



2012 ASSET MANAGEMENT UPDATE

Stewardship of Current Infrastructure and Facilities



Executive Summary

The required changes in financial reporting for municipalities in 2008 brought needed attention to aging infrastructure, and challenges for local governments in funding operations, renewal and growth of their infrastructures. Asset management principles and practices were developed to help local governments face these challenges. Asset information and planning are important components of optimal asset management, and provide decision makers with needed information for assessing sustainable levels of service and funding strategies.

A complete asset management plan includes expenditures and funding for operating, renewal and new infrastructure. The information and plans contained in this update are for renewal of existing assets. All costs are expressed in current dollars. Future updates and asset management plans will include operating and new assets.

The 2012 Asset Management Update has been prepared to update Council on the organization's efforts to continue developing asset management capacity, to provide current information on current City infrastructures and to provide long term renewal and financial plans. The update focuses on current asset infrastructure. Long term plans have been developed for renewal of current assets to meet current service levels.

The City of Nanaimo has made significant progress in working towards implementing asset management best practices. Work will continue to further improve and develop best asset management processes and information for asset managers and decision makers.



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1. Introduction

Asset Management – Definition

Asset Management is an integrated approach involving planning, finance, engineering and operations to effectively manage existing and new assets. The intent is to maximize benefits, reduce risks and provide satisfactory levels of service to the community in a sustainable manner.

One of the measures of a City's health is the state of its assets. A key issue facing all local governments is the management of ageing infrastructure assets that provide needed and desired services to the community.

Infrastructure assets such as water, sewer, drainage, transportation, parks and public buildings present particular challenges. Financing needs can be large and timing for renewal can cause significant peaks and troughs in expenditures.

The demand for new and improved services due to growth and community expectations adds to the planning and financing complexity. The creation of new assets impact annual operating and maintenance costs and must be added to longer term renewal plans.

The City of Nanaimo faces the same challenges as all other municipalities in Canada. This Asset Management Update is expected to help:

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

2010 Asset Management Plan

The City of Nanaimo's first Asset Management Plan was presented to Council in November of 2010. The plan provided an overview of the asset management process and its key elements:

- What do we own and where is it?
- What is it worth?
- How do we operate?
- What condition is it in?
- What do we need to do and when?
- How much will it cost and how will we pay for it?

Focused on engineering and public works infrastructure including transportation, drainage, sewer and water assets the 2010 Asset Management Plan provided a 'big picture' of infrastructure in-service history, projected lifecycle replacement needs and current funding levels. Long term funding gaps were identified for each asset type. The plan also provided information on current service levels and operating activities.

2011 Level of Service Presentation

In 2011, the Engineering and Public Works department presented information to Council identifying the current levels of service and the infrastructure used to provide those services. Articulating these desired levels of service is an important link to the asset management strategic planning process.

2012 Strategic Plan

At Council's direction, a strategic planning process was completed in 2012 for the City. The process included extensive public consultation. The Strategic Plan adopted by Council included Asset Management as one of the 6 strategic priorities for the City of Nanaimo.

Council, through its Strategic Plan, has directed staff to adopt a longer-term approach to service delivery and funding.

The Strategic Plan identified the importance of a robust asset management program to provide sustainable services for the City. Desired outcomes included: optimized infrastructure and facility life, capital financial plans and reserves in place to adequately fund major maintenance and replacement costs, minimized service disruption and risk to public health and property.

2012 Asset Management Update

The 2012 Asset Management Update will communicate the organization's progress on developing and implementing asset management best practices and planning tools. The update includes long term renewal plans for all current asset infrastructures. The information will help staff and Council to track the organization's progress as it works toward a more complete consideration of the long term renewal, growth and upgrading needs for our infrastructure.

Significant work has been accomplished to build greater capacity within the organization for asset management. An asset management steering committee was created to continue with educating, coordinating and developing asset management information and processes within the organization. Inter-disciplinary teams,

including engineers, accountants, technical and operational staff, were established to undertake detailed reviews of each asset class of infrastructure.

During 2012, City staff focussed primarily on developing detailed long term renewal plans for current asset infrastructure at current service levels. These plans were used to develop long term financial plans for each funding source: general taxation, sewer user fees, and water user fees.

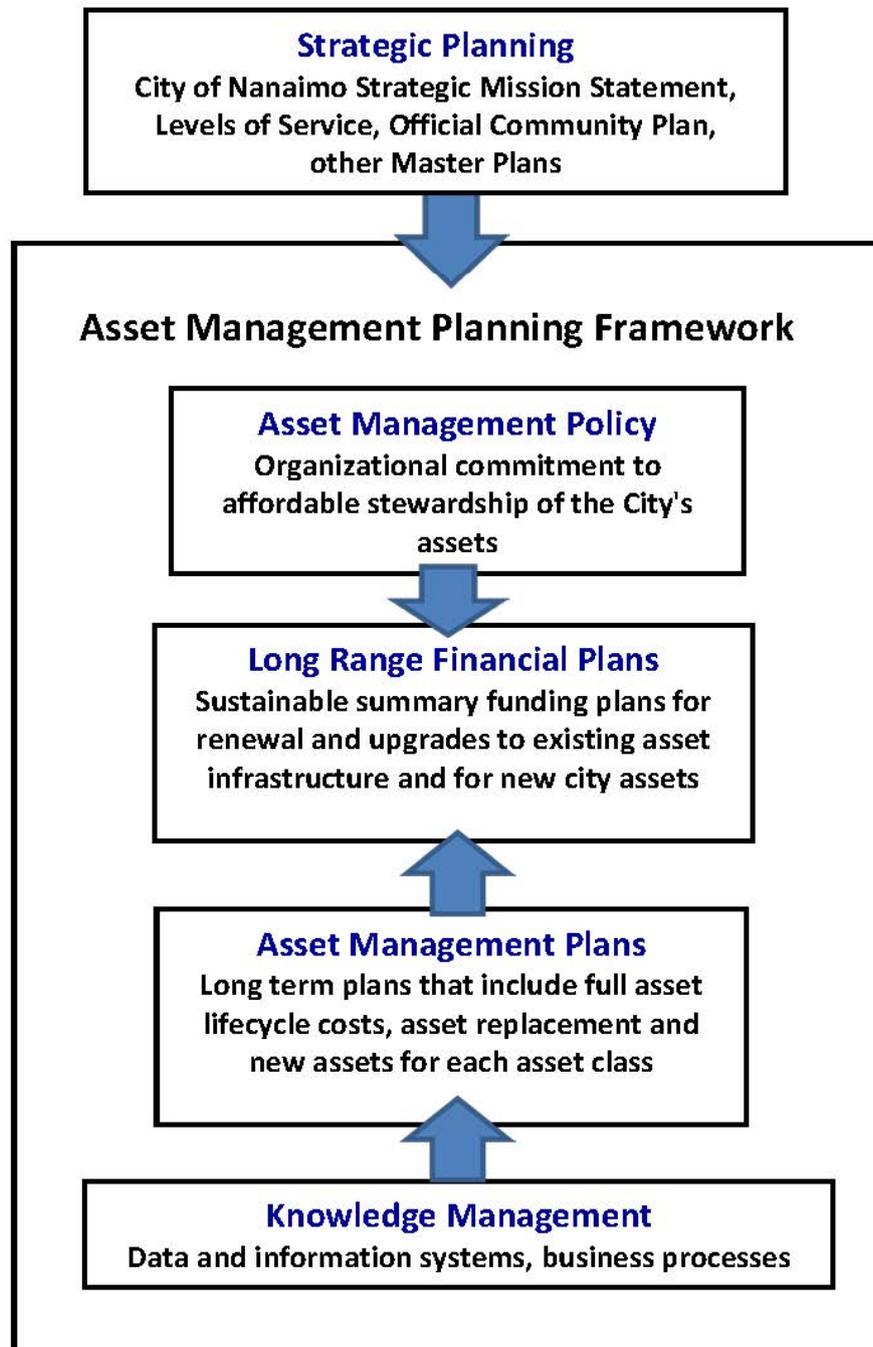
The 2012 Asset Management Update includes a summary of the key information contained in each of the long term renewal plans for each asset class. The long term plans identify required funding requirements to 2031 and projected lifecycle funding requirements for each asset type.

The purpose of preparing longer term renewal plans is to bring attention to significant issues and their probable timing. This will enable decision makers to develop and implement strategies to address these issues.



2. The Asset Management Planning Framework

The following is a comprehensive process that follows best practices for asset management. It highlights a top down (or a strategic) approach, and a bottom up (or operational) approach to effectively manage assets. The City of Nanaimo is using this approach for developing and implementing its asset management program.



Strategic Planning

Council adopted the following mission statement as part of the strategic planning process in 2012:

Preserving and enhancing quality of life in Nanaimo through efficient, effective, affordable delivery and facilitation of municipal services

The Official Community Plan articulates the desired goals and guidelines for development within the City. Specific levels of service measures provide feedback on the efficiency and effectiveness of organizational planning and operations. Other important master plans, such as the Parks Recreation and Culture Master Plan and the Transportation Master Plan currently under development describe the community's priorities and identify strategies to implement them.

Asset Management Policy

An Asset Management Policy articulates organizational commitment to affordable stewardship of assets and is considered a best practice for asset management. Information in this update should help Council and staff develop an Asset Management Policy for the City of Nanaimo.

Long Range Financial Plans

Long range financial plans have been developed for all assets and funding sources. These plans are critical to understanding the funding needs for asset renewal over a range of future periods. This information will support Council in adopting effective strategies for sustainable funding of asset renewal.

Asset Management Plans

Asset management information and processes have been further developed to support the development of detailed long term renewal models for each asset class. The long term asset renewal plans project replacement of assets at a detailed level using useful life and current replacement cost estimates.

Actual timing and costs of asset renewal can vary due to many factors. Some of these factors include; early failure of an asset, current condition assessment information that may indicate asset can provide service beyond the initial useful life estimate, inflation and other considerations. Risk management strategies may be used where lower risk asset replacement may be delayed due to cost or resource constraints.

More precise timing and costs of actual asset renewal will be incorporated each year in the City's five year financial plans.

Knowledge Management

Asset information is maintained in enterprise wide systems such as the Geographical Information System (GIS), the City's financial system (SAP) and in department maintained documents. A site was created on the City's network to provide a central and easily accessed location for asset management information.

Key team members have attended training sessions provided by the National Asset Management Strategy Group (NAMS) from the Institute of Public Works Engineering Australia, who are considered global leaders in asset management principles and best practices. More staff will attend these attractively priced sessions when they come available.

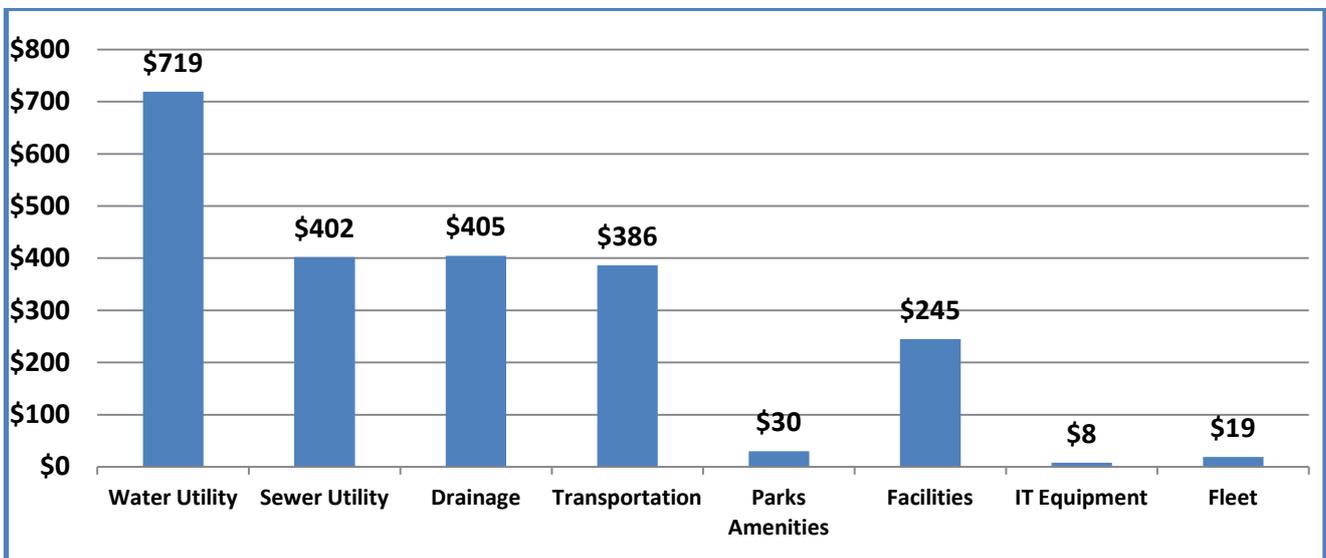


3. The City's Infrastructure Assets

The City currently owns and operates over \$2 billion in infrastructure assets that support provision of a wide range of services to the community. Currently, the City is able to provide excellent service with the assets that Council has invested in. The City's assets are on average less than half-way through their life cycle but as these assets age the replacement costs will burden the City's financial capacity.

An overview of the City's assets include current replacement value, current age and current condition

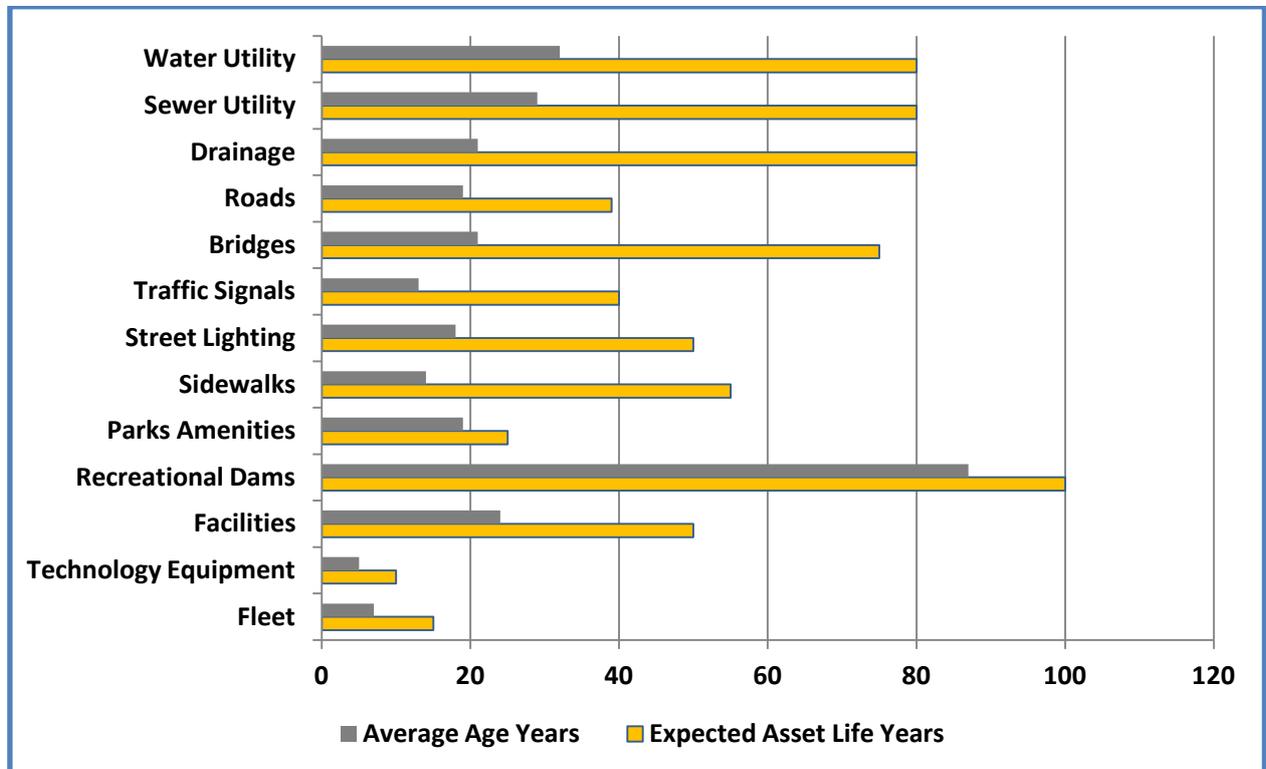
City Infrastructure – Current Replacement Value - \$M



Infrastructure	Description	Current Asset Value - \$M	%
Water Utility	Dams, reservoirs, mains, control stations	719	33%
Sewer Utility	Mains, lift stations	402	18%
Drainage	Mains	405	18%
Transportation	Roads, bridges, sidewalks, traffic signals, street lighting	386	18%
Parks Amenities	Playfields, playgrounds, trails, recreational dams	30	1%
Facilities	Civic offices, public works yards, fire and police buildings, parkades, recreation and cultural buildings	245	11%
IT Equipment	Hardware, communication equipment	8	0%
Fleet	Cars, pickups, heavy equipment, sanitation equipment, fire apparatus, zambonis	19	1%
Total		2,214	100%

City Infrastructure – Average Age and Expected Useful Life

Currently, most of the City's infrastructure is less than half way through its useful life. As assets age annual maintenance costs may increase.

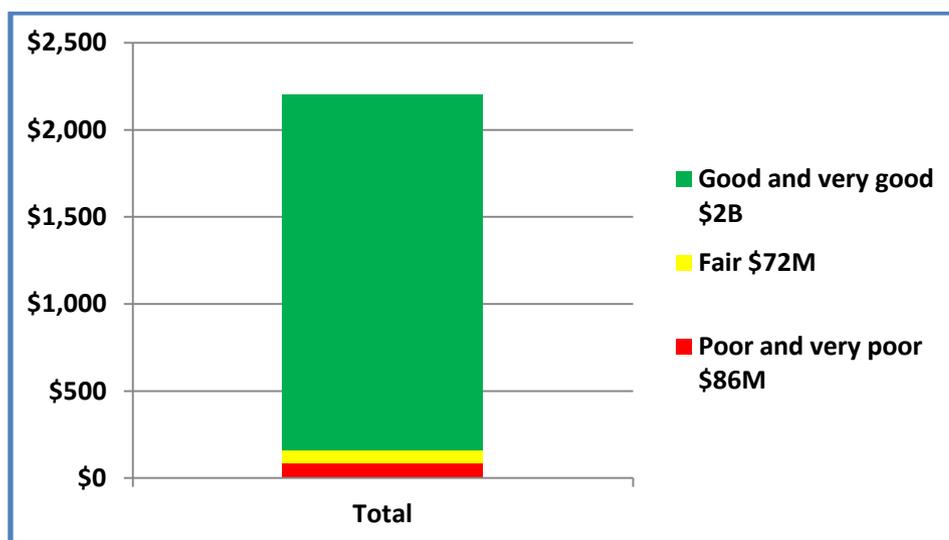


City Infrastructure – Current Condition

A simple ranking system was used to evaluate the condition of current infrastructure assets. Due to the relatively ‘new’ age of City assets most are still in the good or very good condition.

Rating		Description
Very good		Asset is physically sound, performing its function as originally intended. Required maintenance costs are well within standards. Asset is new or recently rehabilitated
Good		Asset is physically sound, performing its function as originally intended. Required maintenance costs are within acceptable standards but increasing. Asset has been used for sometime but is within mid stage of its expected life.
Fair		Asset is showing signs of deterioration, performing at a lower level than originally intended. Some components are becoming physically deficient. Required maintenance costs exceed acceptable standards and increasing. Asset has been used for a long time and is within the later stage of its expected life.
Poor		Asset is showing significant signs of deterioration, performing to a much lower level than originally intended. A major portion of the asset is physically deficient. Required maintenance costs significantly exceed acceptable standards. Asset is approaching the end of its expected life.
Very poor		Asset is physically unsound and/or not performing as originally intended. Asset has higher probability of failure or failure is imminent. Maintenance costs are unacceptable. Replacement/major refurbishment is required.

City Infrastructure Current Condition 2012 \$B



4. Long Term Asset Management Plans

During 2012 asset management teams developed detailed asset renewal plans for each asset infrastructure class.

4.1 Water Utility

The City provides water that is clean and safe to drink with minimal service disruption, to satisfy all anticipated consumption and fire protection.

The City's water system is made up of dams, reservoirs, facilities (pump/pressure reducing control stations) and over 600 kilometers of supply and distribution mains. During 2011, the City delivered over 15 billion liters of water to its residential, commercial and industrial customers. Nanaimo residents use 251 liters per person per day.

Department documents are maintained to provide information on dams, reservoirs and control stations. Detailed asset information for mains including location, type of material and in service year are maintained in the city's GIS system. Engineering drawings, often referred to as 'as built' drawings, are completed after construction of all water infrastructure and are the primary source of asset information.

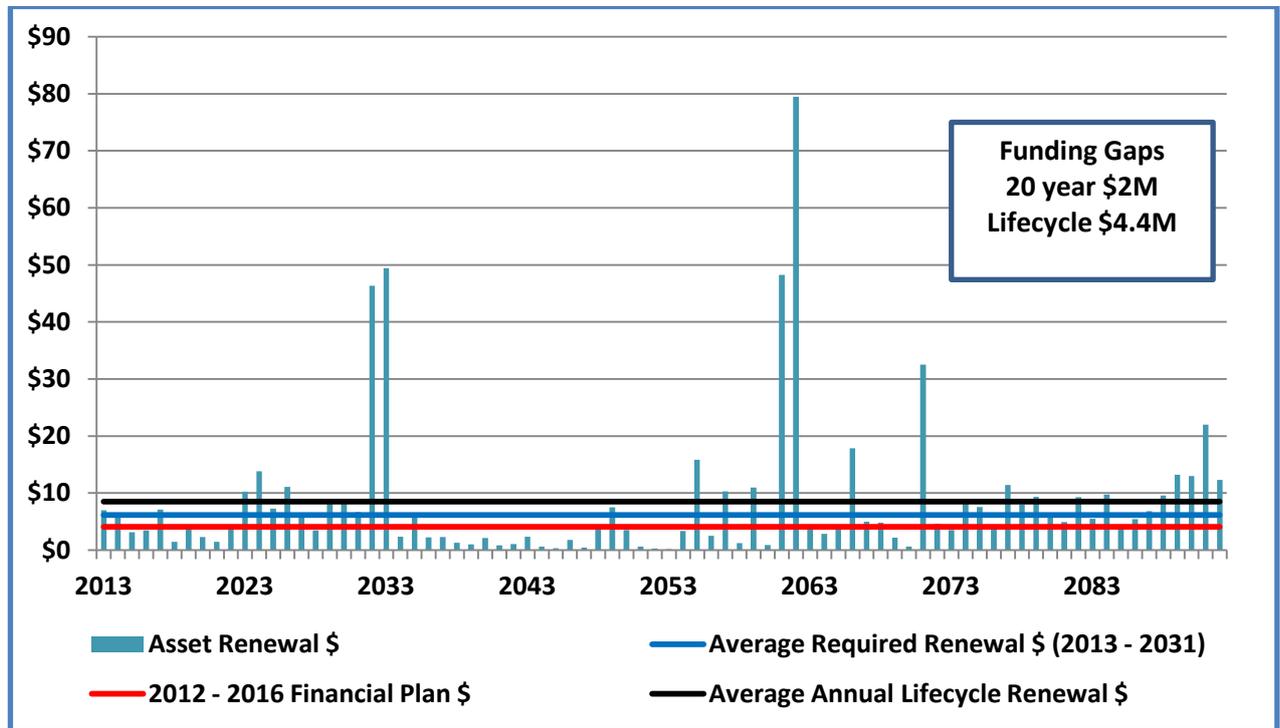
Long term renewal plans use:

- current asset inventory information
- useful life assumptions by asset type, by material type for mains and by major component for control stations
- current cost estimates based on industry standards and the city's current experience

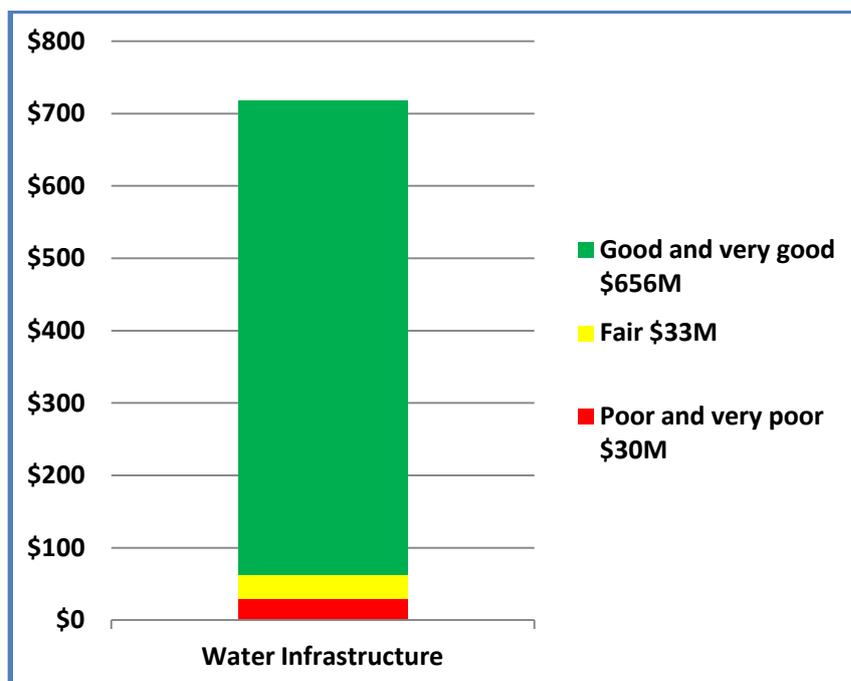
The annual operating and maintenance and renewal of water infrastructure are funded through user fees.

Excluded from the current long term plan are the new water treatment plant and new #1 reservoir currently under construction. Future long term plans will include replacement needs for these assets. Also excluded from the current long term plan is replacement of the current water treatment facility and replacement of the current #1 reservoir as these assets will no longer be needed.

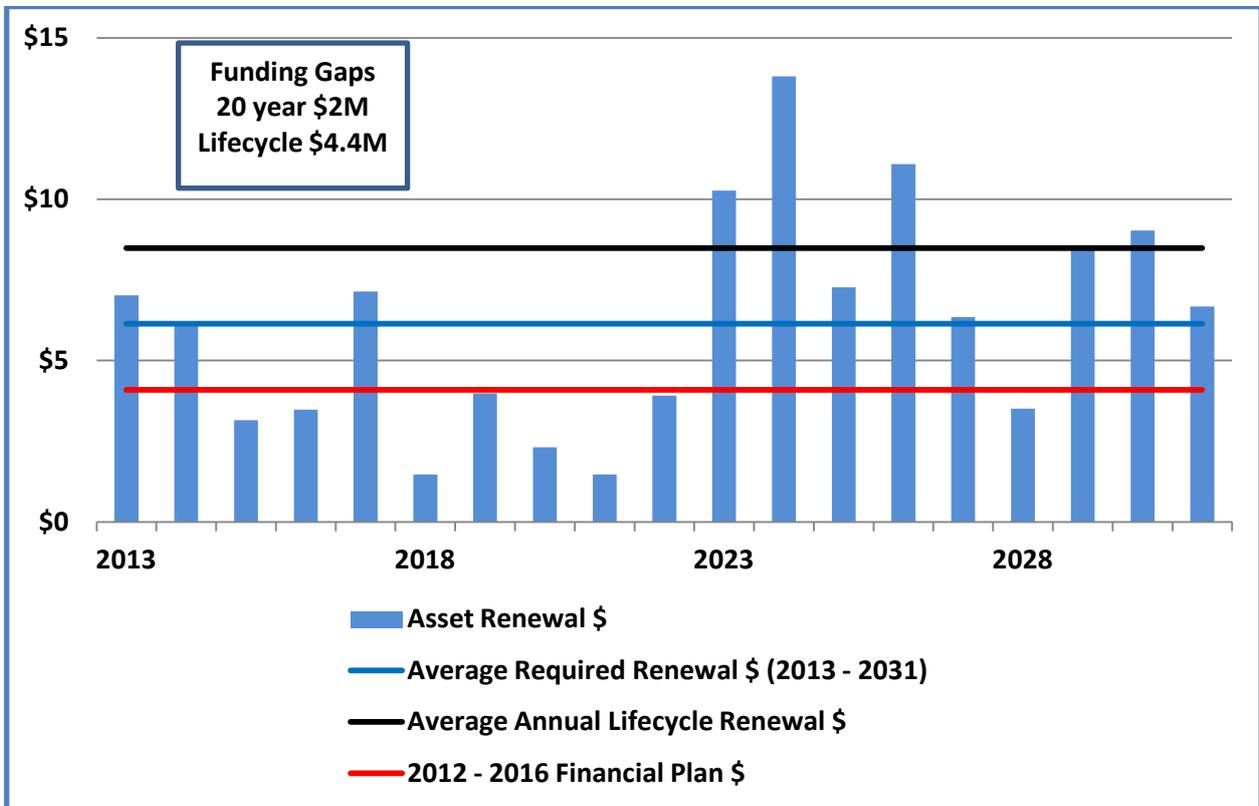
Water Infrastructure Lifecycle Renewal Plan 2012 \$M Funded from user fees and grants



Water Infrastructure Current Condition Assessment 2012 \$M



Water Infrastructure Long Term Renewal Plan 2012 \$M Funded from user fees and grants



4.2 Sanitary Sewer Utility

The City provides sewer service that maintains public health and safety, with minimal service disruption and impact to environment and property

The City's sanitary sewer system is made up of mains and facilities (lift stations). There are over 548 kilometers of sanitary sewer mains. During 2011, the City's average daily flow was 31,100 cubic meters per day.

Detailed asset information for mains including location, type of material and in service year are maintained in the city's GIS system. Department documents are maintained to provide information on lift stations. Engineering drawings, often referred to as 'as built' drawings, are completed after construction of all sanitary sewer infrastructure and are the primary source of asset information.

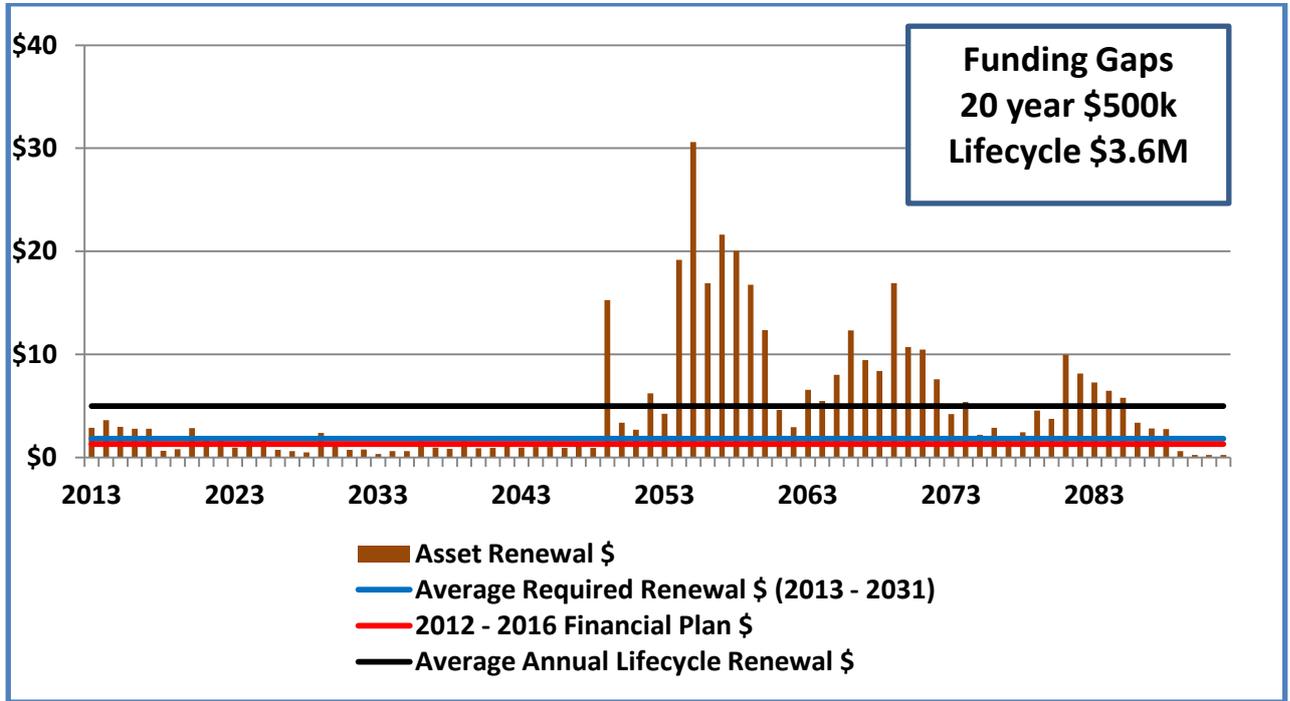
A condition assessment program is used to monitor critical sewer mains.

Long term renewal plans use:

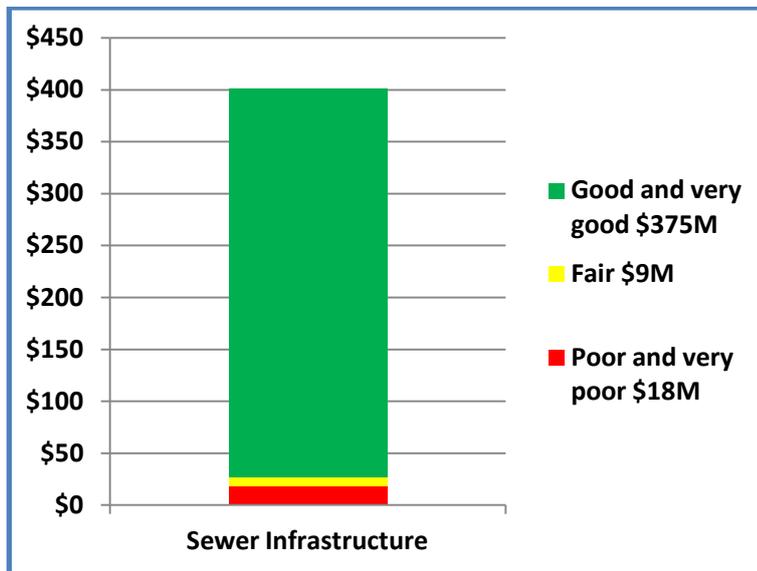
- current asset inventory information
- current condition assessment information
- useful life assumptions by material type for mains and remaining useful life for mains where a condition assessment has recently been completed
- current cost estimates based on industry standards and the city's current experience

The annual operating and maintenance and renewal of sanitary sewer infrastructure are funded through user fees.

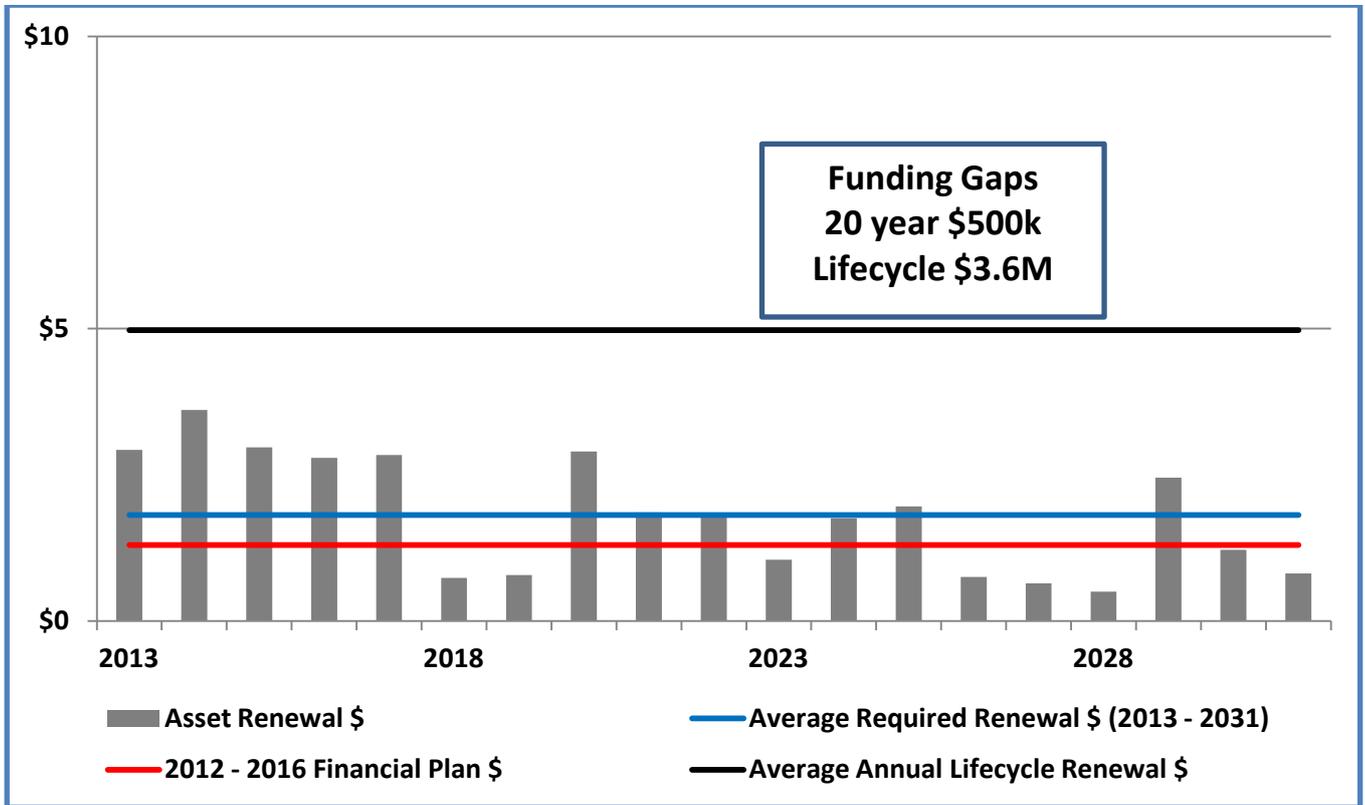
Sanitary Sewer Infrastructure Lifecycle Renewal Plan 2012 \$M
Funded from user fees and grants



Sanitary Sewer Infrastructure Current Condition Assessment 2012 \$M



Sanitary Sewer Infrastructure Long Term Renewal Plan 2012 \$M
Funded from user fees and grants



City infrastructure funded through general taxation includes:

- Drainage Infrastructure
- Transportation Infrastructure
- Parks Amenities
- Facilities
- Information Technology Equipment
- Fleet

A summary graph of projected 80 year expenditures for asset renewal funded by general taxation is provided in section 4.9.

4.3 Drainage

The City provides a drainage system that minimizes impact to property and environment.

The City's drainage system includes mains, ditches and retention ponds. There are over 423 kilometers of drainage mains.

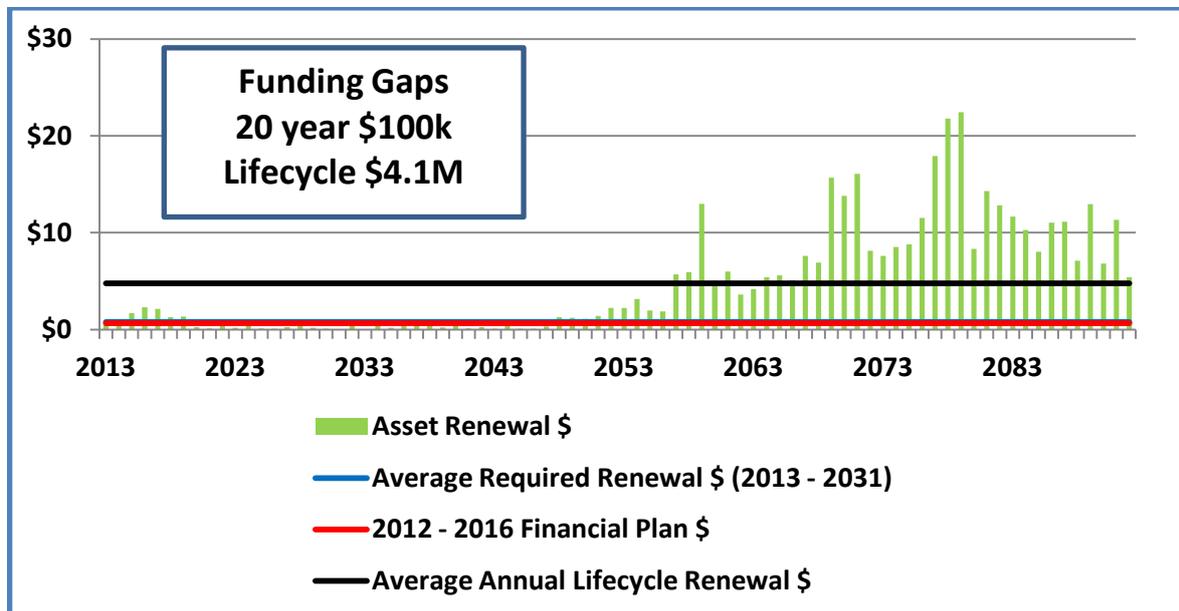
Detailed asset information for mains including location, type of material and in service year are maintained in the city's GIS system. There is a data correction process underway to verify and update data in the GIS system. Engineering drawings, often referred to as 'as built' drawings, are completed after construction of drainage mains and are the primary source of asset information.

Long term renewal plans use:

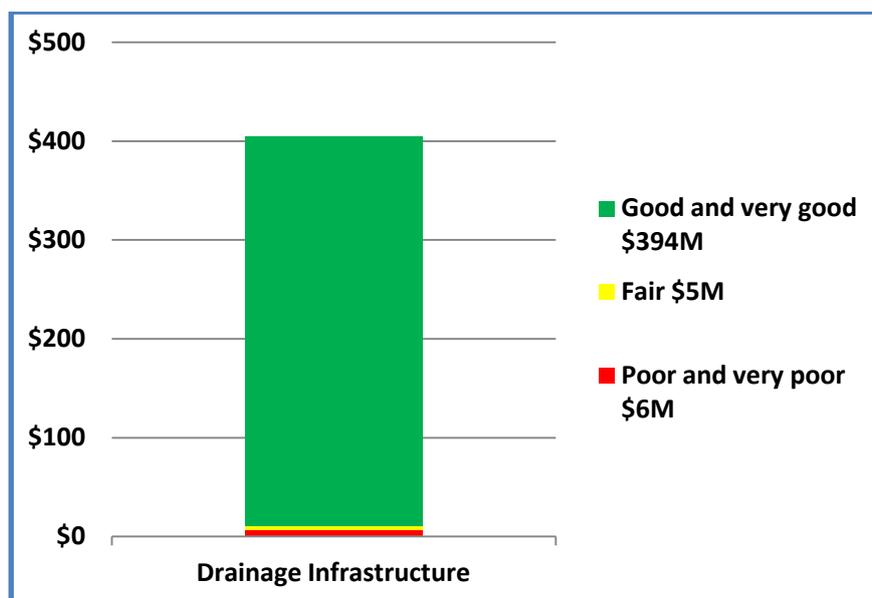
- current asset inventory information for mains only
- useful life assumptions by material type for mains
- current cost estimates based on industry standards and the city's current experience

The annual operating and maintenance and renewal of drainage infrastructure are funded through general taxation.

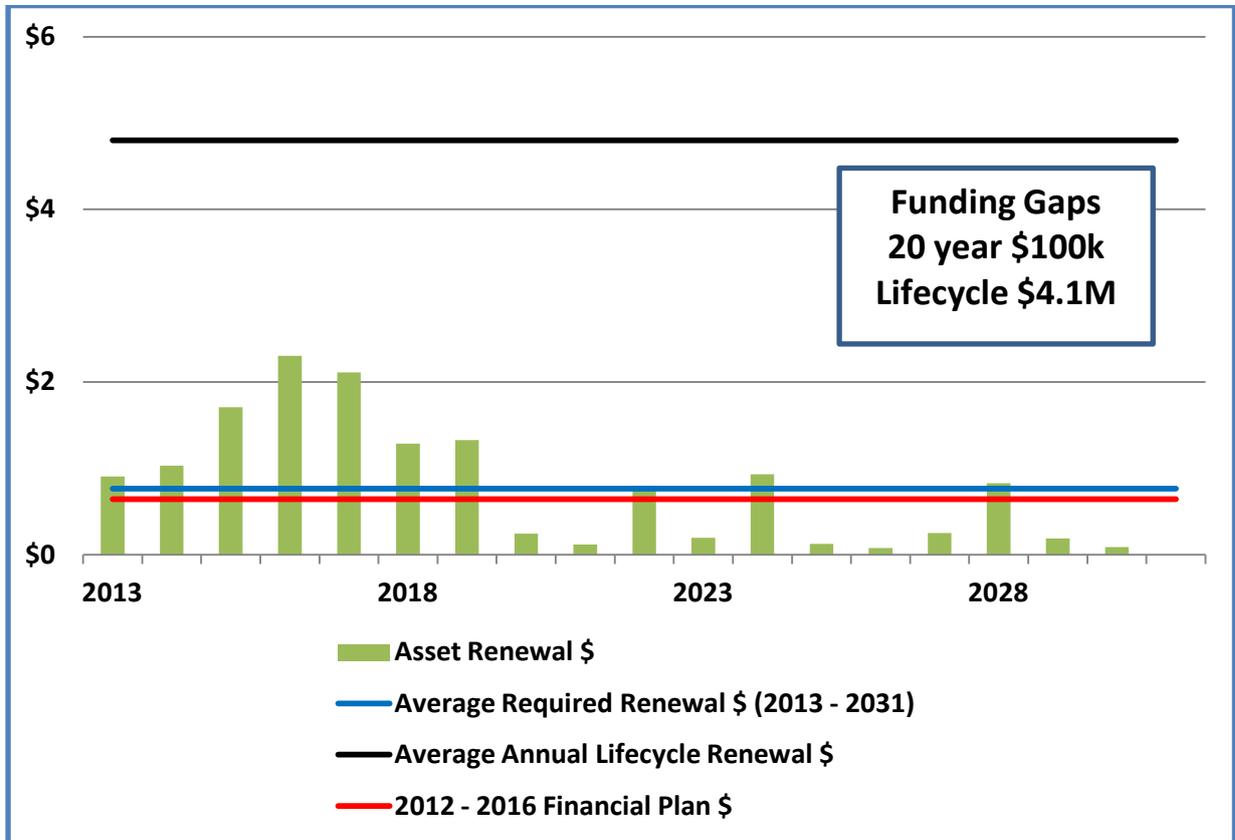
Drainage Infrastructure Lifecycle Renewal Plan 2012 \$M Funded from general taxation and grants



Drainage Infrastructure Current Condition 2012 \$M



Drainage Infrastructure Long Term Renewal Plan 2012 \$M
Funded from general taxation and grants



4.4 Transportation

The City provides streets, sidewalks, signs and street lighting that are safe, accessible, clean and convenient.

The City's transportation system includes roads (arterial, industrial, collector and local), bridges, sidewalks, traffic signals and street lights. There are approximately 1,100 lane kilometers of roads.

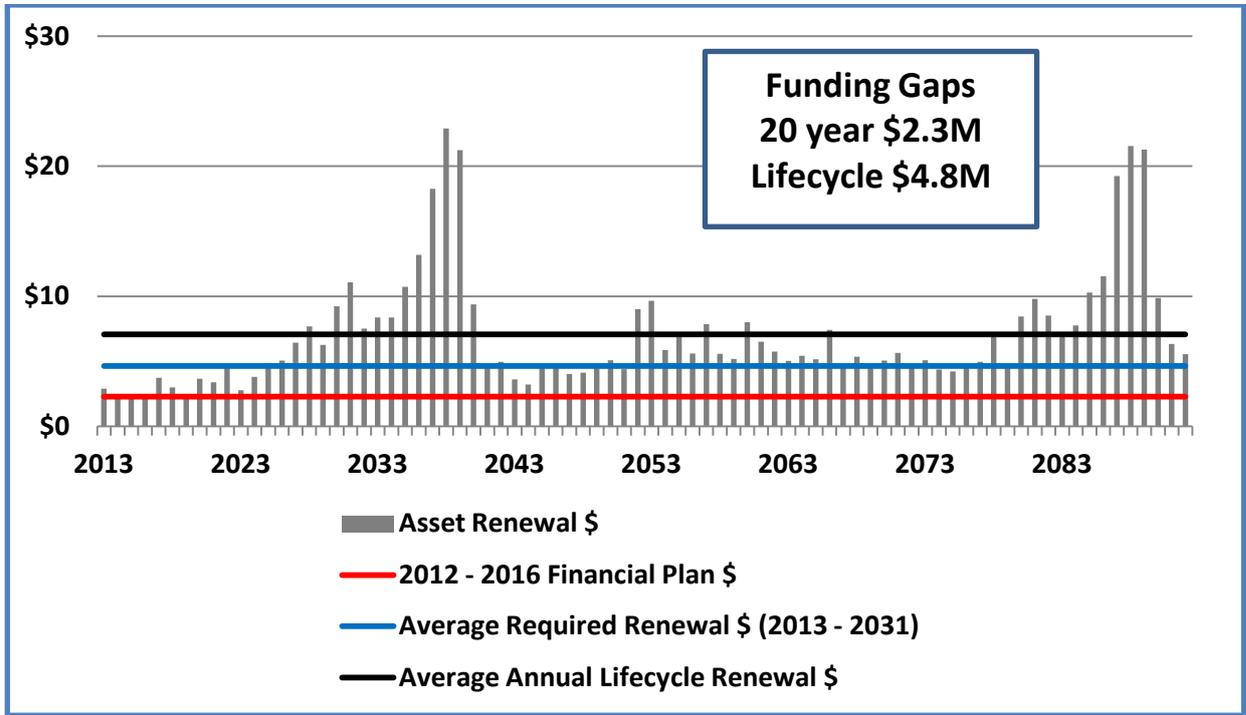
Detailed asset information for transportation infrastructure is maintained in the City's GIS system. Road inventory information is also maintained in the City's pavement management system. A condition assessment program is completed every three to five years and information is updated to the pavement management system. The system generates optimum road surface replacement schedules and recent improvements have reconciled road data between GIS and the pavement management system. The department has received additional training in the pavement management system to better utilize its benefits. Department documents are also maintained to provide additional information on bridges, sidewalks, traffic signals and street lighting.

Long term renewal plans use:

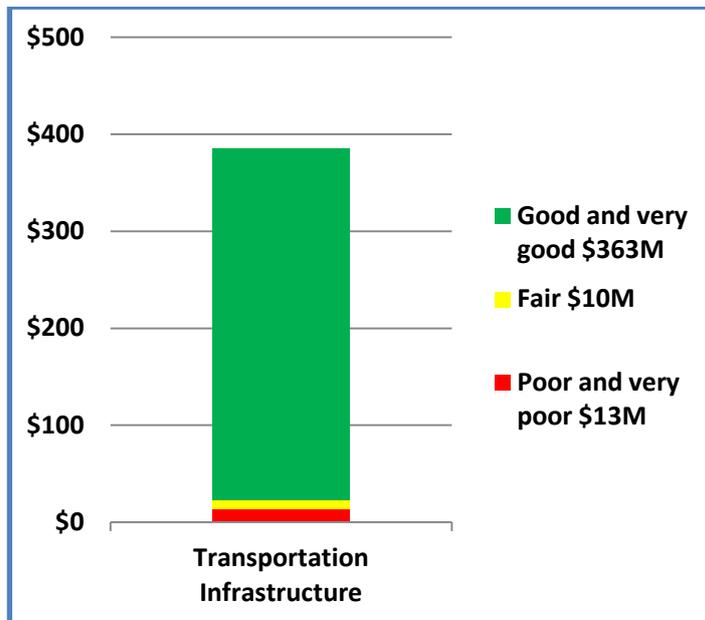
- current asset inventory information
- current condition assessments and remaining useful life for road surface
- useful life assumptions by asset type for bridges, sidewalks, signals and lights
- current cost estimates based on industry standards and the City's current experience

The annual operating and maintenance and renewal of transportation infrastructure are funded through general taxation.

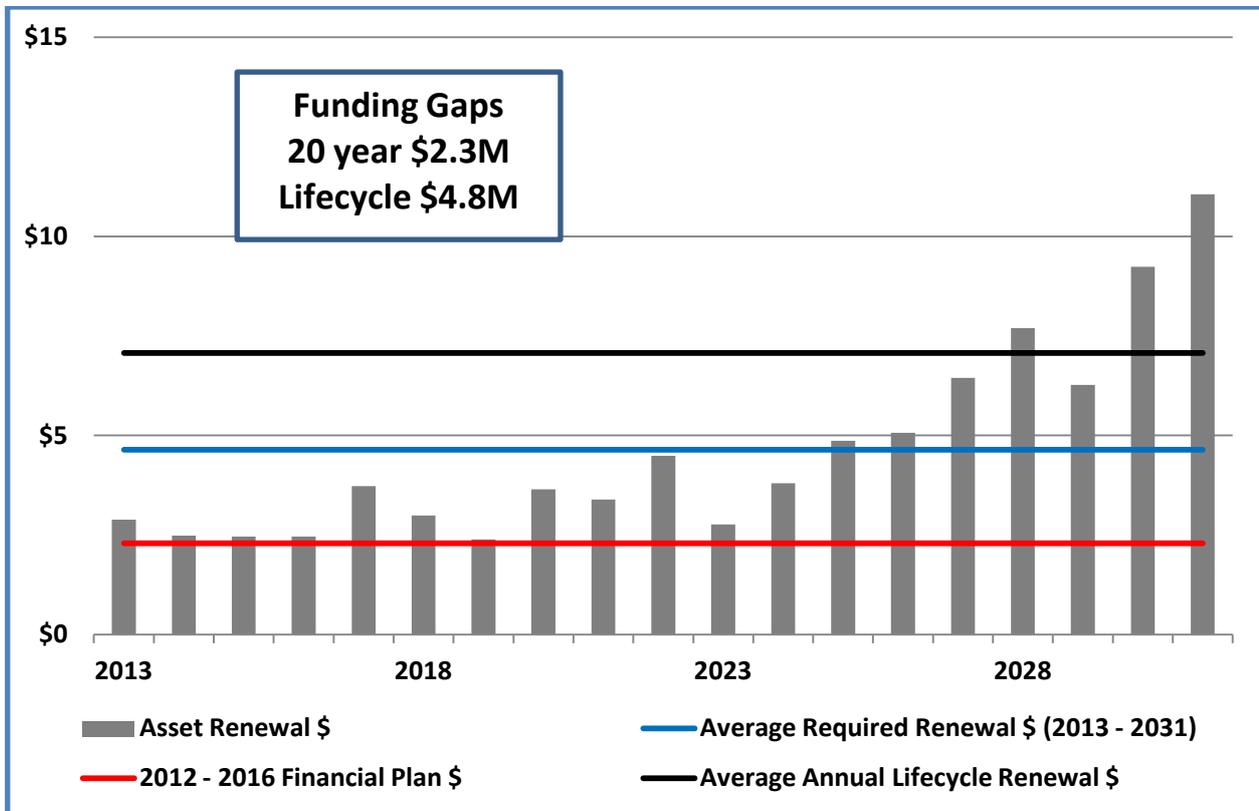
Transportation Infrastructure Lifecycle Renewal Plan 2012 \$M
Funded from general taxation and grants



Transportation Infrastructure Current Condition 2012 \$M



Transportation Infrastructure Long Term Renewal Plan 2012 \$M
Funded from general taxation and grants



4.5 Parks Amenities

The City's current parks amenities include:

- 13 destination parks including Maffeo Sutton and Westwood Lake parks
- 87 neighborhood parks
- 4 spray parks
- 23 sports fields including 2 artificial turf fields
- 61 playgrounds
- 12 tennis/sport courts
- 140 kilometers of trails
- 2 highway gateways
- 3 boat ramps
- 6 dams in recreational areas

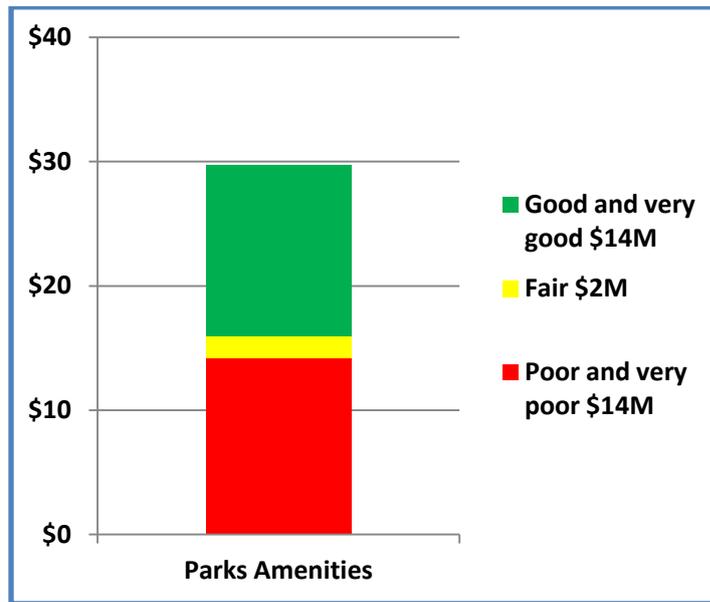
Long term renewal plans use:

- current asset inventory information
- useful life assumptions by asset type
- current cost estimates based on industry standards and the City's current experience

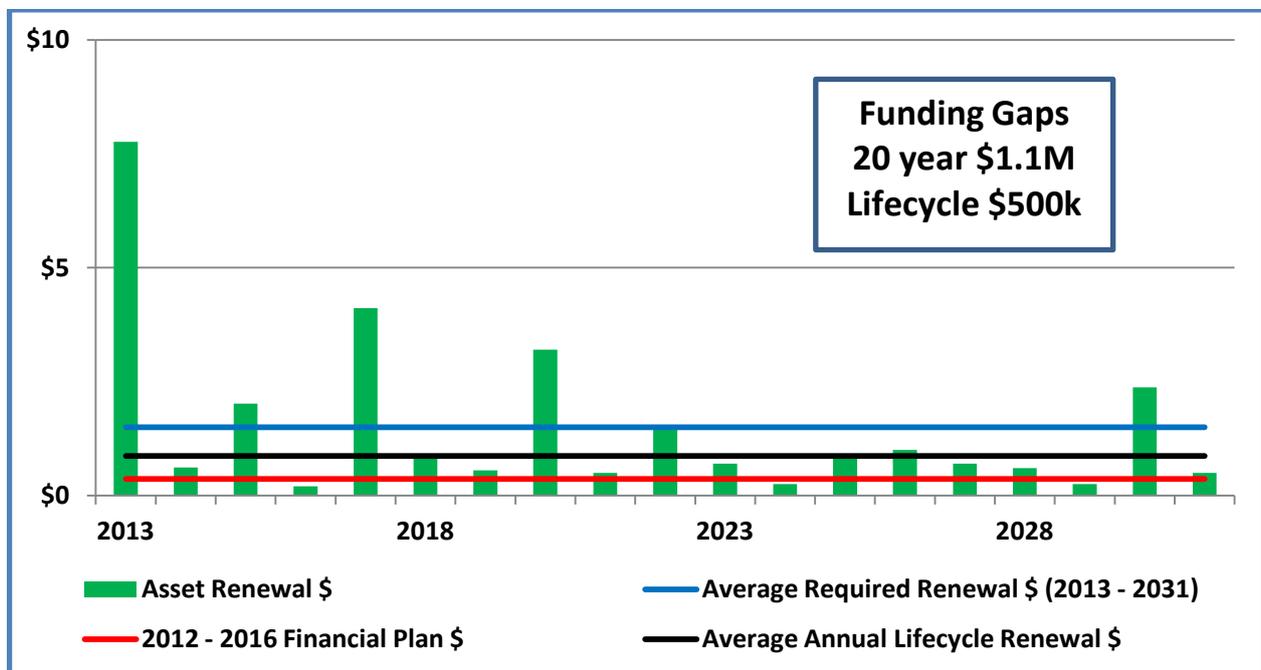
The most significant single cost in the long term plan is the current estimate of \$7M to remove the middle and lower dams located in Colliery Park. City Council has also requested concept level cost estimates for rehabilitation or rebuilding these dams. This project is planned for 2013.

The annual operating and maintenance and renewal of parks amenities infrastructure are funded through general taxation.

Parks Amenities Current Condition 2012 \$M



Parks Amenities Long Term Renewal Plan 2012 \$M Funded from general taxation and grants



The City currently owns 647 hectares of parkland or about 7% of the total City's total land area. The Parks Recreation and Culture Master Plan (February 2005) included a goal to provide waterfront access every 500 meters where possible.

Renewal projects included in the 2013 – 2017 Financial Plan for Council's consideration include improvements to Harewood Centennial Park and Maffeo Sutton Park.

In addition to renewal decisions and the ongoing replacement of parks amenities, community growth and additional service expectations will drive Parks development and additional land acquisition. Future projects not included in either the long term renewal plan or in the 2013 – 2017 Financial Plan may include upgrades to the Italian Fountain, Loudon Park boathouse, extension to the E & N Trail system, development of the East Wellington and West Marsh Park, and improvements to Caledonia Park.

4.6 Facilities

The City currently has 114 facilities, which support delivery of services, and include civic office buildings, fire and police buildings, public works yards, recreation facilities, cultural facilities, parkades and the Port of Nanaimo Centre.

In addition to these facilities, the City has 44 facilities that are included in either the water or sewer utility replacement plans. These facilities include lift and pump stations. There are also 18 small storage or container type facilities not included in the asset renewal plans.

Asset management for buildings is complex, as they are made up of many components with different useful lives, different functions and different operating and maintenance requirements.

Significant work has been accomplished to develop an inventory of the major components within each facility. Components include roofs, exterior walls, mechanical, electrical and plumbing systems, interior finishing and parking.

The facilities long term renewal plan is based on the replacement of existing components within each building to maintain current function and service levels. A condition assessment program was undertaken by City staff and the major components within 36 major facilities were evaluated. Estimated remaining useful life and current replacement cost were identified for each component evaluated.

The City engaged an engineering consultant to complete a condition assessment on the superstructure and exterior envelopes of major civic buildings. Recommendations from this assessment have been included in the current long term plan for facilities.

Long term renewal plans use:

- current asset inventory information by component
- current condition assessment
- remaining useful life assumptions
- useful life assumptions by total facility for buildings not assessed
- current cost estimates based on industry standards and the City's current experience

The recently completed Service and Resource Centre is not included in the long term renewal plan. This building will be added in the next asset management update.

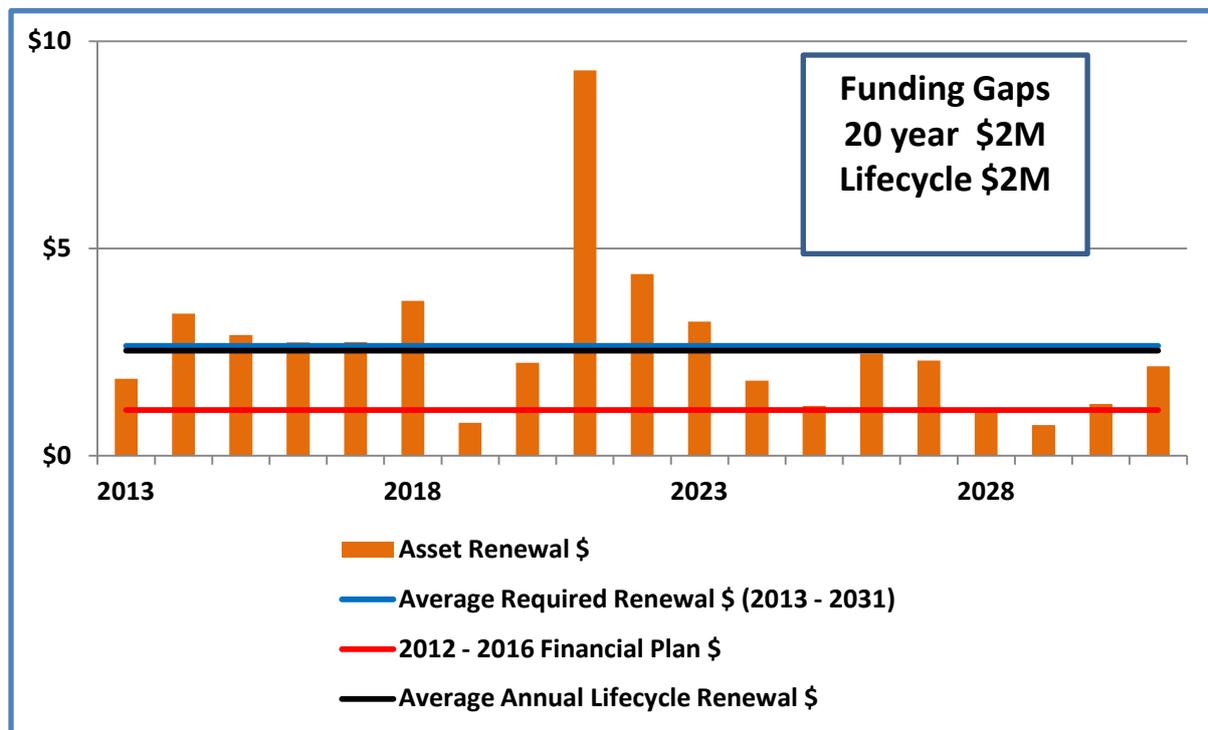
Two significant costs included in the long term plan is replacement of the Departure Bay activity building in 2018 at an estimated cost \$2.1M, and replacement of the public works administration building in 2021 at an estimated cost of \$8M. Both buildings are considered end of life.

The annual operating and maintenance and renewal of facilities are funded through general taxation.

Facilities Current Condition 2012 \$M



Facilities Long Term Renewal Plan 2012 \$ Funded from general taxation and grants



City staff recently completed a seismic review on buildings constructed prior to 1990 which has been reviewed by an engineering consultant. Decisions for Council's consideration include:

- Seismic upgrade of the City building leased by the Nanaimo Boys and Girls Club at 1400 Cranberry (old Chase River Fire Station). A second stage assessment is currently underway to provide a cost estimate for upgrade
- Replacement or removal of Departure Bay Activity Centre
- Seismic upgrade of the Public Works vehicle shop at 2020 Labieux Street
- Seismic upgrade of the Fire Rescue – Command and Business Centre at 580 Fitzwilliam. A second stage assessment is currently underway to provide a cost estimate for upgrade
- Seismic upgrade of the CIBC Centre of the Arts at 150 Commercial Street

In addition to facility renewal plans and decisions, community growth and additional service expectations will require Council's consideration regarding development of new facilities and significant expansion to existing facilities.

Construction or expansion of new facilities included in the 2013 – 2017 Financial Plan:

- Construction of new fire station on Hammond Bay Road – current pre-design cost estimate \$2.7M
- Police building expansion – current pre design cost estimate \$8.5M

Construction or upgrades of facilities, not included in the 2013 – 2017 Financial Plan, may need Council's consideration in the next 10 years:

- Replacement of building envelope for the performing theatre at 25 Victoria Road. Current cost estimate is \$800,000. Council has directed that this project will be considered as part of the 2013 – 2017 Financial Plan deliberations
- Replacement of buildings at the Public Works yard
- #1 Fire Station - upgrade or replacement to post-seismic standard
- Port Theatre – addition of small performing theatre
- Downtown Art Gallery upgrade
- Beban Social Centre renovation
- Bowen Community Centre renovation
- Construction of a South Nanaimo Community Centre
- Construction of a Multiplex / Event Arena
- Upgrade of the VIEB barns to a multi-purpose facility

The cost for construction, operation, maintenance and replacement need to be considered for all of the above projects.

4.7 Information Technology Equipment

The City's technology equipment, managed by the Information System department, maintains systems access for network and mission critical applications at 99% availability.

The City's technology equipment includes typical computer network hardware, communication infrastructure, radio systems and specialized equipment. This equipment supports over 140 business applications and 600 workstations distributed over 12 sites, including 4 server rooms hosting over 150 servers. Equipment is interconnected through fibre optic cable.

Developing asset management plans for technology equipment is challenging as renewal can be required due to changing technologies, end of maintenance and support services as well as physical end of life. Analysis indicates that technology equipment is replaced every five to six years. Replacement of assets will often include different configurations and functionality as replacement with current functionality is no longer available.

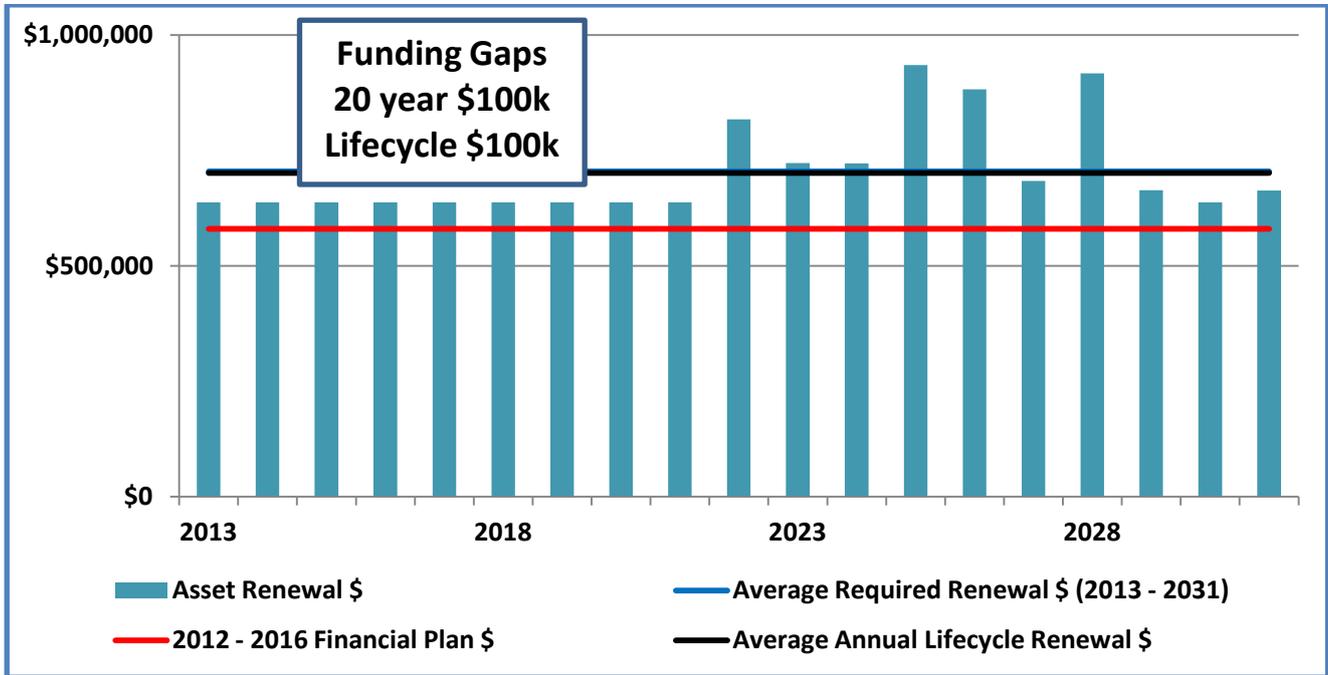
Long term renewal plans use:

- current hardware purchases for past ten years, except for the telephone systems and fibre optic cable and assumption that past ten years purchase history would predict future renewal needs
- useful life assumption for telephone systems and fibre optic cable
- historical actual costs inflated to today's current cost for hardware replacement

Internal charges to user departments based on number of computers help fund replacement of network assets.

The annual operating and maintenance and renewal of technology equipment are funded through general taxation.

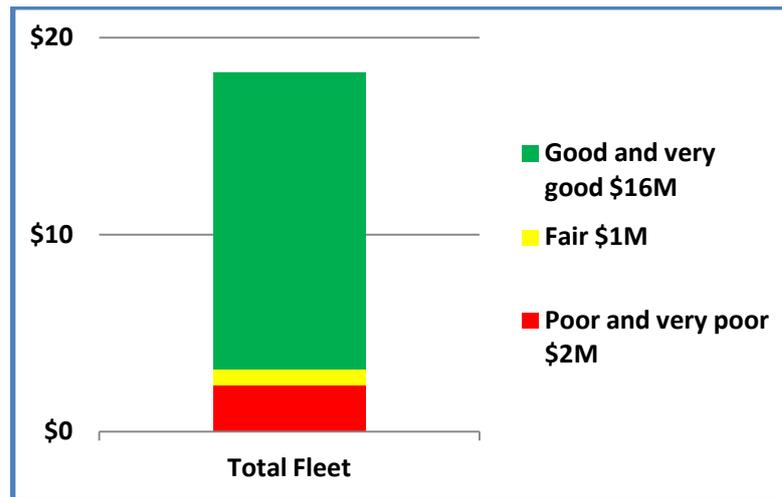
**Information Technology Equipment Long Term Renewal Plan 2012 \$
 Funded from general taxation and grants**



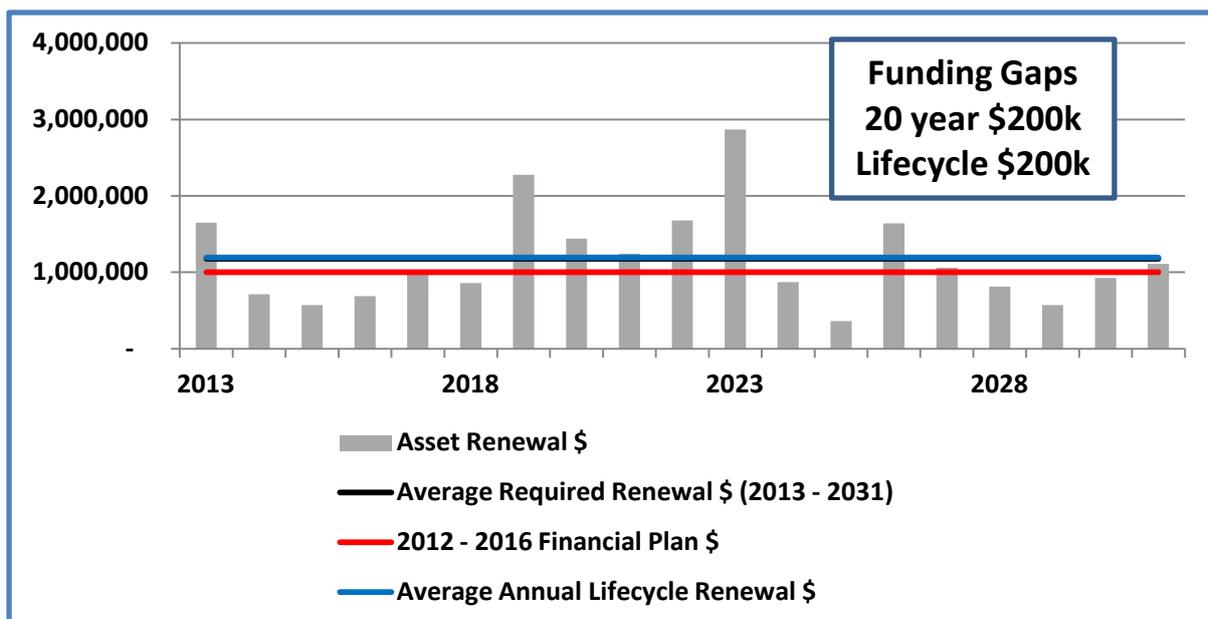
4.8 Fleet

The City's fleet is currently 196 units and includes cars, trucks, heavy equipment, sanitation equipment, fire apparatus and ice resurface equipment. The lifecycle of this equipment is relatively short lived compared to other city assets. The current average age of the fleet is 9 years.

Fleet Current Condition 2012 \$M



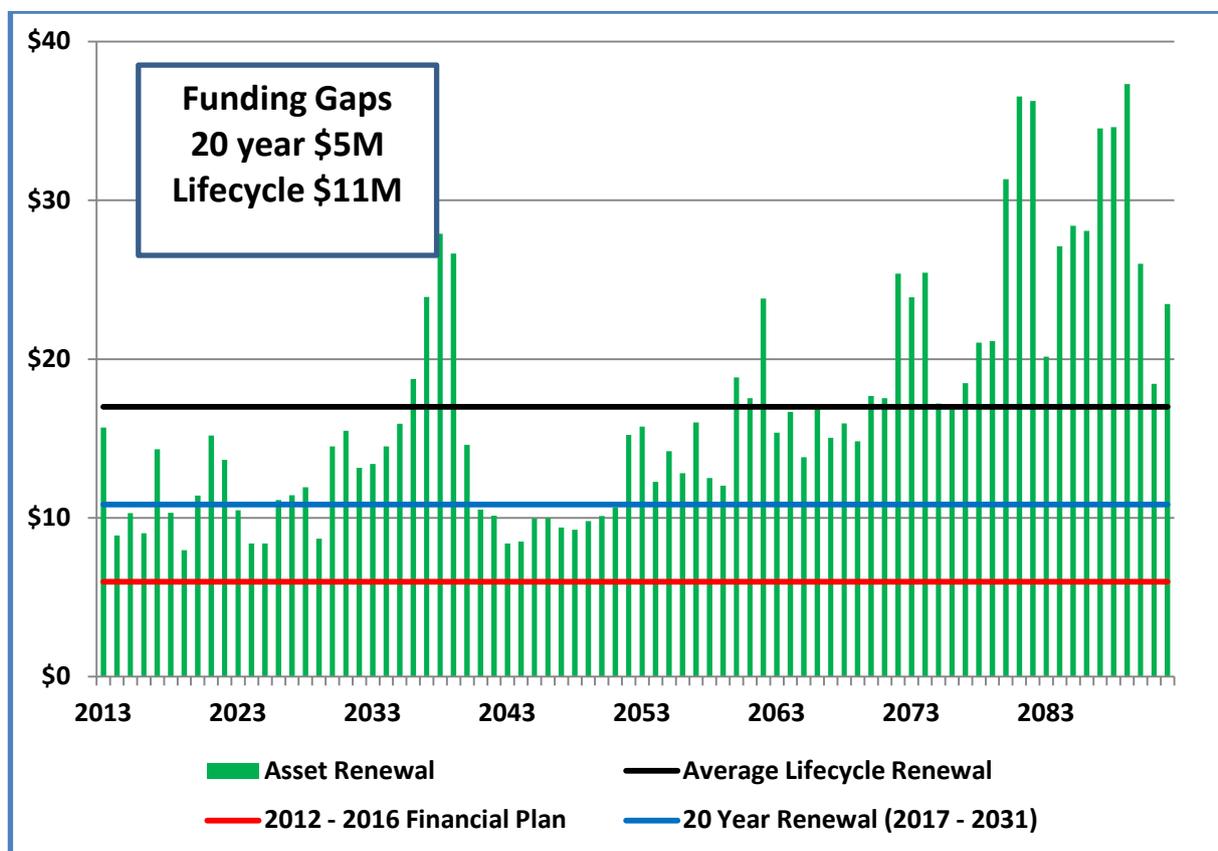
Fleet Long Term Renewal Plan 2012 \$ Funded from general taxation and grants



4.9 Long Term Renewal Plan for Infrastructure Assets Funded from General Taxation

A long term renewal plan for all City assets funded from general taxation includes; transportation infrastructure, drainage infrastructure, facilities, parks amenities, Information technology equipment and fleet.

Infrastructure Assets funded from General Taxation Lifecycle Plan 2012 \$M Funded from general taxation and grants



5. Long Term Financial Plans

Long term financial plans have been prepared for infrastructure assets funded through general taxation, sewer user fees and water user fees.

The City's strategy will ensure that our assets are protected and maintained at the lowest long-term cost to our taxpayers. While the City has some reserves in place for this purpose, there is presently a gap between the annual funding level for asset management and the long term needs. Accordingly, annual contributions for capital renewal need to be increased on an annual basis with the goal of reaching full cash financing for all renewal projects. In any year where the capital funding exceeds the assets acquired, the residual shall be credited to a statutory reserve fund established for the purpose of asset management. Interest on the balance in this statutory reserve fund will accumulate in the fund to be used for future asset management projects.

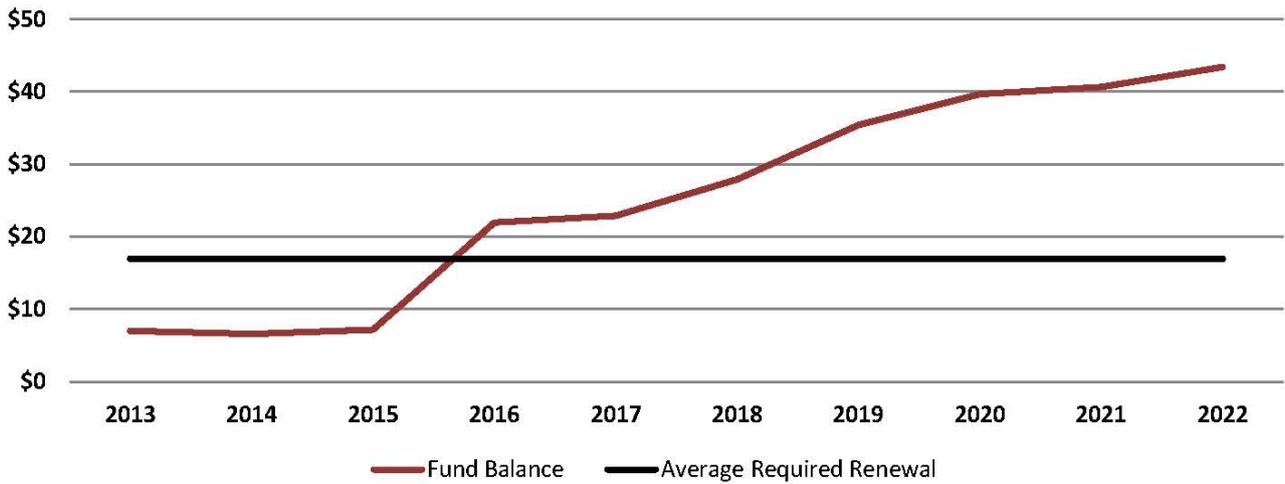
As part of the long-term strategy, all new assets need to be considered, both City constructed and developer contributed, since they will also increase the long term life cycle costs. During the initial years of this funding plan, it may be necessary to borrow for needed renewal and replacement as the Reserve Funds may be insufficient for all needed works. This could be internal borrowing from other reserves or borrowing from the Municipal Finance Authority.

The funding recommendation is based on obtaining grant funding from senior governments of 20%. While this may be attainable over the long term, there is no commitment to this level of funding today. When the plans are revised over the next 5 years, the needed funds will be impacted by several factors: the timing of the work, the interest rate, the inflation rate, the level of grant funding, the level of funding provided by non-government groups. The recommended increases to property taxes and user fees will be reviewed annually and adjusted accordingly.

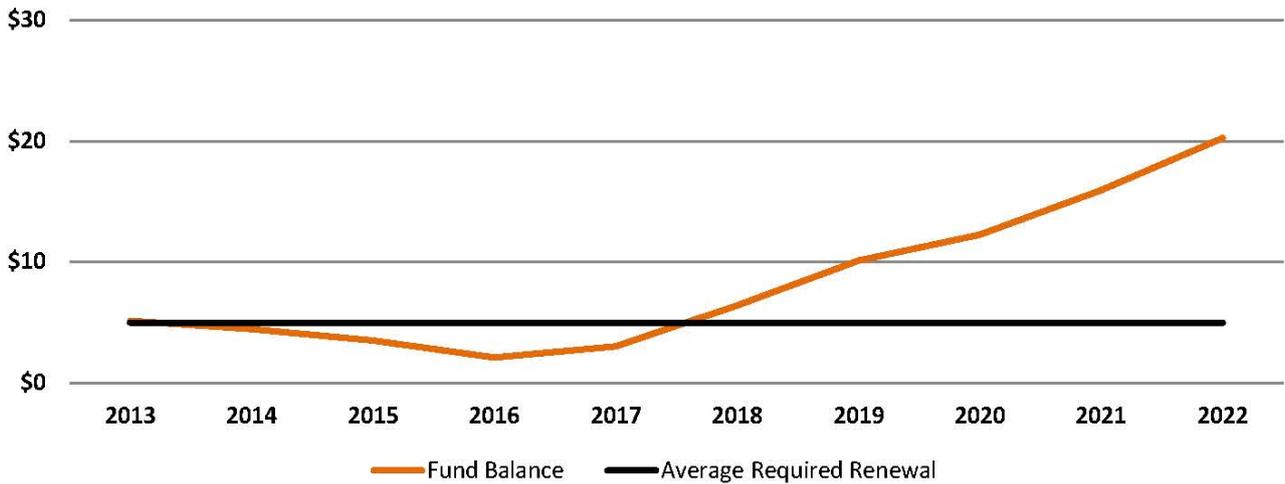
Recommendation:

Property taxes	1% each year for 5 years
Sewer user fees	5% per year for 5 years and then 4% per year for 5 years
Water user fees	2.5% per year for 8 years

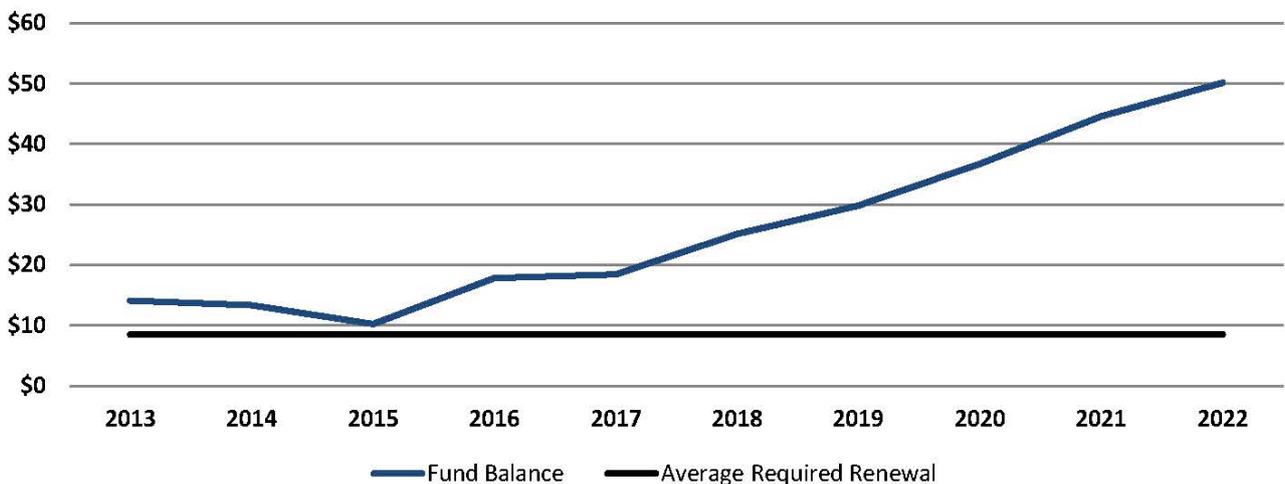
Projected General Reserve Balance - \$ M



Projected Sewer Reserve Balance - \$ M



Projected Water Reserve Balance - \$ M



6. Next Steps

Much work has been accomplished to adopt asset management best practices in the City of Nanaimo.

Council's leadership in adopting a Strategic Plan that includes Asset Management as a strategic priority is critical support for the continuing development and implementation of asset management processes and planning.

The long term financial plans for asset renewal will provide Council with information needed to develop longer term strategies for funding asset renewal and for development of an Asset Management Policy.

City staff will continue to improve asset management capacity within the organization to provide critical information for decision making.

Future Asset Management Updates will have long term plans that include operating and growth costs for all asset infrastructures, in addition to the renewal costs provided in the 2012 Asset Management Update. The City will then have a complete asset management process and planning.

7. Definitions

Asset: A useful or valuable resource with the intended purpose of providing a benefit or service.

Asset Management: An integrated approach involving planning, engineering and finance to effectively manage existing and new municipal infrastructure to maximize benefits, reduce risk and provide satisfactory levels of service to local users and citizens.

Best Practices: State-of-the-art methodologies or technologies for municipal infrastructure planning, design, construction, management, assessment, maintenance and rehabilitation that consider local economic environmental and social factors.

Contributed Assets: Assets that have been constructed and funded by developers or other partners and upon completion transferred to City ownership.

Expansion: Investment in new assets designed to extend the similar standard and type of service to a greater number of users, e.g., extending a drainage or road network.

Infrastructure: The physical assets developed and used by a municipality to support its social and economic activities. The City of Nanaimo's infrastructure inventory includes such diverse assets as drainage, roads, parks and green spaces, buildings, fleet vehicles, traffic control infrastructure, water, sewer, traffic control infrastructure, recreation facilities and computer networks.

Infrastructure Gap: The difference between the capital needs and financing capabilities.

Level of Service: A composite indicator that reflects the social and economic goals of the community and may include any of the following parameters: safety, customer satisfaction, quality, quantity, capacity, reliability, responsiveness, environmental acceptability, cost and availability.

Life Cycle Costing: A method of expressing costs in which both capital costs and operations and maintenance costs are considered over the expected service life of an asset.

Maintenance: The set of activities required to keep a component, system, infrastructure asset or facility functioning as it was originally designed and constructed. Maintenance refers to all actions necessary for retaining an asset as near as possible to its original condition, including repair but excluding renewal (rehabilitation or replacement).

- **Repair:** The action of restoring a component, system, infrastructure asset, or facility to its former condition after failure or damage. Repairs do not extend asset life or expand capacity and do not increase or improve functionality.

Operations: The set of on-going activities and expenses that allow the use of an asset for its intended function. Operations refer to the use of an asset that consumes resources such as manpower, energy, chemicals and materials.

- Operations (Asset): The set of on-going activities that allow the use of the asset for its intended function.
- Operations (Service Delivery): The set of activities and resources required to deliver the service or program related to the use of the infrastructure asset.

Renewal: Investment in existing infrastructure to restore to its former condition and may extend its service life, which may include replacement of individual components as they age or become obsolete. Capital investment in renewal extends the period of service potential but does not increase the size of the infrastructure asset portfolio.

- Rehabilitation: The action of restoring a component, system, infrastructure asset, or facility to a former condition or status.
- Replacement Value: The cost of total replacement of an existing asset in today's dollars.

Replacement Value: The cost of total replacement of an existing asset in today's dollars.

Upgrade: Investment in added or enhanced components to existing infrastructure assets designed to improve the type of service provided to existing ratepayers. Upgrading generally prolongs the asset's service life or improves its functionality, and may sometimes be the result of building code changes, new regulations, adjusted service levels, or technology improvements.

User-Pay: Fees charged specifically to the users of a service based on the user's consumption of or reliance on the service.

Utility: A service that operates on a self-supporting and cost-recovery basis.

