	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)	Note
General Government								
Administration								
Salary Review	-	-	-	-	50	-	-	
Destination Marketing Plan	-	-	-	-	50	0	0	
Communication and Outreach Plan	40	70	-	-	-	-	-	
Tourism Strategy	-	-	50	51	-	-	-	
Economic Development Readiness	-	-	-	16	-	-	-	
Promotion	-	-	-	33	-	-	-	
Tourism Kiosk	-	-	-	-	-	50	80	
Stores- Shelving	12	12	-	-	-	-	-	
CCBF-911 Emergency Services	-	2	-	7	-	-	-	
	52	84	50	107	100	50	80	
Community Energy Plan (CEP)								
CEP District Energy Studies	-	145	-	179	-	-	-	
CEP Energy Coordinator	85	105	90	110	95	95	95	
CEP Energy Efficiency Projects	415	137	320	700	205	405	405	
	500	388	410	989	300	500	500	(1)

Note:

(1) In 2015, another $200,000 CEP Funding will be used to partly finance the Yellowknfife Community Arena's project, YKCA ice plant replacement & heat recovery installation

	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
Information Technology							
Network Upgrades	25	23	25	25	25	25	25
GIS Enhancements	50	49	50	50	40	50	50
Server and Storage Replacements	25	22	30	30	40	40	40
Desktop Telephone Replacement	10	-	-	10	-	-	-
Satellite Imagery	75	68	-	-	60	-	-
Communication Infrastructure	225	731	-	592	5	25	25
Security Cameras	20	16	20	20	-	20	20
Secondary Site & Data Replication	50	49	20	20	20	20	20
Library Public Access	-	-	-	-	-	20	-
MED In-Car Computer	-	-	10	10	10	-	-
MED In-Car Cameras	-	-	-	-	-	30	-
MED Web Applications	-	3	-	5	-	-	-
Website Enhancement	15	5	15	26	11	15	15
Website Redesign	-	-	35	35	-	-	-
Server Room Upgrades	25	24	-	-	25	25	-
Server Room UPS	-	-	35	35	-	-	-
Core Switch Upgrades	-	-	25	25	60	-	-
Inventory Bar Coding	-	8	-	18	-	-	-
Virtualization	40	39	40	40	100	100	25
One-Stop Shopping	200	12	-	188	-	-	-

(cont'd)

	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
Information Technology (cont'd)							
Wireless Authentication/ Authorization	-	-	-	20	-	-	-
Document Management	25	-	-	-	-	-	-
Mapping	27	13	-	-	-	-	-
Door Access Controls	150	81	-	69	10	20	20
Wireless Standardization	20	-	-	-	-	-	-
Meeting Automation	-	-	-	100	-	-	-
Development and Building Permit Automation	50	91	-	20	-	-	-
Human Resources System Automation	-	-	-	30	-	-	-
Smart Boards	25	20	-	-	-	-	-
GeoWare Standardization	20	13	-	7	-	-	-
OptiView Tablet	25	25	-	-	-	-	-
Multi-function Devices and Printers	50	-	50	100	50	50	50
Social Media	5	-	-	5	-	-	-
Automated Ticket Writer	-	-	20	20	-	-	-
Digital Signatures	-	-	30	-	-	-	-
Client Access Switches	-	-	50	50	-	-	-
Open Data	-	-	25	25	-	-	-
Computer Aided Dispatch	-	-	125	125	20	-	-
Automatic Vehicle Location	-	-	25	25	-	-	-
Teleconferencing	-	-	30	30	-	-	-
Webcasting	-	-	-	20	-		-
Equipment Cameras	-	-	35	35	-	-	-
Emergency Operations Centre Equipment	-	-	-	-	20	-	-
Client Access Management	-	-	-	-	-	25	-
Wireless Controllers	-	-	-	-	-	55	-
	1,157	1,293	695	1,809	496	520	290

		2015 Budget Recommended ($000s)	Formula Funding ($000s)	CCBF ($000s)	IT Reserve ($000s)
	Page				
General Government					
Administration					
Salary Review	209	50	50		
Destination Marketing Plan	210	50	50		
		100	100	-	-
Community Energy Plan (CEP) Initiatives					
Energy Coordinator	212	95	95		
Bulk Pellet Receiving System for Pellet Boiler	214	60	60		
Air Source Heat Pump Pilot Project	216	10	10		
Renewable Electricity Generation (Solar)	218	100	100		
Micro Retrofits Program & Continuous Improvement	220	35	35		
		300	300	-	-
Information Technology					
Network Upgrades	222	25			25
GIS Enhancements	222	40			40
Server and Storage Replacements	223	40			40
Satellite Imagery	223	60			60
Communication Infrastructure Renewal	224	5	5		
Secondary Site & Data Replication	224	20			20
MED In-Car Computers	227	10			10
Website Enhancements	225	11			11
Server Room Upgrades	229	25	25		
Core Switch Upgrades	231	60	60		
Virtualization	233	100			100
Door Access Controls	225	10	10		
Multi-function Devices and Printers	226	50			50
Computer Aided Dispatch	235	20		20	
Emergency Operations Centre Equipment	236	20	20		
		496	120	20	356
Subtotal		896	520	20	356

Department Administration
Division Human Resources
Project Salary Review

Project Description
The City is to contract out a salary review of all employee groups to determine competitiveness of City salaries in the marketplace.

Justification
In 2013, Council requested that a salary review of all employee groups take place before the next expiry of the collective agreements (December 31, 2015). This will show how City of Yellowknife salaries compare in the marketplace to competitors, both northern and southern. The last review, done in 2007, formed the basis of bargaining mandates in subsequent years.

Operating Cost Impact
A salary review will help determine bargaining mandates, which affect operating costs.

Project's Impact on Other Departments
Bargaining mandates affect all departments.

Project's Return on Investment
N/A

City Council's Goals/Objectives/Actions
Goal #1: Building a sustainable future
Objective #1(c): Emphasize fairness, value and transparency in financial decisions, program delivery and land administration
Goal #4: Creating and sustaining meaningful relationships
Objective #4(d): Create an environment of mutual respect, open dialogue and teamwork
Action #4.3: Strengthen internal culture / relationships (staff)
Action #4.4: Measure and improve employee retention

2015 Capital Cost: $50,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	50,000		50,000		
Total:	50,000		50,000		

Department: Communications and Economic Development
Division: N/A
Project: Destination Marketing Plan

Project Description

The 2014 Tourism Strategy identifies the need for a Destination Marketing Plan. While this specific project was initially combined with a range of responsibilities related to tourism, marketing and conventions, this current submission focuses only on the one component of a Destination Marketing Plan. It is specifically justified by the premise that an effective tourism marketing approach is necessary for this community's tourism sector to function well and to achieve its growth potential. The requested project is intended to raise market awareness in Yellowknife.

Currently the Department of Communications and Economic Development is implementing the action items identified in the Economic Development Strategy. Starting in 2015, the Department will begin implementation of the Tourism Strategy.

Operating Cost Impact

There is no O&M Impact in 2015. This project can be undertaken within existing O&M resources; however, recommendations from the Plan may impact future O&M deliberations.

Project's Impact on Other Departments

A project dedicated to generating business, tourism, and conference opportunities could result in an increase in business licencing and investment in the commercial sector, both of which would increase revenue for the departments of Planning & Development and Corporate Services.

Project's Return on Investment

The project outcomes could play a significant role in drawing more conferences, business activity and investment to Yellowknife which, in turn, will contribute to improved business resiliency, creation of new businesses, and an enhanced property tax base. For example, attracting one three-day conference attended by 100 delegates who spend an average of $300/day would generate $90,000 in spending.

If overall annual visitation to Yellowknife increased by 5% as a result of enhanced visitor marketing, the estimated related impact would be about $4 million ($38 million in current accommodation spending + 5% = $39.9 million, an increase of about $2 million.) If accommodation spending represents half of total visitor spending, then the overall estimated increase in annual tourism spending would be about $4 million.

Council Goals/Objectives/Actions

Goal #1:	Building a sustainable future
Objective #1(a):	Realize opportunities to encourage economic growth and diversity
Action #1.1:	Develop an Economic Development Strategy
Action #1.2:	Develop a Tourism Strategy

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost					
Design					
Development	50,000		50,000	0	0
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	50,000		50,000	0	0

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	50,000		50,000	0	0
Total:	50,000		50,000	0	0

Department: Corporate Services
Division: Corporate Services and Risk Management
Project: Energy Coordinator

Project Description
The Energy Coordinator is responsible for implementing the CEP and was made a permanent position in 2009. The Energy Coordinator's primary duties include:

- Identifying funding opportunities to support the implementation of the CEP and assist in the application process
- Briefing Administration and Council on the energy and emissions implications of their decisions when deemed applicable
- Providing quarterly updates to the CEP Implementation Advisory Committee on the progress of the CEP
- Working with facilities and operations managers to identify and implement energy efficiency projects
- Working on a "continuous improvement" policy
- Working with City departments to ensure purchases give consideration to energy efficiency
- Working with other levels of government and the private sector to support the implementation of the CEP
- Working to develop a centralized boiler system for City facilities
- Communicating with the general public and City staff on activities and projects related to the CEP
- Renew the CEP

Justification
In addition to coordinating the implementation of capital projects, the Energy Coordinator undertakes energy monitoring and issues recommendations on facility operations. Such collaboration with other departments is estimated to have saved the City $60,000 in the last 12 months at the Yellowknife Community Arena and Multiplex. Energy monitoring enabled the early detection of outages in pellet boilers and the identification of energy use trends that were then improved.

Operating Cost Impacts
Monitoring and optimizations activities typically lead to reduced operating expenditures.

Project's Impact on Other Departments
Capital projects and energy monitoring mostly benefit other departments.

Project's Return on Investment
Integrated within other Capital Projects

Council Goals/Objectives/Actions

Goal #2:	Stewards of our natural and built environment
Objective #2(c):	Develop smart and sustainable approaches to energy, water and sewer, waste management and building systems

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Personnel Cost	285,000		95,000	95,000	95,000
Operating Cost					
Capital Cost					
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	285,000		95,000	95,000	95,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	285,000		95,000	95,000	95,000
Total:	285,000		95,000	95,000	95,000

Department: Corporate Services
Division: Corporate Services and Risk Management
Project: Bulk Pellet Receiving System for Pellet Boiler

Project Description
This project will see the installation of a bulk transfer station at the pellet boiler behind the Yellowknife Community Arena. A bulk transfer station uses augers to receive full tractor trailer loads, or 45 tonnes of pellets per delivery, directly from a producer.

Justification
Pellet producers' prices are approximately 30% less than retail distributors. The pellet boiler behind the Yellowknife Community Arena uses approximately 520 tonnes of pellets per year.

Operating Cost Impacts
At current prices and consumption levels, this project would save the City $57,200 per year.

Project's Impact on Other Departments
Community Services staff will need to unlock the equipment for transfers approximately 12 times per year.

Project's Return on Investment
95%

Council Goals/Objectives/Actions
Goal #2:	Stewards of our natural and built environment
Objective #2(c):	Develop smart and sustainable approaches to energy, water and sewer, waste management and building systems

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost					
Design					
Development					
Construction Engineering	5,000		5,000		
Construction	20,000		20,000		
Equipment	25,000		25,000		
Materials	10,000		10,000		
Total:	60,000		60,000		

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	60,000		60,000		
Total:	60,000		60,000		

Department: Corporate Services
Division: Corporate Services and Risk Management
Project: Air Source Heat Pump Pilot Project

Project Description
Air-source heat pumps are similar to air conditioning units that provide heating instead of cooling. This project proposes to install two units in two locations to evaluate their effectiveness within the City's operation.

Justification
Small facilities like office trailers, storage sheds, liftstations and pumphouses, do not have the minimum heat loads required to make pellet stoves cost-effective for the City. Low maintenance alternatives such as heat pumps have the potential to reduce the City's greenhouse gas (GHG) emissions and costs.

While electricity is mostly renewable energy in Yellowknife, it is more expensive than oil. Air-source heat pumps are able to transfer up to five times the heat energy from exterior air for each kilowatt-hour (kWh) of electricity used to operate the pump. The overall seasonal impacts on heating would result in net savings of approximately 30%. These savings estimates include variations in efficiencies due to cold temperatures.

Two $5,000 systems would be installed in two locations, each displacing 4,000 litres of oil, representing a 20-tonne reduction in GHG emissions. A total of 12 potential locations have been identified for implementation, provided the pilot project is conclusive.

Operating Cost Impacts
$3,000 savings

Project's Impact on Other Departments
No other impacts on host department

Project's Return on Investment
30%

Council Goals/Objectives/Actions

Goal #2:	Stewards of our natural and built environment
Objective #2(c):	Develop smart and sustainable approaches to energy, water and sewer, waste management and building systems

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost					
Design					
Development					
Construction Engineering					
Construction					
Equipment	8,000		8,000		
Materials	2,000		2,000		
Total:	10,000		10,000		

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	10,000		10,000		
Total:	10,000		10,000		

Department: Corporate Services
Division: Corporate Services and Risk Management
Project: Renewable Electricity Generation (Solar)

Project Description
This project proposes to leverage territorial government funding for solar power by installing approximately 15kW of photovoltaic (PV) cells in one or multiple locations. Four potential sites were identified: City Hall, Public Works Garage, Multiplex and the new Water Treatment Plant.

Justification
The current proposed increase in power rates and the use of diesel to produce electricity have made small-scale solar projects a cost-effective way to reduce the City's GHG emissions.

The pilot project at the Baling Facility has been successful, generating 80% of its forecasted production, even in this summer's extremely smoky conditions.

As the cost of diesel generation is higher than the rate the City is receiving for the power produced, some savings are anticipated for the community as a whole, as solar power would reduce the amount of diesel needed to replenish the hydro reservoirs.

Operating Cost Impacts
$2,500 savings for host departments

Project's Impact on Other Departments
No other impacts on host department

Project's Return on Investment
4.2% return on equity
8.4% return on investment, if funding applications are successful

Council Goals/Objectives/Actions

Goal #2:	Stewards of our natural and built environment
Objective #2(c):	Develop smart and sustainable approaches to energy, water and sewer, waste management and building systems

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost					
Design					
Development					
Construction Engineering	10,000		10,000		
Construction	40,000		40,000		
Equipment	40,000		40,000		
Materials	10,000		10,000		
Total:	100,000		100,000		

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	100,000		100,000		
Total:	100,000		100,000		

Department: Corporate Services
Division: Corporate Services and Risk Management
Project: Micro Retrofits Program and Continuous Improvement

Project Description
The Community Energy Plan recommended the creation of a continuous improvement program to complete small incremental improvements. Retrofits such as installing occupancy sensors for lighting, insulating boiler pipes, replacing windows, sealing air infiltrations and installing electronic thermostats are intended in this program, and often produce a great return on investment when done along with other retrofits.

Justification
Energy efficiency opportunities often present themselves during maintenance work or when new products become available. Having budgets available to capitalize on those opportunities is a cost-effective way to increase energy efficiency and reduce the City's use of non-renewable energy.

Operating Cost Impacts
$5,250 savings

Project's Impact on Other Departments
No other impacts on host department

Project's Return on Investment
Minimum target return on investment of 15%

Council Goals/Objectives/Actions

Goal #2:	Stewards of our natural and built environment
Objective #2(c):	Develop smart and sustainable approaches to energy, water and sewer, waste management and building systems

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost					
Design					
Development					
Construction Engineering					
Construction	17,500		17,500		
Equipment	17,500		17,500		
Materials					
Total:	35,000		35,000		

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	35,000		35,000		
Total:	35,000		35,000		

PROJECT Network Upgrades

COST
2015 $25,000
2016 $25,000
2017 $25,000

DESCRIPTION

The City's Information Technology infrastructure is essential for effective service delivery, and the network that provides connectivity among its diverse computers, servers, printers, cameras, and mobile devices is vital to the City's operations. As employees and stakeholders increasingly turn to technology to achieve efficiencies and service enhancements, demands and reliance on the network continue to grow. For example, in recent years the City has adopted enterprise solutions such as CityWorks, CityView, and CityExplorer; introduced traffic cameras; expanded its security camera fleet; extended its website and online service offerings, and branched out into mobile applications. All of these add to the increasingly heavy demands on the network, both in terms of capacity and reliability.

Therefore it is critical that network capacity and reliability keep expanding at a comparable pace through regular, ongoing enhancements. This incremental approach has proven highly effective as it minimizes service disruptions, enables the exploitation of technological improvements, and maximizes the City's return on its investments.

In 2015, the major initiative will be to upgrade the capacity of the backbone between the City's Main Distribution Form (MDF) and its Intermediate Distribution Form (IDF) from the current two gigabits per second (Gbps) to 10 Gbps. In 2016, the City's wireless network controllers will be enhanced to expand capacity to keep pace with demands and to introduce redundancy in the face of increased reliance on the service. In 2017, the focus is expected to be on security enhancements.

PROJECT GIS Enhancements

COST
2015 $40,000
2016 $50,000
2017 $50,000

DESCRIPTION

cityExplorer – the City's geographic information system (GIS) – is a powerful and popular tool for both staff and citizens. It provides intuitive, single window access to diverse data from across the organization and is a dynamic, evolving entity that can continue to grow and expand in response to user requirements.

In order to maintain and grow the value of this system the data must be current, accurate and relevant. This requires an ongoing investment of both people and financial resources. Likewise, expenditures are necessary to ensure the system remains responsive to its users. To achieve this, the Information Technology Division has developed a strategy of sustained investment in the system, its data and its capabilities. This project reflects the requirement for the regular, predictable expenditures that are essential to ensure the upkeep and growth of cityExplorer.

Over the next three years, major initiatives include migrating the City's GIS infrastructure to the ESRI Local Government database schemas, expanding the City's data library with the creation of new datasets, expanding internal GIS utilization within the organization, and introducing new functionality such as mapping Citizen Engagement efforts, enhancing document management, CAD, and record drawing integration, and improving online data editing capabilities. As well, the City's Global Positioning System (GPS) data collection will be standardized to achieve "on-the-fly" centimetre precision.

PROJECT Server and Storage Replacement

COST
2015 $40,000
2016 $40,000
2017 $40,000

DESCRIPTION The Information Technology Division maintains numerous servers to support a wide range of services to citizens and staff. The City's reliance on this server fleet is intensifying rapidly as more and more activities are automated. In addition to the traditional applications such as finance, payment processing, and payroll, both staff and citizens are adopting increasingly sophisticated solutions to meet diverse needs including mapping, work management, meeting management, and permit processing. In addition, most communications – including email, telephone, websites, and social media – are now electronic and thus server-dependent. Along with this expanded range of solutions comes considerable data growth: in 2014 the organization managed 1700% more data than it did just five years ago.

To keep pace with these rising processing and data management demands, the servers need to remain current and reliable. This requires sustained investment in the server fleet, with the goal of regular, predictable expenditures.

Over the next three years, the Information Technology Division will continue to maintain and renew the City's server and file storage infrastructure to ensure that the performance and reliability demands of staff and citizens are met. This initiative will replace and redeploy servers that are nearing the end of their life expectancies. sustain a reasonable inventory of spare parts to ensure replacements are readily available when failures occur, and expand the City's file storage capacity.

PROJECT Satellite Imagery / Orthophotos

COST 2015 $60,000

DESCRIPTION Orthophotos – digital aerial photographs with uniform scale and minimal distortion – are an important part of a geographic information system (GIS) because they provide an accurate representation of the earth's surface. In 2006, the City began acquiring high resolution colour digital orthophotography and incorporating it into CityExplorer. It provides the base mapping for the City's database, and its high spatial accuracy and resolution have made it a powerful and popular tool for both staff and citizens. As well, the layer is often used for creating new information layers, and to help keep existing layers current and accurate.

In 2006, the City also acquired high resolution elevation data. The data was captured using LIDAR, which enabled the creation of several datasets, including the bare earth model, vegetation, elevation, building footprints, building heights, contour lines.

The high resolution imagery and elevation data are used regularly throughout the organization. For example:

- The GIS group uses aerial photos to update thetool's Building layer. High resolution imagery enables tracing of building footprints, and LIDAR information allows the building heights to be captured. This provides the basis for 3D and land development modeling
- Taxation and Assessment staff refer to the imagery to verify the existence of specific property improvements and developments
- The Engineering group relies on aerial photos for conducting preliminary site studies, and on elevation data for planning future developments;

the latter is especially valuable when producing accurate grading plans

- Current and upcoming energy studies and plans will require elevation and terrain data for prefeasibility work looking at alternative energy production. With increasing power costs, utility-scale wind and solar projects are becoming more attractive

However, since the last data collection efforts, the city landscape has changed significantly and the current data does not reflect these changes; it no longer meets user requirements, particularly in areas of high interest: the Con Mine area, Block 501, Niven Lake, Grace Lake, Giant Mine, and the Solid Waste Facility.

Therefore, it is important that the imagery and elevation data be updated so that it can continue to serve the needs of the various stakeholders. To make this more affordable, the Information Technology Division has partnered with MACA to coordinate joint imagery collection and thus share costs.

PROJECT Communications Infrastructure Renewal

COST
2015 $5,000
2016 $25,000
2017 $25,000

DESCRIPTION The City's new Communications Infrastructure system was deployed in late 2014. It created a robust, redundant backbone for radio communications and introduced significant improvements to the organization's public safety and emergency communications capabilities. Regular, ongoing maintenance and enhancements will be required to protect the City's investment in this infrastructure, and to ensure that it remains effective throughout its life expectancy.

PROJECT Security Cameras

COST
2015 0
2016 $20,000
2017 $20,000

DESCRIPTION The City's security camera infrastructure has expanded drastically over the last several years to meet the organization's need for improved site security. The system has aided law enforcement officials in many investigations and has proven to be a valuable tool in deterring crime and abuse and protecting staff, citizens, and property.

The infrastructure consists of not only the cameras, but also of several servers to process the data and numerous network storage devices to manage it. Based on the current demand for increased facility security and safety, it is anticipated that an additional 15 cameras will be added to the system over the next three years. As well, parts of the infrastructure will reach their end of life during this time period, necessitating timely replacements.

PROJECT Secondary Site and Data Replication

COST
2015 $20,000
2016 $20,000
2017 $20,000

DESCRIPTION The City's IT infrastructure is currently centralized at City Hall. If this location becomes compromised due to a security breach, disaster or fire, the organization will not be able to conduct business as it does today. To mitigate this risk, the IT Division is establishing a secondary site that can run essential services in the event that the primary site becomes unavailable for any reason.

An incremental replace-and-redeploy strategy approach

is being taken to mitigate the budget impact. In 2013 physical facility preparations at the secondary site were completed, a new server rack installed, an IBM Blade Center and Storage Area Network (SAN) were deployed and configured, and the IT Division began replicating some data to the site. In 2014, additional blade servers were purchased for use in the City's primary Blade Center and the replaced blades moved to the secondary site, and some networking components were upgraded to improve overall performance. In 2015, additional storage will be acquired to accommodate organizational data growth. In 2016 additional blade servers will again be purchased for use in the City's primary Blade Center and the replaced blades moved to the secondary site, and in 2017 it is anticipated that additional storage will be acquired.

Continued, incremental enhancements of this secondary site will be crucial to maintaining an increasingly functional off-site data centre capable of resuming and sustaining operations in a timely fashion, should the need arise.

PROJECT Website Enhancements

COST
2015 $10,600
2016 $15,000
2017 $15,000

DESCRIPTION The City's website is an established component of the organization's communication and engagement strategies, and technological advances and expanding expectations are creating opportunities for more effective and efficient uses of this tool. Internally, Departments are always seeking new ways to engage with residents and businesses, and the use of the City's website for this purpose is increasing. Externally, stakeholder expectations are growing as citizens become more accustomed to, and comfortable with, online services

Ongoing enhancements are essential to ensuring the City's website keeps pace with demands, and these require sustained and predictable investments. By allocating funds for continuous improvement, the City can respond to citizen needs and expectations and exploit new technologies to more effectively and efficiently provide improved information and services to its clients.

During the citizen engagement sessions conducted during the 2014 re-design initiative, there were numerous ideas and requests for additional functionality; over the next three years these will be evaluated and implemented as appropriate.

PROJECT Door Access Controls

COST
2015 $10,000
2016 $20,000
2017 $20,000

DESCRIPTION Electronic door access controls were initially introduced in City Hall, and in 2014 were expanded to other facilities including the Fire Hall, Pool, Garage, and Library. They have proven much easier to administer and control than traditional key methods and the backend systems can provide valuable reports.

Based on the success of these initial implementations, there are growing client demands for additional controls. Therefore there is an immediate need for funding to expand the number of doors and sites managed by this system. In future years, costs will be incurred to maintain equipment and to replace it as it reaches the end of its useful life.

PROJECT Multi-function Devices and Printers

COST
2015 $50,000
2016 $50,000
2017 $50,000

DESCRIPTION In 2014 the City issued a request for proposals for multifunction device management and entered into a long-term arrangement with the successful proponent. The vendor conducted an initial inventory of the City's existing printer/copier/fax/multifunction device fleet and met with key stakeholders to ascertain user requirements. Based on this information they prepared a multi-year plan to standardize City devices to reduce costs and realize maintenance and support efficiencies. The initial acquisitions identified in this plan were made in 2014, and in subsequent years additional funds will be required to stabilize the City's multifunction device fleet and, eventually, replace units as they reach the end of their useful life.

2015 Budget Capital Projects

Department: Corporate Services
Division: Information Technology (recurring projects)

			Replacement Year				
Project	Replacement (R) or New (N)	Year	2015 $	2016 $	2017 $	Justification	Council Goals/ Objectives/Actions Link
Network Upgrades	R	Ongoing	25,000	25,000	25,000	The City's Information Technology infrastructure is	These projects help ensure
GIS Enhancements	R	Ongoing	40,000	50,000	50,000	essential for effective service delivery. As employee	that the appropriate
Servers and Storage Replacements	R	Ongoing	40,000	40,000	40,000	and stakeholder demands and reliance on its components	information technology
Satellite Imagery	R	Ongoing	60,000			continue to grow, it is critical that overall capacity and	infrastructure is in place to
Communication Infrastructure Renewal	R	Ongoing	5,000	25,000	25,000	reliability keep pace through regular, ongoing	support the organization as
Security Cameras	R/N	Ongoing	0	20,000	20,000	enhancements. This incremental approach has proven	it works toward all City
Secondary Site and Data Replication	R/N	Ongoing	20,000	20,000	20,000	highly effective in recent years as it minimizes service	Council Goals, Objectives,
Website Enhancements	R	Ongoing	10,600	15,000	15,000	distruptions, enables the exploitation of technological	and Actions.
Door Access Controls	R/N	Ongoing	10,000	20,000	20,000	improvements and maximizes the City's return on its	
Multi-function Devices and Printers	R	Ongoing	50,000	50,000	50,000	investments.	
			260,600	265,000	265,000		

Department Corporate Services
Division Information Technology
Project In-Car Computers

Project Description
The Municipal Enforcement Division operates four patrol vehicles in which the officers spend most of their day. The officers rely heavily on computers to document occurrences or to retrieve information such as motor vehicle information checks. In 2010 computers were installed in the four patrol cars, allowing officers to be more efficient and spend more time on the street instead of in the office. Under the City's evergreening policy these computers are due for replacement after four years of service. These computers, unlike office computers, are operated in extreme conditions and are prone to malfunction. In the last year these computers have seen an increase in the amount of downtime due to malfunction. In the 2014 Budget, City Council approved the replacement of only one computer.

Justification
Good reliable computers are important for officer safety. They allow officers to have immediate access to information about dangerous individuals, dogs, stolen vehicles, and so on which allows them to take proper precautions when dealing with these situations. Officers also rely heavily on these computers to access motor vehicle information on persons and vehicles during traffic stops, which is a large component of their work day. They can access by-laws and GNWT legislation by computer rather than carrying around large binders with this information. The patrol cars are equipped with a global positioning system which is a major component of an officer's safety and requires a reliable computer in the patrol vehicle. It also allows officers to monitor each other and is used for dispatching purposes reducing the need to use radio communications.

Operating Cost Impact
The Information Technology (IT) Division is required to support these four computers.

Project's Impact on Other Departments
The Information Technology (IT) Division supports and provides service for the in-car computers. New computers should generate less frequent requests for service from the IT Division.

Project's Return on Investment
With the computers in the patrol cars, officers can spend more time on the road and less time in the office. It is difficult to give an actual dollar figure but officers should be more productive and spend more time enforcing City by-laws and the *Northwest Territories Motor Vehicles Act*.

Council Goals/Objectives/Actions
Objective #2(e): Maintain and enhance core services and adapt to changing needs

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	20,000	10,000	10,000		
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	20,000	10,000	10,000		

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
IT Reserve	20,000	10,000	10,000		
Total:	20,000	10,000	10,000		

Department Corporate Services
Division Information Technology
Project Server Room Upgrades

Project Description
This project will implement server room upgrades required to ensure that the facility continues to meet the evolving demands placed on it.

In 2015, the focus will be on installing an improved cable management system and an additional rack with an appropriate uninterruptible power supply (UPS) and power distribution unit (PDU). As well, work will be done to clean up old and obsolete electrical power infrastructure.

In 2016, the old air conditioning units that have been supplanted by newer, more energy-efficient devices will be removed. As well, an air purifier will be installed to remove dust and other contaminants, and all cabinets and storage will be removed to improve airflow and environmental cleanliness.

Justification
These upgrades will provide essential server room modifications needed to support future growth of the City's information technology infrastructure and to maintain a suitable, safe, and professional working environment.

The cable management system improvements will make the cabling easier to access and identify and thus improve staff efficiencies, especially when making changes or performing troubleshooting.

The additional server rack is needed to house the City's growing equipment fleet. It will be an enclosed and soundproof unit with appropriate and energy-efficient power and cooling. This will protect the equipment and also make it easier to access and maintain. As well, it will reduce the noise and heat generation in the room, creating a safer work environment for Information Technology staff.

The power infrastructure work will eliminate obsolete wiring and standardize, consolidate, and label current wiring. These are necessary housekeeping efforts that will make future changes more efficient and also remove potential safety concerns.

The 2016 improvements will advance the server room environment toward a "clean room", an essential best practice to protect the City's investment in its information technology infrastructure.

Operating Cost Impact
This project will not directly impact operating costs.

Project's Impact on Other Departments
There will be no direct impact on other Departments; however the improvements will enhance the Information Technology staff's overall ability to provide improved services to all clients, and the proper housing of the information technology infrastructure equipment will help ensure it achieves maximum uptime availability to provide reliable services to all Departments.

Project's Return on Investment
n/a

Council Goals/Objectives/Actions
This project will help ensure that the appropriate information technology infrastructure is in place to support the organization as it works toward all City Council Goals, Objectives, and Actions.

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost					
Design					
Development	50,000		25,000	25,000	
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	50,000		25,000	25,000	

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	25,000		25,000		
IT Reserve	25,000			25,000	
Total:	50,000		25,000	25,000	

Department Corporate Services
Division Information Technology
Project Core Switch Upgrades

Project Description
This project will upgrade core components of the City's network to ensure it can continue to handle the increasing demands being placed on it.

Justification
As the City's application platform expands and more sophisticated hardware and software solutions are adopted, the demands on its network grow. For example:

- Virtualization is being adopted to achieve management efficiencies, improve reliability, and reduce overall operating costs. However, these front-end benefits require expanded back-end network capabilities to ensure clients can log on, access applications, and analyze information in a timely manner.
- Blade centre technology has been in use at the City for many years. Combining several servers into one enclosure reduces hardware management efforts, space requirements, and energy consumption. However, it also creates highly concentrated data traffic demands on the back-end network.
- Data volumes are growing rapidly within the organization; the City now stores 1700% more data than it did five years ago. As this data is managed and stored it travels across the network, necessitating increasing capacity. As it is accessed and analyzed, the demands on the database server, and the amount of data it handles, increase significantly.
- Expectations are for faster application responses and more rapid data access. These require not only faster work stations and servers, but also higher speed and larger capacity network services.

The City's network infrastructure is built on a hub-and-spoke model: City Hall serves as the hub, and there are spokes to all eleven civic facilities where Information Technology infrastructure is used. This model means that all network traffic passes through the hub; the associated network component is referred to as the main distribution frame (MDF). From there, the data must in turn communicate with application servers and network resources located in an intermediate distribution frame (IDF). In 2015, this project will upgrade the hub:

- The core network switches within the MDF will be upgraded to current models.
- The communications link between the MDF and the IDF will be upgraded from its current two gigabytes per second (Gbps) capacity to 10 Gbps.
- The blade centre will be upgraded so that it is capable of 10 Gbps communications.

Operating Cost Impact
This project will not directly impact the operating budget but, if it is not undertaken, the resulting network bottlenecks will cause increased delays in network services, meaning applications will run more slowly and access to data will take more time. This means it will take employees longer to do many aspects of their jobs, including delivering service to the public.

Project's Impact on Other Departments
Successful completion of this project will ensure that the network infrastructure can continue to meet the increasing demands being placed on it by every department.

Project's Return on Investment
n/a

Council Goals/Objectives/Actions
This project will help ensure that the appropriate information technology infrastructure is in place to support the organization as it works toward all City Council Goals, Objectives, and Actions.

2015 Capital Cost: $60,000

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	60,000		60,000		
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	60,000		60,000		

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	60,000		60,000		
Total:	60,000		60,000		

Department Corporate Services
Division Information Technology
Project Virtualization

Project Description
This project will migrate the City's virtual environment to the VMware platform.

Several years ago the Information Technology Division began to implement server virtualization. This technique of partitioning one physical server into several virtual servers meant the organization's burgeoning application requirements could be met with fewer physical devices than under traditional approaches. It also meant that applications used throughout the organization could be served up centrally, and that infrequently-used programs could be shared from a single location.

At the time, the Citrix family of products was the best virtualization solution for the City and until recently it has provided the anticipated benefits. However, changes in licensing, technology, and the general market are making the environment increasingly difficult to manage and maintain. In addition, many software vendors are no longer supporting products running on this platform.

The VMware product has emerged as the industry leader for virtualization, and has become the standard for businesses worldwide. It is recommended that the City adopt this solution, and over the next two years rebuild its virtual environment on this platform.

Justification
As City staff and citizens become increasingly dependent on technology, the demands on the Information Technology Division also increase and the Division is continually looking for ways to manage more with less. Virtualization has proven to be an effective tool in this endeavour – it helps to centralize server administration tasks, improves scalability and overall hardware resource utilization, and reduces space and energy requirements.

Along with increased demands come greater reliability expectations – staff and citizens count on all services to be available at all times – along with more significant impacts if outages occur. For example, if the City's core financial application was not available it would impede all revenue collection and financial tracking activities throughout the organization, and if the program registration program were to go down it would negatively impact service delivery at City Hall, the Pool, the YK Arena, the Multiplex, the Fieldhouse, the Library, and online. If a more centralized function, such as the database server, were to fail, all services at all facilities would be interrupted. Therefore it is increasingly important to have redundancy within the information technology infrastructure, particularly for key, or central, services. The VMware solution provides more intuitive, powerful and robust tools for creating, managing, and maintaining this redundancy than does the existing Citrix environment. As well, because the VMware environment is supported by most software developers, it will not limit future application choices.

Operating Cost Impact
If this project proceeds, there should be no net impact on hard operating costs as expenditures for Citrix software maintenance will essentially be replaced by fees for VMware maintenance. If the project does not proceed, it will impede the Division's ability to provide redundancy and the result may be outages that incur soft costs due to staff downtime and service interruptions.

Project's Impact on Other Departments
This project is key to the Information Technology Division's ability to efficiently provide robust and redundant services to all other Departments.

Project's Return on Investment
n/a

Council Goals/Objectives/Actions
This project will help ensure that the appropriate information technology infrastructure is in place to support the organization as it works toward all City Council Goals, Objectives, and Actions.

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	225,000		100,000	100,000	25,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	225,000		100,000	100,000	25,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
IT Reserve	225,000		100,000	100,000	25,000
Total:	225,000		100,000	100,000	25,000

Department Corporate Services
Division Information Technology
Project Computer-Aided Dispatching (CAD)

Project Description
This computer software is designed to make dispatching emergency services more effective and efficient. It will also help firefighters write their incident reports in a more efficient manner, leaving them more time to devote to other requirements of the job.

Justification
This project needs to be set up and operating simultaneously with the transfer of dispatch responsibilities from Pumphouse No. 1 to the Fire Hall.

Operating Cost Impact
None

Project's Impact on Other Departments
Fire Hall staff will require the support of IT staff to troubleshoot problems with the new dispatch system.

Project's Return on Investment
None

Council Goals/Objectives/Actions
Objective #2(f): Fully implement and sustain a customer service culture
Objective #2(e): Maintain and enhance core services and adapt to changing needs
Action #2.18: Create a safer, cleaner and vibrant city

2015 Capital Cost: $20,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Community Capacity Building Fund	20,000		20,000		
Total:	20,000		20,000		

Department Corporate Services
Division Information Technology
Project Emergency Operations Centre Equipment

Project Description
This project will replace the existing Emergency Operations Centre (EOC) workstations. The first step will be to assess the EOC requirements to identify the most appropriate equipment complement. Then the equipment will be acquired and configured so that it is ready for immediate deployment, should the need arise.

Justification
The current EOC equipment was purchased in 2008 and can no longer be considered reliable. It is anticipated that laptops and a portable printer will be the likely solution; however this will not be finalized until the needs analysis is complete.

Operating Cost Impact
This will not directly impact operating costs.

Project's Impact on Other Departments
This project will not directly impact other Departments, but will be critical to the City's role in the event the EOC is activated.

Project's Return on Investment
n/a

Council Goals/Objectives/Actions
Objective #2(g): A sense of personal and community safety

2015 Capital Cost: $20,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	20,000		20,000		
Total:	20,000		20,000		

Community Services	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
YKCA Upgrades - Dehumidifiers	40	40	-	-	-	-	-
YKCA Upgrade - Sprinkler System	220	149	-	-	-	-	-
YKCA Ice Plant Replacement & Heat Recovery Installation	-	-	600	221	1,200	-	-
YKCA Upgrades -Wiring	-	-	-	-	20	-	-
Multiplex Man Lift	-	28	-	-	-	-	-
Multiplex Façade Repair	85	27	-	58	-	-	-
Multiplex - Painting DND Gymnasium & Lobby	70	-	-	-	-	-	-
Fieldhouse Landscaping	-	-	75	75	-		-
Fieldhouse Multi-Use Flooring	-	-	-	-	-	200	-
	415	243	675	354	1,220	200	-
Library							
Expansion / Renovations	-	45	-	50	-	-	-

(cont'd ...)

Community Services (cont'd)	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
Parks/Trails							
Re-surfacing of McMahon Frame Lake Trail	-	-	-	-	-	180	-
Lakeview Cemetery Expansion	35	-	-	35	-	495	-
Fencing - Cemetery and Ballparks	80	65	-	18	-	-	-
Playground Equipment Replacement	100	68	-	32	-	-	-
Fritz Theil Upgrade	-	13	-	13	-	-	-
Ball Diamonds Upgrade	-	-	-	-	-	45	-
Rental Equipment	15	22	-	-	-	-	-
Sport & Multi-use Fields Upgrade	180	174	-	13	-	-	-
Old Aiprort Road Multi-Purpose Trail	-	-	-	5	-	-	-
Trail Development - Tin Can Hill	60	36	100	41	-	-	-
Yellowknife Rotary Park - Trail Extension	30	20	20	28	20	20	20
Tommy Forrest Ball Park	-	-	-	-	60	-	-
Twin Pine Hill Trail Development	150	9	-	-	-	-	-
Surfacing of Niven Lake Trail	-	-	-	-	-	-	195
Trash Containers & Butt Canisters	-	-	66	66	-	-	-
Outdoor Recreation Facility - Design Development	90	-	-	30	-	-	-
Tennis Court Re-surfacing	-	-	-	-	-	-	100
Somba K'e Sculpture/ Painting	46	45	-	-	-	-	-
"United in Celebration" Sculture Painting	-	-	-	-	45	-	-
Spray Park at Sombe Ke Civic Plaza	-	-	-	-	-	-	585
	786	452	186	281	125	740	900

(cont'd ...)

Community Services (cont'd)	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
Pool							
Generator	-	135	-	15	-	-	-
Pool Upgrade	100	6	200	200	100	250	100
	100	141	200	215	100	250	100
Wildcat Café							
Structural Repair	-	111	-	17	-	-	-
City Hall							
Building Renovations	980	284	-	896	-	-	-
Boiler Replacement	40	-	-	310	-	-	-
	1,020	395	-	1,223	-	-	-
Total	2,321	1,277	1,061	2,123	1,445	1,190	1,000

		2015 Budget Recommended ($000s)	Formula Funding ($000s)	Grants ($000s)
Community Services	Page			
Arenas				
YKCA Ice Plant Replacement & Heat Recovery Installation	241	1,200	1,200	
YKCA - Wiring	243	20	20	
Parks/Trails				
Yellowknife Rotary Park - Trail Extension	244	20		20
Tommy Forrest Ball Park	246	60		60
"United in Celebration" Sculture Painting	248	45	45	
Pool				
Painting of Interior Main Deck Area	249	100	100	
Subtotal		1,445	1,365	80

Department	**Community Services**
Division	**Facilities**
Project	**Yellowknife Community Arena – Ice Plant Replacement and Heat Recovery Installation**

Project Description
The replacement of the Community Arena ice plant and the installation of a waste heat recovery system is a two-stage project that commenced in 2014 with the engineering and partial development of the building required. The second stage is the final engineering, supply and installation of the ice plant and heat recovery system. The new ice plant will replace the plants currently at the arena and the curling rink. This has been identified as an Asset Management project with the installation of the ice plant extending the longevity of the facility as well as reaping the benefits of heat recovery.

The arena opened to the public in 1982 and the curling rink in 1988. Both facilities have served as the premier facilities for many sports throughout the years including regional, territorial, national and Arctic Winter Games. The facilities currently have ice plants that utilize R-22 freon as the primary refrigerant.

R-22 freon systems are currently being phased out, as they produce a greenhouse gas that contributes significantly to global warming. Since January 1, 2010, there has been no production or import of R-22 except for use in equipment manufactured before that date. By 2020, the use of R-22 technology will be completely phased out and no longer available.

It is proposed that the City install a 150-ton heat-recovery refrigeration system that will provide refrigeration for the Curling Club and Community Arena, simultaneously providing heat for the two arenas and Ruth Inch Memorial Pool.

Justification
As of 2010, the production and import of R-22 refrigerant stopped. In 2020, it will be totally phased out and no longer available. Both the Community Arena and Curling Club utilize R-22 as their primary refrigerant.

Each of these facilities has the original ice plant that was included in the facility development. Although maintenance on the compressors has been regular and ongoing, age and use have become factors in the machines' ability to achieve peak performance. The need for maintenance grows and efficiency suffers.

The process of heat recovery has been successful at the Multiplex, where waste heat is in use and is also pumped over to the Fieldhouse. With the installation of a new plant that includes a waste heat recovery unit, the primary heat utilized at the arena, curling facility and pool will be recovered heat, followed by heat from wood pellets and, if necessary, heat from oil as the third option.

Over the last two years, the average oil consumption for the Curling Club, Yellowknife Community Arena, and Ruth Inch Memorial Pool has been approximately 53,000 litres, the balance of the heating requirements being provided by the central pellet boiler. This oil consumption caused the emission of 138 tonnes of carbon dioxide annually.

As demonstrated at the Multiplex, a refrigeration system with heat recovery would be able to cover the remaining heating requirements for this cluster of facilities, saving the City approximately $165,000 annually in oil costs. This would essentially make the Yellowknife Community Arena, Ruth Inch Memorial Pool, and Curling Club carbon-neutral and completely powered by renewable energy.

Operating Cost Impact
As the proposed system will have the same heat recovery capacity as the one at the Multiplex, the balance of the waste heat recovered would displace approximately $33,000 in pellets and $76,000 in oil consumption.

Project's Impact on Other Departments
N/A

Project's Return on Investment
In total, heat recovery would save $109,000 and 159 tonnes of carbon dioxide annually.

Council Goals/Objectives/Actions

Goal #2: Stewards of our natural and built environment.
Objective #2(a): Maintain, respect, preserve and enhance the natural environment, natural heritage and green space.
Objective #2(b): Improve transit, roads, sidewalks, recreation facilities and trails with an emphasis on active and healthy living choices.
Objective #2(e): Maintain and enhance core services and adapt to changing needs.

2015 Capital Cost: $1,200,000

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	1,200,000		1,200,000		
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	1,200,000		1,200,000		

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
2015 Budget	1,000,000		1,000,000		
CEP Funding (Formula Funding)	200,000		200,000		
Total:	1,200,000		1,200,000		

DEPARTMENT Community Services
DIVISION Facilities
PROJECT Yellowknife Community Arena – Wiring

DESCRIPTION
The Yellowknife Community Arena was built in 1982 and has served the needs of the community very well over the years. During the regular maintenance of the facility and, on advice of our electrical contractor, it has been determined that some aspects of the facility's wiring require upgrading. The specific area identified is on the penalty box side where the control for the game clock, public address system and some lighting is located. The project proposed will address this by replacing the defective wiring.

Justification
This wiring controls power to the game clock, the facility's public address system, and the entire arena on the penalty box side. A failure in the wiring system will result in these items being inoperative. This project has been identified under the Asset Management project as a weakness that needs to be addressed. By dealing with the wiring defect in the off-season, the Department would eliminate the possibility of an embarrassing breakdown in mid-season and the need to interrupt programs and services to complete the repair.

Operating Cost Impact
There will be no additional costs for maintenance as this will be covered under our current budget for repairs and maintenance.

Project's Impact on Other Departments
N/A

Project's Return on Investment
The replacement of the wiring for this area will ensure that the PA system, game clock and the lighting in that area of the facility will remain functional. When highly public areas of City facilities become non-functional the image of the City is diminished in the public's eye. The project will help to ensure the public's perception of the City is maintained to a high standard.

Council Goals/Objectives/Actions

Goal #2:	Stewards of our natural and built environment
Objective #2(a):	Maintain, respect, preserve and enhance the natural environment, natural heritage and green space
Objective #2(b):	Improve transit, roads, sidewalks, recreation facilities and trails with an emphasis on active and healthy living choices
Objective: #2(e):	Maintain and enhance core services and adapt to changing needs

2015 Capital Cost: $20,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	20,000		20,000		
Total:	20,000		20,000		

DEPARTMENT Community Services
DIVISION Facilities
PROJECT Yellowknife Rotary Park – Trail Extension

Description
In 2003, the Yellowknife Rotary Club and the City collaborated to build the Yellowknife Rotary Centennial Waterfront Park off School Draw Avenue. In 2005, a picnic shelter was completed and the boardwalk expanded. In 2006, a bandstand was added to the park, and, in 2008, a further extension to the boardwalk was completed. In 2010, the walkway in the park was paved and a disabled ramp installed to allow access for disabled citizens.

It is proposed that the City of Yellowknife continue its partnership with the Yellowknife Rotary Club in the development of the boardwalk. Specifically, the City will purchase the necessary materials for the project, while the Rotary Club will continue to provide the labour to construct it.

Justification
This project will continue to enhance the Great Slave Lake waterfront and provide additional opportunities for citizens and visitors to Yellowknife to access and view the waterfront.

Operating Cost Impact
There would be a minimal increase to maintain this trail system as it is currently on the inventory to maintain regularly.

Project's Impact on Other Departments
N/A

Project's Return on Investment
Residents throughout the city use the park extensively, as it offers a good -quality green picnic area and provides an excellent view of the waterfront. The provision of additional opportunities for the visitors to the City to stop and view various amenities increases their satisfaction and contributes to longer or additional visits.

Council Goals/Objectives/Actions

Goal #2:	Stewards of our natural and built environment
Objective #2(a):	Maintain, respect, preserve and enhance the natural environment, natural heritage and green space
Objective #2(b):	Improve transit, roads, sidewalks, recreation facilities and trails with an emphasis on active and healthy living choices
Objective #2(e):	Maintain and enhance core services and adapt to changing needs

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	60,000		20,000	20,000	20,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	60,000		20,000	20,000	20,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Grant	20,000		20,000		
Formula Funding	40,000			20,000	20,000
Total:	60,000		20,000	20,000	20,000

Department: Community Services
Division: Facilities
Project Tommy Forrest Ball Park Collaborative Upgrading

Project Description
During the 2015 – 2017 Budget deliberations, Council heard a presentation from the Yellowknife Fastball Association regarding an improvement plan for the Tommy Forrest ball park. The plan includes upgrading the park with the addition of topsoil/turf in the outfield as well as upgrading the shale in the infield. Various other items are also required including the purchase of a mower and watering equipment.

The Association has proposed a collaborative model in carrying out the work for this project. The request was for $61,000 with the Association contributing approximately $26,000. Council approved the expenditure of $60,000.

Justification
The park has been in existence for many years and is operated under an agreement between the City and Fastball Association whereby the Association has full access to the park from May to September for their ball activities. The agreement is that for this period of time the Association does not pay user fees, but they are responsible for all aspects of the park maintenance.

Over the years, there have been some collaborative improvements undertaken to address items as they occur including removal/ replacement of the bleachers, removal/replacement of dugouts, installation of watering system, installation of screen to protect passing vehicles/pedestrians, etc.

Despite having a gravel outfield, the park has remained the premier fastball facility and has hosted many local, regional, and territorial events.

Operating Cost Impact
The City and the Fastball Association will re-commit to the current arrangement where the Association will have access to the park for their league, tournaments, and events from April to September. In exchange, the City will not charge a user fee for the use of the park.

Project's Impact on Other Departments
These projects will have no impact on any other department.

Project's Return on Investment
The upgrades that will be undertaken will further enhance the ability of the local and territorial sport association to attract and host larger events. This will bring more players and fans to Yellowknife and will contribute to the tourist market as well increasing the exposure of Yellowknife to the sports market entities.

Council Goals/Objectives/Actions
This project works toward Council's Goals #2, #3, and #4.

Expenditures	**Total Estimated Cost $**	**Prior Year Funding $**	**2015 $**	**2016 $**	**2017 $**
Personnel Cost					
Operating Cost					
Capital Cost					
Design					
Development					
Construction Engineering					
Construction	$2,500		$2,500		
Equipment					
Materials	$57,500		$57,500		
Total:	$60,000		$60,000		

Funding Sources	**Total Estimated Cost $**	**Prior Year Funding $**	**2015 $**	**2016 $**	**2017 $**
Grant	$60,000		$60,000		
Total:	$60,000		$60,000		

Department Community Services
Division Facilities
Project "United in Celebration" Sculpture Painting

Project Description
During the development of the Somba K'e Park, several nodes were developed within the park for the purpose of displaying various types of art.

The City had agreed to assist a local artist, the late Francois Thibault, in the development of a sculpture for the node immediately adjacent to Frame Lake within the park. The City agreed to cover the cost of the base for the installation of a sculpture entitled "United in Celebration". Subsequent to the City paying for the base and installation of the sculpture to its current state, a further $46,000 was allocated to the artist to off-set costs incurred. This payment, as directed by Council, was reallocated from the 2013 budget which was originally allocated for painting.

Council has requested that, through the budgeting process, the City undertake the painting of the sculpture. It is proposed that the funding identified in 2013, $45,500, be allocated to the 2015 budget to undertake the painting of the "United in Celebration" sculpture.

Justification
This project is being brought forward at the request of City Council.
Operating Cost Impact
There are no impacts anticipated to the O&M budget.

Project's Impact on Other Departments
N/A

Project's Return on Investment
There is extensive use of the park by residents and visitors to Yellowknife as they congregate or pass through Somba K'e Park on a regular basis. Although no direct return on investment is expected, those utilizing the area will be able to view and photograph the sculpture which adds to the ever-increasing opportunities to showcase the City of Yellowknife parks and trails system.

Council Goals/Objectives/Actions
Goal #2: Stewards of our natural and built environment
Objective #2(a): Maintain, respect, preserve and enhance the natural environment, natural heritage and green space

2015 Capital Cost: $45,500

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	45,000		45,500		
Total:	45,000		45,000		

Department Community Services
Division: Programs
Project Ruth Inch Memorial Pool – Painting of Interior Main Deck Area

Project Description
The proposed project for the painting of the entire upper level of the pool is scheduled for September 2015.

Justification
The Ruth Inch Memorial Pool opened its doors to the public in the fall of 1988. The pool continues to be a popular facility for the citizens and visitors of Yellowknife. In 2010, the City contracted an engineering firm for a life cycle analysis of the facility which identified items that needed to be addressed to ensure the pool meets or exceeds its life expectancy. The interior of the main deck area was last painted in 1992. The report indicated that the painted interior finish of the pool has surpassed its life expectancy, and consideration should be given to replacing the most obvious damaged finishes as part of the renovation. This would ensure longevity of the interior finish and give the appearance of a well maintained facility. It was indicated at the time of the report that this work should be done within the next three to five years.

Operating Cost Impact
This project will have no impact on the operating costs of the Pool.

Project's Impact on Other Departments
This project will have no impact on other Departments.

Project's Return on Investment
This project would ensure that the facility achieves its full life expectancy.

Council Goals/Objectives/Actions
Objective #2(b): Improve transit, roads, sidewalks, recreation facilities and trails with an emphasis on active and healthy living choices

2015 Capital Cost: $100,000

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost					
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials	100,000		100,000		
Total:	100,000		100,000		

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	100,000		100,000		
Total:	100,000		100,000		

	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
Public Safety							
Directorate							
Wildland Fire Mitigation -Emergency Measures	-	-	-	-	100	100	100
Municipal Enforcement							
Communication Equipment Replacement	90	-	-	90	-	-	-
New Parking Meters	-	-	-	-	92	92	-
Mobile Radar Replacement	-	-	-	-	5	-	-
	90	-	-	90	197	192	100
Fire & Ambulance							
Air Conditioning for Fire Hall	-	-	-	-	60	-	-
Aggressor Jackets	-	-	-	-	40	-	-
Repairs to Air Make-up System	-	-	-	-	20	-	-
Fire Safety House	-	-	-	-	-	75	-
Fire Extinguisher Trainer	-	-	-	-	-	12	-
Paving and Foundation Repairs	-	-	-	-	-	140	-
Storage Facility	-	-	50	45	-	-	-
Self-Contained Breathing Apparatus	50	50	-	-	-	-	-
Rescue Equipment Upgrade	-	5	-	-	-	-	-
Bunker Gear Lockers	60	32	-	-	-	-	-
Front Ramps and Site Improvement	150	30	-	120	-	-	-
Installation of Training Hydrant	80	190	-	-	-	-	-
Emergency Medical Services Training Manikin	-	-	-	-	-	-	115
Propane-Fueled Fire Trainer	-	-	-	-	-	-	90
Live Fire Training Structure	-	-	-	12	-	-	-
Thermal Imaging Cameras	-	-	25	25	-	-	-
FDM Software (Apparatus Maintenance Module)	-	-	30	-	-	-	-
	340	307	105	201	120	227	205

		2015 Budget Recommended ($000s)	Formula Funding ($000s)
Public Safety	**Page**		
Directorate			
Wildland Fire Mitigation -Emergency Measures	253	100	100
Municipal Enforcement			
New Parking Meters	255	92	92
Mobile Radar Replacement	257	5	5
Fire & Ambulance			
Air Conditioning for Fire Hall	258	60	60
Aggressor Jackets	259	40	40
Repairs to Air Make-up System	260	20	20
Subtotal		317	317

Department Public Safety
Division Directorate
Project Wildland Fire Mitigation – Emergency Measures

Project Description

This project will be the initial phase for a wildland fire mitigation strategy for the southern flank of Yellowknife. This initial phase will provide for the following items:

- Emergency structure protection kits, as suggested by officials of the GNWT Department of Environment and Natural Resources (ENR). Each kit includes hoses, connections and sprinklers that could be deployed in neighbourhoods where wildland fires are approaching.
- Brush clearing equipment to clear out specific areas of the city as part of an overall "fire-smarting" practice. This may mean an attachment for an existing piece of City equipment, sourcing other equipment through a lease or contracting the service.
- Implementation of a fire-break system from Highway 3 west of the city, going toward Great Slave Lake in the Negus Point area to the southwest of the city.

Justification

The 2014 forest (or wildland) fire season was the worst ever recorded in the Northwest Territories. Based upon recommendations from ENR regarding fire-smarting in Yellowknife, this phased approach will start to deal with the most serious threats first.

Operating Cost Impact

There should be minimal operating cost for this emergency measures equipment or projects, other than required maintenance of any cut-lines or fire-smart zones south of Yellowknife.

Project's Impact on Other Departments

This project should not impact other departments in a negative manner. Some of the brush that needs to be cleared will be mulched and given to Public Works or Community Services for departmental uses (mulch for planting, ground cover at landfill).

Project's Return on Investment

Emergency preparedness often does not have a return on investment that can be quantified. However, given a serious wildland fire in the future, these measures could prevent the potentially high losses that might happen if no work is completed.

Council Goals/Objectives/Actions

Goal #2: Stewards of our natural and built environment
Objective #2(g): A sense of personal and community safety

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost					
Design					
Development					
Construction Engineering					
Construction	180,000		30,000	50,000	50,000
Equipment	20,000		20,000		
Materials	200,000		50,000	50,000	50,000
Total:	400,000		100,000	100,000	100,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	400,000		100,000	100,000	100,000
Total:	400,000		100,000	100,000	100,000

Department Public Safety
Division Municipal Enforcement
Project New Parking Meters

Project Description
The City of Yellowknife is adding 328 new metered parking spaces to the Central Business District between 2014 and 2016. There are 124 new stalls slated to be installed in 2015 and an additional 124 in 2016.

Justification
In 2014 the City of Yellowknife conducted a parking study of the Central Business District and adjacent areas. Several non-metered areas were identified for potential parking meters. A memorandum was presented to City Council recommending that an additional 328 parking meters be installed on streets adjacent to the current meter streets. City Council approved this plan on April 28, 2014 to be phased in over three years. Eighty new parking meters were installed in 2014. An additional 124 parking meters are slated to be installed in 2015 and another 124 parking meters to be installed in 2016.

Operating Cost Impact
The addition of all 328 new parking meters will require an additional staff member to effectively maintain, monitor, and enforce them.

Project's Impact on Other Departments
Public Works would be required to install the meter poles. Each meter pole costs $166 and there will be approximately 70 meter poles installed.

Project's Return on Investment
Each meter has the potential of earning $10 per day. On average a parking meter earns $3.50 per day. The 124 meters slated for 2015 will be installed in May and are anticipated to earn $54,000 that year, and then approximately $108,000 per year in coin revenue. In addition, there will be revenue from fines issued to people who do not pay the meters.

Council Goals/Objectives/Actions

Goal #2:	Stewards of our natural and built environment
Objective #2(e):	Maintain and enhance core services and adapt to changing needs
Action #2.9:	Parking in downtown core

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost					
Design					
Development					
Construction Engineering					
Construction					
Equipment	160,000		80,000	80,000	
Materials	24,000		12,000	12,000	
Total:	184,000		92,000	92,000	

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	184,000		92,000	92,000	
Total:	184,000		92,000	92,000	

Department Public Safety
Division Municipal Enforcement
Project Mobile Radar Replacement

Project Description
The Municipal Enforcement Division operates four patrol cars to enforce City by-laws and the GNWT *Motor Vehicles Act*. Each vehicle is equipped with a mobile radar unit that can measure the speeds of vehicles to the front and rear of the patrol car. A substantial amount of time is spent enforcing speeding infractions, which is one of the most serious risks to public safety on our roadways.

Justification
The radar units currently in use are over seven years old and, while they are still operating properly, they require increased maintenance. Radar units have to be sent to Edmonton for service, which means it can take weeks until they are operational again. When a radar unit is sent for maintenance, the patrol car is left without radar capabilities, which poses a potential loss in fine revenue. Radar technology has advanced since these radar units were purchased. The existing units require officers to toggle back and forth from the front and rear radar antennas, depending on where an offending vehicle is in relation to the patrol vehicle. Newer units display speeds from both antennas at the same time, allowing an officer to focus more on the road. If new radar units are purchased, the older ones would be kept for use as backup when a unit is out for service, ensuring uninterrupted radar enforcement.

Operating Cost Impact
There is no operating cost impact.

Project's Impact on Other Departments
Public Works staff would be called upon to install the wiring for the new units.

Project's Return on Investment
Newer units should require less downtime for servicing. Keeping the old units as backup would eliminate interruptions in speed enforcement and the subsequent loss of fine revenue.

Council Goals/Objectives/Actions

Goal #2 :	Stewards of our natural and built environment
Objective #2(g):	A sense of personal and community safety
Action #2.18:	Create a safer, cleaner, and vibrant city

2015 Capital Cost: **$5,000**

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	5,000		5,000		
Total:	5,000		5,000		

Department Public Safety
Division Fire and Ambulance
Project Air Conditioning for the Fire Hall

Project Description
The 2012 project to expand the Fire Hall did not include air conditioning.

Justification
Air conditioning will improve the working environment of the staff.

Operating Cost Impact
Minimal, but there will be an increase in power consumption.

Project's Impact on Other Departments
None

Project's Return on Investment
None

Council Goals/Objectives/Actions

Goal #4:	Creating and sustaining meaningful relationships
Objective #4(d):	Create an environment of mutual respect, open dialogue and teamwork
Action #4.3:	Strengthen internal culture / relationships (staff)

2015 Capital Cost: **$60,000**

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	60,000		60,000		
Total:	60,000		60,000		

Department Public Safety
Division Fire and Ambulance
Project Aggressor Jackets

Project Description
The Division requires new jackets for the firefighters, as the old ones are worn out and unprofessional in appearance.

Justification
There are no resources in the Division's O&M budget for a jacket-replacement program.

Operating Cost Impact
Minimal, as the Division cleans the jackets at the Fire Hall; however, minor repairs are necessary from time to time.

Project's Impact on Other Departments
None

Project's Return on Investment
None

Council Goals/Objectives/Actions
Goal #2: Stewards of our natural and built environment
Objective #2(e): Maintain and enhance core services and adapt to changing needs
Action #2.18: Create a safer, cleaner and vibrant city

2015 Capital Cost: $40,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	40,000		40,000		
Total:	40,000		40,000		

Department Public Safety
Division Fire and Ambulance
Project Repairs to Air Make-Up System

Project Description
The air make-up system in the apparatus bay is leaking from the roof, due to deterioration over the years and sub-standard design of 25 years ago.

Justification
The Division's O&M budget does not have the resources to cover the cost of these repairs.

Operating Cost Impact
None

Project's Impact on Other Departments
None

Project's Return on Investment
None

Council Goals/Objectives/Actions
Goal #2: Stewards of our natural and built environment

2015 Capital Cost: $20,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	20,000		20,000		
Total:	20,000		20,000		

	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
Planning & Development							
Housing & Affordability Strategy/ Eco-Housing	-	34	-	50	-	-	-
Old Airport Road / Franklin Ave. Streetscaping	-	83	-	-	-	-	-
Harbour Plan & Smart Growth Improvements	600	427	100	374	350	600	700
Streetscaping Initiatives	500	392	750	1223	250	500	700
	1,100	936	850	1,647	600	1,100	1,400

		2015 Budget Recommended ($000s)	Formula Funding ($000s)
Planning & Development	**Page**		
Harbour Plan & Smart Growth Improvements	262	350	350
Streetscaping Initiatives	264	250	250
Subtotal		600	600

Department Planning and Development
Division Planning and Development
Project Harbour Plan & Smart Growth Improvements

Project Description
City Council adopted the Smart Growth Development Plan in 2010, and the Harbour Plan and General Plan in 2012. All three plans have a number of recommendations relating to revitalization and redevelopment initiatives that will enhance the character, quality of life, tourism and economic development potential of the City.

The overlapping priority for these plans is the Old Town Waterfront. As part of the 2013 Capital Budget, Council allocated $600,000 for the design and development of two parks in Old Town: Pilot's Monument and the Government Dock. With extensive consultation and design, the construction of these nodes was completed in 2014. These improvements allow for increased waterfront access, tourism, programmable recreation and event space, and increased parking and mooring for commercial industry, residents, and tourists.

As part of the 2014 budget, Administration proposed $600,000 for improvements to Wiley Road Park and Otto and Lessard Drive parks. For the 2015 budget, the scope was reduced to focus primarily on Wiley Road, with minor improvements to Lessard Drive and the McMeekan Causeway (i.e. grading, bike racks and benches). This reduces the project scope to $300,000. In addition to this, $50,000 is allocated to traffic study and design improvements for Kam Lake Road.

Justification
To achieve the broader tourism, economic development, and harbour management objectives continued investment in the waterfront is necessary.

Operating Cost Impact
General maintenance and monitoring of the site will be required by City staff (i.e. garbage pick-up, landscape maintenance, parking enforcement). It will be a design objective to minimize such expenses, and some opportunities for cost recovery may be possible through user fees.

Project's Impact on Other Departments
Community Services staff will have increased park maintenance duties, as noted above.

Project's Return on Investment
Continued revitalization of the Old Town Waterfront encourages private sector investment, tourism, and revitalization. Recent initiatives, for example, provide for recreational day-use, parking for tourists and visitors, space for vendors and commercial operators, and opportunities for festivals and events.

Council Goals/Objectives/Actions
Goal #1: Building a sustainable future
Goal #2: Stewards of our natural and built environment

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Operating Cost	1,650,000				
Capital Cost					
Design			17,500		
Development					
Construction Engineering			17,500		
Construction			122,500		
Equipment			17,500		
Materials			175,000		
Total:	1,650,000		350,000	600,000	700,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	1,650,000		350,000	600,000	700,000
Other grants if available					
Total:	1,650,000		350,000	600,000	700,000

Department Planning and Development
Division Planning and Development
Project Streetscaping Initiatives

Project Description
Over the past five years the City has continued to make investments in streetscaping in areas such as Old Airport Road and Downtown. These improvements serve to promote active transportation (e.g. walking and cycling), beautification, tourism, and community pride. It has been demonstrated that this investment has resulted in increased investment from the business sector; it is, therefore, a significant contributor to revitalization.

In 2014 Council initially allocated funding to support the streetscaping of 52nd Avenue (49th Street to 56th Street) and 50th Street (51st Avenue to 52nd Avenue). Due to higher than expected tender results for these roadway improvements, 50th Street improvements were deferred in their entirety and 52nd Avenue landscaping was deferred to 2015. Approximately 80% of the paving and concrete work was completed in 2014, with the remaining 20% to be completed in 2015.

Council reduced the proposed $500,000 landscaping and irrigation budget to $250,000.

Justification
Streetscaping has been demonstrated to have a positive impact on residents' quality of life. This work was partially completed in 2014 and it was designed and agreed that the balance of work will be completed under the 2015 budget.

Operating Cost Impact
General maintenance will be required for emptying garbage bins and landscaping. It is noted, however, that the up-front installation of the irrigation system significantly reduces landscaping maintenance. Additionally, the contract for landscaping will include a two- to three-year maintenance agreement which will come out of the Capital allocation.

Project's Impact on Other Departments
Community Services will have some maintenance as noted above. Most of the maintenance work would not come into effect until 2018 or 2019.

Project's Return on Investment
In areas where streetscaping has occurred there has been concurrent or subsequent investment from the private sector. Increased tourism and revitalization are the main benefits of this investment.

Council Goals/Objectives/Actions

Goal #1:	Building a sustainable future
Goal #2:	Stewards of our natural and built environment
Objective #2(a):	Maintain, respect, preserve and enhance the natural environmental, natural heritage and green space
Action #2.18:	Create a safer, cleaner and vibrant city

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost				500,000	700,000
Design			2,500		
Development					
Construction Engineering			2,500		
Construction			75,000		
Equipment			12,500		
Materials			157,500		
Total:	1,450,000		250,000	500,000	700,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	1,450,000		250,000	500,000	700,000
Total:	1,450,000		250,000	500,000	700,000

Public Works & Engineering	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
Fleet Replacement	1,035	1,145	1,378	1,298	1,126	1,334	1,045
	1,035	1,145	1,378	1,298	1,126	1,334	1,045
Engineering & Garage							
Traffic Lights Video Detection Equipment	38	31	75	82	40	40	40
Diagnostic Equipment & Specialty Tools For Mechanics	-	18	20	20	20	20	20
Survey Equipment & AutoCad Software	-	-	75	75	-	-	-
Management Operating System	-	18	-	-	-	-	-
City Garage Building and Yard Improvements	-	-	50	-	-	50	50
	38	67	220	177	60	110	110
Roads & Sidewalks							
Road Rehabilitation	2,622	3,945	3,500	3,650	2,350	2,925	2,325
Drainage Improvements and Storm Sewer Repairs	50	50	50	50	50	50	50
McMeekan Causeway Abutment Stabilization	-	6	100	33	-	-	-
	2,672	4,000	3,650	3,733	2,400	2,975	2,375

(cont'd ...)

Road Rehabilitation	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
Latham Island Area:							
Otto Drive (Hearne Hill Park to Morrison Drive)	1,000	840				575	
N'Dilo		290					
Raccine Road, Ingraham Drive & Doornbos Lane	322		450	420			
Central Business District:							
50 St (52 Ave to 51 Ave)			500		700		
52 Ave. (49 St. - 56 St.)			1,500	2,370	450		
52 St (Overlay from 52 Ave to 51 Ave)							575
Franklin Ave. (41 St. to Wiley Rd.)						2,000	
Forrest Drive Area:							
Con Road		235					
Kam Lake Industrial:							
Kam Lake Road (Finlayson to Deh Cho)							1,750
Deh Cho Boulevard	1,300	2,580					
Cameron Rd.(between Nahanni Drive & Taltheilei Drive)			250				
Utsingi (including Etthen/Taltheilei/Drybones tie-ins to Deh Cho Blvd.)					1,200		
Cemetery Rd.						350	
Niven Lake:							
de Weerdt Drive, Driscoll Rd. & Haener Drive			800	860			
	2,622	3,945	3,500	3,650	2,350	2,925	2,325

Solid Waste Management	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
Landfill/Baler							
Landfill Expansion/New Landfill Cell Construction	-	18	250	15	-	3,000	-
Baling Facility Mechanical Upgrades	25	6	25	25	25	25	25
Site Restoration Liability	150	17	150	314	-	-	-
Ban Commercial Cardboard	-	-	-	25	-	-	-
Landfill Fire Control & Risk Reduction Plan	-	-	-	25	-	-	-
Solid Waste Facility Fencing	25	20	-	-	-	-	-
Recycling Depot Fencing	25	8	-	-	-	-	-
Centralized Composting Project/ Program	750	99	510	1,256	825	750	700
Transfer Station Phase 1	-	-	150	-	-	-	-
Baling Facility Roof Repairs	-	-	-	-	-	100	-
Scrap Metal Recycling	-	8	-	-	-	-	-
Office/Break Room/ Washroom for Solid Waste Facility	-	207	-	20	-	-	-
	975	382	1,085	1,680	850	3,875	725

	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
Water & Sewer							
Pumphouses (PHs)/Liftstations(LSs)/Forcemains							
Water Treatment Plant/Reservoir Expansion	9,900	1,836	6,227	19,391	8,321	150	-
Water & Sewer System Review	-	2	-	-	-	-	-
Capital Upgrades	65	201	65	65	65	65	65
Potable Water Reservoir Flushing & Cleaning	25	93	25	25	-	25	25
Pump Replacement Program	-	-	100	100	100	100	100
Monitoring & Controls Maintenance and Upgrading	75	75	75	75	75	75	75
PH#3 Pipe Replacement	300	161	300	10	-	1,000	-
LS#5 Pipe Replacement	-	-	-	-	-	300	300
	10,365	2,368	6,792	19,666	8,561	1,715	565
Other							
Water Meter Replacement & Upgrade	-	-	-	-	15	25	25
Water Meter Readers	-	59	-	-	-	-	-
Water Meter Replacement for PHs & LSs	-	2	-	13	-	-	-
Potable Water Submarine Pipe Inspection	-	-	30	30	-	30	-
PH & LS - Genset Installation	175	574	175	175	175	250	200
Fire Hydrant Maintenance	30	30	30	30	-	-	-
Lagoon Control Structure Replacement	-	-	150	150	-	-	-
Rebuilding of Trappers Lake Flow Control Structures	-	-	150	-	-	-	-
Water Licence Study & Report Requirements	100	59	60	109	-	-	-
PH#4 Sodium Hypochlorite Generation	-	15	-	5	-	-	-
Personal Gas Monitoring Equipment Upgrade	-	11	-	-	-	-	-
	305	751	595	512	190	305	225

	2013 Budget ($000's)	2013 Actual ($000's)	2014 Budget ($000's)	2014 Forecast ($000's)	2015 Budget ($000's)	2016 Budget ($000's)	2017 Budget ($000's)
CMP Replacement Program (includes repavement and concrete)							
Central Business District:							
54th Avenue (2017 Water & Sewer, 2018 Paving)							860
52nd Avenue				640			
Taylor Road Area:							
Franklin Avenue (2014 Water & Sewer & Paving)			2,600	2,085			
Lanky Court (2014 Water & Sewer & Paving)	1,200		1,350	1,780			
Reservoir Road (Paving)			60	40			
Matonabee Street (2012 Water & Sewer, 2013 Paving)	1,100	1,240		120			
LS#5/ Public Works Garage/ Fire Hall (Water & Sewer)			400	380			
LS#2 Replacement		550					
Forrest Drive Area:							
Con Road - Rycon to 54 St. (2016 Water & Sewer, 2017 Paving)						1,860	730
Forrest Dr - Burwash Dr. to 51A Ave.(2015 Water & Sewer & 2016 Paving)	650			75	750	490	
Frame Lake South:							
Horton Crescent (2015 Water & Sewer, 2016 Paving)					2,045	500	
Williams Avenue (2016 Water & Sewer, 2017 Paving)						1,725	775
Range Lake Court (2017 Water & Sewer and Paving)							615
Knutsen Court (2013 Water & Sewer, 2014 Paving)	1,000	1,465	400	400			
Byrne Road (Paving)	850	500					
Bromley Drive & Bromley Court (2013 Water & Sewer, 2014 Paving)	2,000	2,650	900	900			
Others:							
LS#5, PH#4 & Northlands Water Tie-ins (PH#4 & Byrne Rd.)		1,710		80			
	6,800	8,115	5,710	6,500	2,795	4,575	2,980

		2015 Budget Recommended ($000s)	M.E.R. Reserve ($000s)
Public Works & Engineering	**Page**		
Fleet Management	274		
1152-06 F-350		64	64
1154-05 F-150		34	34
1157-05 F-150		34	34
1174-09 34" Exmark Mower		15	15
1162-10 72" Exmark Mower		19	19
2108-94 Ford Cyclone Aerial		960	960
		1,126	1,126

		2015 Budget Recommended ($000s)	Formula Funding ($000s)	MACA Capital Grant ($000s)
Engineering & Garage	**Page**			
Traffic Lights Video Detection Equipment	278	40	40	
Diagnostic Equipment & Specialty Tools for Mechanics	280	20	20	
Roads & Sidewalks				
Road Rehabilitation	282	2,350	140	2,210
Drainage Improvements and Storm Sewer Repairs	286	50	50	
		2,460	250	2,210
Solid Waste Management				
Landfill				
Baling Facility Mechanical Upgrades	288	25	25	
Centralized Composting Program	290	825	825	
		850	850	-

		2015 Budget Recommended ($000s)	Formula Funding ($000s)	Long-Term Debt ($000s)	Water & Sewer User Fees ($000s)	M.E.R. Reserve ($000s)	Gas Tax Rebate ($000s)	MACA Capital Grant ($000s)
Pumphouses/Liftstations (PHs/LSs)	**Page**							
Water Treatment Plant	295	8,321		5,977			2,344	
Capital Upgrades	298	65			65			
Pump Replacement	300	100			100			
Monitoring & Controls Maintenance and Upgrading	302	75			75			
Other								
Water Meter Replacement and Upgrades	304	15			15			
PH & LS - Genset Installation	306	175			175			
CMP Replacement Program	308	2,795			620		2,175	
		11,546	-	5,977	1,050	-	4,519	-
PW Subtotal		**15,982**	**1,100**	**5,977**	**1,050**	**1,126**	**4,519**	**2,210**

Department Public Works & Engineering
Division Fleet Management
Project Fleet Upgrades & Additions

Project Description
The mobile equipment fleet has a replacement value of $15 million and must be maintained to meet the service levels expected by residents. The City has a fleet of 128 heavy-duty and mobile equipment that support Fire and Ambulance, Road Maintenance, Water and Sewer Maintenance, Solid Waste, Parks, Arenas and Administrative functions, plus 24 stationary engines for emergency power generation and fire pumping capacity.

The replacement vehicles listed have passed their useful lives according to City practices. In addition, they are recommended for replacement according to a mechanical assessment carried out by mechanics. In the 2006 Infrastructure Needs Assessment by FSC Architects and Engineers, now Stantec, it was noted that nearly half of the City's fleet is beyond its anticipated life span.

Light-Duty Trucks – 43 units
According to the City of Yellowknife Fleet Management Practices, these vehicles should be reviewed for replacement after seven years and replaced after ten years. We currently have 43 pickups and vans in the fleet. The ages vary from one year to more than ten years, depending on current use of those units. The average age of the trucks is six years. If the policy was followed the average age would be five years.

Medium-Duty Trucks – 8 units
According to the City of Yellowknife Fleet Management Practices, these vehicles should be reviewed for replacement after eight years and replaced after ten years. The City currently has eight medium-duty trucks in the fleet, with none of them over ten years old. The average age of the fleet is four years. If the policy were followed, the average age of the medium-duty truck fleet would be five years.

Municipal Enforcement Vehicles – 4 units
These are to be replaced every four years or 100,000 km. The average age of the fleet of four Municipal Enforcement vehicles is three years. Due to the high usage, Municipal Enforcement vehicles require a high amount of maintenance (nearly five times that of similar vehicles in the fleet). For this reason, it is important to maintain the replacement of the vehicles. One Municipal Enforcement vehicle must be replaced yearly to maintain the City standards and in order to reduce O&M costs and labour requirements. With the replacement of one vehicle this year, the City will meet the practice identified.

Heavy Trucks – 18 units
The 18 heavy-duty trucks and trailers, includes trailers, tandem tractors, dump trucks, and street sweepers. One of the heavy-duty trucks and trailers is due for replacement. The heavy trucks are to be replaced every twelve years. Currently, the age of the fleet is ten years old, and if the replacement policy is followed, the average age should be six years old. Trucks are used for City projects and snow removal in the winter. The cost of operating these vehicles over hiring contractors is about half. Each truck is operated for about 1,000 hrs/yr, saving the City $45,000/ year each truck it operates rather than contracting out.

Trailers are reviewed when aged out. If practical, the trailer is refurbished and returned to service. The dump trailer (due to more use and normal wear and tear) is replaced when aged out.

As trucks get older, increased maintenance and repairs are required, such as replacing motors and transmissions at costs of $20,000 and $10,000 respectively. Breakdowns inevitably occur when equipment is needed resulting in a cost to the City to engage contractors at a much higher cost than using our own forces. Condition: if replacements continue, heavy duty fleet condition is good.

Heavy Equipment – 10 units
The heavy equipment is to be replaced every 12 years. Currently, the fleet is six years old, and the average age should be six years old. Heavy equipment is used for City projects and snow removal in the winter. The cost of operating our equipment over hiring contractors is about half. Each piece of heavy equipment is operated for about 1,000 hrs/yr, saving the City $45,000 per year for each piece of heavy equipment it operates. As heavy equipment gets older, increased maintenance and repairs are required, such as replacing motors and transmissions at a cost of $30,000 and $20,000 respectively. Breakdowns inevitably occur when equipment is needed resulting in a cost to the City to engage contractors.

Mobile Tractors – 6 units

The average age of the fleet is six years. This includes Zambonis, skid steers, compactors, and forklifts. The anticipated life span is ten years. The average age of fleet if replaced as per the schedule should be five years. This equipment is currently tasked with sidewalk maintenance in the winter. Work in the summer includes sidewalk resurfacing and cold mix patches, Community Services trail repairs, and grounds maintenance.

Emergency Vehicles – 9 units

This includes fire trucks, ambulances and water trucks. The average age of the fleet is 15 years. Due to increased demand, the replacement life cycle standard has been evaluated by the Public Works and the Fire Department. The standard for replacement was reduced from 30 years to 20 years for most firefighting equipment. This was done after a replacement part was not available for a fire truck that was over 20 years old. This emergency vehicle was out of service for 8 weeks until a part was found at a used car wrecker. Parts are no longer manufactured for vehicles over 20 years old.

Ambulances are now replaced on a 12-year cycle due to the high amount of use and reliability issues with ambulances as they get older. We have three ambulances and one is replaced every four years. The newest is placed on “first out the door” service and the oldest is surplus.

Other Equipment – 34 units

Other equipment includes the miscellaneous equipment required by City departments to do their work. Included are: riding mowers, snowmobiles (Municipal Enforcement Division), All-Terrain Vehicles (firefighters), Solid Waste Facility baler, light trailers (Community Services and Public Works), line-painters, crack sealing equipment, trailer mounted water pumps, and ground thawing equipment. Equipment in this group has a varied life expectancy and replacement cost.

Stationary Engines – 21 Units

Our fleet mechanics also maintain and service 24 stationary engines. These include standby generators for City water and sewer supply and City facilities (City Hall, Fire and Ambulance Division, Multiplex/ Fieldhouse). The stationary engines provide standby electricity on water and sewer services in times of power outage or natural disaster. The estimated value of the stationary engines is approximately $4.8 million. Many of the existing engines are older: five are over 30 years old, 12 are over 20 years old, 14 are over 10 years old, and only seven are under 10 years. Parts are often unavailable for engines over 20 years old. Though these engines get little use, even small breakdowns may lead to lengthy repairs.

The Mobile Reserve Fund is not used to replace stationary engines even though the Fleet resources are used to maintain them. It is recommended to departmental managers that the older stationary engines be replaced. Fleet-wide, it is recommended that one engine a year be replaced until all stationary engines are less than 20 years old.

Summer Vehicles – 12 Units

Summer vehicles are vehicles that have been replaced but are still useful in a secondary or low priority role. There are nine light vehicles used mainly by Community Services Park staff in the summer or by Administration year-round, and one heavy equipment class dump trailer used in winter as a backup or with a leased tractor for winter snow removal. If repair of a summer vehicle exceeds an estimated cost of $500, the vehicle may be removed from service at the discretion of the Works Superintendent.

Justification

Maintenance costs will decrease if City of Yellowknife Fleet Management Practices are followed due to reduced fuel consumption and repair costs. City residents will have a high satisfaction with City services. If the fleet is replaced and a schedule followed, services will be more consistent and not interrupted due to equipment failure.

City Administration is currently reviewing all replacement schedules to ensure that the fleet is being replaced in the most fiscally responsible manner possible. The Fleet Replacement Policy will be reviewed and updated if necessary in 2015.

Operating Cost Impact
N/A

Project's Impact on Other Departments
N/A

Project's Return on Investment
N/A

Council Goals/Objectives/Actions
Goal #1: Building a sustainable future
Objective #1(b): Continue to have a sustainable and practical approach to infrastructure deficit reduction for replacement.

See Fleet Management Table, next page ...

Department: Public Works & Engineering											
Division: Fleet											
						Replacement Year					
		Replacement (R) or			2015	2016	2017			End	Link to Council Goals/Objectives/
Unit #	Description	New (N)	Year	Class	$	$	$	Hours	Kilometers	Use	Actions
1152-06	F-350	R	2006		63,600			5,290	87,973		Objective #1(b): Continue to have a
1154-05	F-150	R	2005		33,920			7,212	79,970		sustainable and practical approach to
1157-05	F-150	R	2005		33,920			7,383	82,813		infrastructure deficit reduction
1174-09	34" Exmark Mower	R	2009		15,000			177			
1162-10	72" Exmark Mower	R	2009		19,080			158			
2108-94	Ford Cyclone Aerial	R	1994		960,000			4,719	59,223		
2015					**1,125,520**						
1004-06	F-150	R	2006			34,880					
1005-06	F-150	R	2006			34,880					
1163-06	F-150	R	2006			34,880					
1164-06	F-150	R	2006			34,880					
1124-04	F-150	R	2004			32,960					
1125-04	F-150	R	2004			32,960					
1165-06	F-250	R	2006			45,780					
1166-06	E-150 Leak detection	R	2006			38,150					
1188-11	Zero Turn Exmark Mower	R	2011			19,620					
1190-11	Can Am ATV	R	2011			15,000					
1193-12	Polaris S12BA6NSL	R	2012			15,260					
1194-12	Polaris S12BA6NSL	R	2012			15,260					
2099-02	Freightliner FC70 Road Sweeper	R	2002			370,800					
2012-10	John Deere 304J	R	2010			147,150					
2101-03	LT9500 Sterling (Mercedes)	R	2003			163,500					
2104-04	LT9500 Sterling (Cat)	R	2004			163,500					
2121-08	CAT 246C Skid Steer	R	2008			70,850					
T010-65	45' High Boy Trailer	R	1965			42,400					
T011-80	45-Ton Low Boy Trailer	R	1980			20,000					
2016						**1,332,710**					
1167-06	F250 4X4	R	2006				65,000				
1193-12	Polaris Snowmobile	R	2012				15,000				
1194-12	Polaris Snowmobile	R	2012				15,000				
1016-07	RAM 2500	R	2007				65,000				
1049-13	F-150 XLT	R	2013				55,000				
1061-07	RAM 1500	R	2007				35,000				
1069-07	E-150	R	2007				40,000				
1072-07	Ranger 4x4	R	2007				35,000				
1075-07	RAM 1500	R	2007				35,000				
1158-05	F-550 Picker	R	2005				85,000				
1159-05	F-550 Steamer	R	2005				85,000				
1160-05	60" Exmark Mower	R	2005				15,000				
2109-01	E-350 SD Ambulance	R	2001				175,000				
2120-98	Ford LT8513 Water Tanker	R	1998				325,000				
2017							**1,045,000**				

Department Public Works & Engineering
Division Roads and Sidewalks
Project Traffic Lights Video Detection Equipment

Project Description
There are 18 intersections which rely on vehicle detection equipment for proper functioning of the traffic lights. Video detection equipment is the new standard in detection and data collection and is easy to install and program. This equipment has a proven field detection accuracy of 98% according to the manufacturer's specifications; this also includes motorcycles and bicycles. The cameras can also capture traffic data, such as traffic counts of cars, trucks and pedestrians, as well as vehicle speeds. However, vehicle speed data can only be used for design methods and not as a method of speed enforcement.

Most intersections would require four cameras, one for each direction of traffic. Intersections along Franklin Avenue use vehicle detection for cross streets only, which would require the installation of only two cameras per intersection. Additional cameras could be installed along Franklin Avenue for data collection.

In 2013 cameras were installed at the intersection of Norseman Drive and Franklin Avenue as a pilot project to determine the effectiveness of the cameras for detection of vehicles under Yellowknife conditions. The cameras operated well for the detection of vehicles during the trial period and in 2014 additional cameras were installed at the intersections of Franklin Avenue and Matonabee Street and Old Airport Road at Borden Drive North.

The approximate cost for camera installation is $35,000 per intersection (four-way) while allowing approximately $5,000 for installation costs.

Justification
The City of Yellowknife has historically relied solely upon wire loops in the asphalt surface of intersections to detect vehicle presence and subsequently give a call to change the traffic lights in that particular direction.

Traffic loops can be troublesome in the winter under snowy conditions. They are expensive to install and maintain. They are also susceptible to road conditions and construction activity. Over 35% of loops currently in use require some measure of repair. This can cause major inefficiencies in traffic flows and timing patterns.

Operating Cost Impact
The use of cameras for vehicle detection will increase public safety and reduce call-outs for Public Works & Engineering staff.

Project's Impact on Other Departments
N/A

Project's Return on Investment
N/A

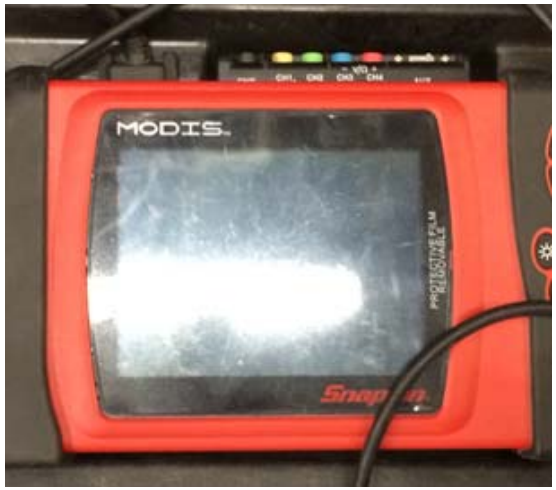
Council Goals/Objectives/Actions
Goal #2: Stewards of our natural and built environment

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	120,000		40,000	40,000	40,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	120,000		40,000	40,000	40,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	120,000		40,000	40,000	40,000
Total:	120,000		40,000	40,000	40,000

Department Public Works & Engineering
Division Fleet Management
Project Diagnostic Equipment and Specialty Tools for Mechanics

Project Description
The City's fleet is comprised of 147 pieces of equipment and 24 stationary engines, with a total value of approximately $18 million. The diversity of makes and models of heavy- and light-duty equipment requires a range of equipment and specialty tools for maintenance of the City's mobile fleet. Ever-changing technologies, software, parts and tools require the City to keep up-to-date to maintain its investments.



Justification
Diagnostic maintenance manuals will help mechanics troubleshoot problems and reduce pollution by providing better maintenance practices. Nearly all new equipment utilizes code readers to troubleshoot electronic and mechanical problems. Each make and model requires specialized equipment to read its codes.

Operating Cost Impact
Providing our mechanics with the proper tools to do their jobs enables more efficient use of City resources and cuts down on contracted costs, since problems can be diagnosed and fixed with in-house resources.

Project's Impact on Other Departments
N/A

Project's Return on Investment
N/A

Council Goals/Objectives/Actions
Goal #2: Stewards of our natural and built environment

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	60,000		20,000	20,000	20,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	60,000		20,000	20,000	20,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	60,000		20,000	20,000	20,000
Total:	60,000		20,000	20,000	20,000

Department Public Works and Engineering
Division Roads and Sidewalks
Project Road Paving & Rehabilitation

Project Description
Paving work includes not only new asphalt pavement, concrete curbs and sidewalks, but also considers the replacement and future needs of the city's underground infrastructure: water, sewer, storm, traffic communication, power, telephone, cable, fibre optic, etc.

The typical design life of pavement is generally between 20 to 25 years, but will vary significantly. This design life is dependent on various factors such as traffic volumes, vehicle types, geotechnical conditions, construction practices, and adequate maintenance. The design life of 20 to 25 years applies to most city streets, except for the Kam Lake Industrial Subdivision where the roads were historically paved with no base reconstruction. This construction practice has changed and all roads in Yellowknife receive the same base preparation prior to paving. However, the older paved roads in Kam Lake Industrial Subdivision will likely have a life of only ten years or less. It is important to note that concrete curbs and sidewalks are not installed in downtown alleys or on roadways with rural cross sections. In areas of potential settlement, the City considers asphalt sidewalks as opposed to concrete sidewalks as they are less costly and are easier to maintain or repair should settlement occur.

The construction of new roads generally coincides with the development of new subdivisions. The replacement of roads generally follows the replacement of water and sewer infrastructure. Otherwise, paving is scheduled for reconstruction when a road is in poor condition and may be a danger to the public or when maintenance and repairs are no longer cost-effective. The paving of roads may be done in the same year as water and sewer infrastructure replacement or may be delayed a year or two to allow for settlement, depending on the ground conditions.

There has been concern expressed by the public as to the condition of the sidewalks and roads in the Central Business District (CBD) and Kam Lake Industrial Park. The majority of roads in the CBD are over 30 years old and are well beyond their life expectancy. The replacement of several downtown streets is scheduled over the next few years. There are several roads in Kam Lake that currently have no form of asphalt surfacing, or are in a very poor state of repair. These streets are also being addressed in upcoming budget seasons.

As streets are reconstructed, the City works with Northland Utilities Limited to ensure that street lighting levels are evaluated and increased, to comply with national standards. Additional underground ductwork is being coordinated in this work with Northland Utilities Ltd., NorthwesTel Inc. and NorthwesTel Cable Inc. for present and future needs.

2015 Road Paving/Reconstruction Projects

Utsingi Drive - Kam Lake Industrial Park (including tie-ins for Etthen Drive, Taltheilei Driv, Drybones Drive)
This will nearly complete the paving in the Kam Lake area.

50th Street (between 51 Avenue and 52 Avenue)
The sidewalks and the asphalt road surface are in poor condition and need to be repaired. Several large sections of sidewalk have been patched with asphalt and need replacement. Upgrading of this street will also address several areas of ponding that have occurred due to settlement.

52 Avenue Completion
As shown in the Memo to Committee, dated May 5, 2014, the third option was selected for award. This included 52 Avenue reconstruction. This decision also showed a project deficit of $447,415.86, and that this amount would be requested in the 2015 budget process to complete the project.

2016 Road Paving/Reconstruction Projects

Otto Drive (Hearne Hill Park to Morrison Drive)
Otto Drive has major dips in some areas, and is subject to movement due to unstable ground conditions. Upgrading of the street will address these concerns as well as any drainage issues in the area.

Franklin Avenue (41 Street to Wiley Road)
The bottom of the Franklin Avenue hill into Old Town has several major dips and other areas of concern. The section of roadway by Fritz Theil Park has subsided, creating a safety concern. Reconstruction of this area will include provision for bike lanes.

Cemetery Road
Cemetery Road is one of the remaining gravel roads in the city. Paving of the road will lessen the need for grading and dust control on the road.

2017 Road Paving/Reconstruction Projects

Kam Lake Road (Finlayson Drive to Deh Cho Boulevard)
This section of Kam Lake Road is riddled with potholes, bumps and dips which will be addressed during road reconstruction.

Downtown Street Overlay Program – 52nd Street
Public Works has determined a method of road resurfacing that may make construction less invasive and timelier on streets that have no differential settling problems. Many downtown streets have no movement problems, but the concrete sidewalks are severely deteriorated. A prime example of this is a section of 52nd Street, between 51st Avenue and 52nd Avenue (by Mary Murphy Senior Home). Instead of completely removing asphalt and concrete materials, the contractor will be required to remove dilapidated structures, such as sidewalks, while keeping intact the asphalt roadway. New concrete appurtenances will then be installed and an overlay of asphalt will be applied to resurface the road.

Justification
n/a

Operating Cost Impact
Paving of roads which are currently gravel, as is the case for the older section of the Kam Lake industrial area, eliminates the need for grading and dust control on the streets.

Upgrading streets that have significant surface issues (dips, rough pavement, potholes, etc.) reduces the amount of upkeep required on the roads, and improves safety. It also provides the opportunity to redesign roadways to include items such as multi-use trails and bike lanes.

Project's Impact on Other Departments
n/a

Project's Return on Investment
n/a

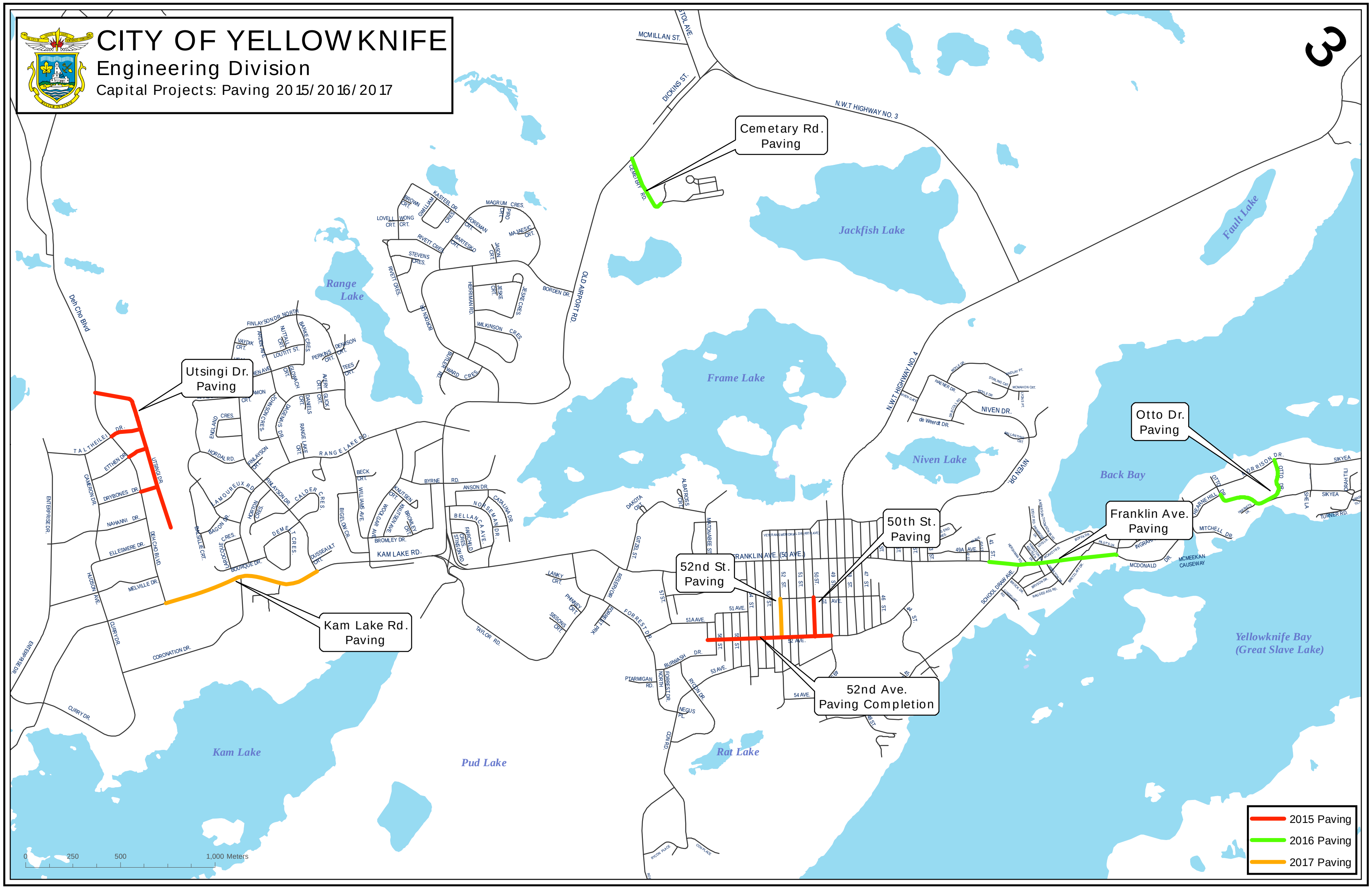
Council Goals/Objectives/Actions
Objective #2(b): Improve transit, roads, sidewalks, recreation facilities and trails with an emphasis on active and healthy living choices
Objective #2(c): Develop smart and sustainable approaches to energy, water and sewer, waste management and building systems

Tentative 3-year Paving Plan

Street	Replacement Year	Paving Estimate
50st Street (52nd Avenue to 51st Avenue)	2015	$700,000
Utsingi (including Etthen/Taltheilei/Drybones tie-ins to Deh Cho Boulevard)	2015	$1,200,000
52 Avenue Completion	2015	$450,000
Otto Drive (Hearne Hill Park to Morrison Drive)	2016	$575,000
Franklin Ave (41st Street to Wiley Road)	2016	$2,000,000
Cemetery Road	2016	$350,000
Kam Lake Road (Finlayson Drive to Deh Cho Boulevard)	2017	$1,750,000
52nd Street (overlay from 52nd Avenue to 51st Avenue)	2017	$575,000
TOTAL		**$7,600,000**

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	7,600,000		2,350,000	2,925,000	2,325,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	7,600,000		2,350,000	2,925,000	2,325,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	970,000		140,000	715,000	115,000
MACA Capital Grant	6,630,000		2,210,000	2,210,000	2,210,000
Total	7,600,000		2,350,000	2,925,000	2,325,000


CITY OF YELLOWKNIFE
Engineering Division
Capital Projects: Paving 2015/2016/2017
Cemetary Rd. Paving
Utsingi Dr. Paving
Otto Dr. Paving
Franklin Ave. Paving
50th St. Paving
52nd St. Paving
Kam Lake Rd. Paving
52nd Ave. Paving Completion
Jackfish Lake
Range Lake
Frame Lake
Niven Lake
Back Bay
Fault Lake
Yellowknife Bay (Great Slave Lake)
Kam Lake
Pud Lake
Rat Lake
2015 Paving
2016 Paving
2017 Paving
0 250 500 1,000 Meters
3

Department Public Works & Engineering
Division Roads & Sidewalks
Project Drainage Improvements & Storm Sewer Repairs

Project Description
Water from the spring freshet can cause serious problems, including erosion of roads and flooding of properties. A washed-out road creates a hazard to residents since there is no safe way to get off a property. As well, service and emergency vehicles cannot access a property while flooding is occurring.

The proposed project could consist of ditch restoration or installation. It could include underground storm sewer repairs, replacements or installations ranging from manholes, catch basins or outfalls to receiving water bodies. Since the capital budget for such activities is used on a priority basis, it could be consumed by one large project or several smaller ones.

2014 Highlights:
- Low area affecting remaining unsold lot in Grace Lake.
- Culver on Curry Drive that was causing flooding of private property.
- Large section of Franklin Avenue near Bretzlaf Drive.

2015 Work:
- Ditching and culvert work near Fibreglass North in Kam Lake.
- Ponding and severe road deformation in Forrest Park.
- Repairs on several low, ponding areas on School Draw Avenue (budget depending).

Justification
Drainage issues take considerable effort to resolve, as many locations were not designed with drainage in mind. This creates significant work for City staff or contractors hired by the City to minimize property damage.

The City has had a number of requests from concerned residents regarding storm water drainage along streets throughout Yellowknife. In most instances, settlement of the road has caused significant ponding which resulted in roadways being undermined or homes damaged during heavy rainfalls. Since these roads are not scheduled for reconstruction in the near future, the City intends to extend existing storm sewers in these areas or install new ones to remediate problems.

Operating Cost Impact
The Roads & Sidewalks Division attempts to complete some ditching activity with staff during the summer period, depending on conflicting priorities such as water or sewer digs, street sweeping, line painting or other division activities. This capital allocation would allow the department to plan contracted work, should City staff be occupied with other operational requirements.

Project's Impact on Other Departments
This allocation could free up City staff to help other departments with City activities. For example, during the summer of 2014 the Roads & Sidewalks Division provided equipment and labour for the remediation of the Bristol Pit property, which saved the City approximately $30,000 in clean-up costs.

Improvements to drainage will also result in lower pumping costs for residents and the City, greatly reduce flood damage and emergency repairs to roads, and provide continuous safe access to property by owners and emergency vehicles.

Project's Return on Investment
N/A

Council Goals/Objectives/Actions
Goal #1: Building a sustainable future
Goal #2: Stewards of our natural and built environment

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	150,000		50,000	50,000	50,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	150,000		50,000	50,000	50,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	150,000		50,000	50,000	50,000
Total:	150,000		50,000	50,000	50,000

Department Public Works & Engineering
Division Solid Waste Management
Project Baling Facility Mechanical Upgrades

Project Description
This project will complete mechanical upgrades to the Baling Facility that cannot otherwise be completed by City staff as routine operation and maintenance activities. The equipment currently in use at the Baling Facility consists of a dust collector unit, HVAC burners, overhead doors, fire pump and sprinkler system, fire alarm system, electrical components, air compressor and boilers for in-floor heating.

Previous items completed under this budget allocation:
- 2003, hydraulic ram replacement on the bailer.
- 2004, overhead door replacement.
- 2007, fire suppression pump replacement.

Proposed work for 2015:
- Interior roof repairs.
- Pellet boiler upgrades.
- Methane gas detector replacement.

Justification
In 2006, the City completed an internal audit at the facility. Several items were noted for upgrade, repair or replacement. These items include electrical, plumbing, heating and signage which have been worked on each year, as the budget permits. This continual maintenance of the Baling Facility also ensures a safe work environment for employees.

Operating Cost Impact
Mechanical breakdowns on aging equipment can impact operating costs in several ways. Breakdowns increase the budgets for staff, overtime and contracted costs, and impact the public by affecting facility operations. Adherence to the annual maintenance schedule of the facility will result in fewer breakdowns, less downtime and lower costs.

Project's Impact on Other Departments
n/a

Project's Return on Investment
n/a

Council Goals/Objectives/Actions
Goals #2: Stewards of our natural and built environment
Objective #2(c): Develop smart and sustainable approaches to energy, water and sewer, waste management and building stems

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	75,000		25,000	25,000	25,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	75,000		25,000	25,000	25,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	50,000		25,000	25,000	
Gas Tax Rebate	25,000				25,000
Total:	75,000		25,000	25,000	25,000

Department Public Works & Engineering
Division Solid Waste Facility
Project Centralized Composting Program (Phased Approach)

Project Description
Background

In July 2007, Gartner Lee conducted a waste audit at the Solid Waste Facility. The Waste Composition Study showed that 2,100 tonnes of food waste were disposed of from the residential and commercial sector in 2006, accounting for 26% of the total waste stream. The study recommended a significant diversion of food waste from the various sectors which will require the development of a centralized organic waste processing facility.

Between 2009 and 2012, the City of Yellowknife carried out a Centralized Composting Pilot Project to learn about the composting process and to evaluate the feasibility of expanding composting efforts to involve a greater number of participants and sectors of the community. The project focused on the commercial and institutional sectors in order to gain the most organic material from the smallest number of participants. During the pilot project the City, in partnership with Ecology North, was able to evaluate windrow composting from the collection of organics to the production of finished compost.

The final report from the pilot project recommended ways to expand composting from a pilot project to a citywide program. The composting facility that was built for the pilot project is already functioning at capacity. In order to expand the program, a larger facility must be built.

It was determined that the most cost effective way to implement a citywide composting program is to use a phased in approach. This allows for the cost of the program to be spread out over several years.

In 2013, the City began working on the design, construction costs, water board regulatory approval, and program logistics for expansion into a citywide composting program. It was determined that the 2013 approved budget would cover only the cost of the retention pond due to regulatory requirements and minimal base pad construction. The entire facility needs to be constructed with materials approved by the Mackenzie Valley Land and Water Board as acceptable for landfill closure requirements.

2013 Highlights of Work Completed

- Meetings held with regulatory authorities in October 2013 which provided necessary information to move forward with detailed design
- Design of the compost pad, retention pond, and access road were completed by City Staff
- Site survey and rough site shaping has been completed by Solid Waste Facility Staff, as well as 50% of the access road construction
- Program logistics are being developed as recommended in the Pilot Project report, some 2013 tasks completed were:
- Streamlining data collection through standardized operator tracking sheets, and windrow monitoring sheets
- Held operator training for SWF staff.
- Implemented site-specific sampling procedures for soil sampling process
- Maintained relationships with participant (troubleshooting and support)
- Drafted “Compost Facility Operations Manual”
- Planning compost facility specific “Fire and Incidents Protocol” in line with SWF practices
- Implemented occupational health and safety and hazard protocols in line with SWF practices
- Increased communications via social media
- Increased exposure at public events
- Participated in the Annual Canadian Compost Council Conference and Ecology North received Composting Facility Operator Training
- Prioritized investigation of feedstock as recommended by experts in the compost industry

2014 Construction and Implementation ($1,150,000)

In 2014 members of the engineering and solid waste divisions met with the “Compost Doctor” to discuss the implementation of the citywide compost program. The “Compost Doctor” provided insight on numerous topics, including the materials that should be used to construct the compost facility. The compost facility had been designed using liner materials for the leachate collection pond and an asphalt pad. Since the facility was being built on top of the existing landfill, the “Compost

Doctor" recommended that a liner system be used for the entire facility as it would allow for greater flexibility in case of settlement of the ground underneath the compost pad and pond. With this information, and additional research into liner materials, the design of the compost facility was revised to remove the asphalt pad and replace it with a liner system covered by granular materials.

The design change that occurred, introduced new costs into the project as the liner systems used are more expensive than the use of asphalt. However, the liner system was preferred by the Mackenzie Valley Land and Water Board (MVLWB) as it used the same materials that will be used in the closure of the landfill.

Highlights of 2014 include:

- Completion of first phases of construction consisting of the pond and one-quarter of the pad area
- Continued to use pilot project base pad until the new pad was fully functional, at which point operations shifted to new facility. Pilot project pad will be used to complete the compost on site, and then used for other activities
- Installed yard waste bins onsite (SWF) to more efficiently provide feedstock to compost facility.
- Purchased black (garbage) bins for every residence in the City and green (compost) bins for each residence in Range Lake North. These bins will be City of Yellowknife property and attached to each property
- Evaluation of neighbourhoods to determine which of the 4 neighbourhoods (Range Lake North, Frame Lake South (includes Kam Lake area), Old Town (includes Niven Lake area), or Downtown) to bring online with the composting program in which year. The following implementation schedule was determined:
- Range Lake North - 2014
- Old Town - 2015
- Frame Lake South - 2016
- Downtown - 2017
- Revision of garbage collection contract to address collection using bins as well as alternating weekly pick-up for garbage and compost in the Range Lake North neighbourhood
- Conducted public information sessions for bin usage for all residents
- Created info packages for both black and green bin usage
- Specify and confirm operational equipment required to operate an efficient and cost-effective compost facility. Tender in late 2014, arrival in 2015

2015 Expansion ($825,000)

Construction:

- Tender pad expansion to accommodate the second neighbourhoods compost material quantities. Design already complete in 2014 for entire facility

Program Expansion:

- Operate compost facility for commercial and first phase of curbside collection. Including use and/or sale of any finished compost product
- Purchase of green bins for Old Town.
- Increased publicity and education campaign
- Implementation of organics recycling at all public events
- Continue to increase Industrial, Commercial and Institutional (ICI) sector participation

2016 Expansion ($750,000)

Construction:

- Tender pad expansion to accommodate the third neighbourhoods compost material quantities.

Program Expansion:

- Operate compost facility for commercial and first two phases of curbside collection. Including use and/or sale of any finished compost product
- Purchase of green bins for Frame Lake South
- Continue publicity and education campaign. Implement changes if necessary
- Continued implementation of organics recycling at all public events
- Continue to increase Industrial, Commercial and Institutional (ICI) sector participation

2017 Expansion ($700,000)

Construction:

- Tender pad expansion to accommodate the final neighbourhoods compost material quantities

Program Expansion:

- Operate compost facility for commercial and first three phases of curbside collection. Including use and/or sale of any finished compost product
- Purchase of green bins for Downtown
- Continue publicity and education campaign. Implement changes if necessary
- Continued implementation of organics recycling at all public events
- Continue to increase Industrial, Commercial and Institutional (ICI) sector participation

Program Costs

Expansion to a citywide program will require a phased-in approach as detailed, which will allow for the costs of the program to be spread out over four years. The overall costs of the program are higher than initially anticipated due to the following:

- Changes in construction materials – the pad is now to be constructed using a liner system which is more expensive than using asphalt as originally planned
- Changes in length of contract with Ecology North – It was initially thought that Ecology North's involvement in the composting program would be scaled back over the next three years so that the City would be fully running the composting program in the fourth year of this project. However, after careful consideration and discussions with Ecology North, it was decided to continue working with Ecology North until the composting program was instituted citywide

The table below outlines the anticipated costs over the next 3 years:

2014 Forecasted Expenditures	$1,256,000
2015 Budget	$825,000
2016 Budget	$750,000
2017 Budget	$700,000
Total Project Costs	**$3,531,000**

Justification

Composting will divert waste from the Solid Waste Facility, reduce greenhouse gas emissions associated with production of methane in the landfill, reduce the attractiveness of the active landfill to birds and other wildlife, and produce a finished product that is in high demand. A centralized composting program is more efficient than the smaller backyard composters, because it reaches higher temperatures, is able to decompose more waste including all food scraps and animal products. It is also worth considering that paper products are required during the process, and contribute to the overall sustainability and increased self-sufficiency of the landfill. It has been proven that finished compost is a highly sought after item in Yellowknife and will be usable for many City projects including cover material for the landfill closure.

Operating Cost Impact

Changing the composting facility to a permanent program will increase the overall O&M for the Solid Waste Facility. Time will be required for maintaining the compost piles, including turning the piles, mixing feedstocks upon arrival at the facility and adding moisture to composting material, as well as maintenance associated with the fencing, pond liner system and compost pad. However, diverting waste from the main waste stream will reduce the amount of waste being baled and added to the landfill site which, in turn, will reduce the amount of staff time needed at the baler and increase the overall lifespan of new landfill cells.

Project's Impact on Other Departments

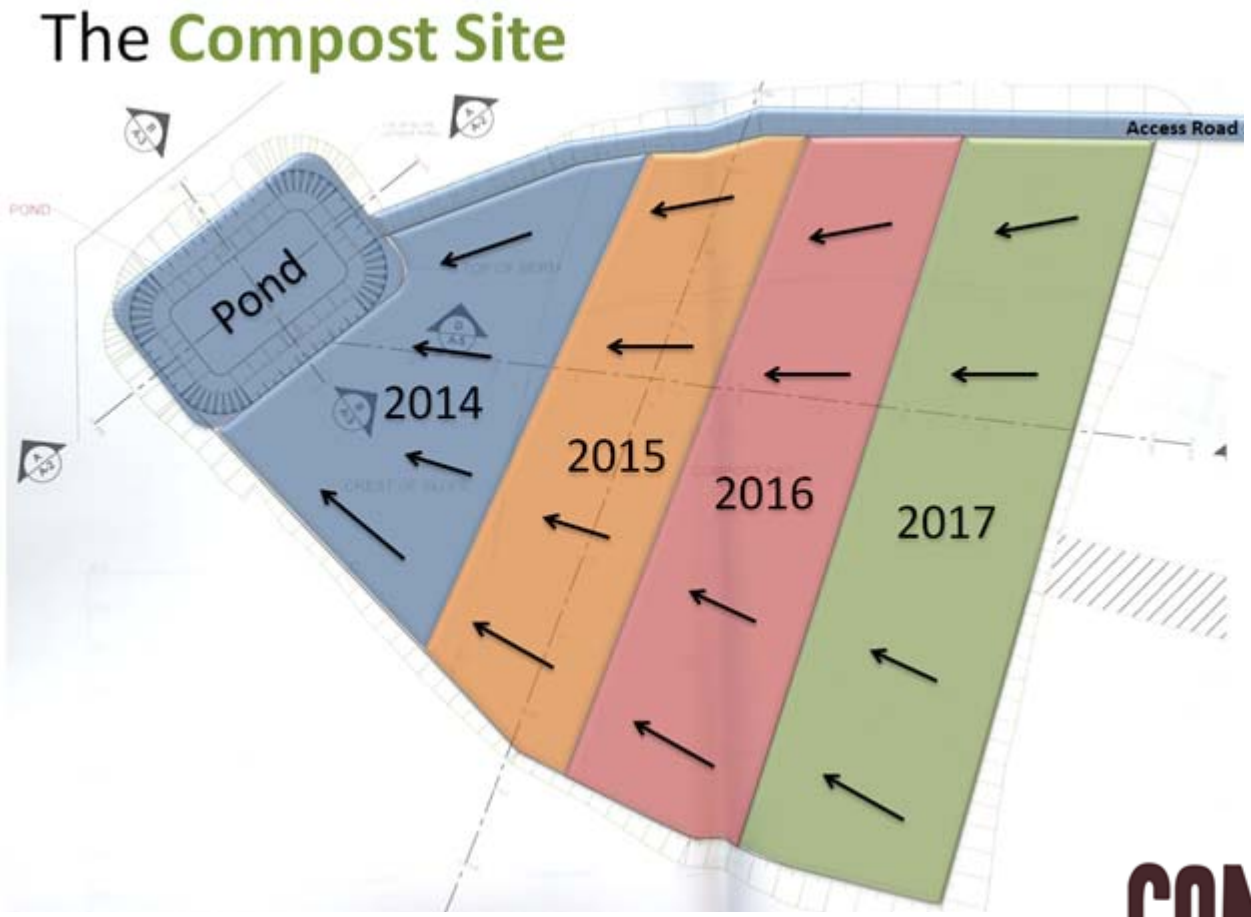
N/A

Project's Return on Investment

N/A

Council Goals/Objectives/Actions

Objective #2(c): Develop smart and sustainable approaches to energy, water and sewer, waste management and building systems


The Compost Site
Access Road
Pond
2014
2015
2016
2017

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	2,275,000		825,000	750,000	700,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	2,275,000		825,000	750,000	700,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Formula Funding	1,575,000		825,000	750,000	
Gas Tax Rebate	700,000				700,000
Total:	2,275,000		825,000	750,000	700,000

Department Public Works & Engineering
Division Water & Sewer
Project Water Treatment Plant and Pumphouse #1 Upgrade

Project Description

The City obtains its potable water from the Yellowknife River. Pumphouse #2, located at the Yellowknife River, delivers water to Pumphouse #1 via an eight-kilometre submarine pipeline in Yellowknife Bay. Pumphouse #1, located at the end of 48th Street toward Yellowknife Bay, is the water treatment/distribution and computer monitoring/control centre for the City.

Currently, the City's only water treatment is disinfection using chlorine gas. The water is also fluoridated to assist in reducing dental decay.

In addition to the daily tests at the Pumphouse and twice-weekly tests at the hospital laboratory, the City carries out comprehensive water tests annually or semi-annually. In 2001, Public Works & Engineering started a comprehensive year-round water testing and analysis program. This program was followed by an assessment of the water quality and recommendation for improvements to meet more stringent guidelines.

During the 2002-2004 budget planning process, it became apparent that another related factor needed to be considered simultaneously for the project. Pumphouse #1 was constructed in 1948 and added to piece-by-piece from 1968 through the mid-1980s. It is long overdue for replacement and was originally planned to be done in the early 1990s following the construction of the new reservoir (1991). The new pumphouse building has been designed to be located on top of the reservoir. The extensive growth of the city over the recent past has created an additional burden on the capacity of the reservoir. The current demand is starting to exceed the capacity of the reservoir. In order to meet the growth of the city, the reservoir must also be expanded. The intent is to expand the capacity of the reservoir to meet Yellowknife's current and future ten-year needs.

The first phase of this project was the reservoir expansion at the existing facility; this work was completed in 2008. The engineering services contract was awarded to AECOM in the spring of 2010. In August 2013, the contract to build the new Water Treatment Plant (WTP) was awarded. Work on site began in October 2013 and will continue until 2015. The project is projected to meet the original completion date of March 31, 2015.

Justification

In 2009, the Government of the Northwest Territories adopted the Canada Drinking Water Guidelines as legislation, thus requiring the City of Yellowknife to comply with the new guidelines. The new guidelines state the following: waterworks systems that use a surface water source or a groundwater source under the direct influence of surface water should filter the source to meet the turbidity limits. As well, increased water quality criteria that are more stringent than the current drinking water quality guidelines are expected to be established in the future. For example, reduced acceptable levels of turbidity and trihalomethanes (THMs) are currently under review and a resulting requirement for further treatment is expected to be forthcoming within the next couple of years. Public demand for improved water quality is expected, which would in turn establish the need for water conditioning in the future.

Since the City obtains its water from the Yellowknife River, a surface water source, there is always a potential for either of the water-borne pathogens (*Cryptosporidium* and *Giardia lamblia* which causes giardiasis, referred to as beaver fever) to enter our water supply. To date, Yellowknife has not experienced an outbreak of either of these pathogens. Although the likelihood of an occurrence is low, the City should nevertheless establish emergency response procedures. A key emergency measure, besides issuing a boil-water order, would be to implement appropriate water treatment processes.

During the summer of 2004, a boil-water advisory was issued because the high level of silt in the Yellowknife River exceeded the guidelines. Due to these circumstances and the adopted legislation, the City of Yellowknife was ordered to begin the process of building a water treatment plant that addresses these drinking water parameters.

Operating Cost Impact

The water treatment process and facility is a new addition to the City's potable water infrastructure. This means an increase in power and fuel consumption. It also means a reduction in staffing for Pumphouse #1, as the new facility no longer has to be occupied 24 hours a day under the

Northwest Territories Boilers and Pressure Vessels Act as a Class 5 Plant Operation.

It is estimated that the new Water Treatment Plant will consume 333,000 litres of fuel and 2,041,000 kWh of electricity per year. The net operating costs for the new facility will be $500,000 annually; this includes the reduction of staff and other fuel and power reductions at Pumphouse #1.

Escalating fuel and power costs were not accounted for when the original O&M budget was established for this treatment plant.

Project's Impact on Other Departments
N/A

Project's Return on Investment
N/A

Council Goals/Objectives/Actions
Objective #2(c): Develop smart and sustainable approaches to energy, water and sewer, waste management, and building systems.

Prior Year Funding	$24,697,787
2015 Capital Cost	$8,321,000
2016 Capital Cost	$150,000
Total	**$33,168,787**

Water Treatment Plant (City of Yellowknife photos)

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	8,471,000		8,321,000	150,000	
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	8,471,000		8,321,000	150,000	

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Long-term Debt	5,977,000		5,977,000		
Gas Tax Rebate	2,344,000		2,344,000		
Water & Sewer User Fees	150,000			150,000	
Total:	8,471,000		8,321,000	150,000	

Department Public Works & Engineering
Division Water & Sewer
Project Pumphouse and Liftstation Capital Upgrades

Project Description
Many of the City's six Pumphouses and 14 Liftstations are aging and require increased architectural care and maintenance. These buildings have aged exterior cladding and inefficient windows, and it is suggested that insulation and windows be upgraded to reduce heating costs. This, in conjunction with new siding and roofing, will reduce operating costs for each building and will help the buildings to blend better with the surrounding neighbourhood.

Proposed work for 2015:
- Lift Station #9 (1986), roofing, siding and door replacement.
- Pump House #5 (1990), roofing, siding and door replacement.

The amount of work complete is budget dependent.

Justification
In addition to the architectural upgrades, mechanical and electrical upgrades are required for the heating and ventilation systems. The upgrades include installation of energy-efficient furnaces and boilers, double-walled or self-contained fuel storage tanks and upgrades to air handling units.

Operating Cost Impact
Replacing the siding, roofing and windows as well as improving insulation will reduce heating costs and remove the need for painting every three to four years. Replacement of fuel tanks will reduce the risk of spilling environmental contaminants.

Project's Impact on Other Departments
N/A

Project's Return on Investment
N/A

Council Goals/Objectives/Actions
Goal #2: Stewards of our natural and built environment

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	195,000		65,000	65,000	65,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	195,000		65,000	65,000	65,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Water & Sewer User Fees	130,000		65,000	65,000	
Gas Tax Rebate	65,000				65,000
Total:	195,000		65,000	65,000	65,000

Department Public Works & Engineering
Division Water & Sewer
Project Pump Replacement for Pumphouses and Liftstations

Project Description
The City has six pumphouses and 12 liftstations which, along with water and sewer pipe networks, make up its water distribution and sewage collection system. Each station contains between two and nine pumps. Liftstations also use communitors (sewage grinders) to break down sewage before it returns to the collection system. The pumps and grinders must be maintained in order to ensure a continuous supply of water and discharge of sewage for residents. Failure of pumps or grinders at any liftstation can result in a sewage overflow, which has occurred in the past, resulting in sewage entering people's homes. In 2003, a sewage overflow at Liftstation #6 cost the City $25,000 for remediation.

Pump rebuilding costs about $7,000 to $25,000 per pump, while replacement costs $10,000 to $35,000 per pump. The costs to rebuild or replace a communitor are $30,000 and $80,000, respectively. Larger pumps, as in Liftstations #5 and #6, cost between $30,000 and $40,000 to replace.

A new standard for electric motors has been determined by the Water & Sewer Division. The new motor specification is more efficient and capable of upgrades to variable frequency drive in the future. Levels of maintenance have also increased to ensure efficiencies are of the highest possible level. In many instances, specialized personnel and equipment must be utilized to achieve this level. Public Works & Engineering staff continue to improve the efficiency of the water and sewer service and increase maintenance standards to provide a high level of service to residents.

Justification
Based on standard industry procedure and the experience of Public Works & Engineering staff, pumps are to be replaced after approximately 25 years of operation. Pumps and communitors have been installed at different times, so the replacement dates of these items will be spread out. The high number of components and the high cost of repairs justify a capital expenditure that can be allocated to repair and replacement of these pumps and communitors.

Public Works & Engineering estimates that the total replacement value of the pumps is approximately $1.6 million, and proposes to spend about $100,000 per year for pump replacements and monitoring to continue the orderly replacement of pumps that are in poor condition.

Operating Cost Impact
Generally, newer pumps are more efficient, requiring less energy to run. O&M funding should decrease as a result. Utility costs will be reduced and call-outs to check on failed pumps will also be reduced.

Project's Impact on Other Departments
N/A

Project's Return on Investment
N/A

Council Goals/Objectives/Actions
Goal #2: Stewards of our natural and built environment

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	300,000		100,000	100,000	100,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	300,000		100,000	100,000	100,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Water & Sewer User Fees	200,000		100,000	100,000	
Gas Tax Rebate	100,000				100,000
Total:	300,000		100,000	100,000	100,000

Department Public Works & Engineering
Division Water & Sewer
Project Monitoring & Controls Maintenance and Upgrading

Project Description
In a three-phase program from 1997 through 2000, the City began automating all of its pumphouses and liftstations. In addition, the City installed a dedicated communication line to interconnect its most crucial facilities in order to avoid the characteristic interruptions of a telephone line. Many parts are now obsolete and, with the advancement of computer technology, some replacement parts are no longer available and upgrades are required.

The City's new water treatment plant project will be the hub for the City's Supervisory Control and Data Acquisition (SCADA) system. The upgrading that has been continuous since 2007 will ensure up-to-date equipment and an easy transition when the new water treatment plant comes online.

Justification
The automation of these stations used for the delivery of essential services reduced operator time and increased the system reliability. The City implemented the Supervisory Control and Data Acquisition (SCADA) computer system as the network controller of the system. The main computer for the SCADA system is located in Pumphouse #1. As a result of the automation, this is the only station that is staffed 24 hours a day. All alarms and system feedback are received on the SCADA computer in Pumphouse #1. This is the centre for emergency dispatch, and automation is needed to relieve operators of the hands-on requirement. Emergency dispatch is now their primary function.

Operating Cost Impact
The upgrades to the monitoring and controls system will effectively increase the efficiency of the system and reduce operational maintenance by reducing the number of call-outs. With the proper repair of the SCADA system, Water & Sewer trades workers will be able to reduce building inspections and spend more time repairing worn components. Implementation of new water quality monitors will relieve the need for weekend rounds and increase water quality compliance ability and public expectations.

Project's Impact on Other Departments
N/A

Project's Return on Investment
N/A

Council Goals/Objectives/Actions
Goal #1: Building a sustainable future
Goal #2: Stewards of our natural and built environment

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	225,000		75,000	75,000	75,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	225,000		75,000	75,000	75,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Water & Sewer User Fees	150,000		75,000	75,000	
Gas Tax Rebate	75,000				75,000
Total:	225,000		75,000	75,000	75,000

Department Public Works & Engineering
Division Water & Sewer
Project Water Meter Replacement and Upgrades

Project Description
The City introduced a water meter replacement program in 1995, which started with the replacement or recalibration of the larger commercial units in the city. The remaining old meters were installed in the 1970s and they are now 20 to 30 years old. This replacement plan is intended to bring the City up to par with other major municipalities across Canada.

Justification
The aging of the meters has caused operational and maintenance inefficiencies, as well as inaccurate readings, which account for an estimated 12% to 25% of lost revenue to the City. The Corporate Services Department has identified a number of accounts with increased revenue after new meters were installed. In addition, unlike the newer meters installed today, old meters are not compatible with the latest computerized meter-reading and data-processing technology.

Operating Cost Impact
Upgrading the City's water meters to computerized water meters and meter-reading devices will reduce labour requirements for meter-reading and data entry into the City's computer system. Also, the new meters have the capability to be upgraded to remote meter-reading. Should this be implemented, there will be a reduction in the amount of staff time spent on meter-reading and data processing.

Project's Impact on Other Departments
N/A

Project's Return on Investment
N/A

Council Goals/Objectives/Actions
Goal #2: Stewards of our natural and built environment
Objective #2(c): Develop smart and sustainable approaches to energy, water and sewer, waste management and building systems

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	65,000		15,000	25,000	25,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	65,000		15,000	25,000	25,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Water & Sewer User Fees	40,000		15,000	25,000	
Gas Tax Rebate	25,000				25,000
Total:	65,000		15,000	25,000	25,000

Department: Public Works & Engineering
Division: Water & Sewer
Project: Pumphouse and Liftstation Genset Installation

Project Description
The age of our infrastructure is such that the City of Yellowknife will have to rebuild a pumphouse or liftstation genset regularly to avoid catastrophic failure. Genset's (backup generators), provide backup power in case of power failure. Backup power at pumphouses is required in order to ensure a continuous supply of water to the city.

In the original design for liftstations, backup power was not required because wells could receive sewage for hours and not overflow. With the growth of the city in recent years, however, any power outage lasting longer than 15 minutes at a high-flow time of day creates the risk of a liftstation overflow. An overflow would result in sewage flowing into the nearest lake, causing an environmental hazard.

The next facilities scheduled to be equipped with or to replace their gensets are:

2015 Liftstation #8
2016 Pumphouse #4
2017 Pumphouse #3

Justification
In order to maintain water and sewer services to the community during power outages, the City is installing backup generators at each of our pumphouses and liftstations. This has been underway since 2009.

Operating Cost Impact
There will be fewer sewage spills due to power outages, and greater public confidence in the water and sewer system. The project would reduce the staff time and costs associated with cleanup should there be an overflow at one of the sewage liftstations. These costs can be substantial, depending on the nature of the spill.

Project's Impact on Other Departments
N/A

Project's Return on Investment
N/A

Council Goals/Objectives/Actions
Goal #2: Stewards of our natural and built environment

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	625,000		175,000	250,000	200,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	625,000		175,000	250,000	200,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Water & Sewer User Fees	425,000		175,000	250,000	
Gas Tax Rebate	200,000				200,000
Total:	625,000		175,000	250,000	200,000

Department	**Public Works & Engineering**
Division	**Water and Sewer**
Project	**Water and Sewer Infrastructure Replacement - Accelerated Corrugated Metal Pipe (CMP) Replacement Program**

Project Description

The water and sewer capital projects are part of ongoing replacement of the deteriorated water and sewer mains, and upgrading of residential water and sewer services.

Background - The Development of the City's Water & Sewer Infrastructure

The majority of Yellowknife is on piped water and sewer service with the exception of Old Town, Latham Island, Kam Lake Industrial Park, commercial buildings at the Airport, and some commercial buildings along Old Airport Road.

In the late 1940s, the City began providing piped water and sewer services in the present downtown area. Pumphouse #1 was constructed during this time to draw water from Great Slave Lake and distribute it to the downtown residents of Yellowknife.

Expansion of the city through the 1950s and 1960s was predominantly in the downtown area, later referred to as the Central Business District (CBD). By the late 1960s, the expansion had reached the area of 50A Avenue and 57 Street.

The city continued to obtain its water directly from Great Slave Lake until runoff and windblown arsenic resulted in high arsenic levels in the water and lake bottom sediments. In 1969, a new water intake line was constructed from the mouth of the Yellowknife River to Pumphouse #1. The submarine line is still in use and is a good example of Yellowknife's aging infrastructure requiring major work in the future. The estimated cost of replacing the water intake line is about $15 million.

There was considerable expansion during the 1970s. The early 1970s saw the development of Matonabee/Gitzel streets and construction along Forrest Drive. Pumphouse #3 was constructed in 1970 to serve the new areas of the city. In 1976, development began in Frame Lake South in the area of Bromley Drive and Williams Avenue. To supply water to this area, Pumphouse #4 was constructed in 1978 to serve Frame Lake South and Range Lake North areas. Pumphouse #4 has the capacity to service 10,000 people, and currently serves about two-thirds of that capacity.

In the 1980s, expansion of the City was generally in Frame Lake South. In the 1990s, expansion of the city was generally in Range Lake North. Pumphouse #5, the recirculation pumphouse, was built in 1989 and serves as a recirculation station which simply keeps the water moving in the Range Lake area to avoid freezing.

Water and Sewer Replacement Program

Water and sewer mains and services in the downtown core of the city were installed in the 1940s and 1950s. By 1977, the sewer mains had degraded to the point of failing entire sections of the city's piped system. This jeopardized the provision of reliable and safe water and sewer services for a significant part of the city.

Corrugated metal pipe (CMP) sanitary sewers were first installed in Yellowknife in the 1940s and continued to be used until 1977. After 1977, ductile iron pipe became widely available as a viable and cost-effective alternative. CMP was considered feasible at the time due to its ability to withstand deformations resulting from permafrost deformation or freeze/thaw ground movements, its low economic cost, and its ability to withstand the necessary freighting from Edmonton to Yellowknife. However, infrastructure replacement programs have revealed that CMP used in the 1940s is badly corroded and, in some cases, no longer intact in the bottom half of the pipe. Sewers without bottoms will sometimes collapse, resulting in the blocking of the pipe, and causing sewage to back up into the homes of residents. In some cases sewage is travelling into the surrounding environment which results in high groundwater infiltration and gravel/soil accumulation in sewers which in turn taxes the City's remaining infrastructure.

Cast iron water mains were installed at the same time as the CMP sanitary sewers from the 1940s to the early 1970s. These cast iron water mains are uninsulated and, as a result, substantial thaw settlement of areas with permafrost has occurred. This results in pulling apart at the joints and sudden failure of the mains in some locations. The uninsulated mains necessitated substantial heating of the water to prevent freezing of the water mains. Finally, the water mains originally

installed were not large enough, in many cases, to provide current levels of fire protection.

The useful life of the CMP sewers, installed during the 1940s through the 1970s, has been found to be about 25 - 30 years. In 1984, a program was initiated by the City to replace all of its deteriorated water and sewer piping in the downtown core, referred to as the Central Business District (CBD). As this was far beyond the City's financial capabilities, the GNWT funded a significant portion of the replacement costs annually. Since 1984, the City, along with GNWT cost sharing, has spent nearly $23 million. An estimated $7 million is required to complete the CBD area's piping infrastructure. A substantial amount of CMP sewer and cast iron water mains lies outside of the CBD and also needs to be replaced.

With the ongoing replacement programs continuing today, the City changed the standard to more modern materials such that the water mains are now insulated ductile iron pipe and the sewer mains are ductile iron. With the newer materials and standard installation construction practices, the life expectancy of water and sewer pipes can be as much as 50 years. While 50 years is expected, the actual life of a particular pipe will vary depending on the area of the city where the water and sewer infrastructure is located. In Yellowknife, we have three different areas of rock, granular native material, and frost-susceptible soils. A note of caution in assuming life expectancy: some areas of Yellowknife have inferior ground conditions (frost-susceptible soils) that will result in lower life expectancies.

Typically, the driving force for the replacement of the water and sewer mains has been the perforated corrugated metal pipe sewer lines which have collapsed. The replacement program consisted of not only replacing the sewer pipes but, while the trenches are open, upgrading the water mains and services to current standards and levels of installation.

Included in the annual Water & Sewer Upgrading Programs are the following:

- Replacement of existing corrugated metal pipe sewer mains with ductile iron pipe
- Replacement of concrete sewer manholes
- Replacement of existing cast iron water mains with appropriately sized insulated ductile iron pipe
- Replacement of in-line hydrants and valves with hydrants and valves located in insulated, poured-in-place concrete vaults with manhole access
- Road stabilization and reconstruction with crushed rock backfill
- Completion of the project with concrete sidewalks and a paved roadway

As part of its water/sewer infrastructure replacement program, the City also replaces single-line water services (both the heat trace type and Aquaflow). We suspect that a significant number of these are inoperative leading to freeze-ups during the winter. Generally, when single-line services fail, a bleeder is installed to avoid freezing. Bleeders work by continually running water so it does not freeze. The water coming out of the bleeders is wasted, and is a burden to the City's infrastructure. The bleeders and single-line water services will be replaced with a dual-line insulated copper re-circulating system. Sewer services will be repaired/ replaced based on their condition, assessed by camera inspection or field determination.

In 2012, City Council approved a plan that would accelerate the replacement of all CMP remaining in the city. The acceleration of this program means increased funding to replace the CMP as quickly as possible to avoid costly emergency repairs in cold winter months and concerns for public safety, that plan remains in place today.

2015 Water and Sewer Projects

Horton Crescent
Frost-susceptible ground conditions have caused the sanitary sewer mains to heave which has resulted in severe sewer back-ups due to the residential services becoming disconnected from the sewer mains. The sewer main has sagged and holds large amounts of standing sewage which, in turn, creates problems during the winter months when the sewage freezes.

Forrest Drive (between 51A Avenue and Burwash Drive)
This section of CMP was not scheduled to be replaced until near the end of the CMP program. It was thought to be in relatively good shape compared to the remaining sections. However, in the summer of 2012, there was a major failure of this pipe and the City had to perform an emergency repair to keep the infrastructure intact. In 2014, an additional

repair was necessary. It became evident that this pipe has deteriorated rapidly and needs replacement.

2016 Water and Sewer Replacement Projects

Con Road (Rycon Drive to 54th Street)
This is an older section of CMP that is scheduled to be replaced. The Rycon Drive loop was replaced in 2004. The remaining CMP in this section of Con Road should be replaced simultaneously with the planned redevelopment of the Shaganappi/Ptarmigan area in order to provide local residents with a great finished product.

Williams Avenue
This is one of the last streets to have the sewer mains upgraded from CMP to ductile iron. The remaining section runs from Range Lake Road to approximately 70 metres past Bigelow Crescent and services a number of multi-family units.

Horton Crescent Paving (from 2015 W&S replacement)
This street was excavated in preparation for the 2015 CMP replacement program. It is scheduled to be resurfaced with asphalt and concrete in 2016.

Forrest Drive Paving (from 2015 CMP replacement)
This street was excavated in preparation for the 2015 CMP replacement program. It is scheduled to be resurfaced with asphalt and concrete in 2016.

2017 Water and Sewer Replacement Projects

54th Avenue
Due to unstable ground conditions in this area, there has been major movement of the road surface. With this movement, the underground infrastructure in this area has shifted and will require regrading or replacement.

Range Lake Court
The infrastructure in Range Lake Court was installed in 1978 and is nearing the end of its useful life. There have been repairs to several of the services in the court. Paving will immediately follow the water and sewer work.

Con Road Paving (from 2016 CMP replacement)
This street was excavated in preparation for the 2016 CMP replacement program. It is scheduled to be resurfaced with asphalt and concrete in 2017.

Williams Avenue Paving (from 2016 CMP replacement)
This street was excavated in preparation for the 2016 CMP replacement program. It is scheduled to be resurfaced with asphalt and concrete in 2017.

Street	Replacement	CMP Estimate	Paving Estimate	Total Estimate
Forrest Drive	2015/2016	$750,000	$490,000	$1,240,000
Horton Crescent	2015/2016	$2,045,000	$500,000	$2,545,000
Con Road	2016/2017	$1,860,000	$730,000	$2,590,000
Williams Avenue	2016/2017	$1,725,000	$775,000	$2,500,000
54th Avenue	2017/2018	$860,000	$400,000	$1,260,000
Range Lake Court	2017	$430,000	$185,000	$615,000
TOTAL		**$7,670,000**	**$3,080,000**	**$10,750,000**

These priorities are subject to change from year to year depending on failures and deteriorating pipe conditions. Therefore, the section which has the highest probability of failure based on inspections will be placed higher in the priority queue. This is reviewed and evaluated on an annual basis.

Justification
N/A

Operating Cost Impact
Upgrading of aging, shifting and problematic infrastructure reduces the amount of time spent repairing mains and services and allows for maintenance activities to occur with fewer difficulties. These upgrades also eliminate bleeders, reducing the amount of water wastage in the city.

Project's Impact on Other Departments
N/A

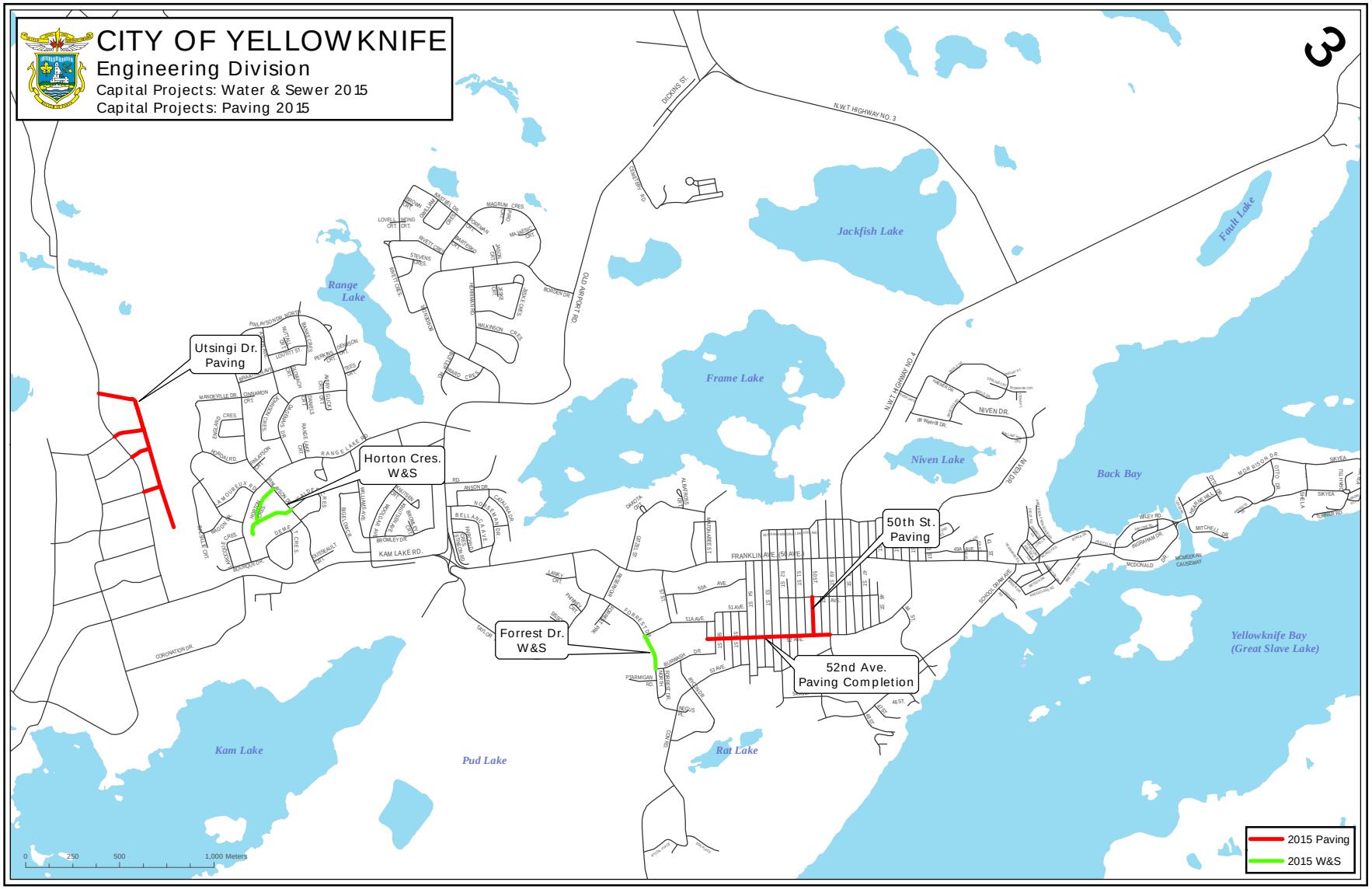
Project's Return on Investment
N/A

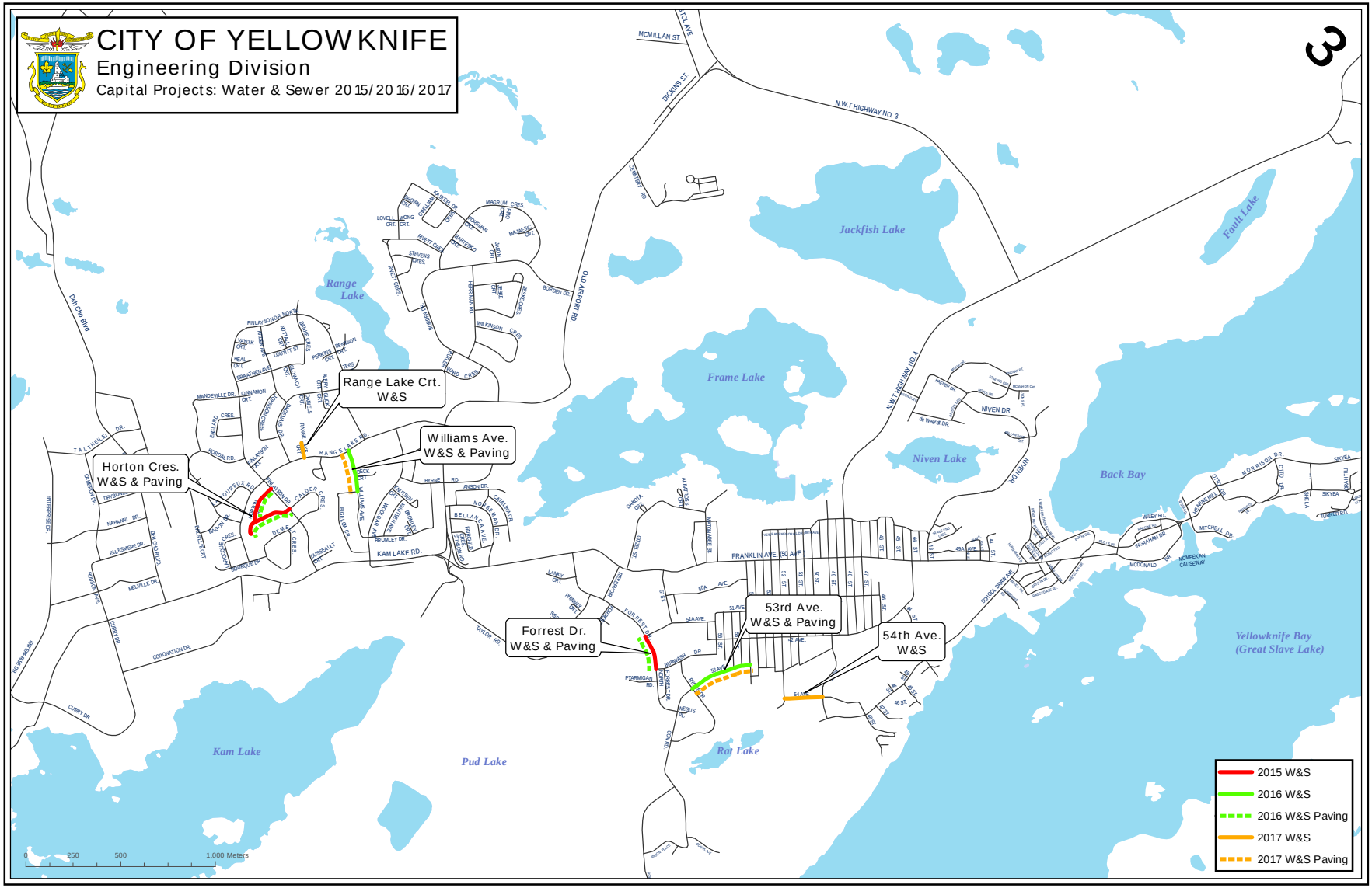
Council Goals/Objectives/Actions
Objective #1(b): Continue to have a sustainable and practical approach to infrastructure deficit reduction

Objective #2(c): Develop smart and sustainable approaches to energy, water and sewer, waste management and building systems

Expenditures	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Capital Cost	10,350,000		2,795,000	4,575,000	2,980,000
Design					
Development					
Construction Engineering					
Construction					
Equipment					
Materials					
Total:	10,350,000		2,795,000	4,575,000	2,980,000

Funding Sources	Total Estimated Cost $	Prior Year Funding $	2015 $	2016 $	2017 $
Gas Tax rebate	9,674,000		2,175,000	4,519,000	2,980,000
Water & Sewer User Fees	676,000		620,000	56,000	
Total:	10,350,000		2,795,000	4,575,000	2,980,000


CITY OF YELLOWKNIFE
Engineering Division
Capital Projects: Water & Sewer 2015
Capital Projects: Paving 2015
3
Utsingi Dr. Paving
Horton Cres. W&S
Forrest Dr. W&S
50th St. Paving
52nd Ave. Paving Completion
Jackfish Lake
Range Lake
Frame Lake
Niven Lake
Back Bay
Fault Lake
Yellowknife Bay (Great Slave Lake)
Kam Lake
Pud Lake
Rat Lake
N.W.T HIGHWAY NO. 3
OLD AIRPORT RD
FRANKLIN AVE. (50 AVE.)
KAM LAKE RD.
RANGE LAKE RD.
CORONATION DR.
NIVEN DR.
0 250 500 1,000 Meters
2015 Paving
2015 W&S


CITY OF YELLOWKNIFE
Engineering Division
Capital Projects: Water & Sewer 2015/2016/2017
3
Range Lake Crt. W&S
Williams Ave. W&S & Paving
Horton Cres. W&S & Paving
Forrest Dr. W&S & Paving
53rd Ave. W&S & Paving
54th Ave. W&S
Jackfish Lake
Frame Lake
Niven Lake
Back Bay
Fault Lake
Range Lake
Kam Lake
Pud Lake
Rat Lake
Yellowknife Bay (Great Slave Lake)
N.W.T HIGHWAY NO. 3
N.W.T HIGHWAY NO. 4
OLD AIRPORT RD
KAM LAKE RD.
FRANKLIN AVE.
0 250 500 1,000 Meters
2015 W&S
2016 W&S
2016 W&S Paving
2017 W&S
2017 W&S Paving