildings assets are valued at $19.8 million based on 2016 replacement costs. The useful life indicated for each asset type below was assigned by the municipality.

Table 11 Key Asset Attributes – Buildings & Facilities

Asset Type	Asset Component	Quantity	Useful Life in Years	Valuation Method	2016 Replacement Cost
Buildings & Facilities	Keeler Centre Arena	10	15, 20, 30, 50	User Defined Cost	$7,507,115
	Buildings Under 1,000 Sq Ft	8	50	User Defined Cost	$1,438,845
	Buildings Over 1,000 Sq Ft	33	15, 20, 50	User Defined Cost/CPI (ON)	$10,811,900
				Total	$19,757,860

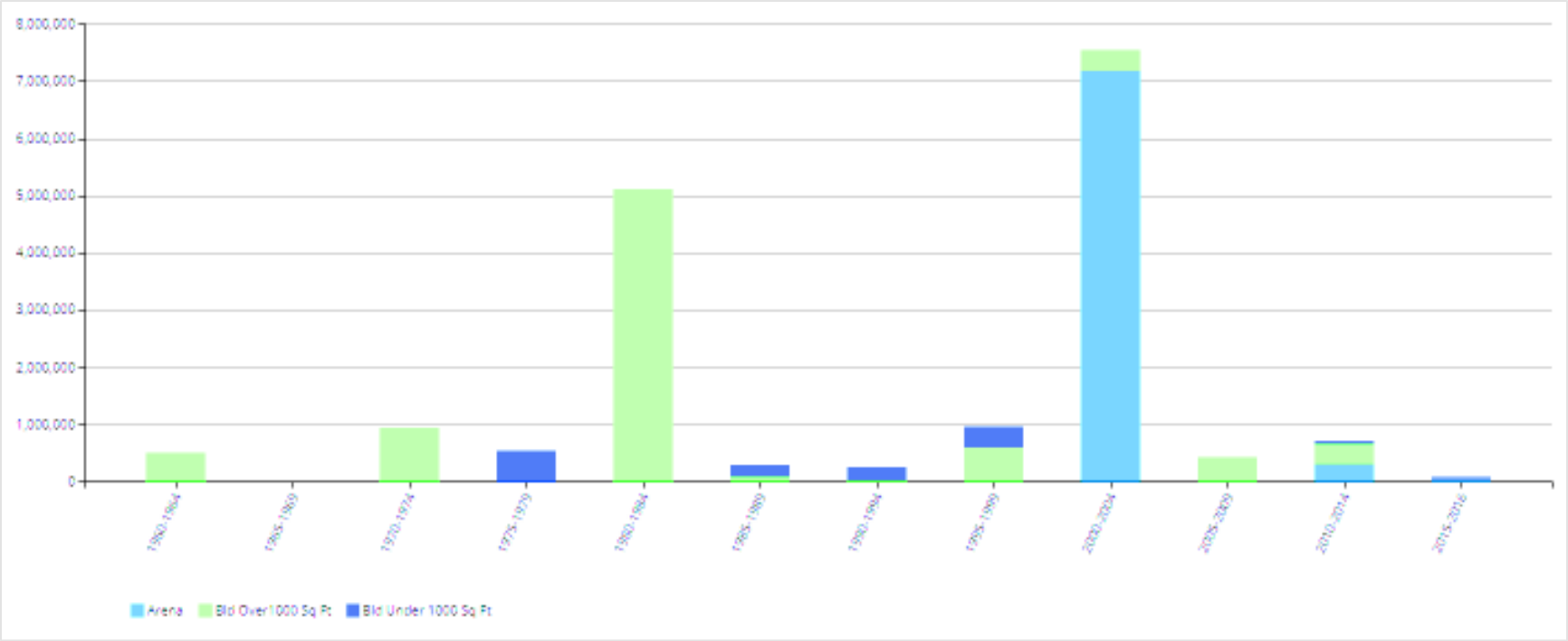
Figure 36 Asset Valuation – Buildings & Facilities



6.2 Historical Investment in Infrastructure

Figure 37 shows the municipality's historical investments in its buildings & facilities since 1950. While observed condition data will provide superior accuracy in estimating replacement needs and should be incorporated into strategic plans, in the absence of such information, understanding past expenditure patterns and current useful life consumption levels (Section 6.3) can inform the forecasting and planning of infrastructure needs and in the development of a capital program. Note that this graph only includes the active asset inventory as of December 31, 2016.

Figure 37 Historical Investment – Buildings & Facilities

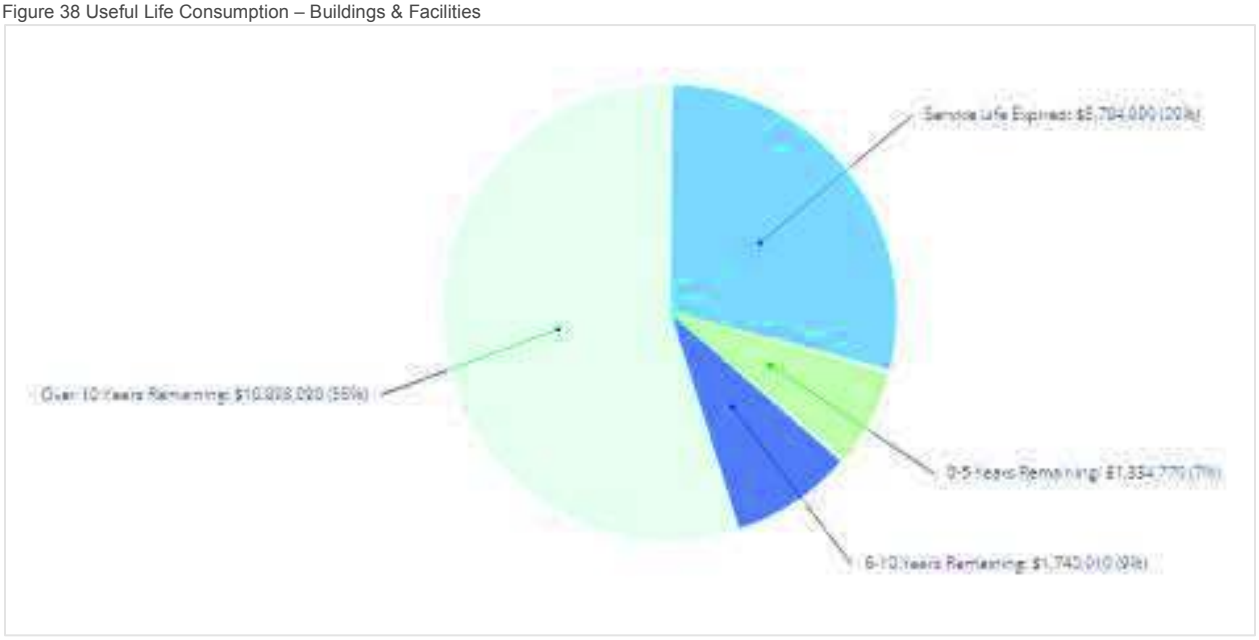


The municipality's investments into its building assets have fluctuated since the 1970s. Between 2000 and 2004, the period of largest investment, $7.5 million was invested into the building assets with a focus on the arena.

6.3 Useful Life Consumption

In conjunction with historical spending patterns and observed condition data, understanding the consumption rate of assets based on industry established useful life standards provides a more complete profile of the state of a community's infrastructure. Figure 38 illustrates the useful life consumption levels as of 2016 for the municipality's buildings assets.

Figure 38 Useful Life Consumption – Buildings & Facilities

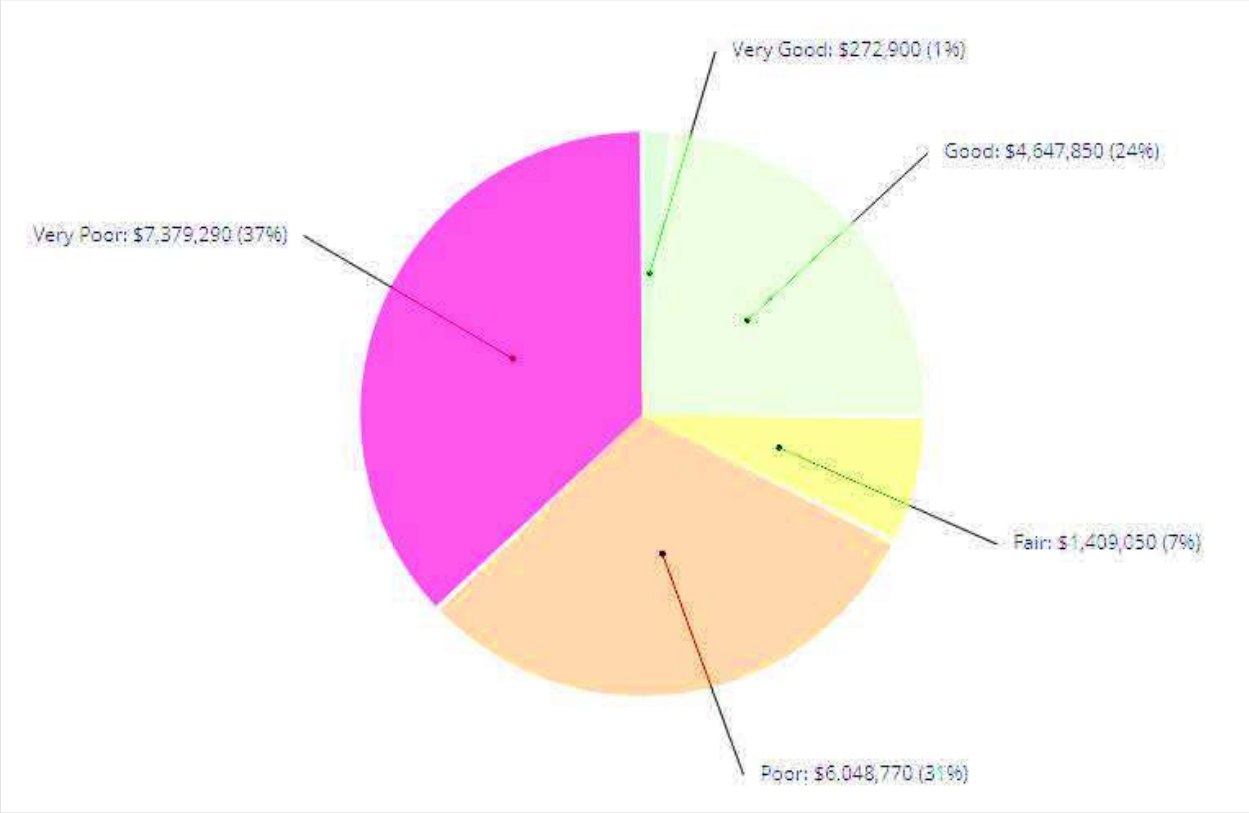


55% of buildings assets have at least 10 years of useful life remaining; 29%, with a valuation of $5.8 million remain in operation beyond their established useful life. An additional 7% will reach the end of their useful life in the next five years.

6.4 Current Asset Condition

Using replacement cost, in this section we summarize the condition of the municipality's buildings assets. By default, we rely on observed field data as provided by the municipality. In the absence of such information, age-based data is used as a proxy. The municipality has not provided condition data for its structures.

Figure 39 Asset Condition – Buildings & Facilities (Age-Based)

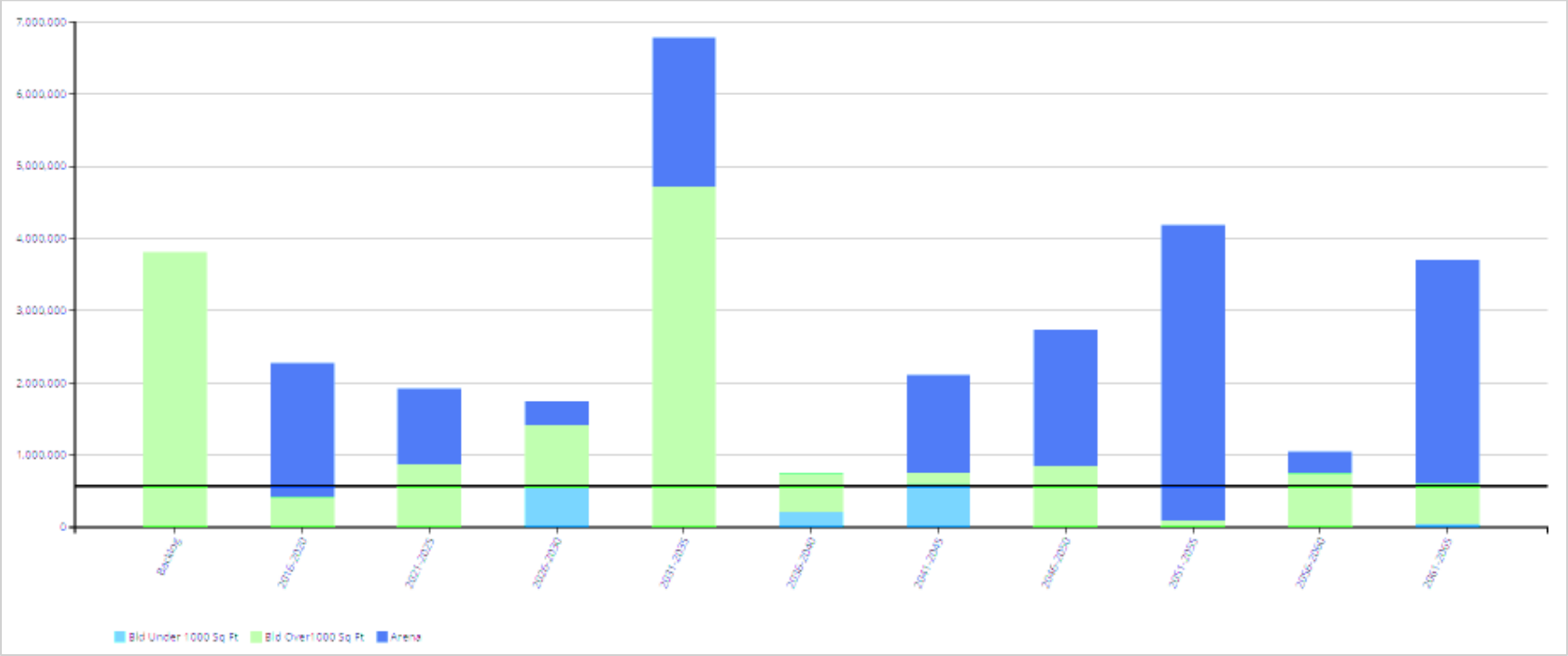


25% of buildings assets, with a valuation of $4.9 million, are in good to very good condition; 68% are in poor to very poor condition.

6.5 Forecasting Replacement Needs

In this section, we illustrate the short-, medium- and long-term infrastructure spending requirements (replacement only) for the municipality's buildings assets. The backlog is the aggregate investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 40 Forecasting Replacement Needs – Buildings & Facilities



Age-based data shows a backlog of $3.8 million and five-year replacement needs of $2.2 million. An additional $1.9 million will be required between 2021-2025. The municipality's annual requirements (indicated by the black line) for its buildings total $580,000. At this funding level, the municipality would be allocating sufficient funds on an annual basis to meet replacement needs as they arise without the need for deferring projects and accruing annual infrastructure deficits. The municipality is currently allocating $47,000, leaving an annual deficit of $533,000. See the 'Financial Strategy' section for achieving a more optimal and sustainable funding level. Further, while fulfilling the annual requirements will position the municipality to meet its future replacement needs, injection of additional revenues will be needed to mitigate existing infrastructure backlogs.

6.6 Recommendations – Buildings & Facilities

- Age-based data indicates a significant backlog of $3.8 million and 10-year replacement needs of $4.1 million. The municipality should implement a condition inspection program for its buildings & facilities to precisely estimate future financial needs. See Section 2, 'Condition Assessment Programs' in the 'Asset Management Strategies' chapter.

- Using the above information, the municipality should assess its short-, medium- and long-term capital, and operations and maintenance needs.

- An appropriate percentage of the replacement costs should then be allocated for the municipality's O&M requirements.

- Facility key performance indicators should be established and tracked annually as part of an overall level of service model. See Chapter VII, 'Levels of Service'.

- The municipality is funding 8% of its long-term requirements on an annual basis. See the 'Financial Strategy' section on how to achieve more sustainable and optimal funding levels.

7. Machinery & Equipment

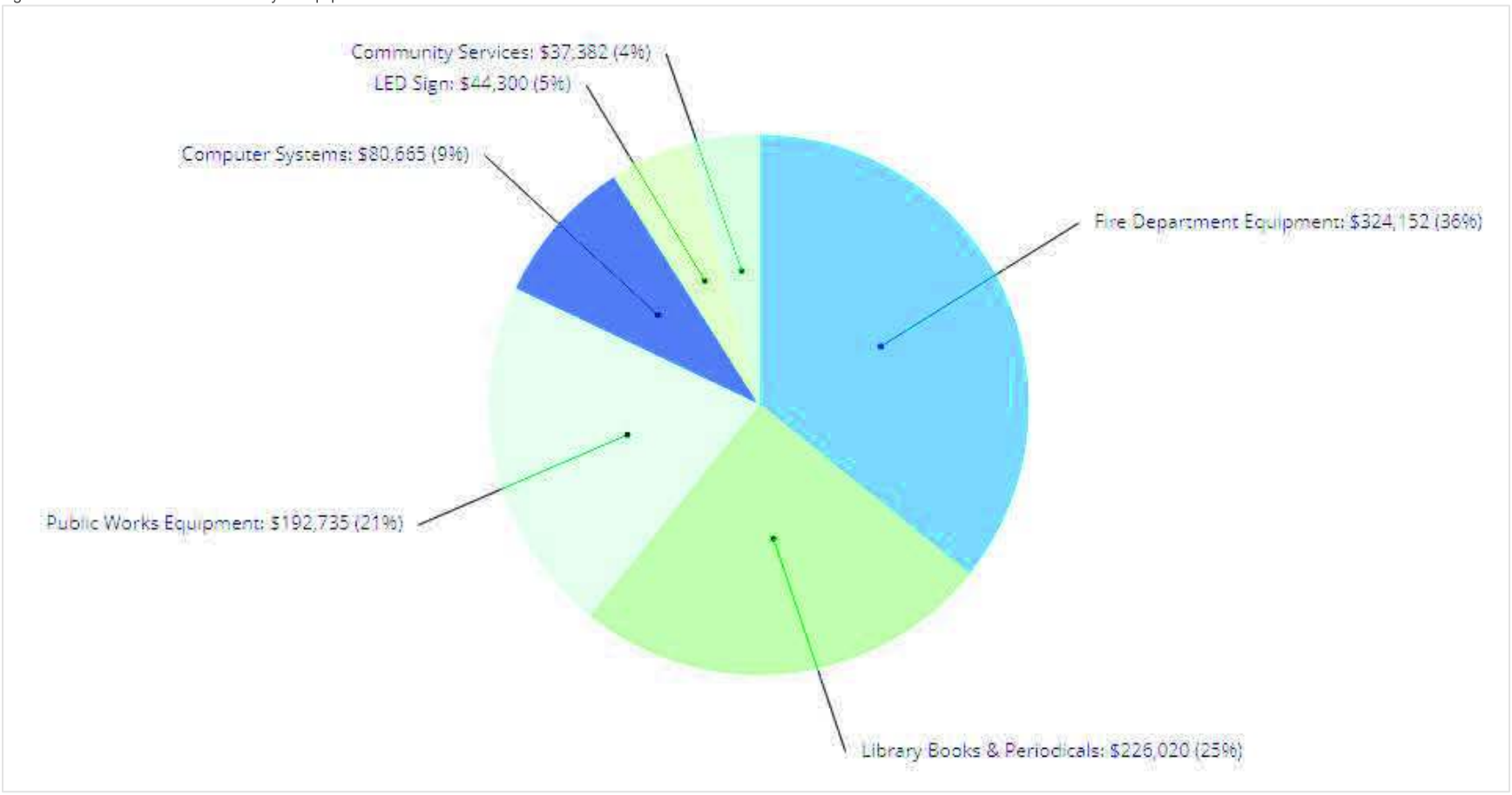
7.1 Asset Portfolio: Quantity, Useful Life and Replacement Cost

Table 12 illustrates key asset attributes for the municipality's machinery & equipment, including quantities of various assets, their useful life, their replacement cost, and the valuation method by which the replacement costs were derived. In total, the municipality's machinery & equipment assets are valued at $905,000 based on 2016 replacement costs. The useful life indicated for each asset type below was assigned by the municipality.

Table 12 Key Asset Attributes – Machinery & Equipment

Asset Type	Components	Quantity	Useful Life in Years	Valuation Method	2016 Replacement Cost
Machinery & Equipment	Community Service	3	7	User Defined Cost	$37,382
	Fire Department Equipment	170	5, 7, 10, 15, 20	User Defined Cost	$324,152
	LED Sign	2	15, 25	User Defined Cost	$44,300
	Library Books & Periodicals	8	7	CPI (ON)	$226,020
	Public Works Equipment	37	7, 10, 12, 15, 20	User Defined Cost	$192,735
	Computer Systems	1	5	CPI (ON)	$80,665
				Total	$905,254

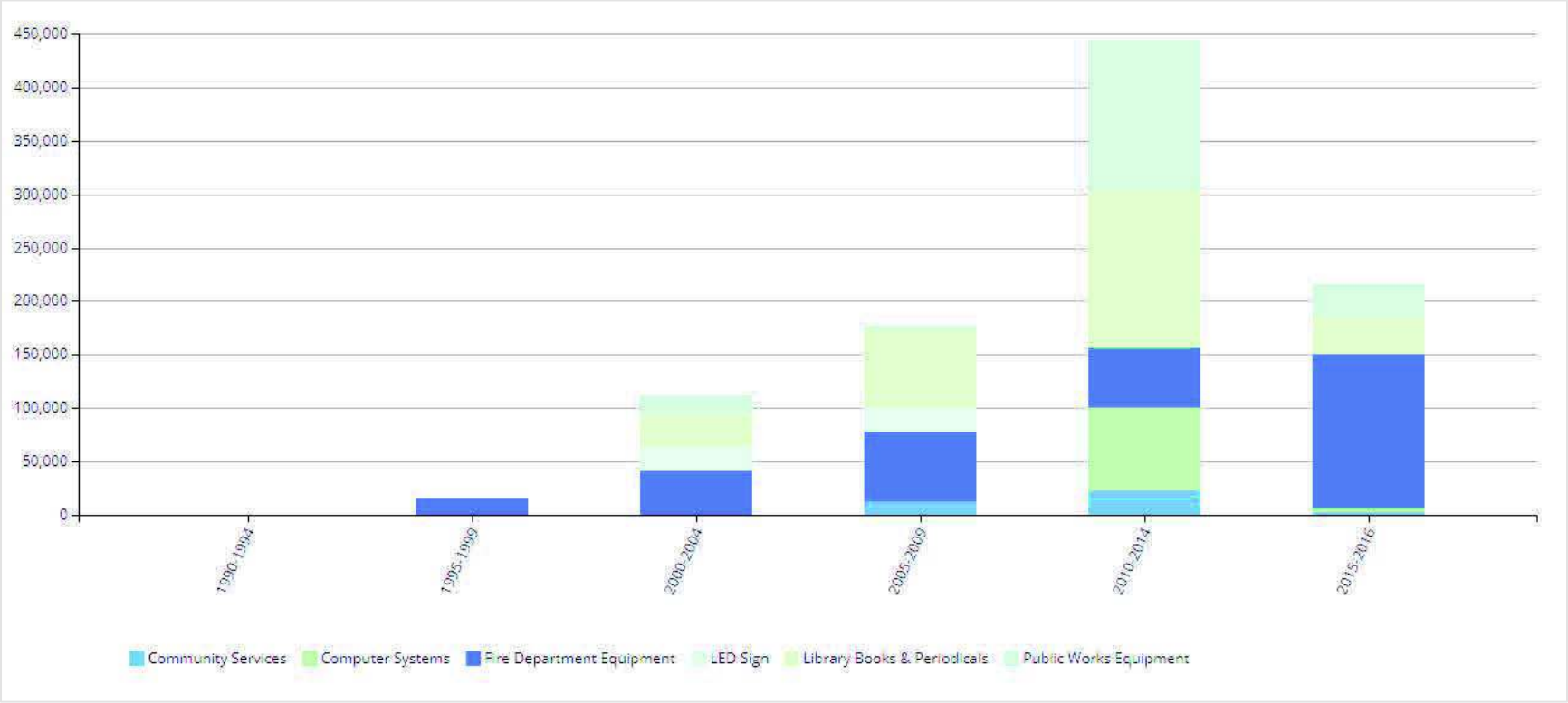
Figure 41 Asset Valuation – Machinery & Equipment



7.2 Historical Investment in Infrastructure

Figure 42 shows the municipality's historical investments in its machinery & equipment since 1990. While observed condition data will provide superior accuracy in estimating replacement needs and should be incorporated into strategic plans, in the absence of such information, understanding past expenditure patterns and current useful life consumption levels (Section 7.3) can inform the forecasting and planning of infrastructure needs and in the development of a capital program. Note that this graph only includes the active asset inventory as of December 31, 2016.

Figure 42 Historical Investment – Machinery & Equipment

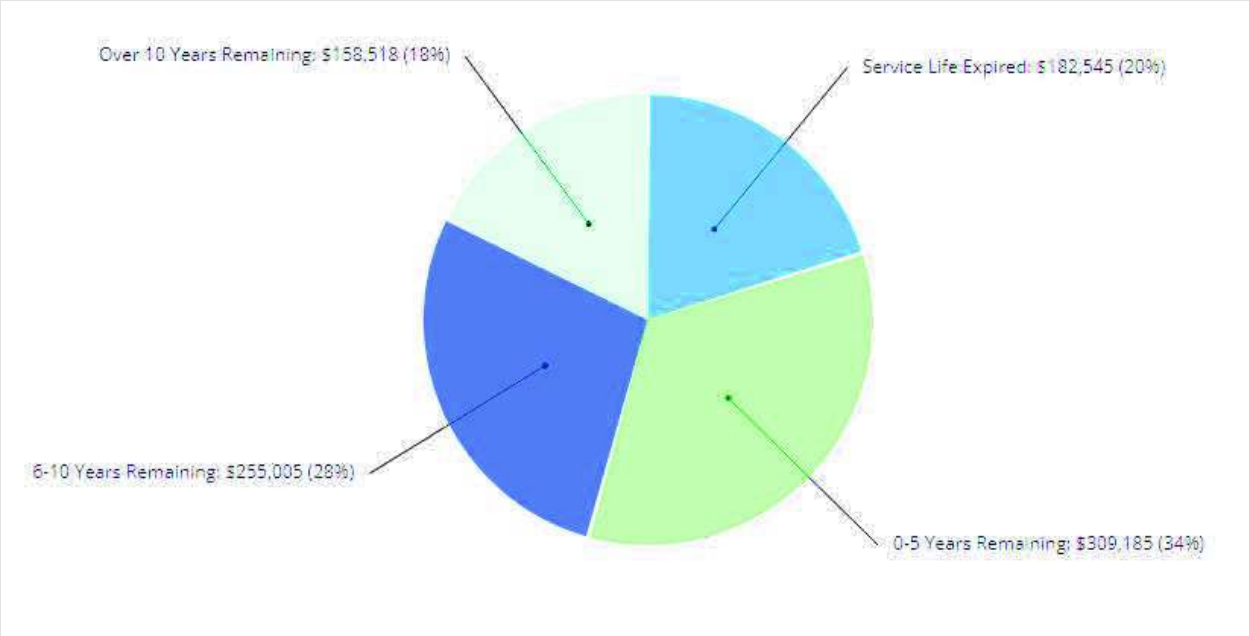


The municipality rapidly expanded its machinery & equipment portfolio beginning in the late 1990s. Between 2010 and 2014, the period of largest investment, $444,000 was invested in the machinery and equipment category.

7.3 Useful Life Consumption

In conjunction with historical spending patterns and observed condition data, understanding the consumption rate of assets based on industry established useful life standards provides a more complete profile of the state of a community's infrastructure. Figure 43 illustrates the useful life consumption levels as of 2016 for the municipality's machinery & equipment assets.

Figure 43 Useful Life Consumption – Machinery & Equipment

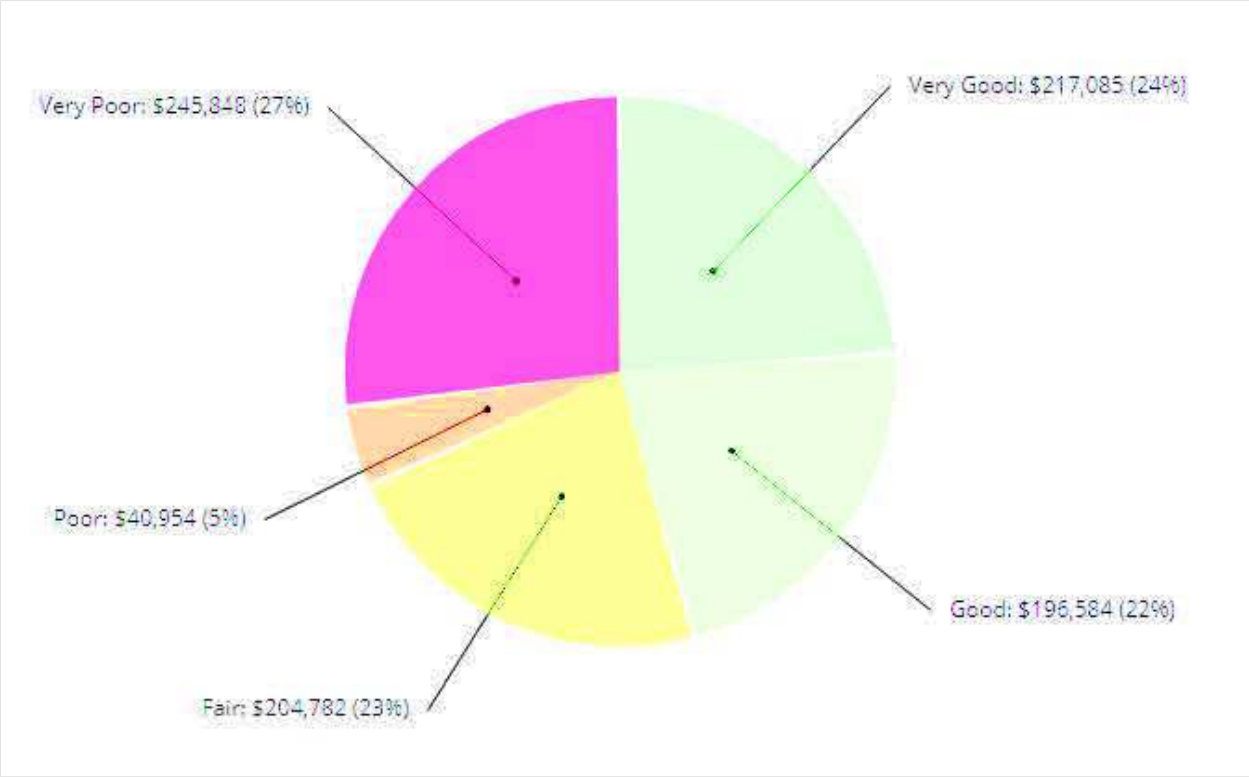


While 18% of assets have at least 10 years of useful life remaining, 20%, with a valuation of $183,000, remain in operation beyond their useful life. An additional 34% will reach the end of their useful life within the next five years.

7.4 Current Asset Condition

Using replacement cost, in this section we summarize the condition of the municipality's machinery & equipment assets as of 2016. By default, we rely on observed field data as provided by the municipality. In the absence of such information, age-based data is used as a proxy. The municipality has not provided condition data for its machinery & equipment.

Figure 44 Asset Condition – Machinery & Equipment (Age-based)

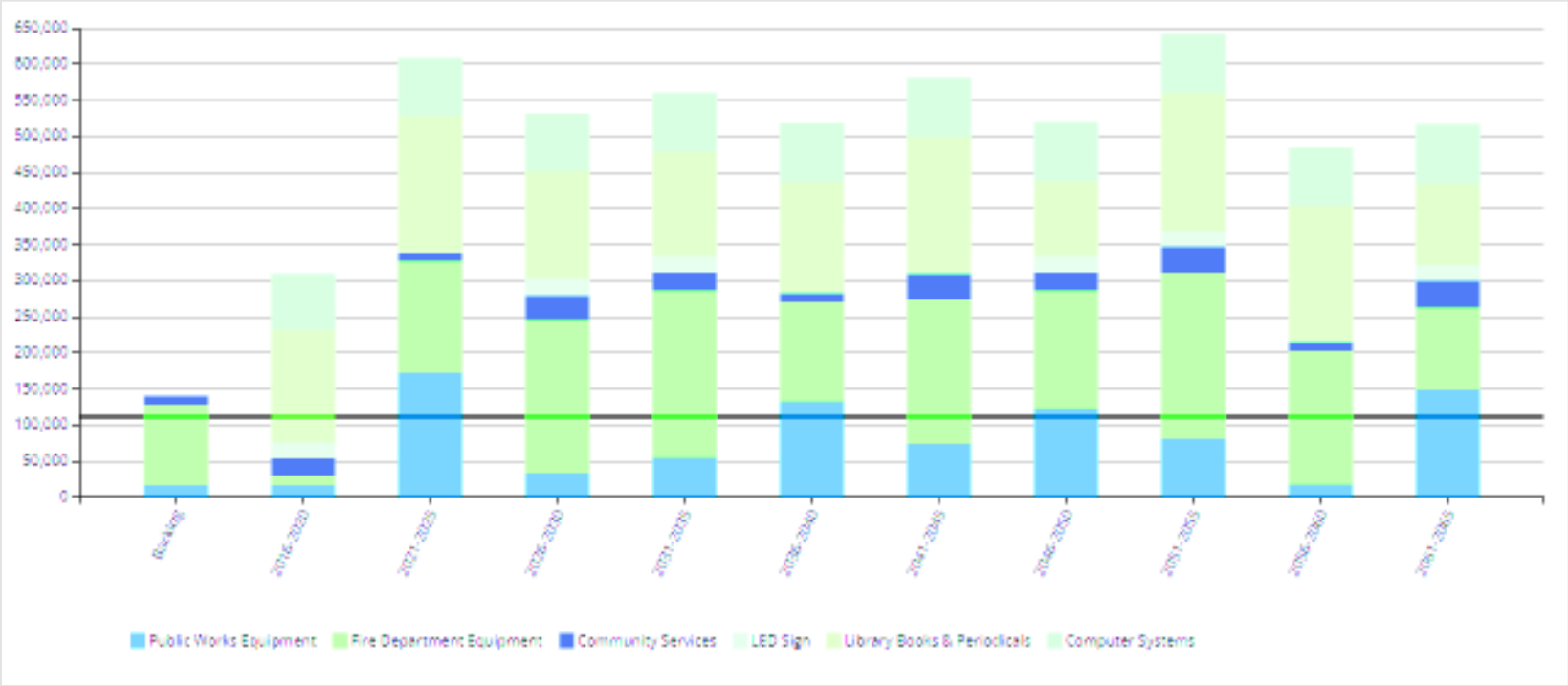


Based on age-based data, 32% of assets, with a valuation of $287,000, are in poor to very poor condition; 46% are in good to very good condition.

7.5 Forecasting Replacement Needs

In this section, we illustrate the short-, medium- and long-term infrastructure spending requirements (replacement only) for the municipality's machinery & equipment assets. The backlog is the aggregate investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 45 Forecasting Replacement Needs – Machinery & Equipment



In addition to a backlog of $139,000, the municipality's replacement needs total $308,000 in the next five years. An additional $608,000 will be required between 2021-2025. The municipality's annual requirements (indicated by the black line) for its machinery & equipment total $111,000. At this funding level, the municipality would be allocating sufficient funds on an annual basis to meet replacement needs as they arise without the need for deferring projects and accruing annual infrastructure deficits. However, the municipality is currently allocating $128,000, leaving an annual surplus of $17,000. See the 'Financial Strategy' section for maintaining a sustainable funding level. Further, while fulfilling the annual requirements will position the municipality to meet its future replacement needs, injection of additional revenues will be needed to mitigate existing infrastructure backlogs.

7.6 Recommendations – Machinery & Equipment

- The municipality should implement a component based condition inspection program for all machinery & equipment assets to better define financial requirements for its machinery and equipment. See Section 2, 'Condition Assessment Programs' in the 'Asset Management Strategies' chapter.

- Using the above information, the municipality should assess its short-, medium- and long-term capital, and operations and maintenance needs.

- An appropriate percentage of the replacement costs should then be allocated for the municipality's O&M requirements.

- The municipality is over funding its long-term requirements on an annual basis. See the 'Financial Strategy' section on how to maintain sustainable and optimal funding levels.

8. Land Improvements

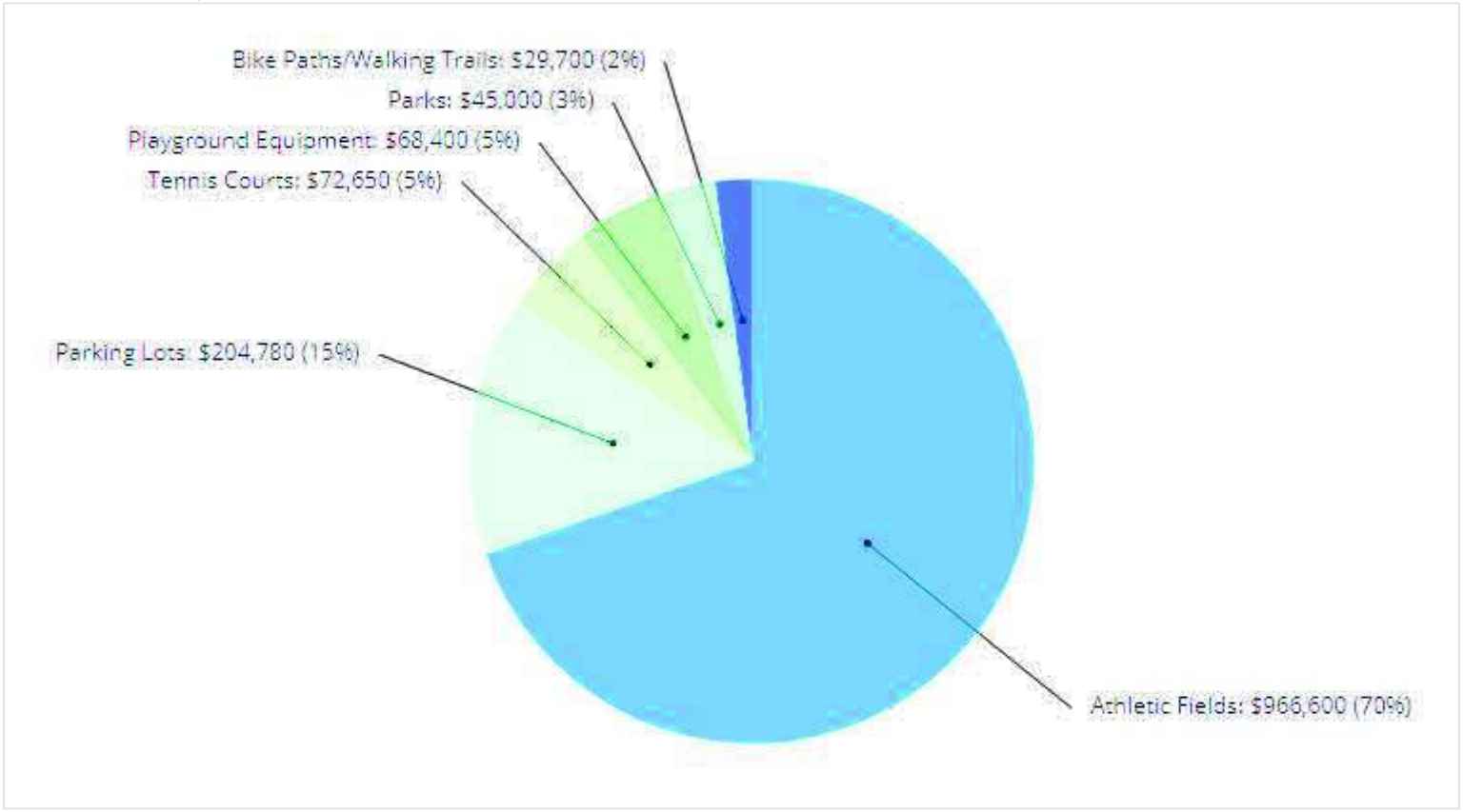
8.1 Asset Portfolio: Quantity, Useful Life and Replacement Cost

Table 13 illustrates key asset attributes for the municipality's land improvements, including quantities of various assets, their useful life, their replacement cost, and the valuation method by which the replacement costs were derived. In total, the municipality's land improvements assets are valued at $1.4 million based on 2016 replacement costs. The useful life indicated for each asset type below was assigned by the municipality.

Table 13 Key Asset Attributes – Land Improvements

Asset Type	Components	Quantity	Useful Life in Years	Valuation Method	2016 Replacement Cost
Land Improvements	Athletic Fields (Backstops, Infield Clay, Landscaping, Fencing, Stands & Washrooms)	3	10, 20, 25, 50	User Defined Cost	$966,600
	Bike Paths/Walking Trails	2	30	User Defined Cost	$29,700
	Parking Lots	7	15, 40	User Defined Cost	$204,780
	Park Assets	1	10, 50	User Defined Cost	$45,000
	Playground Equipment	1	15	User Defined Cost	$68,400
	Tennis Courts	1	15	User Defined Cost	$72,650
				Total	**$1,387,130**

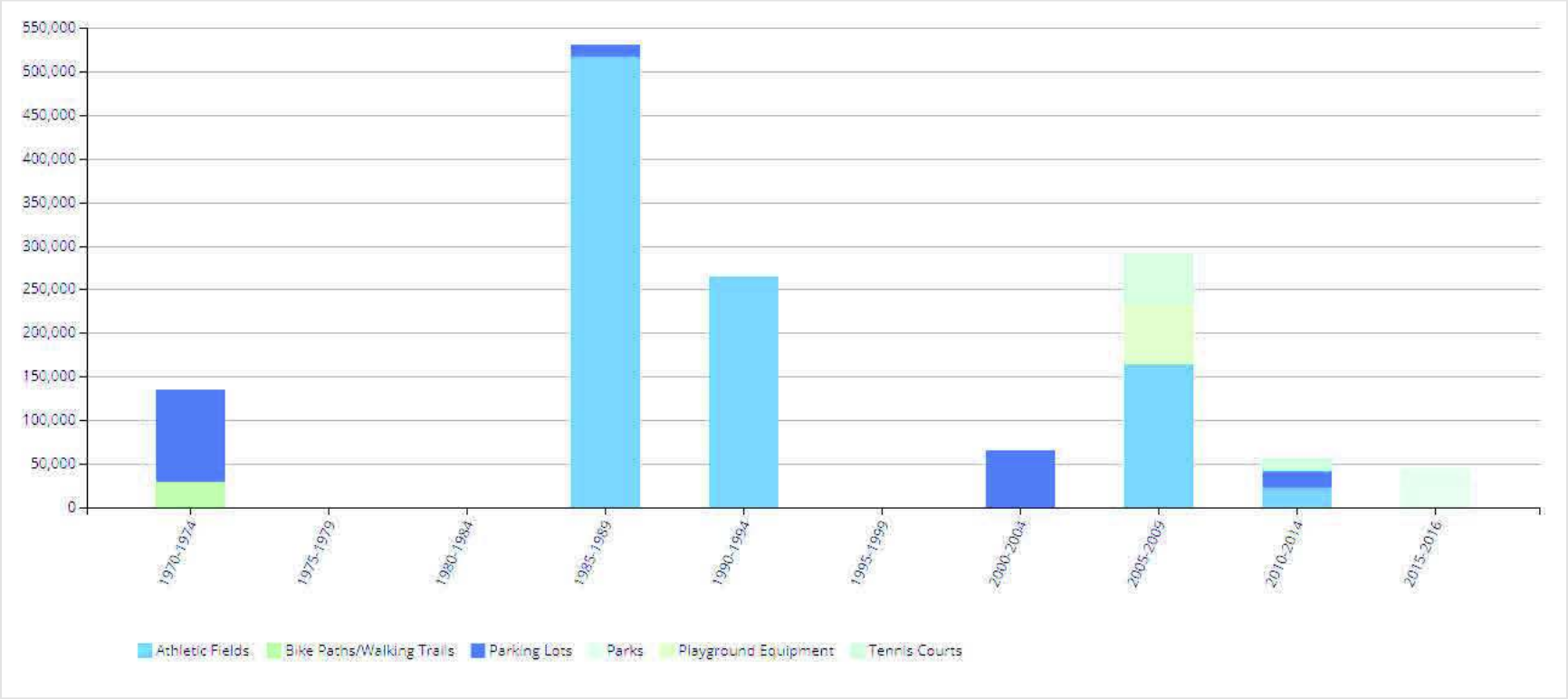
Figure 46 Asset Valuation – Land Improvements



8.2 Historical Investment in Infrastructure

Figure 47 shows the municipality's historical investments in its land improvements since 1970. While observed condition data will provide superior accuracy in estimating replacement needs and should be incorporated into strategic plans, in the absence of such information, understanding past expenditure patterns and current useful life consumption levels (Section 8.3) can inform the forecasting and planning of infrastructure needs and in the development of a capital program. Note that this graph only includes the active asset inventory as of December 31, 2016.

Figure 47 Historical Investment – Land Improvements

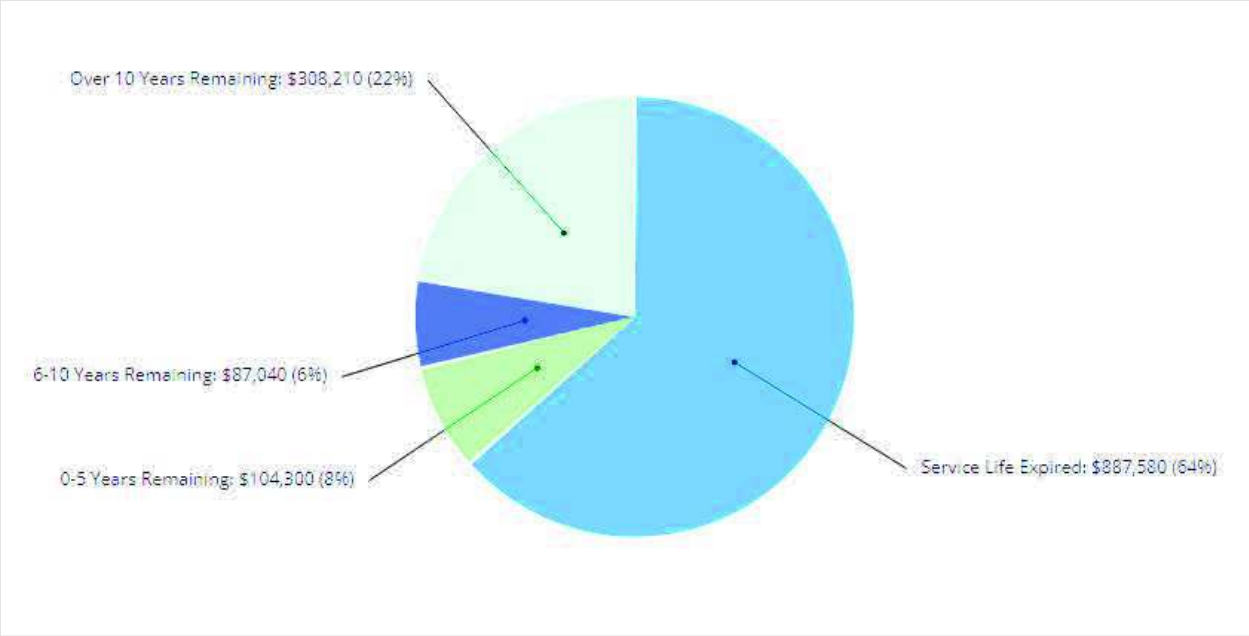


Expenditures in land improvements have fluctuated across the decades. Between 1985 and 1989, the period of largest investment, $530,000 was invested with a focus on athletic fields.

8.3 Useful Life Consumption

In conjunction with historical spending patterns and observed condition data, understanding the consumption rate of assets based on industry established useful life standards provides a more complete profile of the state of a community's infrastructure. Figure 48 illustrates the useful life consumption levels as of 2016 for the municipality's land improvement assets.

Figure 48 Useful Life Consumption – Land Improvements

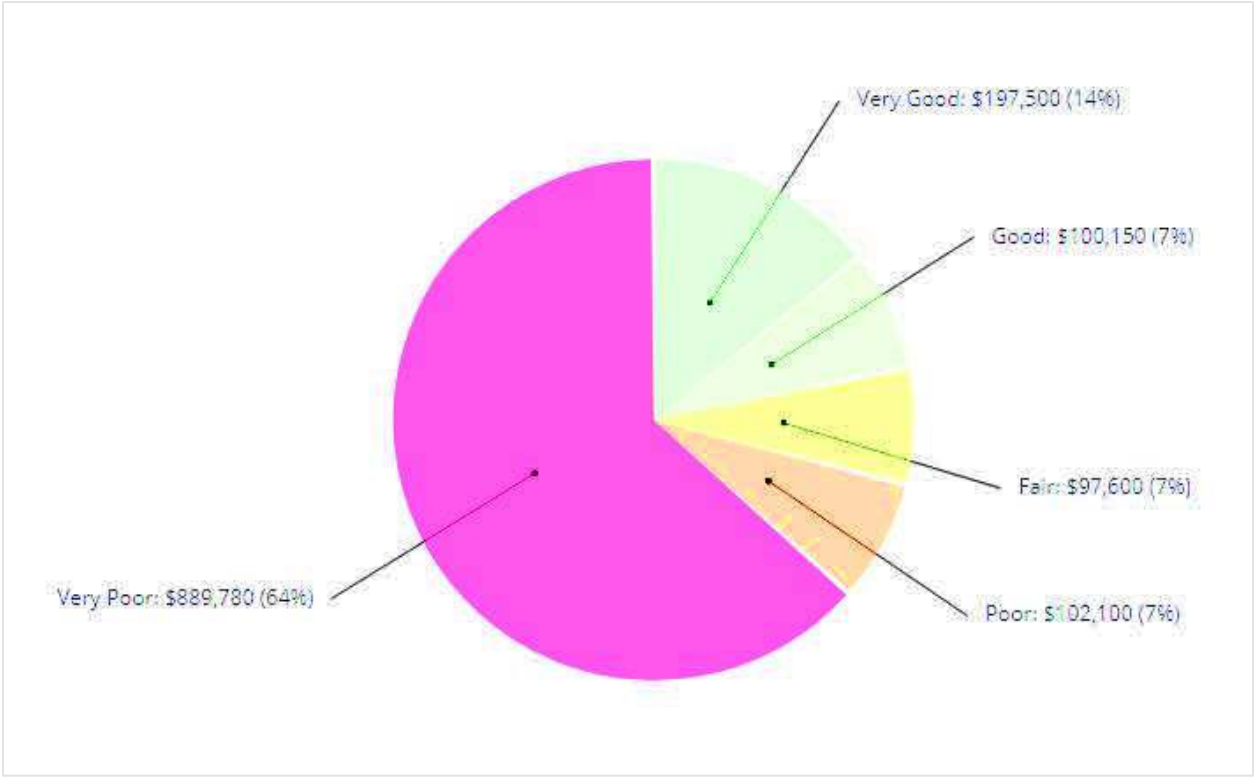


While 22% of assets have at least 10 years of useful life remaining, 64%, with a valuation of $888,000, remain in operation beyond their useful life. An additional 8% will reach the end of their useful life within the next five years.

8.4 Current Asset Condition

Using replacement cost, in this section we summarize the condition of the municipality's land improvement assets. By default, we rely on observed field data as provided by the municipality. In the absence of such information, age-based data is used as a proxy. The municipality has not provided condition data for its land improvement assets.

Figure 49 Asset Condition - Land Improvements (Age-Based)

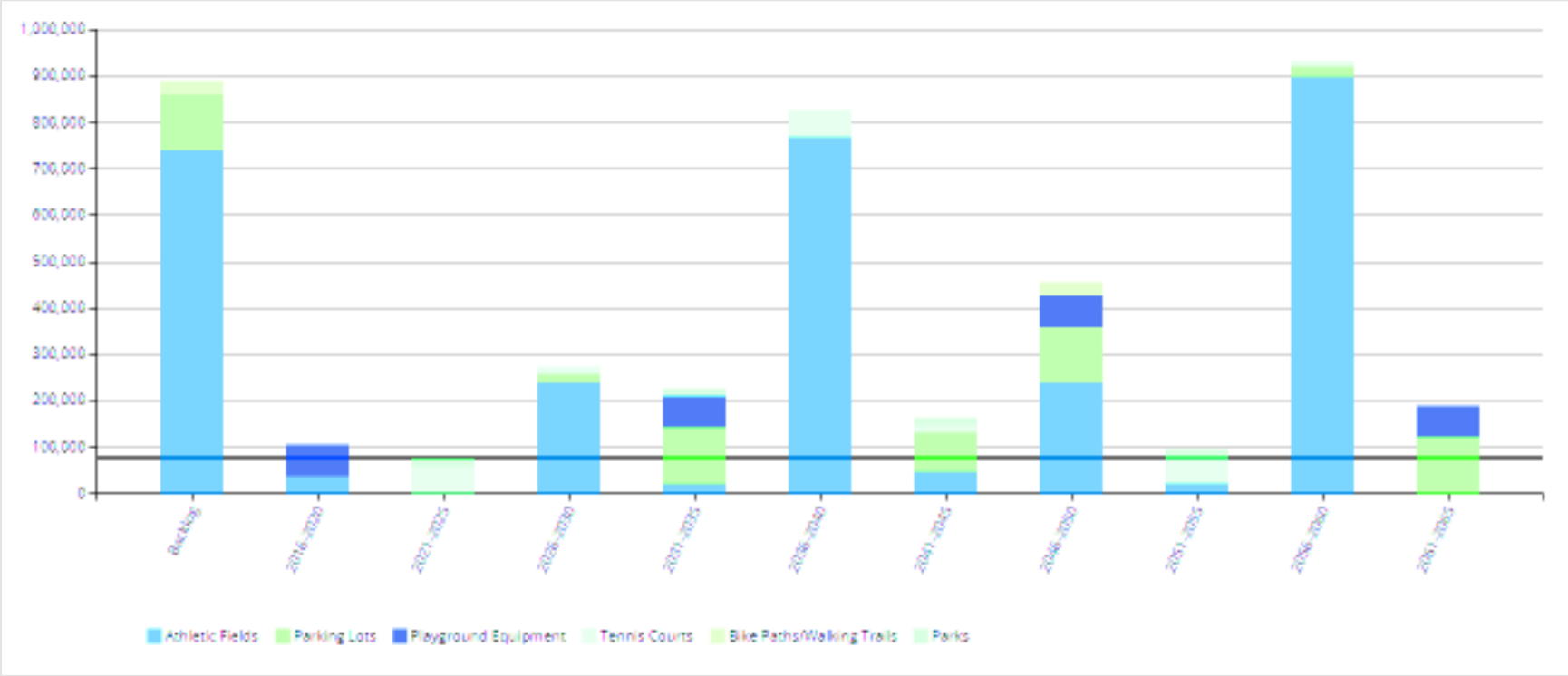


Based on age-based data, 21% of the municipality's land improvement assets, with a valuation of $298,000, are in good to very good condition; 71% are in poor to very poor condition.

8.5 Forecasting Replacement Needs

In this section, we illustrate the short-, medium- and long-term infrastructure spending requirements (replacement only) for the municipality's land improvements assets. The backlog is the aggregate investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 50 Forecasting Replacement Needs – Land Improvements



In addition to a backlog of $888,000, the municipality's replacement needs total $104,000 in the next five years. An additional $72,000 will be required between 2021-2025. The municipality's annual requirements (indicated by the black line) for its land improvements total $78,000. At this funding level, the municipality would be allocating sufficient funds on an annual basis to meet replacement needs as they arise without the need for deferring projects and accruing annual infrastructure deficits. However, the municipality is currently allocating $3,000, leaving an annual deficit of $75,000. See the 'Financial Strategy' section for achieving a more optimal and sustainable funding level. Further, while fulfilling the annual requirements will position the municipality to meet its future replacement needs, injection of additional revenues will be needed to mitigate existing infrastructure backlogs

8.6 Recommendations – Land Improvements

- The municipality should implement a condition assessment program for its land improvement assets to precisely estimate financial needs. See Section 2, 'Condition Assessment Programs' in the 'Asset Management Strategies' chapter.

- Using the above information, the municipality should assess its short-, medium- and long-term capital and operations and maintenance needs.

- An appropriate percentage of the replacement costs should then be allocated for the municipality's O&M requirements.

- The municipality is funding 4% of its long-term replacement needs on an annual basis. See the 'Financial Strategy' section on how to achieve more sustainable and optimal funding levels

9. Vehicles

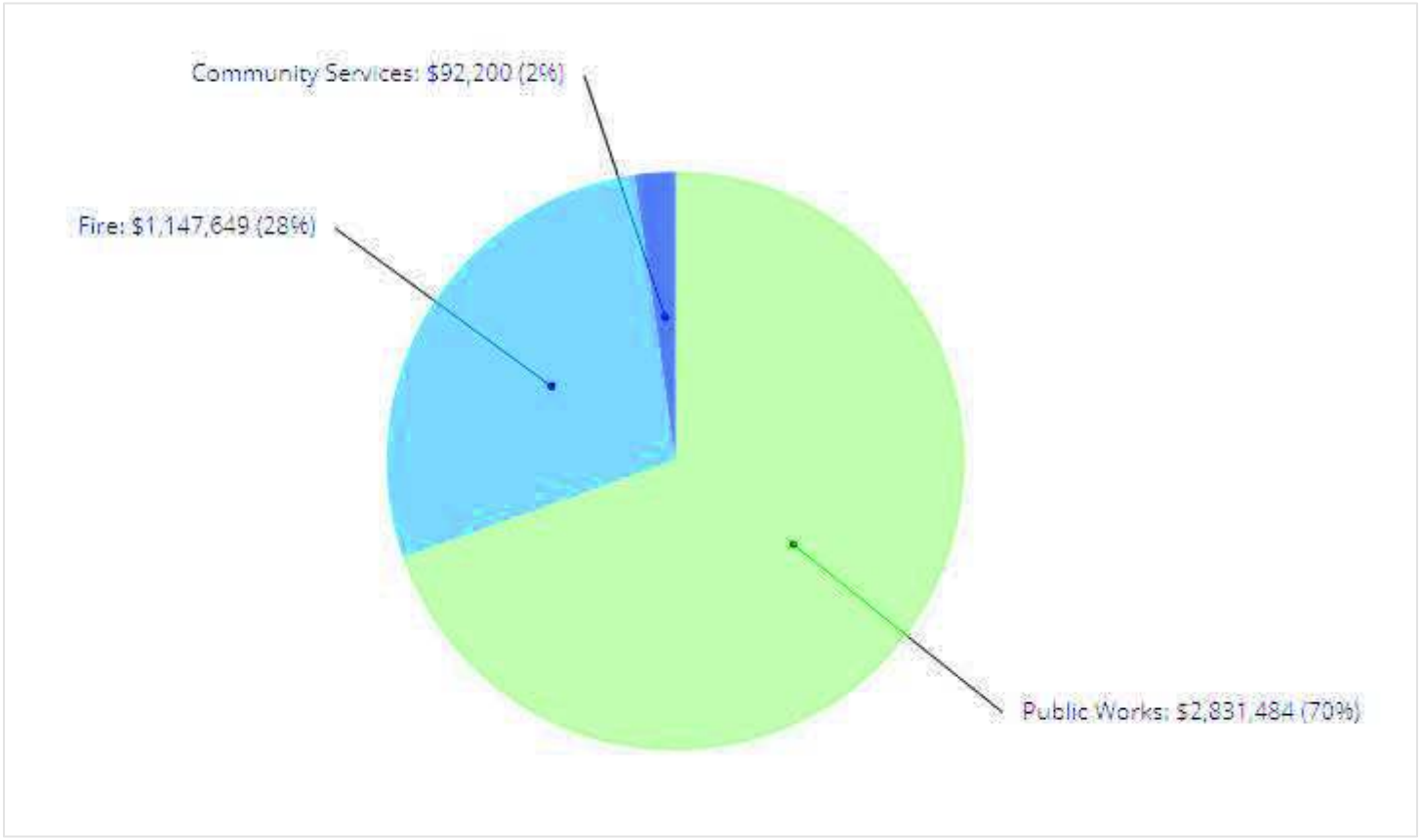
9.1 Asset Portfolio: Quantity, Useful Life and Replacement Cost

Table 14 illustrates key asset attributes for the municipality's vehicles portfolio, including quantities of various assets, their useful life, their replacement cost, and the valuation method by which the replacement costs were derived. In total, the municipality's vehicles assets are valued at $4 million based on 2016 replacement costs. The useful life indicated for each asset type below was assigned by the municipality.

Table 14 Key Asset Attributes – Vehicles

Asset Type	Components	Quantity	Useful Life in Years	Valuation Method	2016 Replacement Cost
Vehicles	Community Services	1	14	User Defined Cost	$92,200
	Fire	9	10, 20	User Defined Cost	$1,147,649
	Public Works	21	8, 10, 12, 15	User Defined Cost/CPI (ON)	$2,831,484
				Total	$4,071,333

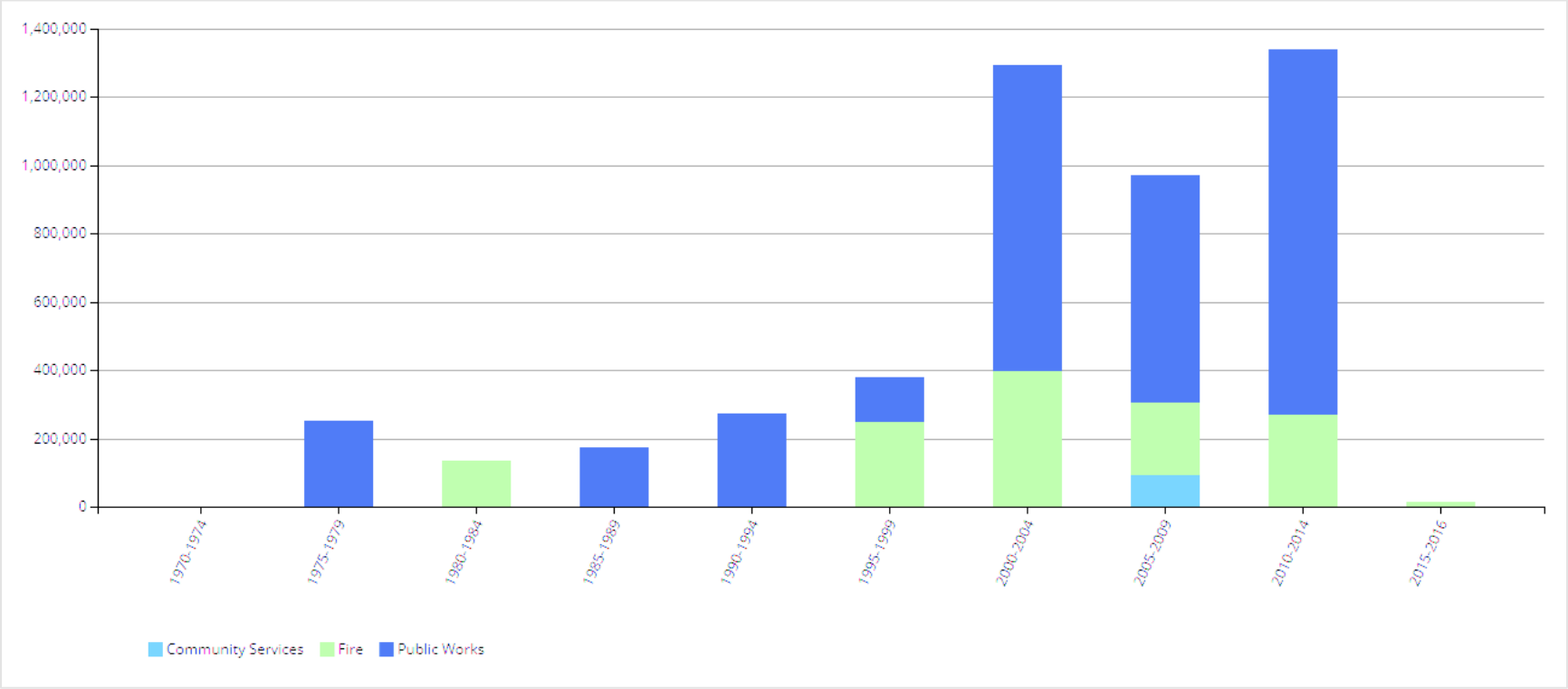
Figure 51 Asset Valuation – Vehicles



9.2 Historical Investment in Infrastructure

Figure 52 shows the municipality's historical investments in its vehicles portfolio since 1970. While observed condition data will provide superior accuracy in estimating replacement needs and should be incorporated into strategic plans, in the absence of such information, understanding past expenditure patterns and current useful life consumption levels (Section 9.3) can inform the forecasting and planning of infrastructure needs and in the development of a capital program. Note that this graph only includes the active asset inventory as of December 31, 2016.

Figure 52 Historical Investment – Vehicles

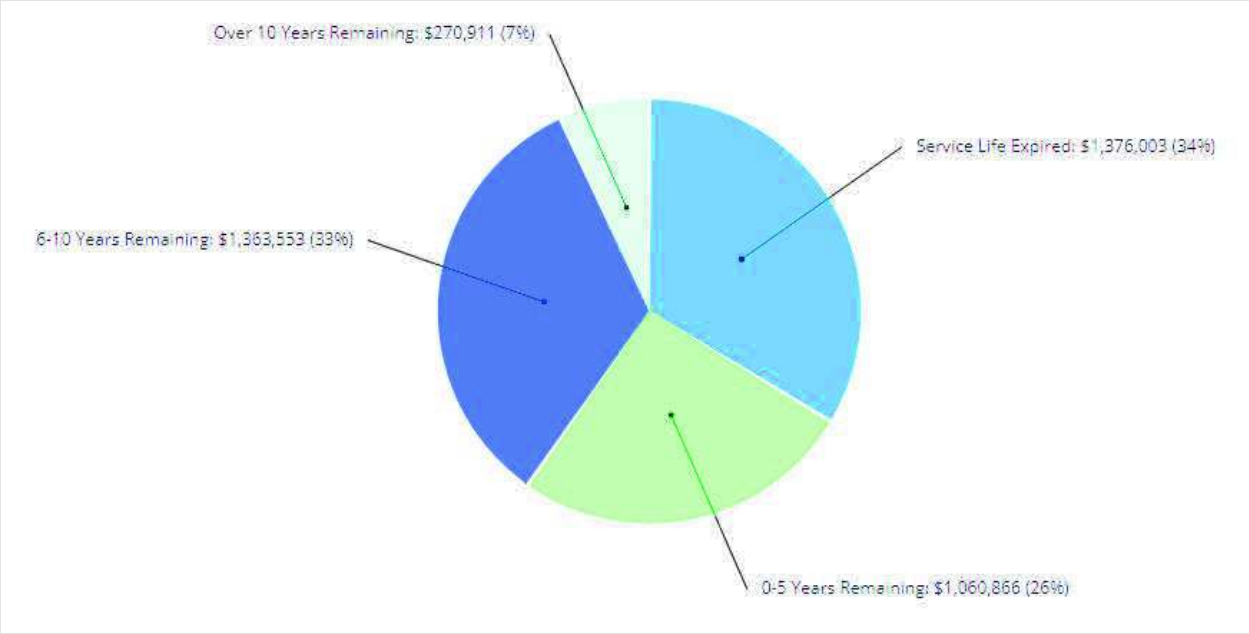


Investments in vehicles quickly increased starting in the late 1970s. In 2010-2014, the period of largest investment, $1.3 million was invested with $1 million put into public works vehicles.

9.3 Useful Life Consumption

In conjunction with historical spending patterns and observed condition data, understanding the consumption rate of assets based on industry established useful life standards provides a more complete profile of the state of a community's infrastructure. Figure 53 illustrates the useful life consumption levels as of 2016 for the municipality's vehicles.

Figure 53 Useful Life Consumption – Vehicles

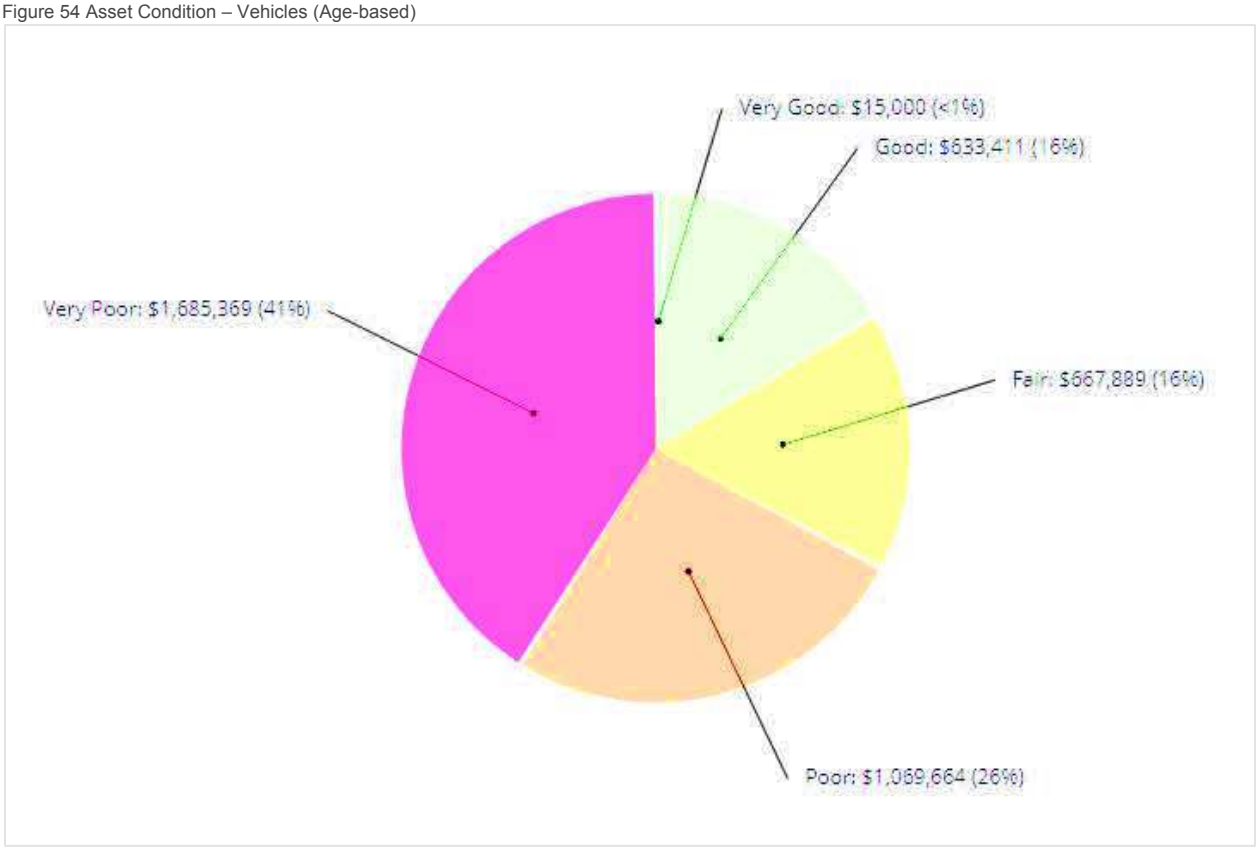


7% of assets have at least 10 years of useful life remaining; 34%, with a valuation of $1.4 million remain in operation beyond their useful life. An additional 26% will reach the end of their useful life within the next five years.

9.4 Current Asset Condition

Using replacement cost, in this section, we summarize the condition of the municipality's vehicles assets as of 2015. By default, we rely on observed field data as provided by the municipality. In the absence of such information, age-based data is used as a proxy. The municipality has not provided condition data for its vehicle assets.

Figure 54 Asset Condition – Vehicles (Age-based)

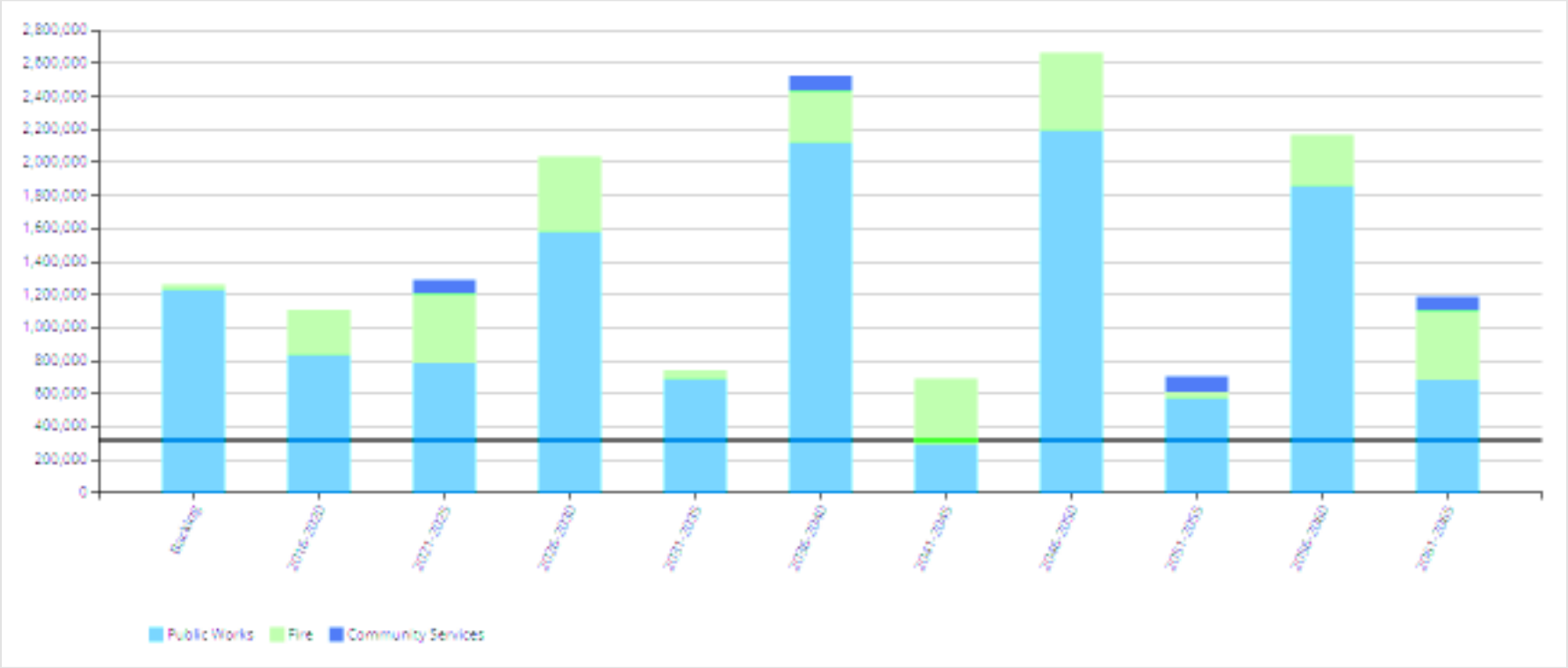


Age-based data shows that 67% of the municipality's vehicle assets are in poor to very poor condition; 17%, with a valuation of $648,000 are in good to very good condition.

9.5 Forecasting Replacement Needs

In this section, we illustrate the short-, medium- and long-term infrastructure spending requirements (replacement only) for the municipality's vehicles assets. The backlog is the aggregate investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 55 Forecasting Replacement Needs – Vehicles



In addition to a backlog of $1.3 million, replacement needs will total over $1.1 million over the next five years; an additional $1.3 million will be required between 2021-2025. The municipality's annual requirements (indicated by the black line) for its vehicles total $319,000. At this funding level, the municipality would be allocating sufficient funds on an annual basis to meet replacement needs as they arise without the need for deferring projects and accruing annual infrastructure deficits. However, the municipality is currently allocating $241,000, leaving an annual deficit of $78,000. See the 'Financial Strategy' section for achieving a more optimal and sustainable funding level. Further, while fulfilling the annual requirements will position the municipality to meet its future replacement needs, injection of additional revenues will be needed to mitigate existing infrastructure backlogs.

9.6 Recommendations – Vehicles

- Age-based data indicates a backlog of $1.3 million and 10-year replacement needs of $2.4 million. A preventative maintenance and lifecycle assessment program should be established for all vehicle assets to gain a better understanding of current condition and performance as well as the short- and medium-term replacement needs. See Section 2, 'Condition Assessment Programs' in the 'Asset Management Strategies' chapter.

- Using the above information, the municipality should assess its short-, medium- and long-term capital and operations and maintenance needs.

- An appropriate percentage of the replacement costs should then be allocated for the municipality's O&M requirements.

- The municipality is funding 76% of its long-term replacement needs on an annual basis. See the 'Financial Strategy' section on how to achieve more sustainable and optimal funding levels.

VII. Levels of Service

The two primary risks to a municipality's financial sustainability are the total lifecycle costs of infrastructure, and establishing levels of service (LOS) that exceed its financial capacity. In this regard, municipalities face a choice: overpromise and underdeliver; under promise and overdeliver; or promise only that which can be delivered efficiently without placing inequitable burden on taxpayers. In general, there is often a trade-off between political expedience and judicious, long-term fiscal stewardship.

Developing realistic LOS using meaningful key performance indicators (KPIs) can be instrumental in managing citizen expectations, identifying areas requiring higher investments, driving organizational performance and securing the highest value for money from public assets. However, municipalities face diminishing returns with greater granularity in their LOS and KPI framework. That is, the objective should be to track only those KPIs that are relevant and insightful and reflect the priorities of the municipality.

1. Guiding Principles for Developing LOS

Beyond meeting regulatory requirements, levels of service established should support the intended purpose of the asset and its anticipated impact on the community and the municipality. LOS generally have an overarching corporate description, a customer oriented description, and a technical measurement. Many types of LOS, e.g., availability, reliability, safety, responsiveness and cost effectiveness, are applicable across all service areas in a municipality. The following LOS categories are established as guiding principles for the LOS that each service area in the municipality should strive to provide internally to the municipality and to residents/customers. These are derived from the Town of Whitby's *Guide to Developing Service Area Asset Management Plans*.

Table 15 LOS Categories

LOS Category	Description
Reliable	Services are predictable and continuous; services of sufficient capacity are convenient and accessible to the entire community.
Cost Effective	Services are provided at the lowest possible cost for both current and future customers, for a required level of service, and are affordable.
Responsive	Opportunities for community involvement in decision making are provided; and customers are treated fairly and consistently, within acceptable timeframes, demonstrating respect, empathy and integrity.
Safe	Services are delivered such that they minimize health, safety and security risks.
Suitable	Services are suitable for the intended function (fit for purpose).
Sustainable	Services preserve and protect the natural and heritage environment.

2. Key Performance Indicators and Targets

In this section, we identify industry standard KPIs for major infrastructure classes that the municipality can incorporate into its performance measurement and for tracking its progress over future iterations of its AMPs. The municipality should develop appropriate and achievable targets that reflect evolving demand on infrastructure, its fiscal capacity and the overall corporate objectives.

Table 16 Key Performance Indicators – Road Network and Bridges & Culverts

Level	KPI (Reported Annually)
Strategic	– Percentage of total reinvestment compared to asset replacement value – Completion of strategic plan objectives (related to roads, and bridges & culverts)
Financial Indicators	– Annual revenues compared to annual expenditures – Annual replacement value depreciation compared to annual expenditures – Cost per capita for roads, and bridges & culverts – Maintenance cost per square metre – Revenue required to maintain annual network growth – Total cost of borrowing vs. total cost of service
Tactical	– Overall Bridge Condition Index (BCI) as a percentage of desired BCI – Percentage of road network rehabilitated/reconstructed – Percentage of paved road lane kilometres rated as poor to very poor – Percentage of bridges and large culverts rated as poor to very poor – Percentage of asset class value spent on O&M
Operational Indicators	– Percentage of roads inspected within the last five years – Percentage of bridges and large culverts inspected within the last two years – Operating costs for paved lane per kilometres – Operating costs for bridge and large culverts per square metre – Percentage of customer requests with a 24-hour response rate

Table 17 Key Performance Indicators – Buildings & Facilities

Level	KPI (Reported Annually)
Strategic	– Percentage of total reinvestment compared to asset replacement value – Completion of strategic plan objectives (related to buildings & facilities)
Financial Indicators	– Annual revenues compared to annual expenditures – Annual replacement value depreciation compared to annual expenditures – Revenue required to meet growth related demand – Repair and maintenance costs per square metre – Energy, utility and water cost per square metre
Tactical	– Percentage of component value replaced – Percent of facilities rated poor or critical – Percentage of facilities replacement value spent on O&M – Facility utilization rate – $Utilization\ Rate = \frac{Occupied\ Space}{Facility\ Usable\ Area}$
Operational Indicators	– Percentage of facilities inspected within the last five years – Number/type of service requests – Percentage of customer requests addressed within 24 hours

Table 18 Key Performance Indicators – Vehicles

Level	KPI (Reported Annually)
Strategic	– Percentage of total reinvestment compared to asset replacement value – Completion of strategic plan objectives (related to vehicles)
Financial Indicators	– Annual revenues compared to annual expenditures – Annual replacement value depreciation compared to annual expenditures – Cost per capita for vehicles – Revenue required to maintain annual fleet portfolio growth – Total cost of borrowing vs. total cost of service
Tactical	– Percentage of all vehicles replaced – Average age of vehicles – Percent of vehicles rated poor or critical – Percentage of vehicles replacement value spent on O&M
Operational Indicators	– Average downtime per vehicles category – Average utilization per vehicles category and/or each vehicle – Ratio of preventative maintenance repairs vs. reactive repairs – Percent of vehicles that received preventative maintenance – Number/type of service requests – Percentage of customer requests addressed within 24 hours

Table 19 Key Performance Indicators – Water, Sanitary and Storm Networks

Level	KPI (Reported Annually)
Strategic	– Percentage of total reinvestment compared to asset replacement value – Completion of strategic plan objectives (related to water, sanitary and storm)
Financial Indicators	– Annual revenues compared to annual expenditures – Annual replacement value depreciation compared to annual expenditures – Total cost of borrowing compared to total cost of service – Revenue required to maintain annual network growth
Tactical	– Percentage of water, sanitary and storm network rehabilitated/reconstructed – Annual percentage of growth in water, sanitary and storm network – Percentage of mains where the condition is rated poor or critical for each network – Percentage of water, sanitary and storm network replacement value spent on O&M
Operational Indicators	– Percentage of water, sanitary and storm network inspected – Operating costs for the collection of wastewater per kilometre of main – Number of wastewater main backups per 100 kilometres of main – Operating costs for storm water management (collection, treatment, and disposal) per kilometre of drainage system. – Operating costs for the distribution/transmission of drinking water per kilometre of water distribution pipe – Number of days when a boil water advisory issued by the medical officer of health, applicable to a municipal water supply, was in effect – Number of water main breaks per 100 kilometres of water distribution pipe in a year – Number of customer requests received annually per water, sanitary and storm – Percentage of customer requests addressed within 24 hours per water, sanitary and storm network

Table 20 Key Performance Indicators – Machinery & Equipment

Level	KPI (Reported Annually)
Strategic	– Percentage of total reinvestment compared to asset replacement value – Completion of strategic plan objectives (related to machinery & equipment)
Financial Indicators	– Annual revenues compared to annual expenditures – Annual replacement value depreciation compared to annual expenditures – Cost per capita for machinery & equipment – Revenue required to maintain annual portfolio growth – Total cost of borrowing vs. total cost of service
Tactical	– Percentage of all machinery & equipment replaced – Average age of machinery & equipment assets – Percent of machinery & equipment rated poor or critical – Percentage of vehicles replacement value spent on O&M
Operational Indicators	– Average downtime per machinery & equipment asset – Ratio of preventative maintenance repairs vs. reactive repairs – Percent of machinery & equipment that received preventative maintenance – Number/type of service requests

Table 21 Key Performance Indicators – Land Improvements

Level	KPI (Reported Annually)
Strategic	– Percentage of total reinvestment compared to asset replacement value – Completion of strategic plan objectives (related to land improvements)
Financial Indicators	– Annual revenues compared to annual expenditures – Annual replacement value depreciation compared to annual expenditures – Cost per capita for supplying parks, playgrounds, etc. – Repair and maintenance costs per square metre
Tactical	– Percent of land improvements rated poor or critical – Percentage of replacement value spent on O&M – Parkland per capita
Operational Indicators	– Percentage of land improvements inspected within the last five years – Number/type of service requests – Percentage of customer requests addressed within 24 hours

3. Future Performance

In addition to a municipality's financial capacity and legislative requirements, many factors, internal and external, can influence the establishment of LOS and their associated KPI. These can include the municipality's overarching mission as an organization, the current state of its infrastructure and the wider social, political and macroeconomic context. The following factors should inform the development of most levels of service targets and their associated KPIs:

Strategic Objectives and Corporate Goals
The municipality's long-term direction is outlined in its corporate and strategic plans. This direction will dictate the types of services it aims to deliver to its residents and the quality of those services. These high-level goals are vital in identifying strategic (long-term) infrastructure priorities and as a result, the investments needed to produce desired levels of service.

State of the Infrastructure
The current state of capital assets will determine the quality of services the municipality can deliver to its residents. As such, levels of service should reflect the existing capacity of assets to deliver those services, and may vary (increase) with planned maintenance, rehabilitation or replacement activities and timelines.

Community Expectations
The general public will often have qualitative and quantitative insights regarding the levels of service a particular asset or a network of assets should deliver, e.g., what a road in 'good' condition should look like or the travel time between destinations. The public should be consulted in establishing LOS; however, the discussions should be centered on clearly outlining the lifecycle costs associated with delivering any improvements in LOS.

Economic Trends
Macroeconomic trends will have a direct impact on the LOS for most infrastructure services. Fuel costs, fluctuations in interest rates and the purchasing power of the Canadian dollar can impede or accelerate any planned growth in infrastructure services.

Demographic Changes
The composition of residents in a municipality can also serve as an infrastructure demand driver, and as a result, can change how a municipality allocates its resources (e.g., an aging population may require diversion of resources from parks and sports facilities to additional wellbeing centers). Population growth is also a significant demand driver for existing assets (lowering LOS), and may require the municipality to construct new infrastructure to parallel community expectations.

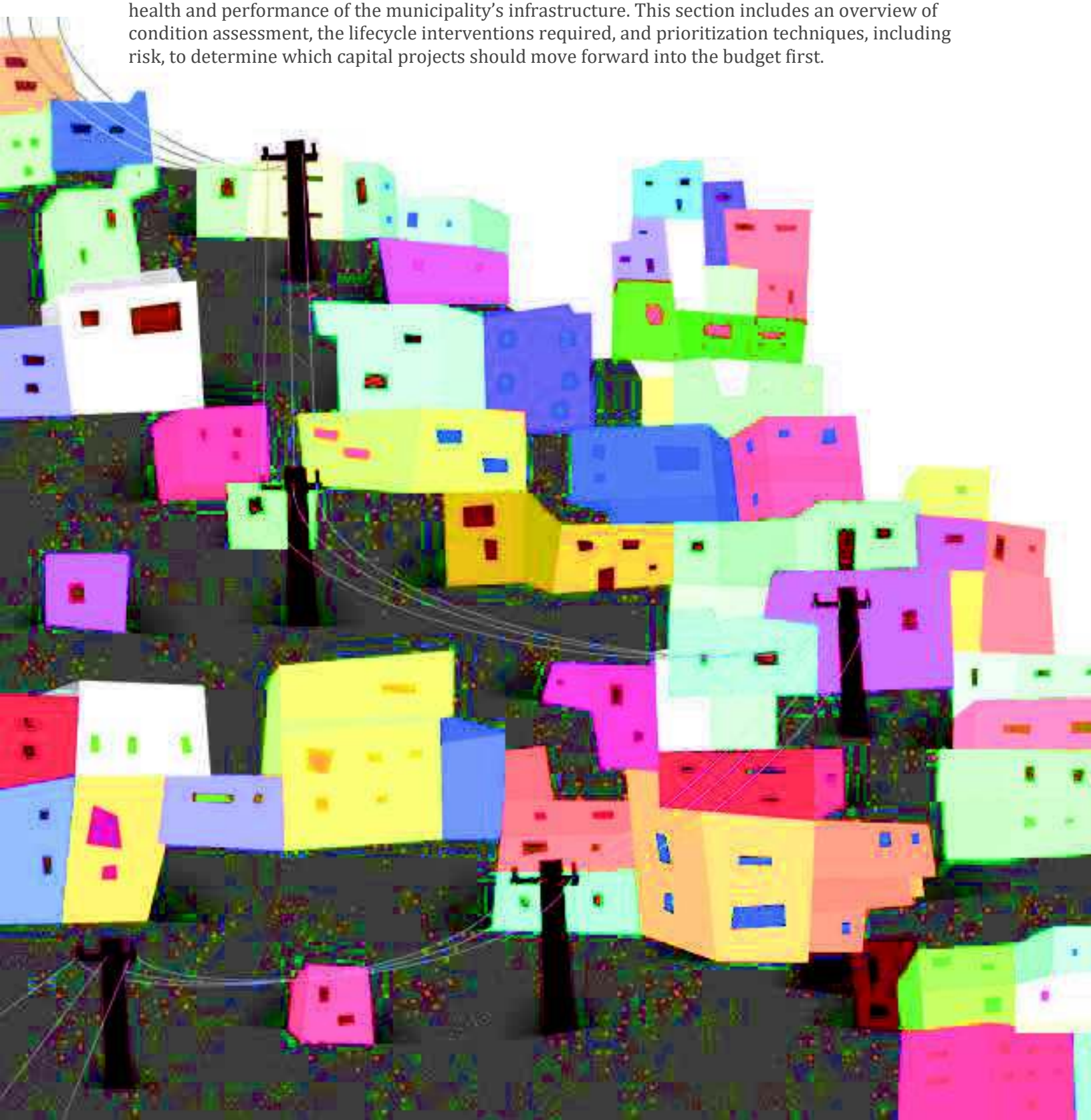
Environmental Change
Forecasting for infrastructure needs based on climate change remains an imprecise science. However, broader environmental and weather patterns have a direct impact on the reliability of critical infrastructure services.

4. Monitoring, Updating and Actions

The municipality should collect data on its current performance against the KPIs listed and establish targets that reflect the current fiscal capacity of the municipality, its corporate and strategic goals, and as feasible, changes in demographics that may place additional demand on its various asset classes. For some asset classes, e.g., minor equipment, furniture, etc., cursory levels of service and their respective KPIs will suffice. For major infrastructure classes, detailed technical and customer-oriented KPIs can be critical. Once this data is collected and targets are established, the progress of the municipality should be tracked annually.

VIII. Asset Management Strategies

The asset management strategy section will outline an implementation process that can be used to identify and prioritize renewal, rehabilitation and maintenance activities. This will assist in the development of a 10-year capital plan, including growth projections, to ensure the best overall health and performance of the municipality's infrastructure. This section includes an overview of condition assessment, the lifecycle interventions required, and prioritization techniques, including risk, to determine which capital projects should move forward into the budget first.



1. Non-Infrastructure Solutions & Requirements

The municipality should explore, as requested through the provincial requirements, which non-infrastructure solutions should be incorporated into the budgets for its infrastructure services. Non-infrastructure solutions are such items as studies, policies, condition assessments, consultation exercises, etc., that could potentially extend the life of assets or lower total asset program costs in the future without a direct investment into the infrastructure.

Typical solutions for a municipality include linking the asset management plan to the strategic plan, growth and demand management studies, infrastructure master plans, better integrated infrastructure and land use planning, public consultation on levels of service and condition assessment programs. As part of future asset management plans, a review of these requirements should take place, and a portion of the capital budget should be dedicated for these items in each programs budget.

It is recommended, under this category of solutions, that the municipality should develop and implement holistic condition assessment programs for all asset classes. This will advance the understanding of infrastructure needs, improve budget prioritization methodologies and provide a clearer path of what is required to achieve sustainable infrastructure programs.

2. Condition Assessment Programs

The foundation of an intelligent asset management practice is based on having comprehensive and reliable information on the current condition of the infrastructure. Municipalities need to have a clear understanding regarding the performance and condition of their assets, as all management decisions regarding future expenditures and field activities should be based on this knowledge. An incomplete understanding of an asset may lead to its untimely failure or premature replacement.

Some benefits of holistic condition assessment programs within the overall asset management process are listed below:

- understanding of overall network condition leads to better management practices
- allows for the establishment of rehabilitation programs
- prevents future failures and provides liability protection
- potential reduction in operation/maintenance costs
- accurate current asset valuation
- allows for the establishment of risk assessment programs
- establishes proactive repair schedules and preventive maintenance programs
- avoids unnecessary expenditures
- extends asset service life therefore improving level of service
- improves financial transparency and accountability
- enables accurate asset reporting which, in turn, enables better decision making

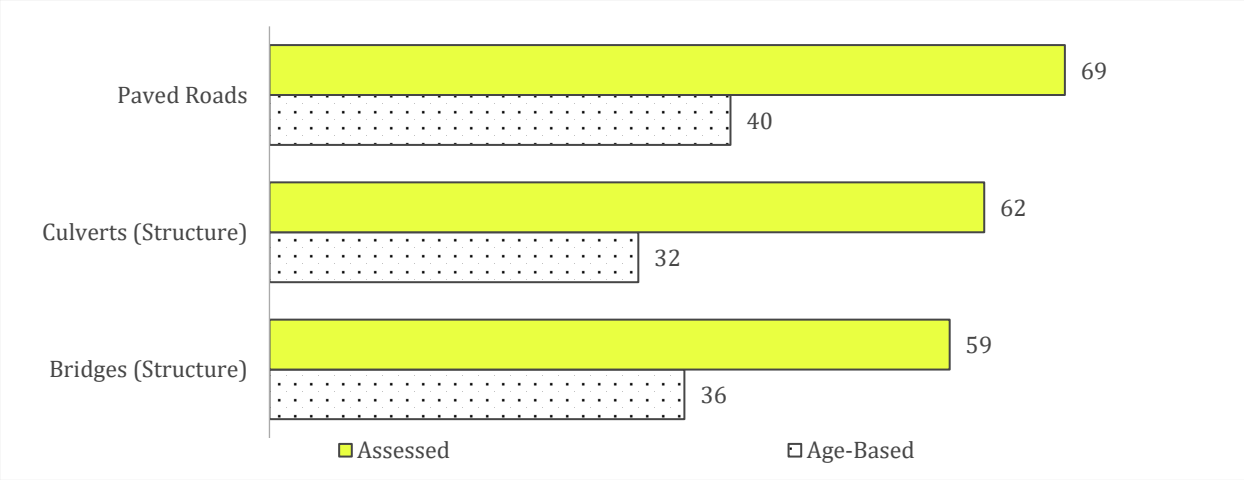
Condition assessment can involve different forms of analysis such as subjective opinion, mathematical models, or variations thereof, and can be completed through a very detailed or very cursory approach. When establishing the condition assessment for an entire asset class, a cursory approach (metrics such as good, fair, poor, very poor) is used. This is an economical strategy that will still provide up to date information, and will allow for detailed assessment or follow-up inspections on those assets captured as poor or critical condition later.

The Impact of Condition Assessments

In 2015, PSD published a study in partnership with the Association of Municipalities of Ontario (AMO). The report, *The State of Ontario's Roads and Bridges: An Analysis of 93 Municipalities*, enumerated the infrastructure deficits, annual investment gaps, and the physical state of roads, bridges and culverts with a 2013 replacement value of $28 billion.

A critical finding of the report was the dramatic difference in the condition profile of the assets when comparing age-based estimates and actual field inspection observations. For each asset group, field data based condition ratings were significantly higher than age-based condition ratings, with paved roads, culverts, and bridges showing an increase in score (0-100) of +29, +30, and +23 points respectively. In other words, age-based measurements maybe underestimating the condition of assets by as much as 30%.

Figure 56 Comparing Age-based and Assessed Condition Data



2.1 Pavement Network

Typical industry pavement inspections are performed by consulting firms using specialized assessment vehicles equipped with various electronic sensors and data capture equipment. The vehicles will drive the entire road network and typically collect two different types of inspection data: surface distress data and roughness data.

Surface distress data involves the collection of multiple industry standard surface distresses, which are captured either electronically using sensing detection equipment mounted on the van, or visually by the van's inspection crew. Roughness data capture involves the measurement of the roughness of the road, measured by lasers that are mounted on the inspection van's bumper, calibrated to an international roughness index.

Another option for a cursory level of condition assessment is for municipal road crews to perform simple windshield surveys as part of their regular patrol. Many municipalities have created data collection inspection forms to assist this process and to standardize what presence of defects would constitute a good, fair, poor, or critical score. Lacking any other data for the complete road network, this can still be seen as a good method and will assist greatly with the overall management of the road network.

The municipality will be conducting a pavement condition assessment in 2017. We recommend that a portion of capital funding is dedicated to this.

2.2 Bridges & Culverts

Ontario municipalities are mandated by the Ministry of Transportation to inspect all structures that have a span of 3 metres or more, according to the OSIM (Ontario Structure Inspection Manual).

Structure inspections must be performed by, or under the guidance of, a structural engineer, must be performed on a biennial basis (once every two years), and include such information as structure type, number of spans, span lengths, other key attribute data, detailed photo images, and structure element by element inspection, rating and recommendations for repair, rehabilitation, and replacement.

The best approach to develop a 10-year needs list for the municipality’s structure portfolio relies on the structural engineer who performs the inspections to also produce a maintenance requirements report, and rehabilitation & replacement requirements report as part of the overall assignment. In addition to defining the overall needs requirements, the structural engineer should identify those structures that will require more detailed investigations and non-destructive testing techniques. Examples of these investigations are:

- Detailed deck condition survey
- Non-destructive delamination survey of asphalt covered decks
- Substructure condition survey
- Detailed coating condition survey
- Underwater investigation
- Fatigue investigation
- Structure evaluation

Through the OSIM recommendations and additional detailed investigations, a 10-year needs list can be developed for the municipality's bridges.

2.3 Buildings & Facilities

The most popular and practical type of buildings & facilities assessment involves qualified groups of trained industry professionals (engineers or architects) performing an analysis of the condition of a group of facilities and their components, that may vary in terms of age, design, construction methods and materials. This analysis can be done by walk-through inspection (the most accurate approach), mathematical modeling or a combination of both. The following asset classifications are typically inspected:

- **Site Components** – property around the facility and outdoor components such as utilities, signs, stairways, walkways, parking lots, fencing, courtyards and landscaping
- **Structural Components** – physical components such as the foundations, walls, doors, windows, roofs
- **Electrical Components** – all components that use or conduct electricity such as wiring, lighting, electric heaters, and fire alarm systems
- **Mechanical Components** – components that convey and utilize all non-electrical utilities within a facility such as gas pipes, furnaces, boilers, plumbing, ventilation, and fire extinguishing systems
- **Vertical Movement** – components used for moving people between floors of buildings such as elevators, escalators and stair lifts

Once collected, this information can be uploaded into the CityWide®, the municipality's asset management and asset registry software database in order for short- and long-term repair, rehabilitation and replacement reports to be generated to assist with programming the short- and long-term maintenance and capital budgets.

It is recommended that the municipality conduct inspections of structures and expand its condition assessment program for other segments. It is also recommended that a portion of capital funding is dedicated to this.

2.4 Vehicles and Machinery & Equipment

The typical approach to optimizing the maintenance expenditures of vehicles and machinery & equipment, is through routine vehicle and component inspections, routine servicing, and a routine preventative maintenance program. Most makes and models of vehicles and machinery assets are supplied with maintenance manuals that define the appropriate schedules and routines for typical maintenance and servicing, and also more detailed restoration or rehabilitation protocols.

The primary goal of sound maintenance is to avoid or mitigate the consequence of failure of equipment or parts. An established preventative maintenance program serves to ensure this, as it will consist of scheduled inspections and follow up repairs of vehicles and machinery & equipment in order to decrease breakdowns and excessive downtimes.

A good preventative maintenance program will include partial or complete overhauls of equipment at specific periods, including oil changes, lubrications, fluid changes and so on. In addition, workers can record equipment or part deterioration so they can schedule to replace or repair worn parts before they fail.

The ideal preventative maintenance program would move progressively further away from reactive repairs and instead towards the prevention of all equipment failure before it occurs.

It is recommended that a preventative maintenance routine is defined and established for all vehicles and machinery & equipment assets, and that a software application is utilized for the overall management of the program.

2.5 Water System

Unlike sewer mains, it is often prohibitively difficult to inspect water mains from the inside due to the constant and high-pressure flow of water. A physical inspection requires a disruption of service to residents, can be an expensive exercise and is time consuming to set up. It is recommended practice that physical inspection of water mains typically occurs only for high-risk, large transmission mains within the system, and only when there is a requirement. There are a number of high tech inspection techniques in the industry for large diameter pipes but these should be researched first for applicability as they are quite expensive. Examples include remote eddy field current (RFEC), ultrasonic and acoustic techniques, impact echo (IE), and Georadar.

For the majority of pipes within the distribution network, gathering key information in regards to the main and its environment can supply the best method to determine a general condition. Key data that may be used, along with weighting factors, to determine an overall condition score include age, material type, breaks, hydrant flow inspections and soil condition.

It is recommended that the municipality conduct a watermain assessment program, and that funds are budgeted for this.

2.6 Sewer Network Inspection (Sanitary and Storm)

The most popular and practical type of sanitary and storm sewer assessment is the use of Closed Circuit Television Video (CCTV). The process involves a small robotic crawler vehicle with a CCTV camera attached that is lowered down a maintenance hole into the sewer main to be inspected.

The vehicle and camera then travel the length of the pipe, providing a live video feed to a truck on the road above where a technician/inspector records defects and information regarding the pipe. A wide range of construction or deterioration problems can be captured, including open/displaced joints, presence of roots, infiltration & inflow, cracking, fracturing, exfiltration, collapse, deformation of pipe and more. Therefore, sewer CCTV inspection is an effective tool for locating and evaluating structural defects and general condition of underground pipes.

Even though CCTV is an excellent option for inspection of sewers, it is a fairly costly process and does take significant time to inspect a large volume of pipes.

Another option in the industry today is the use of Zoom Camera equipment. This is very similar to traditional CCTV, however, a crawler vehicle is not used. Rather, in its place, a camera is lowered down a maintenance hole attached to a pole like piece of equipment. The camera is then rotated towards each connecting pipe and the operator above progressively zooms in to record all defects and information about each pipe. The downside to this technique is the further down the pipe the image is zoomed, the less clarity is available to accurately record defects and measurement. The upside is the process is far quicker and significantly less expensive and an assessment of the

manhole can be provided as well. Also, it is important to note that 80% of pipe deficiencies generally occur within 20 metres of each manhole.

It is recommended that the municipality conduct a wastewater main assessment program and expand it to include storm sewer mains. A portion of capital funding should be dedicated to this.

2.7 Parks and Land Improvements

CSA standards provide guidance on the process and protocols in regards to the inspection of parks and their associated assets, e.g., play spaces and equipment. The land improvements inspection will involve qualified groups of trained industry professionals (operational staff or landscape architects) performing an analysis of the condition of a group of land improvement assets and their components. The most accurate way of determining the condition requires a walk-through to collect baseline data. The following key asset classifications are typically inspected:

- **Physical Site Components –** physical components on the site of the park such as fences, utilities, stairways, walkways, parking lots, irrigation systems, monuments, fountains
- **Recreation Components –** physical components such as playgrounds, bleachers, back stops, splash pads, and benches
- **Land Site Components** – land components on the site of the park such as landscaping, sports fields, trails, natural areas, and associated drainage systems
- **Minor Park Facilities –** small facilities within the park site such as: sun shelters, washrooms, concession stands, change rooms, storage sheds

It is recommended that the municipality conduct a parks condition assessment and that a portion of capital funding is dedicated to this.

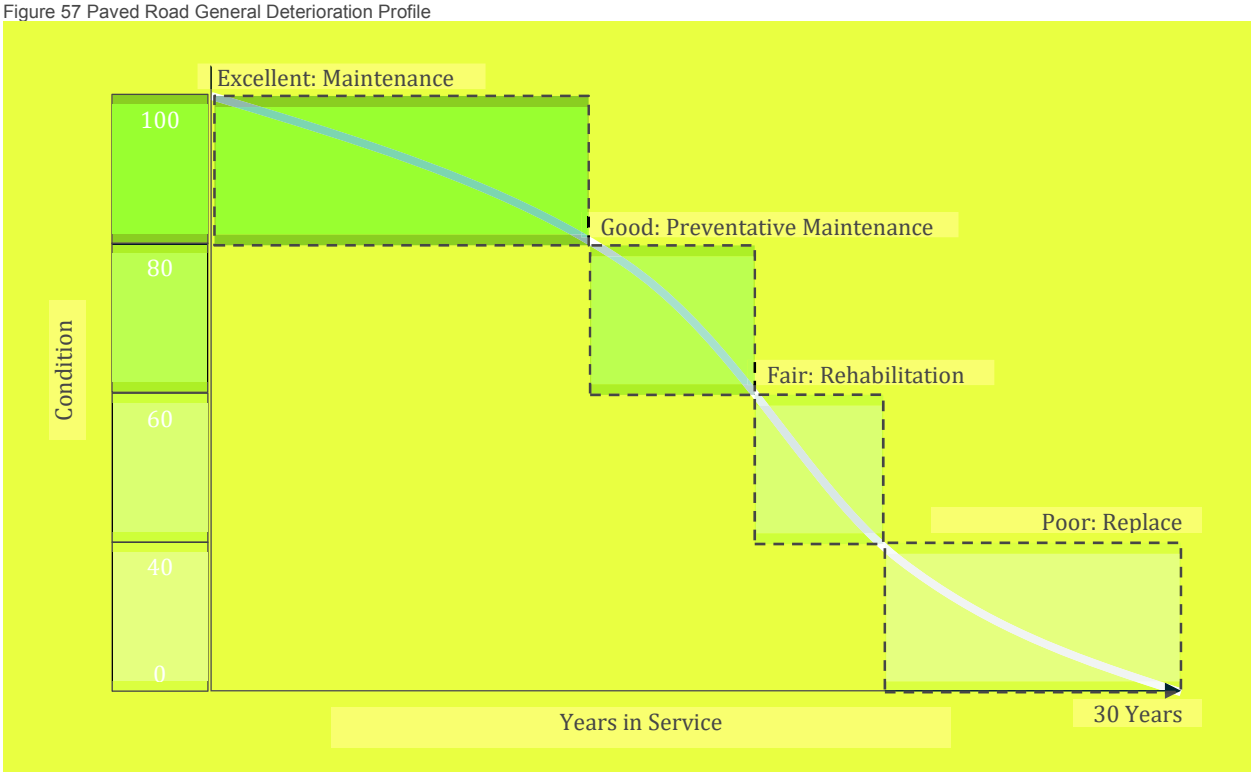
3. Lifecycle Analysis Framework

An industry review was conducted to determine which lifecycle activities can be applied at the appropriate time in an asset's life, to provide the greatest additional life at the lowest cost. In the asset management industry, this is simply put as doing the right thing to the right asset at the right time. If these techniques are applied across entire asset networks or portfolios (e.g., the entire road network), the municipality can gain the best overall asset condition while expending the lowest total cost for those programs.

3.1 Paved Roads

The following analysis has been conducted at a fairly high level, using industry standard activities and costs for paved roads. With future updates of this asset management strategy, the municipality may wish to run the same analysis with a detailed review of municipality activities used for roads and the associated local costs for those work activities. All of this information can be entered into the CityWide® software suite in order to perform updated financial analysis as more detailed information becomes available. The following diagram depicts a general deterioration profile of a road with a 30-year life.

Figure 57 Paved Road General Deterioration Profile



As shown above, during the road's lifecycle, there are various windows available for work activity that will maintain or extend the life of the asset. These windows are: maintenance; preventative maintenance; rehabilitation; and replacement or reconstruction.

The windows or thresholds for when certain work activities should be applied to also coincide approximately with the condition state of the asset as shown below:

Table 22 Asset Condition and Related Work Activity for Paved Roads

Condition	Condition Range	Work Activity
Very Good (Maintenance only phase)	81-100	– Maintenance only
Good (Preventative maintenance phase)	61-80	– Crack sealing – Emulsions
Fair (Rehabilitation phase)	41-60	– Resurface - mill & pave – Resurface - asphalt overlay – Single & double surface treatment (for rural roads)
Poor (Reconstruction phase)	21-40	– Reconstruct - pulverize and pave – Reconstruct - full surface and base reconstruction
Very Poor (Reconstruction phase)	0-20	– Critical includes assets beyond their useful lives which make up the backlog. They require the same interventions as the 'poor' category above.

With future updates of this asset management strategy, the municipality may wish to review the above condition ranges and thresholds for when certain types of work activity occur, and adjust to better suit the municipality's work program. Also note: when adjusting these thresholds, it actually adjusts the level of service provided and ultimately changes the amount of money required. These thresholds and condition ranges can be updated and a revised financial analysis can be calculated. These adjustments will be an important component of future asset management plans, as the province requires each municipality to present various management options within the financing plan.

It is recommended that the municipality establish a lifecycle activity framework for the various classes of paved road within their transportation network.

3.2 Bridges & Culverts

The best approach to develop a 10-year needs list for the municipality's bridge structure portfolio relies on the structural engineer who performs the inspections to develop a maintenance requirements report, a rehabilitation and replacement requirements report and identify additional detailed inspections as required.

3.3 Buildings & Facilities

The best approach to develop a 10-year needs list for the municipality's facilities portfolio would be to have the engineers, operational staff or architects who perform the facility inspections to also develop a complete portfolio maintenance requirements report and rehabilitation and replacement requirements report, and also identify additional detailed inspections and follow up studies as

required. This may be performed as a separate assignment once all individual facility audits/inspections are complete.

The above reports could be considered the beginning of a 10-year maintenance and capital plan; however, within the facilities industry, there are other key factors that should be considered to determine over all priorities and future expenditures. Some examples would be functional and legislative requirements, energy conservation programs and upgrades, customer complaints and health and safety concerns, and customer expectations balanced with willingness-to-pay initiatives.

It is recommended that the municipality establish a prioritization framework for the facilities asset class that incorporates the key components outlined above.

3.4 Vehicles and Machinery & Equipment

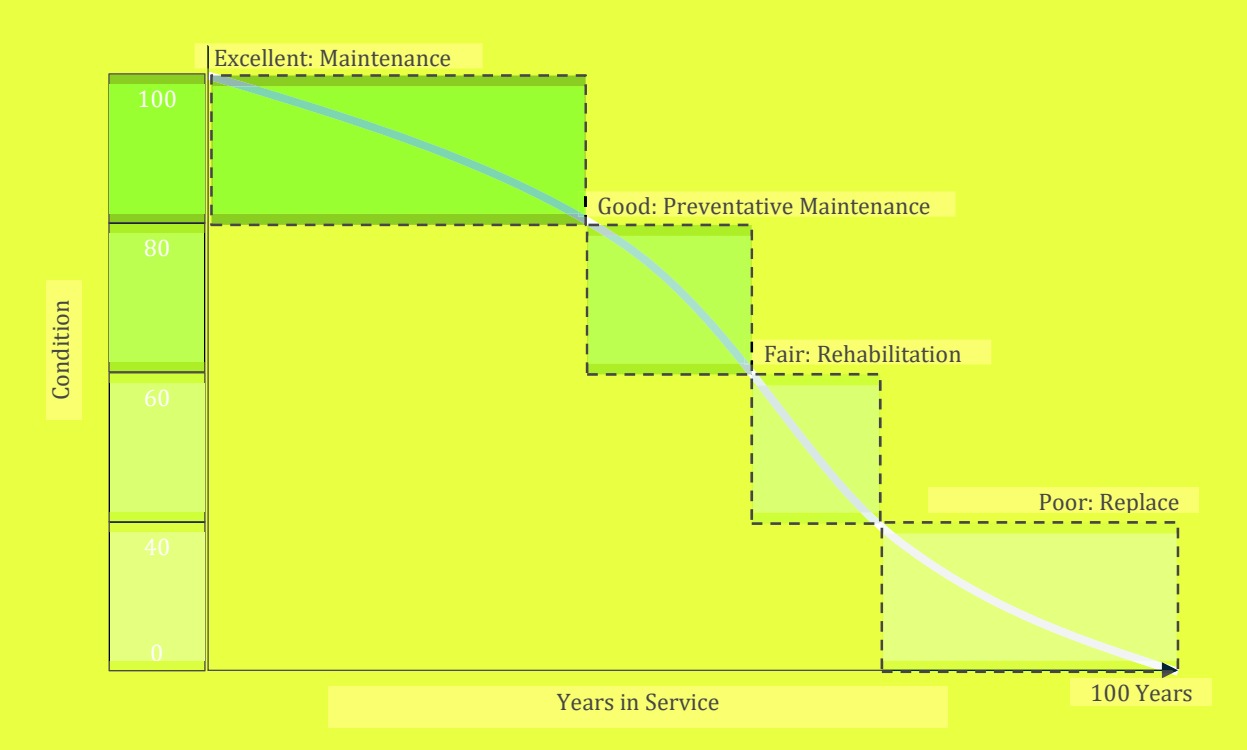
The best approach to develop a 10-year needs list for the municipality's vehicles and machinery & equipment portfolio would first be through a defined preventative maintenance program, and secondly, through an optimized lifecycle vehicle replacement schedule. The preventative maintenance program would serve to determine budget requirements for operating and minor capital expenditures for renewal of parts, and major refurbishments and rehabilitations. An optimized replacement program will ensure a vehicle or equipment asset is replaced at the correct point in time in order to minimize overall cost of ownership, minimize costly repairs and downtime, while maximizing potential re-sale value. There is significant benchmarking information available within the vehicles industry in regard to vehicle lifecycles which can be used to assist in this process. Once appropriate replacement schedules are established, the short- and long-term budgets can be funded accordingly.

There are, of course, functional aspects of vehicles management that should also be examined in further detail as part of the long-term management plan, such as vehicles utilization and incorporating green vehicles, etc. It is recommended that the municipality establish a prioritization framework for the vehicles asset class that incorporates the key components outlined above.

3.5 Sanitary and Storm Sewers

The following analysis has been conducted at a fairly high level, using industry standard activities and costs for sanitary and storm sewer rehabilitation and replacement. With future updates of this asset management strategy, the municipality may wish to run the same analysis with a detailed review of activities used for sewer mains and the associated local costs for those work activities. This information can be input into the CityWide® software suite in order to perform updated financial analysis as more detailed information becomes available. The following diagram depicts a general deterioration profile of a sewer main with a 100-year life.

Figure 58 Sewer Main General Deterioration



As shown above, during the sewer main's lifecycle there are various windows available for work activity that will maintain or extend the life of the asset. These windows are: maintenance; major maintenance; rehabilitation; and replacement or reconstruction. The windows or thresholds for when certain work activities should be applied also coincide approximately with the condition state of the asset as shown below:

Table 23 Asset Condition and Related Work Activity for Sewer Mains

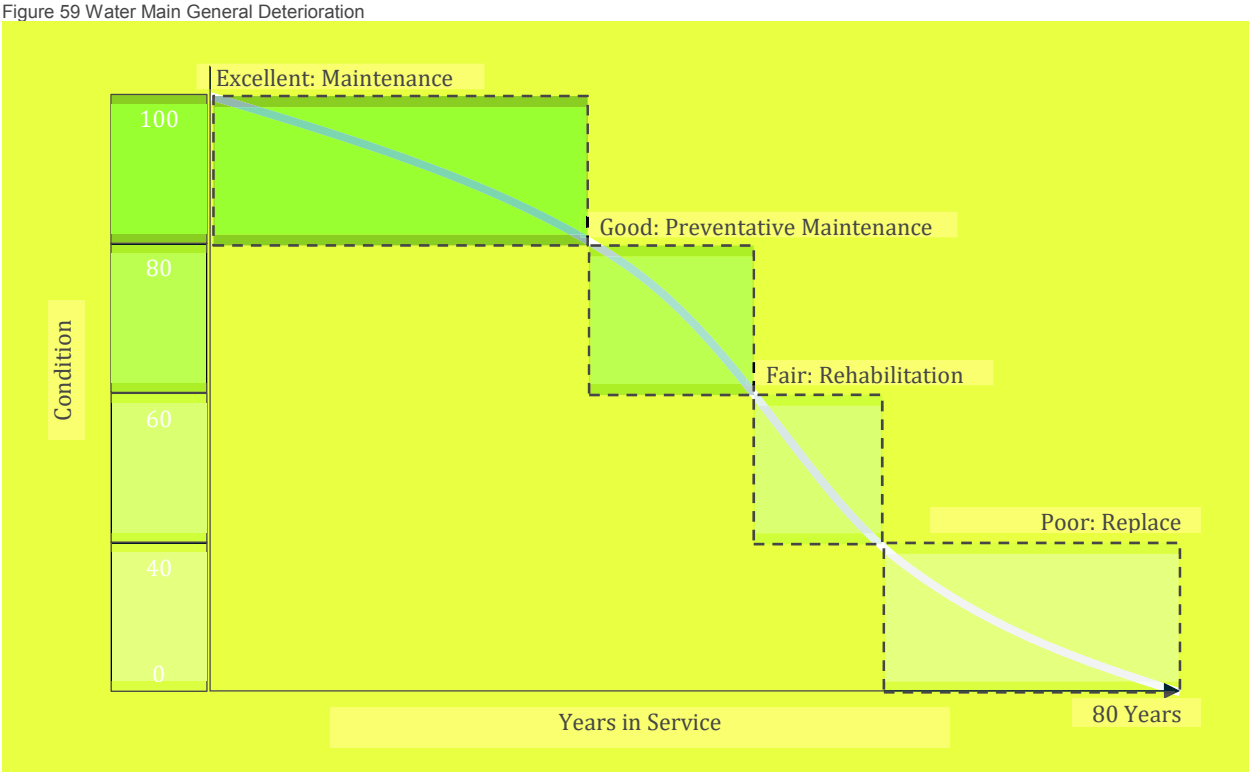
Condition	Condition Range	Work Activity
Very Good (Maintenance only phase)	81-100	– Maintenance only (cleaning & flushing etc.)
Good (Preventative maintenance phase)	61-80	– Mahhole repairs – Small pipe section repairs
Fair (Rehabilitation phase)	41-60	– Structural relining
Poor (Reconstruction phase)	21-40	– Pipe replacement
Very Poor (Reconstruction phase)	0-20	– Critical includes assets beyond their useful lives which make up the backlog. They require the same interventions as the "poor" category above.

With future updates of this asset management strategy the municipality may wish to review the above condition ranges and thresholds for when certain types of work activity occur, and adjust to better suit the municipality's work program. Also note: when adjusting these thresholds, it actually adjusts the level of service provided and ultimately changes the amount of money required. These adjustments will be an important component of future asset management plans, as the province requires each municipality to present various management options within the financing plan.

3.6 Water System

As with roads and sewers, the following analysis has been conducted at a high level, using industry standard activities and costs for water main rehabilitation and replacement. The following diagram depicts a general deterioration profile of a water main with an 80-year life.

Figure 59 Water Main General Deterioration



As shown above, during the water main's lifecycle, there are various windows available for work activity that will maintain or extend the life of the asset. These windows are: maintenance; major maintenance; rehabilitation; and replacement or reconstruction. The windows or thresholds for when certain work activities should be applied also coincide approximately with the condition state of the asset as shown in Table 24.

Table 24 Asset Condition and Related Work Activity for Water Mains

Condition	Condition Range	Work Activity
Very Good (Maintenance only phase)	81-100	– Maintenance only (cleaning & flushing etc.)
Good (Preventative maintenance phase)	61-80	– Water main break repairs – Small pipe section repairs
Fair (Rehabilitation phase)	41-60	– Structural water main relining
Poor (Reconstruction phase)	21-40	– Pipe replacement
Very Poor (Reconstruction phase)	0-20	– Critical includes assets beyond their useful lives which make up the backlog. They require the same interventions as the “poor” category above.

4. Growth and Demand

Growth is a critical infrastructure demand driver for most infrastructure services. As such, the municipality must not only account for the lifecycle cost for its existing asset portfolio, but those of any anticipated and forecasted capital projects associated specifically with growth. Based on the 2016 census, the population for Cramahe has increased 4.6% since 2011 to reach 6,355. Population changes will require the municipality to determine the impact to expected levels of service and if any changes to the existing asset inventory may be required.

5. Project Prioritization and Risk Management

Generally, infrastructure needs exceed municipal capacity. As such, municipalities rely heavily on provincial and federal programs and grants to finance important capital projects. Fund scarcity means projects and investments must be carefully selected based on the state of infrastructure, economic development goals, and the needs of an evolving and growing community. These factors, along with social and environmental considerations will form the basis of a robust risk management framework.

5.1 Defining Risk Management

From an asset management perspective, risk is a function of the consequences of failure (e.g., the negative economic, financial, and social consequences of an asset in the event of a failure); and, the probability of failure (e.g., how likely is the asset to fail in the short- or long-term). The consequences of failure are typically reflective of:

- **An asset's importance in an overall system**:
  For example, the failure of an individual computer workstation for which there are readily available substitutes is much less consequential and detrimental than the failure of a network server or telephone exchange system.

- **The criticality of the function performed**:
  For example, a mechanical failure on a road construction equipment may delay the progress of a project, but a mechanical failure on a fire pumper truck may lead to immediate life safety concerns for fire fighters, and the public, as well as significant property damage.

- **The exposure of the public and/or staff to injury or loss of life**:
  For example, a single sidewalk asset may demand little consideration and carry minimum importance to the municipality's overall pedestrian network and performs a modest function. However, members of the public interact directly with the asset daily and are exposed to potential injury due to any trip hazards or other structural deficiencies that may exist.

The probability of failure is generally a function of an asset's physical condition, which is heavily influenced by the asset's age and the amount of investment that has been made in the maintenance and renewal of the asset throughout its life.

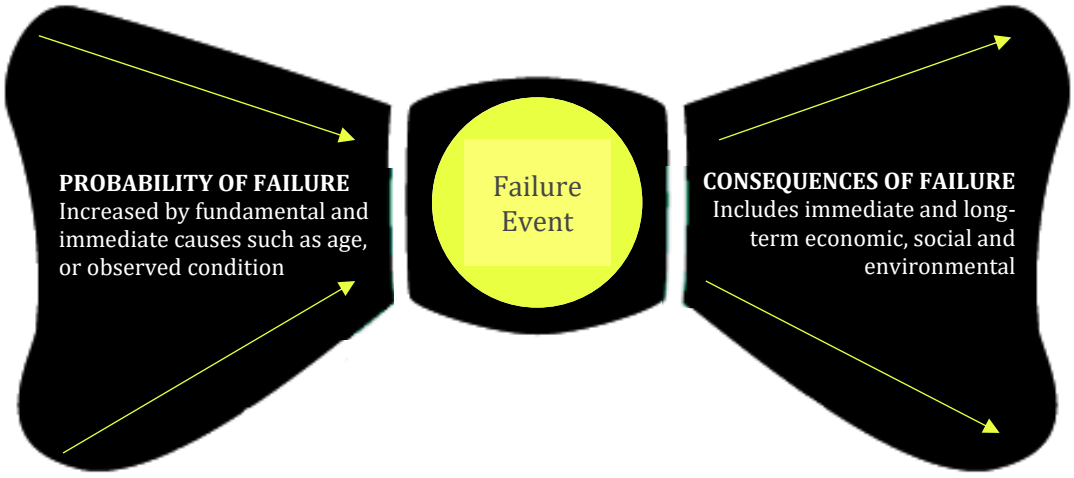
Risk mitigation is traditionally thought of in terms of safety and liability factors. In asset management, the definition of risk should heavily emphasize these factors but should be expanded to consider the risks to the municipality's ability to deliver targeted levels of service

- The impact that actions (or inaction) on one asset will have on other related assets
- The opportunities for economic efficiency (realized or lost) relative to the actions taken

5.2 Risk Matrices

Using the logic above, a risk matrix will illustrate each asset's overall risk, determined by multiplying the probability of failure (PoF) scores with the consequence of failure (CoF) score, as illustrated in the table that follow. This can be completed as a holistic exercise against any data set by determining which factors (or attributes) are available and will contribute to the PoF or CoF of an asset. Figure 60 (known as a bowtie model in the risk industry) illustrates this concept. The probability of failure is increased as more and more factors collude to cause asset failure.

Figure 60 Bow Tie Risk Model



Probability of Failure

In this AMP, the probability of a failure event is predicted by the condition of the asset.

Table 25 Probability of Failure – All Assets

Asset Classes	Condition Rating	Probability of Failure
ALL	0-20 Very Poor	5 – Very High
	21-40 Poor	4 – High
	41-60 Fair	3 – Moderate
	61-80 Good	2 – Low
	81-100 Excellent	1 – Very Low

Consequence of Failure

The consequence of failure for the asset classes analyzed in this AMP will be determined either by the replacement costs of assets, or other attributes as relevant. These attributes include material types, classifications, or size. Asset classes for which replacement cost is used include: bridges & culverts, buildings & facilities, land improvements, vehicles, and machinery & equipment. This approach is premised on the assumption that the higher the replacement cost, the larger (and likely more important) the asset, requiring a higher risk scoring.

Assets for which other attributes are used include: water, wastewater, storm and roads. Attributes are selected based on their impact on service delivery. Scoring for roads, the risk is based on classification as it reflects the traffic volumes and number of people affected. For linear infrastructure, pipe diameter is used to estimate a suitable consequence of failure score as it reflects the potential upstream service area affected. The municipality does not have pipe diameter information available for its sanitary and storm assets therefore a risk rating cannot be provided for these categories. It is recommended that this information is incorporated into future AMPs.

Table 26 Consequence of Failure – Roads

Road Classification	Consequence of failure
Gravel	Score of 1
Surface Treated	Score of 3
Hot Mix (Paved)	Score of 5

Table 27 Consequence of Failure – Bridges & Culverts

Replacement Value	Consequence of failure
Up to $200k	Score of 1
$201 to $400k	Score of 2
$401 to $800k	Score of 3
$801 to $1 Million	Score of 4
$1 Million and over	Score of 5

Table 28 Consequence of Failure – Water Mains

Pipe Diameter	Consequence of Failure
Less than 100mm	Score of 1
101–150mm	Score of 2
151–200mm	Score of 3
201–250mm	Score of 4
251mm and over	Score of 5

Table 29 Consequence of Failure – Buildings & Facilities

Replacement Value	Consequence of failure
Up to $50k	Score of 1
$51k to $100k	Score of 2
$101k to $300k	Score of 3
$301k to $1 million	Score of 4
Over $1 million	Score of 5

Table 30 Consequence of Failure – Machinery & Equipment

Replacement Value	Consequence of failure
Up to $10k	Score of 1
$11k to $20k	Score of 2
$21k to $30k	Score of 3
$31k to $50k	Score of 4
Over $50k	Score of 5

Table 31 Consequence of Failure – Land Improvements

Replacement Value	Consequence of failure
Up to $25k	Score of 1
$26k to $50k	Score of 2
$51k to $80k	Score of 3
$81k to $100k	Score of 4
Over $100k	Score of 5

Table 32 Consequence of Failure – Vehicles

Replacement Value	Consequence of failure
Up to $25k	Score of 1
$26k to $50k	Score of 2
$51k to $100k	Score of 3
$101k to $250k	Score of 4
Over $250k	Score of 5

The risk matrices that follow show the distribution of assets within each asset class according to the probability and likelihood of failure scores as discussed above.

Figure 61 Distribution of Assets Based on Risk – All Asset Classes

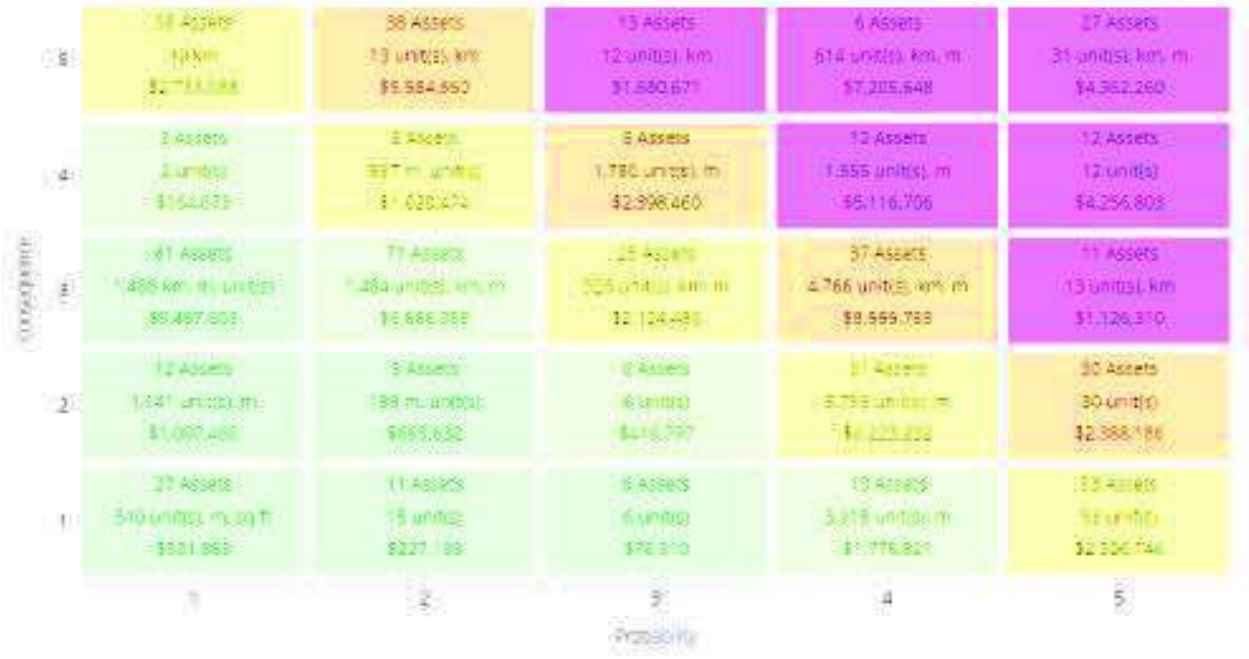


Figure 62 Distribution of Assets Based on Risk – Road Network

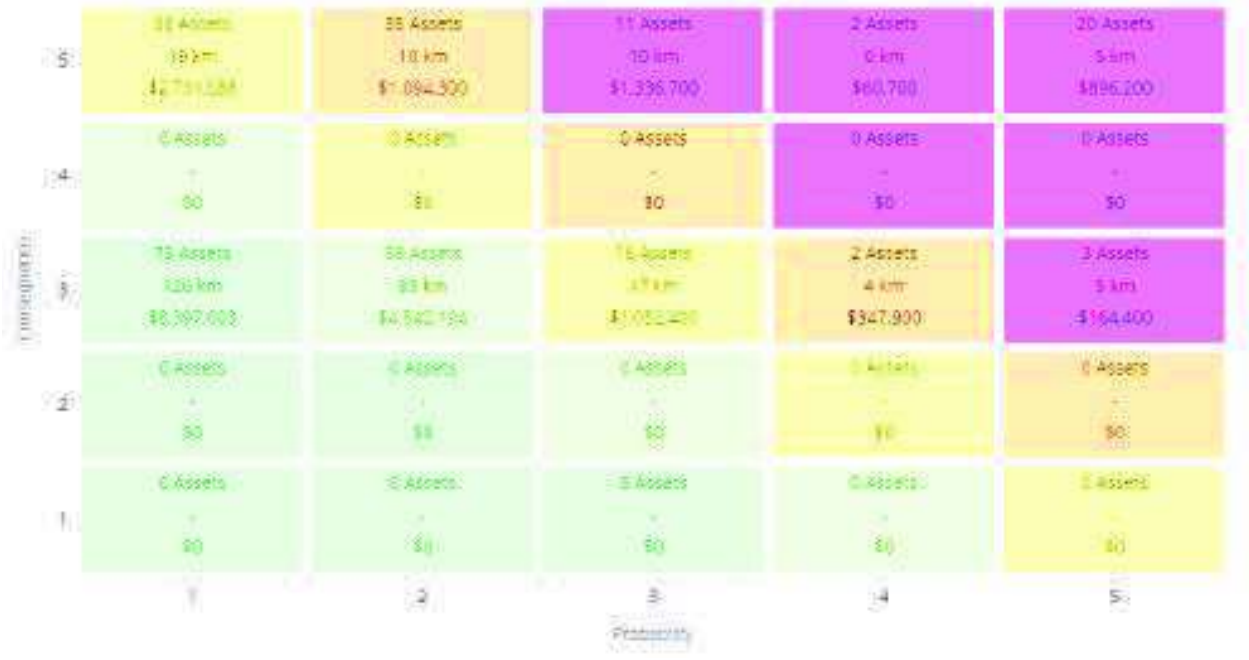


Figure 63 Distribution of Assets Based on Risk – Bridges & Culverts

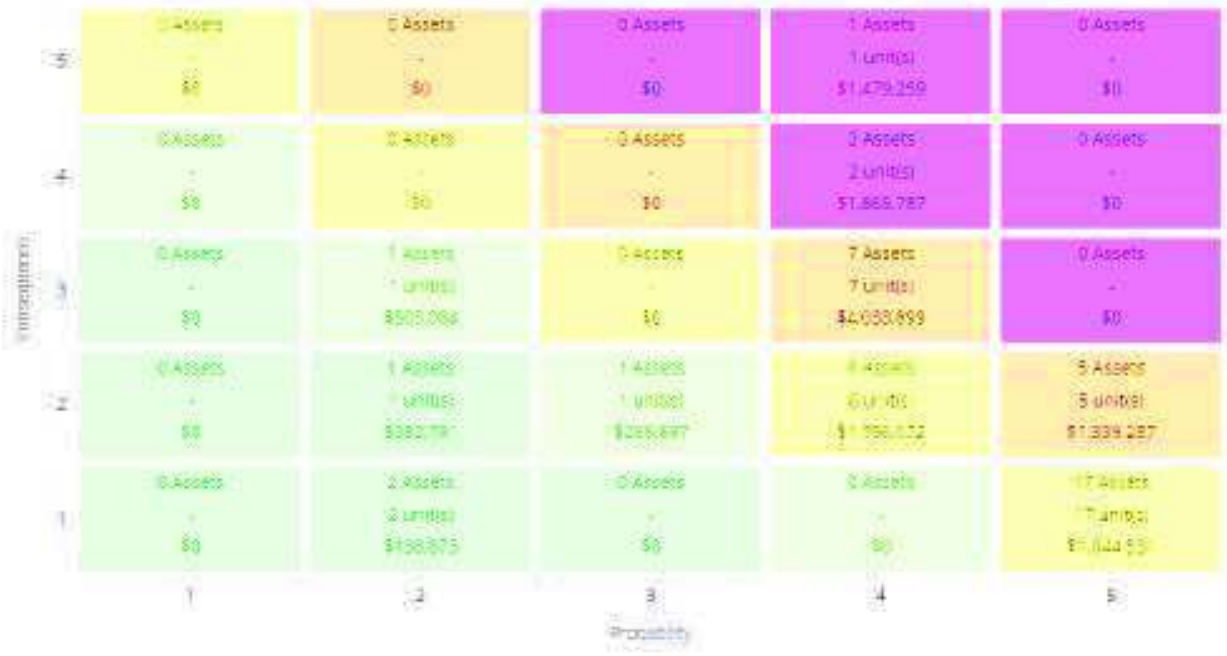


Figure 64 Distribution of Assets Based on Risk – Water System

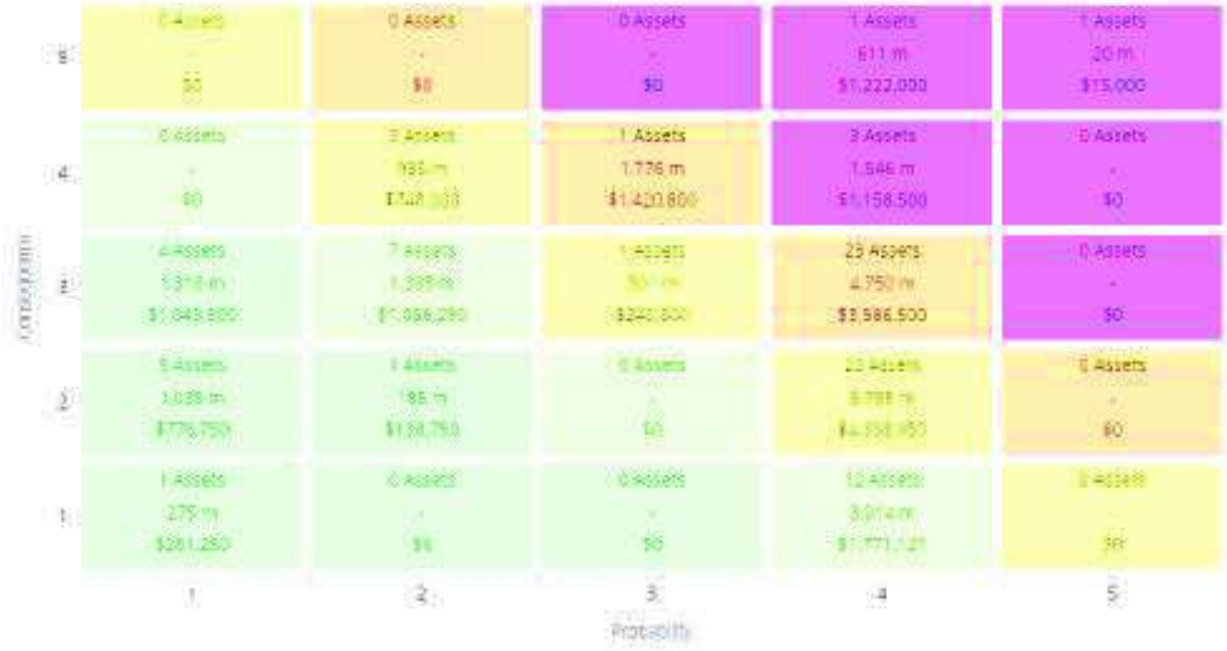


Figure 65 Distribution of Assets Based on Risk – Buildings & Facilities

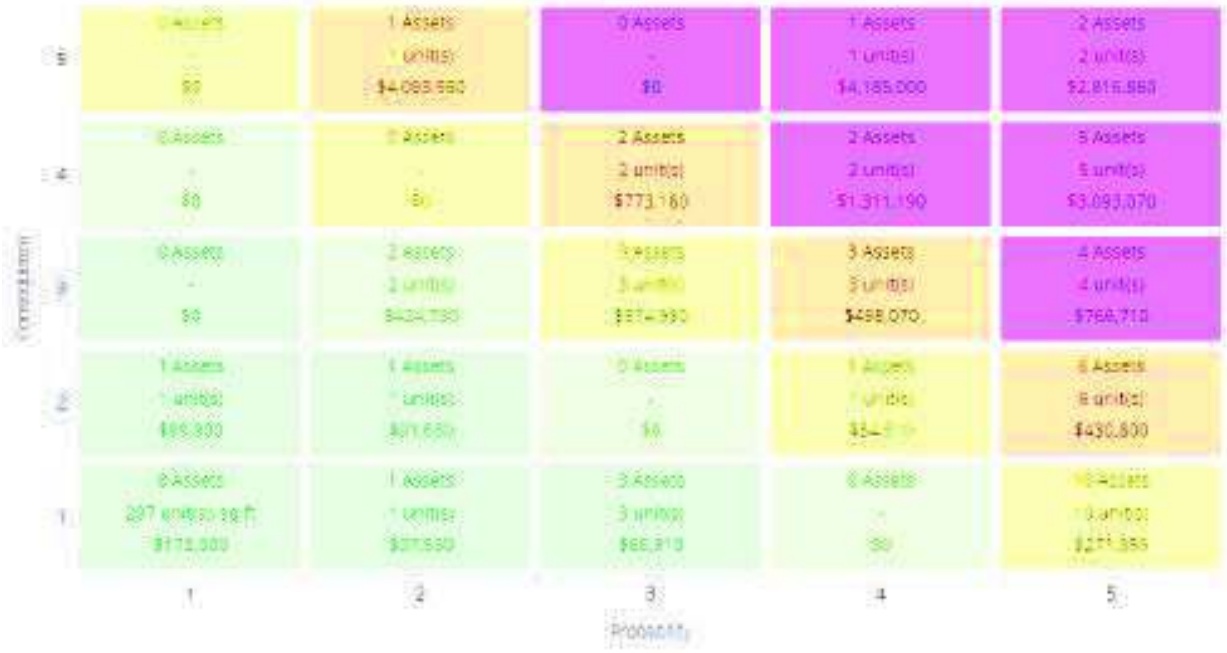


Figure 66 Distribution of Assets Based on Risk – Machinery & Equipment

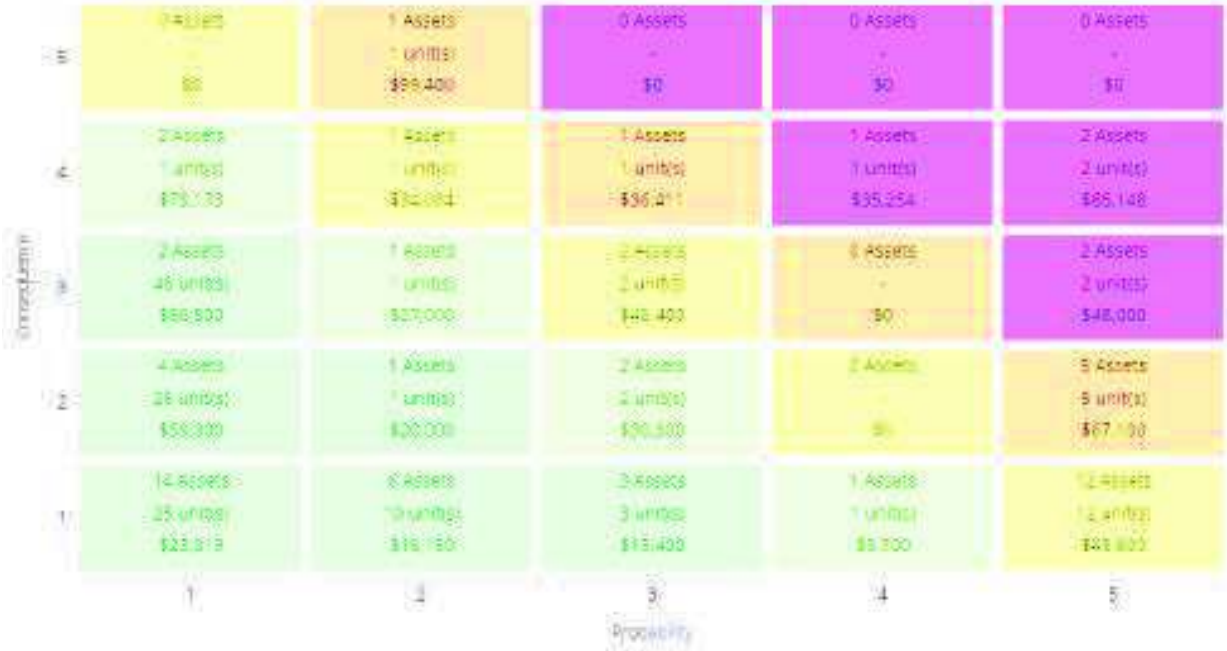


Figure 67 Distribution of Assets Based on Risk – Land Improvements

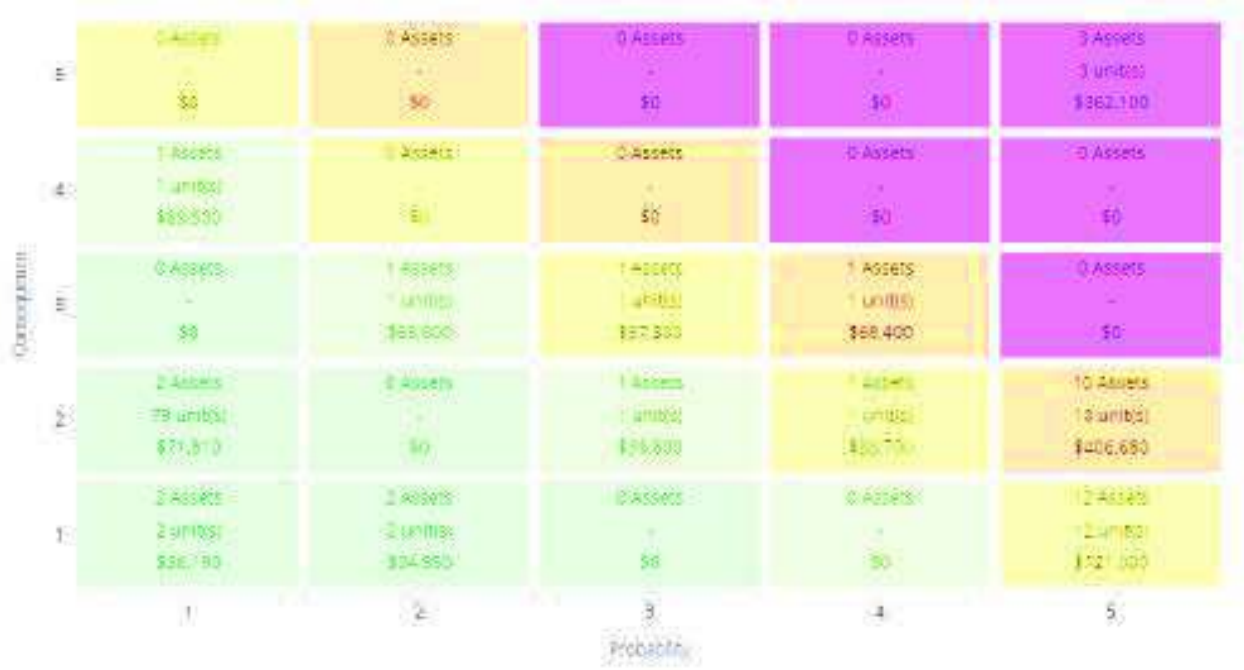
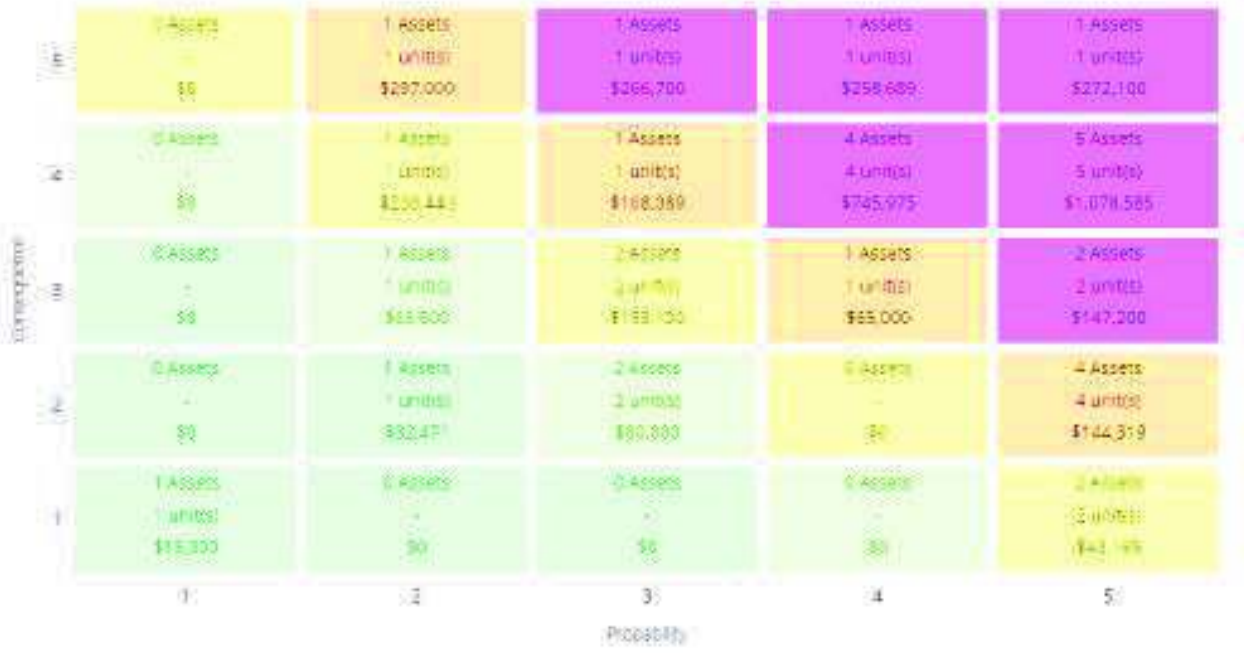


Figure 68 Distribution of Assets Based on Risk – Vehicles



IX. Financial Strategy

1. General Overview

In order for an AMP to be effective and meaningful, it must be integrated with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow the municipality to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service and projected growth requirements.

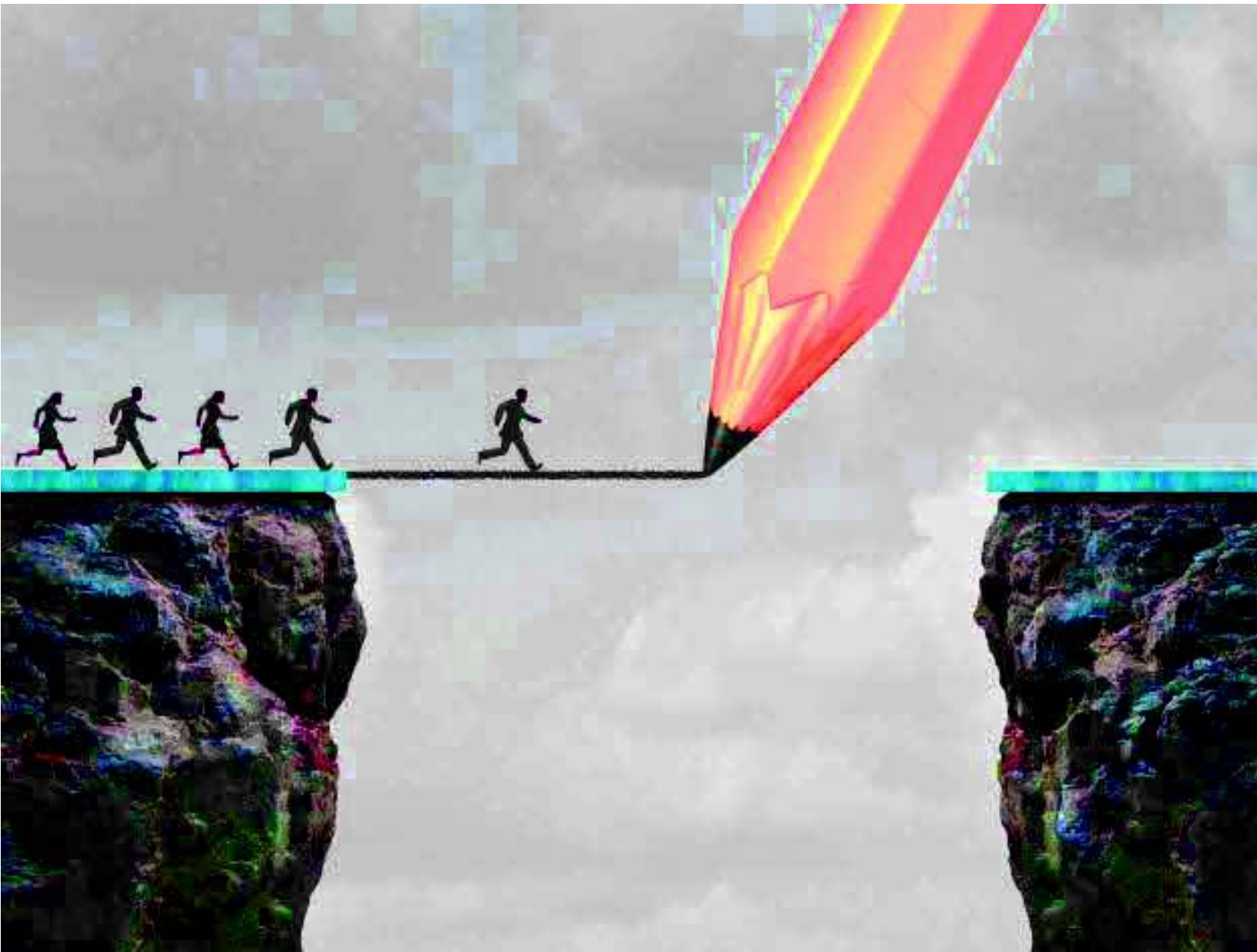


Figure 69 Cost Elements

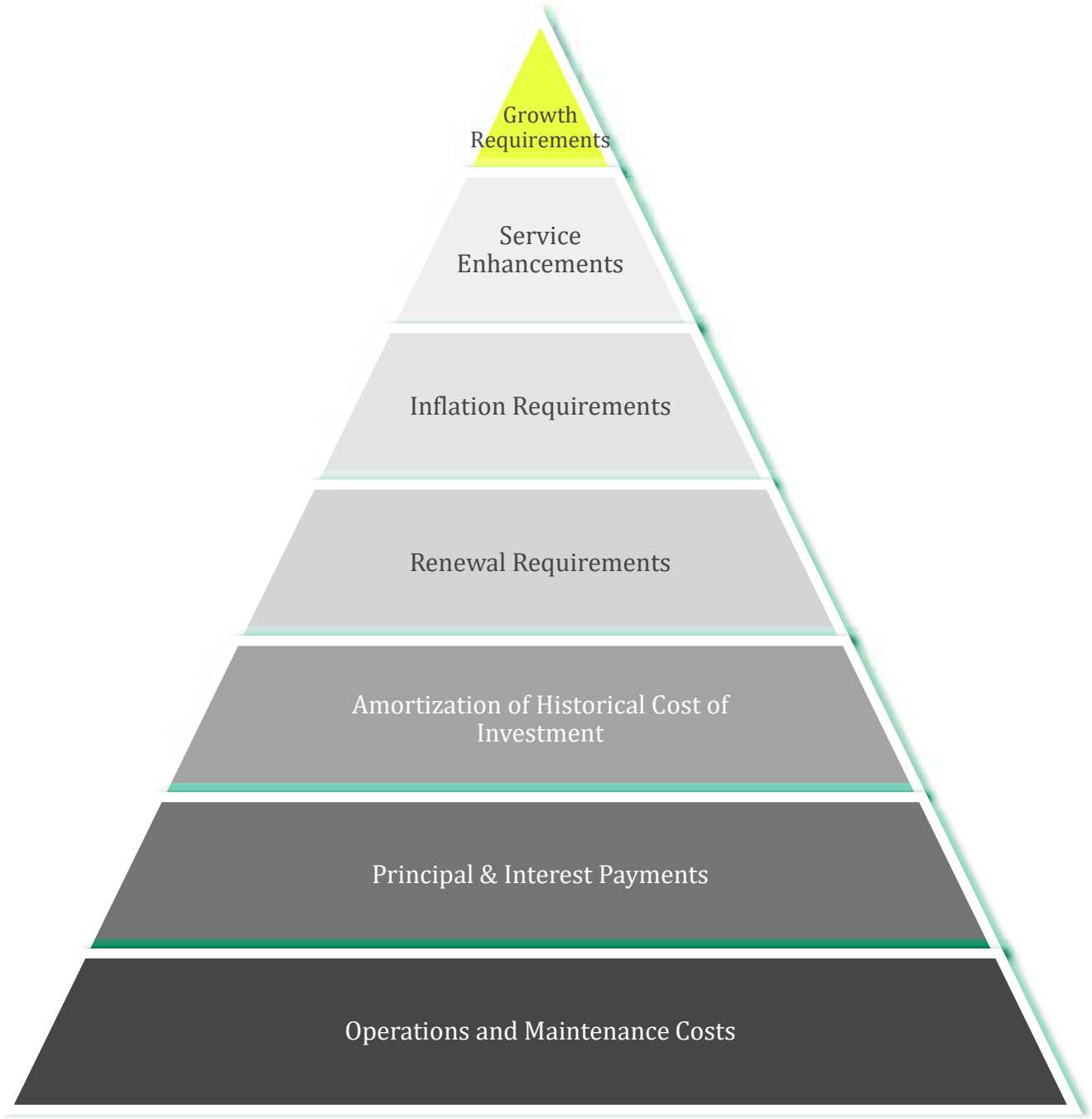


Figure 69 depicts the various cost elements and resulting funding levels that should be incorporated into AMPs that are based on best practices. Municipalities meeting their operational and maintenance needs, and debt obligations are funding only their cash cost. Funding at this level is severely deficient in terms of lifecycle costs.

Meeting the annual amortization expense based on the historical cost of investment will ensure municipalities adhere to accounting rules implemented in 2009; however, funding is still deficient for long-term needs. As municipalities graduate to the next level and meet renewal requirements, funding at this level ensures that need and cost of full replacement is deferred. If municipalities meet inflation requirements, they're positioning themselves to meet replacement needs at existing levels of service. In the final level, municipalities that are funding for service enhancement and growth requirements are fiscally sustainable and cover future investment needs.

This report develops a financial plan by presenting several scenarios for consideration and culminating with final recommendations. It includes recommendations that avoid long-term funding deficits. As outlined below, the scenarios presented model different combinations of the following components:

- the financial requirements (as documented in the SOTI section of this report) for existing assets, existing service levels, requirements of contemplated changes in service levels (none identified for this plan), and requirements of anticipated growth (none identified for this plan)
- use of traditional sources of municipal funds including tax levies, user fees, reserves, debt, and development charges
- use of non-traditional sources of municipal funds, e.g., reallocated budgets
- use of senior government funds, such as the federal Gas Tax Fund, Ontario Community Infrastructure Fund (OCIF)

If the financial plan component of an AMP results in a funding shortfall, the province requires the inclusion of a specific plan as to how the impact of the shortfall will be managed. In determining the legitimacy of a funding shortfall, the province may evaluate a municipality's approach to the following:

- In order to reduce financial requirements, consideration has been given to revising service levels downward.
- All asset management and financial strategies have been considered. For example:
    - If a zero debt policy is in place, is it warranted? If not, the use of debt should be considered.
    - Do user fees reflect the cost of the applicable service? If not, increased user fees should be considered.

2. Financial Profile: Tax Funded Assets

2.1 Funding Objective

We have developed scenarios that would enable the municipality to achieve full funding within five to 20 years for the following assets: road network; bridges & culverts; storm network; buildings & facilities; machinery & equipment; land improvement; and vehicles. For each scenario developed, we have included strategies, where applicable, regarding the use of tax revenues, user fees, reserves and debt.

2.2 Current Funding Position

Table 33 and Table 34 outline, by asset class, the municipality's average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by taxes.

Table 33 Infrastructure Requirements and Current Funding Available: Tax Funded Assets

Asset class	Average Annual Investment Required	Total Funding Available in 2017					Annual Deficit/Surplus
		Taxes	Gas Tax	OCIF	Taxes to Reserves	Total Funding Available	
Road Network	826,000	97,000	176,000	50,000	221,000	544,000	282,000
Bridges & Culverts	269,000	0	0	0	20,000	20,000	249,000
Storm Sewer System	60,000	0	0	0	0	0	60,000
Machinery & Equipment	111,000	0	0	0	128,000	128,000	-17,000
Facilities	580,000	0	0	0	47,000	47,000	533,000
Land Improvements	78,000	0	0	0	3,000	3,000	75,000
Vehicles	319,000	0	0	0	241,000	241,000	78,000
Total	2,243,000	97,000	176,000	60,000	660,000	983,000	1,260,000

2.3 Recommendations for Full Funding

The average annual investment requirement for tax funded categories is $2,243,000. Annual revenue currently allocated to these assets for capital purposes is $983,000, leaving an annual deficit of $1,260,000. To put it another way, these infrastructure categories are currently funded at 44% of their long-term requirements.

In 2017, the municipality had annual tax revenues of $5,208,000. As illustrated in Table 34, without consideration of any other sources of revenue, full funding would require the following tax change over time:

Table 34 Tax Change Required for Full Funding

Asset class	Tax Change Required for Full Funding
Road Network	5.4%
Bridges & Culverts	4.8%
Storm Sewer System	1.2%
Machinery & Equipment	-0.3%
Facilities	10.2%
Land Improvements	1.4%
Vehicles	1.5%
Total	24.2%

The following changes in costs and/or revenues over the next number of years should also be considered in the financial strategy:

- Cramahe's formula based OCIF grant is scheduled to grow from $50,000 in 2017 to $92,000 in 2019.
- As shown in Table 42, Cramahe's debt payments for these asset categories will be increasing by $75,000 over the next 5 years and by $75,000 over the next 10 years. Although not shown in the table, debt payment increases will be $75,000 over the next 15 and 20 years.

Our recommendations include capturing the above changes and allocating them to the infrastructure deficit. Table 35 outlines this concept and presents a number of options.

Table 35 Effect of Changes in OCIF Funding and Reallocating Decreases in Debt Costs

	Without Capturing Changes				With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	1,260,000	1,260,000	1,260,000	1,260,000	1,260,000	1,260,000	1,260,000	1,260,000
Change in OCIF Grant	N/A	N/A	N/A	N/A	-42,000	-42,000	-42,000	-42,000
Changes in Debt Costs	N/A	N/A	N/A	N/A	75,000	75,000	75,000	75,000
Resulting Infrastructure Deficit	1,260,000	1,260,000	1,260,000	1,260,000	1,293,000	1,293,000	1,293,000	1,293,000
Resulting Tax Increase Required:								
Total Over Time	**24.2%**	**24.2%**	**24.2%**	**24.2%**	**24.8%**	**24.8%**	**24.8%**	**24.8%**
Annually	4.8%	2.4%	1.6%	1.2%	5.0%	2.5%	1.7%	1.2%

Considering all of the above information, we recommend the 20-year option that includes capturing the changes. This involves full funding being achieved over 20 years by:

- when realized, reallocating the debt cost increases of $75,000 to the infrastructure deficit as outlined above.
- increasing tax revenues by 1.2% each year for the next 20 years solely for the purpose of phasing in full funding to the tax funded asset classes covered in this AMP.
- allocating the current gas tax and OCIF revenue as outlined in Table 33.
- allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
- Reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
- increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

- As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula based funding, if applicable, since this funding is a multi-year commitment.
- We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full funding on an annual basis in 20 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $1,985,000 for paved roads, $2,789,000 for bridges & culverts, $177,000 for storm sewers, $139,000 for machinery & equipment, $3,809,000 for facilities, $889,000 for land improvements and $1,256,000 for vehicles. Prioritizing future projects will require the current data to be replaced by condition based data. Although our recommendations include no further use of debt, the results of the condition based analysis may require otherwise.

3. Financial Profile: Rate Funded Assets

3.1 Funding Objective

We have developed scenarios that would enable the municipality to achieve full funding within five to 20 years for the following assets: water, and wastewater. For each scenario developed we have included strategies, where applicable, regarding the use of tax revenues, user fees, reserves and debt.

3.2 Current Funding Position

Table 36 and Table 37 outline, by asset class, the municipality's average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by rates.

Table 36 Summary of Infrastructure Requirements and Current Funding Available

Asset class	Average Annual Investment Required	Total Funding Available in 2016				Annual Deficit/Surplus
		Rates	To Operations	Other	Total Funding Available	
Wastewater Network	530,000	638,000	-563,000	0	75,000	455,000
Water Network	330,000	640,000	-140,000	0	500,000	-170,000
Total	860,000	1,278,000	-703,000	0	575,000	285,000

3.3 Recommendations for Full Funding

The average annual investment requirement for wastewater services and water services is $860,000. Annual revenue currently allocated to these assets for capital purposes is $575,000 leaving an annual deficit of $285,000. To put it another way, these infrastructure categories are currently funded at 67% of their long-term requirements.

In 2017, Cramahe has annual wastewater revenues of $638,000 and annual water revenues of $640,000. As illustrated in Table 37, without consideration of any other sources of revenue, full funding would require the following increases over time:

Table 37 Rate Change Required for Full Funding

Asset class	Rate Change Required for Full Funding
Wastewater Network	84.3%
Water Network	-32.1%

As illustrated in Table 42, Cramahe's debt payments for wastewater services will be decreasing by $61,000 over the next 5 years and by $185,000 over the next 10 years. Although not shown in the table, debt payment decreases will be $185,000 over the next 15 years and 20 years. For water services, there is no change in debt payments.

Our recommendations include capturing the above changes and allocating them to the infrastructure deficit outlined above. The tables below outline this concept and present a number of options.

Table 38 Without Change in Debt Costs

	Wastewater Network			Water Network		
	10 Years	15 Years	20 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	455,000	455,000	455,000	-170,000	-170,000	-170,000
Change in Debt Costs	N/A	N/A	N/A	N/A	N/A	N/A
Resulting Infrastructure Deficit/Surplus	455,000	455,000	455,000	-170,000	-170,000	-170,000
Resulting Rate Increase Required:						
Total Over Time	**84.3%**	**84.3%**	**84.3%**	**-32.1%**	**-32.1%**	**-32.1%**
Annually	8.4%	5.6%	4.2%	-3.2%	-2.1%	-1.6%

Table 39 With Change in Debt Costs

	Wastewater Network			Water System		
	10 Years	15 Years	20 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	455,000	455,000	455,000	-170,000	-170,000	-170,000
Change in Debt Costs	-185,000	-185,000	-185,000	0	0	0
Resulting Infrastructure Deficit/Surplus	270,000	270,000	270,000	-170,000	-170,000	-170,000
Resulting Rate Increase Required:						
Total Over Time	**50.0%**	**50.0%**	**50.0%**	**-32.1%**	**-32.1%**	**-32.1%**
Annually	5.0%	3.3%	2.5%	-3.2%	-2.1%	-1.6%

Recommendations for water services:
At least two factors need to be quantified before implementing the above reductions for water services:

- Age based data shows a pent-up investment demand of $845,000 for water services. Prioritizing future projects will require the age based data to be replaced by condition based data. The results of the condition based analysis may identify different pent up investment requirements. As a result, rates should not be decreased until a detailed work plan is developed for these projects based on their actual condition. A corresponding financial plan can then be developed taking into account that there are $1,625,000 of reserves available for water infrastructure (as noted in Table 43).
- 22% of water revenues are currently allocated to operations as opposed to capital. Overall rates should not be decreased until longer term operational requirements are determined and taken into account. This will avoid the complications of lowering rates for capital purposes and then possibly increasing them for operational requirements.

We recommend that the required work for the above points be completed in order to determine what rate reductions can be achieved and over what period those reductions can be implemented.

Recommendations for wastewater services:
Considering all of the above information, we recommend the 20-year option in Table 39 that includes the reallocations. This involves full funding being achieved over 20 years by:

- when realized, reallocating the debt cost reductions of $185,000 for sanitary services to the infrastructure deficit.
- increasing rate revenues by 2.5% for sanitary services each year for the next 20 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
- increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:
- As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula based funding, if applicable, since this funding is a multi-year commitment.
- We realize that raising rate revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.
- Any increase in rates required for operations would be in addition to the above recommendations.

Although this option achieves full funding on an annual basis in 15 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $1,437,000 for wastewater services and $845,000 for water services. Prioritizing future projects will require the current data to be replaced by condition based data. Although our recommendations include no further use of debt, the results of the condition based analysis may require otherwise.

4. Use of Debt

For reference purposes, Table 40 outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[3] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not take into account the time value of money or the effect of inflation on delayed projects.

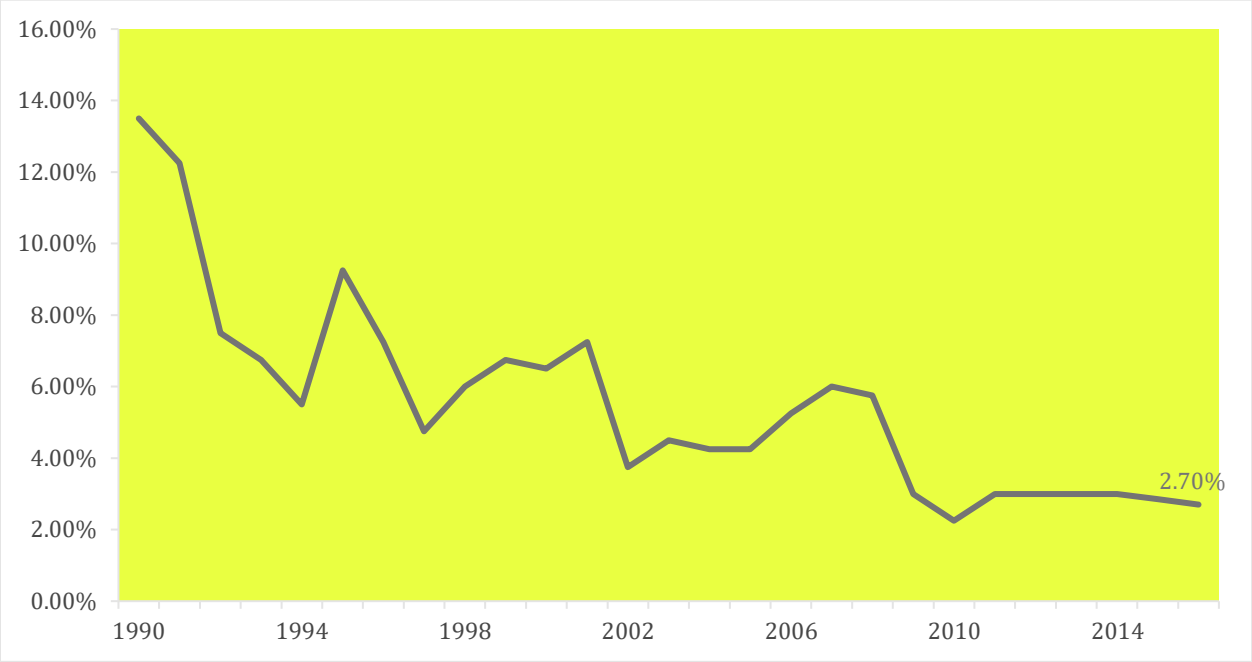
Table 40 Total Interest Paid as a Percentage of Project Costs

Interest Rate	Number of Years Financed					
	5	10	15	20	25	30
7.0%	22%	42%	65%	89%	115%	142%
6.5%	20%	39%	60%	82%	105%	130%
6.0%	19%	36%	54%	74%	96%	118%
5.5%	17%	33%	49%	67%	86%	106%
5.0%	15%	30%	45%	60%	77%	95%
4.5%	14%	26%	40%	54%	69%	84%
4.0%	12%	23%	35%	47%	60%	73%
3.5%	11%	20%	30%	41%	52%	63%
3.0%	9%	17%	26%	34%	44%	53%
2.5%	8%	14%	21%	28%	36%	43%
2.0%	6%	11%	17%	22%	28%	34%
1.5%	5%	8%	12%	16%	21%	25%
1.0%	3%	6%	8%	11%	14%	16%
0.5%	2%	3%	4%	5%	7%	8%
0.0%	0%	0%	0%	0%	0%	0%

[3] Current municipal Infrastructure Ontario rates for 15 year money is 3.2%.

It should be noted that current interest rates are near all-time lows. Sustainable funding models that include debt need to incorporate the risk of rising interest rates. The following graph shows where historical lending rates have been:

Figure 70 Historical Prime Business Interest Rates



As illustrated in Table 40, a change in 15-year rates from 3% to 6% would change the premium from 26% to 54%. Such a change would have a significant impact on a financial plan.

Table 41 and Table 42 outline how Cramahe has historically used debt for investing in the asset categories as listed. There is currently $1,157,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $341,000, well within its provincially prescribed maximum of $1,736,000.

Table 41 Overview of Use of Debt

Asset class	Current Outstanding Debt	Use of Debt in Last Five Years				
		2013	2014	2015	2016	2017
Road Network	0	0	0	0	0	2,050,000
Bridges & Culverts	0	0	0	0	0	0
Storm Sewer System	0	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0
Facilities	153,000	0	0	0	0	2,200,000
Land Improvements	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0
Total Tax Funded	153,000	0	0	0	0	4,250,000
Wastewater Network	1,004,000	0	0	0	0	0
Water Network	0	0	0	0	0	0
Total Rate Funded	1,004,000	0	0	0	0	0

Table 42 Overview of Debt Costs

Asset class	Principal & Interest Payments in Next Ten Years						
	2017	2018	2019	2020	2021	2022	2027
Road Network	0	112,000	112,000	112,000	112,000	112,000	112,000
Bridges & Culverts	0	0	0	0	0	0	0
Storm Sewer System	0	0	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0	0
Facilities	156,000	119,000	119,000	119,000	119,000	119,000	119,000
Land Improvements	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Total Tax Funded	156,000	231,000	231.000	231.000	231.000	231.000	231.000
Wastewater Network	185,000	185,000	185,000	124,000	124,000	124,000	0
Water Network	0	0	0	0	0	0	0
Total Rate Funded	185,000	185,000	185,000	124,000	124,000	124,000	0

The revenue options outlined in this plan allow Cramahe to fully fund its long-term infrastructure requirements without further use of debt. However, project prioritization based on replacing age-based data with observed data for several tax funded and rate funded classes may require otherwise.

5. Use of Reserves

5.1 Available Reserves

Reserves play a critical role in long-term financial planning. The benefits of having reserves available for infrastructure planning include: the ability to stabilize tax rates when dealing with variable and sometimes uncontrollable factors; financing one-time or short-term investments; accumulating the funding for significant future infrastructure investments; managing the use of debt; and, normalizing infrastructure funding requirements. By infrastructure class, Table 43 outlines the details of the reserves currently available to Cramahe.

Table 43 Summary of Reserves Available

Asset class	Balance at December 31st, 2015
Road Network	502,000
Bridges & Culverts	41,000
Storm Sewer System	0
Machinery & Equipment	907,000
Facilities	257,000
Land Improvements	88,000
Vehicles	405,000
Total Tax Funded	2,200,000
Water System	1,625,000
Wastewater Services	547,000
Total Rate Funded	2,172,000

There is considerable debate in the municipal sector as to the appropriate level of reserves that a municipality should have on hand. There is no clear guideline that has gained wide acceptance. Factors that municipalities should take into account when determining their capital reserve requirements include: breadth of services provided, age and condition of infrastructure, use and level of debt, economic conditions and outlook, and internal reserve and debt policies.

The reserves in Table 43 are available for use by applicable asset classes during the phase-in period to full funding. This, coupled with Cramahe's judicious use of debt in the past, allows the scenarios to assume that, if required, available reserves and debt capacity can be used for high priority and emergency infrastructure investments in the short to medium-term.

5.2 Recommendation

As Cramahe updates its AMP, we recommend that future planning should include determining what its long-term reserve balance requirements are and a plan to achieve such balances.

X. 2016 Infrastructure Report Card

The following infrastructure report card illustrates the municipality's performance on the two key factors: Asset Health and Financial Capacity. Appendix 1 provides the full grading scale and conversion chart, as well as detailed descriptions, for each grading level.

Table 44 2016 Infrastructure Report Card

Asset class	Asset Health Grade	Funding Percentage	Financial Capacity Grade	Average Asset Class Grade	Comments
Roads	C	66%	C	C	Based on 2016 replacement cost, and age-based data, 36% of assets, with a valuation of $43.5 million, are in good to very good condition; 49% are in poor to very poor condition. The municipality is underfunding its assets. Tax-funded categories are funded at 44% while rate-funded categories are funded at 67%.
Bridges & Culverts	F	7%	F	F	
Water System	D	152%	A	C	
Wastewater Services	C	14%	F	F	
Storm	C	0%	F	F	
Buildings & Facilities	D	8%	F	F	
Machinery & Equipment	C	115%	A	B	
Land Improvements	F	4%	F	F	
Vehicles	D	76%	C	D	
		Average Asset Health Grade	D		
		Average Financial Capacity Grade	F		
		Overall Grade for the Municipality	D		

XI. Appendix: Grading and Conversion Scales

Table 45 Asset Health Scale

Letter Grade	Rating	Description
A	Excellent	Asset is new or recently rehabilitated
B	Good	Asset is no longer new, but is fulfilling its function. Preventative maintenance is beneficial at this stage.
C	Fair	Deterioration is evident but asset continues to full its function. Preventative maintenance is beneficial at this stage.
D	Poor	Significant deterioration is evident and service is at risk.
F	Very Poor	Asset is beyond expected life and has deteriorated to the point that it may no longer be fit to fulfill its function.

Table 46 Financial Capacity Scale

Letter Grade	Rating	Funding percent	Timing Requirements	Description
A	Excellent	90-100 percent	☑ Short Term ☑Medium Term ☑Long Term	The municipality is fully prepared for its short-, medium- and long-term replacement needs based on existing infrastructure portfolio.
B	Good	70-89 percent	☑Short Term ☑Medium Term ☒Long Term	The municipality is well prepared to fund its short-term and medium-term replacement needs but requires additional funding strategies in the long-term to begin to increase its reserves.
C	Fair	60-69 percent	☑Short Term ☒Medium Term ☒Long Term	The municipality is underprepared to fund its medium- to long-term infrastructure needs. The replacement of assets in the medium-term will likely be deferred to future years.
D	Poor	40-59 percent	☒/☑ Short Term ☒Medium Term ☒Long Term	The municipality is not well prepared to fund its replacement needs in the short-, medium- or long-term. Asset replacements will be deferred and levels of service may be reduced.
F	Very Poor	0-39 percent	☒Short Term ☒Medium Term ☒Long Term	The municipality is significantly underfunding its short-term, medium-term, and long-term infrastructure requirements based on existing funds allocation. Asset replacements will be deferred indefinitely. The municipality may have to divest some of its assets (e.g., bridge closures, arena closures) and levels of service will be reduced significantly.