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Town of Grand Valley Asset Management Plan Report

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Prepared for:

Town of Grand Valley

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Executive Summary

This report contains the Asset Management Plan for the Town of Grand Valley with respect to their roads, bridges (including culverts over 3 m), water and wastewater assets. The report has been organized as follows:

Chapter 1: Introduction;
Chapter 2: State of Local Infrastructure;
Chapter 3: Expected Levels of Service;
Chapter 4: Asset Management Strategy;
Chapter 5: Financing Strategy; and
Chapter 6: Recommendations.

The "state of local infrastructure" chapter provides an overview of the capital assets owned by the Town. This includes detailed information on the Town's asset inventory, including asset attributes, accounting valuations, replacement costs, useful life, age and asset condition. This information provides the foundation for other sections of the asset management plan.

The Town of Grand Valley has been developing their asset inventory for many years with their GIS system. This was further enhanced in 2008 to comply with PSAB 3150. The useful lives identified in the PSAB financial statements for Road assets were found to be shorter than true life experience. Condition information provided by the 2012 Bridge Inspection study and the 2013 Paved Road Condition Assessment enabled for a more accurate asset strategy.

Town Paved Road Surfaces on average were found to be in "Good" condition.

Town Bridges on average were found to be in "Good" condition.

"Expected levels of service" compares the current level of service provided by the Town to the recommended level of service that will help extend the life of the above mentioned asset types. The Town takes great care in service levels they offer the public. With some additional annual maintenance funding the road and bridge assets will be able to extend their lifecycle, and therefore be more cost effective over the life of these assets.

The "asset management strategy" provides a long term operating and capital forecast for asset related costs, indicating the requirements for maintaining, rehabilitating, replacing/disposing and expanding the Town's assets, while moving towards the specified expected levels of service identified above. The goal of the asset management strategy is to have the Town in (or moving towards) a sustainable asset management position over the forecast period.

The "financing strategy" identifies a funding plan for the asset management strategy, including a review of historical results and recommendations with respect to the required amounts and types of funding (revenue) annually. Also, any infrastructure funding deficits/shortfalls are identified and recommendations are made regarding potential approaches to reduce and mitigate the shortfall over the forecast period.

Overall, this asset management plan is a tool to be used by Town staff for capital and financial decision making. It can be tied to various existing reports (such as the Town's budget, official plan and strategic planning reports) to ensure the asset management plan can be updated to reflect any changes in the municipality's priorities.

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1.0 Introduction

1.1 Overview

R.J. Burnside & Associates Limited (Burnside) and Ms. Sharon Larmour were retained by the Town of Grand Valley (Town) to prepare an asset management plan. This plan is intended to be a tool for Town staff to use during various decision making processes, including the annual budget process and Provincial/Federal capital grant application processes. This plan will serve as a road map for sustainable infrastructure planning going forward.

Assets included in this asset management plan are the following:

- Roads;
- Bridges/Culverts;
- Wastewater (mains, facilities, manholes, equipment, other); and
- Water (wells, mains, hydrants, facilities, other).

It is recommended that this plan be updated in the near future for other Town owned capital assets.

1.2 Plan Objectives

The Town's goals and objectives with respect to their capital assets relate to the level of service being provided to Town residents. Services should be provided at expected levels, as defined within this asset management plan. Town infrastructure and other capital assets should be maintained at condition levels that provide for a safe and functional environment for its residents. Therefore, the asset management plan and its implementation will be evaluated based on the Town's ability to meet these goals and objectives.

1.3 Plan Development

The development of the Town's asset management plan was based on the steps summarized below:

1. Develop a complete listing of capital assets to be included in the plan, including attributes such as useful life, age, accounting valuation and current valuation. Update the current valuation to 2013 dollars, and where required, using applicable inflationary indices.

2. Assess current condition of the assets, based on a combination of the following:
 - Existing reports;
 - Asset degradation curves;
 - Age analysis; and
 - Additional condition inspections.
3. Assess the risk of asset failure for each asset, based on determining the probability of each asset failing, as well as the consequence of the asset failing. This risk analysis is one of the components used to identify priority projects for inclusion in the asset management plan, as well as asset risk levels that require mitigation.
4. Determine and document current levels of service, based on discussions with Town staff. Further analysis of the practices and identification of additional maintenance measures that can be applied to the assets to extend their lifecycle.
5. Prepare an asset management strategy (i.e. operating and capital forecast) based on the asset inventory, identified priorities, forecast scenarios, and level of service analysis discussed above.
6. Determine a financial strategy to support the asset management strategy, thus determining how the operating and capital related expenditure forecast will be funded over the plan period.
7. Prepare a Final report, summarizing the process, strategy and results of the asset management plan.

1.4 Maintaining the Asset Management Plan

The asset management plan should be updated as the capital needs and priorities of the Town changes. This can be accomplished in conjunction with the Town's budget process. Town staff will have the tools available to perform updates to the plan when needed.

When updating the asset management plan, note that the state of local infrastructure, expected levels of service, asset management strategy and financing strategy are integrated and impact each other. Looking at these components in reverse order, the financing strategy outlines how the asset management strategy will be funded. The asset management strategy illustrates the costs required to maintain expected levels of service at a sustainable level. The expected levels of service component summarizes and links each service area to specific assets contained in the state of local infrastructure section and thus determines how these assets will be used to provide expected service levels.

This report covers a forecast period of 10 years, however it is suggested that more focus and attention be put on the first 5 years of the asset management plan, to ensure accurate capital planning in the short term.

1.5 Plan Integration

The municipal environment is continually changing and demanding when it comes to legislation and other responsibilities. Integrating the asset management plan with the Town's budget process as well as PSAB 3150 (tangible capital asset) requirements can make updates in all three areas more efficient.

With respect to integrating the Town's budget process with asset management planning, both require a projection of capital and operating costs of a future period. The budget outlines total operating and capital requirements for the Town, while the asset management plan focuses in on specific asset related requirements. With this link to the annual budget, the budget update process can also become an asset management plan update process.

Both asset management and Public Standards Accounting Board Section 3150 (PSAB 3150) require a complete and accurate asset inventory. The significant difference between the two lies in valuation approaches (PSAB 3150 requires historical cost valuation, while asset management requires future replacement cost valuation). Using a single asset inventory as the Town's Asset Management database and software which contains both valuation methods is an effective approach to maintaining the Town's asset data.

2.0 State of Local Infrastructure

2.1 Scope and Process

This section of the plan provides an opportunity to develop a greater understanding of the capital assets owned by the Town. The state of local infrastructure analysis includes:

- An asset database inventory documenting asset types, sub-types including quantities, materials and other similar asset attributes;
- Financial accounting valuation (where available);
- Replacement cost valuation;
- Asset age distribution analysis and asset age as a proportion of expected useful life;
- Asset condition information;
- Data Verification and Asset Condition policies; and
- Documentation of assumptions made in creating the asset inventory.

The Town has a detailed inventory listing, created through years of proactive asset management and budgeting methods. This asset inventory is updated annually and was used as a starting point in fulfilling the requirements for this report. This inventory provides current financial accounting valuations (i.e. historical cost, accumulated amortization and net book value) as well as attributes such as replacement cost, useful life and age. With respect to replacement cost, the Town's asset listing contained various recent valuations, which were inflated in order to estimate current 2013 replacement costs.

The following data and reports were used to supplement the Town's asset inventory during this process:

- a. 2013 Paved Road Inspection (completed by Burnside);
- b. Recent Bridge Inspection Reports;
- c. Water Rate Study (completed by Watson & Associates);
- d. Wastewater Rate Study (completed by Watson & Associates); and
- e. Discussions with Town staff.

The Town has been in the process of continuously improving the way their infrastructure assets have been managed. The process began with soliciting engineering advice when necessary and then looking to new technologies to better develop and maintain a complete asset inventory. The Town as a rural municipality has taken full advantage of Federal and Provincial programs wherever possible for capital infrastructure funding and technology development.

One such program, the Provincial GeoSmart program enabled the Town to develop a digital GIS geodatabase inventory of all the Town's infrastructure assets. Making use of this technology has benefitted the Town from improved planning processes to road maintenance and capital planning. Based on these successes, the Town further invested in GPS enabled hardware technology which has ensured that the Town remains compliant with the minimum maintenance standards for roads (Provincial Regulation 239/02 plus amendments).

The Town of Grand Valley further expanded its GIS geodatabase to include all the Town's tangible capital assets to assist with PSAB 3150's requirement to financially report on all municipal assets. To accomplish this, the Town did not just want to financially report on its capital assets but to make use of this opportunity to move towards improving the management of their assets.

The PSAB 3150 process required the valuation of all capital assets and the assessment of useful life for each asset type and sub-type so that proper straight-line amortization was established. The financial reporting was a helpful initiation to better evaluate the complexity of managing all the various asset types across the Town.

Further analysis of the assets revealed that an update to useful life values would better reflect the lifecycle and remaining life of the Town's assets. The Director of Public Works reviewed and reassessed the useful lives of the asset types identified in this study so that they better reflected conditions, maintenance practices and management of the assets under their supervision.

These useful life changes will be reflected in the Town's Tangible Capital Asset Policy Amendment. The resulting more realistic useful lives will also better establish a general sense of the future capital needs to replace and dispose of the Town's assets.

The review of assets also revealed some updates to the asset inventory and their replacement costs. The Town's recent Bridge Inspection reports contain various recent valuations. There is still more work that needs to be done but there has been a good effort accomplished for most of the assets reviewed in this study.

2.2 Capital Asset Overview

The Town presently owns road, bridge water and wastewater capital assets with a 2013 replacement value of approximately \$47.9 million (excluding land assets as they are not included in this plan). This total is split into \$20.8 million of road and bridge tax supported assets and \$5.1 million of water assets and \$22.0 million of wastewater assets. Tables 2-1, 2-2 and 2-3 outline the breakdown of these totals.

The capital asset inventory as part of the asset management software was organized in a Microsoft Sequel database. This made for quick extraction of information and processing for this project and report. Each of the asset types were assessed for their age, condition (if available), and for data accuracy and completeness.

Table 2.1: Road and Bridge Assets (Excluding Land)

Asset Type	Historic Cost	2012 Accumulated Amortization	2012 Net Book Value	Replacement Cost (2013 \$)
Road Surfaces	2,033,216	1,047,416	1,019,878	4,100,511
Road Bases	5,706,147	5,451,335	254,811	11,412,294
Bridges	2,648,691	1,073,585	1,575,106	5,297,382
Total	10,388,054	7,572,336	2,849,796	20,810,186

Figure 2.1: Road and Bridge Asset Distribution Replacement Costs

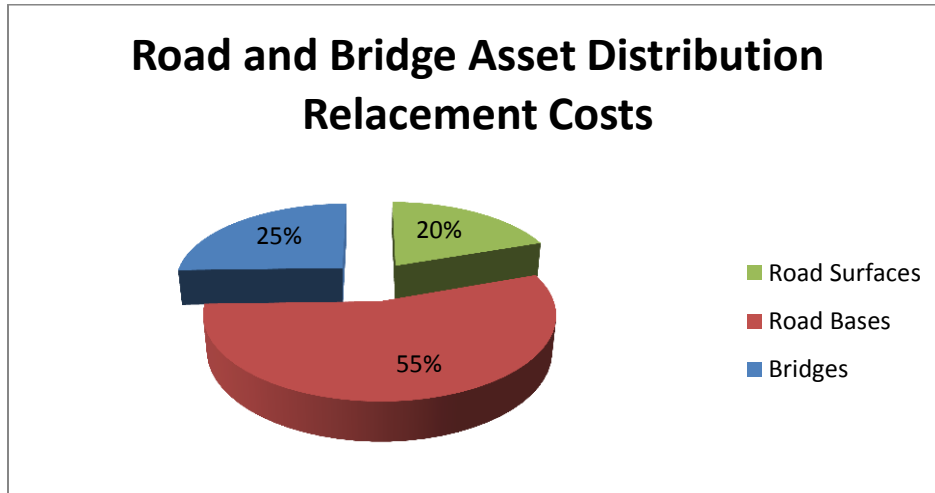
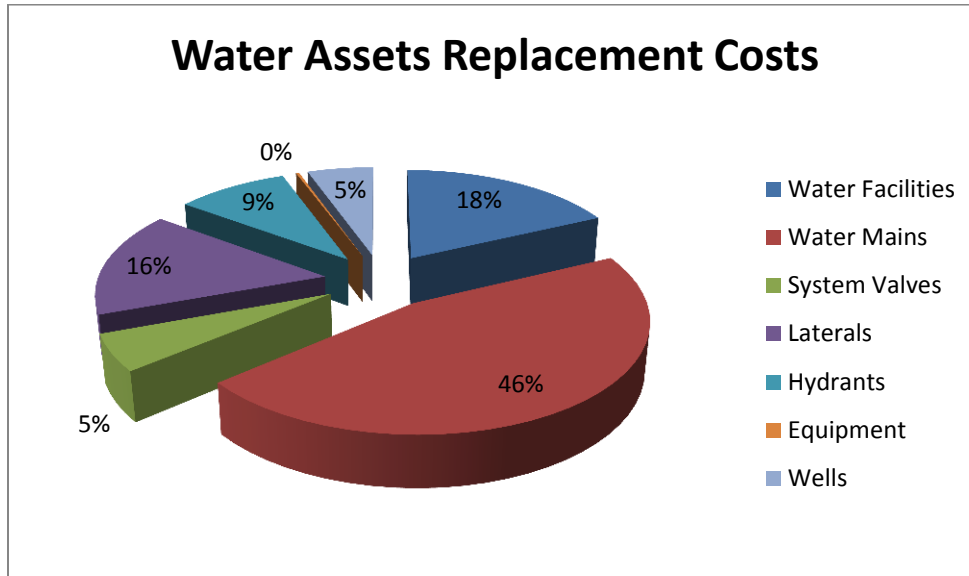


Table 2.2: 2013 Water Assets

Asset Type	Historic Cost	2012 Accumulated Amortization	2012 Net Book Value	Replacement Cost
Water Facilities	701,368	256,707	444,661	915,463
Water Mains	1,144,877	217,527	927,350	2,336,534
System Valves	135,705	47,231	88,475	276,956
Laterals	392,000	74,480	317,520	800,017
Hydrants	265,981	99,991	165,990	468,815
Equipment	12,525	12,525	-	13,189
Wells	143,722	116,920	26,802	276,236
Total	2,796,178	825,380	1,970,797	5,087,211

Figure 2.2: 2013 Water Assets Replacement Costs

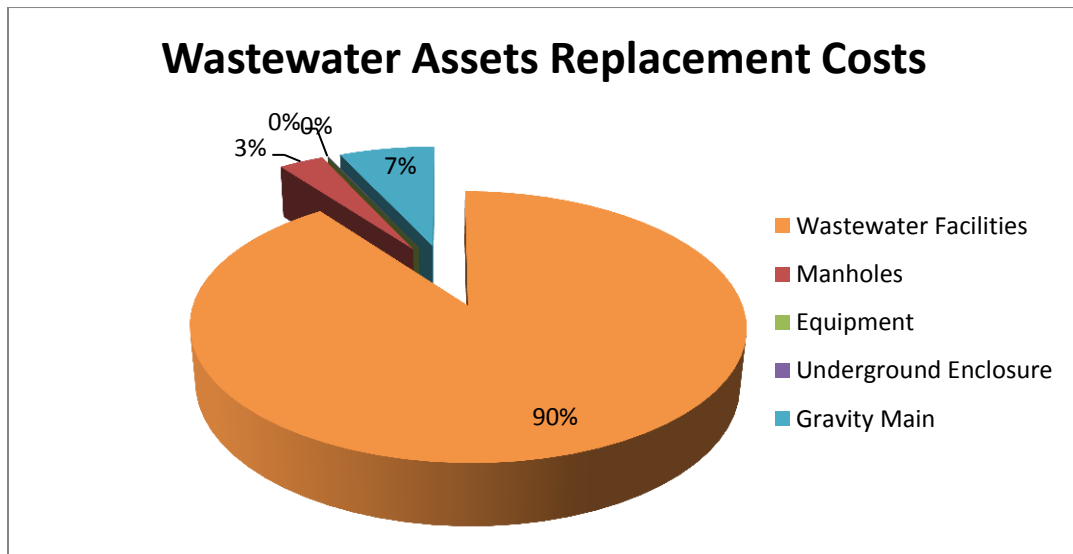
Tables 2.1 and 2.2 show the Town's financial accounting valuation summary by asset type. Since 2009, the Town has been required under the Public Sector Accounting Board section 3150 (PSAB 3150) to maintain asset listings complete with historical cost (i.e. the original cost to purchase or construct an asset), accumulated amortization and net book value. These values are reported on the Town's audited financial statements each year. Including tax supported Road and Bridge assets and water and wastewater assets, the Town's total tangible capital asset historical cost (excluding land) is approximately \$29.4 million. This is approximately 61% of the total replacement cost of these assets. It is expected that historical cost totals are much smaller than replacement cost totals, given inflationary adjustments that would occur between the original asset purchase/construction date and today. Total accumulated amortization for the Town's assets is \$9.3 million or 32% of the total asset historical cost. This represents the proportion of tangible capital assets that have been amortized (i.e. used up) to date from a financial valuation perspective.

Road and Bridge assets represent the most significant tax supported asset category of the Town. Appendix A provides a further breakdown of these asset types.

Table 2.3: 2013 Wastewater Assets

Asset Type	Historic Cost	2012 Accumulated Amortization	2012 Net Book Value	Replacement Cost
Wastewater Facilities	15,891,409	742,170	15,149,239	19,809,595
Manholes	142,802	37,415	105,387	713,928
Equipment	1,256	63	1,193	1,300
Underground Enclosure	1,183	509	674	7,537
Gravity Main	197,112	74,665	122,448	1,516,160
Total	16,233,762	854,822	15,378,941	22,048,519

Figure 2.3: 2013 Wastewater Assets Replacement Costs



2.3 Asset Age Analysis

Each asset is tracked based on estimated total useful life and remaining service life. Using this information, age analysis of the Towns assets can assist in identifying potential areas of focus for the asset management plan where asset inspected condition is not available. We do wish to state that asset condition is always best defined via engineering best practices. Age related condition values can be problematic if the asset's useful life is not appropriately defined. For example, if a useful life of an asset is defined shorter than the assets true performance, this results in a lower age assessed condition rating. This method of condition approximation was only used when inspected conditions were not available.

Tables 2.4, 2.5 and 2.6 provide a summary of the age analysis undertaken including the average useful life and average remaining useful life of road and bridge tax supported and water and wastewater assets, respectively. This analysis can identify potential short-term priorities within specific asset areas.

Table 2.4: Road and Bridge Assets Age Analysis

Average			
Asset Type	Useful Life	Remaining Life	% Remaining Life
Road Surfaces - Asphalt	20	5.3	27%
Road Surfaces - Gravel	4	1.2	30%
Road Bases	60	1.1	2%
Bridges	50	9.5	19%

Table 2.5: Water Assets Age Analysis

Average			
Asset Type	Useful Life	Remaining Life	% Remaining Life
Water Facilities	50	29	58%
Water Mains	100	80	80%
Water System Valves	100 / 25	80 / 5	80% / 20%
Water Laterals	100	80	80%
Water Hydrants	50	30	60%
Water Equipment	10	0	0%
Water Wells	50	27	54%

Table 2.6: Water Assets Age Analysis

Average			
Asset Type	Useful Life	Remaining Life	% Remaining Life
Wastewater Facilities	100 / 50 / 20	80 / 30 / 0	80% / 60% / 0%
Wastewater Equipment	20	18	90%
Wastewater Manholes	100	56.7	57%
Underground Enclosure	100	56	56%
Wastewater Mains	100	56.7	57%

While this analysis can be useful in looking at the overall age characteristics of specific asset areas, asset condition (see below) will assist in providing a more accurate assessment of assets reaching the end of their useful life.

2.4 Asset Condition

Including condition assessments in the asset management plan provides for a higher level of accuracy than simply relying on useful life assumptions, especially when it comes to older, highly used, or more financially significant assets. Engineering based

condition assessments can provide more realistic estimates of remaining service life, which can then be used to establish rehabilitation or replacement schedules.

A rating out of 100 was established for all assets and was based on a combination of physical inspections, degradation curve analysis, and asset age analysis. This rating was then converted to a condition description of “Very Poor” to “Very Good”. Please refer to the table below:

Table 2.7: Asset Condition Format All Assets

Condition (Provided by Burnside)	Condition
81 - 100	Very Good
61 - 80	Good
41 - 60	Average
21 - 40	Poor
0 - 20	Very Poor

The condition of the assets is an important element of any lifecycle assessment process. The condition assessment process also identifies maintenance and operating practices that can be applied to ensure appropriate service, as well as extending the life of the asset to its maximum service life. The Town undertakes the following regular condition inspections for the studies asset types:

- a. Bridges and culverts (larger than 3 metres);
- b. Roads and sidewalks;
- c. Water treatment processes and facilities; and
- d. Water hydrants.
- e. Wastewater treatment processes and facilities.

A new policy has been proposed that will ensure all Town’s assets are reviewed using established engineering methods and practices. Appendix B contains the draft Condition Assessment Policy, which identifies how often Town assets will be assessed.

All of the Town’s assets, financial valuation, replacement costs, and conditions have been integrated into the Town’s asset management software, which is an enterprise cloud hosted system. The software was used during this project to ensure all assets

were reviewed. It is vital that one municipal asset inventory is used for all assets and all departments, which provides an efficient managing and reporting process.

A high level summary of the average condition in each of the studied tax supported asset types is as follows:

Table 2.8: Average Condition by Asset Type

Tax Supported Assets

Asset Type	Condition
Road Surfaces - Asphalt	Good
Road Bases	Not Available
Bridges	Good

Further discussion of condition assessment will take place in Chapter 4 when assessing asset risk and identifying asset priorities.

2.5 Data Accuracy and Completeness

An important element of this asset management plan is ensuring that tools and procedures are in place to maintain accuracy and completeness of the asset data and calculations moving forward. As time passes, assets are used, maintained, improved, disposed of, and replaced.

All of these lifecycle events can trigger changes to the asset database used within the asset management plan. Therefore, tools and procedures are essential to ensure the asset data remains accurate and complete. Please refer to Appendix B to this report for the "Data Verification and Condition Assessment Policy" for the Town. This policy illustrates how the asset data will be updated and verified going forward. This includes the timing of condition assessments for each asset area and what should be included within the condition assessment procedures.

3.0 Expected Levels of Service

The Town of Grand Valley has been offering and maintaining for its residents excellent service levels, during challenging economic times. As a lower tier small urban and rural community, it has been difficult to ensure Town assets are maintained to appropriate service levels. The Province and County have become more demanding of Town residents to invest more and more into replacing older infrastructure. Town residents are fortunate that many expensive infrastructure asset types as water and wastewater are relatively new. These asset types are being used by many within the Town and financial rates are being applied. Regulated operations and maintenance practices are provided to ensure that these assets will be maintained and replaced in a sustainable full life cycle manner.

The road and bridge assets are not as new and therefore require greater care in planning for their replacement. Many of these assets once had Provincial programs that offered funding to maintain them. The Town now is responsible for condition inspection assessments and technical reporting that demand aggressive schedules of capital improvements and replacements of assets to maintain the high service levels that Ontarians have grown accustomed to.

3.1 Scope and Process

A level of service (LOS) analysis gives the Town an opportunity to document the level of service that is currently being provided and compare it to the level of service that will ensure the asset achieves its full lifecycle. This can be done through a review of current practices and procedures, an examination of trends or issues facing the Town, or through an analysis of performance measures and targets that staff can use to measure performance.

Expected LOS can be impacted by a number of factors, including:

- Legislative requirements;
- Strategic planning goals and objectives;
- Resident expectations;
- Council or Town staff expectations; and
- Financial or resource constraints.

The previous task of determining the state of the Town's local infrastructure establishes the asset inventory and condition, as well as asset management policies and principles to guide the refinement and upkeep of asset infrastructure. The LOS analysis will utilize this information and factor in the impact of asset service level targets. It is important to document an expected LOS that is realistic to the Town. It is common to strive for the

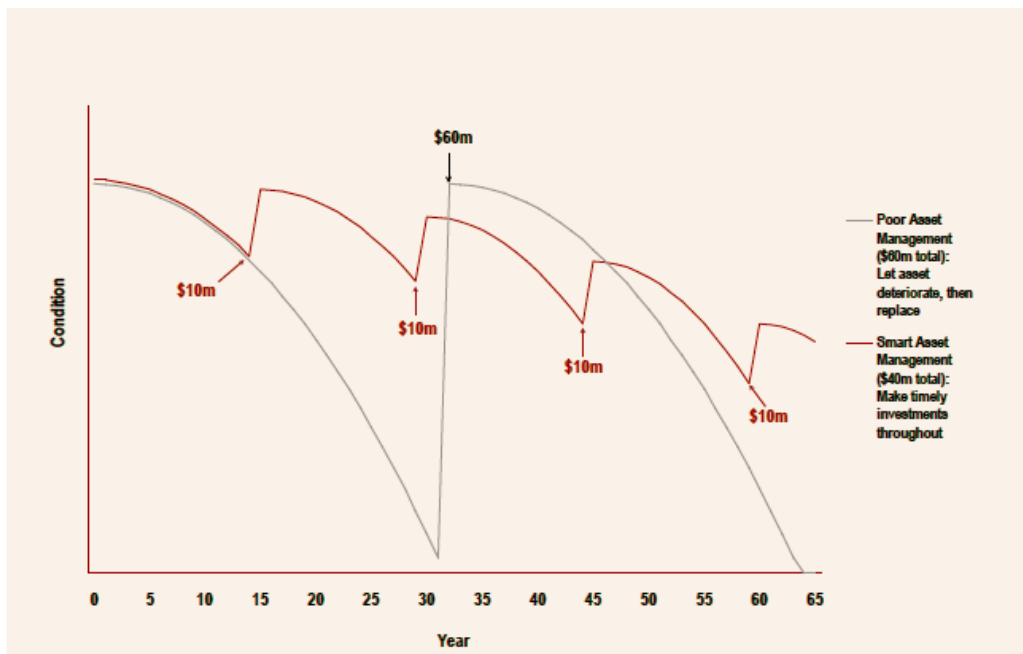
highest LOS, however these service levels usually come at a cost. It is also helpful to consider the risk associated with a certain LOS. Therefore, expected LOS should be determined in a way that balances both level of investment and associated risk to the Town.

The project team reviewed the current maintenance and operations practices being applied to the Town assets. Each asset type had engineering specialists review how the Town achieved their service levels. These maintenance and operations practices were then scrutinized against known best practices as well as the practices of other well run municipalities. It is appropriate to point out that the Town continues to do a good job of maintaining assets that are under their care.

Once the analysis was complete discussions with the Director of Public Works was undertaken to outline some additional maintenance processes that would improve and extend the life of some Town assets. Being able to extend the life of a costly asset by ten or more years could save each tax payer hundreds of dollars.

The Levels of Service analysis and discussions resulted in some recommendations that will improve maintenance of various Town assets providing higher levels of service as well as expecting results of extended asset life. The figure below, from The Provincial “Building Together Guideline” illustrates this strategy.

Figure 3.1: Small but Timely Renewal Investments Save Money



3.2 Current Levels of Service versus Expected Levels of Service

The Town's current LOS has resulted in the current state of infrastructure as discussed in the previous section of the report. This current LOS also relates to the risk assessment discussed in later report sections. Regarding the cost of this LOS, the Town has established an operating and capital budget for the current year that includes the cost of providing this LOS to residents. Therefore in moving from the current LOS to an enhanced LOS, consideration has to be made for the associated cost (or impact on the Town's current budget) in moving to an enhanced LOS.

The table below outlines broad LOS descriptions (both current and enhanced LOS). This analysis was documented through discussions with Town staff.

Table 3.1: Level of Services Analysis

Asset Type	Level of Service	Year to Start	Next Need (years)	Cost
Road Surface	Crack - Rout and Sealing	2014	1	\$12,000
	Additional Road Patching and Maintenance	2014	1	\$30,000
	Staff person for Asset Maintenance Assistance	2019	1	\$65,000
Bridge & Bridge Deck	Bridge Maintenance	2014	1	\$15,000
	Bridge Washing	2014	1	Staff

Roads

Department	Level of Service Description	
	Current	Expected
Public Works	Meet "Minimum Maintenance Standards" as defined by Ontario Regulation 239/02.	Meet "Minimum Maintenance Standards" as defined by Ontario Regulation 239/02.
Public Works	No Road Crack Rout and Sealing Program.	New Road Crack, Rout and Sealing Program.
Public Works	Pavement Patching	Enhanced Pavement Patching Program.

Bridges & Culverts

Department	Level of Service Description	
	Current	Expected
Public Works	Maintain adequate condition and load limits.	Maintain adequate condition and load limits.
Public Works	Maintenance and rehabilitation completed when needed.	Proactive and planned approach to rehabilitation and maintenance. Increase in bridge monitoring.
Public Works	Bridge inspections (i.e. using OSIM reports) required every 2 years.	Bridge inspections (i.e. using OSIM reports) required every 2 years.
Public Works	No Bridge Washing.	Bridge Washing.

Water

Department	Level of Service Description	
	Current	Expected
Public Works	Meet all legislative requirements.	Meet all legislative requirements.

Wastewater

Department	Level of Service Description	
	Current	Expected
Public Works	Some Pipe Camera inspections.	Regular annual camera inspections for pipe condition and infiltration.
Public Works	Some manhole maintenance	Manhole maintenance program.

Please refer to Appendix C of this report for a table summarizing the estimated budget impacts associated with implementing the expected LOS over the 10-year forecast period. This impact analysis will be factored into the asset management strategy discussed in Chapter 4 of this report.

3.3 Level of Service Performance Measures

As mentioned above, using performance measures in the LOS review can also be helpful in measuring the Town's goals and objectives when it comes to capital assets. The Town currently tracks specific performance measures as part of the Municipal Performance Measurement Program (MPMP) which the province has in place as part of the annual Financial Information Return (FIR) submission. The FIR provides the annual financial results of the Town, while the MPMP provides an evaluation of the Town's "performance".

The Town will continue to calculate and monitor these performance measures, both for MPMP and asset management purposes. As the Town's asset management plan evolves over time, new performance measures can be introduced to further measure the LOS being provided in each service area.

4.0 Asset Management Strategy

4.1 Scope and Process

The asset management strategy provides the recommended course of actions required to maintain (or move towards) a sustainable asset position while delivering the levels of service discussed in the previous chapter. The course of actions, when combined together, form a long-term operating and capital forecast that includes:

- a. Non-infrastructure solutions: reduce costs and/or extend expected useful life estimates;
- b. Maintenance activities: regularly scheduled activities to maintain existing useful life levels, or repairs needed due to unplanned events;
- c. Renewal/Rehabilitation: significant repairs or maintenance planned to increase the useful life of assets;
- d. Replacement/Disposal: complete disposal and replacement of assets, when renewal or rehabilitation is no longer an option; and
- e. Expansion: given planned growth as outlined in the Town's Development Charge Background Study, other expansion or due to the introduction of new services.

Priority identification becomes a critical process during the development of an asset management strategy. Priorities have been determined based on assessment of the overall risk of asset failure, which is determined by looking at both the probability of an asset failing, as well as the consequences of failure. The consequences of the Town not meeting desired levels of service must also be considered in determining risk. As discussed in Chapter 3, moving to enhanced levels of service results in both operating and capital budget impacts over the 10 year forecast period. This has to be taken into consideration, with the overall objective of reaching sustainable levels while mitigating risk.

4.2 Risk Assessment

The risk of an asset failing is defined by the following calculation:

Risk of Asset Failure = Probability of Failure X Consequence of Failure

Probability of failure has been linked to the condition assessment for each asset, assuming that an asset in "very good" condition would have a "rare" probability of failure. The following table outlines the probability factor tied to each condition rating:

Table 4.1: Probability of Failure Matrix

Condition (Provided by Burnside)	Condition	Probability of Failure
81 - 100	Very Good	Rare
61 - 80	Good	Unlikely
41 - 60	Average	Possible
21 - 40	Poor	Likely
0 - 20	Very Poor	Almost Certain

Consequence of failure has been determined by examining each asset type separately. Consequence refers to the impact on the Town if a particular asset were to fail.

Types of impacts include the following:

- Cost Impacts: the cost of failure to the Town (i.e. capital replacement, rehabilitation, fines & penalties, damages, etc.);
- Social impacts: potential injury or death to residents or Town staff;
- Environmental impacts: the impact of the asset failure on the environment;
- Service delivery impacts: the impact of the asset failure on the Town's ability to provide services at desired levels; and
- Location impacts: the varying impact of asset failure based on the asset's location within the Town.

Each type of impact was discussed with Town staff and consequence of failure for each asset type was determined by using the information contained in Table 4.2 as a guide to assess the level of impact. Levels of impact were documented as ranging from "significant" to "insignificant". Location factors were considered when asset failures in specific areas would result in significant impacts to hospitals, schools, and other similar "high impact" areas.

With both probability of failure and consequence of failure documented, total risk of asset failure was determined using the matrix contained in Table 4.3. Total risk has been classified under the following categories:

- Extreme Risk (E): risk beyond acceptable levels;
- High Risk (H): risk slightly beyond acceptable levels;

- Medium Risk (M): risk at acceptable levels, monitoring required to ensure risk does not become high; and
- Low Risk (L): very little risk.

Table 4.2: Consequence of Failure Matrix

	Cost	Social	Environmental	Service Delivery
Significant	Significant Cost – Difficult to Recover	Death, Serious Injury	Long-term Impact – Permanent	Major Interruptions
Major	Substantial Cost – Multi-year Budget Impacts	Major Injury	Long-term Impact – Fixable	Significant Interruptions
Moderate	Considerable Cost – Requires Revisions to Budget	Moderate Injury	Medium-term Impact – Fixable	Moderate Interruptions
Minor	Small/Minor Cost – within Budget Allocations	Minor Injury	Short-term/Minor Impact – Fixable	Minor Interruptions
Insignificant	Negligible or Insignificant Cost	No Injury	No Impact	No Interruptions

Table 4.3: Total Risk of Asset Failure Matrix

Probability of Failure	Consequence of Failure				
	Significant	Major	Moderate	Minor	Insignificant
Almost Certain	E	E	H	H	M
Likely	E	H	H	M	M
Possible	E	H	M	M	L
Unlikely	H	M	M	M	L
Rare	H	M	M	L	L

Risk levels can be reduced or mitigated through planned maintenance, rehabilitation and/or replacement. An objective of this asset management plan is to reduce risk levels where they are deemed to be too high, as well as ensure assets are maintained in a way that keeps risk levels at acceptable levels.

4.3 Priority Identification

Through discussions with Town staff and review of the asset risk of failure assessment, the following assets/categories were identified as being priorities of the Town:

Table 4.4: Priorities for the Next Five Years Capital Projects

Asset Type	Total Risk	Planned Action
Bridge 08 - Concession Road 8-9	High	Rehabilitation
Bridge 09 - Concession Road 8-9	Moderate	Replacement
Bridge 11 - Concession Road 2-3	High	Replacement
Amaranth Street From: Emma Street To: Main Street	Moderate	Replacement
Concession Road 2-3 From: Sideroad 24-25 To: Sideroad 27-28	Moderate	Replacement
Amaranth Street From: Leeson Street To: Emma Street	Moderate	Replacement
Concession Road 2-3 - From: East Luther - Wellington N Townline To: Sideroad 21-22	Moderate	Replacement
Concession Road 2-3 From: Sideroad 21-22 To: Sideroad 24-25	Moderate	Replacement
Crozier Street From: Gier Street To: Webb Street	Moderate	Replacement
Concession Road 8-9 From: Sideroad 27-28 To: County Road 25	High	Replacement
Crozier Street From: Webb Street To: Baker Court	Moderate	Replacement
King Street From: Mill Street To: Amaranth Street	Moderate	Replacement
Sideroad 24-25 - From: County Road 109 To: Concession Road 2-3	Low	Rehabilitation
Amaranth - East Luther Townline - From: County Road 109 To: Concession Road 2-3	Low	Replacement

4.4 Long-term Forecast

For many years, lifecycle costing has been used in the field of engineering and to evaluate the advantages of using alternative materials in construction or production design. The method has gained wider acceptance and use recently in the management of capital assets. By definition, lifecycle costs are all the costs which are incurred during the lifecycle of a capital asset, from the time it is purchased or constructed, to the time it is taken out of service for disposal.

In defining the long-term forecast for the Town's asset management strategy, costs incurred through an asset's lifecycle were considered and documented.

Tax Supported Asset Replacement Analysis in forecasting the Town's asset replacement needs, comparisons were made between the following scenarios:

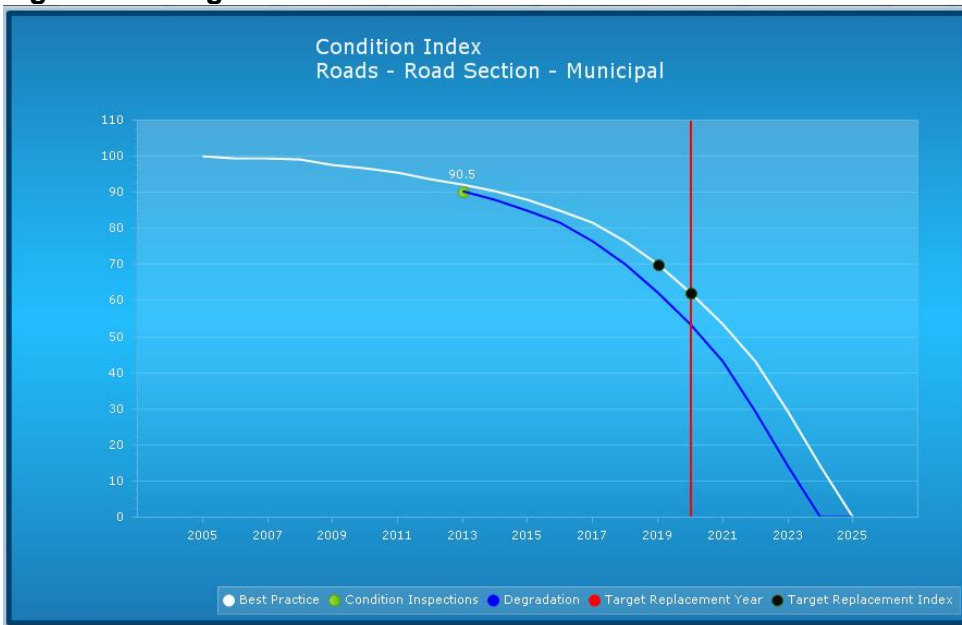
- Scenario 1: Replacement forecast based on “PSAB 3150 Asset Data”
 - The strategy was to maintain current maintenance levels. The outcome of this scenario was to retain the current asset service levels, and assets had to be replaced more quickly. The degradation of the assets was rapid and would lead to increased infrastructure deficits.

- Scenario 2: Replacement forecast based on “Desktop Condition Data”;
 - The levels of service were maintained at current levels and desktop analysis using asset specific degradation curves were applied to identify a “Target Replacement” but the assets were still not extending the expected life that much.

- Scenario 3: Replacement forecast based on an “Informed Condition Analysis”.
 - The strategy was to apply increased maintenance practices and use staff knowledge on how the assets reacted in their environment and under various maintenance programs. The resulting “Informed Condition Analysis” both extended the useful life of many assets beyond the target replacement and was the most cost effective strategy.

Target replacement, is the theoretical best practice replacement schedule for each asset as identified by its degradation curve. Each asset’s degradation curve has been defined from literature and/or engineering experience with hundreds of assets in the sample.

Figure 4.1: Degradation Curve

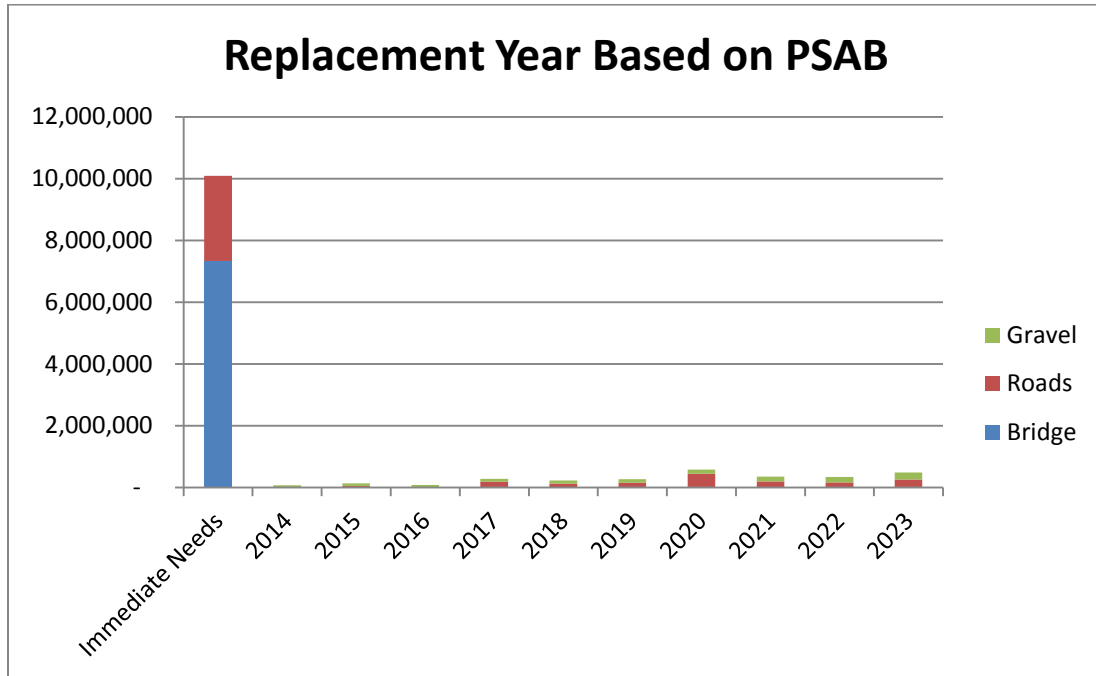


The replacement cost of the road bases under the gravel surface roads is approximately \$53.4 million. All of these road bases are well past their expected useful lives. However, there will never be sufficient funds to be able to replace all of these road bases. As the surface gravel of these roads continue to settle into the base, it is expected that the continual topping up of gravel every few years has supported the completely used up or limited remaining life of the road base. The continual maintenance gravel application and spot repairs are anticipated to allow these less travelled roads to provide an acceptable level of service. Where increased traffic flows or other unanticipated circumstances warrant substantial capital improvements to one (or more) of these road sections, it will be identified as a special future project. This type of project is beyond the 10 year forecast window of this study.

Scenario 1: Replacement forecast based on “PSAB 3150 Asset Data”

The replacement forecast based on the PSAB 3150 asset data provides a snapshot of assets at or nearing the end of their useful lives from a purely financial accounting perspective. Figure 4.2 below shows the forecast over a 10-year period, where approximately \$10.1 million (replacement cost) in capital assets are showing as “immediate needs”. For this scenario, these assets have reached the end of their accounting useful lives. This total does not include all road base assets worth approximately \$67.8 million. In total, over \$12.9 million in assets (inflated to appropriate year) are shown as replacement needs in the 10-year forecast, which would expand to over \$80.7 million if road base assets were included.

Figure 4.2: Replacement Forecasted Based on “PSAB 3150 Asset Data”

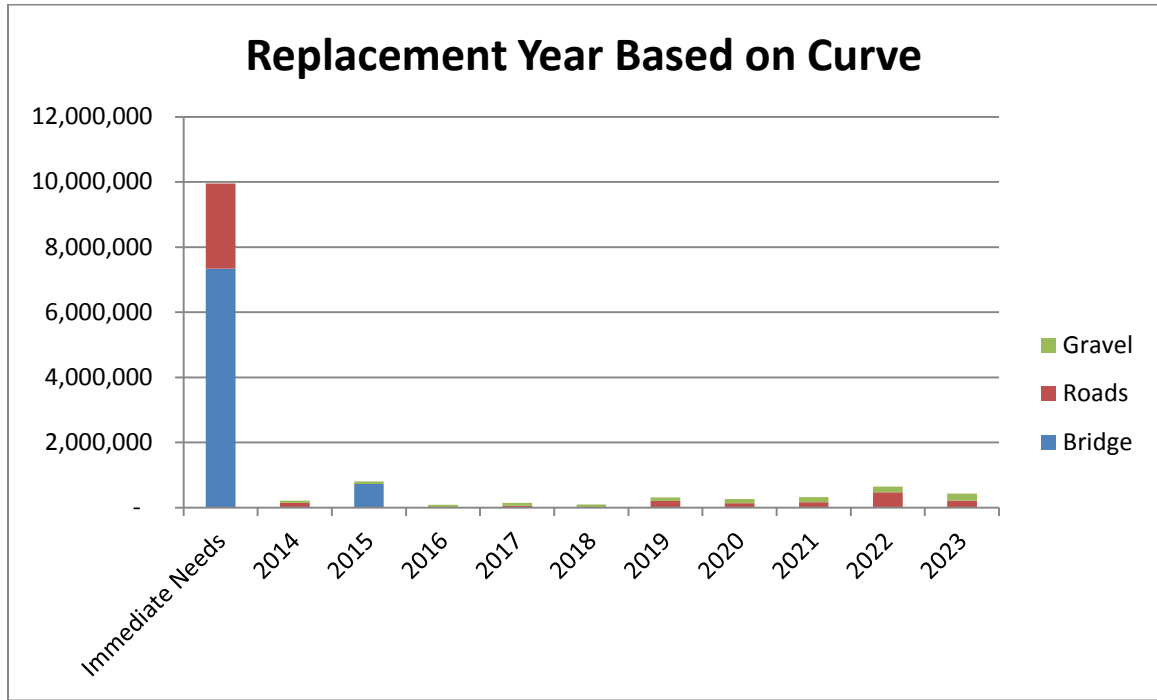


Scenario 2: Replacement forecast based on “Desktop Condition Data”

Figure 4.3 below shows the asset replacement forecast developed using the condition data discussed in Chapter 2. As mentioned earlier, each asset was assigned a condition assessment using a physical inspection, a degradation curve analysis or an asset age analysis.

Under this scenario, approximately \$9.9 million in capital assets are showing the need to be immediately replaced (not including road base assets for gravel surfaces). In total, approximately \$13.3 million in assets (inflated to appropriate year) are shown as replacement needs in the 10-year forecast.

Figure 4.3: Replacement Forecast Based on “Desktop Condition Data”

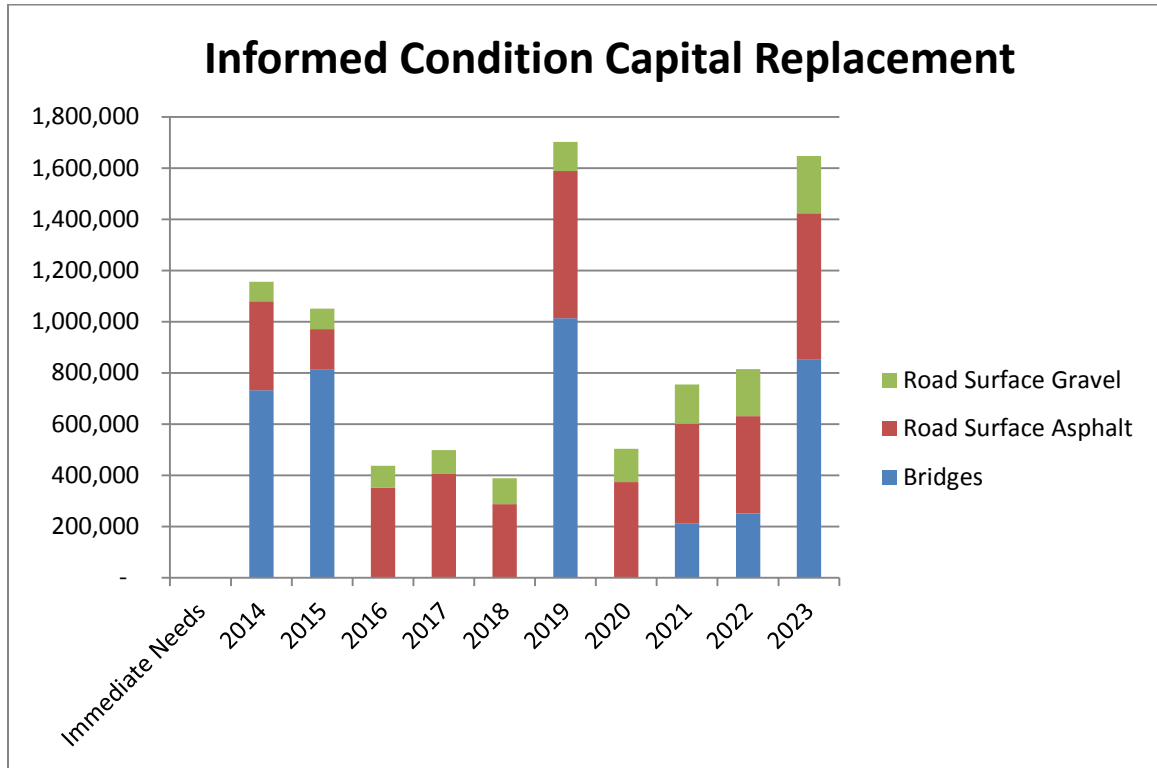


While the condition data scenario above provides a more realistic view of replacement needs over the forecast period, it is not financially feasible, given the Town’s current annual capital investment amounts. Significant grant funding would be required to assist in catching up on the immediate capital need requirements.

Scenario 3: Replacement forecast based on an “Informed Condition Analysis”

A capital replacement scenario was developed that takes the condition information and adjusts replacement timing based on identified priorities and Town staff’s knowledge and experience with the assets. Figure 4.4 shows the capital needs forecast under this scenario. All immediate needs have been distributed within the forecast period. In total, approximately \$8.9million in assets (inflated to appropriate year) are shown as replacement needs in the 10-year forecast. This is the recommended scenario for the Town.

Figure 4.4: Replacement Schedule Based on an Informed Condition Analysis



Tax Supported Maintenance, Non-Infrastructure Solutions, Renewal & Rehabilitation

For the recommended scenario to be feasible, the level of service adjustments discussed in Chapter 3 are needed in conjunction with the current level of service amounts in order to effectively maintain and rehabilitate the assets as required.

The financing strategy discussed in the next chapter will incorporate the level of service adjustments into the recommended financing analysis. Please refer to Appendix F for details.

Please refer to Appendix E for a breakdown of each capital forecast scenario by year and by asset type.

Water Asset Management Strategy

The water capital forecast and required operating needs were developed as part of the Town’s Water Rate Study completed by Watson & Associates. Given that the Town’s water infrastructure is relatively new, capital replacement needs identified in the rate

study were limited. In total, approximately \$81,000 in capital needs were identified in the 10-year capital forecast period. Please refer to Appendix G for the Town's Water Rate Study detailed operating and capital forecast.

Wastewater Asset Management Strategy

The wastewater capital forecast and required operating needs were developed as part of the Town's Wastewater Rate Study completed by Watson & Associates as well as Ontario Clean Water Agency who are operating the new Wastewater Treatment Plant. Given that the Town's wastewater infrastructure is relatively new, capital replacement needs identified in the rate study were limited. A new rate study is underway and should be available in 2014. Please refer to Appendix H for the Town's Wastewater Rate Study detailed operating and capital forecast.

4.5 Procurement Methods

Section 270(1) of the Municipal Act, S.O. 2001, provides that municipalities (and local boards) shall adopt and maintain policies with respect to its procurement of goods and services. The Town has a procurement policy in place.

5.0 Financing Strategy

5.1 Scope and Process

The financing strategy outlines the suggested financial approach to funding the recommended asset management strategy outlined in Chapter 4, while utilizing the Town's existing budget structure. This section of the asset management plan will include:

- Annual expenditure forecasts broken down by:
 - Maintenance/non-infrastructure solutions;
 - Renewal/rehabilitation activities;
 - Replacement/disposal activities;
 - Expansion activities.
- Actual expenditures in the above named categories for 2012 and 2013 budgeted amounts;
- A breakdown of annual funding/revenue by source;
- Identification of the funding shortfall, including how the impact will be managed; and
- All key assumptions will be documented within Appendix B.

The long-term financing strategy forecast (including both expenditure and revenue sources) was prepared, consistent with the Town's departmental budget structure, so that it can be used in conjunction with the annual budget process. Various financing options, including taxation, reserves, reserve funds, debt, user fees and grants were considered and discussed with Town staff during the process.

For the recommended asset management strategy scenario, a detailed ten (10) year plan was generated, consistent with the Town's current budget structure. The plan identifies specific maintenance & non-infrastructure solutions, renewal & rehabilitation, replacement & disposal, and expansion activities required for the 10-year forecast period as described in Chapter 4.

Table 5.1 outlines the historical capital results for 2012 and 2013 budgeted results for renewal/rehabilitation, replacement/disposal, and expansion. The capital funding includes the use: of grants, development charges for growth (expansion) related costs, reserve/reserve funds as well as contributions from the operating budget.

Table 5.1: Tax Supported Historical Results

Description	Actual 2012	Budget 2013
<u>Prior Capital Expenses</u>		
Bridge 9	6,946	345,297
Gravel Budget 155,00	36,409	126,789
Construction Contracts matches	147	130,000
<u>Total Capital Expenses less Capital Financing</u>	43,502	602,086
<u>Capital Financing</u>		
Provincial Mill Grant		345,297
Grants and Subsidies - Gas Tax		130,000
Capital Paid from Property Taxes	43,502	126,789
Reserve Fund - Capital Reserve - Roads		
Reserve Fund - Development Charges (All)		
Reserve Fund - Roads (?)		
Debentures (?)		
Reserve Fund - Bridges (?)		
Reserves and Reserve Funds		
Growth Related Debt		
Non-Growth Related Debt		
Other - Developer Contribution		
Other - Transfer from Operating		
Total Capital financing	43,502	602,086
Total Capital Expenses less Capital Financing	-	-

5.2 Financing Strategy

Tax Supported Financing Strategy

Table 5.2 shows the tax supported expenditure forecast summary. While this summary only shows high level cost classifications of maintenance, renewal/rehabilitation, replacement and expansion categories, further detail can be obtained from Appendix E and the asset management model provided to Town staff for future use.

Items in Table 5.2 labelled as “LOS Adjustment” refer to the level of service analysis discussed in Chapter 3. Contributed assets refer to assets that are expected to be assumed from ongoing development within the Town.

Table 5.2: Change in Level of Service

Departments	Forecast									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Transportation Services										
Expenditures										
Bridge Maintenance	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Bridge Washing	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Road Crack - Rout and Sealing	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Pavement Patching	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Additional Maintenance Assistance (due to additional sub-division infrastructure)						65,000	65,000	65,000	65,000	65,000
Wastewater										
Camera Inspections	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Manhole Upgrades	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Total Expenditures (uninflated)	112,000	112,000	112,000	112,000	112,000	177,000	177,000	177,000	177,000	177,000
Grand Total Expenditures (Inflated)	114,240	116,525	118,855	121,232	123,657	199,331	203,317	207,384	211,531	215,762

Table 5.3 summarizes the recommended strategy to finance only the Town of Grand Valley Asset Management Plan is not intended to be a comprehensive operating and capital funding requirement for the Town.

Asset Management Plan Report
December 2013

Table 5.3: Tax Supported Capital Forecast

Tax Supported Capital forecast												
Description	Actual 2012	Budget 2013	Forecast									
			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Prior Capital Expenses												
Bridge 9	6,946	345,297										
Gravel Budget 155,00	36,409	126,789										
Construction Contracts matches	147	130,000										
Subtotal			-	-	-	-	-	-	-	-	-	-
Capital Replacement Forecast	43,502	602,086	-	-	-	-	-	-	-	-	-	-
Roads - Paved												
Amaranth - EL TL - From: Con 2-3 To: 328m N Of Con 2-3			-	-	-	-	-	292,802	-	-	-	-
Amaranth - EL TI - From: County 109 To: Con 2-3			-	-	-	-	143,531	146,401	-	-	-	-
Amaranth Street From: Leeson Street To: Emma Street			-	-	-	-	143,531	146,401	-	-	-	-
Amaranth St From: Emma St To: Main St			153,000	-	-	-	-	-	-	-	-	-
Amaranth St From: Leeson St To: Emma St			-	156,060	-	-	-	-	-	-	-	-
Bielby Str From: Amaranth St To: Gier St			-	-	-	-	-	-	114,869	-	-	-
Bielby Str From: Gier St To: Scott St			-	-	-	-	-	-	-	117,166	-	-
Con 2-3 - From: 162m East Of Bielby Str To: 277m East Of Bielby Str			-	-	7,663	-	-	-	-	-	-	-
Con 2-3 - From: 453m East Of Bielby St To: Amaranth - EL TI			-	-	-	-	-	-	-	-	17,195	-
Con 2-3 - From: EL - Wellington N TI To: Sideroad 21-22			-	-	132,651	-	-	-	-	-	-	-
Con 2-3 From: Sideroad 21-22 To: Sideroad 24-25			-	-	127,345	-	-	143,531	-	-	-	-
Con 2-3 From: Sideroad 24-25 To: Sideroad 27-28			117,300	-	-	-	-	-	-	-	-	-
Con 2-3 From: Sideroad 27-28 To: Sideroad 28-29			-	-	-	-	-	-	-	-	54,320	-
Con 2-3 From: Sideroad 28-29 To: Leeson St			-	-	-	-	-	-	135,139	-	-	-
Con 6-7 From: Sideroad 24-25 To: Sideroad 27-28			76,500	-	-	-	-	-	-	-	-	-
Con 8-9 From: Sideroad 27-28 To: County Road 25			-	-	-	125,150	-	-	-	-	-	-
Crozier St From: Baker Court To: Spruyt Ave			-	-	-	-	-	-	-	78,111	-	-
Crozier St From: Gier St To: Webb St			-	-	84,897	-	-	-	-	-	-	-
Crozier St From: Spruyt Ave To: Fife Road			-	-	-	-	-	-	-	78,111	-	-
Crozier St From: Webb St To: Baker Court			-	-	-	86,595	-	-	-	-	-	-
Deaken Drive From: County 15 To: County Road 15			-	-	-	-	-	-	-	-	89,632	91,425
Fife Road From: Crozier St To: Mary Court			-	-	-	-	-	-	-	-	79,673	-
Fife Road From: Joyce Court To: Crozier St			-	-	-	-	-	-	-	-	79,673	-
Fife Road From: Main St To: Joyce Court			-	-	-	-	-	-	-	-	-	81,267
Fife Road From: Mary Court To: End (cul-de-sac)			-	-	-	-	-	-	-	-	-	81,267
Gier St From: Crozier St To: Bielby St			-	-	-	-	-	-	-	117,166	-	-
Joyce Court From: Fife Road To: End (cul-de-sac)			-	-	-	-	-	-	-	-	-	81,267
King St From: Mill St To: Amaranth St			-	-	-	86,595	-	-	-	-	-	-
Leeson St From: 175m S Of Mill St To: Mill St			-	-	-	-	-	-	-	-	-	72,069
Leeson St From: Amaranth St To: Douglas St			-	-	-	-	-	-	-	-	-	22,130
Leeson St From: Melody Lane To: 175 M.S. Of Mill St			-	-	-	-	-	-	-	-	-	9,815
Leeson St From: Mill St To: Amaranth St			-	-	-	-	-	-	-	-	-	16,935
Mary Court From: Fife Road To: End (cul-de-sac)			-	-	-	-	-	-	-	-	-	81,267
Melody Lane From: Leeson St To: End			-	-	-	-	-	-	-	-	-	10,106
Melody Lane From: Water St To: Leeson St			-	-	-	-	-	-	-	-	-	15,200
Monty Avenue From: Leeson St To: End			-	-	-	-	-	-	-	-	-	7,621
Scott St From: Bielby St To: End (west)			-	-	-	-	-	-	143,586	-	-	-
Sideroad 24-25 - From: County 109 To: Con 2-3			-	-	-	108,243	-	-	-	-	-	-
Spruyt Ave From: Main St To: Crozier St			-	-	-	-	-	-	-	-	59,755	-
Webb St From: Main St To: Crozier St			-	-	-	-	-	-	114,869	-	-	-
Roads - Maintenance Gravel			76,500	79,591	84,462	91,425	100,940	113,675	130,577	152,992	182,839	222,880
Roads Sub Total			423,300	235,651	437,018	498,006	531,532	834,419	503,900	543,545	563,086	793,146
Bridges												
Bridge 08 - Concession Road 8-9			181,560	-	-	-	-	-	-	-	-	-
Bridge 09 - Concession Road 8-9			550,800	-	-	-	-	-	-	-	-	-
Bridge 11 - Concession Road 2-3			-	811,512	-	-	-	-	-	-	-	-
Bridge 01 - Sideroad 27-28			-	-	-	-	-	1,013,546	-	-	-	-
Bridge 04 - Sideroad 24-25			-	-	-	-	-	-	-	-	250,969	-
Bridge 07 - Sideroad 24-25			-	-	-	-	-	-	-	-	-	853,296
Bridge 14 - Sideroad 21-22			-	-	-	-	-	-	-	210,899	-	-
Bridges Sub Total			732,360	811,512	-	-	-	1,013,546	-	210,899	250,969	853,296
Enhanced Levels of Service Total			114,240	116,525	118,855	121,232	123,657	199,331	203,317	207,384	211,531	215,762
Subtotal			1,269,900	1,163,687	555,874	619,239	655,189	2,047,296	707,217	961,828	1,025,587	1,862,204
Capital Expansion Forecast												
Mayberry Hill Phase 1 - roads			-	-	1,668,000	-	-	-	-	-	-	-
Mayberry Hill Phase 2 - roads			-	-	-	-	-	-	-	2,196,000	-	-
Subtotal			-	-	1,668,000	-	-	-	-	2,196,000	-	-
Total			1,269,900	1,163,687	2,223,874	619,239	655,189	2,047,296	707,217	3,157,828	1,025,587	1,862,204
Capital Financing												
Provincial Mill Grant - Bridge 9		345,297										
Grants and Subsidies - Gas Tax		130,000	290,736	87,239	87,239	87,239	87,239	87,239	87,239	87,239	87,239	87,239
Capital Paid from Property Taxes	43,502	126,789	127,000	127,000	127,000	127,000	127,000	127,000	127,000	127,000	127,000	127,000
Reserve Fund - Capital Reserve - Roads			67,700									
Reserve Fund - Development Charges												
Reserve Fund - Roads												
Debentures												
Reserve Fund - Bridges												
Reserves and Reserve Funds												
Growth Related Debt												
Non-Growth Related Debt												
Other - Developer Contribution					1,668,000					2,196,000		
Other - Transfer from Operating												
Annual Growth 1%												
Total Capital financing	43,502	602,086	485,436	214,239	1,882,239	214,239	214,239	214,239	214,239	2,410,239	214,239	214,239
Total Capital Expenses less Capital Financing	-	-	784,464	949,448	341,635	405,000	440,950	1,833,057	492,978	747,589	811,348	1,647,965

These lifecycle costs can be recovered through several methods:

- Taxation funding is suggested for all maintenance costs as well as enhanced level of service related costs;
- As the Town has recently applied for provincial grant funding for a high priority project (i.e. Bridge # 11: Concession Road 2/3), grant funding has been included for this bridge based on the terms and conditions of the grant application;
- The portion of newly acquired or constructed assets that are “growth (DC) related” are shown as financed by development charges;
- Federal Gas Tax has been shown as a stable and long-term funding source for eligible capital projects;
- Developer Contributions related to the assets that are anticipated to be contributed (assumed) over the forecast period (i.e. the developers transfer ownership of these assets to the Town at no cost, therefore it is considered contribution related revenue);
- The Town will be dependent upon maintaining healthy capital reserves/reserve funds in order to provide the remainder of the required lifecycle funding over the forecast period. This will require the Town to proactively increase amounts being transferred to these capital reserves during the annual budget process.

While the annual funding requirements may fluctuate, it is important for the Town to implement a consistent, yet increasing annual investment in capital so that the excess annual funds can accrue in capital reserve funds specifically for roads and bridges. In order to fund the recommended non-growth related road and bridge asset requirements over the 10 year forecast period using the Town’s own available funding sources (i.e. using taxation, gas tax funding and debentures), an increase in the Town’s taxation will be required. However, if other funding sources become available (i.e. grant funding) or if maintenance and rehabilitation practices allow for the deferral of capital works, then the impact on Town taxation would decrease.

Please refer to further details provided in Appendix F.

Water Financing Strategy

As mentioned earlier, the water asset management strategy as well as the financing strategy was prepared as part of the Town’s Water Rate Study. Maintenance costs (which includes an operational contract) are funded through water rates. Any renewal/rehabilitation or replacement/disposal is funded from the water capital reserve fund.

Wastewater Financing Strategy

As mentioned earlier, the wastewater asset management strategy as well as the financing strategy was prepared as part of the Town's Wastewater Rate Study. Maintenance costs (which includes an operational contract) are funded through wastewater rates. Any renewal/rehabilitation or replacement/disposal is funded from the wastewater capital reserve fund.

5.3 Funding Shortfall

Assuming the Town maintains adequate capital reserve funds, the recommended asset management strategy discussed in Chapter 4 will be fully funded. It is believed this can be accomplished through each annual budget process. However, the recommended asset management strategy (i.e. scenario 3) does defer significant capital replacements, in comparison to the condition based scenario (i.e. scenario 2). In the event that certain deferred replacements result in increased risks and/or projected asset failures, further funding may be required to address the costs associated with accelerating replacement timelines. In addition, in the event that the Town is not successful in the recent grant application, additional funding would be required in the short-term.

Under the recommended financing strategy, the Town would be making proactive attempts to mitigate this funding gap over the forecast period. To further mitigate the potential infrastructure funding deficit, the Town could consider:

- Issuing debt for significant and/or unforeseen capital projects (this would have the impact of spreading out the capital repayment over a defined term, constrained by debt capacity limits);
- Actively seeking out and applying for grants;
- Taxation rate increases (where needed); and
- Implementing operating efficiencies (i.e. reduced operating costs to allow more capital investment).

6.0 Recommendations

The following recommendations have been provided for staff (and Council's consideration):

- That this Road, Bridge, Water and Wastewater Asset Management Plan be received and approved by Council;
- That consideration of this Road, Bridge, Water and Wastewater Asset Management Plan be given as part of the annual budgeting process to ensure sufficient funds are available to fund the asset management plan;
- That the Town continues using a "capital reserve fund" for roads and bridges capital purposes, ensuring capital investments accrue interest annually, and that contributions to this roads/bridges capital reserve fund be considered during the budget process.

The current level of funding for asset replacement and renewal at the Town will not sufficiently fund required capital needs or close the infrastructure funding gap. As such, it is recommended that the following road/bridge impacts be considered during the annual budget process:

- Initiation of an annual roads crack, rout and sealing program – \$15,000 in 2014 (and then every 5 years);
- Additional Road Patching and Maintenance – \$30,000 annually;
- Additional Gravel – \$25,000;
- A bridge washing program in 2014 (and every year thereafter) at no cost to the Town;
- A bridge maintenance program at \$15,000 annually;
- Annual increase to the Town's taxation levy each year (after inflationary adjustments) to be dedicated to the roads and bridges capital program, starting in 2014 to cover the Capital short fall. This amount is to be allocated to a roads and bridges capital reserve fund, and be used to fund the related capital program.

Substantial investment in roads and bridge capital needs will be required over the 10 year forecast period. Through the recommendations provided above, proactive steps would be taken to increase capital investment as well as reduce the annual infrastructure funding gap for these assets. Enhanced maintenance plans will assist in maintaining adequate asset conditions, mitigate asset risk as well as potentially defer capital needs within the forecast period. In addition, the Town should pursue available capital grants wherever possible to further reduce the infrastructure funding gap.

Through the creation of this plan, Town staff have been provided with a model in which amendments and revisions can be made as needed. It is anticipated that this plan adopted by Council will be monitored and updated frequently by Town staff as part of the budget process, with refinements and specific recommendations being provided with respect to the priority of each individual project.



Appendix A
Detailed Asset Analysis

APPENDIX A: DETAILED ASSET ANALYSIS

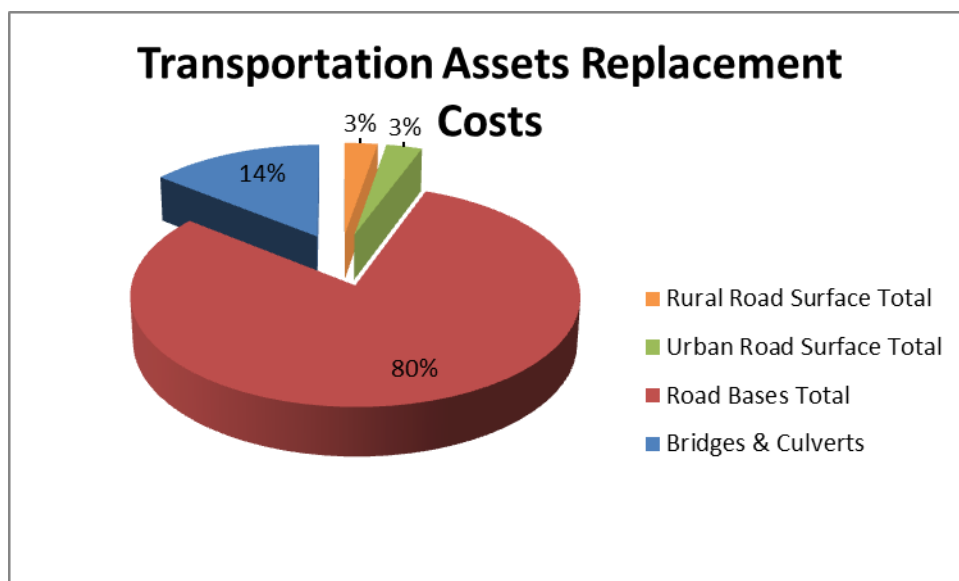
A.1 Transportation Assets

The Town's Transportation Assets make up one of the key services that reflect the economic and social development of the community. The Transportation assets in this study are made up of the following asset types:

- Road Surfaces
 - Rural – Asphalt
 - Gravel
 - Urban - Asphalt
- Road Bases
 - Asphalt
- Bridges & Culverts (Greater than 3 meters).

Together at current replacement cost these assets account for \$84.7 million dollars of the Town's assets. Further discussion of these assets follows.

Asset Type	Replacement Cost	Roads %	Total %
Rural Surface			
Road Surface - Asphalt	1,728,141	36%	
Road Surface - Gravel	580,607	12%	
Rural Road Surface Total	2,308,748		3%
Urban Surface			
Road Surface - Asphalt	2,512,542	52%	
Road Surface - Gravel	-		
Urban Road Surface Total	2,512,542		3%
Road Surface Total	4,821,290		
Road Bases - Under Asphalt Surface	14,462,072	21%	
Road Bases - Under Gravel Surface	53,374,402	79%	
Road Bases Total	67,836,474		80%
Road Total	72,657,764		
Bridges & Culverts	12,089,049		14%
Total	84,746,813		



A.1.1 Roads

The Town has a vast network of maintained roads totaling over 181.9 km of roads. To establish more appropriate asset management processes the road assets were split into two asset types as Road Surfaces and Road Bases. Road asset management best practices identify that a paved road will replace the asphalt surface twice before requiring the reconstruction of the road base. Gravel roads are assumed to require a top up of gravel every 4 years.

The Town of Grand Valley road surfaces are further grouped into the following categories:

Asset Type	Useful Life	Average Condition	Length (km)
Road Surface - Asphalt (Inspected)	20	63.4	31.9
Road Surface - Gravel	4	N/A	150.0
Total			181.9

The Town has undertaken Road Needs Studies in the past every 5 – 10 years. This practice has provided road surface condition assessments for all road segments of the Town. Condition of the asphalt road surfaces was reviewed for this project and condition indexes were calculated, based on the Ontario Good Roads approved MTO methodology. This engineering assessment of the asphalt roads inspected for road distress indices and road ride comfort rating, producing a calculated condition index for each road segment (generally intersection to intersection).

The overall average condition rating of the Town's paved road surfaces is 63.4, which is identified as the low end of Good. Most of the paved surfaces in the Town have not yet been replaced but are quickly coming due for crack rout and sealing and/or patch maintenance or micro surfacing to ensure these roads achieve the greatest value to rate payers. The average remaining life of the asphalt surfaces is 5.2 years which is one quarter of the asset useful life. This information identifies that the Town's road surfaces have outperformed their expected lifecycles, and indicates that most of these assets are well designed and constructed. It also means that the useful life of asphalt road surfaces in urban areas are under estimated and can be increased to 25.

Gravel roads did not have an updated condition assessment as the Town's standard maintenance practices identify and respond to condition deficiencies.

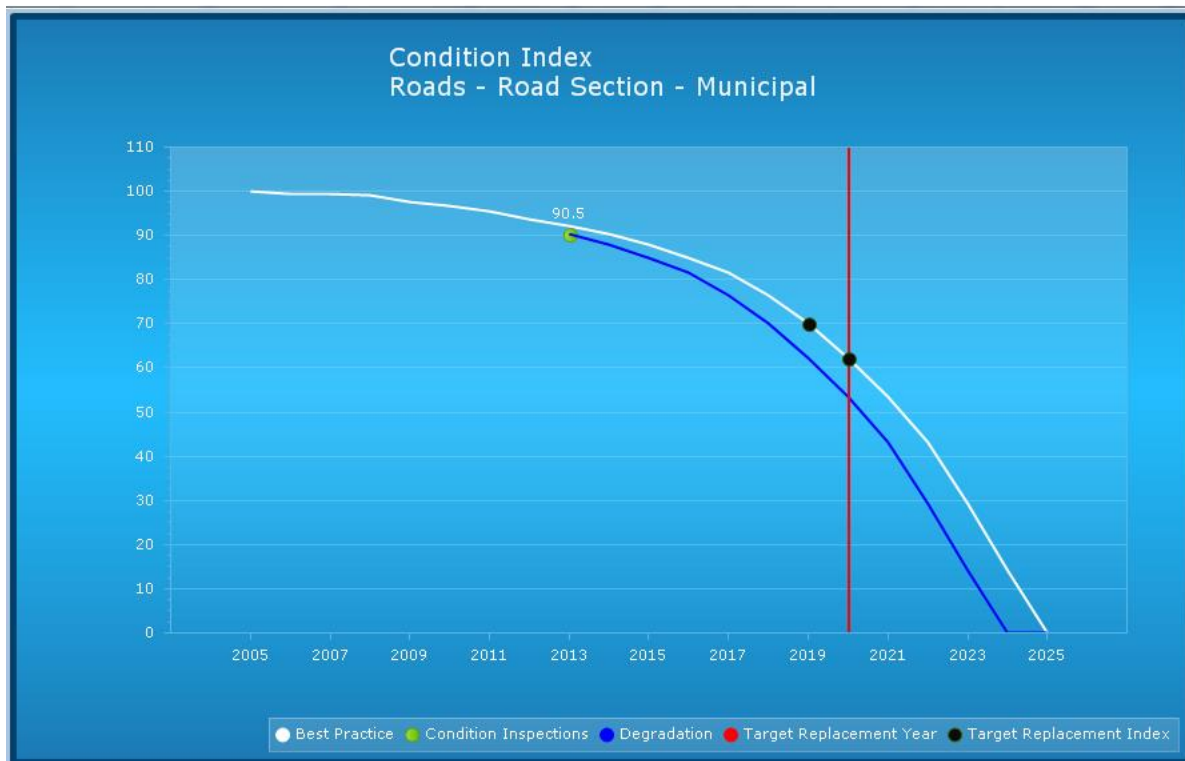
Road bases are very difficult to assess condition without intrusive drilling of bore holes. However, the surface inspections can reveal some potential road base issues which can be addressed via maintenance spot improvements or small capital road reconstruction betterments.

The Town's greatest infrastructure challenge is with its road bases. Based on the values in the asset database the total replacement of road bases asset type is over \$67.8 million. We believe that these costs are actually under-estimated and should be reviewed in the future. Almost all

the gravel road bases, which account for 79% of all road replacement costs, have exceeded their lifecycle expectancy and report a Net Book Value of \$0 and therefore are not expected to be in good condition. This may also lead one to believe that these road bases must be a high priority replacement need. However, the Town maintains these road bases via their gravel resurfacing program and other maintenance practices.

The road bases under asphalt surfaces, which are 31.9% of the road bases based on road lengths. The asset management software includes asset degradation curves which help predict what the assets condition may be if the asset was constructed and maintained using existing best practices. The degradation curve figure shows a Town road asphalt surface with a useful life of 20 years.

The condition/degradation curve reveals that Town paved roads in general are exceeding their useful life. This is shown by the pavement condition index being above the white “Best Practice” curve. The condition assessment of the Town paved roads indicate that the Town is achieving 20-30 years of life depending on traffic volume and weights of trucks using these roads (e.g. high weight/traffic 20, low weight/traffic 30). For example, most sub-division paved roads are expected to reach 30 year life cycle if additional maintenance as crack sealing or micro-surfacing programs are put in place.



A.1.2 Bridges and Culverts

The Town undertakes bi-annual bridge and large culvert (greater than 3 meter) inspections by qualified engineers. These condition assessments are to be completed using the up to date Ministry of Transportation documented inspection methodology (OSIM), which can then calculate a Bridge Condition Index (BCI) for each structure.

The engineering reports establish the appropriate maintenance needs and timing of capital improvements and replacements of bridge/culvert structures. The average condition of inspected bridges/culverts owned by the Town is Good which is not surprising since the average

age is close to half of the useful life of these assets. The Town needs to work harder to keep up with the replacement of these structures.

Even with a relatively aggressive bridge replacement program as outlined in this study, this asset type still remains as the most critical with respect to capital replacement program, due to their age and extremely high replacement costs. The Town has been very fortunate to be able to partner with the Province on capital funding programs. It is very important that these capital assistance programs continue to help the Town reach funding sustainability.

A.6 Water Assets

Water assets are a critical asset group as these assets require a separate financial plan (Ontario Regulation 453/07) to ensure rate payers are not just paying for the water they use but also for the maintenance, operations and replacement of these water assets. The water asset inventory was developed as part of a Water Rate Study. All inventoried water assets are young in age and therefore have very high estimated conditions. A more rigorous condition inspection is suggested in the near future. The water chemical processing assets are reviewed regularly to comply with Provincial Water regulations. See Appendix G for a copy of the Water Rate Study.

A.7 Wastewater Assets

Wastewater assets are a critical asset group as these assets also require a separate financial plan to ensure rate payers are not just paying for the wastewater but also for the maintenance, operations and replacement of these wastewater assets. The wastewater asset inventory was developed as part of a Wastewater Rate Study completed by Watson & Associates. All inventoried wastewater assets are relatively young in age and therefore have high estimated conditions. A more rigorous condition inspection is suggested in the near future. See Appendix H for a copy of the Wastewater Rate Study.

The Town has started camera inspection of the wastewater system to identify any pipe maintenance and infiltration issues. It is recommended that the Town continue with a camera inspection program to ensure that pipe issues are identified and rectified. This program will also assist in identifying the optimal time of when to insert a liner in the wastewater pipes to extend their useful lives.



Appendix B
Asset Management Plan Assumptions

APPENDIX B: ASSET MANAGEMENT PLAN ASSUMPTIONS

The following assumptions were made during the creation of the Town's asset management plan.

1. STATE OF LOCAL INFRASTRUCTURE

- a) Indexing: When inflating an asset value to a 2013 replacement value, the Non-Residential Building Construction Price Index (NRBCPI) was used for Road, Bridge/Culvert, related assets.

2. ASSET MANAGEMENT STRATEGY

- a) Capital inflation rate will be assumed to be 2% annually.
- b) Operating budget inflation rate will be assumed to be 2% annually.
- c) Asset condition was estimated based on age where asset inspection assessments were not performed.
- d) Road Bases were not considered in the Capital Replacement plan. However, the cost of replacing a road base if required was included in the road surface reconstruction costs.

3. FINANCING STRATEGY

- a) Development charges rates are assumed to increase at 2% annually.
- b) Gas tax revenue has been identified as a funding source for the purposes of the analysis (i.e. for asset replacement purposes), and has been assumed to continue throughout the forecast period.
- c) Interest rate earned on a Capital Replacement Reserve Fund will be 3% annually.
- d) Contributions to Lifecycle Cost Replacement Reserve Fund will increase annually based on the capital inflation rate of 3% annually.
- e) Assessment growth is assumed to be 1% annually.
- f) In the case where debt financing is needed, the model assumed debt terms of 20 years at 5% annual interest.



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Appendix C
Data Verification and Condition
Assessment Policy

APPENDIX C

Town of Grand Valley Data Verification and Condition Assessment Policy

Data Verification

1. The main source of asset data updating and editing will be through the Town's PSAB 3150 compliance procedures.
2. Asset additions, disposals, betterments, and write-offs will be recorded based on the Town's PSAB 3150 Compliance Policies.
3. Verification of the correct treatment of asset revisions will be completed through frequent annual reviews by the Town's Treasurer as well as an annual review by the Town's external auditor.
4. During years in which condition assessments are not being performed, asset replacement cost will be determined based on a combination of inflating previous current values or through the use of the current year's historical invoice data. Where indices are being used, the Non-Residential Building Construction Price Index (NRBCPI) shall be used for construction related assets (i.e. roads related, water, and facilities) and the Consumer Price Index (CPI) shall be used for all other assets (i.e. machinery & equipment).

Condition Assessment

1. Condition assessments shall be performed as outlined in Table C-1 below. Condition assessments shall be performed by qualified individuals (or companies) and shall include a review of the following:
 - Current asset condition (consistent with the rating format use within this report, unless Town staff stipulate a new format);
 - i. Identify any unusual wear from asset use that may hinder asset performance and eventually reduce useful life.
 - ii. Assess asset performance and identify (if any) capital improvements that can be applied to extend the asset's useful life and/or bring the asset back to proper service levels.
 - Current asset replacement cost. This is to be based on replacing the asset under current legislation/requirements using the Town's specifications; and
 - Remaining service life, assuming current maintenance and usage levels.

Table C-1**Condition Assessment Time Table**

Asset Type	Frequency of Condition Assessment	Comments
Road Surface	Every 5 Years	Engineer Inspections along with Minimum Maintenance Standards Compliance
Bridges & Culverts (greater than 3m)	Every 2 Years	As per MTO OSIM inspections
Water Main / other pipes and Chambers	Every 5 Years	As per Water Regulations and maintenance history
Hydrants		As per Fire and Water Regulations
Wells & Pumps	Every 5 Years	As per Water Regulations and maintenance history
Water Facilities		As per Water Regulations and maintenance history
Generators	Every Season	Minimum twice per year
Water Equipment		As per Water Regulations and maintenance history
Water Valves	Annual Exercising	As per Water Regulations and maintenance history
Wastewater Mains and Pipes	Every 10 - 15 Years	After 1/3 of useful life begin Camera program, and maintenance history
Wastewater Facilities & Components	Every 5 Years	

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Appendix D
Level of Service Impact

APPENDIX D: LEVEL OF SERVICE IMPACT

Departments	Forecast									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Transportation Services										
Expenditures										
Bridge Maintenance	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Bridge Washing	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Road Crack - Rout and Sealing	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Pavement Patching	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Additional Maintenance Assistance (due to additional sub-division infrastructure)						65,000	65,000	65,000	65,000	65,000
Wastewater										
Camera Inspections	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Manhole Upgrades	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Total Expenditures (uninflated)	112,000	112,000	112,000	112,000	112,000	177,000	177,000	177,000	177,000	177,000
Grand Total Expenditures (Inflated)	114,240	116,525	118,855	121,232	123,657	199,331	203,317	207,384	211,531	215,762



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Appendix E

Scenario – Capital Forecasts

Appendix E: Scenario – Capital Forecasts

Scenario 1

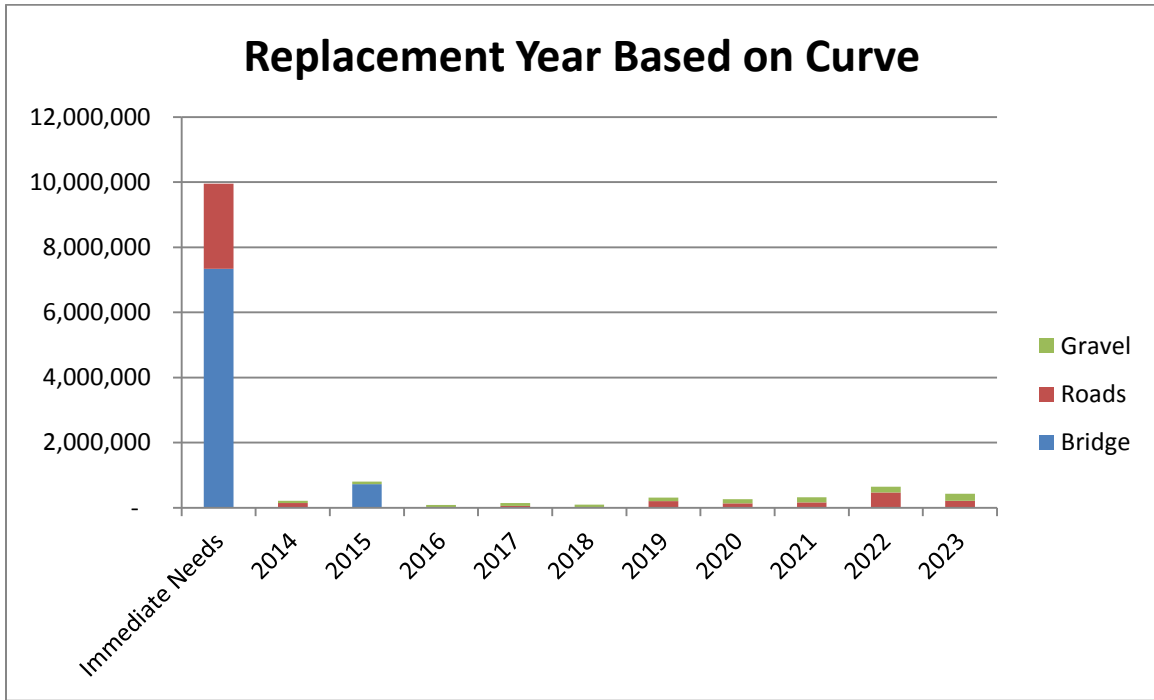
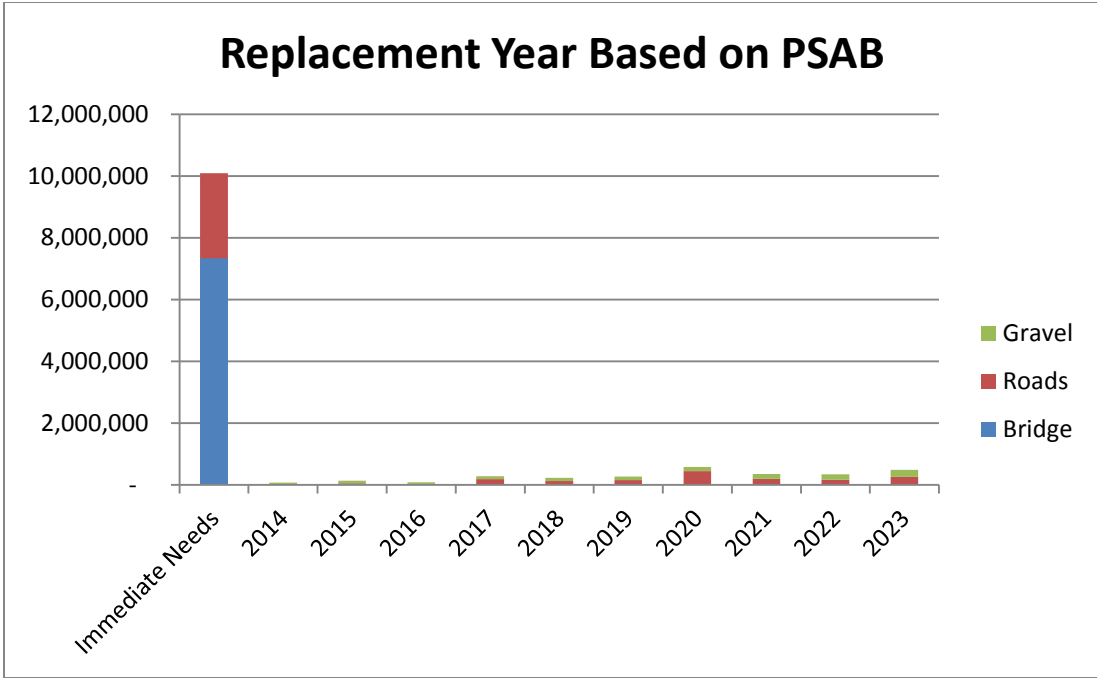
Asset Type	Immediate Needs	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Total Scheduled Capital - Inflated	10,088,379	76,500	135,552	84,462	286,089	227,909	275,639	579,554	358,032	349,315	490,882	12,952,313
Road Surface	2,752,007	-	55,961	-	194,665	126,969	161,964	448,977	205,040	166,476	268,002	4,380,062
Gravel		76,500	79,591	84,462	91,425	100,940	113,675	130,577	152,992	182,839	222,880	1,235,880
Bridge	7,336,372	-	-	-	-	-	-	-	-	-	-	7,336,372

Scenario 2

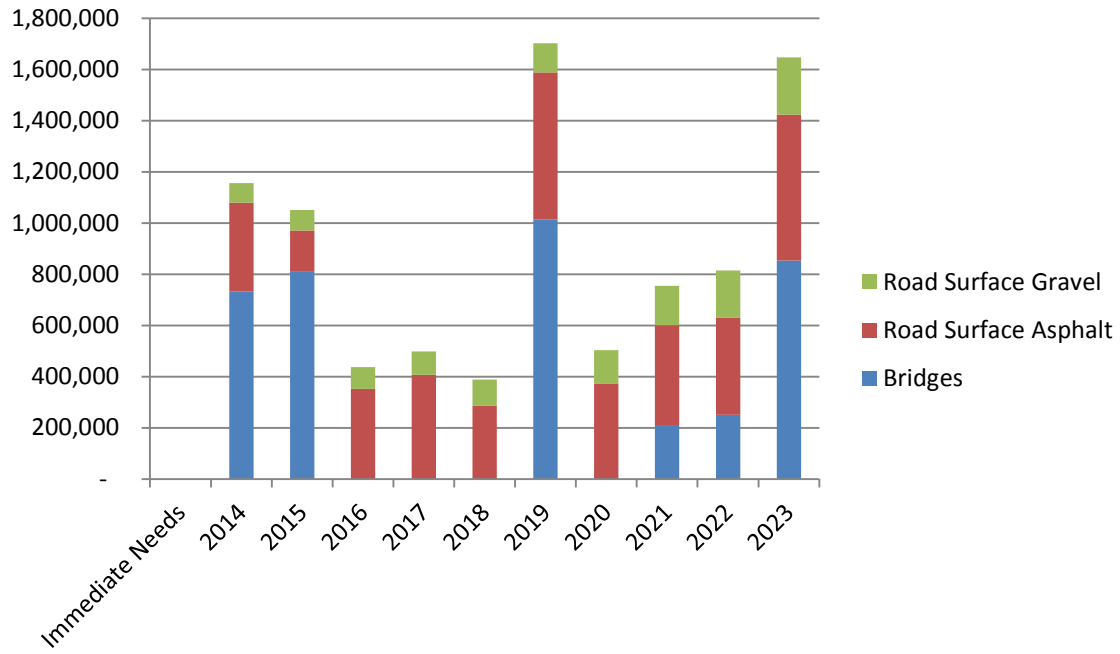
Asset Type	Immediate Needs	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Total Scheduled Capital - Inflated	9,948,663	219,010	807,871	84,462	149,647	100,940	316,204	262,676	321,499	649,955	436,204	13,297,130
Road Surface	2,612,291	142,510	0	0	58222.1188	0	202,529	132098.852	168,508	467,116	213324.0235	3,996,598
Gravel		76,500	79,591	84,462	91,425	100,940	113,675	130,577	152,992	182,839	222,880	1,235,880
Bridge	7,336,372	-	728,280	-	-	-	-	-	-	-	-	8,064,652

Scenario 3

Asset Type	Immediate Needs	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Total Scheduled Capital - Inflated	0	1,155,660	1,047,163	437,018	498,006	388,001	1,701,564	503,900	754,444	814,056	1,646,442	8,946,255
Road Surface	0	346800	156,060	352556.094	406,582	287,061	574,343	373,323	390,554	380,247	570,267	3,837,792
Gravel		76,500	79,591	84,462	91,425	100,940	113,675	130,577	152,992	182,839	222,880	1,235,880
Bridge	-	732,360	811,512	-	-	-	1,013,546	-	210,899	250,969	853,296	3,872,582



Informed Condition Capital Replacement





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Appendix F
Road and Bridge Asset Management
Strategy and Financing Strategy

Appendix F: Road and Bridge Asset Management Strategy and Financing Strategy

Tax Supported Capital forecast

Description	Actual 2012	Budget 2013	Forecast											
			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023		
Prior Capital Expenses														
Bridge 9	6,946	345,297												
Gravel Budget 155,00	36,409	126,789												
Construction Contracts matches	147	130,000												
Subtotal														
Capital Replacement Forecast	43,502	602,086												
Roads - Paved														
Amaranth - EL TL - From: Con 2-3 To: 328m N Of Con 2-3									292,802					
Amaranth - EL TI - From: County 109 To: Con 2-3								143,531	146,401					
Amaranth Street From: Leeson Street To: Emma Street								143,531	146,401					
Amaranth St From: Emma St To: Main St			153,000											
Amaranth St From: Leeson St To: Emma St				156,060										
Bielby Str From: Amaranth St To: Gier St										114,869				
Bielby St From: Gier St To: Scott St											117,166			
Con 2-3 - From: 162m East Of Bielby Str To: 277m East Of Bielby St					7,663									
Con 2-3 - From: 453m East Of Bielby St To: Amaranth - EL TI												17,195		
Con 2-3 - From: EL - Wellington N TI To: Sideroad 21-22					132,651									
Con 2-3 From: Sideroad 21-22 To: Sideroad 24-25					127,345			143,531						
Con 2-3 From: Sideroad 24-25 To: Sideroad 27-28			117,300											
Con 2-3 From: Sideroad 27-28 To: Sideroad 28-29												54,320		
Con 2-3 From: Sideroad 28-29 To: Leeson St									135,139					
Con 6-7 From: Sideroad 24-25 To: Sideroad 27-28			76,500											
Con 8-9 From: Sideroad 27-28 To: County Road 25						125,150								
Crozier St From: Baker Court To: Spruyt Ave											78,111			
Crozier St From: Gier St To: Webb St					84,897									
Crozier St From: Spruyt Ave To: Fife Road											78,111			
Crozier St From: Webb St To: Baker Court						86,595								
Deaken Drive From: County 15 To: County Road 15												89,632	91,425	
Fife Road From: Crozier St To: Mary Court												79,673		
Fife Road From: Joyce Court To: Crozier St												79,673		
Fife Road From: Main St To: Joyce Court														81,267
Fife Road From: Mary Court To: End (cul-de-sac)														81,267
Gier St From: Crozier St To: Bielby St											117,166			
Joyce Court From: Fife Road To: End (cul-de-sac)														81,267
King St From: Mill St To: Amaranth St						86,595								
Leeson St From: 175m S Of Mill St To: Mill St														72,069
Leeson St From: Amaranth St To: Douglas St														22,130
Leeson St From: Melody Lane To: 175 M.S. Of Mill St														9,815
Leeson St From: Mill St To: Amaranth St														16,935
Mary Court From: Fife Road To: End (cul-de-sac)														81,267
Melody Lane From: Leeson St To: End														10,106
Melody Lane From: Water St To: Leeson St														15,200
Monty Avenue From: Leeson St To: End														7,521
Scott St From: Bielby St To: End (west)										143,586				
Sideroad 24-25 - From: County 109 To: Con 2-3						108,243								
Spruyt Ave From: Main St To: Crozier St													59,755	
Webb St From: Main St To: Crozier St										114,869				
Roads - Maintenance Gravel			76,500	79,591	84,462	91,425	100,940	113,675	130,577	152,992	182,839	222,880		
Roads Sub Total			423,300	235,651	437,018	498,006	531,532	834,419	503,900	543,545	563,086	793,146		
Bridges														
Bridge 08 - Concession Road 8-9			181,560											
Bridge 09 - Concession Road 8-9			550,800											
Bridge 11 - Concession Road 2-3				811,512										
Bridge 01 - Sideroad 27-28								1,013,546						
Bridge 04 - Sideroad 24-25												250,969		
Bridge 07 - Sideroad 24-25													853,296	
Bridge 14 - Sideroad 21-22											210,899			
Bridges Sub Total			732,360	811,512				1,013,546			250,969	853,296		
Enhanced Levels of Service Total			114,240	116,525	118,855	121,232	123,657	199,331	203,317	207,384	211,531	215,762		
Subtotal			1,269,900	1,163,687	555,874	619,239	655,189	2,047,296	707,217	961,828	1,025,587	1,862,204		
Capital Expansion Forecast														
Mayberry Hill Phase 1 - roads					1,668,000									
Mayberry Hill Phase 2 - roads										2,196,000				
Subtotal					1,668,000					2,196,000				
Total			1,269,900	1,163,687	2,223,874	619,239	655,189	2,047,296	707,217	3,157,828	1,025,587	1,862,204		
Capital Financing														
Provincial Mill Grant - Bridge 9		345,297												
Grants and Subsidies - Gas Tax		130,000	290,736	87,239	87,239	87,239	87,239	87,239	87,239	87,239	87,239	87,239	87,239	87,239
Capital Paid from Property Taxes	43,502	126,789	127,000	127,000	127,000	127,000	127,000	127,000	127,000	127,000	127,000	127,000	127,000	127,000
Reserve Fund - Capital Reserve - Roads			67,700											
Reserve Fund - Development Charges														
Reserve Fund - Roads														
Debentures														
Reserve Fund - Bridges														
Reserves and Reserve Funds														
Growth Related Debt														
Non-Growth Related Debt														
Other - Developer Contribution					1,668,000					2,196,000				
Other - Transfer from Operating														
Annual Growth 1%														
Total Capital financing	43,502	602,086	485,436	214,239	1,882,239	214,239	214,239	214,239	214,239	2,410,239	214,239	214,239		
Total Capital Expenses less Capital Financing	-	-	784,464	949,448	341,635	405,000	440,950	1,833,057	492,978	747,589	811,348	1,647,965		



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Appendix G

Water Assets Capital Forecast

APPENDIX G

Town of Grand Valley Water Assets Capital Forecast



Appendix H
Wastewater Assets Capital Forecast

APPENDIX H

Town of Grand Valley Wastewater Assets Capital Forecast