District of Lake Country

Integrated Asset Management Capital Plan






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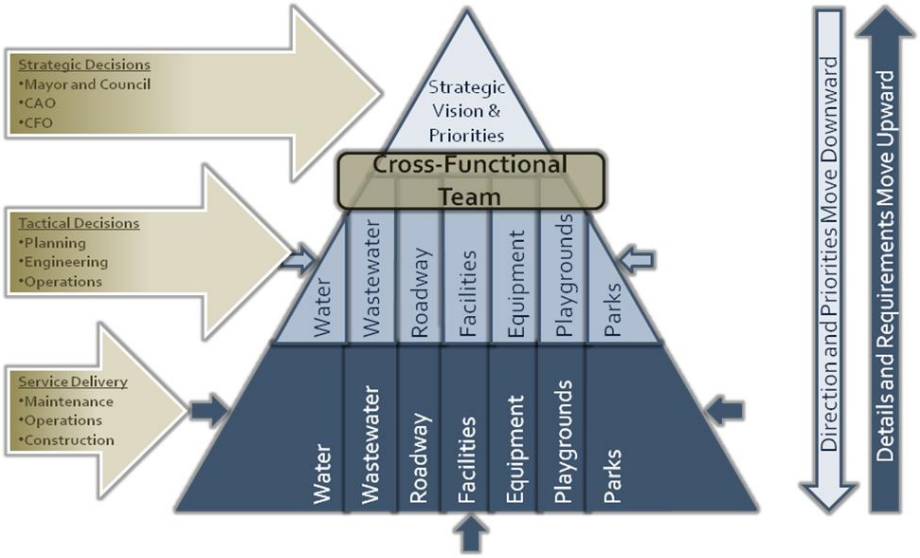
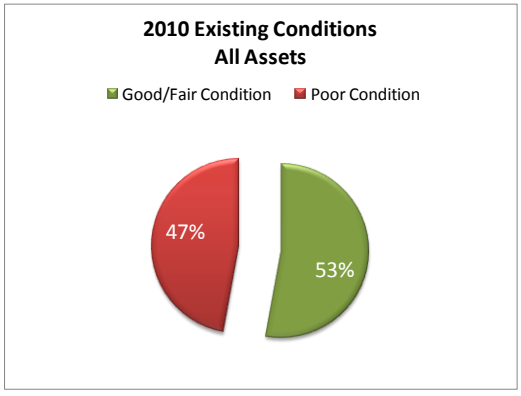
1.0 EXECUTIVE SUMMARY

Infrastructure is the framework upon which communities are built and the quality, aesthetics and supply of this infrastructure are the attributes that help a community retain and attract residents and businesses. Infrastructure is actually very powerful economic development tool, and is reflection of the people it attracts.

The District of Lake Country is responsible for providing and maintaining a wide variety of infrastructure. This infrastructure is vital to the well being of the citizens and businesses of the community. With ongoing use and the passage of time, existing infrastructure deteriorates. Much of the District's infrastructure will be reaching the end of useful life over the next few decades and will require a significant investment to maintain existing levels of service. Reinvestment in the infrastructure, which includes replacement and restoration, is required to ensure that the District's asset base is preserved and that future generations are able to enjoy the same quality of service.

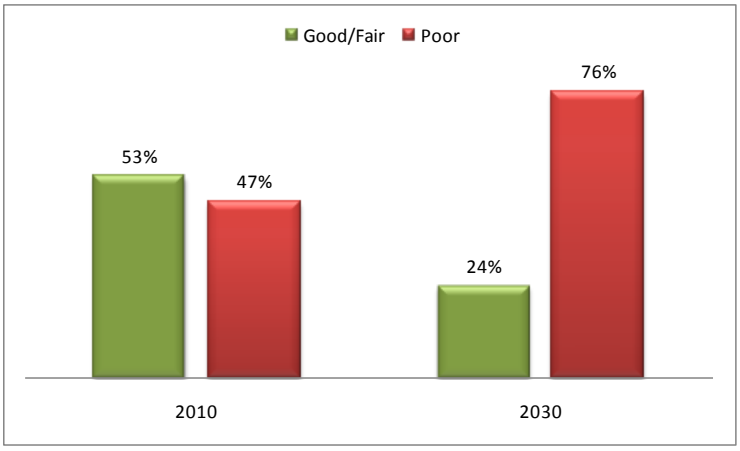


Managing infrastructure is a team sport, and an effective strategic to implementation governance (decision-making) approach enables cost effective and timely infrastructure management. As infrastructure is physical it is relatively predictable, being predictable makes long term needs and cost to be quantified. The quantification of infrastructure costs enables Mayors and Councils to have less uncertainty when trading off budgeting for their infrastructure and non-infrastructure community cost pressures.



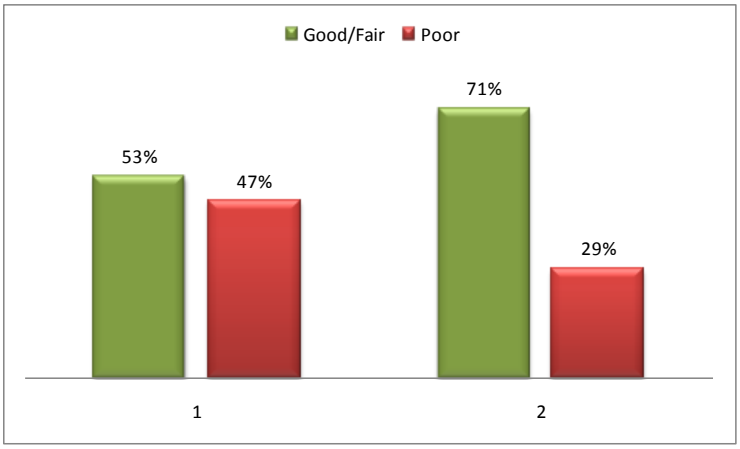
The estimated full replacement value of the District's linear and non-linear infrastructure assets is approximately $250 million (2010). This infrastructure has a remaining (deteriorated) value of approximately $135 million (2010) which is 53% of the replacement value (remaining life). The 53% remaining life represents a condition threshold of Good/Fair, the remaining 47% represents infrastructure in poor condition. Assets in poor condition are prone to failure and are typically no longer to standard, and may be unsafe to operate.

Under existing $530,000 budget level for linear assets the District's infrastructure deficit will continue to grow from $117 million to $190 million over the next 20 years. Conversely an average annual investment of $4.2 million will hold the deficit flat at $117 million however, the loss of service and performance and failure risk would remain. The ideal budget of $6.4 million will accommodate future deterioration and reduce the deficit to $72 million over the same period.



Investment in infrastructure is a one to one relationship with the infrastructure's condition, performance and risk of failure. Under the existing budget scenario the District's infrastructure in poor condition grows from 47% to 76% over the 20 year period.

While under the ideal budget scenario the poor condition drops from 47% to 29% over the same period. From a manageable perspective having 1/3 of a community's infrastructure in poor condition is reasonable; it provides for a 1/3, 1/3, 1/3 split between good, fair and poor conditions which allows for an effective transition in condition, and less budget level fluctuation.



2.0 BACKGROUND

The District of Lake Country is a rural community of approximately 11,000 residents with a population goal of reaching approximately 21,000 residents by 2030. This population growth will need to be built upon a sound and sustainable foundation of existing infrastructure that is affordable and provides service levels consistent with resident's expectations and attractive to new residents and businesses.

The integrated infrastructure asset management methodology presented and discussed in this report is aligned with the infrastructure goal in Lake Country's 2010 Draft Official Community Plan (OCP):

- **Make use of existing infrastructure to reduce environmental and financial costs of growth**.
- Emphasize infill and the intensification of land use in appropriate locations.
- Pursue a more compact, efficient and sustainable community.
- Protect and preserve the rural character of Lake Country.
- Establish Lake Country as a complete community.
- Maintain the core and nodal growth pattern in approving new development proposals.
- Grow the population of Lake Country to 21,000 people by 2030.

When it comes to the infrastructure necessary to promote and provide a community its social and economic affluence the choices are simple and the consequences of neglect or under funding are dire; a community funds the repair and replacement of its infrastructure to an adequate service and risk level, or the infrastructure continues to age until it expires (failure). This is the same infrastructure that attracts and retains residents and businesses.

This 20 year Integrated Asset Management Capital Plan (IAMCP) will provide Lake Country with its first long term multi-asset investment plan that provides community decision-makers with the information needed to better understand the level of expenditure required to maintain Lake Country's infrastructure at a sustainable level.

A good IAMCP has benefits to the community, elected officials, non-elected senior management, and line staff:

- **Makes the best use of Council's time**
- **Council, management and staff expectations are aligned**
- **Alignment of community expectations and affordable service levels and reasonable risk**
- **Value for money through least life cycle cost management and asset supply**
- **Integrated decision-making and budgeting (performance-based budgeting)**

- **Sustainable asset base to expand upon**
- **Stable organization driven by business principles rather than individual preference**
- **Healthy and focused workplace with top performers and low staff turnover**
- **Quantification of investment priorities and benefits for constituents**

2.1 IAMCP Overview

The District of Lake Country has undertaken the development of an IAMCP by August 31, 2010 so that it can be approved and used in the 2011 budgeting cycle. The IAMCP will be a high-level 20 year forecast of the expenditures required for all tangible capital asset infrastructure necessary to maintain adequate and sustainable levels of service, condition and risk. For this iteration of the IAMCP levels of age and condition were defined in consultation with the Lake Country team. Future iterations of the IAMCP should include assessments of levels of service, performance and risk. The IAMCP identifies infrastructure deficit where it exists in each asset category, and produces an improvement model that addresses deficit and regular annual repair.

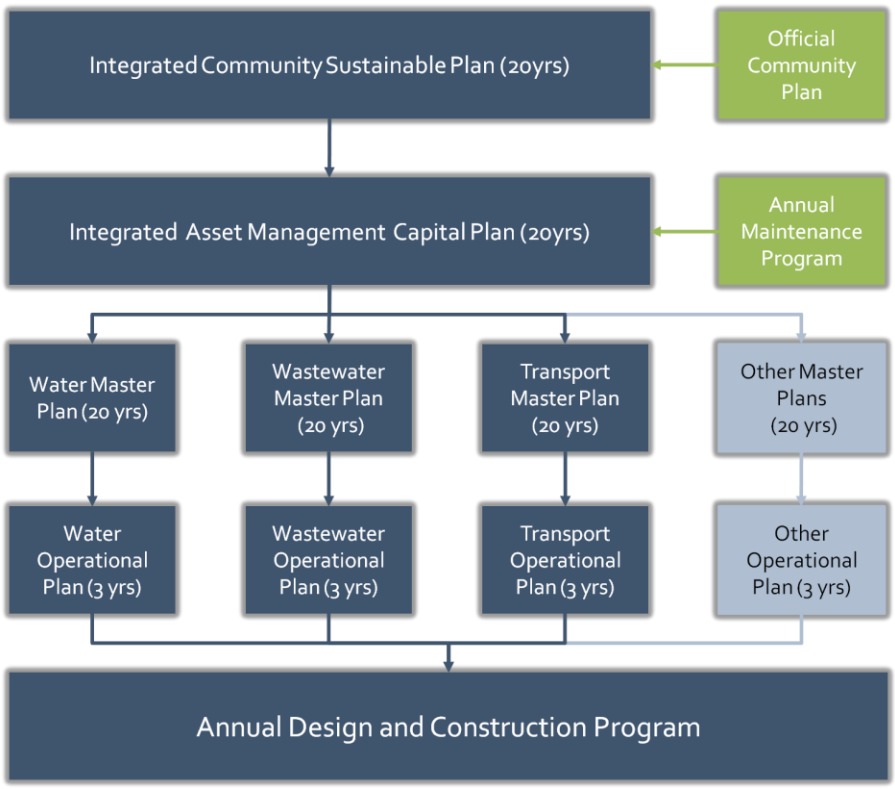


Figure 1: Lake Country Infrastructure Governance Model

This initial IAMCP will be based upon high-level costing with the expectation that future iterations will be based upon more detailed costs from associated master plans for each asset category. The IAMCP developed is both functional and transition in nature; it is based on the best detail available and can be used for budgeting purposes, and is an informative document that provides a basis for continual cross-functional teamwork and ongoing improvements with future versions. The IAMCP was designed to fit practically into Lake Country's infrastructure asset management governance (informed decision-making) process shown schematically in **Figure 1**. This governance model presents how strategic direction is relayed down; and detailed cost, timing, service levels and infrastructure supply required to meet the strategic directions are communicated back up.

2.2 Asset Management Trends

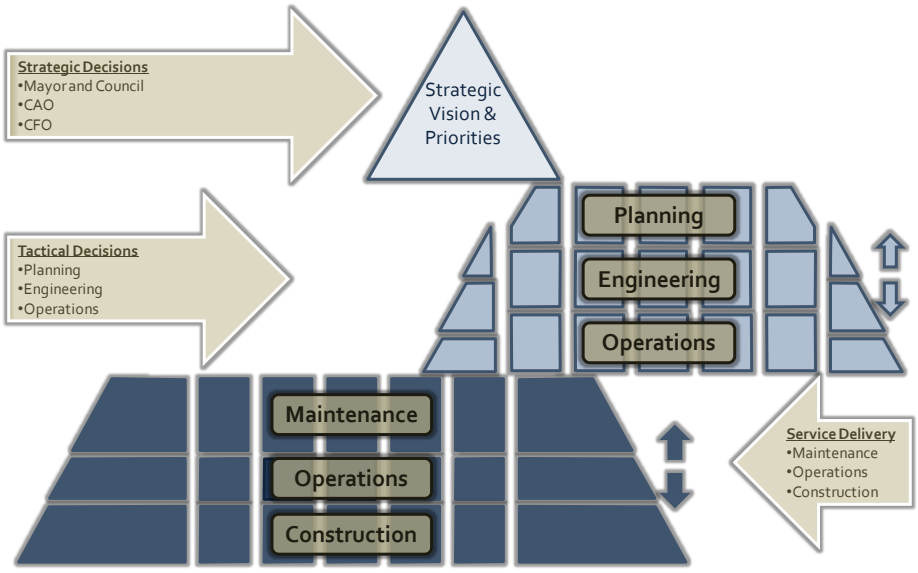


Figure 2: Governance Dislocation

Managing the supply and repair of public or private infrastructure is not new, it has been around for centuries. What is new, or relatively recent, is the growing competition for the diminishing funds available to provide the public with the cost effective, balanced and affordable levels of service that they expect and require of their preferred community. Close scrutiny appears to show that governance or decision-making became fractured and dislocated (**Figure 2**)

Over the past 20 years asset management practitioners have successfully focused on the technical components of asset management: inventories, GIS mapping, condition assessments and tangible capital asset accounting. These technical components are very good analytical components yet miss the integration and transitional building blocks necessary for communities do to make sustainable progress. The missing the integration and transitional pieces are the blueprint or framework for the successful implementation of an asset management business practice. A community needs to change or modify itself to adopt and institutionalize asset management business techniques consistently throughout its organizational structure. It is very challenging for asset management to take hold in a community when only a few functional units participate, while other functional units remain unchanged, or if the change does not enable consistent trade-off analysis across all

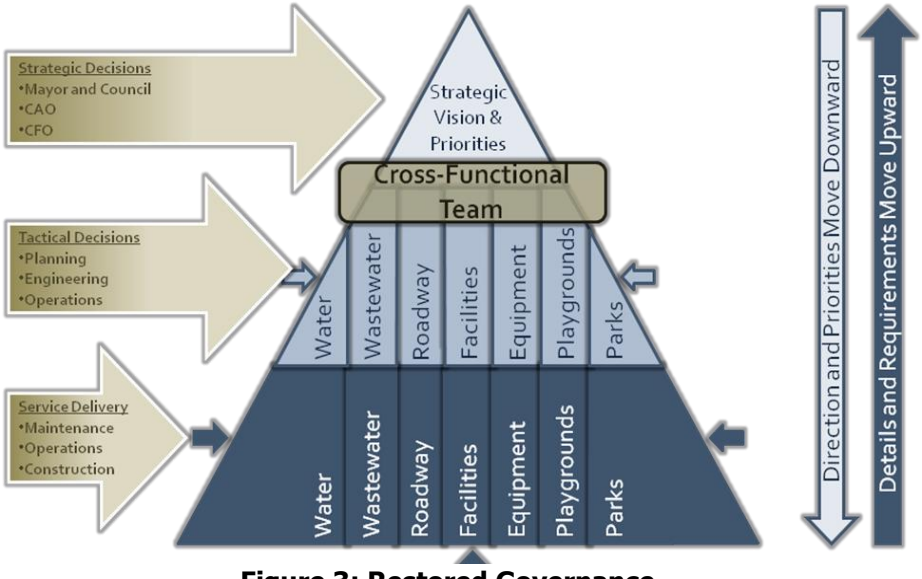


Figure 3: Restored Governance

tangible capital assets. The unchanged functional units or inconsistencies prevent overall integrated decision-making, a performance-based budgeting process, and the pursuit of incremental revenue generation strategies and practices.

Change does not have to be radical; it can be a matter of closing governance gaps (direction-setting and decision-making gaps) through cross-functional teams and long term multi-asset planning and programming (**Figure 3)**; and this is the essence of modern asset management. Change is most successful if introduced through a rallying issue or product, with early wins. For the District of Lake Country this rallying point is the IAMCP. The IAMCP is functional (can be used immediately as an early win); and transitional (common to all functional areas, provides a target format for future master plans and implementation, and enables the integration of functional areas into a team approach to decision-making.

The importance of using an IAMCP as a starting point is underscored by its prominence at the beginning of each annual cycle in setting the context and direction for the management of the community's infrastructure. The 'directional' positioning of the IAMCP up front in IAM governance also shapes the fullness of the governance framework, as well as the downstream processes and procedures. It should therefore follow that a weak or incomplete or partial IAMCP will result in a weak framework with processes and procedures that are subject to broad interpretation. Without the IAMCP there is little control over what comes out of the overall IAM governance each year. This creates an environment of uncertainty which adversely affects line staff, and prevents Councils from achieving long-term value for money under its IAM governance.

2.3 Layout of Report

This document is organized in the following sections:

- **Section 1**: Executive Summary – presents the rationale and summary of findings for senior management.
- **Section 2**: Background – discusses the origin of the project and methodology.
- **Section 3**: Investment Planning and Programming – presents the needs analysis for the IAMCP Model.
- **Section 4**: IAMCP Model – investment and deficit details and findings.
- **Section 5**: Next Steps – actions for the District to consider for future iterations of the IAMCP and overall infrastructure asset management business processes.
- **Appendix A** – deterioration tables with useful life and unit cost recommendations.

2.4 Definitions

IAMCP Model	means an un-programmed and un-funded 20 year multi-asset investment plan;
IAMCP Capital Plan	means a programmed and theoretically funded 20 year multi-asset investment plan;
Linear Asset	means infrastructure that perform utility functions and are typically used for transporting commodities, e.g. water, roadway;
Non-Linear Asset	means infrastructure that is in-situ, e.g. parks, buildings;
Existing Budget	means the District's current annual budget level for linear tangible capital assets;
Sustainable Budget	means the annual budget level required to repair and replace assets in a cost effective cycle if there was no infrastructure deficit (assumes reasonable operations and maintenance levels);
Ideal Budget	means the annual budget required to repair and replace assets in a cost effective cycle and begin reducing the infrastructure deficit (assumes reasonable operations and maintenance levels);
Infrastructure Deficit	means the backlog of work required to repair and replace assets. Infrastructure deficit increases costs with advanced structural failure, system failure, obsolescence, emergency repairs. Infrastructure deficit typically results in public complaints, e.g. roads are unsafe, roads are flooding property, roads are falling apart, the water is brown, the water smells. Infrastructure deficit could be expanded to include a shortfall of infrastructure supply for community growth;
Governance	means robust decision-making from strategy to implementation;
Replacement Cost	means the cost to repair or replace and asset in current dollars.

2.5 Methodology

To develop the IAMCP a typical infrastructure 4-Step analytical approach (**Figure 4**) was used, and where possible existing District data and information was used. This ensured that the results and recommendations that ensued were based on the best and latest information available.

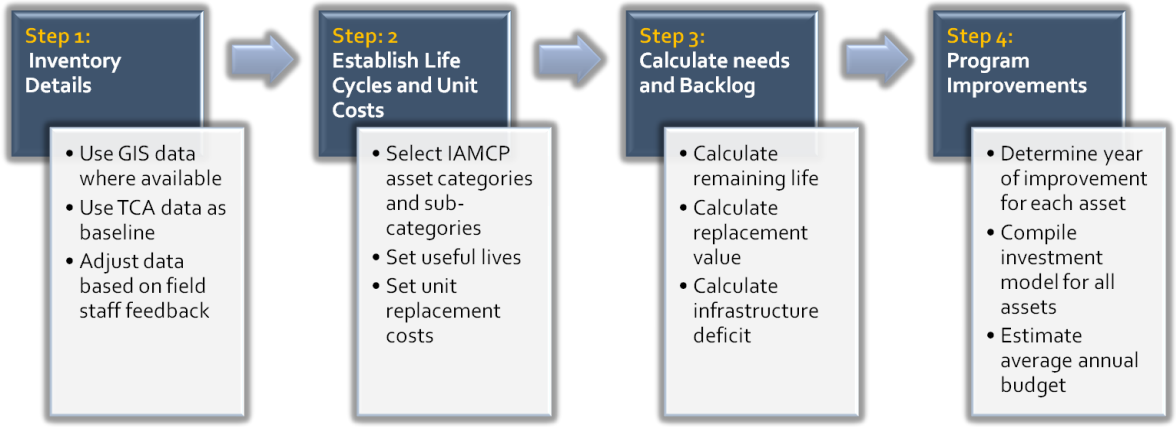


Figure 4: 4-Step IAMCP Process

Using actual District data samples the 4-Step data would appear as in **Figure 5**.

Step 1: Take Stock of Inventory

Asset Category	Asset Sub-category	Asset Project	Location	From	To	Asset Description	Surface Type	Length (km)	Road Width	Year Built	Service Life
Roadway	Collector	Lakes Phase 2	Shoreline Drive	Stillwater Way	Dead End	Surface	Hot Mix	0.18	7.5	2005	25
Roadway	Collector	Lakes Phase 2	Shoreline Drive	Stillwater Way	Dead End	Base	Hot Mix	0.18	7.5	2005	60
Roadway	Collector	Lakes Phase 1	Lake Hill Drive	Oceola Road	Stillwater Way	Surface	Hot Mix	1.36	10	2005	25
Roadway	Collector	Lakes Phase 1	Lake Hill Drive	Oceola Road	Stillwater Way	Base	Hot Mix	1.36	10	2005	60
Roadway	Collector	Lakes Phase 1	Stillwater Way	Lakehill Drive	Dead End	Surface	Hot Mix	0.33	10	2005	25
Roadway	Collector	Lakes Phase 1	Stillwater Way	Lakehill Drive	Dead End	Base	Hot Mix	0.33	10	2005	60

Step 2: Set Life Cycles and Current Costs

Description	Useful Lives	Unit Rates
Streetlights	35	$7,000.00
Dirt - Base	200	$40.00
Gravel - Base	200	$40.00
Treated - Base	200	$40.00
Treated - Surface	5	$5.00
Cold Mix - Base	40	$40.00
Cold Mix - Surface	8	$7.50
Base - Arterial	60	$52.00
Base - Collector	60	$52.00
Base - Local	80	$40.00
Hot Mix -Arterial	20	$19.50
Hot Mix -Collector	25	$19.50
Hot Mix -Local	30	$15.00

Step 3: Assess Infrastructure Backlog and Needs

Asset Sub-category	100% Replacement Value	Loss in Value	Remaining Value	Percent Remaining Life
Roads - Arterial (Paved)	$1,554,243	$1,001,704	$552,539	36%
Roads - Collector (Paved)	$23,016,360	$13,186,392	$9,829,968	43%
Roads - Local (Paved)	$32,561,744	$11,225,005	$21,336,739	66%
Roads - Gravel or Treated	$20,926,191	$10,731,492	$10,194,699	49%
Culverts	$2,583,592	$1,740,463	$843,129	33%
Sidewalks	$812,475	$99,776	$712,699	88%
Streetlights	$1,834,000	$1,310,000	$524,000	29%
Appurtenances	$3,902,927	$1,807,230	$2,095,697	54%
Totals	$87,191,532	$41,102,062	$46,089,470	49%

Step 4: Program Needs in Investment Plan

Asset Sub-category	2011	2012	2013	2014	2015	2016	2017
Roads - Arterial (Paved)	$1,393,805	$0	$0	$0	$0	$0	$0
Roads - Collector (Paved)	$18,320,969	$0	$0	$0	$0	$0	$0
Roads - Local (Paved)	$5,885,353	$132,622	$103,976	$386,158	$382,569	$136,056	$377,255
Roads - Gravel or Treated	$7,575,513	$0	$0	$0	$0	$593,893	$639,260
Culverts	$645,398	$0	$0	$0	$92,512	$0	$0
Sidewalks	$2,402	$0	$0	$0	$0	$0	$0
Streetlights	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400
Appurtenances	$1,658,782	$6,631	$5,199	$19,308	$19,128	$36,497	$50,826
Totals	$35,534,622	$191,654	$161,575	$457,866	$546,610	$818,847	$1,119,741

Figure 5: Typical 4-Step Detail

2.6 Data Relevance

An additional benefit of using the IAMCP as the rallying point for modern assert management techniques is that identifies the basic data that is required. When an organization starts its asset management business practice development at a lower level it unfortunately focuses on too much data. As a result future iterations of the asset management program become bogged down in detail or cannot afford the data streams perceived to be needed. Using the IAMCP as the starting point allows an effective assessment of what data is needed for investment planning, and what data is required for ongoing operations using the following seven criteria:

- ✓ Relevance
  - Should focus on business needs of the organization
  - Data need should not be based on what has historically been collected
- ✓ Correctness/accuracy/precision
  - 100% accurate for data of major assets for multi-year programs
  - Updated comprehensively as conditions change
- ✓ Timeliness
  - Essential to program development & budget allocation decisions
- ✓ Usability
  - Data must be packaged in understandable formats
- ✓ Accessibility
  - Ability to access the data, access improved with GIS
- ✓ Consistency
  - Adequacy of the data collected with different equipment and accuracy levels over time may not be appropriate for certain analyses
- ✓ Cost
  - Data collection, entry, storage, packaging, and delivery, which require personnel, hardware and software, and time.

2.7 Section Highlights

- The IAMCP level is an ideal starting pointing for designing and implementing an asset management business framework;
- Repairing infrastructure governance is the key to a long term sustainable asset management solution;
- Ongoing data collection is expensive and too much data can confuse the decision-making process, a test for data relevance for the asset management business framework should be conducted.

3.0 INVESTMENT PLANNING AND PROGRAMMING

3.1 Investing in Infrastructure

Sustainable capital reinvestment requires looking well beyond the 5 year period of the legislated timeframe of a typical municipal Capital Plan to appreciate the long range capital needs and upcoming financial shortcomings. This initial phase of the IAMCP considers projects that have been identified by the District over a 20 year timeframe. The emphasis has been placed on the upcoming 5 years, in which capital projects identified within this time period have been fine tuned based on the expertise and knowledge of District staff. This is the transition period as master plans are completed and the District's infrastructure base is refined. A preliminary list of capital projects beyond this period have also been identified, however this list is expected to change as additional studies, such as the currently underway District Water Master Plan, informs the IAMCP.

Identifying necessary capital reinvestments and related expenditures must be completed in a clear and logical manner which prioritizes the need for capital works and balances this with the financial resources. Through development of a meaningful, long-term capital plan the District will be better prepared to accommodate:

- Replacement of failing and aging infrastructure
- Increases in construction costs
- Anticipated government-mandated increases in level of service
- Infrastructure improvements within the fiscal parameters of the District
- Coordinated improvements by integrating infrastructure projects

The 'Center Piece' of the IAMCP is the Level 1 Detail - Investment Level summary. The Level 1 Detail is a model of the costs required for sustainable tangible capital assets over the next 20 year period, and copies are included in Section 4 and Appendix B of this report. The attributes of the Level 1 Detail include:

- It is based on very detailed information from Level 2 and 3 Detail (**Figure 6**); this provides a sound basis for credible and defensible decision making. It also demonstrates to senior and line staff the Level 1 Detail is well grounded, and helps achieve buy-in;
- It is a comprehensive tool that focuses financial and community infrastructure management discussions on all tangible capital assets;
- It encourages exploration around sustainable funding levels and funding reform; and
- It provides a basis for discussions on affordable levels of service, and the pace of community growth.

Level 1 Detail - Investment Level (Summaries all Asset Category Information)

Asset Category	100% Replacement Value	Loss in Value	Remaining Value	2011	2012	2013	2014	2015
Water Systems	$111,713,000	$69,679,521	$42,033,479	$11,432,500	$978,500	$2,500	$1,279,500	$137,500
Wastewater Systems	$22,294,031	$1,734,730	$20,559,301	$2,500	$2,500	$2,500	$2,500	$119,588
Stormwater Systems	$6,978,625	$1,895,642	$5,082,982	$148,564	$148,564	$148,564	$148,564	$148,564
Roadway Systems	$87,191,532	$41,102,062	$46,089,470	$35,534,622	$191,654	$161,575	$457,866	$546,610
Fleet	$120,762	$81,641	$39,122	$31,721	$44,078	$0	$0	$44,964
Fire & Emergency Services	$2,514,635	$1,686,130	$828,504	$683,575	$0	$323,338	$0	$188,887
Solid Waste Management	$614,055	$61,406	$552,650	$0	$0	$0	$0	$0
Parks and Recreation	$15,120,562	$729,481	$14,391,082	$2,500,000	$2,500,000	$2,500,000	$2,500,000	$2,500,000
Transit	$170,000	$6,800	$163,200	$0	$0	$0	$0	$0
Hydro	$4,067,306	$101,683	$3,965,623	$0	$0	$0	$0	$0
Environmental Protection	N/A	N/A	N/A	$50,000	$50,000	$50,000	$50,000	$50,000
Program Support Costs	N/A	N/A	N/A	$100,000	$50,000	$100,000	$0	$50,000
Totals	$250,784,507	$117,079,095	$133,705,412	$50,483,482	$3,965,296	$3,288,477	$4,438,430	$3,786,113

Level 2 Detail - Program Level (Expanded Level 1 Detail by Individual Asset Category)

Sub-category	Asset Description	Surface Type	Length	Road Width	Year Built	Service Life	100% Replacement Value	Loss in Value	Remaining Value	Percent Remaining Life	2011	2012	2013
Local (Paved)	Surface	Hot Mix	0.39	6.5	1971	40	$39,211	$38,231	$980	3%	$39,211	$0	$0
Local (Paved)	Base	Hot Mix	0.39	6.5	1971	80	$104,564	$50,975	$53,589	51%	$104,564	$0	$0
Local (Paved)	Surface	Hot Mix	0.08	6.3	1972	40	$7,796	$7,406	$390	5%	$0	$7,796	$0
Local (Paved)	Base	Hot Mix	0.08	6.3	1972	80	$20,789	$9,875	$10,914	53%	$0	$0	$0
Local (Paved)	Surface	Hot Mix	0.69	6.4	1972	40	$68,307	$64,891	$3,415	5%	$0	$68,307	$0
Local (Paved)	Base	Hot Mix	0.69	6.4	1972	80	$182,151	$86,522	$95,629	53%	$0	$0	$0
Local (Paved)	Surface	Hot Mix	0.14	6.6	1972	40	$14,292	$13,578	$715	5%	$0	$14,292	$0
Local (Paved)	Base	Hot Mix	0.14	6.6	1972	80	$38,113	$18,104	$20,009	53%	$0	$0	$0
Local (Paved)	Surface	Hot Mix	0.42	6.5	1972	40	$42,228	$40,116	$2,111	5%	$0	$42,228	$0
Local (Paved)	Base	Hot Mix	0.42	6.5	1972	80	$112,607	$53,488	$59,119	53%	$0	$0	$0
Local (Paved)	Surface	Hot Mix	0.2	6.6	1973	40	$20,418	$18,886	$1,531	8%	$0	$0	$20,418
Local (Paved)	Base	Hot Mix	0.2	6.6	1973	80	$54,447	$25,182	$29,265	54%	$0	$0	$0

Level 3 Detail - Project Level (Expanded Level 2 Detail by Individual Geo-Referenced Asset)

No Example Shown

Figure 6: Data Levels and Their Detail

3.2 Lake Country Infrastructure

The District of Lake Country is responsible for providing and maintaining a wide variety of infrastructure. This infrastructure is vital to the well being of the citizens and businesses of the community. With ongoing use and the passage of time, existing infrastructure deteriorate. Much of the District's infrastructure will be reaching the end of useful life over the next few decades and will require a significant investment to maintain existing levels of service. Reinvestment in the infrastructure, which includes replacement and restoration, is required to ensure that the District's asset base is preserved and that future generations are able to enjoy the same quality of service.

The focus of developing IAMCP was to include all of the District's tangible capital assets (**Figure 7**). Including all relevant asset categories helped illustrate the importance and benefit in presenting an infrastructure investment plan that included all capital cost pressure within the District. Future IAMCP iterations could fine-tune the non-linear asset needs information; and should consider the merit of including major or critical non-capital funding pressures.

Linear Assets	Non-Linear Assets
Water System	Fleet
Wastewater System	Fire and Emergency
Stormwater System	Solid Waste Management
Roadway System	Parks and Recreation
	Transit
	Hydro
	Environmental Protection
	Program Support Costs

Figure 7: IAMCP Asset Categories

The primary basis for the inventory used was the output from the District's PSAB 3150 - Tangible Capital Assets process. That information was supplemented by the District's GIS information and input from District Staff. Where necessary, assumptions and estimated were also used in compiling the inventory. As the IAMCP evolves over the years through future iterations, data enhancements will be available to further refine the inventory.

In order to provide an appropriate level of accuracy to the analysis of the linear asset categories, each category was divided into sub-categories (**Figure 8**). Sub-categories were based upon similar useful lives and limited to only sub-categories that were significant to an IAMCP investment planning level, e.g. manhole covers and roadway signs are not suitable stand alone sub-categories for an IAMCP exercise. The linear asset sub-categories used are shown below.

Asset Category	Sub-Category	Asset category	Sub-Category
Water System	Mains Water Supply and Pump Houses Reservoirs Dams Pressure Reducing Stations	**Roadway System**	Roads - Arterial (Paved) Roads - Collector (Paved) Roads - Local (Paved) Roads - Gravel or Treated Culvert Bridges Sidewalks Streetlights
Wastewater System	Sewers Lift Stations Treatment Plant Appurtenances	**Stormwater System**	Sewers Appurtenances

Figure 8: Asset Sub-Categories

3.3 Estimating the Replacement Value

The replacement value refers to the cost required to re-build or re-acquire the District's assets in 2010 dollars (excluding property).This information was built up using the linear asset sub-category, and the non-linear asset categories. Asset useful life estimates and unit replacement costs were compiled, reviewed and approved changes were made where appropriate based upon Western Canadian practice and affordability to the District (Appendix A). This information was then used to calculate the replacement value using the escalation values in the Engineering News Record (ENR). The ENR escalation rates were used rather than the Consumer Price Index (CPI) to more accurately represent the impacts of cost changes related to labour, materials and energy that are typically associated with infrastructure investments.

Future 20 year costs in the IAMCP model used the unit costs shown in Appendix A. In summary the ENR is was used to bring historic costs up to 2010 levels, and future costs were based upon the unit costs in Appendix A, which represent the costs Lake country is now experiencing.

Replacement costs were based upon original standards and have not been increased to accommodate for changes to standards and regulations since their original installation. Standards and regulations do change over time and typically result in incremental costs, and these changes should be determined at the master planning level. The following table (**Figure 9**) presents the calculated replacement value, loss in value and remaining value of the District's linear and non-linear infrastructure assets.

Asset Category	100% Replacement Value	Loss in Value	Remaining Value	Percent Remaining Life
Water Systems	$111,713,000	$69,679,521	$42,033,479	38%
Wastewater Systems	$22,294,031	$1,734,730	$20,559,301	92%
Stormwater Systems	$6,978,625	$1,895,642	$5,082,982	73%
Roadway Systems	$87,191,532	$41,102,062	$46,089,470	53%
Fleet	$120,762	$81,641	$39,122	32%
Fire & Emergency Services	$2,514,635	$1,686,130	$828,504	33%
Solid Waste Management	$614,055	$61,406	$552,650	90%
Parks and Recreation	$15,120,562	$729,481	$14,391,082	95%
Transit	$170,000	$6,800	$163,200	96%
Hydro	$4,067,306	$101,683	$3,965,623	98%
Total	**$250,784,507**	**$117,079,095**	**$133,705,412**	

Figure 9: Replacement Values and Remaining Life

At a current replacement value of more than $250 million, the District of Lake Country has made a substantial investment in their infrastructure however the aggregate remaining value of the District's assets is 53%. Further, the District's two major asset components (by value), the water system (45%) and roadway system (35%) together have 45% remaining value. In order to ensure that this investment is protected over time it will be critical that a proactive rehabilitation and replacement of assets be undertaken. This will require that fiscal resources be allocated towards maintaining existing levels of service, discussed in more detail in subsequent report Sections.

3.4 Predicting Improvement/Replacement Timing

For this IAMCP iteration asset useful lives were used to determine the improvement/replacement timing. Ideally condition assessments coded to actual infrastructure elements should be used to adjust asset life predictions. With future iterations of the IAMCP the District can collect condition data that can be used to correct to remaining useful life of each asset sub-category as time passes. This correction is a useful adjustment as predicted useful lives are average estimates only and are affected by items such as material quality, construction quality, soils, usage and weather. In many jurisdictions practitioners must management assets that are fully depreciated according to their tangible capital accounting methods.

3.5 Tangible Capital Asset Vs. Replacement Value

For this IAMCP exercise the tangible capital accounting (TCA) depreciation charge was not used as an annual re-investment amount as the TCA process, while a valuable exercise, is an accounting of what was spent and is not a reasonable representation of what needs to be spent in the future for the following reasons:

- TCA uses historic costs rather than current replacement costs;
- TCA does not account for fully depreciated assets (fully depreciated assets are 'off book'); and
- TCA does not account for regulatory or standard changes that have occurred over the life of the asset.

These differences result in significant variances in what level of budget is actually required to maintain a sound infrastructure asset base. These variances are shown below (**Figure 10**) with the linear assets only.

Linear Assets	2010 Management Accounting			2009 Financial Accounting (TCA)			Variance Remaining Life Less NBV
	100% Replacement Value	Loss in Value	Remaining Value	Closing Balance	Accumulated Depreciation to Dec 31, 2008	NBV at Dec 31, 2009	
Water Systems	$111,713,000	$69,679,521	$42,033,479	$23,716,651	$6,631,003	$17,085,648	$24,947,831
Wastewater Systems	$22,294,031	$1,734,730	$20,559,301	$23,918,725	$3,347,496	$20,571,229	-$11,928
Stormwater Systems	$6,978,625	$1,895,642	$5,082,982	$5,431,424	$1,247,583	$4,183,841	$899,141
Roadway Systems	$87,191,532	$41,102,062	$46,089,470	$18,803,864	$5,678,302	$13,125,562	$32,963,908
Totals	$228,177,187	$114,411,955	$113,765,232	$71,870,664	$16,904,384	$54,966,280	$58,798,952

Figure 10: Management vs. Financial Accounting

Using TCA annual depreciation charge the annual budget requirement for linear assets would be approximately $1,560,000; while using the 2010 replacement values the annual budget requirement would be approximately $3,800,000. Using the TCA annual depreciation charge as a budget level would result in an additional deficit of $45 million over the 20 year period.

TCA Annual Depreciation	$1,560,000
Annual Replacement Deterioration	$228,177,187/60 years = $3,800,000
Annual Deficit Growth	$3,800,000 - $1,560,000 = $2,240,000
20-Year Deficit Growth	$2,240,000 * 20 = $44,800,000
Current Deficit (linear assets)	$42,000,000
20-Year Total Deficit (linear assets)	$44,800,000 + $42,000,000 = $86,800,000

3.6 Section Highlights

- The importance of looking a long term infrastructure investment requirements;
- Strategic direction informs the asset management tactical processes, and data details roll up to the Level 1 Summary so the District's full capital cost pressures can be managed;
- The TCA annual depreciation is not representative of current improvement and replacement costs.

4.0 IAMCP MODEL

The IAMPC Model presents a Level 1 view of the sustainable investment scenario for the District's linear and non-linear infrastructure assets over a 20 year period (**Figure 14)**. This scenario assumes that an adequate annual operations and maintenance budget is in place to optimize asset useful lives. Reduced or inadequate O&M budget levels would reduce the useful lives and increase the unit replacement costs used. The estimated full replacement value of the District's linear and non-linear infrastructure assets is approximately $250 million (2010). This infrastructure has a remaining (deteriorated) value of approximately $135 million (2010) which is 53% (**Figure 11**) of the replacement value (remaining life). The remaining life represents a condition level of Good to Fair. As discussed previously the District's two major asset components (by value), the water system (45%) and roadway system (35%) together have 45% remaining life. This low percentage of remaining life shows that there are infrastructure deficits (repair backlog) in both the water and roadway systems. Symptoms of this should also be found in the number and focus of resident complaints. These deficits are discussed in the following sub-sections that deal with the individual asset categories. As an example, without changes to the current re-investment budget level in the roadway system the percent remaining life of the roadway system (also 53%) will drop from 53% to 27% over the next 20 years (**Figure 12)**. Based on the IAMCP Level 1 Model the uniform average annual budget required to reduce the deficit and address future deterioration is approximately $6.5 million:

- Tax-based = $2.9 million; and
- Rate-based = $3.6 million.

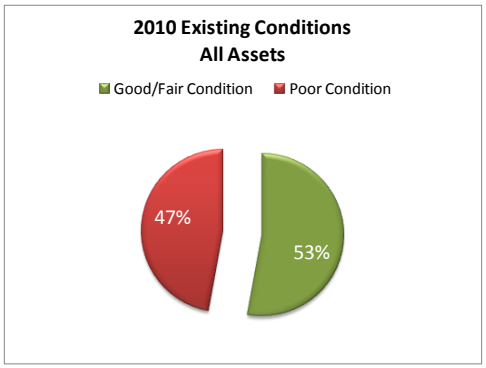


Figure 11: 2010 Existing Conditions

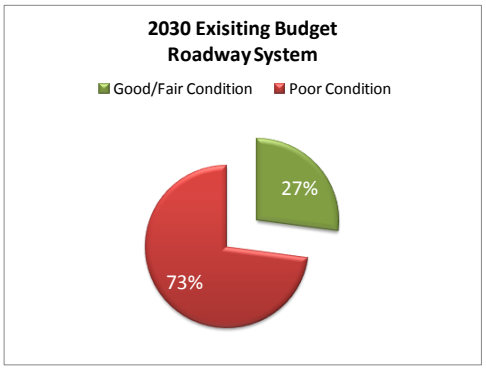


Figure 12: 2030 Roadway - Existing Budget

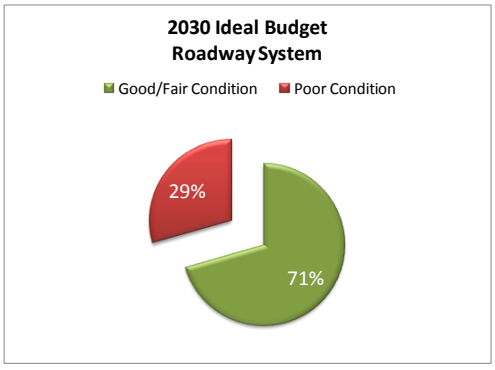


Figure 13: 2030 Roadway - Ideal Budget

Using the roadway system as an example, increasing the roadway budget to the sustainable level results in a growth in the remaining life from 53% to 71% over the next twenty years (**Figure 13)**.

District of Lake Country
Integrated Asset Management Model
Sustainable Infrastructure Scenario

Asset Category	2010 100% Replacement Value	2010 Loss in Value	2010 Remaining Value	2010 Percent Remaining Life	Investment Year (2010 Dollars) 2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	20 Year Total	Average Annual Investment
Water Systems																										
Mains	$87,428,000	$54,449,000	$32,979,000	38%	$0	$976,000	$0	$1,277,000	$135,000	$6,000	$264,000	$0	$0	$0	$0	$0	$0	$0	$4,849,000	$10,867,000	$41,206,000	$0	$0	$0	**$59,580,000**	**$2,979,000**
Water Supply and Pump Houses	$7,890,000	$7,746,000	$144,000	2%	$7,730,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$7,730,000**	**$386,500**
Reservoirs	$12,035,000	$3,542,188	$8,492,813	71%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**	**$0**
Dams	$400,000	$225,000	$175,000	44%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**	**$0**
Pressure Reducing Stations	$3,960,000	$3,717,333	$242,667	6%	$3,700,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$3,700,000**	**$185,000**
SCADA	TBD	TBD	TBD	TBD	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	**$50,000**	**$2,500**
Sub-total Water	**$111,713,000**	**$69,679,521**	**$42,033,479**	**38%**	**$11,432,500**	**$978,500**	**$2,500**	**$1,279,500**	**$137,500**	**$8,500**	**$266,500**	**$2,500**	**$2,500**	**$2,500**	**$2,500**	**$2,500**	**$2,500**	**$2,500**	**$4,851,500**	**$10,869,500**	**$41,208,500**	**$2,500**	**$2,500**	**$2,500**	**$71,060,000**	**$3,553,000**
					$3,553,000	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**		
					Average Annual Budget Required																					
Wastewater Systems																										
Sewers	$13,191,916	$2,785	$13,189,131	100%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**	**$0**
Lift Stations	$3,148,934	$819,346	$2,329,588	74%	$0	$0	$0	$0	$99,222	$0	$199,393	$0	$0	$0	$0	$0	$0	$1,010,019	$0	$0	$0	$0	$0	$106,818	**$1,415,451**	**$70,773**
Treatment Plant	$5,532,413	$828,051	$4,704,362	85%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**	**$0**
SCADA	TBD	TBD	TBD	TBD	2500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	**$50,000**	**$2,500**
Appurtenances	$420,768	$84,548	$336,220	80%	$0	$0	$0	$0	$17,866	$0	$0	$0	$0	$10,209	$0	$0	$2,552	$5,105	$12,762	$0	$0	$0	$2,552	$40,837	**$91,883**	**$4,594**
Sub-total Wastewater	**$22,294,031**	**$1,734,730**	**$20,559,301**	**92%**	**$2,500**	**$2,500**	**$2,500**	**$2,500**	**$119,588**	**$2,500**	**$201,893**	**$2,500**	**$2,500**	**$12,709**	**$2,500**	**$5,052**	**$1,017,624**	**$15,262**	**$2,500**	**$2,500**	**$2,500**	**$5,052**	**$43,337**	**$109,318**	**$1,557,334**	**$77,867**
					$77,867	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**		
					Average Annual Budget Required																					
Stormwater Systems																										
Sewers	$5,235,357	$1,581,012	$3,654,345	70%	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	$114,178	**$2,283,559**	**$114,178**
Appurtenances	$1,743,268	$314,631	$1,428,637	82%	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	$34,387	**$687,735**	**$34,387**
Sub-total Stormwater	**$6,978,625**	**$1,895,642**	**$5,082,982**	**73%**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$2,971,286**	**$148,564**
					$148,564	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**		
					Average Annual Budget Required																					
Roadway Systems																										
Roads - Arterial (Paved)	$1,554,243	$1,001,704	$552,539	36%	$1,393,805	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$43,756	$0	$0	$0	**$1,437,561**	**$71,878**
Roads - Collector (Paved)	$23,016,360	$13,186,392	$9,829,968	43%	$18,320,969	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$410,713	**$18,731,682**	**$936,584**
Roads - Local (Paved)	$32,561,744	$11,225,005	$21,336,739	66%	$5,885,353	$132,622	$103,976	$386,158	$382,569	$136,056	$377,255	$16,783	$242,321	$148,415	$469,391	$52,900	$123,156	$102,151	$0	$659,524	$0	$0	$0	$0	**$9,218,631**	**$460,932**
Roads - Gravel or Treated	$20,926,191	$10,731,492	$10,194,699	49%	$7,575,513	$0	$0	$0	$0	$593,893	$639,260	$75,896	$0	$0	$1,223,161	$0	$0	$0	$0	$58,820	$0	$8,910	$0	$0	**$10,175,453**	**$508,773**
Culverts	$2,583,592	$1,740,463	$843,129	33%	$645,398	$0	$0	$0	$92,512	$0	$0	$0	$1,031,157	$0	$0	$0	$0	$0	$0	$0	$122,003	$0	$0	$0	**$1,891,070**	**$94,554**
Sidewalks	$812,475	$99,776	$712,699	88%	$2,402	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$2,402**	**$120**
Streetlights	$1,834,000	$1,310,000	$524,000	29%	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	$52,400	**$1,048,000**	**$52,400**
Appurtenances	$3,902,927	$1,807,230	$2,095,697	54%	$1,658,782	$6,631	$5,199	$19,308	$19,128	$36,497	$50,826	$4,634	$12,116	$7,421	$84,628	$2,645	$6,158	$5,108	$0	$35,917	$2,188	$445	$0	$20,536	**$1,978,166**	**$98,908**
Sub-total Roadway	**$87,191,532**	**$41,102,062**	**$46,089,470**	**53%**	**$35,534,622**	**$191,654**	**$161,575**	**$457,866**	**$546,610**	**$818,847**	**$1,119,741**	**$149,713**	**$1,337,994**	**$208,236**	**$1,829,580**	**$107,946**	**$181,714**	**$159,658**	**$52,400**	**$806,660**	**$220,347**	**$61,755**	**$52,400**	**$483,649**	**$44,482,965**	**$2,224,148**
					$2,224,148	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**		
					Average Annual Budget Required																					
Fleet																										
Trucks	$120,762	$81,641	$39,122	32%	$31,721	$44,078	$0	$0	$44,964	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$120,762**	**$6,038**
Sub-total Fleet	**$120,762**	**$81,641**	**$39,122**	**32%**	**$31,721**	**$44,078**	**$0**	**$0**	**$44,964**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$120,762**	**$6,038**
					$6,038	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**		
					Average Annual Budget Required																					
Fire & Emergency Services																										
Buildings	$662,100	$413,813	$248,288	38%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**	**$0**
Trucks	$1,852,535	$1,272,318	$580,217	31%	$683,575	$0	$323,338	$0	$188,887	$0	$0	$0	$0	$371,699	$0	$0	$285,035	$0	$0	$0	$0	$0	$0	$0	**$1,852,535**	**$92,627**
Sub-total Fire & Emergency	**$2,514,635**	**$1,686,130**	**$828,504**	**33%**	**$683,575**	**$0**	**$323,338**	**$0**	**$188,887**	**$0**	**$0**	**$0**	**$371,699**	**$0**	**$0**	**$285,035**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$1,852,535**	**$92,627**
					$92,627	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**		
					Average Annual Budget Required																					
Solid Waste Management																										
Carts	$614,055	$61,406	$552,650	90%	$0	$0	$0	$0	$0	$0	$0	$0	$614,055	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$614,055**	**$30,703**
Sub-total Solid Waste	**$614,055**	**$61,406**	**$552,650**	**90%**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$614,055**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$614,055**	**$30,703**
					$30,703	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**		
					Average Annual Budget Required																					
Parks and Recreation																										
TBD	$15,120,562	$729,481	$14,391,082	95%	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	**$2,500,000**	**$125,000**
Sub-total Parks	**$15,120,562**	**$729,481**	**$14,391,082**	**95%**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$2,500,000**	**$125,000**
					$125,000	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**		
					Average Annual Budget Required																					
Transit																										
Bus Shelters	$170,000	$6,800	$163,200	96%	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	$8,500	**$170,000**	**$8,500**
Sub-total Transit	**$170,000**	**$6,800**	**$163,200**	**96%**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$170,000**	**$8,500**
					$8,500	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**		
					Average Annual Budget Required																					
Hydro																										
Generation Plant	$4,067,306	$101,683	$3,965,623	98%	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	**$2,000,000**	**$100,000**
Sub-total Hydro	**$4,067,306**	**$101,683**	**$3,965,623**	**98%**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$2,000,000**	**$100,000**
					$100,000	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**		
					Average Annual Budget Required																					
Environmental Protection																										
Fire	N/A	N/A	N/A	N/A	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	**$500,000**	**$25,000**
Pine Beetle Control	N/A	N/A	N/A	N/A	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	**$500,000**	**$25,000**
Sub-total Environmental	**$0**	**$0**	**$0**		**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$1,000,000**	**$50,000**
					$50,000	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**		
					Average Annual Budget Required																					
Total Infrastructure	**$250,784,507**	**$127,079,095**	**$133,705,412**	**53%**	**$48,116,982**	**$1,648,796**	**$921,977**	**$2,171,930**	**$1,469,613**	**$1,261,911**	**$2,020,198**	**$586,777**	**$2,760,813**	**$655,510**	**$2,266,644**	**$832,597**	**$1,633,902**	**$609,484**	**$5,338,464**	**$12,110,725**	**$41,863,411**	**$501,372**	**$530,301**	**$1,027,531**	**$128,328,937**	**$6,416,447**
					$6,416,447	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**	**$6,415,447**	**$6,416,447**	**$6,416,447**	**$6,416,447**		
					Average Annual Budget Required																					
Program Support Costs																										
Asset Management Support	N/A	N/A	N/A	N/A	$50,000	$50,000	$50,000	$0	$0	$0	$0	$0	$0	$50,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$200,000**	**$10,000**
Infrastrurture Inspections	N/A	N/A	N/A	N/A	$50,000	$0	$50,000	$0	$50,000	$0	$50,000	$0	$50,000	$0	$50,000	$0	$50,000	$0	$50,000	$0	$50,000	$0	$50,000	$0	**$500,000**	**$25,000**
Sub-total Program Support					**$100,000**	**$50,000**	**$100,000**	**$0**	**$50,000**	**$0**	**$50,000**	**$0**	**$50,000**	**$50,000**	**$50,000**	**$0**	**$50,000**	**$0**	**$50,000**	**$0**	**$50,000**	**$0**	**$50,000**	**$0**	**$700,000**	**$35,000**
Total Average Annual Budget					**$6,516,447**	**$6,466,447**	**$6,516,447**	**$6,416,447**	**$6,466,447**	**$6,416,447**	**$6,466,447**	**$6,416,447**	**$6,466,447**	**$6,466,447**	**$6,466,447**	**$6,416,447**	**$6,466,447**	**$6,416,447**	**$6,466,447**	**$6,416,447**	**$6,466,447**	**$6,416,447**	**$6,466,447**	**$6,416,447**	**$6,466,447**	**$6,416,447**	
Tax-based					$2,854,877	$2,804,877	$2,854,877	$2,754,877	$2,804,877	$2,754,877	$2,804,877	$2,754,877	$2,804,877	$2,804,877	$2,804,877	$2,754,877	$2,804,877	$2,754,877	$2,804,877	$2,754,877	$2,804,877	$2,754,877	$2,804,877	$2,754,877	$2,804,877	$2,754,877	
Rate-based					$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	$3,630,867	

Figure 14: IAMCP Model

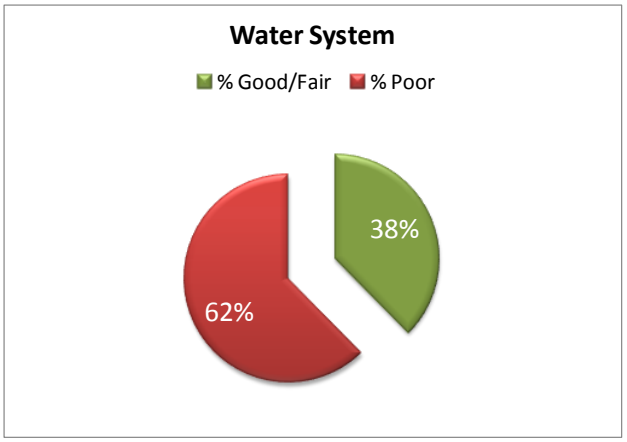
4.1 Water System Investment Requirements

The following figure shows a sub-set of the water system information provided in **Figure** .

Asset Category	2010				Investment Year (2010 Dollars)						
	100% Replacement Value	Loss in Value	Remaining Value	Percent Remaining Life	2011	2015	2020	2025	2030	20 Year Total	Average Annual Investment
Water Systems											
Mains	$87,428,000	$54,449,000	$32,979,000	38%	$0	$135,000	$0	$4,849,000	$0	**$59,580,000**	**$2,979,000**
Water Supply and Pump Hou	$7,890,000	$7,746,000	$144,000	2%	$7,730,000	$0	$0	$0	$0	**$7,730,000**	**$386,500**
Reservoirs	$12,035,000	$3,542,188	$8,492,813	71%	$0	$0	$0	$0	$0	**$0**	**$0**
Dams	$400,000	$225,000	$175,000	44%	$0	$0	$0	$0	$0	**$0**	**$0**
Pressure Reducing Stations	$3,960,000	$3,717,333	$242,667	6%	$3,700,000	$0	$0	$0	$0	**$3,700,000**	**$185,000**
SCADA	TBD	TBD	TBD	TBD	$2,500	$2,500	$2,500	$2,500	$2,500	**$50,000**	**$2,500**
Sub-total Water	**$111,713,000**	**$69,679,521**	**$42,033,479**	**38%**	**$11,432,500**	**$137,500**	**$2,500**	**$4,851,500**	**$2,500**	**$71,060,000**	**$3,553,000**
	Average Annual Budget Required				**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**	**$3,553,000**		

Summary Information:

2010 Replacement Value	$111,715,000
Loss in Value	$69,680,000
Remaining Value	$42,035,000
Approximate Deficit (Backlog)	$11,000,000
Percent Good to Fair condition	38%
Percent Poor Condition	62%
20 Year Total Investment	$71,100,000
Average Annual Budget Required	$3,550,000



Anomalies:

- Based upon a remaining life 38% the water system assets are in critical condition, a prefer range of remaining life (good/fair condition) would be approximately 67%.
- Due to the similar ages of the infrastructure there are significant investments required around years 2026 and 2027 that will need to be spread out and funded.
- Due to the length of the useful life of water system assets the average annual budget requirements of $3.6 million should reduce if investment is spread over 30 to 40 years.

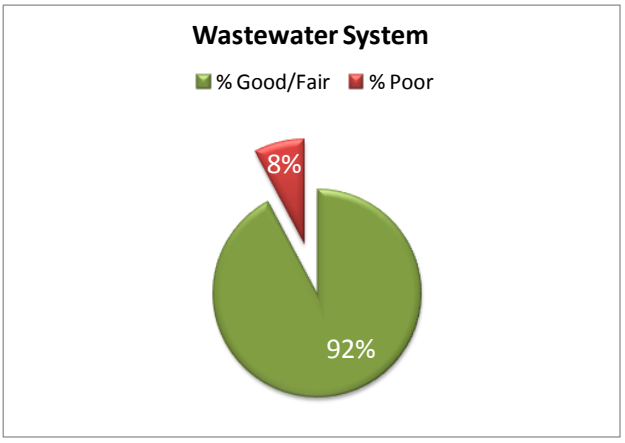
4.2 Wastewater System Investment Requirements

The following figure shows a sub-set of the wastewater system information provided in **Figure** .

Asset Category	2010				Investment Year (2010 Dollars)						
	100% Replacement Value	Loss in Value	Remaining Value	Percent Remaining Life	2011	2015	2020	2025	2030	20 Year Total	Average Annual Investment
Wastewater Systems											
Sewers	$13,191,916	$2,785	$13,189,131	100%	$0	$0	$0	$0	$0	**$0**	**$0**
Lift Stations	$3,148,934	$819,346	$2,329,588	74%	$0	$99,222	$0	$0	$106,818	**$1,415,451**	**$70,773**
Treatment Plant	$5,532,413	$828,051	$4,704,362	85%	$0	$0	$0	$0	$0	**$0**	**$0**
SCADA	TBD	TBD	TBD	TBD	2500	$2,500	$2,500	$2,500	$2,500	**$50,000**	**$2,500**
Appurtenances	$420,768	$84,548	$336,220	80%	$0	$17,866	$10,209	$0	$0	**$91,883**	**$4,594**
Sub-total Wastewater	**$22,294,031**	**$1,734,730**	**$20,559,301**	**92%**	**$2,500**	**$119,588**	**$12,709**	**$2,500**	**$109,318**	$1,557,334	$77,867
	Average Annual Budget Required				**$77,867**	**$77,867**	**$77,867**	**$77,867**	**$77,867**		

Summary Information:

2010 Replacement Value	$22,300,0
Loss in Value	$1,735,000
Remaining Value	$20,565,000
Approximate Deficit (Backlog)	$0
Percent Good to Fair condition	92%
Percent Poor Condition	8%
20 Year Total Investment	$1,560,000
Average Annual Budget Required	$77,900



Anomalies:

- The wastewater system shows a remaining life of 92% and is in good condition. This is probably due to recent construction.
- No significant anomalies.

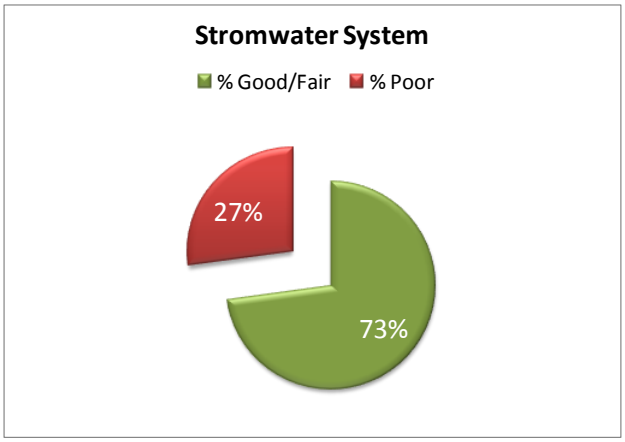
4.3 Stormwater System Investment Requirements

The following figure shows a sub-set of the stormwater system information provided in **Figure 14**.

	2010				Investment Year (2010 Dollars)						
Asset Category	100% Replacement Value	Loss in Value	Remaining Value	Percent Remaining Life	2011	2015	2020	2025	2030	20 Year Total	Average Annual Investment
Stormwater Systems											
Sewers	$5,235,357	$1,581,012	$3,654,345	70%	$114,178	$114,178	$114,178	$114,178	$114,178	**$2,283,550**	**$114,178**
Appurtenances	$1,743,268	$314,631	$1,428,637	82%	$34,387	$34,387	$34,387	$34,387	$34,387	**$687,735**	**$34,387**
Sub-total Stormwater	**$6,978,625**	**$1,895,642**	**$5,082,982**	**73%**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**	$2,971,286	$148,564
	Average Annual Budget Required				**$148,564**	**$148,564**	**$148,564**	**$148,564**	**$148,564**		

Summary Information:

2010 Replacement Value	$6,980,000
Loss in Value	$1,895,000
Remaining Value	$5,085,000
Approximate Deficit (Backlog)	$0
Percent Good to Fair condition	73%
Percent Poor Condition	27%
20 Year Total Investment	$2,970,000
Average Annual Budget Required	$148,500



Anomalies:

- The known inventory of the stormwater system shows a remaining life of 73% and is in good condition. However the data gaps in stormwater are associated with older inventory; this missing inventory is considered to be in poor condition and failing.
- No significant anomalies other than data set being incomplete.

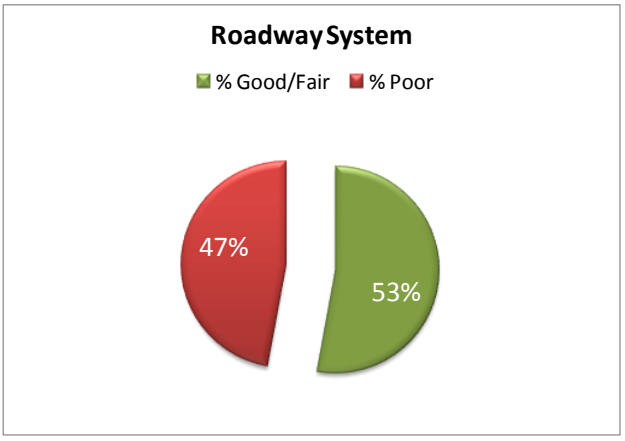
4.4 Roadway System Investment Requirements

The following figure shows a sub-set of the roadway system information provided in **Figure 14**.

Asset Category	2010				Investment Year (2010 Dollars)						
	100% Replacement Value	Loss in Value	Remaining Value	Percent Remaining Life	2011	2015	2020	2025	2030	20 Year Total	Average Annual Investment
Roadway Systems											
Roads - Arterial (Paved)	$1,554,243	$1,001,704	$552,539	36%	$1,393,805	$0	$0	$0	$0	**$1,437,561**	**$71,878**
Roads - Collector (Paved)	$23,016,360	$13,186,392	$9,829,968	43%	$18,320,969	$0	$0	$0	$410,713	**$18,731,682**	**$936,584**
Roads - Local (Paved)	$32,561,744	$11,225,005	$21,336,739	66%	$5,885,353	$382,569	$148,415	$0	$0	**$9,218,631**	**$460,932**
Roads - Gravel or Treated	$20,926,191	$10,731,492	$10,194,699	49%	$7,575,513	$0	$0	$0	$0	**$10,175,453**	**$508,773**
Culverts	$2,583,592	$1,740,463	$843,129	33%	$645,398	$92,512	$0	$0	$0	**$1,891,070**	**$94,554**
Sidewalks	$812,475	$99,776	$712,699	88%	$2,402	$0	$0	$0	$0	**$2,402**	**$120**
Streetlights	$1,834,000	$1,310,000	$524,000	29%	$52,400	$52,400	$52,400	$52,400	$52,400	**$1,048,000**	**$52,400**
Appurtenances	$3,902,927	$1,807,230	$2,095,697	54%	$1,658,782	$19,128	$7,421	$0	$20,536	**$1,978,166**	**$98,908**
Sub-total Roadway	**$87,191,532**	**$41,102,062**	**$46,089,470**	**53%**	**$35,534,622**	**$546,610**	**$208,236**	**$52,400**	**$483,649**	**$44,482,965**	**$2,224,148**
	Average Annual Budget Required				**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**	**$2,224,148**		

Summary Information:

2010 Replacement Value	$87,190,000
Loss in Value	$41,100,000
Remaining Value	$46,090,000
Approximate Deficit (Backlog)	35,000,000
Percent Good to Fair condition	53%
Percent Poor Condition	47%
20 Year Total Investment	$44,480,000
Average Annual Budget Required	$2,225,000



Anomalies:

- The remaining life of the system assets is nearing critical.
- The deficit (backlog) of work is approximately $35,000,000. This is a significant deficit that will continue to increase repair costs as structural failure continues.
- Deficit amount will likely result in reconstruction rather than re-surfacing. Re-surfacing over poor or damaged based will reduce the useful life of the re-surfacing.

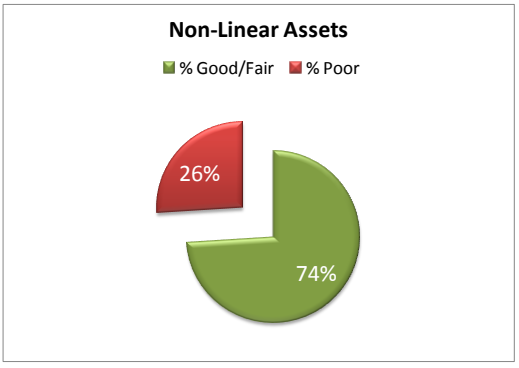
4.5 Non-Linear Asset Investment Requirements

The following figure shows a sub-set of the non-linear asset information provided in **Figure 14**.

	2010				Investment Year (2010 Dollars)						
Asset Category	100% Replacement Value	Loss in Value	Remaining Value	Percent Remaining Life	2011	2015	2020	2025	2030	20 Year Total	Average Annual Investment
Fleet											
Trucks	$120,762	$81,641	$39,122	32%	$31,721	$44,964	$0	$0	$0	**$120,762**	**$6,038**
Sub-total Fleet	**$120,762**	**$81,641**	**$39,122**	**32%**	**$31,721**	**$44,964**	**$0**	**$0**	**$0**	$120,762	$6,038
	Average Annual Budget Required				**$6,038**	**$6,038**	**$6,038**	**$6,038**	**$6,038**		
Fire & Emergency Services											
Buildings	$662,100	$413,813	$248,288	38%	$0	$0	$0	$0	$0	**$0**	**$0**
Trucks	$1,852,535	$1,272,318	$580,217	31%	$683,575	$188,887	$0	$0	$0	**$1,852,535**	**$92,627**
Sub-total Fire & Emergency	**$2,514,635**	**$1,686,130**	**$828,504**	**33%**	**$683,575**	**$188,887**	**$0**	**$0**	**$0**	$1,852,535	$92,627
	Average Annual Budget Required				**$92,627**	**$92,627**	**$92,627**	**$92,627**	**$92,627**		
Solid Waste Management											
Carts	$614,055	$61,406	$552,650	90%	$0	$0	$0	$0	$0	**$614,055**	**$30,703**
Sub-total Solid Waste	**$614,055**	**$61,406**	**$552,650**	**90%**	**$0**	**$0**	**$0**	**$0**	**$0**	$614,055	$30,703
	Average Annual Budget Required				**$30,703**	**$30,703**	**$30,703**	**$30,703**	**$30,703**		
Parks and Recreation											
TBD	$15,120,562	$729,481	$14,391,082	95%	$125,000	$125,000	$125,000	$125,000	$125,000	**$2,500,000**	**$125,000**
Sub-total Parks	**$15,120,562**	**$729,481**	**$14,391,082**	**95%**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**	$2,500,000	$125,000
	Average Annual Budget Required				**$125,000**	**$125,000**	**$125,000**	**$125,000**	**$125,000**		
Transit											
Bus Shelters	$170,000	$6,800	$163,200	96%	$8,500	$8,500	$8,500	$8,500	$8,500	**$170,000**	**$8,500**
Sub-total Transit	**$170,000**	**$6,800**	**$163,200**	**96%**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**	$170,000	$8,500
	Average Annual Budget Required				**$8,500**	**$8,500**	**$8,500**	**$8,500**	**$8,500**		
Hydro											
Generation Plant	$4,067,306	$101,683	$3,965,623	98%	$100,000	$100,000	$100,000	$100,000	$100,000	**$2,000,000**	**$100,000**
Sub-total Hydro	**$4,067,306**	**$101,683**	**$3,965,623**	**98%**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	$2,000,000	$100,000
	Average Annual Budget Required				**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**		
Environmental Protection											
Fire	N/A	N/A	N/A	N/A	$25,000	$25,000	$25,000	$25,000	$25,000	**$500,000**	**$25,000**
Pine Beetle Control	N/A	N/A	N/A	N/A	$25,000	$25,000	$25,000	$25,000	$25,000	**$500,000**	**$25,000**
Sub-total Environmental	**$0**	**$0**	**$0**		**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	$1,000,000	$50,000
	Average Annual Budget Required				**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**		
Program Support Costs											
Asset Management Support	N/A	N/A	N/A	N/A	$50,000	$0	$50,000	$0	$0	**$200,000**	**$10,000**
Infrastrurture Inspections	N/A	N/A	N/A	N/A	$50,000	$50,000	$0	$50,000	$0	**$500,000**	**$25,000**
Sub-total Program Support					**$100,000**	**$50,000**	**$50,000**	**$50,000**	**$0**	$700,000	$35,000

Summary Information:

2010 Replacement Value	$22,600,000
Loss in Value	$2,670,000
Remaining Value	$19,930000
Approximate Deficit (Backlog)	$0
Percent Good to Fair condition	88%
Percent Poor Condition	12%
20 Year Total Investment	$8,960,000
Average Annual Budget Required	$450,000



Anomalies:

- No significant anomalies. Non-linear assets values should be re-confirmed in future IAMCP iterations.

4.6 Investment Summary

Figure 10 shows how the existing budget level continues to fall short of a sustainable infrastructure investment level, and the deficit continues to grow from $117 million to $190 million. The blue line in the chart shows the un-programmed investment requirement for the sustainable infrastructure scenario. The green dashed line represents the uniform average annual sustainable budget scenario.

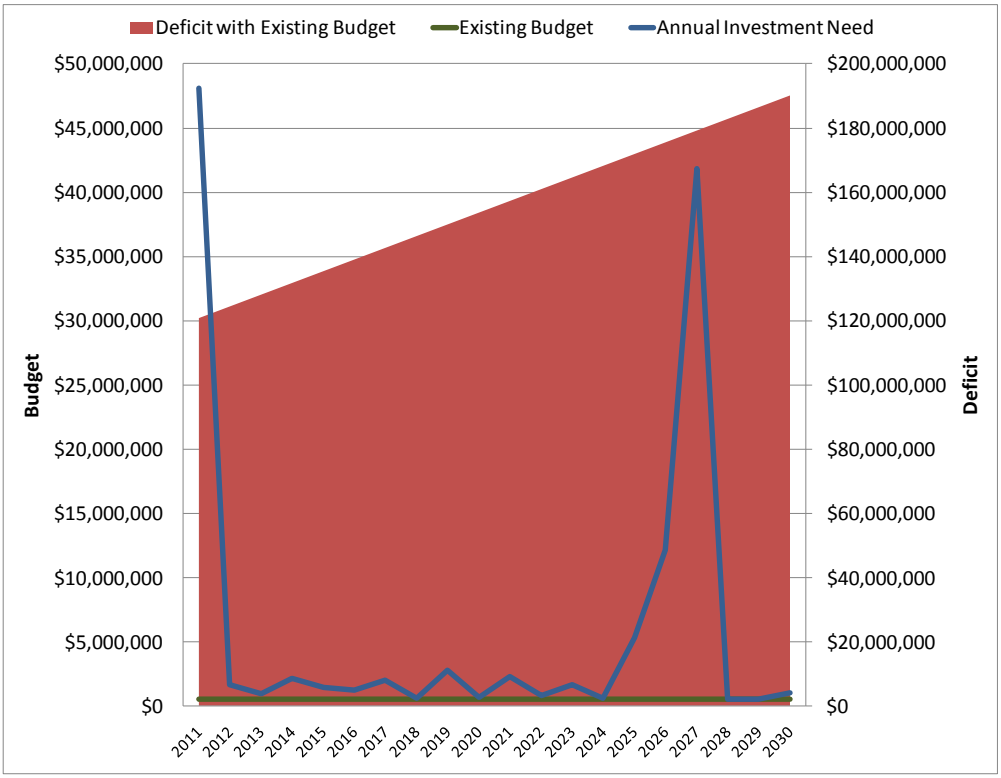


Figure 10: Existing Budget and Deficit

Conversely an average annual investment of $4.2 million **(Figure6**) would hold the deficit flat at $117 million however, the loss of service and performance and failure risk would remain. The ideal budget of $6.4 million (shown in **Figure 7)** would accommodate future deterioration and reduce the deficit to $72 million over the same period.

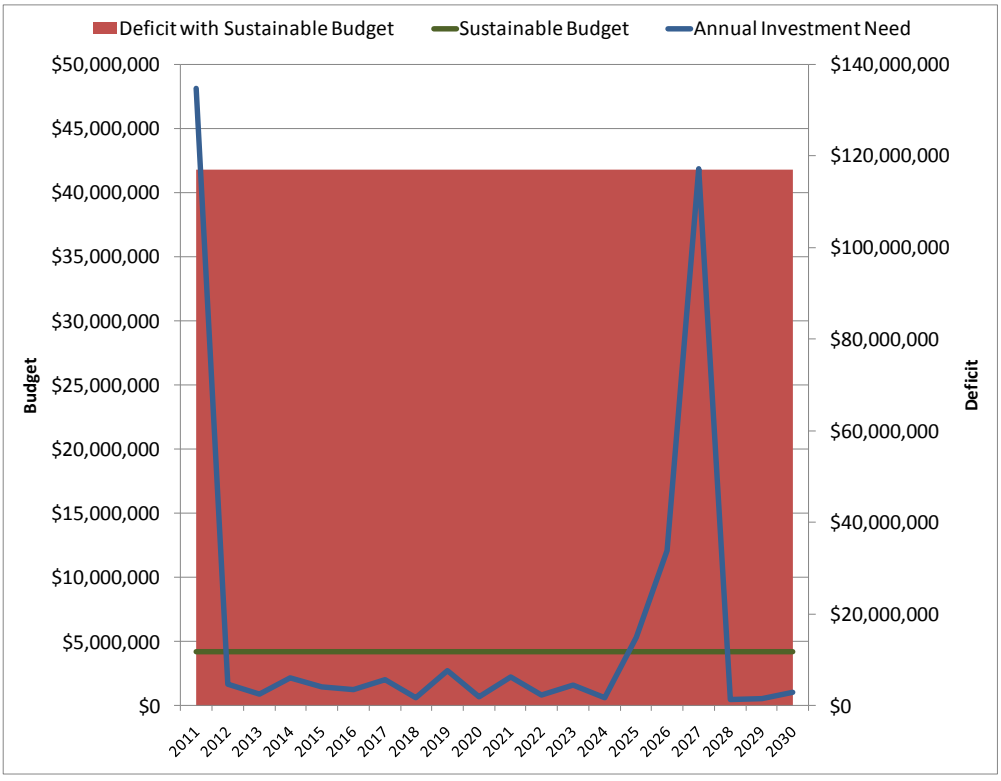


Figure 16: Sustainable Budget and Deficit

Investment in infrastructure is a one to one relationship with the infrastructure's condition, performance and risk of failure. Under the existing budget scenario the District's infrastructure in poor condition grows from 47% to 76% over the 20 year period (**Figure 18**).

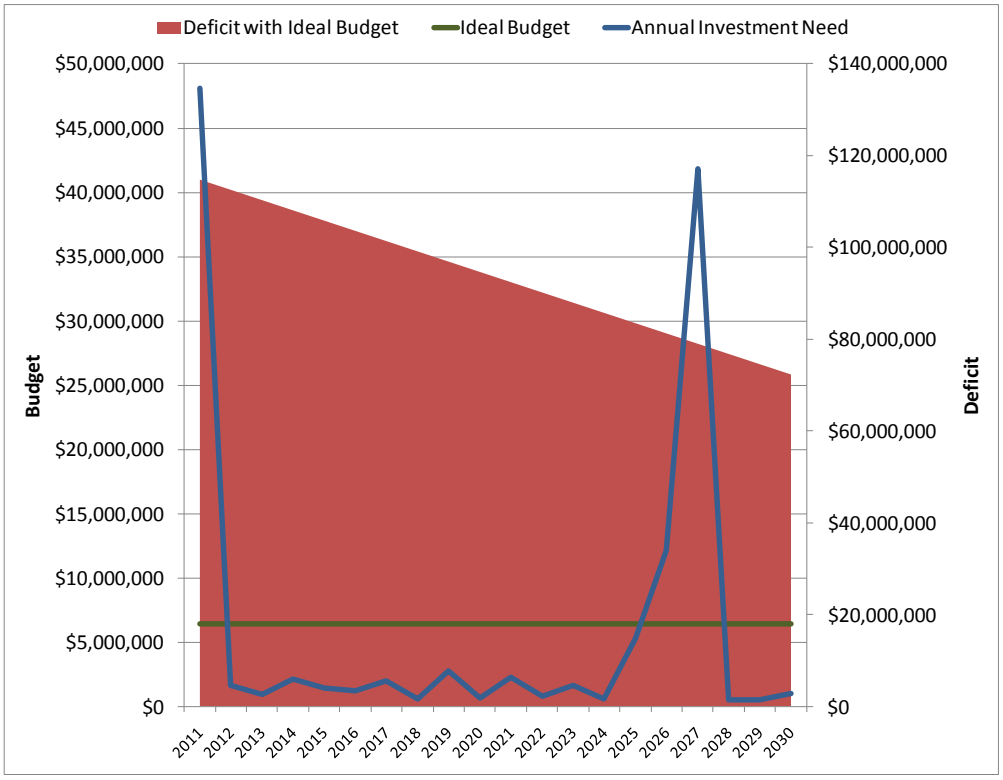


Figure 17: Ideal Budget and Deficit

While under the ideal budget scenario the poor condition drops from 47% to 29% over the same period (**Figure 19**). From a manageable perspective having 1/3 of a community's infrastructure in poor condition is reasonable; it provides for a 1/3, 1/3, 1/3 split between good fair and poor conditions which allows for an effective transition in condition, and less budget fluctuation.

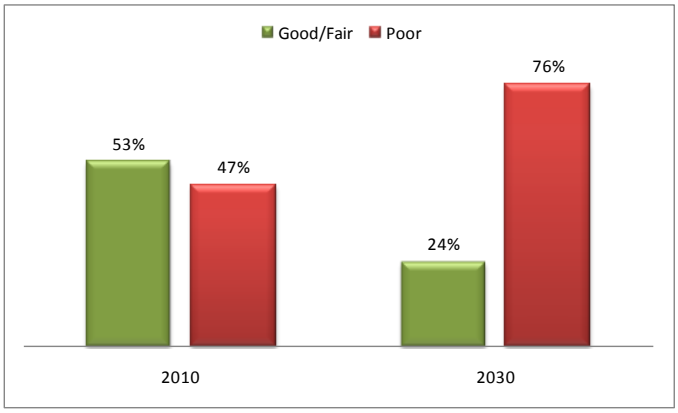


Figure 18: Condition with Existing Budget

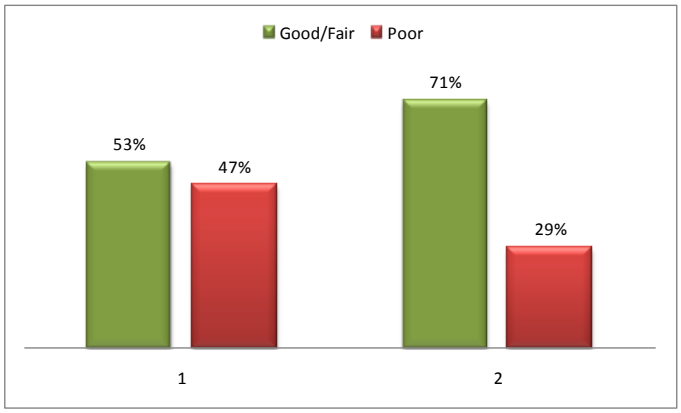


Figure 19: Condition with Ideal Budget

4.7 IAMCP Capital Plan

The IAMCP differs from the IAMCP Model in that the Model presents the ideal investment cost and timing based upon asset useful lives and age, and the forecast average annual cost to repair or replace the infrastructure over the 20 year period (**Figure 20**). To make the Model practical and functional annual funding levels needs to be soothed, infrastructure service and supply levels need to be balanced and

affordable across asset categories and sub-categories, some form of funding reform and/or innovation needs to take place, project life cycles need to be scheduled (planning, environmental, design, property, utilities, and construction), and capital funds must be allocated.

Figure presents the current IAMCP Capital Plan for linear assets.

4.8 Section Highlights

- Current funding levels are not capable of sustaining the District's infrastructure;
- There are significant infrastructure deficits in the water and roadway systems;
- Current funding levels will increase the deficit from $117million to $190 million over the next 20 years. This will result in a growing incident of failures and visible deterioration.

Asset Category	Investment Year (2010 Dollars)																					
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	20 Year Total	Average Annual Investment
Water Systems	897,000	6,788,500	975,000	977,000	11,509,000	725,000	10,725,000	725,000	725,000	26,250,000	725,000	725,000	725,000	725,000	725,000	725,000	725,000	725,000	725,000	725,000	**67,546,500**	**3,377,325**
Wastewater Systems	888,150	6,137,500	887,500	887,500	3,687,500	887,500	887,500	887,500	887,500	887,500	887,500	887,500	887,500	887,500	8,387,500	887,500	887,500	887,500	887,500	887,500	**33,300,650**	**1,665,033**
Roadway & Stormwater Systems	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	**40,000,000**	**2,000,000**
Program Support Costs	100,000	50,000	100,000	0	50,000	0	50,000	0	50,000	50,000	50,000	0	50,000	0	50,000	0	50,000	0	50,000	0	**700,000**	**35,000**
Totals	3,885,150	14,976,000	3,962,500	3,864,500	17,246,500	3,612,500	13,662,500	3,612,500	3,662,500	29,187,500	3,662,500	3,612,500	3,662,500	3,612,500	11,162,500	3,612,500	3,662,500	3,612,500	3,662,500	3,612,500	141,547,150	7,077,358

Figure 20: IAMCP Capital Plan Details for Linear Assets

5.0 NEXT STEPS

The development of the initial IAMCP for the District is the first steps towards a robust infrastructure investment decision-making framework. This version of the IAMCP is both functional and transitional. The transitional capability encourages the District's leadership team to continue to implement changes and enhancements over the ensuing years at a pace suitable to the District.

Based upon our asset management experience and trends we recommend that the District maintains it current asset management momentum and continue its transition by pursuing the opportunities of improvement recommended below.

5.1 Opportunities for Improvement

Starting to implement asset management business practices at the IAMCP level was an ideal kick-off point for the District's asset management business framework as it has the following attributes:

- A single point to review all tangible capital asset cost pressures;
- Is based upon the best Level 2 and 3 data available;
- Identifies the current repair and replacement deficit;
- Enables a leadership team around future funding capability;
- Encourages discussions around affordable levels of service, performance and risk;
- Describes a collective infrastructure baseline that can be used to temper growth strategies and timing;
- Provides a defensible rationale for developing outreach material to engage the public; and
- It's transitional; it encourages exploration into ongoing improvement and use.

We recommend that the District undertake the following 6 next steps.

Next Steps	Description
1	Build IAMCP logic and focus into all master plans
2	Close inventory and data gaps
3	Undertake a short/long term sustainable funding review
4	Determine affordable levels of service, performance and risk
5	Develop and implement a public outreach program
6	Continue to transition in asset management business practices

appendix a

Integrated Asset Management Capital Plan

DETERIATION TABLES

Water Systems

Description	Useful Lives		Unit Rates	
	Existing	Proposed	Dia. (mm)	Cost/m
Hydrants	40		> 600	$1,000
AC	60		600 - 350	**$750**
CI	60		300	$560
DI	60		250	$530
SS	60		200	$470
CU	60		150	$420
PVC	80		<=100	$380
HDPE	80			
POLY	80			
GI	60			

Wastewater Systems

Description	Useful Lives		Unit Rates	
	Existing	Proposed	2008 Costs	Proposed
Air Valve	25	25	$2,400	$2,400
Cleanout	30	30	$2,400	$2,400
Drain Field	80	80	as provided	as provided
Lift Station	25	25	as provided	as provided
Manhole	50	50	$2,400	$2,400
Pipe	80	80	$175	$175
Reducer	80	80	$2,400	$2,400
Tank	80	80	as provided	as provided
WWTP	none	40	as provided	as provided
Valve	25	25	$2,400	$2,400

Stormwater Systems

Description	Useful Lives		Unit Rates	
	Existing	Proposed	Existing	Proposed
Catch Basin	50	50	TBD	TBD
Cleanout	50	50	TBD	TBD
Control Manhole	50	50	TBD	TBD
Detention Pond	75	75	TBD	TBD
Double Catch Basin	50	50	TBD	TBD
Drywell	75	40	TBD	TBD
Headwall	50	50	TBD	TBD
Inlet Structure	25	50	TBD	TBD
Manhole	50	50	TBD	TBD
Oil Interceptor	50	50	TBD	TBD
Outlet Structure	25	50	TBD	TBD
Pipe - PVC	30	80	TBD	TBD
Pipe - Ultra-Rib PVC	30	80	TBD	TBD
Pipe - Ultra-Rib PVC Perforated	30	80	TBD	TBD
Pipe - HDPE	30	80	TBD	TBD
Pipe - CMP, CSP, Perforated	30	30	TBD	TBD

Roadway Systems

Description	Useful Lives		Unit Rates	
	Existing	Proposed	Existing	Proposed
Streetlights	n/a	35		$7,000
Sidewalks	50	50		as provided
Culverts	30	30	as provided	as provided
Dirt - Base	0	200	$13.42	$40.00
Gravel - Base	0	200	$13.42	$40.00
Treated - Base	80	200	$13.42	$40.00
Treated - Surface	20	5	$12.53	$5.00
Cold Mix - Base	80	40	13.42	40
Cold Mix - Surface	20	8	$12.53	$7.50
Base				
Arterial	80	60	$13.42	$52.00
Collector	80	60	$13.42	$52.00
Local	80	80	$13.42	$40.00
Hot Mix Asphalt				
Arterial	20	20	$12.53	$19.50
Collector	20	25	$12.53	$19.50
Local	20	30	$12.53	$15.00

appendix b

Integrated Asset
Management
Capital Plan

LEVEL 1
SPREADSHEET

appendix C

Integrated Asset
Management
Capital Plan

LEVEL 2
SPREADSHEETS

appendix D

MAPS

Integrated Asset Management Capital Plan

appendix e

ELECTRONIC COPY

Integrated Asset Management Capital Plan