CITY OF NANAIMO
THE HARBOUR CITY

ENGINEERING & PUBLIC WORKS

ASSET MANAGEMENT PLAN

NOVEMBER
2010

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1. Introduction

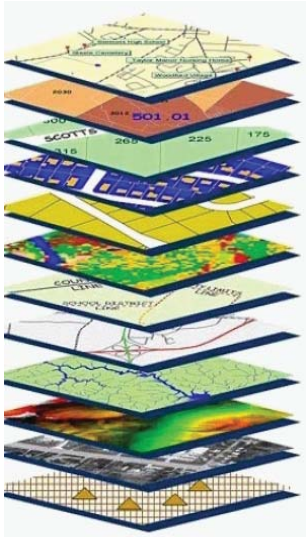
Asset Management includes the planning, design, construction, operation and maintenance of infrastructure used to provide services. Asset Management is not new; it has always been a primary function of local government.

The Asset Management Process defines:

- What we own? (Inventory)
- What is it worth? (Valuation)
- Where is it? (Geographical Information System)
- How we operate? (Service Level)
- What is its condition? (Risk of Failure / Consequence of Failure)
- What do we need to do? (Construct, Maintain or Replace)
- How much will it cost and how will it be funded? (Financial Plan)

The City of Nanaimo's Engineering and Public Works Department manages assets with a value of about $1.6 billion. Services are provided for water, sewer, drainage, transportation, sanitation and recycling to the City's population of over 80,000 people.

Currently, the Engineering and Public Works Department 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.



In Canada municipalities build, own and maintain the majority of this country's infrastructure - infrastructure that supports our economy and quality of life. A report completed in 2007 by McGill University professor Dr. Saeed Mirza for the Federation of Canadian Municipalities estimated that the Canadian municipal infrastructure deficit was $123 billion. The survey on which the report was based indicated that Municipal governments are finding it extremely difficult to manage current infrastructure demands, let alone deal with the accumulated backlog of infrastructure maintenance and rehabilitation. This is compounded by population growth, which further strains existing infrastructure resources while creating additional demand for more infrastructure.

The City of Nanaimo faces the same challenges as all other municipalities in Canada. This Asset Management Plan for Engineering and Public Works is expected to help:

- Council in making service level and investment decisions.
- Staff with the planning and management of the assets.
- Taxpayers by sustaining value for the services provided.Early in the preparation of this plan Engineering and Public Works staff developed the following mission statement and goals.

2. Mission Statement and Goals

Early in the preparation of this plan Engineering and Public Works staff developed the following mission statement and goals.

Mission Statement:

The purpose of Asset Management is to help preserve, protect and enhance the quality of life in Nanaimo by systematically managing the City's assets in an efficient, effective and sustainable manner.

Goals:

1. To provide levels of service that meet the needs of the community.
2. To provide an Asset Management process that is effective, achievable and efficient.
3. To enable the collection, coordination, sharing and communication of information.
4. To develop operating, maintenance and capital financial plans that support the defined level of service.
5. To manage the assets in a sustainable manner.

Bowen / 19A Intersection (left) 1965 approx. and today.

3. How does the Asset Management Plan support the Capital and Operating Financial Plan?

Capital planning and budgets identify the timing for asset renewal or additions and the initial cost to acquire or construct these assets. The capital planning and budget process focuses on infrastructure such as transportation, drainage, sewer and water as well as the fleet and other equipment.

Infrastructure planning includes short term financial plans (1-5 years) and long-term asset management plans (5+ years). The long term infrastructure planning process begins with comprehensive consultation and information gathering. Current infrastructure information includes:

- Condition and capacity assessment reports
- Age, material and size
- Demand, density and land use
- Critical or emergency locations
- Break and surcharging (over capacity) history

For the 5 Year Financial Plan infrastructure projects are prioritized and preliminary scope of work and cost estimates are prepared. Design work is targeted to be completed two years before the construction year for each project. The projects are presented to Council as part of the 5 year financial plan for review and approval.

The fleet and equipment planning process includes a review of age, condition, maintenance costs and utilization. The criteria for prioritizing requests from departments for new or replacement vehicles and equipment includes: operational need, sustainability objectives and a cost benefit analysis. The timing of the replacement of vehicles is identified in the 10 year fleet replacement plan and funded through the fleet reserve. The 5 year financial plan provides further detail on the timing and cost of fleet replacement for Council's review and approval.

Operating plans and budget are prepared annually by each department to maintain current service levels. Service levels are monitored and managed through operating performance indicators.

The capital and operating budgets should ensure that the acquisition and management of assets is clearly linked to:

- Council goals and strategies.
- Community service expectations.
- Growth and demand projections.
- Asset life-cycle management.
- Operating and maintenance programs
- Annual and long term financial planning.

The benefits of good asset management practices include:

- Improved understanding of service level options and costs
- An ability to better communicate and justify investments to stakeholders
- An ability to demonstrate responsible investment in infrastructure
- Improved knowledge of the timing and magnitude of future investments required to operate, maintain, renew and acquire assets
- An ability to establish and evaluate performance benchmarks

4. Service Levels and Operating Performance Indicators

Levels of Service (LOS) are statements of service performance delivery. LOS are established based on Council direction, the needs or wants of the community as well as legislative and regulatory requirements.

This report includes Operating Performance Indicators (OPI's) for current levels of service.

Through the ongoing Asset Management process LOS will be further defined for the City, the Customer, the City's Assets. All are interconnected. A reduction or increase in the LOS in any one of these four areas has an effect on the other three and on the budget.

As a next step staff will work with Council to define City and Customer levels of service.

5. Services

This section provides summary information for Engineering and Public Works Services for Transportation, Water, Sewer, Drainage, Fleet, Sanitation and Recycling. Land and Public Works Yard buildings are excluded from this report

The information for each service area includes where applicable:

Asset Inventory and Value with the asset value calculated using current replacement cost. The asset value does not consider land value. A detailed inventory of the linear assets is maintained in the City's Geographic Information System.

Estimated Annual Replacement Cost – In most cases this calculation is based on the current replacement cost divided by the expected asset life. Some exceptions to this include roads where the maintenance and rehabilitation programs extend asset life and do not require the replacement of the entire asset.

Because this initial plan is focussed on the City's linear assets, cemeteries, the public works yard and the engineering offices are not included though they have significant value and replacement cost. These assets will be included when the plan is further developed to include a facilities section.

Current Investment – Indicates the average annual funding the City has invested in the last five years. This funding is primarily from the capital budget but also includes operating budget expenditures that help maintain or extend asset life.

For the Water, Sewer and Drainage sections a graph of the construction history of the mains is provided. The spikes shown in the graph correspond to periods of high growth in the City.

A second graph shows the annual funding now being invested to replace this infrastructure and the annual investment needed to replace the asset over the long term. The area between the two lines is the cumulative cost difference when the budget does not match the needed funding. No allowance is included for inflation, though inflation will widen the annual gap over time.

Operating Budget and Staffing Level – This information is from the City's financial plan.

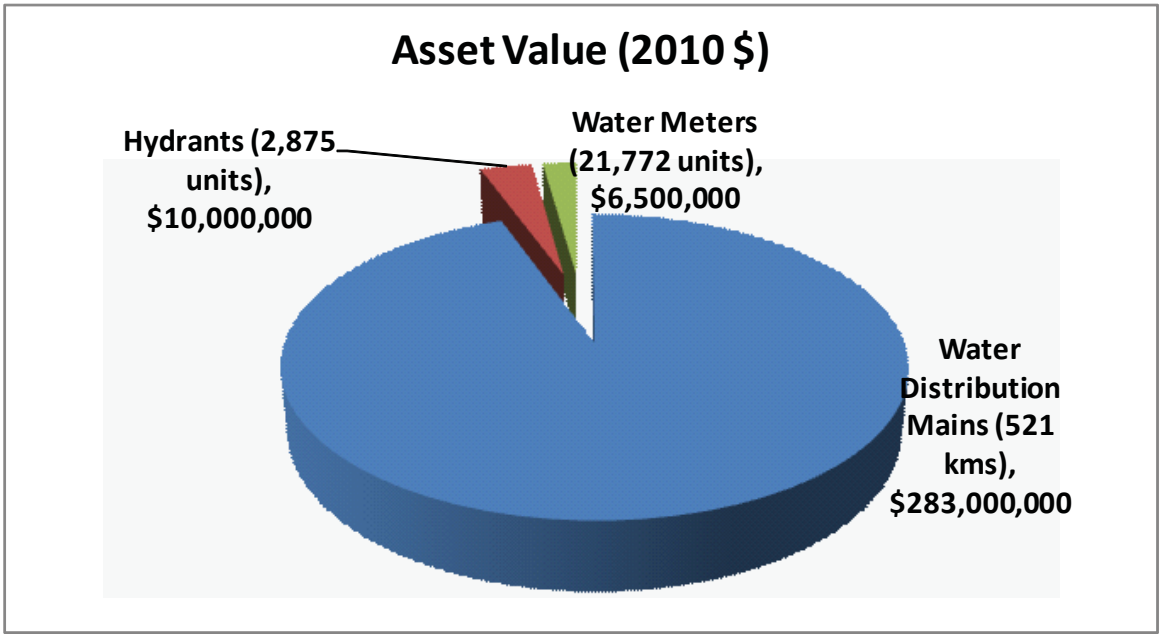
Operating Performance Indicators – These are the main activities within each operating budget cost centre. These activities (OPI's) link directly to the level of service provided to the customer. The OPI's also include maintenance tasks that help extend asset life. **A good balance between asset replacement through capital funding and ongoing maintenance provides the best cost efficiency and service productivity.**

Water

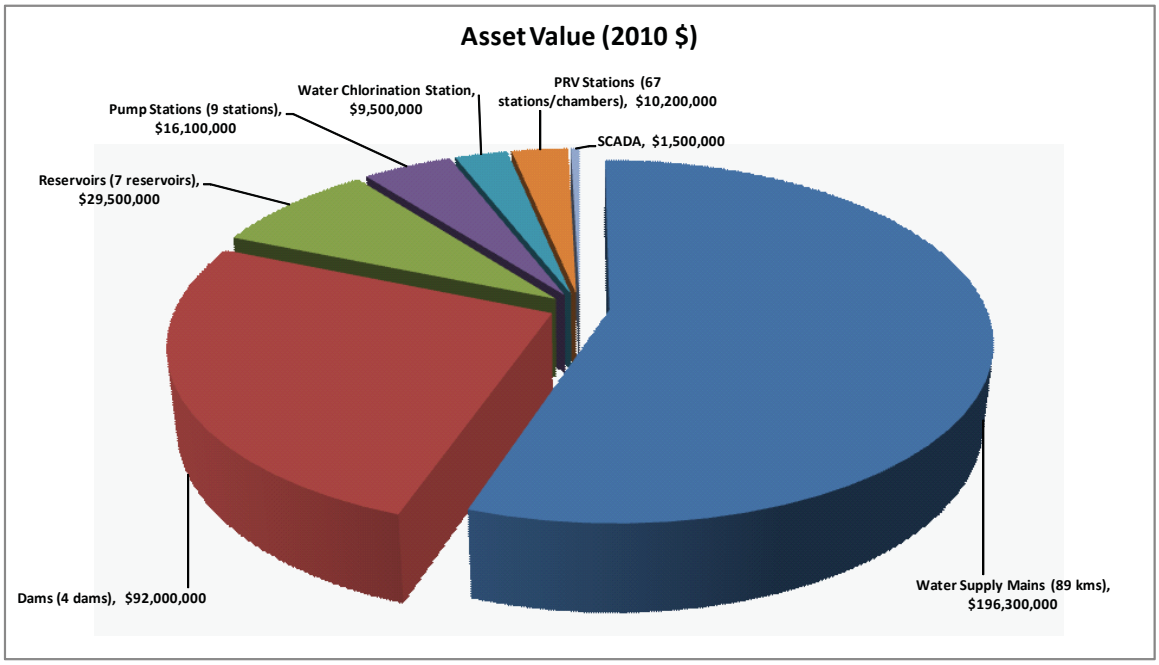
The City of Nanaimo's water supply and distribution system has been developed over the past 100 years and is now a large network with hundreds of kilometers of pipes plus dams, reservoirs, pump stations and pressure regulating stations. Blessed with the foresight of our predecessors, more than seventy-five percent of water that reaches customer's taps is delivered by gravity.

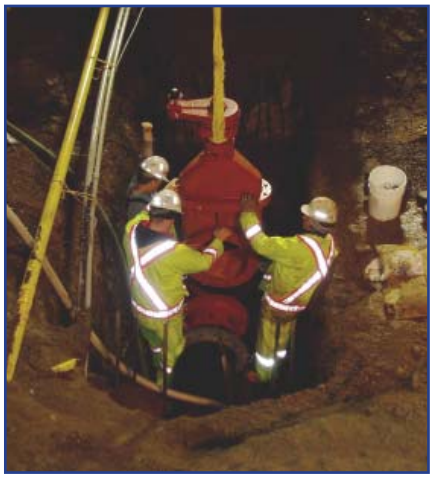
The supply system delivered 17.5 million cubic metres of treated water in 2009 which is 206,000 Litres per person in Nanaimo. Through ongoing conservation efforts, this represents a 5% decline in water consumption this decade alone. Water that is delivered to consumers is safe, reliable and always available, thanks to the City's ongoing water quality monitoring, operations and maintenance and capital upgrade programs. The next couple of decades will see major changes to the supply system, as a new water treatment plant is brought on line and a new source of water is developed to serve the needs of a growing region decades into the future.

Component	Estimated Asset Life (years)	Asset Value (2010 $)	Average Annual Replacement Cost (2010 $)
Water Distribution Mains (521 kms)	60	$283,000,000	$4,700,000
Hydrants (2,875 units)	40	$10,000,000	$250,000
Meters (21,772 units)	20	$6,500,000	$350,000
	Total	$298,200,000	$5,300,000
		Current Investment	$3,800,000

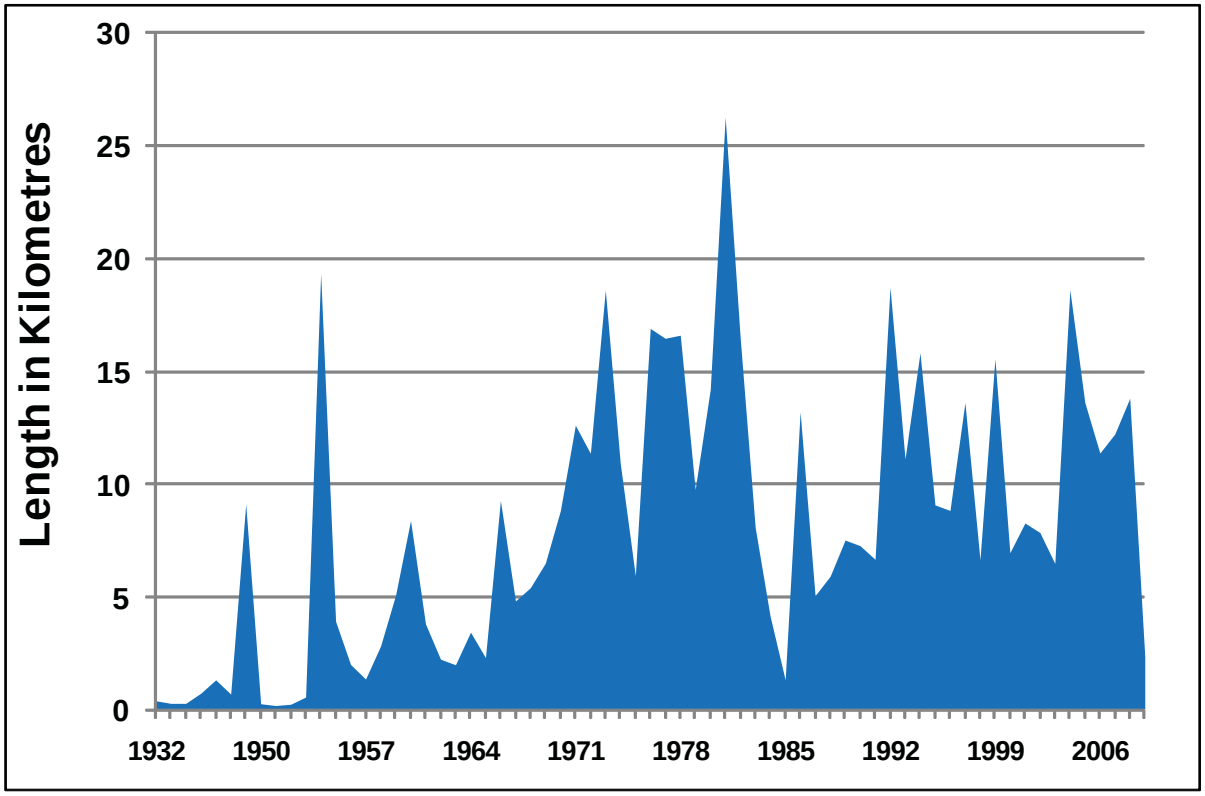


Component	Estimated Asset Life (years)	Asset Value (2010 $)	Average Annual Replacement Cost (2010 $)
Water Supply Mains (89 kms)	70	$196,300,000	$2,800,000
Dams (4 dams)	80	$92,000,000	$1,200,000
Reservoirs (7 reservoirs)	65	$29,500,000	$500,000
Pump Stations (9 stations)	25	$16,100,000	$600,000
Water Chlorination Station	40	$9,500,000	$200,000
PRV Stations (67 stations/chambers)	25	$10,200,000	$400,000
SCADA	15	$1,500,000	$100,000
TOTAL		$355,100,000	$5,800,000
		Current Investment	$2,900,000

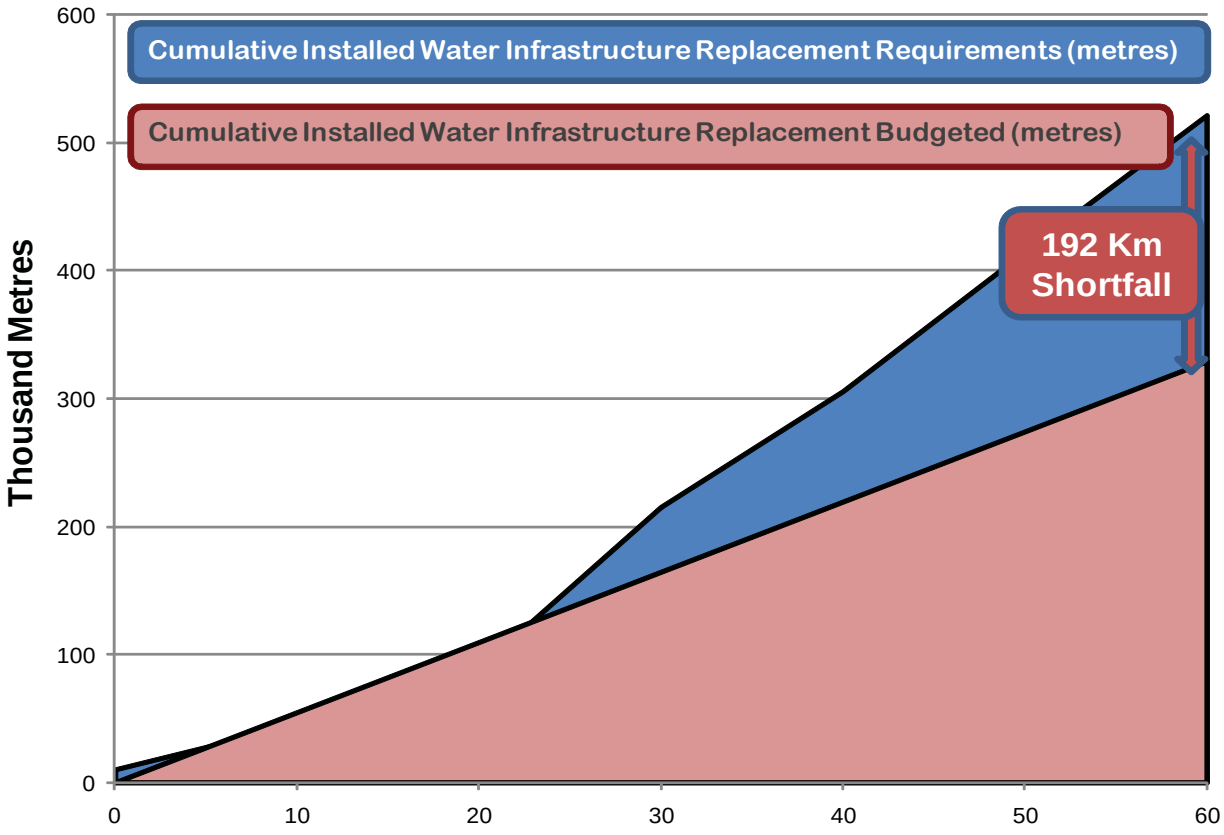




DISTRIBUTION SYSTEM - CONSTRUCTION HISTORY



REPLACEMENT INVESTMENT



Operating Performance Indicators

Staffing Level: 20 FTE's

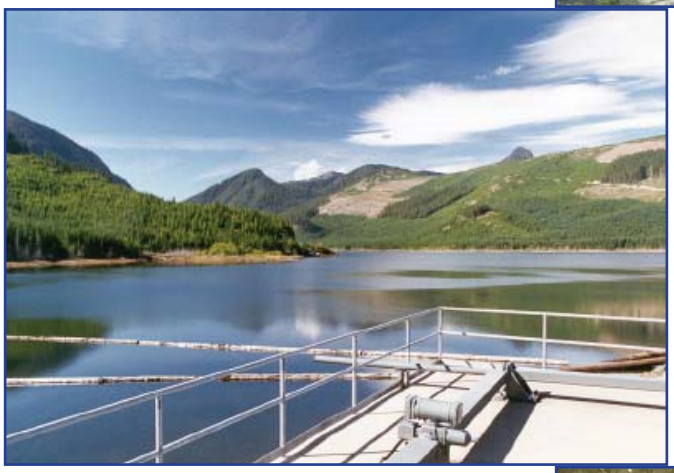
Total Operating Expenditure 2010 Budget: $4.2 million

Water Distribution System	
Service (Cost Centre)	**Operating Performance Indicators (OPI's)**
Valves & Air Valves (1849)	• Exercise all line valves once per year with monthly reporting
Water Main Breaks (1859)	• Upon notification emergency response and water shut down within 30 minutes. • Repair completed and water service re-instated within six hours. • Currently experiencing 18 breaks per year on average
Service Connection Renewals (1854)	• 20 renewals completed each year on average. • Service connections associated with Road Rehab Program and capital projects are checked and replaced as necessary.

Water Supply System	
Service (Cost Centre)	• Operating Performance Indicators (OPI's)
Dams ((1835)	• Annual engineers formal inspections, licensing, permitting • Thrice weekly monitoring. • 10 Year major comprehensive dam safety review of all dams. • Annual "Wet face" inspection of water supply dams.
Transmission Lines (1836)	• Annual painting and replacement of valve markers. • Annual painting of equipment • Monthly gate maintenance and repair. • Annual inspection and maintenance on line valves. • Five Year assessment of cathodic protection. • Annual flushing program. • Thrice weekly right of way inspection. • Semi - annual vegetation control.

Reservoirs (1837)	• Weekly inspections • Three year cycle - drain, inspect, clean and repair
Pump Stations (1838)	• Annual painting • Annual vegetation control • Five year cycle – rebuild control valves. • Ten year cycle – rebuild or replace pumps. • Weekly trouble shooting and repairs • Thrice weekly visual inspections
Telemetry & Instrumentation (1839)	• Weekly calibration of instruments, communications and central system. • Annual data compilation and audit.
Pressure Reducing Stations (1840)	• Maintain all pressure reducing stations to operate without failure. • Forty year cycle - complete replacement of each station • Five year cycle - complete rebuild of system. • Annual painting and vegetation control.
Water Testing (1846)	• 100% of water samples contain no bacteriological contaminants. • Monthly reporting
WPC Chlorination (1844)	• Disinfects 70 % of City supply. • Daily data acquisition and inspection • Daily water testing • Monthly chlorine cylinder replacement. • Semi-annual chlorination equipment replacement and repairs • Annual painting and vegetation removal • Five year cycle - replacement of small piping and control valves.
#1 Reservoir Chlorination (1845)	• Disinfects 30% of City supply
Water Main Flushing (1850)	• Annually flush all supply lines.
Service Call-outs	• Provide 24/7 on call coverage for emergency response.

NO
TRESPASSING

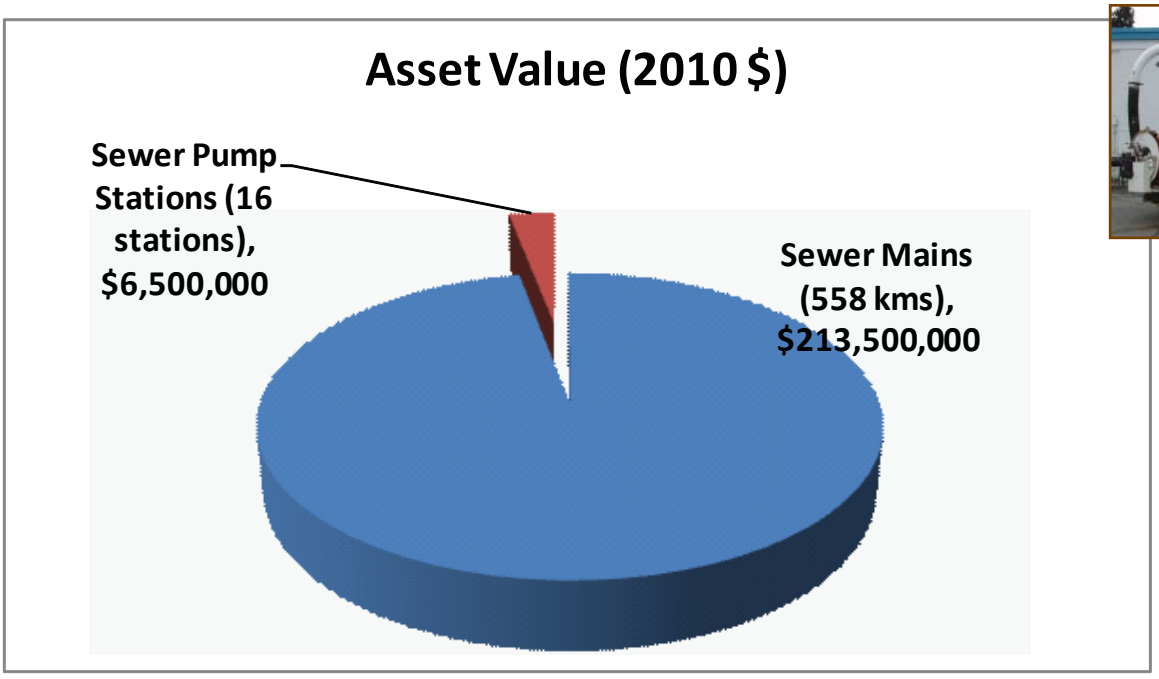


Sanitary Sewer

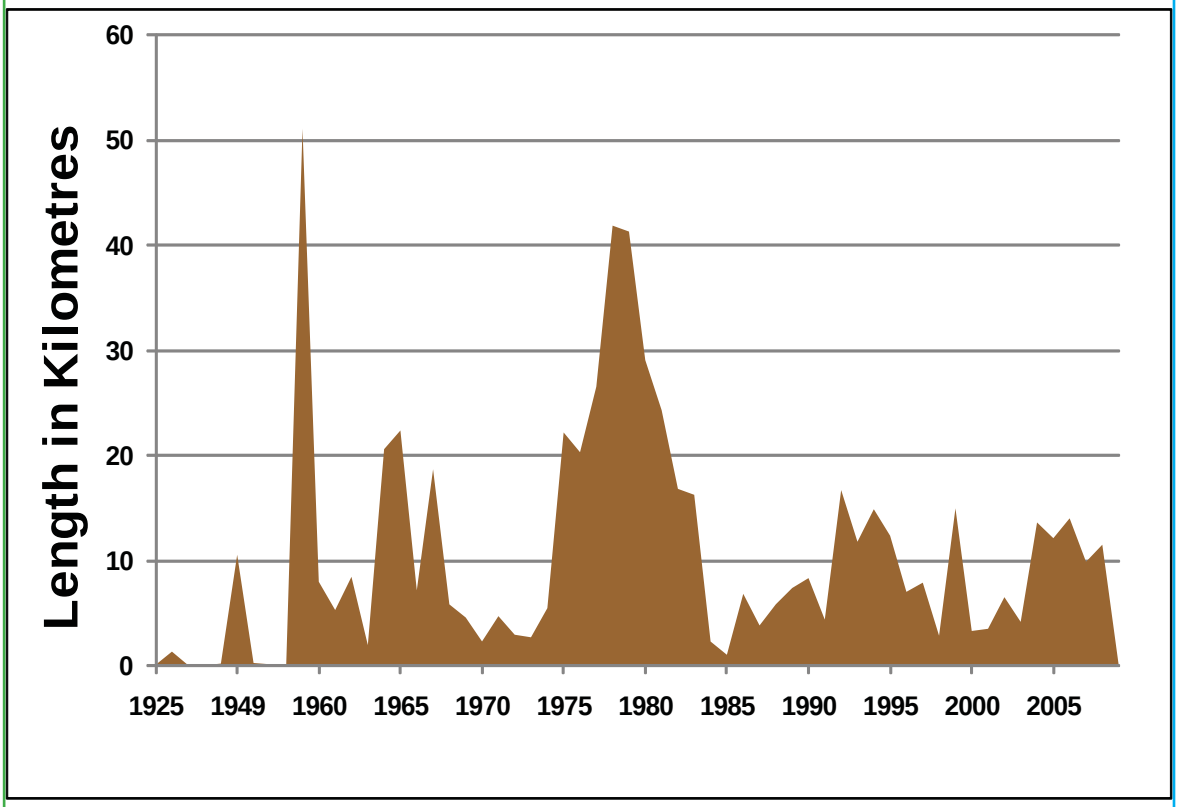
The City of Nanaimo provides Sanitary Sewer collection over 24,000 connections to the Regional District of Nanaimo's wastewater treatment plant. Currently the City's collection system has good capacity and excellent reliability. The total flow from the City to the wastewater treatment plant for 2009 was 11,699,400 Cubic Meters. The City's average daily flow was 32,047 Cubic Meters/ Day (32 megaliters) with a minimum one day flow of 25,200 Cubic Meters/Day (25 megaliters) and a maximum one day flow of 105,800 Cubic Meters/ Day (106 megaliters). To provide some perspective on how much wastewater is collected the City's average flow could fill the Nanaimo Aquatic Centre almost 7 times a day or 2,550 times through the year.

The 2003-05 downtown infrastructure project replaced 13 kilometers of aging sewer infrastructure and significantly improved the reliability of the sewer system in that area.

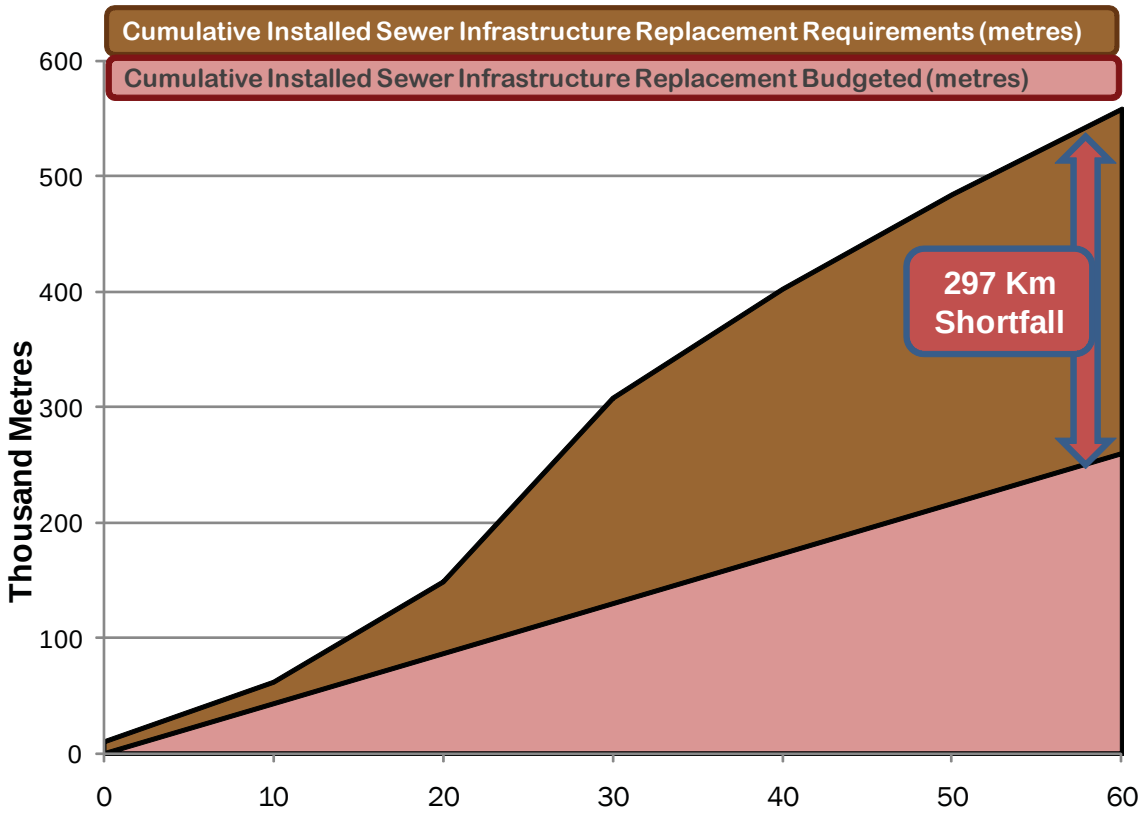
Component	Estimated Asset Life (years)	Asset Value (2010 $)	Average Annual Replacement Cost (2010 $)
Sewer Mains (558 kms)	60	$213,500,000	$3,600,000
Sewer Pump Stations (16 stations)	25	$6,500,000	$260,000
Total		$220,000,000	$3,900,000
		Current Investment	$1,700,000



CONSTRUCTION HISTORY



REPLACEMENT INVESTMENT



Operating Performance Indicators

Staffing Level: 9 FTE's

Total Operating Expenditure 2010 Budget: $1.9 million

Service (Cost Centre)	Operating Performance Indicators (OPI's)
Video Inspection (1624)	• Annual video inspection of 30 km of the 558 km of sanitary sewer system.
Sewer Main Flushing (1625)	• Annual flushing of 135 km of sanitary sewer • Every 5 years inspect all sanitary sewer mains. • Every 3 months flush 9 km of sewer mains with high plug risk. • Every 6 months flush 13 km of sewer mains with moderate plug risk.
Service Call-outs (1627)	• 24/7 on call coverage
Right-of-way Inspections (1628)	• Annual inspection and maintenance of all critical statutory right-of-ways. • 5 year cycle of inspection of all right of ways. • 50 km of right-of-way inspected and maintained as needed.
Coli form Program (1629)	• Weekly, during the summer, test Departure Bay for coli form.
Sewer Pump Stations (1631)	• Maintain 15 pump stations to operate without failure
Sewer Step Systems (1632)	• Weekly inspection of Fielding and Protection step systems
Monitoring (1633)	• Maintain SCADA connections, sewer controllers and flow monitors so system performance is monitored at all times.

Downtown Infrastructure Project

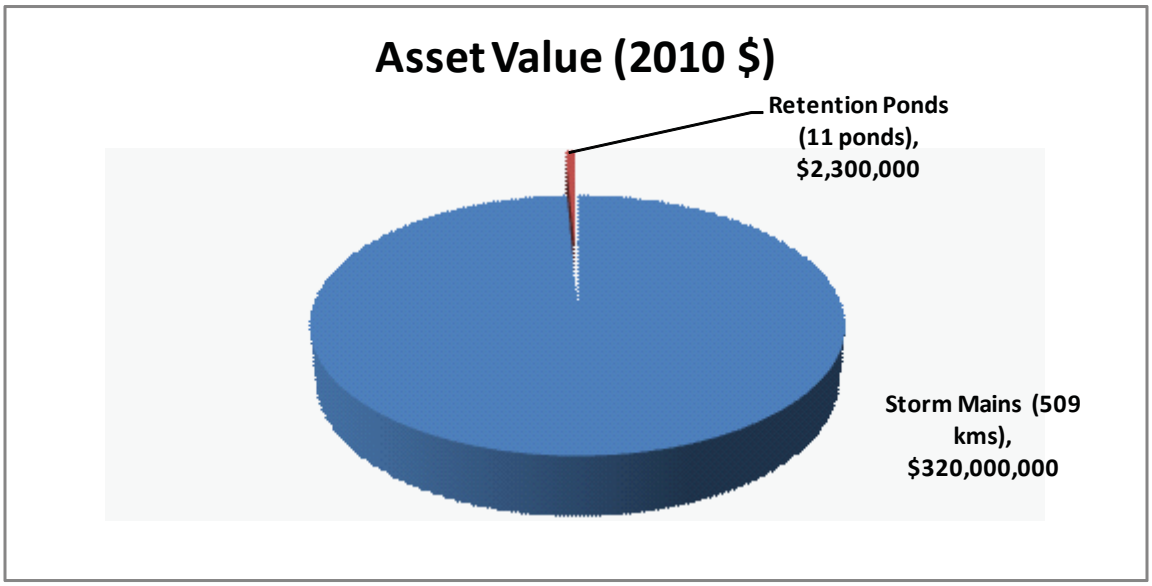
(left) Milton Street before...

and after (right).

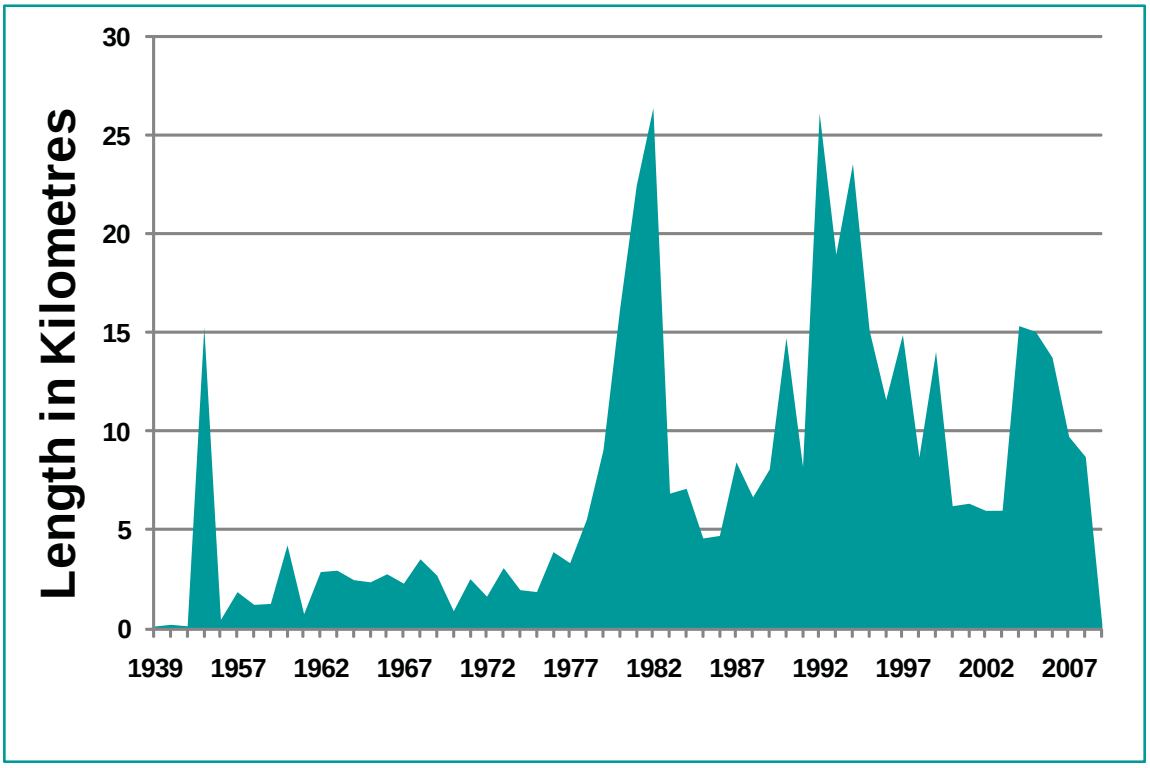
Drainage

City Council's investment in the Drainage System over the last 20 years coupled with a very good preventative maintenance program have proven to be effective. Last November more than 130 mm of rainfall was recorded over a three day period (200+ year storm event) and there were no flooding issues related to the City system. City staff were able to provide support and advice to property owners with drainage problems.

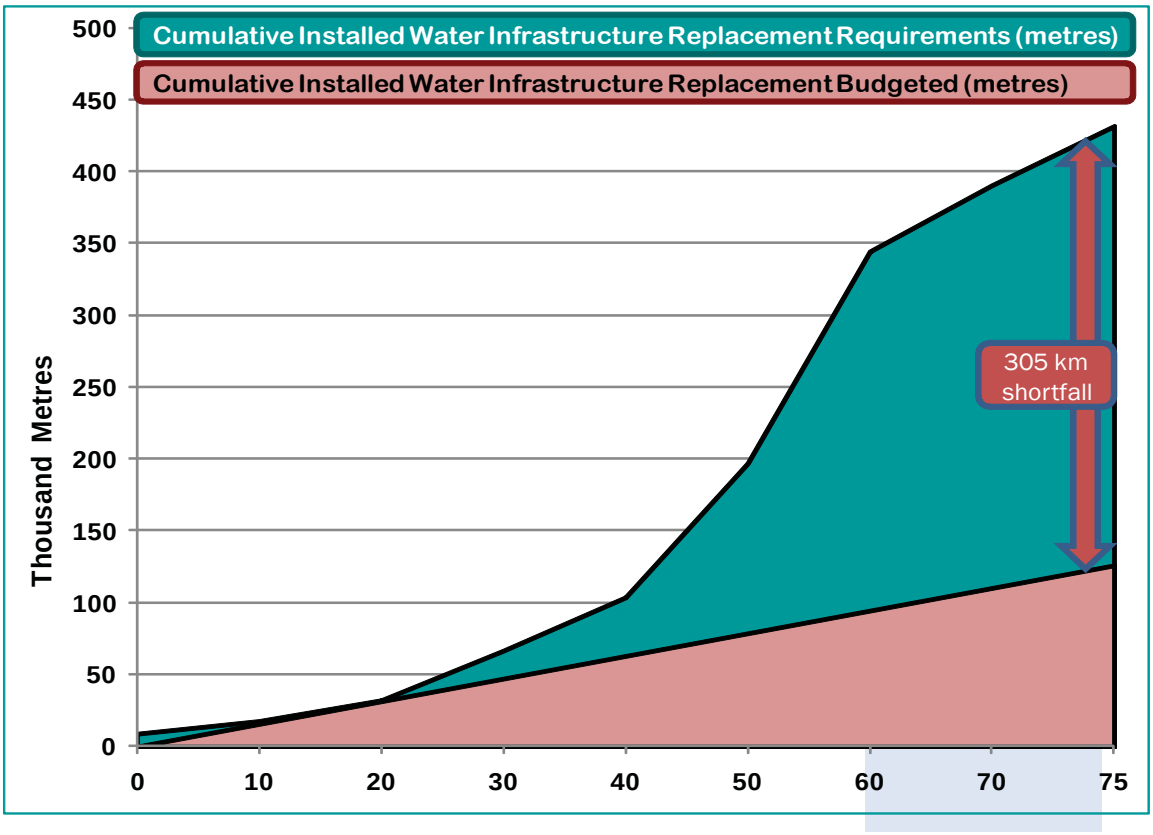
Component	Estimated Asset Life (years)	Asset Value (2010 $)	Average Annual Replacement Cost (2010 $)
Storm Mains (509 kms)	75	$320,000,000	$4,300,000
Retention Ponds (11 ponds)	40	$2,300,000	$60,000
Total		$322,300,000	$4,360,000
		Current Investment	$930,000



CONSTRUCTION HISTORY



REPLACEMENT INVESTMENT



Operating Performance Indicators

Staffing Level: 14.5 FTE's

Total Operating Expenditure 2010 Budget: $1.9 million

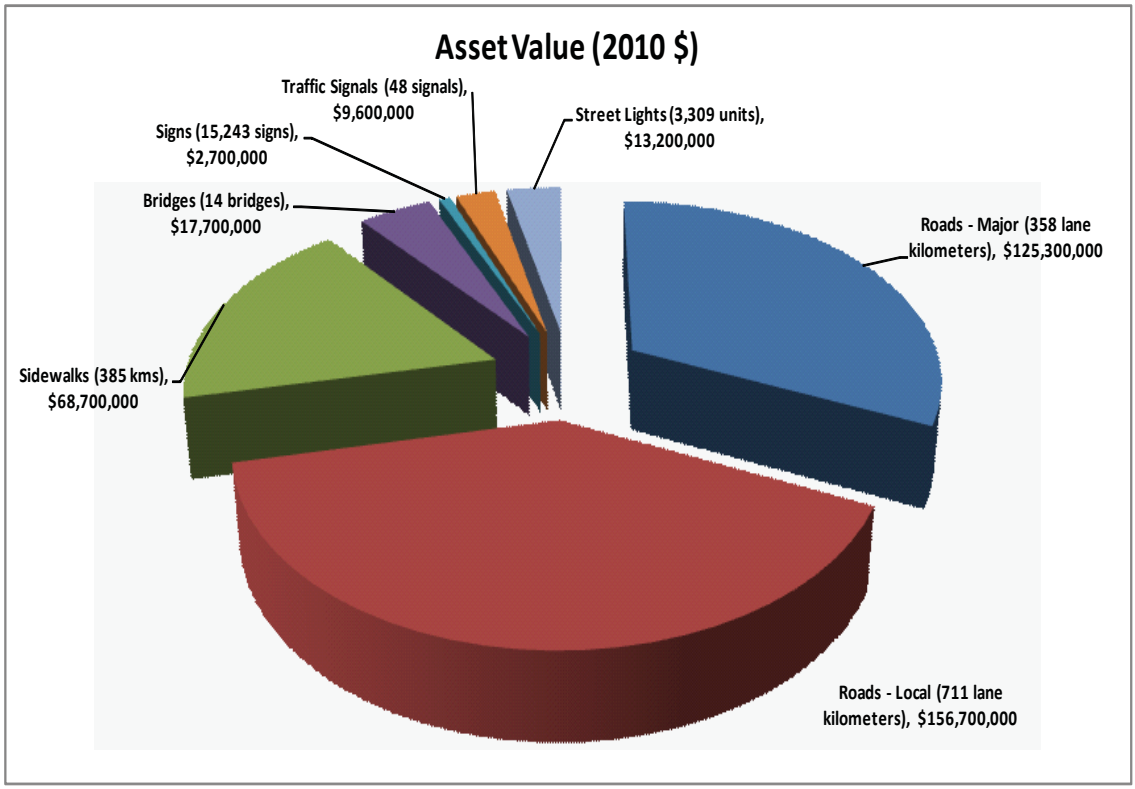
Service (Cost Centre)	Operating Performance Indicators (OPI's)
Flushing (3346)	Annual flushing of 19 km of the 416 km storm system
Video Inspections (3347)	Annual video inspection of 10 km of the storm system.
Manholes / Cleanouts (3348)	Install and repair manholes and cleanouts.
Catch Basins (3352)	Annual inspection and cleaning of all 11,500 catch basins
Detention Systems (3356)	Annual inspection of all 30 detention systems.
Inlet / Outlet Structures (3357)	As needed Inspect and clean all critical inlet and outlet structures and service before, during and post-storm events. Annual inspection and maintenance of approximately 2000 inlet and outlet structures.
Ditch Cleaning (3362)	Annual inspection of all 350 km of ditch and clean as needed.
Culverts (3364)	Repair driveway and road crossing culverts as assigned through work orders.
Service Call-outs	Provide 24/7 on call coverage for sewer and drainage emergency response.

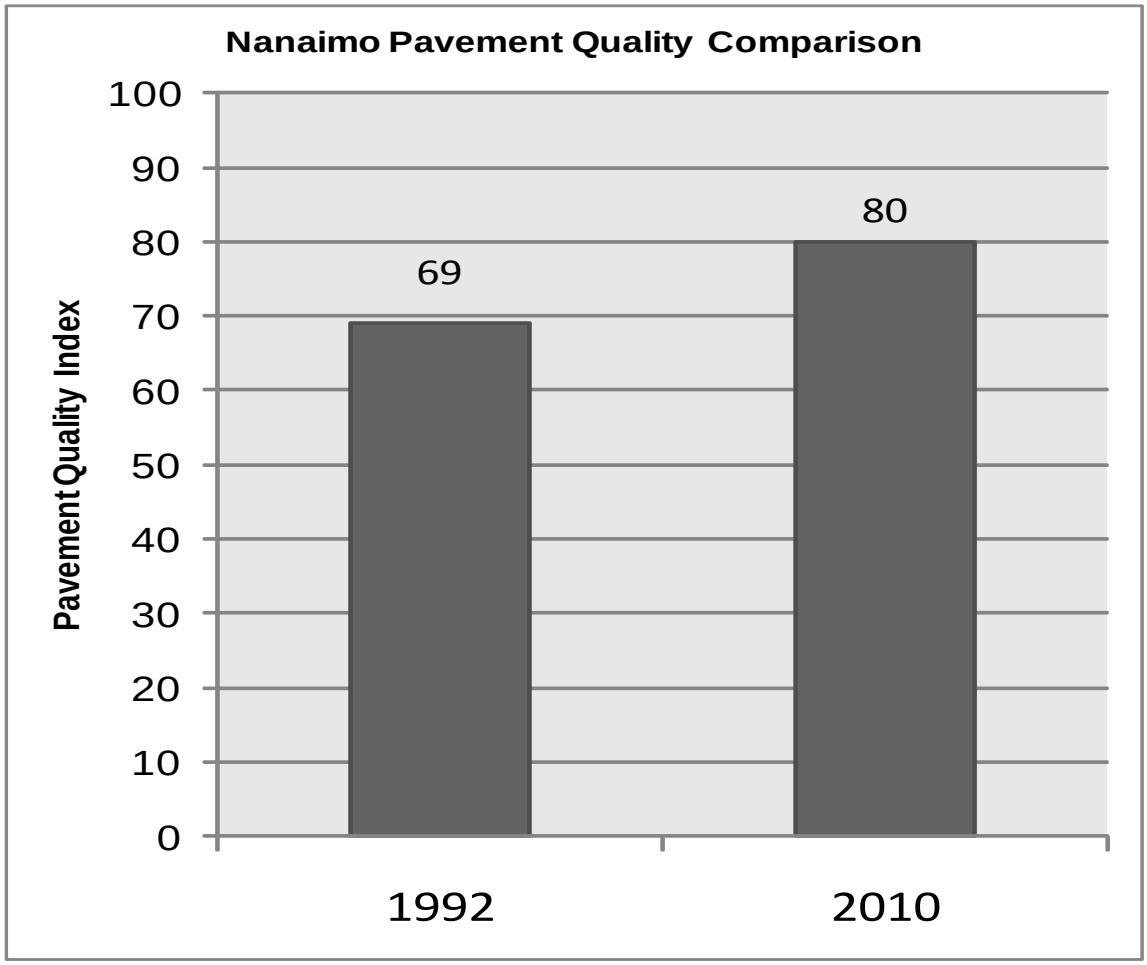
Transportation

Recently, Stantec Engineering completed a pavement quality assessment of the City's road system. The Pavement Quality Index (PQI) is used to provide an overall assessment based on the evaluation of Surface Distress, Riding Comfort and Structural Adequacy.

In 1992, the average Pavement Quality for the City's road system was 69 out of 100. Because of road quality issues at that time, City Council initiated a maintenance and rehabilitation program for local roads in 1996. The average Pavement Quality is now 80 out of 100 for the City's road system (81 for Major Roads and 79 for Minor Roads). Currently, Nanaimo's road quality is very good compared to most communities in Canada.

Component	Estimated Asset Life (years)	Asset Value (2010 $)	Average Annual Replacement Cost (2010 $)
Roads - Major (358 lane kms)	30	$125,300,000	$1,700,000
Roads - Local (711 lane kms)	50	$156,700,000	$2,100,000
Sidewalks (385 kms)	40 - 70	$68,700,000	$1,000,000
Bridges (14)	50	$17,700,000	$350,000
Signs (15,243)	12	$2,700,000	$200,000
Traffic Signals (48)	30	$9,600,000	$300,000
Street Lights (3,309)	60	$13,200,000	$220,000
	Total	$393,900,000	$5,870,000
		Current Investment	$3,600,000


Asset Value (2010 $)
Traffic Signals (48 signals), $9,600,000
Signs (15,243 signs), $2,700,000
Street Lights (3,309 units), $13,200,000
Bridges (14 bridges), $17,700,000
Roads - Major (358 lane kilometers), $125,300,000
Sidewalks (385 kms), $68,700,000
Roads - Local (711 lane kilometers), $156,700,000


Nanaimo Pavement Quality Comparison
Pavement Quality Index
100
90
80
70
60
50
40
30
20
10
0
69
80
1992
2010

Operating Performance Indicators

Staffing Level: 28 FTE's

Total Operating Expenditure 2010 Budget: $4.7 million

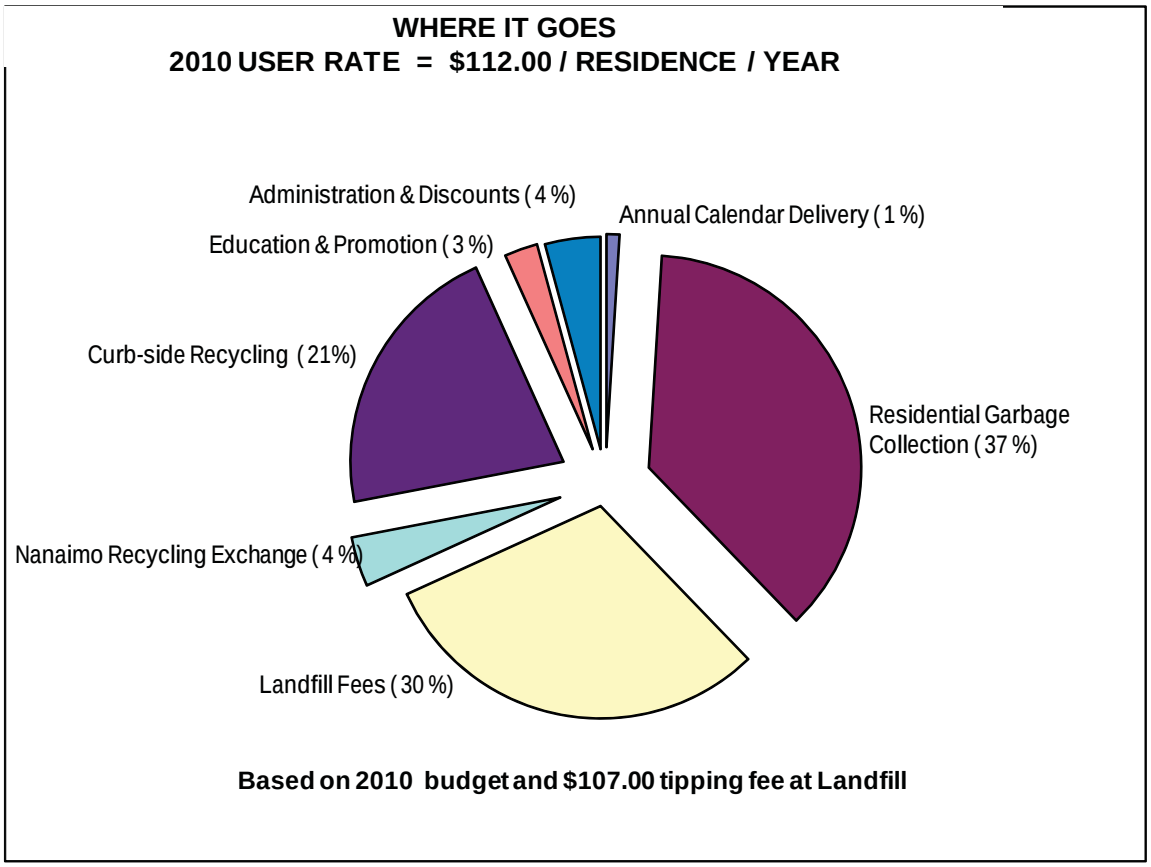
Service (Cost Centre)	Operating Performance Indicators (OPI's)
Road Maintenance & Repairs (3301)	• Complete approximately 800 work orders per year for service requests including pot hole repair, minor asphalt patching, alley maintenance, sightline improvement, MVA clean-up.
Major Asphalt Patching (3320)	• Annual repair of approximately 2,500 square meters of asphalt pavement.
Utility Patching	• Complete approximately 1,900 square meters of utility cuts annually. • On major roads target to complete hot mix asphalt patch in seven working days.
Boulevard Maintenance (3302)	• Twice per year cut every boulevard in Nanaimo. • Four times per year minimum cut the boulevards and traffic islands on major community entrance ways. • Annual weeding, cleaning and caulking of 5 km of sidewalk and curb. • Maintain sight lines at intersections for vehicle and pedestrian safety. • Annual cleaning and maintenance of all hard surfaced traffic islands.
Crack seal (3303)	• Annual Crack sealing of 15 km of road.
Preventative Maintenance (3305)	• One year in advance of scheduled road rehab work video inspect all affected underground utilities. • During road rehab projects, take two asphalt tests per day.
Curbing/Shoulders (3306)	• Annual repair, by August, of all curbing damage in previous winter.
Sidewalks & Walkways (3311)	• Annual Weeding, brush removal and cleaning all walkways.. • Every two years power wash downtown paver sidewalks including curb face.
Vandalism (3313)	• Within 48 hours of notification, remove graffiti. • Weekly check all traffic controllers and remove graffiti as needed.

Street Lighting (3315)	• Service requests for street light repair completed within 72 hours.
Traffic Signals (3316)	• Every two years inspect and maintain all traffic signals. • Annual testing of all traffic signal conflict monitors. • Annual inspection and maintenance of all pedestrian beacons. Includes cleaning lenses, and inspecting batteries and solar power supply.
Signs (3325)	• Annual inspection and maintenance of all 2000 City stop signs. • Annual inspection of crosswalk, pedestrian, school and playground signs and beacons. • Annual Upgrade of 250 signs to diamond grade.
Street Marking (3326)	• Annual repaint of all 210 km of directional centre lines. • Twice per year repaint all directional centre lines on major collectors and arterials. • Annual repaint of all 50 km of trim line. • Annual painting, prior to May long weekend, of all downtown street markings. • Annual inspection and repair of all 500 crosswalks and thermal plastic markings.
Bridge Maintenance (3331)	• Annual engineering inspection of bridges and completion of repairs as recommended.
Christmas Lights (3342)	• Annual installation of downtown Christmas lights by December. • Annual removal of downtown Christmas lights by mid January.
Street Banners (3343)	• Annual installation of 600 City banners and 300 Arts banners by May 24 and their removal by mid-September. • Every two years replace all banners.
Snow and Ice Control (3335)	To plough and maintain: • Major roads including emergency routes during winter events. • Residential areas – through roads first then cul-de-sacs and dead ends. • Residential areas will be ploughed and maintained within 96 hours unless snow and icy conditions return crews back to major roads.

Sanitation / Recycling

In recent years communities across Canada have been introducing curb-side food waste collection. The City of Nanaimo in partnership with the RDN, Parksville and Qualicum has initiated a curb-side kitchen waste collection program. In Nanaimo 10 of the 30 routes are now on the program with the other routes to begin in 2011. It is expected that diversion of waste from the landfill will increase from 32% to 70% (4,200 tonnes or just over 700 garbage truck loads)

Sanitation staff are providing excellent customer support during this service change.



Operating Performance Indicators

Staffing Level: 12 FTE's

Total Operating Expenditure 2010 Budget: $4.0 Million

Service (Cost Centre)	Operating Performance Indicators (OPI's)
Street Cleaning Operations (3101)	• Twice per year sweep all streets in the City. Usually done once in the Spring and Fall. • Weekly sweep all streets in the Downtown core. • Bi-weekly sweeping of all sidewalks in the downtown core.
Bus Shelter/Bench Sanitary Maintenance (3104)	• Maintain 262 bus benches, 13 street side benches and 44 bus shelters.
Street Waste Receptacles (3106)	• Regular scheduled collection from approximately 79 waste receptacles in the Downtown Core. • Regular scheduled collection from 41 waste receptacles located at bus shelters and along main pedestrian corridors.
Cleaner Community Partnership (3107)	• Annual support of litter pick up by approximately 16 volunteer groups performing 200 kms of road side cleaning each spring and fall.
Annual Calendar Delivery (3108)	• Annual delivery of route calendars to city serviced residences in December for the following year.
Public Education and Program Promotion (3109)	• Twice per year prepare and deliver 35,000 garbage and recycling newsletters plus advertising and community education through a variety of media.
City – Residential Collections for over 25,000 (3112)	• Weekly pick up of one can of residential garbage on 20 of 30 residential routes. • Bi-weekly pick up of one can of residential garbage on 10 of 30 routes. • Weekly collection of kitchen waste on 10 of 30 routes
Community Programs (3117)	• To provide funding and support for the Nanaimo Recycling Exchange.
Residential Curb-side Recycling (3118)	• Bi-weekly pick up of residential recyclables from over 25,000 residences on 30 routes.
Public Works Yard Administration (3739)	• Provide operational dispatch during working hours and 24 hour emergency services through Commissionaires.

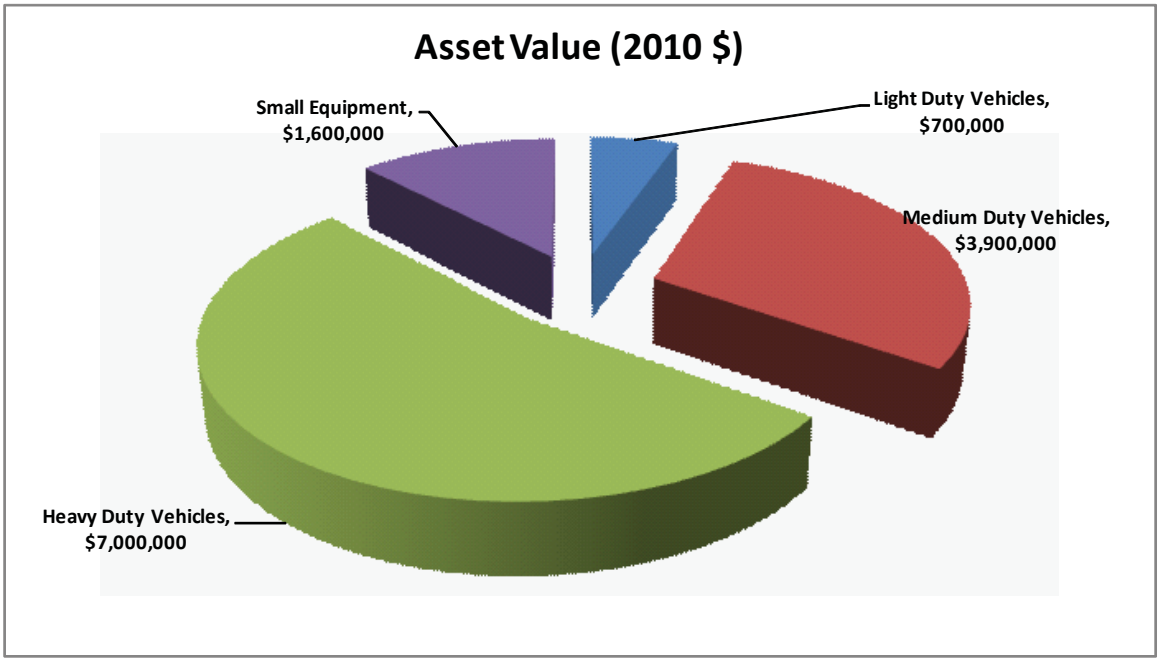
Fleet

In 2010, the City's fleet performance was rated through the E3 Fleet Review process, which is a national green fleet rating system. The review indicated that the City of Nanaimo fleet was well managed and that vehicle utilization (11,822 km average) and availability (98%) were close to other leading municipal fleets. The E3 recommendations for fleet improvement are consistent with current fleet initiatives with the exception that they recommend being more aggressive in reducing the 9.4 year average age of our fleet than is currently planned.

In continuing support of environmental sustainability and reducing the City of Nanaimo's carbon footprint, initiatives for the City's Fleet include:

- Using biodiesel.
- Purchasing hybrid electric or electric vehicles as a first consideration when replacing cars and light trucks in the fleet.
- Downsizing vehicle weight and engine size where possible.

Component	**# of Units**	**Estimated Asset Life (years)**	**Asset Value (2010**	Average Annual Replacement Cost (2010 $)
Light Duty Vehicles	23	8 - 10	$700,000	$100,000
Medium Duty Vehicles	80	8 - 10	$3,900,000	$400,000
Heavy Duty Vehicles	45	5 - 15	$7,000,000	$500,000
Small Equipment and Machinery	72	5 - 10	$1,600,000	$200,000
Total	220		$13,200,000	$1,200,000
			Current Investment	$800,000



Operating Performance Indicators

Staffing Level: 12 FTE's

Total Operating Expenditure 2010 Budget: $2.1 Million

Service (Cost Centre)	Operating Performance Indicators (OPI's)
Fleet Maintenance (3801)	• Undertake preventative maintenance and repairs to meet industry standards for safety and operation. • Maintain fleet availability at 98%.
Small Equipment (3802)	• Inventory, maintain and repair 250 pieces of small equipment for use by all departments.
Preventative Maintenance Services (3803)	• 160 units inspected every three months to maintain safety and fleet efficiency.
Leases (3806)	• Lease vehicles for summer projects and operations. • To keep fleet utilization high.
Communications (3811)	• License, repair and purchase fleet and hand-held communications to maintain dependable operation.

6. Summary

Residents of the City of Nanaimo enjoy high quality service from sanitation and recycling, the road network, water system, sanitary sewer collection system and drainage works. To maintain these services the City faces the same challenges as all other municipalities in Canada. Challenges that include more stringent environmental regulations, sustainability issues, increasing power and fuel costs, growth and aging infrastructure.

Over the years, Nanaimo City Council has introduced several initiatives that have helped maintain the quality of life, service and supporting infrastructure for the community including:

- Funding a Road Rehabilitation program that has enabled the City's road quality to be maintained.
- Metering water consumption and using a tiered rate system which has promoted water conservation and deferred the need to up size infrastructure.
- Establishing Development Cost Charges, paid by new developments and subdivisions, to fund a significant portion of new infrastructure and the upgrading of existing infrastructure.
- Introducing environmental standards to preserve the quality and promote the sustainability of the environment including fish, animals, trees, marsh lands, rivers, lakes and the ocean.
- Promoting community densification to make more efficient and effective use of existing infrastructure.
- Introducing recycling programs and composting.

The City's infrastructure, including the road network, water system, sanitary collection system and drainage works, has grown considerably over the last thirty years. Since the amalgamation of the City in 1975 the level of service in all these systems has been maintained very well. This is because the majority of these systems were relatively new and the initiatives of Council mentioned above have worked very well.

Now, after 35 years, some parts of these systems are showing their age and significant replacement costs are on the financial horizon. This is particularly noticeable with the water, sanitary and drainage systems.

The sufficiency of the funding for roads infrastructure requires more analysis. Over the last 15 years the Road Rehabilitation Program has enabled the City to improve its pavement quality. However, the price of oil has greatly inflated during that time while budgets have decreased which is a challenge.

6. Summary

Options can be explored to reduce the increase in infrastructure investment including:

- Further promote conservation.
- Support alternative transportation.
- Reduce service levels.
- Lobby for provincial and federal government funding

However, the City needs to prepare for increases in infrastructure investment to maintain current service levels as assets age and need replacement.

A good balance between asset replacement through capital funding and ongoing maintenance provides the best cost efficiency and service productivity.