

CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
General Government							
Administration							
Salary Review	50	38	-	-	-	-	-
Destination Marketing	50	6	-	44	350	350	-
CCBF-911 Emergency Services	-	19	-	35	-	-	-
	100	63	-	79	350	350	-

CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Information Technology							
Network Renewal & Expansion	25	19	25	31	44	52	63
GIS Maintenance & Enhancements	40	21	44	63	20	46	49
Server and Storage Renewal and Expansion	40	17	45	68	49	53	59
Phone System	-	-	-	-	-	40	40
Satellite Imagery /LIDAR	60	48	-	12	-	66	-
Communication Infrastructure & Renewal	5	265	10	71	16	20	25
Security Cameras	-	-	25	25	20	21	22
Secondary Site & Data Replication	20	28	20	20	12	12	13
Library Public Access	-	-	20	20	-	-	-
MED In-Car Computer	10	11	-	-	-	34	-
MED In-Car Cameras	-	-	30	30	-	-	56
MED Web Applications	-	-	-	-	-	25	-
Website/ Online Service	11	16	20	20	-	29	30
Website Redesign/ Refresh	-	5	-	-	-	50	-
Server Room Upgrades	25	17	20	20	-	-	100
Core Switch Upgrades	60	54	-	7	-	-	-
Inventory Bar Coding	-	-	-	15	-	-	-

(cont'd ...)



CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Information Technology (cont'd)							
Virtualization	100	87	100	121	26	28	29
One-Stop Shopping	-	9	-	-	-	-	-
Document Management System	-	-	-	-	-	-	25
Door Access Controls	10	10	20	20	11	12	12
Wireless Controllers	-	-	55	55	-	-	61
Multi-function Devices and Printers	50	99	50	50	51	53	56
Social Media	-	5	-	-	-	-	-
Automated Ticket Writer	-	23	-	-	-	-	-
Disk Expansion	-	-	-	-	-	34	-
Plotter	-	-	-	-	-	15	-
Computer Aided Dispatch	20	33	-	15	-	-	-
Automatic Vehicle Location	-	6	-	4	-	-	-
Emergency Operations Centre Equipment	20	10	-	-	-	-	11
Webcasting	-	-	-	-	-	-	75
Mapping, Data Collection & Verification	-	-	-	-	18	-	19
Stanton Equipment Relocation	-	-	-	-	50	100	-
Budget Management	-	-	-	-	134	-	-
Class/Active Net Replacement	-	-	-	-	147	-	-
	496	780	484	653	598	690	745

CAPITAL FUND - 2017 Capital Projects

		2017 Budget Recommended (\$000s)	Formula Funding (\$000s)	Grants (\$000s)	IT Reserve (\$000s)
General Government	Page				
Administration					
Destination Marketing	131	350	70	280	
		350	70	280	-
Information Technology					
Network Renewal and Expansion	136	44			44
GIS Maintenance & Enhancements	140	20			20
Server and Storage Renewal and Expansion	143	49			49
Communication Infrastructure Renewal	145	16			16
Security Cameras	147	20			20
Secondary Site & Data Replication	149	12			12
Virtualization	151	26			26
Door Access Controls	153	11			11
Multi-function Devices and Printers	155	51			51
Mapping, Data Collection & Verification	157	18			18
Stanton Equipment Relocation	159	50			50
Budget Management	161	134			134
Class/Active Net Replacement	162	147			147
Subtotal		598	-	-	598



CAPITAL FUND - 2017 Capital Projects

Department/Division Communications and Economic Development
 Project Destination Marketing with Term Position

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	350,000	350,00		700,000
O&M Expenses				
Total:				
Formula Funding	70,000	70,000		140,000
Grants	280,000	280,000		560,000

Purpose

The \$350,000 in 2017 and 2018 is targeted towards the implementation of the Destination Marketing Plan (approved for information by Council Motion #0095-16). This project incorporates staffing a two-year full-term position (or a contractor) along with resources to satisfy the Plan’s implementation priorities until a DMO is established (targeted for late 2018 or 2019). The long term intent of this project is to incubate a DMO within the bureaucracy, then to establish the legislative framework to initiate a hotel levy which would support the DMO without municipal resources in the future.

Due to the timing of the budget, the hiring of staff (or contractor), and the required legislative amendments by the City and the GNWT, this project timeline is indicated over two calendar years.

This project meets the funding criteria through the **Canadian Northern Economic Development Agency’s (CanNor)** Strategic Investments In Northern Economic Development (SINED) Program. A formal application has been submitted for the project which may contribute up to 80% of the total cost (\$560,000). The City of Yellowknife will be expected to contribute at least 20% of the total cost of the project, identified above.

See tables on following pages outlining all costs.

Background

The City of Yellowknife can have a direct impact on the success of tourism. Visitors contributed close to \$98M to Yellowknife’s economy in 2014 and the number of visitors has been trending upward over the last 5 years with an average growth of 5% both in visitor numbers and revenues generated. The average visitor spends \$1,550 during their stay in Yellowknife, with most of this spent on hotels, restaurants and other businesses.

A 10% increase in the number of visitors annually will increase revenues by \$10M which will create thriving local businesses, increase employment opportunities and overall standard of life in Yellowknife and ultimately produce additional tax revenue. To achieve such growth requires an investment by the City of Yellowknife to incubate a Destination Marketing Organization (DMO), enhance the visitor experience and pursue tourism marketing initiatives in partnership with other tourism stakeholders.

This submission identifies the initial seed capital investment of approximately \$350,000 in fiscal year 2017 to establish a DMO and fund the initial marketing activities until a visitor levy can be established. A visitor levy, targeted to be in place by 2018 will provide sustainable funding for the DMO budget without the need for further City investment.

Triple Bottom Line

Social

N/A

Economic

Visitors to the NWT and to Yellowknife in particular, are rising along with visitor spending:

- Overall visitors to the Northern Frontier Visitor Centre– both at the downtown and airport locations – have increased year-over-year since 2012¹. In 2015, more than 40,000 people went through the Northern Frontier Visitor Centre.
- The total number of visitors to Yellowknife has grown by approximately 48% (from 46,587 to 69,094 from 2009/10 to 2013/14²) while spending has increased by 43% from \$61.2 million to \$87.7 million over the same period.
- Per capita visitor spending, which had been relatively stable from 2010 to 2013, saw a marked increase (almost 30%), from \$1,201 in 2013 to \$1,550 in 2015³.
- \$47.2 million was spent in Yellowknife on business travel in 2015. Tourism is a \$140 million/year industry in the NWT. Much of this benefits Yellowknife, as most visitors must come through Yellowknife on their way anywhere in the NWT⁴.

Environmental

N/A

Operational Impact

The incubation of a DMO within City bureaucracy places the City of Yellowknife in a better position to drive the local economy. The current programs operating via the O&M budget will be expanded and used as leverage in 2017 marketing campaigns to promote visitation to Yellowknife.

¹ Northern Frontier Visitors Association

² Department of ITI North Slave Tourism.

³ Ibid.

⁴ Department of ITI - Research and Planning



CAPITAL FUND - 2017 Capital Projects

YEAR ONE				
Activity/task	Basis of cost	Completion Date	Budget	Result
Staffing a two-year full-time term position or contractor.	Full time position plus statutory deductions and benefits. Purpose: Continue discussions and negotiations with respect to establishing a visitor levy. Continue discussions and negotiations with respect to establishing a DMO	End of 2017	\$150,000	Hiring/contracting services for the purpose of creating, implementing and ensuring success of the project.
Collect baseline data by surveying Yellowknife residents.	External contract	End of 2017	\$30,000	Baseline data for the purpose of analysing success of the project and leveraging partners.
Stakeholders' forum (ongoing).	Hospitality cost for meetings	End of 2017	\$2,000	In order to keep all stakeholders properly informed, regular communication on project will occur at the forums.
Establish a memorandum of understanding (MOU) or partnership with NWT Tourism's Conference Bureau.	Budget for participating in MPI (or similar) conference, Conference Bureau familiarization tours (FAM)	End of 2017	\$50,000	Currently, NWTT is the centralized conference bureau for the NWT, an MOU will detail the role of the City in the marketing for conferences in the capital city.
Create high impact signage/coordinate with website presence and on line strategy.	Production/printing/installation costs	End of 2017	\$50,000	Production of a plan and the installation of signs along with coordinated website.
Investigate development of Yellowknife visitors' resources.	Production/printing/distribution	End of 2017	\$18,000	Products such as a revamped Visitors Guide, maps, tours and partnerships that tourists can access.
Partnership activities.	Pursuing opportunities arising from partnership forum discussions	End of 2017	\$50,000	Partnership activities result in ad campaigns such as a Globe & Mail Travel ads, tour packages, contests with travel prizes and other advertising campaigns.
Total			\$350,000	

CAPITAL FUND - 2017 Capital Projects

YEAR TWO				
Activity/task	Basis of cost	Completion Date	Budget	Result
Staffing a two-year full-time term position or contractor.	Full time position plus statutory deductions and benefits	End of 2018	\$150,000	Hiring/contracting services for the purpose of creating, implementing and ensuring success of the project.
Stakeholders' forum.	Administration costs for forum	End of 2018	\$2,000	In order to keep all stakeholders properly informed, regular communication on the project will occur at the forums.
Partnership activities (continued from year 1).	Budget for pursuit of joint initiatives	End of 2018	\$15,000	Partnership activities result in ad campaigns such a Globe & Mail Travel ads, tour packages, contests with travel prizes and other advertising campaigns.
Continue to partner with Conference Bureau (continued from year 1).	Budget for participating in MPI (or similar) conference, Conference Bureau familiarization tours	End of 2018	\$35,000	Currently, NWTT is the centralized conference bureau for the NWT, a MOU will detail the role of the City in marketing for conferences in the capital city.
Implementation of online strategy (continued from year 1).	Social media and website services costs (may be contracted)	End of 2018	\$18,000	Production of a plan and the installation of signs along with coordinated website.
Create and launch a "host" campaign.	Agency costs	End of 2018	\$50,000	Provide Yellowknifers with a "self-guided tour" or a "host package". Social media campaigns including targeted crowd-sourced social media videos as a means for Yellowknifers and visiting friends and relatives to share information, photos and videos to encourage increased travel to Yellowknife.

*Year two budget anticipates that funds from the visitor levy will begin to flow after 2018, and will provide approximately \$1 million in support of destination marketing activities. In 2019 and years following, the DMO will have access up to up to \$3M from the visitor levy which will be used to fund year the future operational needs and marketing of the organization. It is anticipated that in 2019 and beyond, the DMO will be an independent organization and not within the City of Yellowknife bureaucracy.

(cont'd...)



CAPITAL FUND - 2017 Capital Projects

Participate in NWT Tourism FAM tours.	FAM hosting budget	End of 2018	\$10,000	Participate with NWT Tourism to host Yellowknife-based familiarization tours with travel media and industry representatives. Tours include cost of meal, tours, transportation and other hosting costs within Yellowknife.
Prepare to commission DMO (including planning for visitor hub or “tourism marketplace”).	This activity will include planning for visitor hub or “tourism marketplace”	End of 2018	\$15,000	Develop job description, operational requirements for office space, legal/corporate registration, lease arrangements. Office renovation, rent and furniture. Operations costs.
Broker packages between operators and develop marketable tours/packages.	Contracted design, printing	End of 2018	\$30,000	This task can include self-guided tours that visitors can download from a website or pick up at the downtown visitor hub. The tours will encourage visitors to discover Yellowknife on their own and provide them with daytime activities to engage in while waiting for aurora viewing. The City can work with designated “tour stops” to provide incentives at each stop. These self-guided tours can be tailored to the season and the target market. These tours can benefit from the wayfinding signage plan.
Conduct annual tourism Yellowknife resident survey and measure and communicate tourism ROI (continued from year 1).	External contract	End of 2018	\$25,000	Baseline data for the purpose of analysing success of the project and leveraging partners.
Total			\$350,000	

CAPITAL FUND - 2017 Capital Projects

Department/Division Corporate Services / Information Technology
Project Network Renewal and Expansion

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	43,500	52,200	62,640	158,340
O&M Expenses				
Total:				
IT Reserve	43,500	52,200	62,640	158,340
Formula Funding				
Grants				

Purpose

To continue the City's planned and incremental investment in its network so that it can continue to meet the increasing demands placed on it as functions throughout the organization turn to technology to streamline workloads and improve services.

Background

The City's Information Technology infrastructure is essential for effective service delivery and the network that provides connectivity among its computers, laptops, servers, printers, cameras, mobile devices, telephones, and emergency voice radios, which is vital to the City's operations.

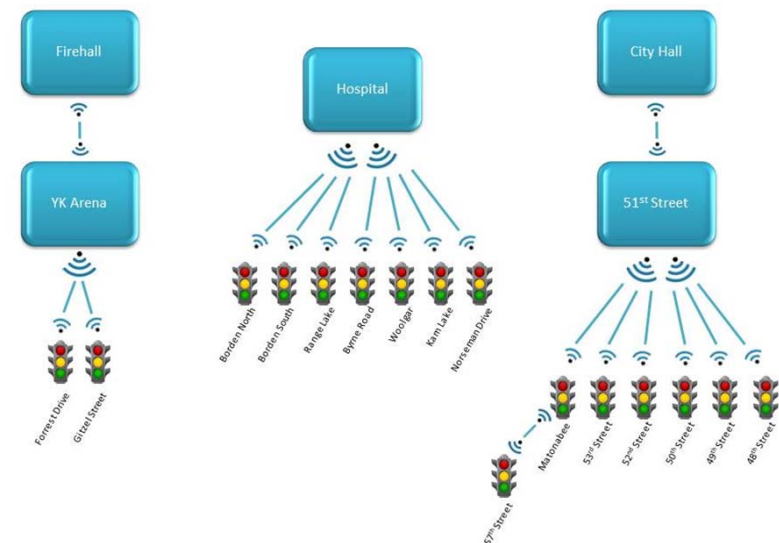
The City's network employs Ethernet, leased and city-owned fiber, wireless, and microwave technologies to create connections among thirteen sites.

Within each site the network connects numerous devices, ensuring that staff, citizens, and stakeholders have consistent and reliable access to applications, data, printers, and the internet.

In 2016, the network expanded to provide connectivity to every traffic light in order to streamline traffic control management within the Public

Works department; this initiative alone added 63 network devices to the City's infrastructure.

Traffic Light Network



In addition to connectivity, the network also plays a key role in protecting the City's information technology infrastructure and the corporate data assets stored within it. The network's firewalls and other protective mechanisms routinely deny more than 100 unauthorized access attempts per minute while its spam filter rejects an average of 80% (over 150,000 per month) of the emails directed at the organization.

As employees and stakeholders increasingly turn to technology to maintain and expand service levels, demands and reliance on the network continue to grow. In recent years, the City established traffic light connectivity; implemented Computer-Aided Dispatch; adopted enterprise solutions such as CityWorks, CityView, and CityExplorer; installed industry-standard communications infrastructure; introduced traffic cameras; expanded online service offerings; deployed mobile solutions; provided public internet access; increased its reliance on security cameras; and enhanced its Customer Service function. All of these data-intense applications create increasingly heavy demands on the network, both in terms of capacity and reliability. As well, the increased reliance on specialty applications such as SCADA and computer-based consoles has introduced unique network security and dependability challenges. It is therefore critical that network capacity and reliability keep expanding at a comparable pace through regular, ongoing enhancements.

Over the term of this budget, the focus will be on security enhancements because threats – both internal and external – continue to grow and evolve, making it evermore challenging to adequately protect the City's infrastructure. Attention will also be given to using appropriate technologies to grow the network to meet increasing demands for services, and to addressing the feasibility of repatriating some network connectivity solutions to reduce the City's reliance on third party services and thus reduce overall operating costs.

This project helps to ensure that the necessary network infrastructure is in place to provide the tools and services required by employees throughout the organization, and to deliver services to citizens and stakeholders. It does so by contributing to the following Information Technology Division goals:

- Provide focused, reliable, and sustainable information technology infrastructure that is responsive to current City requirements and proac-

tive in anticipation of future requirements;

- Provide secure, high-availability network services; and
- Support the efficient and effective operation of all information systems.

It also addresses these Information Technology Division objectives:

- Supply ongoing leadership to support and sustain the City's information technology infrastructure;
- Provide City employees with the appropriate hardware and software tools to enable them to do their jobs efficiently and effectively;
- Acquire and deploy new and replacement components in a timely and cost effective manner;
- Adopt increasingly stringent industry-standard security and data protection practices and procedures; and
- Grow mobile workforce opportunities to improve employee productivity and provide more effective service delivery.

Triple Bottom Line

Social

N/A

Economic

The incremental approach reflected in this budget allocation has proven highly effective in minimizing service disruptions, exploiting technological improvements, and maximizing the City's return on its investments. The overall costs of regular, planned improvements are substantially lower than expenditures generated by system failures, outages, and urgent replacements.

Environmental

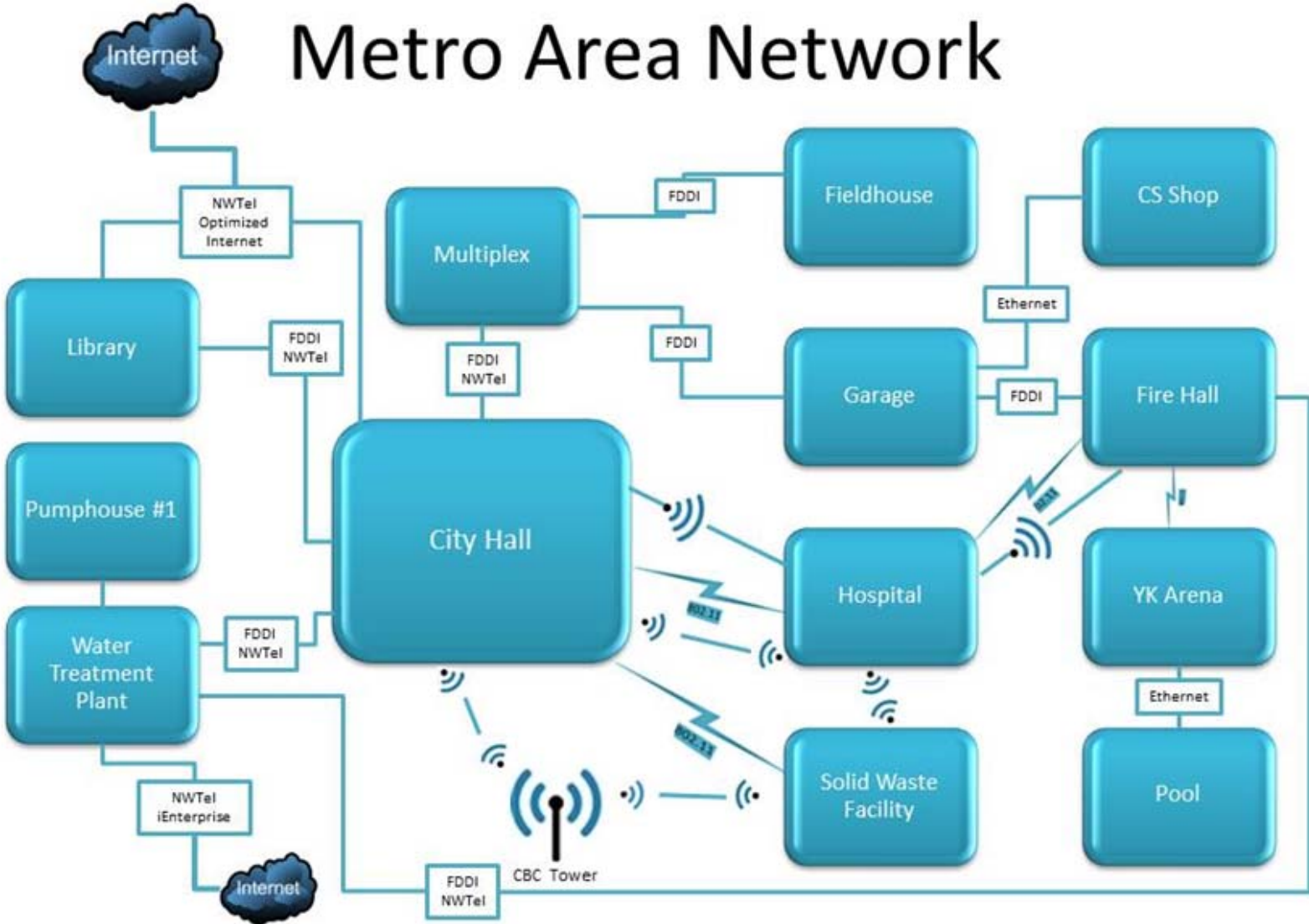
N/A

Operational Impact

The City's network is vital to its operations and even short service interruptions have significant impacts on service delivery and employee productivity. It will be more cost effective – and present a lower risk to the City – to replace and enhance this equipment in a planned and orderly fashion than to experience problems that require excessive troubleshooting and repair, or failures that create service outages.

If this project does not proceed, it will negatively impact the organization's ability to sustain its network. In the short term, network congestion will reduce service delivery to staff, citizens, and stakeholders, and there will be no opportunity to expand services to meet new requirements. Over time, there will be increasingly frequent service disruptions when equipment fails. These failures will interrupt many aspects of City operations, including most internal staff activities as well as external citizen and stakeholders services.





CAPITAL FUND - 2017 Capital Projects

Department/Division Corporate Services / Information Technology
Project GIS Maintenance and Enhancements

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	20,000	46,310	48,630	139,040
O&M Expenses				
Total:				
IT Reserve	20,000	46,310	48,630	139,040
Formula Funding				
Grants				

Purpose

To achieve planned and incremental investments in the City's Geographic Information Systems to bring data up-to-date and, when resources allow, provide targeted services to meet staff, citizen, and stakeholder requirements .

Background

CityExplorer – the City's geographic information system (GIS) – is a powerful and popular tool for both staff and citizens. Based on the principal that most information has a spatial component, it provides single-window access to diverse data from across the organization, and should be a dynamic and evolving entity. This project reflects the necessity of the regular, predictable expenditures that are essential to the upkeep and growth of CityExplorer.

To sustain the value of this system the data must be current, accurate and relevant; this requires ongoing investments of both time and money. As well, the more staff and citizens utilize the system, the more potential they identify and so dedicated people and financial resources are needed if the City is to develop and implement the enhancements to meet this potential.

As with many other infrastructure components, the Information Technology Division developed a strategy of sustained investment in this system, its data and its capabilities. This investment and growth are dictated and

directed by the needs and requirements of staff, citizens, and stakeholders.

In 2017, funding will be devoted to maintaining the existing infrastructure and services. No new features or enhancements will be undertaken.

In 2018 and 2019, specific enhancements will be driven by current and foreseeable requirements, and will depend on available funding. Major initiatives could include migrating the City's GIS infrastructure to the Canadian Municipal Data Model, enhancing the City's data library with the creation of new datasets, expanding internal GIS utilization within the organization, and introducing new functionality to CityExplorer to allow for the distribution of public data.

Enhancement plans also include:

- Continuing to fine-tune security and permission settings on the City's spatial database so that internal clients can take greater ownership of the data they originate and assume responsibility for routine and regular updates. As demonstrated when Planning and Development undertook responsibility for lease data in 2016, this improves the quality of the data as it is maintained by those who are the most knowledgeable about it.
- Expanding data collection capabilities to further streamline data capture and processing. ESRI's Collector software enables data collection



by GPS units, tablets, and smartphones so any employee can easily gather data in electronic form for real-time updates, rather than manually recording information and then entering it into one or more systems. This initiative will build on the success of 2015's CLEM (Cart Location Editing Matrix) deployment and where feasible, put data collection opportunities in the hands of the people closest to that data. Asset inspection data will be a prime candidate as there are considerable advantages to having the crews capture the data in the field during the inspection process and then integrating this information directly into CityExplorer (for asset management) and CityWorks (for work management). Similarly, it will be beneficial for maintenance crews to capture fixed asset data in the field and to update the City's GIS database in real time, and for hydrant flow testing and water meter installation information to be captured in the field and fed directly into the systems that utilize it.

- Enhancing the City's 3D data offerings by adding 3D versions of building information and facility floor plans, and introducing Geodesign capability to support integrated processes for planning built and natural environments.
- Enabling more of the City's fleet with Automatic Vehicle Location (AVL) services that not only track location but also monitor factors such as vehicle speeds, engine data, and fuel consumption to help improve overall fleet management.
- Expanding the City's route analysis capabilities by adding an integrated road network to support route planning and aid in identifying potential cost savings. Expanding the City's route analysis capabilities by adding an integrated road network to support route planning and aid in identifying potential cost savings.

Triple Bottom Line

Ongoing investments are required to sustain the existing infrastructure; 2017 work will be limited to these activities. In future years, enhancements to the City's GIS infrastructure could help to keep the information current and to expand the toolsets and services to meet evolving needs of employees, citizens and stakeholders. As with all Information Technology projects, this one contributes to a consistent set of goals established to

create a focus for technology investment and effort:

- Provide focused, reliable, and sustainable information technology infrastructure that is responsive to current City requirements and proactive in anticipation of future requirements
- Support the efficient and effective operation of all information systems
- Provide efficient, effective, and timely geomatics services to citizens and stakeholders.

It also addresses these Information Technology Division objectives:

- Enhance the capabilities of CityExplorer and further expand its use throughout the organization and among the citizens of Yellowknife by developing additional integrations with existing applications and data, responding to client feedback and requests in a timely and structured manner, and adhering to industry-standard practices for collecting and maintaining data
- Supply ongoing leadership to support and sustain the City's information technology infrastructure
- Provide City employees with the appropriate hardware and software tools to enable them to do their jobs efficiently and effectively
- Adopt increasingly stringent industry-standard security and data protection practices and procedures
- Grow mobile workforce opportunities to improve employee productivity and provide more effective service delivery

Social

In 2017, this project will maintain the City's existing GIS infrastructure. In future years, if adequate funding is available, new features will be added to further empower staff, citizens, and/or stakeholders to locate and compile diverse information that helps them accomplish their day-to-day activ-

ities more efficiently and with greater independence. For example, the 2016 enhancement that allows staff throughout the organization to create a mailing list based on a set of selected properties streamlined their processes and removed the need for them to request this information from Help Desk. Similarly, the 2015 Open Data portal provided citizens and external stakeholders with ready access to a number of datasets they would otherwise have to request from the Information Technology Division and in the process increased the transparency of City data.

Economic

In 2017, maintaining the existing GIS infrastructure is crucial. In future years, maintaining it and incrementally enhancing its feature sets and capabilities will be a prudent approach to both protecting the City's investment and providing tools that benefit staff and citizens.

Environmental

Providing information electronically to both internal and external clients reduces paper consumption. For example, Open Data offerings provide citizens and stakeholders with almost instant access to a variety of maps that otherwise would be requested from the Information Technology Division and often provided in paper format.

Operational Impact

The City's GIS services have been widely embraced by staff, citizens, and stakeholders and have created efficiencies throughout the organization. Although no new services will be added in 2017, in future years continued investment in this resource could help ensure that data accuracy is maintained and that features and functionality continue to grow to meet expanding demands.

If this project does not proceed, the associated enhancements will not be implemented and the anticipated benefits will not be realized. This will adversely affect the clients who have identified the needs for additional data and features.



CAPITAL FUND - 2017 Capital Projects

Department/Division Corporate Services / Information Technology
 Project Server and Storage Renewal and Expansion

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	48,400	53,240	58,560	160,200
O&M Expenses				
Total:				
IT Reserve	48,400	53,240	58,560	160,200
Formula Funding				
Grants				

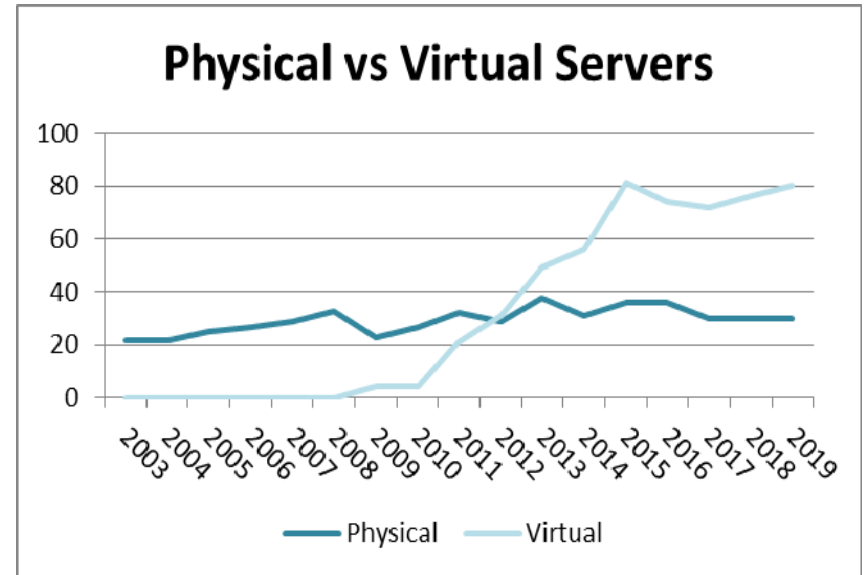
Purpose

To continue the City's planned and incremental investment in its server fleet and file storage infrastructure to ensure that it can meet the growing requirements being placed on it.

Background

The Information Technology Division maintains physical and virtual servers to support a wide range of services to staff, citizens, and stakeholders. It also maintains a redundant file storage system to house and protect the City's burgeoning collection of data and documents that are essential to its day-to-day operations.

The City's dependence on its server fleet intensifies with each activity that is automated. In addition to traditional applications such as accounting, payment processing, and payroll, both staff and citizens are adopting increasingly sophisticated solutions to meet diverse needs including emergency services dispatch, mapping, work management, elections, transit, permit processing, problem reporting, security cameras, building access, pellet boilers, solar panels, voice radio control, and black/green cart management. In addition, most communications – including email, telephone, websites, and social media – are now electronic and therefore depend on increasingly powerful servers and require rapidly expanding storage space.



The increasing reliance on this infrastructure is evident in the numbers: in recent years, the City's server fleet more than tripled in size, the number of network devices increased by 450%, and data storage requirements grew by over 4000%.

To keep pace with these demands, the servers need to remain current and reliable and data storage needs to grow. This requires sustained investment in the server fleet and regular expansion of the storage capacity, with the goal of regular, predictable expenditure.

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.

Adequate server and storage resources must be in place to support the escalating demands being created as operational units increasingly turn to technology. This project will help grow this capacity in the context of these Information Technology goals:

- Provide focused, reliable, and sustainable information technology infrastructure that is responsive to current City requirements and proactive in anticipation of future requirements;
- Provide secure, high-availability network services; and
- Support the efficient and effective operation of all information systems.

It will also address several Information Technology Division objectives:

- Supply ongoing leadership to support and sustain the City's information technology infrastructure;
- Provide City employees with the appropriate hardware and software tools to enable them to do their jobs efficiently and effectively;
- Acquire and deploy new and replacement components in a timely and cost effective manner; and

- Adopt increasingly stringent industry-standard security and data protection practices and procedures.

Triple Bottom Line

Social:

N/A

Economic

As with the Network Renewal and Expansion expenditures, the strategy of applying steady and ongoing investments to maintain and grow the City's server and storage network has proven to be cost-effective and operationally efficient.

Environmental:

N/A

Operational Impact

When servers are appropriately matched to the work that needs to be done and sufficient disk space is available, services can be delivered more reliably and at a lower cost than when resources must be constantly manipulated and reallocated, often in response to failures.

In 2016, insufficient storage space was available to meet client needs. Information Technology staff spent considerable time reconfiguring disk allocations and moving content around in attempts to free up sufficient storage, however it was not possible to meet all of the demands; most notably there was inadequate storage for the Public Works video documentation of the City's underground infrastructure. This type of situation prevents staff from completing their tasks and places additional pressure on Information Technology staff resources.

If this project does not proceed, the Division will not be able to replace end-of-life servers or acquire much-needed additional storage capacity. In the short term, this will negatively impact overall infrastructure performance and thus degrade service delivery to both internal and external clients, and over time it will lead to more frequent system outages and necessitate increased support efforts and costs.



CAPITAL FUND - 2017 Capital Projects

Department/Division Public Safety
 Project Communication Infrastructure Renewal

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	15,780	19,730	24,660	60,170
O&M Expenses				
Total:				
IT Reserve	15,780	19,730	24,660	60,170
Formula Funding				
Grants				

Purpose

To implement regular, ongoing maintenance and enhancements of the City’s Communications Infrastructure system so that it continues to provide essential voice radio services to emergency personnel and to Public Works and Community Services staff.

Background

The City’s Communications Infrastructure system was deployed in early 2015. 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 of this infrastructure will be required to protect the City’s investment and to ensure that it remains effective throughout its life expectancy.

The 2017 allocation request remains modest as the equipment is still relatively new and the system is managed under a support contract with the vendor. However, beginning in 2018 it is anticipated that some of the original devices will be out of warranty and due for replacement, and that process and technology changes will create requirements for a more substantial investment to maintain the infrastructure.

The City’s voice radio system is a critical part of its infrastructure and this project will help ensure that it is properly maintained so that its maximum

life expectancy is attained. This approach is consistent with key Information Technology goals:

- Provide focused, reliable, and sustainable information technology infrastructure that is responsive to current City requirements and proactive in anticipation of future requirements;
- Provide secure, high-availability network services; and
- Support the efficient and effective operation of all information systems.

It is also consistent with achieving these Information Technology Division objectives:

- Supply ongoing leadership to support and sustain the City’s information technology infrastructure;
- Provide City employees with the appropriate hardware and software tools to enable them to do their jobs efficiently and effectively; and
- Acquire and deploy new and replacement components in a timely and cost effective manner.

Triple Bottom Line

Social

The Communications Infrastructure provides a vital lifeline for City first-responders as they protect citizens and property and contribute to a safer community.

Economic

Regular, incremental investments will ensure the voice radio system continues to function optimally and will avoid the need for a premature replacement.

Environmental:

N/A

Operational Impact

A voice radio outage could severely jeopardize the safety of the City's emergency responders and its citizens. Every reasonable effort must be made to ensure uninterrupted service, including proper maintenance and incremental enhancements.

If this project does not proceed, it will not be possible to implement the incremental improvements and repairs necessary to ensure ongoing reliable system performance. This presents considerable risk to the organization. Over time, lack of regular investments will shorten the life expectancy of this system, and necessitate a costly replacement.



CAPITAL FUND - 2017 Capital Projects

Department/Division Corporate Services / Information Technology
 Project Security Cameras

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	19,750	20,740	21,780	62,270
O&M Expenses				
Total:				
IT Reserve	19,750	20,740	21,780	62,270
Formula Funding				
Grants				

Purpose

To maintain the existing security camera deployments and their associated back-end support infrastructure.

Background

Security cameras are an integral part of the City’s operations and have proven to be a valuable tool for deterring crime and abuse and for protecting staff, citizens, and property.

City staff members use camera footage for security-related tasks like determining crime timelines, identifying intruders in City facilities, and assessing incidents related to insurance claims. As well, employees frequently provide footage to the RCMP to aid them in their investigations. Staff members also use the cameras for operational purposes such as obtaining license plate information at the Gate House, observing baler processes at the Solid Waste Facility, and monitoring membership pass usage at the Fieldhouse.

Much of the infrastructure has been in place for several years and many of the original devices – which are past their end-of-life – have failed and need to be replaced. This budget allocation is required to acquire and install these replacements. It does not allow for any expansion of the existing camera system and so will leave significant unmet needs for additional cameras, especially at the Library, Pool, Fieldhouse, Solid Waste

Facility, and Water Treatment Plant. However, given current budget challenges, priority should be given to maintaining what is already in place.

If this project does not proceed, cameras that fail will remain in place and the affected areas left without coverage.

This project helps to maintain existing security camera infrastructure relied upon by staff, citizens, and outside agencies. It does so by contributing to the following Information Technology Division goals:

- Support the efficient and effective operation of all information systems; and
- Acquire and deploy new and replacement components in a timely and cost effective manner.

It also addresses these Information Technology Division objectives:

- Maintain existing security cameras throughout the city to protect citizens, staff, and property; and
- Supply ongoing leadership to support and sustain the City’s information technology infrastructure.

Triple Bottom Line

Social

The City's security camera system has proven to be a valuable tool for deterring crime and abuse and for protecting staff, citizens, and property.

Economic

The City has invested considerable time and financial resources in its security camera system, and staff, citizens, and stakeholders have come to depend on it. It is more economical to deter theft, vandalism, and crime than to recover from it.

Environmental:

N/A

Operational Impact

As the existing cameras age, they are becoming less reliable and are requiring increasing amounts of Information Technology staff support to coax them into further service. When they finally cease to operate they are currently being abandoned as there are no funds to remove or replace them. However, each one that fails increases the City's risk as it means another site or location is not monitored.



CAPITAL FUND - 2017 Capital Projects

Department/Division Corporate Services / Information Technology
Project Secondary Site and Data Replication

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	11,500	12,080	12,680	36,260
O&M Expenses				
Total:				
IT Reserve	11,500	12,080	12,680	36,260
Formula Funding				
Grants				

Purpose

To maintain the organization's secondary Data Centre site.

Background

The City's Information Technology infrastructure was traditionally centralized at City Hall. However, this singularity presented an unacceptable level of risk to the organization because if the site had been compromised in any way, the organization would not have been able to conduct business. To mitigate this risk, the Information Technology Division undertook to establish a secondary site to run essential services in the event that the primary site becomes unavailable for any reason.

An incremental replace-and-redeploy strategy approach was adopted to alleviate the budget impact. In 2013 physical facility preparations at the secondary site were completed, a server rack was installed, an IBM Blade Center and Storage Area Network (SAN) were deployed and configured, and the Information Technology Division began replicating some data to the site. In 2014, additional blade servers were purchased for use in the City's primary Data Centre and the replaced blades moved to the secondary site, and some networking components were upgraded to improve overall performance. In 2015, additional storage was acquired to accommodate organizational data growth. In 2016, the focus was on cleaning up legacy rack equipment and associated cabling at the secondary site, and in future years efforts will be concentrated on shifting more services to the

secondary site and fine tuning automated failover processes.

Continued, incremental enhancements of this secondary site are needed to sustain an increasingly functional off-site Data Centre capable of resuming and sustaining operations in a timely fashion. However, given current budget challenges, priority should be given to supporting what is already in place and therefore this budget allocation is sufficient to maintain, not expand, the secondary site.

This project works towards creating and maintaining a secondary site that will enable the organization to continue basic operations if functionality at the main Data Centre is interrupted for any reason.

As part of the overall Information Technology strategy, this initiative contributes to the following goals:

- Provide focused, reliable, and sustainable information technology infrastructure that is responsive to current City requirements and proactive in anticipation of future requirements;
- Provide secure, high-availability network services;
- Support the efficient and effective operation of all information systems; and

- Supply technical leadership and support for ongoing information technology projects within the civic organization.

It also addresses these Information Technology Division objectives:

- Supply ongoing leadership to support and sustain the City's information technology infrastructure;
- Provide City employees with the appropriate hardware and software tools to enable them to do their jobs efficiently and effectively; and
- Acquire and deploy new and replacement components in a timely and cost effective manner.

Triple Bottom Line

Social

The City relies heavily on its Information Technology infrastructure and when these services are interrupted – even briefly – it severely impacts the entire organization's ability to provide services to citizens and stakeholders. Therefore it is essential that the organization maintain a secondary site that will allow it to continue basic operations in the event that functionality at the main Data Centre is compromised in any way.

Economic

Brief service interruptions created by power failures have demonstrated that without access to the City's Information Technology infrastructure, many staff members simply cannot do their jobs: productivity is negatively impacted, services cannot be delivered, and money cannot be collected. If Data Centre issues cause prolonged outages, these impacts will be exponentially greater.

Environmental:

N/A

Operational Impact

The maintenance-only approach reflected in this budget allocation can only be sustained for the short term. If incremental updates and enhancements are not resumed soon so that the secondary site keeps pace with the primary site, the City may have to return to the single Data Centre

model. This would leave the City in a very vulnerable position should anything prevent normal operations within the sole Centre.



CAPITAL FUND - 2017 Capital Projects

Department/Division Corporate Services / Information Technology
 Project Virtualization

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	26,250	27,560	28,940	82,750
O&M Expenses				
Total:				
IT Reserve	26,250	27,560	28,940	82,750
Formula Funding				
Grants				

Purpose

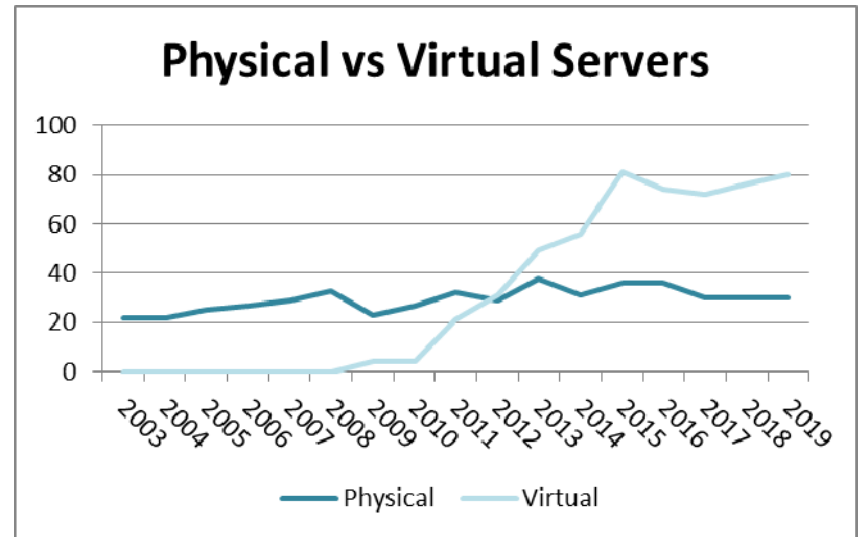
To sustain the City's virtual environment.

Background

The Information Technology Division implemented server virtualization several years ago. This technique essentially partitions one physical server into several virtual servers, so instead of buying and maintaining several small servers, funds are invested in acquiring and supporting large, powerful units that are allocated and re-allocated as requirements dictate. One large server takes up less space than that required for multiple smaller devices and typically consumes less energy and produces less heat, which in turn requires less air conditioning. The concept is somewhat analogous to an apartment-style condominium complex: multiple families can live in less overall space than would be required to house them in detached homes, and cost savings can be realized because they share the roof and external walls, and possibly infrastructure such as heat, water, or air conditioning.

Initially, virtualization was implemented at the City using the Citrix family of products as they were best suited to the organization's requirements. When changes in licensing, technology and the software market made this environment increasingly difficult and costly to manage and maintain, the Information Technology Division researched possible alternatives and confirmed that the VMware environment, which had emerged as the industry leader for virtualization and become the standard for business

worldwide, would be a good fit. Work to move the City to VMware began in 2015 and was completed in 2016. Now it is important that this environment be maintained.



The 2017 expenditure will be the first of a recurring investment in the virtualized environment, recognizing the value of ongoing, planned, incremental expenditures to protect the City's Information Technology infrastructure. The initiative will contribute to the following Information Technology Division goals:

- Provide focused, reliable, and sustainable information technology infrastructure that is responsive to current City requirements and proactive in anticipation of future requirements;
- Provide secure, high-availability network services; and
- Support the efficient and effective operation of all information systems.

It will also work towards these Information Technology Division objectives:

- Supply ongoing leadership to support and sustain the City's information technology infrastructure; and
- Provide City employees with the appropriate hardware and software tools to enable them to do their jobs efficiently and effectively.

More specifically, this project will help maintain the Division's long-term efforts to virtualize the City's Information Technology infrastructure as part of its initiatives to manage more with less: virtualization helps to centralize server administration tasks, improves scalability and overall hardware resource utilization, and reduces space and energy requirements.

Triple Bottom Line

Social:

N/A

Economic

A fully-implemented virtualization paradigm costs less to operate, maintain, and support than a stand-alone server environment thus resulting in cost savings to the organization. It enables the Information Division to meet the organization's burgeoning application requirements with fewer physical devices than under traditional approaches, thus conserving scarce Data Centre space, reducing electricity use, and generating less heat. It also provides a way to centrally serve up applications used throughout the organization, which streamline deployments and upgrades

as the installations only need to be done once on the central server, instead of multiple times on individual workstations and laptops. This creates efficiencies for the Information Technology Division because the work is only done once, and improves services to clients because they are not interrupted while software is installed on their computers. The technology also allows infrequently-used programs to be shared from a single location thereby enabling the Information Technology Division to meet sporadic requirements throughout the organization without purchasing licenses that would be rarely used or performing numerous installs and uninstalls to meet migrating needs.

Environmental

One large server takes up less space than that required for multiple smaller devices and typically consumes less energy and produces less heat, which in turn requires less air conditioning.

Operational Impacts

The City's information technology infrastructure is facing growing reliability expectations because staff and citizens increasingly depend on all services being available at all times. Along with these expectations come more significant impacts if outages do 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, particularly for key or central services. The VMware solution provides tools for creating, managing, and maintaining this essential redundancy.



CAPITAL FUND - 2017 Capital Projects

Department/Division Corporate Services / Information Technology
 Project Door Access Controls

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	11,070	11,620	12,200	34,890
O&M Expenses				
Total:				
IT Reserve	11,070	11,620	12,200	34,890
Formula Funding				
Grants				

Purpose

To continue to maintain the organization’s electronic door access controls.

Background

Electronic door access controls are used at City Hall, the Fire Hall, the Pool, the Garage, and the Library. They have proven much easier to administer and control than traditional key methods, as changes can be made instantaneously without the need to physically assign and retrieve keys. When an employee joins the organization, their ID card is programmed to provide access related to their position, and if responsibilities change, the card can be readily re-programmed to reflect them. More importantly, when an employee leaves or a card is lost, it can be deactivated instantly. In addition, the back-end systems provide valuable reporting capabilities.

The success of the initial implementations created client demand for additional controls, most notably at the Library, Fire Hall, and City Hall. However, given the current budget challenges the immediate focus is on maintaining the existing infrastructure and therefore this allocation will suffice to maintain the controls that are already in place, and will not be adequate to expand the services.

This project helps protect the City’s buildings and facilities, as well as employee and citizen safety. The Information Technology Division’s role in

supporting the backend components is consistent with its goals:

- Support the efficient and effective operation of all information systems; and
- Supply technical leadership and support for ongoing information technology projects within the civic organization.

It also addresses these Information Technology Division objectives:

- Supply ongoing leadership to support and sustain the City’s information technology infrastructure;
- Provide City employees with the appropriate hardware and software tools to enable them to do their jobs efficiently and effectively;
- Acquire and deploy new and replacement components in a timely and cost effective manner;
- Provide clients with additional tools and resources to enable them to better utilize the City’s information technology infrastructure; and
- Adopt increasingly stringent industry-standard security and data protection practices and procedures.

Triple Bottom Line

Social

The City has a civic obligation to keep its buildings and facilities secure, to protect its staff members who work in them, and to provide safe environments for citizens who utilize the programs and services within them. Electronic door access controls provide a cost-effective mechanism that helps achieve this security.

Economic

The electronic door access system is more economical to operate than the traditional lock-and-key system as it eliminates the requirement to manage physical keys and to re-key locks as roles and responsibilities change.

Environmental:

N/A

Operational Impact

In the short term, this project will maintain the controls that are already in place. In the future it will be beneficial to deploy controls on additional doors in more facilities, as the system has proven to simplify access for City staff (especially those who require access to numerous areas at several sites), streamline the management of that access, and improve building security.



CAPITAL FUND - 2017 Capital Projects

Department/Division Corporate Services / Information Technology
 Project Multi-function Devices and Printers

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	50,650	53,180	55,840	159,670
O&M Expenses				
Total:				
IT Reserve	50,650	53,180	55,840	159,670
Formula Funding				
Grants				

Purpose

To continue the organization’s incremental approach to implementing and maintaining multifunction devices throughout the organization so that printing, scanning and copying requirements can be met in the most cost-effective manner possible.

Background

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 and assessment of the City’s existing printer/copier/fax/multifunction device fleet and then met with key stakeholders to ascertain current and future user requirements. Based on this information the vendor prepared a multi-year Plan with the goals of reducing costs and realizing maintenance and support efficiencies.

The Plan identifies three tiers of devices with the expectation that all future acquisition choices will be selected from one of these three tiers. The intent is to gradually minimize the variety of devices installed throughout the organization so that usage, support, and consumables management are streamlined.

In 2014, two top-tier printers and one middle-tier multifunction device were acquired and deployed to meet the most pressing needs in City Hall.

In 2015, top-tier devices were acquired and deployed at the Fire Hall and Garage, and a middle-tier device was acquired and deployed at the Library. Middle-tier devices for the Pool, City Hall, and Multiplex and lower-tier units for the Pool and Library were acquired and deployed in 2016.

The Plan also identifies end-of-life and high-cost, low-usage devices with the intent of retiring them in favor of lower cost, centralized units. In 2015, fifteen such units were removed from service at City Hall, the Solid Waste Facility, the Fieldhouse, and the Garage.

Another component of the Plan is the reallocation of devices to better meet varied needs within the organization. In 2015, three existing devices were reassigned among the Garage, the Solid Waste Facility, and City Hall.

In late 2016, a follow up analysis will be conducted to ascertain where unmet requirements exist and to identify detailed acquisition, deployment, reallocation, and retirement plans for 2017, 2018, and 2019.

This project helps to ensure that the necessary printing, scanning, and copying services are in place throughout the organization. It does so by contributing to the following Information Technology Division goals:

- Provide focused, reliable, and sustainable information technology infrastructure that is responsive to current City requirements and pro-

active in anticipation of future requirements;

- Support the efficient and effective operation of all information systems; and
- Supply technical leadership and support for ongoing information technology projects within the civic organization.

It also addresses these Information Technology Division objectives:

- Supply ongoing leadership to support and sustain the City's information technology infrastructure;
- Provide City employees with the appropriate hardware and software tools to enable them to do their jobs efficiently and effectively;
- Acquire and deploy new and replacement components in a timely and cost effective manner;
- Provide clients with additional tools and resources to enable them to better utilize the City's information technology infrastructure; and
- Adopt increasingly stringent industry-standard security and data protection practices and procedures.

Triple Bottom Line

Social:

N/A

Economic

Properly matching equipment capabilities with service requirements helps ensure that needs are met in a cost-effective manner. For example, if a functional unit routinely produces a large volume of black and white copies, it is beneficial to invest in higher-priced, but lower cost-per-page device at that location. Conversely, if an area only occasionally produces color output, a lower-end, lower-capacity printer may suffice.

Environmental

Although printing and copying are not innately environmentally-friendly, this initiative has proven that there are ways to reduce the impact. To date, centralizing print, scan, and copy functionality has reduced the overall number of devices in use throughout the organization; eliminating old-

er units that required a high power draw has reduced the City's electricity consumption; and scanning documents and storing and distributing them electronically has reduced paper usage and storage needs.

Operational Impact

Most staff members rely on scanning, printing, and copying services during their day-to-day activities. If these services are not readily available or are not dependable it negatively impacts their productivity and their ability to provide services.



CAPITAL FUND - 2017 Capital Projects

Department/Division Corporate Services / Information Technology
 Project Mapping: Data Collection and Verification

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	17,960		19,050	37,010
O&M Expenses				
Total:				
IT Reserve	17,960		19,050	37,010
Formula Funding				
Grants				

Purpose

To update spatial database datasets to ensure data is as accurate and complete as possible.

Background

Staff, citizens, and stakeholders rely on the City’s spatial datasets for decision making purposes, and it is important that they be current and accurate. However, several datasets within the City’s spatial database are out of date. For example, buildings, street signs, trail markers, trash cans, recycling bins, outdoor furniture, and park structures throughout the City have all changed considerably since the existing data was collected.

While important, collecting current data for these types of items is also time consuming and largely repetitive work. For example, when data about the City’s 751 parking meters was updated in 2016, it took over a week of staff time to collect it. Other datasets are even larger; for example street signs were last updated in 2008 and there now are more than 2,000 of them and information for the over 6,000 buildings was last gathered in 2012. Assuming a modest five minutes per point, this translates into almost 90 days of work for just these two datasets.

The straightforward yet repetitive nature of this data gathering task makes it ideally suited to a summer student, particularly one who is studying in the Geographic Information Systems field. Therefore it is recom-

mended that a summer student be hired in 2017, and again in 2019, to capture current data and to update the spatial database. This will free up City staff to provide day-to-day mapping services and to pursue larger scale projects.

This project helps to ensure that the City’s spatial database remains current, useful, and reliable. It goes beyond the regular data maintenance processes conducted as part of routine operations and represents an extraordinary effort to keep pace with rapidly changing data. As such, it complements, but does not replace, work to be done as part of the ongoing GIS Maintenance and Enhancements project.

As with all Information Technology projects, this initiative contributes to a consistent set of goals, including:

- Provide focused, reliable, and sustainable information technology infrastructure that is responsive to current City requirements and proactive in anticipation of future requirements;
- Support the efficient and effective operation of all information systems; and
- Provide efficient, effective, and timely geomatics services to citizens and stakeholders.

It also addresses these Information Technology Division objectives:

- Supply ongoing leadership to support and sustain the City's information technology infrastructure; and
- Provide City employees with the appropriate hardware and software tools to enable them to do their jobs efficiently and effectively.

Triple Bottom Line

Social

Hiring a Summer Student to gather this data provides a unique opportunity for that individual in that it affords them an opportunity to work in their area of study and to gain exposure to real-world implementations of the theoretical knowledge they gain from an academic environment.

Economic

It is more cost-effective to hire a student to perform this largely repetitive work than it is to dedicate a permanent staff member to the tasks. It also frees up the staff member to perform more complicated or challenging work, thus improving the overall level of service provided by the Division.

Environmental:

N/A

Operational Impact

Spatial data is a valuable organizational asset and it is important that it be current and accurate as staff, citizens, and stakeholders are becoming increasingly reliant on it for service delivery, work planning, and decision making. If this data is out of date or incomplete, it puts the City at risk of providing incorrect information and/or making erroneous decisions.



CAPITAL FUND - 2017 Capital Projects

Department/Division Public Safety / Corporate Services
 Project Stanton Equipment Relocation

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	50,000	100,000		150,000
O&M Expenses				
Total:				
IT Reserve	50,000	100,000		150,000
Formula Funding				
Grants				

Purpose

To facilitate the relocation of existing Information Technology and Communications Infrastructure equipment from the Stanton Territorial Hospital to the new hospital building.

Background

The City has a long-standing agreement with Stanton management that has enabled it to locate key pieces of infrastructure within the hospital penthouse and on the building roof. It began with voice radio equipment, and gradually expanded to include some wireless Information Technology infrastructure devices and, most significantly, the City's new Communication Infrastructure system that provides radio services to emergency personnel.

Once the new building is complete, the City's radio and communication equipment must be transferred to it. An equipment room is being readied for this purpose, and Information Technology staff members have worked closely with the project engineers and the City's radio consultant to identify requirements. The initial budget allocation estimate is based on the outcomes of this very preliminary work. However, at this point insufficient details are available to determine the specific timing and logistics of the move. Therefore it is recommended that funding be set aside in each of 2017 and 2018 in recognition of the need to facilitate this effort. It is anticipated that the 2017 money will be needed for consultations with the

City's radio vendor and radio consultant to plan the move, and that the 2018 money will go towards making any necessary accommodations in the new equipment room and moving the equipment into it. As construction proceeds and more details become available, these estimates will be refined.

Triple Bottom Line

This project is necessary for continued operation of the City's communication and wireless infrastructure. There is no other suitable site within the City to locate the equipment, and it is critical to the delivery of emergency voice radio communications and many other city services.

Social

Public Safety personnel rely heavily on the communications infrastructure system for routine day-to-day interactions as well as critical emergency communications. Jeopardizing it will also jeopardize citizen and community safety.

Economic:

N/A

Environmental:

N/A

Operational Impact

The relocation must be planned and staged to minimize interruptions in service delivery.



CAPITAL FUND - 2017 Capital Projects

Department/Division **Corporate Services / Taxation, Budgeting and Evaluation**
Project **Budget Management**

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	133,820			133,820
O&M Expenses				
Total:				
IT Reserve	133,820			133,820
Formula Funding				
Grants				

Purpose

To provide appropriate tools and redefine processes to streamline the budget preparation effort.

Background

The City's current budget process is an onerous undertaking, relying heavily on spreadsheets and desktop publishing applications. Recent advances in the software market make this an opportune time to reassess the City's approach and to adopt tools that will streamline and simplify the collection of information, the review process, and the actual document preparation.

In 2014 an ad-hoc committee investigated potential solutions and confirmed that there are at least two products that will meet the City's requirements, from both procedural and technical perspectives. It is anticipated that a competitive process will be conducted in early 2017 to identify the best solution for the organization, with acquisition and implementation to follow soon after to ensure the new processes and tools are in place for the 2018 budget cycle.

Triple Bottom Line

This project will provide efficiencies throughout the organization. The new tools will make it easier for contributors to prepare submissions, for reviewers to complete evaluations, and for administrative staff to compile the final product.

Social:

N/A

Economic

The first budget cycle may be challenging as contributors throughout the organization will have to adapt to the new tools, as will reviewers and the staff who prepare the final document. However, as clients become more comfortable with them, efficiencies will be experienced on several levels. For example, many submissions are similar year-over-year and the new tools will facilitate building a submission on a prior year's plan. The tools automatically roll up values based on various criteria, eliminating the need to manually compile the various summaries required at different levels in the organization. As well, ending the current practice of creating multiple copies of spreadsheets and write-ups will significantly reduce inconsistencies and errors.

Environmental:

N/A

Operational Impacts

Simplifying and streamlining the annual budget process will reduce the amount of time contributors, reviewers, and administrative staff members spend on the manual, mechanical tasks. This will enable them to spend more time gathering data, consulting with stakeholders, and analysing information.

CAPITAL FUND - 2017 Capital Projects

Department/Division Community Services / Corporate Services
 Project Class / Active Net Replacement

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	147,180			147,180
O&M Expenses				
Total:				
IT Reserve	147,180			147,180
Formula Funding				
Grants				

Purpose

To replace the deprecated Class / Active Net application with a suitable solution to meet the City's program registration, facility booking, point of sale, and payment processing requirements.

Background

In 2003, the City implemented the Class application to meet program registration, facility booking, point of sale, payment processing, and interactive voice response service needs. It has been a solid solution and is integrated into the City's financial, municipal, and permitting programs. However, the vendor has announced a product sunset (phase out) date of November 30, 2017, and therefore the City must move to select and implement a new solution prior to this date.

An ad-hoc committee has researched alternatives and confirmed that suitable replacements are available in the current software market. A competitive procurement process will be launched in early 2017 to ensure the best solution for the City is identified, and then the acquisition, deployment, and training phases will be addressed along an aggressive timeline in an effort to reduce the amount of time the organization is reliant on a non-supported product.

Triple Bottom Line

This project will provide City staff with an appropriate software solution for managing its program registration and facility booking services and for accepting and processing all types of payments. It is consistent with the following Information Technology Division goals:

- Provide focused, reliable, and sustainable information technology infrastructure that is responsive to current City requirements and proactive in anticipation of future requirements; and
- Support the efficient and effective operation of all information systems.

It also addresses these Information Technology Division objectives:

- Supply ongoing leadership to support and sustain the City's information technology infrastructure; and
- Provide City employees with the appropriate hardware and software tools to enable them to do their jobs efficiently and effectively.

Social

A significant portion of the population benefits from the Programs offered by the City, and from using the various civic facilities. Without a suitable



software tool to manage program registration and facility bookings, the City will not be able to sustain its offerings.

Economic

Most of the City's revenues – including property tax and utility bill payments, program registration and facility booking fees, business license and animal licence fees, and parking ticket payments – are processed through the Class Point of Sale system. Without a functional replacement, the City's ability to accept money will be severely limited.

Environmental:

N/A

Operational Impact

This project should not impact the O&M budget as it is anticipated that annual software maintenance costs will be comparable to those of the existing application.

If the current application is not replaced, it will be increasingly difficult to maintain its functionality as vendor support will no longer be available (the City has already had to retire the Interactive Voice Response service due to the vendor's inability to support it). Furthermore, as the vendor will not be releasing any further upgrades or patches for the software, continued use places the City at risk for security breaches, particularly within the online portion of the system.

CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Community Services							
Directorate							
Replace Cigarette Butt Receptacles in Downtown	-	-	-	-	10	-	-
Accessibility Audit	-	-	-	-	55	-	-
	-	-	-	-	65	-	-
Arenas							
YKCA Ice Plant Replacement & Heat Recovery Installation	1,200	2,024	-	-	-	-	-
YKCA Upgrades -Wiring	20	20	-	-	-	-	-
YKCA Upgrade	-	-	-	42	-	-	-
Painting /Re-surfacing DND GYM	-	-	-	-	-	40	-
Climbing Wall at the Fieldhouse					160		
Fieldhouse Track Access Door	-	-	-	-	-	90	-
Fieldhouse - Floor Cover	-	-	-	-	-	-	160
	1,220	2,044	-	42	160	130	160
Library							
Washroom Development	-	-	57	57	-	-	-

(cont'd ...)



CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Community Services (cont'd)							
Parks/Trails							
Lakeview Cemetery Expansion/Irrigation	-	3	105	105	105	-	-
Playground Equipment Replacement	-	30	60	60	-	-	-
Moyles Park - Multi-use Sport Pad	-	-	-	-	-	-	30
Ball Diamonds Upgrade	-	-	-	-	-	45	-
Sport & Multi-use Fields Upgrade	-	3	-	4	-	-	-
Trail Development - Tin Can Hill	-	9	-	-	-	-	-
Yellowknife Rotary Park - Trail Extension	20	16	20	27	20	20	20
Re-surfacing of McMahon Frame Lake Trail	-	-	-	-	200	-	-
Surfacing of Niven Lake Trail	-	-	-	-	-	-	210
Twin Pine Hill Trail Development	-	13	-	-	-	-	-
Tommy Forrest Ball Park	60	60	-	-	-	-	-
Park Development - Block 501	-	-	-	-	-	-	80
Trash Containers & Butt Canisters	-	20	-	-	-	-	-
Outdoor Recreation Facility	-	-	-	-	-	3,393	1,700
Re-surfacing of Tennis Courts	-	-	-	-	137	-	-
Rental Equipment	-	-	-	-	-	43	20
Somba K'e Park - Public Water Fountain	-	-	-	-	-	10	-
Mountain Bike Trail	-	-	-	-	-	20	20
"United in Celebration" Sculpture Painting	45	-	-	-	-	-	-
	125	154	185	196	462	3,531	2,080

(cont'd ...)

CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Pool							
Aquatic Centre Development						75	4,500
Pool Upgrade	100	152	-	14	-	250	20
	100	152	-	14	-	325	4,520
City Hall							
Upgrades	-	46	50	50	-	-	-
	-	46	50	50	-	-	-
Total	1,445	2,396	292	359	687	3,986	6,760



CAPITAL FUND - 2017 Capital Projects

		2017 Budget Recommended (\$000s)	Formula Funding (\$000s)	Other Revenue (\$000s)	Grants (\$000s)
Community Services	Page				
Directorate					
Replace Cigarette Butt Receptacles in Downtown	168	10	10		
Accessibility Audit	169	55	55		
Arenas					
Climbing Wall at the Fieldhouse	170	160	160		
Parks/Trails					
Lakeview Cemetery Expansion	172	105	105		
Yellowknife Rotary Park -Trail Extension	174	20	20		
Re-surfacing of McMahon Frame Lake Trail	175	200	50		150
Re-surfacing of Tennis Courts	176	137	37	20	80
Subtotal		687	437	20	230

CAPITAL FUND - 2017 Capital Projects

Department/Division: Community Services/Facilities Division
 Project Cigarette Butt Containers in Downtown

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	10,000			10,000
O&M Expenses				
Total:				
Formula Funding	10,000			10,000
Grants				

Purpose

To replace and enhance the current inventory of cigarette butt containers in the City Core and City Hall grounds.

Background

In 2009 the department placed 24 butt containers in the City Core and around City Hall. Since that time many of the containers have been vandalized beyond repair and it is time to replace them with a newer more durable model.

It is proposed to purchase 30 containers for the enhancement and replacement the current inventory.

Triple Bottom Line

Social

Yellowknife has a natural and built system that contributes to the social well-being of its residents.

Economic

The management of corporate assets is optimized.

Environmental

By managing our assets properly we will be able to optimize their use and longevity.

Operational Impact

There will no operational impact.



CAPITAL FUND - 2017 Capital Projects

Department/Division: Community Services/Facilities Division
 Project Accessibility Audit - City Facilities and Infrastructure

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	55,000			55,000
O&M Expenses				
Total:				
Formula Funding	55,000			55,000
Grants				

Purpose

To engage the services of a qualified service provider to carry out an accessibility audit of City facilities and infrastructure. Public City facilities such as the Library, Multiplex, Ruth Inch Memorial Pool, Fieldhouse, Bailing Facility, playgrounds, parks, sidewalks etc. will be considered under such an audit.

Background

City Council has requested that an accessibility audit of City facilities and infrastructure be included for discussion in the 2017 budget.

Triple Bottom Line

Social

Creating an inclusive City. The City of Yellowknife values and promotes independence and is a vital partner in creating an inclusive city where all residents have the opportunity to take an active part in the social, economic and cultural life of the community.

Economic

Promoting an environment conducive to attracting, retaining and nurturing business.

Environmental

N/A

Operational Impact

Following the conclusion of the audit there may be some ongoing operational costs as well as other capital projects that may be identified.

CAPITAL FUND - 2017 Capital Projects

Department/Division: Community Services/Facilities Division
 Project Climbing Wall at the Fieldhouse

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	160,000			160,000
O&M Expenses	20,000	21,000	22,050	63,050
Total:				
Formula Funding	160,000			160,000

Purpose

City Council has received a presentation from the Yellowknife Climbing Club for the addition of a climbing wall in the Yellowknife Fieldhouse. At the Municipal Services Committee held September 12, 2016, Committee recommended that Administration bring forward the project in the 2017 Capital Budget for consideration by Council.

Background

City staff has met with members of the Club over the past several years to discuss the possibility of partnering on the development of a climbing wall in a City facility. Subsequent to this, the Club has made a presentation to Council outlining their proposal to partner with the City in the development of the project in the Fieldhouse facility.

Through participating in several discussions with the Club, they were informed that a climbing wall must meet certain conditions of the City, such as not interfering with traffic patterns, blocking any existing internal and external glazing, minimize any additional costs to the City, and most importantly that Council will decide if the project is to receive support through the budget process.

In the presentation to Council the budget request for the project was identified at \$185,050. Additional costs to address the required changes

to the existing facility - including the relocation of desk and playground door - increase the project budget to \$212,050. The City will finance \$160,000 and Yellowknife Climbing Club will finance the balance.

The operation of the climbing wall has been discussed in broad terms only. Following the completion of the climbing wall the City would become the owner and operator. Access will be restricted to appropriate pass holders who have been properly trained to utilize the apparatus. The City would be in a position to contract/hire Club members to offer climbing programs and assist with any certification that will be required.

Triple Bottom Line

Social

The City of Yellowknife values and promotes independence and is a vital partner in creating an inclusive city where all residents have the opportunity to take an active part in the social, economic and cultural life of the community.

Economic

The City of Yellowknife ensures its long term economic development and fiscal health by managing its assets wisely and strategically investing in infrastructure to optimize function and service.



Environmental

N/A

Operational Impact

It is anticipated that the current staff resources will be sufficient to address the ongoing maintenance. Additional funding in the amount of \$20,000 annually will be required for structural maintenance and staff training.

It is anticipated that the addition of a climbing wall to a City facility will increase the usage of the facility and increase revenues through membership sales, climbing programs etc.

CAPITAL FUND - 2017 Capital Projects

Department/Division: Community Services/Facilities Division
Project Lakeview Cemetery Expansion

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	105,000			105,000
O&M Expenses				
Total:				
Formula Funding	105,000			105,000
Grants				

Purpose

To expand the Lakeview Cemetery to meet the interment needs of the community.

Background

Lakeview Cemetery has been in use since the late 1940s. There are approximately 15 to 20 interments annually, a number which has been steadily increasing over the past few years. The active area of the cemetery covers an area of 17,500 square metres which, until recently, has been adequate for interments, including cremations and regular casket burials. In 2009, the area was expanded to the west, requiring the removal of trees and addition of topsoil. This expansion used up the last of the easily accessible land, and it is now necessary to undertake further development of the cemetery to ensure it continues to meet the needs of the community.

In 2015 a Lakeview Cemetery Expansion study was completed by Hilton Landmarks Inc. The study recommended that the City expand the cemetery in two phases as illustrated below. In 2017, the first phase of expansion will occur in Area 1 (see map below). This will cover an area of 1.1 acres of an area of 2.3 acres and allow for 850+ casket lots. Area 1 will provide up to 75+ years of casket burials for the community when completed and 1725+ casket lots.

Expansion into Area 1 will cost \$210,000 of which \$105,000 is budgeted for 2017. Area 2 will cover 2.11 acres of developable land, but at a cost of \$1,317,165 and will provide for 1,660 in ground burials. This project will allow the City to manage its assets wisely by strategically investing in infrastructure to optimize function and service.

Triple Bottom Line

Social

The cemetery is a place of respect and reflection for the residents of Yellowknife and, as such, it should be kept in a condition that is appropriate for its use.

Economic

The management of public and corporate assets is optimized and based on continuous improvement.

Environmental

To maintain, respect, preserve and enhance the current facility.

Operational Impact

There will be an impact on O&M, as the area will need to be maintained as a Class A park after its completion. The anticipated expansion is 2.3 acres, with an annual O&M budget of approximately \$12,000 that comprises \$5,000 for labor and \$7,000 for materials.





Proposed areas for Lakeview Cemetery expansion

CAPITAL FUND - 2017 Capital Projects

Department/Division: Community Services – Facilities Division
 Project: Yellowknife Rotary Park - Trail Extension

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	20,000	20,000	20,000	60,000
O&M				
Other O&M Expenses				
Total:				
Formula Funding	20,000	20,000	20,000	60,000
Grants				

Purpose

This Community Partnership project permits the City of Yellowknife to continue its ongoing 11-year partnership with the Yellowknife Rotary Club in the development of the boardwalk.

Background

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 ramp installed to increase accessibility. From 2010 through to 2016 the Rotary Club has continued to expand the walkway which now covers approximately 340 meters.

This project will continue to enhance the Great Slave Lake waterfront and provide additional opportunities for our residents and visitors to access and view the waterfront. Not continuing to support this project will only delay its completion as the Rotary Club depends on materials from the City to complete the project.

By working with the Rotary Club on this project, the Department is realizing a savings of approximately \$5,000 in labor costs annually

Triple Bottom Line

Social

This project will provide for and sustain the Rotary Club's ambition to complete this project with the City through the use of volunteers for the betterment of the community.

Economic

Yellowknife's high quality of life and attractive physical environment makes it a desirable place to live, work and invest.

Environmental

The Rotary Park plays a major role as one of the core outdoor recreational facilities within the City. The City strives to maintain quality green spaces so that they remain accessible to all.

Operational Impact

There will be no operational impact as the Rotary Park and Trail are already serviced by the Department.



CAPITAL FUND - 2017 Capital Projects

Department/Division Community Services
 Project Re-surfacing of McMahon Frame Lake Trail

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	200,000			200,000
O&M Expenses				
Total:				
Formula Funding	50,000			50,000
Grants (CanNor)	150,000			150,000

Purpose

This project will widen and re-surface the McMahon Frame Lake Trail thus enhancing its ability to be used as a multi-use trail and bike route while at the same time minimizing pedestrian issues.

Background

The Frame Lake trail is 7.2 km in length of which 2 km is paved. It is proposed to widen this trail from two to three metres and asphalt it, thus making the trail more adaptable and safer as a multi-use trail. A dividing line will be added to the surface, thus increasing safety. The cost to prepare, widen, and pave the trail is \$200,000 (\$100 per square metre x 2,000 metres).

This is the main commuter trail for the residents of Yellowknife. Widening and resurfacing the trail would not only enhance its ability to be used as a multi-use trail and bike route, it would also minimize pedestrian issues and provide a safe environment on the trail. This will lead to increased use which will lead to a more active and healthy community.

Feedback was received during the consultation process from council and the public regarding the widening of the trail. This project will allow the City to manage its assets wisely by strategically investing in infrastructure to optimize function and service.

Triple Bottom Line

Social

Yellowknife has a natural and built environment that contributes to the physical, mental, and social well-being of all of its residents.

Economic

Yellowknife's high quality of life and attractive physical environment makes it a desirable place to live, work and invest.

Environmental

The City strives to maintain high quality trails which will remain accessible for all and will incur alternate modes of transportation.

Operational Impact

There will be no additional costs for maintenance, as the trail falls within the Facilities Division's normal operations budget.

CAPITAL FUND - 2017 Capital Projects

Department/Division: Community Services/Facilities Division
 Project Resurfacing Of Tennis Courts

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	137,000			137,000
O&M Expenses				
Total:	137,000			137,000
Formula Funding	37,000			37,000
Grants	80,000			80,000
Yellowknife Tennis Club Contribution	20,000			20,000

Purpose

To protect the integrity of the game of tennis and to ensure longevity of our assets, it is proposed to re-surface the City's eight tennis courts.

Background

The City has tennis courts at three locations in Yellowknife: Niven Beach (three courts), Somba K'e Park (three courts), and the City reservoir (two courts), all of which are heavily used by the Yellowknife Tennis Club and drop-in users. Over the past few years, the protective rubber surface on these courts has started to peel away through a combination of use and age.

It is proposed that the City use a 100% acrylic tennis court surface for this project. This material is formulated to resist fading and will withstand a variety of weather conditions, from ice and snow to intense heat and ultraviolet light.

The tennis courts are among the City's most popular recreational facilities over the summer months, so it is important to use good quality, durable products.

This project will allow the City to manage its assets wisely by strategically investing in infrastructure to optimize function, service and safety.

Triple Bottom Line

Social

Yellowknife has a natural and built system that contributes to the physical, social, and mental well-being of its residents.

Economic

The management of public and corporate assets are optimized and based on continuous improvement.

Environmental

By managing our assets properly we will be able to optimize the use and longevity of the park.

Operational Impact

There will be no operational impact.





Example of existing tennis court surface condition

CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Public Safety							
Directorate							
Wildland Fire Mitigation -Emergency Measures	100	86	125	139	125	125	150
Municipal Enforcement							
Communication Equipment Replacement	-	64	-	21	-	-	-
New Parking Meters	92	88	92	92	-	-	-
Radar Equipment Replacement	5	5	10	10	5	-	-
	197	243	227	262	130	125	150
Fire & Ambulance							
Air Conditioning for Fire Hall	60	60	-	-	-	-	-
Aggressor Jackets	40	-	-	40	-	-	-
Repairs to Air Make-up System	20	-	-	19	-	-	-
Fire Division Master Plan	-	-	110	110	-	-	-
Fire Extinguisher Trainer	-	-	-	-	-	12	-
Paving and Foundation Repairs	-	-	80	80	30	-	-
Fire Safety Helmets	-	-	-	-	12	9	9
Portable Radios	-	-	-	-	132	141	-
Bunker Gear	-	-	-	29	20	10	10
Additional Firefighter Outfitting Costs	-	-	-	-	40	-	-
Automatic External Defibrillators	-	-	-	-	105	-	-
Fire Hall Emergency Generator	-	-	-	-	100	-	-
Powered Receptacles for Parking	-	-	-	-	-	-	25
Front Ramps and Site Improvement	-	47	-	3	-	-	-
Emergency Medical Services Training Manikin	-	-	-	-	-	115	-
Propane-Fueled Fire Trainer	-	-	-	-	-	90	-
Training Gallery	-	-	-	-	-	-	40
BullsEye Digital Fire Trainer	-	-	-	-	-	-	28
FDM Software (Apparatus Maintenance Module)	-	20	-	-	-	-	-
	120	127	190	281	439	377	112



CAPITAL FUND - 2017 Capital Projects

		2017 Budget Recommended (\$000s)	Formula Funding (\$000s)
Public Safety	Page		
Directorate			
Wildland Fire Mitigation -Emergency Measures	180	125	125
Municipal Enforcement			
Radar Equipment Replacement	182	5	5
		130	130
Fire & Ambulance			
Paving and Foundation Repairs	184	30	30
Fire Safety Helmets	185	12	12
Portable Radios	186	132	132
Bunker Gear	187	20	20
Additional Firefighter Outfitting Cost	188	40	40
Automatic External Defibrillators	189	105	105
Fire Hall Emergency Generator	190	100	100
		439	439
Subtotal		569	569

CAPITAL FUND - 2017 Capital Projects

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

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total
Capital Cost	118,000	110,000	135,000	363,000
O&M Expenses	7,000	15,000	15,000	37,000
Total:	125,000	125,000	150,000	400,000
Formula Funding	125,000	125,000	150,000	400,000
Grants				

Purpose

This project is the continuation of emergency mitigation, started in 2015. Specifically, the project is intended to protect residential neighbourhoods in the southern portion of our City from the risk of wildland fire.

Background

Starting in 2010, the Government of the Northwest Territories Department of Environment and Natural Resources (ENR) began to conduct assessments for territorial communities in relation to the risk of wildfire. The GNWT-ENR Department completed the “Yellowknife Community Wildfire Protection Plan” in 2012 for the City, and this report has become the basis for the City’s wildland fire mitigation strategy.

The 2014 and 2015 forest (or wildland) fire seasons in the Northwest Territories (NWT) were the worst ever recorded in the territory. The 2016 fire season was difficult elsewhere in Canada (northern British Columbia and northern Alberta) as well, and new climate models indicate low water levels and minimal precipitation in the years to come in the NWT. Wildland (forest) fires are often large and difficult to control or subdue; therefore, work that reduces the risks from wildland fire is important to ensure the safety of our residents.

Based upon recommendations from ENR regarding “fire-smarting” in Yellowknife, this phased approach will continue to deal with the most serious threats first.

Work in 2017 will provide for the following:

1. A review of the number of emergency structure protection kits, forestry hoses and pumps, as suggested by officials from ENR, to determine if more kits or equipment are required. Each structural protection kit includes hoses, connections and sprinklers that could be deployed in neighbourhoods threatened by approaching wildland fires (multiple neighbourhoods facing the south); and
2. Brush-clearing in specific areas of the city as part of an overall “fire-smarting” project - For more information on fire-smarting, visit; www.firesmartcanada.ca. In 2016, no new specialized equipment was needed for the areas where work was completed. In 2017 and beyond, however, City crews will continue to review equipment requirements to assist with work.

If the City of Yellowknife does not continue with this project, there is a risk that those properties near the forested areas of the southern-side of the City may be exposed to a wildland fire. As the City only has 24 full-time firefighters, mitigating the risks to the City will assist in dealing with any potential emergency in the future as the City has limited mutual aid (Town of Hay River, Town of Fort Smith) and any ‘available’ resources (personnel or equipment) from ENR.



Triple Bottom Line

Social

By conducting emergency mitigation for those neighbourhoods towards the south, the City is enhancing the safety of our residents in the event of a future wildland fire. As part of the work, fire-smart activities will open up the area and clear underbrush and could allow for more activity in those areas through established or ad hoc trails in the area (An active city).

Economic

This project is an investment in the City's emergency response capabilities. It is a proactive solution to ensure that emergency responders are utilized in the best possible manner and have the appropriate equipment to deal with an eventual wildland fire risk. This strategic investment in infrastructure is similar to what other communities in southern Canada have done to mitigate emergencies. Such projects often save 3-4 times their cost in future potential damages (e.g., City of Winnipeg flood mitigation, 1959 to present; City of Calgary flood, 2013).

Environmental

Fire-smart activity opens spaces up and helps protect them from fire by removing ground-source fuels that could be ignited by an ember storm. This work, along with the deployment of sprinkler kits by City personnel, will limit the ability of wildland fires to spread into adjacent neighbourhoods.

Operational Impact

As stated earlier, the strategic investment in infrastructure will allow emergency responders to better assess, handle and control a potential wildland fire approaching the City. Staff from Community Services has performed the majority of the work in 2016, with input from Public Safety and Planning and Development. This will continue in 2017 and, depending on resources, the City may employ outside contractors to assist in the work. Brush that has been cleared will be used in other City operations, if possible.

CAPITAL FUND - 2017 Capital Projects

Department/Division Public Safety / Municipal Enforcement Division
 Project Radar Equipment Replacement

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	5,000			5,000
O&M Expenses				
Total:	5,000			5,000
Formula Funding	5,000			5,000
Grants				

Purpose

To complete the purchase of new radar equipment (two were purchased in 2016, the final unit to be purchased in 2017) for Municipal Enforcement Vehicles to allow the continued enforcement of speed limits within the City of Yellowknife.

Background

The City of Yellowknife Municipal Enforcement Division (MED) has 4 vehicles that patrol approximately 120 km of municipal maintained roads and approximately 30 km of territorial highways that are within our municipal boundaries. MED 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 speed of vehicles to the front and rear of the patrol car. A substantial amount of time is spent enforcing speeding infractions, as this is one of the most serious risks to public safety on our roadways.

One of the radar units was replaced during the 2015 budget by City Council. The remaining three radar units currently in use are more than 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 returned and put back in operation.

Radar technology has advanced since these older 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. When new radar units are purchased, the old units will be kept for use as backup when a unit is out for service, ensuring uninterrupted radar enforcement. This will complete the purchase of the fleet's radar equipment.

Triple Bottom Line

Social

This new equipment will ensure no interruption in essential emergency services to the residents of the City of Yellowknife, contributing to a safe community.

Economic

This project is a strategic investment in MED's essential equipment. Improvement and maintenance of our mobile equipment is vital to continued provision of essential services to our residents.



Environmental

The use of mobile radar equipment in MED vehicles ensures that fewer people speed and should result in less collisions and the effect those accidents have on our roadways and eco-system (chemical/fuel spills).

Operational Impact

Aging technology (infrastructure) costs have a higher operational cost as they get older. In the case of electronic equipment operating at a range of temperatures in the vehicles, the down-time of the equipment will adversely affect MED staff and their enforcement activities.

CAPITAL FUND - 2017 Capital Projects

Department/Division Public Safety / Fire and Ambulance Division
 Project Paving and Foundation Repairs

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	30,000			30,000
O&M Expenses				
Total:	30,000			30,000
Formula Funding	30,000			30,000
Grants				

Purpose

To repair both the foundation and surrounding pavement adjacent to the fire hall to reduce future maintenance costs and further damage to the building

Background

The City's Fire Hall was built in 1989 and opened in 1991. Since that time, there has been one expansion (addition) in 2012 with minor retrofits to some of the operating systems in the facility.

In 2016, this project was brought forward and it was requested that a structural engineer review the foundation and report back. That report was completed and noted that the initial budget of \$80,000 (including the structural engineer's report) would require an additional funding in the amount of approximately \$30,000.

Triple Bottom Line

Social

The improvements to the fire hall will ensure no interruption in essential emergency services to the residents of the City of Yellowknife, contributing to a safe community.

Economic

This project is a strategic investment in Yellowknife's only fire hall and ensures the provision of emergency services within the community.

Environmental

N/A

Operational Impact

Aging infrastructure costs have a higher operational cost over time. This project may have a minimal impact if Public Works could assist with the scheduling of this work in conjunction with other paving work in the area (to help offset costs).



CAPITAL FUND - 2017 Capital Projects

Department/Division Public Safety / Fire and Ambulance Division
 Project Fire Safety Helmets

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	12,000	9,000	9,000	30,000
O&M Expenses				
Total:	12,000	9,000	9,000	30,000
Formula Funding	12,000	9,000	9,000	30,000
Grants				

Purpose

To replace outdated bunker gear to meet requirements set out in the National Fire Protection Association (NFPA) guidelines for protective gear.

Background

The City of Yellowknife Fire Division (YKFD) budget in O&M has historically not been able to keep up with the required replacement and maintenance of outdated or worn protective gear on an annual basis.

The Office of the Fire Marshall (OFM) of the Government of the Northwest Territories (GNWT) has adopted some standards of the National Fire Protections Association (NFPA) within the regulations of the *Fire Protection Act* of the Northwest Territories. The NFPA 1851 has a standard (or best practices) on the age that certain equipment must be replaced and that standard is adopted by manufacturers and certified repair agencies for that equipment. If a helmet is older than 10 years as stipulated by the NFPA, they will no longer be repaired by the certified repair agency and leaves the YKFD short of required equipment.

Triple Bottom Line

Social

The improvements to protective equipment utilized on scene will ensure no interruption in essential emergency services to the residents of the City of Yellowknife, contributing to a safe community.

Economic

This project is a strategic investment in Yellowknife’s fire and rescue services and ensures the provision of emergency services within the community.

Environmental

N/A

Operational Impact

The YKFD has an O&M budget to maintain protective gear, however, it is not enough to replace all outdated bunker gear, helmets, gloves, and do any necessary repairs or servicing.

CAPITAL FUND - 2017 Capital Projects

Department/Division Public Safety / Fire and Ambulance Division
 Project Portable Radios

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	132,100	141,000		273,100
O&M Expenses				
Total:	132,100	141,000		273,100
Formula Funding	132,100	141,000		273,100
Grants				

Purpose

To replace outdated radios that have reached the end of their useful life cycle and will not have parts or servicing available beyond 2017.

Background

The City of Yellowknife Fire Division (YKFD) responds to approximately 5,000 emergency and non-emergency calls for service each year. The portable radios are part of a larger system developed to provide a robust and reliable communications system that will protect the City's employees, citizens and property.

The portable radios used by the YKFD are often utilized in harsh conditions at emergency scenes and may be subject to extreme cold, heat, water or other fluids that could affect their operations if they are not designed to handle those conditions.

The current radios are near the end of their serviceable life and will no longer have replacement parts sometime in 2017, making them extremely difficult to repair in the event that they become damaged or no longer work. The budget was determined to replace half of the radios required by YKFD in the 2017 fiscal year and then replace the remaining radios in 2018, to complete the project.

Triple Bottom Line

Social

The improvements to the communications required on scene will ensure no interruption in essential emergency services to the residents of the City of Yellowknife, contributing to a safe community.

Economic

This project is a strategic investment in Yellowknife's fire and rescue services and ensures the provision of emergency services within the community.

Environmental

N/A

Operational Impacts

There should be minimal operational impacts as the O&M in place for communications will still be required for repairs or replacement of parts if required after fire or rescue scenes. Given the nature of emergency scenes, equipment is often used to in harsh conditions with demands that are immediate in nature.



CAPITAL FUND - 2017 Capital Projects

Department/Division Public Safety / Fire and Ambulance Division
 Project Bunker Gear

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	20,000	10,000	10,000	40,000
O&M Expenses				
Total:	20,000	10,000	10,000	40,000
Formula Funding	20,000	10,000	10,000	40,000
Grants				

Purpose

To replace outdated bunker gear to meet requirements set out in the National Fire Protection Association (NFPA) guidelines for protective gear.

Background

The City of Yellowknife Fire Division (YKFD) budget in O&M has historically not been able to keep up with the required replacement and maintenance of outdated or worn protective gear on an annual basis. If bunker gear is destroyed during a fire or hazmat situation, the bunker gear costs are billed out. However, the revenues go back into the general revenues of the City (as the process for most billings) and not back to the YKFD to replace the bunker gear in question.

The Office of the Fire Marshall (OFM) of the Government of the Northwest Territories (GNWT) has adopted some standards of the National Fire Protections Association (NFPA) within the regulations of the *Fire Protection Act* of the Northwest Territories for the manufacture of bunker gear. The NFPA 1851 has a standard (or best practices) on the age that certain equipment must be replaced and that standard is adopted by manufacturers and certified repair agencies for that equipment. If bunker gear is older than 10 years as stipulated by the NFPA, they will no longer be repaired by the certified repair agency and leaves the YKFD short of required bunker gear.

Triple Bottom Line

Social

The improvements to protective equipment utilized on scene will ensure no interruption in essential emergency services to the residents of the City of Yellowknife, contributing to a safe community.

Economic

This project is a strategic investment in Yellowknife’s fire and rescue services and ensures the provision of emergency services within the community.

Environmental

N/A

Operational Impact

The YKFD has an O&M budget to maintain protective gear, however, it is not enough to replace all outdated bunker gear, helmets, gloves, and do any necessary repairs or servicing.

CAPITAL FUND - 2017 Capital Projects

Department/Division Public Safety / Fire and Ambulance Division
Project Additional Fire Fighters – Outfitting Costs

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	40,000			40,000
O&M Expenses				
Total:	40,000			40,000
Formula Funding	40,000			40,000
Grants				

Purpose

The Yellowknife Fire Division (YKFD) in 2017 will hire four (4) additional fire fighters July. All gear, clothing and equipment will need to meet requirements set out in the National Fire Protection Association (NFPA) guidelines.

Background

During the 2017 budget deliberations, Council recommended that the City of Yellowknife Fire Division (YKFD) hire an additional four (4) fire fighters for July of 2017. The additional personnel will require additional equipment that was not previously budgeted towards. Therefore, Council requested that these costs be included as a separate budget item.

These outfitting costs will cover the costs for the following required equipment (list is not exhaustive); bunker gear, safety helmets, station wear, boots, pagers, O&M costs for physicals/medicals and new lockers.

Triple Bottom Line

Social

The improvements to protective equipment utilized on scene will ensure no interruption in essential emergency services to the residents of the City of Yellowknife, contributing to a safe community.

Economic

This project is a strategic investment in Yellowknife's fire and rescue services and ensures the provision of emergency services within the community.

Environmental

N/A

Operational Impact

The YKFD has an O&M budget to maintain protective gear. However, it is not enough to purchase new bunker gear, helmets, gloves for the additionally requested fire fighters and do any necessary repairs or servicing through the year.



CAPITAL FUND - 2017 Capital Projects

Department/Division Public Safety / Fire and Ambulance Division
 Project Automatic External Defibrillators (AED's)

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	105,000			105,000
O&M Expenses				
Total:	105,000			105,000
Formula Funding	105,000			105,000
Grants				

Purpose

To replace outdated automatic external defibrillators found in the City of Yellowknife Fire Division (YKFD) ambulances.

Background

The current automatic external defibrillators (AED's) are outdated and parts have become difficult to locate when repairs are needed. The YKFD has already experienced frequent breakdowns or battery issues on 3 of the 4 AED's that are used within the fleet. There is one AED per ambulance and one AED for the rescue truck.

These are not pieces of equipment that get replaced when they break down; they need to be replaced before anticipated failures. The current AED's with the ambulance fleet are used 3 to 4 times per day, often when a patient complains of chest pains as the AED's allow for the monitoring of vital signs for the patient.

Triple Bottom Line

Social

The improvements to protective equipment utilized on scene will ensure no interruption in essential emergency services to the residents of the City of Yellowknife, contributing to a safe community.

Economic

This project is a strategic investment in Yellowknife's fire and rescue services and ensures the provision of emergency services within the community.

Environmental

N/A

Operational Impact

The YKFD does have an O&M budget to maintain medical supplies, thus the purchase of new AED's will not affect that budget area.

CAPITAL FUND - 2017 Capital Projects

Department/Division Public Safety / Fire and Ambulance Division
 Project Fire Hall Emergency Generator

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	100,000			100,000
O&M Expenses				
Total:	100,000			100,000
Formula Funding	100,000			100,000
Grants				

Purpose

To replace a 27 year-old emergency stand-by generator for the fire hall that also acts as the secondary Emergency Operations Centre for the City of Yellowknife in the event of an emergency.

Background

When the City of Yellowknife fire hall was built in 1990 it had an emergency stand-by generator installed to ensure there was power for our emergency responders. The generator has worked beyond its useful age and the City's mechanics and private contractors (called in to attempt repairs) recommend that it should be replaced.

The cost for the replacement generator was reviewed by Public Works as they have replaced, installed or repaired the majority of the back-up generators within the City (used at pumphouses or lift stations).

Triple Bottom Line

Social

The improvements to equipment used within the fire hall will ensure no interruption in essential emergency services to the residents of the City of Yellowknife, contributing to a safe community. Further, this will ensure the YKFD can meet the public expectations of the City's mandates, as the

fire hall is the back-up "Emergency Operations Centre" and the emergency generator ensures that this contingency plan works.

Economic

This project is a strategic investment in Yellowknife's fire and rescue services and ensures the provision of emergency services within the community.

Environmental

N/A

Operational Impact

There will be a positive impact on O&M once the generator has been replaced given the repairs and necessary maintenance required on that machinery.



CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Planning & Development							
Housing & Affordability Strategy/ Eco Housing	-	21	-	10	-	-	-
50th Street Revitalization & Business Incubation	-	175	-	13	-	-	-
School Draw Parking Lot Improvements					250		
50 th Street Revitalization	-	-	-	-	75	-	1,900
Harbour Plan & Smart Growth Improvements	350	194	-	159	-	-	-
Streetscaping Initiatives	250	250	-	394	-	-	-
	600	640	-	576	325	-	1,900

		2017 Budget Recommended (\$000s)	Formula Funding (\$000s)	Downtown Development Reserve (\$000s)
Planning & Development	Page			
School Draw Parking Lot Improvements	192	250	250	
Downtown Multi-Purpose Building Study	194	75	-	75
Subtotal		325	250	75

(cont'd...)

CAPITAL FUND - 2017 Capital Projects

Department/Division Planning and Development
 Project School Draw Parking Lot Improvements

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	250,000			250,000
O&M Expenses	15,000	15,000	15,000	45,000
Total:	265,000	15,000	15,000	295,000
Formula Funding	250,000			250,000
Grants				

Purpose

To complete improvements to the parking lot on the corner of School Draw Avenue and Franklin Avenue.

Background

In May 2016, a public meeting was held to discuss details of the 2016 Paving Program, specifically regarding the Franklin Avenue portion of the capital work. During the discussions it became prevalent that the City should investigate options to upgrade the School Draw Parking Lot to accommodate parking demands in the Old Town area. Because parking has been removed from Franklin Avenue this further exacerbates the need for enhanced parking at other locations such as the School Draw corner.

The approximate area of the parking lot is 5000 square meters. It also serves as a parking and loading area for Lift Station #1, as well as a recycling depot location and parking for the community/public garden as can be seen in the attached photo.

The proposed budget is for grading, rearrangement, and asphalt surfacing of the entire site. It would also include increased signage and advertising of this lot as a public parking area. This scope of work can be altered to reduce the budget allocation; with the understanding this will impact the final product.

Triple Bottom Line

Social

This project will further help delineate this public parking area and help to address some of the parking demands in the Old Town neighbourhood.

Economic

The economic benefits of this project are minimal but would be reflected in increased use of the Old Town neighbourhood, which includes several businesses. The City could potentially look into leasing permanent parking stalls for boat trailers and overnight/weekend parking, but is not the recommendation of the capital write up.

Environmental

This project would help to reduce dust and debris in the area, and rearrangement would promote a more efficient use of the land.

Operational Impact



The annual snow removal costs for the YK Arena parking lot are approximately \$15,000 which includes equipment, labour and materials. This area would be similar in size and would require the same effort should this level of service be required. Alternatively, it can be graded and maintained as/when needed which would lower the frequency of snow removal activities.



Photo: School Draw Parking Lot aerial photo.

CAPITAL FUND - 2017 Capital Projects

Department/Division Planning and Development
Project Downtown Multi-Purpose Building Study

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	75,000			75,000
O&M Expenses				
Total:				
Formula Funding				
Downtown Development Reserve	75,000			75,000

Purpose

This project has been requested by Council with the goal of advancing the Downtown revitalization strategy.

Background

Realizing Council's vision of revitalizing the Downtown requires a committed effort including coordinated capital investment. In May of 2016 the final report - "50th Street/50th Avenue Revitalization Report" was submitted by Taylor Architecture Group and Picea Landscape Architecture to Administration. Council decided to defer consideration of this report and Planning and Development's recommendations until they established goals, objectives and an overarching vision for the Downtown.

The draft report incorporates broad concepts and options for an integrated Library and Cultural Centre within the heart of the Downtown on either the 50/50 Lot or the three City owned lots on the Gold Range side of the street. This report includes estimated square footage of the proposed uses as well as the Class "D" estimated costs.

The Multipurpose Building Study will go into more detail in exploring options for an integrated civic facility that can host uses such as the library, cultural centre, and other commercial institutional uses within the Down-

town. It will do so by engaging various user groups and municipal Departments with clear direction and vision from Council.

Triple Bottom Line

The project aligns with a number of plans including the Smart Growth Development Plan, the General Plan, Economic Development Strategy, and the Tourism Development Strategy.

Social

Investment in the Downtown is required to improve quality of life, pride, and cultural identity. The initiative advances work to creating a safer and healthier neighbourhood for all residents by diversifying the land use mix and promoting active transportation. The project creates the opportunity for ongoing community partnerships and cooperation between business, non-governmental organizations and other levels of government. This private/public space balance in the heart of the City is vital to Yellowknife's character, identity, and cultural diversity. Without it the benefits of the social contract and broader public good are diminished along with the hope of improving the associated issues of homelessness and addictions.



Economic

Downtown investment is a “smart” allocation of capital, as development in this area generates the highest tax revenues for the City while minimizing the infrastructure deficit. The proposed study aims to revitalize the core by encouraging business investment, tourism, and a “sense of place”. Numerous buildings in the area (on 50th and 51st Street) are in significant decline and the trend of vacancies projected five years ago continues, suggesting further redevelopment is imminent.

Environmental

A compact City with a mix of land uses increases active modes of transportation and reduces the number of motorized trips people take. The location of such a facility in the heart of the Downtown will serve to revitalize the core, promote mixed use development, and encourage active transportation.

Operational Impact

While the proposed study will rely on consultants to do the majority of work it will require time investment by Planning and Development staff as well as the time of other Departments for their involvement. There will be no increase or decrease to the O&M budget for this project.

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CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Public Works & Engineering							
Fleet Replacement	1,126	522	1,089	3,065	1,090	1,119	1,550
Engineering & Garage	-	-	-	-	-	50	500
New Mobile Equipment Hoist	40	-	25	-	-	-	-
Traffic Lights Video Detection	20	22	200	249	80	80	80
Diagnostic Equipment & Specialty Tools For Mechanics	-	12	-	-	-	-	-
Traffic Light Installation - 44 Street & Franklin Avenue	-	-	-	-	-	500	-
Transit Upgrades (Federal Funded)	-	-	-	-	213	213	-
	60	34	225	249	293	843	580
Roads & Sidewalks	-	-	-	-	-	-	825
McMeekan Causeway Stabilization	-	-	-	-	-	450	-
Road Rehabilitation	2,350	2,007	2,850	2,850	2,950	4,500	3,300
Intersection Widening & New Traffic Light Installation	-	-	-	-	500	-	-
Drainage Improvements and Storm Sewer Repairs	50	50	-	-	-	-	-
	2,400	2,057	2,850	2,850	3,450	4,950	4,125

(cont'd...)



CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Road Rehabilitation							
Latham Island Area:							
Otto Drive							700
Central Business District:							
50 St (52 Ave to 51 Ave)	700						
52 Ave. (49 St. to 56 St.)	450	840					
51 St (52 Ave to 51 Ave)					600		
52 St (52 Ave to 51 Ave)					600		
Franklin Ave. (41 St. to Wiley Rd.)			2,000	2,075			
Northlands						1,300	
School Draw Avenue							800
Kam Lake Area:							
Kam Lake Road					1,750		
Cameron Rd. (Kam Lake Industrial Park)			350	325			
Etthen Drive, Taltheilei Drive	1,200	1,167	500	450			
Hall Crescent (Phase 1 & 2)						1,700	
Hall Crescent (Phase 3 & 4)							1,800
Grace Lake North						850	
Highway#4 Sidewalk						650	
	2,350	2,007	2,850	2,850	2,950	4,500	3,300

(cont'd)

CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Sustainability & Solid Waste Management	-	-	-	-	-	400	400
Landfill/Baler							
Landfill Expansion/New Landfill Cell Construction	-	21	3,500	3,711	-	-	-
Baling Facility Mechanical Upgrades	25	2	-	-	-	-	-
Site Restoration Liability	-	-	-	18	-	-	-
Recommendations of Wildlife Study	-	25	-	-	-	-	-
Recycling Depot Fencing	-	5	-	-	-	-	-
Centralized Composting Project/ Program	825	487	750	750	700	150	-
Baling Facility Roof Repairs	-	-	100	100	-	-	-
Waste Audit & Long Term Planning Study	-	-	-	-	75	-	-
	850	540	4,350	4,579	775	550	400
Community Energy Plan (CEP)							
Sustainability Coordinator	95	116	100	83	100	100	100
CEP Energy Efficiency Projects	205	236	1,235	582	1,205	550	1,000
	300	352	1,335	665	1,305	650	1,100



CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Water & Sewer							
Pumphouses (PHs)/Liftstations(LSs)/Forcemains							
Water Treatment Plant/Reservoir Expansion	8,321	4,430	150	150	-	-	-
Federal Funded Projects	-	-	-	-	12,863	7,963	425
PH#4 Righ-Hand Only Exit	-	-	-	-	50	-	-
Capital Upgrades	65	22	-	43	-	-	-
Potable Water Reservoir Flushing & Cleaning	-	5	-	-	-	-	-
Pump Replacement Program	100	39	-	61	-	-	-
Monitoring & Controls Maintenance and Upgrading	75	148	-	-	-	-	-
	8,561	4,644	150	254	12,913	7,963	425
Other	-	-	-	-	-	240	1,200
Water Meter Replacement & Upgrade	15	1	-	14	-	-	-
Submarine Intake Line	-	-	-	-	-	-	1,000
Potable Water Submarine Pipe Inspection	-	-	30	30	-	-	-
Water & Sewer Service Repairs	-	-	250	250	-	-	-
PH & LS - Genset Installation	175	85	-	90	-	-	-
Lagoon Control Structure Replacement	-	47	-	-	-	-	-
Lagoon Phosphorus Study	-	-	-	-	50	-	-
Water Source Selection Study	-	-	-	-	75	-	-
	190	133	280	384	125	240	2,200

(cont'd...)

CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Water & Sewer							
Pumphouses (PHs)/Liftstations(LSs)/Forcemains							
Water Treatment Plant/Reservoir Expansion	8,321	4,430	150	150	-	-	-
Federal Funded Projects	-	-	-	-	12,863	7,963	425
PH#4 Righ-Hand Only Exit	-	-	-	-	50	-	-
Capital Upgrades	65	22	-	43	-	-	-
Potable Water Reservoir Flushing & Cleaning	-	5	-	-	-	-	-
Pump Replacement Program	100	39	-	61	-	-	-
Monitoring & Controls Maintenance and Upgrading	75	148	-	-	-	-	-
	8,561	4,644	150	254	12,913	7,963	425
Other	-	-	-	-	-	240	1,200
Water Meter Replacement & Upgrade	15	1	-	14	-	-	-
Submarine Intake Line							1,000
Potable Water Submarine Pipe Inspection	-	-	30	30	-	-	-
Water & Sewer Service Repairs	-	-	250	250	-	-	-
PH & LS - Genset Installation	175	85	-	90	-	-	-
Lagoon Control Structure Replacement	-	47	-	-	-	-	-
Lagoon Phosphorus Study	-	-	-	-	50	-	-
Water Source Selection Study	-	-	-	-	75	-	-
	190	133	280	384	125	240	2,200

(cont'd...)



CAPITAL FUND - 2017 Capital Projects

	2015 Budget (\$000's)	2015 Actual (\$000's)	2016 Budget (\$000's)	2016 Forecast (\$000's)	2017 Budget Approved (\$000's)	2018 Budget (\$000's)	2019 Budget (\$000's)
Water & Sewer Infrastructure Replacement: (includes repavement and concrete)							
Central Business District:							
54 Avenue							1,500
Forrest Drive Area:							
Con Road - Rycon to 54 St. (2016 Water & Sewer, 2017 Paving)			2,300	2,300	780		
Forrest Dr - Burwash Dr. to 51A Ave.(2015 Water & Sewer & 2016 Paving)	750	793	500	400			
Frame Lake South:							
Horton Crescent (2015 Water & Sewer, 2016 Paving)	2,045	3,156	700	800			
Williams Avenue (2017 Water & Sewer & 2018 Paving)					2,100	800	
Dagenais Drive (2018 Water & Sewer, 2019 Paving)						3,500	1,800
	2,795	3,949	3,500	3,500	2,880	4,300	3,300

CAPITAL FUND - 2017 Capital Projects

		2017 Budget Recommended (\$000s)	M.E.R. Reserve (\$000s)
Public Works & Engineering	Page		
Fleet Management	205		
1167-06 F250 4X4		65	65
1106-07 Polaris Snowmobile S07PT6HS		13	13
1115-07 Polaris Snowmobile S07PT6HS		13	13
1049-13 F-150 XLT		64	64
1125-04 F-150		36	36
1061-07 RAM 1500		37	37
1102-04 F-350 W/Service Body		43	43
2064-07 LT8500 Sterling Haul (SWF)		164	164
1069-07 E-150		42	42
1160-05 60" Exmark Mower		15	15
2109-01 E-350 SD Ambulance		250	250
2120-98 Ford LT8513 Water Tanker		332	332
T014-97 Tandem Tilt Trailer		16	16
		1,090	1,090

		2017 Budget Recommended (\$000s)	Formula Funding (\$000s)	Grants (\$000s)	Gas Tax Rebate (\$000s)	Community Public Infrastructure Funding (\$000s)
Engineering & Garage	Page					
Traffic Lights Video Detection	209	80	80			
Transit Upgrades (Federal Funded)	211	213	53	160		
Roads & Sidewalks						
Road Rehabilitation	213	2,950	233		507	2,210
Intersection Widening & New Traffic Light Installation	217	500	500			
		3,743	866	160	507	2,210

(cont'd...)



CAPITAL FUND - 2017 Capital Projects

		2017 Budget Recommended (\$000s)	Formula Funding (\$000s)	Gas Tax Rebate (\$000s)
Solid Waste Management	Page			
Landfill				
Centralized Composting Program	219	700		700
Waste Audit & Long Term Planning Study	221	75	75	
		775	75	700
Community Energy Plan (CEP) Initiatives				
Sustainability Coordinator	222	100	100	
Interior LED Lighting	222	110		110
Community Outreach	222	20	20	
Centralized Biomass Boiler Projects	224	1,075		1,075
		1,305	120	1,185

(cont'd...)

CAPITAL FUND - 2017 Capital Projects

		2017 Budget Recommended (\$000s)	Formula Funding (\$000s)	Water & Sewer User Fees (\$000s)	Grants (\$000s)	M.E.R. Reserve (\$000s)	Gas Tax Rebate (\$000s)	Community Public Infrastructure Funding (\$000s)
Pumphouses/Liftstations (PHs/LSs)	Page							
Federal Funded:								
CMP/W&S	211	12,100	776	2,249	9,075			
LS#5 Piping	211	263	66		197			
Supervisory Control & Data Acquisition (SCADA) System Upgrades	211	500	125		375			
PH#4 Righ-Hand Only Exit	226	50		50				
Other								
Lagoon Phosphorus Study	228	50		50				
Water Source Selection Study	229	75		75				
Water & Sewer Infrastructure Replacement	231	2,880					2,880	
		15,918	967	2,424	9,647	-	2,880	-
PW Subtotal		22,831	2,028	2,424	9,807	1,090	5,272	2,210



CAPITAL FUND - 2017 Capital Projects

Department/Division Public Works & Engineering / Fleet Management
 Project Annual Fleet Replacement Program

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	1,090,000	1,119,000	1,550,000	3,759,000
O&M Expenses				
Total:				
M.E.R. Reserve	1,090,000	1,119,000	1,550,000	3,759,000
Grants				

Purpose

To continue replacing fleet units according to the City's Fleet Management Practices.

Background

The mobile equipment fleet has a replacement value of \$16.2 million and must be maintained to meet the service levels expected by residents. The City has a fleet of 148 heavy-duty and mobile equipment that support Fire and Ambulance, Road Maintenance, Water and Sewer Maintenance, Solid Waste, Parks, Arenas and Administrative functions, plus 26 stationary engines for emergency power generation and fire pumping capacity.

Fleet management practices allow the City to properly budget and plan the replacement of all fleet vehicles on a regular basis. These policies and practices help to mitigate risk and repair costs associated with aged vehicles. As vehicles and equipment get older, the operation and maintenance costs of those vehicles increase, with limited resources available for maintenance and repairs. These vehicles should be replaced on a scheduled basis to reduce 'down time' due to repairs or failures, which could negatively impact the delivery of City services such as snow removal or water/sewer repairs.

Summary of Units:

Small Equipment – 30 units

Small 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), 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.

Light-Duty Trucks – 41 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 41 pickup trucks and vans in the fleet. The ages vary from one year to more than ten years, depending on current use of those units.

Medium-Duty Trucks – 8 units

According to the City of Yellowknife Fleet Management Practices, these vehicles should be reviewed for replacement after Six years and replaced after ten years. The City currently has eight medium-duty trucks in the fleet.

CAPITAL FUND - 2017 Capital Projects

Heavy Trucks – 15 units

The 15 heavy-duty trucks and trailers includes: trailers, tandem tractors, dump trucks. The heavy trucks are to be replaced every twelve years. 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 approximately 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.

Heavy Equipment – 10 units

The heavy equipment is to be replaced every 12 years, except specialty equipment, which is explained under that heading. Each piece of heavy equipment is operated for approximately 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 – 9 units

This includes Zambonis, skid steers, compactors, and forklifts. The anticipated life span is ten years.

Municipal Enforcement Vehicles – 4 units

These are to be replaced every four years or 100,000 km. Due to 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 labor requirements.

Emergency Vehicles – 10 units

This includes fire trucks, ambulances and water trucks. Due to increased demand, the replacement life cycle standard has been evaluated by the Public Works and Fire Department. The standard for replacement was reduced from 30 years to 20 years for most firefighting equipment. Ambulances are now replaced on a 12-year cycle due to the high amount of use and reliability is-

sues 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.

Seasonal Vehicles – 18 Units

Once a vehicle is removed from its primary use, such as a light duty pick up, they are placed into a lower priority use such as summer student work activities. If repair costs of a summer vehicle exceed an estimated cost of \$500, the vehicle may be removed from service at the discretion of the Director of Public Works & Engineering.

Stationary Engines – 26 Units

Our fleet mechanics also maintain and service 26 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 Equipment Reserve Fund (MERF) 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.

Specialty Equipment – 9 Units

These pieces of equipment fall into their own category due to their level of importance to City operations. They are graders, street sweepers and vector trucks. These are replaced more frequently because vital City operations would suffer due to prolonged breakdowns or repairs, which would have a direct impact on residents, vehicular traffic, emergency vehicle routes and the City’s transit system.

Triple Bottom Line



CAPITAL FUND - 2017 Capital Projects

Social

The City's mobile fleet is vital to providing essential and non-essential municipal services to the residents of Yellowknife.

Economic

The City's fleet replacement program reduces the amount of repair time required for the various units. Reduction of repairs results in less down-time of the units which provides Yellowknife with a more efficient fleet and therefore, provision of municipal services.

Environmental

The replacement of aging vehicles will help to provide a more fuel efficient mobile fleet.

Operational Impact

The total O&M costs of the units to be replaced are shown in the attached table.

CAPITAL FUND - 2017 Capital Projects

2016 Fleet Replacement Schedule									
Unit #:	Description:	Year:	Class:	Replace Year:	Estimated Budget:	O&M To Date:	Hours	Kilometres	End Use:
1167-06	F250 4X4	2006	2	2016	65,000.00	23,400.14	2,845	53,095	New engine, seasonal use, retire yellow unit.
1106-07	Polaris Snowmobile SO7PT6HS	2007	1	2017	13,000.00	2,794.47	n/a	1,454	Trade if possible, or auction.
1115-07	Polaris Snowmobile SO7PT6HS	2007	1	2017	13,000.00	3,652.64	n/a	1,293	Trade if possible, or auction.
1049-13	F-150 XLT	2013	7	2017	64,260.00	36,213.61	8,464	132,246	New engine, seasonal use, retire yellow unit.
1125-04	F-150	2004	2	2014	36,280.00	4,957.98	6,490	114,300	Move to seasonal use, retire yellow unit.
1061-07	RAM 1500	2007	2	2017	36,280.00	3,525.52	3,148	48,724	Move to seasonal use, retire yellow unit.
1102-04	F-350 W/Service Body	2004	2	2014	42,850.00	5,573.65	4,106	114,195	Trade if possible, or auction.
2064-07	LT8500 Sterling Haul (SWF)	2007	4	2014	163,780.00	7,520.00	3,833	29,644	Under evaluation for more suitable unit.
1069-07	E-150	2007	2	2017	41,600.00	5,242.34	7,278	101,161	Trade if possible, or auction.
1160-05	60" Exmark Mower	2005	1	2017	15,300.00	1,117.58	689	n/a	Trade if possible, or auction.
2109-01	E-350 SD Ambulance	2001	8	2017	250,000.00	12,610.62	n/a	170,526	Trade if possible, or auction.
2120-98	Ford LT8513 Water Tanker	1998	6	2017	332,350.00	27,784.26	2,481	22,128	Trade if possible, or auction.
T014-97	Tandem Tilt Trailer	1997	4	2017	15,530.00	2,425.23	n/a	n/a	Upgrade to heavier unit for mini-excavator.
					1,089,230.00	136,818.04			

City of Yellowknife Fleet Replacement Cycle Guidelines Summary:

Class	Description:	Examples:	Life Cycle:
1	Small Equipment	Riding mower, ground thaw, line painter, snowmobiles, ATVs, etc.	Different replacement cycles dependant on use.
2	Light Duty	Cars, vans, half ton trucks, 3/4 ton trucks.	Review after 7 years, replace after 10 years.
3	Medium Duty	One ton to 5 ton trucks, includes zambonis.	Review after 6 years or 100,000 kms, replace after 10 years.
4	Heavy Duty	Trucks/ Trailers used for sanding, snow removal, waste removal, etc.	Review after 6 years or 6000 hrs, replace after 12 years.
5	Heavy Equipment	Loaders, dozers, excavators, backhoes, plows, etc.	Review after 8 years or 10,000 hrs, replace after 12 years.
6	Mobile Tractors	Heavy rollers, sander bodies, steamers, etc.	Review after 8 years or 10,000 hrs, replace after 10 years.
7	Municipal Enforcement	Cars, trucks, SUV ("sport utility vehicles").	Replace after 4 years or 100,000 kms.
8	Emergency Equipment	Fire trucks, tankers, aerial ladder, ambulance, etc.	Replaced based on industry standards and NFPA requirements.
9	Seasonal Vehicles	Any vehicle replaced but still servicable, summer trucks, etc.	Not replaced, removed disposed of if repair costs exceed \$500.
10	Stationary Engines	Used to pump water, sewage, produce emergency power.	Review after 15 years, replacement after 20 years.
11	Specialty Equipment	Graders, street sweepers, vactor trucks, etc.	Replacement depends on the use of the unit.



CAPITAL FUND - 2017 Capital Projects

Department/Division Public Works & Engineering / Engineering and Garage
 Project Traffic Lights Video Detection

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	80,000	80,000	80,000	240,000
Total:				
Formula Funding	80,000	80,000	80,000	240,000
Grants				

Purpose

To upgrade vehicle detection at traffic light intersections from failed in-ground wire loops to video detection equipment.

Background

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.

Anticipated remaining investment as shown on adjacent table:

48 Street	20,000	49 Street	20,000
50 Street	20,000	51 Street	20,000
52 Street	20,000	53 Street	20,000
54 Street	20,000	57 Street	20,000
Gitzel Street	20,000	Forrest Drive	40,000
Woolgar Avenue	40,000	Franklin/OAR	50,000
Byrne Road	40,000	Range Lake Rd	50,000
Borden Drive (Walmart)	40,000	TOTAL	440,000

*not in order of priority

An investment of \$80,000 annually would see this replacement completed in approximately 5 years.

Triple Bottom Line

Social

This project provides essential upgrades to the traffic light system that creates a controlled traffic environment that allows for safe passage of pedestrians and vehicular traffic. Efficiencies also reduce driver frustration and wait times.

Economic

This upgrade is a significant investment in the City's traffic light infrastructure that is vital to allowing efficient and effective traffic control throughout Yellowknife.

Environmental

This project will allow City staff to monitor and program a more efficient traffic light system that will reduce idling times and promote a better flow of traffic.

Operational Impact

The video detection will collect data such as traffic counts which would otherwise require a person counting vehicles which is used for timing and coordination patterns.



Photo: Example of video detection camera.

CAPITAL FUND - 2017 Capital Projects

Department/Division Public Works & Engineering / Water & Sewer/Engineering
Project Federally Funded Capital Projects

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$ (March 31)	Total \$
Capital Cost	13,075,833	8,175,833	425,000	21,676,666
Transit Upgrades	213,333	213,333	-	426,666
CMP/W&S	12,100,000	6,000,000	200,000	18,300,000
LS#5 Piping	262,500	1,312,500	175,000	1,750,000
SCADA Upgrades	500,000	650,000	50,000	1,200,000
Total:	13,075,833	8,175,833	425,000	21,676,666
Capital Fund		1,991,000		1,991,000
Water & Sewer User Fees	2,248,958		106,250	2,355,208
Formula Funding	1,020,000	52,958		1,072,958
Grants (Federal)	9,806,875	6,131,875	318,750	16,257,500

* Approximate cash flows only, actuals to be determined, fully expended by March 31, 2019.

Purpose

To complete approved projects under the Clean Water and Wastewater Fund (CWWF) and Public Transportation Infrastructure Fund (PTIF) announced by the Government of Canada.

Background

The Federal Government Budget 2016 announced new infrastructure funding that will be announced in two (2) phases. The first phase has been announced with the Northwest Territories receiving \$51.7 Million in funding for the communities of the Territory.

The federal objective of the funding is to, “accelerate short term municipal investments, while supporting either new or rehabilitation of water, wastewater and storm water infrastructure, and the planning and design of future facilities or upgrades to existing systems. The goal is to accelerate projects that would not occur in the next three years if this funding was not available.”

Project application requirements:

The Federal Government has listed several criteria that have to be met in order to qualify for CWWF and PTIF funding.

1. **Schedule:** Due to auditing requirements of projects and CWWF program reporting requirements, NWT communities should plan to have their approved projects substantially completed and “operational” before March 31, 2019.
2. **Incrementality:** A project that would not otherwise have been undertaken in 2016/17, 2017/18 or 2018/19 and/or a project that would not have been undertaken without federal funding.
3. **Funding:** Municipality must contribute 25% matching funding and have the capacity (cash flow) to outlay cash payments which are then reimbursed quarterly with progress reports to MACA.
4. **City Council Endorsement:** Projects applications must have an attached resolution of Council support for the project and the commitment to the 25% matching funding criteria over the next 2.5 years.

CAPITAL FUND - 2017 Capital Projects

The City of Yellowknife submitted applications for a total funding amount of \$17,382,500, unanimously supported by Council Motion #0211-16. The final approved amount was \$16,257,500.

Approved projects:

This will require the City to commit an additional \$5,419,166.67 to the annual capital budget over the next two fiscal years (2017-18 and 2018-19). This is the required 25% funding to match the federal contribution.

Project descriptions:

	<u>Total</u>	<u>Federal (75%)</u>	<u>City (25%)</u>
Transit Upgrades	426,666.67	320,000.00	106,666.67
CMP/W&S	18,300,000.00	13,725,000.00	4,575,000.00
LS#5 Pipe Replacement	1,750,000.00	1,312,500.00	437,500.00
SCADA Upgrades	1,200,000.00	900,000.00	300,000.00
	<u>21,676,666.67</u>	<u>16,257,500.00</u>	<u>5,419,166.67</u>

1. **Transit Upgrades:** The City's transit service is contracted to a third party; therefore the capital upgrades are limited. We have proposed: Replacement of bus shelters (approx. \$50,000), creating accessible bus stops with proper sidewalk, wheel chair ramps and curb drops (approx. \$150,000), create bus pull out areas to create a safe pull over area for buses removed from lanes of travel (approx.\$200,000).
2. **CMP/W&S Replacement:** We have proposed five (5) additional areas that are in need of immediate repair. They are Franklin Avenue (Gitzel to Norseman), Finlayson Drive (south), Lamoureux Road, Calder Crescent, and Forrest Park. These five (5) areas are in addition to Williams Avenue and Dagenais Drive that are already in the capital plan.
3. **Pipe Replacement at Lift Station 5:** The pipe at Lift Station #5 has deteriorated over time to the point that it is now 40% of its original thickness. Average thickness at elbow bends is 50% of original thickness and most straight-run pipes are 60% to 65% of original thickness (A.D. Williams Engineering, November 2004). Leaks require repair approximately every two months. Should pipe replacement not be completed, it is inevitable that a main pipe break will occur resulting in the City being unable to remove sewage. Lift Station #5 is the main

lift station for the city. All but one of the other lift stations in the city pump sewage to this facility and from there it is pumped to Fiddler's Lake Lagoon. This project was once part of the capital plan but had to be removed because of higher priority projects, this is a great opportunity to complete the project.

4. **SCADA System Upgrades:** This project would help to modernize our SCADA (Supervisory Control and Data Acquisition) system, which monitors and controls the City's pump houses and lift stations. Many parts are now obsolete and with the advancement of computer technology, some replacement parts are no longer available and upgrades are required. This project was once part of the capital plan but had to be removed because of higher priority projects, this is a great opportunity to complete the project.

Triple Bottom Line

Social

This project provides safe and reliable water and sewer infrastructure necessary for quality of life of our residents.

Economic

This funding provides a large investment into the City's water and sewer infrastructure. The \$16,257,500 in federal dollars will allow the City to invest future funding into other projects that would have been otherwise allocated to these investments.

Environmental

This project replaces old and potentially failing infrastructure in Yellowknife neighbourhoods with new and reliable assets. This removes the possibility of ground and property contamination due to main breaks or blockages.

Operational Impacts

Aging infrastructure has an operational cost somewhere between 2-4% of replacement costs. By replacing this infrastructure, it allows the department to focus operational and maintenance activities on other areas of the water and sewer systems.

This project will have minimal impact on other City departments.



CAPITAL FUND - 2017 Capital Projects

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

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	2,950,000	4,500,000	3,300,000	10,750,000
Kam Lake Road	1,750,000			
51 Street (52 Ave - 51 Ave)	600,000			
52 Street (52 Ave - 51 Ave)	600,000			
Northlands		1,300,000		
Hall Crescent - Phases 1&2		1,700,000		
HWY 4 - Sidewalk		650,000		
Grace Lake North		850,000		
Otto Drive			700,000	
School Draw Avenue			800,000	
Hall Crescent - Phases 3&4			1,800,000	
Total:				
Land Fund		850,000		850,000
Formula Funding	740,000	1,440,000	1,090,000	3,270,000
Community Public Infrastructure Funding	2,210,000	2,210,000	2,210,000	6,630,000

Purpose

To repair or replace asphalt, concrete and other appurtenances on City streets as required, including storm water infrastructure. This project also installs concrete, asphalt and landscaping (if specified) on newly developed streets in the City.

Background

The typical design life of pavement is generally between 20 and 25 years, but will vary significantly due to 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.

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.

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

CAPITAL FUND - 2017 Capital Projects

NorthwestTel Cable Inc. to answer present and future needs.

New Road Construction

As new areas of Yellowknife are developed and constructed, the road asphalt and concrete infrastructure must also be installed. There will be three new areas of the City that require new road construction, they are:

- Northlands Area, which includes Stinson Rd, Fairchild Dr, Bellanca Ave, Norseman Dr, Catalina Dr, and Anson Dr, scheduled to be done in 2018.
- Hall Crescent, which will be done in two paving phases in 2018 and 2019, and includes Gibbon Dr.
- Grace Lake North scheduled to be done in 2018.

Triple Bottom Line

Social

This project focuses on providing Yellowknife neighbourhoods with quality pedestrian sidewalks, multi-use paths, and driving surfaces.

Economic

This project is a strategic investment in Yellowknife's road and storm water infrastructure. It is a proactive approach to address the infrastructure deficit that was identified in an infrastructure needs assessment. Continuous improvement is vital to ensuring the provision of essential services to residents.

Environmental

Replacing failing road and storm water infrastructure removes standing water from City streets which can accumulate and cause operational and resident concerns.

Operational Impact

Aging infrastructure has an operational cost somewhere between 2-4% of replacement costs. By replacing this infrastructure, it allows the department to focus operational and maintenance activities on other roads, sidewalks and storm water appurtenances in the City.

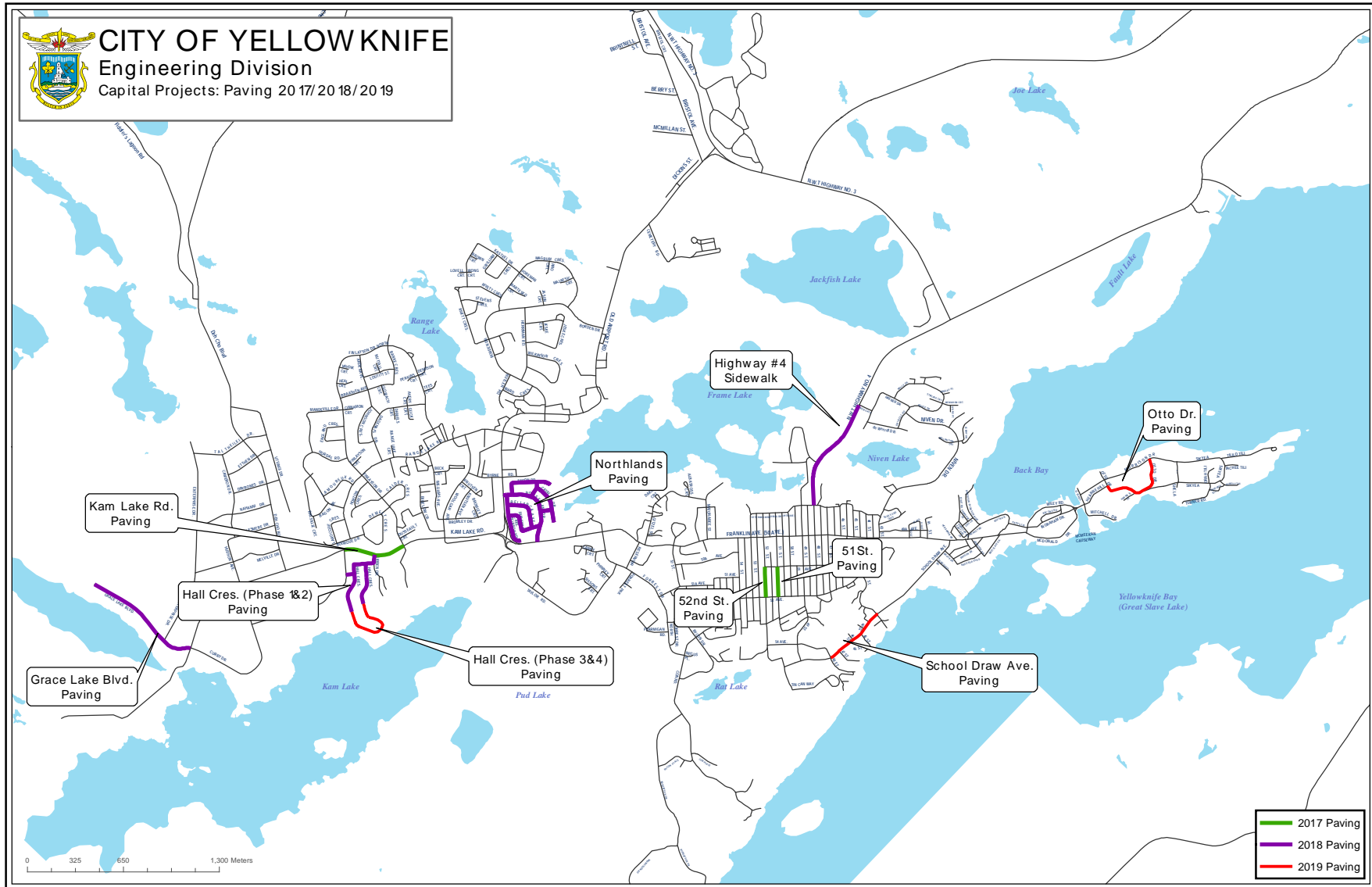
This project will have minimal impact on other City departments as there are no landscaping requirements in the upcoming three-year plan.

However, there will be increased operational costs due to the City taking over the section of Highway #4 from the GNWT. These costs are estimated to be approximately \$55,000 annually for various maintenance activities as well as \$60,000 in added equipment (ie plow wing for grader) necessary for snow removal.





CAPITAL FUND - 2017 Capital Projects



CAPITAL FUND - 2017 Capital Projects

Department/Division Public Works & Engineering / Roads & Sidewalks
 Project Intersection Widening & Traffic Light Installation – Finlayson Dr. and Kam Lake Rd.

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	500,000			500,000
O&M Expenses (+6%)				
Total:				
Formula Funding	500,000			500,000
Grants				

Purpose

To complete road and intersection improvements at the Kam Lake Road and Finlayson Drive intersection, including the installation of a signalized intersection to better accommodate the flow of traffic in the area.

Background

Traffic at the intersection of Finlayson Drive and Kam Lake road has increased over the last few years due to increased development in the Kam Lake Area. This intersection is heavily used by residents of Frame Lake, Kam Lake and Grace Lake to access the City’s downtown core.

In 2003 and 2012 traffic studies conducted at the intersection indicated that, while the intersection did not meet the Transportation Association of Canada (TAC) requirements for a signalized intersection, it should be monitored due to the heavy side street traffic entering the intersection from Finlayson Drive.

In 2015 a traffic study was done for Kam Lake Road from the intersection at Old Airport Road to the proposed intersection at the Grace Lake South residential subdivision. The 2015 traffic study included current and projected traffic conditions, safety concerns, potential multi-use trail location, potential transit route and stop locations, and recommended infrastructure improvements (i.e., road widening, dedicated turning lanes, traffic lights). Preliminary findings are pending, but staff anticipates a recommendation for another traffic light and additional lanes.

This intersection is also part of Yellowknife Transit’s Route B which serves the Frame Lake area. During the morning and afternoon peak periods, transit experiences delays of up to 10 minutes in making the left turn from Finlayson Drive onto Kam Lake Road. This delay has a major impact on the transit route as it causes delays for the entire route during the peak periods of the day.

Installation of traffic lights at this intersection will include:
 widening of the Finlayson Drive to allow for turning lanes
 widening of Kam Lake Road to allow for turning lanes
 installation of traffic lights with communication and video detection equipment

The upgrades to this intersection are planned to coincide with the Annual Paving Program which is scheduled to re-do Kam Lake Road from Finlayson Drive to Deh Cho Boulevard in 2017.

Triple Bottom Line

Social

This project will address increasing resident concerns and observed traffic increases at this intersection and should decrease frustration and wait times while attempting to access Kam Lake Road from Finlayson Drive. It should also help to create a more efficient and on-time Route B of the City's transit system.

Economic

This project will create additional infrastructure and power requirements at this intersection. The costs indicated for this project are estimates only and may require updating during the 2016 budget season.

Environmental

The environmental impact of this project will be minimal, but as mentioned it should create a more efficient and on-time Route B of the City's transit system. It should also reduce vehicle idle time associated with long waits attempting access to Kam Lake Road from Finlayson Drive.

Operational Impact

The project will increase the number of traffic controlled intersections to 19, which is approximately a 6% increase in the operational budget for traffic light maintenance as well as traffic light power costs.



Photo: Aerial of the Kam Lake Road and Finlayson Drive intersection, Correction Facility entrance to the right.



CAPITAL FUND - 2017 Capital Projects

Department/Division Public Works & Engineering /Sustainability and Solid Waste Management
 Project Centralized Composting Program

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	700,000	150,000		850,000
Total:				
Gas Tax Rebate	700,000	150,000		850,000
Grants				

Purpose

To continue the phased approach of implementing a city-wide centralized composting program.

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 by the residential and commercial sectors in 2006, accounting for 26% of the total waste stream. The study recommended a significant diversion of food waste from the various sectors, which would 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 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 initial collection of organics to the end result of finished compost.

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. City Staff in conjunction with Ecology North and pilot project participants devised a multi-year, phased approach for city wide implementation. It was determined that this would be the most cost effective way of implementation because it spreads costs out over several budget seasons while minimizing resident frustration by concentrating on specific neighborhoods each year. It also allows time for consultation and engagement on how to incorporate large multi-family dwellings and “Industrial, Commercial and Institutional” (ICI) into the program.

CAPITAL FUND - 2017 Capital Projects

The following table outlines the overall anticipated costs and phases of the project:

2014 Expenditures	\$1,521,000	Retention pond and pad construction, city wide black bins, and Range Lake green bins.
2015 Expenditures	\$482,989.78	Pad extension and Niven/Old Town green bins.
2016 Budget	\$750,000	Pad extension and Frame Lake green bins.
2017 Budget	\$700,000	Pad extension and Downtown green bins.
2018 Budget	\$150,000	Multi-family residential and ICI sector collection.
Total Project Costs	\$3,603,989.78	

Triple Bottom Line

Social

This project provides the residents and businesses of Yellowknife an opportunity to participate in a city-wide initiative that will contribute to extending the useful life of the City's landfill cells. It will also produce a compost material that will be available for gardening or landscaping activities and helps us to move toward a more sustainable society.

Economic

Compost is a diversion tactic that will remove organics from the City's waste stream. The cost of landfilling waste has historically been estimated at \$150/cu.m. The City believes that this has dramatically increased with the necessary construction of new landfill cells, and will be completing a desktop study internally to update this per cubic meter cost. This project will also produce a finished material used to fertilize gardens and landscaping.

Environmental

Every cubic meter of material that can be diverted from the landfill will save money, extend the life of the landfill cells, reduce greenhouse gas emissions associated with the production of methane from the breakdown of organic matter, and will reduce the attractiveness of the landfill to birds and other wildlife.

Operational Impact

Changing the composting operation 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 feed-stocks 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 will in turn reduce the amount of staff time needed for baling activities. The overall impact on operations should be minimal as work required for composting will balance with less time required for baling waste.

The Compost Site

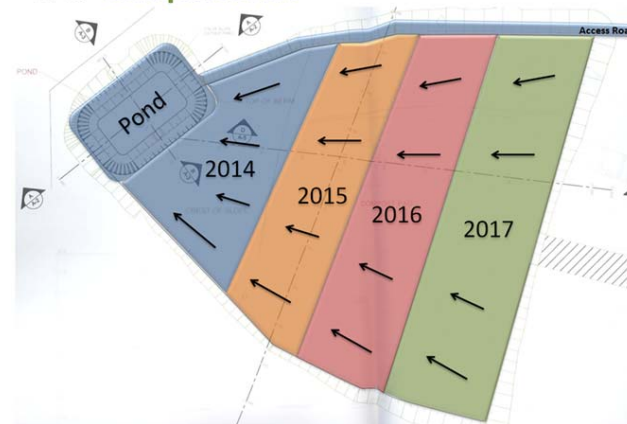


Photo: Planned phasing of the project.



CAPITAL FUND - 2017 Capital Projects

Department/Division Public Works & Engineering / Sustainability and Solid Waste Management
 Project Waste Audit & Long Term Planning Study

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	75,000			75,000
Total:				
Formula Funding	75,000			75,000
Grants				

Purpose

To reassess the City’s waste stream to better define and enhance waste diversion techniques. The study would also look at long-term planning options for solid waste management.

Background

In 2007, Gartner Lee completed a report for the City called the “Solid Waste Composition Study and Waste Reduction Recommendations”. This work completed an audit of the waste stream to better characterize the types and amounts of waste being generated in the City. There were two main objectives generated from the report. The first objective was to focus on enhancing programs for marketable recyclables; the second was to focus on organic waste management (ie. composting). This study would look at updating this information and assessing the current characterization of the waste stream.

In addition to the waste audit, the study would also focus on longer term planning and initiatives that the City can investigate and potentially implement. Also, due to the physical limitations of our current landfill arrangement, the report would look at alternatives to landfilling and other waste diversion tactics to increase the amount of waste diverted from our landfill and therefore increasing the life spans of future landfill cells.

Triple Bottom Line

Social

This project will provide a detailed look into solid waste management practices which will directly benefit the Yellowknife community.

Environmental

Enhanced diversion rates and tactics will prolong the useful life of landfill cells and will reduce the amount of waste being buried in the ground.

Economic

Every cubic meter of waste that can be diverted from landfill cells will save budget dollars in both operations and long term care of the facility.

Operational Impacts

The operational impacts of this study would be small. However, any initiatives from the study that have operational impacts would be detailed at a future date.

CAPITAL FUND - 2017 Capital Projects

Department/Division Public Works & Engineering / Community Energy Plan (CEP)/Sustainability and Solid Waste Management
 Project Community Energy Plan Projects

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	230,000	650,000	500,000	1,502,000
O&M Expenses	(62,100)	(25,000)	TBD	(87,100)
Total:				
Formula Funding	120,000	250,000	500,000	870,000
Gas Tax Rebate	110,000	400,000		632,000

Purpose

The multiple projects of the Community Energy Plan will reduce the cost of the core services offered by the City; they will reduce greenhouse gas (GHG) emissions and diversify our energy supply. The CEP makes our community more sustainable and resilient.

Background

The CEP is a plan adopted under the guidance of the Federation of Canadian Municipalities' Partners for Climate Protection Program. It was first drafted in 2006 with the objective of reducing the City's greenhouse gas emissions. The City has now completed all five milestones of the Plan and is now working on updating its energy strategy for the future, setting new targets for 2025 and 2050.

Ongoing savings from past CEP projects are estimated to have surpassed \$650,000 last year. The City also reduced its GHG emissions by more than 1,000 tonnes of CO₂, reaching the targets set in 2005.

Table Summary of Projects:

Project	2017	2018	2019
Interior LED Lighting	270,000 (w/carry over)	100,000	-
Sustainability Coordinator	100,000	100,000	100,000
Solar Panels	-	150,000	-
Community Outreach	20,000	20,000	-
Heat Pipe (PH1 to WTP)	-	150,000	-
City Hall Boiler Design	-	130,000	-
Other	-	-	400,000
TOTAL	390,000	650,000	500,000



CAPITAL FUND - 2017 Capital Projects

The 2016 Interior LED lighting project was not completed due to staff turnover and other workload priorities. The allocated budget of \$160,000 is recommended for carryover and is shown in the above table in 2017 combined with the allocation for LED lighting in 2017 for a total of \$270,000.

At this time no specific projects are noted for the 2019 fiscal year and similar to projects listed for 2018, would only be approved in principle for the 2017 budget deliberations. City staff will continue to finalize the new CEP document and will work towards new initiatives that will be encompassed in the 2016-2026 Community Energy Plan.

Triple Bottom Line

Social

These projects will help reduce operational costs for the City of Yellowknife in regards to energy use projects which depend on either heating fuel or electricity. Savings realized by these projects reduce City expenditures in these areas, thus savings in budget allocations for fuel and power.

Economic

These projects also continue to provide economic benefit to operations in the areas of fuel and power consumption. Ongoing savings from CEP projects are estimated to have surpassed \$650,000 at the end of 2015.

Environmental

These projects continue to help City of Yellowknife operations reduce GHG emissions. As noted, since targets were set in 2005, the City has reduced our GHG output by more than 1,000 tonnes of CO₂. The projects noted within are estimated to increase this reduction by approximately 405 tonnes.

Operational Impact

The specific projects detailed will have positive operational impacts in regards to fuel and power cost savings. There will be no operation expenses incurred as a result from these projects other than project management of the installations.

CAPITAL FUND - 2017 Capital Projects

Department/Division Public Works & Engineering / Community Energy Plan (CEP)/Sustainability and Solid Waste Management
 Project Biomass Boiler Projects

Expenditures & Funding Sources	2016 carryover \$	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost:	1,075,000	1,075,000		600,000	2,750,000
Centralized Biomass Boiler	1,075,000	1,075,000			2,150,000
Second PH#1 Biomass Boiler				600,000	600,000
O&M Expenses					
FTE			90,080	94,600	184,680
Other			(157,000)	(179,500)	(336,500)
Total:					
Gas Tax Rebate		1,075,000		600,000	1,675,000
Grants					

Purpose

To install a centralized biomass boiler system to serve the Multiplex, Fieldhouse, Fire Hall, City Garage and Community Services Shop. As well as install a second biomass boiler at Pump House #1 as part of the second phase of the project.

Background

Phase 1 of the centralized biomass boiler project was publicly tendered in 2016 with an approved budget allocation of \$1,075,000, with Phase 2 tentatively scheduled for 2017. There was one bidder for the project, but the final amount was \$380,079.50 over the allocated budget for 2016. While the bidding contractor is highly competent and recommended, City Administration could not award the contract for the tendered amount as there was not sufficient budget allocated to cover the tendered amount.

The 2016 budget of \$1,075,000 is carried over into the 2017 budget to create a total budget allocation in 2017 of \$2,150,000. It is recommended that the entire project be tendered in its entirety rather than the previ-

ously recommended phased approach. City Administration hopes to gain some economies of scale with a much larger and complete project, but may require an increase in budget should the tender amounts come in high.

There is a Phase 3 of the project as shown on the enclosed sketch which includes Lift Station #5 and Public Works Parking Garage. City staff will complete a feasibility analysis to determine if this phase should occur. To date it is not included in the capital plan.

A second biomass boiler is planned for Pump House #1. Once the heat distribution pipe is installed between Pump House #1 and the Water Treatment Plant, boilers in both facilities can share their space heating loads. The remaining heat load of approximately 150,000 liters of oil, not covered by the capacity of the single biomass boiler, would need to be supplied by a second boiler installed in the system. This is the budget allocation shown in 2019.



CAPITAL FUND - 2017 Capital Projects

Triple Bottom Line

Social

These projects will help reduce operational costs for the City of Yellowknife in regards to heating fuel consumption. Savings realized by these projects reduce City expenditures in these areas, thus savings in budget allocations for heating fuel.

Economic

These projects also continue to provide economic benefit to operations in the areas of fuel and power consumption. Ongoing savings from CEP projects are estimated to have surpassed \$650,000 at the end of 2015. These two installations alone are expected to save \$157,000 and \$179,500 in 2018 and 2019, respectively. This is dependent on the price of heating fuel remaining high.

Environmental

The estimated total GHG emission reduction for these two projects is 1,350 tonnes.

Operational Impact

During the 2016 budget deliberations, Phase 1 of the centralized project was approved along with one (1) full time permanent position. This position was not filled because the project was deferred until 2017 but is still accounted for in the budget. This position is still required because of the continued addition of biomass boilers to city operations. Once these projects are completed, the City will have five (5) biomass boilers to maintain and operate, plus an additional boiler in the design stages for City Hall and RCMP headquarters should it be approved. This full time position is shown in the expense table above for 2018 and forward as the position is not anticipated to be needed until late 2017 or early 2018.

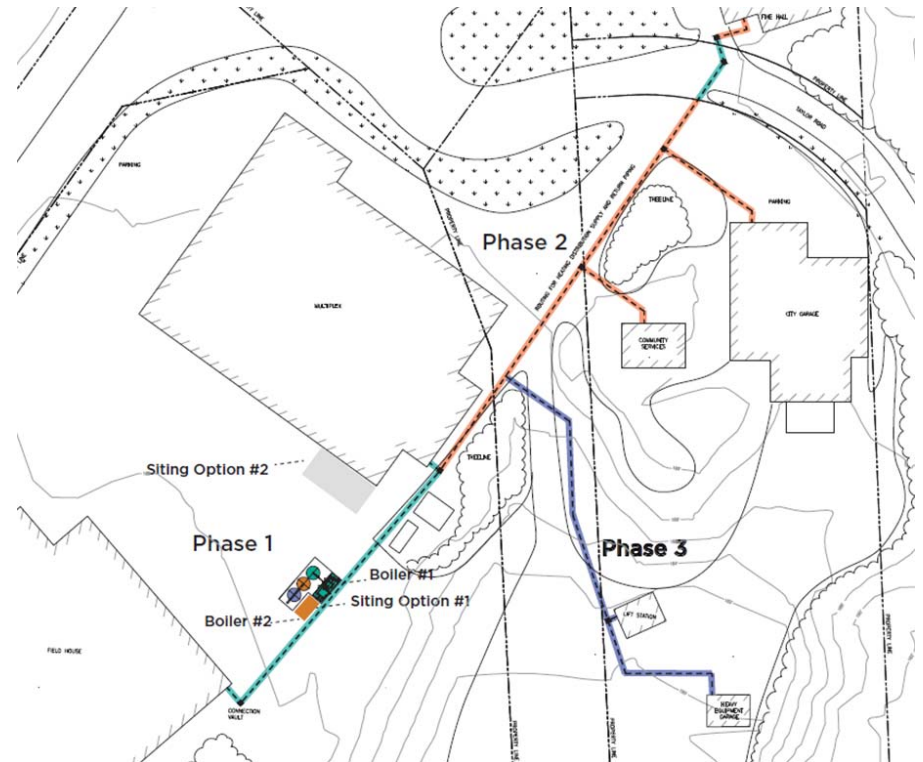


Photo: Phasing of the centralized biomass boiler project. Phases 1 and 2 to be completed in 2017. Phase 3 yet to be determined.

CAPITAL FUND - 2017 Capital Projects

Department/Division Public Works & Engineering / Water and Sewer
 Project Pump House #4 Right-Hand Only Exit

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	50,000			50,000
Total:				
Water & Sewer User Fees	50,000			50,000
Grants				

Purpose

To create a right-hand turn out from the parking lot at Pump House 4 onto Old Airport Road.

Background

Pump House #4 (PH4) is one of the City's main pump houses that forms the City's potable water distribution system. Other services provided at PH4 are a RV (recreational vehicle) sewage disposal connection and a potable water truck fill connection that is used by residents, tourists and multiple contractors.

As shown in the sketch, the vehicles currently enter off Old Airport Road as indicated by the dotted black line. Once finished with whatever service being used, they must navigate the parking lot as shown with the black dotted arrow leader. This manoeuvring can be very difficult depending on the vehicle and if there is an RV in tow. In some instances, multiple point turns are required and can lead to congestion during peak periods. It also requires left turning traffic (indicated with an "X") to cross two on-coming lanes of traffic on Old Airport Road with a large vehicle or heavy load in tow.

Additionally, this can also impact the City's trucked potable water contract

deliveries if the contractor has to wait for other users to vacate the truck fill area.

A right-hand turn, exit only, installation is recommended to help alleviate this situation. This will allow vehicles an easy access point back onto Old Airport Road. The recommended exit is indicated with a red arrow leader.

Triple Bottom Line

Social

This will provide users of the facility an easier means of egress from the pump house parking lot to Old Airport Road and will reduce potential traffic conflicts.

Economic

This will allow for the better flow of traffic for residents, tourists and contractors which will reduce queue times for people waiting to make use of the services.



CAPITAL FUND - 2017 Capital Projects

Environmental

There will be little to no environmental impacts of this project other than removals required for the construction of the new exit area.

Operational Impact

The installation of this exit should present minimal operational impacts.

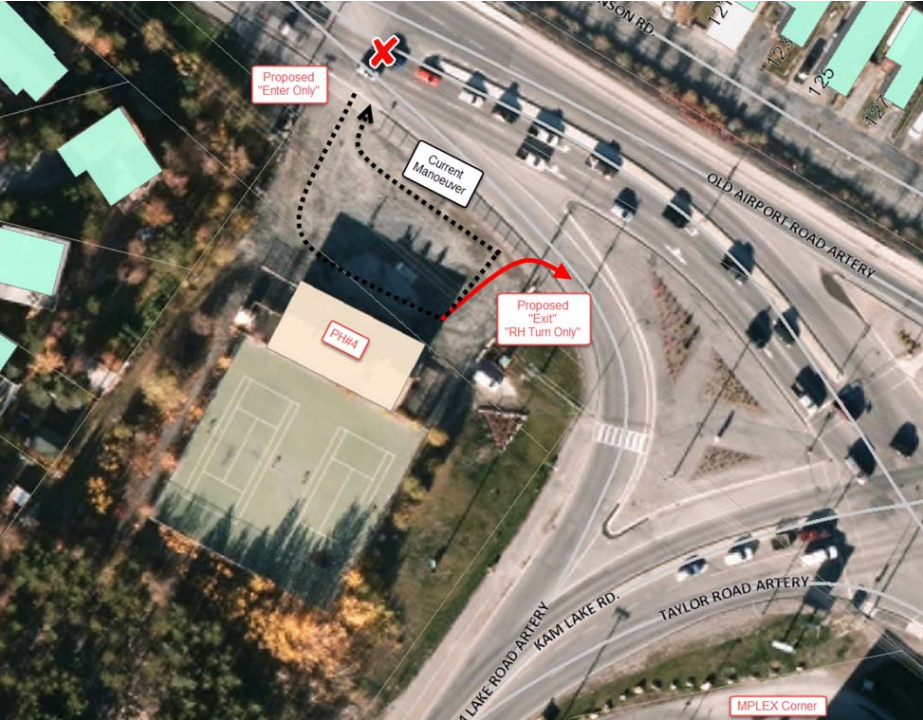


Photo: Proposed Right-Hand Only Exit at Pump House #4.

CAPITAL FUND - 2017 Capital Projects

Department/Division Public Works & Engineering / Water and Sewer
Project Lagoon Phosphorus Study

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	50,000			50,000
O&M Expenses				
Total:				
Water & Sewer User Fees	50,000			50,000
Formula Funding				
Grants				

Purpose

To complete an environmental risk assessment of the effect of phosphorus in the lagoon, wetland system and receiving water body as required by the Mackenzie Valley Land and Water Board (MVLWB) as part of the City's Water Licence requirements.

Background

The City's current water licence has required numerous studies to be performed on the Fiddler's Lake Lagoon and Wetland System. The MVLWB has requested an additional study be done regarding the effect of phosphorus on the receiving water body, Great Slave Lake. This study will be modelled after the CCME Canada-wide Strategy for the Management of Municipal Wastewater Effluent. It is anticipated once the environmental risk assessment for phosphorus is completed, changes will be made to the effluent criteria at the compliance point for the City's water licence.

Triple Bottom Line

Social

This project will assist with proper characterization of wastewater effluent quality parameters to meet the needs of the municipality and its residents.

Economic

There are minimal economic impacts aside from the budget allocation required to complete this study. The results of this study will determine whether additional treatment of wastewater to remove phosphorus is required.

Environmental

This study is to determine the environmental effects of phosphorus in the lagoon and wetland system. High concentrations of phosphorus in water bodies can cause algae blooms and die offs which contribute to the depletion of oxygen in the water - a process known as eutrophication. It is necessary to balance the amount of phosphorus available to ensure the environment does not become oxygen deficient.

Operational Impact

This study will not produce an operational impact. However, the recommendations resulting from the completed study may have operational impacts which would be detailed at a later date.



CAPITAL FUND - 2017 Capital Projects

Department/ Division Public Works & Engineering / Water and Sewer
 Project Water Source Selection Study

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	75,000			75,000
O&M Expenses				
Total:				
Water & Sewer User Fees	75,000			75,000
Grants				

Purpose

To review recommendations of work completed by consultants in 2011, incorporate data collected since 2011 and provide an updated recommendation to Mayor and Council on potable water source selection.

Background

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

The submarine pipeline was installed by the federal government in the late 1960's at the Yellowknife River to access water that was upstream of any arsenic contamination from mining activities in and surrounding Yellowknife. This pipeline is nearing the end of its useful life.

Submarine inspections completed in 2016 showed leaking occurring near the junction where an old service to Giant Mine was taken from the main pipeline. This further supports the need to make a decision regarding the City's water source. The submarine pipeline either needs to be replaced, or the City needs to switch to Yellowknife Bay as the primary water source.

The recommendation by consultants in 2011 was to move to Yellowknife Bay as the primary water source with the addition of an arsenic treatment system to be installed in the water treatment plant. There is concern within the community that a discharge from Giant Mine could contaminate the water source, regardless of the installed arsenic treatment process.

A presentation was made to City Council on June 27, 2016 to update the current City Council on the specifics surrounding the water source discussion. Administration recommended a review of historical information and recommendations, and incorporating all data to date. The study will produce an updated recommendation and will be brought forward for Council's consideration.

Triple Bottom Line

Social

There is concern within the community regarding the potential of a discharge from Giant Mine contaminating the City's water source should Yellowknife Bay be chosen as the primary water source. This study will amalgamate past recommendations with current data and bring forward an updated recommendation.

CAPITAL FUND - 2017 Capital Projects

Economic

There will be minimal economic impacts aside from the budget allocation required to complete this study.

Environmental

There will be no environmental impacts associated with this study. The impacts of the recommendations resulting from the study would be detailed at a later date.

Operational Impacts

Similar to the environmental impacts, this study will not produce an operational impact. However, the recommendations resulting from the completed study may have operational impacts and would be detailed at a later date.

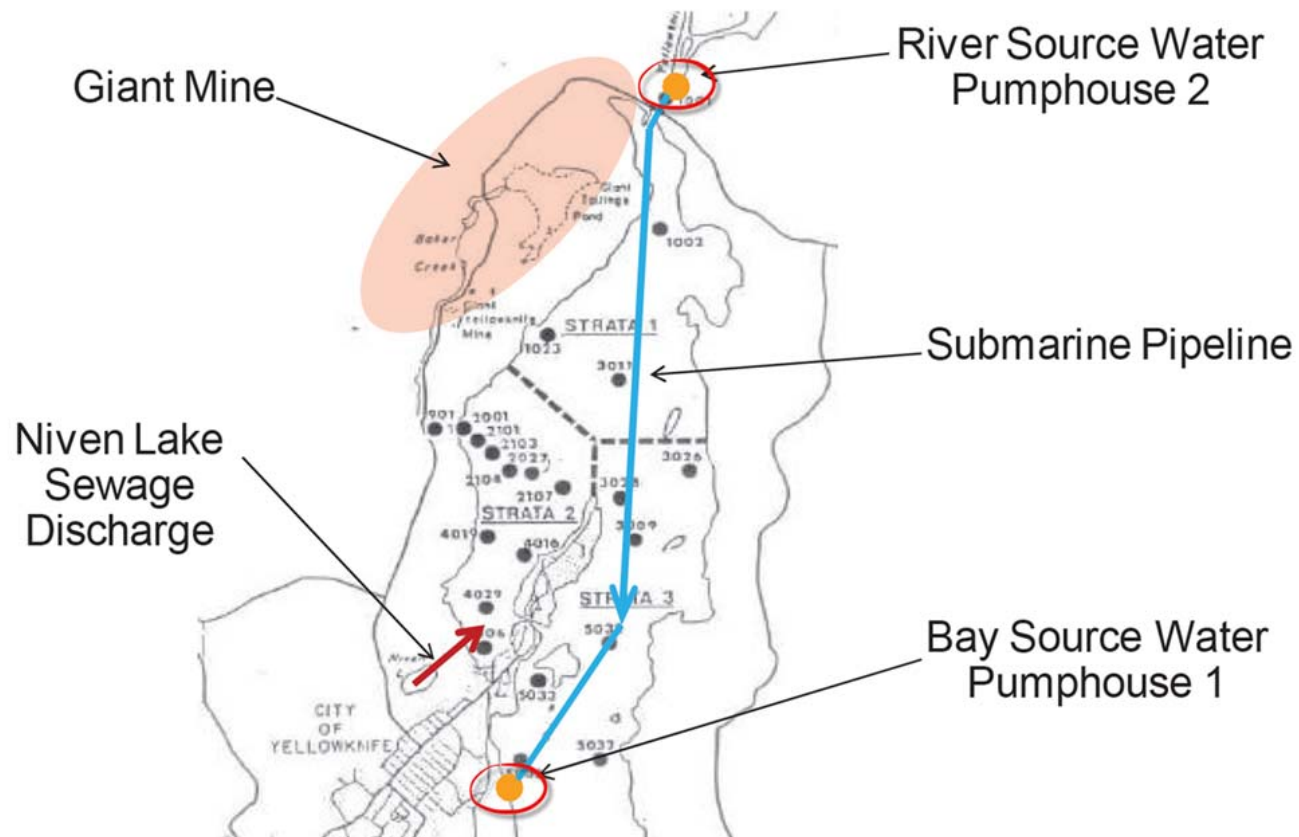


Photo: Sketch showing both water source and submarine line locations.



CAPITAL FUND - 2017 Capital Projects

Department/Division Public Works & Engineering / Water and Sewer
 Project Annual Water and Sewer Infrastructure Replacement

Expenditures & Funding Sources	2017 \$	2018 \$	2019 \$	Total \$
Capital Cost	2,880,000	4,300,000	3,300,000	10,480,000
<i>Con Road (Paving)</i>	<i>780,000</i>			
Willams Avenue	2,100,000			
<i>Williams (Paving)</i>		800,000		
Dagenais Drive		3,500,000		
<i>Dagenais (Paving)</i>			1,800,000	
54 Avenue			1,500,000	
Total:				
Gas Tax Rebate	2,880,000	4,300,000	3,300,000	10,480,000
Grants				

Purpose

To replace failing underground water and/or sewer infrastructure on a planned and prioritized basis to reduce reactive maintenance costs.

Background

In the late 1940s, the City began providing piped water and sewer services in the present downtown area. Pump House #1 was constructed during this time to draw water from Great Slave Lake and distribute it to the downtown residents of Yellowknife. By 1977, the sewer mains had degraded to the point of failing entire sections of the city’s piped system. The water and sewer mains were comprised of cast iron and corrugated metal pipe (CMP) respectively, and were predominantly uninsulated. The pipe material, combined with no insulation in the freeze/thaw layer, resulted in high maintenance and repair costs that the City continues to deal with today.

The City has since changed pipe material standards to insulated, ductile iron pipe. With these changes to City standards, the life expectancy of

water and sewer mains can be as much as 50 years. However, prevailing ground conditions and permafrost presence can impact the life span of pipe installation.

Currently included in annual Water & Sewer Infrastructure Replacement is 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 concrete vaults with manhole access;
- Replacement of individual lot water and sewer services where deemed necessary;
- Road stabilization and reconstruction with crushed rock backfill;
- Completion of the project with concrete sidewalks and a paved roadway.

Triple Bottom Line

Social

This project provides safe and reliable water and sewer infrastructure necessary for quality of life of our residents.

Economic

This project is a strategic investment in Yellowknife's water and sewer infrastructure. It is a proactive approach to address the infrastructure deficit that was identified in an infrastructure needs assessment. Continuous improvement is vital to ensuring the provision of essential services to residents.

Environmental

This project replaces old and potentially failing infrastructure in Yellowknife neighbourhoods with new and reliable assets. This removes the possibility of ground and property contamination due to main breaks or blockages.

Operational Impacts

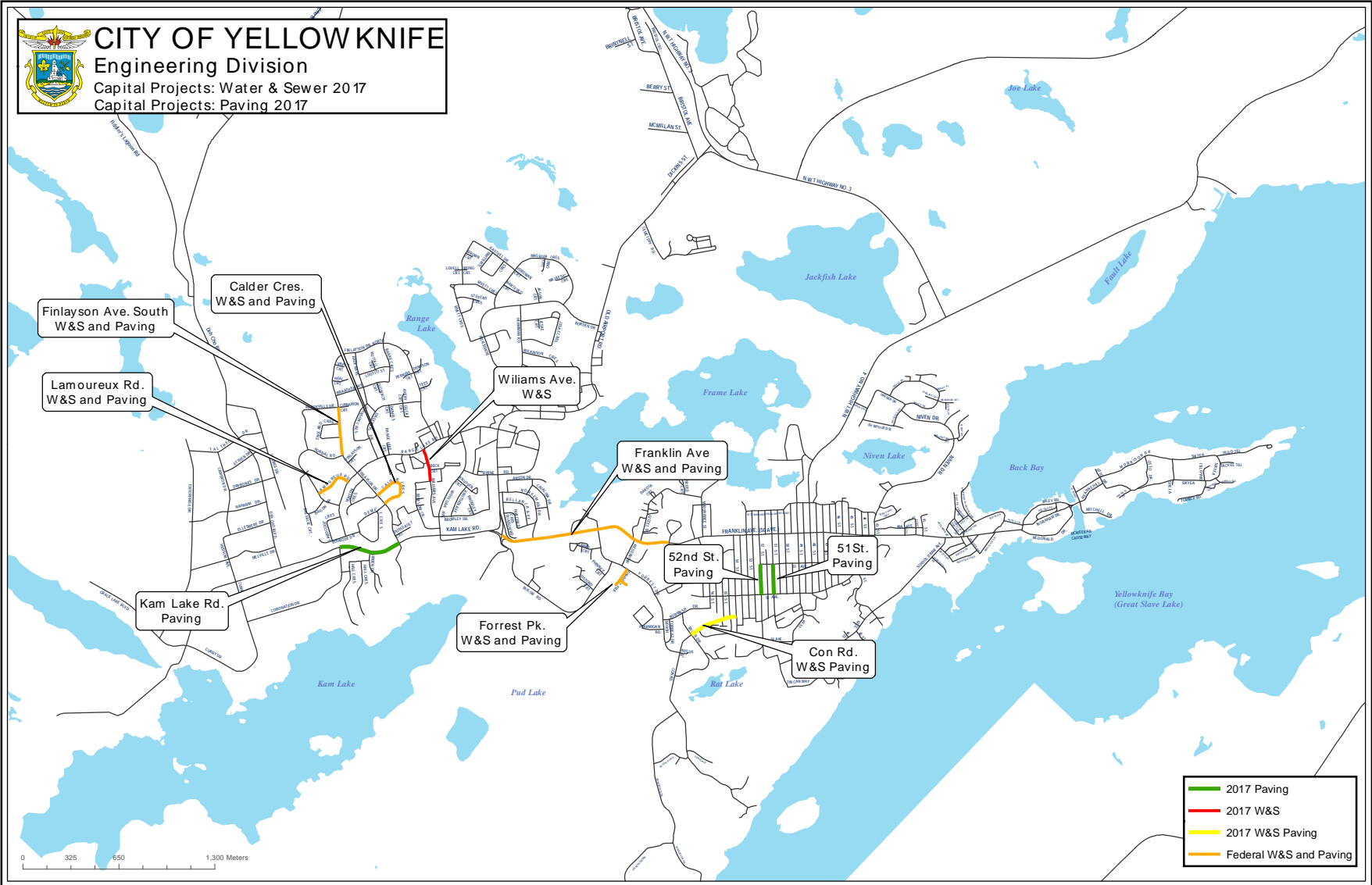
Aging infrastructure has an operational cost somewhere between 2-4% of replacement costs. By replacing this infrastructure, it allows the department to focus operational and maintenance activities in other areas of the water and sewer systems.

This project will have minimal impact on other City departments.



Photo: Failed CMP sewer main showing no bottom left in the pipe

CAPITAL FUND - 2017 Capital Projects



CAPITAL FUND - 2017 Capital Projects

